CUTTING SOLUTIONS BY CERATIZIT

COMPLETE RANGE

CUTTING TOOLS

2016

EN

CUTTING SOLUTIONS BY
CERATIZIT

CUTTING TOOLS

COMPLETE PROGRAMME


PM 16R-2.25D

Introduction

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Tools and Inserts for turning

Tools and inserts for milling

Tools and inserts for parting and grooving

Tools and inserts for drilling

Multi-function tools

Solid carbide tools

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Welcome to CERATIZIT

Our dedication is your solution!

For over 90 years, we have been producing unique and consistently innovative hard material solutions for cutting tools, wear protection, as well as wood and stone working. Whether it's highly specialised cutting tools, inserts, or rods and preforms made of hard materials, with a total of four top class brands, the CERATIZIT GROUP is your partner for exceptional and custom-made hard material solutions which guarantee the economy, consistency and performance of your production. Ever more powerful machines, facilities and machining methods constantly create new challenges for our development engineers. More than 5,900 employees worldwide are already working today on the solutions of tomorrow.

Hard material for your success

Hard materials in general and hard materials in particular are applied wherever tools or components are exposed to high wear. They improve the quality of the tools and parts, extend the life of the tool and ensure secure processes. High pressure and temperature, the application of abrasive or aggressive materials, and the machining of hard materials are just some examples of factors that cause wear, and to which our hard materials and hard metals are resistant.

Cutting Solutions by CERATIZIT – your creative partner for competent dialogue

Cutting Solutions by CERATIZIT is one of the four top class brands of the CERATIZIT GROUP. As part of this quality label, we offer you a comprehensive range of premium standard products for the cutting tools sector: benefit from inserts and solid carbide tools with maximum precision and the best performance for turning, milling, drilling, parting and grooving. As a creative partner, we develop industry-specific and individual solutions in consultation with you, with which you can optimise your productivity, for example in the automotive sector, mechanical engineering as well as in the energy and transport industries. Trust in services which guarantee a real added value and quality from the raw material to the ready-to-use tooling solution.

Guided by corporate values

During his everyday tasks every single employee of the CERATIZIT GROUP relies on the solid basis of our corporate values:

① The views and focus of our business partners matter

Instead of talking product with customers, we work on real solutions for business partners.

② Innovative and flexible thinking matters

We challenge state-of-the-art technologies and develop intelligent alternatives. Our speed of thought and decisive actions give us a leading edge.

③ Communication matters

Trust and respect enable open communication. We show who we are and what we feel. We keep our promises. We are open to and accept constructive criticism.

④ Employee development matters

We continuously invest in personnel and offer outstanding internal development opportunities. We attract talents around the world and create a favourable environment for long-term personal growth.

⑤ Professionalism matters

We strive to be professional in everything we do. Our performance leads to results and growth which are always above average.

⑥ Our environment matters

Environmental protection is a matter of each employee – at home and at work. As a company we guarantee the community to be a 'considerate neighbour'.

The carbide formula for success

The CERATIZIT GROUP has the metallurgical competence that allows it to control the entire process chain of carbide production: from raw materials production and powder preparation to forming, sintering and finishing, we can make the right adjustments at any time and adapt the material properties to your individual requirements.

Composite materials with valuable properties

Cemented carbides are composite materials consisting of a hard component and a comparatively soft binder metal, such as cobalt. The performance characteristics of carbide are determined by hardness, transverse rupture strength and fracture toughness. With regard to their application, important parameters for the optimisation of the characteristics here are the cobalt content and the grain size of the metal binder phase. The tungsten carbide grains have an average size of 0.5 up to several micrometres (µm). The cobalt fills the gaps between the carbide grains. On the one hand, when extremely high toughness is required, the cobalt content can amount up to 30%. On the other, the cobalt content is reduced and the grain size decreased to the submicron range (for example 0.3 µm), in order to guarantee maximum wear resistance.

CERATIZIT produces far more than 100 different carbide grades particularly for wear parts and cutting tools, thus offering a customised solution for every one of your applications.

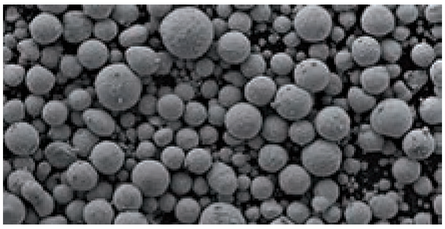
Carbide production

W-Ti-Ta oxides

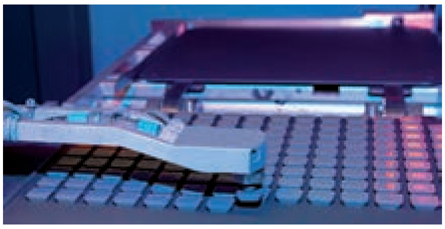
Reduction

Carburising, mixing and milling process

Granulation

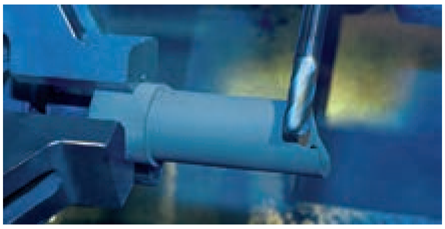


Pressing

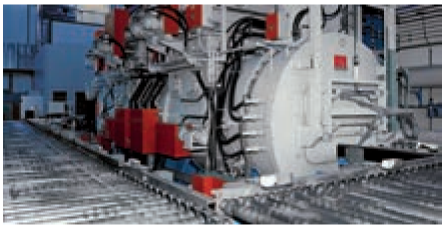


Presintering

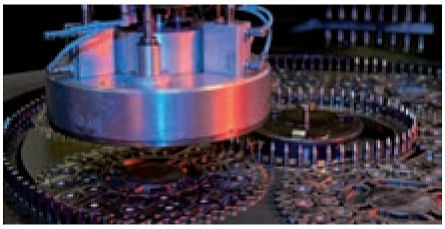
Forming



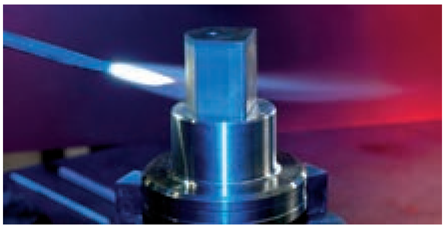
Final sintering



Finishing

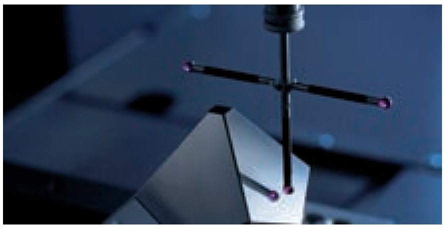


Tool and die construction, mechanical engineering

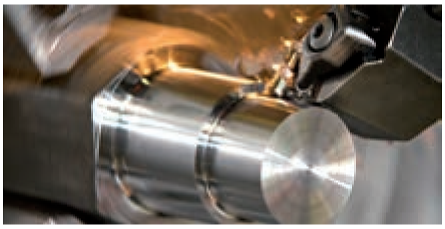


Coating

Control

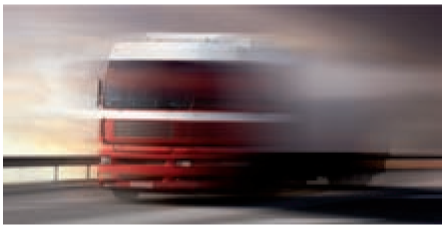


Testing (Tooling Academy)



Packaging

Dispatch



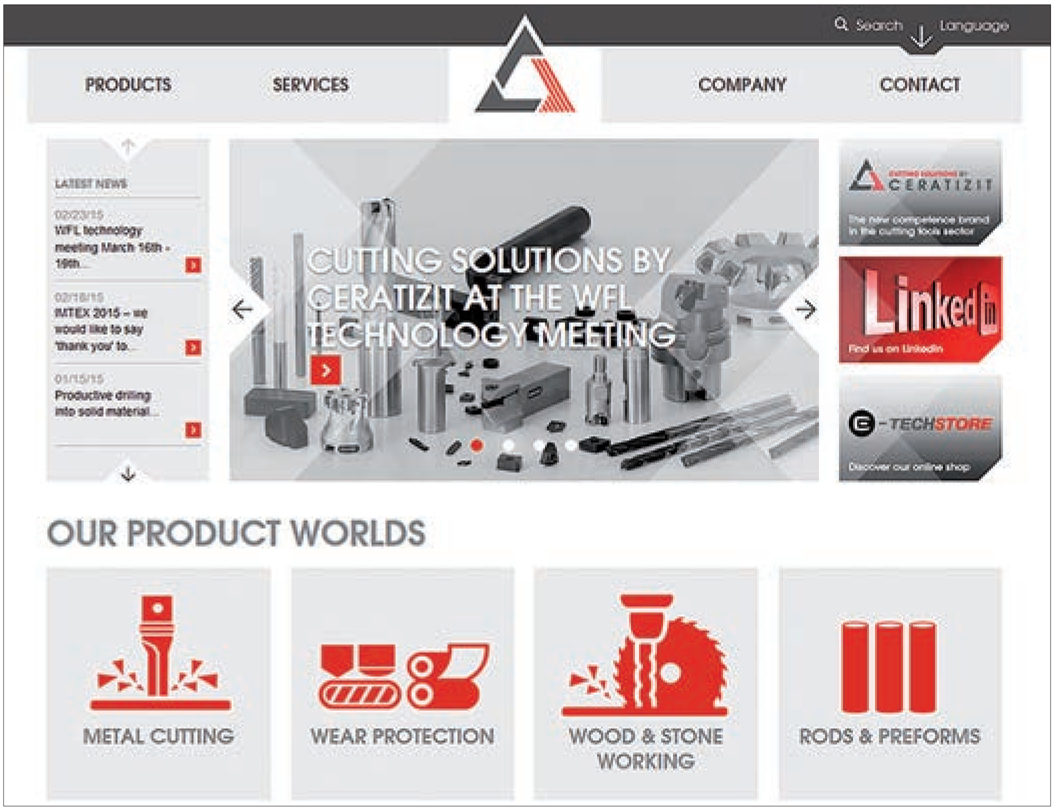
Online service

Of course we are also available for you online – around the clock! On the new CERATIZIT website you will not only find details about our innovative products, but you can also order them.

Orders can be placed in our new and improved E-TECH-STORE. With the CONFIGURATE service you can even order customised semi-standard tools.

The new CERATIZIT website

CERATIZIT's website combines a modern design with increased user-friendliness making it easy and intuitive to use on mobile devices.



02/23/15
WFL technology meeting March 16th - 19th...

02/18/15
IMTEX 2015 – we would like to say 'thank you' to...

01/15/15
Productive drilling into solid material...

CERATIZIT Product Worlds

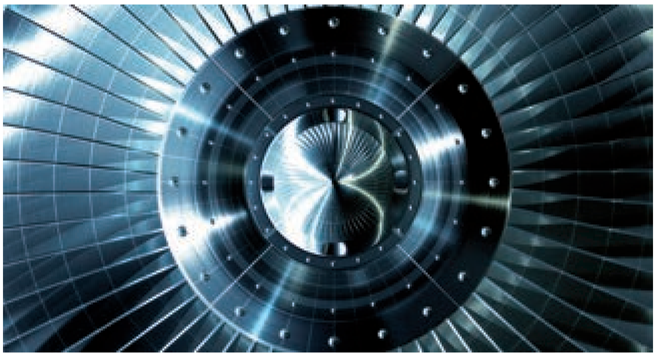
In our various Product Worlds, you have access to over 80 pages with product details on cutting tools, rods & preforms, wear protection and wood & stone machining. Discover product videos, application examples and success stories.

Engineering

Benefit from our decades of experience and the unique knowledge about the behaviour of materials during engineering. Let our experts analyse your application process in detail and choose the right product range for you.

Service package

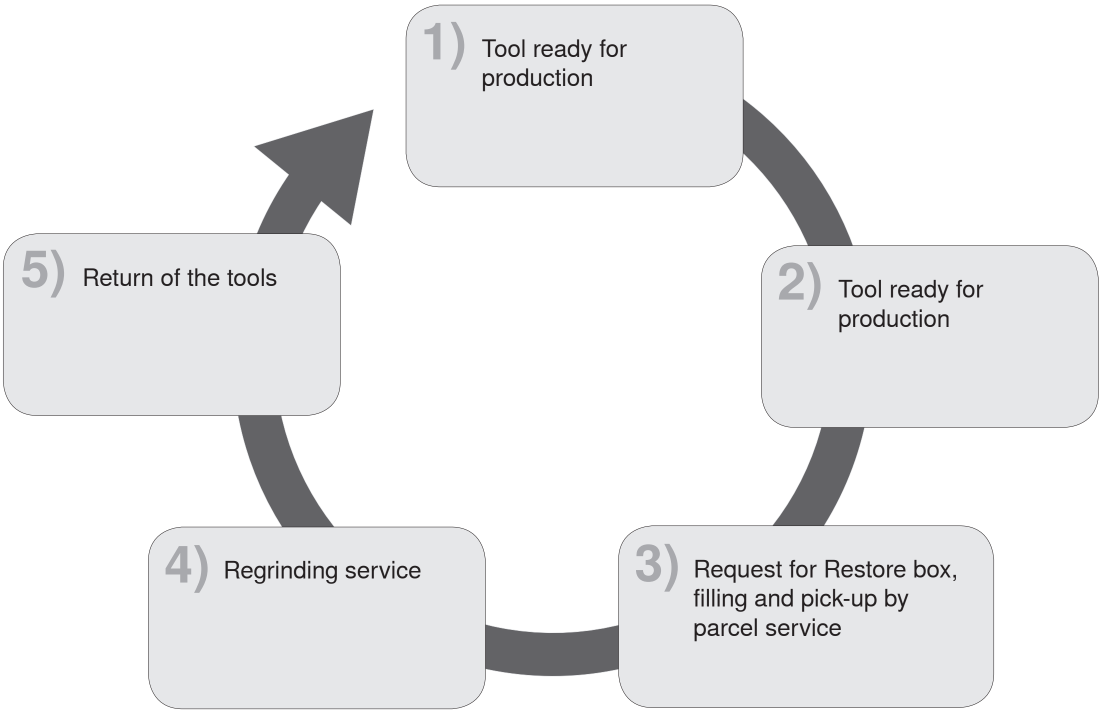
- ○ Recommendation of application data and tools with regard to product design
- ○ Technical support via e-mail and telephone
- ○ On site technical support for customers and distributors for all standard and segment products
- ○ Elaboration of suggestions for machining
- ○ Assessment of reduced output
- ○ Implementation of market trials
- ○ Support and presence at trade fairs
- ○ Technical training for customers, distributors and sales representatives



RESTORE

Regrinding service for standard, semi-standard and special tools

Rely on the internationally renowned and consistently high product quality from CERATIZIT and its reliable service tailored to your needs and products. This includes the regrinding of solid carbide tools, as despite both maximum quality and tool life every tool sooner or later reaches its wear limit.
As always, the prices of our RESTORE service are fair and transparent. For the CERATIZIT standard range they depend on the extent of the service and the tool group. Prices are, however, the same regardless of the condition the tools are in at their arrival.



Almost as good as a new tool

You will receive the ground tools with their original geometries. The tools are ground on the original machines with the original programmes and, if requested, coated in the original coating facilities. The reground tool has virtually 100 % of the tool life and cutting performance of a new tool.

Your advantages

- High process security as the process parameters are the same as for new tools
- Clearly reduced production and tooling costs
- Lower tool inventory thanks to quick service

What to do:

- ○ Write an e-mail to restore@ceratizit.com or contact your local sales representative or the CERATIZIT support centre directly.
- ○ Upon request you will receive our specially developed RESTORE service box for the safe transport of your tools, including the regrinding order form to ensure uncomplicated order handling.
- ○ After filling the RESTORE service box, simply call the service number or send an e-mail to restore@ceratizit.com.
- ○ At the latest on the following working day, the authorised parcel service will collect the service box. We will, of course, cover the costs for the return of your tools.
- ○ Upon arrival your tools will be checked in our regrinding centre in order to find out if or to what degree they can be reground. If it is not possible to regrind a tool, it will be returned to you without being reground.
- ○ Your tools will be ground to manufacturer's standard and coated if required. All reground tools are subject to strict quality control by qualified employees before they are dispatched. Upon request we will enclose a measurement report.

After completion of the regrinding service you will receive your tools back in the original CERATIZIT packaging. The standard delivery time is 15 working days. Your tools will be returned according to the conditions agreed with you.

Any questions? Feel free to contact us!
E-mail: **restore@ceratizit.com**

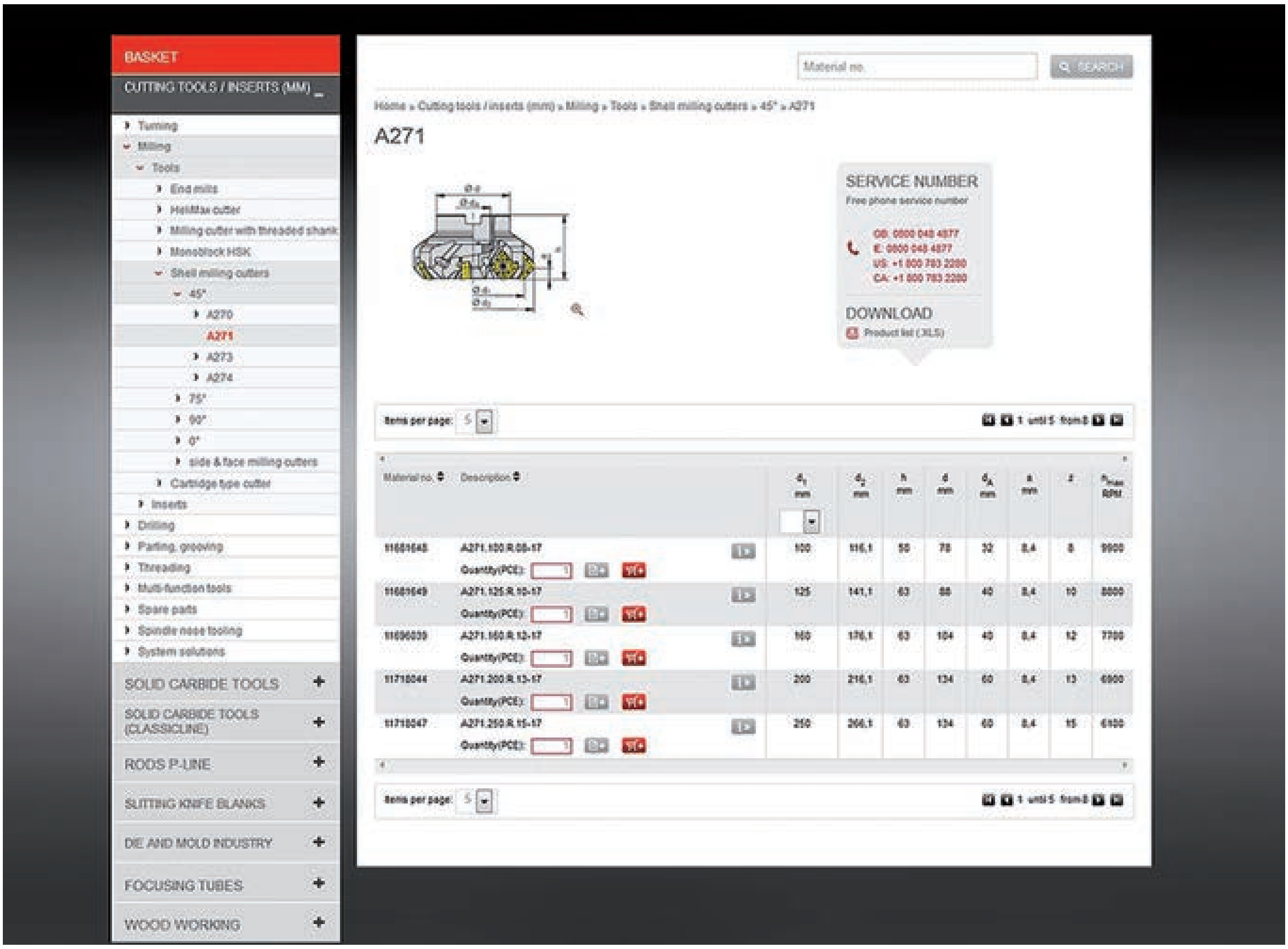
E-TECHSTORE

Our online shop offers more than 25,000 standard and special products: tools with inserts and solid carbide tools for the cutting tools sector as well as products for wood and stone machining, carbide rods, blanks for slitting knives, products for the tool and die industry and focusing tubes.

Order 24/7 and check availability for all products in real time.

Everything at a glance

See all important product information at a glance, including STEP files and an overview of all customer-specific online and offline transactions with CERATIZIT. Via the 'track & trace' feature you can view the progress of your order at any time. If required you have the possibility to get in touch directly with your individual contact person.



Home » Cutting tools / inserts (mm) » Milling » Tools » Shell milling cutters » 45° » A271

A271

SERVICE NUMBER

Free phone service number

GB: 0800 048 4877
IE: 0800 048 4877
US: +1 800 783 2280
CA: +1 800 783 2280

DOWNLOAD

Product list (XLS)

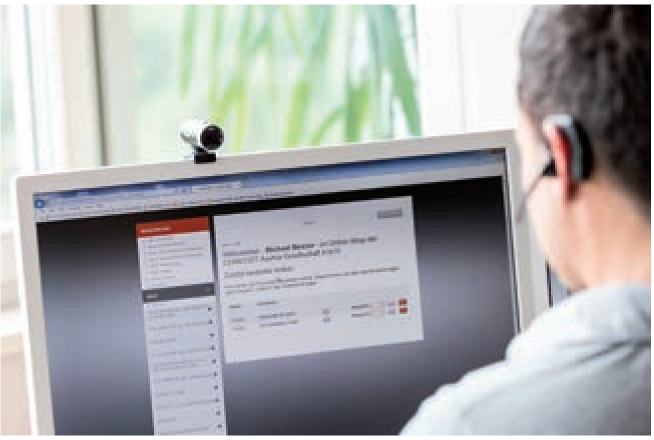
Material no.	Description	d_1 mm	d_2 mm	h mm	d mm	d_A mm	a mm	z	n_{max} RPM
11681648	A271.100.R.08-17 Quantity(PCE): 1	100	116,1	50	78	32	8,4	8	9900
11681649	A271.125.R.10-17 Quantity(PCE): 1	125	141,1	63	88	40	8,4	10	8000
11696039	A271.160.R.12-17 Quantity(PCE): 1	160	176,1	63	104	40	8,4	12	7700
11718044	A271.200.R.13-17 Quantity(PCE): 1	200	216,1	63	134	60	8,4	13	6900
11718047	A271.250.R.15-17 Quantity(PCE): 1	250	266,1	63	134	60	8,4	15	6100

Easier to use

Thanks to the user-friendly design and intelligent navigation you will quickly and easily find the product information you need.

We have simplified the ordering process. Recurring orders are now also possible. Furthermore we have optimised our shop for use with tablet PCs and smartphones.

In the new profile area you can manage your personal data.



Connection to your system

Want to connect your ERP system to our shop? No problem! Our e-commerce team will be happy to help. Our IT supports all common linkage formats (EDI, XML, OCI, etc.).
Don't hesitate to contact us! Our technical engineer will analyse your requirements together with you and will help you to choose the right technology.

Any questions? Feel free to contact us!
E-mail: **esolutions@ceratizit.com**

OEM service

You will receive not only excellent cutting tools but also customised complete solutions and tooling packages for optimal machining of entire work pieces on your machine.

Your service package

Every project is supported by a large team comprising various specialisations and fields of expertise. No matter whether project leader, employees in the field or in the office, engineers, construction, production or logistics – you will benefit from the full range of services of an international company with a worldwide service network:

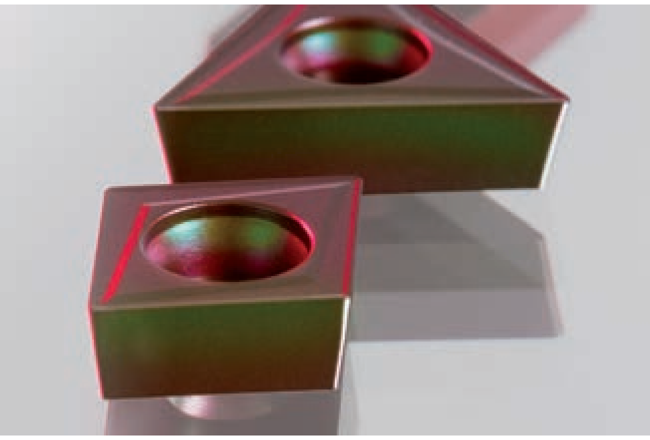
- o Definition of machining phases with tool assignment
- o Determination of cutting data and calculation of machining times
- o Calculation of machining costs per piece
- o Projection of tooling costs per piece
- o Calculation of performance (cutting forces, spindle power, torque moment)
- o Testing at the CERATIZIT Tooling Academy
- o Tool mounting and presetting
- o Support during final acceptance and commissioning runs
- o Detailed project documentation

Everything from one source – operating globally for you

Our OEM team coordinates every project centrally from our centre of excellence for Cutting Solutions by CERATIZIT in Reutte, Austria. In this way we are able to guarantee maximum professionalism and reliability as well as solutions that are individually adapted to your requirements. Additionally, we will provide you with the expert support you need when implementing your specific concept on site – anywhere in the world!

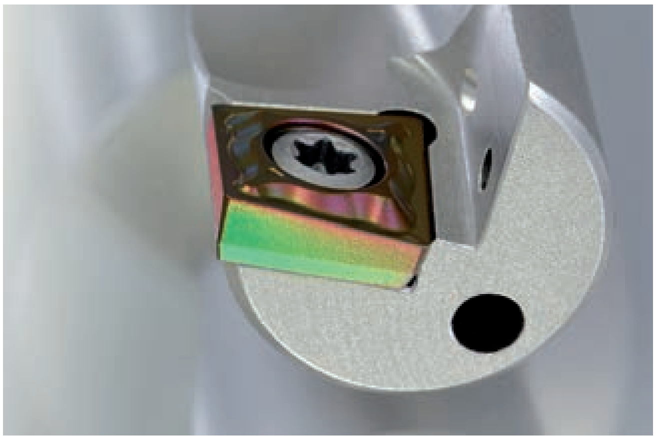
Variable tooling offer

In addition to the analysis and optimisation of the machining processes, we offer suitable tooling packages with CERATIZIT tools, including spindle nose tools, accessories and spare parts.



Cutting materials

Based on the application we recommend the suitable cutting material including a suitable coating: no matter whether carbide, cermets, cutting ceramic, PCD or CBN - the entire process chain for the manufacture of the products is carried out in-house. This enables us to offer you first class quality.



Standard tools

We provide a wide range of inserts and solid carbide tools for cutting tool applications, including multi-function tools. Discover the performance capacity and reliability of our products for yourself.

Industry-specific solutions

A large selection of our tools and inserts is applied with great success in the aerospace industry, power engineering, automotive, heavy duty machining or oil production. Benefit from our long-standing and comprehensive focus and know-how in these areas of application for cutting tools.

Any questions? Feel free to contact us!
E-mail: **info@ceratizit.com**

CONFIGURATE

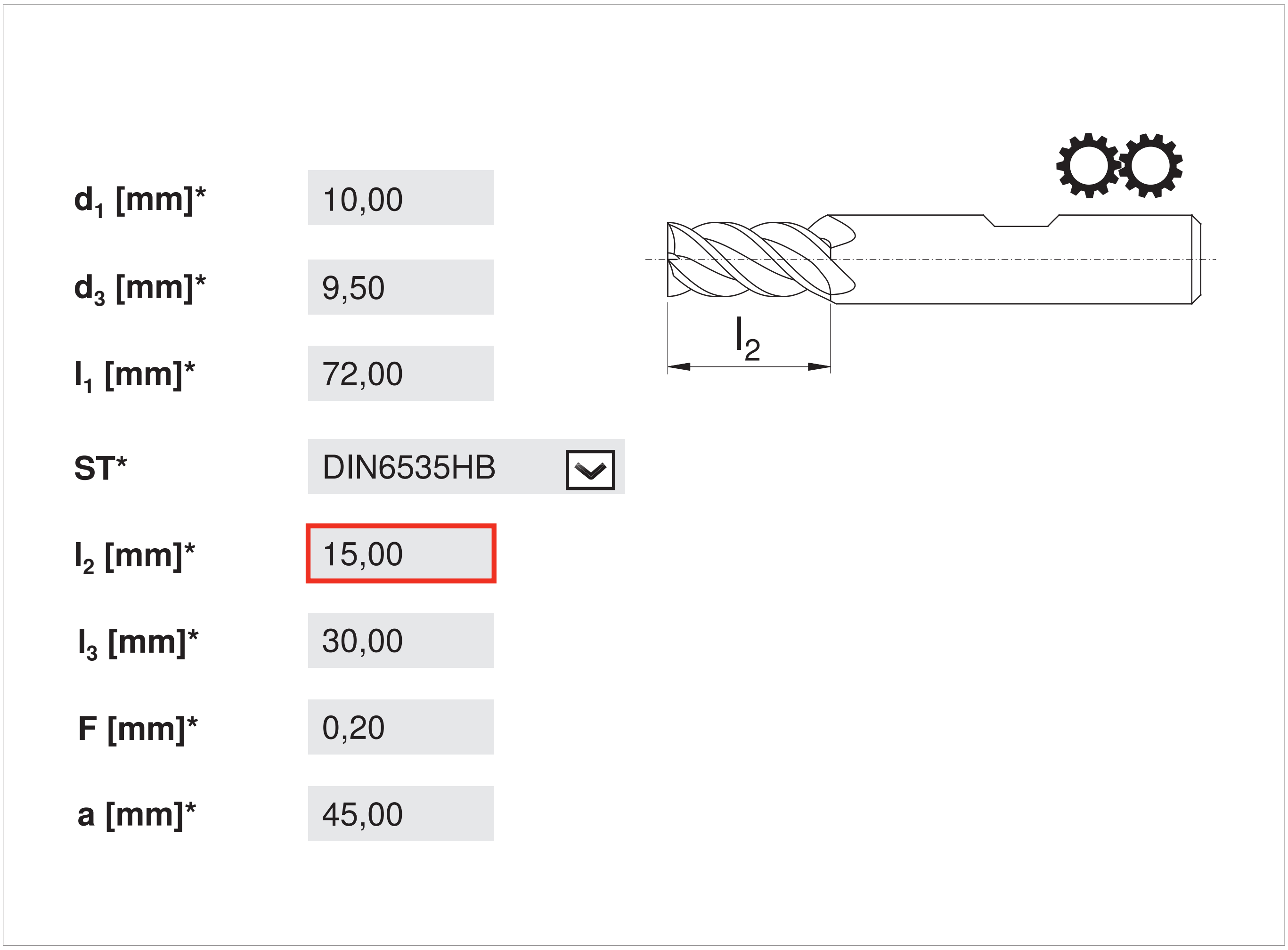
Your customised tool

Using the online solution CONFIGURATE, it is possible to configure a customised semi-standard tool with only a few mouse clicks.

Thanks to the new CONFIGURATE tool we are able to offer simple and easy order processing of customised solid carbide tools. You can configure a customised semi-standard tool with just a few mouse clicks in our E-TECHSTORE – 24 hours a day, 7 days a week.

Your customised tool

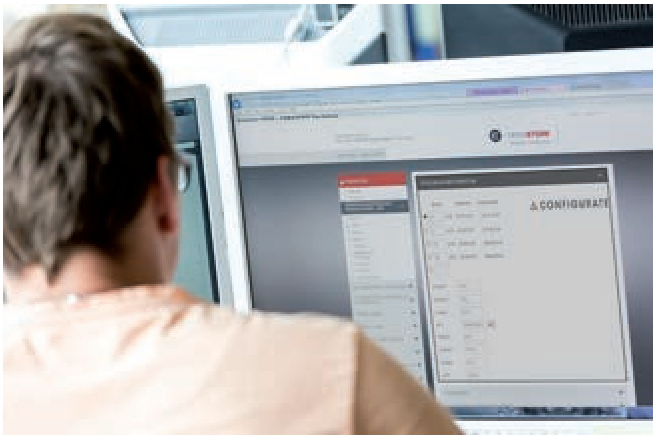
- Offers and orders of individual tools - as fast and easy as for any standard tool.
- Availability 24 hours a day. Order regardless of business hours, thanks to fully automated processing.
- Easy to use thanks to menu-guided navigation: obtain your individual tool in just a few steps.
- Optimised for tablet PCs and smartphones.

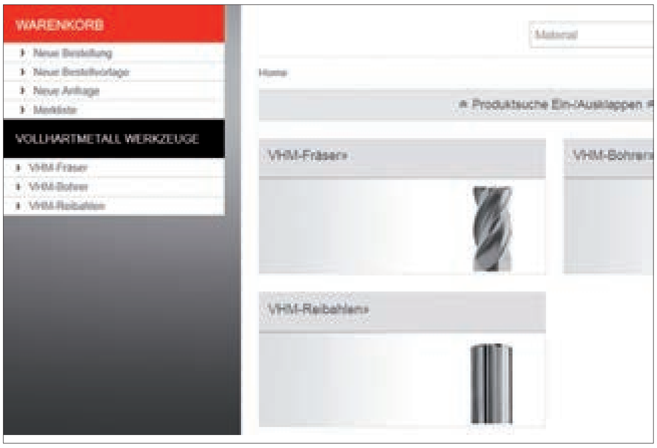


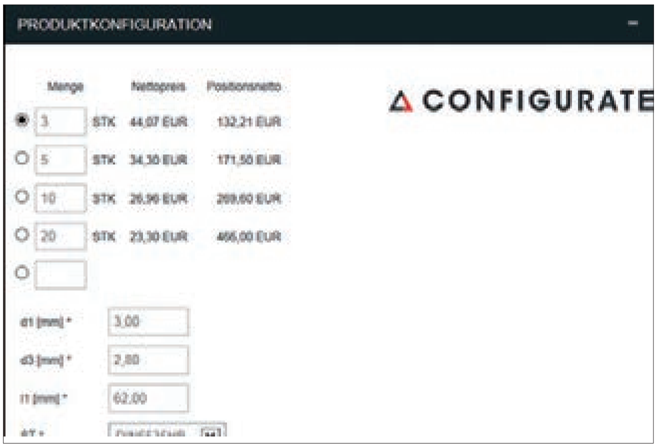
d_1 [mm]*	10,00
d_3 [mm]*	9,50
l_1 [mm]*	72,00
ST*	DIN6535HB
l_2 [mm]*	15,00
l_3 [mm]*	30,00
F [mm]*	0,20
a [mm]*	45,00

What to do:

- Log in as usual with your personal access data at e-techstore.com.
- Choose a basic product from our broad standard programme of solid carbide milling cutters and drills.
- Define your individual tool dimensions using the simple menu.
- The feasibility of your information will be verified at the touch of a button and you will receive scaled prices online for the quantity you require.
- You can see a true-to-scale 3D-model of your configured tool.
- Order your product immediately or receive a quotation.
- Within only a few minutes you will receive an e-mail with an order confirmation or an offer including price and delivery time. A drawing, a DXF-file and a true-to scale STEP volume model for collision analysis will also be sent to you.

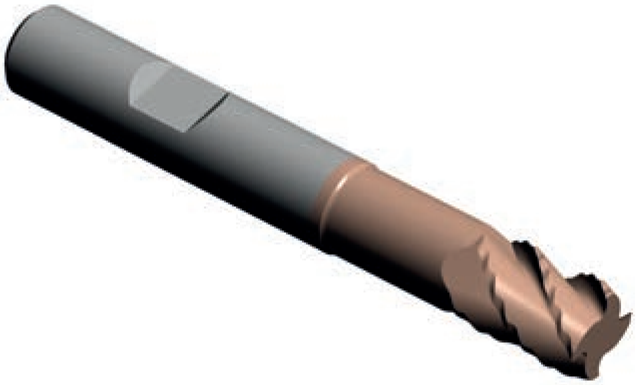






	Menge		Nettopreis	Positionsnetto
●	3	STK	44,07 EUR	132,21 EUR
○	5	STK	34,30 EUR	171,50 EUR
○	10	STK	26,96 EUR	269,60 EUR
○	20	STK	23,30 EUR	466,00 EUR
○				

d1 [mm] * 3,00
d3 [mm] * 2,80
l1 [mm] * 62,00



Any questions? Feel free to contact us!
E-mail: **configurate@ceratizit.com**

Tooling Academy

Get to know your tools in detail – watch them during the respective applications on machines which today are used in all production departments. To do so, we have established up-to-date machining centres for tests and training courses and the latest analysis technology at our Tooling Academy. In collaboration with you, we analyse the machinability of the materials and work pieces. Based on the findings of simulations and practical tests, we then deduce specific tool recommendations or develop specific tool solutions for you.

We have opened our first Tooling Academy in Reutte, Austria – our centre of excellence for cutting solutions. For us to also be close to our Asian customers, we have had our second Tooling Academy in Tianjin, China since 2011.

Modern equipment

Seven high-tech lathes and milling machines stand at the ready in the Tooling Academy in Reutte. Tianjin is equipped with three metal cutting machines.

○ 3- and 5-axis milling machine
○ HSC milling centre
○ Bed-type milling machine
○ Heavy milling machine
○ Lathe
○ Turn-mill centre
○ Heavy lathe
○ NC turret lathe

Additionally, we apply the latest in high-speed camera technology in order to view the machining processes in extreme slow motion. In this way, we receive detailed information about the entire machining process.

Contents

Introduction

Application

Inserts

Tools

Contents

Technical information

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Catalogue guidelines

Innovations in the turning section

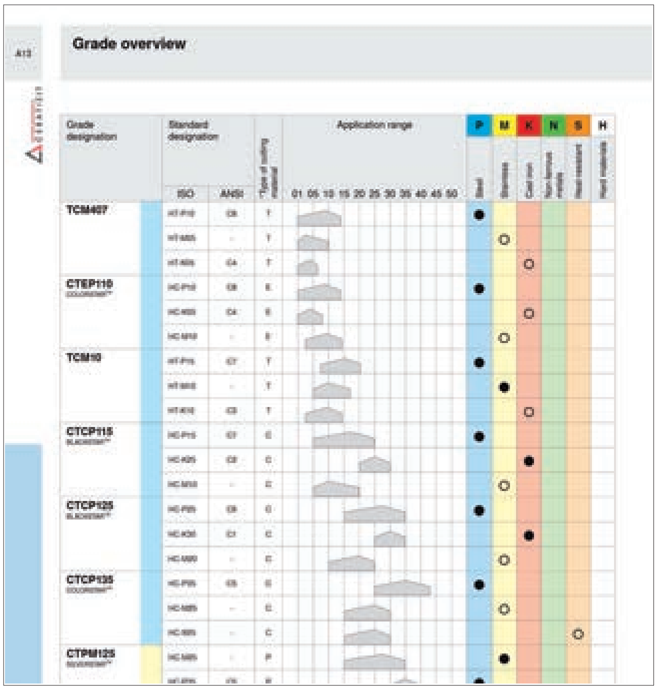
○ Newly designed structure of the overview and assignment of the cutting materials
○ Detailed description and display of the chip grooves

Make the right choice in just a few steps

1

Selection of the cutting material

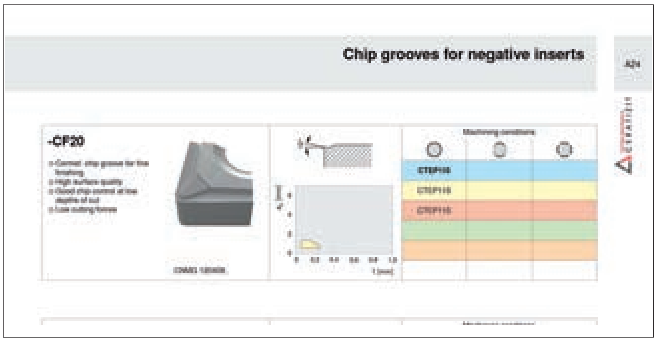
The cutting material is chosen according to the material to be machined


Grade overview

2

Selection of the chip groove

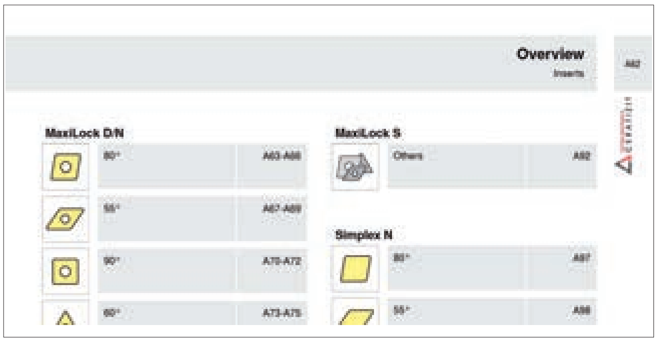
The chip groove is chosen based on the machining conditions and the material to be machined


Chip grooves for negative inserts

3

Selection of the insert type

Overview of the tooling systems and insert shapes

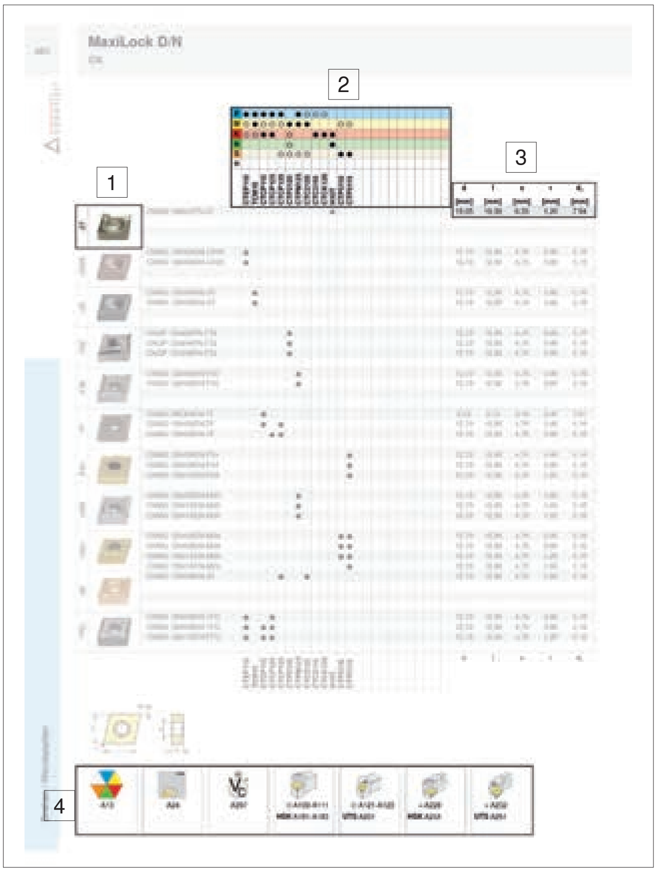

Overview
Inserts

5

Selection of the insert

This product page shows the available geometries and grades for the selected insert form

- 1 Chip grooves
- 2 Possible cutting materials
- 3 The main dimensions
- 4 Reference regarding further information

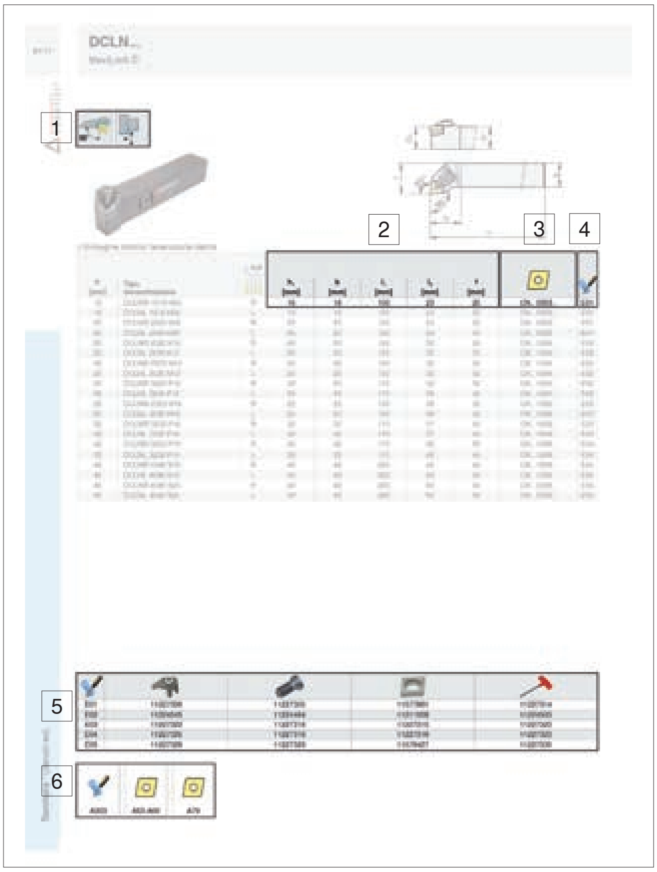


4

Selection of the tool

The product page shows the turning tool range with the main dimensions and information on the insert types

- 1 Possible applications
- 2 The main dimensions
- 3 Insert reference
- 4 Spare parts
- 5 Spare parts overview
- 6 Reference regarding further information



CERATIZIT designation system

Tool holders

0	1	2	3	4	5	6	7	8	9	10
	P	C	L	N	R	20	20	K	12	-T
UT50 -	P	C	L	N	R				-12	
HSK-T63 -	D	C	L	N	R				-12	

0

System / size

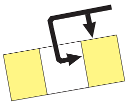
UT = UTS
according to ISO 26622
UT40 = UTS 40 mm
UT50 = UTS 50 mm
UT63 = UTS 63 mm

HSK-T
according to ISO 12164
HSK-T63 = 63mm
HSK-T100 = 100mm

1

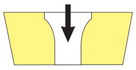
Tool holder

D



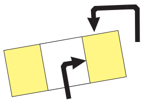
Retained from above and via bore

S



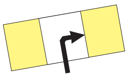
Retained via centre screw

M



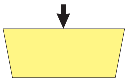
Retained from above and via bore

P



Retained via the bore

C



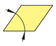
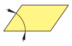
Retained from above

X

X Special version

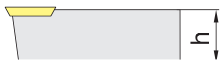
2

Insert shape

Included angle				35°	**V**
				55°	**D**
				75°	**E**
				80°	**C**
				86°	**M**
Included angle				55°	**K**
				82°	**B**
				85°	**A**
Other shapes 90°	**L**	▭	–	○	**R**
108°	**P**	⬠	90°	□	**S**
120°	**H**	⬡	60°	△	**T**
135°	**O**	⯃	80°	⏢	**W**

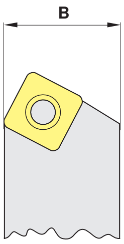
6

Shank height



7

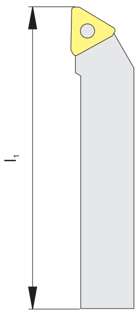
Shank width



8

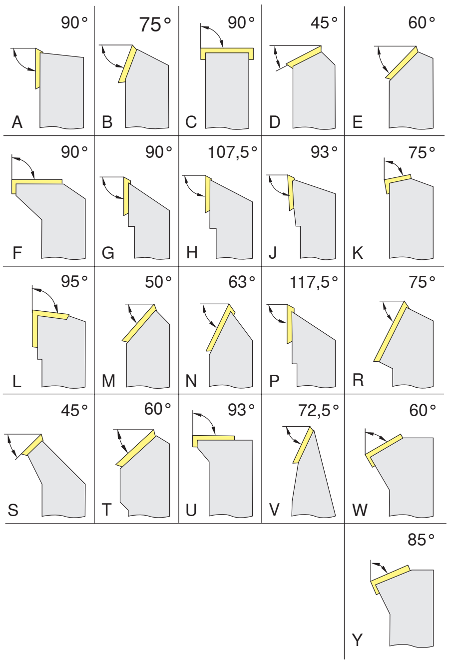
Tool length

l_1 mm	l_1 inch		l_1 mm	l_1 inch	
32	4.000	**A**	160	4.500	**N**
40	4.500	**B**	170	5.500	**P**
50	5.000	**C**	180	–	**Q**
60	6.000	**D**	200	6.000	**R**
70	7.000	**E**	250	7.000	**S**
80	8.000	**F**	300	8.000	**T**
90	5.500	**G**	350	5.500	**U**
100	5.625	**H**	400	3.500	**V**
110	5.300	**J**	450	3.500	**W**
125	14.000	**K**	500	3.750	**Y**
140	6.800	**L**	Special		**X**
150	4.400	**M**			



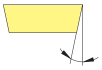
3

Style



4

Clearance angle

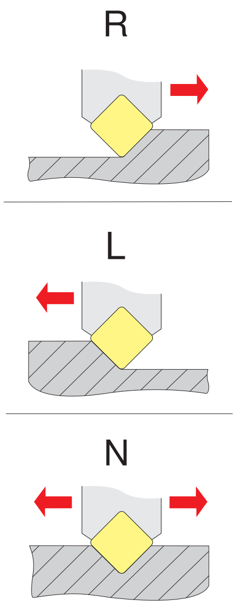


3°	**A**	25°	**F**
5°	**B**	30°	**G**
7°	**C**	0°	**N**
15°	**D**	11°	**P**
20°	**E**	*)	**O**

*) Clearance angles not included within the standard for which particular information is necessary

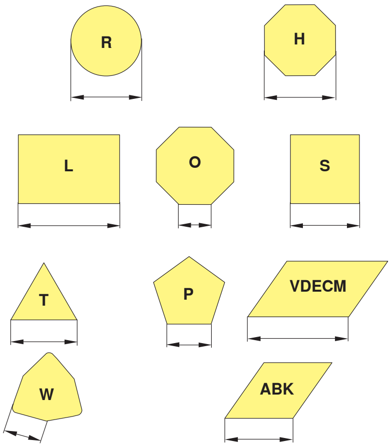
5

Cutting direction



9

Cutting edge length



10

Manufacturer specification

T = lever
Special length (mm)
Insert thickness (other than standard)
Special version (X..)
Machine manufacturer (specific)

CERATIZIT designation system

Boring bars

0	1	2	3	4	5	6	7	8	9	10
	A	25	R	P	C	L	N	R	12	
UT40-		25	G -	P	C	L	N	R -	12	
HSK-T63-		50	Q -	D	C	L	N	R -	12	

0

System / size

UT = UTS
according to ISO 26622
UT40 = UTS 40 mm
UT50 = UTS 50 mm
UT63 = UTS 63 mm

HSK-T
according to ISO 12164
HSK-T63 = 63mm
HSK-T100 = 100mm

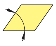
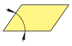
1

Shank version

S	Steel shank	**E**	As C with coolant hole
A	Steel shank with coolant hole	**F**	As C with anti-vibration system
B	Steel shank with anti-vibration system	**G**	As C with coolant hole and anti-vibration system
D	Steel shank with coolant hole and anti-vibration system	**H**	Heavy metal
C	Carbide shank with steel head	**J**	Heavy metal with coolant hole

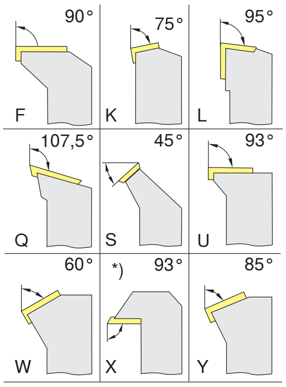
5

Insert shape

Included angle 				35°	**V**
				55°	**D**
				75°	**E**
				80°	**C**
				86°	**M**
Included angle 				55°	**K**
				82°	**B**
				85°	**A**
90°	**L**	▭	–	○	**R**
108°	**P**	⬠	90°	□	**S**
120°	**H**	⬡	60°	△	**T**
135°	**O**	⯃	80°	◬	**W**

6

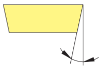
Style



*) CERATIZIT factory standard

7

Clearance angle



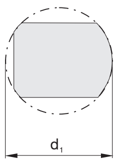
3°	**A**	25°	**F**
5°	**B**	30°	**G**
7°	**C**	0°	**N**
15°	**D**	11°	**P**
20°	**E**	*	**O**

*) Clearance angles not included within the standard for which particular information is necessary

2

Shank diameter

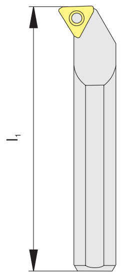
d_1 mm	d_1 inch
08	A double-digit number which shows the boring bar diameter in 1/16 inch.
10	
12	
16	
20	
25	
32	
40	
50	
60	



3

Tool length

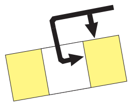
l_1 mm	l_1 inch	
80	3	**F**
100	3,5	**H**
110	4	**J**
125	4,5	**K**
140	5	**L**
150	5,5	**M**
160	6	**N**
170	6,5	**P**
180	6,75	**Q**
200	7	**R**
250	8	**S**
300	10	**T**
350	12	**U**
400	14	**V**
450	16	**W**
500	18	**Y**
	20	
Special		**X**



4

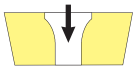
Clamping method

D



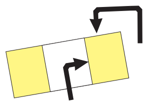
Retained from above and via bore

S



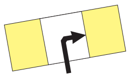
Retained via centre screw

M



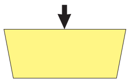
Retained from above and via bore

P



Retained via the bore

C



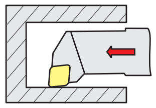
Retained from above

X Special version

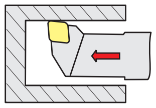
8

Cutting direction

R

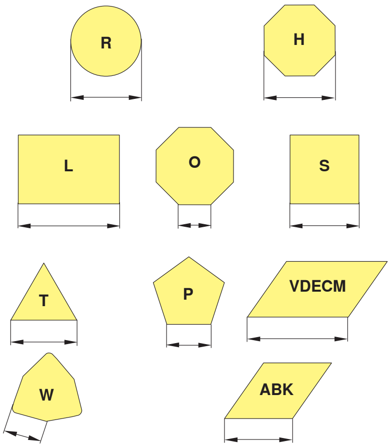


L



9

Cutting edge length



10

Manufacturer specification

T = lever
Special length (mm)
Insert thickness (other than standard)
Special version (X..)
Machine manufacturer (specific)

Designation system according to ISO 1832

Inserts

Insert – metric

C	N	M	G	12	04	08	E	N	-	M50
1	2	3	4	5	6	7	8	9		13

Insert – inch

C	N	M	G	4	3	2	E	N	-	M50
1	2	3	4	5	6	7	8	9		13

Insert, CBN, ceramic – metric

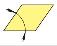
C	N	G	A	12	04	08	S	N	-	020D	_	B	3
1	2	3	4	5	6	7	8	9		10		11	12

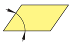
Insert, CBN, ceramic – inch

C	N	G	A	4	3	2	S	N	-	020D	_	B	3
1	2	3	4	5	6	7	8	9		10		11	12

1

Insert shape

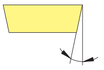




Included angle		35°	V
		55°	D
		75°	E
		80°	C
		86°	M
Included angle		55°	K
		82°	B
		85°	A
Other shapes	▭	90°	L
	⬠	108°	P
	⬡	120°	H
	⯃	135°	O
	○	–	R
	□	90°	S
	△	60°	T
	△	80°	W

2

Clearance angle



3°	A	25°	F
5°	B	30°	G
7°	C	0°	N
15°	D	11°	P
20°	E		

Clearance angles not included within the standard for which particular information is necessary } O

3

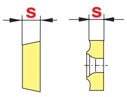
Tolerances

	d ±		m ±		s ±	
	[mm]	[inch]	[mm]	[inch]	[mm]	[inch]
A	0,025	.0010	0,005	.0002	0,025	.001
F	0,013	.0005	0,005	.0002	0,025	.001
C	0,025	.0010	0,013	.0005	0,025	.001
H	0,013	.0005	0,013	.0005	0,025	.001
E	0,025	.0010	0,025	.0010	0,025	.001
G	0,025	.0010	0,025	.0010	0,13	.005
J	0,05-0,15*	.002-.006*	0,005	.0002	0,025	.001
K	0,05-0,15*	.002-.006*	0,013	.0005	0,025	.001
L	0,05-0,15*	.002-.006*	0,025	.0010	0,025	.001
M	0,05-0,15*	.002-.006*	0,05-0,20	.003-.008*	0,13	.005
N	0,05-0,15*	.002-.006*	0,05-0,20	.003-.008*	0,025	.001
U	0,08-0,25*	.003-.010*	0,13-0,38	.005-.015*	0,13	.005

* depends on insert size

6

Insert thickness



		Index	
[inch]	[mm]	[mm]	[inch]
1/16	1,59	01	1
3/32	2,38	02	
1/8	3,18	03	2
5/32	3,97	T3	
3/16	4,76	04	3
7/32	5,56	05	
1/4	6,35	06	4
5/16	7,94	07	5
3/8	9,52	09	6

7

Corner radius

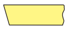
RN **00**
RC **MO**

		Index		
[mm]	[inch]	[mm]	[inch]	
≤ 0,05	.0015	00	X0	
0,1	.004	01	0	
0,2	.008	02	.5	
0,4	1/64	04	1	
0,8	1/32	08	2	
1,2	3/64	12	3	
1,6	1/16	16	4	
2,0	5/64	20	5	
2,4	3/32	24	6	
2,8	7/64	28	7	
3,2	1/8	32	8	

8

Cutting edge

F



sharp

E

honed

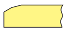
T

chamfered

S

chamfered and honed

K



double chamfered

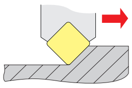
P

double chamfered & honed

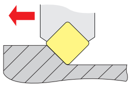
9

Cutting direction

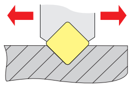
R



L

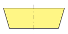
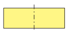
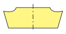
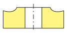
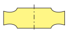
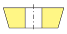
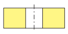
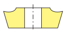
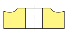
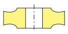
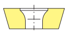
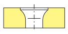
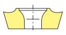
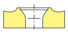
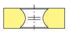
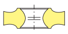
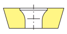
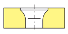
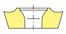
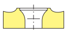
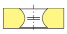
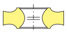


N



4

Form of top surface

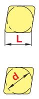
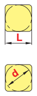
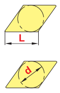
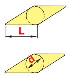
N		
R		
F		
A		
M, P		
G, P		
W		
T		
Q		
U		
B		
H		
C		
J		
X	Special version	

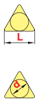
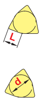
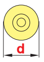
[inch]
Changes at inscribed circle IK < 1/4"

IK >1/4"	IK <1/4"
N / R / F	E
A / M / G	D
X	X

5

Cutting edge length

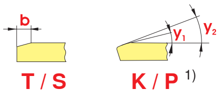
Typ	ISO	ANSI	L [mm]	L [inch]	d [mm]	d [inch]
C 	06	2	6,4	.250	6,35	.250
	09	3	9,7	.382	9,525	.375
	12	4	12,9	.508	12,70	.500
	16	5	16,1	.634	15,875	.625
	19	6	19,3	.760	19,05	.750
	25	8	25,8	1.016	25,4	1.000
	32	12	32,24	1.269	31,75	1.250
S 	06	2	6,35	.250	6,35	.250
	09	3	9,525	.375	9,525	.375
	12	4	12,7	.500	12,7	.500
	15	5	15,875	.625	15,875	.625
	19	6	19,05	.750	19,05	.750
	25	8	25,4	1.000	25,4	1.000
	31	10	31,75	1.250	31,75	1.250
D 	07	2	7,7	.303	6,35	.250
	11	3	11,6	.457	9,525	.375
	15	4	15,5	.610	12,70	.500
V 	11	2	11,1	.437	6,35	.250
	16	3	16,6	.653	9,525	.375
	22	4	22,10	.870	12,70	.500

Typ	ISO	ANSI	L [mm]	L [inch]	d [mm]	d [inch]
T 	06	1.2	6,9	.272	3,97	.156
	09	1.8	9,6	.378	5,56	.219
	11	2	11,0	.433	6,35	.250
	16	3	16,5	.650	9,525	.375
	22	4	22,0	.079	12,70	.039
	27	5	27,5	1.083	15,875	.625
	33	6	33,0	1.299	19,05	.750
W 	06	3	6,5	.256	9,525	.375
	08	4	8,7	.331	12,70	.039
	10	5	10,9	.429	15,875	.625
R 	06	2	6,35	.250	6,35	.250
	08	–	8,0	.315	8,0	.315
	09	3	9,52	.375	9,52	.375
	10	–	10,0	.394	10,0	.394
	12	–	12,0	.472	12,0	.472
	12*	4	12,7	.488	12,70	.488
	15	5	15,875	.625	15,875	.625
	16	–	16,0	.630	16,0	.630
	19	6	19,05	.750	19,05	.750
	25	8	25,0	.984	25,0	.984
	25*	–	25,4	1.000	25,4	1.000
	31	10	31,75	1,250	31,75	1,250
	32	–	32,0	1.260	32,0	1.260

*) inch version

10

Chamfer type



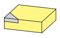
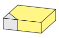
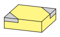
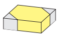
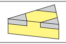
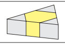
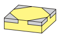
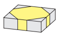
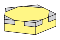
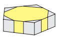
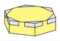
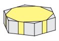
	[mm]	[inch]		
015	0,15	.006	A	05°
020	0,20	.008	B	10°
025	0,25	.010	C	15°
050	0,50	.020	D	20°
075	0,75	.030	E	25°
100	1,00	.040	F	30°

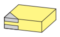
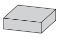
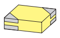
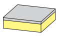
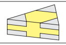
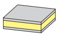
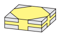
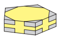
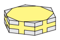
1) For double chamfered cutting edges two letters are used.

For example:
BE = chamfer angle 1 = 10°
chamfer angle 2 = 25°

11

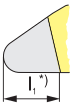
Number of cutting edges

single-sided		total thickness	
A		**T**	
B		**U**	
C		**V**	
D		**W**	
G		**X**	
H		**Y**	

bilateral		entire rake face	
K		**S**	
L		**F**	
M		**E**	
N			
P			
Q			

12

Length of segment



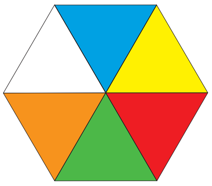
*) approximate dimension in mm

13

Chip groove designation

Manufacturer's information see page A24

MasterGuide



Material

Based on VDI 3323 CERATIZIT's MasterGuide divides materials into six main groups (P, M, K, N, S, H). Each is given a colour, according to the system partly adopted in ISO 513.

P **Steel**

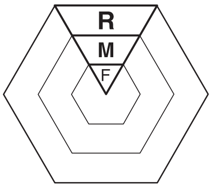
M **Stainless steel**

K **Cast iron**

N **Non-ferrous metals and non-metals**

S **Heat-resistant alloys, titanium**

H **Hard materials**



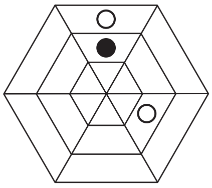
Machining application type

Each coloured segment is divided into three sections, and each section indicates the relevant machining application type:

R = rough machining

M = medium machining

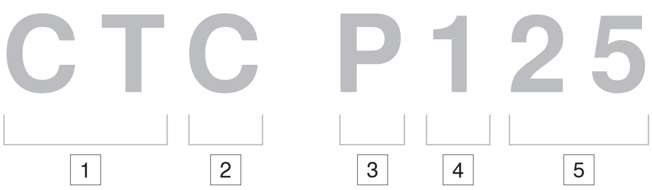
F = fine machining



● **Main application**
o **Extended application**

Application

The ideal application area for each insert is indicated by a black circle. Extended applications are indicated by an open circle. The CERATIZIT MasterGuide provides you with an easily understandable structure for choosing a product and enables you to reduce grade and geometry inventory.



1 Manufacturer: CERATIZIT

2 Cutting material

W	Uncoated carbide
C	CVD coated carbide
P	PVD coated carbide
T	Uncoated cermet
E	Coated cermet
N	Uncoated silicon nitride
M	Coated silicon nitride
S	Mixed ceramic
I	Sialon
D	PCD
B	CBN
L	CBN coated
H	Sintered HSS

3 Main application (material) Variant 1: number

1	Steel
2	Stainless steel
3	Cast iron
4	Light and non ferrous metals, non metals
5	Heat resistant alloys, titanium
6	Hard materials
7	Universal grade for a variety of applications

Main application (material) Variant 2: ISO letter

P	Steel
M	Stainless steel
K	Cast iron
N	Light and non ferrous metals, non metals
S	Heat resistant alloys, titanium
H	Hard materials
X	Universal grade for a variety of applications

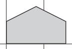
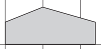
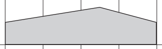
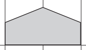
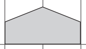
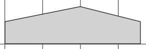
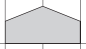
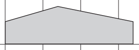
4 Main application (machining method)

1	Turning
2	Milling
3	Parting and grooving
4	Drilling
5	Threading
6	Others
7	Universal grade for a variety of applications

5 ISO 513
Application range

For example:
05
10
15
25
35 ISO P35
.
.
.

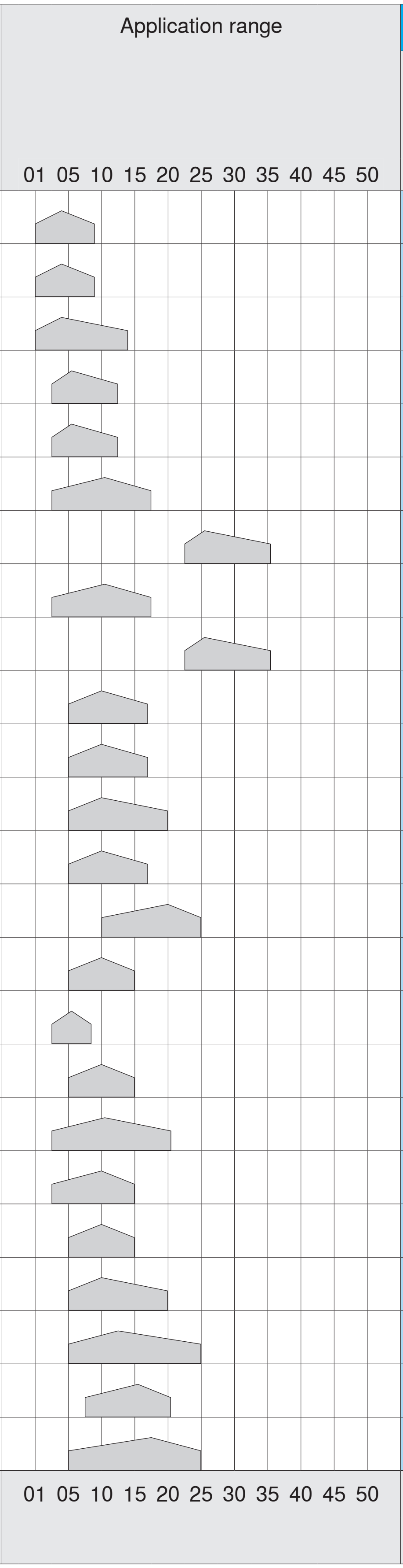
Grade overview

Grade designation	Standard designation		*Type of cutting material	Application range	P	M	K	N	S	H
	ISO	ANSI		01 05 10 15 20 25 30 35 40 45 50	Steel	Stainless	Cast iron	Non-ferrous metals	Heat-resistant	Hard materials
TCM407	HT-P10	C8	T		●					
	HT-M05	-	T			○				
	HT-K05	C4	T				○			
CTEP110 COLORSTAR™	HC-P10	C8	E		●					
	HC-K05	C4	E				○			
	HC-M10	-	E			○				
TCM10	HT-P15	C7	T		●					
	HT-M10	-	T			●				
	HT-K10	C3	T				○			
CTCP115 BLACKSTAR™	HC-P15	C7	C		●					
	HC-K25	C2	C				●			
	HC-M10	-	C			○				
CTCP125 BLACKSTAR™	HC-P25	C6	C		●					
	HC-K30	C1	C				●			
	HC-M20	-	C			○				
CTCP135 COLORSTAR™	HC-P35	C5	C		●					
	HC-M25	-	C			○				
	HC-S25	-	C						○	
CTPM125 SILVERSTAR™	HC-M25	-	P			●				
	HC-P35	C5	P		●					
	HC-S25	-	P						○	
CTC2135	HC-M30	-	C			●				
	HC-P35	C5	C		○					
	HC-S35	-	C						○	
				01 05 10 15 20 25 30 35 40 45 50						

● Main application

○ Extended application

Grade overview

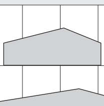
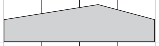
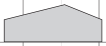
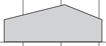


Grade designation		Standard designation ISO	Standard designation ANSI	*Type of cutting material	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
CTI3105	🟥	CN-K05	C3	I			●			
	🟥	CN-S05	-	I					○	
CTN3105	🟥	CN-K05	C4	N			●			
CTS3105	🟥	CM-K05	C4	S			●			
	🟥	CM-H05	C4	S						●
CTBK102	🟥	BH-K10	C3	B			●			
	🟥	BH-H25	C2	B						●
CTBK104	🟥	BH-K10	C3	B			●			
	🟥	BH-H25	C2	B						●
CTM3110	🟥	CC-K10	C3	M			●			
CTN3110	🟥	CN-K10	C3	N			●			
CTC3110	🟥	HC-K10	C3	C			●			
	🟥	HC-P10	C8	C	○					
CTCK120 BLACKSTAR™	🟥	HC-K20	C2	C			●			
	🟥	HC-P10	C8	C	○					
CTD4110	🟩	DP-N05	C4	D				●		
H210T	🟩	HW-N10	C3	W				●		
	🟩	HW-S10	-	W					●	
	🟩	HW-K10	C3	W			○			
AMZ	🟩	HC-N10	C3	P				●		
	🟩	HC-P10	C8	P	○					
	🟩	HC-K10	C3	P			○			
H10T	🟩	HW-N15	C3	W				●		
	🟩	HW-K15	C3	W			●			

● Main application

○ Extended application

Grade overview

Grade designation		Standard designation ISO	Standard designation ANSI	*Type of cutting material	Application range 01 05 10 15 20 25 30 35 40 45 50	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
H216T	🟩	HW-N15	C3	W					●		
		HW-K15	C3	W				●			
CTP5110	🟧	HC-S15	-	P						●	
		HC-M15	-	P			○				
CTP5115	🟧	HC-S15	-	P						●	
		HC-M15	-	P			○				
CTL6115	▨	BC-H15	C3	L							●
					01 05 10 15 20 25 30 35 40 45 50						

● Main application

○ Extended application

Carbide

HW	Uncoated carbide, consisting mainly of tungsten carbide (WC)
HT[1]	Uncoated carbide, consisting mainly of titanium carbide (TiC) or titanium nitride (TiN) or both
HC	Carbides as above, but coated

Ceramic

CA	Oxide ceramic, consisting mainly of aluminium oxide (Al_2O_3)
CM	Mixed ceramic, based on aluminium oxide (Al_2O_3), but with different oxide components
CN	Nitride ceramic, consisting mainly of silicon nitride (Si_3N_4)
CC	Ceramics as above, but uncoated

Diamond

DP[2]	Polycryistalline diamond

Boron nitride

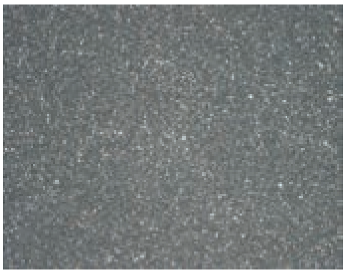
BL[2]	Polycrystalline cubic boron nitride with a low CBN content (40% - 65%)
BH[2]	Polycrystalline cubic boron nitride with a high CBN content (70% - 95%)
BC[2]	Polycrystalline cubic boron nitride with coating

[1]) These carbides are also called ‘cermets’.

[2]) Polycrystalline diamond and polycrystalline boron nitride are also called ultra-hard cutting materials.

Grade description

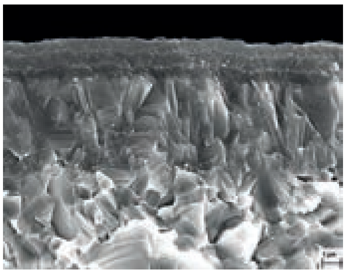
TCM407	HT-P10 | HT-M05 | HT-K05	● ○ ○



Specification:
Composition: Co/Ni 8.0%; WC 16.0%; TaNbC 10.0%; TiCN balance | Hardness: HV_{30} 1780

Recommended application:
Uncoated cermet grade for precision finishing of steel materials.

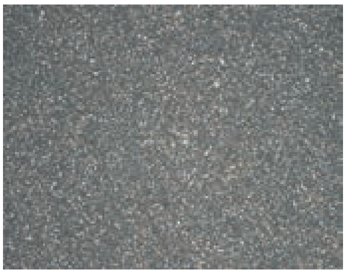
CTEP110 COLORSTAR™	HC-P10 | HC-K05 | HC-M10	● ○ ○



Specification:
Composition: Co/Ni 12.2%; WC 15.0%; TaNbC 10.0%; TiCN balance | Grain size: fine | Hardness: HV_{30} 1620 | Coating specification: CVD TiCN-Al_2O_3 multi-layer

Recommended application:
The cermet grade with additional toughness for finishing operations at high speeds.

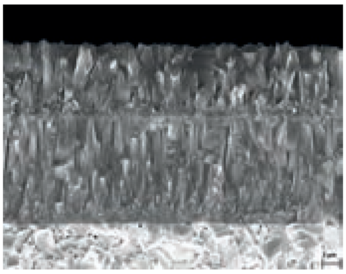
TCM10	HT-P15 | HT-M10 | HT-K10	● ● ○



Specification:
Composition: cermet Co/Ni 12.2%; WC 15.0%; TaNbC 10.0%; TiCN balance | Hardness: HV_{30} 1620

Recommended application:
The uncoated cermet grade for the finishing of hardened steel.

CTCP115 BLACKSTAR™	HC-P15 | HC-K25 | HC-M10	● ● ○



Specification:
Composition: Co 5.8%; mixed carbides 6.4%; WC balance | Grain size: 1 - 2 μm | Hardness: HV_{30} 1550 | Coating specification: CVD TiCN-Al_2O_3

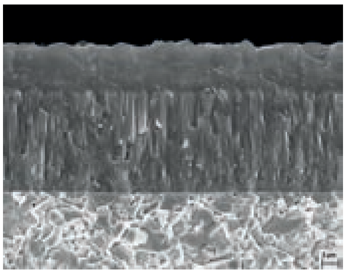
Recommended application:
The wear-resistant high-performance grade for steel machining.

Grade description

CTCP125
BLACKSTAR$^{\text{TM}}$

HC-P25 | HC-K30 | HC-M20

● ● ○



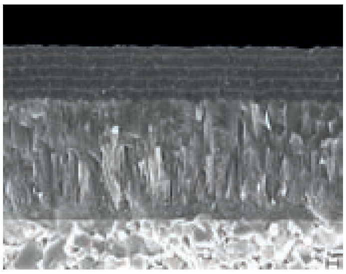
Specification:
Composition: Co 7.0%; mixed carbides 8.0%; WC balance | Grain size: 1 - 2 μm | Hardness: HV_{30} 1450 | Coating specification: CVD TiCN-Al_2O_3

Recommended application:
The first choice for the universal machining of steel.

CTCP135
COLORSTAR$^{\text{TM}}$

HC-P35 | HC-M25 | HC-S25

● ○ ○



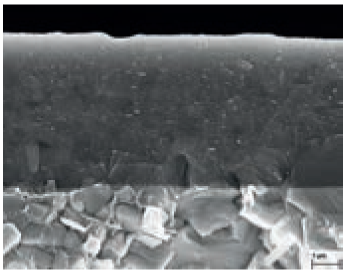
Specification:
Composition: Co 9.6%; mixed carbides 6.7%; WC balance | Grain size: 1 - 2 μm | Hardness: HV_{30} 1460 | Coating specification: CVD TiCN-Al_2O3 multi-layer

Recommended application:
The tough alternative for heavily interrupted cutting action.

CTPM125
SILVERSTAR$^{\text{TM}}$

HC-M25 | HC-P35 | HC-S25

● ● ○



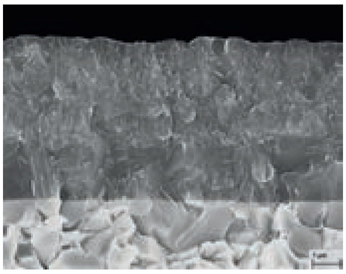
Specification:
Composition: Co 9.6%; mixed carbides 7.8%; others 0.4%; WC balance | Grain size: 1 - 2 μm | Hardness: HV_{30} 1460 | Coating specification: PVD TiAlTaN

Recommended application:
The first choice for the machining of austenitic steels.

CTC2135

HC-M30 | HC-P35 | HC-S35

● ○ ○

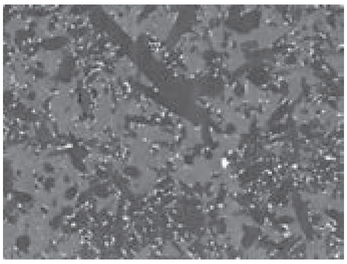


Specification:
Composition: Co 9.6%; mixed carbides 7.4%; WC balance | Grain size: 1 - 2 μm | Hardness: HV_{30} 1400 | Coating specification: CVD TiCN-TiNB multi-layer

Recommended application:
The turning grade for stainless applications.

Grade description

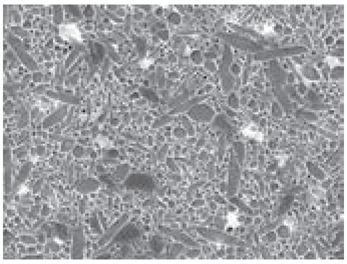
CTI3105	CN-K05 | CN-S05	● ○



Specification:
Composition: α, β Sialon | Hardness: HV_{10} 1900

Recommended application:
The hardest Sialon available in the market; high-performance grade for the machining of cast iron and materials with Ni-base.

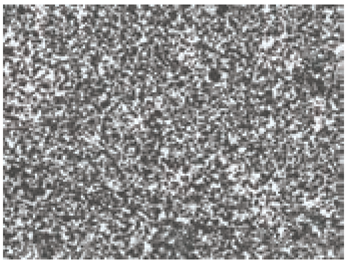
CTN3105	CN-K05	●



Specification:
Composition: β - Si_3N_4 | Grain size: fine | Hardness: HV_{10} 1620

Recommended application:
Universal silicon grade for cast iron machining.

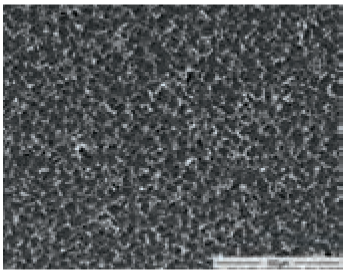
CTS3105	CM-K05 | CM-H05	● ●



Specification:
Composition: Al_2O_3; TiC | Grain size: > 1 μm | Hardness: HV_{30} 2100

Recommended application:
This mixed ceramic grade is suitable for the finish turning of steel and the turning of steel, cast iron and rolls made of chilled cast iron.

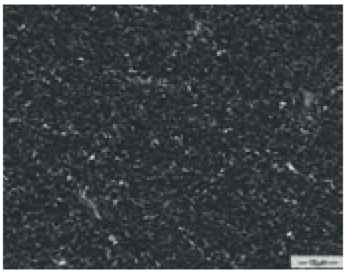
CTBK102	BH-K10 | BH-H25	● ●



Specification:
Composition: cubic boron nitride (CBN) | 90 vol.% + metallic binder phase

Recommended application:
First choice solid CBN grade for cast iron machining.

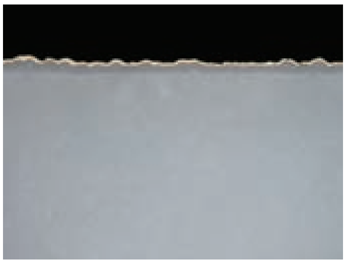
CTBK104	BH-K10 | BH-H25	● ●



Specification:
Composition: cubic boron nitride (CBN) | 90 vol.% + metallic binder phase

Recommended application:
First choice solid CBN grade for cast iron and sintered steels when finishing.

CTM3110	CC-K10	●



Specification:
Composition: Si_3N_4 | Grain size: > 2 μm | Hardness: HV_{30} 1550 | Coating specification: CVD Ti (C,N) + TiN; > 2μm

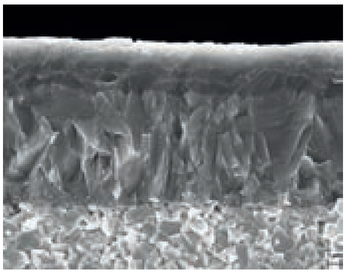
Recommended application:
Coated silicon nitride for chromium alloyed cast iron.

CTN3110	CN-K10	●

Specification:
Composition: Si_3N_4 | Grain size: > 2 μm | Hardness: HV_{10} 1500

Recommended application:
Silicon nitride grade for roughing of cast iron materials with unfavourable cutting conditions, e.g. when roll machining.

CTC3110	HC-K10 | HC-P10	● ○



Specification:
Composition: Co 6.0%; TaC 2.0%; WC balance | Grain size: 1 μm | Hardness: HV_{30} 1650 | Coating specification: CVD TiCN-Al_2O_3 multi-layer

Recommended application:
The grade for the machining of cast iron at high cutting speeds.

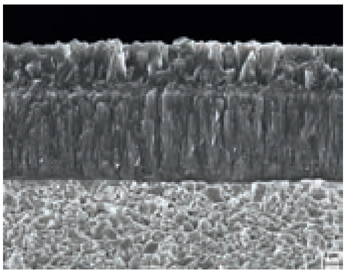
Grade description

CTCK120

BLACKSTAR$^{\text{TM}}$

HC-K20 | HC-P10

● ○



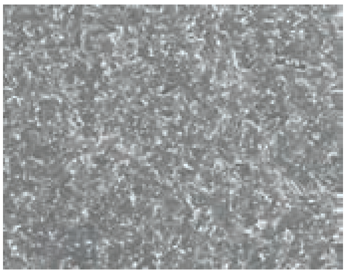
Specification:
Composition: Co 6.0%; TaC 2.0%; WC balance | Grain size: 1 μm | Hardness: HV$_{30}$ 1630 | Coating specification: CVD TiCN-Al$_2$O$_3$

Recommended application:
The first choice for the machining of cast iron at high cutting speeds and where high toughness is required.

CTD4110

DP-N05

●



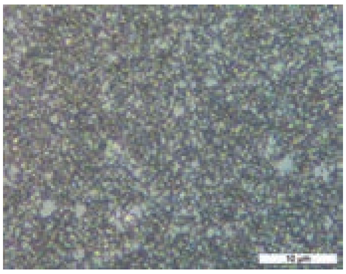
Specification:
Composition: polycrystalline diamond (PCD) | Grain size: ~ 5 μm

Recommended application:
Polycrystalline diamond grade for the machining of non-ferrous metals and non-metallic materials.

H210T

HW-N10 | HW-S10 | HW-K10

● ● ○



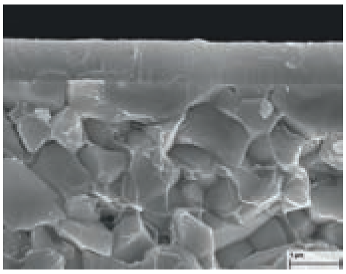
Specification:
Composition: Co 6.0%; WC balance | Grain size: 0.8 μm | Hardness: HV$_{30}$ 1850

Recommended application:
The wear-resistant uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

AMZ

HC-N10 | HC-P10 | HC-K10

● ○ ○



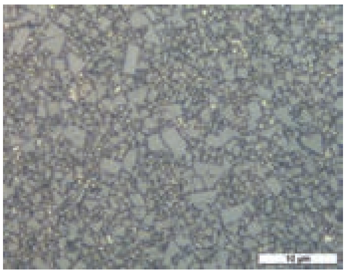
Specification:
Composition: Co 6%; WC balance | Grain size: 1 μm | Hardness: HV$_{30}$ 1630 | Coating specification: PVD TiAlN

Recommended application:
The coated carbide grade for the machining of aluminium.

H10T

HW-N15 | HW-K15

● ●



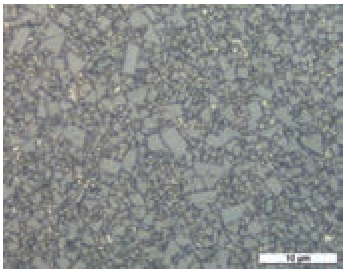
Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 μm | Hardness: HV$_{30}$ 1630

Recommended application:
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

H216T

HW-N15 | HW-K15

● ●



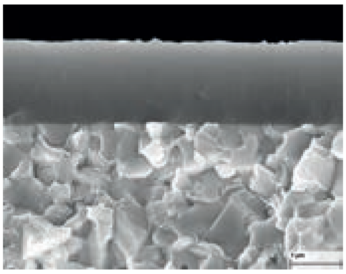
Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 μm | Hardness: HV$_{30}$ 1630

Recommended application:
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

CTP5110

HC-S15 | HC-M15

● ○



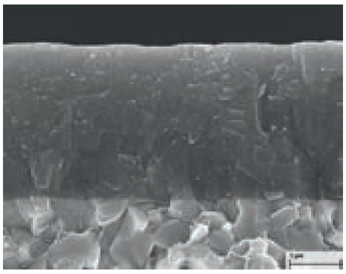
Specification:
Composition: Co 6.0%; WC balance | Grain size: 0.8 μm | Hardness: HV$_{30}$ 1820 | Coating specification: PVD TiAlN

Recommended application:
The alternative when machining heat-resistant materials.

CTP5115

HC-S15 | HC-M15

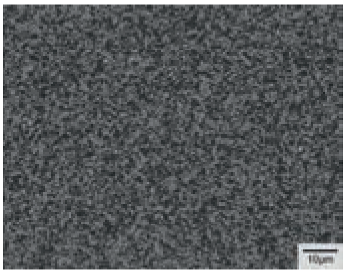
● ○



Specification:
Composition: Co 6.0%; WC balance | Grain size: 0.8 μm | Hardness: HV$_{30}$ 1820 | Coating specification: PVD TiAlN-TiN

Recommended application:
The first choice for the machining of heat-resistant materials.

Grade description

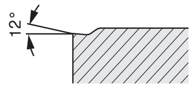
CTL6115	BC-H15	●
	**Specification:** Composition: cubic boron nitride (CBN) | 50 Vol.% + ceramic binder phase | Coating specification: PVD TiAlN **Recommended application:** First choice for case hardened steels from continuous cut to slightly interrupted cut.	

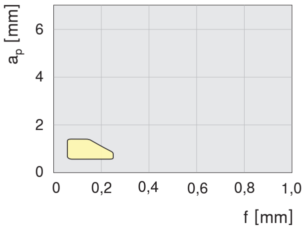
Chip grooves for negative inserts

-CF20

- ○ Cermet: chip groove for fine finishing
- ○ High surface quality
- ○ Good chip control at low depths of cut
- ○ Low cutting forces

CNMG 120408..





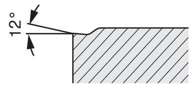
Machining conditions

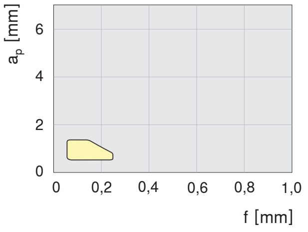
	○	◑	◌
🟦	**CTEP110**		
🟨	CTEP110		
🟥	CTEP110		
🟩			
🟧			
⬜			

-CF

- ○ Cermet: chip groove for fine finishing
- ○ High surface quality
- ○ Good chip control at low depths of cut
- ○ Low cutting forces

CNMG 120408..





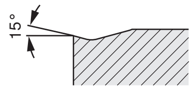
Machining conditions

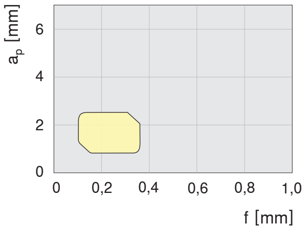
	○	◑	◌
🟦	**TCM10**		
🟨	TCM10		
🟥	TCM10		
🟩			
🟧			
⬜			

-F30

- ○ Finishing of stainless steels
- ○ Continuous cut
- ○ High surface quality
- ○ Good chip control

CNMG 120408..





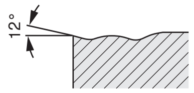
Machining conditions

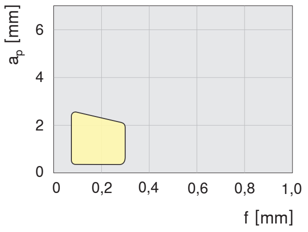
	○	◑	◌
🟦	CTPM125	CTPM125	
🟨	**CTPM125**	**CTPM125**	
🟥			
🟩			
🟧			
⬜			

-TF

- ○ Finest chip groove for steel
- ○ Finishing / profile turning
- ○ Good chip control
- ○ High surface quality
- ○ Low cutting forces

CNMG 120408..





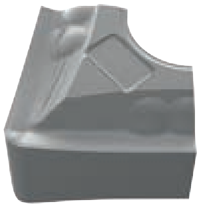
Machining conditions

	○	◑	◌
🟦	**CTCP115**	**CTCP125**	**CTCP135**
🟨	**CTCP125**	**CTCP135**	**CTCP135**
🟥	CTCP125	CTCP125	CTCP125
🟩			
🟧	CTCP125	CTCP135	
⬜			

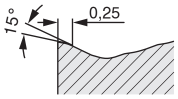
Chip grooves for negative inserts

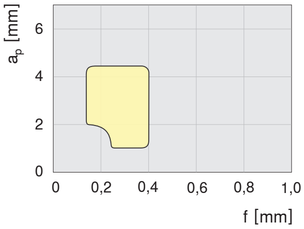
-M30

- ○ First choice for stainless steel machining
- ○ Good chip control
- ○ Reduced formation of burrs
- ○ Low cutting forces
- ○ Reduced built-up edge
- ○ Suitable for unstable machines



CNMG 120408..





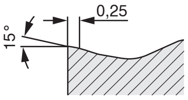
Machining conditions

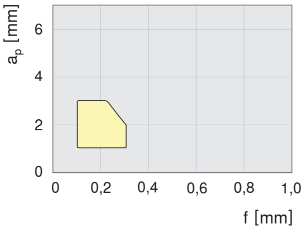
	●	◑	◌
🟦	CTPM125	CTPM125	CTPM125
🟨	**CTPM125**	**CTPM125**	**CTPM125**
🟥			
🟩			
🟧		CTPM125	

-M34

- ○ First choice for super alloys
- ○ Light cutting geometry
- ○ Reduced built-up edge
- ○ Low cutting forces

CNMG 120408..





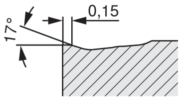
Machining conditions

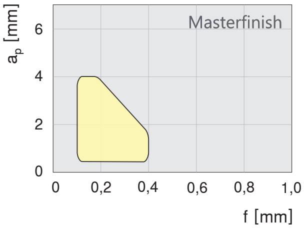
	●	◑	◌
🟦			
🟨	**CTP5110** CTP5115	**CTP5115**	
🟥			
🟩			
🟧	**CTP5110** CTP5115	CTP5110 **CTP5115**	

-TFQ

- ○ Masterfinish geometry
- ○ Finishing to medium machining
- ○ Very high feed rates
- ○ High surface quality

CNMG 120408..





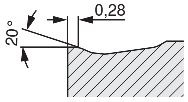
Machining conditions

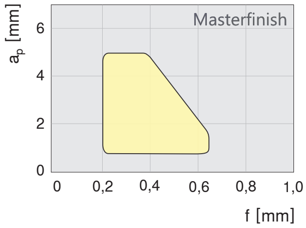
	●	◑	◌
🟦	**CTCP115** **CTEP110**	**CTCP125**	
🟨	CTEP110	CTCP125	
🟥	CTEP110		
🟩			
🟧			

-TMQ

- ○ Masterfinish geometry
- ○ Light to medium roughing
- ○ Very high feed rates
- ○ High surface quality

CNMG 120408..





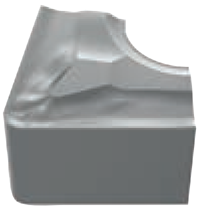
Machining conditions

	●	◑	◌
🟦	**CTCP115**	**CTCP125**	
🟨	CTCP115	CTCP125	
🟥	CTCP115	CTCP125	
🟩			
🟧			

Chip grooves for negative inserts

-TMF

- ○ Finishing to medium machining
- ○ Long-chipping and soft steels
- ○ Good chip control
- ○ Profiling



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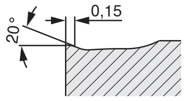
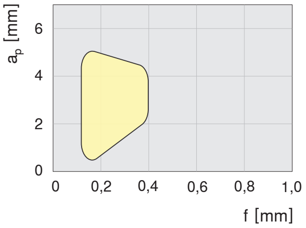


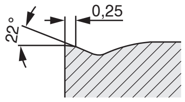


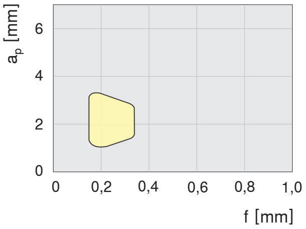
Machining conditions		
○	○	◌
CTCP115	**CTCP125**	**CTCP135**
CTCP125	**CTCP135**	**CTCP135**
	CTCK120	
CTCP135		

-TM

- ○ Medium machining
- ○ Universal chip groove

CNMG 120408..



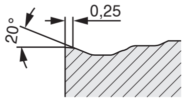


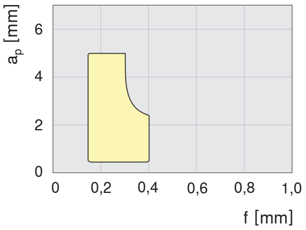
Machining conditions		
○	○	◌
CTCP115	**CTCP125**	**CTCP135**
CTCP125	**CTCP135**	**CTC2135**
	CTCK120	
CTC2135	CTC2135	

-M50

- ○ Medium machining
- ○ First choice for steel machining
- ○ Universal application

CNMG 120408..



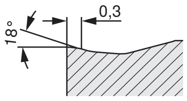


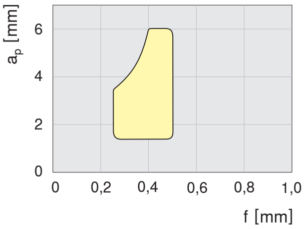
Machining conditions		
○	○	◌
CTCP115	**CTCP125**	**CTCP135**
CTCP115	CTCP135	CTCP135
	CTCP125	**CTCP125**

-M60

- ○ Light to medium roughing
- ○ Stable cutting edge
- ○ Interrupted cut
- ○ Skin on castings or forgings

CNMG 120408..





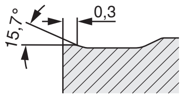
Machining conditions		
○	○	◌
CTPM125	CTPM125	CTPM125
CTPM125	**CTPM125**	**CTPM125**
	CTPM125	CTPM125

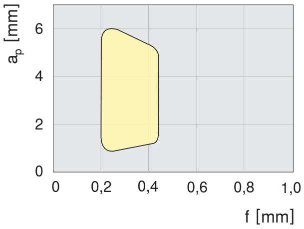
Chip grooves for negative inserts

-M70

- ○ Light to medium roughing
- ○ Skin on castings or forgings
- ○ Stable cutting edge
- ○ Interrupted cut
- ○ For blanks and forged parts

CNMG 120408..



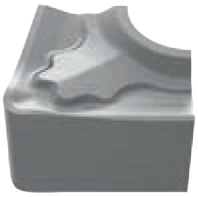


Machining conditions

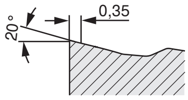
	○	◒	◌
🟦	**CTCP115**	**CTCP125**	**CTCP135**
🟨	**CTCP125**	**CTC2135**	**CTC2135**
🟥	**CTC3110** CTCP115	**CTCK120**	**CTCP125**
🟩			
🟧			
⬜			

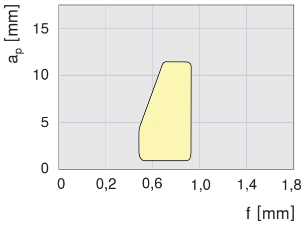
-R28

- ○ Single-sided roughing geometry
- ○ Longitudinal and face turning, profiling
- ○ Inconsistent cutting depth
- ○ For steels with high strength (800 N/mm^2)
- ○ Good chip control



CNMM 190616..





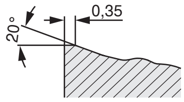
Machining conditions

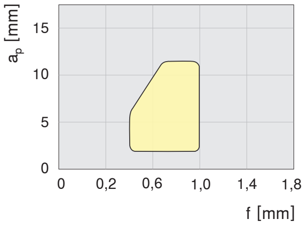
	○	◒	◌
🟦	**CTCP115**	CTCP115 **CTCP125**	**CTCP135**
🟨	CTCP115	CTCP115 CTCP125	CTCP135
🟥	**CTCP115**	**CTCP115** CTCP125	**CTCP125**
🟩			
🟧			
⬜			

-R58

- ○ Single-sided roughing geometry
- ○ Longitudinal and face turning
- ○ Slightly interrupted cut
- ○ Low cutting forces
- ○ Unstable machines

CNMM 190616..





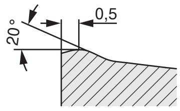
Machining conditions

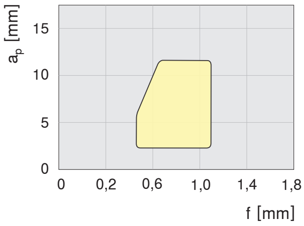
	○	◒	◌
🟦	**CTCP115**	CTCP115 **CTCP125**	**CTCP135**
🟨	CTCP115	CTCP115 CTCP125	CTCP135
🟥	**CTCP115**	**CTCP115** CTCP125	**CTCP125**
🟩			
🟧			
⬜			

-R88

- ○ Unilateral roughing geometry
- ○ Longitudinal and face turning
- ○ High feed rates
- ○ Large depths of cut
- ○ Heavily interrupted cut

CNMM 190616..





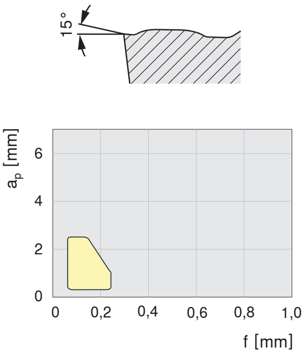
Machining conditions

	○	◒	◌
🟦	**CTCP115**	CTCP115 **CTCP125**	**CTCP135**
🟨	CTCP115	CTCP115 CTCP125	CTCP135
🟥	**CTCP115**	**CTCP115** CTCP125	**CTCP125**
🟩			
🟧			
⬜			

-CF05

- ○ Cermet: fine finishing grade (ground periphery)
- ○ Good chip control
- ○ High surface quality
- ○ Low cutting forces

CCGT 09T308..



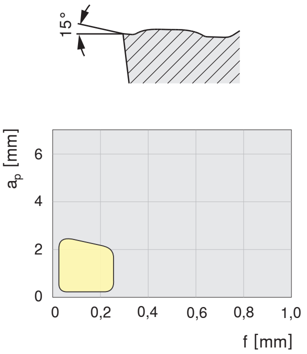
Machining conditions

	○	◐	◌
🟦	**CTEP110**		
🟨	CTEP110		
🟥	CTEP110		
🟩			
🟧			

-SF

- ○ Finishing, profile turning
- ○ Good chip control
- ○ High surface quality
- ○ Low cutting forces

CCGT 09T308..



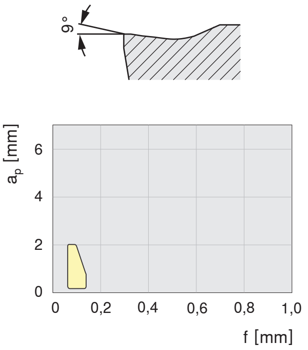
Machining conditions

	○	◐	◌
🟦	**CTCP115** **TCM407**	**CTCP125** **TCM10**	**CTCP135**
🟨	**CTCP125**	**CTC2135**	**CTC2135**
🟥		**CTCP125**	**CTCP125**
🟩			
🟧	CTCP125	CTCP125	

-F23

- ○ Finest finishing geometry (ground periphery)
- ○ Very high surface quality
- ○ Good repeatability
- ○ Low depth of cut

CCGT 09T308..



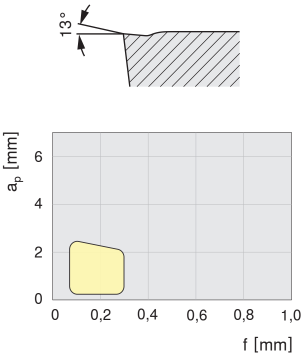
Machining conditions

	○	◐	◌
🟦			
🟨	**CTP2120**	**CTP2120**	
🟥	CTP2120		
🟩	CTP2120		
🟧	CTP2120		

-CF55

- ○ Cermet: finishing to medium machining
- ○ Low cutting forces
- ○ Good chip control
- ○ High surface quality

CCMT 09T308..



Machining conditions

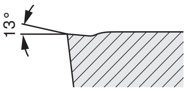
	○	◐	◌
🟦	**CTEP110**		
🟨	CTEP110		
🟥	CTEP110		
🟩			
🟧			

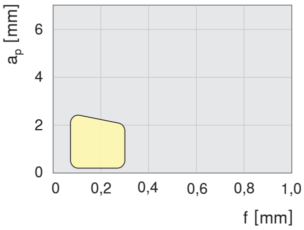
Chip grooves for positive inserts

-SMF

- Finishing to medium machining
- Low cutting forces
- Good chip control
- High surface quality

CCMT 09T308..



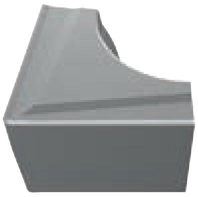


Machining conditions

	●	◐	◌
🟦	**CTCP115 TCM10**	**CTCP125 TCM10**	**CTCP125**
🟨	**CTCP125**	**CTCP135**	**CTCP135**
🟥	CTCP115		
🟩			
🟧			
⬜			

-SM

- Medium machining
- Universal application
- Stable cutting edge
- Inconsistent cutting depth
- Wide range of applications



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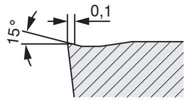
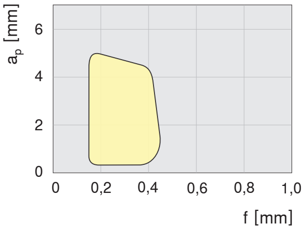




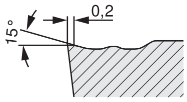
Machining conditions

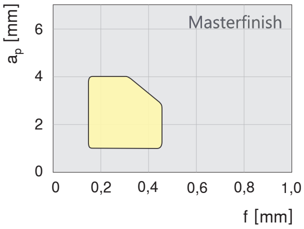
	●	◐	◌
🟦	**CTCP115**	**CTCP125**	**CTCP135**
🟨	**CTCP125**	**CTC2135**	**CTC2135**
🟥	**CTC3110**	**CTCK120**	**CTCK120**
🟩			
🟧			
⬜			

-SMQ

- Positive Masterfinish geometry
- Finishing to medium machining
- Very high feed rates
- High surface quality

CCMT 09T308..





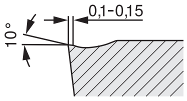
Machining conditions

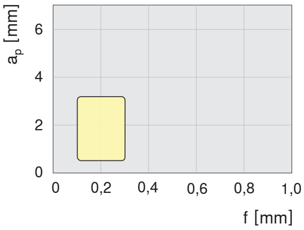
	●	◐	◌
🟦	**CTCP115**	**CTCP125**	
🟨	CTCP115	CTCP125	
🟥	CTCP115	CTCP125	
🟩			
🟧			
⬜			

-M25

- First choice for finishing to medium machining of stainless steel
- Smooth cut
- High surface quality
- Reduced built-up edge

CCMT 09T308..





Machining conditions

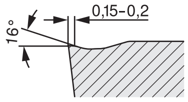
	●	◐	◌
🟦			CTPM125
🟨		**CTPM125**	CTPM125
🟥			
🟩			
🟧	CTPM125	CTPM125	
⬜			

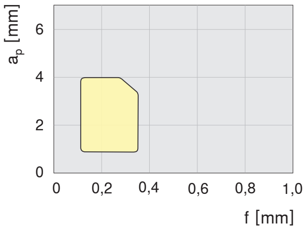
Chip grooves for positive inserts

-M55

- ○ First choice for medium roughing of stainless steel
- ○ Continuous to slightly interrupted cut
- ○ Good chip control
- ○ Stable cutting edge

CCMT 09T308..



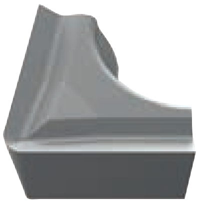


Machining conditions

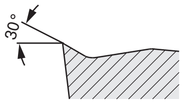
	○	◐	◌
🟦			CTPM125
🟨		**CTPM125**	CTPM125
🟥			
🟩			
🟧	CTPM125	CTPM125	
⬜			

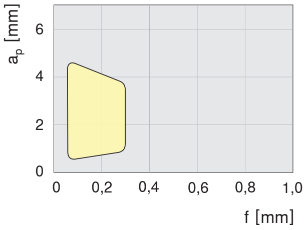
-23P

- ○ Reduced tendency to adhesion
- ○ Good chip control for soft aluminium alloys



CCGT 09T308..



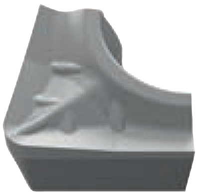


Machining conditions

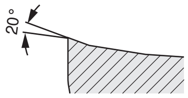
	○	◐	◌
🟦			
🟨			
🟥			
🟩	**H216T**	**H216T**	**H216T**
🟧			
⬜			

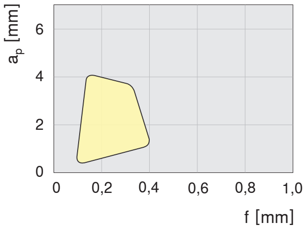
-25P

- ○ Sharp cutting edge
- ○ Good chip control for soft aluminium alloys
- ○ Reduced tendency to adhesion



CCGT 09T308..





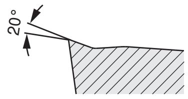
Machining conditions

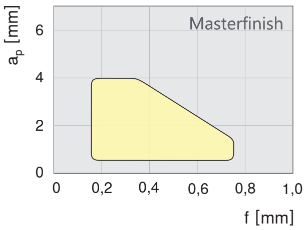
	○	◐	◌
🟦	AMZ	AMZ	
🟨	AMZ	AMZ	
🟥	**AMZ**	**AMZ**	
🟩	**H210T**	**H210T**	**H210T**
🟧	**AMZ**	**AMZ**	
⬜			

-25Q

- ○ Masterfinish geometry
- ○ High feed rates
- ○ High surface quality
- ○ Good chip control for soft aluminium alloys
- ○ Reduced tendency to adhesion

CCGT 09T308..





Machining conditions

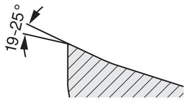
	○	◐	◌
🟦	H210T		
🟨	H210T	H210T	
🟥	**H210T**	**H210T**	
🟩	**H210T**	**H210T**	**H210T**
🟧	**H210T**	**H210T**	
⬜			

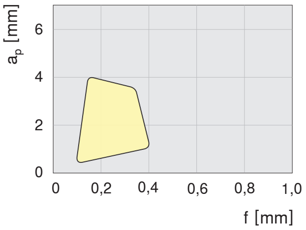
Chip grooves for positive inserts

-27

- ○ The universal geometry for aluminium
- ○ Sharp cutting edge
- ○ Extremely positive rake angle
- ○ Reduced tendency to adhesion
- ○ High feed rates

CCGT 09T308..





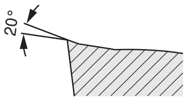
Machining conditions

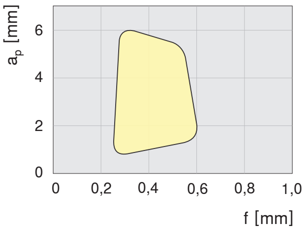
	●	◐	◌
🟦	AMZ	AMZ	
🟨	AMZ	AMZ	
🟥	**AMZ**	**AMZ**	**H10T**
🟩	**H10T**	**H10T**	**H10T**
🟧			

-29

- ○ Geometry for aluminium, periphery not ground
- ○ Positive rake angle
- ○ Good chip control
- ○ For medium to rough machining

CCMT 09T308..





Machining conditions

	●	◐	◌
🟦	AMZ	AMZ	
🟨	AMZ	AMZ	
🟥	**AMZ**	**AMZ**	
🟩	**H216T**	**H216T**	**H216T**
🟧	AMZ	AMZ	

Chip grooves for aluminium wheel machining

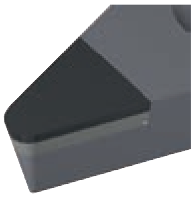
-24P

- For the machining of wrought aluminium with less than 1 % of silicon, non-ferrous metals, plastics and refractory metals
- Medium and rough machining
- Good chip control for a wide range of applications

	Machining conditions		
	○	◒	◌
🟦			
🟨			
🟥			
🟩	H210T, H216T	H210T, H216T	H210T, H216T
🟧			

-F4

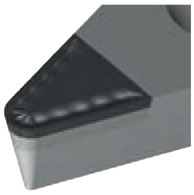
- PCD segment without chip groove
- Mainly suitable for interrupted cut
- Available types of edge preparation: sharp (F), honed (E), chamfered (T) according to the ISO designation system



	Machining conditions		
	○	◒	◌
🟦			
🟨			
🟥			
🟩	CTD4110	CTD4110	CTD4110
🟧			

-F41

- PCD segment
- Chip groove for good chip control and small depths of cut
- Available types of edge preparation: sharp (F), honed (E), chamfered (T) according to the ISO designation system



	Machining conditions		
	○	◒	◌
🟦			
🟨			
🟥			
🟩	CTD4110	CTD4110	CTD4110
🟧			

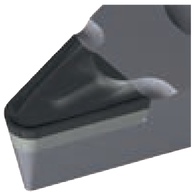
-M4

- PCD segment with carbide pin to improve chip control with larger depths of cut
- Available types of edge preparation: sharp (F), honed (E), chamfered (T) according to the ISO designation system

	Machining conditions		
	○	◒	◌
🟦			
🟨			
🟥			
🟩	CTD4110	CTD4110	CTD4110
🟧			

-M41

- PCD segment with proven M41 chip groove
- Optimised chip groove for low cutting pressure and ideal chip form
- Available types of edge preparation: sharp (F), honed (E), chamfered (T) according to the ISO designation system

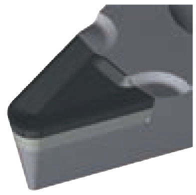


	Machining conditions		
	○	◒	◌
🟦			
🟨			
🟥			
🟩	CTD4110	CTD4110	CTD4110
🟧			

Chip grooves for aluminium wheel machining

-R41

- ○ PCD segment with chip groove R41
- ○ Roughing geometry for up to 4mm depth of cut
- ○ Available types of edge preparation: sharp (F), honed (E), chamfered (T) according to the ISO designation system



Machining conditions		
○	◒	◌
CTD4110	CTD4110	CTD4110

-U41

- ○ PCD segment with chip groove U41
- ○ Universal chip groove with good chip control for both small and large dephts of cut
- ○ Available types of edge preparation: sharp (F), honed (E), chamfered (T) according to the ISO designation system

Machining conditions		
○	◒	◌
CTD4110	CTD4110	CTD4110

Chip grooves for railway wheel-set machining

-M23

- Soft cutting geometry with excellent chip control for small depths of cut in finishing operations

Machining conditions		
●	◐	◌
CTCP115	**CTCP125**	**CTCP125**

-R23

- For high surface quality in machining operations with continuous cut

Machining conditions		
●	◐	◌
CTCP115	**CTCP125**	**CTCP125**

-R53

- Soft cutting geometry with a very positive rake angle in combination with a stable land
- For medium turning

Machining conditions		
●	◐	◌
CTCP115	**CTCP125**	**CTCP125**

-R70

- Roughing geometry for the reprocessing of railway wheels
- Stable geometry for long tool life
- For very good chip control

Machining conditions		
●	◐	◌
CTCP115	**CTCP125**	**CTCP125**

-R71

- Finishing geometry for the reprocessing of railway wheels
- Very smooth cut for high surface quality
- Special chip groove for good chip control - short-chipping - at low cutting speed

Machining conditions		
●	◐	◌
CTCP115	**CTCP125**	**CTCP125**

Chip grooves for railway wheel-set machining

-R74

- ○ Universal geometry for the reprocessing of railway wheels
- ○ For smooth cut, short-chipping

Machining conditions		
○	◐	◌
CTCP115	**CTCP125**	**CTCP125**

-R83

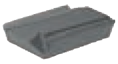
- ○ Geometry for high feed rates and large depth of cut as well as varying forging allowance
- ○ For a very good chip control

Machining conditions		
○	◐	◌
CTCP115	**CTCP125**	**CTCP125**

Additional chip grooves

-11

- For finish profiling
- On general steels, stainless steels and cast iron
- Application on low-power machines



	Machining conditions	
○	◒	◌
	CTCP125	**CTCP135**

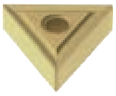
-12

- For profiling in the medium range
- On general steels, stainless steels and cast iron

	Machining conditions	
○	◒	◌
	CTCP125	**CTCP135**

-EN

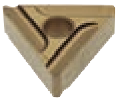
- Universal chip groove for general steels



	Machining conditions	
○	◒	◌
CTCP115	**CTCP125**	**CTCP135**
CTCP125	CTCP135	CTCP135
CTC3110	**CTCK120**	CTCP125

-ER/EL

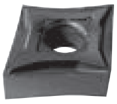
- Problem solver for unstable conditions
- Suitable for low-power machines
- For general steels, suitable as extended application on stainless steels



	Machining conditions	
○	◒	◌
	CTCP125	**CTCP135**

-F32

- For the finishing of stainless steels
- As extended application for general steels and super alloys



	Machining conditions	
○	◒	◌
CTP2120	**CTP2120**	
CTP2120		
CTP2120	CTP2120	
CTP2120		

Additional chip grooves

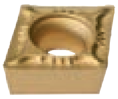
-F34

- ○ Stable, positve cutting edge
- ○ Also for slighlty interrupted cut

	Machining conditions		
	○	◒	◌
🟦			
🟨	**CTP5115**	**CTP5115**	
🟥			
🟩			
🟧	**CTP5115**	**CTP5115**	
⬜			

-F43

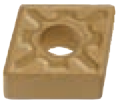
- ○ For finishing and medium machining of all stainless steels, general steels and super alloys



	Machining conditions		
	○	◒	◌
🟦			
🟨	**CTC2135**	**CTC2135**	**CTC2135**
🟥			
🟩			
🟧			
⬜			

-M42

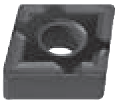
- ○ For medium machining of stainless steels
- ○ As extended application on general steels and super alloys



	Machining conditions		
	○	◒	◌
🟦			
🟨	**CTP2120**	**CTC2135**	**CTC2135**
🟥			
🟩			
🟧			
⬜			

-M52

- ○ Universal geometry for the machining of stainless steels
- ○ As extended application for general steels and super alloys



	Machining conditions		
	○	◒	◌
🟦			
🟨	**CTP2120**	**CTP2120**	
🟥	CTP2120	CTP2120	CTP2120
🟩			
🟧	**CTP2120**		
⬜			

-R80

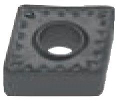
- ○ Single-sided roughing geometry
- ○ Bearing steels
- ○ Skin on castings or forgings

	Machining conditions		
	○	◒	◌
🟦	**CTCP125**	**CTCP125**	**CTCP125**
🟨	**CTCP125**	**CTCP125**	**CTCP125**
🟥			
🟩			
🟧			
⬜			

Additional chip grooves

-TR

- Light to medium roughing
- Steels with high strength (>800 N/mm^2)
- Good chip control
- Interrupted cut



	Machining conditions		
	○	◐	◌
🟦	**CTCP125**	**CTCP125**	**CTCP125**
🟨	**CTCP125**	**CTCP125**	
🟥	**CTCP125**	**CTCP125**	
🟩			
🟧			
⬜			

-TRM

- Light to medium roughing
- Bearing steels
- Skin on castings or forgings
- Slightly interrupted cut

	Machining conditions		
	○	◐	◌
🟦	**CTCP115**	**CTCP125**	**CTCP135**
🟨	**CTCP125**	**CTCP135**	**CTCP135**
🟥			
🟩			
🟧	CTCP125	CTCP135	
⬜			

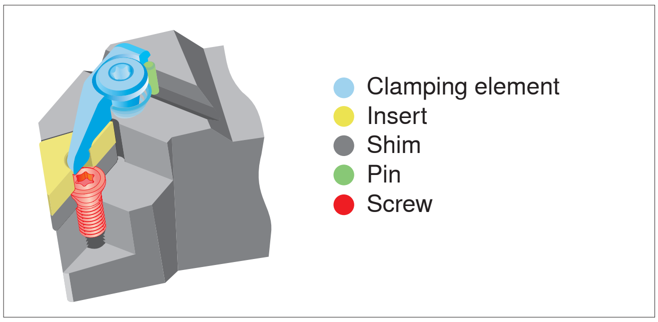
-TRR

- Light to medium roughing
- Steels with low strength (300-800 N/mm^2)
- Long-chipping materials
- Interrupted cut

	Machining conditions		
	○	◐	◌
🟦	**CTCP125**	**CTCP125**	**CTCP125**
🟨	**CTCP125**	**CTCP125**	**CTCP125**
🟥			
🟩			
🟧	CTCP125	CTCP125	
⬜			

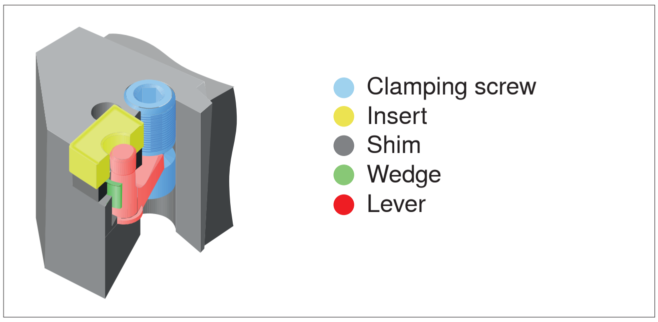
Clamping systems

MaxiLock D



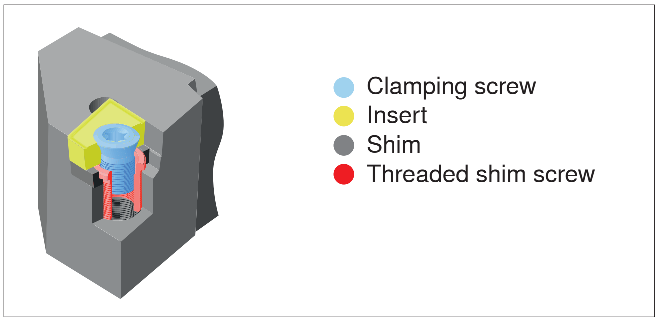
First choice for cutting with negative inserts with hole. **Safe** and **precise positioning** of the insert through **double clamping effect**.

MaxiLock N



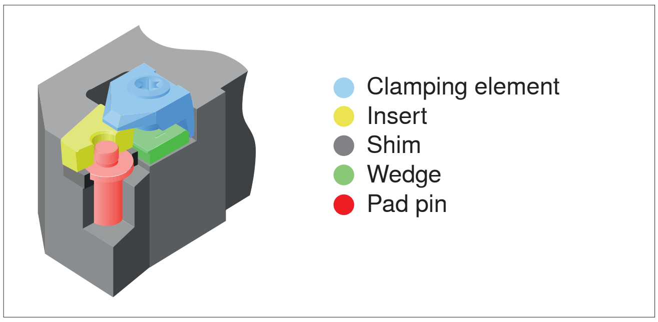
This clamping system is suitable for all negative form inserts with holes. The actuation screw can easily be reached from the upper and the lower side of the tool holder. In the unlocked position constituent parts remain intact.

MaxiLock S



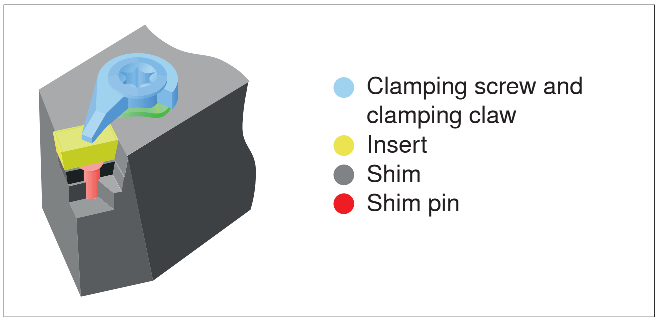
The form lock screw guarantees a safe connection of the insert and the tool holder. Chip evacuation is not hindered by obstructive clamping elements. Due to the neutral insert position the effective rake angle is identical to that of the insert form and geometry.

MaxiLock P



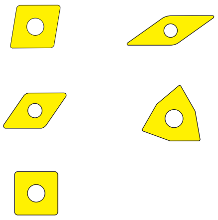
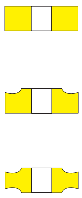
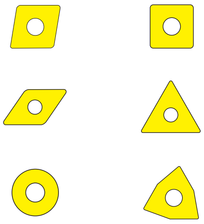
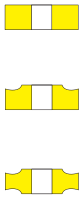
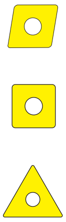
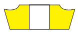
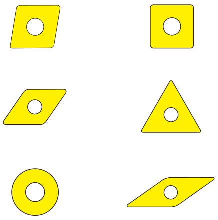
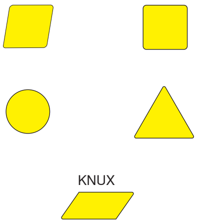
The insert with a clearance angle of 7° and a cylindrical bore is fixed with a wedge and claw lock against a fix pin. Up to three cutting edges can be used (1 support face).

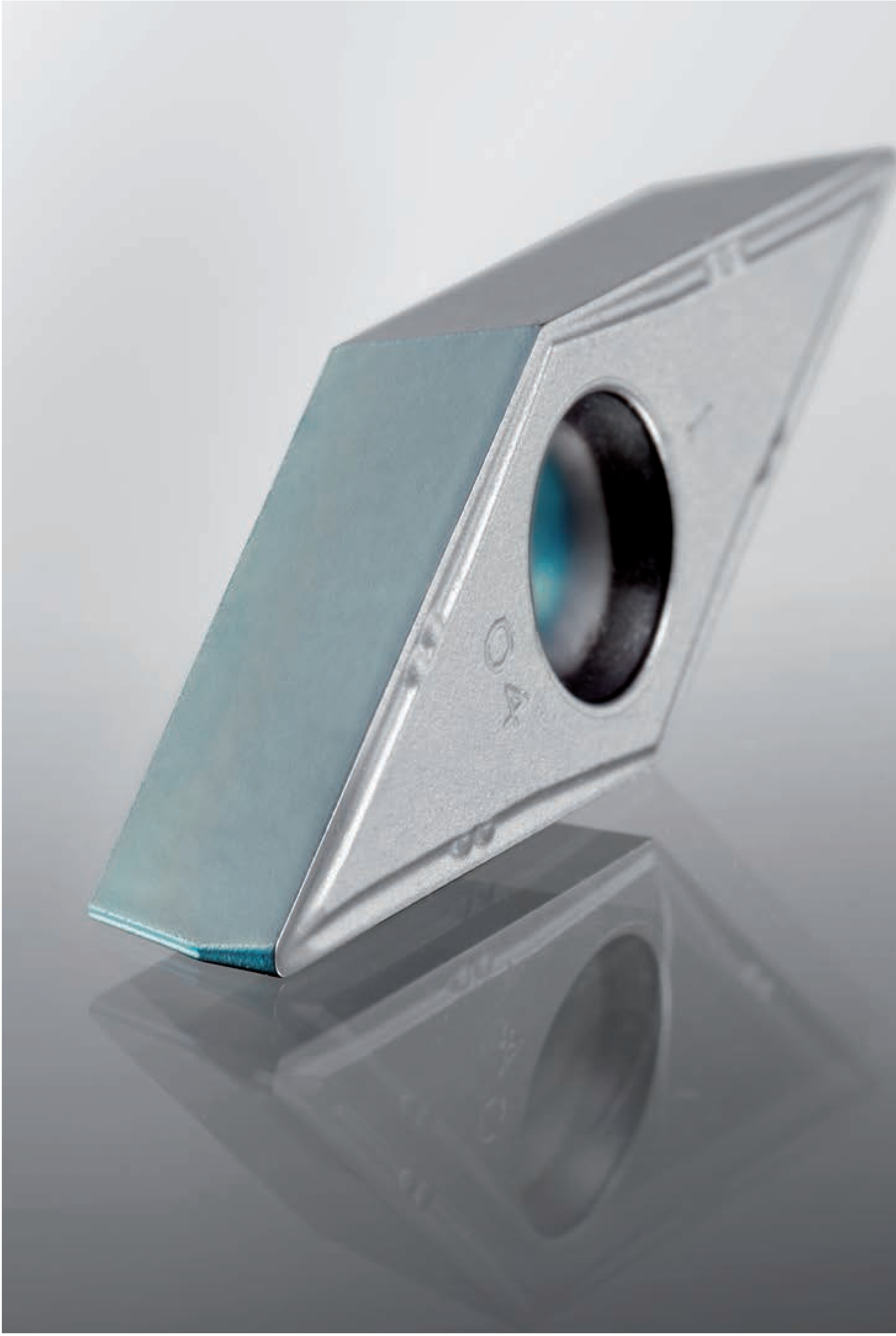
Simplex N / P



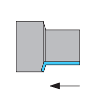
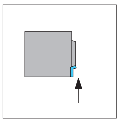
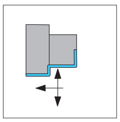
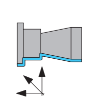
The tried and tested CERATIZIT Simplex clamping systems are characterised by their simplicity. The insert is clamped by means of a claw. Not suitable for drawing cuts.

Selection of the correct clamping system

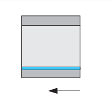
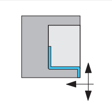
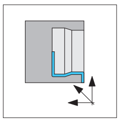
Clamping system	Cutting depth / feed rate (mm)						Insert shape	Insert form of top surface
	a_p	f	a_p	f	a_p	f		
	0,3 - 2,0	0,08 - 0,25	2,0 - 6,0	0,2 - 0,6	5,0 - 15,0	0,5 - 1,5		
MaxiLock D 	✓		✓		✓			
MaxiLock N 	✓		✓		✓			
MaxiLock P 			✓					
MaxiLock S 	✓		✓					
Simplex N 			✓					
Simplex P 	✓		✓					


04

External machining

	Longitudinal turning	A43-A47
	Face turning	A48-A50
	Longitudinal/face turning	A51
	Profiling	A52-A54

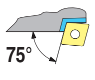
Internal machining

	Boring	A55
	Boring and face turning	A56-A57
	Profiling	A58-A59

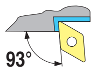
External machining

Longitudinal turning

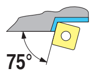
DCBN...
A109

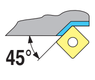
DDJN...
A112

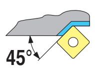
DSBN...
A113

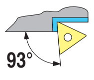
DSDN...
A114

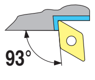
DSSN...
A116

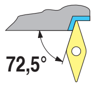
DTJN...
A117

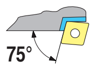
DVJN...
A118

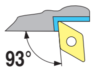
DVVN...
A119

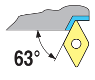
PCBN...
A121

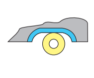
PDJN...
A124

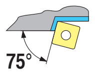
PDNN...
A125

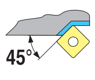
PRDC...
A126

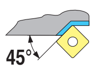
PSBN...
A128

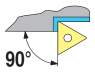
PSDN...
A129

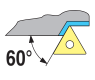
PSSN...
A131

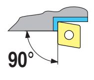
PTGN...
A133

PTTN...
A134

SCAC...
A136

External machining

Longitudinal turning

SCDC...

A137

SCMC...

A140

SCRC...

A141

SCSC...

A142

SDAC...

A143

SDJC...

A145

SDNC...

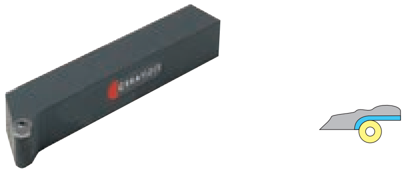
A146

SRDC...

A147

SRGC...

A148



SSBC...

A149

SSDC...

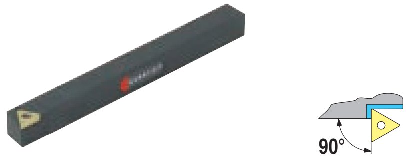
A150

SSSC...

A152

STAC...

A153



STGC...

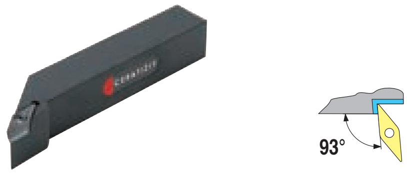
A156

SVHC...

A157

SVJC...

A158

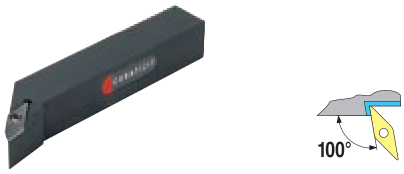


SVVC...

A159

SVZC/SVZP...

A160



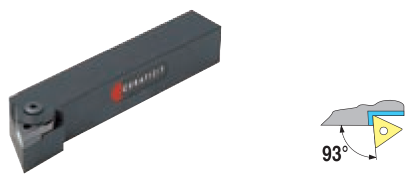
External machining

Longitudinal turning

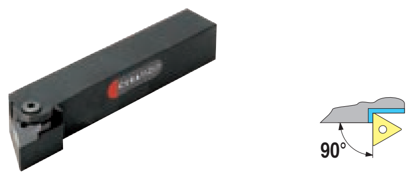
MCLC... A161

MSSC... A162

MTJC... A165

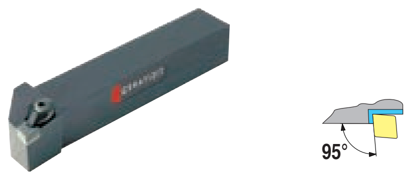


MTGC... A164



MTNC... A166

CCLN... A167



CKJN... A168

CRDN... A169

CSBN... A171

CSDN... A172

CTAN... A173

CTGN... A175

CTRN... A176

CTAP... A177

CTGP... A179

CTSP... A180

HSK-T DDHN... A184

HSK-T DDJN... A185

HSK-T DSDN...
A188

HSK-T DCMN...
A182

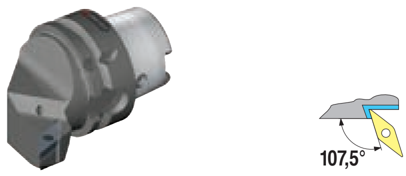
HSK-T DDMN...
A186

HSK-T DVMN...
A189

HSK-T PRDC...
A191

HSK-T SDJC...
A195

HSK-T SVHC...
A197



HSK-T SVJC...
A198

HSK-T SCMC...
A194

HSK-T SDMC...
A196

HSK-T SVMC...
A199

UTS PDJN...
A202

UTS PDNN...
A203

UTS PRDC...
A205

UTS PSBN...
A207

UTS PSDN...
A208

UTS PSSN...
A210

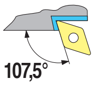
UTS PTGN...
A212

External machining

Longitudinal turning

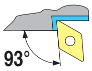
UTS SDHC...

A215



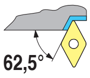
UTS SDJC...

A216



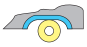
UTS SDNC...

A217



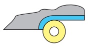
UTS SRDC...

A220



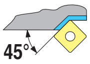
UTS SRGC...

A221



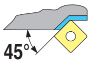
UTS SSDC...

A150



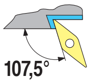
UTS SSSC...

A224



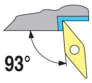
UTS SVHC...

A225



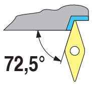
UTS SVJC...

A226



UTS SVVC...

A227



External machining

Face turning

DCKN... A110

DSKN... A115

DSSN... A116

PCKN... A122

PDJN... A124

PRGC... A127

PSKN... A130

PSSN... A131

PTFN... A132

PTTN... A134

SCFC... A138

SCSC... A142

SDHC... A144

SDJC... A145

SRGC... A148

SSKC... A151

SSSC... A152

STCC... A154

External machining

Face turning

STFC...

A155

SVHC...

A157

MCLC...

A161

MSSC...

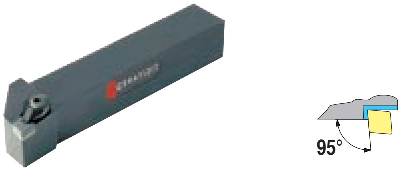
A162

MTFC...

A163

CCLN...

A167



CRGN...

A170

CTFN...

A174

CTRN...

A176

CTFP...

A178

CTSP...

A180

HSK-T DDHN...

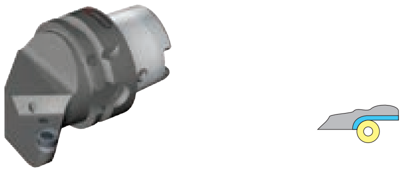
A184

HSK-T DDUN...

A187

HSK-T PRSC...

A192

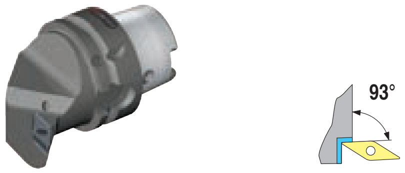


HSK-T SVHC...

A197

HSK-T SVUC...

A200



UTS PDJN...

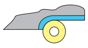
A202

UTS PDUN...

A204

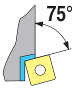
UTS PRGC...

A206



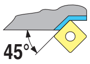
UTS PSKN...

A209



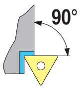
UTS PSSN...

A210



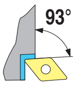
UTS PTFN...

A211



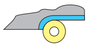
UTS SDUC...

A218



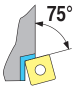
UTS SRGC...

A221



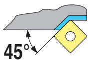
UTS SSKC...

A223



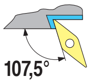
UTS SSSC...

A224



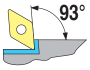
UTS SVHC...

A225



UTS SDXC...

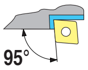
A219



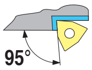
External machining

Longitudinal and face turning

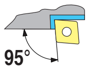
DCLN... A111

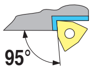
DWLN... A120

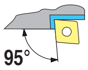
PCLN... A123

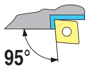
PWLN... A135

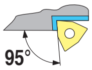
SCLC... A139

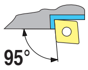
HSK-T DCLN... A181

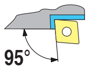
HSK-T DWLN... A190

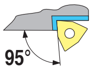
HSK-T SCLC... A193

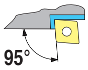
UTS PCLN... A201

UTS PWLN... A213

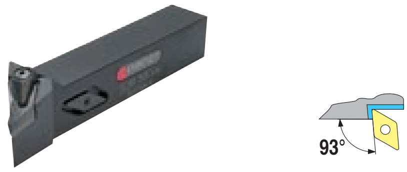
UTS SCLC... A214

DDJN...
A112

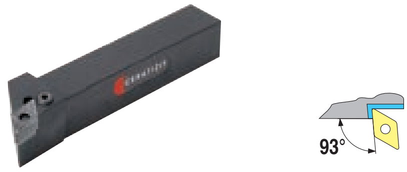
DTJN...
A117

DVJN...
A118



DVVN...
A119

PDJN...
A124



PDNN...
A125

PRDC...
A126

PRGC...
A127

PTTN...
A134

SCDC...
A137

SCMC...
A140

SDAC...
A143

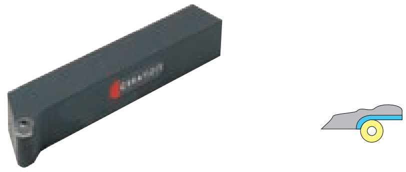
SDHC...
A144

SDJC...
A145

SDNC...
A146

SRDC...
A147

SRGC...
A148



SVHC...
A157

External machining

Profiling

SVJC...

A158

SVVC...

A159

SVZC/SVZP...

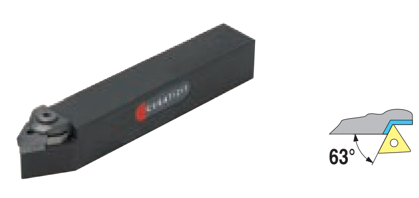
A160

MTJC...

A165

MTNC...

A166



CKJN...

A168

CRDN...

A169

CRGN...

A170

HSK-T DDHN...

A184

HSK-T DDJN...

A185

HSK-T DDUN...

A187

HSK-T DDMN...

A186

HSK-T DVMN...

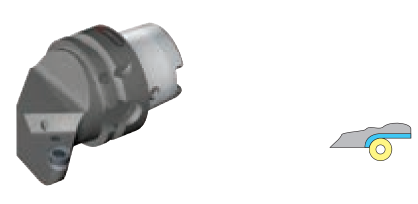
A189

HSK-T PRDC...

A191

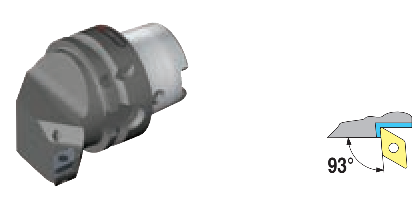
HSK-T PRSC...

A192



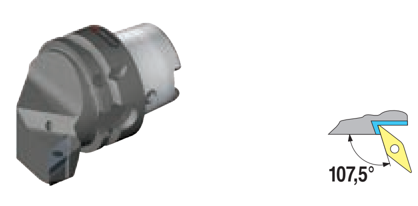
HSK-T SDJC...

A195



HSK-T SVHC...

A197

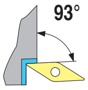


HSK-T SVJC...

A198

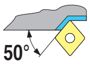
HSK-T SVUC...

A200



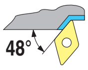
HSK-T SCMC...

A194



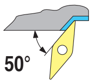
HSK-T SDMC...

A196



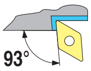
HSK-T SVMC...

A199



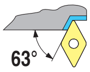
UTS PDJN...

A202



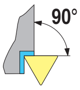
UTS PDNN...

A203



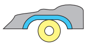
UTS PDUN...

A204



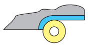
UTS PRDC...

A205



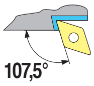
UTS PRGC...

A206



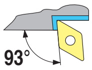
UTS SDHC...

A215



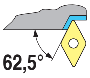
UTS SDJC...

A216



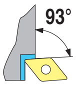
UTS SDNC...

A217



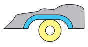
UTS SDUC...

A218



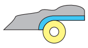
UTS SRDC...

A220



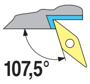
UTS SRGC...

A221



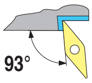
UTS SVHC...

A225



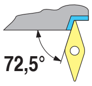
UTS SVJC...

A226



UTS SVVC...

A227

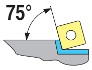


Internal machining

Boring

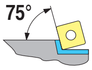
DSKN...

A230



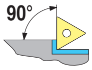
PSKN...

A234



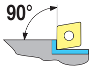
PTFN...

A235



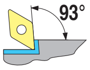
SCFC...

A237



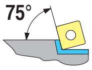
SDXC...

A243



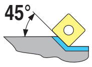
SSKC...

A244



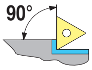
SSSC...

A245



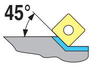
STFC...

A246



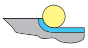
MSSC...

A251



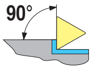
CRSN...

A253



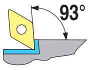
CTFP...

A254



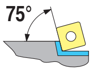
UTS SDXC...

A266



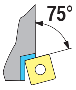
UTS SSKC...

A267

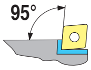


UTS PSKN...

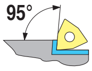
A209



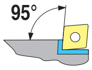
DCLN... A228

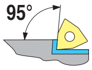
DWLN... A231

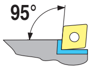
PCLN... A232

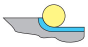
PWLN... A236

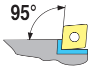
SCLC... A238

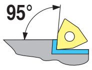
CRSN... A253

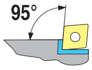
UTS PCLN... A261

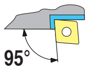
UTS PWLN... A263

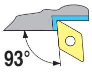
UTS SCLC... A264

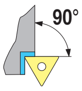
UTS PCLN... A201

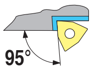
UTS PDJN... A202

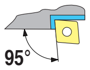
UTS PTFN... A211

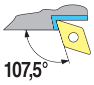
UTS PWLN... A213

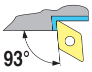
UTS SDJC... A216

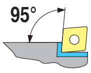
UTS SDHC... A215

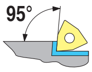
UTS SDJC... A216

HSK-T DCLN... A255

HSK-T DWLN... A257

Internal machining

Boring and face turning

HSK-T SCLC...

A258

HSK-T DCLN...

A181

HSK-T DWLN...

A190

HSK-T DDJN...

A185

HSK-T DCMN...

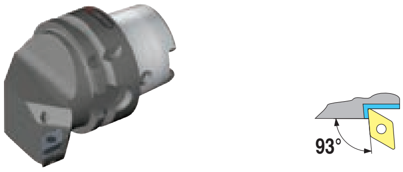
A182

HSK-T SCLC...

A193

HSK-T SDJC...

A195



HSK-T SVJC...

A198

HSK-T SCMC...

A194

DDUN...
A229

PDUN...
A233

SDQC...
A240

SDUC...
A241

SVQC...
A247

SVUC...
A248

SVXC/P
A269

MTUC...
A252

HSK-T DDUN...
A256

HSK-T SDUC...
A259

HSK-T SVUC...
A260

HSK-T DDHN...
A184

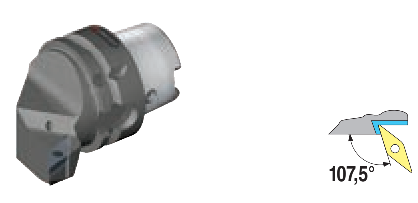
HSK-T DDUN...
A187

HSK-T DDMN...
A186

HSK-T DVMN...
A189

HSK-T PRSC...
A192

HSK-T SVHC...
A197



HSK-T SVUC...
A200

Internal machining

Profiling

HSK-T SDMC...

A196

HSK-T SVMC...

A199

UTS PDUN...

A262

UTS SDUC...

A265

SVQC...

A268

SVUC...

A269

UTS PDUN...

A204

UTS SDUC...

A218

UTS SDXC...

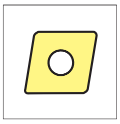
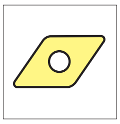
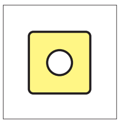
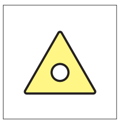
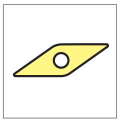
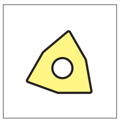
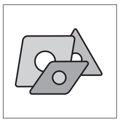
A219

Notes

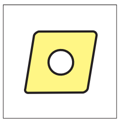
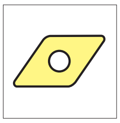
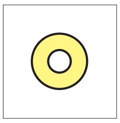
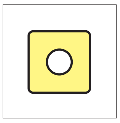
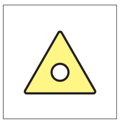
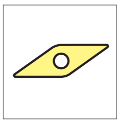
Overview

Inserts

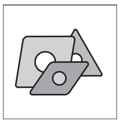
MaxiLock D/N

	80°	A63-A66
	55°	A67-A69
	90°	A70-A72
	60°	A73-A75
	35°	A76
	80°	A77-A78
	Others / railway wheel sets	A79-A81

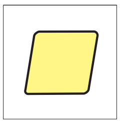
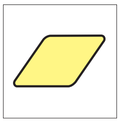
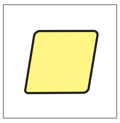
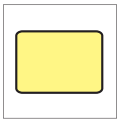
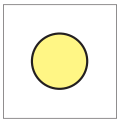
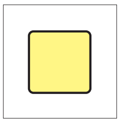
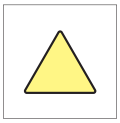
MaxiLock S

	80°	A82-A84
	55°	A85-A86
	0°	A87
	90°	A88
	60°	A89
	35°	A90-A91

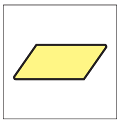
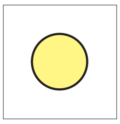
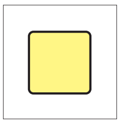
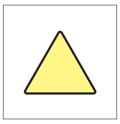
MaxiLock S

	Others	A92

Simplex N

	80°	A97
	55°	A98
	75°	A98
	90°	A98
	0°	A99
	90°	A100
	60°	A101

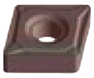
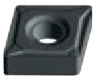
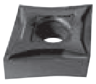
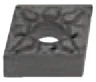
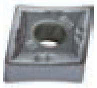
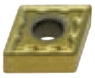
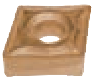
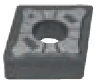
Simplex P

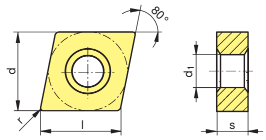
	55°	A102
	0°	A103
	90°	A104
	60°	A105

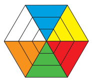
MaxiLock D/N

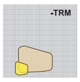
CN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
-27		CNGM 190612FN-27											●			19.05	19.30	6.35	1.20	7.94
-CF20		CNMG 120404EN-CF20	●													12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-CF20	●													12.70	12.90	4.76	0.80	5.16
-CF		CNMG 120404EN-CF		●												12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-CF		●												12.70	12.90	4.76	0.80	5.16
-F32		CNGP 120402FN-F32						●								12.70	12.90	4.76	0.20	5.16
		CNGP 120404FN-F32						●								12.70	12.90	4.76	0.40	5.16
		CNGP 120408FN-F32						●								12.70	12.90	4.76	0.80	5.16
-F30		CNMG 120404EN-F30							●							12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-F30							●							12.70	12.90	4.76	0.80	5.16
-TF		CNMG 090304EN-TF			●											9.52	9.70	3.18	0.40	3.81
		CNMG 120404EN-TF			●		●									12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-TF				●	●									12.70	12.90	4.76	0.80	5.16
-F34		CNMG 120404EN-F34													●	12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-F34													●	12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-F34													●	12.70	12.90	4.76	1.20	5.16
-M30		CNMG 120408EN-M30							●							12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-M30							●							12.70	12.90	4.76	1.20	5.16
		CNMG 120416EN-M30							●							12.70	12.90	4.76	1.60	5.16
-M34		CNMG 120404EN-M34												●	●	12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-M34												●	●	12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-M34												●	●	12.70	12.90	4.76	1.20	5.16
		CNMG 120416EN-M34													●	12.70	12.90	4.76	1.60	5.16
-42		CNMG 120408EN-42					●			●						12.70	12.90	4.76	0.80	5.16
-TFQ		CNMG 120404EN-TFQ	●			●										12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-TFQ	●		●	●										12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-TFQ	●		●	●										12.70	12.90	4.76	1.20	5.16

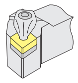


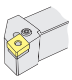

A13

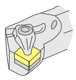


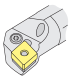
A24


A297


□ A109-A111
HSK A181-A183


□ A121-A123
UTS A201

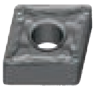
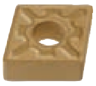
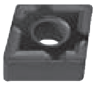
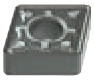
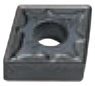
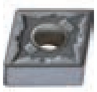

⌀ A228
HSK A255

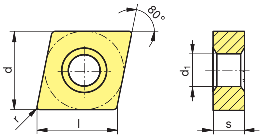

⌀ A232
UTS A261

MaxiLock D/N

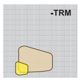
CN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-TMF		CNMG 120404EN-TMF			●	●	●									12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-TMF			●	●	●									12.70	12.90	4.76	0.80	5.16
-M42		CNMG 120404EN-M42						●		●						12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-M42						●		●						12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-M42								●						12.70	12.90	4.76	1.20	5.16
-M52		CNMG 120404EN-M52						●								12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-M52						●								12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-M52						●								12.70	12.90	4.76	1.20	5.16
-M50		CNMG 120404EN-M50			●	●	●									12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-M50			●	●	●									12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-M50			●	●	●									12.70	12.90	4.76	1.20	5.16
		CNMG 120416EN-M50			●	●	●									12.70	12.90	4.76	1.60	5.16
		CNMG 160608EN-M50			●	●	●									15.88	16.10	6.35	0.80	6.35
		CNMG 160612EN-M50			●	●	●									15.88	16.10	6.35	1.20	6.35
		CNMG 160616EN-M50			●	●	●									15.88	16.10	6.35	1.60	6.35
-TM		CNMG 090308EN-TM				●						●				9.52	9.70	3.18	0.80	3.81
		CNMG 120408EN-TM			●	●	●			●						12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-TM				●	●			●						12.70	12.90	4.76	1.20	5.16
		CNMG 120416EN-TM					●									12.70	12.90	4.76	1.60	5.16
		CNMG 160608EN-TM				●	●									15.88	16.10	6.35	0.80	6.35
		CNMG 160612EN-TM				●	●									15.88	16.10	6.35	1.20	6.35
		CNMG 190612EN-TM				●										19.05	19.30	6.35	1.20	7.94
		CNMG 190616EN-TM				●										19.05	19.30	6.35	1.60	7.94
-TMQ		CNMG 120408EN-TMQ				●										12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-TMQ			●	●										12.70	12.90	4.76	1.20	5.16
-TRM		CNMG 120408EN-TRM			●	●	●									12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-TRM				●	●									12.70	12.90	4.76	1.20	5.16
		CNMG 120416EN-TRM				●										12.70	12.90	4.76	1.60	5.16
		CNMG 160612EN-TRM			●	●										15.88	16.10	6.35	1.20	6.35
		CNMG 160616EN-TRM				●	●									15.88	16.10	6.35	1.60	6.35
		CNMG 190612EN-TRM				●										19.05	19.30	6.35	1.20	7.94
-M60		CNMG 120408EN-M60							●							12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-M60							●							12.70	12.90	4.76	1.20	5.16
		CNMG 120416EN-M60							●							12.70	12.90	4.76	1.60	5.16
		CNMG 160612EN-M60							●							15.88	16.10	6.35	1.20	6.35
			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d	l	s	r	d_1

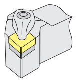


A13

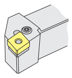


A24

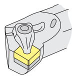
A297



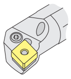
☐ A109-A111
HSK A181-A183



☐ A121-A123
UTS A201



⌀ A228
HSK A255

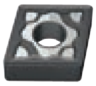
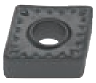


⌀ A232
UTS A261

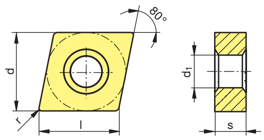
MaxiLock D/N

CN..

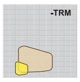
	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
-M70		CNMG 120408EN-M70			●	●	●			●	●	●				12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-M70			●	●	●			●	●	●				12.70	12.90	4.76	1.20	5.16
		CNMG 120416EN-M70			●	●	●				●	●				12.70	12.90	4.76	1.60	5.16
		CNMG 160608EN-M70			●	●	●									15.88	16.10	6.35	0.80	6.35
		CNMG 160612EN-M70			●	●	●			●	●					15.88	16.10	6.35	1.20	6.35
		CNMG 160616EN-M70			●	●	●				●					15.88	16.10	6.35	1.60	6.35
		CNMG 190612EN-M70			●	●	●			●						19.05	19.30	6.35	1.20	7.94
		CNMG 190616EN-M70			●	●	●			●						19.05	19.30	6.35	1.60	7.94
		CNMG 190624EN-M70			●	●	●									19.05	19.30	6.35	2.40	7.94
		CNMG 250924EN-M70				●										25.40	25.80	9.52	2.40	9.12
-R28		CNMM 120408EN-R28			●	●										12.70	12.90	4.76	0.80	5.16
		CNMM 120412EN-R28			●	●	●									12.70	12.90	4.76	1.20	5.16
		CNMM 120416EN-R28			●	●	●									12.70	12.90	4.76	1.60	5.16
		CNMM 160612EN-R28			●	●	●									15.88	16.10	6.35	1.20	6.35
		CNMM 160616EN-R28			●	●	●									15.88	16.10	6.35	1.60	6.35
		CNMM 190612EN-R28			●	●	●									19.05	19.30	6.35	1.20	7.94
		CNMM 190616EN-R28			●	●	●									19.05	19.30	6.35	1.60	7.94
		CNMM 190624EN-R28			●	●	●									19.05	19.30	6.35	2.40	7.94
-R58		CNMM 120408EN-R58			●	●	●									12.70	12.90	4.76	0.80	5.16
		CNMM 120412EN-R58			●	●	●									12.70	12.90	4.76	1.20	5.16
		CNMM 120416EN-R58			●	●	●									12.70	12.90	4.76	1.60	5.16
		CNMM 160612EN-R58			●	●	●									15.88	16.10	6.35	1.20	6.35
		CNMM 160616EN-R58			●	●	●									15.88	16.10	6.35	1.60	6.35
		CNMM 190612EN-R58			●	●	●									19.05	19.30	6.35	1.20	7.94
		CNMM 190616EN-R58			●	●	●									19.05	19.30	6.35	1.60	7.94
		CNMM 190624EN-R58			●	●	●									19.05	19.30	6.35	2.40	7.94
		CNMM 250924EN-R58			●	●	●									25.40	25.80	9.52	2.40	9.12
-TR		CNMM 120408EN-TR				●										12.70	12.90	4.76	0.80	5.16
		CNMM 120412EN-TR				●										12.70	12.90	4.76	1.20	5.16
		CNMM 160612EN-TR				●										15.88	16.10	6.35	1.20	6.35
		CNMM 160616EN-TR				●										15.88	16.10	6.35	1.60	6.35
		CNMM 190616EN-TR				●										19.05	19.30	6.35	1.60	7.94
-TRR		CNMM 120408SN-TRR				●										12.70	12.90	4.76	0.80	5.16
		CNMM 120412SN-TRR				●										12.70	12.90	4.76	1.20	5.16
		CNMM 160612SN-TRR				●										15.88	16.10	6.35	1.20	6.35
		CNMM 160616SN-TRR				●										15.88	16.10	6.35	1.60	6.35
		CNMM 190616SN-TRR				●										19.05	19.30	6.35	1.60	7.94
-R80		CNMM 190616SN-R80				●										19.05	19.30	6.35	1.60	7.94
		CNMM 190624SN-R80				●										19.05	19.30	6.35	2.40	7.94

CTEP110 TCM10 CTCP115 CTCP125 CTCP135 CTP2120 CTPM125 CTC2135 CTC3110 CTCK120 H10T CTP5110 CTP5115 d l s r d₁



A13



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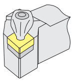
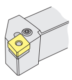
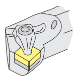
A297



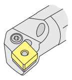
☐ A109-A111
HSK A181-A183



☐ A121-A123
UTS A201



⌀ A228
HSK A255

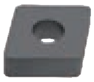


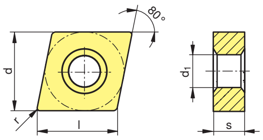
⌀ A232
UTS A261

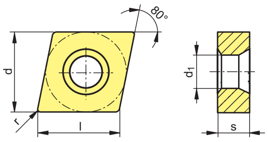
MaxiLock D/N

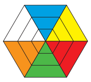
CN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
-R88		CNMM 190616SN-R88			●	●	●									19.05	19.30	6.35	1.60	7.94
		CNMM 190624SN-R88			●	●	●									19.05	19.30	6.35	2.40	7.94
		CNMM 250924SN-R88			●	●	●									25.40	25.80	9.52	2.40	9.12
		CNMT 320932SN-R88			●	●	●									31.75	32.24	9.52	3.20	9.12
-R88Q		CNMM 190624SN-R88Q			●	●										19.05	19.30	6.35	2.40	7.94
CN..A		CNMA 120404EN									●					12.70	12.90	4.76	0.40	5.16
		CNMA 120408EN									●	●				12.70	12.90	4.76	0.80	5.16
		CNMA 120412EN									●	●				12.70	12.90	4.76	1.20	5.16
		CNMA 120416EN										●				12.70	12.90	4.76	1.60	5.16
		CNMA 160608EN									●					15.88	16.10	6.35	0.80	6.35
		CNMA 160612EN									●					15.88	16.10	6.35	1.20	6.35
		CNMA 160616EN									●					15.88	16.10	6.35	1.60	6.35
		CNMA 190612EN									●					19.05	19.30	6.35	1.20	7.94
		CNMA 190616EN									●					19.05	19.30	6.35	1.60	7.94



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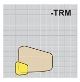
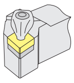
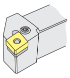
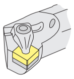


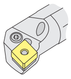
A24


A297


□ A109-A111
HSK A181-A183


□ A121-A123
UTS A201

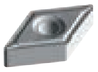
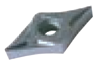
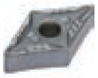
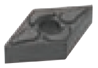
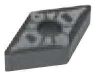
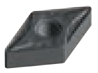

⌀ A228
HSK A255

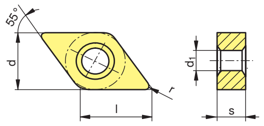

⌀ A232
UTS A261

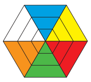
MaxiLock D/N

DN..

	P	M	K	N	S	H
CTEP110	●	○	○			
TCM10	●	●	○			
CTCP115	●	○	●			
CTCP125	●	○	●			
CTCP135	●	○			○	
CTP2120		●	○	○	○	
CTPM125	●	●			○	
CTC2135	○	●			○	
CTC3110	○		●			
CTCK120	○		●			
H10T			●	●		
CTP5110		○			●	
CTP5115		○			●	

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-CF20		DNMG 110404EN-CF20	●													9.52	11.60	4.76	0.40	3.81
		DNMG 110408EN-CF20	●													9.52	11.60	4.76	0.80	3.81
		DNMG 150604EN-CF20	●													12.70	15.50	6.35	0.40	5.16
		DNMG 150608EN-CF20	●													12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-CF20	●													12.70	15.50	6.35	1.20	5.16
-CF		DNMG 110404EN-CF		●												9.52	11.60	4.76	0.40	3.81
		DNMG 150604EN-CF		●												12.70	15.50	6.35	0.40	5.16
-F32		DNGP 150402FN-F32						●								12.70	15.50	4.76	0.20	5.16
		DNGP 150404FN-F32						●								12.70	15.50	4.76	0.40	5.16
		DNGP 150408FN-F32						●								12.70	15.50	4.76	0.80	5.16
		DNGP 150602FN-F32						●								12.70	15.50	6.35	0.20	5.16
		DNGP 150604FN-F32						●								12.70	15.50	6.35	0.40	5.16
		DNGP 150608FN-F32						●								12.70	15.50	6.35	0.80	5.16
-F30		DNMG 110404EN-F30							●							9.52	11.60	4.76	0.40	3.81
		DNMG 110408EN-F30							●							9.52	11.60	4.76	0.80	3.81
		DNMG 150604EN-F30							●							12.70	15.50	6.35	0.40	5.16
		DNMG 150608EN-F30							●							12.70	15.50	6.35	0.80	5.16
-TF		DNMG 110404EN-TF			●	●										9.52	11.60	4.76	0.40	3.81
		DNMG 110408EN-TF				●										9.52	11.60	4.76	0.80	3.81
		DNMG 150604EN-TF			●	●										12.70	15.50	6.35	0.40	5.16
		DNMG 150608EN-TF			●	●										12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-TF			●											12.70	15.50	6.35	1.20	5.16
-M30		DNMG 110408EN-M30							●							9.52	11.60	4.76	0.80	3.81
		DNMG 110412EN-M30							●							9.52	11.60	4.76	1.20	3.81
		DNMG 150608EN-M30							●							12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-M30							●							12.70	15.50	6.35	1.20	5.16
-M34		DNMG 150404EN-M34												●	●	12.70	15.50	4.76	0.40	5.16
		DNMG 150408EN-M34												●	●	12.70	15.50	4.76	0.80	5.16
		DNMG 150412EN-M34												●	●	12.70	15.50	4.76	1.20	5.16
		DNMG 150608EN-M34												●	●	12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-M34												●	●	12.70	15.50	6.35	1.20	5.16
-TFQ		DNMG 150604EN-TFQ	●			●										12.70	15.50	6.35	0.40	5.16
		DNMG 150608EN-TFQ	●		●	●										12.70	15.50	6.35	0.80	5.16
-TMF		DNMG 110404EN-TMF			●	●										9.52	11.60	4.76	0.40	3.81
		DNMG 110408EN-TMF			●		●									9.52	11.60	4.76	0.80	3.81
		DNMG 110412EN-TMF			●											9.52	11.60	4.76	1.20	3.81
		DNMG 150604EN-TMF			●	●	●									12.70	15.50	6.35	0.40	5.16
		DNMG 150608EN-TMF			●	●	●									12.70	15.50	6.35	0.80	5.16
			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d	l	s	r	d_1

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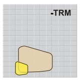
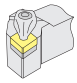
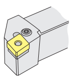
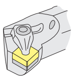


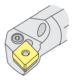
A24


A297


☐ A112
HSK A183-A187


☐ A124-A125
UTS A202-A204


⌀ A229
HSK A256

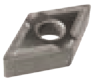
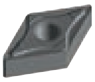
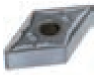

⌀ A233
UTS A262

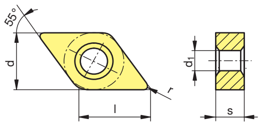
Turning / Inserts

MaxiLock D/N

DN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d$_1$ [mm]
-M42		DNMG 110404EN-M42								●						9.52	11.60	4.76	0.40	3.81
		DNMG 110408EN-M42								●						9.52	11.60	4.76	0.80	3.81
		DNMG 150404EN-M42						●		●						12.70	15.50	4.76	0.40	5.16
		DNMG 150408EN-M42								●						12.70	15.50	4.76	0.80	5.16
		DNMG 150604EN-M42						●		●						12.70	15.50	6.35	0.40	5.16
		DNMG 150608EN-M42						●		●						12.70	15.50	6.35	0.80	5.16
-M52		DNMG 150404EN-M52						●								12.70	15.50	4.76	0.40	5.16
		DNMG 150408EN-M52						●								12.70	15.50	4.76	0.80	5.16
		DNMG 150604EN-M52						●								12.70	15.50	6.35	0.40	5.16
		DNMG 150608EN-M52						●								12.70	15.50	6.35	0.80	5.16
-M50		DNMG 110404EN-M50			●	●	●									9.52	11.60	4.76	0.40	3.81
		DNMG 110408EN-M50			●	●	●									9.52	11.60	4.76	0.80	3.81
		DNMG 110412EN-M50			●	●	●									9.52	11.60	4.76	1.20	3.81
		DNMG 150404EN-M50			●	●	●									12.70	15.50	4.76	0.40	5.16
		DNMG 150408EN-M50			●	●	●									12.70	15.50	4.76	0.80	5.16
		DNMG 150412EN-M50			●	●	●									12.70	15.50	4.76	1.20	5.16
		DNMG 150416EN-M50			●	●	●									12.70	15.50	4.76	1.60	5.16
		DNMG 150604EN-M50			●	●	●									12.70	15.50	6.35	0.40	5.16
		DNMG 150608EN-M50			●	●	●									12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-M50			●	●	●									12.70	15.50	6.35	1.20	5.16
		DNMG 150616EN-M50			●	●	●									12.70	15.50	6.35	1.60	5.16
-TM		DNMG 110408EN-TM			●	●										9.52	11.60	4.76	0.80	3.81
		DNMG 150608EN-TM			●	●	●			●						12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-TM				●	●									12.70	15.50		1.20	
		DNMG 150616EN-TM				●	●									12.70	15.50	6.35	1.60	5.16
-TMQ		DNMG 150608EN-TMQ				●										12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-TMQ			●	●										12.70	15.50	6.35	1.20	5.16
-TRM		DNMG 110408EN-TRM				●										9.52	11.60	4.76	0.80	3.81
		DNMG 110412EN-TRM			●											9.52	11.60	4.76	1.20	3.81
		DNMG 150412EN-TRM				●										12.70	15.50	4.76	1.20	5.16
		DNMG 150608EN-TRM				●										12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-TRM			●	●										12.70	15.50	6.35	1.20	5.16
		DNMG 150616EN-TRM				●										12.70	15.50	6.35	1.60	5.16
-M60		DNMG 150608EN-M60							●							12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-M60							●							12.70	15.50	6.35	1.20	5.16
			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d	l	s	r	d$_1$



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☐ A112
HSK A183-A187

☐ A124-A125
UTS A202-A204

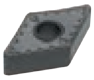
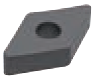
⌀ A229
HSK A256

⌀ A233
UTS A262

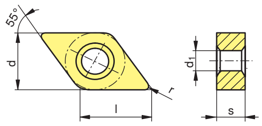
MaxiLock D/N

DN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
-M70		DNMG 110408EN-M70			●	●	●			●						9.52	11.60	4.76	0.80	3.81
		DNMG 110412EN-M70			●	●	●									9.52	11.60	4.76	1.20	3.81
		DNMG 150408EN-M70			●	●	●									12.70	15.50	4.76	0.80	5.16
		DNMG 150412EN-M70			●	●	●									12.70	15.50	4.76	1.20	5.16
		DNMG 150416EN-M70			●	●	●									12.70	15.50	4.76	1.60	5.16
		DNMG 150608EN-M70			●	●	●				●					12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-M70			●	●	●				●	●				12.70	15.50	6.35	1.20	5.16
		DNMG 150616EN-M70			●	●	●					●				12.70	15.50	6.35	1.60	5.16
-R28		DNMM 150612EN-R28			●	●	●									12.70	15.50	6.35	1.20	5.16
		DNMM 150616EN-R28			●	●	●									12.70	15.50	6.35	1.60	5.16
-R58		DNMM 150612EN-R58			●	●	●									12.70	15.50	6.35	1.20	5.16
		DNMM 150616EN-R58			●	●	●									12.70	15.50	6.35	1.60	5.16
-TR		DNMM 150608EN-TR				●										12.70	15.50	6.35	0.80	5.16
		DNMM 150612EN-TR				●										12.70	15.50	6.35	1.20	5.16
DN..A		DNMA 150608EN									●					12.70	15.50	6.35	0.80	5.16
		DNMA 150612EN									●					12.70	15.50	6.35	1.20	5.16

CTEP110 TCM10 CTCP115 CTCP125 CTCP135 CTP2120 CTPM125 CTC2135 CTC3110 CTCK120 H10T CTP5110 CTP5115 d l s r d₁



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□ A112
HSK A183-A187

□ A124-A125
UTS A202-A204

⌀ A229
HSK A256

⌀ A233
UTS A262

MaxiLock D/N

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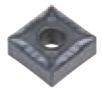
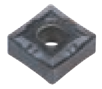
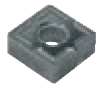
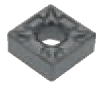
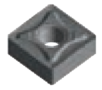
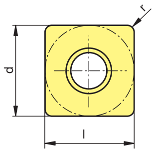
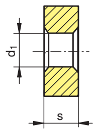
	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d1 [mm]
-F30		SNMG 120404EN-F30							●							12.70	12.70	4.76	0.40	5.16
		SNMG 120408EN-F30							●							12.70	12.70	4.76	0.80	5.16
-TF		SNMG 120404EN-TF				●										12.70	12.70	4.76	0.40	5.16
-M30		SNMG 120408EN-M30							●							12.70	12.70	4.76	0.80	5.16
		SNMG 120412EN-M30							●							12.70	12.70	4.76	1.20	5.16
-M34		SNMG 120408EN-M34												●	●	12.70	12.70	4.76	0.80	5.16
		SNMG 120412EN-M34												●	●	12.70	12.70	4.76	1.20	5.16
-TMF		SNMG 120408EN-TMF			●											12.70	12.70	4.76	0.80	5.16
		SNMG 120412EN-TMF					●									12.70	12.70	4.76	1.20	5.16
-M42		SNMG 120408EN-M42								●						12.70	12.70	4.76	0.80	5.16
		SNMG 120412EN-M42								●						12.70	12.70	4.76	1.20	5.16
-M52		SNMG 120408EN-M52						●								12.70	12.70	4.76	0.80	5.16
-M50		SNMG 120408EN-M50			●	●	●									12.70	12.70	4.76	0.80	5.16
		SNMG 120412EN-M50			●	●	●									12.70	12.70	4.76	1.20	5.16
		SNMG 120416EN-M50			●	●	●									12.70	12.70	4.76	1.60	5.16
		SNMG 150612EN-M50			●	●	●									15.88	15.88	6.35	1.20	6.35
		SNMG 150616EN-M50			●	●	●									15.88	15.88	6.35	1.60	6.35
-TM		SNMG 120408EN-TM			●	●	●			●						12.70	12.70	4.76	0.80	5.16
		SNMG 120412EN-TM				●										12.70	12.70	4.76	1.20	5.16
		SNMG 120416EN-TM				●	●									12.70	12.70	4.76	1.60	5.16
-TRM		SNMG 120412EN-TRM				●										12.70	12.70	4.76	1.20	5.16
		SNMG 120416EN-TRM				●										12.70	12.70	4.76	1.60	5.16
			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d	l	s	r	d1





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☐ A113-A116
HSK A188

☐ A128-A131
UTS A207-A210

⌀ A230

Turning / Inserts

MaxiLock D/N

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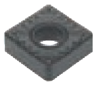
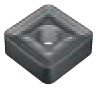
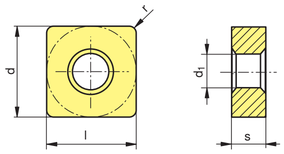
	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-M60		SNMG 120408EN-M60							●							12.70	12.70	4.76	0.80	5.16
		SNMG 120412EN-M60							●							12.70	12.70	4.76	1.20	5.16
		SNMG 120416EN-M60							●							12.70	12.70	4.76	1.60	5.16
-M70		SNMG 120408EN-M70			●	●	●			●	●					12.70	12.70	4.76	0.80	5.16
		SNMG 120412EN-M70			●	●	●			●	●					12.70	12.70	4.76	1.20	5.16
		SNMG 120416EN-M70			●	●	●				●					12.70	12.70	4.76	1.60	5.16
		SNMG 150612EN-M70			●	●	●									15.88	15.88	6.35	1.20	6.35
		SNMG 150616EN-M70			●	●	●									15.88	15.88	6.35	1.60	6.35
		SNMG 190612EN-M70			●	●	●									19.05	19.05	6.35	1.20	7.94
		SNMG 190616EN-M70			●	●	●			●						19.05	19.05	6.35	1.60	7.94
		SNMG 190624EN-M70			●	●	●									19.05	19.05	6.35	2.40	7.94
		SNMG 250924EN-M70				●										25.40	25.40	9.52	2.40	9.12
-R28		SNMM 150612EN-R28			●	●	●									15.88	15.88	6.35	1.20	6.35
		SNMM 150616EN-R28			●	●	●									15.88	15.88	6.35	1.60	6.35
		SNMM 190616EN-R28			●	●	●									19.05	19.05	6.35	1.60	7.94
		SNMM 250724EN-R28					●									25.40	25.40	7.94	2.40	9.12
		SNMM 250924EN-R28			●	●	●									25.40	25.40	9.52	2.40	9.12
-R58		SNMM 120408EN-R58			●	●	●									12.70	12.70	4.76	0.80	5.16
		SNMM 120412EN-R58			●	●	●									12.70	12.70	4.76	1.20	5.16
		SNMM 150612EN-R58			●	●	●									15.88	15.88	6.35	1.20	6.35
		SNMM 150616EN-R58			●	●	●									15.88	15.88	6.35	1.60	6.35
		SNMM 190612EN-R58			●	●	●									19.05	19.05	6.35	1.20	7.94
		SNMM 190616EN-R58			●	●	●									19.05	19.05	6.35	1.60	7.94
		SNMM 190624EN-R58			●	●	●									19.05	19.05	6.35	2.40	7.94
		SNMM 250724EN-R58			●	●	●									25.40	25.40	7.94	2.40	9.12
		SNMM 250924EN-R58			●	●	●									25.40	25.40	9.52	2.40	9.12
-TR		SNMM 120408EN-TR				●										12.70	12.70	4.76	0.80	5.16
		SNMM 120412EN-TR				●										12.70	12.70	4.76	1.20	5.16
		SNMM 150612EN-TR				●										15.88	15.88	6.35	1.20	6.35
		SNMM 190616EN-TR				●										19.05	19.05	6.35	1.60	7.94
		SNMM 250724EN-TR				●										25.40	25.40	7.94	2.40	9.12
-TRR		SNMM 190616SN-TRR				●										19.05	19.05	6.35	1.60	7.94
		SNMM 250724SN-TRR				●										25.40	25.40	7.94	2.40	9.12
-R88		SNMM 190616SN-R88			●	●	●									19.05	19.05	6.35	1.60	7.94
		SNMM 190624SN-R88			●	●	●									19.05	19.05	6.35	2.40	7.94
		SNMM 250724SN-R88			●	●	●									25.40	25.40	7.94	2.40	9.12
		SNMM 250732SN-R88			●	●	●									25.40	25.40	7.94	3.20	9.12
		SNMM 250924SN-R88			●	●	●									25.40	25.40	9.52	2.40	9.12
		SNMM 250932SN-R88			●	●	●									25.40	25.40	9.52	3.20	9.12
		SNMM 310932SN-R88			●	●										31.75	31.75	9.52	3.20	9.12
		SNMT 310932SN-R88			●	●	●									31.75	31.75	9.52	3.20	9.12
			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d	l	s	r	d_1



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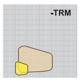

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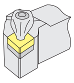
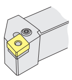


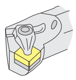
□ A113-A116

HSK A188



□ A128-A131

UTS A207-A210



⌀ A230

MaxiLock D/N

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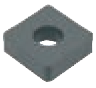
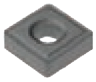
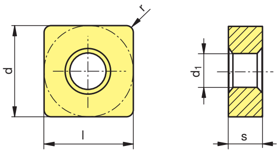
	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
SN..A		SNMA 120408EN									●	●				12.70	12.70	4.76	0.80	5.16
		SNMA 120412EN									●	●				12.70	12.70	4.76	1.20	5.16
		SNMA 120416EN									●	●				12.70	12.70	4.76	1.60	5.16
		SNMA 150616EN									●					15.88	15.88	6.35	1.60	6.35
		SNMA 190616EN									●					19.05	19.05	6.35	1.60	7.94
EN		SNMG 090308EN				●	●					●				9.52	9.52	3.18	0.80	3.81
			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d	l	s	r	d_1



A13

A24

A297

☐ A113-A116
HSK A188

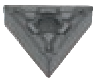
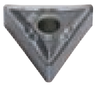
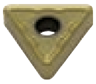
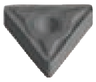
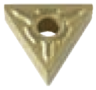
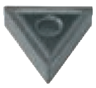
☐ A128-A131
UTS A207-A210

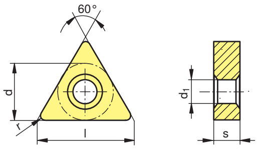
⌀ A230

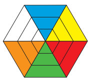
MaxiLock D/N

TN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d1 [mm]
-CF20		TNMG 160404EN-CF20	●													9.52	16.50	4.76	0.40	3.81
		TNMG 160408EN-CF20	●													9.52	16.50	4.76	0.80	3.81
		TNMG 160412EN-CF20	●													9.52	16.50	4.76	1.20	3.81
-F30		TNMG 160404EN-F30							●							9.52	16.50	4.76	0.40	3.81
		TNMG 160408EN-F30							●							9.52	16.50	4.76	0.80	3.81
-TF		TNMG 110304EN-TF				●										6.35	11.00	3.18	0.40	2.26
		TNMG 160404EN-TF			●	●	●									9.52	16.50	4.76	0.40	3.81
		TNMG 160408EN-TF			●	●										9.52	16.50	4.76	0.80	3.81
-M30		TNMG 160408EN-M30							●							9.52	16.50	4.76	0.80	3.81
		TNMG 160412EN-M30							●							9.52	16.50	4.76	1.20	3.81
-M34		TNMG 160408EN-M34													●	9.52	16.50	4.76	0.80	3.81
		TNMG 220404EN-M34													●	12.70	22.00	4.76	0.40	5.16
		TNMG 220408EN-M34													●	12.70	22.00	4.76	0.80	5.16
		TNMG 220416EN-M34													●	12.70	22.00	4.76	1.60	5.16
-TMF		TNMG 160404EN-TMF			●	●	●									9.52	16.50	4.76	0.40	3.81
		TNMG 160408EN-TMF				●	●									9.52	16.50	4.76	0.80	3.81
		TNMG 160412EN-TMF			●											9.52	16.50	4.76	1.20	3.81
-M42		TNMG 160404EN-M42						●		●						9.52	16.50	4.76	0.40	3.81
		TNMG 160408EN-M42						●		●						9.52	16.50	4.76	0.80	3.81
-M52		TNMG 160404EN-M52						●								9.52	16.50	4.76	0.40	3.81
		TNMG 160408EN-M52						●								9.52	16.50	4.76	0.80	3.81
-M50		TNMG 160404EN-M50			●	●	●									9.52	16.50	4.76	0.40	3.81
		TNMG 160408EN-M50			●	●	●									9.52	16.50	4.76	0.80	3.81
		TNMG 160412EN-M50			●	●	●									9.52	16.50	4.76	1.20	3.81
		TNMG 220408EN-M50			●	●	●									12.70	22.00	4.76	0.80	5.16
		TNMG 220412EN-M50			●	●	●									12.70	22.00	4.76	1.20	5.16
-TM		TNMG 160408EN-TM			●	●	●			●						9.52	16.50	4.76	0.80	3.81
		TNMG 160412EN-TM				●	●									9.52	16.50	4.76	1.20	3.81
		TNMG 220408EN-TM			●	●	●									12.70	22.00	4.76	0.80	5.16
		TNMG 220412EN-TM				●	●									12.70	22.00	4.76	1.20	5.16





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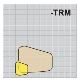
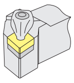
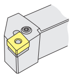


A24

A297

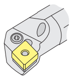


☐ A117



☐ A132-A134

UTS A211-A212

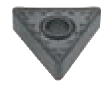
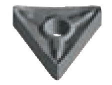
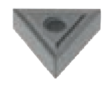


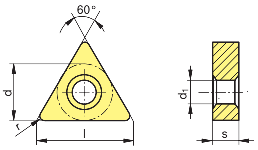
⌀ A235

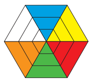
MaxiLock D/N

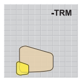
TN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
-TRM		TNMG 160408EN-TRM				●										9.52	16.50	4.76	0.80	3.81
		TNMG 160412EN-TRM				●										9.52	16.50	4.76	1.20	3.81
		TNMG 220408EN-TRM				●										12.70	22.00	4.76	0.80	5.16
		TNMG 220412EN-TRM				●	●									12.70	22.00	4.76	1.20	5.16
		TNMG 220416EN-TRM				●										12.70	22.00	4.76	1.60	5.16
-M60		TNMG 160408EN-M60							●							9.52	16.50	4.76	0.80	3.81
		TNMG 160412EN-M60							●							9.52	16.50	4.76	1.20	3.81
-M70		TNMG 160408EN-M70			●	●	●			●	●	●				9.52	16.50	4.76	0.80	3.81
		TNMG 160412EN-M70			●	●	●				●					9.52	16.50	4.76	1.20	3.81
		TNMG 220404EN-M70				●										12.70	22.00	4.76	0.40	5.16
		TNMG 220408EN-M70			●	●	●					●				12.70	22.00	4.76	0.80	5.16
		TNMG 220412EN-M70			●	●	●					●				12.70	22.00	4.76	1.20	5.16
		TNMG 220416EN-M70			●	●	●					●				12.70	22.00	4.76	1.60	5.16
-R28		TNMM 220416EN-R28			●	●	●									12.70	22.00	4.76	1.60	5.16
-R58		TNMM 220412EN-R58			●	●	●									12.70	22.00	4.76	1.20	5.16
-TR		TNMM 160412EN-TR				●										9.52	16.50	4.76	1.20	3.81
		TNMM 220408EN-TR				●										12.70	22.00	4.76	0.80	5.16
		TNMM 220416EN-TR				●										12.70	22.00	4.76	1.60	5.16
		TNMM 270616EN-TR				●										15.88	27.50	6.35	1.60	6.35
-TRR		TNMM 160408SN-TRR				●										9.52	16.50	4.76	0.80	3.81
		TNMM 220412SN-TRR				●										12.70	22.00	4.76	1.20	5.16
TN..A		TNMA 160408EN									●	●				9.52	16.50	4.76	0.80	3.81
		TNMA 160412EN									●	●				9.52	16.50	4.76	1.20	3.81
		TNMA 160416EN										●				9.52	16.50	4.76	1.60	3.81
		TNMA 220408EN									●	●				12.70	22.00	4.76	0.80	5.16
		TNMA 220412EN									●	●				12.70	22.00	4.76	1.20	5.16
		TNMA 220416EN									●	●				12.70	22.00	4.76	1.60	5.16
EN		TNMG 110302EN					●									6.35	11.00	3.18	0.20	2.26
		TNMG 330924EN				●										19.05	33.00	9.52	2.40	7.94
			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d	l	s	r	d₁

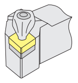


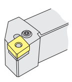

A13

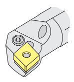


A24


A297


☐ A117

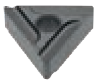

☐ A132-A134
UTS A211-A212

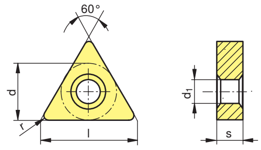

⌀ A235

MaxiLock D/N

TN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	**d** **[mm]**	**l** **[mm]**	**s** **[mm]**	**r** **[mm]**	**d_1** **[mm]**
ER-EL		TNMG 160404ER				●	●									9.52	16.50	4.76	0.40	3.81
		TNMG 160408EL				●										9.52	16.50	4.76	0.80	3.81
		TNMG 160408ER				●	●									9.52	16.50	4.76	0.80	3.81



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☐ A117

☐ A132-A134
UTS A211-A212

⌀ A235

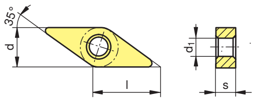
MaxiLock D/N

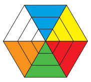
VN..

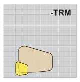
	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
-F32		VNGP 160402FN-F32						●								9.52	16.60	4.76	0.20	3.81
		VNGP 160404FN-F32						●								9.52	16.60	4.76	0.40	3.81
-F30		VNMG 160404EN-F30							●							9.52	16.60	4.76	0.40	3.81
		VNMG 160408EN-F30							●							9.52	16.60	4.76	0.80	3.81
-F40		VNMG 160404EN-F40				●										9.52	16.60	4.76	0.40	3.81
		VNMG 160408EN-F40				●										9.52	16.60	4.76	0.80	3.81
-M30		VNMG 160408EN-M30							●							9.52	16.60	4.76	0.80	3.81
-M34		VNMG 160404EN-M34												●	●	9.52	16.60	4.76	0.40	3.81
		VNMG 160408EN-M34												●	●	9.52	16.60	4.76	0.80	3.81
		VNMG 160412EN-M34												●	●	9.52	16.60	4.76	1.20	3.81
-M50		VNMG 160404EN-M50			●	●										9.52	16.60	4.76	0.40	3.81
		VNMG 160408EN-M50			●	●						●				9.52	16.60	4.76	0.80	3.81
		VNMG 160412EN-M50			●	●						●				9.52	16.60	4.76	1.20	3.81
-M40		VNMG 160404EN-M40				●										9.52	16.60	4.76	0.40	3.81
		VNMG 160408EN-M40				●										9.52	16.60	4.76	0.80	3.81

CTEP110 TCM10 CTCP115 CTCP125 CTCP135 CTP2120 CTPM125 CTC2135 CTC3110 CTCK120 H10T CTP5110 CTP5115 d l s r d₁

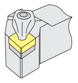



A13



A24

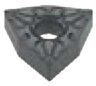
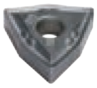
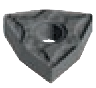
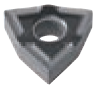

A297

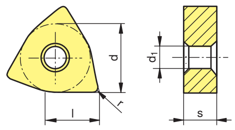

□ A118-A119
HSK A189

MaxiLock D/N

WN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-CF20		WNMG 060404EN-CF20	●													9.52	6.50	4.76	0.40	3.81
		WNMG 060408EN-CF20	●													9.52	6.50	4.76	0.80	3.81
		WNMG 080408EN-CF20	●													12.70	8.69	4.76	0.80	5.16
-F30		WNMG 060404EN-F30							●							9.52	6.50	4.76	0.40	3.81
		WNMG 060408EN-F30							●							9.52	6.50	4.76	0.80	3.81
		WNMG 080404EN-F30							●							12.70	8.69	4.76	0.40	5.16
		WNMG 080408EN-F30							●							12.70	8.69	4.76	0.80	5.16
-TF		WNMG 060404EN-TF			●											9.52	6.50	4.76	0.40	3.81
		WNMG 080404EN-TF			●											12.70	8.69	4.76	0.40	5.16
		WNMG 080408EN-TF				●										12.70	8.69	4.76	0.80	5.16
-F34		WNMG 080408EN-F34													●	12.70	8.69	4.76	0.80	5.16
-M30		WNMG 060408EN-M30							●							9.52	6.50	4.76	0.80	3.81
		WNMG 060412EN-M30							●							9.52	6.50	4.76	1.20	3.81
		WNMG 080408EN-M30							●							12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-M30							●							12.70	8.69	4.76	1.20	5.16
-M34		WNMG 080408EN-M34												●	●	12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-M34												●	●	12.70	8.69	4.76	1.20	5.16
-TFQ		WNMG 060404EN-TFQ				●										9.52	6.50	4.76	0.40	3.81
		WNMG 060408EN-TFQ	●			●										9.52	6.50	4.76	0.80	3.81
		WNMG 080404EN-TFQ	●													12.70	8.69	4.76	0.40	5.16
		WNMG 080408EN-TFQ	●		●	●										12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-TFQ				●										12.70	8.69	4.76	1.20	5.16
-TMF		WNMG 060404EN-TMF				●	●									9.52	6.50	4.76	0.40	3.81
		WNMG 060408EN-TMF			●	●										9.52	6.50	4.76	0.80	3.81
		WNMG 080404EN-TMF				●	●					●				12.70	8.69	4.76	0.40	5.16
		WNMG 080408EN-TMF			●	●	●									12.70	8.69	4.76	0.80	5.16
-M42		WNMG 060404EN-M42								●						9.52	6.50	4.76	0.40	3.81
		WNMG 060408EN-M42								●						9.52	6.50	4.76	0.80	3.81
		WNMG 080404EN-M42								●						12.70	8.69	4.76	0.40	5.16
		WNMG 080408EN-M42						●		●						12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-M42								●						12.70	8.69	4.76	1.20	5.16
-M52		WNMG 060404EN-M52						●								9.52	6.50	4.76	0.40	3.81
		WNMG 060408EN-M52						●								9.52	6.50	4.76	0.80	3.81
		WNMG 080404EN-M52						●								12.70	8.69	4.76	0.40	5.16
		WNMG 080408EN-M52						●								12.70	8.69	4.76	0.80	5.16
			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d	l	s	r	d_1



A13

A24

A297

☐ A120
HSK A190

☐ A135
UTS A213

⌀ A231
HSK A257

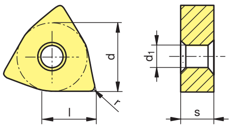
⌀ A236
UTS A263

MaxiLock D/N

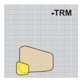
WN..

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
-M50		WNMG 060404EN-M50			●	●	●									9.52	6.50	4.76	0.40	3.81
		WNMG 060408EN-M50			●	●	●									9.52	6.50	4.76	0.80	3.81
		WNMG 060412EN-M50			●	●	●									9.52	6.50	4.76	1.20	3.81
		WNMG 080404EN-M50			●	●	●									12.70	8.69	4.76	0.40	5.16
		WNMG 080408EN-M50			●	●	●									12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-M50			●	●	●									12.70	8.69	4.76	1.20	5.16
		WNMG 080416EN-M50			●	●	●									12.70	8.69	4.76	1.60	5.16
-TM		WNMG 060408EN-TM			●	●	●			●						9.52	6.50	4.76	0.80	3.81
		WNMG 080408EN-TM			●	●	●			●						12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-TM				●				●						12.70	8.69	4.76	1.20	5.16
-TMQ		WNMG 080408EN-TMQ				●										12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-TMQ			●	●										12.70	8.69	4.76	1.20	5.16
-TRM		WNMG 060408EN-TRM				●										9.52	6.50	4.76	0.80	3.81
		WNMG 060412EN-TRM				●										9.52	6.50	4.76	1.20	3.81
		WNMG 080408EN-TRM				●										12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-TRM				●										12.70	8.69	4.76	1.20	5.16
		WNMG 080416EN-TRM				●										12.70	8.69	4.76	1.60	5.16
-M60		WNMG 060408EN-M60							●							9.52	6.50	4.76	0.80	3.81
		WNMG 060412EN-M60							●							9.52	6.50	4.76	1.20	3.81
		WNMG 080408EN-M60							●							12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-M60					●		●							12.70	8.69	4.76	1.20	5.16
-M70		WNMG 060408EN-M70			●	●	●									9.52	6.50	4.76	0.80	3.81
		WNMG 060412EN-M70			●	●	●									9.52	6.50	4.76	1.20	3.81
		WNMG 080408EN-M70			●	●	●			●	●	●				12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-M70			●	●	●				●	●				12.70	8.69	4.76	1.20	5.16
		WNMG 080416EN-M70			●	●	●				●	●				12.70	8.69	4.76	1.60	5.16
			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d	l	s	r	d₁

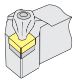


A13

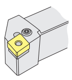


A24

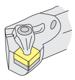
A297



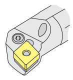
□ A120
HSK A190



□ A135
UTS A213



⌀ A231
HSK A257

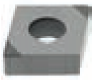
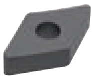
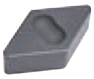


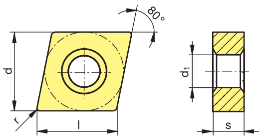
⌀ A236
UTS A263

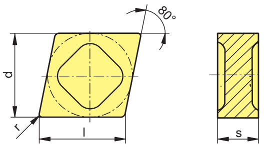
MaxiLock D/N

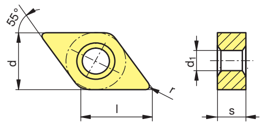
CN.. - DN.. (other cutting materials)

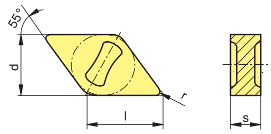
	CTI3105	CTN3105	CTS3105	CTBK102	CTM3110	CTN3110	CTL6115
P							
M							
K	●	●	●	●	●	●	
N							
S	○						
H			●	●			●

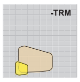
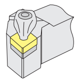
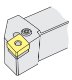
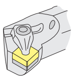
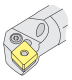
			CTI3105	CTN3105	CTS3105	CTBK102	CTM3110	CTN3110	CTL6115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
CN..A		CNGA 120408SN-025C						●		12.70	12.90	4.76	0.80	5.16
		CNGA 120408TN-020D			●	●				12.70	12.90	4.76	0.80	5.16
		CNGA 120412SN-020D		●						12.70	12.90	4.76	1.20	5.16
		CNGA 120412SN-025C						●		12.70	12.90	4.76	1.20	5.16
		CNGA 120412TN-020D				●				12.70	12.90	4.76	1.20	5.16
		CNGA 160608SN-028C					●			15.88	16.10	6.35	0.80	6.35
		CNGA 160616SN-028C						●		15.88	16.10	6.35	1.60	6.35
		CNGA 160616TN-020D			●					15.88	16.10	6.35	1.60	6.35
CN..A-B		CNGA 120404SN-013E_B3							●	12.70	12.90	4.76	0.40	5.16
		CNGA 120408SNQ-013E_B2							●	12.70	12.90	4.76	0.80	5.16
		CNGA 120408SN-013E_B3							●	12.70	12.90	4.76	0.80	5.16
		CNGA 120412SN-013E_B3							●	12.70	12.90	4.76	1.20	5.16
CN..X		CNGX 120712TN-020D	●	●						12.70	12.90	7.94	1.20	
		CNGX 120716TN-020D	●	●						12.70	12.90	7.94	1.60	
		CNGX 160716TN-020D	●							15.88	16.10	7.94	1.60	
		CNNX 120716TN-020D	●	●						12.70	12.90	7.94	1.60	
DN..A		DNGA 150604TN-020D			●					12.70	15.50	6.35	0.40	5.16
		DNGA 150608TN-020D			●					12.70	15.50	6.35	0.80	5.16
		DNGA 150612TN-020D			●					12.70	15.50	6.35	1.20	5.16
		DNGA 150616TN-020D			●					12.70	15.50	6.35	1.60	5.16
DN..A-B		DNGA 150404SN-013E_B3							●	12.70	15.50	4.76	0.40	5.16
		DNGA 150408SN-013E_B3							●	12.70	15.50	4.76	0.80	5.16
		DNGA 150608SN-013E_B3							●	12.70	15.50	6.35	0.80	5.16
		DNGA 150612SN-013E_B3							●	12.70	15.50	6.35	1.20	5.16
DN..X		DNGX 120712TN-020D		●						10.00	12.30	7.94	1.20	







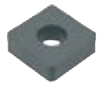
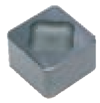
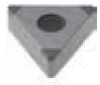
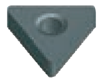


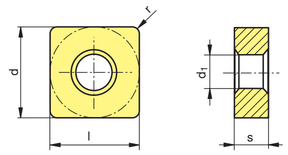
A13	 A24	A297	 ☐ A109-A112 **HSK** A181-A187	 ☐ A121-A125 **UTS** A201-A204	 ⌀ A228-A229 **HSK** A255-A256	 ⌀ A232-A233 **UTS** A261-A262

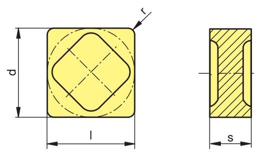
MaxiLock D/N

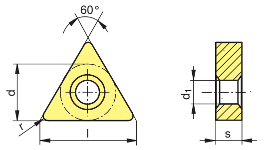
SN.. TN.. VN.. (other cutting materials)

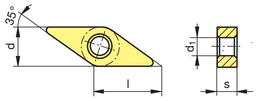
	CTI3105	CTN3105	CTS3105	CTBK102	CTM3110	CTN3110	CTL6115
P							
M							
K	●	●	●	●	●	●	
N							
S	○						
H			●	●			●

			CTI3105	CTN3105	CTS3105	CTBK102	CTM3110	CTN3110	CTL6115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
SN..A		SNGA 120408SN-025C					●			12.70	12.70	4.76	0.80	5.16
		SNGA 120412SN-025C					●			12.70	12.70	4.76	1.20	5.16
		SNGA 120412TN-020D				●				12.70	12.70	4.76	1.20	5.16
SN..X		SNGX 120712TN-020D	●	●						12.70	12.70	7.94	1.20	
		SNGX 120716TN-020D	●	●						12.70	12.70	7.94	1.60	
		SNGX 150716TN-020D	●	●						15.88	15.88	7.94	1.60	
		SNGX 150716TN-040D	●							15.88	15.88	7.94	1.60	
		SNNX 120716TN-020D	●	●						12.70	12.70	7.94	1.60	
TN..A-C		TNGA 160408SN-013E_C3							●	9.52	16.50	4.76	0.80	3.81
TN..A		TNGA 160408TN-020D			●					9.52	16.50	4.76	0.80	3.81
VN..A-B		VNGA 160404SN-013E_B3							●	9.52	16.60	4.76	0.40	3.81
		VNGA 160408SN-013E_B3							●	9.52	16.60	4.76	0.80	3.81
		VNGX 160408SN-010E_B3							●	9.52	16.60	4.76	0.80	3.81
VN..A		VNGA 160408TN-020D			●					9.52	16.60	4.76	0.80	3.81
		VNGA 160412TN-020D			●					9.52	16.60	4.76	1.20	3.81









A13

A24

A297

□ A113-A119
HSK A188-A189

□ A128-A134
UTS A207-A212

⌀ A230

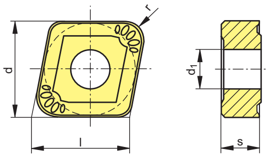
⌀ A234-A235

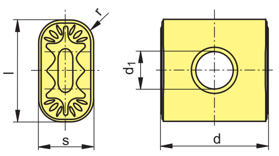
MaxiLock D/N

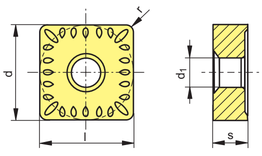
CN.. LN.. SN.. (inserts for railway wheel set machining)

	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115
P	●	●	●	●	●		●	○	○	○			
M	○	●	○	○	○	●	●	●				○	○
K	○	○	●	●		○			●	●	●		
N						○					●		
S					○	○	○	○				●	●
H													

			CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H10T	CTP5110	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
CN..X		CNMX 190740SN			●							●				19.05	19.30	7.94	4.00	7.93
-R70		LNUX 191940SN-R70			●	●										19.05	19.05	10.00	4.00	6.35
		LNUX 301940SN-R70			●	●										19.05	30.00	12.00	4.00	6.35
-R74		LNUX 191940SN-R74			●	●										19.05	19.05	10.00	4.00	6.35
		LNUX 301940SN-R74			●	●										19.05	30.00	12.00	4.00	6.35
-R70		SNMG 211040SN-R70			●	●										21.00	21.00	10.50	4.00	7.84
-R71		SNMG 211040SN-R71			●	●										21.00	21.00	10.50	4.00	7.84







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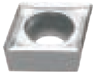
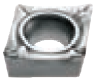
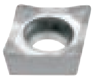
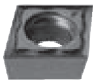
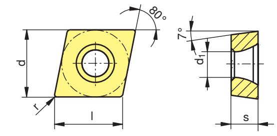
□ A270

MaxiLock S

CC..

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d1 [mm]
-23P		CCGT 060202FN-23P																●			6.35	6.40	2.38	0.20	2.80
		CCGT 060204FN-23P																●			6.35	6.40	2.38	0.40	2.80
		CCGT 09T304FN-23P																●			9.52	9.70	3.97	0.40	4.40
		CCGT 09T308FN-23P																●			9.52	9.70	3.97	0.80	4.40
-25P		CCGT 060202FN-25P												●	●						6.35	6.40	2.38	0.20	2.80
		CCGT 060204FN-25P												●	●						6.35	6.40	2.38	0.40	2.80
		CCGT 09T302FN-25P												●	●						9.52	9.70	3.97	0.20	4.40
		CCGT 09T304FN-25P												●	●						9.52	9.70	3.97	0.40	4.40
		CCGT 09T308FN-25P												●	●						9.52	9.70	3.97	0.80	4.40
		CCGT 120402FN-25P												●							12.70	12.90	4.76	0.20	5.50
		CCGT 120404FN-25P												●	●						12.70	12.90	4.76	0.40	5.50
		CCGT 120408FN-25P												●	●						12.70	12.90	4.76	0.80	5.50
-25Q		CCGT 060204FN-25Q												●							6.35	6.40	2.38	0.40	2.80
		CCGT 09T304FN-25Q												●							9.52	9.70	3.97	0.40	4.40
		CCGT 09T308FN-25Q												●							9.52	9.70	3.97	0.80	4.40
		CCGT 120404FN-25Q												●							12.70	12.90	4.76	0.40	5.50
		CCGT 120408FN-25Q												●				●			12.70	12.90	4.76	0.80	5.50
-27		CCGT 060202FN-27													●	●					6.35	6.40	2.38	0.20	2.80
		CCGT 060204FN-27													●	●					6.35	6.40	2.38	0.40	2.80
		CCGT 09T302FN-27													●	●					9.52	9.70	3.97	0.20	4.40
		CCGT 09T304FN-27													●	●					9.52	9.70	3.97	0.40	4.40
		CCGT 09T308FN-27													●	●					9.52	9.70	3.97	0.80	4.40
		CCGT 120402FN-27													●	●					12.70	12.90	4.76	0.20	5.50
		CCGT 120404FN-27													●	●					12.70	12.90	4.76	0.40	5.50
		CCGT 120408FN-27													●	●					12.70	12.90	4.76	0.80	5.50
-29		CCMT 060204EN-29													●			●			6.35	6.40	2.38	0.40	2.80
		CCMT 09T304EN-29													●			●			9.52	9.70	3.97	0.40	4.40
		CCMT 09T308EN-29													●			●			9.52	9.70	3.97	0.80	4.40
-CF05		CCGT 060202EN-CF05		●																	6.35	6.40	2.38	0.20	2.80
		CCGT 060204EN-CF05		●																	6.35	6.40	2.38	0.40	2.80
		CCGT 09T302EN-CF05		●																	9.52	9.70	3.97	0.20	4.40
		CCGT 09T304EN-CF05		●																	9.52	9.70	3.97	0.40	4.40
		CCGT 09T308EN-CF05		●																	9.52	9.70	3.97	0.80	4.40
-F23		CCGT 060200FN-F23							●												6.35	6.40	2.38	0.00	2.80
		CCGT 060201FN-F23							●												6.35	6.40	2.38	0.10	2.80
		CCGT 09T300FN-F23							●												9.52	9.70	3.97	0.00	4.40
		CCGT 09T301FN-F23							●												9.52	9.70	3.97	0.10	4.40
-CF55		CCMT 060204EN-CF55		●																	6.35	6.40	2.38	0.40	2.80
		CCMT 09T304EN-CF55		●																	9.52	9.70	3.97	0.40	4.40
		CCMT 09T308EN-CF55		●																	9.52	9.70	3.97	0.80	4.40
		CCMT 120404EN-CF55		●																	12.70	12.90	4.76	0.40	5.50



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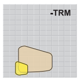

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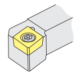
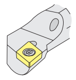
A297



☐ A136-A142
HSK A193-A194
UTS A214



⌀ A237-A239
HSK A258
UTS A264

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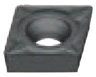
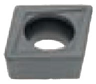
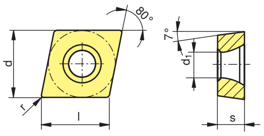
CC..

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-SF		CCGT 060202EN-SF	●		●		●	●													6.35	6.40	2.38	0.20	2.80
		CCGT 060204EN-SF	●		●																6.35	6.40	2.38	0.40	2.80
		CCGT 09T302EN-SF	●		●																9.52	9.70	3.97	0.20	4.40
		CCGT 09T304EN-SF	●		●																9.52	9.70	3.97	0.40	4.40
		CCGT 09T308EN-SF			●																9.52	9.70	3.97	0.80	4.40
		CCGT 120404EN-SF			●																12.70	12.90	4.76	0.40	5.50
		CCMT 060204EN-SF				●	●	●			●										6.35	6.40	2.38	0.40	2.80
		CCMT 09T304EN-SF				●	●	●			●										9.52	9.70	3.97	0.40	4.40
		CCMT 09T308EN-SF				●	●														9.52	9.70	3.97	0.80	4.40
		CCMT 120404EN-SF					●														12.70	12.90	4.76	0.40	5.50
		CCMT 120408EN-SF					●														12.70	12.90	4.76	0.80	5.50
		CPMT 060204EN-SF				●															6.35	6.40	2.38	0.40	2.80
		CPMT 060208EN-SF				●															6.35	6.40	2.38	0.80	2.80
		CPMT 09T304EN-SF				●															9.52	9.70	3.97	0.40	4.40
		CPMT 09T308EN-SF				●															9.52	9.70	3.97	0.80	4.40
-M25		CCMT 060204EN-M25								●											6.35	6.40	2.38	0.40	2.80
		CCMT 09T304EN-M25								●											9.52	9.70	3.97	0.40	4.40
		CCMT 09T308EN-M25								●											9.52	9.70	3.97	0.80	4.40
-F43		CCMT 09T304EN-F43									●										9.52	9.70	3.97	0.40	4.40
		CCMT 09T308EN-F43									●										9.52	9.70	3.97	0.80	4.40
-SMF		CCMT 060204EN-SMF			●		●	●													6.35	6.40	2.38	0.40	2.80
		CCMT 060208EN-SMF					●														6.35	6.40	2.38	0.80	2.80
		CCMT 09T304EN-SMF			●	●	●	●													9.52	9.70	3.97	0.40	4.40
		CCMT 09T308EN-SMF			●	●	●														9.52	9.70	3.97	0.80	4.40
		CCMT 120404EN-SMF			●		●														12.70	12.90	4.76	0.40	5.50
		CCMT 120408EN-SMF				●		●													12.70	12.90	4.76	0.80	5.50
-M55		CCMT 060204EN-M55								●											6.35	6.40	2.38	0.40	2.80
		CCMT 09T304EN-M55								●											9.52	9.70	3.97	0.40	4.40
		CCMT 09T308EN-M55								●											9.52	9.70	3.97	0.80	4.40
		CCMT 120404EN-M55								●											12.70	12.90	4.76	0.40	5.50
		CCMT 120408EN-M55								●											12.70	12.90	4.76	0.80	5.50
-SM		CCGT 060202EN-SM					●	●													6.35	6.40	2.38	0.20	2.80
		CCMT 060204EN-SM				●	●	●			●	●									6.35	6.40	2.38	0.40	2.80
		CCMT 060208EN-SM				●		●				●									6.35	6.40	2.38	0.80	2.80
		CCMT 09T304EN-SM				●	●	●			●	●									9.52	9.70	3.97	0.40	4.40
		CCMT 09T308EN-SM				●	●	●			●	●	●								9.52	9.70	3.97	0.80	4.40
		CCMT 09T312EN-SM											●								9.52	9.70	3.97	1.20	4.40
		CCMT 120404EN-SM				●	●	●			●										12.70	12.90	4.76	0.40	5.50
		CCMT 120408EN-SM				●	●	●			●	●									12.70	12.90	4.76	0.80	5.50
		CCMT 120412EN-SM					●														12.70	12.90	4.76	1.20	5.50
			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d	l	s	r	d_1

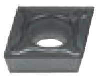
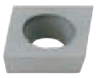


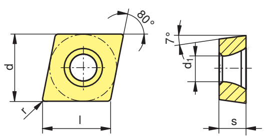
A13	A28	A297	☐ A136-A142 **HSK** A193-A194 **UTS** A214	⌀ A237-A239 **HSK** A258 **UTS** A264

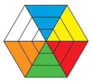
MaxiLock S

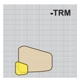
CC..

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
-SMQ		CCMT 09T304EN-SMQ					●														9.52	9.70	3.97	0.40	4.40
		CCMT 09T308EN-SMQ					●														9.52	9.70	3.97	0.80	4.40
		CCMT 120404EN-SMQ					●														12.70	12.90	4.76	0.40	5.50
		CCMT 120408EN-SMQ				●	●														12.70	12.90	4.76	0.80	5.50
CC..W		CCGW 09T304FN																	●		9.52	9.70	3.97	0.40	4.40
			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d	l	s	r	d₁

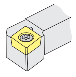


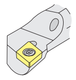

A13



A28

A297

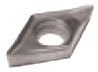
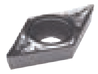
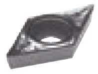
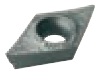
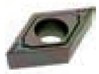
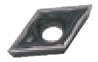

□ A136-A142
HSK A193-A194
UTS A214

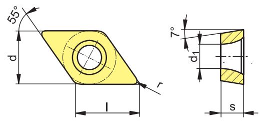

⌀ A237-A239
HSK A258
UTS A264

MaxiLock S

DC..

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d$_1$ [mm]
-23P		DCGT 070204FN-23P																●			6.35	7.75	2.38	0.40	2.80
		DCGT 11T304FN-23P																●			9.52	11.60	3.97	0.40	4.40
		DCGT 11T308FN-23P																●			9.52	11.60	3.97	0.80	4.40
-25P		DCGT 070202FN-25P												●	●						6.35	7.75	2.38	0.20	2.80
		DCGT 070204FN-25P												●	●						6.35	7.75	2.38	0.40	2.80
		DCGT 11T302FN-25P												●	●						9.52	11.60	3.97	0.20	4.40
		DCGT 11T304FN-25P												●	●						9.52	11.60	3.97	0.40	4.40
		DCGT 11T308FN-25P												●	●						9.52	11.60	3.97	0.80	4.40
-25Q		DCGT 11T304FL-25Q												●							9.52	11.60	3.97	0.40	4.40
		DCGT 11T304FN-25Q												●							9.52	11.60	3.97	0.40	4.40
		DCGT 11T304FR-25Q												●							9.52	11.60	3.97	0.40	4.40
		DCGT 11T308FL-25Q												●							9.52	11.60	3.97	0.80	4.40
		DCGT 11T308FN-25Q												●							9.52	11.60	3.97	0.80	4.40
		DCGT 11T308FR-25Q												●							9.52	11.60	3.97	0.80	4.40
-27		DCGT 070202FN-27													●	●					6.35	7.75	2.38	0.20	2.80
		DCGT 070204FN-27													●	●					6.35	7.75	2.38	0.40	2.80
		DCGT 11T302FN-27													●	●					9.52	11.60	3.97	0.20	4.40
		DCGT 11T304FN-27													●	●					9.52	11.60	3.97	0.40	4.40
		DCGT 11T308FN-27													●	●					9.52	11.60	3.97	0.80	4.40
-29		DCMT 070204EN-29													●			●			6.35	7.75	2.38	0.40	2.80
		DCMT 11T304EN-29													●			●			9.52	11.60	3.97	0.40	4.40
		DCMT 11T308EN-29													●			●			9.52	11.60	3.97	0.80	4.40
-CF05		DCGT 070202EN-CF05		●																	6.35	7.75	2.38	0.20	2.80
		DCGT 070204EN-CF05		●																	6.35	7.75	2.38	0.40	2.80
		DCGT 11T302EN-CF05		●																	9.52	11.60	3.97	0.20	4.40
		DCGT 11T304EN-CF05		●																	9.52	11.60	3.97	0.40	4.40
		DCGT 11T308EN-CF05		●																	9.52	11.60	3.97	0.80	4.40
-F23		DCGT 070200FN-F23							●												6.35	7.75	2.38	0.00	2.80
		DCGT 070201FN-F23							●												6.35	7.75	2.38	0.10	2.80
		DCGT 11T300FN-F23							●												9.52	11.60	3.97	0.00	4.40
		DCGT 11T301FN-F23							●												9.52	11.60	3.97	0.10	4.40
-CF55		DCMT 070202EN-CF55		●																	6.35	7.75	2.38	0.20	2.80
		DCMT 070204EN-CF55		●																	6.35	7.75	2.38	0.40	2.80
		DCMT 11T304EN-CF55		●																	9.52	11.60	3.97	0.40	4.40
		DCMT 11T308EN-CF55		●																	9.52	11.60	3.97	0.80	4.40



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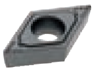
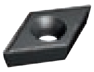
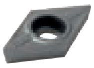
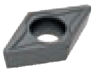
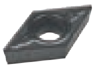
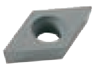
☐ A143-A146
HSK A195-A196
UTS A215-A219

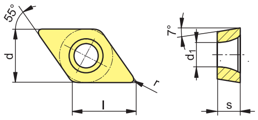
⌀ A240-A243
HSK A259
UTS A265-A266

MaxiLock S

DC..

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d1 [mm]
-SF		DCGT 070201EN-SF			●																6.35	7.75	2.38	0.10	2.80
		DCGT 070202EN-SF	●		●		●				●										6.35	7.75	2.38	0.20	2.80
		DCGT 070204EN-SF	●		●																6.35	7.75	2.38	0.40	2.80
		DCGT 11T302EN-SF	●		●																9.52	11.60	3.97	0.20	4.40
		DCGT 11T304EN-SF	●		●																9.52	11.60	3.97	0.40	4.40
		DCGT 11T308EN-SF	●		●																9.52	11.60	3.97	0.80	4.40
		DCMT 070204EN-SF				●	●	●			●										6.35	7.75	2.38	0.40	2.80
		DCMT 11T304EN-SF				●	●	●			●										9.52	11.60	3.97	0.40	4.40
		DCMT 11T308EN-SF				●	●	●			●										9.52	11.60	3.97	0.80	4.40
-M25		DCMT 070202EN-M25								●											6.35	7.75	2.38	0.20	2.80
		DCMT 070204EN-M25								●											6.35	7.75	2.38	0.40	2.80
		DCMT 11T302EN-M25								●											9.52	11.60	3.97	0.20	4.40
		DCMT 11T304EN-M25								●											9.52	11.60	3.97	0.40	4.40
		DCMT 11T308EN-M25								●											9.52	11.60	3.97	0.80	4.40
-F43		DCMT 070202EN-F43									●										6.35	7.75	2.38	0.20	2.80
		DCMT 070204EN-F43									●										6.35	7.75	2.38	0.40	2.80
		DCMT 11T302EN-F43									●										9.52	11.60	3.97	0.20	4.40
		DCMT 11T304EN-F43									●										9.52	11.60	3.97	0.40	4.40
		DCMT 11T308EN-F43									●										9.52	11.60	3.97	0.80	4.40
-SMF		DCMT 070202EN-SMF			●																6.35	7.75	2.38	0.20	2.80
		DCMT 070204EN-SMF			●		●	●													6.35	7.75	2.38	0.40	2.80
		DCMT 070208EN-SMF						●													6.35	7.75	2.38	0.80	2.80
		DCMT 11T304EN-SMF			●	●	●	●													9.52	11.60	3.97	0.40	4.40
		DCMT 11T308EN-SMF			●	●	●	●													9.52	11.60	3.97	0.80	4.40
-M55		DCMT 070204EN-M55								●											6.35	7.75	2.38	0.40	2.80
		DCMT 070208EN-M55								●											6.35	7.75	2.38	0.80	2.80
		DCMT 11T304EN-M55								●											9.52	11.60	3.97	0.40	4.40
		DCMT 11T308EN-M55								●											9.52	11.60	3.97	0.80	4.40
-SM		DCGT 070202EN-SM					●	●													6.35	7.75	2.38	0.20	2.80
		DCMT 070204EN-SM				●	●	●			●	●									6.35	7.75	2.38	0.40	2.80
		DCMT 070208EN-SM				●	●	●			●										6.35	7.75	2.38	0.80	2.80
		DCMT 11T304EN-SM				●	●	●			●	●									9.52	11.60	3.97	0.40	4.40
		DCMT 11T308EN-SM				●	●	●			●	●									9.52	11.60	3.97	0.80	4.40
		DCMT 11T312EN-SM					●														9.52	11.60	3.97	1.20	4.40
-SMQ		DCMT 070204EN-SMQ				●	●														6.35	7.75	2.38	0.40	2.80
		DCMT 11T304EL-SMQ					●														9.52	11.60	3.97	0.40	4.40
		DCMT 11T304EN-SMQ					●														9.52	11.60	3.97	0.40	4.40
		DCMT 11T304ER-SMQ					●														9.52	11.60	3.97	0.40	4.40
		DCMT 11T308EN-SMQ					●														9.52	11.60	3.97	0.80	4.40
DC..W		DCGW 070204FN																	●		6.35	7.75	2.38	0.40	2.80



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□ A143-A146
HSK A195-A196
UTS A215-A219

⌀ A240-A243
HSK A259
UTS A265-A266

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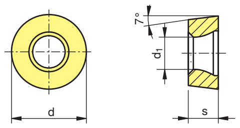
RC..

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	s [mm]	d₁ [mm]
-25P		RCGT 0803MOFN-25P												●							8.00	3.18	3.40
		RCMT 0803MOEN-25												●							8.00	3.18	3.40
-27		RCGT 0602MOFN-27														●					6.00	2.38	2.80
		RCGT 0803MOFN-27													●	●					8.00	3.18	3.40
		RCGT 1003MOFN-27													●	●					10.00	3.18	4.00
-M23		RCMT 1606MOSN-M23				●	●														16.00	6.35	5.30
		RCMT 2006MOSN-M23				●	●														20.00	6.35	6.50
-SMF		RCMT 1606MOEN-SMF										●									16.00	6.35	5.30
-SM		RCGT 0602MOEN-SM					●	●													6.00	2.38	2.80
		RCGT 0803MOEN-SM					●	●													8.00	3.18	3.40
		RCMT 1003MOSN-SM					●	●													10.00	3.18	4.00
		RCMT 1204MOSN-SM				●	●	●													12.00	4.76	4.90
		RCMT 1606MOSN-SM				●	●	●													16.00	6.35	5.30
		RCMT 2006MOSN-SM					●	●													20.00	6.35	6.50
		RCMT 2507MOSN-SM				●	●	●													25.00	7.94	7.20
		RCMT 3209MOSN-SM				●	●														32.00	9.52	9.50
-R23		RCMX 2507MOSN-R23				●	●														25.00	7.94	7.20
		RCMX 3209MOSN-R23				●	●														32.00	9.52	9.50
-R53		RCMX 2507MOSN-R53				●	●														25.00	7.94	7.20
		RCMX 3209MOSN-R53				●	●														32.00	9.52	9.50
-R83		RCMX 2507MOSN-R83				●	●														25.00	7.94	7.70
		RCMX 3209MOSN-R83				●	●														32.00	9.52	9.50
			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d	s	d₁



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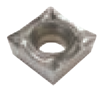
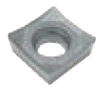
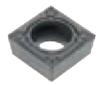
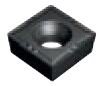
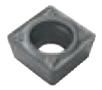
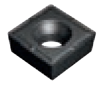
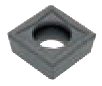
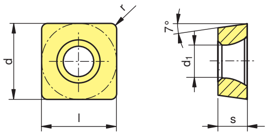
☐ A126-A127
HSK A191-A192
UTS A205-A206

☐ A147-A148
UTS A220-A221

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-25P		SCGT 120408FN-25P												●	●						12.70	12.70	4.76	0.80	5.50
-27P		SCGT 09T304FN-27														●					9.52	9.52	3.97	0.40	4.40
		SCGT 09T308FN-27													●	●					9.52	9.52	3.97	0.80	4.40
		SCGT 09T308FN-27P														●					9.52	9.52	3.97	0.80	4.40
		SCGT 120408FN-27														●					12.70	12.70	4.76	0.80	5.50
-CF05		SCGT 09T304EN-CF05		●																	9.52	9.52	3.97	0.40	4.40
		SCGT 09T308EN-CF05		●																	9.52	9.52	3.97	0.80	4.40
-CF55		SCMT 09T304EN-CF55		●																	9.52	9.52	3.97	0.40	4.40
		SCMT 09T308EN-CF55		●																	9.52	9.52	3.97	0.80	4.40
-SF		SCGT 09T304EN-SF	●		●																9.52	9.52	3.97	0.40	4.40
		SCGT 09T308EN-SF			●																9.52	9.52	3.97	0.80	4.40
		SCMT 09T304EN-SF					●														9.52	9.52	3.97	0.40	4.40
		SCMT 09T308EN-SF					●														9.52	9.52	3.97	0.80	4.40
		SCMT 120408EN-SF					●														12.70	12.70	4.76	0.80	5.50
-M25		SCMT 09T304EN-M25								●											9.52	9.52	3.97	0.40	4.40
-SMF		SCMT 09T304EN-SMF				●															9.52	9.52	3.97	0.40	4.40
		SCMT 09T308EN-SMF				●															9.52	9.52	3.97	0.80	4.40
		SCMT 120408EN-SMF						●													12.70	12.70	4.76	0.80	5.50
-M55		SCMT 09T308EN-M55								●											9.52	9.52	3.97	0.80	4.40
		SCMT 120408EN-M55								●											12.70	12.70	4.76	0.80	5.50
-SM		SCMT 09T304EN-SM				●	●	●													9.52	9.52	3.97	0.40	4.40
		SCMT 09T308EN-SM				●	●	●			●	●									9.52	9.52	3.97	0.80	4.40
		SCMT 120408EN-SM				●	●	●			●	●									12.70	12.70	4.76	0.80	5.50
		SCMT 120412EN-SM					●					●									12.70	12.70	4.76	1.20	5.30



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A297

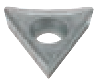
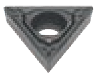
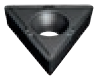
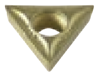
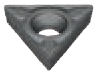
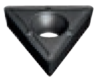
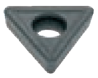
☐ A149-A152
UTS A222-A224

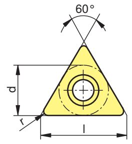
⌀ A244-A245
UTS A267

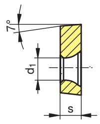
MaxiLock S

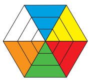
TC..

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-27		TCGT 110202FN-27														●					6.35	11.00	2.38	0.20	2.80
		TCGT 110204FN-27													●	●					6.35	11.00	2.38	0.40	2.80
		TCGT 16T302FN-27														●					9.52	16.50	3.97	0.20	4.40
		TCGT 16T304FN-27														●					9.52	16.50	3.97	0.40	4.40
		TCGT 16T308FN-27													●	●					9.52	16.50	3.97	0.80	4.40
-CF05		TCGT 110202EN-CF05		●																	6.35	11.00	2.38	0.20	2.80
		TCGT 110204EN-CF05		●																	6.35	11.00	2.38	0.40	2.80
		TCGT 110208EN-CF05		●																	6.35	11.00	2.38	0.80	2.80
		TCGT 16T304EN-CF05		●																	9.52	16.50	3.97	0.40	4.40
-CF55		TCMT 110204EN-CF55		●																	6.35	11.00	2.38	0.40	2.80
		TCMT 16T308EN-CF55		●																	9.52	16.50	3.97	0.80	4.40
-SF		TCGT 110202EN-SF			●																6.35	11.00	2.38	0.20	2.80
		TCGT 110204EN-SF	●		●																6.35	11.00	2.38	0.40	2.80
		TCGT 16T304EN-SF			●																9.52	16.50	3.97	0.40	4.40
		TCMT 110204EN-SF					●														6.35	11.00	2.38	0.40	2.80
		TCMT 110208EN-SF					●														6.35	11.00	2.38	0.80	2.80
		TCMT 16T304EN-SF					●														9.52	16.50	3.97	0.40	4.40
		TCMT 16T308EN-SF					●														9.52	16.50	3.97	0.80	4.40
-M25		TCMT 090204EN-M25								●											5.56	9.60	2.38	0.40	2.50
		TCMT 110204EN-M25								●											6.35	11.00	2.38	0.40	2.80
		TCMT 16T304EN-M25								●											9.52	16.50	3.97	0.40	4.40
		TCMT 16T308EN-M25								●											9.52	16.50	3.97	0.80	4.40
-F43		TCMT 110204EN-F43									●										6.35	11.00	2.38	0.40	2.80
		TCMT 16T304EN-F43									●										9.52	16.50	3.97	0.40	4.40
		TCMT 16T308EN-F43									●										9.52	16.50	3.97	0.80	4.40
-SMF		TCMT 110204EN-SMF			●																6.35	11.00	2.38	0.40	2.80
		TCMT 110208EN-SMF				●		●													6.35	11.00	2.38	0.80	2.80
		TCMT 16T304EN-SMF				●															9.52	16.50	3.97	0.40	4.40
		TCMT 16T308EN-SMF				●															9.52	16.50	3.97	0.80	4.40
-M55		TCMT 090204EN-M55								●											5.56	9.60	2.38	0.40	2.50
		TCMT 110204EN-M55								●											6.35	11.00	2.38	0.40	2.80
		TCMT 16T308EN-M55								●											9.52	16.50	3.97	0.80	4.40
-SM		TCGT 110202EN-SM						●													6.35	11.00	2.38	0.20	2.80
		TCMT 090204EN-SM					●	●			●										5.56	9.60	2.38	0.40	2.50
		TCMT 110204EN-SM				●	●	●			●	●									6.35	11.00	2.38	0.40	2.80
		TCMT 110208EN-SM				●		●				●									6.35	11.00	2.38	0.80	2.80
		TCMT 16T304EN-SM				●	●	●													9.52	16.50	3.97	0.40	4.40
		TCMT 16T308EN-SM				●	●	●			●	●	●								9.52	16.50	3.97	0.80	4.40
		TCMT 16T312EN-SM											●								9.52	16.50	3.97	1.20	4.40
		TCMT 220408EN-SM					●	●													12.70	22.00	4.76	0.80	5.30
			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d	l	s	r	d_1



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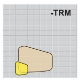

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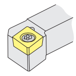
A297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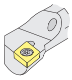
☐ A246

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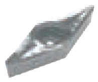
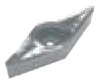
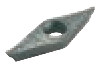
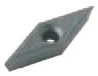
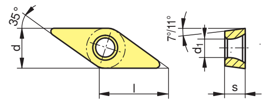
VC..

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-25P		VCGT 110302FN-25P												●	●						6.35	11.10	3.18	0.20	2.90
		VCGT 110304FN-25P												●	●						6.35	11.10	3.18	0.40	2.90
		VCGT 160404FN-25P												●	●						9.52	16.60	4.76	0.40	4.40
		VCGT 160408EN-25P																		●	9.52	16.60	4.76	0.80	4.40
		VCGT 160408FN-24P												●							9.52	16.60	4.76	0.80	4.40
		VCGT 160408FN-25P												●	●						9.52	16.60	4.76	0.80	4.40
		VCGT 160412EN-25P																		●	9.52	16.60	4.76	1.20	4.40
		VCGT 160412FN-24P												●							9.52	16.60	4.76	1.20	4.40
		VCGT 160412FN-25P												●	●						9.52	16.60	4.76	1.20	4.40
		VCGT 220530FN-24P																●			12.70	22.10	5.56	3.00	5.50
		VCGT 220530FN-25P												●	●						12.70	22.10	5.56	3.00	5.50
		VCMT 160412EN-25												●							9.52	16.60	4.76	1.20	4.40
		VCMT 220530EN-25												●							12.70	22.10	5.56	3.00	5.50
		VPGT 220516FN-24P																●			12.70	22.10	5.56	1.60	5.50
		VPGT 220516FN-25P												●							12.70	22.10	5.56	1.60	5.50
		VPGX 220612FN-25P																●			12.90	22.10	6.35	1.20	5.16
-25Q		VCGT 110304FL-25Q												●							6.35	11.10	3.18	0.40	2.90
		VCGT 110304FR-25Q												●							6.35	11.10	3.18	0.40	2.90
-27		VCGT 110302FN-27													●	●					6.35	11.10	3.18	0.20	2.90
		VCGT 110304FN-27													●	●					6.35	11.10	3.18	0.40	2.90
		VCGT 110308FN-27														●					6.35	11.10	3.18	0.80	2.90
		VCGT 160404FN-27													●	●					9.52	16.60	4.76	0.40	4.40
		VCGT 160408FN-27													●	●					9.52	16.60	4.76	0.80	4.40
		VCGT 160412FN-27														●					9.52	16.60	4.76	1.20	4.40
		VCGT 220530FN-27														●					12.70	22.10	5.56	3.00	5.50
		VPGT 220516FN-27														●					12.70	22.10	5.56	1.60	5.50
-29		VCMT 160404EN-29													●			●			9.52	16.60	4.76	0.40	4.40
		VCMT 160408EN-29													●			●			9.52	16.60	4.76	0.80	4.40
		VCMT 160412EN-29													●			●			9.52	16.60	4.76	1.20	4.40
-CF05		VCGT 110302EN-CF05		●																	6.35	11.10	3.18	0.20	2.80
		VCGT 110304EN-CF05		●																	6.35	11.10	3.18	0.40	2.90
		VCGT 160404EN-CF05		●																	9.52	16.60	4.76	0.40	4.40
		VCGT 160408EN-CF05		●																	9.52	16.60	4.76	0.80	4.40
-F23		VCGT 110300FN-F23							●												6.35	11.10	3.18	0.00	2.80
		VCGT 110301FN-F23							●												6.35	11.10	3.18	0.10	2.80
		VCGT 160401FN-F23							●												9.52	16.60	4.76	0.10	4.40
-CF55		VCMT 110304EN-CF55		●																	6.35	11.10	3.18	0.40	2.90
		VCMT 160404EN-CF55		●																	9.52	16.60	4.76	0.40	4.40
		VCMT 160408EN-CF55		●																	9.52	16.60	4.76	0.80	4.40
			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d	l	s	r	d_1



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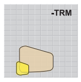

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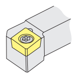
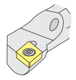
A297



□ A157-A160
HSK A197-A200
UTS A225-A227



⌀ A247-A250
HSK A260
UTS A268-A269

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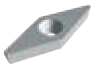
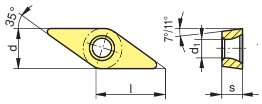
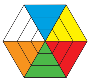
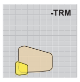
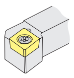
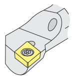
VC..

	TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115
P	●	●	●	●	●	●		●	○	○	○		○					
M	○	○	●	○	○	○	●	●	●								○	○
K	○	○	○	●	●		○			●	●	○	○	●		●		
N							○					●	●	●	●	●	●	
S						○	○	○	○			●					○	●
H																		

			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-SF		VCGT 110301EN-SF			●																6.35	11.10	3.18	0.10	2.80
		VCGT 110302EN-SF	●		●	●	●	●			●										6.35	11.10	3.18	0.20	2.80
		VCGT 110304EN-SF	●		●	●	●	●			●										6.35	11.10	3.18	0.40	2.90
		VCGT 110308EN-SF				●	●	●													6.35	11.10	3.18	0.80	2.90
		VCGT 160404EN-SF	●		●																9.52	16.60	4.76	0.40	4.40
		VCGT 160408EN-SF	●		●																9.52	16.60	4.76	0.80	4.40
		VCMT 160404EN-SF				●	●	●			●										9.52	16.60	4.76	0.40	4.40
		VCMT 160408EN-SF				●	●														9.52	16.60	4.76	0.80	4.40
-M25		VCMT 160404EN-M25								●											9.52	16.60	4.76	0.40	4.40
		VCMT 160408EN-M25								●											9.52	16.60	4.76	0.80	4.40
-SMF		VCGT 110302EN-SMF						●													6.35	11.10	3.18	0.20	2.80
		VCMT 110304EN-SMF			●	●	●	●													6.35	11.10	3.18	0.40	2.90
		VCMT 160404EN-SMF			●	●	●	●													9.52	16.60	4.76	0.40	4.40
		VCMT 160408EN-SMF			●	●	●	●													9.52	16.60	4.76	0.80	4.40
-M55		VCMT 160404EN-M55								●											9.52	16.60	4.76	0.40	4.40
		VCMT 160408EN-M55								●											9.52	16.60	4.76	0.80	4.40
-SM		VCMT 160404EN-SM				●	●	●			●	●									9.52	16.60	4.76	0.40	4.40
		VCMT 160406EN-SM				●															9.52	16.60	4.76	0.60	4.40
		VCMT 160408EN-SM				●	●	●			●	●									9.52	16.60	4.76	0.80	4.40
		VCMT 160412EN-SM						●				●									9.52	16.60	4.76	1.20	4.40
VC..W		VCMW 160404FN																●			9.52	16.60	4.76	0.40	4.40
			TCM407	CTEP110	TCM10	CTCP115	CTCP125	CTCP135	CTP2120	CTPM125	CTC2135	CTC3110	CTCK120	H210T	AMZ	H10T	CTP4115	H216T	CTW7120	CTP5115	d	l	s	r	d_1

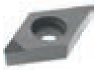
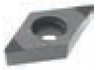


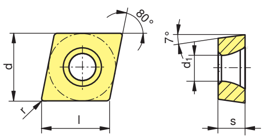
 A13	 A28	 A297	 ☐ A157-A160 **HSK** A197-A200 **UTS** A225-A227	 ⌀ A247-A250 **HSK** A260 **UTS** A268-A269

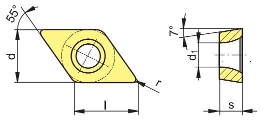
MaxiLock S

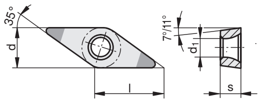
CC.. DC.. VC.. (other cutting materials)

	CTBK104	CTD4110	CTL6115
P			
M			
K	●		
N		●	
S			
H	●		●

			CTBK104	CTD4110	CTL6115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
CC..W-B		CCGW 09T304FN_B3	●			9.52	9.70	3.97	0.40	4.40
		CCGW 09T304SN-013E_B3			●	9.52	9.70	3.97	0.40	4.40
		CCGW 09T304TN-020D_B3	●			9.52	9.70	3.97	0.40	4.40
		CCGW 09T308FN_B3	●			9.52	9.70	3.97	0.80	4.40
		CCGW 09T308SN-013E_B3			●	9.52	9.70	3.97	0.80	4.40
		CCGW 09T308TN-020D_B3	●			9.52	9.70	3.97	0.80	4.40
DC..W-A		DCGW 070208FN_A3	●			6.35	7.75	2.38	0.80	2.80
		DCGW 070208TN-020D_A3	●			6.35	7.75	2.38	0.80	2.80
DC..W-B		DCGW 11T304FN_B3	●			9.52	11.60	3.97	0.40	4.40
		DCGW 11T304SN-013E_B3			●	9.52	11.60	3.97	0.40	4.40
		DCGW 11T304TN-020D_B3	●			9.52	11.60	3.97	0.40	4.40
		DCGW 11T308SN-013E_B3			●	9.52	11.60	3.97	0.80	4.40
-F4		VCUW 160408FL-F4		●		9.52	16.60	4.76	0.80	4.40
		VCUW 160408FN-F4		●		9.52	16.60	4.76	0.80	4.40
		VCUW 160408FR-F4		●		9.52	16.60	4.76	0.80	4.40
		VCUW 160408TL-F4		●		9.52	16.60	4.76	0.80	4.40
		VCUW 160408TN-F4		●		9.52	16.60	4.76	0.80	4.40
		VCUW 160408TR-F4		●		9.52	16.60	4.76	0.80	4.40
		VCUW 160412FL-F4		●		9.52	16.60	4.76	1.20	4.40
		VCUW 160412FR-F4		●		9.52	16.60	4.76	1.20	4.40
		VCUW 160412TL-F4		●		9.52	16.60	4.76	1.20	4.40
		VCUW 160412TN-F4		●		9.52	16.60	4.76	1.20	4.40
		VCUW 160412TR-F4		●		9.52	16.60	4.76	1.20	4.40
		VCUW 220530FL-F4		●		12.70	22.10	5.56	3.00	5.50
		VCUW 220530FR-F4		●		12.70	22.10	5.56	3.00	5.50
		VCUW 220530TL-F4		●		12.70	22.10	5.56	3.00	5.50
		VCUW 220530TN-F4		●		12.70	22.10	5.56	3.00	5.50
		VCUW 220530TR-F4		●		12.70	22.10	5.56	3.00	5.50
		VPUW 220516FL-F4		●		12.70	22.10	5.56	1.60	5.50
		VPUW 220516FN-F4		●		12.70	22.10	5.56	1.60	5.50
		VPUW 220516FR-F4		●		12.70	22.10	5.56	1.60	5.50
		VPUW 220516TL-F4		●		12.70	22.10	5.56	1.60	5.50
		VPUW 220516TN-F4		●		12.70	22.10	5.56	1.60	5.50
		VPUW 220516TR-F4		●		12.70	22.10	5.56	1.60	5.50
			CTBK104	CTD4110	CTL6115	d	l	s	r	d_1







A13

A32

A297

□ A136-A146
HSK A193-A196
UTS A214-A219

□ A157-A160
HSK A197-A200
UTS A225-A227

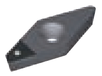
⌀ A237-A243
HSK A258-A259
UTS A264-A266

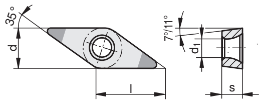
⌀ A247-A250
HSK A260
UTS A268-A269

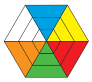
MaxiLock S

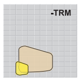
CC.. DC.. VC.. (other cutting materials)

	CTBK104	CTD4110	CTL6115
P			
M			
K	●		
N		●	
S			
H	●		●

			CTBK104	CTD4110	CTL6115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-F41		VCUT 160408FL-F41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408FN-F41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408FR-F41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TL-F41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TN-F41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TR-F41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160412FL-F41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412FN-F41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412FR-F41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412TL-F41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412TN-F41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412TR-F41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 220530FL-F41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530FN-F41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530FR-F41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TL-F41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TN-F41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TR-F41		●		12.70	22.10	5.56	3.00	5.50
		VPUT 220516FL-F41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516FN-F41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516FR-F41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516TL-F41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516TN-F41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516TR-F41		●		12.70	22.10	5.56	1.60	5.50
-M4		VCUW 160408FN-M4		●		9.52	16.60	4.76	0.80	4.40
		VCUW 160412FN-M4		●		9.52	16.60	4.76	1.20	4.40
		VCUW 160412TN-M4		●		9.52	16.60	4.76	1.20	4.40
		VCUW 220530FN-M4		●		12.70	22.10	5.56	3.00	5.50
		VCUW 220530TN-M4		●		12.70	22.10	5.56	3.00	5.50
		VPUW 220516FN-M4		●		12.70	22.10	5.56	1.60	5.50
		VPUW 220516TN-M4		●		12.70	22.10	5.56	1.60	5.50
			CTBK104	CTD4110	CTL6115	d	l	s	r	d_1

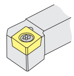


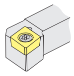

A13

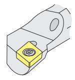


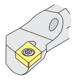
A32


A297


☐ A136-A146
HSK A193-A196
UTS A214-A219


☐ A157-A160
HSK A197-A200
UTS A225-A227


⌀ A237-A243
HSK A258-A259
UTS A264-A266

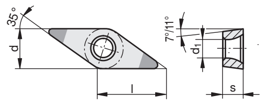

⌀ A247-A250
HSK A260
UTS A268-A269

MaxiLock S

CC.. DC.. VC.. (other cutting materials)

	CTBK104	CTD4110	CTL6115
P			
M			
K	●		
N		●	
S			
H	●		●

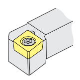
			CTBK104	CTD4110	CTL6115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-M41		VCUT 160408FL-M41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408FN-M41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408FR-M41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TL-M41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TN-M41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TR-M41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160412FL-M41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412FN-M41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412FR-M41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412TL-M41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412TN-M41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412TR-M41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 220530FL-M41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530FN-M41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530FR-M41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TL-M41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TN-M41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TR-M41		●		12.70	22.10	5.56	3.00	5.50
		VPUT 220516FL-M41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516FN-M41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516FR-M41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516TL-M41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516TN-M41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516TR-M41		●		12.70	22.10	5.56	1.60	5.50
-U41		VCUT 160408FN-U41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TN-U41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160412FN-U41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412TN-U41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 220530FN-U41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TN-U41		●		12.70	22.10	5.56	3.00	5.50
		VPUT 220516FN-U41		●		12.70	22.10	5.56	3.00	5.50
		VPUT 220516TN-U41		●		12.70	22.10	5.56	3.00	5.50
			CTBK104	CTD4110	CTL6115	d	l	s	r	d_1



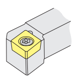
A13

A32

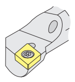
A297



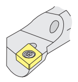
☐ A136-A146
HSK A193-A196
UTS A214-A219



☐ A157-A160
HSK A197-A200
UTS A225-A227



⌀ A237-A243
HSK A258-A259
UTS A264-A266



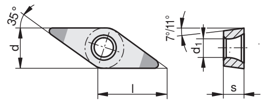
⌀ A247-A250
HSK A260
UTS A268-A269

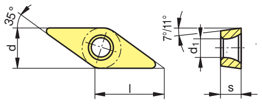
MaxiLock S

CC.. DC.. VC.. (other cutting materials)

	CTBK104	CTD4110	CTL6115
P			
M			
K	●		
N		●	
S			
H	●		●

			CTBK104	CTD4110	CTL6115	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-R41		VCUT 160408FL-R41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408FN-R41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408FR-R41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TL-R41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TN-R41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160408TR-R41		●		9.52	16.60	4.76	0.80	4.40
		VCUT 160412FL-R41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412FN-R41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412FR-R41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412TL-R41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 160412TR-R41		●		9.52	16.60	4.76	1.20	4.40
		VCUT 220530FL-R41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530FN-R41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530FR-R41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TL-R41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TN-R41		●		12.70	22.10	5.56	3.00	5.50
		VCUT 220530TR-R41		●		12.70	22.10	5.56	3.00	5.50
		VPUT 220516FL-R41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516FN-R41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516FR-R41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516TL-R41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516TN-R41		●		12.70	22.10	5.56	1.60	5.50
		VPUT 220516TR-R41		●		12.70	22.10	5.56	1.60	5.50
VC..W-B		VBGW 160404SN-013E-B3			●	9.52	16.60	4.76	0.40	4.40
		VCGW 110302SN-010E_B3			●	6.35	11.10	3.18	0.20	2.80
		VCGW 110304FN_B3	●			6.35	11.10	3.18	0.40	2.90
		VCGW 110304TN-020D_B3	●			6.35	11.10	3.18	0.40	2.90
		VCGW 160408FN_B3	●			9.52	16.60	4.76	0.80	4.40
		VCGW 160408TN-020D_B3	●			9.52	16.60	4.76	0.80	4.40
FN		VCUW 160404FN		●		9.52	16.60	4.76	0.40	4.40
		VCUW 160412FN		●		9.52	16.60	4.76	1.20	4.40
		VCUW 160416FN		●		9.52	16.60	4.76	1.60	4.40
		VCUW 220530FN-F4		●		12.70	22.10	5.56	3.00	5.50
			CTBK104	CTD4110	CTL6115	d	l	s	r	d_1





A13

A32

A297

☐ A136-A146
HSK A193-A196
UTS A214-A219

☐ A157-A160
HSK A197-A200
UTS A225-A227

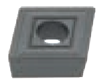
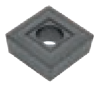
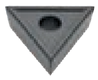
⌀ A237-A243
HSK A258-A259
UTS A264-A266

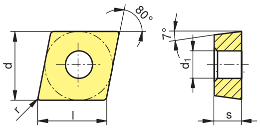
⌀ A247-A250
HSK A260
UTS A268-A269

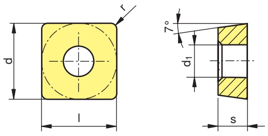
MaxiLock P

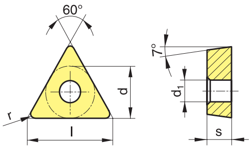
CC.. SC.. TC..

	CTCP115	CTCP125	CTCP135
P	●	●	●
M	○	○	○
K	●	●	
N			
S			○
H			

			CTCP115	CTCP125	CTCP135	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
CC..X		CCMX 120408EN		●		12.70	12.90	4.76	0.80	5.16
SC..X		SCMX 120408EN		●	●	12.70	12.70	4.76	0.80	5.16
		SCMX 190616EN			●	19.05	19.05	6.35	1.60	7.93
TC..X		TCMX 160404EN	●	●	●	9.52	16.50	4.76	0.40	3.81
		TCMX 160408EN	●	●	●	9.52	16.50	4.76	0.80	3.81
		TCMX 160412EN		●		9.52	16.50	4.76	1.20	3.81
		TCMX 220404EN			●	12.70	22.00	4.76	0.40	5.16
		TCMX 220408EN			●	12.70	22.00	4.76	0.80	5.16
		TCMX 220412EN		●		12.70	22.00	4.76	1.20	5.16







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A36

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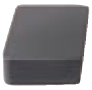
☐ A161-A166

⌀ A251-A252

Simplex N

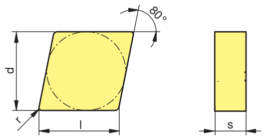
CN..

	CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120
P						○	○
M							
K	●	●	●	●	●	●	●
N							
S							
H		●	●				



CN..N

	CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120	d [mm]	l [mm]	s [mm]	r [mm]
CNGN 090308TN-020D			●					9.52	9.70	3.18	0.80
CNGN 090316TN-020D			●					9.52	9.70	3.18	1.60
CNGN 120404TN-020D		●						12.70	12.90	4.76	0.40
CNGN 120408TN-020D		●						12.70	12.90	4.76	0.80
CNGN 120416TN-020D			●					12.70	12.90	4.76	1.60
CNGN 120712PN-100CF		●						12.70	12.90	7.94	1.20
CNGN 120712SN-025C					●			12.70	12.90	7.94	1.20
CNGN 120716PN-100CF		●						12.70	12.90	7.94	1.60
CNGN 120716SN-025C					●			12.70	12.90	7.94	1.60
CNGN 160716SN-025C					●			15.88	16.10	7.94	1.60
CNGN 160716SN-200C		●						15.88	16.10	7.94	1.60
	CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120	d	l	s	r



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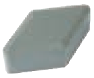
A297

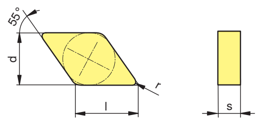
□ A167

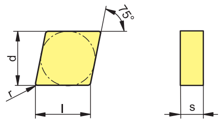
Simplex N

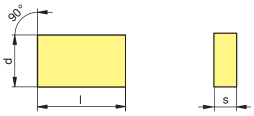
DN.. EN.. LN..

	CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120
P						○	○
M							
K	●	●	●	●	●	●	●
N							
S							
H		●	●				

		CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120	d [mm]	l [mm]	s [mm]	r [mm]
DN..N 	DNGN 150704TN-020D		●						12.70	15.50	7.94	0.40
	DNGN 150708TN-020D		●						12.70	15.50	7.94	0.80
	DNGN 150712SN-200C		●						12.70	15.50	7.94	1.20
	DNGN 150712TN-020D		●						12.70	15.50	7.94	1.20
	DNGN 150716PN-100CF		●						12.70	15.50	7.94	1.60
	DNGN 150716SN-200C		●						12.70	15.50	7.94	1.60
	DNGN 150716TN-020D		●						12.70	15.50	7.94	1.60
EN..N 	ENGN 130704TN-020D		●						12.70	13.20	7.94	0.40
	ENGN 130708TN-020D		●						12.70	13.20	7.94	0.80
	ENGN 130712TN-020D		●						12.70	13.20	7.94	1.20
	ENGN 130716SN-200C		●						12.70	13.20	7.94	1.60
	ENGN 130732TN-020D		●						12.70	13.20	7.94	3.20
LN..N 	LNMN 6688PN-150CE					●			19.05	38.10	12.70	3.00
	LNMN 6688PN-200CE		●						19.05	38.10	12.70	3.00
	LNMN 6688SN-040D	●							19.05	38.10	12.70	3.00
	LNMN 6688SN-100B	●							19.05	38.10	12.70	3.00
		CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120	d	l	s	r







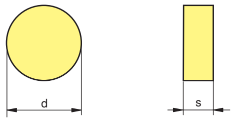
A13 A36 A297

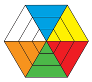
Simplex N

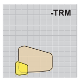
RN..

	CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120
P						○	○
M							
K	●	●	●	●	●	●	●
N							
S							
H		●	●				

RN..N		CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120	d [mm]	s [mm]
RN..N	RNGN 060400TN-020D		●						6.35	4.76
	RNGN 090300TN-020D			●					9.52	3.18
	RNGN 090400TN-020D		●						9.52	4.76
	RNGN 120300TN-020D			●					12.70	3.18
	RNGN 120400PN-150CF				●	●			12.70	4.76
	RNGN 120400TN-020D			●					12.70	4.76
	RNGN 120700PN-100CF		●						12.70	7.94
	RNGN 120700SN-200C		●						12.70	7.94
	RNGN 120700TN-020D		●						12.70	7.94
	RNGN 150700PN-150CE					●			15.80	7.94
	RNGN 150700SN-200C		●						15.80	7.94
	RNGN 190700PN-100CF		●						19.00	7.94
	RNGN 190700TN-020D		●						19.00	7.94
	RNGN 250700PN-100CF		●						25.40	7.94
	RNGN 250700PN-200CE		●		●	●			25.40	7.94
	RNGN 250700TN-020D		●						25.40	7.94
	RNGN 310900PN-100CF		●						31.75	9.52
		CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120	d	s




A13



A36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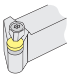
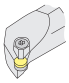
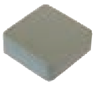
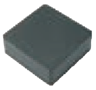
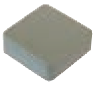

☐ A169-A170

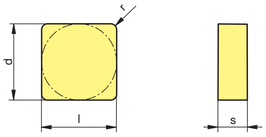

⌀ A253

Simplex N

SN..

	CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120
P						○	○
M							
K	●	●	●	●	●	●	●
N							
S							
H		●	●				

			CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120	d [mm]	l [mm]	s [mm]	r [mm]
SN..N		SNGN 090312TN-020D			●					9.52	9.52	3.18	1.20
		SNGN 120316TN-020D			●					12.70	12.70	3.18	1.60
		SNGN 120408SN-015D					●			12.70	12.70	4.76	0.80
		SNGN 120408TN-020D		●						12.70	12.70	4.76	0.80
		SNGN 120412PN-150CF					●			12.70	12.70	4.76	1.20
		SNGN 120412SN-015D					●			12.70	12.70	4.76	1.20
		SNGN 120412TN-020D		●						12.70	12.70	4.76	1.20
		SNGN 120416TN-020D			●					12.70	12.70	4.76	1.60
		SNGN 120704TN-020D		●						12.70	12.70	4.76	0.40
		SNGN 120716PN-100CF		●						12.70	12.70	7.94	1.60
		SNGN 120716PN-150CF					●			12.70	12.70	7.94	1.60
		SNGN 120716SN-025C					●			12.70	12.70	7.94	1.60
		SNGN 120716SN-200C		●						12.70	12.70	7.94	1.60
		SNGN 120716TN-020D		●						12.70	12.70	7.94	1.60
		SNGN 120720PN-100CF		●						12.70	12.70	7.94	2.00
		SNGN 120720SN-200C		●						12.70	12.70	7.94	2.00
		SNGN 150712TN-020D		●						15.80	15.80	7.94	1.20
		SNGN 150716PN-150CF					●			15.80	15.80	7.94	1.60
		SNGN 150720SN-200C		●						15.80	15.80	7.94	2.00
		SNGN 190716PN-150CF					●			19.00	19.00	7.94	1.60
		SNGN 190716TN-020D		●						19.00	19.00	7.94	1.60
		SNGN 190720PN-100CF		●						19.00	19.00	7.94	2.00
		SNGN 190720SN-200C		●						19.00	19.00	7.94	2.00
		SNGN 190720TN-020D		●						19.00	19.00	7.94	2.00
		SNGN 250724PN-100CF		●						25.40	25.40	7.94	2.40
		SNGN 250724PN-150CE					●			25.40	25.40	7.94	2.40
		SNGN 250724PN-200CE		●						25.40	25.40	7.94	2.40
		SNGN 250724SN-050C		●						25.40	25.40	7.94	2.40
		SNGN 250724SN-200C		●						25.40	25.40	7.94	2.40
		SNGN 250924PN-100CF		●						25.40	25.40	9.52	2.40
		SNGN 250924PN-150CE					●			25.40	25.40	9.52	2.40
		SNGN 250924SN-030E					●			25.40	25.40	9.52	2.40
		SNGN 250924SN-200C		●						25.40	25.40	9.52	2.40
		SNGN 250924TN-020D		●						25.40	25.40	9.52	2.40
SNUN		SNUN 120412EN						●		12.70	12.70	4.76	1.20
		SNUN 120416EN						●	●	12.70	12.70	4.76	1.60
SN..N		SNUN 250724TN-100C	●							25.40	25.40	7.94	2.40
		SNUN 250924TN-100C	●							25.40	25.40	9.52	2.40



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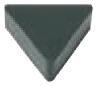
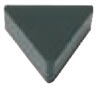
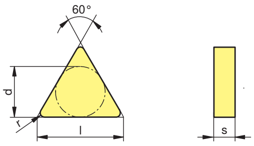
☐ A171-A172

Simplex N

TN..

	CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120
P						○	○
M							
K	●	●	●	●	●	●	●
N							
S							
H		●	●				

			CTWK601	CTS3105	CTBK102	CTM3110	CTN3110	CTC3110	CTCK120	d [mm]	l [mm]	s [mm]	r [mm]
TN..N		TNGN 110308TN-020D		●	●					6.35	11.00	3.18	0.80
		TNGN 160408TN-020D		●						9.52	16.50	4.76	0.80
		TNGN 220408TN-020D		●						12.70	22.00	4.76	0.80
TNUN		TNUN 160412EN						●		9.52	16.50	4.76	1.20
		TNUN 160416EN						●		9.52	16.50	4.76	1.60



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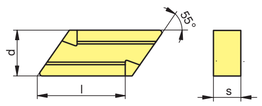
☐ A173-A176

Simplex P

KN..

			CTCP125	CTCP135	CTS3105	CTBK102	CTN3110	CTC3110	CTD4110	CTD4125	H10T	d [mm]	l [mm]	s [mm]	r [mm]
		P	●	●				○							
		M	○	○											
		K	●		●	●	●	●			●				
		N							●	●	●				
		S		○											
		H			●	●									
-11		KNUX 160405EL-11	●	●				●				9.52	16.00	4.76	0.50
		KNUX 160405ER-11	●	●				●				9.52	16.00	4.76	0.50
		KNUX 160410EL-11		●								9.52	16.00	4.76	1.00
		KNUX 160410ER-11	●	●								9.52	16.00	4.76	1.00
-12		KNUX 160405EL-12		●								9.52	16.00	4.76	0.50
		KNUX 160405ER-12		●								9.52	16.00	4.76	0.50
		KNUX 160410EL-12		●								9.52	16.00	4.76	1.00
		KNUX 160410ER-12		●								9.52	16.00	4.76	1.00



A13

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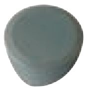
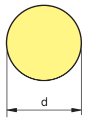
☐ A168

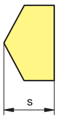
Simplex P

RC..

	CTCP125	CTCP135	CTS3105	CTBK102	CTN3110	CTC3110	CTD4110	CTD4125	H10T
P	●	●				○			
M	○	○							
K	●		●	●	●	●			●
N							●	●	●
S		○							
H			●	●					

			CTCP125	CTCP135	CTS3105	CTBK102	CTN3110	CTC3110	CTD4110	CTD4125	H10T	d [mm]	s [mm]
RC..X		RCGX 060600TN-020D			●	●						6.00	6.20
		RCGX 070400SN-050C			●							7.00	4.76
		RCGX 090700PN-075CF					●					9.52	7.70
		RCGX 090700PN-100CF			●							9.52	7.70
		RCGX 090700SN-200C			●							9.52	7.70
		RCGX 090700TN-020D			●	●						9.52	7.70
		RCGX 120700PN-100CF			●							12.70	7.70
		RCGX 120700PN-150CF					●					12.70	7.70
		RCGX 120700SN-200C			●							12.70	7.70
		RCGX 120700TN-020D			●	●						12.70	7.70
		RCGX 151000PN-100CF			●							15.80	10.00
		RCGX 151000SN-200C			●							15.80	10.00
		RCGX 191000PN-100CF			●							19.05	10.00
		RCGX 191000SN-200C			●							19.05	10.00
		RCGX 251200PN-100CF			●							25.40	12.00
		RCGX 251200PN-200CE			●							25.40	12.00
		RCGX 251200PN-200CF					●					25.40	12.00
		RCGX 251200SN-200C			●							25.40	12.00
			CTCP125	CTCP135	CTS3105	CTBK102	CTN3110	CTC3110	CTD4110	CTD4125	H10T	d	s





A13

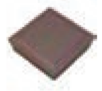
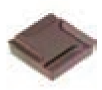
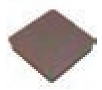
A36

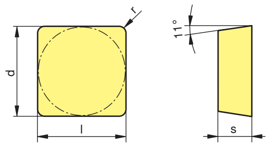
A297

Simplex P

SP..

	CTCP125	CTCP135	CTS3105	CTBK102	CTN3110	CTC3110	CTD4110	CTD4125	H10T
P	●	●				○			
M	○	○							
K	●		●	●	●	●			●
N							●	●	●
S		○							
H			●	●					

			CTCP125	CTCP135	CTS3105	CTBK102	CTN3110	CTC3110	CTD4110	CTD4125	H10T	d [mm]	l [mm]	s [mm]	r [mm]
-57		SPMR 090308EN-57		●								9.52	9.52	3.18	0.80
SPMR		SPMR 090304EN		●								9.52	9.52	3.18	0.40
		SPMR 120304EN		●								12.70	12.70	3.18	0.40
		SPMR 120308EN	●	●								12.70	12.70	3.18	0.80
SPMR-R		SPMR 120308ER		●								12.70	12.70	3.18	0.80
SP..N		SPUN 120308EN		●				●				12.70	12.70	3.18	0.80
			CTCP125	CTCP135	CTS3105	CTBK102	CTN3110	CTC3110	CTD4110	CTD4125	H10T	d	l	s	r



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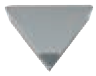
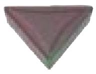
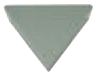
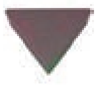
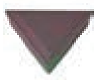
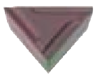
A36

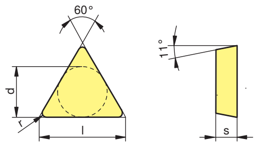
A297

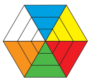
Simplex P

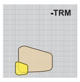
TP..

	CTCP125	CTCP135	CTS3105	CTBK102	CTN3110	CTC3110	CTD4110	CTD4125	H10T
P	●	●				○			
M	○	○							
K	●		●	●	●	●			●
N							●	●	●
S		○							
H			●	●					

			CTCP125	CTCP135	CTS3105	CTBK102	CTN3110	CTC3110	CTD4110	CTD4125	H10T	d [mm]	l [mm]	s [mm]	r [mm]
-D		TPUN 160304FN							●			9.52	16.50	3.18	0.40
-57		TPMR 160308EN-57		●								9.52	16.50	3.18	0.80
TPGN		TPGN 160304TN-020D			●							9.52	16.50	3.18	0.40
TP..N		TPUN 110304EN		●								6.35	11.00	3.18	0.40
		TPUN 110304FN									●	6.35	11.00	3.18	0.40
		TPUN 110308EN						●				6.35	11.00	3.18	0.80
		TPUN 160304EN	●	●				●				9.52	16.50	3.18	0.40
		TPUN 160304FN									●	9.52	16.50	3.18	0.40
		TPUN 160308EN	●	●								9.52	16.50	3.18	0.80
		TPUN 160308FN									●	9.52	16.50	3.18	0.80
		TPUN 160312EN		●								9.52	16.50	3.18	1.20
		TPUN 220408EN		●								12.70	22.00	4.76	0.80
		TPUN 220412EN		●								12.70	22.00	4.76	1.20
TPMR		TPMR 110304EN	●	●								6.35	11.00	3.18	0.40
		TPMR 110308EN		●								6.35	11.00	3.18	0.80
		TPMR 160304EN	●	●								9.52	16.50	3.18	0.40
		TPMR 160308EN	●	●				●				9.52	16.50	3.18	0.80
TPMR-RL		TPMR 110304EL		●								6.35	11.00	3.18	0.40
		TPMR 110304ER		●								6.35	11.00	3.18	0.40
		TPMR 160304EL		●								9.52	16.50	3.18	0.40
		TPMR 160304ER		●								9.52	16.50	3.18	0.40
		TPMR 160308EL		●								9.52	16.50	3.18	0.80
		TPMR 160308ER		●								9.52	16.50	3.18	0.80

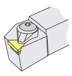


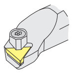

A13



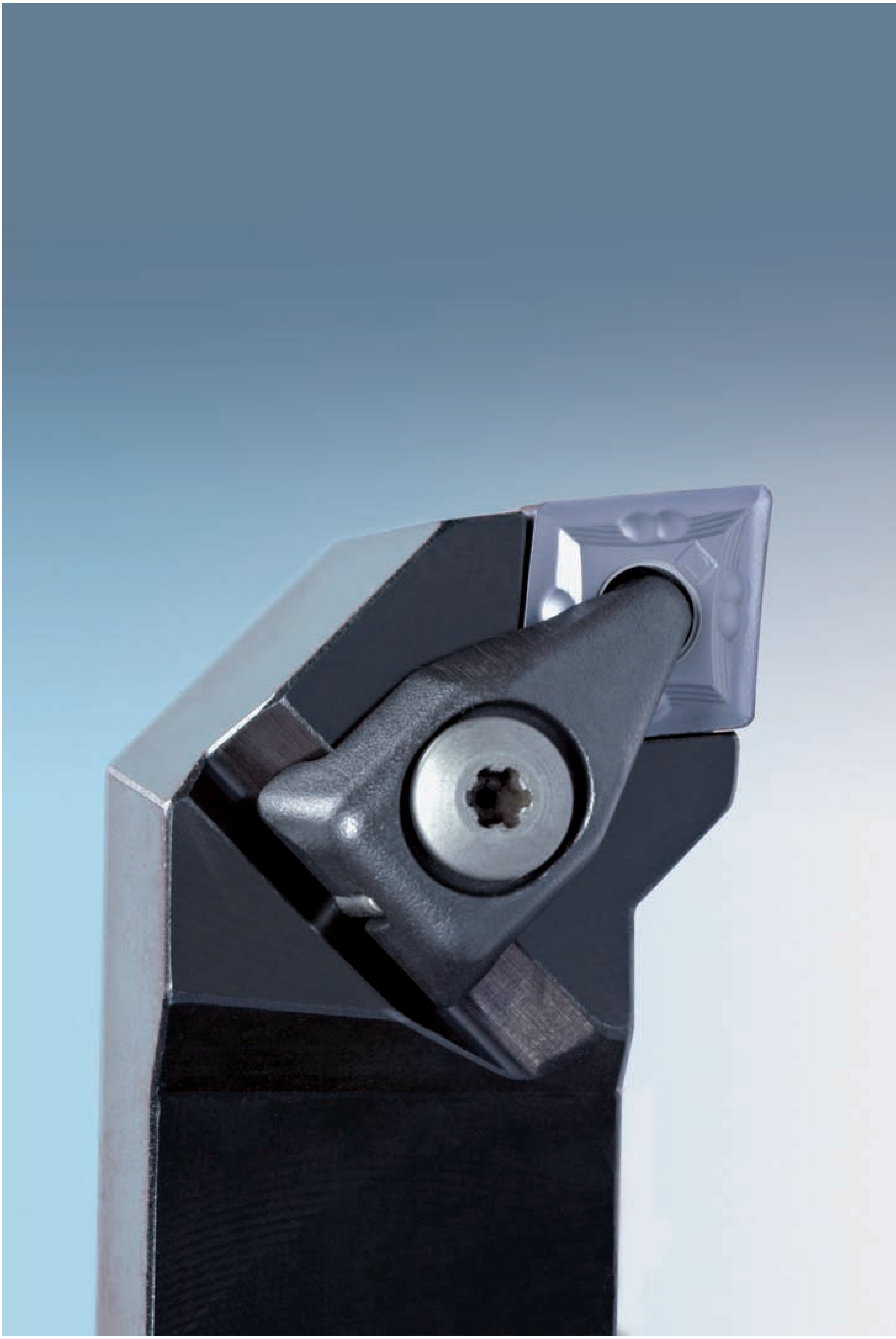
A36


A297


☐ A177-A180


⌀ A254

Notes



External machining square shank

MaxiLock D	A109-A120
MaxiLock N	A121-A135
MaxiLock S	A136-A160
MaxiLock P	A161-A166
Simplex N	A167-A176
Simplex P	A177-A180

External machining HSK-T

MaxiLock D	A181-A190
MaxiLock N	A191-A192
MaxiLock S	A193-A200

External machining UTS

MaxiLock N	A201-A213
MaxiLock S	A214-A227

Internal machining round shank

MaxiLock D	A228-A231
MaxiLock N	A232-A236
MaxiLock S	A237-A250
MaxiLock P	A251-A252
Simplex N	A253
Simplex P	A254

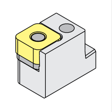
Internal machining HSK-T

MaxiLock D	A255-A257
MaxiLock S	A258-A269

Internal machining UTS

MaxiLock N	A261-A263
MaxiLock S	A264-A269

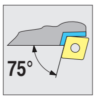
Railway wheel set machining

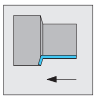


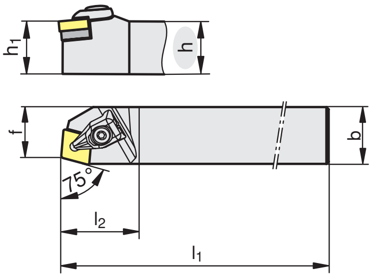
Railway wheel set cartridges	A270

DCBN...

MaxiLock D

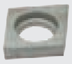






Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]		
25	DCBNR 2525 M12	R	25	25	150	32	22	CN.. 1204..	E01
25	DCBNL 2525 M12	L	25	25	150	32	22	CN.. 1204..	E01

				
E01	11224545	11224494	11211558	11224503

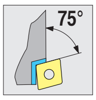
A303

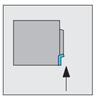
A63-A66

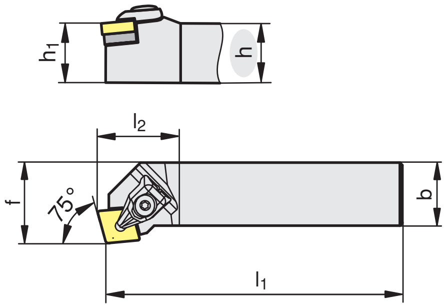
A79

DCKN...

MaxiLock D

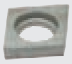






Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	◻	
25	DCKNR 2525 M12	R	25	25	150	29.1	32	CN.. 1204..	E01
25	DCKNL 2525 M12	L	25	25	150	29.1	32	CN.. 1204..	E01

				
E01	11224545	11224494	11211558	11224503

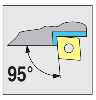
A303

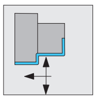
A63-A66

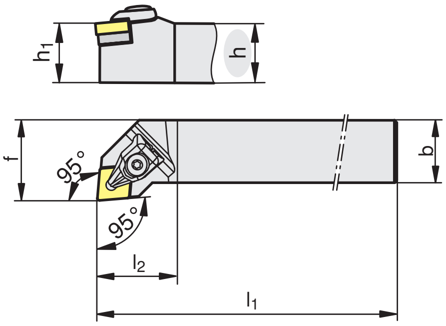
A79

DCLN...

MaxiLock D

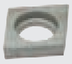






Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]		
16	DCLNR 1616 H09	R	16	16	100	23	20	CN.. 0903..	E01
16	DCLNL 1616 H09	L	16	16	100	23	20	CN.. 0903..	E01
20	DCLNR 2020 K09	R	20	20	125	24	25	CN.. 0903..	E01
20	DCLNL 2020 K09	L	20	20	125	24	25	CN.. 0903..	E01
20	DCLNR 2020 K12	R	20	20	125	32	25	CN.. 1204..	E02
20	DCLNL 2020 K12	L	20	20	125	32	25	CN.. 1204..	E02
25	DCLNR 2525 M12	R	25	25	150	32	32	CN.. 1204..	E02
25	DCLNL 2525 M12	L	25	25	150	32	32	CN.. 1204..	E02
32	DCLNR 3225 P12	R	32	25	170	32	32	CN.. 1204..	E02
32	DCLNL 3225 P12	L	32	25	170	32	32	CN.. 1204..	E02
25	DCLNR 2525 M16	R	25	25	150	38	32	CN.. 1606..	E03
25	DCLNL 2525 M16	L	25	25	150	38	32	CN.. 1606..	E03
32	DCLNR 3232 P16	R	32	32	170	37	40	CN.. 1606..	E03
32	DCLNL 3232 P16	L	32	32	170	37	40	CN.. 1606..	E03
32	DCLNR 3232 P19	R	32	32	170	42	40	CN.. 1906..	E04
32	DCLNL 3232 P19	L	32	32	170	42	40	CN.. 1906..	E04
40	DCLNR 4040 S19	R	40	40	250	42	50	CN.. 1906..	E04
40	DCLNL 4040 S19	L	40	40	250	42	50	CN.. 1906..	E04
40	DCLNR 4040 S25	R	40	40	250	60	50	CN.. 2509..	E05
40	DCLNL 4040 S25	L	40	40	250	60	50	CN.. 2509..	E05

				
E01	11227306	11227305	11577861	11227314
E02	11224545	11224494	11211558	11224503
E03	11227322	11227318	11227315	11227323
E04	11227325	11227318	11227316	11227323
E05	11227328	11227329	11579427	11227330

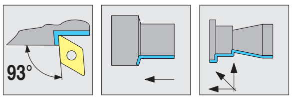
A303

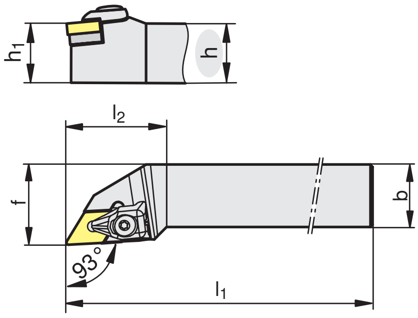
A63-A66

A79

DDJN...

MaxiLock D





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
16	DDJNR 1616 H11	R	16	16	100	33	20	DN.. 1104..	E01
16	DDJNL 1616 H11	L	16	16	100	33	20	DN.. 1104..	E01
20	DDJNR 2020 K11	R	20	20	125	40	25	DN.. 1104..	E01
20	DDJNL 2020 K11	L	20	20	125	40	25	DN.. 1104..	E01
25	DDJNR 2525 M11	R	25	25	150	40	32	DN.. 1104..	E01
25	DDJNL 2525 M11	L	25	25	150	40	32	DN.. 1104..	E01
20	DDJNR 2020 K15	R	20	20	125	40	25	DN.. 1506..	E02
20	DDJNL 2020 K15	L	20	20	125	40	25	DN.. 1506..	E02
25	DDJNR 2525 M15	R	25	25	150	40	32	DN.. 1506..	E02
25	DDJNL 2525 M15	L	25	25	150	40	32	DN.. 1506..	E02
32	DDJNR 3225 P15	R	32	25	170	40	32	DN.. 1506..	E02
32	DDJNL 3225 P15	L	32	25	170	40	32	DN.. 1506..	E02

				
E01	11258694	11227305	11227308	11227314
E02	11224545	11224494	11211562	11224503

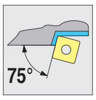
A303

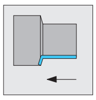
A67-A69

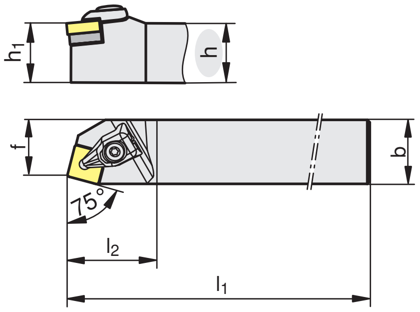
A79

DSBN...

MaxiLock D

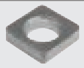






Picture shows right-hand version

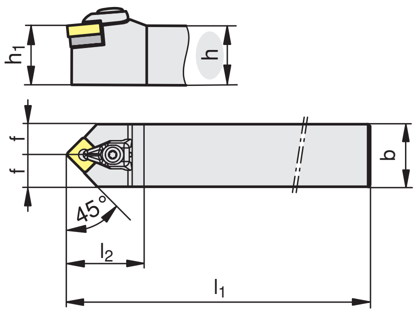
h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	◻	🔧
20	DSBNR 2020 K12	R	20	20	125	35	17	SN.. 1204..	E01
20	DSBNL 2020 K12	L	20	20	125	35	17	SN.. 1204..	E01
25	DSBNR 2525 M12	R	25	25	150	35	22	SN.. 1204..	E01
25	DSBNL 2525 M12	L	25	25	150	35	22	SN.. 1204..	E01
25	DSBNR 2525 M15	R	25	25	150	43	22	SN.. 1506..	E02
25	DSBNL 2525 M15	L	25	25	150	43	22	SN.. 1506..	E02
32	DSBNR 3232 P15	R	32	32	170	42	27	SN.. 1506..	E02
32	DSBNL 3232 P15	L	32	32	170	42	27	SN.. 1506..	E02
32	DSBNR 3232 P19	R	32	32	170	48	27	SN.. 1906..	E03
32	DSBNL 3232 P19	L	32	32	170	48	27	SN.. 1906..	E03
40	DSBNR 4040 S19	R	40	40	250	48	35	SN.. 1906..	E03
40	DSBNL 4040 S19	L	40	40	250	48	35	SN.. 1906..	E03
40	DSBNR 4040 S25	R	40	40	250	57	35	SN.. 2507..	E04
40	DSBNL 4040 S25	L	40	40	250	57	35	SN.. 2507..	E04

🔧				
E01	11224545	11224494	11211561	11224503
E02	11227322	11227318	11247269	11227323
E03	11227325	11227318	11227317	11227323
E04	11227328	11227329	11227319	11227330

🔧 A303
◻ A70-A72
◻ A80

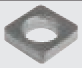
DSDN...

MaxiLock D



Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	◻	🔧
20	DSDNN 2020 K12	N	20	20	125	38	10	SN.. 1204..	E01
25	DSDNN 2525 M12	N	25	25	150	38	12.5	SN.. 1204..	E01

🔧				
E01	11224545	11224494	11211561	11224503

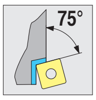
🔧 A303

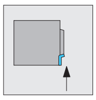
◻ A70-A72

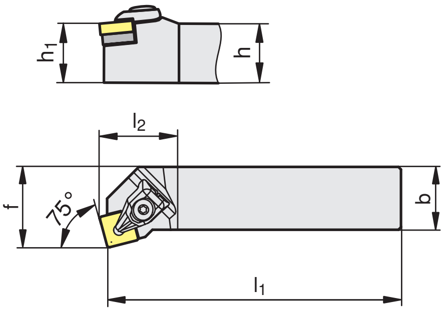
◻ A80

DSKN...

MaxiLock D

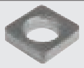






Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]	◻	
25	DSKNR 2525 M12	R	25	25	150	31.0	32	SN.. 1204..	E01
25	DSKNL 2525 M12	L	25	25	150	31.0	32	SN.. 1204..	E01

				
E01	11224545	11224494	11211561	11224503

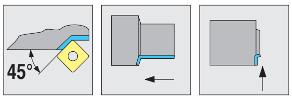
A303

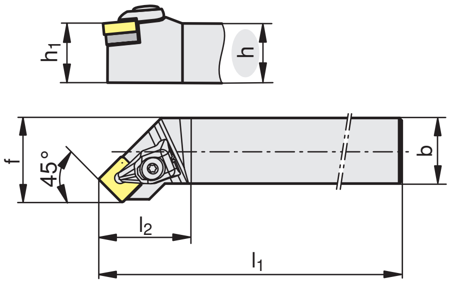
A70-A72

A80

DSSN...

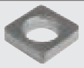
MaxiLock D





Picture shows right-hand version

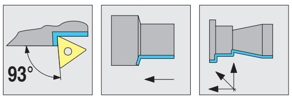
h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	◻	🔧
20	DSSNR 2020 K12	R	20	20	125	35	25	SN.. 1204..	E01
20	DSSNL 2020 K12	L	20	20	125	35	25	SN.. 1204..	E01
25	DSSNR 2525 M12	R	25	25	150	35	32	SN.. 1204..	E01
25	DSSNL 2525 M12	L	25	25	150	35	32	SN.. 1204..	E01
32	DSSNR 3225 P12	R	32	25	170	35	32	SN.. 1204..	E01
32	DSSNL 3225 P12	L	32	25	170	35	32	SN.. 1204..	E01

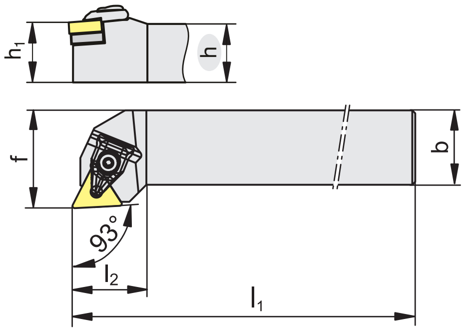
🔧				
E01	11224545	11224494	11211561	11224503

A303
A70-A72
A80

DTJN...

MaxiLock D





Picture shows right-hand version

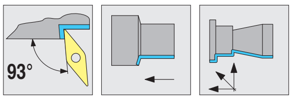
h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	🔧
20	DTJNR 2020 K16	R	20	20	125	23	25	TN.. 1604..	E01
20	DTJNL 2020 K16	L	20	20	125	23	25	TN.. 1604..	E01
25	DTJNR 2525 M16	R	25	25	150	24	32	TN.. 1604..	E01
25	DTJNL 2525 M16	L	25	25	150	24	32	TN.. 1604..	E01

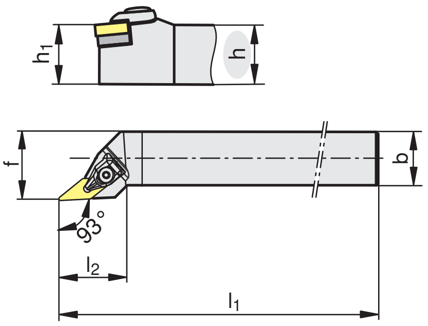
🔧				
E01	11227306	11227305	11344329	11227314

🔧	△	△
A303	A73-A75	A80

DVJN...

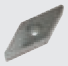
MaxiLock D





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
20	DVJNR 2020 K16	R	20	20	125	39	25	VN.. 1604..	E01
20	DVJNL 2020 K16	L	20	20	125	39	25	VN.. 1604..	E01
25	DVJNR 2525 M16	R	25	25	150	39	32	VN.. 1604..	E01
25	DVJNL 2525 M16	L	25	25	150	39	32	VN.. 1604..	E01

				
E01	11258694	11227305	11227311	11227314

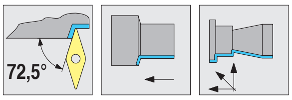
A303

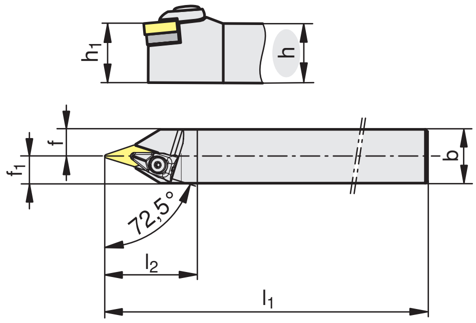
A76

A80

DVVN...

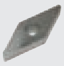
MaxiLock D





Picture shows right-hand version

h [mm]	Type, description	L N R	h$_1$ [mm]	b [mm]	l$_1$ [mm]	l$_2$ [mm]	f [mm]	f$_1$ [mm]	◇	🔧
20	DVVNN 2020 K16	N	20	20	125	43	7.5	12.5	VN.. 1604..	E01
25	DVVNN 2525 M16	N	25	25	150	43	12.5	12.5	VN.. 1604..	E01

🔧				
E01	11258694	11227305	11227311	11227314

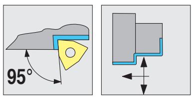
A303

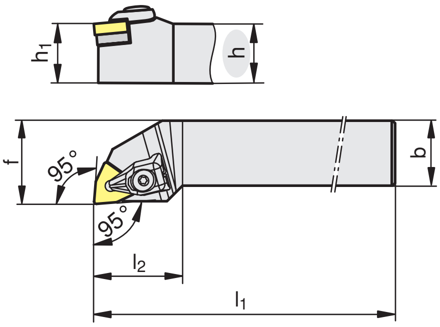
A76

A80

DWLN...

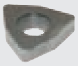
MaxiLock D





Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]		
16	DWLNR 1616 H06	R	16	16	100	25	20	WN.. 0604..	E01
16	DWLNL 1616 H06	L	16	16	100	25	20	WN.. 0604..	E01
20	DWLNR 2020 K06	R	20	20	125	27	25	WN.. 0604..	E01
20	DWLNL 2020 K06	L	20	20	125	27	25	WN.. 0604..	E01
25	DWLNR 2525 M06	R	25	25	150	27	32	WN.. 0604..	E01
25	DWLNL 2525 M06	L	25	25	150	27	32	WN.. 0604..	E01
20	DWLNR 2020 K08	R	20	20	125	34	25	WN.. 0804..	E02
20	DWLNL 2020 K08	L	20	20	125	34	25	WN.. 0804..	E02
25	DWLNR 2525 M08	R	25	25	150	34	32	WN.. 0804..	E02
25	DWLNL 2525 M08	L	25	25	150	34	32	WN.. 0804..	E02

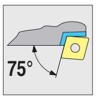
				
E01	11227306	11227305	11227310	11227314
E02	11224545	11224494	11211563	11224503

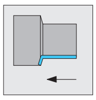
A303

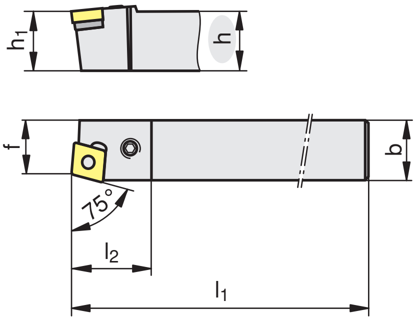
A77-A78

PCBN...

MaxiLock N

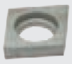






Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]		
25	PCBNR 2525 M12-T	R	25	25	150	27.7	22	CN.. 1204..	E01
25	PCBNL 2525 M12-T	L	25	25	150	27.7	22	CN.. 1204..	E01
25	PCBNR 2525 M16-T	R	25	25	150	31.8	22	CN.. 1606..	E02
25	PCBNL 2525 M16-T	L	25	25	150	31.8	22	CN.. 1606..	E02
32	PCBNR 3232 P19-T	R	32	32	170	38.0	27	CN.. 1906..	E03
32	PCBNL 3232 P19-T	L	32	32	170	38.0	27	CN.. 1906..	E03

							
E01	59446	59568	59437	59430	86176	4771	140587
E02	59443	59451	59438	59426	86177	4771	140589
E03	59448	59569	59439	59434	86178	4209	140590

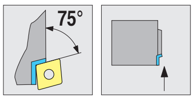
A303

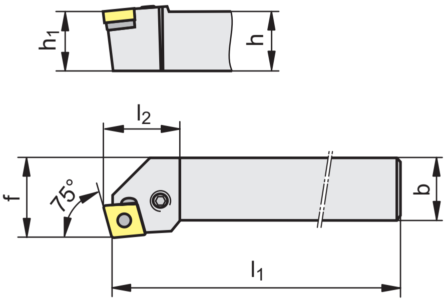
A63-A66

A79

PCKN...

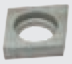
MaxiLock N





Picture shows right-hand version

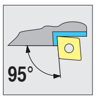
h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
25	PCKNR 2525 M12-T	R	25	25	150	31.4	32	CN.. 1204..	E01
25	PCKNL 2525 M12-T	L	25	25	150	31.4	32	CN.. 1204..	E01

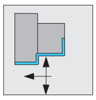
							
E01	59446	59568	59437	59430	86176	4771	140587

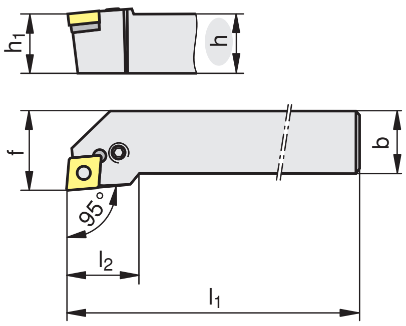
A303 A63-A66 A79

PCLN...

MaxiLock N

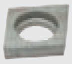






Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
16	PCLNR 1616 H12-T	R	16	16	100	26.2	20	CN.. 1204..	E01
16	PCLNL 1616 H12-T	L	16	16	100	26.2	20	CN.. 1204..	E01
20	PCLNR 2020 K12-T	R	20	20	125	27.4	25	CN.. 1204..	E02
20	PCLNL 2020 K12-T	L	20	20	125	27.4	25	CN.. 1204..	E02
25	PCLNR 2525 M12-T	R	25	25	150	28	32	CN.. 1204..	E02
25	PCLNL 2525 M12-T	L	25	25	150	28	32	CN.. 1204..	E02
32	PCLNR 3225 P12-T	R	32	25	170	32.6	32	CN.. 1204..	E02
32	PCLNL 3225 P12-T	L	32	25	170	32.6	32	CN.. 1204..	E02
25	PCLNR 2525 M16-T	R	25	25	150	32.7	32	CN.. 1606..	E03
25	PCLNL 2525 M16-T	L	25	25	150	32.7	32	CN.. 1606..	E03
32	PCLNR 3232 P16-T	R	32	32	170	32.6	40	CN.. 1606..	E03
32	PCLNL 3232 P16-T	L	32	32	170	32.6	40	CN.. 1606..	E03
32	PCLNR 3232 P19-T	R	32	32	170	38	40	CN.. 1906..	E04
32	PCLNL 3232 P19-T	L	32	32	170	38	40	CN.. 1906..	E04
40	PCLNR 4040 S19-T	R	40	40	250	38	50	CN.. 1906..	E04
40	PCLNL 4040 S19-T	L	40	40	250	38	50	CN.. 1906..	E04
40	PCLNR 4040 S25	R	40	40	250	50	50	CN.. 2509..	E05
40	PCLNL 4040 S25	L	40	40	250	50	50	CN.. 2509..	E05

							
E01	59442	59568	59437	59430	86176	4771	140586
E02	59446	59568	59437	59430	86176	4771	140587
E03	59443	59451	59438	59426	86177	4771	140589
E04	59448	59569	59439	59434	86178	4209	140590
E05	59449	11294214	59440	59435	86182	4496	

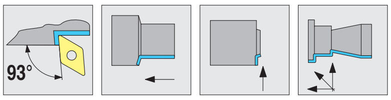
A303

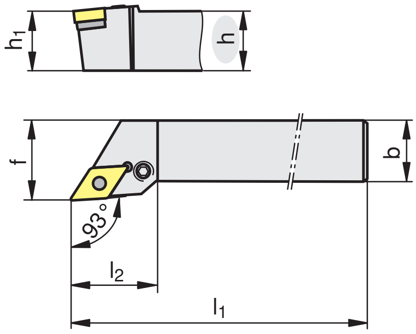
A63-A66

A79

PDJN...

MaxiLock N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
16	PDJNR 1616 H11	R	16	16	100	26	20	DN.. 1104..	E01
16	PDJNL 1616 H11	L	16	16	100	26	20	DN.. 1104..	E01
20	PDJNR 2020 K11	R	20	20	125	30	25	DN.. 1104..	E01
20	PDJNL 2020 K11	L	20	20	125	30	25	DN.. 1104..	E01
25	PDJNR 2525 M11	R	25	25	150	30	32	DN.. 1104..	E01
25	PDJNL 2525 M11	L	25	25	150	30	32	DN.. 1104..	E01
20	PDJNR 2020 K15-T	R	20	20	125	34.9	25	DN.. 1506..	E02
20	PDJNL 2020 K15-T	L	20	20	125	34.9	25	DN.. 1506..	E02
25	PDJNR 2525 M15-T	R	25	25	150	34.7	32	DN.. 1506..	E02
25	PDJNL 2525 M15-T	L	25	25	150	34.7	32	DN.. 1506..	E02
32	PDJNR 3225 P15-T	R	32	25	170	34.7	32	DN.. 1506..	E02
32	PDJNR 3232 P15-T	R	32	32	170	34.7	40	DN.. 1506..	E02
32	PDJNL 3225 P15-T	L	32	25	170	34.7	32	DN.. 1506..	E02
32	PDJNL 3232 P15-T	L	32	32	170	34.7	40	DN.. 1506..	E02

							
E01	59445	293140	293147	293143	86174	4770	293151
E02	59443	59570	59437	59432	86176	4771	140591

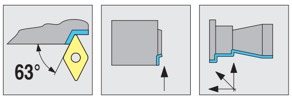
A303

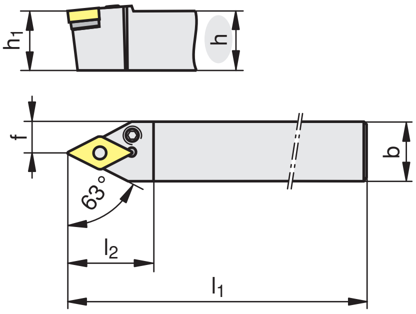
A67-A69

A79

PDNN...

MaxiLock N





Picture shows right-hand version

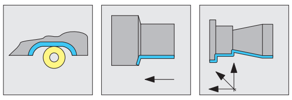
h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]	◇	
25	PDNNR 2525 M11	R	25	25	150	30	12.5	DN.. 1104..	E01
25	PDNNL 2525 M11	L	25	25	150	30	12.5	DN.. 1104..	E01
25	PDNNR 2525 M15-T	R	25	25	150	37.4	12.5	DN.. 1506..	E02
25	PDNNL 2525 M15-T	L	25	25	150	37.4	12.5	DN.. 1506..	E02

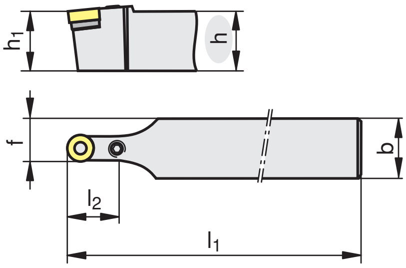
							
E01	59445	293140	293147	293143	86174	4770	293151
E02	59443	59570	59437	59432	86176	4771	140591

A303	A67-A69	A79

PRDC...

MaxiLock N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	◎	🔧
25	PRDCN 2525 M12-T	N	25	25	150	24	18.5	RC.. 1204..	E01
32	PRDCN 3225 P12-T	N	32	25	170	24	18.5	RC.. 1204..	E01
32	PRDCN 3225 P16-T	N	32	25	170	28	20.5	RC.. 1606..	E02
32	PRDCN 3232 P20-T	N	32	32	170	32	26	RC.. 2006..	E03
40	PRDCN 4040 S25-T	N	40	40	250	42	32.5	RC.. 2507..	E04

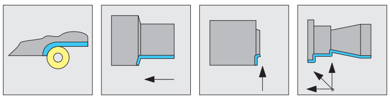
🔧							
E01	59445	154563	59436	154568	86174	4770	154578
E02	154575	154564	154577	154570	86176	4771	154579
E03	59441	154565	59438	154571	86177	4773	154580
E04	154576	154566	59439	154572	86178	4209	154581

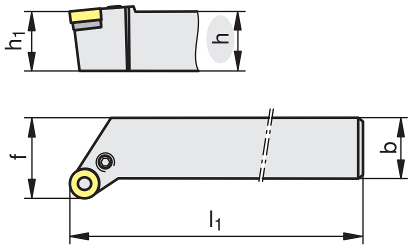
🔧 A303

◎ A87

PRGC...

MaxiLock N





Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	f [mm]	◎	
25	PRGCR 2525 M12-T	R	25	25	150	32	RC.. 1204..	E01
25	PRGCL 2525 M12-T	L	25	25	150	32	RC.. 1204..	E01
32	PRGCR 3225 P12-T	R	32	25	170	32	RC.. 1204..	E01
32	PRGCL 3225 P12-T	L	32	25	170	32	RC.. 1204..	E01
32	PRGCR 3225 P16-T	R	32	25	170	32	RC.. 1606..	E02
32	PRGCR 3232 P20-T	R	32	32	170	40	RC.. 2006..	E03
32	PRGCL 3232 P20-T	L	32	32	170	40	RC.. 2006..	E03
40	PRGCR 4040 S25-T	R	40	40	250	50	RC.. 2507..	E04
40	PRGCL 4040 S25-T	L	40	40	250	50	RC.. 2507..	E04

							
E01	59445	154563	59436	154568	86174	4770	154578
E02	154575	154564	154577	154570	86176	4771	154579
E03	59441	154565	59438	154571	86177	4773	154580
E04	154576	154566	59439	154572	86178	4209	154581

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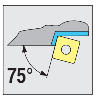
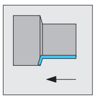
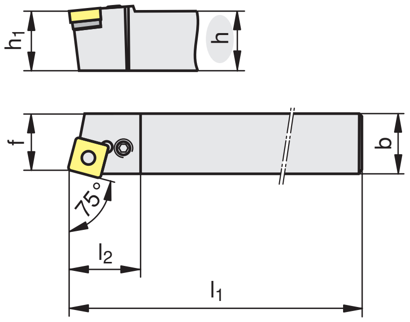
PSBN...

MaxiLock N

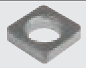






Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	▢	🔧
20	PSBNR 2020 K12-T	R	20	20	125	27.5	17	SN.. 1204..	E01
20	PSBNL 2020 K12-T	L	20	20	125	27.5	17	SN.. 1204..	E01
25	PSBNR 2525 M12-T	R	25	25	150	27.5	22	SN.. 1204..	E01
25	PSBNL 2525 M12-T	L	25	25	150	27.5	22	SN.. 1204..	E01
32	PSBNR 3225 P12-T	R	32	25	170	32	22	SN.. 1204..	E01
32	PSBNL 3225 P12-T	L	32	25	170	32	22	SN.. 1204..	E01
25	PSBNR 2525 M15-T	R	25	25	150	32.5	22	SN.. 1506..	E02
25	PSBNL 2525 M15-T	L	25	25	150	32.5	22	SN.. 1506..	E02
32	PSBNR 3232 P15-T	R	32	32	170	32	27	SN.. 1506..	E02
32	PSBNL 3232 P15-T	L	32	32	170	32	27	SN.. 1506..	E02
32	PSBNR 3232 P19-T	R	32	32	170	39.2	27	SN.. 1906..	E03
32	PSBNL 3232 P19-T	L	32	32	170	39.2	27	SN.. 1906..	E03
40	PSBNR 4040 S19-T	R	40	40	250	38.5	35	SN.. 1906..	E03
40	PSBNL 4040 S19-T	L	40	40	250	38.5	35	SN.. 1906..	E03
40	PSBNR 4040 S25-T	R	40	40	250	48.0	35	SN.. 2507..	E04
40	PSBNL 4040 S25-T	L	40	40	250	48.0	35	SN.. 2507..	E04

🔧							
E01	59446	59564 / 59547	59437	59430	86176	4771	140595
E02	59443	59549	59438	59426	86177	4771	140596
E03	59448	59566	59439	59434	86178	4209	140597
E04	59449	59567	59440	59435	86182	4496	140599

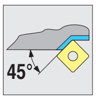
🔧 A303

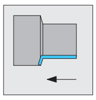
▢ A70-A72

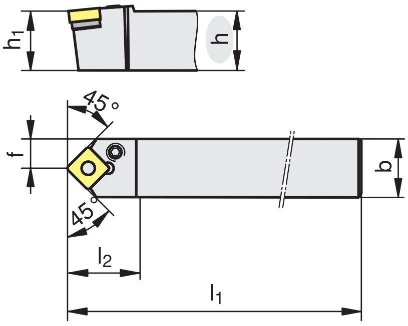
▢ A80

PSDN...

MaxiLock N

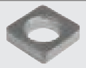






Picture shows right-hand version

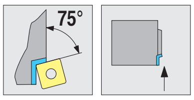
h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	▢	🔧
16	PSDNN 1616 H09-T	N	16	16	100	21.5	8.0	SN.. 0903..	E01
20	PSDNN 2020 K12-T	N	20	20	125	27.6	10.0	SN.. 1204..	E02
25	PSDNN 2525 M12-T	N	25	25	150	27.6	12.5	SN.. 1204..	E02
32	PSDNN 3225 P19-T	N	32	25	170	40.4	12.5	SN.. 1906..	E03
40	PSDNN 4040 S25-T	N	40	40	250	48.8	20	SN.. 2507..	E04

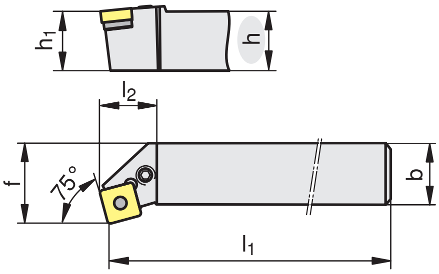
🔧							
E01	59445	59562	59436	59429	86174	4770	154584
E02	59446	59564 / 59547	59437	59430	86176	4771	140595
E03	59448	59566	59439	59434	86178	4209	140597
E04	59449	59567	59440	59435	86182	4496	140599

🔧	▢	▢
A303	A70-A72	A80

PSKN...

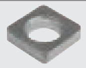
MaxiLock N





Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]		
16	PSKNR 1616 H09-T	R	16	16	100	18.6	20	SN.. 0903..	E01
16	PSKNL 1616 H09-T	L	16	16	100	18.6	20	SN.. 0903..	E01
20	PSKNR 2020 K12-T	R	20	20	125	24.1	25	SN.. 1204..	E02
20	PSKNL 2020 K12-T	L	20	20	125	24.1	25	SN.. 1204..	E02
25	PSKNR 2525 M12-T	R	25	25	150	24.1	32	SN.. 1204..	E02
25	PSKNL 2525 M12-T	L	25	25	150	24.1	32	SN.. 1204..	E02
32	PSKNR 3225 P12-T	R	32	25	170	24.1	32	SN.. 1204..	E02
32	PSKNL 3225 P12-T	L	32	25	170	24.1	32	SN.. 1204..	E02
40	PSKNR 4040 S19-T	R	40	40	250	38.3	50	SN.. 1906..	E03

							
E01	59445	59562	59436	59429	86174	4770	154584
E02	59446	59564 / 59547	59437	59430	86176	4771	140595
E03	59448	59566	59439	59434	86178	4209	140597

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A70-A72

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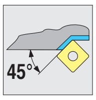
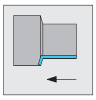
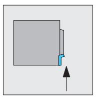
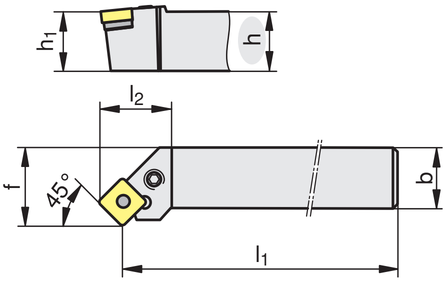
PSSN...

MaxiLock N



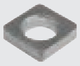






Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]		
16	PSSNR 1616 H09-T	R	16	16	100	23.0	20	SN.. 0903..	E01
16	PSSNL 1616 H09-T	L	16	16	100	23.0	20	SN.. 0903..	E01
20	PSSNR 2020 K12-T	R	20	20	125	27.3	25	SN.. 1204..	E02
20	PSSNL 2020 K12-T	L	20	20	125	27.3	25	SN.. 1204..	E02
25	PSSNR 2525 M12-T	R	25	25	150	29.3	32	SN.. 1204..	E02
25	PSSNL 2525 M12-T	L	25	25	150	29.3	32	SN.. 1204..	E02
32	PSSNR 3225 P12-T	R	32	25	170	29.3	32	SN.. 1204..	E02
32	PSSNL 3225 P12-T	L	32	25	170	29.3	32	SN.. 1204..	E02
25	PSSNR 2525 M15-T	R	25	25	150	32.5	32	SN.. 1506..	E03
32	PSSNR 3232 P15-T	R	32	32	170	37.5	40	SN.. 1506..	E03
32	PSSNR 3232 P19-T	R	32	32	170	40.2	40	SN.. 1906..	E04
32	PSSNL 3232 P19-T	L	32	32	170	40.2	40	SN.. 1906..	E04
40	PSSNR 4040 S25-T	R	40	40	250	48.8	50	SN.. 2507..	E05

							
E01	59445	59562	59436	59429	86174	4770	154584
E02	59446	59564 / 59547	59437	59430	86176	4771	140595
E03	59443	59549	59438	59426	86177	4771	140596
E04	59448	59566	59439	59434	86178	4209	140597
E05	59449	59567	59440	59435	86182	4496	140599

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A70-A72

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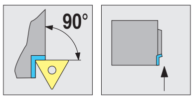
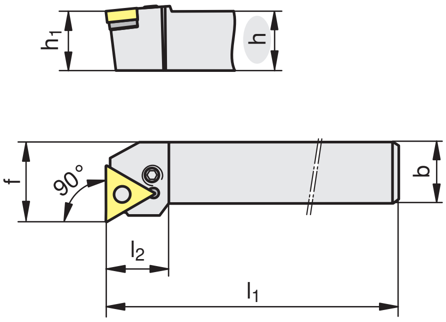
PTFN...

MaxiLock N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	
16	PTFNR 1616 H16-T	R	16	16	100	20.2	20	TN.. 1604..	E01
16	PTFNL 1616 H16-T	L	16	16	100	20.2	20	TN.. 1604..	E01
20	PTFNR 2020 K16-T	R	20	20	125	20.5	25	TN.. 1604..	E01
20	PTFNL 2020 K16-T	L	20	20	125	20.5	25	TN.. 1604..	E01
25	PTFNR 2525 M16-T	R	25	25	150	25	32	TN.. 1604..	E01
25	PTFNL 2525 M16-T	L	25	25	150	25	32	TN.. 1604..	E01
25	PTFNR 2525 M22-T	R	25	25	150	25.2	32	TN.. 2204..	E02
25	PTFNL 2525 M22-T	L	25	25	150	25.2	32	TN.. 2204..	E02
32	PTFNR 3225 P22-T	R	32	25	170	25	32	TN.. 2204..	E02
32	PTFNL 3225 P22-T	L	32	25	170	25	32	TN.. 2204..	E02

							
E01	59445	59556	59436	59429	86174	4770	140601
E02	59446	59557	59437	59430	86176	4771	140602

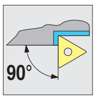
A303

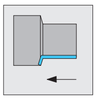
△ A73-A75

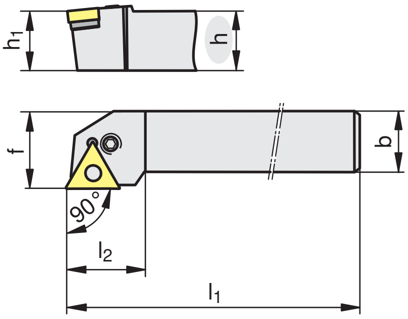
△ A80

PTGN...

MaxiLock N







Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	🔧
16	PTGNR 1616 H16-T	R	16	16	100	20	20	TN.. 1604..	E01
16	PTGNL 1616 H16-T	L	16	16	100	20	20	TN.. 1604..	E01
20	PTGNR 2020 K16-T	R	20	20	125	20	25	TN.. 1604..	E01
20	PTGNL 2020 K16-T	L	20	20	125	20	25	TN.. 1604..	E01
25	PTGNR 2525 M16-T	R	25	25	150	22.2	32	TN.. 1604..	E01
25	PTGNL 2525 M16-T	L	25	25	150	22.2	32	TN.. 1604..	E01
32	PTGNR 3225 P16-T	R	32	25	170	22	32	TN.. 1604..	E01
32	PTGNL 3225 P16-T	L	32	25	170	22	32	TN.. 1604..	E01
25	PTGNR 2525 M22-T	R	25	25	150	29	32	TN.. 2204..	E02
25	PTGNL 2525 M22-T	L	25	25	150	29	32	TN.. 2204..	E02
32	PTGNR 3232 P22-T	R	32	32	170	29	40	TN.. 2204..	E02
32	PTGNL 3232 P22-T	L	32	32	170	29	40	TN.. 2204..	E02

🔧							
E01	59445	59556	59436	59429	86174	4770	140601
E02	59446	59557	59437	59430	86176	4771	140602

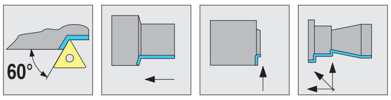
🔧 A303

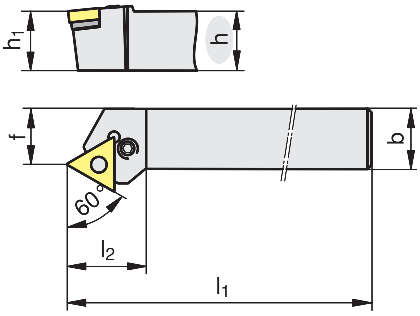
△ A73-A75

△ A80

PTTN...

MaxiLock N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	🔧
20	PTTNR 2020 K16-T	R	20	20	125	25.9	17	TN.. 1604..	E01
20	PTTNL 2020 K16-T	L	20	20	125	25.9	17	TN.. 1604..	E01
25	PTTNR 2525 M22-T	R	25	25	150	32.7	22	TN.. 2204..	E02
25	PTTNL 2525 M22-T	L	25	25	150	32.7	22	TN.. 2204..	E02

🔧							
E01	59445	59556	59436	59429	86174	4770	140601
E02	59446	59557	59437	59430	86176	4771	140602

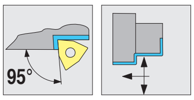
🔧 A303

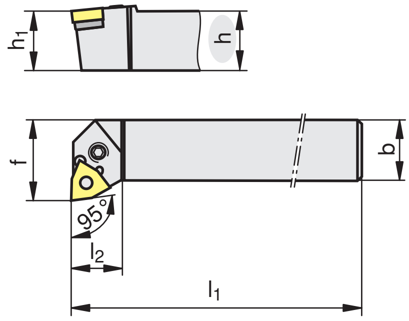
△ A73-A75

△ A80

PWLN...

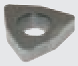
MaxiLock N





Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]		
16	PWLNR 1616 H06	R	16	16	100	20	20	WN.. 0604..	E01
16	PWLNL 1616 H06	L	16	16	100	20	20	WN.. 0604..	E01
20	PWLNR 2020 K06	R	20	20	125	25	25	WN.. 0604..	E01
20	PWLNL 2020 K06	L	20	20	125	25	25	WN.. 0604..	E01
25	PWLNR 2525 M06	R	25	25	150	25	32	WN.. 0604..	E01
25	PWLNL 2525 M06	L	25	25	150	25	32	WN.. 0604..	E01
20	PWLNR 2020 K08	R	20	20	125	22	25	WN.. 0804..	E02
20	PWLNL 2020 K08	L	20	20	125	22	25	WN.. 0804..	E02
25	PWLNR 2525 M08	R	25	25	150	22	32	WN.. 0804..	E02
25	PWLNL 2525 M08	L	25	25	150	22	32	WN.. 0804..	E02
32	PWLNR 3225 P08	R	32	25	170	22	32	WN.. 0804..	E02
32	PWLNL 3225 P08	L	32	25	170	22	32	WN.. 0804..	E02

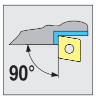
							
E01	59445	293139	293147	59429	86174	4770	293148
E02	59446	218151	59437	59430	86176	4771	222127

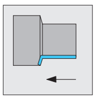
A303

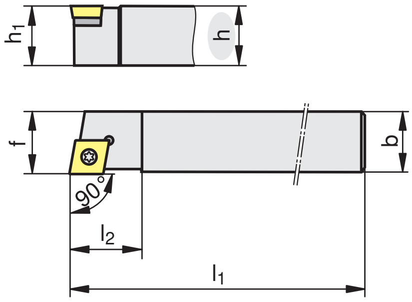
A77-A78

SCAC...

MaxiLock S

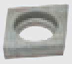






Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]		
8	SCACR 0808 D06	R	8	8	60	9	8	CC.. 0602..	E01
8	SCACR 0808 K06	R	8	8	125	9	8	CC.. 0602..	E01
8	SCACL 0808 D06	L	8	8	60	9	8	CC.. 0602..	E01
8	SCACL 0808 K06	L	8	8	125	9	8	CC.. 0602..	E01
10	SCACR 1010 E06	R	10	10	70	9	10	CC.. 0602..	E01
10	SCACR 1010 M06	R	10	10	150	9	10	CC.. 0602..	E01
10	SCACL 1010 E06	L	10	10	70	9	10	CC.. 0602..	E01
10	SCACL 1010 M06	L	10	10	150	9	10	CC.. 0602..	E01
12	SCACR 1212 F09	R	12	12	80	13	12	CC.. 09T3..	E02
12	SCACR 1212 M09	R	12	12	150	13	12	CC.. 09T3..	E02
12	SCACL 1212 F09	L	12	12	80	13	12	CC.. 09T3..	E02
12	SCACL 1212 M09	L	12	12	150	13	12	CC.. 09T3..	E02
14	SCACR 1414 M09	R	14	14	150	13	14	CC.. 09T3..	E02
14	SCACL 1414 M09	L	14	14	150	13	14	CC.. 09T3..	E02
16	SCACR 1616 H09	R	16	16	100	13	16	CC.. 09T3..	E03
16	SCACL 1616 H09	L	16	16	100	13	16	CC.. 09T3..	E03
20	SCACR 2020 K12	R	20	20	125	17	20	CC.. 1204..	E04
20	SCACL 2020 K12	L	20	20	125	17	20	CC.. 1204..	E04

						
E01	24645				8095010200	29280
E02	24647				8095010500	82271
E03	24647	69216	69294	69293		82756
E04	54981	61006	69296	69293		74208

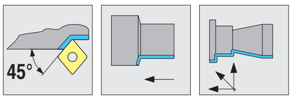
A303

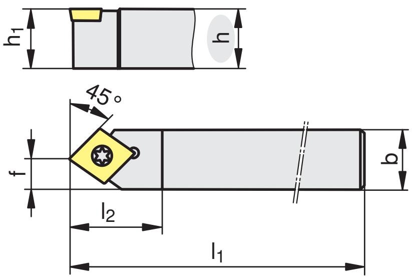
A82-A84

A92

SCDC...

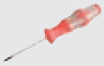
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]		
8	SCDCL 0808 K06	L	8	8	125	13	4	CC.. 0602..	E01
10	SCDCL 1010 M06	L	10	10	150	13	5	CC.. 0602..	E01
12	SCDCL 1212 M09	L	12	12	150	18	6	CC.. 09T3..	E02
14	SCDCL 1414 M09	L	14	14	150	18	7	CC.. 09T3..	E02

			
E01	24645	8095010200	29280
E02	24647	8095010500	82271

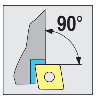
A303

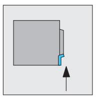
A82-A84

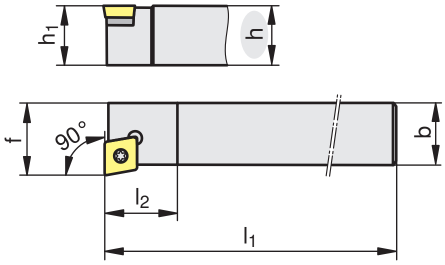
A92

SCFC...

MaxiLock S

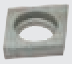






Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]		
8	SCFCR 0808 D06	R	8	8	60	10	10	CC.. 0602..	E01
8	SCFCL 0808 D06	L	8	8	60	10	10	CC.. 0602..	E01
10	SCFCR 1010 E06	R	10	10	70	10	12	CC.. 0602..	E01
10	SCFCL 1010 E06	L	10	10	70	10	12	CC.. 0602..	E01
12	SCFCR 1212 F09	R	12	12	80	13	16	CC.. 09T3..	E02
12	SCFCL 1212 F09	L	12	12	80	13	16	CC.. 09T3..	E02
16	SCFCR 1616 H09	R	16	16	100	13	20	CC.. 09T3..	E03
16	SCFCL 1616 H09	L	16	16	100	13	20	CC.. 09T3..	E03
20	SCFCR 2020 K12	R	20	20	125	17	25	CC.. 1204..	E04
20	SCFCL 2020 K12	L	20	20	125	17	25	CC.. 1204..	E04

						
E01	24645				8095010200	29280
E02	24647				8095010500	82271
E03	24647	69216	69294	69293		82756
E04	54981	61006	69296	69293		74208

A303

A82-A84

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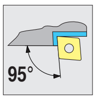
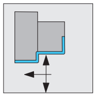
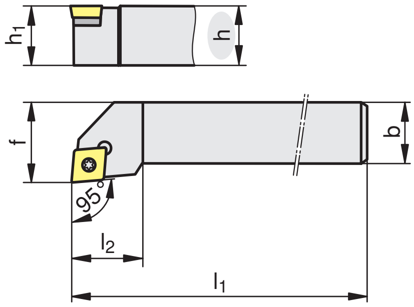
SCLC...

MaxiLock S

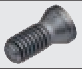
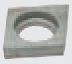
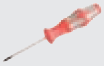






Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]		
8	SCLCR 0808 D06	R	8	8	60	9	10	CC.. 0602..	E01
8	SCLCL 0808 D06	L	8	8	60	9	10	CC.. 0602..	E01
10	SCLCR 1010 E06	R	10	10	70	9	12	CC.. 0602..	E01
10	SCLCL 1010 E06	L	10	10	70	9	12	CC.. 0602..	E01
12	SCLCR 1212 F09	R	12	12	80	15	16	CC.. 09T3..	E02
12	SCLCL 1212 F09	L	12	12	80	15	16	CC.. 09T3..	E02
16	SCLCR 1616 H09	R	16	16	100	17	20	CC.. 09T3..	E03
16	SCLCL 1616 H09	L	16	16	100	17	20	CC.. 09T3..	E03
20	SCLCR 2020 K09	R	20	20	125	17	25	CC.. 09T3..	E03
20	SCLCL 2020 K09	L	20	20	125	17	25	CC.. 09T3..	E03
16	SCLCR 1616 H12	R	16	16	100	20	20	CC.. 1204..	E04
16	SCLCL 1616 H12	L	16	16	100	20	20	CC.. 1204..	E04
20	SCLCR 2020 K12	R	20	20	125	20	25	CC.. 1204..	E04
20	SCLCL 2020 K12	L	20	20	125	20	25	CC.. 1204..	E04
25	SCLCR 2525 M12	R	25	25	150	20	32	CC.. 1204..	E04
25	SCLCL 2525 M12	L	25	25	150	20	32	CC.. 1204..	E04
32	SCLCR 3225 P12	R	32	25	170	20	32	CC.. 1204..	E04
32	SCLCL 3225 P12	L	32	25	170	20	32	CC.. 1204..	E04

						
E01	24645				8095010200	29280
E02	24647				8095010500	82271
E03	24647	69216	69294	69293		82756
E04	54981	61006	69296	69293		74208

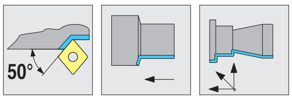
A303

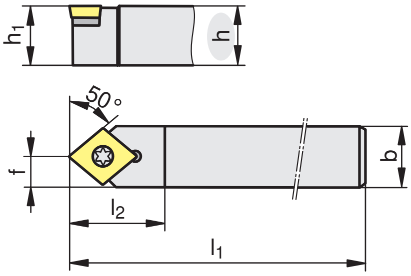
A82-A84

A92

SCMC...

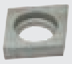
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
16	SCMCN 1616 H12	N	16	16	100	25	8	CC.. 1204..	E01
20	SCMCN 2020 K12	N	20	20	125	25	10	CC.. 1204..	E01
25	SCMCN 2525 M12	N	25	25	150	25	12.5	CC.. 1204..	E01
32	SCMCN 3225 P12	N	32	25	170	25	12.5	CC.. 1204..	E01

					
E01	54981	61006	69296	69293	74208

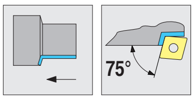
A303

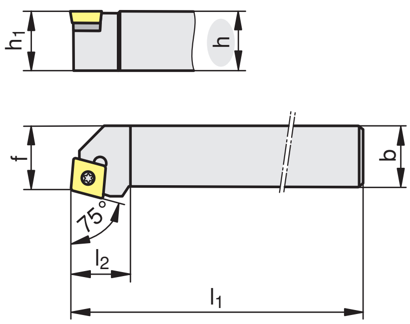
A82-A84

A92

SCRC...

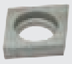
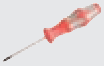
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h$_1$ [mm]	b [mm]	l$_1$ [mm]	l$_2$ [mm]	f [mm]	◇	🔧
10	SCRCR 1010 E06	R	10	10	70	10	11	CC.. 0602..	E01
12	SCRCR 1212 F09	R	12	12	80	16	13	CC.. 09T3..	E02
12	SCRCL 1212 F09	L	12	12	80	16	13	CC.. 09T3..	E02
16	SCRCR 1616 H09	R	16	16	100	17	17	CC.. 09T3..	E03
16	SCRCL 1616 H09	L	16	16	100	17	17	CC.. 09T3..	E03
20	SCRCR 2020 K09	R	20	20	125	17	22	CC.. 09T3..	E03
20	SCRCL 2020 K09	L	20	20	125	17	22	CC.. 09T3..	E03
16	SCRCR 1616 H12	R	16	16	100	20	17	CC.. 1204..	E04
20	SCRCR 2020 K12	R	20	20	125	20	22	CC.. 1204..	E04
20	SCRCL 2020 K12	L	20	20	125	20	22	CC.. 1204..	E04
25	SCRCR 2525 M12	R	25	25	150	20	27	CC.. 1204..	E04
25	SCRCL 2525 M12	L	25	25	150	20	27	CC.. 1204..	E04
32	SCRCR 3225 P12	R	32	25	170	20	27	CC.. 1204..	E04
32	SCRCL 3225 P12	L	32	25	170	20	27	CC.. 1204..	E04

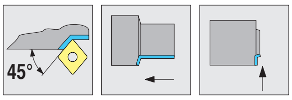
🔧						
E01	24645				8095010200	29280
E02	24647				8095010500	82271
E03	24647	69216	69294	69293		82756
E04	54981	61006	69296	69293		74208

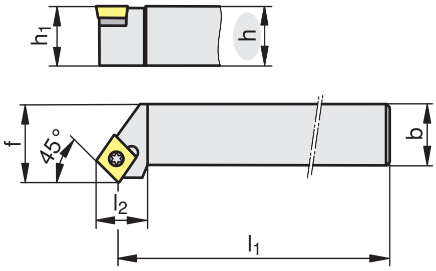
🔧	◇	◇
A303	A82-A84	A92

Turning / Tools ext.

SCSC...

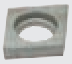
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]		
16	SCSCR 1616 H12	R	16	16	100	20	20	CC.. 1204..	E01
20	SCSCR 2020 K12	R	20	20	125	20	25	CC.. 1204..	E01
20	SCSCL 2020 K12	L	20	20	125	20	25	CC.. 1204..	E01
25	SCSCR 2525 M12	R	25	25	150	20	32	CC.. 1204..	E01
25	SCSCL 2525 M12	L	25	25	150	20	32	CC.. 1204..	E01

					
E01	54981	61006	69296	69293	74208

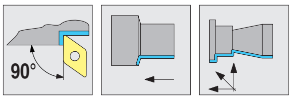
A303

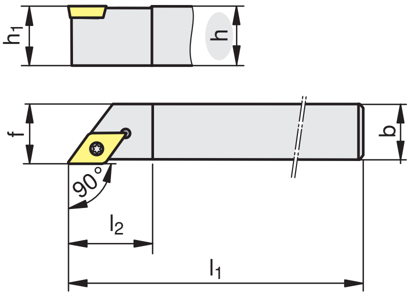
A82-A84

A92

SDAC...

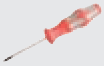
MaxiLock S





Picture shows right-hand version

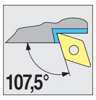
h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]		
8	SDACR 0808 K07	R	8	8	125	14	8	DC.. 0702..	E01
8	SDACL 0808 K07	L	8	8	125	14	8	DC.. 0702..	E01
10	SDACR 1010 M07	R	10	10	150	14	10	DC.. 0702..	E01
10	SDACL 1010 M07	L	10	10	150	14	10	DC.. 0702..	E01
12	SDACR 1212 M07	R	12	12	150	14	12	DC.. 0702..	E01
12	SDACL 1212 M07	L	12	12	150	14	12	DC.. 0702..	E01
12	SDACR 1212 M11	R	12	12	150	21	12	DC.. 11T3..	E02
12	SDACL 1212 M11	L	12	12	150	21	12	DC.. 11T3..	E02
14	SDACR 1414 M11	R	14	14	150	21	14	DC.. 11T3..	E02
14	SDACL 1414 M11	L	14	14	150	21	14	DC.. 11T3..	E02

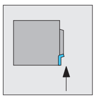
			
E01	24645	8095010200	29280
E02	24647	8095010500	82271

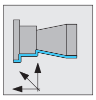
A303 A85-A86 A92

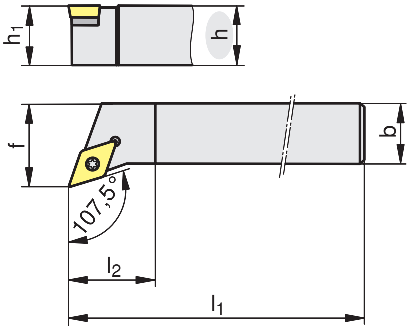
SDHC...

MaxiLock S



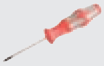






Picture shows right-hand version

h [mm]	Type, description	L N R	hh_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
10	SDHCR 1010 E07	R	10	10	70	7.6	12	DC.. 0702..	E01
10	SDHCL 1010 E07	L	10	10	70	7.6	12	DC.. 0702..	E01
12	SDHCR 1212 F07	R	12	12	80	12.2	16	DC.. 0702..	E01
12	SDHCL 1212 F07	L	12	12	80	12.2	16	DC.. 0702..	E01
16	SDHCR 1616 H11	R	16	16	100	11.6	20	DC.. 11T3..	E02
16	SDHCL 1616 H11	L	16	16	100	11.6	20	DC.. 11T3..	E02
20	SDHCR 2020 K11	R	20	20	125	14.1	25	DC.. 11T3..	E02
20	SDHCL 2020 K11	L	20	20	125	14.1	25	DC.. 11T3..	E02
25	SDHCR 2525 M11	R	25	25	150	20.5	32	DC.. 11T3..	E02
25	SDHCL 2525 M11	L	25	25	150	20.5	32	DC.. 11T3..	E02

						
E01	24645				8095010200	29280
E02	24647	26146	69294	69293		29278

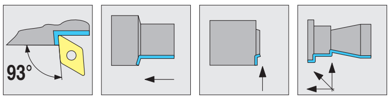
A303

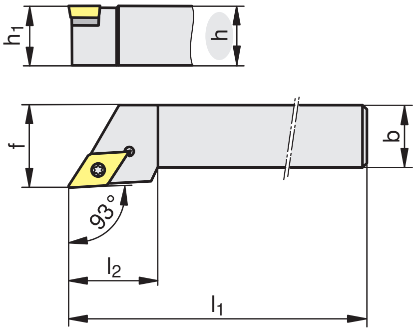
A85-A86

A92

SDJC...

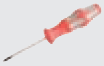
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
8	SDJCR 0808 D07	R	8	8	60	13	10	DC.. 0702..	E01
8	SDJCL 0808 D07	L	8	8	60	13	10	DC.. 0702..	E01
10	SDJCR 1010 E07	R	10	10	70	13	12	DC.. 0702..	E01
10	SDJCL 1010 E07	L	10	10	70	13	12	DC.. 0702..	E01
12	SDJCR 1212 F07	R	12	12	80	14.3	16	DC.. 0702..	E01
12	SDJCL 1212 F07	L	12	12	80	14.3	16	DC.. 0702..	E01
16	SDJCR 1616 H11	R	16	16	100	19.3	20	DC.. 11T3..	E02
16	SDJCL 1616 H11	L	16	16	100	19.3	20	DC.. 11T3..	E02
20	SDJCR 2020 K11	R	20	20	125	19.9	25	DC.. 11T3..	E02
20	SDJCL 2020 K11	L	20	20	125	19.9	25	DC.. 11T3..	E02
25	SDJCR 2525 M11	R	25	25	150	21.2	32	DC.. 11T3..	E02
25	SDJCL 2525 M11	L	25	25	150	21.2	32	DC.. 11T3..	E02
32	SDJCR 3225 P11	R	32	25	170	21.2	32	DC.. 11T3..	E02
32	SDJCL 3225 P11	L	32	25	170	21.2	32	DC.. 11T3..	E02

						
E01	24645				8095010200	29280
E02	24647	26146	69294	69293		29278

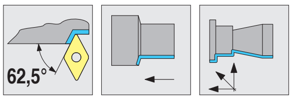
A303

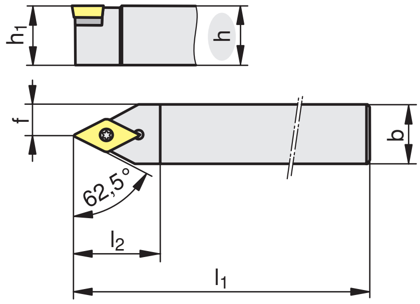
A85-A86

A92

SDNC...

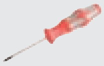
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	f [mm]		
8	SDNCN 0808 D07	N	8	8	60	4	DC.. 0702..	E01
8	SDNCN 0808 K07	N	8	8	125	4	DC.. 0702..	E01
10	SDNCN 1010 E07	N	10	10	70	5	DC.. 0702..	E01
10	SDNCN 1010 M07	N	10	10	150	5	DC.. 0702..	E01
12	SDNCN 1212 F07	N	12	12	80	6	DC.. 0702..	E01
12	SDNCN 1212 M07	N	12	12	150	6	DC.. 0702..	E01
12	SDNCN 1212 M11	N	12	12	150	6	DC.. 11T3..	E02
14	SDNCN 1414 M11	N	14	14	150	7	DC.. 11T3..	E02
16	SDNCN 1616 H11	N	16	16	100	8	DC.. 11T3..	E03
20	SDNCN 2020 K11	N	20	20	125	10	DC.. 11T3..	E03
25	SDNCN 2525 M11	N	25	25	150	12.5	DC.. 11T3..	E03

						
E01	24645				8095010200	29280
E02	24647				8095010500	82271
E03	24647	26146	69294	69293		29278

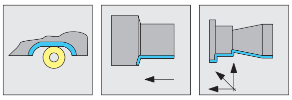
A303

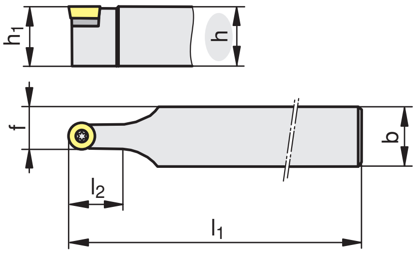
A85-A86

A92

SRDC...

MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h$_1$ [mm]	b [mm]	l$_1$ [mm]	l$_2$ [mm]	f [mm]		
12	SRDCN 1212 F06	N	12	12	80	12	9	RC.. 0602..	E01
16	SRDCN 1616 H06	N	16	16	100	12	11	RC.. 0602..	E01
20	SRDCN 2020 K06	N	20	20	125	12	13	RC.. 0602..	E01
25	SRDCN 2525 M06	N	25	25	150	12.4	15.5	RC.. 0602..	E01
16	SRDCN 1616 H08	N	16	16	100	16	12	RC.. 0803..	E02
20	SRDCN 2020 K08	N	20	20	125	16.5	14	RC.. 0803..	E02
25	SRDCN 2525 M08	N	25	25	150	16.5	16.5	RC.. 0803..	E02
16	SRDCN 1616 H10	N	16	16	100	20.9	13	RC.. 1003..	E03
20	SRDCN 2020 K10	N	20	20	125	20	15	RC.. 1003..	E03
25	SRDCN 2525 M10	N	25	25	150	20.9	17.5	RC.. 1003..	E03

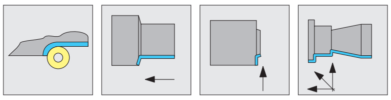
						
E01	24645				8095010200	29280
E02	77613				8095010200	82272
E03	24647	24838	69294	69293		36305

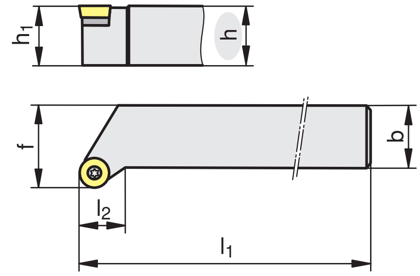
A303

A87

SRGC...

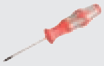
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	○	
12	SRGCR 1212 F06	R	12	12	80	12.5	16	RC.. 0602..	E01
12	SRGCL 1212 F06	L	12	12	80	12.5	16	RC.. 0602..	E01
16	SRGCR 1616 H06	R	16	16	100	12.5	20	RC.. 0602..	E01
20	SRGCR 2020 K06	R	20	20	125	15.0	25	RC.. 0602..	E01
20	SRGCL 2020 K06	L	20	20	125	15.0	25	RC.. 0602..	E01
25	SRGCR 2525 M06	R	25	25	150	18.5	32	RC.. 0602..	E01
25	SRGCL 2525 M06	L	25	25	150	18.5	32	RC.. 0602..	E01
16	SRGCR 1616 H08	R	16	16	100	13.6	20	RC.. 0803..	E02
16	SRGCL 1616 H08	L	16	16	100	13.6	20	RC.. 0803..	E02
20	SRGCR 2020 K08	R	20	20	125	16.1	25	RC.. 0803..	E02
25	SRGCR 2525 M08	R	25	25	150	19.6	32	RC.. 0803..	E02
25	SRGCL 2525 M08	L	25	25	150	19.6	32	RC.. 0803..	E02
16	SRGCR 1616 H10	R	16	16	100	13.6	20	RC.. 1003..	E03
16	SRGCL 1616 H10	L	16	16	100	13.6	20	RC.. 1003..	E03
20	SRGCR 2020 K10	R	20	20	125	16.1	25	RC.. 1003..	E03
20	SRGCL 2020 K10	L	20	20	125	16.1	25	RC.. 1003..	E03
25	SRGCR 2525 M10	R	25	25	150	19.6	32	RC.. 1003..	E03
25	SRGCL 2525 M10	L	25	25	150	19.6	32	RC.. 1003..	E03

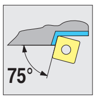
						
E01	24645				8095010200	29280
E02	77613				8095010200	82272
E03	24647	24838	69294	69293		36305

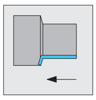
A303

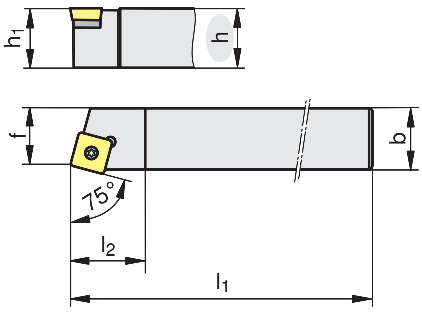
○ A87

SSBC...

MaxiLock S

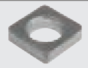






Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]	◻	
16	SSBCR 1616 H09	R	16	16	100	20	13	SC.. 09T3..	E01
16	SSBCL 1616 H09	L	16	16	100	20	13	SC.. 09T3..	E01
20	SSBCR 2020 K09	R	20	20	125	20	17	SC.. 09T3..	E01
20	SSBCR 2020 K12	R	20	20	125	20	17	SC.. 1204..	E02
20	SSBCL 2020 K12	L	20	20	125	20	17	SC.. 1204..	E02
25	SSBCR 2525 M12	R	25	25	150	20	22	SC.. 1204..	E02
25	SSBCL 2525 M12	L	25	25	150	20	22	SC.. 1204..	E02

					
E01	24647	69214	69294	69293	82757
E02	54981	69199	69296	69293	82270

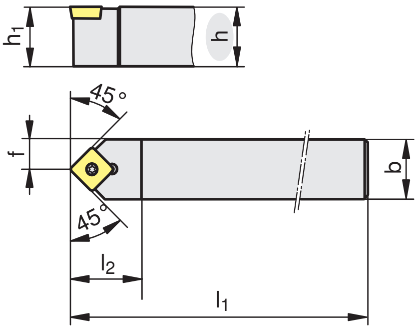
A303

A88

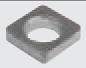
SSDC...

MaxiLock S

Picture shows right-hand version



h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	◻	🔧
12	SSDCN 1212 F09	N	12	12	80	16	6	SC.. 09T3..	E01
16	SSDCN 1616 H09	N	16	16	100	20	8	SC.. 09T3..	E02
20	SSDCN 2020 K09	N	20	20	125	20	10	SC.. 09T3..	E02
16	SSDCN 1616 H12	N	16	16	100	25	8	SC.. 1204..	E03
20	SSDCN 2020 K12	N	20	20	125	25	10	SC.. 1204..	E03
25	SSDCN 2525 M12	N	25	25	150	25	12.5	SC.. 1204..	E03

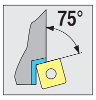
🔧						
E01	24647				8095010500	82271
E02	24647	69214	69294	69293		82757
E03	54981	69199	69296	69293		82270

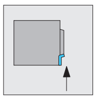
🔧 A303

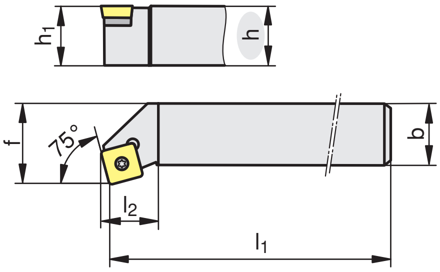
◻ A88

SSKC...

MaxiLock S

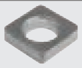






Picture shows right-hand version

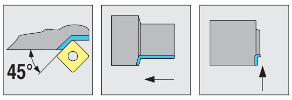
h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]	▢	🔧
16	SSKCR 1616 H09	R	16	16	100	17.5	20	SC.. 09T3..	E01
16	SSKCL 1616 H09	L	16	16	100	17.5	20	SC.. 09T3..	E01
20	SSKCR 2020 K09	R	20	20	125	22.5	25	SC.. 09T3..	E01
20	SSKCL 2020 K09	L	20	20	125	22.5	25	SC.. 09T3..	E01
20	SSKCR 2020 K12	R	20	20	125	23.5	25	SC.. 1204..	E02
25	SSKCR 2525 M12	R	25	25	150	23.5	32	SC.. 1204..	E02

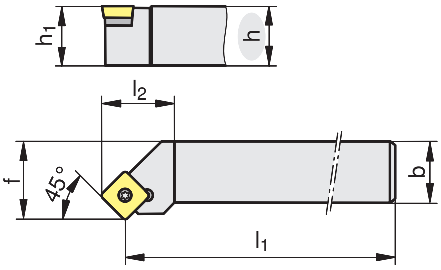
🔧					
E01	24647	69214	69294	69293	82757
E02	54981	69199	69296	69293	82270

🔧	▢
A303	A88

SSSC...

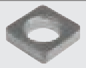
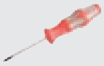
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	◻	
12	SSSCR 1212 F09	R	12	12	80	18	16	SC.. 09T3..	E01
12	SSSCL 1212 F09	L	12	12	80	18	16	SC.. 09T3..	E01
16	SSSCR 1616 H09	R	16	16	100	20	20	SC.. 09T3..	E02
16	SSSCL 1616 H09	L	16	16	100	20	20	SC.. 09T3..	E02
20	SSSCR 2020 K09	R	20	20	125	20	25	SC.. 09T3..	E02
20	SSSCL 2020 K09	L	20	20	125	20	25	SC.. 09T3..	E02
16	SSSCR 1616 H12	R	16	16	100	25	20	SC.. 1204..	E03
16	SSSCL 1616 H12	L	16	16	100	25	20	SC.. 1204..	E03
20	SSSCR 2020 K12	R	20	20	125	25	25	SC.. 1204..	E03
20	SSSCL 2020 K12	L	20	20	125	25	25	SC.. 1204..	E03
25	SSSCR 2525 M12	R	25	25	150	25	32	SC.. 1204..	E03
25	SSSCL 2525 M12	L	25	25	150	25	32	SC.. 1204..	E03
32	SSSCR 3225 P12	R	32	25	170	25	32	SC.. 1204..	E03

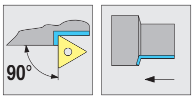
						
E01	24647				8095010500	82271
E02	24647	69214	69294	69293		82757
E03	54981	69199	69296	69293		82270

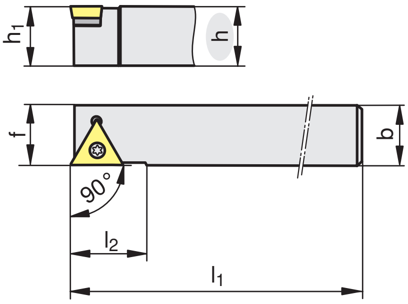
A303

A88

STAC...

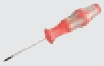
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]	△	
10	STACR 1010 K09	R	10	10	125	12	10	TC.. 0902..	E01
10	STACL 1010 K09	L	10	10	125	12	10	TC.. 0902..	E01
12	STACR 1212 K11	R	12	12	125	15	12	TC.. 1102..	E02
12	STACL 1212 K11	L	12	12	125	15	12	TC.. 1102..	E02
14	STACR 1414 K11	R	14	14	125	15	14	TC.. 1102..	E02

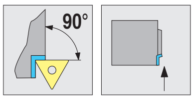
			
E01	56652	8095010100	82273
E02	24645	8095010200	29280

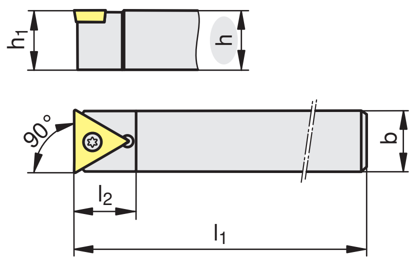
A303

A89

STCC...

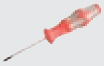
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]	△	
8	STCCN 0808 K09	N	8	8	125	11	0	TC.. 0902..	E01
10	STCCN 1010 K11	N	10	10	125	15	0	TC.. 1102..	E02
12	STCCN 1212 K11	N	12	12	125	15	0	TC.. 1102..	E02
14	STCCN 1414 K11	N	14	14	125	21	0	TC.. 1102..	E02
16	STCCN 1616 K11	N	16	16	125	24	0	TC.. 1102..	E02

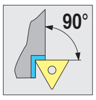
			
E01	56652	8095010100	82273
E02	24645	8095010200	29280

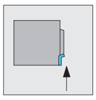
A303

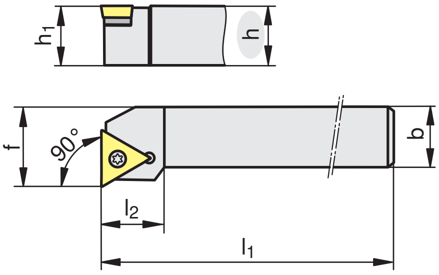
A89

STFC...

MaxiLock S

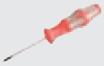






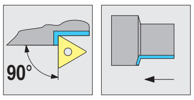
Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]	△	🪛
12	STFCR 1212 F11	R	12	12	80	15	16	TC.. 1102..	E01
12	STFCL 1212 F11	L	12	12	80	15	16	TC.. 1102..	E01
16	STFCR 1616 H16	R	16	16	100	20	20	TC.. 16T3..	E02
16	STFCL 1616 H16	L	16	16	100	20	20	TC.. 16T3..	E02
20	STFCR 2020 K16	R	20	20	125	20	25	TC.. 16T3..	E02
20	STFCL 2020 K16	L	20	20	125	20	25	TC.. 16T3..	E02
25	STFCR 2525 M16	R	25	25	150	20	32	TC.. 16T3..	E02
25	STFCL 2525 M16	L	25	25	150	20	32	TC.. 16T3..	E02

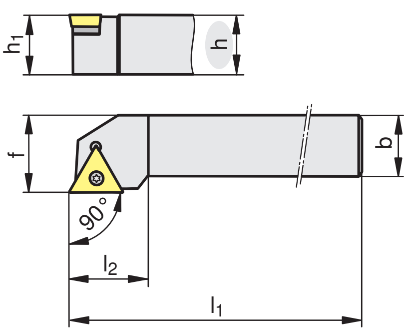
🪛						
E01	24645				8095010200	29280
E02	24647	69209	69294	69293		82758

🪛 A303

△ A89



Picture shows right-hand version



h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	
10	STGCR 1010 E09	R	10	10	70	12	12	TC.. 0902..	E01
10	STGCL 1010 E09	L	10	10	70	12	12	TC.. 0902..	E01
12	STGCR 1212 F11	R	12	12	80	15	16	TC.. 1102..	E02
12	STGCL 1212 F11	L	12	12	80	15	16	TC.. 1102..	E02
16	STGCR 1616 H16	R	16	16	100	22	20	TC.. 16T3..	E03
16	STGCL 1616 H16	L	16	16	100	22	20	TC.. 16T3..	E03
20	STGCR 2020 K16	R	20	20	125	22	25	TC.. 16T3..	E03
20	STGCL 2020 K16	L	20	20	125	22	25	TC.. 16T3..	E03
25	STGCR 2525 M16	R	25	25	150	22	32	TC.. 16T3..	E03
25	STGCL 2525 M16	L	25	25	150	22	32	TC.. 16T3..	E03

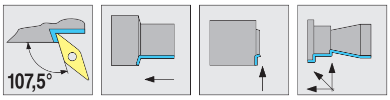
						
E01	56652				8095010100	82273
E02	24645				8095010200	29280
E03	24647	69209	69294	69293		82758

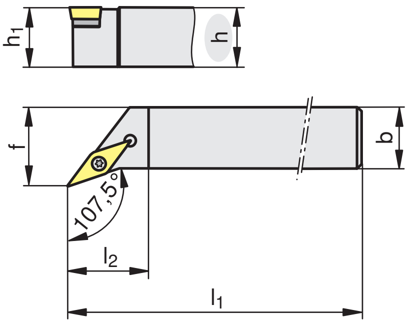
A303

A89

SVHC...

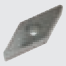
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h₁ [mm]	b [mm]	l₁ [mm]	l₂ [mm]	f [mm]		
12	SVHCR 1212 F11	R	12	12	80	11.9	16	VC.. 1103..	E01
12	SVHCL 1212 F11	L	12	12	80	11.9	16	VC.. 1103..	E01
16	SVHCR 1616 H11	R	16	16	100	11.9	20	VC.. 1103..	E01
16	SVHCL 1616 H11	L	16	16	100	11.9	20	VC.. 1103..	E01
20	SVHCR 2020 K11	R	20	20	125	14.7	25	VC.. 1103..	E01
20	SVHCL 2020 K11	L	20	20	125	14.7	25	VC.. 1103..	E01
25	SVHCR 2525 M11	R	25	25	150	20.1	32	VC.. 1103..	E01
25	SVHCL 2525 M11	L	25	25	150	20.1	32	VC.. 1103..	E01
20	SVHCR 2020 K16	R	20	20	125	13.7	25	VC.. 1604..	E02
20	SVHCL 2020 K16	L	20	20	125	13.7	25	VC.. 1604..	E02
25	SVHCR 2525 M16	R	25	25	150	20.0	32	VC.. 1604..	E02
25	SVHCL 2525 M16	L	25	25	150	20.0	32	VC.. 1604..	E02
32	SVHCR 3225 P16	R	32	25	170	20.0	32	VC.. 1604..	E02
32	SVHCL 3225 P16	L	32	25	170	20.0	32	VC.. 1604..	E02
25	SVHCR 2525 M22	R	25	25	150	21.9	32	VC.. 2205..	E03
25	SVHCL 2525 M22	L	25	25	150	21.9	32	VC.. 2205..	E03
32	SVHCR 3225 P22	R	32	25	170	21.9	32	VC.. 2205..	E03
32	SVHCL 3225 P22	L	32	25	170	21.9	32	VC.. 2205..	E03

						
E01	24645				8095010200	29280
E02	24647	26147	69294	69293		29279
E03	54981	119008	69296	69293		118849

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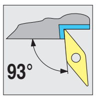
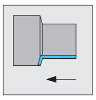
A90-A91

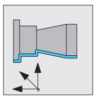
A92

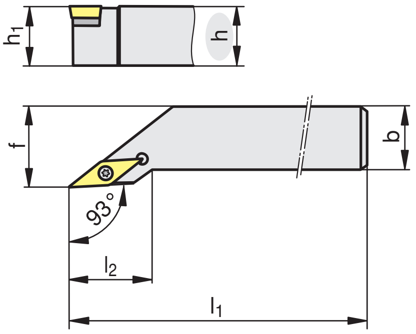
SVJC...

MaxiLock S



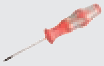






Picture shows right-hand version

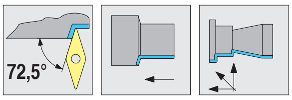
h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	◇	🔧
12	SVJCR 1212 F11	R	12	12	80	21.6	16	VC.. 1103..	E01
12	SVJCL 1212 F11	L	12	12	80	21.6	16	VC.. 1103..	E01
16	SVJCR 1616 H11	R	16	16	100	21.6	20	VC.. 1103..	E01
16	SVJCL 1616 H11	L	16	16	100	21.6	20	VC.. 1103..	E01
20	SVJCR 2020 K11	R	20	20	125	23	25	VC.. 1103..	E01
20	SVJCL 2020 K11	L	20	20	125	23	25	VC.. 1103..	E01
25	SVJCR 2525 M11	R	25	25	150	25.5	32	VC.. 1103..	E01
25	SVJCL 2525 M11	L	25	25	150	25.5	32	VC.. 1103..	E01
20	SVJCR 2020 K16	R	20	20	125	29.4	25	VC.. 1604..	E02
20	SVJCL 2020 K16	L	20	20	125	29.4	25	VC.. 1604..	E02
25	SVJCR 2525 M16	R	25	25	150	32.5	32	VC.. 1604..	E02
25	SVJCL 2525 M16	L	25	25	150	32.5	32	VC.. 1604..	E02
32	SVJCR 3225 P16	R	32	25	170	32.5	32	VC.. 1604..	E02
32	SVJCL 3225 P16	L	32	25	170	32.5	32	VC.. 1604..	E02

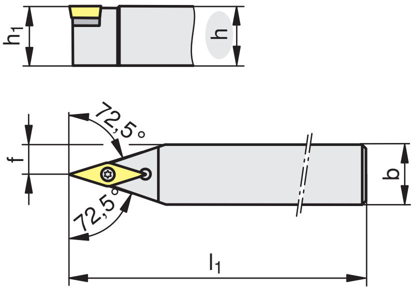
🔧						
E01	24645				8095010200	29280
E02	24647	26147	69294	69293		29279

🔧 A303
◇ A90-A91
◇ A92

SVVC...

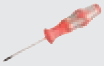
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	f [mm]		
12	SVVCN 1212 F11	N	12	12	80	6	VC.. 1103..	E01
16	SVVCN 1616 H11	N	16	16	100	8	VC.. 1103..	E01
20	SVVCN 2020 K11	N	20	20	125	10	VC.. 1103..	E01
25	SVVCN 2525 M11	N	25	25	150	12.5	VC.. 1103..	E01
20	SVVCN 2020 K16	N	20	20	125	10	VC.. 1604..	E02
25	SVVCN 2525 M16	N	25	25	150	12.5	VC.. 1604..	E02
32	SVVCN 3225 P16	N	32	25	170	12.5	VC.. 1604..	E02

						
E01	24645				8095010200	29280
E02	24647	26147	69294	69293		29279

A303

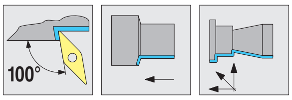
A90-A91

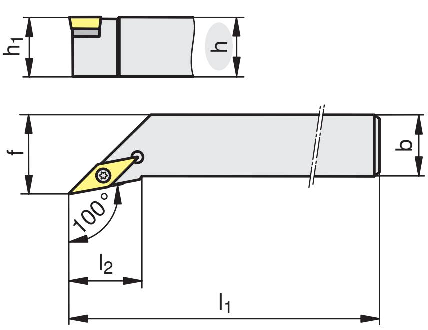
A92

Turning / Tools ext.

SVZC.../SVZP...

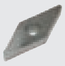
MaxiLock S





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
25	SVZCR 2525 M16	R	25	25	150	27.3	32	VC.. 1604..	E01
25	SVZCL 2525 M16	L	25	25	150	27.3	32	VC.. 1604..	E01
25	SVZPR 2525 M22-16	R	25	25	150	32.3	32	VP.. 2205..	E02
25	SVZPL 2525 M22-16	L	25	25	150	32.3	32	VP.. 2205..	E02

					
E01	24647	26147	69294	69293	29279
E02	54981	148206	69296	69293	260199

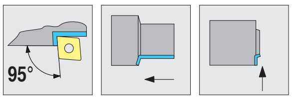
A303

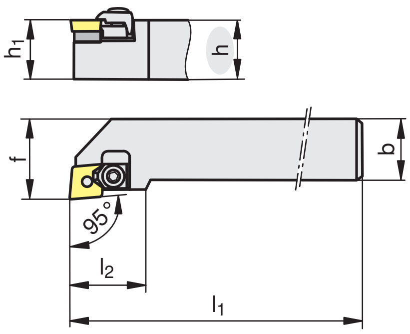
A90-A91

A92

MCLC...

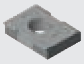
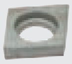
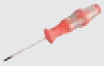
MaxiLock P





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
20	MCLCL 2020 K12	L	20	20	125	35	25	CC.. 1204..	E01
25	MCLCR 2525 M12	R	25	25	150	35	32	CC.. 1204..	E01
25	MCLCL 2525 M12	L	25	25	150	35	32	CC.. 1204..	E01

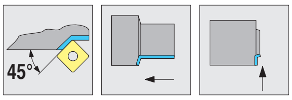
						
E01	4726	26132	4735	4740	8095010600	4746

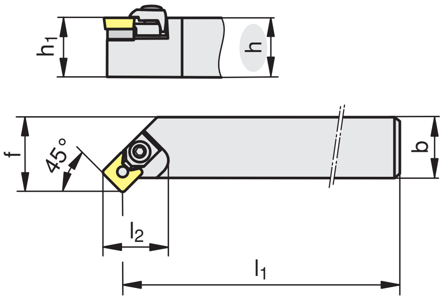
A303

A96

MSSC...

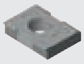
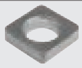
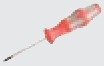
MaxiLock P





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	□	
20	MSSCR 2020 K12	R	20	20	125	32	25	SC.. 1204..	E01
20	MSSCL 2020 K12	L	20	20	125	32	25	SC.. 1204..	E01
25	MSSCR 2525 M12	R	25	25	150	28	32	SC.. 1204..	E01
25	MSSCL 2525 M12	L	25	25	150	28	32	SC.. 1204..	E01
32	MSSCR 3225 P12	R	32	25	170	28	32	SC.. 1204..	E01
32	MSSCL 3225 P12	L	32	25	170	28	32	SC.. 1204..	E01

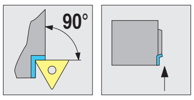
						
E01	4726	26111	4735	4740	8095010600	4745

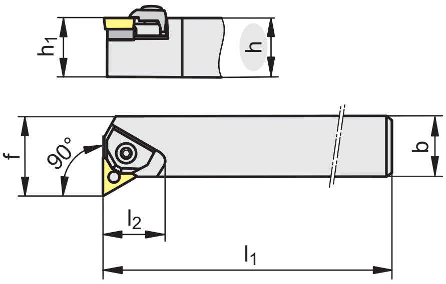
A303

A96

MTFC...

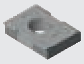
MaxiLock P





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	
25	MTFCR 2525 M16	R	25	25	150	25	32	TC.. 1604..	E01

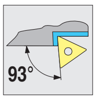
						
E01	4724	26123	4734	4738	8095010600	4743

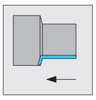
A303

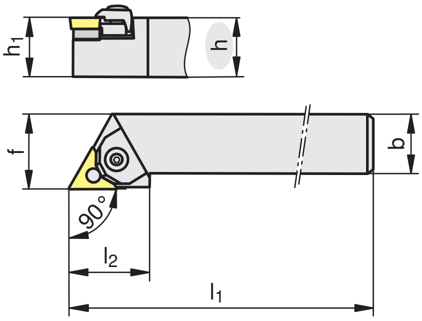
△ A96

MTGC...

MaxiLock P

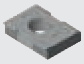
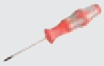






Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	🔧
20	MTGCR 2020 K16	R	20	20	125	32	25	TC.. 1604..	E01
20	MTGCL 2020 K16	L	20	20	125	32	25	TC.. 1604..	E01
25	MTGCR 2525 M16	R	25	25	150	32	32	TC.. 1604..	E01
25	MTGCL 2525 M16	L	25	25	150	32	32	TC.. 1604..	E01
25	MTGCR 2525 M22	R	25	25	150	35	32	TC.. 2204..	E02

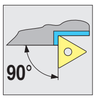
🔧						
E01	4724	26123	4734	4738	8095010600	4743
E02	4725	4719	4735	4739	8095010600	4744

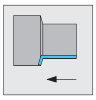
🔧 A303

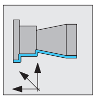
△ A96

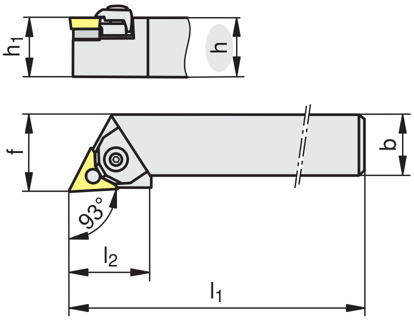
MTJC...

MaxiLock P



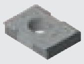
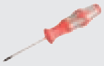






Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	🔧
20	MTJCR 2020 K16	R	20	20	125	32	25	TC.. 1604..	E01
20	MTJCL 2020 K16	L	20	20	125	32	25	TC.. 1604..	E01
25	MTJCR 2525 M16	R	25	25	150	32	32	TC.. 1604..	E01
25	MTJCL 2525 M16	L	25	25	150	32	32	TC.. 1604..	E01
32	MTJCR 3225 P16	R	32	25	170	32	32	TC.. 1604..	E01
32	MTJCL 3225 P16	L	32	25	170	32	32	TC.. 1604..	E01
25	MTJCR 2525 M22	R	25	25	150	35	32	TC.. 2204..	E02

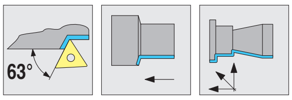
🔧						
E01	4724	26123	4734	4738	8095010600	4743
E02	4725	4719	4735	4739	8095010600	4744

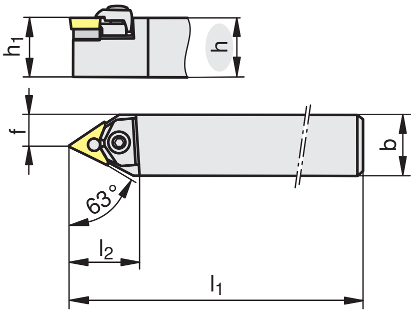
🔧 A303

△ A96

MTNC...

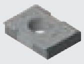
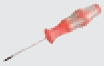
MaxiLock P





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	
20	MTNCR 2020 K16	R	20	20	125	26	10	TC.. 1604..	E01
25	MTNCR 2525 M16	R	25	25	150	26	12.5	TC.. 1604..	E01
25	MTNCL 2525 M16	L	25	25	150	26	12.5	TC.. 1604..	E01

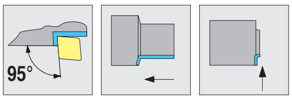
						
E01	4724	26123	4734	4738	8095010600	4743

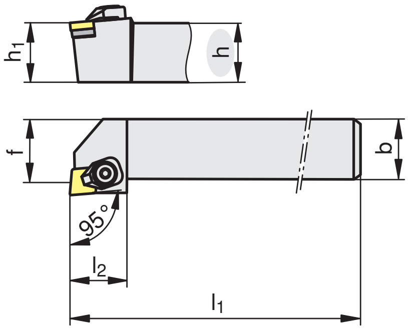
A303

△ A96

CCLN...

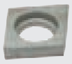
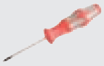
Simplex N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
25	CCLNR 2525 M09	R	25	25	150	26	32	CN.. 0903..	E01
25	CCLNR 2525 M12	R	25	25	150	27	32	CN.. 1204..	E02
25	CCLNL 2525 M12	L	25	25	150	27	32	CN.. 1204..	E02

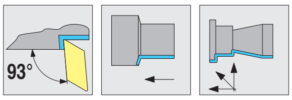
								
E01	4259	54742	4211	4261		8095010600		71533
E02					4209		220985	

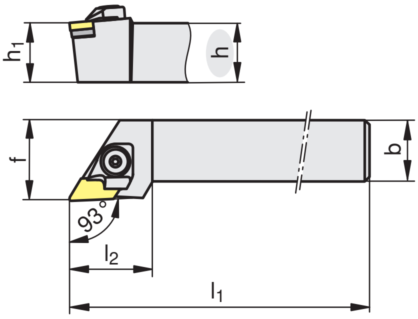
A303

A97

CKJN...

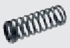
Simplex N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	▱	
25	CKJNR 2525 M16	R	25	25	150	35	32	KN.. 1604R..	E01
25	CKJNL 2525 M16	L	25	25	150	35	32	KN.. 1604L..	E02

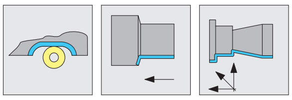
							
E01	149397	106014	4210	149395	149400	149399	4209
E02	149397	106009	4210	149396	149400	149399	4209

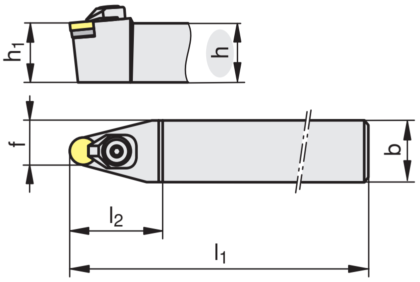
A303

A102

CRDN...

Simplex N





Picture shows right-hand version

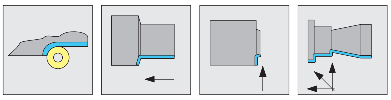
h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]	●	🔧
25	CRDNN 2525 M09	N	25	25	150	35	12.5	RN.. 0903..	E01
32	CRDNN 3232 P09	N	32	32	170	35	16	RN.. 0903..	E01
25	CRDNN 2525 M12	N	25	25	150	35	12.5	RN.. 1203..	E02
32	CRDNN 3232 P12	N	32	32	170	35	16	RN.. 1203..	E02
40	CRDNN 4040 R12	N	40	40	200	35	20	RN.. 1203..	E02
25	CRDNN 2525 M12-04	N	25	25	150	35	12.5	RN.. 1204..	E03

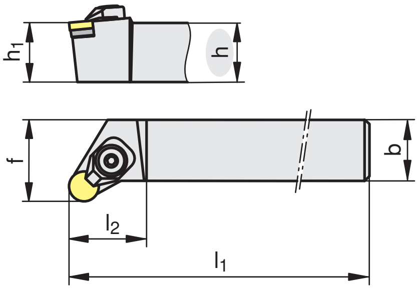
🔧						
E01	4259	40187	4211	4261	8095010600	40505
E02	4259	40192	4210	4261	8095010600	40506
E03	4259	146066	4210	4261	8095010600	146868

🔧	●
A303	A99

CRGN...

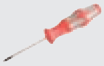
Simplex N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	●	🔧
20	CRGNR 2020 K09	R	20	20	125	21	25	RN.. 0903..	E01
25	CRGNR 2525 M09	R	25	25	150	21	32	RN.. 0903..	E01
25	CRGNL 2525 M09	L	25	25	150	21	32	RN.. 0903..	E01
32	CRGNR 3232 P09	R	32	32	170	21	40	RN.. 0903..	E01
32	CRGNL 3232 P09	L	32	32	170	21	40	RN.. 0903..	E01
25	CRGNR 2525 M12	R	25	25	150	21	32	RN.. 1203..	E02
25	CRGNL 2525 M12	L	25	25	150	21	32	RN.. 1203..	E02
32	CRGNR 3232 P12	R	32	32	170	21	40	RN.. 1203..	E02
32	CRGNL 3232 P12	L	32	32	170	21	40	RN.. 1203..	E02
40	CRGNR 4040 R12	R	40	40	200	21	50	RN.. 1203..	E02
40	CRGNL 4040 R12	L	40	40	200	21	50	RN.. 1203..	E02
25	CRGNR 2525 M12-04	R	25	25	150	21	32	RN.. 1204..	E03
25	CRGNL 2525 M12-04	L	25	25	150	21	32	RN.. 1204..	E03

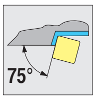
🔧						
E01	4259	40187	4211	4261	8095010600	40505
E02	4259	40192	4210	4261	8095010600	40506
E03	4259	146066	4210	4261	8095010600	146868

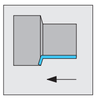
🔧 A303

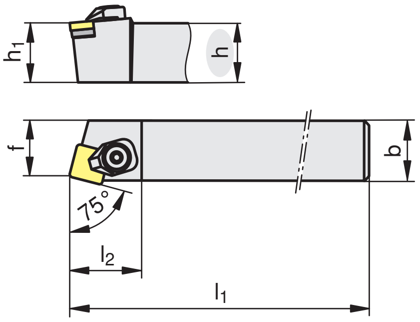
● A99

CSBN...

Simplex N

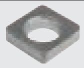






Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	🟨	🔧
25	CSBNR 2525 M09	R	25	25	150	25	22	SN.. 0903..	E01
25	CSBNL 2525 M09	L	25	25	150	25	22	SN.. 0903..	E01
25	CSBNR 2525 M12-03	R	25	25	150	29	22	SN.. 1203..	E02
25	CSBNL 2525 M12-03	L	25	25	150	29	22	SN.. 1203..	E02
25	CSBNR 2525 M12	R	25	25	150	32	22	SN.. 1204..	E03

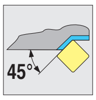
🔧								
E01						4209	8095008700	
E02						4209	220985	
E03	4147	26122	4210	4265	4213	4209		4283

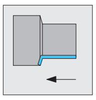
🔧 A303

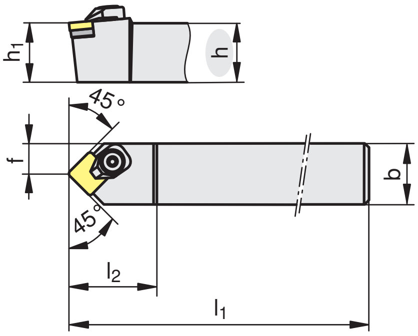
🟨 A100

CSDN...

Simplex N

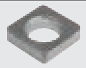
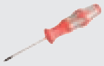






Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]	🟨	
25	CSDNN 2525 M09	N	25	25	150	25	12.5	SN.. 0903..	E01
32	CSDNN 3232 P12-03	N	32	32	170	28	16	SN.. 1203..	E02
25	CSDNN 2525 M12	N	25	25	150	34	12.5	SN.. 1204..	E03

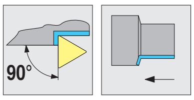
									
E01	4259		4299	4211	4261			8095010600	41917
E02	4259		26122	4210	4261			8095010600	11963665
E03		4147	26122	4210	4265	4213	4209		4283

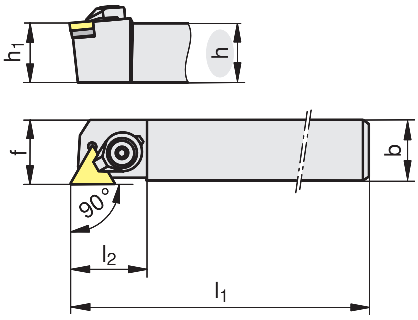
A303

🟨 A100

CTAN...

Simplex N





Picture shows right-hand version

h [mm]	Type, description	L N R	h1 [mm]	b [mm]	l1 [mm]	l2 [mm]	f [mm]	△	
20	CTANR 2020 K16	R	20	20	125	30	20.5	TN.. 1604..	E01
25	CTANR 2525 M16	R	25	25	150	30	25.5	TN.. 1604..	E01

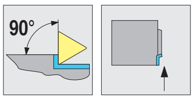
							
E01	4147	26124	4210	4265	4213	4209	4287

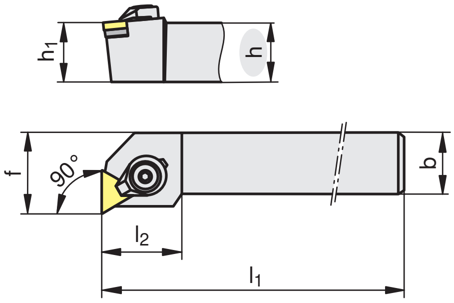
A303

A101

CTFN...

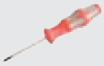
Simplex N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	🪛
12	CTFNR 1212 F11	R	12	12	80	15	16	TN.. 1103..	E01

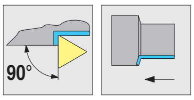
🪛			
E01	4524	4523	8095010500

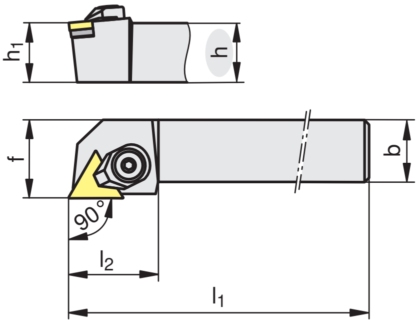
🪛 A303

△ A101

CTGN...

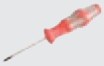
Simplex N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	🔧
12	CTGNR 1212 F11	R	12	12	80	16	16	TN.. 1103..	E01
12	CTGNL 1212 F11	L	12	12	80	16	16	TN.. 1103..	E01
25	CTGNR 2525 M11	R	25	25	150	25	32	TN.. 1103..	E02

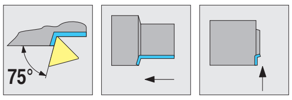
🔧						
E01	4524			4523	8095010500	
E02	4259	4300	4211	4261	8095010600	4288

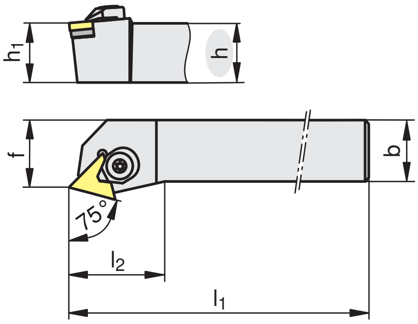
🔧 A303

△ A101

CTRN...

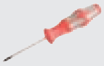
Simplex N





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	🔧
12	CTRNR 1212 F11	R	12	12	80	17.5	13	TN.. 1103..	E01

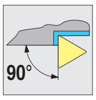
🔧			
E01	4524	4523	8095010500

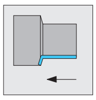
🔧 A303

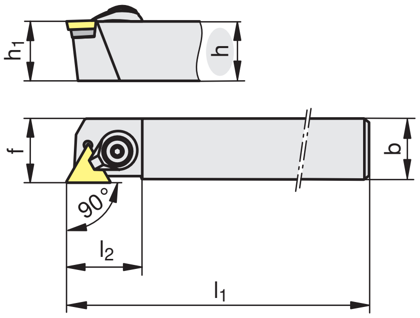
△ A101

CTAP...

Simplex P







Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	
20	CTAPR 2020 K16	R	20	20	125	30	20.5	TP.. 1603..	E01
20	CTAPL 2020 K16	L	20	20	125	30	20.5	TP.. 1603..	E01
25	CTAPR 2525 M16	R	25	25	150	30	25.5	TP.. 1603..	E01
25	CTAPL 2525 M16	L	25	25	150	30	25.5	TP.. 1603..	E01

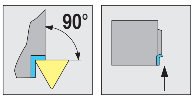
							
E01	4147	26126	4210	4265	4213	4209	4292

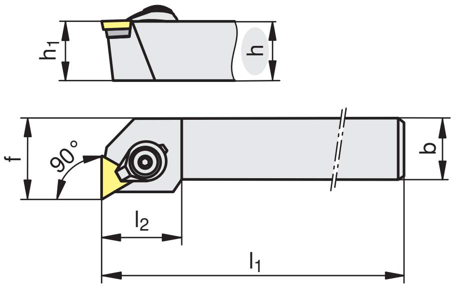
A303

△ A105

CTFP...

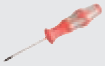
Simplex P





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	
12	CTFPR 1212 F11	R	12	12	80	14	16	TP.. 1103..	E01
20	CTFPR 2020 K16	R	20	20	125	28	25	TP.. 1603..	E02
25	CTFPR 2525 M16	R	25	25	150	32	32	TP.. 1603..	E02
25	CTFPL 2525 M16	L	25	25	150	32	32	TP.. 1603..	E02

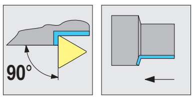
									
E01	4524				4523			8095010500	
E02		4147	26126	4210	4265	4213	4209		4292

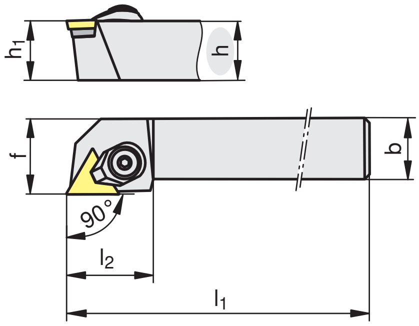
A303

A105

CTGP...

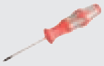
Simplex P





Picture shows right-hand version

h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	🔧
10	CTGPR 1010 E11	R	10	10	70	16.5	12	TP.. 1103..	E01
12	CTGPR 1212 F11	R	12	12	80	16.5	16	TP.. 1103..	E01
12	CTGPL 1212 F11	L	12	12	80	16.5	16	TP.. 1103..	E01

🔧			
E01	4524	4523	8095010500

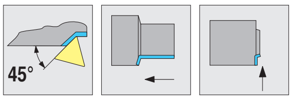
🔧 A303

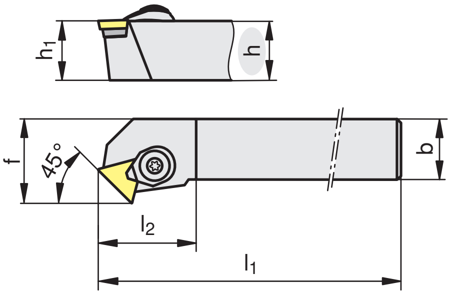
△ A105

Turning / Tools ext.

CTSP...

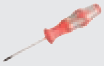
Simplex P





Picture shows right-hand version

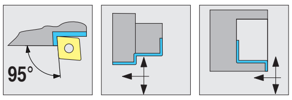
h [mm]	Type, description	L N R	h_1 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	△	
12	CTSPR 1212 F11	R	12	12	80	16	16	TP.. 1103..	E01

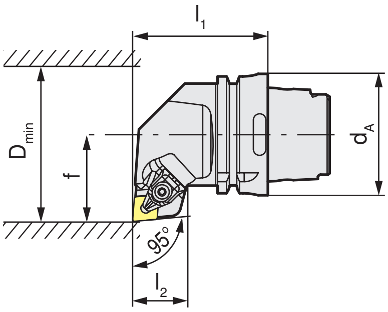
			
E01	4524	4523	8095010500

	△
A303	A105

HSK-T DCLN...

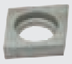
MaxiLock D





Picture shows right-hand version

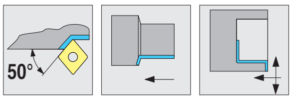
d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	D_{min} [mm]	f [mm]	◇	🔧
63	HSK-T63-DCLNR-12	R	70	28	100	45	CN.. 1204..	E01
63	HSK-T63-DCLNL-12	L	70	28	100	45	CN.. 1204..	E01
63	HSK-T63-DCLNR-16	R	70	28	125	45	CN.. 1606..	E02
63	HSK-T63-DCLNL-16	L	70	28	125	45	CN.. 1606..	E02
63	HSK-T63-DCLNR-19	R	70	28	125	45	CN.. 1906..	E03
63	HSK-T63-DCLNL-19	L	70	28	125	45	CN.. 1906..	E03
100	HSK-T100-DCLNR-12	R	80	28	125	55	CN.. 1204..	E01
100	HSK-T100-DCLNL-12	L	80	28	125	55	CN.. 1204..	E01
100	HSK-T100-DCLNR-19	R	80	28	125	55	CN.. 1906..	E03
100	HSK-T100-DCLNL-19	L	80	28	125	55	CN.. 1906..	E03

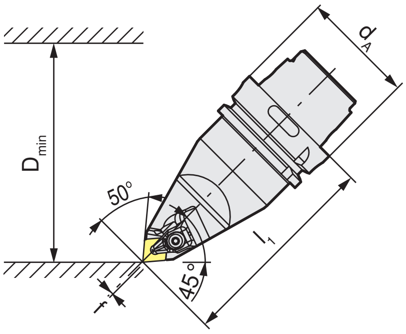
🔧				
E01	11224545	11224494	11211558	11224503
E02	11227322	11227318	11227315	11227323
E03	11227325	11227318	11227316	11227323

🔧	◇	◇
A303	A63-A66	A79

HSK-T DCMN...

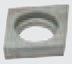
MaxiLock D





Picture shows right-hand version

d$_A$ [mm]	Type, description	L N R	l$_1$ [mm]	D$_{min}$ [mm]	f [mm]		
63	HSK-T63-DCMNN-12	N	115	110	0	CN.. 1204..	E01
100	HSK-T100-DCMNN-12	N	150	115	0	CN.. 1204..	E01

				
E01	11224545	11224494	11211558	11224503

A303

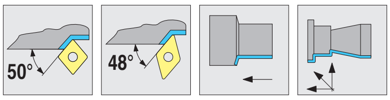
A63-A66

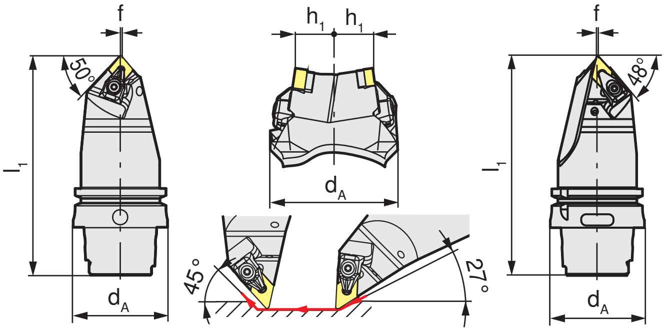
A79

Turning / Tools ext.

HSK-T DCMN+DDMN...

MaxiLock D



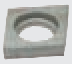


Picture shows left-hand version

d_A [mm]	**Type, description**	L N R	**l_1 [mm]**	**h_1 [mm]**	**f [mm]**		
63	HSK-T63-DCMNL12+DDMNL15	L	115	20	0.5	CN.. 1204.. / DN.. 1506..	E01
100	HSK-T100-DCMNL12+DDMNL15	L	150	20	0.5	CN.. 1204.. / DN.. 1506..	E01

⚠

Note:
Face turning possible up to max. Ø 78 mm

					
E01	11224545	11224494	11211558	11211562	11224503

A303

A63-A66

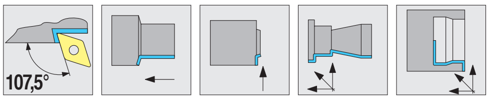
A79

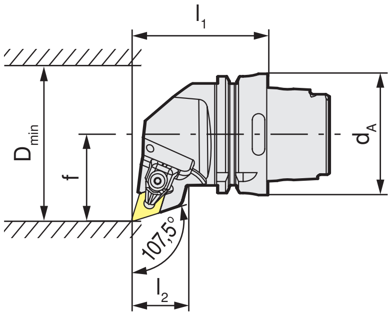
A67-A69

A79

HSK-T DDHN...

MaxiLock D





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-DDHNR-15	R	70	28	125	45	DN.. 1506..	E01
63	HSK-T63-DDHNL-15	L	70	28	125	45	DN.. 1506..	E01

				
E01	11224545	11224494	11211562	11224503

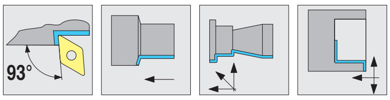
A303

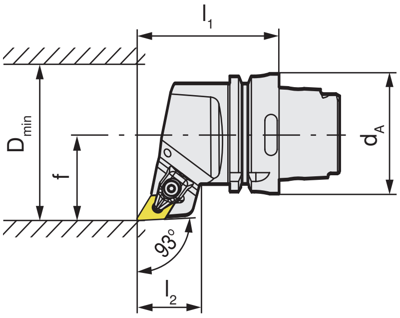
A67-A69

A79

HSK-T DDJN...

MaxiLock D





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-DDJNR-15	R	75	33	125	45	DN.. 1506..	E01
63	HSK-T63-DDJNL-15	L	75	33	125	45	DN.. 1506..	E01
100	HSK-T100-DDJNR-15	R	85	33	125	55	DN.. 1506..	E01
100	HSK-T100-DDJNL-15	L	85	33	125	55	DN.. 1506..	E01

				
E01	11224545	11224494	11211562	11224503

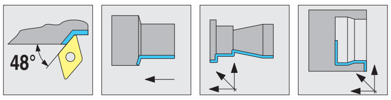
A303

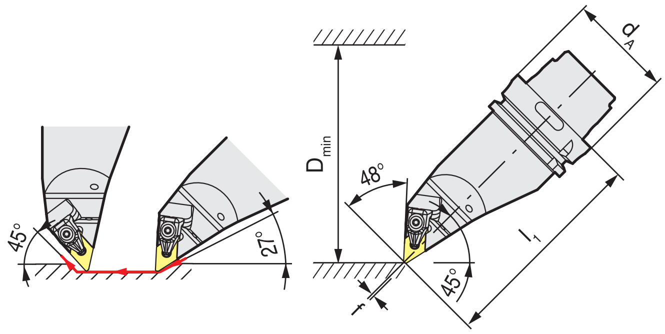
A67-A69

A79

HSK-T DDMN...

MaxiLock D





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-DDMNL-15	L	130	110	0	DN.. 1506..	E01
100	HSK-T100-DDMNL-15	L	160	120	0	DN.. 1506..	E01

				
E01	11224545	11224494	11211562	11224503

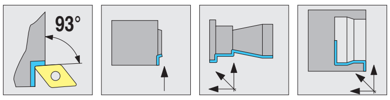
A303

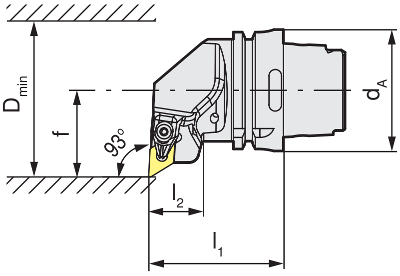
A67-A69

A79

HSK-T DDUN...

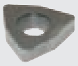
MaxiLock D





Picture shows right-hand version

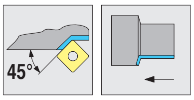
d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	D_{min} [mm]	f [mm]	◇	
63	HSK-T63-DDUNR-15	R	70	28	125	45	DN.. 1506..	E01
63	HSK-T63-DDUNL-15	L	70	28	125	45	DN.. 1506..	E02
100	HSK-T100-DDUNR-15	R	80	26	125	55	DN.. 1506..	E02
100	HSK-T100-DDUNL-15	L	80	26	125	55	DN.. 1506..	E02

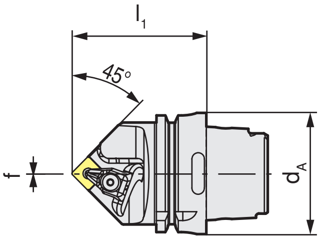
					
E01	11224545		11211562	11211563	11224503
E02	11224545	11224494	11211562		11224503

A303
A67-A69
A79

HSK-T DSDN...

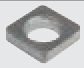
MaxiLock D





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]		
63	HSK-T63-DSDNN-12	N	70	0	SN.. 1204..	E01
63	HSK-T63-DSDNN-15	N	75	0	SN.. 1506..	E02
100	HSK-T100-DSDNN-12	N	80	0	SN.. 1204..	E01
100	HSK-T100-DSDNN-19	N	85	0	SN.. 1906..	E03

				
E01	11224545	11224494	11211561	11224503
E02	11227322	11227318	11247269	11227323
E03	11227325	11227318	11227317	11227323

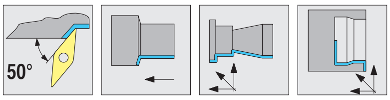
A303

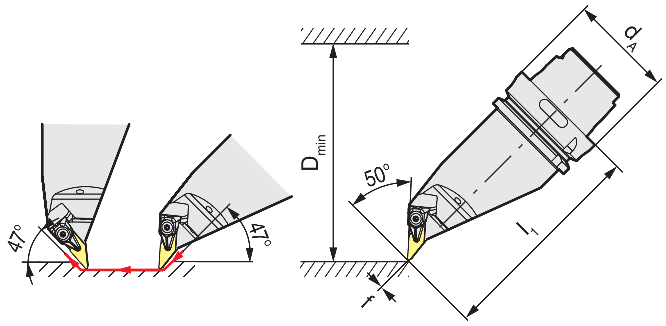
A70-A72

A80

HSK-T DVMN...

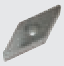
MaxiLock D





Picture shows right-hand version

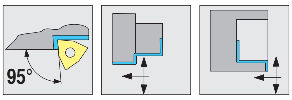
d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-DVMNL-16	L	130	110	0	VN.. 1604..	E01
100	HSK-T100-DVMNL-16	L	160	120	0	VN.. 1604..	E01

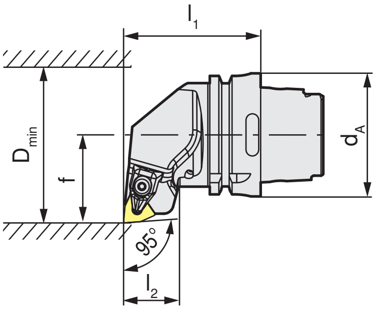
				
E01	11258694	11227305	11227311	11227314

A303
A76
A80

HSK-T DWLN...

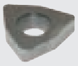
MaxiLock D





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-DWLNR-08	R	70	28	125	45	WN.. 0804..	E01
63	HSK-T63-DWLNL-08	L	70	28	125	45	WN.. 0804..	E01
100	HSK-T100-DWLNR-08	R	80	28	125	55	WN.. 0804..	E01
100	HSK-T100-DWLNL-08	L	80	28	125	55	WN.. 0804..	E01

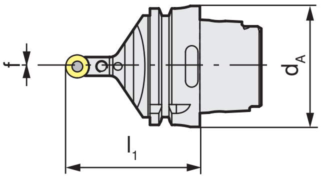
				
E01	11224545	11224494	11211563	11224503

A303

A77-A78

HSK-T PRDC...

MaxiLock N



Picture shows right-hand version

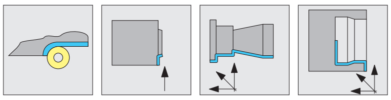
d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]	◎	
63	HSK-T63-PRDCN-12	N	70	0	RC.. 1204..	E01
100	HSK-T100-PRDCN-12	N	80	0	RC.. 1204..	E01
100	HSK-T100-PRDCN-16	N	80	0	RC.. 1606..	E02

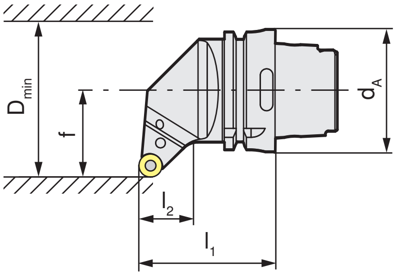
							
E01	59445	154563	59436	154568	86174	4770	154578
E02	154575	154564	154577	154570	86176	4771	154579

A303
A87

HSK-T PRSC...

MaxiLock N





Picture shows right-hand version

dA [mm]	Type, description	L N R	l1 [mm]	l2 [mm]	Dmin [mm]	f [mm]	○	
63	HSK-T63-PRSCR-12	R	70	26	100	45	RC.. 1204..	E01
63	HSK-T63-PRSCL-12	L	70	26	100	45	RC.. 1204..	E01
100	HSK-T100-PRSCR-12	R	80	19	106	55	RC.. 1204..	E01
100	HSK-T100-PRSCL-12	L	80	19	106	55	RC.. 1204..	E01
100	HSK-T100-PRSCR-16	R	80	25	125	55	RC.. 1606..	E02
100	HSK-T100-PRSCL-16	L	80	25	125	55	RC.. 1606..	E02

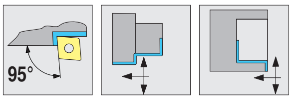
							
E01	59445	154563	59436	154568	86174	4770	154578
E02	154575	154564	154577	154570	86176	4771	154579

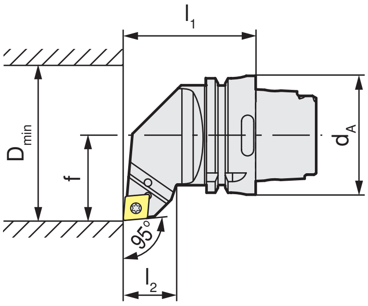
A303

A87

HSK-T SCLC...

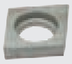
MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-SCLCR-12	R	70	28	100	45	CC.. 1204..	E01
63	HSK-T63-SCLCL-12	L	70	28	100	45	CC.. 1204..	E01

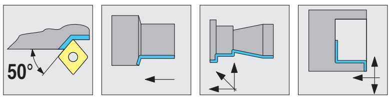
					
E01	54981	61006	69296	69293	74208

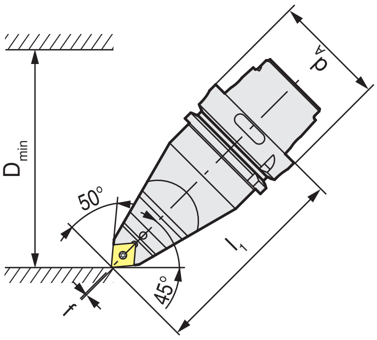
A303	A82-A84	A92

Turning / Tools ext.

HSK-T SCMC...

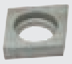
MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-SCMCN-12	N	115	110	0	CC.. 1204..	E01

					
E01	54981	61006	69296	69293	74208

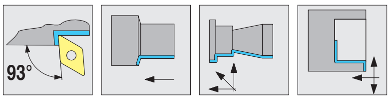
A303

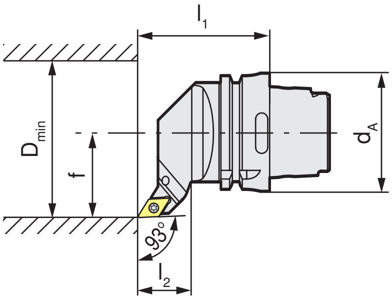
A82-A84

A92

HSK-T SDJC...

MaxiLock S





Picture shows right-hand version

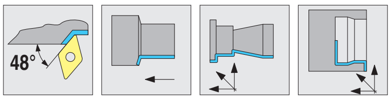
d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	D_{min} [mm]	f [mm]	◇	🔧
63	HSK-T63-SDJCR-11	R	70	28	100	45	DC.. 11T3..	E01
63	HSK-T63-SDJCL-11	L	70	28	100	45	DC.. 11T3..	E01

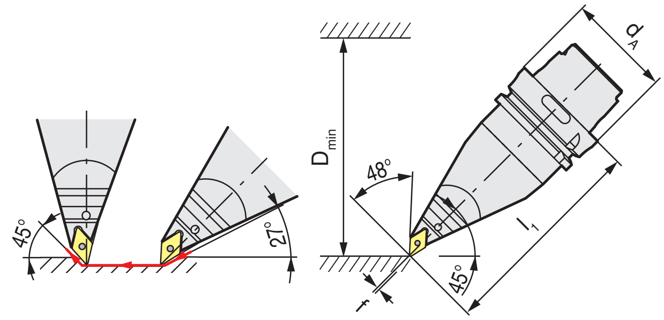
🔧					
E01	24647	26146	69294	69293	29278

🔧	◇	◇
A303	A85-A86	A92

HSK-T SDMC...

MaxiLock S





Picture shows left-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-SDMCL-11	L	130	110	0	DC.. 11T3..	E01

					
E01	24647	26146	69294	69293	29278

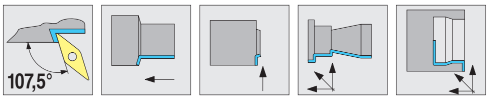
A303

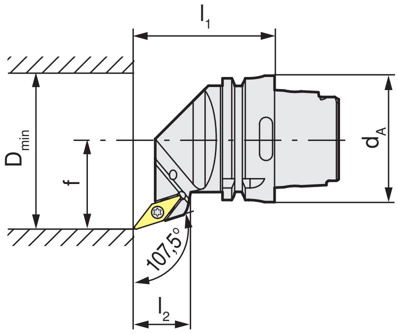
A85-A86

A92

HSK-T SVHC...

MaxiLock S





Picture shows right-hand version

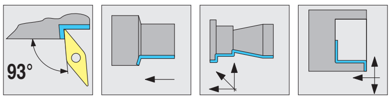
d_A [mm]	**Type, description**	L N R	**l_1 [mm]**	**l_2 [mm]**	**D_{min} [mm]**	**f [mm]**		
63	HSK-T63-SVHCR-16	R	70	28	100	45	VC.. 1604..	E01
63	HSK-T63-SVHCL-16	L	70	28	100	45	VC.. 1604..	E01

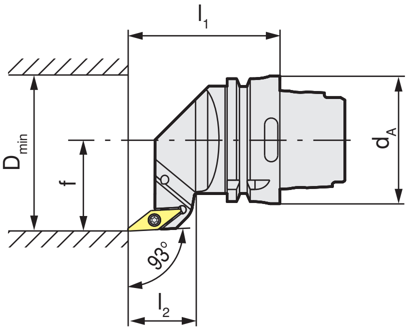
					
E01	24647	26147	69294	69293	29279

A303
A90-A91
A92

HSK-T SVJC...

MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-SVJCR-16	R	75	33	100	45	VC.. 1604..	E01
63	HSK-T63-SVJCL-16	L	75	33	100	45	VC.. 1604..	E01

					
E01	24647	26147	69294	69293	29279

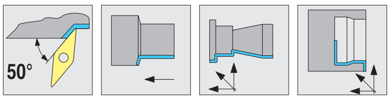
A303

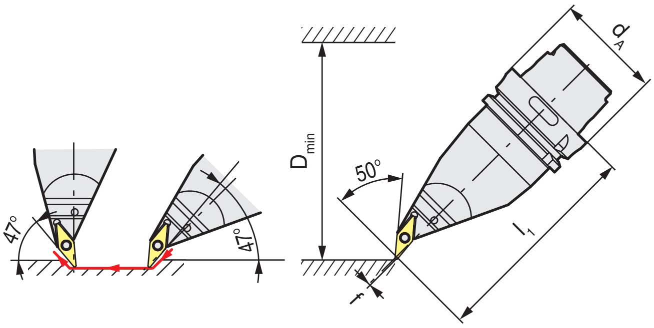
A90-A91

A92

HSK-T SVMC...

MaxiLock S





Picture shows left-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-SVMCL-16	L	130	110	0	VC.. 1604..	E01

					
E01	24647	26147	69294	69293	29279

A303

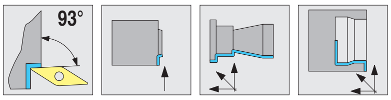
A90-A91

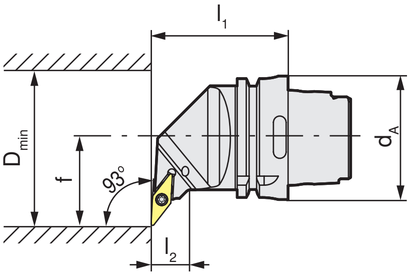
A92

Turning / Tools ext.

HSK-T SVUC...

MaxiLock S





Picture shows right-hand version

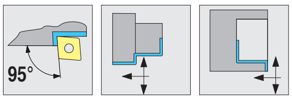
dA [mm]	Type, description	L N R	l1 [mm]	l2 [mm]	Dmin [mm]	f [mm]	◇	
63	HSK-T63-SVUCR-16	R	70	20	100	45	VC.. 1604..	E01
63	HSK-T63-SVUCL-16	L	70	20	100	45	VC.. 1604..	E01

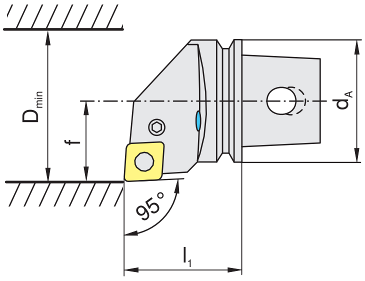
					
E01	24647	26147	69294	69293	29279

A303
A90-A91
A92

UTS PCLN...

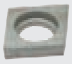
MaxiLock N





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
40	UT40-PCLNR-12	R	40	54	27	CN.. 1204..	E01
40	UT40-PCLNL-12	L	40	54	27	CN.. 1204..	E01
50	UT50-PCLNR-12	R	50	70	35	CN.. 1204..	E02
50	UT50-PCLNL-12	L	50	70	35	CN.. 1204..	E02
50	UT50-PCLNR-16	R	50	70	35	CN.. 1606..	E03
50	UT50-PCLNL-16	L	50	70	35	CN.. 1606..	E03
63	UT63-PCLNR-12	R	60	86	43	CN.. 1204..	E04
63	UT63-PCLNL-12	L	60	86	43	CN.. 1204..	E04
63	UT63-PCLNR-16	R	60	86	43	CN.. 1606..	E05
63	UT63-PCLNL-16	L	60	86	43	CN.. 1606..	E05
63	UT63-PCLNR-19	R	60	86	43	CN.. 1906..	E06
63	UT63-PCLNL-19	L	60	86	43	CN.. 1906..	E06

								
E01	59446	59568	59437	59430	86176	194263	4771	140587
E02	59446	59568	59437	59430	86176	225429	4771	140587
E03	59443	59451	59438	59426	86177	225429	4771	140589
E04	59446	59568	59437	59430	86176	225430	4771	140587
E05	59443	59451	59438	59426	86177	225430	4771	140589
E06	59448	59569	59439	59434	86178	225430	4209	140590

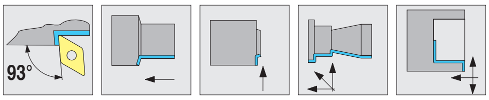
A303

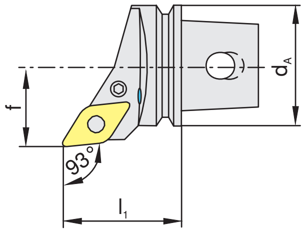
A63-A66

A79

UTS PDJN...

MaxiLock N





Picture shows right-hand version

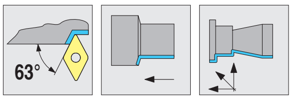
d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]		
40	UT40-PDJNR-11	R	40	27	DN.. 1104..	E01
40	UT40-PDJNL-11	L	40	27	DN.. 1104..	E01
40	UT40-PDJNR-15	R	40	27	DN.. 1506..	E02
40	UT40-PDJNL-15	L	40	27	DN.. 1506..	E02
50	UT50-PDJNR-15	R	50	35	DN.. 1506..	E03
50	UT50-PDJNL-15	L	50	35	DN.. 1506..	E03
63	UT63-PDJNL-11	L	60	43	DN.. 1104..	E04
63	UT63-PDJNR-15	R	60	43	DN.. 1506..	E05
63	UT63-PDJNL-15	L	60	43	DN.. 1506..	E05

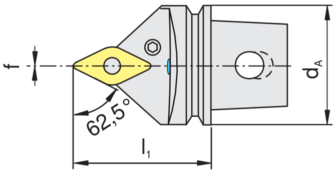
								
E01	59445	293140	293147	293143	86174	194263	4770	293151
E02	59443	59570	59437	59432	86176	194263	4771	140591
E03	59443	59570	59437	59432	86176	225429	4771	140591
E04	59445	293140	293147	293143	86174	225430	4770	293151
E05	59443	59570	59437	59432	86176	225430	4771	140591

A303
A67-A69
A79

UTS PDNN...

MaxiLock N





Picture shows right-hand version

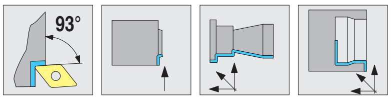
d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]	◇	🔧
40	UT40-PDNNR-15	R	45	0	DN.. 1506..	E01
40	UT40-PDNNL-15	L	45	0	DN.. 1506..	E01
63	UT63-PDNNR-15	R	60	0	DN.. 1506..	E02
63	UT63-PDNNL-15	L	60	0	DN.. 1506..	E02

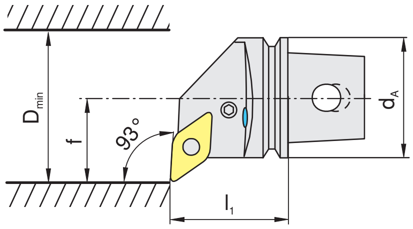
🔧								
E01	59443	59570	59437	59432	86176	194263	4771	140591
E02	59443	59570	59437	59432	86176	225430	4771	140591

🔧	◇	◇
A303	A67-A69	A79

UTS PDUN...

MaxiLock N





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
40	UT40-PDUNR-11	R	40	49	27	DN.. 1104..	E01
40	UT40-PDUNL-11	L	40	49	27	DN.. 1104..	E01
40	UT40-PDUNR-15	R	40	49	27	DN.. 1506..	E02
40	UT40-PDUNL-15	L	40	49	27	DN.. 1506..	E02
50	UT50-PDUNR-15	R	50	62	35	DN.. 1506..	E03
50	UT50-PDUNL-15	L	50	62	35	DN.. 1506..	E03
63	UT63-PDUNR-15	R	60	77	43	DN.. 1506..	E04
63	UT63-PDUNL-15	L	60	77	43	DN.. 1506..	E04

								
E01	59445	293140	293147	293143	86174	194263	4770	293151
E02	59443	59570	59437	59432	86176	194263	4771	140591
E03	59443	59570	59437	59432	86176	225429	4771	140591
E04	59443	59570	59437	59432	86176	225430	4771	140591

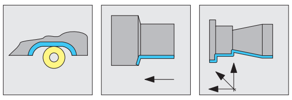
A303

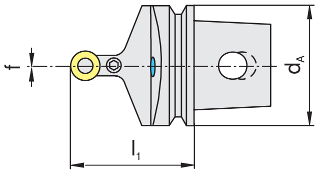
A67-A69

A79

UTS PRDC...

MaxiLock N





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]	○	
50	UT50-PRDCN-12	N	50	0	RC.. 1204..	E01
63	UT63-PRDCN-16	N	60	0	RC.. 1606..	E02

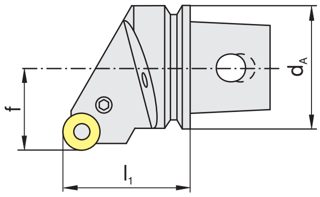
								
E01	59445	154563	59436	154568	86174	225429	4770	154578
E02	154575	154564	154577	154570	86176	225430	4771	154579

A303

A87

UTS PRGC...

MaxiLock N



Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]	◎	
50	UT50-PRGCR-12	R	50	35	RC.. 1204..	E01
50	UT50-PRGCR-16	R	50	35	RC.. 1606..	E02
63	UT63-PRGCL-16	L	60	43	RC.. 1606..	E03

								
E01	59445	154563	59436	154568	86174	225429	4770	154578
E02	154575	154564	154577	154570	86176	225429	4771	154579
E03	154575	154564	154577	154570	86176	225430	4771	154579

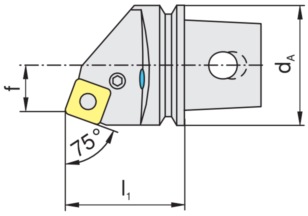
A303

◎ A87

UTS PSBN...

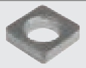
MaxiLock N

75°



Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]		
40	UT40-PSBNL-12	L	40	17	SN.. 1204..	E01
63	UT63-PSBNL-12	L	60	27	SN.. 1204..	E02
63	UT63-PSBNL-15	L	60	27	SN.. 1506..	E03
63	UT63-PSBNR-19	R	60	27	SN.. 1906..	E04
63	UT63-PSBNL-19	L	60	27	SN.. 1906..	E04

								
E01	59446	59564	59437	59430	86176	194263	4771	140595
E02	59446	59564	59437	59430	86176	225430	4771	140595
E03	59443	59549	59438	59426	86177	225430	4771	140596
E04	59448	59566	59439	59434	86178	225430	4209	140597

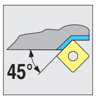
A303

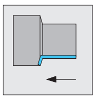
A70-A72

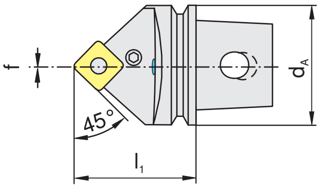
A80

UTS PSDN...

MaxiLock N

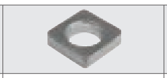
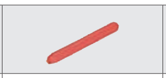
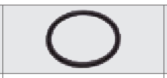
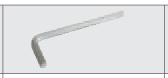
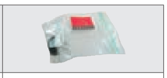






Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]	◻	
40	UT40-PSDNN-12	N	40	0	SN.. 1204..	E01
63	UT63-PSDNN-15	N	60	0	SN.. 1506..	E02

								
E01	59446	59564	59437	59430	86176	194263	4771	140595
E02	59443	59549	59438	59426	86177	225430		

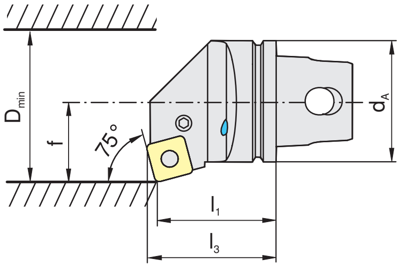
A303

◻ A70-A72

◻ A80

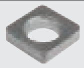
UTS PSKN...

MaxiLock N



Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_3 [mm]	D_{min} [mm]	f [mm]		
40	UT40-PSKNL-12	L	40	44.0	49	27	SN.. 1204..	E01
63	UT63-PSKNL-19	L	60	66.0	80	43	SN.. 1906..	E02
63	UT63-PSKNR-19	L	60	66.0	80	43	SN.. 1906..	E02

								
E01	59446	59564	59437	59430	86176	194263	4771	140595
E02	59448	59566	59439	59434	86178	225430	4209	140597

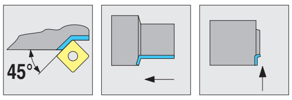
A303

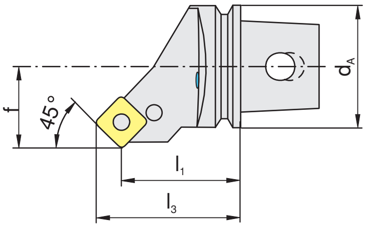
A70-A72

A80

UTS PSSN...

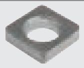
MaxiLock N





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_3 [mm]	f [mm]	▢	🔧
40	UT40-PSSNR-12	R	40	48.0	27	SN.. 1204..	E01
40	UT40-PSSNL-12	L	40	48.0	27	SN.. 1204..	E01
63	UT63-PSSNL-12	L	60	68.0	43	SN.. 1204..	E02
63	UT63-PSSNR-19	R	60	72.0	43	SN.. 1906..	E03

🔧								
E01	59446	59564	59437	59430	86176	194263	4771	140595
E02	59446	59564	59437	59430	86176	225430	4771	140595
E03	59448	59566	59439	59434	86178	225430	4209	140597

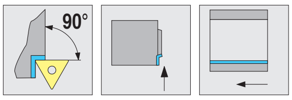
🔧 A303

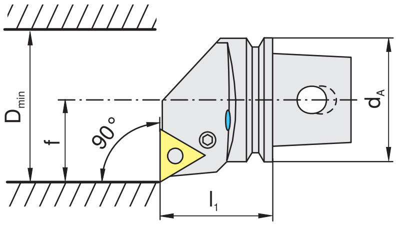
▢ A70-A72

▢ A80

UTS PTFN...

MaxiLock N





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]	△	
40	UT40-PTFNR-16	R	40	54	27	TN.. 1604..	E01
40	UT40-PTFNL-16	L	40	54	27	TN.. 1604..	E01
50	UT50-PTFNL-16	L	50	63	35	TN.. 1604..	E02
63	UT63-PTFNR-16	R	60	80	43	TN.. 1604..	E03

								
E01	59445	59556	59436	59429	86174	194263	4770	140601
E02	59445	59556	59436	59429	86174	225429	4770	140601
E03	59445	59556	59436	59429	86174	225430	4770	140601

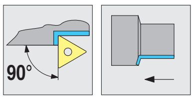
A303

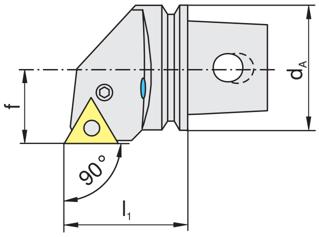
△ A73-A75

△ A80

UTS PTGN...

MaxiLock N





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]	△	🔧
40	UT40-PTGNR-16	R	40	27	TN.. 1604..	E01
40	UT40-PTGNL-16	L	40	27	TN.. 1604..	E01
63	UT63-PTGNR-16	R	60	43	TN.. 1604..	E02

🔧								
E01	59445	59556	59436	59429	86174	194263	4770	140601
E02	59445	59556	59436	59429	86174	225430	4770	140601

🔧 A303

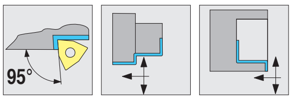
△ A73-A75

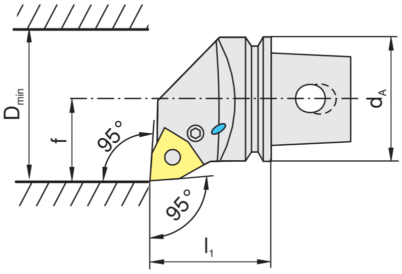
△ A80

Turning / Tools ext.

UTS PWLN...

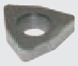
MaxiLock N





Picture shows right-hand version

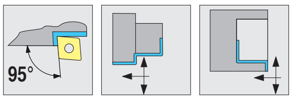
d$_A$ [mm]	Type, description	L N R	l$_1$ [mm]	D$_{min}$ [mm]	f [mm]		
40	UT40-PWLNR-06	R	40	49	27	WN.. 0604..	E01
40	UT40-PWLNL-06	L	40	49	27	WN.. 0604..	E01
40	UT40-PWLNR-08	R	40	49	27	WN.. 0804..	E02
40	UT40-PWLNL-08	L	40	49	27	WN.. 0804..	E02
50	UT50-PWLNR-08	R	50	62	35	WN.. 0804..	E03
50	UT50-PWLNL-08	L	50	62	35	WN.. 0804..	E03
63	UT63-PWLNR-08	R	60	77	43	WN.. 0804..	E04
63	UT63-PWLNL-08	L	60	77	43	WN.. 0804..	E04

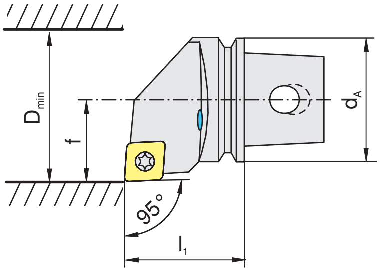
								
E01	59445	293139	293147	59429	86174	194263	4770	293148
E02	59446	218151	59437	59430	86176	194263	4771	222127
E03	59446	218151	59437	59430	86176	225429	4771	222127
E04	59446	218151	59437	59430	86176	225430	4771	222127

A303	A77-A78

UTS SCLC...

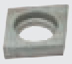
MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
40	UT40-SCLCR-12	R	40	54	27	CC.. 1204..	E01
40	UT40-SCLCL-12	L	40	54	27	CC.. 1204..	E01
50	UT50-SCLCR-12	R	50	64	35	CC.. 1204..	E02
50	UT50-SCLCL-12	L	50	64	35	CC.. 1204..	E02

						
E01	54981	61006	69296	194263	69293	74208
E02	54981	61006	69296	225429	69293	74208

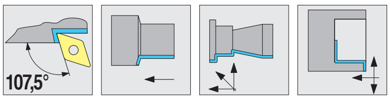
A303

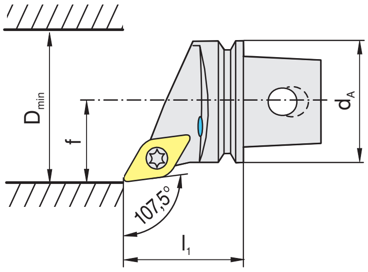
A82-A84

A92

UTS SDHC...

MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
40	UT40-SDHCR-11	R	40	49	27	DC.. 11T3..	E01
40	UT40-SDHCL-11	L	40	49	27	DC.. 11T3..	E01

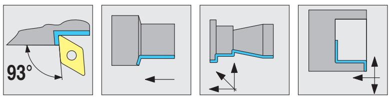
						
E01	24647	26146	69294	194263	69293	29278

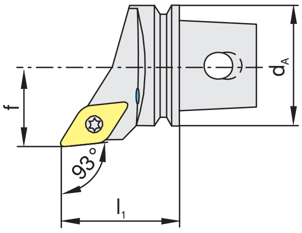
A303
A85-A86
A92

Turning / Tools ext.

UTS SDJC...

MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]		
40	UT40-SDJCR-11	R	40	27	DC.. 11T3..	E01
40	UT40-SDJCL-11	L	40	27	DC.. 11T3..	E01

						
E01	24647	26146	69294	194263	69293	29278

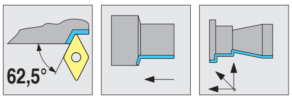
A303

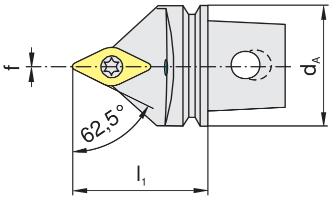
A85-A86

A92

UTS SDNC...

MaxiLock S





Picture shows right-hand version

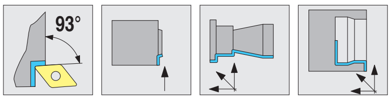
d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]		
40	UT40-SDNCN-11	N	40	0	DC.. 11T3..	E01

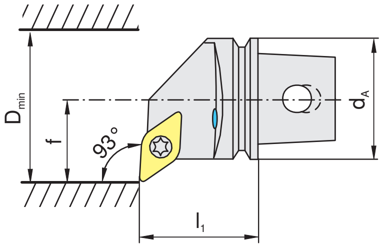
						
E01	24647	26146	69294	194263	69293	29278

A303	A85-A86	A92

UTS SDUC...

MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	D_{min} [mm]	f [mm]		
40	UT40-SDUCL-11	L	40	49	27	DC.. 11T3..	E01
50	UT50-SDUCR-11	R	50	64	35	DC.. 11T3..	E02
50	UT50-SDUCL-11	L	50	64	35	DC.. 11T3..	E02

						
E01	24647	26146	69294	194263	69293	29278
E02	54981	26146	69294	225429	69293	29278

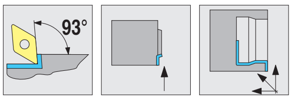
A303

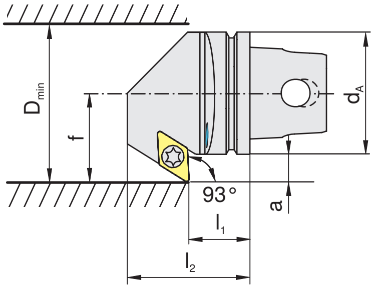
A85-A86

A92

UTS SDXC...

MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	D_{min} [mm]	f [mm]	a [mm]		
40	UT40-SDXCR-11	R	20	40	52	29	9.00	DC.. 11T3..	E01

						
E01	54981	26146	69294	194263	69293	29278

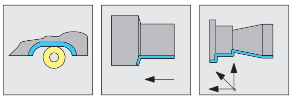
A303

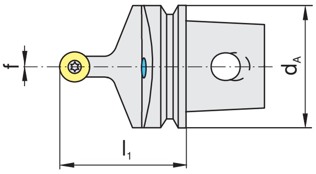
A85-A86

A92

UTS SRDC...

MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]		
40	UT40-SRDCN-10	N	40	0	RC.. 1003..	E01

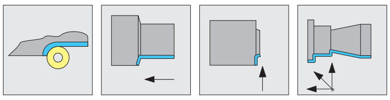
						
E01	24647	24838	69294	194263	69293	36305

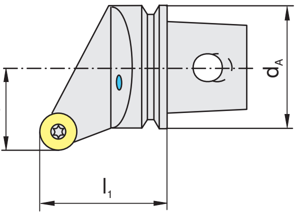
A303

A87

UTS SRGC...

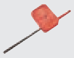
MaxiLock S





Picture shows right-hand version

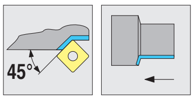
d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]	◎	🔧
40	UT40-SRGCR-06	R	40	27	RC.. 0602..	E01
40	UT40-SRGCL-06	L	40	27	RC.. 0602..	E01
40	UT40-SRGCR-08	R	40	27	RC.. 0803..	E02
40	UT40-SRGCL-08	L	40	27	RC.. 0803..	E02
40	UT40-SRGCR-10	R	40	27	RC.. 1003..	E03

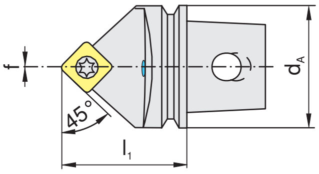
🔧							
E01	24645			194263		24643	29280
E02	77613			194263		24643	82272
E03	24647	24838	69294	194263	69293		36305

🔧	◎
A303	A87

UTS SSDC...

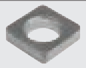
MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]	◻	🔧
40	UT40-SSDCN-12	N	40	0	SC.. 1204..	E01

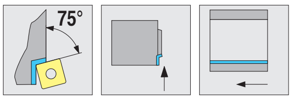
🔧						
E01	54981	69199	69296	194263	69293	82270

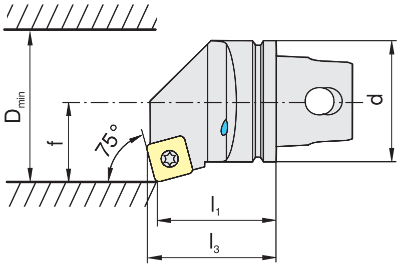
🔧 A303

◻ A88

UTS SSKC...

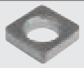
MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_3 [mm]	D_{min} [mm]	f [mm]	□	🔧
40	UT40-SSKCL-12	L	40	44.0	54	27	SC.. 1204..	E01

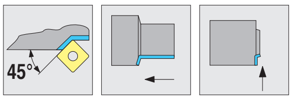
🔧						
E01	54981	69199	69296	194263	69293	82270

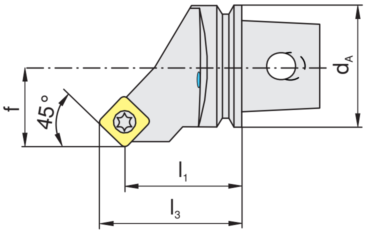
🔧 A303

□ A88

UTS SSSC...

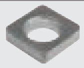
MaxiLock S





Picture shows right-hand version

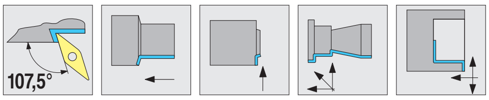
d_A [mm]	Type, description	L N R	l_1 [mm]	l_3 [mm]	f [mm]	▢	🔧
40	UT40-SSSCR-12	R	40	48.0	27	SC.. 1204..	E01
40	UT40-SSSCL-12	L	40	48.0	27	SC.. 1204..	E01

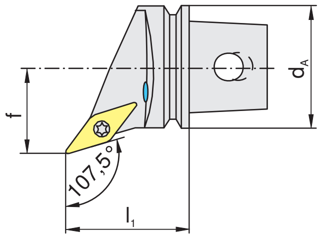
🔧						
E01	54981	69199	69296	194263	69293	82270

🔧	▢
A303	A88

UTS SVHC...

MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]		
40	UT40-SVHCR-16	R	40	27	VC.. 1604..	E01
40	UT40-SVHCL-16	L	40	27	VC.. 1604..	E01
63	UT63-SVHCR-16	R	60	43	VC.. 1604..	E02
63	UT63-SVHCL-16	L	60	43	VC.. 1604..	E02

						
E01	24647	37493 / 26147	69294	194263	69293	29279 / 83343
E02	24647	37493 / 26147	69294	225430	69293	29279 / 83343

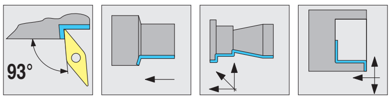
A303

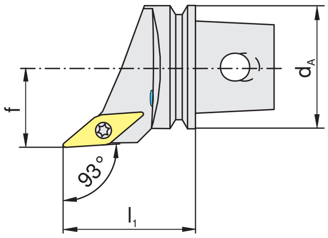
A90-A91

A92

UTS SVJC...

MaxiLock S





Picture shows right-hand version

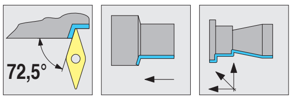
d_A [mm]	Type, description	LNR	l_1 [mm]	f [mm]		
40	UT40-SVJCR-16	R	45	27	VC.. 1604..	E01
40	UT40-SVJCL-16	L	45	27	VC.. 1604..	E01
50	UT50-SVJCR-16	R	50	35	VC.. 1604..	E02
50	UT50-SVJCL-16	L	50	35	VC.. 1604..	E02
63	UT63-SVJCR-16	R	60	43	VC.. 1604..	E03
63	UT63-SVJCL-16	L	60	43	VC.. 1604..	E03

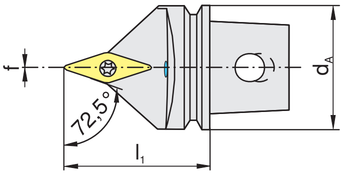
						
E01	24647	26147 / 37493	69294	194263	69293	29279 / 83343
E02	24647	26147 / 37493	69294	225429	69293	83343 / 29279
E03	24647	26147 / 37493	69294	225430	69293	29279 / 83343

A303	A90-A91	A92

UTS SVVC...

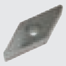
MaxiLock S





Picture shows right-hand version

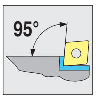
d_A [mm]	Type, description	L N R	l_1 [mm]	f [mm]		
40	UT40-SVVCN-16	N	45	0	VC.. 1604..	E01

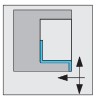
						
E01	24647	37493 / 26147	69294	194263	69293	83343

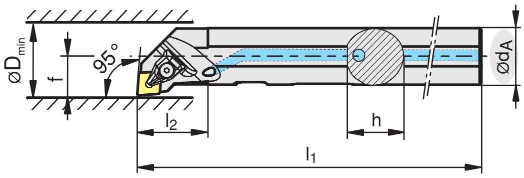
A303 A90-A91 A92

DCLN...

MaxiLock D

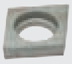
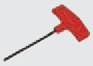






Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
20	A20Q DCLNL 09	L	19	180	35	13	25	CN.. 0903..	E01
20	A20Q DCLNR 09	R	19	180	35	13	25	CN.. 0903..	E01
25	A25R DCLNL 12	L	24	200	36	17	32	CN.. 1204..	E02
25	A25R DCLNR 12	R	24	200	36	17	32	CN.. 1204..	E02
32	A32S DCLNL 12	L	31	250	40	22	40	CN.. 1204..	E03
32	A32S DCLNR 12	R	31	250	40	22	40	CN.. 1204..	E03
40	A40T DCLNL 12	L	39	300	45	27	50	CN.. 1204..	E03
40	A40T DCLNR 12	R	39	300	45	27	50	CN.. 1204..	E03
50	A50U DCLNL 16	L	47	350	45	35	63	CN.. 1606..	E04

				
E01	11227306	11227305	11577861	11227314
E02	11224545	11224494		11224503
E03	11224545	11224494	11211558	11224503
E04	11227322	11227318	11227315	11227323

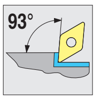
A303

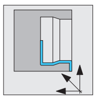
A63-A66

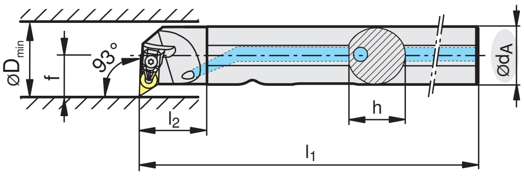
A79

DDUN...

MaxiLock D







Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
25	A25R DDUNL 11	L	24	200	30	17	32	DN.. 1104..	E01
25	A25R DDUNR 11	R	24	200	30	17	32	DN.. 1104..	E01
32	A32S DDUNL 11	L	31	250	40	22	40	DN.. 1104..	E01
32	A32S DDUNR 11	R	31	250	40	22	40	DN.. 1104..	E01
40	A40T DDUNL 15	L	39	300	45	27	50	DN.. 1506..	E02
40	A40T DDUNR 15	R	39	300	45	27	50	DN.. 1506..	E02

				
E01	11258694	11227305	11227308	11227314
E02	11224545	11224494	11211562	11224503

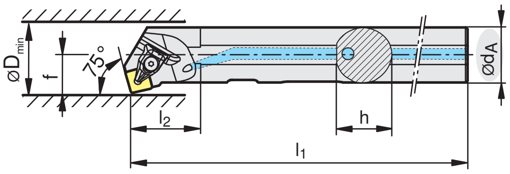
A303

A67-A69

A79

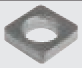
DSKN...

MaxiLock D



Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
32	A32S DSKNL 12	L	31	250	40	22	40	SN.. 1204..	E01
32	A32S DSKNR 12	R	31	250	40	22	40	SN.. 1204..	E01

				
E01	11224545	11224494	11211561	11224503

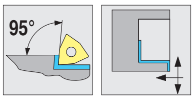
A303

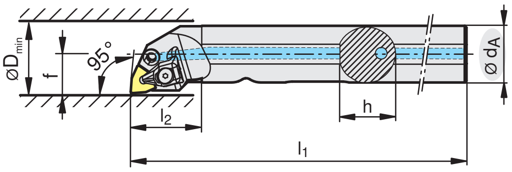
A70-A72

A80

DWLN...

MaxiLock D



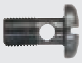
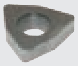
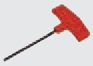


▨ Version A with coolant hole

▨ Version S without coolant hole

Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
25	A25R DWLNL 06	L	24	200	32	17	32	WN.. 0604..	E01
25	A25R DWLNR 06	R	24	200	32	17	32	WN.. 0604..	E01
32	A32S DWLNL 08	L	31	250	40	22	40	WN.. 0804..	E02
32	A32S DWLNR 08	R	31	250	40	22	40	WN.. 0804..	E02
40	A40T DWLNL 08	L	39	300	45	27	50	WN.. 0804..	E02
40	A40T DWLNR 08	R	39	300	45	27	50	WN.. 0804..	E02
25	S25T DWLNR 08	R	23	300	40	17	32	WN.. 0804..	E03
32	S32U DWLNR 08	R	30	350	40	22	40	WN.. 0804..	E04
40	S40V DWLNR 08	R	38	400	45	27	50	WN.. 0804..	E04

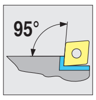
					
E01	11227306	11232874	11227305	11227310	11227314
E02	11224545	11232874	11224494	11211563	11224503
E03	11224545				11224503
E04	11224545		11224494	11211563	11224503

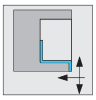
A303

A77-A78

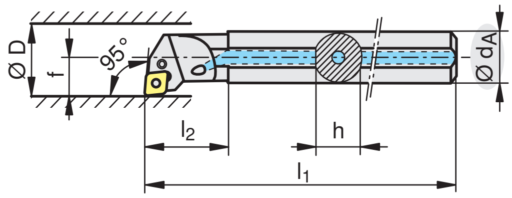
PCLN...

MaxiLock N





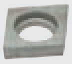
Picture shows right-hand version



◉ Version A with coolant hole

▨ Version S without coolant hole

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
25	A25R PCLNL 12	L	23	200	36	17	32	CN.. 1204..	E01
25	A25R PCLNR 12	R	23	200	36	17	32	CN.. 1204..	E01
32	A32S PCLNL 12	L	30	250	50	22	40	CN.. 1204..	E01
32	A32S PCLNR 12	R	30	250	50	22	40	CN.. 1204..	E01
40	A40T PCLNL 12	L	38	300	60	27	50	CN.. 1204..	E02
40	A40T PCLNR 12	R	38	300	60	27	50	CN.. 1204..	E02
25	S25T PCLNL 12	L	23	300	22	17	32	CN.. 1204..	E01
25	S25T PCLNR 12	R	23	300	22	17	32	CN.. 1204..	E01
32	S32U PCLNL 12	L	30	350	24.1	22	40	CN.. 1204..	E01
32	S32U PCLNR 12	R	30	350	24.1	22	40	CN.. 1204..	E01
40	S40V PCLNL 12	L	38	400	24.1	27	50	CN.. 1204..	E02
40	S40V PCLNR 12	R	38	400	24.1	27	50	CN.. 1204..	E02
50	S50W PCLNL 16	L	47	450	31	35	63	CN.. 1606..	E03
50	S50W PCLNR 16	R	47	450	31	35	63	CN.. 1606..	E03

							
E01	59442	59568	59437	59430	86176	4771	140586
E02	59446	59568	59437	59430	86176	4771	140587
E03	59443	59451	59438	59426	86177	4771	140589

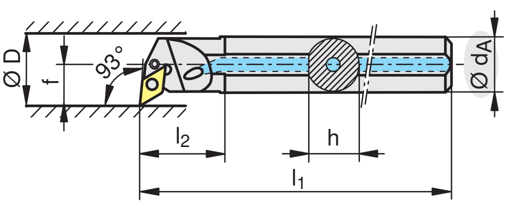
A303

A63-A66

A79

PDUN...

MaxiLock N



Version A with coolant hole

Version S without coolant hole

Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
20	A20Q PDUNL 11	L	18.5	180		16	28	DN.. 1104..	E01
20	A20Q PDUNR 11	R	18.5	180		16	28	DN.. 1104..	E01
25	A25R PDUNL 11	L	23	200		18.5	32	DN.. 1104..	E02
25	A25R PDUNR 11	R	23	200		18.5	32	DN.. 1104..	E02
32	A32S PDUNL 11	L	30	250		22	40	DN.. 1104..	E02
32	A32S PDUNR 11	R	30	250		22	40	DN.. 1104..	E02
32	A32S PDUNL 15	L	30	250	50	22	40	DN.. 1506..	E03
32	A32S PDUNR 15	R	30	250	50	22	40	DN.. 1506..	E03
40	A40T PDUNL 15	L	38	300	60	27	50	DN.. 1506..	E03
40	A40T PDUNR 15	R	38	300	60	27	50	DN.. 1506..	E03
50	S50W PDUNL 15	L	47	450		35	63	DN.. 1506..	E03
50	S50W PDUNR 15	R	47	450		35	63	DN.. 1506..	E03

							
E01	293145			293144		4770	293152
E02	59445	293140	293147	293143	86174	4770	293151
E03	59443	59570	59437	59432	86176	4771	140591

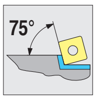
A303

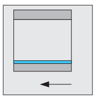
A67-A69

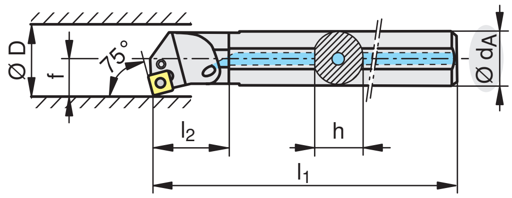
A79

PSKN...

MaxiLock N

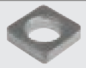






Picture shows right-hand version

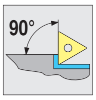
dA [mm]	Type, description	L N R	h [mm]	l1 [mm]	l2 [mm]	f [mm]	Dmin [mm]	⊡	🔧
25	A25R PSKNL 12	L	23	200	36	17	32	SN.. 1204..	E01
25	A25R PSKNR 12	R	23	200	36	17	32	SN.. 1204..	E01
32	A32S PSKNL 12	L	30	250	50	22	40	SN.. 1204..	E01
32	A32S PSKNR 12	R	30	250	50	22	40	SN.. 1204..	E01
40	A40T PSKNL 12	L	38	300	60	27	50	SN.. 1204..	E02
40	A40T PSKNR 12	R	38	300	60	27	50	SN.. 1204..	E02

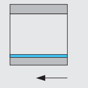
🔧							
E01	59442	59547	59437	59430	86176	4771	140594
E02	59446	59547	59437	59430	86176	4771	140595

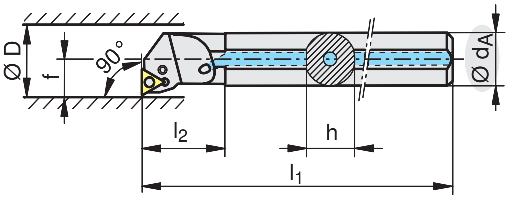
A303
A70-A72
A80

PTFN...

MaxiLock N







▨ Version A with coolant hole

▨ Version S without coolant hole

Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]	△	
16	A16M PTFNL 11	L	15	150	29	11	20	TN.. 1103..	E01
16	A16M PTFNR 11	R	15	150	29	11	20	TN.. 1103..	E01
20	A20Q PTFNL 11	L	18.5	180	32	13	25	TN.. 1103..	E01
20	A20Q PTFNR 11	R	18.5	180	32	13	25	TN.. 1103..	E01
25	A25R PTFNL 16	L	23	200	36	17	32	TN.. 1604..	E02
25	A25R PTFNR 16	R	23	200	36	17	32	TN.. 1604..	E02
32	A32S PTFNL 16	L	30	250	50	22	40	TN.. 1604..	E02
32	A32S PTFNR 16	R	30	250	50	22	40	TN.. 1604..	E02
25	S25T PTFNR 16	R	23	300	17.5	17	32	TN.. 1604..	E02
40	A40T PTFNL 22	L	38	300	60	27	50	TN.. 2204..	E03
40	A40T PTFNR 22	R	38	300	60	27	50	TN.. 2204..	E03
50	S50W PTFNR 22	R	47	450	35	35	63	TN.. 2204..	E03

							
E01	59444			59427		4773	140600
E02	59445	59556	59436	59429	86174	4770	140601
E03	59446	59557	59437	59430	86176	4771	140602

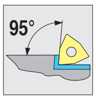
A303

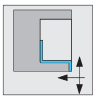
△ A73-A75

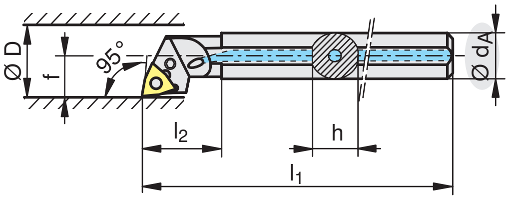
△ A80

PWLN...

MaxiLock N

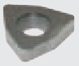






Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
16	A16M PWLNL 06	L	15	150		11	21	WN.. 0604..	E01
16	A16M PWLNR 06	R	15	150		11	21	WN.. 0604..	E01
20	A20Q PWLNL 06-1	L	19	180		13	25	WN.. 0604..	E01
20	A20Q PWLNR 06-1	R	19	180		13	25	WN.. 0604..	E01
25	A25R PWLNL 06	L	23	200		17	32	WN.. 0604..	E02
25	A25R PWLNR 06	R	23	200		17	32	WN.. 0604..	E02
32	A32S PWLNL 06	L	30	250		22	40	WN.. 0604..	E02
32	A32S PWLNR 06	R	30	250		22	40	WN.. 0604..	E02
32	A32S PWLNL 08	L	30	250	50	22	40	WN.. 0804..	E03
32	A32S PWLNR 08	R	30	250	50	22	40	WN.. 0804..	E03
40	A40T PWLNL 08	L	38	300	60	27	50	WN.. 0804..	E03
40	A40T PWLNR 08	R	38	300	60	27	50	WN.. 0804..	E03

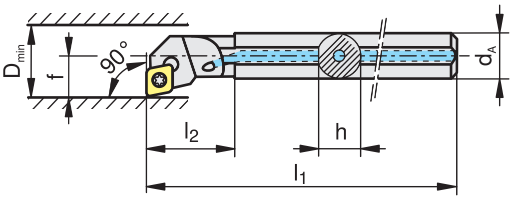
							
E01	310913			293141		4773	293150
E02	59445	293139	293147	59429	86174	4770	293148
E03	59446	218151	59437	59430	86176	4771	222127

A303

A77-A78

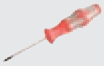
SCFC...

MaxiLock S



Picture shows right-hand version

d$_A$ [mm]	Type, description	L N R	h [mm]	l$_1$ [mm]	l$_2$ [mm]	f [mm]	D$_{min}$ [mm]		
8	A08F SCFCR 06	R	7.6	80	17	5	11	CC.. 0602..	E01
8	A08F SCFCL 06	L	7.6	80	17	5	11	CC.. 0602..	E01
10	A10H SCFCR 06	R	9.5	100	19	7	13	CC.. 0602..	E01
10	A10H SCFCL 06	L	9.5	100	19	7	13	CC.. 0602..	E01
12	A12K SCFCR 06	R	11.5	125	22	9	16	CC.. 0602..	E01
12	A12K SCFCL 06	L	11.5	125	22	9	16	CC.. 0602..	E01

			
E01	76913	8095010200	82274

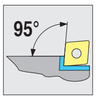
A303

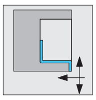
A82-A84

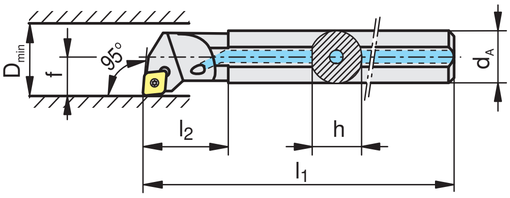
A92

SCLC...

MaxiLock S





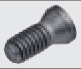
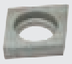


Version A with coolant hole

Version S without coolant hole

Picture shows right-hand version

dA [mm]	Type, description	L N R	h [mm]	l1 [mm]	l2 [mm]	f [mm]	Dmin [mm]		
8	A08F SCLCR 06	R	7.6	80	17	5	11	CC.. 0602..	E01
8	S08H SCLCR 06	R	7.2	100	8	5	11	CC.. 0602..	E01
8	A08F SCLCL 06	L	7.6	80	17	5	11	CC.. 0602..	E01
8	S08H SCLCL 06	L	7.2	100	8	5	11	CC.. 0602..	E01
10	A10H SCLCR 06	R	9.5	100	19	7	13	CC.. 0602..	E01
10	S10K SCLCR 06	R	9	125	10	7	13	CC.. 0602..	E01
10	A10H SCLCL 06	L	9.5	100	19	7	13	CC.. 0602..	E01
10	S10K SCLCL 06	L	9	125	10	7	13	CC.. 0602..	E01
12	A12K SCLCR 06	R	11.5	125	22	9	16	CC.. 0602..	E01
12	S12Q SCLCR 06	R	11	180	10	9	16	CC.. 0602..	E01
12	A12K SCLCL 06	L	11.5	125	22	9	16	CC.. 0602..	E01
12	S12Q SCLCL 06	L	11	180	10	9	16	CC.. 0602..	E01
16	A16M SCLCR 09	R	15	150	29	11	20	CC.. 09T3..	E02
16	S16R SCLCR 09	R	14.5	200	16	11	20	CC.. 09T3..	E02
16	A16M SCLCL 09	L	15	150	29	11	20	CC.. 09T3..	E02
16	S16R SCLCL 09	L	14.5	200	16	11	20	CC.. 09T3..	E02
20	A20Q SCLCR 09	R	18.5	180	32	13	25	CC.. 09T3..	E03
20	S20S SCLCR 09	R	18	250	16	13	25	CC.. 09T3..	E02
20	A20Q SCLCL 09	L	18.5	180	32	13	25	CC.. 09T3..	E03
20	S20S SCLCL 09	L	18	250	16	13	25	CC.. 09T3..	E02
25	A25R SCLCR 09	R	23	200	36	17	32	CC.. 09T3..	E03
25	S25T SCLCR 09	R	23	300	16	17	32	CC.. 09T3..	E04
25	A25R SCLCL 09	L	23	200	36	17	32	CC.. 09T3..	E03
25	S25T SCLCL 09	L	23	300	16	17	32	CC.. 09T3..	E04
32	A32S SCLCR 12	R	30	250	50	22	40	CC.. 1204..	E05
32	A32S SCLCL 12	L	30	250	50	22	40	CC.. 1204..	E05
40	A40T SCLCR 12	R	38	300	60	27	50	CC.. 1204..	E05
40	A40T SCLCL 12	L	38	300	60	27	50	CC.. 1204..	E05

						
E01	76913				8095010200	82274
E02	54976				8095010500	82275
E03	165795				8095010500	183936
E04	24647				8095010500	82271
E05	54981	61006	69296	69293		74208

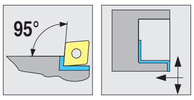
A303

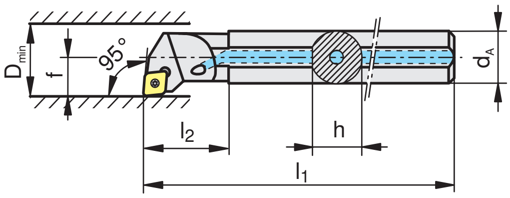
A82-A84

A92

SCLC... with carbide shank

MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
8	E08H SCLCR 06	R	7.6	100		6	11	CC.. 0602..	E01
8	E08H SCLCL 06	L	7.6	100		6	11	CC.. 0602..	E01
10	E10K SCLCR 06	R	9	125	10	7	13	CC.. 0602..	E01
10	E10K SCLCL 06	L	9	125	10	7	13	CC.. 0602..	E01
12	E12Q SCLCR 06	R	11.5	180	10	9	16	CC.. 0602..	E01
12	E12Q SCLCL 06	L	11.5	180	10	9	16	CC.. 0602..	E01
16	E16R SCLCR 09	R	15	200	16	11	20	CC.. 09T3..	E02
16	E16R SCLCL 09	L	15	200	16	11	20	CC.. 09T3..	E02
20	E20S SCLCR 09	R	18.5	250	16	13	25	CC.. 09T3..	E03
20	E20S SCLCL 09	L	18.5	250	16	13	25	CC.. 09T3..	E03
25	E25T SCLCR 09	R	23	300	16	17	32	CC.. 09T3..	E04
25	E25T SCLCL 09	L	23	300	16	17	32	CC.. 09T3..	E04

			
E01	76913	8095010200	82274
E02	54976	8095010500	82275
E03	165795	8095010500	183936
E04	24647	8095010500	82271

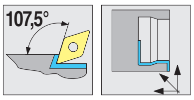
A303

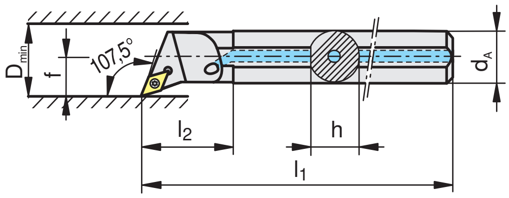
A82-A84

A92

SDQC...

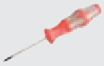
MaxiLock S





Picture shows right-hand version

dA [mm]	Type, description	L N R	h [mm]	l1 [mm]	l2 [mm]	f [mm]	Dmin [mm]		
12	A12K SDQCR 07	R	11.5	125	22	9	16	DC.. 0702..	E01
12	A12K SDQCL 07	L	11.5	125	22	9	16	DC.. 0702..	E01
16	A16M SDQCR 07	R	15	150	29	11	20	DC.. 0702..	E01
16	A16M SDQCL 07	L	15	150	29	11	20	DC.. 0702..	E01
20	A20Q SDQCR 07	R	18.5	180	32	13	25	DC.. 0702..	E01
20	A20Q SDQCL 07	L	18.5	180	32	13	25	DC.. 0702..	E01
25	A25R SDQCR 11	R	23	200	36	17	32	DC.. 11T3..	E02
25	A25R SDQCL 11	L	23	200	36	17	32	DC.. 11T3..	E02
32	A32S SDQCR 11	R	30	250	50	22	40	DC.. 11T3..	E03
32	A32S SDQCL 11	L	30	250	50	22	40	DC.. 11T3..	E03
40	A40T SDQCR 11	R	38	300	60	27	50	DC.. 11T3..	E03
40	A40T SDQCL 11	L	38	300	60	27	50	DC.. 11T3..	E03

						
E01	24645				8095010200	29280
E02	165795				8095010500	183936
E03	24647	26146	69294	69293		29278

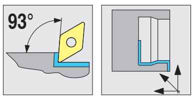
A303

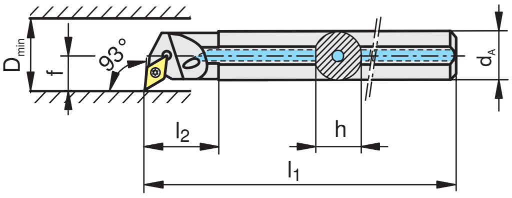
A85-A86

A92

SDUC...

MaxiLock S



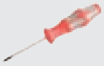


▨ Version A with coolant hole

▨ Version S without coolant hole

Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
12	A12K SDUCR 07	R	11.5	125	22	9	16	DC.. 0702..	E01
12	S12Q SDUCR 07	R	11	180	12.5	9	16	DC.. 0702..	E01
12	A12K SDUCL 07	L	11.5	125	22	9	16	DC.. 0702..	E01
12	S12Q SDUCL 07	L	11	180	12.5	9	16	DC.. 0702..	E01
16	A16M SDUCR 07	R	15	150	29	11	20	DC.. 0702..	E01
16	S16R SDUCR 07	R	14.5	200	16.5	11	20	DC.. 0702..	E01
16	A16M SDUCL 07	L	15	150	29	11	20	DC.. 0702..	E01
16	S16R SDUCL 07	L	14.5	200	16.5	11	20	DC.. 0702..	E01
20	A20Q SDUCR 07	R	18.5	180	32	13	25	DC.. 0702..	E01
20	S20S SDUCR 07	R	18	250	20.5	13	25	DC.. 0702..	E01
20	A20Q SDUCL 07	L	18.5	180	32	13	25	DC.. 0702..	E01
20	A20Q SDUCR 11	R	18.5	180	32	13	25	DC.. 11T3..	E02
20	S20S SDUCR 11	R	18	250	16	13	25	DC.. 11T3..	E03
20	A20Q SDUCL 11	L	18.5	180	32	13	25	DC.. 11T3..	E04
25	A25R SDUCR 11	R	23	200	36	17	32	DC.. 11T3..	E04
25	S25T SDUCR 11	R	23	300	26	17	32	DC.. 11T3..	E05
25	A25R SDUCL 11	L	23	200	36	17	32	DC.. 11T3..	E04
25	S25T SDUCL 11	L	23	300	26	17	32	DC.. 11T3..	E05
32	A32S SDUCR 11	R	30	250	50	22	40	DC.. 11T3..	E05
32	S32U SDUCR 11	R	30	350	33	22	40	DC.. 11T3..	E05
32	A32S SDUCL 11	L	30	250	50	22	40	DC.. 11T3..	E05
40	A40T SDUCR 11	R	38	300	60	27	50	DC.. 11T3..	E05
40	A40T SDUCL 11	L	38	300	60	27	50	DC.. 11T3..	E05

						
E01	24645				8095010200	29280
E02	54976				8095010500	183936
E03	54976				8095010500	82275
E04	165795				8095010500	183936
E05	24647	26146	69294	69293		29278

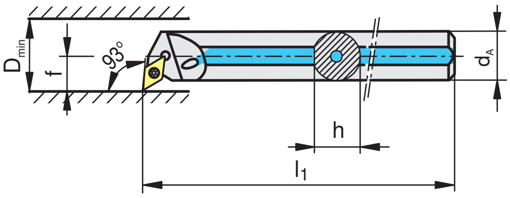
A303

A85-A86

A92

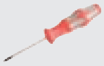
SDUC... with carbide shank

MaxiLock S



Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	f [mm]	D_{min} [mm]		
12	E12Q SDUCR 07	R	11.5	180	9	16	DC.. 0702..	E01
12	E12Q SDUCL 07	L	11.5	180	9	16	DC.. 0702..	E01
16	E16R SDUCR 07	R	15	200	11	20	DC.. 0702..	E01
16	E16R SDUCL 07	L	15	200	11	20	DC.. 0702..	E01
20	E20S SDUCR 11	R	18.5	250	13	25	DC.. 11T3..	E02
20	E20S SDUCL 11	L	18.5	250	13	25	DC.. 11T3..	E02
25	E25T SDUCR 11	R	23	300	17	32	DC.. 11T3..	E03
25	E25T SDUCL 11	L	23	300	17	32	DC.. 11T3..	E03

			
E01	24645	8095010200	29280
E02	165795	8095010500	183936
E03	24647	8095010500	82271

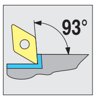
A303

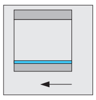
A85-A86

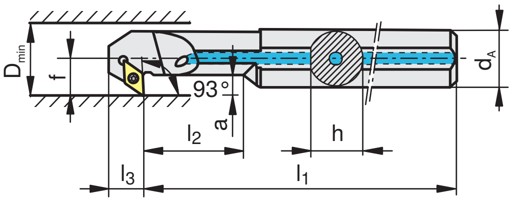
A92

SDXC...

MaxiLock S

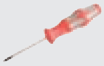






Picture shows right-hand version

dA [mm]	Type, description	L N R	l1 [mm]	l2 [mm]	l3 [mm]	d2 [mm]	Dmin [mm]	f [mm]	a [mm]		
12	A12K SDXCR 07	R	125		12.0		16	9	4.00	DC.. 0702..	E01
12	A12K SDXCL 07	L	125		12.0		16	9	4.00	DC.. 0702..	E01
16	A16M SDXCR 07	R	150		12.0		20	11	4.00	DC.. 0702..	E01
16	A16M SDXCL 07	L	150		12.0		20	11	4.00	DC.. 0702..	E01
20	A20Q SDXCR 11	R	180		16.5		25	13	6.20	DC.. 11T3..	E02
20	A20Q SDXCL 11	L	180		16.5		25	13	6.20	DC.. 11T3..	E02
25	A25R SDXCR 11	R	200		16.8		32	17	9.20	DC.. 11T3..	E02
25	A25R SDXCL 11	L	200		16.8		32	17	9.20	DC.. 11T3..	E02

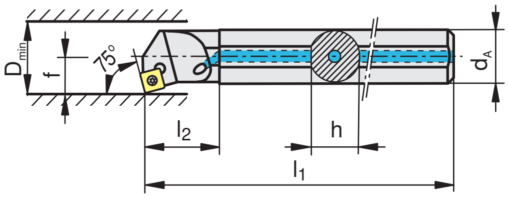
			
E01	24645	8095010200	29280
E02	165795	8095010500	183936

A303
A85-A86
A92

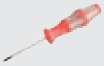
SSKC...

MaxiLock S

Picture shows right-hand version



d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
16	A16M SSKCR 09	R	15	150	29	11	20	SC.. 09T3..	E01
16	A16M SSKCL 09	L	15	150	29	11	20	SC.. 09T3..	E01
20	A20Q SSKCR 09	R	18.5	180	32	13	25	SC.. 09T3..	E02
20	A20Q SSKCL 09	L	18.5	180	32	13	25	SC.. 09T3..	E02
25	A25R SSKCR 09	R	23	200	36	17	32	SC.. 09T3..	E02
25	A25R SSKCL 09	L	23	200	36	17	32	SC.. 09T3..	E02

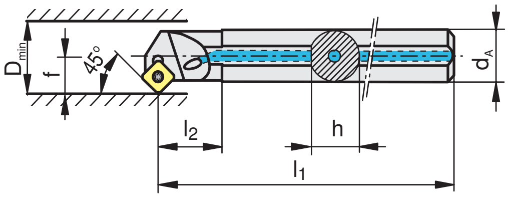
			
E01	54976	8095010500	82275
E02	165795	8095010500	183936

A303

A88

SSSC...

MaxiLock S

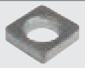
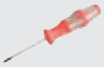


◉ Version A with coolant hole

▨ Version S without coolant hole

Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]	▢	
16	A16M SSSCR 09	R	15	150	29	11	20	SC.. 09T3..	E01
16	S16R SSSCR 09	R	14.5	200	8.4	11	20	SC.. 09T3..	E01
16	A16M SSSCL 09	L	15	150	29	11	20	SC.. 09T3..	E01
20	A20Q SSSCR 09	R	18.5	180	32	13	25	SC.. 09T3..	E02
20	A20Q SSSCL 09	L	18.5	180	32	13	25	SC.. 09T3..	E02
25	A25R SSSCR 09	R	23	200	36	17	32	SC.. 09T3..	E02
25	A25R SSSCL 09	L	23	200	36	17	32	SC.. 09T3..	E02
32	A32S SSSCR 12	R	30	250	50	22	40	SC.. 1204..	E03
32	A32S SSSCL 12	L	30	250	50	22	40	SC.. 1204..	E03
40	A40T SSSCR 12	R	38	300	60	27	50	SC.. 1204..	E03
40	A40T SSSCL 12	L	38	300	60	27	50	SC.. 1204..	E03

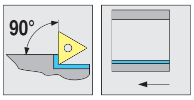
						
E01	54976				8095010500	82275
E02	165795				8095010500	183936
E03	54981	69199	69296	69293		82270

A303

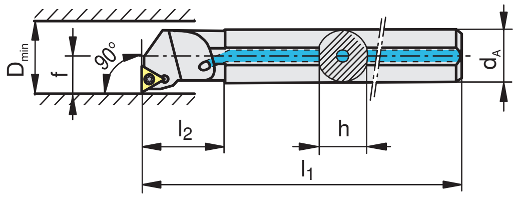
A88

STFC...

MaxiLock S



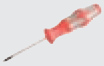
Picture shows right-hand version



▨ Version A with coolant hole

▨ Version S without coolant hole

dA [mm]	Type, description	L N R	h [mm]	l1 [mm]	l2 [mm]	f [mm]	Dmin [mm]	△	🪛
10	A10H STFCR 09	R	9.5	100	19	7	13	TC.. 0902..	E01
10	A10H STFCL 09	L	9.5	100	19	7	13	TC.. 0902..	E01
12	A12K STFCR 11	R	11.5	125	22	9	16	TC.. 1102..	E02
12	A12K STFCL 11	L	11.5	125	22	9	16	TC.. 1102..	E02
16	A16M STFCR 11	R	15	150	29	11	20	TC.. 1102..	E02
16	S16R STFCR 11	R	14.5	200	13	11	20	TC.. 1102..	E02
16	A16M STFCL 11	L	15	150	29	11	20	TC.. 1102..	E02
20	A20Q STFCR 11	R	18.5	180	32	13	25	TC.. 1102..	E02
20	S20S STFCR 11	R	18	250	13	13	25	TC.. 1102..	E02
20	A20Q STFCL 11	L	18.5	180	32	13	25	TC.. 1102..	E02
25	A25R STFCR 16	R	23	200	36	17	32	TC.. 16T3..	E03
25	A25R STFCL 16	L	23	200	36	17	32	TC.. 16T3..	E03
32	A32S STFCR 16	R	30	250	50	22	40	TC.. 16T3..	E03
32	A32S STFCL 16	L	30	250	50	22	40	TC.. 16T3..	E03
40	A40T STFCR 16	R	38	300	60	27	50	TC.. 16T3..	E03
40	A40T STFCL 16	L	38	300	60	27	50	TC.. 16T3..	E03

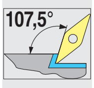
🪛						
E01	56652				8095010100	82273
E02	24645				8095010200	29280
E03	24647	69209	69294	69293		82758

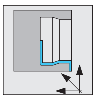
🪛 A303

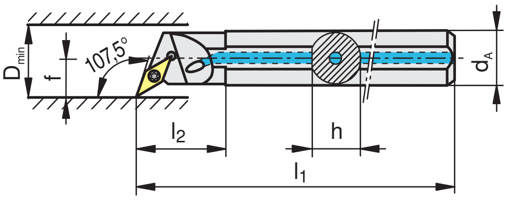
△ A89

SVQC...

MaxiLock S

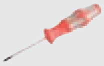






Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
16	A16M SVQCR 11	R	15	150	29	11	20	VC.. 1103..	E01
16	A16M SVQCL 11	L	15	150	29	11	20	VC.. 1103..	E01
20	A20Q SVQCR 11	R	18.5	180	32	13	25	VC.. 1103..	E01
20	A20Q SVQCL 11	L	18.5	180	32	13	25	VC.. 1103..	E01
25	A25R SVQCR 11	R	23	200	36	17	32	VC.. 1103..	E01
25	A25R SVQCL 11	L	23	200	36	17	32	VC.. 1103..	E01
32	A32S SVQCR 16	R	30	250	50	22	40	VC.. 1604..	E02
32	A32S SVQCL 16	L	30	250	50	22	40	VC.. 1604..	E02
40	A40T SVQCR 16	R	38	300	60	27	50	VC.. 1604..	E02
40	A40T SVQCL 16	L	38	300	60	27	50	VC.. 1604..	E02

						
E01	24645				8095010200	29280
E02	24647	26147	69294	69293		29279

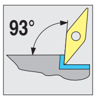
A303

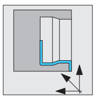
A90-A91

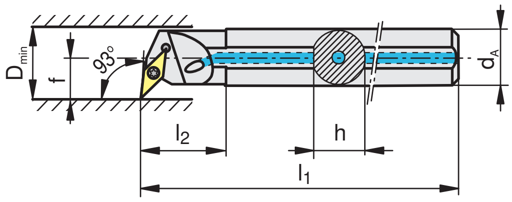
A92

SVUC...

MaxiLock S

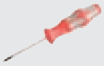






Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
16	A16M SVUCR 11	R	15	150	29	11	20	VC.. 1103..	E01
16	A16M SVUCL 11	L	15	150	29	11	20	VC.. 1103..	E01
20	A20Q SVUCR 11	R	18.5	180	32	13	25	VC.. 1103..	E01
20	A20Q SVUCL 11	L	18.5	180	32	13	25	VC.. 1103..	E01
25	A25R SVUCR 11	R	23	200	36	17	32	VC.. 1103..	E01
25	A25R SVUCL 11	L	23	200	36	17	32	VC.. 1103..	E01
32	A32S SVUCR 16	R	30	250	50	22	40	VC.. 1604..	E02
32	A32S SVUCL 16	L	30	250	50	22	40	VC.. 1604..	E02
40	A40T SVUCR 16	R	38	300	60	27	50	VC.. 1604..	E02
40	A40T SVUCL 16	L	38	300	60	27	50	VC.. 1604..	E02

						
E01	24645				8095010200	29280
E02	24647	26147	69294	69293		29279

A303

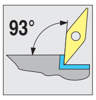
A90-A91

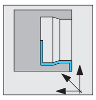
A92

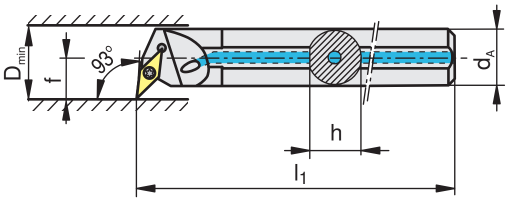
Turning / Tools int.

SVUC... with carbide shank

MaxiLock S

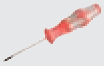






Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	f [mm]	D_{min} [mm]		
16	E16R SVUCR 11	R	15	200	11	20	VC.. 1103..	E01
16	E16R SVUCL 11	L	15	200	11	20	VC.. 1103..	E01
20	E20S SVUCR 11	R	18.5	250	13	25	VC.. 1103..	E01
20	E20S SVUCL 11	L	18.5	250	13	25	VC.. 1103..	E01
25	E25T SVUCR 11	R	23	300	17	32	VC.. 1103..	E01
25	E25T SVUCL 11	L	23	300	17	32	VC.. 1103..	E01

			
E01	24645	8095010200	29280

A303

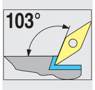
A90-A91

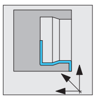
A92

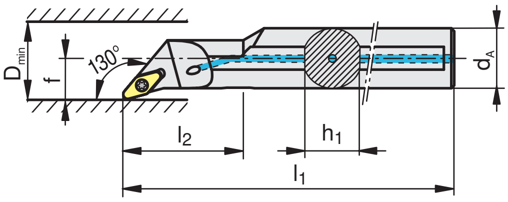
Turning / Tools int.

SVXC.../SVXP...

MaxiLock S

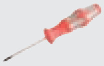






Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]		
40	A40S SVXCR 22	R	37	250	80	27	45	VC.. 2205..	E01
40	A40S SVXCL 22	L	37	250	80	27	45	VC.. 2205..	E01
40	A40S SVXPR 22-16	R	37	250	80	27	45	VP.. 2205..	E01
40	A40S SVXPL 22-16	L	37	250	80	27	45	VP.. 2205..	E01

			
E01	54981	194263	8095010500

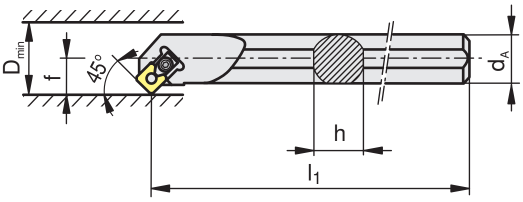
A303

A90-A91

A92

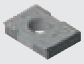
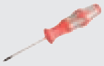
MSSC...

MaxiLock P



Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	f [mm]	D_{min} [mm]	○	
32	S32S MSSCR 12	R	30	250	22	40	SC.. 1204..	E01
32	S32S MSSCL 12	L	30	250	22	40	SC.. 1204..	E01

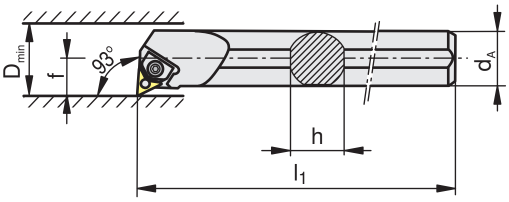
						
E01	4726	26139	5205	5660	8095010600	5664

A303

A96

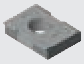
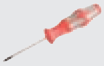
MTUC...

MaxiLock P



Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	f [mm]	D_{min} [mm]	△	
32	S32S MTUCR 16	R	30	250	22	40	TC.. 1604..	E01
32	S32S MTUCL 16	L	30	250	22	40	TC.. 1604..	E01
40	S40T MTUCR 16	R	38	300	27	50	TC.. 1604..	E01

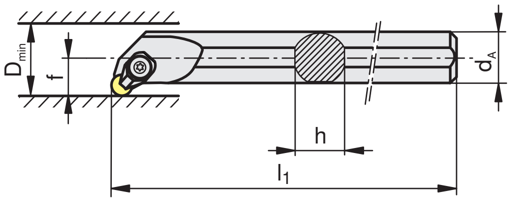
						
E01	4724	26137	5204	5658	8095010600	5662

A303

△ A96

CRSN...

Simplex N



Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	f [mm]	D_{min} [mm]	●	
32	S32U CRSNR 09	R	30	350	22	40	RN.. 0903..	E01

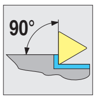
						
E01	4259	40187	4211	4261	8095010600	40505

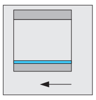
A303

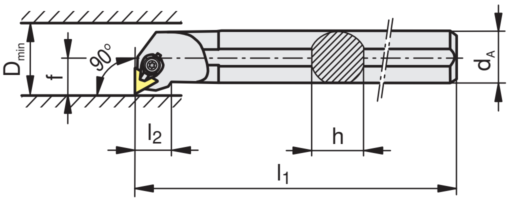
A99

CTFP...

Simplex P

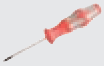






Picture shows right-hand version

d_A [mm]	Type, description	L N R	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]	D_{min} [mm]	△	🔧
12	S12Q CTFPR 11	R	11	180	15	9	16	TP.. 1103..	E01
12	S12Q CTFPL 11	L	11	180	15	9	16	TP.. 1103..	E01
16	S16R CTFPR 11	R	14.5	200	15	11	20	TP.. 1103..	E01
16	S16R CTFPL 11	L	14.5	200	15	11	20	TP.. 1103..	E01
20	S20S CTFPR 11	R	18	250	15	13	25	TP.. 1103..	E01
20	S20S CTFPL 11	L	18	250	15	13	25	TP.. 1103..	E01
25	S25T CTFPR 16	R	23	300	20	17	32	TP.. 1603..	E02
25	S25T CTFPL 16	L	23	300	20	17	32	TP.. 1603..	E02
32	S32U CTFPR 16	R	30	350	20	22	40	TP.. 1603..	E02
32	S32U CTFPL 16	L	30	350	20	22	40	TP.. 1603..	E02

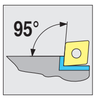
🔧						
E01	4524			4523	8095010500	4527
E02	4259	26126	4210	4261	8095010600	4294

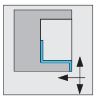
🔧 A303

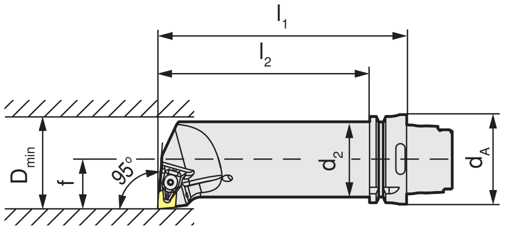
△ A105

HSK-T DCLN...

MaxiLock D

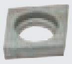






Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-50Q-DCLNR-12	R	175	149	50	63	35	CN.. 1204..	E01
63	HSK-T63-50Q-DCLNL-12	L	175	149	50	63	35	CN.. 1204..	E01

				
E01	11224545	11224494	11211558	11224503

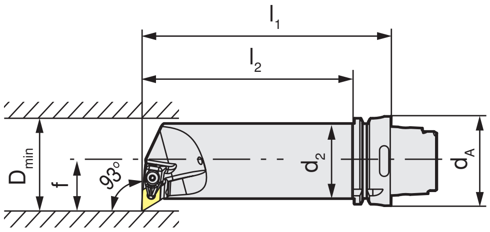
A303

A63-A66

A79

HSK-T DDUN...

MaxiLock D



Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]	◇	🔧
63	HSK-T63-50Q-DDUNR-15	R	175	149	50	63	35	DN.. 1506..	E01
63	HSK-T63-50Q-DDUNL-15	L	175	149	50	63	35	DN.. 1506..	E01

🔧				
E01	11224545	11224494	11211562	11224503

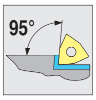
A303

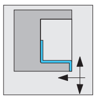
A67-A69

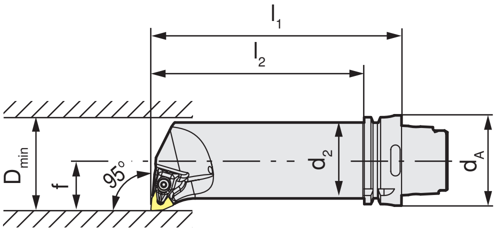
A79

HSK-T DWLN...

MaxiLock D

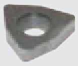






Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-50Q-DWLNR-08	R	175	149	50	63	35	WN.. 0804..	E01
63	HSK-T63-50Q-DWLNL-08	L	175	149	50	63	35	WN.. 0804..	E01

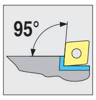
				
E01	11224545	11224494	11211563	11224503

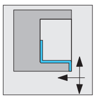
A303

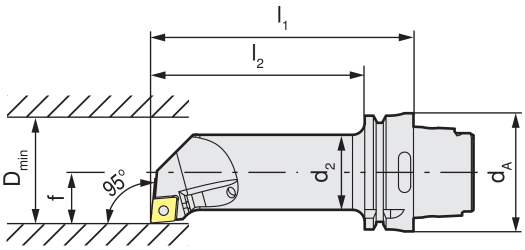
A77-A78

HSK-T SCLC...

MaxiLock S

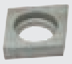






Picture shows right-hand version

dA [mm]	Type, description	L N R	l1 [mm]	l2 [mm]	d2 [mm]	Dmin [mm]	f [mm]		
63	HSK-T63-40L-SCLCR-12	R	140	114	40	50	27	CC.. 1204..	E01
63	HSK-T63-40L-SCLCL-12	L	140	114	40	50	27	CC.. 1204..	E01

					
E01	54981	61006	69296	69293	74208

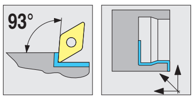
A303

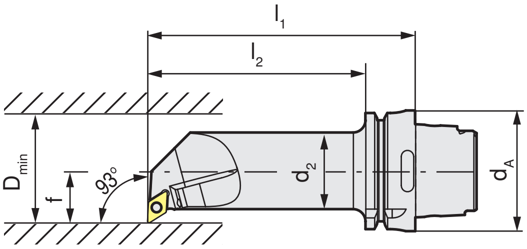
A82-A84

A92

HSK-T SDUC...

MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]	◇	
63	HSK-T63-40L-SDUCR-11	R	140	114	40	50	27	DC.. 11T3..	E01
63	HSK-T63-40L-SDUCL-11	L	140	114	40	50	27	DC.. 11T3..	E01

					
E01	24647	26146	69294	69293	29278

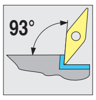
A303

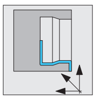
◇ A85-A86

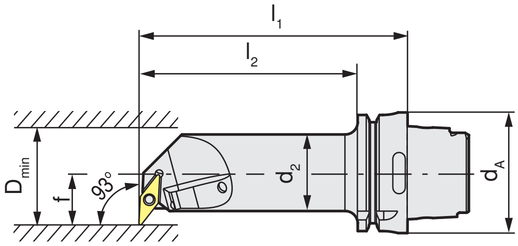
◇ A92

HSK-T SVUC...

MaxiLock S







Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
63	HSK-T63-40L-SVUCR-16	R	140	114	40	50	27	VC.. 1604..	E01
63	HSK-T63-40L-SVUCL-16	L	140	114	40	50	27	VC.. 1604..	E01

					
E01	24647	26147	69294	69293	29279

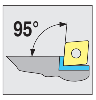
A303

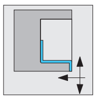
A90-A91

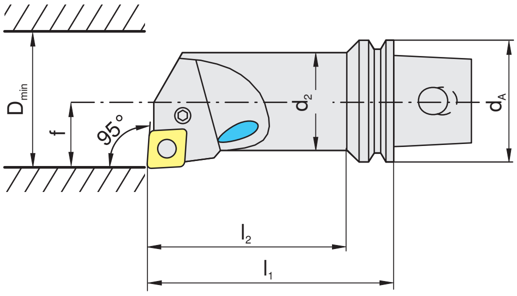
A92

UTS PCLN...

MaxiLock N

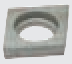






Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
40	UT40-25G-PCLNR-12	R	90	75	25	32	17	CN.. 1204..	E01
40	UT40-25G-PCLNL-12	L	90	75	25	32	17	CN.. 1204..	E01
40	UT40-32H-PCLNR-12	R	100	86	32	40	22	CN.. 1204..	E02
40	UT40-32H-PCLNL-12	L	100	86	32	40	22	CN.. 1204..	E01
50	UT50-40J-PCLNL-12	L	110	82	40	49	27	CN.. 1204..	E03
63	UT63-40J-PCLNL-12	L	110	82	40	49	27	CN.. 1204..	E04

								
E01	59442	59568	59437	59430	86176	194263	4771	140587
E02	59442	59568	59437	59430	86176	194263		
E03	59442	59568	59437	59430	86176	225429	4771	140586
E04	59446	59568	59437	59430	86176	225430	4771	140587

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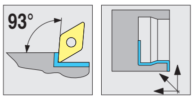
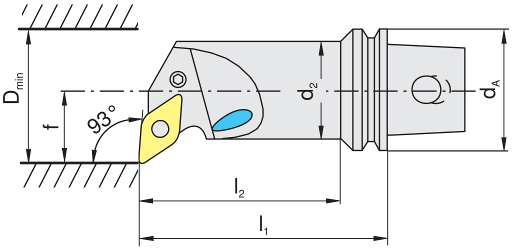
UTS PDUN...

MaxiLock N





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
40	UT40-25G-PDUNR-11	R	90	75	25	32	18.5	DN.. 1104..	E01
40	UT40-25G-PDUNL-11	L	90	75	25	32	18.5	DN.. 1104..	E01
40	UT40-32H-PDUNL-15	L	100	86	32	40	22	DN.. 1506..	E02
50	UT50-25G-PDUNL-11	L	90	70	25	32	18.5	DN.. 1104..	E03
50	UT50-40J-PDUNR-15	R	110	82	40	49	27	DN.. 1506..	E04
63	UT63-32H-PDUNR-15	R	100	66	32	40	22	DN.. 1506..	E05
63	UT63-40J-PDUNR-15	R	110	82	40	49	27	DN.. 1506..	E05

								
E01	59445	293140	293147	293143	86174	194263	4770	293151
E02	59443	59570	59437	59432	86176	194263	4771	140591
E03	59445	293140	293147	293143	86174	225429	4770	293151
E04	59443	59570	59437	59432	86176	225429	4771	140591
E05	59443	59570	59437	59432	86176	225430	4771	140591

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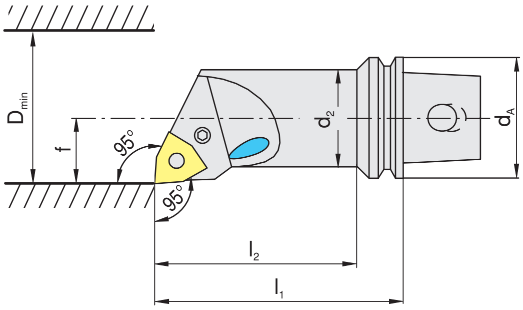
A79

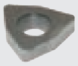
UTS PWLN...

MaxiLock N



Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
40	UT40-25G-PWLNL-06	L	90	75	25	35	17	WN.. 0604..	E01
40	UT40-32H-PWLNR-08	R	100	86	32	49	22	WN.. 0804..	E02
40	UT40-32H-PWLNL-08	L	100	86	32	49	22	WN.. 0804..	E02
50	UT50-40J-PWLNL-08	L	110	82	40	49	27	WN.. 0804..	E03
63	UT63-40J-PWLNR-08	R	110	82	40	49	27	WN.. 0804..	E04

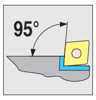
								
E01	59445	293139	293147	59429	86174	194263	4770	293148
E02	59446	218151	59437	59430	86176	194263	4771	222127
E03	59446	218151	59437	59430	86176	225429	4771	222127
E04	59446	218151	59437	59430	86176	225430	4771	222127

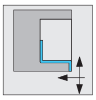
A303

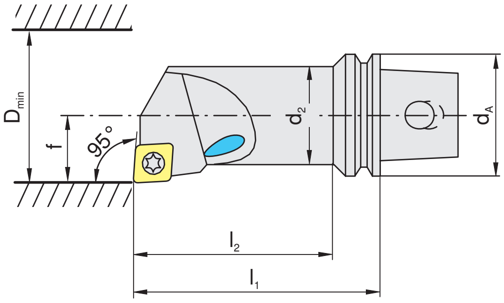
A77-A78

UTS SCLC...

MaxiLock S

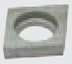






Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
40	UT40-20D-SCLCR-09	R	60	45	20	24	13	CC.. 09T3..	E01
40	UT40-20D-SCLCL-09	L	60	45	20	24	13	CC.. 09T3..	E01
40	UT40-25G-SCLCR-09	R	90	75	25	31	17	CC.. 09T3..	E01
40	UT40-25G-SCLCL-09	L	90	75	25	31	17	CC.. 09T3..	E01
40	UT40-32J-SCLCR-12	R	110	96	32	40	22	CC.. 1204..	E02
40	UT40-32F-SCLCR-12	R	80	65	32	40	22	CC.. 1204..	E02
40	UT40-32J-SCLCL-12	L	110	96	32	40	22	CC.. 1204..	E02
40	UT40-32F-SCLCL-12	L	80	65	32	40	22	CC.. 1204..	E02
50	UT50-20H-SCLCR-09	R	100	70	20	25	13	CC.. 09T3..	E03
50	UT50-32K-SCLCR-12	R	125	96	32	40	22	CC.. 1204..	E04
50	UT50-32K-SCLCL-12	L	125	96	32	40	22	CC.. 1204..	E04

							
E01	165795			194263		8095010500	183936
E02	54981	61006	69296	194263	69293		74208
E03	165795			225429		8095010500	183936
E04	54981	61006	69296	225429	69293		74208

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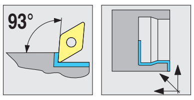
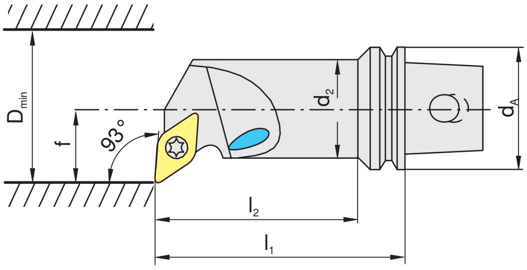
UTS SDUC...

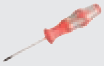
MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
40	UT40-20D-SDUCR-11	R	60	45	20	24	13	DC.. 11T3..	E01
40	UT40-20D-SDUCL-11	L	60	45	20	24	13	DC.. 11T3..	E01
40	UT40-25E-SDUCR-11	R	70	55	25	31	17	DC.. 11T3..	E01
40	UT40-25E-SDUCL-11	L	70	55	25	31	17	DC.. 11T3..	E01
40	UT40-32F-SDUCR-11	R	80	65	32	40	22	DC.. 11T3..	E02
40	UT40-32F-SDUCL-11	L	80	65	32	40	22	DC.. 11T3..	E02

							
E01	165795			194263		8095010500	183936
E02	24647	26146	69294	194263	69293		29278

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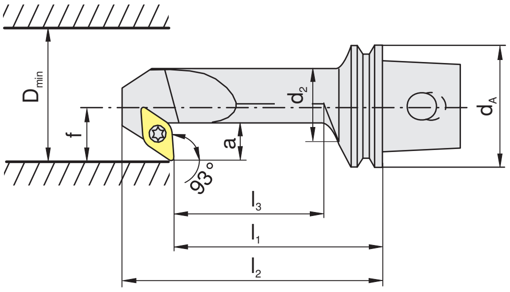
A85-A86

A92

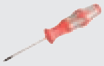
UTS SDXC...

MaxiLock S



Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	l_3 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]	a [mm]		
40	UT40-20D-SDXCR-11	R	60	77	45.0	20	24	13	8.00	DC.. 11T3..	E01
40	UT40-32F-SDXCR-11	R	80	97	65.0	32	40	22	10.00	DC.. 11T3..	E02
40	UT40-20D-SDXCL-11	L	60	77	45.0	20	24	13	8.00	DC.. 11T3..	E01
40	UT40-32F-SDXCL-11	L	80	97	65.0	32	40	22	10.00	DC.. 11T3..	E02

							
E01	165795			194263		8095010500	183936
E02	24647	26146	69294	194263	69293		29278

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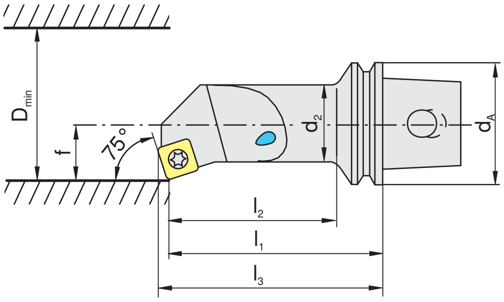
A85-A86

A92

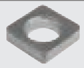
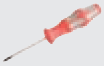
UTS SSKC...

MaxiLock S



Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	l_3 [mm]	D_{min} [mm]	d_2 [mm]	f [mm]	□	🔧
40	UT40-20D-SSKCL-09	L	60	45	63.0	24	20	13	SC.. 09T3..	E01
40	UT40-32F-SSKCL-12	L	80	65	84.0	40	32	22	SC.. 1204..	E02

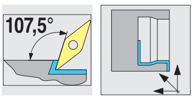
🔧							
E01	165795			194263		8095010500	183936
E02	54981	69199	69296	194263	69293		82270

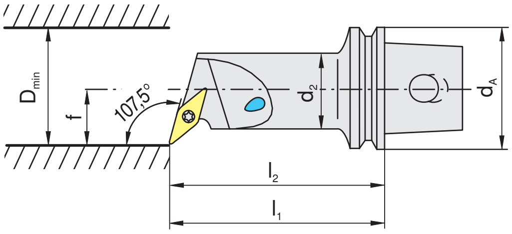
🔧 A303

□ A88

UTS SVQC...

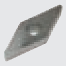
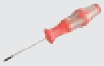
MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
40	UT40-20D-SVQCR-11	R	60	45	20	24	13	VC.. 1103..	E01
40	UT40-20D-SVQCL-11	L	60	45	20	24	13	VC.. 1103..	E01
40	UT40-25E-SVQCL-11	L	70	55	25	31	17	VC.. 1103..	E01
40	UT40-32F-SVQCL-16	L	80	65	32	40	22	VC.. 1604..	E02

							
E01	24645			194263		8095010200	29280
E02	24647	37493 / 26147	69294	194263	69293		29279 / 83343

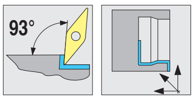
A303

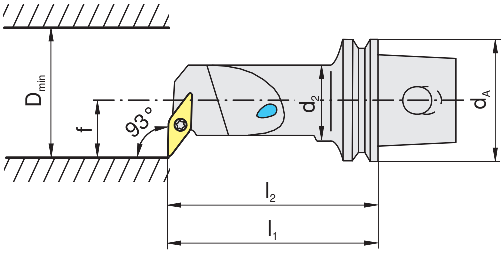
A90-A91

A92

UTS SVUC...

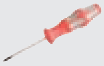
MaxiLock S





Picture shows right-hand version

d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	d_2 [mm]	D_{min} [mm]	f [mm]		
40	UT40-20D-SVUCR-11	R	60	45	20	24	13	VC.. 1103..	E01
40	UT40-20D-SVUCL-11	L	60	45	20	24	13	VC.. 1103..	E01
40	UT40-25E-SVUCR-11	R	70	55	25	31	17	VC.. 1103..	E01
40	UT40-25E-SVUCL-11	L	70	55	25	31	17	VC.. 1103..	E01
40	UT40-32F-SVUCR-16	R	80	65	32	40	22	VC.. 1604..	E02
40	UT40-32F-SVUCL-16	L	80	65	32	40	22	VC.. 1604..	E02

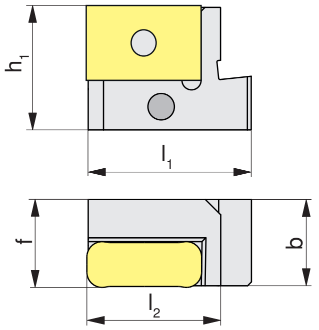
							
E01	24645			194263		8095010200	29280
E02	24647	37493 / 26147	69294	194263	69293		29279 / 83343

A303
A90-A91
A92

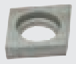
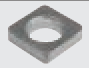
RK...

Railway wheel set cartridges

Picture shows right-hand version (LNUX 30..)



h_1 [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	b [mm]	f [mm]		
31	RK 3219-C19R	R	42.7	36.5	17.9	19	CNMX 19..	E01
31	RK 3223-C19R	R	42.7	36.5	21.9	23	CNMX 19..	E01
31	RK 3219-C19L	L	42.7	36.5	17.9	19	CNMX 19..	E01
31	RK 3223-C19L	L	42.7	36.5	21.9	23	CNMX 19..	E01
32	RK 3219-19R	R	43.0	35	18.6	19	LNUX 19..	E02
32	RK 3223-19R	R	42.5	35	22.5	23	LNUX 19..	E02
32	RK 3219-19L	L	43.0	35	18.6	19	LNUX 19..	E02
32	RK 3223-19L	L	42.5	35	22.5	23	LNUX 19..	E02
32	RK 3223-30R	R	43.0	35	22.5	23	LNUX 30..	E02
32	RK 3223-30L	L	43.0	35	22.5	23	LNUX 30..	E02
32	RK 3226-21R	R	43.0	35	24.8	26	SNMG 21..	E03
32	RK 3226-21L	L	43.0	35	24.8	26	SNMG 21..	E03

							
E01	59448	357187		59439	59434	86178	4209
E02	59441				59433		4771
E03	59448		308268	59439	59434	86178	4209

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A81

A81

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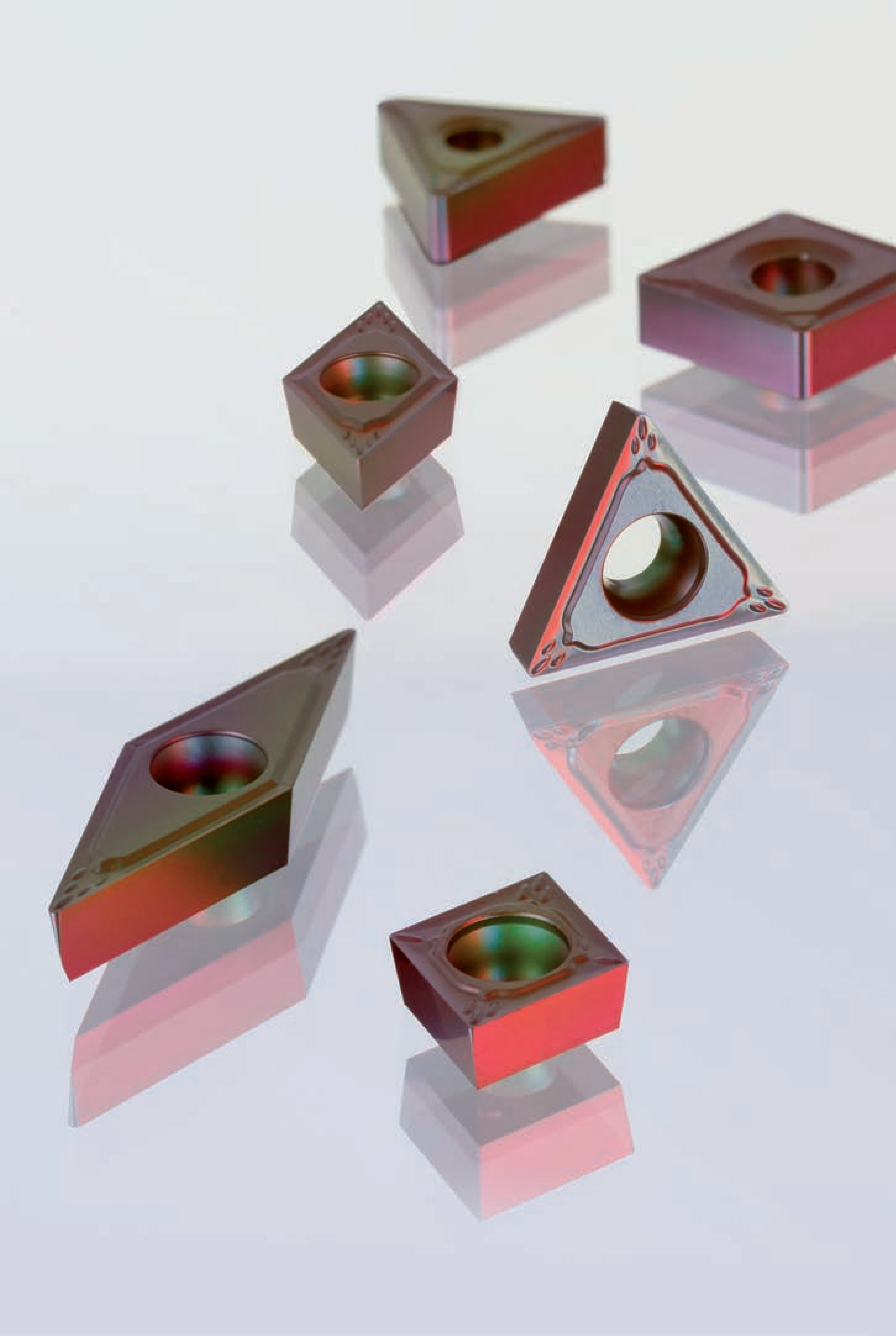


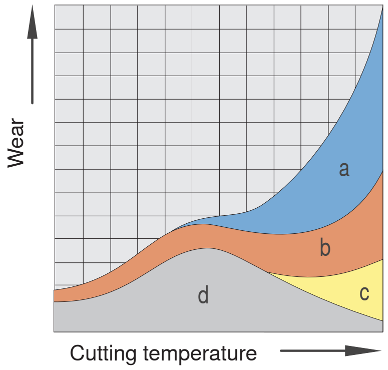
Contents

Technical information

Causes of wear

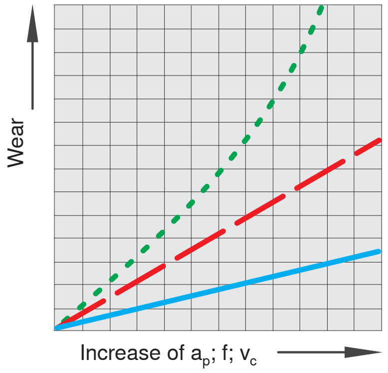
Wear is caused through simultaneous mechanical and thermal stress of the cutting edge.
The most common causes are

o Mechanical abrasion
o Damage due to built-up edge (BUE)
o Oxidation processes
o Diffusion



With increasing cutting temperature the thermally caused wear types of oxidation and diffusion prevail.

a = diffusion
b = mechanical abrasion
c = oxidation
d = damage due to built-up edge (BUE)



Cutting temperature and wear depend decisively upon the machining conditions.

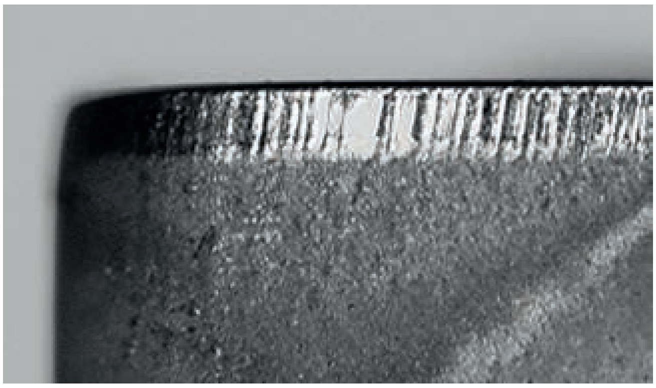
🟩 Cutting speed
🟥 Feed rate
🟦 Cutting depth

Benefits of hard material coatings

Depositing hard material layers on carbide tools positively influences wear characteristics.

The advantages of hard material layers consist in the reduction of

○ Friction
○ Temperature changes
○ Oxidation
○ Diffusion

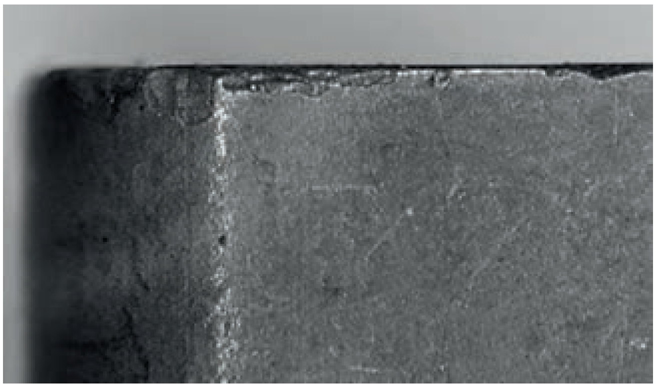


Abrasion on flank, normal wear after a certain machining time.

Flank wear

Reasons
- Cutting speed too high
- Carbide grade with insufficient wear resistance
- Incorrect feed rate

Remedies
- Reduce cutting speed
- Select more wear resistant carbide grade
- Adapt feed rate to cutting speed and cutting depth (increase feed rate)



Through excessive mechanical stress at the cutting edge fracture and chipping can occur.

Edge chipping

Reasons
- Grade with too high wear resistance
- Vibration
- Feed rate too high or excessive cutting depth
- Interrupted cut
- Swarf damage

Remedies
- Use tougher grade
- Use negative cutting edge geometry with chip groove
- Increase stability (tool, work piece)

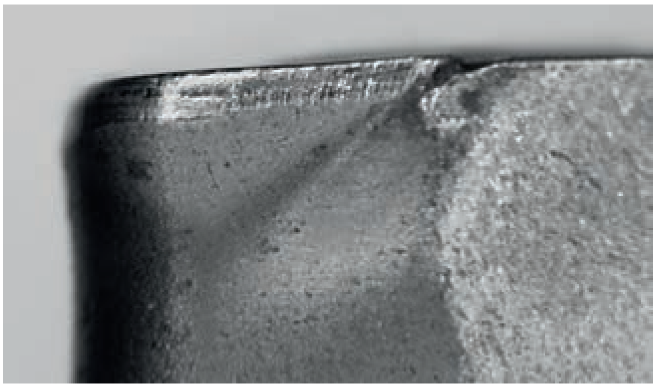
The hot chip which is being evacuated causes cratering at the rake face of the cutting edge.

Cratering

Reasons
- Cutting speed and / or feed rate too high
- Rake angle too shallow
- Grade with low wear resistance
- Insufficient coolant supply

Remedies
- Reduce cutting speed and / or feed rate
- Increase coolant quantity and / or pressure, optimise coolant supply
- Use grade with higher resistance to cratering

Types of wear

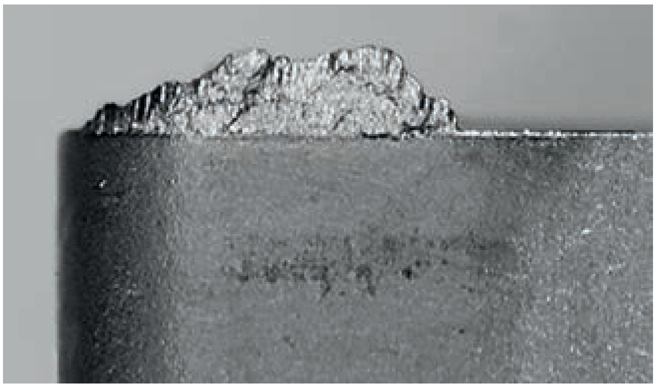


High machining temperature and simultaneous mechanical stress can lead to plastic deformation.

Plastic deformation

Reasons
- ○ Too high machining temperature, resulting in softening of substrate
- ○ Damaged coatings
- ○ Chip groove too narrow

Remedies
- ○ Reduce cutting speed
- ○ Choose carbide grade with higher wear resistance
- ○ Provide cooling

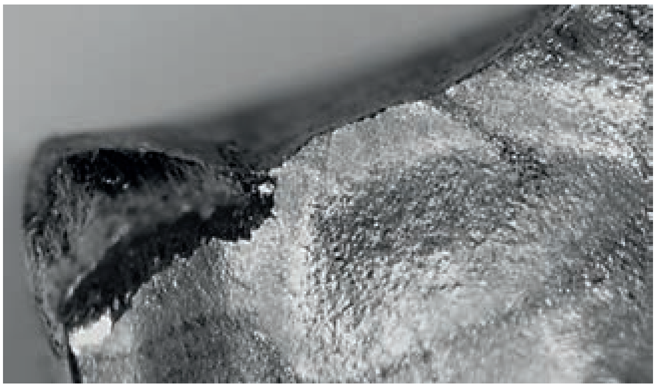


Built-up edge occurs when the chip is not evacuated properly due to insufficient cutting temperature.

Built-up edge

Reasons
- ○ Cutting speed too low
- ○ Rake angle too small
- ○ Wrong cutting material
- ○ Lack of cooling / lubrication

Remedies
- ○ Increase cutting speed
- ○ Increase rake angle
- ○ Apply TiN-coating
- ○ Use emulsion with higher concentration



Excessive stress of the insert causes breakage.

Insert breakage

Reasons
- ○ Excessive stress of cutting material
- ○ Lack of stability
- ○ Corner angle too small
- ○ Excessive notching

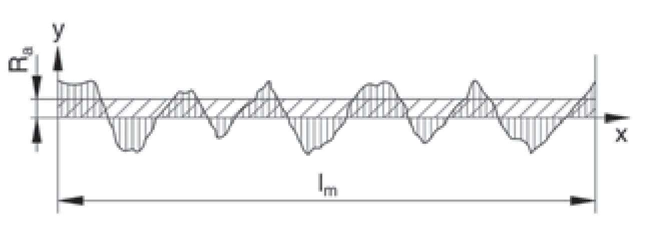
Remedies
- ○ Use tougher cutting material
- ○ Use protective edge chamfer
- ○ Increase honing of edge
- ○ Use more stable geometry

Corrective measures for turning problems

Type of problem													
Type of wear						Work piece problems				Chip control			
Flank wear	Cratering	Edge chipping	Plastic deformation	Insert breakage	Built-up edge	Vibration	Formation of pips and burrs	Chattered surface	Surface quality	Chip too long (tangled swarf)	Chip too short (fragmented chip)	**Corrective measures**	
⬇	⬇		⬇		⬆	⇩			⇧	⇩		Cutting speed	**Cutting values**
≈		⬇	⇩	⬇		⇧		⬇	⬇	⬆	⬇	Feed rate	
	⬇	⬇					⬇	⇩	⇩			Feed - centre area	
		⬆	≈		⬇	≈	⬇	⬇	⇩	⬇	⬆	Chip groove -R ↓ -M ↑ -F	**Selection of inserts**
⬆		⬆	⬆			⇩	⬇	⇩	⇧			Corner radius larger ↓ ↑ smaller	
⬆	⬆	⬇	⬆	⬇								Cutting material wear resistance ↓ ↑ toughness	
		≈		≈		≈		≈	≈			Clamping of tool	**General criteria**
		≈		≈		≈		≈	≈			Clamping of work piece	
		≈		≈		≈			⇩			Overhang	
≈		≈				≈	≈		≈			Tip height	
▢	≈		▢		▢		▢		▢	▢		Cooling lubricant	

⬆	raise, increase, large influence	⬇	avoid, reduce large influence	≈	check, optimise
⇧	raise, increase low influence	⇩	avoid, reduce low influence	▢	use

Surface quality

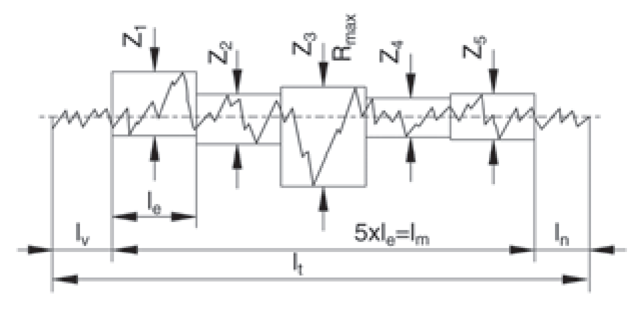


Average roughness value R_a DIN (4768)

This is defined as the arithmetical mean of the absolute sums of the roughness profile R within the entire measured length l_m.

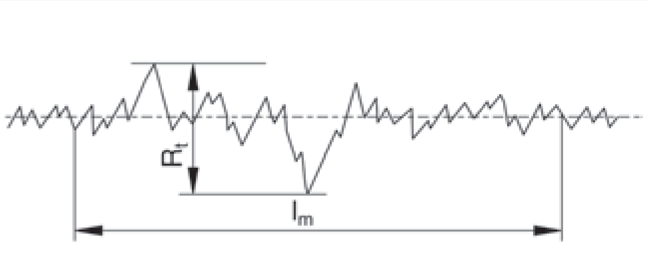
Average roughness depth R_z (DIN 4768)

This is defined as the average value resulting from the single roughness depths of five successive single measured lengths l_e.



Single surface roughness depth Z_1 ... Z_5

This is the vertical distance between the highest and the lowest point of the roughness profile R within a single measured length l_e.



Maximum surface roughness depth R_t (DIN 4768/1)

This is the distance between the elevation and depression of the line within the measured length (reference distance) of profile filtered according to DIN 4768 sheet 1.

Surface quality according to manufacturing method

Surface symbol according to ISO 1302 new	0,025 √	0,05 √	0,1 √	0,2 √	0,4 √	0,8 √	1,6 √	3,2 √	6,3 √	12,5 √	25 √	50 √
Surface symbol according to ISO 3141 until now	▽▽▽▽					▽▽▽		▽▽		▽		
Roughness index	N 1	N 2	N 3	N 4	N 5	N 6	N 7	N 8	N 9	N 10	N 11	N 12
Arithmetic mean value R_a [μm]	0,025	0,05	0,1	0,2	0,4	0,8	1,6	3,2	6,3	12,5	25	50
Surface roughness depth R_z [μm]	0,25	0,63	1	1,6	2,5	4-6,3	10	16-25	40	63	100	160
Longitudinal turning Face turning							░	█	█	█	▓	▓
Longitudinal turning Face turning						MasterFinish						
Longitudinal grinding Surface grinding				░	░█	█	█	▓	▓			

░ ≙ Surface roughness (produced through special methods)

█ ≙ Surface roughness (produced through normal workshop methods)

▓ ≙ Surface roughness (produced through rough machining methods)

Surface and roughness

Table for the comparison of the measuring systems (metric compared to inch) of surface roughness

R_{tmax} [µm]	CLA/R_a [µm]	CLA [µ"]	RMS [µm]	RMS [µ"]
0,06	0,02	0,75	0,02	0,8
0,1	0,03	1,2	0,04	13
0,2	0,06	2,5	0,08	2,8
0,3	0,09	3,7	0,1	4,2
0,4	0,13	5	0,14	5,6
0,5	0,16	6,7	0,18	6,9
0,6	0,19	7,5	0,21	8,3
0,7	0,22	8,7	0,25	9,7
0,8	0,25	10	0,28	11,1
0,9	0,28	11,2	0,32	12,5
1	0,31	12,5	0,35	14
1,2	0,38	15,8	0,42	16,7
1,5	0,47	18,8	0,53	20,9
1,8	0,57	22,6	0,64	25,5
2	0,64	25,1	0,78	27,9
2,4	0,73	30,1	0,85	33,4
2,8	0,89	35,2	0,99	39
3	0,95	37,6	1,06	41,9
3,5	1,11	43,9	1,24	48,8
4	1,27	50,2	1,41	55,8
5	1,59	62,7	1,77	69,7
6	1,91	75,5	2,12	83,6
7	2,22	87,5	2,48	92,6
8	2,54	100	2,83	111,7
10	3,18	125,5	3,54	140
20	6,64	251,5	7,8	279
40	12,7	502	14,1	558
60	19,1	755	21,2	836
125	39,5	1560	43,5	1750
200	64	2510	78	2790

1 *µ*m = 0,001 mm = 39,37 *µ*"

1 *µ*" = 0,000001" = 0,0000254 mm

CLA (centre line average)

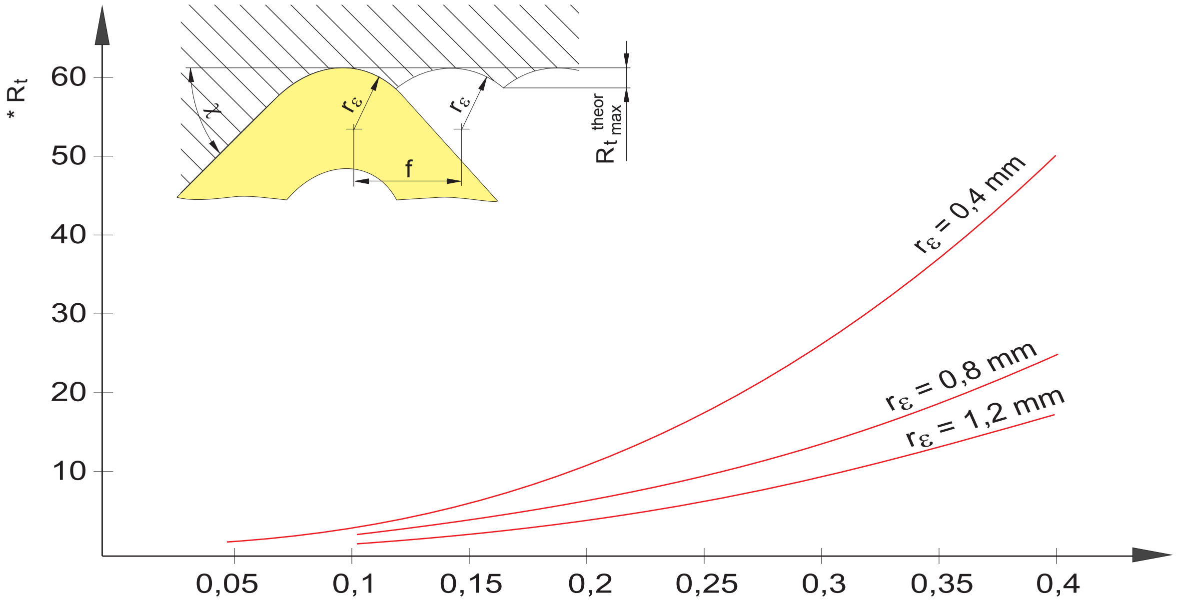
RMS (root mean square)

Surface quality

Theoretical surface finish

The maximum theoretical surface roughness with turning, $R_{t\ theor.}$ is the combination of feed rate and corner radius.

$$R_{t\,theor.} = \left(r_\varepsilon - \sqrt{r_\varepsilon^2 - \frac{f^2}{4}} \right) \cdot 1000 \quad \text{or approximately} \quad R_{t\,theor.} = \frac{0.125 \cdot f^2}{r_\varepsilon}$$



* Theoretical surface roughness

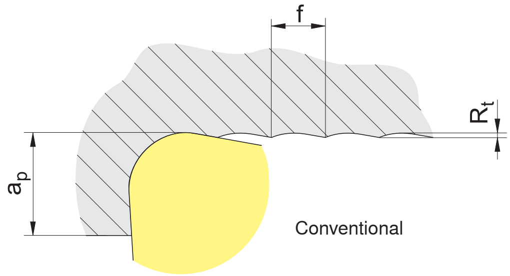
f (mm/rev.)

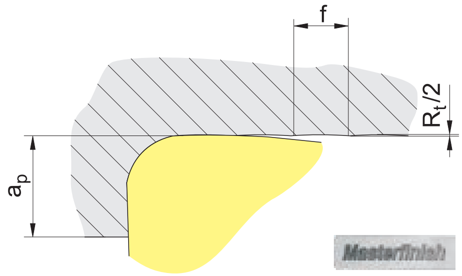
Cutting data for feed rate

Roughness range R_z in µm	$R_{t\,max}$	corresponds to R_a-value	Roughness index	ISO 1302	Corner radius r_ε (mm) and feed rate f (mm/rev.) r_ε = 0,4	r_ε = .80,8	r_ε = 1,2	r_ε = 1,6
63 - 100	$\sqrt{R_t\ 100}$	12,5 - 25	N 11	$25\sqrt{}$	–	0,51	0,69	0,18
40 - 63	$\sqrt{R_t\ 63}$	6,3 - 25	N 10	$12{,}5\sqrt{}$	0,27	0,43	0,56	0,68
31,5 - 40	$\sqrt{R_t\ 40}$	4,9 - 6,3	N 9	$6{,}3\sqrt{}$	0,25	0,37	0,49	0,57
25 - 31,5	$\sqrt{R_t\ 31{,}5}$	4,0 - 4,9			0,22	0,32	0,41	0,47
16 - 25	$\sqrt{R_t\ 25}$	2,5 - 4,0	N 8	$3{,}2\sqrt{}$	0,20	0,28	0,36	0,39
10 - 16	$\sqrt{R_t\ 16}$	1,6 - 2,5			0,15	0,22	0,29	0,31
6,3 - 10	$\sqrt{R_t\ 10}$	1,0 - 1,6	N 7	$1{,}6\sqrt{}$	0,10	0,13	0,18	0,20

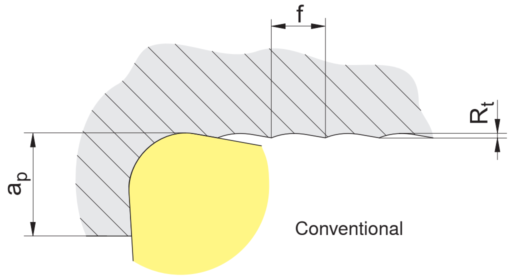
Operating principle / benefit

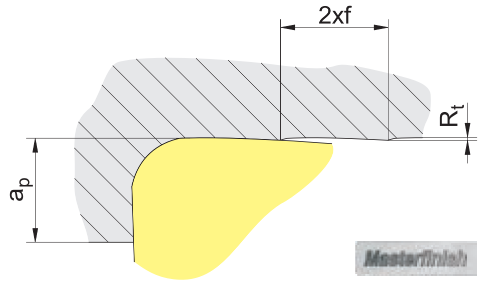
Improved surface finish
With the same feed rate an insert with ‘Masterfinish’ cutting edge reaches a roughness value R_a which is many times higher than the one of a conventional insert.

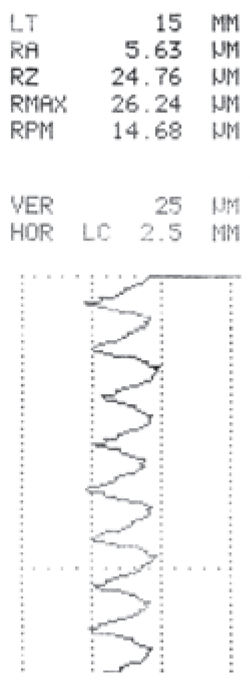




Shorter machining time
If you want to reach the same R_a-value as with a standard insert, a twice as high feed rate can be applied for the insert with ‘Masterfinish’ cutting edge (= shorter production time per component!).





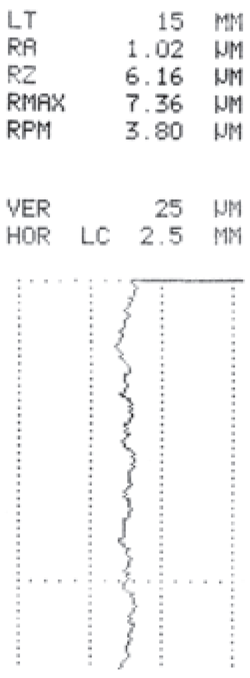


```
LT        15   MM
RA      5.63   µM
RZ     24.76   µM
RMAX   26.24   µM
RPM    14.68   µM

VER       25   µM
HOR  LC  2.5   MM
```

Insert:

WNMG 080408EN-TMR
v_c: 200 m/min
a_p: 1,0 mm
f: 0,4 mm



```
LT        15   MM
RA      1.02   µM
RZ      6.16   µM
RMAX    7.36   µM
RPM     3.80   µM

VER       25   µM
HOR  LC  2.5   MM
```

Insert:

WNMG 080408EN-TFQ
v_c: 200 m/min
a_p: 1,0 mm
f: 0,4 mm

The universal tooling system UTS

Manual (radial) clamping

By turning the actuator to the right (approx. 3.5 revolutions) the lock rod moves towards the centre. Due to the angled ball tracks the clamping balls are pushed outwards into the bores of the cutting head, drawing it towards the location face and into the adapter. During this movement the adapters are elastically deformed allowing true taper and face location.

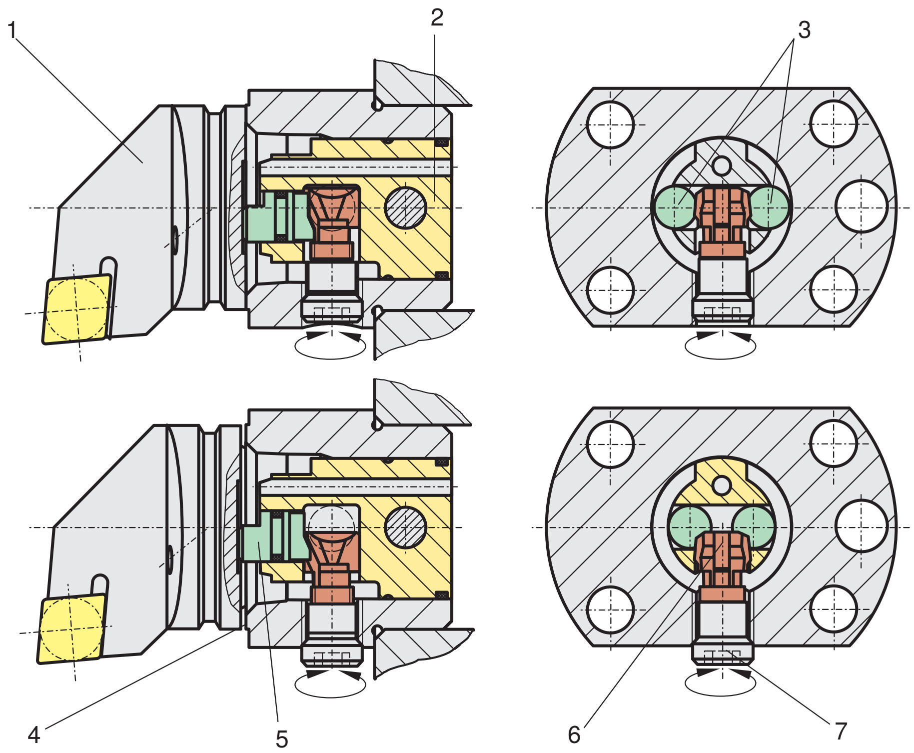
This results in a stable and precise connection.

With manual clamping the actuator has to be fixed applying a defined torque:

Torques:

UT40	16 Nm
UT50	32 Nm
UT63	50 Nm

Unclamping is achieved by turning the actuator to the left. The lock rod moves outwards and the clamping balls retract.
The taper remains in the self-locked condition (taper ratio 1:10). The cutting head is released via positive axial thrust through the bump-off pin.



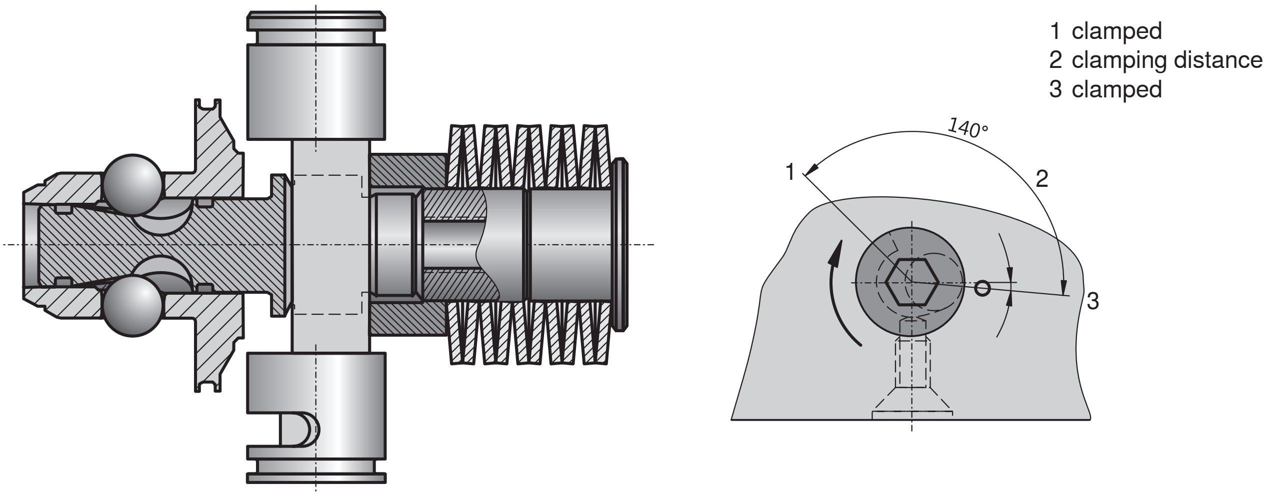
1 Tool head
2 Clamping unit
3 Balls
4 Location face
5 Bump-off pin
6 Lock rod
7 Actuator

Manual clamping is mainly applied in the field of modular constructions and lathes with longer tool changing intervals. The extremely short and compact construction represents a further advantage.

The universal tooling system UTS

The quick lock

With the MaxiFlex UTS quick lock full actuation is achieved by a 140° rotation of an eccentric cam.
The tried and tested principle of ball clamping is maintained, but the defined clamping force is produced through disc springs. Both, when clamping and releasing cutting heads, the rotation of the cam is limited through a fixed stop. Therefore a torque key is no longer necessary for the MaxiFlex UTS quick lock.



1 clamped
2 clamping distance
3 clamped

Special advantages

140° rotation of the key for clamping and unclamping
○ Considerably reduces tool changing times
○ Makes tool changing in difficult to access areas easier

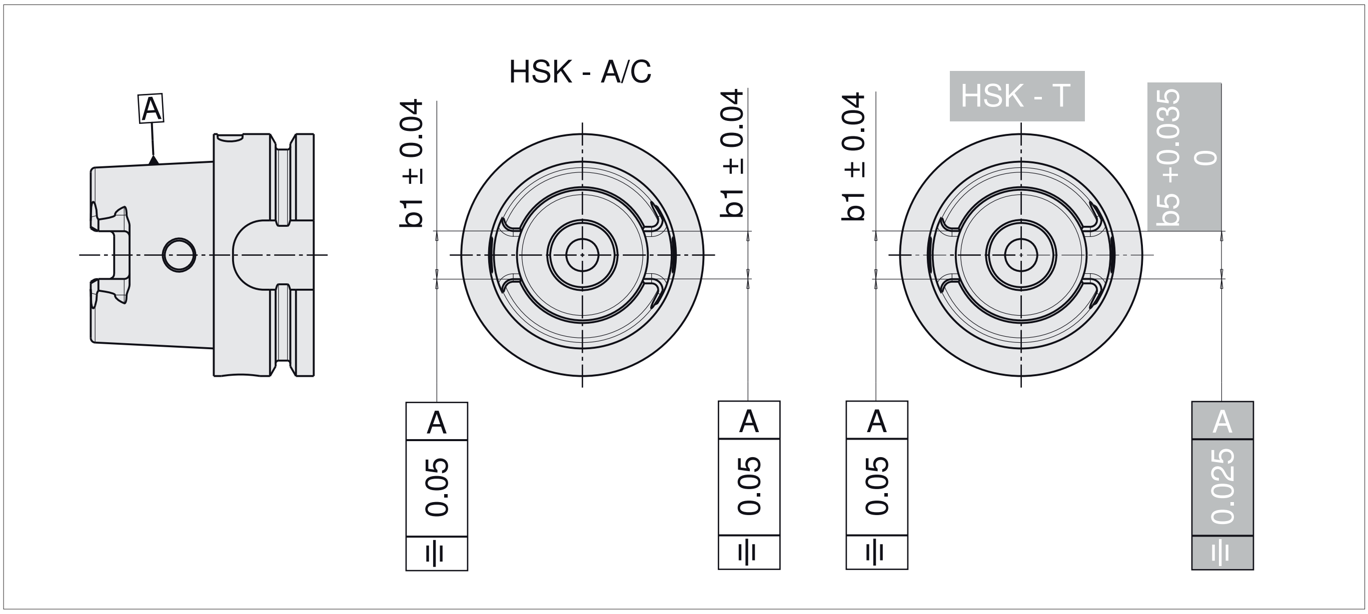
Defined clamping forces through disc spring pack
○ Torque key NO LONGER NECESSARY
○ Constant clamping forces
○ More security and longer tool life

The possibilities of the **MaxiFlex UTS quick lock** are particulary useful **on lathes with frequent tool changes**.

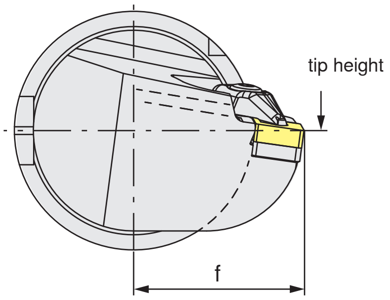
The HSK-T tooling system

What is HSK-T

The ‘T’ stands for ‘Turning’. The HSK-T has the shape of a HSK taper, form A / C (ISO 12164-1 and 2) and can be fundamentally distinguished from this taper by its considerably closer tolerances of the driving grooves (tool) and drive dogs (adapter).
In this way the radial positioning precision (tip height) which is of decisive importance for turning is guaranteed. The HSK-T is standardised according to ISO 12164-3 (outer taper - tool) and -4 (inner taper - adapter).

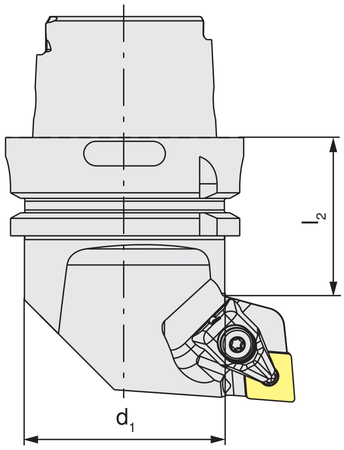


Benefit



Perfect accuracy – also when it comes to the tip height

The positioning of the cutting edge, in HSK-T63, f = 45 mm is thus reduced to ±0.13 mm and in HSK-T100, dimension f = 55 mm to ±0.11 mm.



Applicable on all machines with HSK-T or HSK-A spindle

In all CERATIZIT HSK-T tools the dimensions d1 and l2 comply with ISO 12164-1 (HSK-A).
Therefore they can also be applied and automatically changed on machines which are designed for HSK-A tools.

Optimised coolant supply = more efficient production processes

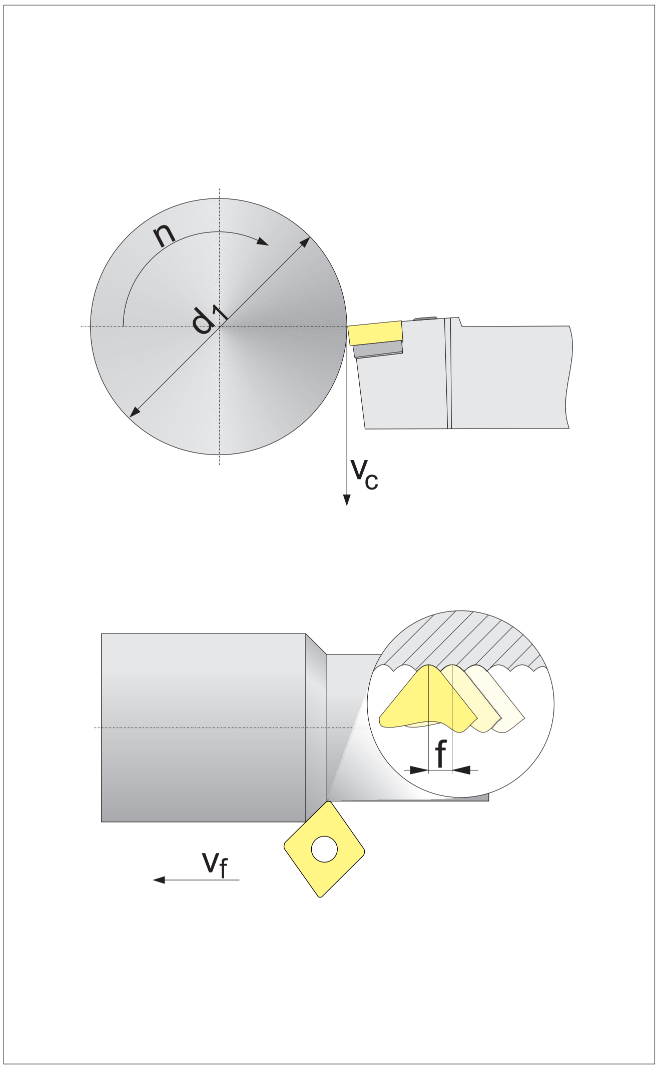
The innovative design of the coolant hole ensures that the cool-jet precisely hits the cutting edge, which ensures efficient cooling and leads to considerably enhanced tool life and reduced production time. Suitable for minimum quantity lubrication (MQL).

Complete tooling programme for one-set-up-machines

The CERATIZIT HSK-T tooling programme is specifically designed for machining in one set-up. At present it is available from stock in sizes HSK-T63 and HSK-T100 and optimally covers all machining types:

- Turning heads for internal and external turning
- Tool heads for parting and grooving
- EcoCut multi-function tools
- Tool holders for square and round shanks
- Extensions and reducers
- HSK-T - UT / KM adapters
- HSK-A adapters for rotating tools

General formula



Cutting speed (v_c)

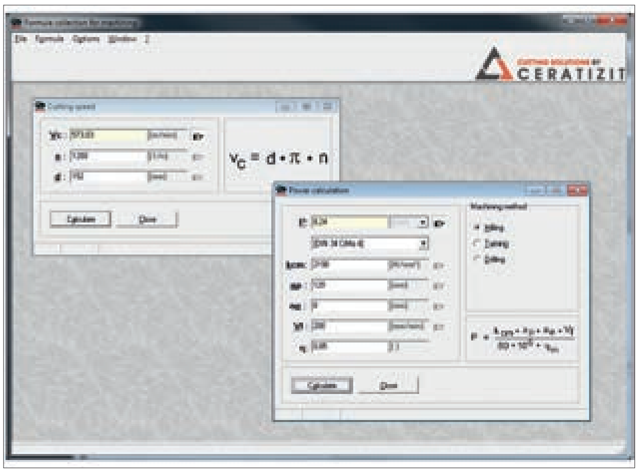
$$v_c = \frac{d_1 \cdot \pi \cdot n}{1000} \quad [\text{m/min}]$$

Revolutions per minute (n)

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \quad [\text{rev./min}]$$

Feed rate (v_f)

$$v_f = f \cdot n \quad [\text{mm/min}]$$



The CERATIZIT formula collection CT-CALC

PC - aided calculation of machining parameters
- ○ Cutting speed
- ○ Chip removal rate
- ○ Power consumption
- ○ Medium chip thickness

Languages
DE, EN, FR, IT, ES, DA, SE, FI

Free-of-charge download from
www.ceratizit.com

Hardness values

Comparison table

Tensile strength N/mm²	**Vickers HV**	**Brinell HB**	**Rockwell HRC**	**Shore C**
575	180	171		
595	185	176		
610	190	181		
625	195	185		
640	200	190	12	
660	205	195	13	
675	210	199	14	
690	215	204	15	
705	220	209	15	28
720	225	214	16	
740	230	219	17	29
755	235	223	18	
770	240	228	20.3	30
785	245	233	21.3	
800	250	238	22.2	31
820	255	242	23.1	32
835	260	247	24	33
850	265	252	24.8	
865	270	257	25.6	
880	275	261	26.4	34
900	280	268	27.1	
915	285	271	27.8	35
930	290	276	28.5	
950	295	280	29.2	36
965	300	285	29.8	37
995	310	295	31	38
1030	320	304	32.2	39
1060	330	314	33.3	40
1095	340	323	34.3	41
1125	350	333	35.5	42
1155	360	342	36.6	43
1190	370	352	37.7	44
1220	380	361	38.8	45
1255	390	371	39.8	46
1290	400	380	40.8	47
1320	410	390	41.8	48
1350	420	399	42.7	
1385	430	409	43.6	49
1420	440	418	44.5	
1455	450	428	45.3	51
1485	460	437	46.1	52
1520	470	447	46.9	53
1555	480	465	47.7	54
1595	490	466	48.4	
1630	500	475	49.1	57
1665	510	485	49.8	58
1700	520	494	50.5	59
1740	530	504	51.1	60
1775	540	513	51.7	61
1810	550	523	52.3	62
1845	560	532	53	63
1880	570	542	53.6	64
1920	580	551	54.1	65
1955	590	561	54.7	66
1995	600	570	55.2	67
2030	610	580	55.7	68
2070	620	589	56.3	69
2105	630	599	56.8	70
2145	640	608	57.3	71
2180	650	618	57.8	72
2210	660	628	58.3	73
2240	665	633	58.8	74
2280	670	638	59.3	
2310	675	643	59.8	75
2350	680	648	60.3	76
2380	685	653	61.1	77
2410	690	658	61.3	78
2450	695	663	61.7	79
2480	710	668	62.2	80
2520	720	678	62.6	81
2550	730	683	63.1	82
2590	740	693	63.5	
2630	750	703	63.9	83
2660	760	708	64.3	84
2700	770	718	64.7	85
2730	780	723	65.1	
2770	790	733	65.5	86
2800	800	738	65.9	
2840	810	748	66.3	87
2870	820	753	66.7	88
2910	830	763	67	
2940	840	768	67.4	89
2980	850		67.7	
3010	860		68.1	90
3050	870		68.4	
3080	880		68.7	91
3120	890		69	
3150	900		69.3	92
3190	910		69.6	
3220	920		69.9	
3260	930		70.1	

The figures given are approximate according to DIN EN ISO18265 (02-2004)

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm^2	mc	VDI 3323 group
10 SPb 20	1.0722		10 PbF 2		11 L 08		1350	0,20	**1**
100 Cr 6	1.2067	BL 3	Y 100 C 6		L 3	SUJ2	1775	0,24	**6/9**
105 WCr 6	1.2419		105 WC 13			SKS31	1775	0,24	**6/9**
12 CrMo 9 10	1.7380	1501-622 Gr. 31; 45	10 CD 9.10	2218	A 182-F22	SPVA,SCMV4	1675	0,24	**6/7**
12 Ni 19	1.5680		Z 18 N 5		2515		2450	0,23	**10/11**
13 CrMo 4 4	1.7335	1501-620 Gr. 27	15 CD 3.5	2216	A 182-F11; F12	SPVAF12	1675	0,24	**6/7**
14 MoV 6 3	1.7715	1503-660-440					1675	0,24	**6/7**
14 Ni 6	1.5622		16 N 6		A 350-LF 5		1675	0,24	**6/7**
14 NiCr 10	1.5732		14 NC 11		3415	SNC415(H)	1675	0,24	**6/7**
14 NiCr 14	1.5752	655 M 13	12 NC 15		3310; 9314	SNC815(H)	1675	0,24	**6/7**
14 NiCrMo 13 4	1.6657						1675	0,24	**6/7**
15 Cr 3	1.7015	523 M 15	12 C 3		5015		1675	0,24	**6/7**
15 CrMo 5	1.7262		12 CD 4			SCM415(H)	1675	0,24	**6/7**
15 Mo 3	1.5415	1501-240	15 D 3	2912	A 204 Gr. A		1675	0,24	**6/7**
16 MnCr 5	1.7131	527 M 17	16 MC 5	2511	5115	SCR415	1675	0,24	**6/7**
16 Mo 5	1.5423	1503-245-420			4520	SB450M	1675	0,24	**6/7**
17 CrNiMo 6	1.6587	820 A 16	18 NCD 6				1675	0,24	**6/7**
21 NiCrMo 2	1.6523	805 M 20	20 NCD 2	2506	8620	SNCM220(H)	1725	0,24	**6/8**
25 CrMo 4	1.7218	1717 CDS 110	25 CD 4 S	2225	4130	SM420;SCM430	1725	0,24	**6/8**
28 Mn 6	1.1170	150 M 28	20 M 5		1330		1500	0,22	**2**
32 CrMo 12	1.7361	722 M 24	30 CD 12	2240			1775	0,24	**6/9**
34 Cr 4	1.7033	530 A 32	32 C 4		5132	SCR430(H)	1725	0,24	**6/8**
34 CrMo 4	1.7220	708 A 37	35 CD 4	2234	4135; 4137	SCM432;SCCRM3	1775	0,24	**6/9**
34 CrNiMo 6	1.6582	817 M 40	35 NCD 6	2541	4340	SNCM447	1775	0,24	**6/9**
35 S 20	1.0726	212 M 36	35 MF 4	1957	1140		1525	0,22	**2/3**
36 CrNiMo 4	1.6511	816 M 40	40 NCD 3		9840	SNCM447	1775	0,24	**6/9**
36 Mn 5	1.1167						1525	0,22	**2/3**
36 NiCr 6	1.5710	640 A 35	35 NC 6		3135	SNC236	1800	0,24	**3/9**
38 MnSi 4	1.5120						1800	0,24	**3/9**
39 CrMoV 13 9	1.8523	897 M 39					1775	0,24	**6/9**
40 Mn 4	1.1157	150 M 36	35 M 5		1039		1525	0,22	**2/3**
40 NiCrMo 2 2	1.6546	311-Type 7	40 NCD 2		8740	SNCM240	1775	0,24	**6/9**
41 Cr 4	1.7035	530 M 40	42 C 4		5140	SCR440(H)	1775	0,24	**6/9**
41 CrAlMo 7	1.8509	905 M 39	40 CAD 6.12	2940	A 355 Cl. A	SACM645	1775	0,24	**6/9**
41 CrMo 4	1.7223	708 M 40	42 CD 4 TS	2244	4142; 4140	SCM440	1775	0,24	**6/9**
42 Cr 4	1.7045	530 A 40	42 C 4 TS	2245	5140	SCr440	1775	0,24	**6/9**
42 CrMo 4	1.7225	708 M 40	42 CD 4	2244	4142; 4140	SCM440(H)	1775	0,24	**6/9**
45 WCrV 7	1.2542	BS 1		2710	S 1		1775	0,24	**6/9**
50 CrV 4	1.8159	735 A 50	50 CV 4	2230	6150	SUP10	1775	0,24	**6/9**
55 Cr 3	1.7176	527 A 60	55 C 3	2253	5155	SUP9(A)	1775	0,24	**6/9**
55 NiCrMoV 6	1.2713		55 NCDV 7		L 6	SKH1;SKT4	1775	0,24	**6/9**
55 Si 7	1.0904	250 A 53	55 S 7	2085; 2090	9255		1775	0,24	**6/9**
58 CrV 4	1.8161						1775	0,24	**6/9**
60 SiCr 7	1.0961		60 SC 7		9262		1775	0,24	**6/9**
9 SMn 28	1.0715	230 M 07	S 250	1912	1213	SUM22	1350	0,21	**1**
9 SMn 36	1.0736	240 M 07	S 300		1215		1350	0,21	**1**
9 SMnPb 28	1.0718		S 250 Pb	1914	12 L 13	SUM22L	1350	0,21	**1**
9 SMnPb 36	1.0737		S 300 Pb	1926	12 L 14		1350	0,21	**1**
Al99	3.0205						700	0,25	**21**
AlCuMg1	3.1325						700	0,25	**22**
AlMg1	3.3315						700	0,25	**21**

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm^2	mc	VDI 3323 group
AlMgSi1	3.2315						700	0,25	**22**
C 105 W1	1.1545		Y1 105	1880	W 110	SK3	1675	0,24	**3**
C 125 W	1.1663		Y2 120		W 112		1675	0,24	**3**
C 15	1.0401	080 M 15	AF3 7 C 12; XC 18	1350	1015	S15C	1350	0,21	**1**
C 22	1.0402	050 A 20	AF 42 C 20	1450	1020	S20C, S22C	1350	0,21	**1**
C 35	1.0501	060 A 35	AF 55 C 35	1550	1035	S35C	1525	0,22	**2/3**
C 45	1.0503	080 M 46	AF 65 C 45	1650	1045	S45C	1525	0,22	**2/3**
C 55	1.0535	070 M 55		1655	1055	S55C	1675	0,24	**3**
C 60	1.0601	080 A 62	CC 55		1060	S60C	1675	0,24	**3**
Cf 35	1.1183					S35C	1525	0,22	**2/3**
Cf 53	1.1213					S50C	1525	0,22	**2/3**
Ck 101	1.1274	060 A 96		1870	1095		1675	0,24	**3**
Ck 15	1.1141	080 M 15	XC 15; XC 18	1370	1015	S15C	1350	0,21	**1**
Ck 55	1.1203	070 M 55	XC 55		1055	S55C	1675	0,24	**3**
Ck 60	1.1221	080 A 62	XC 60	1665; 1678	1060	S58C	1675	0,24	**3**
CoCr20W15Ni	2.4764						3300	0,24	**35**
CuZn15	2.0240						700	0,27	**27**
CuZn36Pb3	2.0375						700	0,27	**26**
E-Cu57	2.0060						700	0,27	**28**
G-AlSi10Mg	3.2381						700	0,25	**24**
G-AlSi12	3.2581						700	0,25	**23**
G-AlSi9Cu3	3.2163						700	0,25	**23**
G-CuSn5ZnPb	2.1096						700	0,27	**26**
G-CuZn40Fe	2.0590						700	0,27	**28**
G-X 120 Mn 12	1.3401	Z 120 M 12	Z 120 M 12		A 128 (A)		3300	0,24	**35**
G-X 20 Cr 14	1.4027	420 C 29	Z 20 C 13 M			SCS2	1875	0,21	**12/13**
G-X 40 NiCrSi 38 18	1.4865	330 C 40					2600	0,24	**31**
G-X 45 CrSi 9 3	1.4718	401 S 45	Z 45 CS 9		HNV 3		2450	.23	**10/11**
G-X 5 CrNi 13 4	1.4313	425 C 11	Z 5 CN 13.4	2385	CA 6-NM		1875	0,21	**12/13**
G-X 5 CrNiMoNb 18 10	1.4581	318 C 17	Z 4 CNDNb 18.12 M				2150	.0,2	**14**
G-X 6 CrNi 18 9	1.4308	304 C 15	Z 6 CN 18.10 M	2333	CF-8		2150	.0,2	**14**
G-X 6 CrNiMo 18 10	1.4408						2150	.0,2	**14**
G-X 7 Cr 13	1.4001						1875	0,21	**12/13**
GG-10	.6010		Ft 10 D	01 10-00	A48-20 B	FC100	1150	.0,2	**15**
GG-15	.6015	Grade 150	Ft 15 D	01 15-00	A48-25 B	FC150	1150	.0,2	**15**
GG-20	.6020	Grade 220	Ft 20 D	01 20-00	A48-30 B	FC200	1150	.0,2	**15**
GG-25	.6025	Grade 260	Ft 25 D	01 25-00	A48-40 B	FC250	1250	0,24	**15/16**
GG-30	.6030	Grade 300	Ft 30 D	01 30-00	A48-45 B	FC300	1350	0,28	**16**
GG-35	.6035	Grade 350	Ft 35 D	01 35-00	A48-50 B	FC350	1350	0,28	**16**
GG-40	.6040	Grade 400	Ft 40 D	01 40-00	A48-60 B	FC400	1350	0,28	**16**
GGG-35.3	.7033					FCD350	1225	0,25	**17**
GGG-40	.7040	SNG 420/12	FGS 400-12	0717-02	60-40-18	FCD400	1225	0,25	**17**
GGG-40.3	.7043	SNG 370/17	FGS 370-17	0717-15		FCD400	1225	0,25	**17**
GGG-50	.7050	SNG 500/7	FGS 500-7	0727-02	65-45-12	FCD500	1350	0,28	**18**
GGG-60	.7060	SNG 600/3	FGS 600-3	0732-03	80-55-06	FCD600	1350	0,28	**18**
GGG-70	.7070	SNG 700/2	FGS 700-2	0737-01	100-70-03	FCD700	1350	0,28	**18**
GGG-NiCr 20 2	.7660	S-NiCr 20 2	S-NC 20 2		A 439 Type D-2		1350	0,28	**18**
GGG-NiMn 13 7	.7652	S-NiMn 13 7	S-NM 13 7				1350	0,28	**18**
GS-Ck 45	1.1191	080 M 46	XC 42	1672	1045	S45C	1525	0,22	**2/3**
GTS-35-10	.8135	B 340/12	MN 35-10				1225	0,25	**19**
GTS-45-06	.8145	P 440/7					1420	0,3	**20**

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm^2	mc	VDI 3323 group
GTS-55-04	.8155	P 510/4	MP 50-5				1420	0,3	**20**
GTS-65-02	.8165	P 570/3	MP 60-3				1420	0,3	**20**
GTS-70-02	.8170	P 690/2	IP 70-2				1420	0,3	**20**
NiCr20TiAl	2.4631	HR 401; 601	Nimonic 80 A				3300	0,24	**33**
NiCr22Mo9Nb	2.4856		Inconel 625				3300	0,24	**33**
NiCu30Al	2.4375		Monel K 500				3300	0,24	**34**
NiFe25Cr20NbTi	2.4955						3300	0,24	**34**
S 18-0-1	1.3355	BT 1	Z 80 WCV 18-04-01		T 1		2450	0,23	**10/11**
S 18-1-2-5	1.3255	BT 4	Z 80 WKCV 18-05-04-0		T 4		2450	0,23	**10/11**
S 2-9-2	1.3348		Z 100 DCWV 09-04-02-	2782	M 7		2450	0,23	**10/11**
S 6-5-2	1.3343	BM 2	Z 85 WDCV 06-05-04-0	2722	M 2	SKH9; SKH51	2450	0,23	**10/11**
S 6-5-2-5	1.3243		Z 85 WDKCV 06-05-05-	2723		SKH55	2450	0,23	**10/11**
TiAl6V4	3.7165	TA 10 bis TA 13	T-A 6 V				2110	0,22	**37**
X 10 Cr 13	1.4006	410 S 21	Z 12 C 13	2302	410; CA-15	SUS410	1875	0,21	**12/13**
X 10 CrNiMoNb 18 12	1.4583				318		2150	0,2	**14**
X 10 CrNiS 18 9	1.4305	303 S 21	Z 10 CNF 18.09	2346	303		2150	0,2	**14**
X 100 CrMoV 5 1	1.2363	BA 2	Z 100 CDV 5	2260	A 2		2450	0,23	**10/11**
X 12 CrMoS 17	1.4104		Z 10 CF 17	2383	430 F	SUS430F	1875	0,21	**12/13**
X 12 CrNi 17 7	1.4310	301 S 21	Z 12 CN 17.07		301		2150	0,2	**14**
X 12 CrNi 22 12	1.4829					SUS301	1350	0,28	**16**
X 12 CrNi 25 21	1.4845	310 S24	Z 12 CN 25.20	2361	310 S	SUH310; SUS310S	2150	0,2	**14**
X 12 CrNiTi 18 9	1.4878	321 S 20	Z 6 CNT 18.12 (B)	2337	321		2150	0,2	**14**
X 12 NiCrSi 36 16	1.4864	NA 17	Z 12 NCS 37.18		330	SUH330	2600	0,24	**31**
X 15 CrNiSi 20 12	1.4828	309 S 24	Z 15 CNS 20.12		309	SUH309	1350	0,28	**16**
X 165 CrMoV 12	1.2601			2310			2450	0,23	**10/11**
X 2 CrNiMo 18 13	1.4440						2150	0,2	**14**
X 2 CrNiMoN 17 13 3	1.4429	316 S 62	Z 2 CND 17.13 Az	2375	316 LN	SUS316LN	2150	0,2	**14**
X 2 CrNiN 18 10	1.4311	304 S 62	Z 2 CN 18 .10	2371	304 LN	SUS304LN	2150	0,2	**14**
X 20 CrNi 17 2	1.4057	431 S 29	Z 15 CN 16.02	2321	431	SUS431	1875	0,21	**12/13**
X 210 Cr 12	1.2080	BD 3	Z 200 C 12		D 3		2450	0,23	**10/11**
X 210 CrW 12	1.2436			2312			2450	0,23	**10/11**
X 30 WCrV 9 3	1.2581	BH 21	Z 30 WCV 9		H 21	SKD5	2450	0,23	**10/11**
X 40 CrMoV 5 1	1.2344	BH 13	Z 40 CDV 5	2242	H 13	SKD61	2450	0,23	**10/11**
X 46 Cr 13	1.4034	420 S 45	Z 40 C 14				1875	0,21	**12/13**
X 5 CrNi 18 9	1.4301	304 S 15	Z 6 CN 18.09	2332; 2333	304; 304 H	SUS304	2150	0,2	**14**
X 5 CrNiMo 17 13 3	1.4436	316 S 16	Z 6 CND 17.12	2343	316	SUS316	2150	0,2	**14**
X 5 CrNiMo 18 10	1.4401	316 S 16	Z 6 CND 17.11	2347	316	SUS316	2150	0,2	**14**
X 53 CrMnNiN 21 9	1.4871	349 S 54	Z 52 CMN 21.09		EV 8		1875	0,21	**12/13**
X 6 Cr 13	1.4000	403 S 17	Z 6 C 13	2301	403	SUS403	1875	0,21	**12/13**
X 6 Cr 17	1.4016	430 S 15	Z 8 C 17	2320	430	SUS430	1875	0,21	**12/13**
X 6 CrMo 17	1.4113	434 S 17	Z 8 CD 17.01	2325	434	SUS434	1875	0,21	**12/13**
X 6 CrNiMoTi 17 12 2	1.4571	320 S 31	Z 6 CNT 17.12	2350	316 Ti		2150	0,2	**14**
X 6 CrNiNb 18 10	1.4550	347 S 17	Z 6 CNNb 18.10	2338	347		2150	0,2	**14**
X 6 CrNiTi 18 10	1.4541	321 S 12	Z 6 CNT 18.10	2337	321		2150	0,2	**14**
X2 CrNi 18-8	1.4317						2150	0,2	**14**

	ISO	ANSI
CCGT	CCGT 060200FN-F23	CCGT 21.5X0FN-F23
	CCGT 060201FN	CCGT 21.50FN
	CCGT 060201FN-F23	CCGT 21.50FN-F23
	CCGT 060202EN-SF	CCGT 21.5.5EN-SF
	CCGT 060202EN-SM	CCGT 21.5.5EN-SM
	CCGT 060202FN	CCGT 21.5.5FN
	CCGT 060202FN-23P	CCGT 21.5.5FN-23P
	CCGT 060202FN-25P	CCGT 21.5.5FN-25P
	CCGT 060202FN-27	CCGT 21.5.5FN-27
	CCGT 060204EN-SF	CCGT 21.51EN-SF
	CCGT 060204FN	CCGT 21.51FN
	CCGT 060204FN-23P	CCGT 21.51FN-23P
	CCGT 060204FN-25P	CCGT 21.51FN-25P
	CCGT 060204FN-25Q	CCGT 21.51FN-25Q
	CCGT 060204FN-27	CCGT 21.51FN-27
	CCGT 09T300FN-F23	CCGT 32.5X0FN-F23
	CCGT 09T301FN	CCGT 32.50FN
	CCGT 09T301FN-F23	CCGT 32.50FN-F23
	CCGT 09T302EN-SF	CCGT 32.5.5EN-SF
	CCGT 09T302FN	CCGT 32.5.5FN
	CCGT 09T302FN-25P	CCGT 32.50.5FN-25P
	CCGT 09T302FN-27	CCGT 32.5.5FN-27
	CCGT 09T304EN-SF	CCGT 32.51EN-SF
	CCGT 09T304FN	CCGT 32.51FN
	CCGT 09T304FN-23P	CCGT 32.51FN-23P
	CCGT 09T304FN-25P	CCGT 32.51FN-25P
	CCGT 09T304FN-25Q	CCGT 32.51FN-25Q
	CCGT 09T304FN-27	CCGT 32.51FN-27
	CCGT 09T308EN-SF	CCGT 32.52EN-SF
	CCGT 09T308FN	CCGT 32.52FN
	CCGT 09T308FN-23P	CCGT 32.52FN-23P
	CCGT 09T308FN-25P	CCGT 32.52FN-25P
	CCGT 09T308FN-25Q	CCGT 32.52FN-25Q
	CCGT 09T308FN-27	CCGT 32.52FN-27
	CCGT 120402FN-25P	CCGT 43.5FN-25P
	CCGT 120402FN-27	CCGT 43.5FN-27
	CCGT 120404EN-SF	CCGT 431EN-SF
	CCGT 120404FN	CCGT 431FN
	CCGT 120404FN-25P	CCGT 431FN-25P
	CCGT 120404FN-25Q	CCGT 431FN-25Q
	CCGT 120404FN-27	CCGT 431FN-27
	CCGT 120408FN	CCGT 432FN
	CCGT 120408FN-25P	CCGT 432FN-25P
	CCGT 120408FN-25Q	CCGT 432FN-25Q
	CCGT 120408FN-27	CCGT 432FN-27
CCGW	CCGW 060202FN	CCGW 21.5.5FN
	CCGW 060204FN	CCGW 21.51FN
	CCGW 09T301FN	CCGW 32.50FN
	CCGW 09T302FN	CCGW 32.5.5FN
	CCGW 09T304FN	CCGW 32.51FN
	CCGW 09T308FN	CCGW 32.52FN
CCMT	CCMT 060204EN-29	CCMT 21.51EN-29
	CCMT 060204EN-SF	CCMT 21.51EN-SF
	CCMT 060204EN-SM	CCMT 21.51EN-SM
	CCMT 060204EN-SMF	CCMT 21.51EN-SMF
	CCMT 060208EN-SM	CCMT 21.52EN-SM
	CCMT 060208EN-SMF	CCMT 21.52EN-SMF
	CCMT 09T304EN-29	CCMT 32.51EN-29
	CCMT 09T304EN-F43	CCMT 32.51EN-F43
	CCMT 09T304EN-SF	CCMT 32.51EN-SF
	CCMT 09T304EN-SM	CCMT 32.51EN-SM
	CCMT 09T304EN-SMF	CCMT 32.51EN-SMF
	CCMT 09T304EN-SMQ	CCMT 32.51EN-SMQ
	CCMT 09T308EN-29	CCMT 32.52EN-29
	CCMT 09T308EN-F43	CCMT 32.52EN-F43
	CCMT 09T308EN-SF	CCMT 32.52EN-SF
	CCMT 09T308EN-SM	CCMT 32.52EN-SM
	CCMT 09T308EN-SMF	CCMT 32.52EN-SMF
	CCMT 09T308EN-SMQ	CCMT 32.52EN-SMQ
	CCMT 120404EN-SF	CCMT 431EN-SF
	CCMT 120404EN-SM	CCMT 431EN-SM
	CCMT 120404EN-SMF	CCMT 431EN-SMF
	CCMT 120404EN-SMQ	CCMT 431EN-SMQ
	CCMT 120408EN-SF	CCMT 432EN-SF
	CCMT 120408EN-SM	CCMT 432EN-SM
	CCMT 120408EN-SMF	CCMT 432EN-SMF
	CCMT 120408EN-SMQ	CCMT 432EN-SMQ
	CCMT 120412EN-SM	CCMT 433EN-SM
CCMX	CCMX 09T304SN	CCMX 32.51SN
	CCMX 09T308SN	CCMX 32.52SN
	CCMX 120408EN	CCMX 432EN
CNGA	CNGA 120408SN-025C	CNGA 432SN-025C
	CNGA 120408TN-020D	CNGA 432TN-020D
	CNGA 120412SN-020D	CNGA 433SN-020D
	CNGA 120412SN-025C	CNGA 433SN-025C
	CNGA 160608SN-028C	CNGA 542SN-028C
	CNGA 160616SN-028C	CNGA 544SN-028C
	CNGA 160616TN-020D	CNGA 544TN-020D
CNGG	CNGG 120404EN-CF	CNGG 431EN-CF
CNGM	CNGM 190612FN-27	CNGM 643FN-27
CNGN	CNGN 120404TN-020D	CNGN 431TN-020D
	CNGN 120408TN-020D	CNGN 432TN-020D
	CNGN 120416SN-020D	CNGN 434SN-020D
	CNGN 120712PN-100CF	CNGN 453PN-100CF
	CNGN 120712SN-025C	CNGN 453SN-025C
	CNGN 120716PN-100CF	CNGN 454PN-100CF
	CNGN 120716PN-150CF	CNGN 454PN-150CF
	CNGN 120716SN-025C	CNGN 454SN-025C
	CNGN 160716SN-025C	CNGN 554SN-025C
	CNGN 160716SN-200C	CNGN 554SN-200C
CNGP	CNGP 120402FN-F32	CNGP 43.5FN-F32
	CNGP 120408FN-F32	CNGP 432FN-F32
CNMA	CNMA 120404EN	CNMA 431EN
	CNMA 120408EN	CNMA 432EN
	CNMA 120412EN	CNMA 433EN
	CNMA 120412FN	CNMA 433FN

Designation

ISO - ANSI

	ISO	ANSI
	CNMA 120412TN-020D	CNMA 433TN-020D
	CNMA 120416EN	CNMA 434EN
	CNMA 120416FN	CNMA 434FN
	CNMA 120416TN-020D	CNMA 434TN-020D
	CNMA 160608EN	CNMA 542EN
	CNMA 160612EN	CNMA 543EN
	CNMA 160616EN	CNMA 544EN
	CNMA 190612EN	CNMA 643EN
	CNMA 190616EN	CNMA 644EN
CNMG	CNMG 090304EN-TF	CNMG 321EN-TF
	CNMG 090308EN-TM	CNMG 322EN-TM
	CNMG 120404EN-42	CNMG 431EN-42
	CNMG 120404EN-CF	CNMG 431EN-CF
	CNMG 120404EN-M42	CNMG 431EN-M42
	CNMG 120404EN-M52	CNMG 431EN-M52
	CNMG 120404EN-TF	CNMG 431EN-TF
	CNMG 120404EN-TFQ	CNMG 431EN-TFQ
	CNMG 120404EN-TMF	CNMG 431EN-TMF
	CNMG 120408EN-42	CNMG 432EN-42
	CNMG 120408EN-CF	CNMG 432EN-CF
	CNMG 120408EN-M42	CNMG 432EN-M42
	CNMG 120408EN-M52	CNMG 432EN-M52
	CNMG 120408EN-TF	CNMG 432EN-TF
	CNMG 120408EN-TFQ	CNMG 432EN-TFQ
	CNMG 120408EN-TM	CNMG 432EN-TM
	CNMG 120408EN-TMF	CNMG 432EN-TMF
	CNMG 120408EN-TMM	CNMG 432EN-TMM
	CNMG 120408EN-TMQ	CNMG 432EN-TMQ
	CNMG 120408EN-TMR	CNMG 432EN-TMR
	CNMG 120412EN-CF	CNMG 433EN-CF
	CNMG 120412EN-M42	CNMG 433EN-M42
	CNMG 120412EN-M52	CNMG 433EN-M52
	CNMG 120412EN-TF	CNMG 433EN-TF
	CNMG 120412EN-TFQ	CNMG 433EN-TFQ
	CNMG 120412EN-TM	CNMG 433EN-TM
	CNMG 120412EN-TMF	CNMG 433EN-TMF
	CNMG 120412EN-TMM	CNMG 433EN-TMM
	CNMG 120412EN-TMQ	CNMG 433EN-TMQ
	CNMG 120412EN-TRM	CNMG 433EN-TRM
	CNMG 120416EN-TM	CNMG 434EN-TM
	CNMG 120416EN-TRM	CNMG 434EN-TRM
	CNMG 160608EN-TM	CNMG 542EN-TM
	CNMG 160612EN-TM	CNMG 543EN-TM
	CNMG 160612EN-TMR	CNMG 543EN-TMR
	CNMG 160616EN-TRM	CNMG 544EN-TRM
	CNMG 190612EN-TM	CNMG 643EN-TM
	CNMG 190612EN-TMR	CNMG 643EN-TMR
	CNMG 190616EN-TMR	CNMG 644EN-TMR
CNMM	CNMM 120408EN-TR	CNMM 432EN-TR
	CNMM 120408SN-TRR	CNMM 432SN-TRR
	CNMM 120412EN-TR	CNMM 433EN-TR
	CNMM 120412SN-TRR	CNMM 433SN-TRR
	CNMM 160612EN-TR	CNMM 543EN-TR

	ISO	ANSI
	CNMM 160612SN-TRR	CNMM 543SN-TRR
	CNMM 160616EN-TR	CNMM 544EN-TR
	CNMM 160616SN-TRR	CNMM 544SN-TRR
	CNMM 190612EN-TR	CNMM 643EN-TR
	CNMM 190612SN-TRR	CNMM 643SN-TRR
	CNMM 190616EN-TR	CNMM 644EN-TR
	CNMM 190616SN-R80	CNMM 644SN-R80
	CNMM 190616SN-TRR	CNMM 644SN-TRR
	CNMM 190624SN-R80	CNMM 646SN-R80
CNMN	CNMN 090308FN	CNMN 322FN
	CNMN 090308TN-020D	CNMN 322TN-020D
	CNMN 090312TN-020D	CNMN 323TN-020D
	CNMN 090316TN-020D	CNMN 324TN-020D
	CNMN 120412FN	CNMN 433FN
	CNMN 120412TN-020D	CNMN 433TN-020D
	CNMN 120416FN	CNMN 434FN
	CNMN 120416TN-020D	CNMN 434TN-020D
CNMX	CNMX 120404SN	CNMX 431SN
	CNMX 120408EN	CNMX 432EN
	CNMX 120408SN	CNMX 432SN
	CNMX 120412SN	CNMX 433SN
	CNMX 120712SN-020D	CNMX 453SN-020D
	CNMX 120716SN-020D	CNMX 454SN-020D
	CNMX 190740SN	CNMX 65XSN-020D
DCGT	DCGT 070200FN-F23	DCGT 21.5X0FN-F23
	DCGT 070201EN-SF	DCGT 21.50EN-SF
	DCGT 070201FN	DCGT 21.50FN
	DCGT 070201FN-F23	DCGT 21.50FN-F23
	DCGT 070202EN-SF	DCGT 21.5.5EN-SF
	DCGT 070202EN-SM	DCGT 21.5.5EN-SM
	DCGT 070202FN	DCGT 21.5.5FN
	DCGT 070202FN-25P	DCGT 21.5.5FN-25P
	DCGT 070202FN-27	DCGT 21.5.5FN-27
	DCGT 070204EN-SF	DCGT 21.51EN-SF
	DCGT 070204FN	DCGT 21.51FN
	DCGT 070204FN-23P	DCGT 21.51FN-23P
	DCGT 070204FN-25P	DCGT 21.51FN-25P
	DCGT 070204FN-27	DCGT 21.51FN-27
	DCGT 11T300FN-F23	DCGT 32.5X0FN-F23
	DCGT 11T302EN-SF	DCGT 32.5.5EN-SF
	DCGT 11T302FN	DCGT 32.5.5FN
	DCGT 11T302FN-25P	DCGT 32.5.5FN-25P
	DCGT 11T302FN-27	DCGT 32.5.5FN-27
	DCGT 11T304EN-SF	DCGT 32.51EN-SF
	DCGT 11T304FL-25Q	DCGT 32.51FL-25Q
	DCGT 11T304FN	DCGT 32.51FN
	DNMG 150608EN-TMF	DNMG 442EN-TMF
	DNMG 150608EN-TMR	DNMG 442EN-TMR
	DNMG 150612EN-CF	DNMG 443EN-CF
	DNMG 150612EN-TF	DNMG 443EN-TF
	DNMG 150612EN-TFQ	DNMG 443EN-TFQ
	DNMG 150612EN-TM	DNMG 443EN-TM
	DNMG 150612EN-TM	DNMG 443EN-TM

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	DNMG 150612EN-TMM	DNMG 443EN-TMM
	DNMG 150612EN-TMQ	DNMG 443EN-TMQ
	DNMG 150612EN-TMR	DNMG 443EN-TMR
	DNMG 150616EN-TM	DNMG 444EN-TM
	DNMG 150616EN-TMM	DNMG 444EN-TMM
	DNMG 150616EN-TMR	DNMG 444EN-TMR
	DNMG 150616EN-TRM	DNMG 444EN-TRM
DNMM	DNMM 150608EN-TR	DNMM 442EN-TR
	DNMM 150612EN-TR	DNMM 443EN-TR
DNMX	DNMX 150608SN	DNMX 442SN
	DNMX 150708SN-020D	DNMX 452SN-020D
	DNMX 150712SN-020D	DNMX 453SN-020D
	DNMX 150716SN-020D	DNMX 454SN-020D
ENGN	ENGN 130704TN-020D	ENGN 451TN-020D
	ENGN 130708TN-020D	ENGN 452TN-020D
	ENGN 130712SN-025E	ENGN 453TN-025D
	ENGN 130712TN-020D	ENGN 453TN-020D
	ENGN 130716SN-025E	ENGN 454TN-025E
	ENGN 130716SN-200C	ENGN 454TN-200C
	ENGN 130732TN-020D	ENGN 458TN-020D
KNUX	KNUX 160405EL-11	
	KNUX 160405EL-12	
	KNUX 160405ER-11	
	KNUX 160405ER-12	
	KNUX 160410EL-11	
	KNUX 160410EL-12	
	KNUX 160410ER-11	
	KNUX 160410ER-12	
LNMN	LNMN 6688PN-150CE	
RCGT	RCGT 0602MOEN-SM	
	RCGT 0602MOFN-27	
	RCGT 0803MOEN-SM	
	RCGT 0803MOFN-25P	
	RCGT 0803MOFN-27	
	RCGT 1003MOFN-27	
RCGX	RCGX 070400SN-050C	RCGX 2.53SN-050C
	RCGX 090700PN-075CF	RCGX 35PN-075CF
	RCGX 090700PN-100CF	RCGX 35PN-100CF
	RCGX 090700SN-200C	RCGX 35SN-200C
	RCGX 090700TN-020D	RCGX 35TN-020D
	RCGX 120700PN-100CF	RCGX 45PN-100CF
	RCGX 120700PN-150CF	RCGX 45PN-150CF
	RCGX 120700SN-200C	RCGX 45SN-200C
	RCGX 120700TN-020D	RCGX 45TN-020D
	RCGX 151000PN-100CF	RCGX 5(6.3)PN-100CF
	RCGX 151000PN-150CF	RCGX 5(6.3)PN-150CF
	RCGX 151000SN-200C	RCGX 5(6.3)SN-200C
	RCGX 191000PN-100CF	RCGX 6(6.3)PN-100CF
	RCGX 191000PN-200CF	RCGX 6(6.3)PN-200CF
	RCGX 191000SN-200C	RCGX 6(6.3)SN-200C
	RCGX 251200PN-100CF	RCGX 88PN-100CF
	RCGX 251200PN-200CF	RCGX 88PN-200CF
	RCGX 251200SN-200C	RCGX 88SN-200C

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RCMT	RCMT 0803MOEN-25	
	RCMT 1003MOSN-SM	
	RCMT 1204MOSN-SM	
	RCMT 1606MOSN-SM	
	RCMT 2006MOSN-SM	
	RCMT 2507MOSN-SM	
	RCMT 3209MOSN-SM	
RNGN	RNGN 060400TN-020D	RNGN 23TN-020D
	RNGN 120400PN-150CF	RNGN 43PN-150CF
	RNGN 120700PN-150CF	RNGN 45PN-150CF
	RNGN 120700SN-020D	RNGN 45SN-020D
	RNGN 120700SN-200C	RNGN 45SN-200C
	RNGN 120700TN-020D	RNGN 45TN-020D
	RNGN 150700PN-150CE	RNGN 55PN-150CE
	RNGN 150700SN-200C	RNGN 55SN-200C
	RNGN 190700PN-100CF	RNGN 65PN-100CF
	RNGN 190700PN-150CE	RNGN 65PN-150CE
	RNGN 190700SN-200C	RNGN 65SN-200C
	RNGN 190700TN-020D	RNGN 65TN-020D
	RNGN 250700PN-100CF	RNGN 85PN-100CF
	RNGN 250700PN-200CE	RNGN 85PN-200CE
	RNGN 250700TN-020D	RNGN 85TN-020D
	RNGN 310900PN-100CF	RNGN 106PN-100CF
	RNGN 310900PN-215CF	RNGN 106PN-215CF
RNMN	RNMN 090300FN	RNMN 32FN
	RNMN 090300TN-020D	RNMN 32TN-020D
	RNMN 120300TN-020D	RNMN 42TN-020D
	RNMN 120400FN	RNMN 43FN
	RNMN 120400TN-020D	RNMN 43TN-020D
	RNMN 250400TN-050D	RNMN 83TN-050D
	RNMN 250600TN-050D	RNMN 84TN-050D
SCGT	SCGT 09T304EN-SF	SCGT 32.51EN-SF
	SCGT 09T308FN-27P	SCGT 32.52FN-27P
	SCGT 120408FN-25P	SCGT 432FN-25P
	SCGT 120408FN-27	SCGT 432FN-27
SCMT	SCMT 09T304EN-SF	SCMT 32.51EN-SF
	SCMT 09T304EN-SM	SCMT 32.51EN-SM
	SCMT 09T304EN-SMF	SCMT 32.51EN-SMF
	SCMT 09T308EN-SF	SCMT 32.52EN-SF
	SCMT 09T308EN-SM	SCMT 32.52EN-SM
	SCMT 09T308EN-SMF	SCMT 32.52EN-SMF
	SCMT 120408EN-SF	SCMT 432EN-SF
	SCMT 120408EN-SM	SCMT 432EN-SM
	SCMT 120408EN-SMF	SCMT 432EN-SMF
	SCMT 120412EN-SM	SCMT 433EN-SM
SCMX	SCMX 120408EN	SCMX 432EN
	SCMX 120412EN	SCMX 433EN
	SCMX 190612EN	SCMX 643EN
	SCMX 190616EN	SCMX 644EN
SNGA	SNGA 120408SN-025C	SNGA 432SN-025C
	SNGA 120412SN-025C	SNGA 433SN-025C
SNGN	SNGN 090308SN-025C	SNGN 322SN-025C
	SNGN 120408SN-015D	SNGN 432SN-015D

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	ISO	ANSI
	SNGN 120408TN-020D	SNGN 432TN-020D
	SNGN 120412PN-150CF	SNGN 433PN-150CF
	SNGN 120412SN-015D	SNGN 433SN-015D
	SNGN 120412TN-020D	SNGN 433TN-020D
	SNGN 120716PN-100CF	SNGN 454PN-100CF
	SNGN 120716PN-150CF	SNGN 454PN-150CF
	SNGN 120716SN-025C	SNGN 454SN-025C
	SNGN 120716SN-200C	SNGN 454SN-200C
	SNGN 120720PN-100CF	SNGN 455PN-100CF
	SNGN 120720PN-150CF	SNGN 455PN-150CF
	SNGN 120720SN-200C	SNGN 455SN-200C
	SNGN 120730PN-028C	SNGN 457.5PN-028C
	SNGN 150712TN-020D	SNGN 553TN-020D
	SNGN 150716PN-150CF	SNGN 554PN-150CF
	SNGN 150720SN-200C	SNGN 555SN-200C
	SNGN 190716PN-150CF	SNGN 654PN-150CF
	SNGN 190716SN-025E	SNGN 654SN-025E
	SNGN 190716TN-020D	SNGN 654TN-020D
	SNGN 190720PN-100CF	SNGN 655PN-100CF
	SNGN 190720SN-200C	SNGN 655SN-200C
	SNGN 190720TN-020D	SNGN 655TN-020D
	SNGN 250724PN-100CF	SNGN 856PN-100CF
	SNGN 250724PN-150CE	SNGN 856PN-150CE
	SNGN 250724SN-050C	SNGN 856SN-050C
	SNGN 250724SN-200C	SNGN 856SN-200C
	SNGN 250924PN-100CF	SNGN 866PN-100CF
	SNGN 250924PN-150CE	SNGN 866PN-150CE
	SNGN 250924SN-030E	SNGN 866SN-030E
	SNGN 250924SN-200C	SNGN 866SN-200C
	SNGN 250924TN-020D	SNGN 866TN-020D
SNMA	SNMA 120408EN	SNMA 432EN
	SNMA 120412TN-020D	SNMA 433TN-020D
	SNMA 120416EN	SNMA 434EN
	SNMA 150616EN	SNMA 544EN
	SNMA 190616EN	SNMA 644EN
SNMG	SNMG 090308EN	SNMG 322EN
	SNMG 120404EN-TF	SNMG 431EN-TF
	SNMG 120408EN-M42	SNMG 432EN-M42
	SNMG 120408EN-M52	SNMG 432EN-M52
	SNMG 120408EN-TM	SNMG 432EN-TM
	SNMG 120408EN-TMF	SNMG 432EN-TMF
	SNMG 120412EN-M42	SNMG 433EN-M42
	SNMG 120412EN-TM	SNMG 433EN-TM
	SNMG 120412EN-TMF	SNMG 433EN-TMF
	SNMG 120412EN-TMR	SNMG 433EN-TMR
	SNMG 120412EN-TRM	SNMG 433EN-TRM
	SNMG 120416EN-TM	SNMG 434EN-TM
	SNMG 120416EN-TMR	SNMG 434EN-TMR
	SNMG 150612EN-TMR	SNMG 543EN-TMR
	SNMG 150616EN-TMR	SNMG 544EN-TMR
	SNMG 190612EN-TMR	SNMG 643EN-TMR
	SNMG 190616EN-TMR	SNMG 644EN-TMR
SNMM	SNMM 120408EN-TR	SNMM 432EN-TR
	SNMM 120408EN-TUB	SNMM 432EN-TUB
	SNMM 120412EN-TR	SNMM 433EN-TR
	SNMM 150612EN-TR	SNMM 543EN-TR
	SNMM 190612EN-TUB	SNMM 643EN-TUB
	SNMM 190616EN-TR	SNMM 644EN-TR
	SNMM 190616SN-TRR	SNMM 644SN-TRR
	SNMM 250724EN-TR	SNMM 856EN-TR
	SNMM 250724SN-TRR	SNMM 856SN-TRR
SNMN	SNMN 090308FN	SNMN 322FN
	SNMN 090308TN-020D	SNMN 322TN-020D
	SNMN 090312FN	SNMN 323FN
	SNMN 090312TN-020D	SNMN 323TN-020D
	SNMN 090316FN	SNMN 324FN
	SNMN 090316TN-020D	SNMN 324TN-020D
	SNMN 120312FN	SNMN 423FN
	SNMN 120312TN-020D	SNMN 423TN-020D
	SNMN 120316FN	SNMN 424FN
	SNMN 120316TN-020D	SNMN 424TN-020D
	SNMN 120412FN	SNMN 433FN
	SNMN 120412TN-020D	SNMN 433TN-020D
	SNMN 120416FN	SNMN 434FN
	SNMN 120416TN-020D	SNMN 434TN-020D
SNMX	SNMX 120712SN-020D	SNMX 453SN-020D
	SNMX 120716SN-020D	SNMX 454SN-020D
SNUN	SNUN 120412EN	SNUN 433EN
	SNUN 120416EN	SNUN 434EN
SPMR	SPMR 090304EN	SPMR 321EN
	SPMR 090308EN-57	SPMR 322EN-57
	SPMR 120304EN	SPMR 421EN
	SPMR 120308EN	SPMR 422EN
	SPMR 120308ER	SPMR 422ER
SPUN	SPUN 120308EN	SPUN 422EN
	SPUN 120312EN	SPUN 423EN
TCGT	TCGT 090202FN	TCGT 1.81.5.5FN
	TCGT 090204FN	TCGT 1.81.51FN
	TCGT 110202EN-SF	TCGT 21.5.5EN-SF
	TCGT 110202EN-SM	TCGT 21.5.5EN-SM
	TCGT 110202FN-27	TCGT 21.5.5FN-27
	TCGT 110204EN-SF	TCGT 21.51EN-SF
	TCGT 110204FN	TCGT 21.51FN
	TCGT 110204FN-27	TCGT 21.51FN-27
	TCGT 110208EN-SF	TCGT 21.52EN-SF
	TCGT 110208FN	TCGT 21.52FN
	TCGT 16T302FN-27	TCGT 32.5.5FN-27
	TCGT 16T304EN-SF	TCGT 32.51EN-SF
	TCGT 16T304FN	TCGT 32.51FN
	TCGT 16T304FN-27	TCGT 32.51FN-27
	TCGT 16T308EN-SF	TCGT 32.52EN-SF
	TCGT 16T308FN	TCGT 32.52FN
	TCGT 16T308FN-27	TCGT 32.52FN-27
TCMT	TCMT 090204EN-SM	TCMT 1.81.51EN-SM
	TCMT 110204EN-F43	TCMT 21.51EN-F43
	TCMT 110204EN-SF	TCMT 21.51EN-SF

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	ISO	ANSI
	TCMT 110204EN-SM	TCMT 21.51EN-SM
	TCMT 110204EN-SMF	TCMT 21.51EN-SMF
	TCMT 110208EN-SF	TCMT 21.52EN-SF
	TCMT 110208EN-SM	TCMT 21.52EN-SM
	TCMT 110208EN-SMF	TCMT 21.52EN-SMF
	TCMT 16T304EN-F43	TCMT 32.51EN-F43
	TCMT 16T304EN-SF	TCMT 32.51EN-SF
	TCMT 16T304EN-SM	TCMT 32.51EN-SM
	TCMT 16T304EN-SMF	TCMT 32.51EN-SMF
	TCMT 16T308EN-F43	TCMT 32.52EN-F43
	TCMT 16T308EN-SF	TCMT 32.52EN-SF
	TCMT 16T308EN-SM	TCMT 32.52EN-SM
	TCMT 16T308EN-SMF	TCMT 32.52EN-SMF
	TCMT 220408EN-SM	TCMT 432EN-SM
TCMW	TCMW 16T304FN	TCMW 32.51FN
TCMX	TCMX 160404EN	TCMX 331EN
	TCMX 160408EN	TCMX 332EN
	TCMX 160412EN	TCMX 333EN
	TCMX 220404EN	TCMX 431EN
	TCMX 220408EN	TCMX 432EN
	TCMX 220412EN	TCMX 433EN
TNGA	TNGA 160408TN-020D	TNGA 332TN-020D
TNGN	TNGN 110308TN-020D	TNGN 222TN-020D
	TNGN 160408TN-020D	TNGN 332TN-020D
	TNGN 220408TN-020D	TNGN 432TN-020D
TNMA	TNMA 160408EN	TNMA 332EN
	TNMA 160412EN	TNMA 333EN
	TNMA 220408EN	TNMA 432EN
	TNMA 220412EN	TNMA 433EN
	TNMA 220416EN	TNMA 434EN
TNMG	TNMG 110302EN	TNMG 22.5EN
	TNMG 110304EN-TF	TNMG 221EN-TF
	TNMG 160404EN-CF	TNMG 331EN-CF
	TNMG 160404EN-M42	TNMG 331EN-M42
	TNMG 160404EN-M52	TNMG 331EN-M52
	TNMG 160404EN-TF	TNMG 331EN-TF
	TNMG 160404EN-TMF	TNMG 331EN-TMF
	TNMG 160404ER	TNMG 331ER
	TNMG 160408EL	TNMG 332EL
	TNMG 160408EN-CF	TNMG 332EN-CF
	TNMG 160408EN-M42	TNMG 332EN-M42
	TNMG 160408EN-M52	TNMG 332EN-M52
	TNMG 160408EN-TF	TNMG 332EN-TF
	TNMG 160408EN-TM	TNMG 332EN-TM
	TNMG 160408EN-TMF	TNMG 332EN-TMF
	TNMG 160408EN-TMR	TNMG 332EN-TMR
	TNMG 160408ER	TNMG 332ER
	TNMG 160412EN-CF	TNMG 333EN-CF
	TNMG 160412EN-TF	TNMG 333EN-TF
	TNMG 160412EN-TM	TNMG 333EN-TM
	TNMG 160412EN-TMF	TNMG 333EN-TMF
	TNMG 160412EN-TMR	TNMG 333EN-TMR
	TNMG 160412EN-TRM	TNMG 333EN-TRM

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	TNMG 220408EN-TM	TNMG 432EN-TM
	TNMG 220408EN-TMR	TNMG 432EN-TMR
	TNMG 220408EN-TRM	TNMG 432EN-TRM
	TNMG 220412EN-TM	TNMG 433EN-TM
	TNMG 220412EN-TMR	TNMG 433EN-TMR
	TNMG 220412EN-TRM	TNMG 433EN-TRM
	TNMG 220416EN-TM	TNMG 434EN-TM
	TNMG 220416EN-TMR	TNMG 434EN-TMR
	TNMG 220416EN-TRM	TNMG 434EN-TRM
TNMM	TNMM 160408EN-TR	TNMM 332EN-TR
	TNMM 160408SN-TRR	TNMM 332SN-TRR
	TNMM 160412EN-TR	TNMM 333EN-TR
	TNMM 220408EN-TR	TNMM 432EN-TR
	TNMM 220412EN-TR	TNMM 433EN-TR
	TNMM 220412SN-TRR	TNMM 433SN-TRR
	TNMM 220416EN-TR	TNMM 434EN-TR
	TNMM 270612EN-TUB	TNMM 543EN-TUB
	TNMM 270616EN-TR	TNMM 544EN-TR
TNMN	TNMN 110304FN	TNMN 221FN
	TNMN 110304TN-020D	TNMN 221TN-020D
	TNMN 110308FN	TNMN 222FN
	TNMN 110308TN-020D	TNMN 222TN-020D
	TNMN 110312TN-020D	TNMN 223TN-020D
TNMX	TNMX 160408SN	TNMX 332SN
TNUN	TNUN 160308EN	TNUN 322EN
	TNUN 160412EN	TNUN 333EN
	TNUN 160416EN	TNUN 334EN
TPGN	TPGN 160304TN-020D	TPGN 321TN-020D
TPMR	TPMR 110304EL	TPMR 221EL
	TPMR 110304EN	TPMR 221EN
	TPMR 110304ER	TPMR 221ER
	TPMR 110308EN	TPMR 222EN
	TPMR 160304EL	TPMR 321EL
	TPMR 160304EN	TPMR 321EN
	TPMR 160304ER	TPMR 321ER
	TPMR 160308EL	TPMR 322EL
	TPMR 160308EN	TPMR 322EN
	TPMR 160308EN-57	TPMR 322EN-57
	TPMR 160308ER	TPMR 322ER
TPUN	TPUN 110304EN	TPUN 221EN
	TPUN 110308EN	TPUN 222EN
	TPUN 160304EN	TPUN 321EN
	TPUN 160304FN	TPUN 321FN
	TPUN 160308EN	TPUN 322EN
	TPUN 160308FN	TPUN 322FN
	TPUN 160312EN	TPUN 323EN
	TPUN 220408EN	TPUN 432EN
	TPUN 220412EN	TPUN 433EN
VCGT	VCGT 110300FN-F23	VCGT 22X0FN-F23
	VCGT 110301EN-SF	VCGT 220EN-SF
	VCGT 110301FN-F23	VCGT 220FN-F23
	VCGT 110302EN-SF	VCGT 220.5EN-SF
	VCGT 110302EN-SMF	VCGT 22.5EN-SMF

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	ISO	ANSI
	VCGT 110302FN-25P	VCGT 220.5FN-25P
	VCGT 110302FN-27	VCGT 22.5FN-27
	VCGT 110304EN-SF	VCGT 221EN-SF
	VCGT 110304FL-25Q	VCGT 221FL-25Q
	VCGT 110304FN-25P	VCGT 221FN-25P
	VCGT 110304FN-27	VCGT 221FN-27
	VCGT 110304FR-25Q	VCGT 221FR-25Q
	VCGT 110308EN-SF	VCGT 222EN-SF
	VCGT 110308FN-27	VCGT 222FN-27
	VCGT 160400FN-F23	VCGT 33X0FN-F23
	VCGT 160401FN-F23	VCGT 330FN-F23
	VCGT 160404EN-SF	VCGT 331EN-SF
	VCGT 160404FN-25P	VCGT 331FN-25P
	VCGT 160404FN-27	VCGT 331FN-27
	VCGT 160408EN-SF	VCGT 332EN-SF
	VCGT 160408FN-25P	VCGT 332FN-25P
	VCGT 160408FN-27	VCGT 332FN-27
	VCGT 160412FN-25P	VCGT 333FN-25P
	VCGT 160412FN-27	VCGT 333FN-27
	VCGT 220530FN-25P	VCGT 43.57.5FN-25P
	VCGT 220530FN-27	VCGT 43.57.5FN-27
VCMT	VCMT 110304EN-SMF	VCMT 221EN-SMF
	VCMT 160404EN-29	VCMT 331EN-29
	VCMT 160404EN-SF	VCMT 331EN-SF
	VCMT 160404EN-SM	VCMT 331EN-SM
	VCMT 160404EN-SMF	VCMT 331EN-SMF
	VCMT 160406EN-SM	
	VCMT 160408EN-29	VCMT 332EN-29
	VCMT 160408EN-SF	VCMT 332EN-SF
	VCMT 160408EN-SM	VCMT 332EN-SM
	VCMT 160408EN-SMF	VCMT 332EN-SMF
	VCMT 160412EN-25	VCMT 333EN-25
	VCMT 160412EN-29	VCMT 333EN-29
	VCMT 160412EN-SM	VCMT 333EN-SM
	VCMT 220530EN-25	VCMT 447EN-25
VCMW	VCMW 160404FN	VCMW 331FN
VCUW	VCUW 160404FL	VCUW 331FL
	VCUW 160404FN	VCUW 331FN
	VCUW 160404FR	VCUW 331FR
	VCUW 160408FL	VCUW 332FL
	VCUW 160408FN	VCUW 332FN
	VCUW 160408FN-F3	VCUW 332FN-F3
	VCUW 160408FN-M4	VCUW 332FN-M4
	VCUW 160408FR	VCUW 332FR
	VCUW 160412FN	VCUW 333FN
	VCUW 160412FN-F3	VCUW 333FN-F3
	VCUW 160412FN-M4	VCUW 333FN-M4
	VCUW 160412TN-M4	VCUW 333TN-M4
	VCUW 160416FN	VCUW 334FN
	VCUW 220530FN	VCUW 43.57.5FN
	VCUW 220530FN-M4	VCUW 43.57.5FN-M4
VNGA	VNGA 160408TN-020D	VNGA 332TN-020D
	VNGA 160412TN-020D	VNGA 333TN-020D

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VNGP	VNGP 160402FN-F32	VNGP 33.5FN-F32
	VNGP 160404FN-F32	VNGP 331FN-F32
VNMG	VNMG 160404EN-F40	VNMG 331EN-F40
	VNMG 160404EN-M40	VNMG 331EN-M40
	VNMG 160408EN-F40	VNMG 332EN-F40
	VNMG 160408EN-M40	VNMG 332EN-M40
VPGT	VPGT 220516FN-25P	VPGT 444FN-25P
	VPGT 220516FN-27	VPGT 43.54FN-27
VPMT	VPMT 220516EN-25	VPMT 43.54EN-25
VPUW	VPUW 220516FN-F3	VPUW 43.54FN-F3
	VPUW 220516FN-M4	VPUW 43.54FN-M4
	VPUW 220612FN-F3	VPUW443FN-F3
WNMG	WNMG 060404EN-CF	WNMG 231EN-CF
	WNMG 060404EN-M42	WNMG 231EN-M42
	WNMG 060404EN-M52	WNMG 231EN-M52
	WNMG 060404EN-TF	WNMG 231EN-TF
	WNMG 060404EN-TFQ	WNMG 331EN-TFQ
	WNMG 060404EN-TMF	WNMG 231EN-TMF
	WNMG 060408EN-CF	WNMG 232EN-CF
	WNMG 060408EN-M42	WNMG 232EN-M42
	WNMG 060408EN-M52	WNMG 232EN-M52
	WNMG 060408EN-TFQ	WNMG 332EN-TFQ
	WNMG 060408EN-TM	WNMG 232EN-TM
	WNMG 060408EN-TMF	WNMG 232EN-TMF
	WNMG 060408EN-TMM	WNMG 232EN-TMM
	WNMG 060408EN-TRM	WNMG 232EN-TRM
	WNMG 060412EN-TMF	WNMG 233EN-TMF
	WNMG 060412EN-TRM	WNMG 233EN-TRM
	WNMG 080404EN-M42	WNMG 431EN-M42
	WNMG 080404EN-M52	WNMG 431EN-M52
	WNMG 080404EN-TF	WNMG 431EN-TF
	WNMG 080404EN-TFQ	WNMG 431EN-TFQ
	WNMG 080404EN-TMF	WNMG 431EN-TMF
	WNMG 080408EN-CF	WNMG 432EN-CF
	WNMG 080408EN-M42	WNMG 432EN-M42
	WNMG 080408EN-M52	WNMG 432EN-M52
	WNMG 080408EN-TF	WNMG 432EN-TF
	WNMG 080408EN-TFQ	WNMG 432EN-TFQ
	WNMG 080408EN-TM	WNMG 432EN-TM
	WNMG 080408EN-TMF	WNMG 432EN-TMF
	WNMG 080408EN-TMM	WNMG 432EN-TMM
	WNMG 080408EN-TMQ	WNMG 432EN-TMQ
	WNMG 080408EN-TMR	WNMG 432EN-TMR
	WNMG 080408EN-TMR	WNMG 432EN-TMR
	WNMG 080412EN-CF	WNMG 433EN-CF
	WNMG 080412EN-M42	WNMG 433EN-M42
	WNMG 080412EN-TFQ	WNMG 433EN-TFQ
	WNMG 080412EN-TM	WNMG 433EN-TM
	WNMG 080412EN-TMF	WNMG 433EN-TMF
	WNMG 080412EN-TMM	WNMG 433EN-TMM
	WNMG 080412EN-TMQ	WNMG 433EN-TMQ
	WNMG 080412EN-TMR	WNMG 433EN-TMR
	WNMG 080412EN-TRM	WNMG 433EN-TRM

Designation

ISO - ANSI

	ISO	ANSI
	WNMG 080416EN-TMR	WNMG 434EN-TMR
	WNMG 080416EN-TRM	WNMG 434EN-TRM
XCET	XCET 040102FL-27P	
	XCET 040102FL-27Q	
	XCET 040102FR-27P	
	XCET 040102FR-27Q	
	XCET 040104FL-27P	
	XCET 040104FL-27Q	
	XCET 040104FR-27P	
	XCET 040104FR-27Q	
	XCET 050202FN-27P	
	XCET 050202FN-27Q	
	XCET 050204FN-27P	
	XCET 050204FN-27Q	
	XCET 060202FN-27P	
	XCET 060202FN-27Q	
	XCET 060204FN-27P	
	XCET 060204FN-27Q	
	XCET 070304FN-27P	
	XCET 070304FN-27Q	
	XCET 080304FN-27P	
	XCET 080304FN-27Q	
	XCET 09T304FN-27P	
	XCET 09T304FN-27Q	
	XCET 10T304FN-27P	
	XCET 10T304FN-27Q	
	XCET 10T308FN-27P	
	XCET 10T308FN-27Q	
	XCET 130404FN-27P	
	XCET 130404FN-27Q	
	XCET 130408FN-27P	
	XCET 130408FN-27Q	
	XCET 170508FN-27P	
	XCET 170508FN-27Q	
XCGT	XCGT 400632FN-25	

ISO	ANSI

Cutting data

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm^2	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

TCM407 v_c [m/min]	CTEP110 v_c [m/min]	TCM10 v_c [m/min]	CTCP115 v_c [m/min]	CTCP125 v_c [m/min]	CTCP135 v_c [m/min]	CTPM125 v_c [m/min]	CTC2135 v_c [m/min]	CTI3105 v_c [m/min]
340 - 430	400 - 520	280 - 350	250 - 500	190 - 290	160 - 210	120 - 280	180 - 230	
290 - 340	350 - 450	230 - 270	220 - 400	170 - 240	150 - 170	130 - 250	170 - 190	
240 - 290	300 - 350	190 - 240	180 - 300	130 - 200	110 - 130	100 - 180	130 - 150	
320 - 360	400 - 440	260 - 300	250 - 400	170 - 250	150 - 170	130 - 200	170 - 190	
230 - 280	300 - 360	180 - 230	200 - 320	100 - 190	80 - 130	60 - 180	90 - 150	
200 - 250	250 - 300	140 - 220	150 - 280	80 - 170	60 - 110	50 - 150	70 - 130	
250 - 310	310 - 380	160 - 200	180 - 320	130 - 210	100 - 180	80 - 200	120 - 200	
230 - 330	280 - 400	160 - 200	120 - 280	80 - 160	40 - 80	40 - 140	50 - 100	
280 - 340	350 - 400	230 - 270	200 - 320	130 - 220	120 - 160	100 - 200	140 - 180	
210 - 250	260 - 310	170 - 250	150 - 280	110 - 190	90 - 140	80 - 150	110 - 160	
200 - 260	250 - 320	170 - 240	220 - 300	140 - 210	120 - 180	120 - 250	140 - 200	
250 - 280	300 - 350	200 - 240		100 - 210	90 - 170	100 - 220	110 - 190	
					70 - 130	60 - 160	80 - 150	
160 - 200	210 - 250	130 - 160		70 - 100	40 - 60	40 - 100	55 - 75	
	340 - 480		140 - 370	130 - 210				600 - 1200
	260 - 360		140 - 330	120 - 200				600 - 1200
280 - 430	360 - 520	220 - 300	190 - 430	120 - 240				300 - 700
250 - 380	300 - 400	180 - 250	140 - 270	120 - 200				
250 - 400	330 - 500	250 - 350	180 - 520	150 - 250				
180 - 320	180 - 320	160 - 250	150 - 330	120 - 200				
							20 - 40	
							15 - 35	
							8 - 25	
							4 - 15	
							4 - 15	
							80 - 130	
							15 - 35	

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Cutting data

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm^2	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

CTN3105 v_c [m/min]	CTS3105 v_c [m/min]	CTBK102 v_c [m/min]	CTBK104 v_c [m/min]	CTM3110 v_c [m/min]	CTN3110 v_c [m/min]	CTC3110 v_c [m/min]	CTCK120 v_c [m/min]	CTD4110 v_c [m/min]
							230 - 450	
							200 - 340	
							160 - 270	
							200 - 360	
							150 - 290	
							130 - 260	
							150 - 290	
							100 - 260	
							160 - 290	
							130 - 250	
300 - 1500	***400 -1200		500 - 2000	500 - 1100	500 - 1100	250 - 450	150 - 400	
200 - 800	***150 - 500			300 - 800	300 - 800	220 - 350	180 - 350	
200 - 700	***250 - 600			200 - 600	200 - 600	220 - 380	200 - 450	
200 - 700		**200 - 700		250 - 450	250 - 450	200 - 350	160 - 300	
300 - 1000				300 - 800	300 - 800	200 - 400	200 - 550	
250 - 700				250 - 600	250 - 600	180 - 320	160 - 350	
								300 - 4000
								300 - 1500
								300 - 4000
								300 - 2000
								200 - 700
								100 - 700
								100 - 1500
								300 - 3000
								80 - 300
								80 - 300
								50 - 200
		100 - 250						
		100 - 250						
	40 - 200	100 - 200						
	30 - 180	100 - 200						
	70 - 200		30 - 120					
	60 - 70		30 - 120					

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

** From cast iron GGG60 onwards / *** For finishing only

Cutting data

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

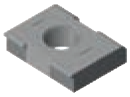
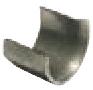
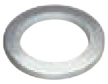
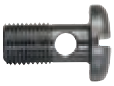
* R_m = ultimate tensile strength, measured in MPa

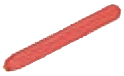
H210T v_c [m/min]	AMZ v_c [m/min]	H10T v_c [m/min]	H216T v_c [m/min]	CTP5110 v_c [m/min]	CTP5115 v_c [m/min]	CTL6115 v_c [m/min]
	110 - 160					
	90 - 140					
	80 - 120					
	90 - 130					
	80 - 120					
	70 - 90					
	90 - 110					
	70 - 90					
	160 - 220					
	70 - 110					
	-			150 - 230	130 - 220	
	90 - 140			140 - 190	120 - 180	
				60 - 100	50 - 90	
140 - 200	180 - 220	120 - 160	120 - 160			
100 - 160	140 - 180	90 - 140	90 - 140			
160 - 200	160 - 220	130 - 170	130 - 170			
110 - 150	120 - 180	90 - 130	90 - 130			**200 - 700
160 - 220	180 - 240	140 - 200	140 - 200			
140 - 180	160 - 200	120 - 160	120 - 160			
300 - 3000	300 - 3200	300 - 2500	300 - 2500			
200 - 2500	200 - 2800	200 - 2000	200 - 2000			
400 - 2000	400 - 2000	400 - 1500	400 - 1500			
400 - 1800	400 - 2000	400 - 1500	400 - 1500			
200 - 1000	200 - 1200	200 - 800	200 - 800			
250 - 800	250 - 1000	250 - 600	250 - 600			
200 - 800	200 - 1000	200 - 600	200 - 600			
150 - 600	150 - 800	150 - 400	150 - 400			
150 - 400	150 - 500	150 - 300	150 - 300			
100 - 220	80 - 200	80 - 180	80 - 180			
80 - 200	80 - 220	60 - 150	60 - 150			
100 - 300	100 - 320	100 - 250	100 - 250			
35 - 50	30 - 50			80 - 120	80 - 120	
25 - 40	20 - 40			60 - 100	60 - 100	
25 - 40	20 - 40			35 - 90	35 - 90	
20 - 30	18 - 30			30 - 50	30 - 50	100 - 250
15 - 25	15 - 25			30 - 45	30 - 45	100 - 250
80 - 140	80 - 140			70 - 120	70 - 120	
40 - 100	40 - 100			40 - 70	40 - 70	
						100 - 200
						100 - 200

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

** From cast iron GGG60 onwards

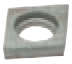
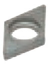
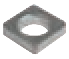
Spare parts

	Material	Type, description
	154568	H 000341/H
	154570	H 000342/H
	154571	H 000343/H
	154572	H 000344/H
	293141	7853608/H
	293143	7853610/H
	293144	7853611/H
	59426	H 000840/H
	59427	H 011446/H
	59429	H 018440/H
	59430	H 023441/H
	59432	H 024447/H
	59433	H 028443/H
	59434	H 033442/H
	59435	H 038444/H
	4724	7880101/K
	4725	7880102/K
	4726	7880103/K
	11224545	SET-02-D
	11227306	SET-01-D
	11227322	SET-03-D
	11227325	SET-04-D
	11227328	SET-05-D
	11258694	SET-01L-D
	149395	70.5-824/SP
	149396	70.5-825/SP
	4261	7485865/SP
	4265	7485869/SP
	4523	7830001/SP
	4738	7880601/KE
	4739	7880602/KE
	4740	7880603/KE
	5658	7880606/KE
	5660	7880608/KE
	69294	7883102/B M 3,5
	69296	7883101/B M 4,5
	4210	7480901/KN 3x10
	4211	7480902/KN 2,6x10
	4734	7880401/PS
	4735	7880402/PS
	5204	7880408/PS
	5205	7880407/PS
	154577	R 000467/R
	293147	7853806/R
	59436	R 018463/R
	59437	R 023461/R
	59438	R 025464/R
	59439	R 033462/R
	59440	R 038465/R
	149400	70.5-841/F+S
	4213	7480910/FS
	149399	70.5-848/F
	11232874	HY-M5

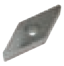
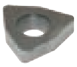
	Material	Type, description
	86174	M 018470/MO
	86176	M 018471/MO
	86177	M 022473/MO
	86178	M 022472/MO
	86182	M 028474/MO
	194263	7896900/O-RING 40
	225429	7896940/O-RING 50
	225430	7896941/O-RING 63

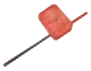
Spare parts

	Material	Type, description
	118849	7883911/SORT
	11963665	7485927/SORT
	140586	7853400/SORT
	140587	7853401/SORT
	140589	7853402/SORT
	140590	7853403/SORT
	140591	7853404/SORT
	140594	7853407/SORT
	140595	7853408/SORT
	140596	7853409/SORT
	140597	7853410/SORT
	140599	7853411/SORT
	140600	7853412/SORT
	140601	7853413/SORT
	140602	7853414/SORT
	146868	7817913/SORT
	154578	7853416/SORT
	154579	7853417/SORT
	154580	7853418/SORT
	154581	7853419/SORT
	154584	7853421/SORT
	183936	7883914/SORT
	222127	7853422/SORT
	260199	7883912/SORT
	29278	7815900/SORT
	29279	7815901/SORT
	29280	7815902/SORT
	293148	7853423/SORT
	293150	7853425/SORT
	293151	7853426/SORT
	293152	7853427/SORT
	36305	7817902/SORT
	40505	7817911/SORT
	40506	7817912/SORT
	41917	7485926/SORT
	4283	7485901/SORT
	4287	7485906/SORT
	4288	7485907/SORT
	4292	7485911/SORT
	4294	7485915/SORT
	4527	7830005/SORT
	4743	7880901/SORT
	4744	7880902/SORT
	4745	7880903/SORT
	4746	7880904/SORT
	5662	7880912/SORT
	5664	7880914/SORT
	71533	7830509/SORT
	74208	7883901/SORT
	82270	7883902/SORT
	82271	7883906/SORT
	82272	7883907/SORT
	82273	7883908/SORT
	82274	7883909/SORT
	82275	7883910/SORT
	82756	7883903/SORT
	82757	7883904/SORT
	82758	7883905/SORT
	83343	7815903/SORT

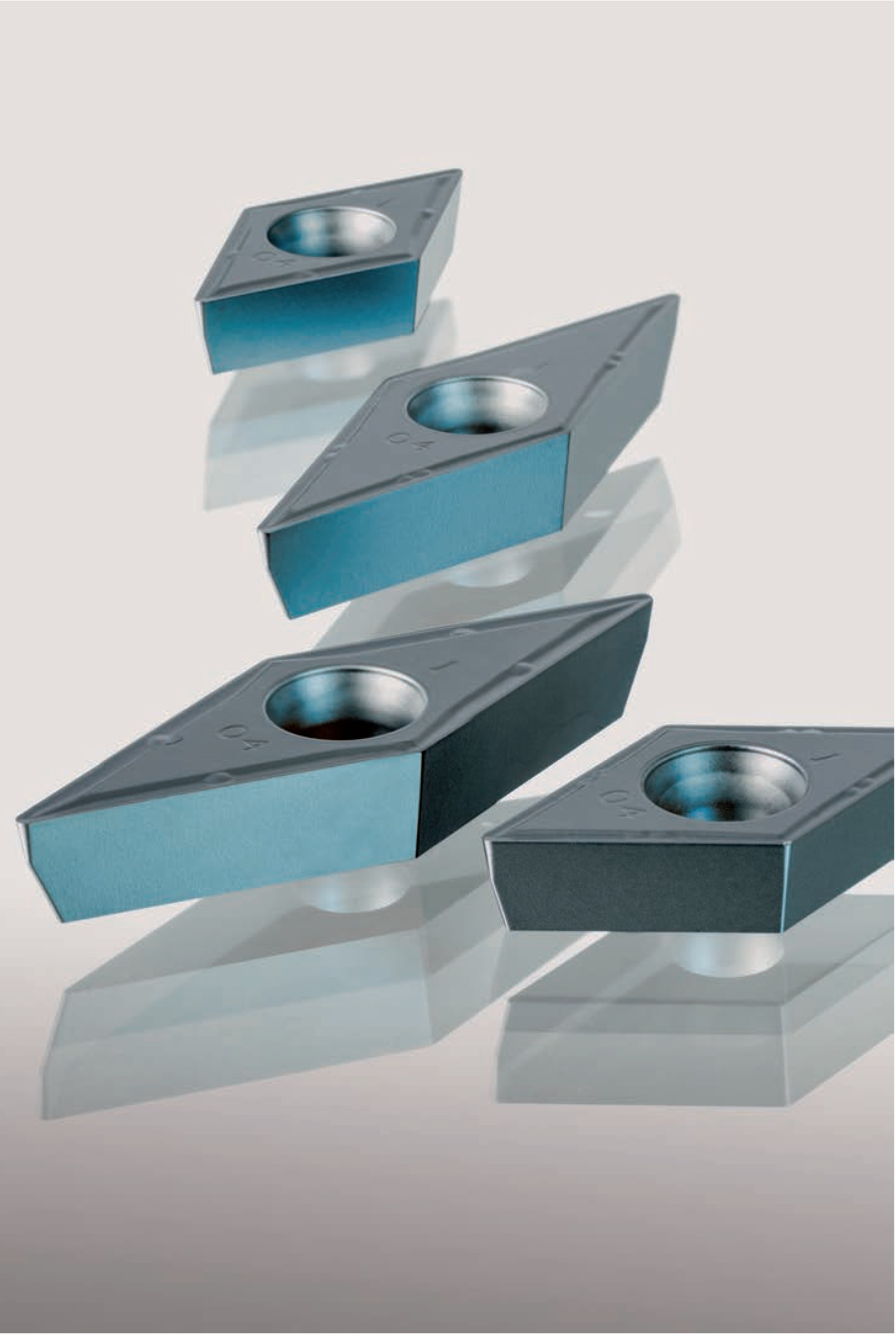
	Material	Type, description
	154575	S 000433/S
	154576	S 000432/S
	293145	7853711/S
	310913	7853712/S
	59441	S 000425/S ISK 3MM
	59442	S 000458/S ISK 3MM
	59443	S 000831/S ISK 3MM
	59444	S 011429/S ISK 2MM
	59445	S 018420/S ISK 2,5MM
	59446	S 023421/S ISK 3MM
	59448	S 033422/S ISK 4MM
	59449	S 038427/S ISK 5MM
	11211558	U-CN12T3-D
	11227315	U-CN1604-D
	11227316	U-CN1905-D
	11294214	U-CN2507
	11577861	U-CN0903-D
	11579427	U-CN2506-D
	26132	7880004/HM-U
	357187	10006885/HM-U CNMX1907
	54742	7830501/HM-U
	59451	U 000152/HM-U
	59568	U 112150/HM-U
	59569	U 123151/HM-U
	61006	7883002/HM-U
	69216	7883001/HM-U
	11211562	U-DN15T3-D
	11227308	U-DN1103-D
	26146	7815000/HM-U
	293140	7853521/HM-U
	59570	U 153150/HM-U
	106009	U 000051L/HM-U
	106014	U 000051R/HM-U
	146066	7817010/HM-U RC 1203
	154563	U 000351/U
	154564	U 000352/U
	154565	U 000353/U
	154566	U000354/U
	24838	7817002/HM-U
	40187	7817008/HM-U RN 0903
	40192	7817009/HM-U
	11211561	U-SN12T3-D
	11227317	U-SN1905-D
	11227319	U-SN2506-D
	11247269	U-SN1504-D
	26111	7880003/HM-U
	26122	7480312/HM-U SN 1203
	26139	7880010/HM-U
	308268	3673051/HM-U SN 2110
	4299	7485940/HM-U
	59547	U 000456/HM-U
	59549	U 000457/HM-U
	59562	U 053450/HM-U
	59564	U 063451/HM-U
	59566	U 083452/HM-U
	59567	U 092453/HM-U
	69199	7883004/HM-U
	69214	7883003/HM-U

Spare parts

	Material	Type, description
	11344329	U-TN1603-D
	26123	7880001/HM-U
	26124	7480313/HM-U TN 1603
	26126	7480316/HM-U TPMX1604
	26137	7880008/HM-U
	4300	7485941/HM-U
	4719	7880002/HM-U
	59556	U 013950/HM-U
	59557	U 021953/HM-U
	69209	7883005/HM-U
	11227311	U-VN1603-D
	119008	7815004/HM-U
	148206	7815005/HM-U
	26147	7815002/HM-U
	37493	7815003/HM-U
	11211563	U-WN08T3-D
	11227310	U-WN0603-D
	218151	7853519/HM-U
	293139	7853520/HM-U

	Material	Type, description	Key size
	24643	7830006/TORX T08 F	T08
	4209	7480412/SW 4	SW4
	4496	7812301/SW 5	SW5
	4770	7882201/SW 2,5	SW2,5
	4771	7882202/SW 3	SW3
	4773	7882301/SW 2	SW2
	69293	7883301/KOMBI T15	T15
	8095010100	SD-T07-60mm	T07
	8095010200	SD-T08-60mm	T08
	8095010500	SD-T15-80mm	T15
	8095010600	SD-T20-100mm	T20
	11224503	S-15IP-T	T15IP
	11227314	S-09IP-T	T09IP
	11227323	S-20IP-T	T20IP
	11227330	S-25IP-T	T25IP

	Material	Type, description	Length [mm]	Thread size	Key size
	11224494	M4,5x12-15IP/10002887	12	M4,5	T15
	11227305	M3,0x7,0-09IP/10003007	7.0	M3,0	T09IP
	11227318	M5x14-20IP/10003023	14	M5	T20
	11227329	M6x16-25IP/10003048	16	M6	T25IP
	165795	7883209/M3,5X8,6/T15	8.6	M3,5	T15
	24645	7815101/M2,5X6,0/T08	6	M2,5	T08
	24647	7815102/M3,5X11,0/T15	11	M3,5	T15
	4259	7485860/M6,0X16,2/T20	16.2	M6	T20
	4524	7830002/M4,0X10/T15	10	M4	T15
	54976	7722111/M3,5X7,2/T15	7.2	M3,5	T15
	54981	7883202/M4,5X12/T15	12	M4,5	T15
	56652	7722113/M2,2X5/T07	5	M2,2	T07
	76913	7883204/M2,5X5/T08	5	M2,5	T08
	77613	7883203/M3,0X7,3/T08	7.3	M3	T08
	149397	70.5-865/S	25	M6	SW4,5
	4147	7480210/M8X20	23	M8	SW4



Contents

Introduction

Application

Types of milling

Technical information

Index

Catalogue guidelines

Innovations in the milling section

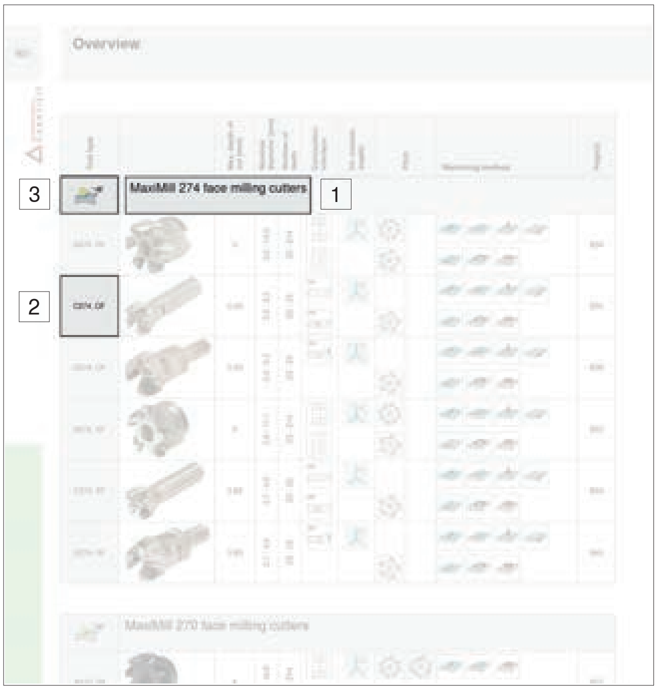
○ Overview of the most important information on all milling systems
○ Improved configuration
○ All necessary information on the milling systems in one block
○ Description of the chip grooves on every milling system

Make the right choice in just a few steps

1

Selection of the milling system

The chapter on applications provides a first overview



Overview

MaxiMill 274 face milling cutters

MaxiMill 270 face milling cutters

1 Machining method / system

2 Tool type

3 Approach angle

2

Possible applications

The system description shows the possible applications for a milling system

MaxiMill 274 system
System overview

Low power consumption, reduced vibration and noise, good surface quality

○ 4 or 8 cutting edges combined in one system
○ Extremely positive position

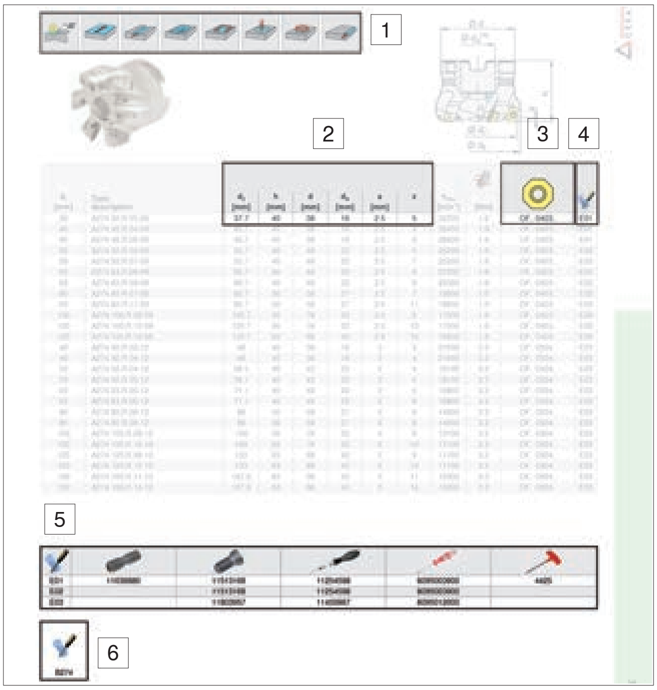
Material groups

Possible applications

3

Selection of the tool

The product page shows the cutter body range including the main dimensions and information on the types of inserts

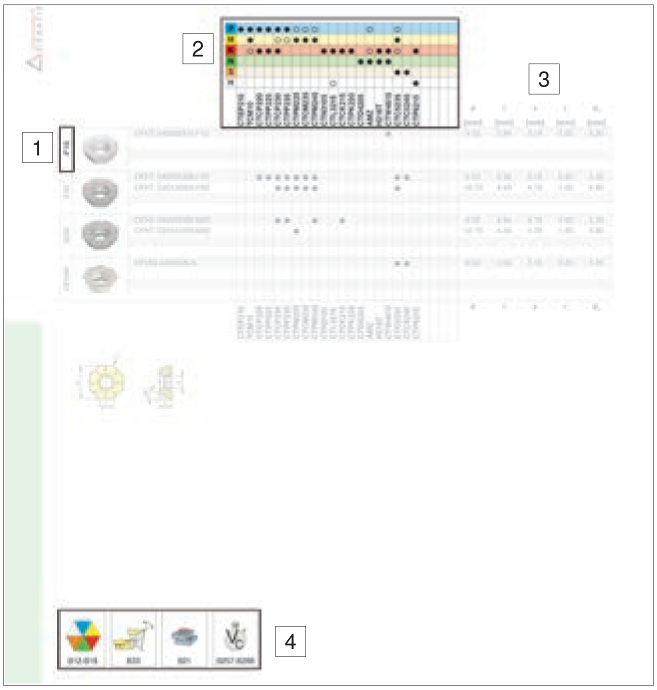


- 1 Possible applications
- 2 The main dimensions
- 3 Insert reference
- 4 Spare parts
- 5 Spare parts overview
- 6 Reference regarding further information

4

Selection of the insert

After choosing the tool the insert is selected including chip groove and cutting material

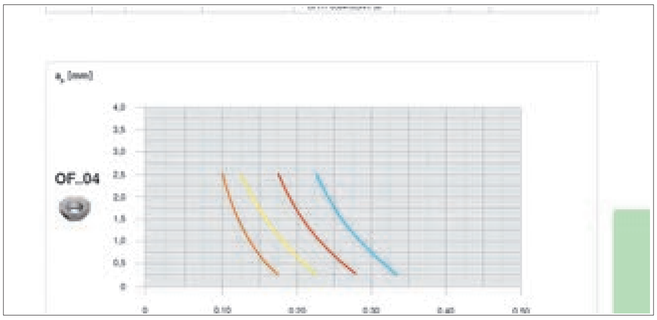


- 1 Chip grooves
- 2 Possible cutting materials
- 3 The main dimensions
- 4 Reference regarding further information

5

Starting parameters

In the last phase it is possible to determine the starting parameters for feed, depth of cut and cutting speed for the respective milling cutter



CERATIZIT designation system

Milling tools

C 211 . 25 . R . 05 - 07 - A20 - 50 - 225

C	211	25	R	05	07	A20	50	225
1	2	3	4	5	6	7	8	9

C 211 . 25 . R . 02 K4 - 11- B - 50

C	211	25	R	02	K4	11	B	50
1	2	3	4	5	10	6	7	8

A 273 . 80 . R . 10 A 10 - 06

A	273	80	R	10	A	10	06
1	2	3	4	5	11	12	6

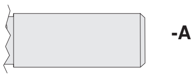
M HPC . 50 . R . 05 - 12 - H63A - 80

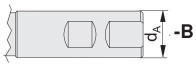
M	HPC	50	R	05	12	H63A	80
1	2	3	4	5	6	7	9

1

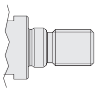
Connection/ interface

C **with shank**

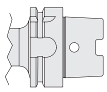




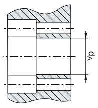
G **with thread**



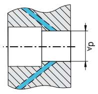
M **monoblock**



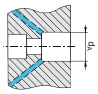
A **with hole**



Form A



Form B



Form C

2

System

MaxiMill 211

.

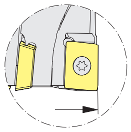
.

.

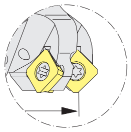
3

Diameter

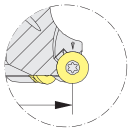
shoulder/slot cutters



face milling cutters



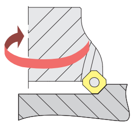
button insert cutters



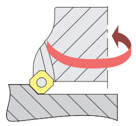
4

Cutting direction

R

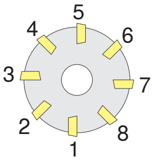


L



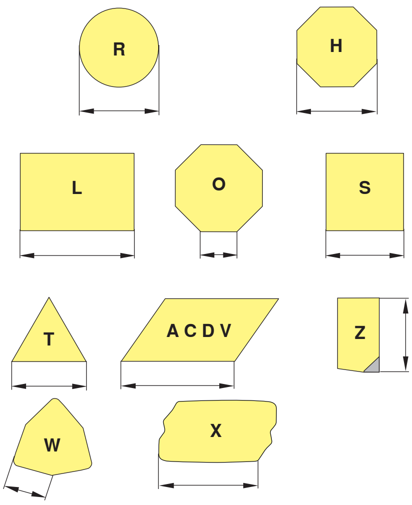
5

Effective No. of cutting edges



6

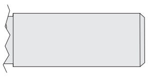
Cutting edge length



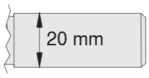
7

Connection / interface

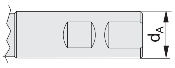
A
$d_A = d_1$



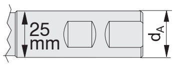
A20
d_A = 20 mm



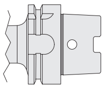
B
$d_A = d_1$



B25
d_A = 25 mm

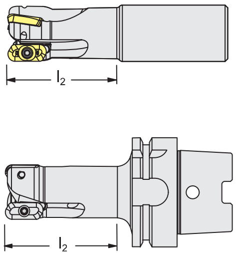


H63A



8

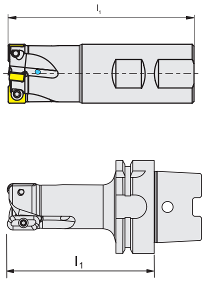
Working length



l_2 [mm]

9

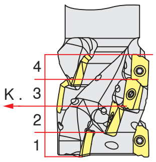
Overall length



l_1 [mm]

10

Number of insert rows



11

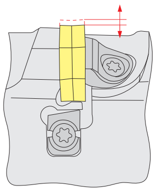
A = with adjustable inserts

(B* = irregular pitch)

* only when a distinction is necessary

12

Number of adjustable inserts



(only axially adjustable tools)

Designation system to ISO 1832

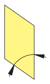
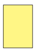
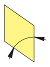
Inserts

X	D	K	T	11	T3	08	S	R	-	F50
1	2	3	4	5	6	7	8	9		10

Z	N	H	W	12	05	PO	S	R	-	15	06	-	R
1	2	3	4	5	6	7	8	9		11	12		13

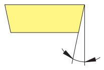
1

Insert shape

A **B** **K**	85° 82° 55°	
H	120°	
L	90°	
O	135°	
P	108°	
C **D** **E** **M** **V**	80° 55° 75° 86° 35°	
R	-	
S	90°	
T	60°	
W	80°	
X **Z**	Special shapes	

2

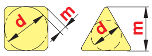
Clearance angle



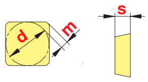
	α
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Special version

3

Tolerances



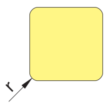
	d [±mm]	m [±mm]	s [±mm]	d=6,35/9,52	d=12,7	d=15,8/19,05
A	0,025	0,005	0,025	●	●	●
C	0,025	0,013	0,025	●	●	●
E	0,025	0,025	0,025	●	●	●
F	0,013	0,005	0,025	●	●	●
G	0,025	0,025	0,13	●	●	●
H	0,013	0,013	0,025	●	●	●
	0,05	0,005	0,025	●		
J	0,08	0,005	0,025		●	
	0,10	0,005	0,025			●
	0,05	0,013	0,025	●		
K	0,08	0,013	0,02		●	
	0,10	0,013	0,02			●



	d [±mm]	m [±mm]	s [±mm]	d=6,35/9,52	d=12,7	d=15,8/19,05
	0,05	0,08	0,13	●		
M	0,08	0,13	0,13		●	
	0,10	0,15	0,13			●
	0,05	0,08	0,025	●		
N	0,08	0,13	0,025		●	
	0,10	0,15	0,025			●
	0,08	0,13	0,13	●		
U	0,13	0,20	0,13		●	
	0,18	0,27	0,13			●

7

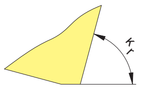
Facet, corner radius



Radius

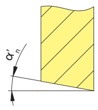
	r [mm]
M0*	
02	0,2
04	0,4
08	0,8
12	1,2

* Shape R only



1st sign

	κ_r
A	45°
D	60°
E	75°
F	85°
P	90°
Z	Others

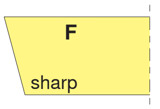


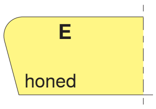
2nd sign

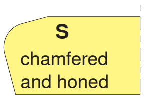
	α'_n
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
Z **O**	Others

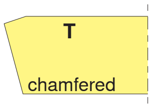
8

Cutting edge





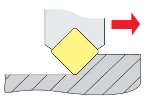




9

Cutting direction

R



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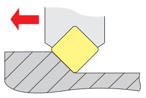

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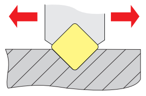
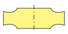
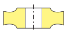


4

Form of top surface

A	
F	
G	
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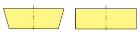
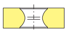
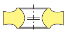
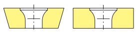
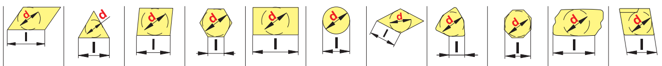
N	
Q	
R	
T	
U	
W	
X	Special shapes

5

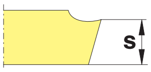
Cutting edge length



d [mm]	A	T	C/S	H	L	R	V	W	O	X	Z
4,90										07	
5,00						05					
5,56			05		08			03			
6,00											
6,35		11	06		10			04		06	
6,65	10										
6,80										11	
7,00											04
7,94			07								
8,00						08					
9,00					12						
9,30										15	
9,52	16	16	09		15			06	04		
9,57	15										
9,60										09	
10,00			10		11	10					12
12,00						12					
12,50										20	
12,70		12/22	12		20		22	08		12	
15,81			15		22			10			
16,00						16					
16,20				09							
16,74			16								
17,00			17								
17,18									06		
18,18									07		
19,05			19					13			
20,00						20					

6

Insert thickness



	s [mm]
01	1,59
T1	1,98
02	2,38
03	3,18
T3	3,97
04	4,76
05	5,56
06	6,35
07	7,94
09	9,52

10

Chip groove

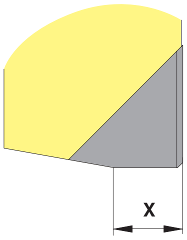
Chip groove designation
F.. = Fine machining
M.. = Medium machining
R.. = Rough machining

Additional characteristics:
R = Blend radius main/secondary cutting edge
Q = Masterfinish

11

Manufacturer specification

Length of the wiper edge

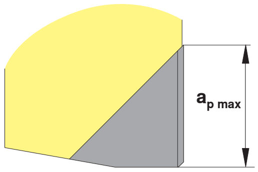


00 = 0,0 mm
10 = 1,0 mm
12 = 1,2 mm
15 = 1,5 mm
30 = 3,0 mm
50 = 5,0 mm

12

Manufacturer specification

$a_{p\ max}$



02 = 2,0 mm
03 = 3,0 mm
04 = 4,0 mm
06 = 6,0 mm
07 = 7,0 mm
11 = 11,0 mm

13

Manufacturer specification

F = Fine machining
M = Medium machining
R = Rough machining

CERATIZIT designation system

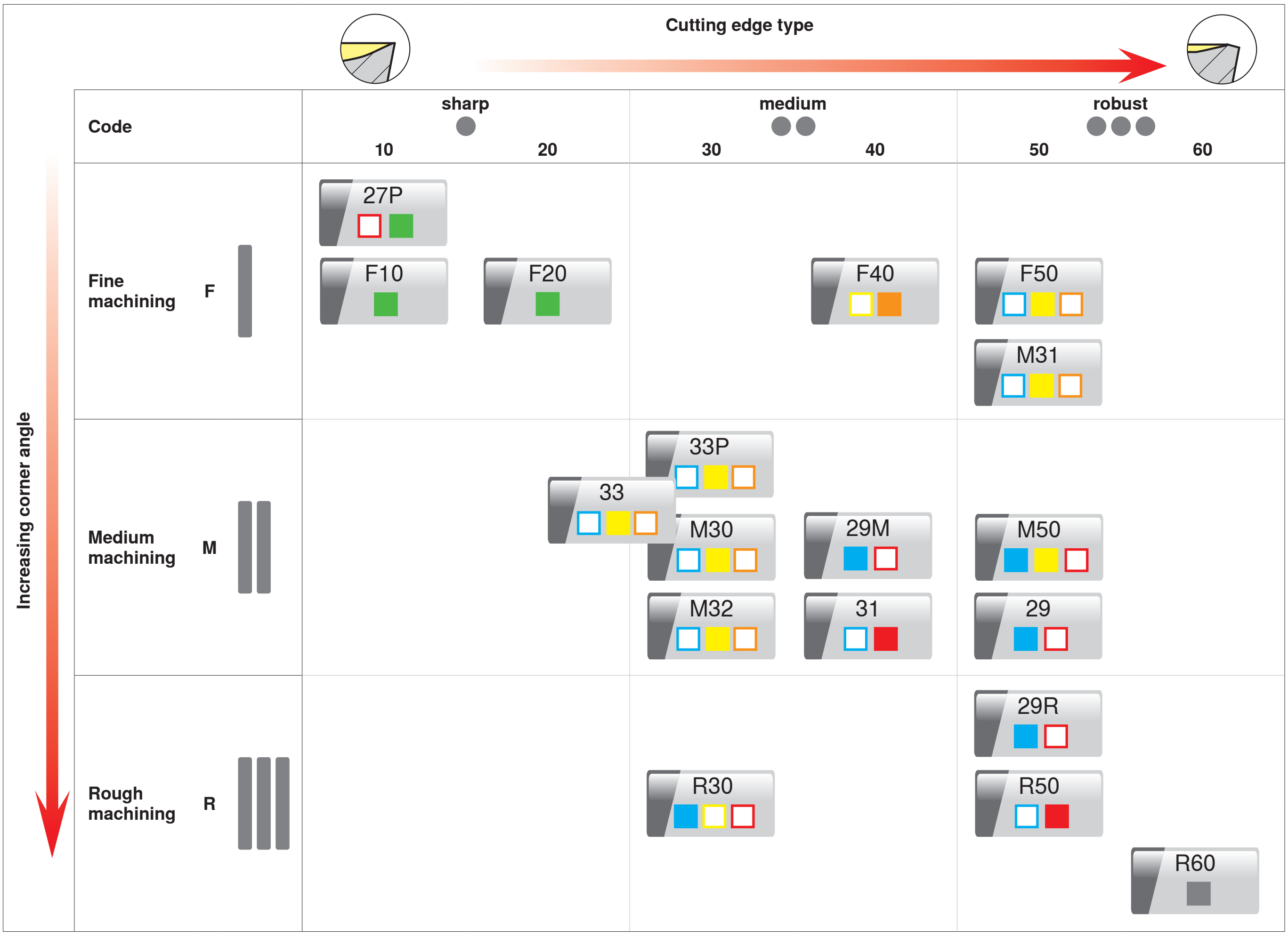
Chip grooves

F 50

1 2

1 Corner angle

2 Cutting edge type



Code		sharp ●		medium ●●		robust ●●●	
		10	20	30	40	50	60
Fine machining	**F**	27P ☐ 🟩 F10 🟩	F20 🟩		F40 ☐ 🟧	F50 ☐ 🟨 ☐ M31 ☐ 🟨 ☐	
Medium machining	**M**		33 ☐ 🟨 ☐	33P ☐ 🟨 ☐ M30 ☐ 🟨 ☐ M32 ☐ 🟨 ☐	29M 🟦 ☐ 31 ☐ 🟥	M50 🟦 🟨 ☐ 29 🟦 ☐	
Rough machining	**R**			R30 🟦 ☐ ☐		29R 🟦 ☐ R50 ☐ 🟥	R60 ⬛

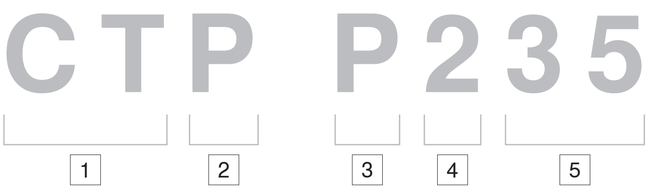
P	🟦	☐	Steel
M	🟨	☐	Stainless steel
K	🟥	☐	Cast iron
N	🟩	☐	Non-ferrous metals
S	🟧	☐	Difficult to machine materials
H	⬛	☐	Hard materials
	1	2	

1 Main application

2 Extended application

Example:

OFHT 040305SN-M50 ●●●



1 Manufacturer: CERATIZIT

2 Cutting material

W Uncoated carbide
C CVD coated carbide
P PVD coated carbide
T Uncoated cermet
E Coated cermet
N Uncoated silicon nitride
M Coated silicon nitride
S Mixed ceramic
I Sialon
D PCD
B CBN
L CBN coated
H Sintered HSS

3 Main application (material) Variant 1: number

1 Steel
2 Stainless steel
3 Cast iron
4 Light and non ferrous metals, non metals
5 Heat resistant alloys, titanium
6 Hard materials
7 Universal grade for a variety of applications

Main application (material) Variant 2: ISO letter

P Steel
M Stainless steel
K Cast iron
N Light and non ferrous metals, non metals
S Heat resistant alloys, titanium
H Hard materials
X Universal grade for a variety of applications

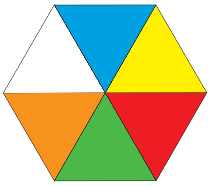
4 Main application (machining method)

1 Turning
2 Milling
3 Parting and grooving
4 Drilling
5 Threading
6 Others
7 Universal grade for a variety of applications

5 ISO 513
Application range

For example:
05
10
15
25
35 ISO P35
.
.
.

MasterGuide



Material

Based on VDI 3323 CERATIZIT's MasterGuide divides materials into six main groups (P, M, K, N, S, H). Each is given a colour, according to the system partly adopted in ISO 513.

P **Steel**

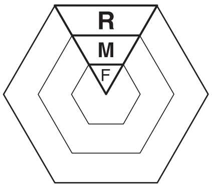
M **Stainless steel**

K **Cast iron**

N **Non-ferrous metals and non-metals**

S **Heat-resistant alloys, titanium**

H **Hard materials**



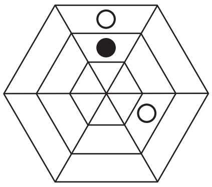
Machining application type

Each coloured segment is divided into three sections, and each section indicates the relevant machining application type:

R = rough machining

M = medium machining

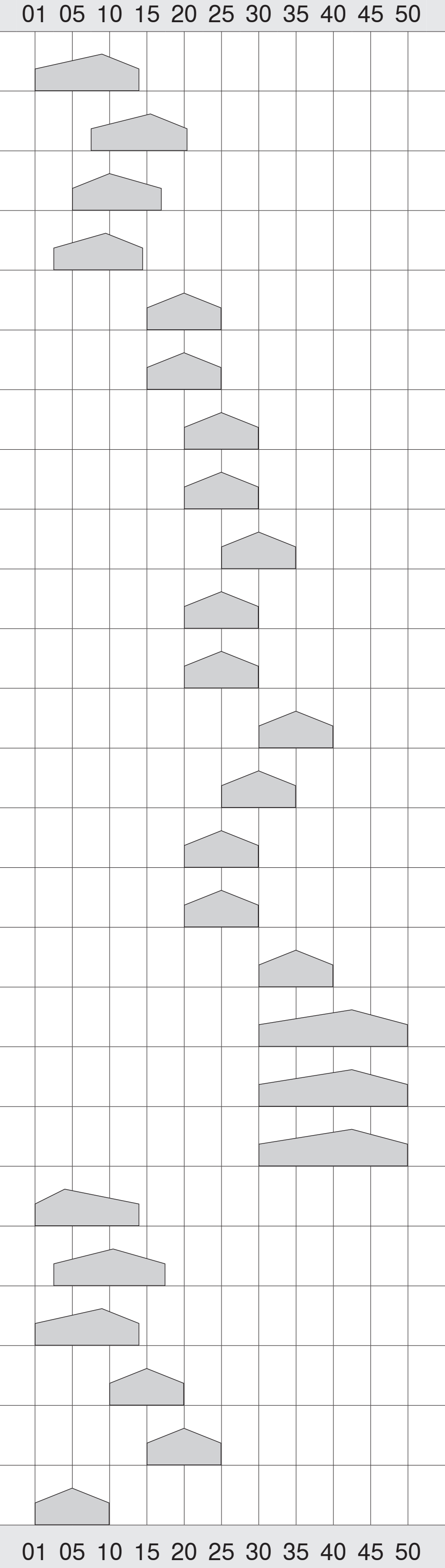
F = fine machining



● **Main application**
o **Extended application**

Application

The ideal application area for each insert is indicated by a black circle. Extended applications are indicated by an open circle. The CERATIZIT MasterGuide provides you with an easily understandable structure for choosing a product and enables you to reduce grade and geometry inventory.

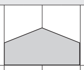
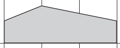
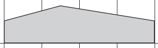
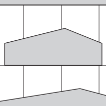
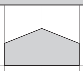
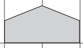
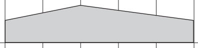


Grade designation		Standard designation ISO	Standard designation ANSI	*Type of cutting material	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
CTEP210 COLORSTAR™	🟦	HC-P10	C8	E	●					
TCM10	🟦	HT-P15	C7	T	●					
	🟦	HT-M10	-	T		●				
	🟦	HT-K10	C3	T			○			
CTCP220 BLACKSTAR™	🟦	HC-P20	C7	C	●					
	🟦	HC-K20	C2	C			●			
CTPP225 SILVERSTAR™	🟦	HC-P25	C6	P	●					
	🟦	HC-K25	C2	P			●			
CTCP230 BLACKSTAR™	🟦	HC-P30	C6	C	●					
	🟦	HC-K25	C2	C			●			
	🟦	HC-M25	-	C		○				
CTPP235 SILVERSTAR™	🟦	HC-P35	C5	P	●					
	🟦	HC-M30	-	P		○				
CTPM225 SILVERSTAR™	🟨	HC-M25	-	P		●				
	🟨	HC-P25	C6	P	○					
CTCM235 BLACKSTAR™	🟨	HC-M35	-	C		●				
	🟨	HC-P40	C5	C	○					
CTPM240 SILVERSTAR™	🟨	HC-M40	-	P		●				
	🟨	HC-P40	C5	P	○					
CTN3105	🟥	CN-K05	C4	N			●			
CTL3215	🟥	BC-K10	C3	L			●			
	🟥	BC-H10	C3	L						○
CTCK215 BLACKSTAR™	🟥	HC-K15	C3	C			●			
CTPK220 SILVERSTAR™	🟥	HC-K20	C2	P			●			
CTD4205	🟩	DP-N05	C4	D				●		

● Main application

○ Extended application

Grade overview

Grade designation		Standard designation ISO	Standard designation ANSI	*Type of cutting material	Application range 01 05 10 15 20 25 30 35 40 45 50	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
AMZ	🟩	HC-N10	C3	P					●		
		HC-P10	C8	P		○					
		HC-K10	C3	P				○			
H216T	🟩	HW-N15	C3	W					●		
		HW-K15	C3	W				●			
CTW4615	🟩	HW-N15	C3	W					●		
		HW-K15	C3	W				●			
CTC5235	🟧	HC-S30	-	C						●	
		HC-M35	-	C			○				
CTC5240	🟧	HC-S40	-	C						●	
					01 05 10 15 20 25 30 35 40 45 50						

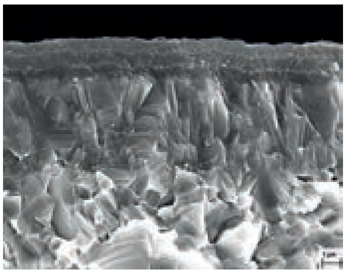
● Main application

○ Extended application

CTEP210
COLORSTAR™

HC-P10

●



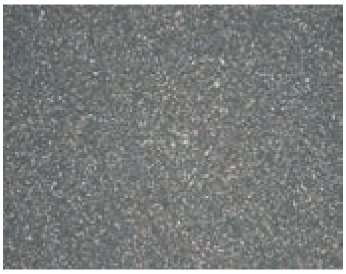
Specification:
Composition: Co/Ni 12.2%; MK 71.4%; others 0.4%; WC balance | Grain size: fine | Hardness: HV_{30} 1620 | Coating specifcation: CVD TiCN-Al_2O_3 multi-layer

Recommended application:
The coated cermet grade with sufficient toughness for finishing at high speed.

TCM10

HT-P15 | HT-M10 | HT-K10

● ● ○



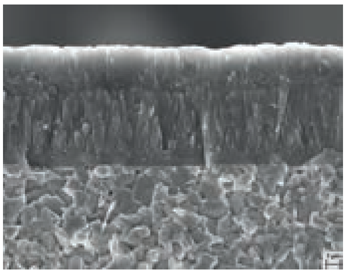
Specification:
Composition: cermet Co/Ni 12.2%; WC 15.0%; TaNbC 10.0%; TiCN balance | Hardness: HV_{30} 1620

Recommended application:
The uncoated cermet grade for the finishing of hardened steel.

CTCP220
BLACKSTAR™

HC-P20 | HC-K20

● ●



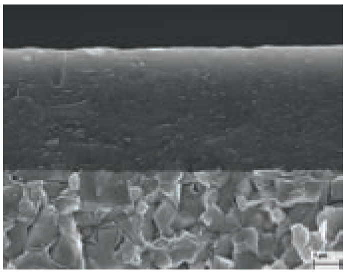
Specification:
Composition: Co 8.0%; mixed carbides 2.0%; WC balance | Grain size: 1-2 μm | Hardness: HV_{30} 1500 | Coating specification: CVD TiCN-Al_2O_3

Recommended application:
The wear-resistant grade for the wet machining of steels.

CTPP225
SILVERSTAR™

HC-P25 | HC-K25

● ●



Specification:
Composition: Co 8.0%; mixed carbides 2.0%; WC balance | Grain size: 1-2 μm | Hardness: HV_{30} 1500 | Coating specification: PVD TiAlTaN

Recommended application:
The wear-resistant grade for the wet machining of steels.

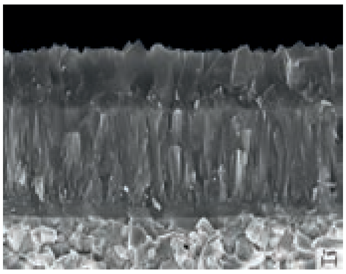
Grade description

CTCP230

BLACKSTAR™

HC-P30 | HC-K25 | HC-M25

● ● ○



Specification:
Composition: Co 10.5%; mixed carbides 2.0%; WC balance | Grain size: 1-2 μm | Hardness: HV_{30} 1400 | Coating specification: CVD TiCN-Al_2O_3

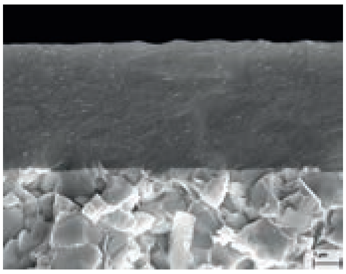
Recommended application:
First choice for dry machining of steels at high cutting speeds.

CTPP235

SILVERSTAR™

HC-P35 | HC-M30

● ○



Specification:
Composition: Co 10.5%; mixed carbide 2.0%; WC balance | Grain size: 1-2 μm | Hardness: HV_{30} 1400 | Coating specification: PVD TiAlTaN

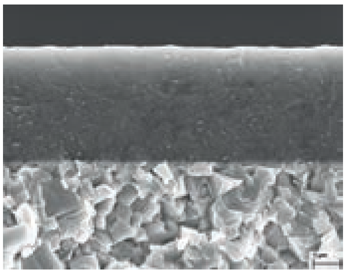
Recommended application:
Particularly suitable for the wet machining of steels.

CTPM225

SILVERSTAR™

HC-M25 | HC-P25

● ○



Specification:
Composition: Co 9.0%; mixed carbides 0.75%; WC balance | Grain size: 0.7-1 μm | Hardness: HV_{30} 1590 | Coating specification: PVD TiAlTaN

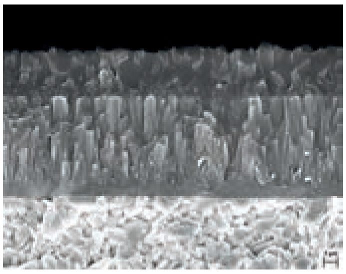
Recommended application:
The wear-resistant choice for the machining of austenitic steels.

CTCM235

BLACKSTAR™

HC-M35 | HC-P40

● ○

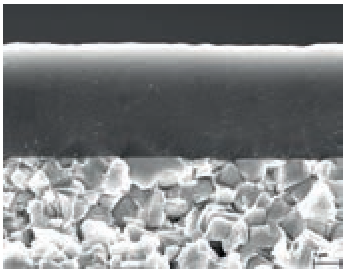


Specification:
Composition: Co 12.5%; mixed carbides 2.0%; WC balance | Grain size: 1 μm | Hardness: HV_{30} 1380 | Coating specification: CVD TiCN-Al_2O_3

Recommended application:
Suitable for martensitic steels and as a tough alternative in general steel machining.

Grade description

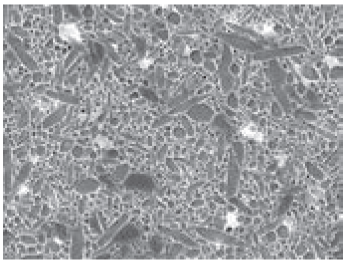
CTPM240 SILVERSTAR™	HC-M40 | HC-P40	● ○



Specification:
Composition: Co 12.5%; mixed carbides 2.0%; WC balance | Grain size: 1 μm | Hardness: HV_{30} 1380 | Coating specification: PVD TiAlTaN

Recommended application:
The first choice for the machining of austenitic steels.

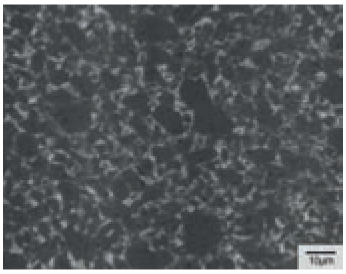
CTN3105	CN-K05	●



Specification:
Composition: β - Si_3N_4 | Grain size: fine | Hardness: HV_{10} 1620

Recommended application:
Universal silicon grade for cast iron machining.

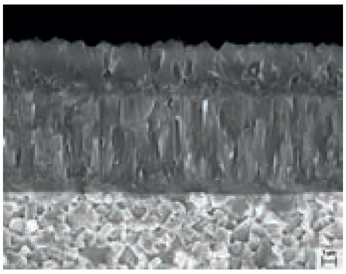
CTL3215	BC-K10 | BC-H10	● ○



Specification:
Composition: cubic boron nitride (CBN) | 85 vol.% + metal binder phase | Coating specification: PVD

Recommended application:
Coated cubic boron nitride with very good toughness of the cutting edge and good wear resistance.

CTCK215 BLACKSTAR™	HC-K15	●

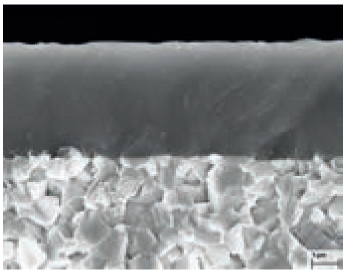


Specification:
Composition: Co 6.0%; mixed carbides 2.0%; WC balance | Grain size: 1 μm | Hardness: HV_{30} 1630 | Coating specification: CVD TiN; MT-TiCN; Al_2O_3

Recommended application:
The first choice for the machining of cast iron at high cutting speeds.

Grade description

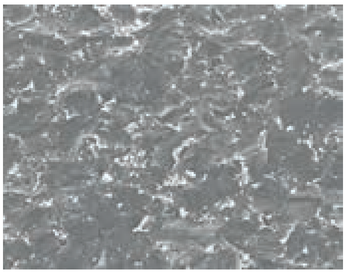
CTPK220 SILVERSTAR™	HC-K20	●



Specification:
Composition: Co 6.0%; mixed carbides 2.0%; WC balance | Grain size: 1 µm | Hardness: HV$_{30}$ 1630 | Coating specification: PVD TiAlTaN

Recommended application:
Optimal for the machining of high-tensile cast iron materials when toughness is required.

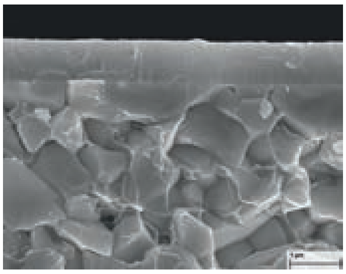
CTD4205	DP-N05	●



Specification:
Composition: polycrystalline diamond (PKD) | Grain size: ~ 25 µm | Coating specification: CVD TiCN-Al_2O_3 multi-layer

Recommended application:
Polycrystalline diamond grade for the machining of non-ferrous metals and non-metallic materials.

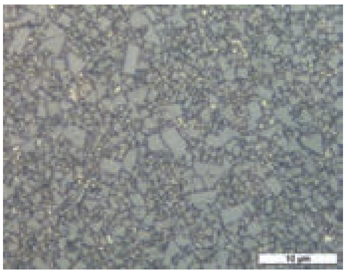
AMZ	HC-N10 | HC-P10 | HC-K10	● ○ ○



Specification:
Composition: Co 6%; WC balance | Grain size: 1 µm | Hardness: HV$_{30}$ 1630 | Coating specification: PVD TiAlN

Recommended application:
The coated carbide grade for the machining of aluminium.

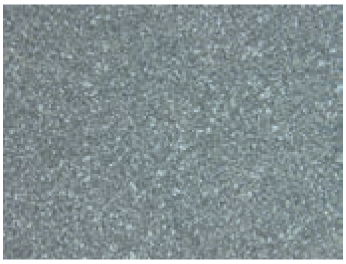
H216T	HW-N15 | HW-K15	● ●



Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 µm | Hardness: HV$_{30}$ 1630

Recommended application:
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

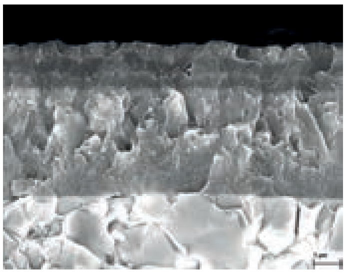
CTW4615	HW-N15 | HW-K15	● ●



Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 µm | Hardness: HV_{30} 1630

Recommended application:
Uncoated carbide grade for the machining of non-ferrous metals

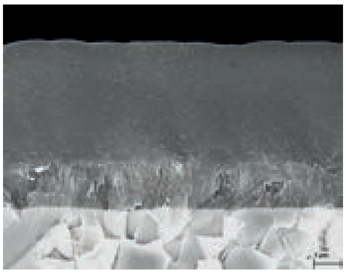
CTC5235	HC-S30 | HC-M35	● ○



Specification:
Composition: 10.0% binder; WC balance | Grain size: 2 µm | Hardness: HV_{30} 1330 | Coating specification: CVD TiCN-Al_2O_3 multi-layer

Recommended application:
Particularly suitable for the machining of heat-resistant steels and iron-based alloys.

CTC5240	HC-S40	●



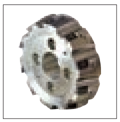
Specification:
Composition: 10.0% binder; WC balance| Grain size: 2 µm | Hardness: HV_{30} 1330 | Coating specification: CVD TiN-TiB_2

Recommended application:
Recommended for the machining of titanium materials

Overview

Tooling systems

Face milling

	MaxiMill 274 system	B32-B49
	MaxiMill 270 system	B52-B62
	MaxiMill 273 system	B64-B73
	MaxiMill 271 system	B76-B80
	MaxiMill HFC system	B82-B96
	MaxiMill HEC system	B98-B104
	MaxiMill HDM system	B106-B108

Shoulder milling

	MaxiMill 211 system	B110-B131
	MaxiMill 490 system	B134-B145
	MaxiMill HSC/HPC system	B148-B161
	MaxiMill HPC system	B164-B172

Form milling

	MaxiMill 251 system	B174-B183
	MaxiMill 252 system	B186-B191

Profile milling

	MaxiMill 272 / CKF / CNF / CZF system	B194-B202

Milling with cassette cutters

	MaxiMill A260 system	B204-B226

Other inserts

	Other inserts	B228-B233

Overview

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch	Machining method	Page(s)
45°	**MaxiMill 274 face milling cutters**								
A274..OF		3	3,2 - 16,0	Z3 - Z14		IC			B34
C274..OF		2,50	2,0 - 3,2	Z3 - Z5	HA HB	IC			B35
G274..OF		2,50	2,0 - 3,2	Z3 - Z5	GS	IC			B36
A274..SF		6	3,9 - 17,1	Z3 - Z14		IC			B43
C274..SF		3,80	2,7 - 4,0	Z3 - Z5	HA HB	IC			B44
G274..SF		3,80	2,7 - 4,0	Z3 - Z5	GS	IC			B45

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch	Machining method	Page(s)
45°	**MaxiMill 270 face milling cutters**								
A270..09		4	3,2 - 16,0	Z3 - Z14		IC			B57
A270..12		6	3,2 - 16,0	Z3 - Z12		IC			B58
C270		4	0,6 - 3,2	Z1 - Z5	HB	IC			B59

Overview

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch		Machining method	Page(s)
45°	MaxiMill 273 face milling cutters									
A273		3,50	4,0 - 16,0	Z3 - Z14		IC				B66
A273..A		3,50	8,0 - 31,5	Z10 - Z40						B67
A273		3,50	8,0 - 31,5	Z10 - Z40						B68
C273		6	3,2 - 4,0	Z3 - Z4	HB	IC				B69
45°	MaxiMill 271 face milling cutters									
A271		8,40	5,0 - 25,0	Z4 - Z15						B78
	MaxiMill HFC face milling cutters									
AHFC		2	3,2 - 10,0	Z3 - Z8		IC				B84
CHFC		2	1,6 - 3,5	Z2 - Z5	HA HB	IC				B85
GHFC		2	1,6 - 3,5	Z2 - Z5	GS	IC				B86

Overview

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch		Machining method	Page(s)
88°	MaxiMill HEC face milling cutters									
AHEC		8	5,0 - 16,0	Z4 - Z20						B101
AHEC..A		4	5,0 - 16,0	Z6 - Z20						B102
75°	MaxiMill HDM face milling cutters									
AHDM		20	16,0 - 31,5	Z8 - Z14						B107
90°	MaxiMill 211 shoulder milling cutters									
A211..07/11		10	3,2 - 12,5	Z4 - Z14		IC				B113
A211..15/20		19	4,0 - 16,0	Z3 - Z12		IC				B114
A211..K		75,50	4,0 - 8,0	Z3 - Z5		IC				B115
C211..07		6	1,0 - 3,2	Z1 - Z8	HA HB	IC				B116
C211..11		10	1,2 - 4,0	Z1 - Z6	HA HB	IC				B117

MaxiMill 211 shoulder milling cutters

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch	Machining method	Page(s)
C211..15		14	2,5 - 4,0	Z2 - Z4	HA HB	IC			B118
C211..K		50,50	2,5 - 5,0	Z2 - Z4	HB	IC			B119
G211		14	1,6 - 4,0	Z2 - Z8	GS	IC			B120

MaxiMill 490 shoulder milling cutters

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch	Machining method	Page(s)
A490..09		10,70	4,0 - 12,5	Z4 - Z10		IC			B137
A490..K..09		41	4,0 - 6,3	Z3 - Z5					B138
C490..12		10,70	2,5 - 4,0	Z2 - Z4	HA HB	IC			B139
C490..K..09		41	4,0 - 4,0	Z3 - Z3	HB				B140
G490..09		10,70	2,5 - 4,0	Z3 - Z4	GS	IC			B141

Overview

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch	Machining method	Page(s)
90°	MaxiMill HSC/HPC shoulder milling cutters								
AHSC		18	4,0 - 12,5	Z3 - Z6		IC			B150
CHSC		18	1,6 - 3,2	Z2 - Z5	HA HB	IC			B151
GHSC		18	1,6 - 4,0	Z2 - Z3	GS	IC			B152
MHSC		18	2,5 - 5,0	Z2 - Z4	HSK	IC			B153
AHPC..19		18	4,0 - 6,3	Z3 - Z4		IC			B155
CHPC..19		18	2,2 - 3,2	Z2 - Z3	HA	IC			B156
MHPC..19		18	2,5 - 5,0	Z2 - Z3	HSK	IC			B157

Overview

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch	Machining method	Page(s)
90°	**MaxiMill HPC shoulder milling cutters**								
AHPC..12		11	4,0 - 31,5	Z4 - Z18		IC			B167
CHPC..04		4	2,0 - 4,0	Z3 - Z6	HA	IC			B168
GHPC..04		4	2,0 - 4,0	Z3 - Z6	GS	IC			B169
MHPC..12		11	4,0 - 16,0	Z4 - Z12	HSK	IC			B170

	MaxiMill 251 form milling cutters								
A251		6	2,8 - 8,8	Z3 - Z10		IC			B178
A251		10	3,4 - 10,5	Z4 - Z7		IC			B179
C251		6	0,5 - 2,5	Z2 - Z6	HA HB	IC			B180
G251		6	1,0 - 3,0	Z2 - Z7	GS	IC			B181

Overview

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch	Machining method	Page(s)
	MaxiMill 252 form milling cutters								
A252		3	2,8 - 6,8	Z4 - Z8		IC			B188
C252		2,50	2,2 - 2,2	Z4 - Z4	HA	IC			B189
G252		2,50	2,2 - 2,2	Z4 - Z4	GS	IC			B190

45° 45°	MaxiMill 272 profile milling cutters								
C272		4	0,6 - 2,5	Z1 - Z3	HB	IC			B195

	MaxiMill C KF profile milling cutters								
C KF		16	1,2 - 3,2	Z1 - Z1	HB	IC			B197

	MaxiMill C NF profile milling cutters								
C NF		20	1,8 - 4,8	Z1 - Z2	HB	IC			B199

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch	Machining method	Page(s)
	MaxiMill C ZF profile milling cutters								
C ZF		2,65	1,6 - 2,5	Z3 - Z3	HB	IC			B201
	MaxiMill 260 45° cassette milling cutters								
A260..059 OF..		3	8,0 - 39,8	Z5 - Z22					B209
A260..059 SF..		6	9,1 - 40,9	Z5 - Z22					B210
A260..031/041 SD../XD..		6	8,0 - 39,8	Z5 - Z22					B211
A260..029/032 SE../SD..		9	7,5 - 39,8	Z5 - Z22					B212
A260..057 OA../XA..		3,50	8,2 - 40,0	Z5 - Z22					B213
A260..058 SA..		8,40	7,7 - 39,5	Z5 - Z22					B214
	MaxiMill 260 75° cassette milling cutters								
A260..018 SP..		9	8,2 - 40,0	Z5 - Z22					B215

Overview

Tool type		Max. depth of cut [mm]	Nominal diameter [mm]	Number of teeth	Connection/ interface	Int. coolant supply	Pitch	Machining method	Page(s)
	MaxiMill 260 90° cassette milling cutters								
A260..042/051 AP../LD..		14	8,9 - 40,7	Z5 - Z22					B216
A260..039/055 SD..		10,70	8,9 - 40,7	Z5 - Z22					B217
A260..025 TP..		18	8,9 - 40,7	Z5 - Z22					B218
A260..026/040 LP../AD..		18	8,9 - 40,7	Z5 - Z22					B219
A260..054/056 XD..		14	8,9 - 40,7	Z5 - Z22					B220

	MaxiMill 260 cassette milling cutters, button inserts								
A260..052/053 RP..		8	8,0 - 39,8	Z5 - Z22					B221

Notes

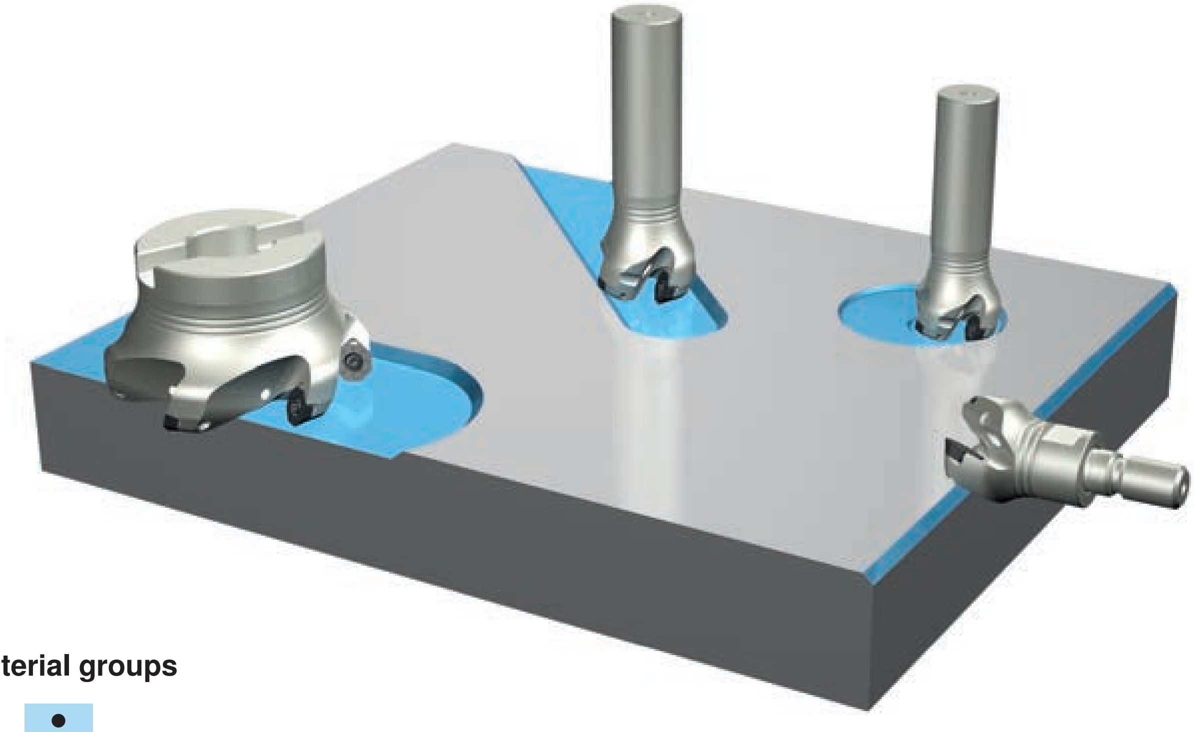

OF..0504../SF..1204..
10012145 / 3.2 Nm

MaxiMill 274 system

System overview

Low power consumption, reduced vibration and noise, good surface quality

○ 4 or 8 cutting edges combined in one system
○ Extremely positive position



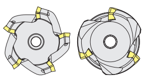
Material groups

P	●
M	●
K	○
N	●
S	●
H	

Possible applications

- Face milling
- Slot milling
- Helical plunge milling
- Pocket milling
- Axial plunging
- Helical plunging
- Chamfering

Detailed information

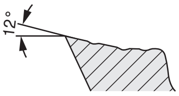
Pitch	Ø range	Inserts
	Ø 20 - 160 mm	OF..04.. OF..05.. SF..09.. SF..12..

MaxiMill 274 system

Geometry overview (OF..)

-F10

- ○ Highly positive geometry
- ○ Sharp cutting edge
- ○ First choice for non-ferrous metals



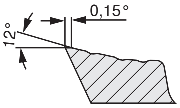
f_z [mm]

0,05 - 0,40

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩	**CTW4615**	**CTW4615**	**CTW4615**
🟧			
⬜			

-F50

- ○ Positive geometry
- ○ Light roughing
- ○ For unstable clamping situations
- ○ First choice for stainless steel materials



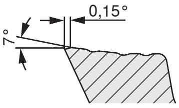
f_z [mm]

0,10 - 0,25

	Machining conditions		
	👍	👉	👎
🟦	**CTCP220** CTPP225	CTCP230 **CTPP235**	
🟨	**CTCM235** CTPM225	CTPM225 **CTPM240**	
🟥			
🟩			
🟧	**CTC5235** **CTC5240**	**CTC5235** **CTC5240**	**CTC5235** CTC5240
⬜			

-M50

- ○ Universal geometry
- ○ Light to medium roughing
- ○ First choice for general steel materials



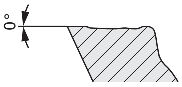
f_z [mm]

0,10 - 0,30

	Machining conditions		
	👍	👉	👎
🟦		**CTCP230** CTPP235	CTCP230 **CTPP235**
🟨		**CTPM240**	**CTPM240**
🟥		**CTCK215**	**CTCK215**
🟩			
🟧			
⬜			

EN

- ○ Universal geometry
- ○ Low cutting forces
- ○ First choice for good flatness



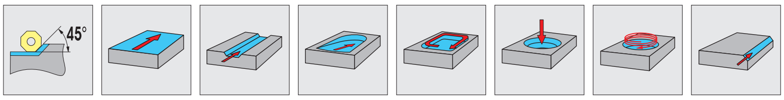
f_z [mm]

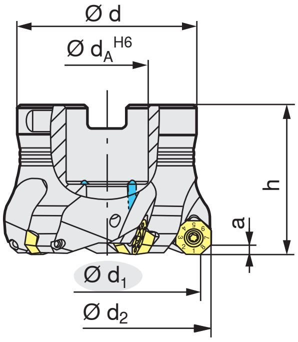
0,10 - 0,25

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩			
🟧	CTC5235 **CTC5240**	CTC5235 **CTC5240**	
⬜			

MaxiMill 274 system

A274 OF..





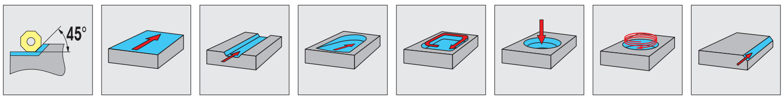
d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
32	A274.32.R.05-09	37.7	40	38	16	2.5	5	32200	1.6	OF.. 0403..	E01
40	A274.40.R.04-09	45.7	40	38	16	2.5	4	28400	1.6	OF.. 0403..	E01
40	A274.40.R.06-09	45.7	40	38	16	2.5	6	28400	1.6	OF.. 0403..	E01
50	A274.50.R.05-09	55.7	40	48	22	2.5	5	25200	1.6	OF.. 0403..	E02
50	A274.50.R.07-09	55.7	40	48	22	2.5	7	25200	1.6	OF.. 0403..	E02
63	A274.63.R.06-09	68.7	40	48	22	2.5	6	22300	1.6	OF.. 0403..	E02
63	A274.63.R.09-09	68.7	40	48	22	2.5	9	22300	1.6	OF.. 0403..	E02
80	A274.80.R.07-09	85.7	50	58	27	2.5	7	19600	1.6	OF.. 0403..	E02
80	A274.80.R.11-09	85.7	50	58	27	2.5	11	19600	1.6	OF.. 0403..	E02
100	A274.100.R.09-09	105.7	50	78	32	2.5	9	17500	1.6	OF.. 0403..	E02
100	A274.100.R.13-09	105.7	50	78	32	2.5	13	17500	1.6	OF.. 0403..	E02
125	A274.125.R.12-09	130.7	63	88	40	2.5	12	15600	1.6	OF.. 0403..	E02
40	A274.40.R.03-12	48	40	38	16	3	3	21600	3.2	OF.. 0504..	E03
40	A274.40.R.04-12	48	40	38	16	3	4	21600	3.2	OF.. 0504..	E03
50	A274.50.R.04-12	58.1	40	43	22	3	4	19100	3.2	OF.. 0504..	E03
50	A274.50.R.05-12	58.1	40	43	22	3	5	19100	3.2	OF.. 0504..	E03
63	A274.63.R.05-12	71.1	40	48	22	3	5	16800	3.2	OF.. 0504..	E03
63	A274.63.R.06-12	71.1	40	48	22	3	6	16800	3.2	OF.. 0504..	E03
80	A274.80.R.06-12	88	50	58	27	3	6	14800	3.2	OF.. 0504..	E03
80	A274.80.R.08-12	88	50	58	27	3	8	14800	3.2	OF.. 0504..	E03
100	A274.100.R.08-12	108	50	78	32	3	8	13100	3.2	OF.. 0504..	E03
100	A274.100.R.10-12	108	50	78	32	3	10	13100	3.2	OF.. 0504..	E03
125	A274.125.R.09-12	133	63	88	40	3	9	11700	3.2	OF.. 0504..	E03
125	A274.125.R.12-12	133	63	88	40	3	12	11700	3.2	OF.. 0504..	E03
160	A274.160.R.11-12	167.9	63	98	40	3	11	10300	3.2	OF.. 0504..	E03
160	A274.160.R.14-12	167.9	63	98	40	3	14	10300	3.2	OF.. 0504..	E03

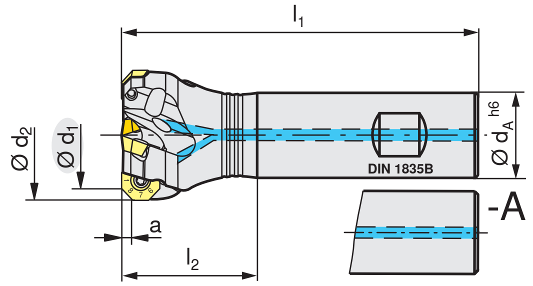
					
E01	11036880	11513168	11254598	8095003900	4425
E02		11513168	11254598	8095003900	
E03		11803957	11450867	8095012000	

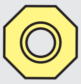
B276

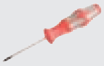
MaxiMill 274 system

C274 OF..





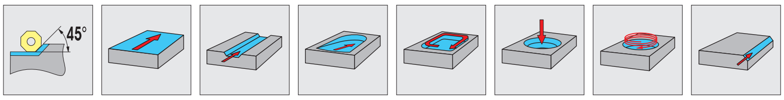
d1 [mm]	Type, description	d2 [mm]	l1 [mm]	l2 [mm]	dA [mm]	a [mm]	z	nmax [min $^{-1}$]	[Nm]		
20	C274.20.R.03-09-A-25	25.6	77	25	20	2.5	3	42600	1.6	OF.. 0403..	E01
20	C274.20.R.03-09-B-25	25.6	77	25	20	2.5	3	42600	1.6	OF.. 0403..	E01
25	C274.25.R.04-09-A20-32	30.7	84	32	20	2.5	4	37200	1.6	OF.. 0403..	E01
25	C274.25.R.04-09-B20-32	30.7	84	32	20	2.5	4	37200	1.6	OF.. 0403..	E01
32	C274.32.R.05-09-A25-40	37.7	98	40	25	2.5	5	32200	1.6	OF.. 0403..	E01
32	C274.32.R.05-09-B25-40	37.7	98	40	25	2.5	5	32200	1.6	OF.. 0403..	E01

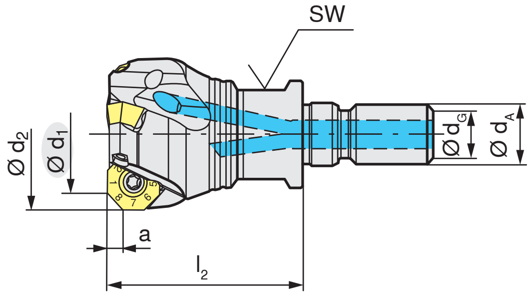
			
E01	11513168	11254598	8095003900

B276

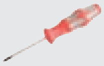
MaxiMill 274 system

G274 OF..





d₁ [mm]	Type, description	d₂ [mm]	l₂ [mm]	d_A [mm]	d_G [mm]	a [mm]	z	n_{max} [min⁻¹]	[Nm]		
20	G274.20.R.03-09	25.6	35	12.5	12	2.5	3	42600	1.6	OF.. 0403..	E01
25	G274.25.R.04-09	30.6	35	12.5	12	2.5	4	37200	1.6	OF.. 0403..	E01
32	G274.32.R.05-09	37.7	35	17.0	16	2.5	5	32200	1.6	OF.. 0403..	E01

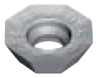
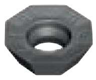
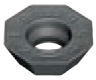
			
E01	11513168	11254598	8095003900

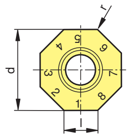
B276

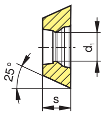
MaxiMill 274 system

OF..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

		CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-F10 	OFHT 040305FN-F10																	●				9.52	3.94	3.18	0.50	3.35
-F50 	OFHT 040305SN-F50			●	●	●	●	●	●	●									●	●		9.52	3.94	3.18	0.50	3.35
	OFHT 050410SN-F50					●	●	●	●	●									●			12.70	4.40	4.76	1.00	4.80
-M50 	OFHT 040305SN-M50					●	●			●			●									9.52	3.94	3.18	0.50	3.35
	OFHT 050410SN-M50							●														12.70	4.40	4.76	1.00	4.80
OFHW 	OFHW 040302EN																		●	●		9.52	3.94	3.18	0.20	3.35





B12-B18

B33

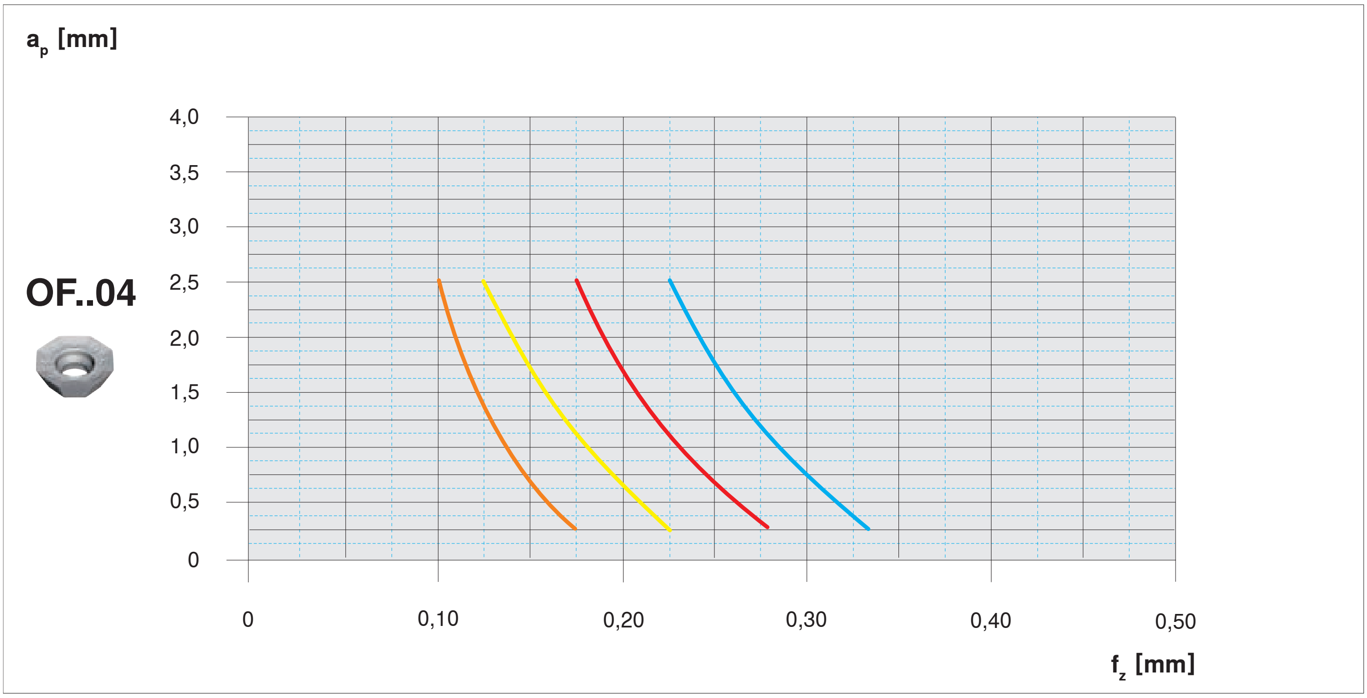
B21

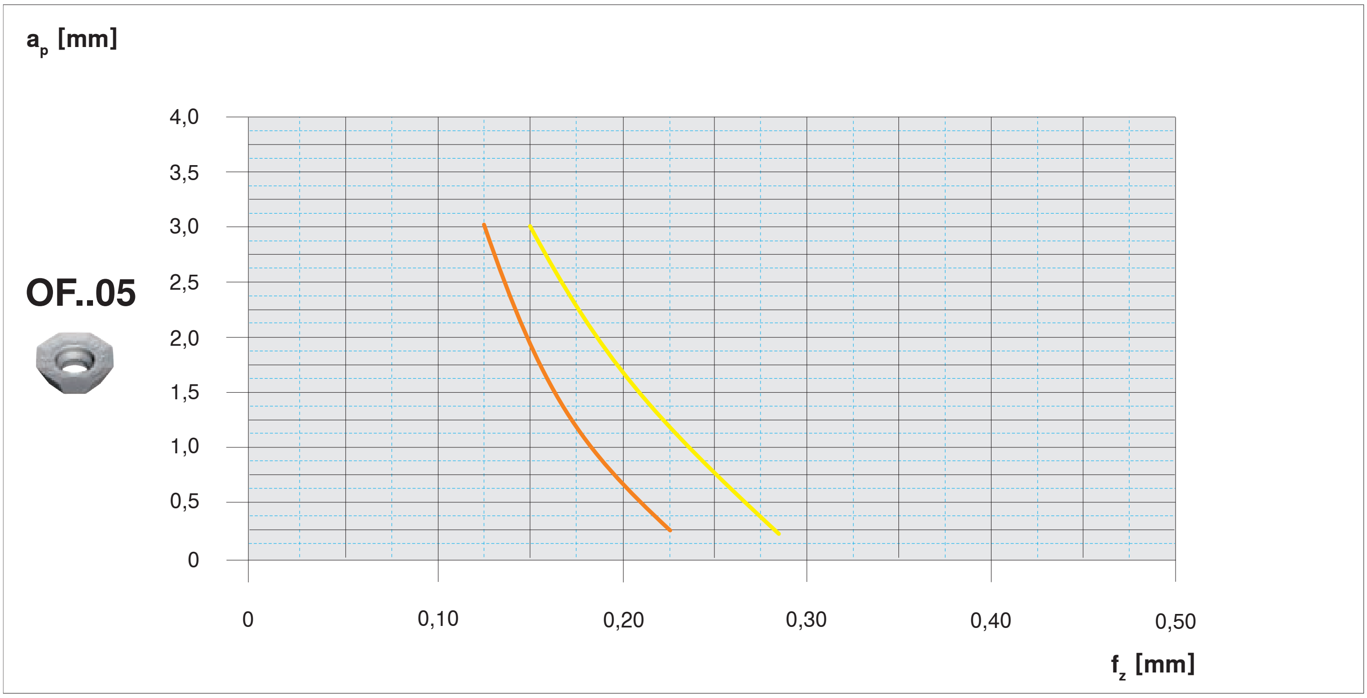
B257-B266

MaxiMill 274 system

Starting parameters for example materials OF..

Materials				Insert		v_c [m/min]	Coolant
▼	1.2312	40CrMnMoS8-6	1.000 N/mm^2	OFHT 040305SN-M50	CTPP235	200	dry
▼	1.4571	X6CrNiMoTi17-12-2	600 N/mm^2	OFHT 040305SN-F50 OFHT 050410SN-F50	CTPM240	180	dry
▼	5.1301	EN-GJL-250	HB 180	OFHT 040305SN-M50	CTCK215	250	dry
▼	2.4856	Inconel 625	1.450 N/mm^2	OFHT 040305SN-F50 OFHT 050410SN-F50	CTC5235	35	emulsion



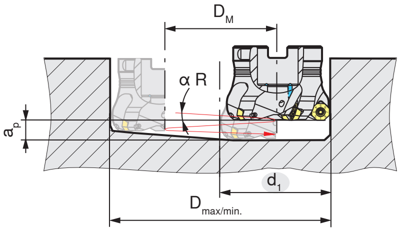


Additional grades and geometries can be used for the application and are illustrated in the respective application range of the system.

MaxiMill 274 system

Application data OF..04..

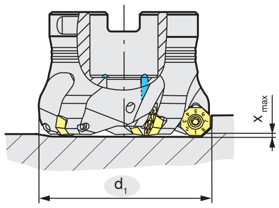
Helical plunge milling



D_{max} **[mm] = maximum diameter for flat bottom ground**
D_{min} **[mm] = minimum hole diameter**
$D_M = D_{max} - d_1$ **or** $D_{min} - d_1$

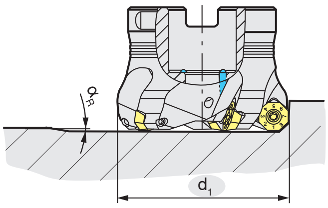
d_1 [mm]	$D_{max / r\,0,8}$ [mm]	D_{min} [mm]	$\alpha_{R\,max}$ [°]
20	45	39	14,2
25	55	49	9,5
32	69	63	6,5
40	85	79	4,7
50	105	99	3,5
63	131	125	2,7
80	165	159	2
100	205	199	1,6
125	255	249	1,2
a_p [mm] = $D_M \times \pi \times \tan \alpha_R$			

Axial plunging



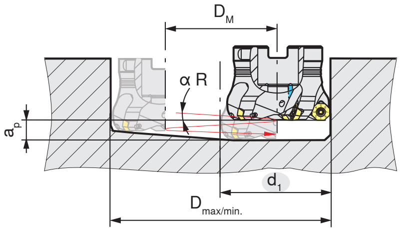
d_1 [mm]	X_{max} [mm]
20	2,5
25	2,5
32	2,5
40	2,5
50	2,5
63	2,5
80	2,5
100	2,5
125	2,5

Angled ramping



d_1 [mm]	α_R [°]
20	14,2
25	9,5
32	6,5
40	4,7
50	3,5
63	2,7
80	2,0
100	1,6
125	1,2

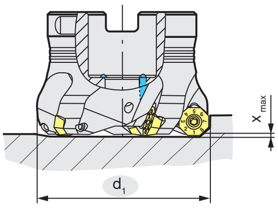
Helical plunge milling



D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

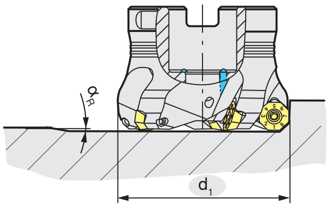
d_1 [mm]	$D_{max / r\ 0,8}$ [mm]	D_{min} [mm]	$\alpha_{R\ max}$ [°]
32	87	79	1,4
40	107	99	1,1
50	133	125	0,9
63	167	159	0,7
80	207	199	0,5
100	257	249	0,4
125	327	319	0,3
a_p [mm] = D_M x π x tan α_R			

Axial plunging



d_1 [mm]	X_{max} [mm]
32	2,8
40	2,2
50	1,9
63	1,8
80	1,1
100	1,4
125	1,4

Angled ramping



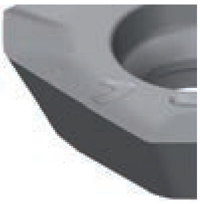
d_1 [mm]	α_R [°]
32	5,9
40	3,2
50	2,0
63	1,5
80	0,7
100	0,7
125	0,5

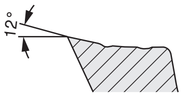
MaxiMill 274 system

Geometry overview (SF..)

-F10

- ○ Highly positive geometry
- ○ Sharp cutting edge
- ○ First choice for non-ferrous metals





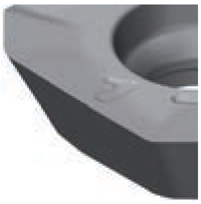
f_z [mm]

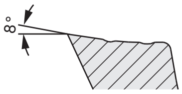
0,05 - 0,40

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩	**CTW4615**	**CTW4615**	**CTW4615**
🟧			
⬜			

-F40

- ○ Positive geometry
- ○ Finishing and roughing geometry
- ○ For unstable clamping situations
- ○ For heat-resistant materials, titanium and super alloys





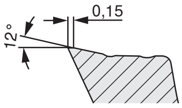
f_z [mm]

0,10 - 0,25

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩			
🟧	**CTC5240**	**CTC5240**	
⬜			

-F50

- ○ Positive geometry
- ○ Light roughing geometry
- ○ For unstable clamping situations
- ○ First choice for stainless steel materials



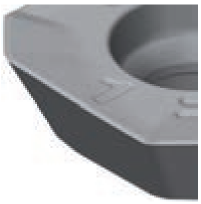
f_z [mm]

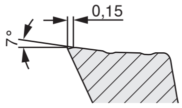
0,10 - 0,25

	Machining conditions		
	👍	👉	👎
🟦	**CTCP220** CTPP225	CTCP230 **CTPP235**	
🟨	**CTCM235** CTPM225	CTPM225 **CTPM240**	
🟥			
🟩			
🟧	**CTC5235**	**CTC5235**	**CTC5235**
⬜			

-M50

- ○ Universal geometry
- ○ Light to medium roughing
- ○ First choice for general steel materials





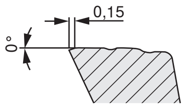
f_z [mm]

0,10 - 0,30

	Machining conditions		
	👍	👉	👎
🟦		**CTCP230** CTPP235	CTCP230 **CTPP235**
🟨		**CTPM225**	**CTPM225**
🟥		**CTCK215**	**CTCK215**
🟩			
🟧			
⬜			

-R50

- ○ Stable geometry
- ○ Medium roughing
- ○ For interrupted cut
- ○ First choice for cast iron materials



f_z [mm]

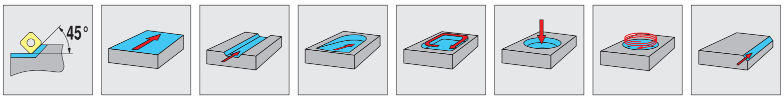
0,10 - 0,35

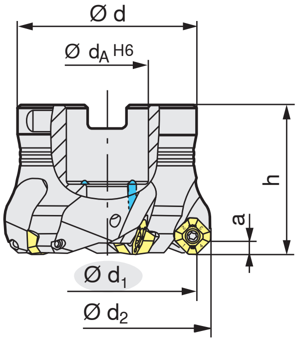
Machining conditions

	👍	👉	👎
🟦			
🟨			
🟥		**CTCK215** CTPK220	CTCK215 **CTPK220**
🟩			
🟧			
⬜			

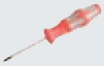
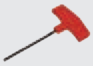
MaxiMill 274 system

A274 SF..





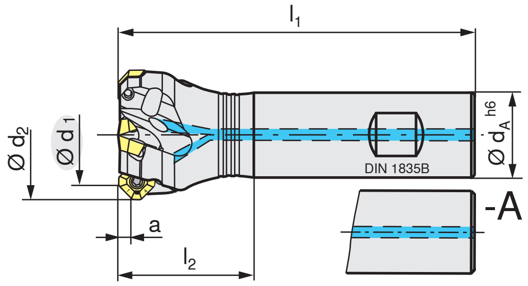
d₁ [mm]	Type, description	d₂ [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_max [min⁻¹]	[Nm]		
30.7	A274.32.R.05-09	39.2	40.7	38	16	3.8	5	32200	1.6	SF.. 0903..	E01
38.7	A274.40.R.04-09	47.6	40.7	38	16	3.8	4	28400	1.6	SF.. 0903..	E01
38.7	A274.40.R.06-09	47.6	40.7	38	16	3.8	6	28400	1.6	SF.. 0903..	E01
48.7	A274.50.R.05-09	57.6	40.7	48	22	3.8	5	25200	1.6	SF.. 0903..	E02
48.7	A274.50.R.07-09	57.6	40.7	48	22	3.8	7	25200	1.6	SF.. 0903..	E02
61.7	A274.63.R.06-09	70.5	40.7	48	22	3.8	6	22300	1.6	SF.. 0903..	E02
61.7	A274.63.R.09-09	70.5	40.7	48	22	3.8	9	22300	1.6	SF.. 0903..	E02
78.7	A274.80.R.07-09	87.5	50.7	58	27	3.8	7	19600	1.6	SF.. 0903..	E02
78.7	A274.80.R.11-09	87.5	50.7	58	27	3.8	11	19600	1.6	SF.. 0903..	E02
98.7	A274.100.R.09-09	107.5	50.7	78	32	3.8	9	17500	1.6	SF.. 0903..	E02
98.7	A274.100.R.13-09	107.5	50.7	78	32	3.8	13	17500	1.6	SF.. 0903..	E02
123.7	A274.125.R.12-09	132.5	63.7	88	40	3.8	12	15600	1.6	SF.. 0903..	E02
36.9	A274.40.R.03-12	50.9	41.5	38	16	6.0	3	21600	3.2	SF.. 1204..	E03
36.9	A274.40.R.04-12	50.9	41.5	38	16	6.0	4	21600	3.2	SF.. 1204..	E03
46.9	A274.50.R.04-12	61	41.5	43	22	6.0	4	19100	3.2	SF.. 1204..	E03
46.9	A274.50.R.05-12	61	41.5	43	22	6.0	5	19100	3.2	SF.. 1204..	E03
59.9	A274.63.R.05-12	74	41.5	48	22	6.0	5	16800	3.2	SF.. 1204..	E03
59.9	A274.63.R.06-12	74	41.5	48	22	6.0	6	16800	3.2	SF.. 1204..	E03
76.9	A274.80.R.06-12	90.9	51.5	58	27	6.0	6	14800	3.2	SF.. 1204..	E03
76.9	A274.80.R.08-12	90.9	51.5	58	27	6.0	8	14800	3.2	SF.. 1204..	E03
96.9	A274.100.R.08-12	110.9	51.5	78	32	6.0	8	13100	3.2	SF.. 1204..	E03
96.9	A274.100.R.10-12	110.9	51.5	78	32	6.0	10	13100	3.2	SF.. 1204..	E03
121.9	A274.125.R.09-12	135.9	64.5	88	40	6.0	9	11700	3.2	SF.. 1204..	E03
121.9	A274.125.R.12-12	135.9	64.5	88	40	6.0	12	11700	3.2	SF.. 1204..	E03
156.9	A274.160.R.11-12	170.9	64.5	98	40	6.0	11	10300	3.2	SF.. 1204..	E03
156.9	A274.160.R.14-12	170.9	64.5	98	40	6.0	14	10300	3.2	SF.. 1204..	E03

					
E01	11036880	11513168	11254598	8095003900	4425
E02		11513168	11254598	8095003900	
E03		11803957	11450867	8095012000	

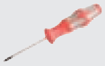
B276

MaxiMill 274 system

C274 SF..



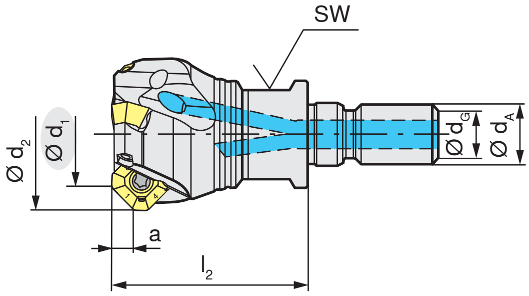
d1 [mm]	Type, description	d2 [mm]	l1 [mm]	l2 [mm]	dA [mm]	a [mm]	z	nmax [min-1]	[Nm]		
18.9	C274.20.R.03-09-A-25	27.4	77.7	25.7	20	3.8	3	42600	1.6	SF.. 0903..	E01
18.9	C274.20.R.03-09-B-25	27.4	77.7	25.7	20	3.8	3	42600	1.6	SF.. 0903..	E01
23.8	C274.25.R.04-09-A20-32	32.5	84.7	32.7	20	3.8	4	37200	1.6	SF.. 0903..	E01
23.8	C274.25.R.04-09-B20-32	32.5	84.7	32.7	20	3.8	4	37200	1.6	SF.. 0903..	E01
30.7	C274.32.R.05-09-A25-40	39.5	98.7	40.7	25	3.8	5	32200	1.6	SF.. 0903..	E01
30.7	C274.32.R.05-09-B25-40	39.5	98.7	40.7	25	3.8	5	32200	1.6	SF.. 0903..	E01

			
E01	11513168	11254598	8095003900

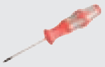
B276

MaxiMill 274 system

G274 SF..



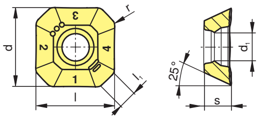
d_1 [mm]	Type, description	d_2 [mm]	l_2 [mm]	d_A [mm]	d_G [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
18.9	G274.20.R.03-09	27.4	35.7	12.5	12	3.8	3	42600	1.6	SF.. 0903..	E01
23.8	G274.25.R.04-09	32.5	35.7	12.5	12	3.8	4	37200	1.6	SF.. 0903..	E01
30.7	G274.32.R.05-09	39.5	35.7	17.0	16	3.8	5	32200	1.6	SF.. 0903..	E01

			
E01	11513168	11254598	8095003900

B276

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-F10		SFHT 0903AFFR-F10																	●				9.52	9.52	3.18	1.00	3.35
-F40		SFHT 0903AFER-F40																			●		9.52	9.52	3.18	1.00	3.35
-F50		SFHT 0903AFSR-F50			●	●	●	●	●	●	●									●			9.52	9.52	3.18	1.00	3.35
		SFHT 1204AFSR-F50							●	●													12.70	12.70	4.76	0.90	4.80
-M50		SFKT 0903AFSR-M50			●	●	●	●	●														9.52	9.52	3.18	1.00	3.35
		SFKT 1204AFSR-M50					●	●	●	●	●												12.70	12.70	4.76	1.00	4.80
-R50		SFKT 0903AFSR-R50												●	●								9.52	9.52	3.18	1.00	3.35

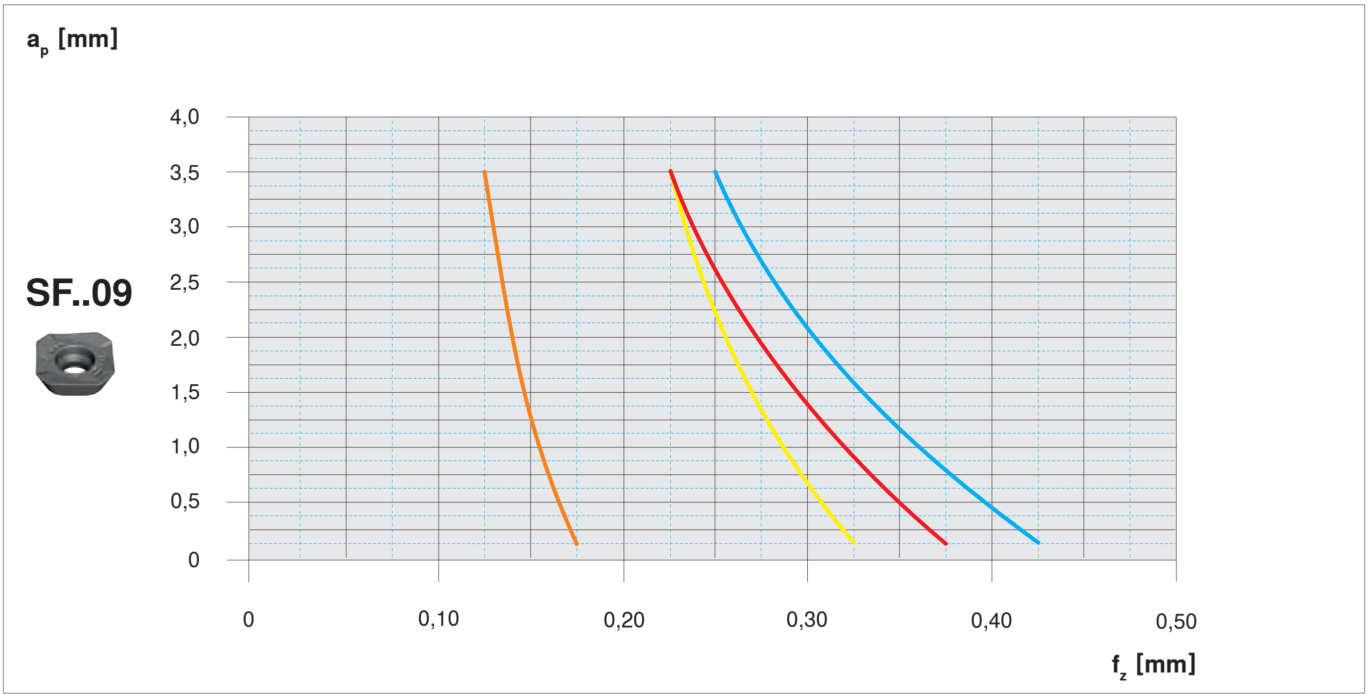


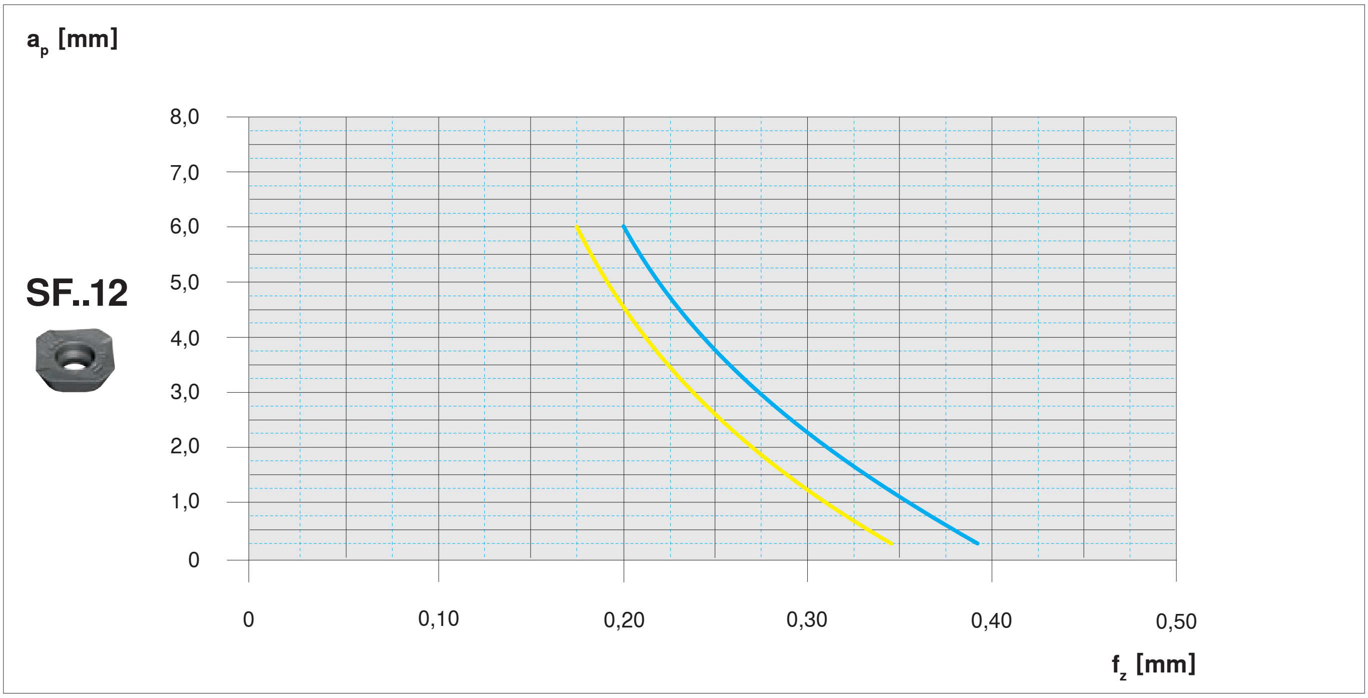
B12-B18
B41-B42
B21
B257-B266

MaxiMill 274 system

Starting parameters for example materials SF..

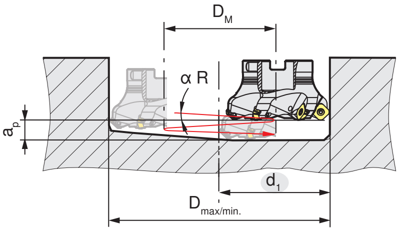
Materials				Insert		v_c [m/min]	Coolant
🟦	1.2312	40CrMnMoS8-6	1.000 N/mm^2	SFKT 0903AFSR-M50 SFKT 1204AFSR-M50	CTPP235	200	dry
🟨	1.4571	X6CrNiMoTi17-12-2	600 N/mm^2	SFHT 0903AFSR-F50 SFKT 1204AFSR-M50	CTPM240	180	dry
🟥	5.1301	EN-GJL-250	HB 180	SFKT 0903AFSR-R50	CTCK215	250	dry
🟧	2.4856	Inconel 625	1.450 N/mm^2	SFHT 0903AFSR-F50	CTC5235	35	emulsion





Additional grades and geometries can be used for the application and are illustrated in the respective application range of the system.

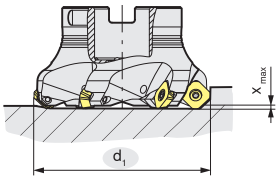
Helical plunge milling



D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

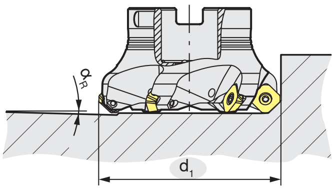
d_1 [mm]	$D_{max / r\ 0,8}$ [mm]	D_{min} [mm]	$\alpha_{R\ max}$ [°]
18,9	45	42	1,9
23,8	55	52	1,5
30,7	69	66	1,1
38,7	85	82	0,9
48,7	105	102	0,7
61,7	131	128	0,5
78,7	165	162	0,4
98,7	205	202	0,3
123,7	255	252	0,3
a_p [mm] = $D_M \times \pi \times \tan \alpha_R$			

Axial plunging



d_1 [mm]	X_{max} [mm]
18,9	3,7
23,8	3,5
30,7	3,2
38,7	3,1
48,7	3,1
61,7	3,0
78,7	2,9
98,7	2,7
123,7	2,7

Angled ramping

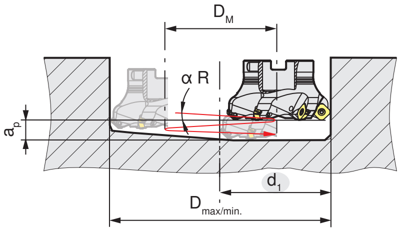


d_1 [mm]	α_R [°]
18,9	20,4
23,8	13
30,7	8
38,7	5,8
48,7	4,3
61,7	3,2
78,7	2,3
98,7	1,7
123,7	1,3

MaxiMill 274 system

Application data SF..12..

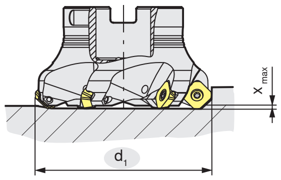
Helical plunge milling



D_{max} **[mm] = maximum diameter for flat bottom ground**
D_{min} **[mm] = minimum hole diameter**
$D_M = D_{max} - d_1$ **or** $D_{min} - d_1$

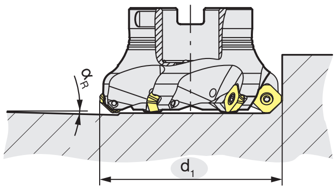
d_1 [mm]	$D_{max / r 0,8}$ [mm]	D_{min} [mm]	$\alpha_{R max}$ [°]
36,9	87	85	0,6
46,9	107	105	0,5
59,9	133	131	0,4
76,9	167	165	0,3
96,9	207	205	0,2
121,9	257	255	0,2
156,9	327	325	0,2
a_p [mm] = $D_M \times \pi \times \tan \alpha_R$			

Axial plunging



d_1 [mm]	X_{max} [mm]
36,9	5,0
46,9	3,4
59,9	3,2
76,9	3,0
96,9	2,5
121,9	2,6
156,9	2,5

Angled ramping



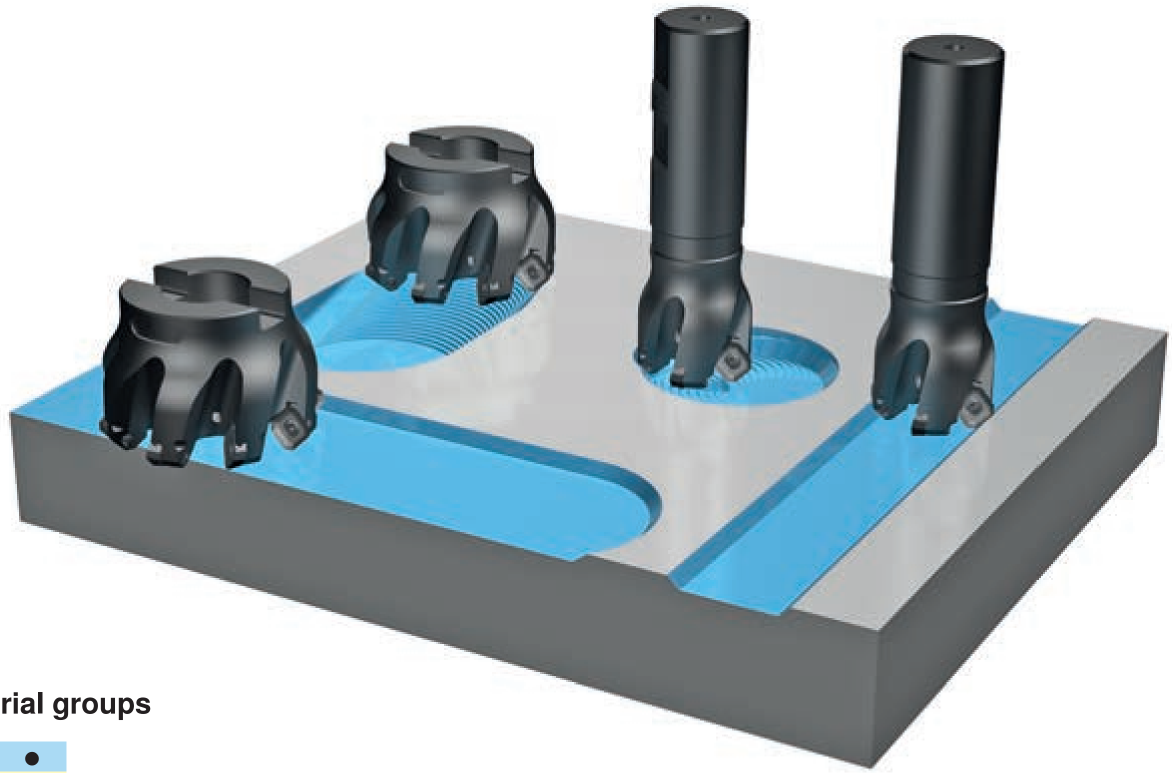
d_1 [mm]	α_R [°]
36,9	10,0
46,9	4,9
59,9	3,4
76,9	2,4
96,9	1,6
121,9	1,3
156,9	0,9

Notes


CERATIZIT

45° face milling system for universal application

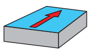
○ Maximum metal removal rate
○ Optimal price-performance ratio

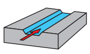


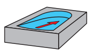
Material groups

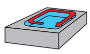
P	●
M	○
K	●
N	○
S	○
H	

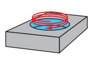
Possible applications

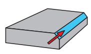

Face milling


Slot milling

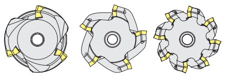

Helical plunge milling


Pocket milling


Helical plunging


Chamfering

Detailed information

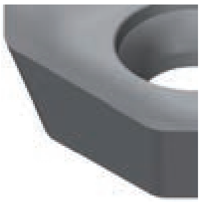
Pitch	Ø range	Inserts
	Ø 6 - 160 mm	SD..09.. SD..12.. SD..15.. XD..09.. XD..12..

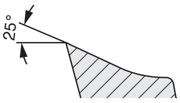
MaxiMill 270 system

Geometry overview (SD..09.. / XD..09..)

-27P

- o Highly positive geometry
- o Sharp cutting edge
- o Reduced tendency to adhesion
- o First choice for non-ferrous metals





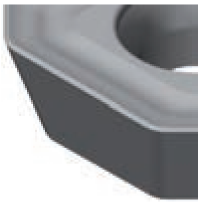
f_z [mm]

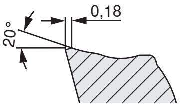
0,05 - 0,40

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩	AMZ **H216T**	AMZ **H216T**	**AMZ** H216T
🟧			
⬜			

-29

- o Universal geometry
- o Light to medium roughing
- o First choice for general steel materials





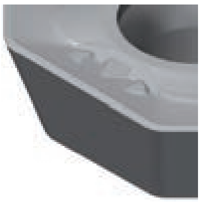
f_z [mm]

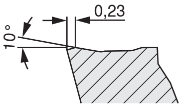
0,10 - 0,30

	Machining conditions		
	👍	👉	👎
🟦	**CTCP230** CTPP235	CTCP230 **CTPP235**	CTCP230 **CTPP235**
🟨			
🟥			
🟩			
🟧			
⬜			

-31

- o Stable geometry
- o Roughing
- o For heavily interrupted cut
- o First choice for cast iron materials





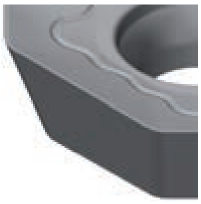
f_z [mm]

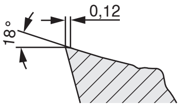
0,10 - 0,35

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥		**CTCK215**	**CTCK215**
🟩			
🟧			
⬜			

-M31

- o Positive geometry
- o Reduced vibration
- o Universal application
- o For heat-resistant materials, titanium and super alloys





f_z [mm]

0,10 - 0,25

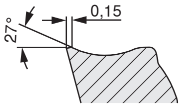
	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩			
🟧	**CTC5235** **CTC5240**	**CTC5235** **CTC5240**	**CTC5235** **CTC5240**
⬜			

MaxiMill 270 system

Geometry overview (SD..09.. / XD..09..)

-33

- ○ Positive geometry
- ○ Light roughing
- ○ First choice for stainless steel materials



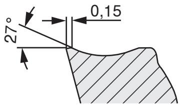
f$_z$ [mm]

0,10 - 0,25

	Machining conditions		
	👍	👉	👎
🟦			
🟨	CTPM240	CTPM240	CTPM240
🟥			
🟩			
🟧			
⬜			

-33P

- ○ Positive geometry
- ○ Reduced tendency to adhesion
- ○ First choice for stainless steel materials



f$_z$ [mm]

0,10 - 0,25

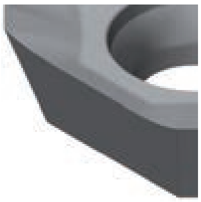
	Machining conditions		
	👍	👉	👎
🟦			
🟨		CTPM240	CTPM240
🟥			
🟩			
🟧			
⬜			

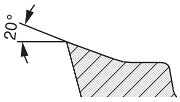
MaxiMill 270 system

Geometry overview (SD..12.. / XD..12..)

-27

- ○ Highly positive geometry
- ○ Sharp cutting edge
- ○ First choice for non-ferrous metals





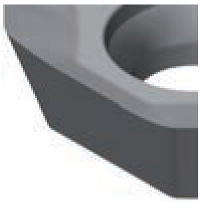
f_z [mm]

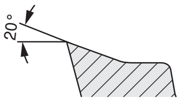
0,05 - 0,40

	Machining conditions		
	👍	✋	👎
🟦			
🟨			
🟥			
🟩	**H216T**	**H216T**	**H216T**
🟧			
⬜			

-27P

- ○ Highly positive geometry
- ○ Sharp cutting edge
- ○ Reduced tendency to adhesion
- ○ First choice for non-ferrous metals





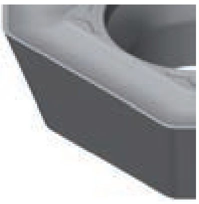
f_z [mm]

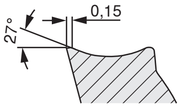
0,05 - 0,40

	Machining conditions		
	👍	✋	👎
🟦			
🟨			
🟥	**AMZ** H216T		
🟩	AMZ **H216T**	AMZ **H216T**	**AMZ** H216T
🟧			
⬜			

-33

- ○ Positive geometry
- ○ Light roughing
- ○ First choice for stainless steel materials





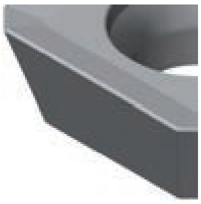
f_z [mm]

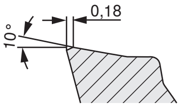
0,10 - 0,25

	Machining conditions		
	👍	✋	👎
🟦			
🟨	**CTPM240**	**CTPM240**	**CTPM240**
🟥			
🟩			
🟧			
⬜			

SN

- ○ Stable geometry
- ○ Light to medium finishing
- ○ For cermet as cutting material
- ○ For steel materials





f_z [mm]

0,10 - 0,25

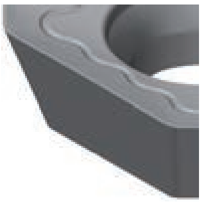
	Machining conditions		
	👍	✋	👎
🟦	**TCM10**	**TCM10**	
🟨			
🟥			
🟩			
🟧			
⬜			

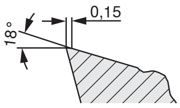
MaxiMill 270 system

Geometry overview (SD..12.. / XD..12..)

-M31

- ○ Positive geometry
- ○ Reduced vibration
- ○ Universal application
- ○ For heat-resistant materials, titanium and super alloys





f_z [mm]

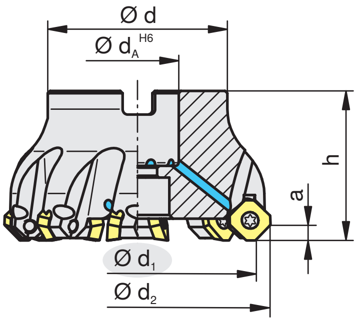
0,10 - 0,25

Machining conditions

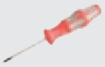
	👍	👉	👎
🟦			
🟨			
🟥			
🟩			
🟧	**CTC5235** **CTC5240**	**CTC5235** **CTC5240**	**CTC5235** **CTC5240**
⬜			

MaxiMill 270 system

A270-09



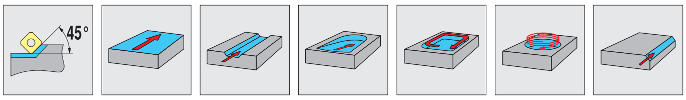
d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[Nm]		
32	A270.32.R.03-09	40.4	40	34	16	4	3	1.2	SD/XD.. 0903..	E01
32	A270.32.R.05-09	40.4	40	34	16	4	5	1.2	SD/XD.. 0903..	E01
40	A270.40.R.04-09	48.4	40	38	16	4	4	1.2	SD/XD.. 0903..	E01
40	A270.40.R.06-09	48.4	40	38	16	4	6	1.2	SD/XD.. 0903..	E01
50	A270.50.R.06-09	58.4	40	43	22	4	6	1.2	SD/XD.. 0903..	E01
50	A270.50.R.08-09	58.4	40	43	22	4	8	1.2	SD/XD.. 0903..	E01
63	A270.63.R.05-09	71.4	40	48	22	4	5	1.2	SD/XD.. 0903..	E01
63	A270.63.R.08-09	71.4	40	48	22	4	8	1.2	SD/XD.. 0903..	E01
63	A270.63.R.10-09	71.4	40	48	22	4	10	1.2	SD/XD.. 0903..	E01
80	A270.80.R.06-09	88.4	50	58	27	4	6	1.2	SD/XD.. 0903..	E01
80	A270.80.R.10-09	88.4	50	58	27	4	10	1.2	SD/XD.. 0903..	E01
80	A270.80.R.12-09	88.4	50	58	27	4	12	1.2	SD/XD.. 0903..	E01
100	A270.100.R.07-09	108.4	50	78	32	4	7	1.2	SD/XD.. 0903..	E01
100	A270.100.R.12-09	108.4	50	78	32	4	12	1.2	SD/XD.. 0903..	E01
100	A270.100.R.14-09	108.4	50	78	32	4	14	1.2	SD/XD.. 0903..	E01
125	A270.125.R.10-09	133.4	63	88	40	4	10	1.2	SD/XD.. 0903..	E01
125	A270.125.R.12-09	133.4	63	88	40	4	12	1.2	SD/XD.. 0903..	E01
160	A270.160.R.12-09	168.4	63	93.4	40	4	12	1.2	SD/XD.. 0903..	E01

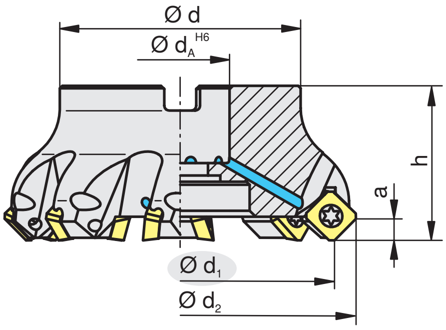
			
E01	77613	11149541	8095010200

B276

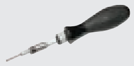
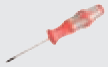
MaxiMill 270 system

A270-12





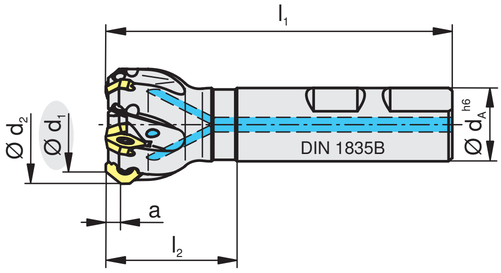
d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[Nm]		
32	A270.32.R.03-12	46	40	32	16	6	3	5	SD/XD.. 1204..	E01
40	A270.40.R.03-12	54	40	38	16	6	3	5	SD/XD.. 1204..	E01
40	A270.40.R.04-12	54	40	38	16	6	4	5	SD/XD.. 1204..	E02
50	A270.50.R.04-12	64	40	43	22	6	4	5	SD/XD.. 1204..	E02
50	A270.50.R.05-12	64	40	43	22	6	5	5	SD/XD.. 1204..	E02
63	A270.63.R.04-12	77	40	48	22	6	4	5	SD/XD.. 1204..	E02
63	A270.63.R.06-12	77	40	48	22	6	6	5	SD/XD.. 1204..	E02
80	A270.80.R.05-12	94	50	58	27	6	5	5	SD/XD.. 1204..	E02
80	A270.80.R.08-12	94	50	58	27	6	8	5	SD/XD.. 1204..	E02
100	A270.100.R.06-12	114	50	78	32	6	6	5	SD/XD.. 1204..	E02
100	A270.100.R.10-12	114	50	78	32	6	10	5	SD/XD.. 1204..	E02
125	A270.125.R.07-12	139	63	88	40	6	7	5	SD/XD.. 1204..	E02
125	A270.125.R.12-12	139	63	88	40	6	12	5	SD/XD.. 1204..	E02
160	A270.160.R.08-12	174	63	93.4	40	6	8	5	SD/XD.. 1204..	E02

					
E01	11036880	106022	11210490	8095010600	4425
E02		106022	11210490	8095010600	

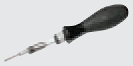
B276

MaxiMill 270 system

C270-09



d1 [mm]	Type, description	d2 [mm]	l1 [mm]	l2 [mm]	dA [mm]	a [mm]	z	[Nm]		
6	C270.06.R.01-09	14.4	80	32	16	4	1	1.2	SD.. 0903..	E01
12	C270.12.R.01-09	20.4	80	32	16	4	1	1.2	SD.. 0903..	E01
16	C270.16.R.02-09	24.4	90	40	20	4	2	1.2	SD.. 0903..	E02
20	C270.20.R.03-09	28.4	90	40	20	4	3	1.2	SD.. 0903..	E02
25	C270.25.R.04-09	33.4	100	44	25	4	4	1.2	SD.. 0903..	E02
32	C270.32.R.05-09	40.4	95	36	25	4	5	1.2	SD.. 0903..	E02

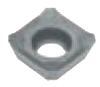
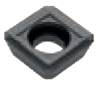
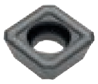
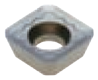
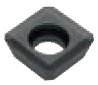
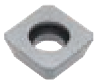
			
E01	169857	11149541	8095010200
E02	77613	11149541	8095010200

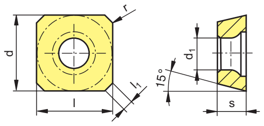
B276

MaxiMill 270 system

SD..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	l_1	r	d_1
																							[mm]	[mm]	[mm]	[mm]	[mm]	[mm]
-27P		SDHT 0903AEFN-27P															●	●					9.52	9.52	3.18	1.68	1.00	3.40
		SDHT 1204AEFN-27																●					12.70	12.70	4.76	1.74	0.20	5.50
		SDHT 1204AEFN-27P																●					12.70	12.70	4.76	1.74	0.20	5.50
-29		SDMT 1204AESN-29R					●	●															12.70	12.70	4.76	1.74	1.00	5.50
		SDNT 0903AESN-29					●	●															9.52	9.52	3.18	1.68	1.00	3.40
-31		SDMT 1204AEEN-31												●									12.70	12.70	4.76	1.74	1.00	5.50
		SDNT 0903AESN-31												●									9.52	9.52	3.18	1.61	1.00	3.40
-33		SDHT 0903AESN-33									●												9.52	9.52	3.18	1.68	1.00	3.40
		SDHT 0903AESN-33P									●												9.52	9.52	3.18	1.68	1.00	3.40
		SDHT 1204AESN-33									●												12.70	12.70	4.76	1.74	1.00	5.50
-M31		SDHT 0903AESN-M31																		●	●		9.52	9.52	3.18	1.68	1.00	3.40
		SDHT 1204AESN-M31																		●	●		12.70	12.70	4.76	1.74	1.00	5.50
SD..T		SDHT 1204AESN		●																			12.70	12.70	4.76	1.74	0.20	5.50
		SDHT 1204AESN-R					●	●															12.70	12.70	4.76	1.74	1.00	5.50
SD..W		SDHW 0903AESN		●																			9.52	9.52	3.18	1.68	1.00	3.40
		SDHW 1204AEEN																●					12.70	12.70	4.76	1.74	0.20	5.50
		SDHW 1204AEEN-R												●									12.70	12.70	4.76	1.74	1.00	5.50
		SDHW 1204AESN-R		●			●	●															12.70	12.70	4.76	1.74	1.00	5.50
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	l_1	r	d_1



B12-B18

B53-B56

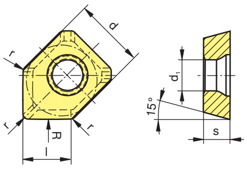
B21

B257-B266

MaxiMill 270 system

XD..

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]	R [mm]
		P	●	●	●	●	●	●	○	○	○						○			○								
		M		●			○	○	●	●	●									●								
		K		○	●	●	●					●	●	●	●		○	●	●	○		●						
		N														●	●	●	●									
		S																		●	●							
		H										○										●						
XDHW		XDHW 0903AEEN												●									9.52	5.50	3.18	1.00	3.40	125
		XDHW 0903AEFN																●					9.52	5.50	3.18	1.00	3.40	125
		XDHW 0903AESN		●			●	●															9.52	5.50	3.18	1.00	3.40	125
		XDHW 1204AEEN												●									12.70	7.50	4.76	1.00	5.50	150
		XDHW 1204AEFN																●					12.70	7.50	4.76	1.00	5.50	150
		XDHW 1204AESN		●			●	●															12.70	7.50	4.76	1.00	5.50	150
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	r	d_1	R

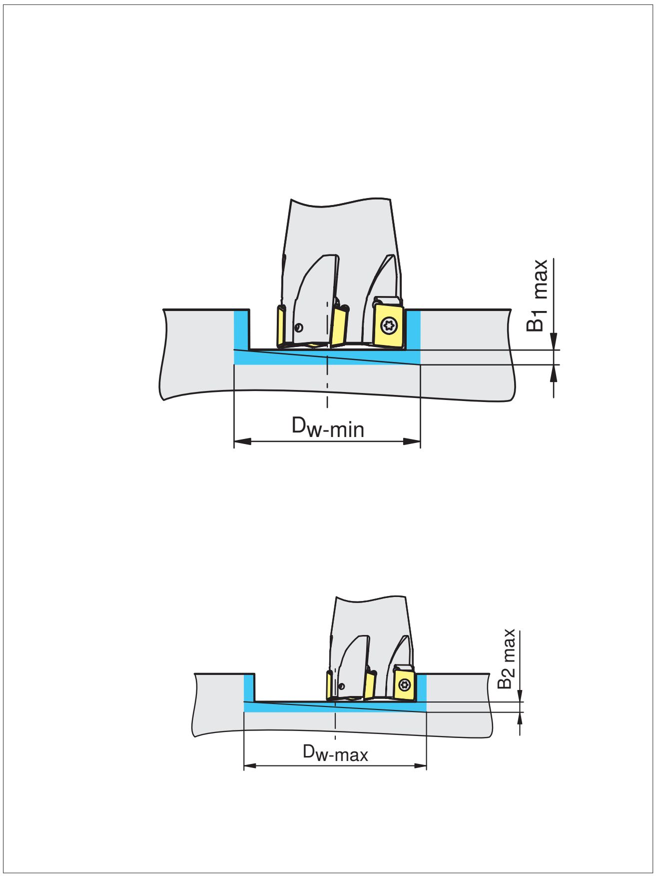


B12-B18

B243

B21

B257-B266



D [mm]	[mm]				
	$D_{w\text{-}min}$	$B_{1\text{-}max}$	$D_{w\text{-}max}$	$B_{2\text{-}max}$	α
270-09					
Ø 06	14,4	1,5	19,0	1,5	–
Ø 12	28,5	1,5	31,0	1,5	–
Ø 16	36,5	1,5	39,0	1,5	–
Ø 20	44,5	1,5	47,0	1,5	–
Ø 25	54,5	1,5	57,0	1,5	–
Ø 32	68,5	1,5	71,0	1,5	–
Ø 40	84,5	1,5	87,0	1,5	–
Ø 50	104,5	1,5	107,0	1,5	–
Ø 63	130,5	1,5	133,0	1,5	–
Ø 80	164,5	1,5	167,0	1,5	–
Ø 100	204,5	1,5	207,0	1,5	–
Ø 125	254,5	1,5	257,0	1,5	–
Ø 160	324,5	1,5	327,0	1,5	–
270-12					
Ø 32	74,5	1,5	78,0	1,5	14,9
Ø 40	90,5	1,5	94,0	1,5	11,1
Ø 50	110,5	1,5	114,0	1,5	8,4
Ø 63	136,5	1,5	140,0	1,5	6,4
Ø 80	170,5	1,5	174,0	1,5	4,9
Ø 100	210,5	1,5	214,0	1,5	3,8
Ø 125	260,5	1,5	264,0	1,5	3,0
Ø 160	330,5	1,5	334,0	1,5	2,3

α
Ramp angle

B
Calculated pitch / $D_w > D_{w\text{-}min}$ and $D_w < D_{w\text{-}max}$

B_{1max}
Max. pitch when plunging with minimum hole diameter

B_{2max}
Max. when plunging with maximum diameter

d_1
Milling cutter diameter

D_w
Diameter of hole

$D_{w\text{-}max}$
Largest hole diameter (without formation of pip)

$D_{w\text{-}min}$
Minimum hole diameter

$$B = (D_w - d_1) \cdot \pi \cdot \tan \alpha$$

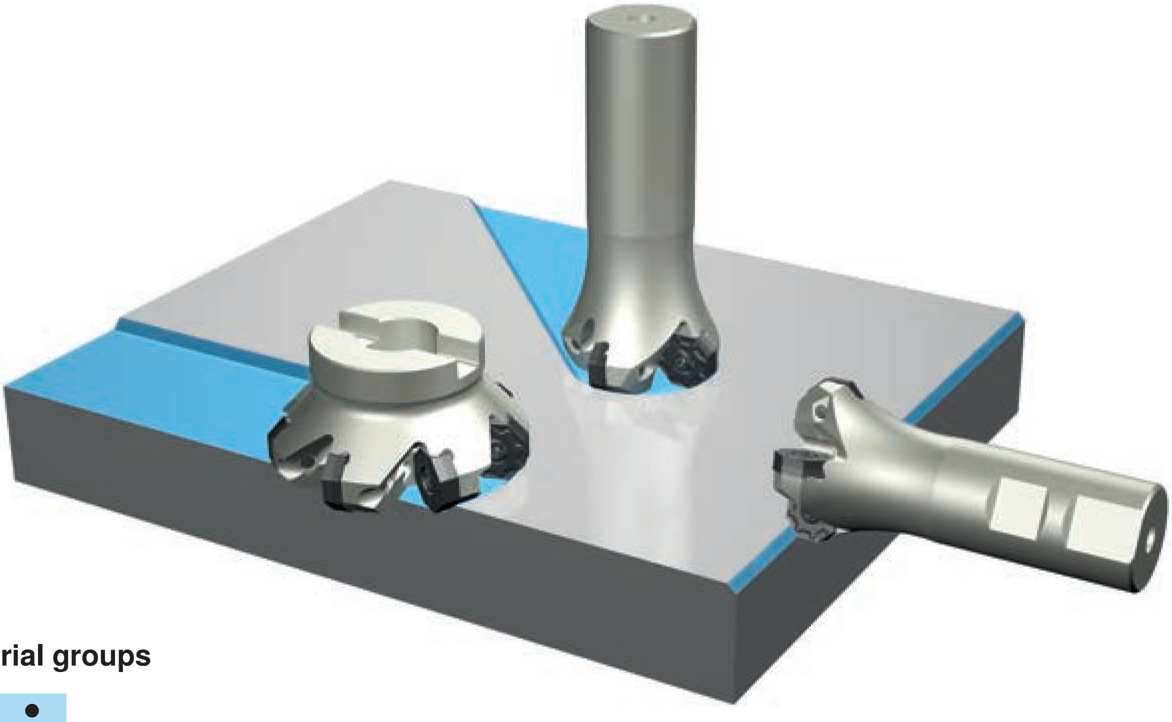

A273.40.R.04-06
nmax=17100 rpm
4500375397/40
CERATIZIT

MaxiMill 273 system

System overview

Economic face milling for a wide range of materials

○ 16 cutting edges
○ Stability and process security combined with low power consumption



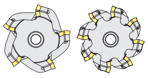
Material groups

P	●
M	○
K	●
N	
S	○
H	

Possible applications

Face milling	Slot milling	Chamfering

Detailed information

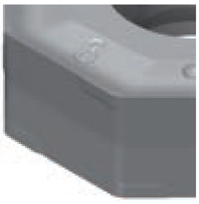
Pitch	Ø range	Inserts
	Ø 32 - 315 mm	OAKU 06..

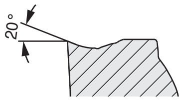
MaxiMill 273 system

Geometry overview

-F40

- ○ Positive geometry
- ○ Finishing and roughing
- ○ For unstable clamping situations
- ○ For heat-resistant materials, titanium and super alloys





f_z [mm]

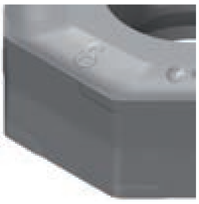
0,20 - 0,25

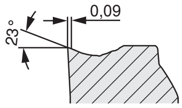
Machining conditions

	👍	👉	👎
🟦			
🟨			
🟥			
🟩			
🟧	CTC5235 **CTC5240**	CTC5235 **CTC5240**	**CTC5235** CTC5240
⬜			

-F50

- ○ Positive geometry
- ○ Light roughing
- ○ For unstable clamping situations
- ○ First choice for stainless steel materials





f_z [mm]

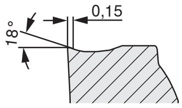
0,20 - 0,25

Machining conditions

	👍	👉	👎
🟦	**CTCP220** CTPP225	CTCP230 **CTPP235**	
🟨	**CTCM235** CTPM225	CTPM225 **CTPM240**	
🟥		**CTCK215** CTPK220	CTCK215 **CTPK220**
🟩			
🟧			
⬜			

-M50

- ○ Universal geometry
- ○ Light to medium roughing
- ○ First choice for general steel materials



f_z [mm]

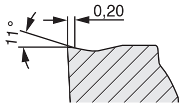
0,20 - 0,50

Machining conditions

	👍	👉	👎
🟦		**CTCP230** CTPP235	CTCP230 **CTPP235**
🟨	CTCM235 CTPM225	CTPM225 **CTPM240**	CTPM225 **CTPM240**
🟥		**CTCK215** CTPK220	CTCK215 **CTPK220**
🟩			
🟧			
⬜			

-R50

- ○ Stable geometry
- ○ Roughing
- ○ For heavily interrupted cut
- ○ First choice for cast iron materials



f_z [mm]

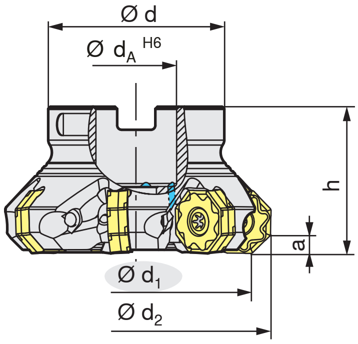
0,20 - 0,50

Machining conditions

	👍	👉	👎
🟦			
🟨			
🟥		**CTCK215** CTPK220	CTCK215 **CTPK220**
🟩			
🟧			
⬜			

MaxiMill 273 system

A273-06



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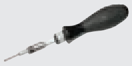
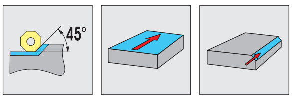
40	A273.40.R.03-06	50.2	40	38	16	3.5	3	17100	5	OA/XA.. 0605..	E01
40	A273.40.R.04-06	50.2	40	38	16	3.5	4	17100	5	OA/XA.. 0605..	E01
50	A273.50.R.05-06	60.2	40	48	22	3.5	5	14900	5	OA/XA.. 0605..	E02
63	A273.63.L.07-06	73.2	40	48	22	3.5	7	13100	5	OA/XA.. 0605..	E03
63	A273.63.R.07-06	73.2	40	48	22	3.5	7	13100	5	OA/XA.. 0605..	E03
80	A273.80.R.08-06	90.2	50	58	27	3.5	8	11500	5	OA/XA.. 0605..	E03
100	A273.100.R.10-06	110.2	50	78	32	3.5	10	10200	5	OA/XA.. 0605..	E04
125	A273.125.L.12-06	135.2	63	88	40	3.5	12	9000	5	OA/XA.. 0605..	E04
125	A273.125.R.12-06	135.2	63	88	40	3.5	12	9000	5	OA/XA.. 0605..	E04
160	A273.160.L.14-06	170.2	63	100	40	3.5	14	7900	5	OA/XA.. 0605..	E04
160	A273.160.R.14-06	170.2	63	100	40	3.5	14	7900	5	OA/XA.. 0605..	E04

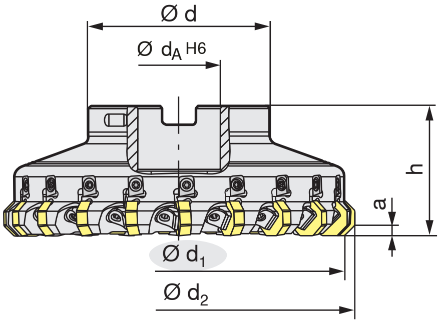
						
E01	11036880	11107792	11210490		8095010600	4425
E02	11040298	11107792	11210490	4496	8095010600	
E03		11107792	11210490		8095010600	
E04		11107792	11802576		8095010600	

B276

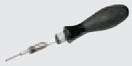
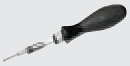
MaxiMill 273 system

A273-06 adjustable (A)





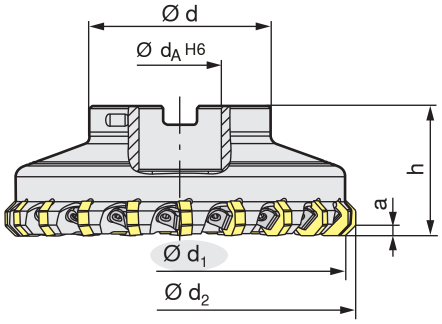
d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
80	A273.80.R.10A10-06	90.2	50	58	27	3.5	10	4800	5	OA/XA.. 0605..	E01
100	A273.100.R.14A14-06	110.3	50	78	32	3.5	14	4200	5	OA/XA.. 0605..	E01
125	A273.125.R.17A17-06	135.2	63	88	40	3.5	17	3800	5	OA/XA.. 0605..	E01
160	A273.160.R.20A20-06	170.2	63	88	40	3.5	20	3300	5	OA/XA.. 0605..	E01
200	A273.200.R.25A25-06	210.2	63	132	60	3.5	25	2900	5	OA/XA.. 0605..	E01
250	A273.250.R.31A31-06	260.2	63	132	60	3.5	31	2600	5	OA/XA.. 0605..	E01
315	A273.315.R.40A40-06	325.2	63	226	60	3.5	40	2300	5	OA/XA.. 0605..	E01

							
E01	11529282	11167992	11529276	11534870	8095018900	11210474	8095010500

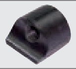
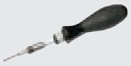
B276

MaxiMill 273 system

A273-06 wedge clamping



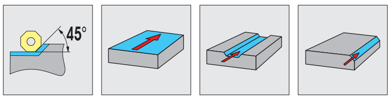
d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
80	A273.80.R.10-06	90.2	50	58	27	3.5	10	4800	5	OA/XA.. 0605..	E01
100	A273.100.R.14-06	110.3	50	78	32	3.5	14	4200	5	OA/XA.. 0605..	E01
125	A273.125.R.17-06	135.2	63	88	40	3.5	17	3800	5	OA/XA.. 0605..	E01
160	A273.160.R.20-06	170.2	63	100	40	3.5	20	3300	5	OA/XA.. 0605..	E01
200	A273.200.R.25-06	210.2	63	153	60	3.5	25	2900	5	OA/XA.. 0605..	E01
250	A273.250.R.31-06	260.2	63	153	60	3.5	31	2600	5	OA/XA.. 0605..	E01
315	A273.315.R.40-06	325.2	63	226	60	3.5	40	2300	5	OA/XA.. 0605..	E01

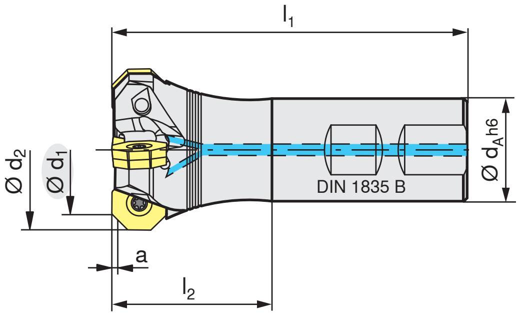
				
E01	11529282	11529276	11534870	8095010500

B276

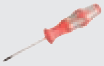
MaxiMill 273 system

C273-06





d_1 [mm]	Type, description	d_2 [mm]	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
32	C273.32.R.03-06-B-40	42.2	101	40	32	6	3	19600	5	OAKU 06..	E01
40	C273.40.R.04-06-B32-50	50.2	111	50	32	6	4	17000	5	OAKU 06..	E01

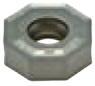
			
E01	11107792	11210490	8095010600

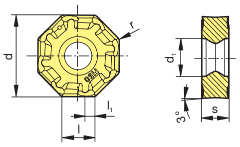
B276

MaxiMill 273 system

OA..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-F40		OAKU 060508ER-F40																		●	●		17.18	6.00	5.56	2.0	0.80	5.80
-F50		OAKU 060508SR-F50			●	●	●	●	●	●	●												17.18	6.00	5.56	2.0	0.80	5.80
-M50		OAKU 060508SL-M50						●						●	●								17.18	6.00	5.56	2.0	0.80	5.80
		OAKU 060508SR-M50			●	●	●	●	●	●	●			●	●								17.18	6.00	5.56	2.0	0.80	5.80
-R50		OAKU 060508SR-R50												●	●								17.18	6.00	5.56	2.0	0.80	5.80
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	l_1	r	d_1

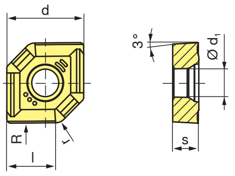


B12-B18
B65
B21
B257-B266

MaxiMill 273 system

XA..

		CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]	R [mm]
P		●	●	●	●	●	●	○	○	○						○			○								
M			●			○	○	●	●	●									●								
K			○	●	●	●					●	●	●	●		○	●	●	○		●						
N															●	●	●	●									
S																			●	●							
H											○										●						
-M50 	XAHT 060525SL-M50												●									17.08	8.40	5.56	2.50	6.00	640
	XAHT 060525SR-M50			●	●	●	●	●	●	●			●	●								17.08	8.40	5.56	2.50	6.00	640
		CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	r	d_1	R

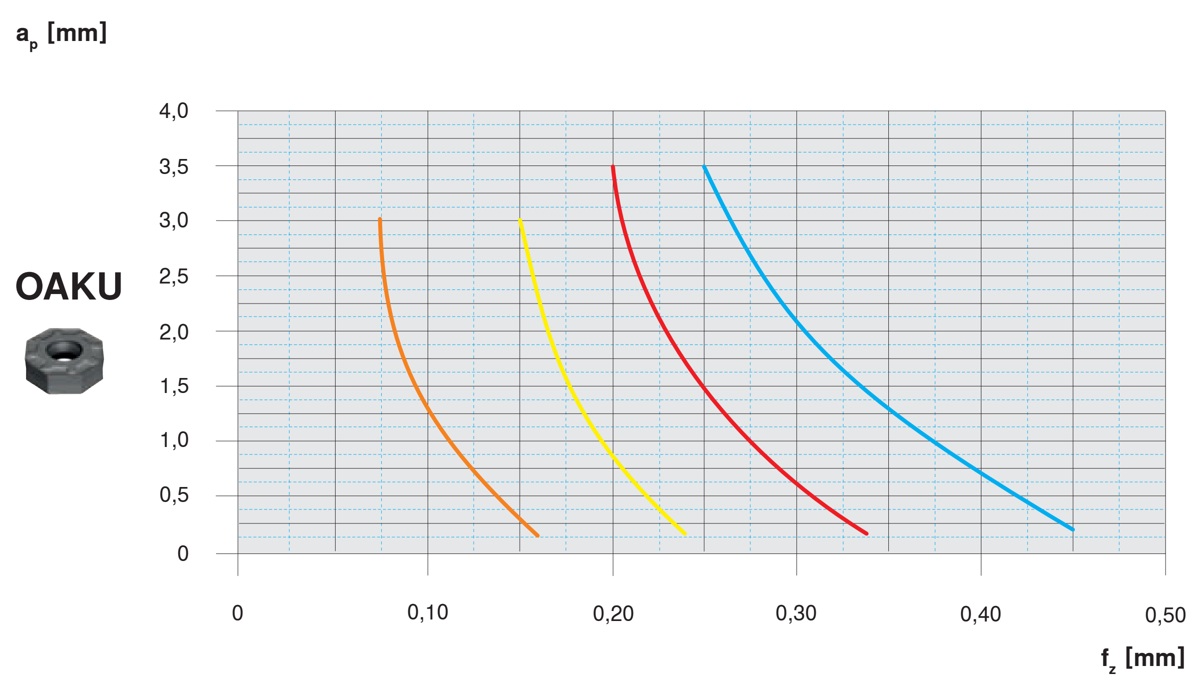


B12-B18
B243
B21
B257-B266

MaxiMill 273 system

Starting parameters for example materials

Materials				Insert		v_c [m/min]	Coolant
▼	1.2312	40CrMnMoS8-6	1.000 N/mm^2	OAKU 060508SR-M50	CTPP235	200	dry
▼	1.4571	X6CrNiMoTi17-12-2	600 N/mm^2	OAKU 060508SR-F50	CTPM240	180	dry
▼	5.1301	EN-GJL-250	HB 180	OAKU 060508SR-R50	CTCK215	250	dry
▼	2.4856	Inconel 625	1.450 N/mm^2	OAKU 060508SR-F40	CTC5235	35	emulsion

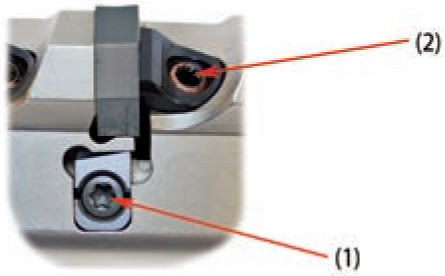


Additional grades and geometries can be used for the application and are illustrated in the respective application range of the system.

MaxiMill 273 system

Assembly procedures

Precision setting procedure



1. Mount the setting wedges in the cutter (as supplied) and tighten the setting screw (1), to lightly hold the wedge without deforming it.

2. Mount inserts and tighten clamping screws (2) with 1.0 Nm.

3. Mark 'highest cutting edge' using a presetting device.

4. Change position of PCD insert by 0.02 mm turning the setting screw (1) clockwise.
   For this purpose use the TORX key (8095018900 / WS-L-T15-136mm).

5. Set the other cutting edges to this level, maximum deviation of 0.005 mm.

Maximum adjustment = 0.10 mm.

6. Tighten all clamping screws (2) with 4.0 Nm (273-06).

7. Check axial run-out of all inserts
→ target < 0.005 mm.

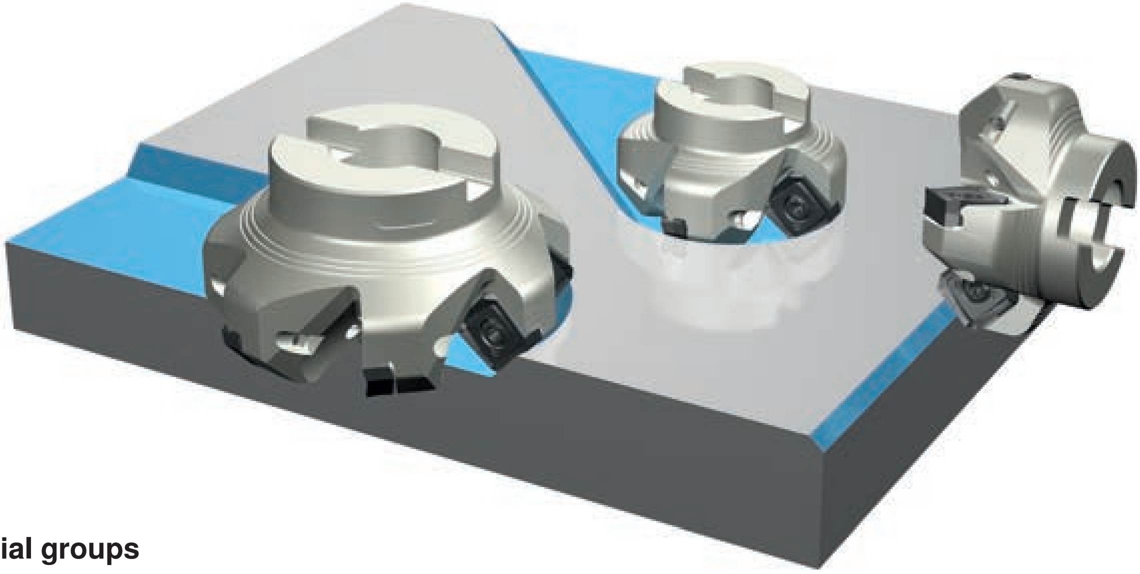
⚠

When changing the insert, first remove the setting screw (1), turning it counter-clockwise. After the mounting procedure is completed, the setting procedure starts again at point 1.


1
2
3
4

Maximum power for high productivity

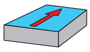
- ○ 8 effective cutting edges
- ○ Maximum depth of cut 8.4 mm



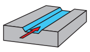
Material groups

P	●
M	○
K	●
N	
S	●
H	

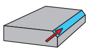
Possible applications



Face milling

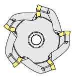


Slot milling



Chamfering

Detailed information

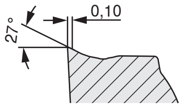
Pitch	Ø range	Inserts
	Ø 50 - 250 mm	SAKU 1706..

MaxiMill 271 system

Geometry overview

-F50

- ○ Positive geometry
- ○ Medium roughing
- ○ For unstable clamping situations when steel machining
- ○ First choice for stainless steel materials



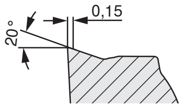
f_z [mm]

0,20 - 0,30

	Machining conditions		
	👍	👉	👎
🟦	**CTCP220** CTPP225	**CTCP230** CTPP235	
🟨	**CTCM235** CTPM225	CTPM225 **CTPM240**	
🟥			
🟩			
🟧	CTC5235 **CTC5240**	CTC5235 **CTC5240**	**CTC5235** CTC5240
⬜			

-M50

- ○ Universal geometry
- ○ Medium and rough machining
- ○ First choice for general steel materials



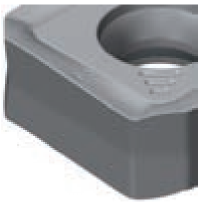
f_z [mm]

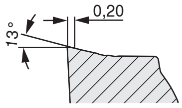
0,20 - 0,50

	Machining conditions		
	👍	👉	👎
🟦		CTCP230 **CTPP235**	CTCP230 **CTPP235**
🟨		CTPM225 **CTPM240**	CTPM225 **CTPM240**
🟥		**CTCK215** CTPK220	CTCK215 **CTPK220**
🟩			
🟧			
⬜			

-R50

- ○ Stable geometry
- ○ Roughing
- ○ For heavily interrupted cut
- ○ First choice for cast iron materials





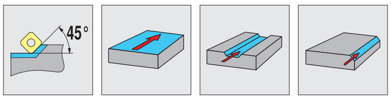
f_z [mm]

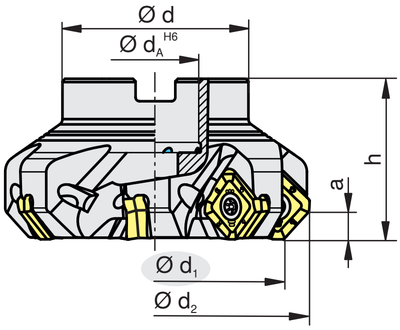
0,20 - 0,50

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥		**CTCK215** CTPK220	CTCK215 **CTPK220**
🟩			
🟧			
⬜			

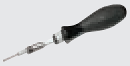
MaxiMill 271 system

A271





d$_1$ [mm]	Type, description	d$_2$ [mm]	h [mm]	d [mm]	d$_A$ [mm]	a [mm]	z	n$_{max}$ [min^{-1}]	[Nm]		
50	A271.50.R.04-17	66.1	40	43	22	8.4	4	14500	5	SAKU 1706..	E01
63	A271.63.R.06-17	79.1	40	48	22	8.4	6	13000	5	SAKU 1706..	E02
80	A271.80.R.07-17	96.1	50	58	27	8.4	7	11200	5	SAKU 1706..	E02
100	A271.100.R.08-17	116.1	50	78	32	8.4	8	9900	5	SAKU 1706..	E02
125	A271.125.R.10-17	141.1	63	88	40	8.4	10	8800	5	SAKU 1706..	E02
160	A271.160.R.12-17	176.1	63	104	40	8.4	12	7700	5	SAKU 1706..	E02
200	A271.200.R.13-17	216.1	63	134	60	8.4	13	6900	5	SAKU 1706..	E02
250	A271.250.R.15-17	266.1	63	134	60	8.4	15	6100	5	SAKU 1706..	E02

			
E01	11040298	11107792	11210490
E02		11107792	11210490

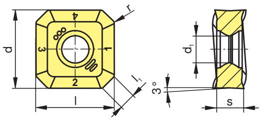
B276

MaxiMill 271 system

SA..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-F50		SAKU 1706ABSR-F50			●	●	●	●	●	●	●									●	●		17.00	17.00	6.35	3.70	0.80	5.80
-M50		SAKU 1706ABSR-M50			●	●	●	●	●	●	●			●	●								17.00	17.00	6.35	3.70	0.80	5.80
-R50		SAKU 1706ABSR-R50												●	●								17.00	17.00	6.35	3.70	0.80	5.80



B12-B18

B77

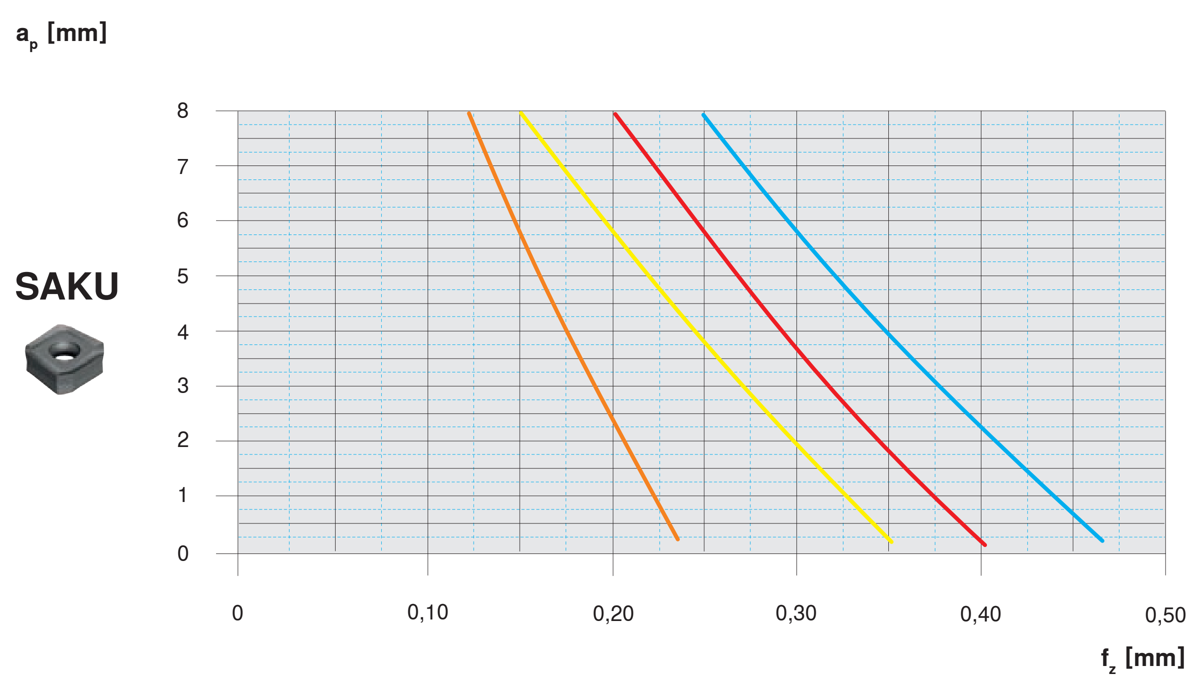
B21

B257-B266

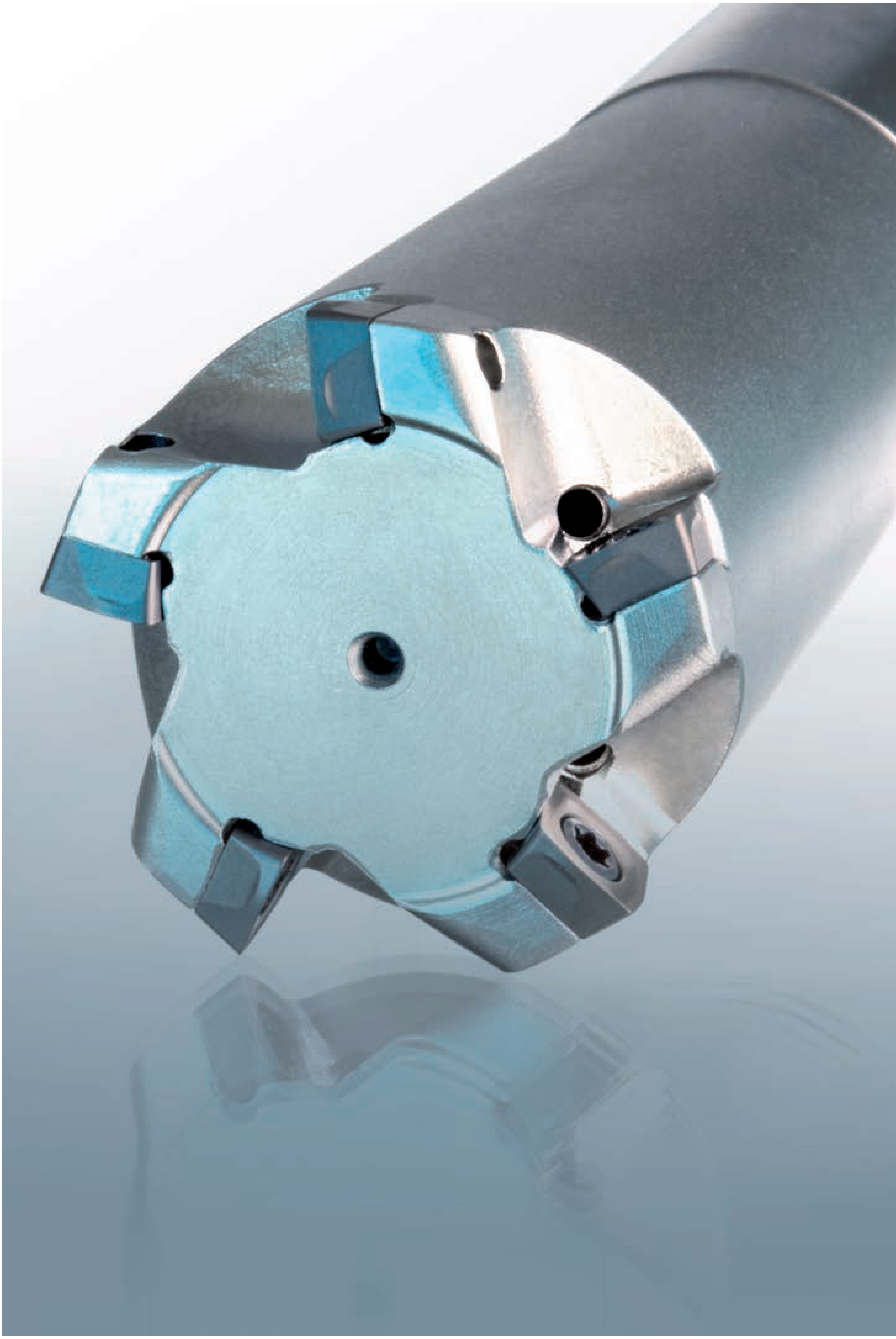
MaxiMill 271 system

Starting parameters for example materials

Materials				Insert		v_c [m/min]	Coolant
▼	1.2312	40CrMnMoS8-6	1.000 N/mm^2	SAKU 1706ABSR-M50	CTPP235	200	dry
▼	1.4571	X6CrNiMoTi17-12-2	600 N/mm^2	SAKU 1706ABSR-F50	CTPM240	180	dry
▼	5.1301	EN-GJL-250	HB 180	SAKU 1706ABSR-R50	CTCK215	250	dry
▼	2.4856	Inconel 625	1.450 N/mm^2	SAKU 1706ABSR-F50	CTC5235	35	emulsion



Additional grades and geometries can be used for the application and are illustrated in the respective application range of the system.

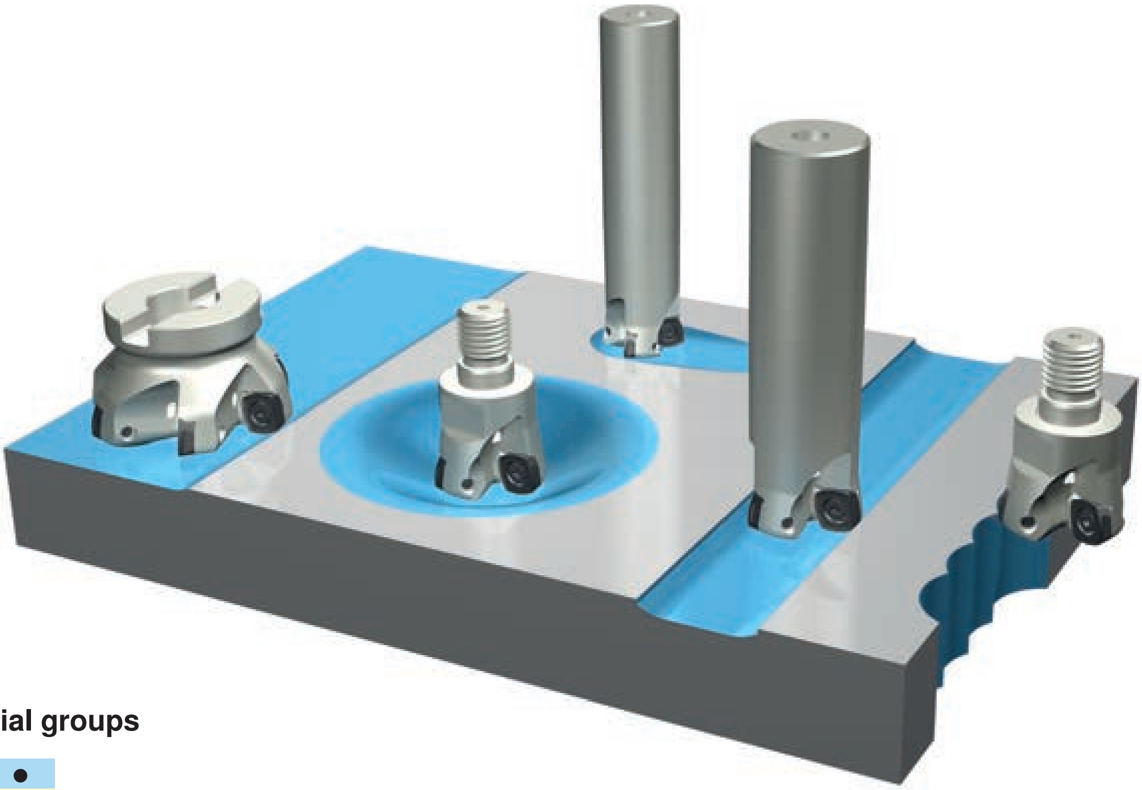


MaxiMill HFC system

System overview

Milling cutter for highest cutting performance

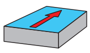
- ○ Extremely high feed rates
- ○ Maximum chip removal rates

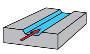


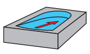
Material groups

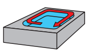
P	●
M	●
K	○
N	
S	●
H	

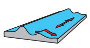
Possible applications

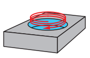

Face milling

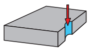

Slot milling


Helical plunge milling

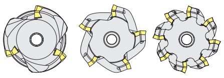

Pocket milling


Profile milling


Helical plunging


Plunge milling

Detailed information

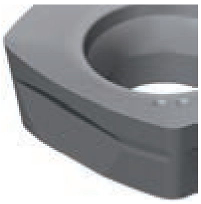
Pitch	Ø range	Inserts
	Ø 16 - 100 mm	XP..06.. XD..09.. XO..12..

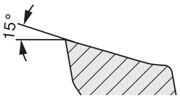
MaxiMill HFC system

Geometry overview

-F40

- ○ Positive geometry
- ○ Roughing and finishing operations
- ○ For unstable clamping situations
- ○ For heat-resistant materials, titanium and super alloys





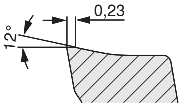
f_z [mm]

0,20 - 1,25

	Machining conditions		
	👍	👉	👎
🟦			
🟨	**CTC5235**	**CTC5235**	**CTC5235**
🟥			
🟩			
🟧	CTC5235 **CTC5240**	CTC5235 **CTC5240**	CTC5235 **CTC5240**
⬜			

-M50

- ○ Universal geometry
- ○ Light to medium roughing
- ○ First choice for general steel materials



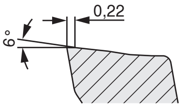
f_z [mm]

0,50 - 3,00

	Machining conditions		
	👍	👉	👎
🟦	**CTCP230** CTPP235	CTCP230 **CTPP235**	CTCP230 **CTPP235**
🟨		**CTCM235** CTPM240	CTPM225 **CTPM240**
🟥		**CTCK215**	**CTCK215**
🟩			
🟧			
⬜			

-R50

- ○ Stable geometry
- ○ For stable machining conditions
- ○ First choice for heavily interrupted cut
- ○ For general steel materials



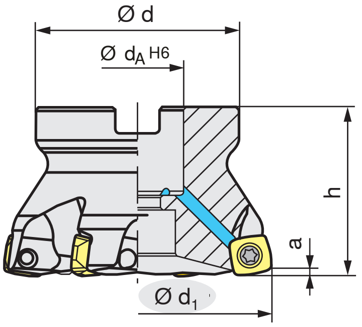
f_z [mm]

0,50 - 3,00

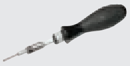
	Machining conditions		
	👍	👉	👎
🟦		**CTPP235**	**CTPP235**
🟨			
🟥			
🟩			
🟧			
⬜			

MaxiMill HFC system

AHFC-09/-12



d1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
32	AHFC.32.R.03-09	40	38	16	1	3	27000	3.2	XD.. 09..	E01
35	AHFC.35.R.04-09	40	38	16	1	4	26700	3.2	XD.. 09..	E01
40	AHFC.40.R.04-09	40	38	16	1	4	26400	3.2	XD.. 09..	E01
42	AHFC.42.R.05-09	40	38	16	1	5	26100	3.2	XD.. 09..	E01
50	AHFC.50.R.05-09	40	43	22	1	5	23500	3.2	XD.. 09..	E02
52	AHFC.52.R.06-09	40	43	22	1	6	23000	3.2	XD.. 09..	E02
63	AHFC.63.R.06-09	40	48	22	1	6	20500	3.2	XD.. 09..	E02
66	AHFC.66.R.07-09	40	48	22	1	7	20000	3.2	XD.. 09..	E02
40	AHFC.40.R.03-12	40	38	16	2	3	21120	5	XO.. 12..	E03
42	AHFC.42.R.04-12	40	38	16	2	4	20880	5	XO.. 12..	E03
50	AHFC.50.R.04-12	40	43	22	2	4	18800	5	XO.. 12..	E04
52	AHFC.52.R.05-12	40	43	22	2	5	18400	5	XO.. 12..	E04
63	AHFC.63.R.05-12	40	48	22	2	5	16400	5	XO.. 12..	E04
66	AHFC.66.R.06-12	40	48	22	2	6	16000	5	XO.. 12..	E04
80	AHFC.80.R.07-12	50	58	27	2	7	14000	5	XO.. 12..	E04
100	AHFC.100.R.08-12	50	78	32	2	8	12000	5	XO.. 12..	E04

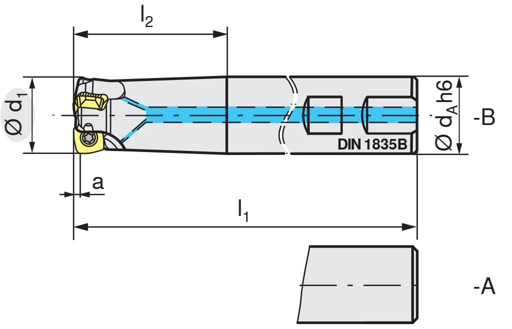
					
E01	11036880	165795	11149570	8095010500	4425
E02		165795	11149570	8095010500	
E03	11036880	106022	11210490	8095010600	4425
E04		106022	11210490	8095010600	

B276

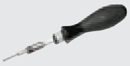
Milling / Face milling

MaxiMill HFC system

CHFC-06/-09/-12



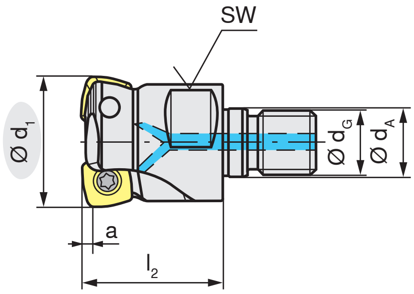
d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
16	CHFC.16.R.02-06-A-40-200	200	40	16	0.8	2	4600	1.2	XP.. 06..	E01
16	CHFC.16.R.02-06-B-40	89	40	16	0.8	2	17300	1.2	XP.. 06..	E01
20	CHFC.20.R.03-06-A-50-225	225	50	20	0.8	3	4200	1.2	XP.. 06..	E01
20	CHFC.20.R.03-06-B-50	101	50	20	0.8	3	14500	1.2	XP.. 06..	E01
25	CHFC.25.R.04-06-A-50-225	225	50	25	0.8	4	4600	1.2	XP.. 06..	E01
25	CHFC.25.R.04-06-B-50	107	50	25	0.8	4	15600	1.2	XP.. 06..	E01
32	CHFC.32.R.05-06-A25-60-225	225	60	25	0.8	5	3900	1.2	XP.. 06..	E01
32	CHFC.32.R.05-06-B25-60	117	60	25	0.8	5	11000	1.2	XP.. 06..	E01
25	CHFC.25.R.02-09-A-50-225	225	50	25	1	2	9000	3.2	XD.. 09..	E02
25	CHFC.25.R.03-09-A-50-225	225	50	25	1	3	9000	3.2	XD.. 09..	E02
32	CHFC.32.R.03-09-A-63-250	250	63	32	1	3	8100	3.2	XD.. 09..	E03
32	CHFC.32.R.02-12-A-63-250	250	63	32	2	2	6480	5	XO.. 12..	E04
35	CHFC.35.R.03-12-A-63-250	250	63	32	2	3	6480	5	XO.. 12..	E04

			
E01	76913	11149541	8095010200
E02	54976	11149570	8095010500
E03	165795	11149570	8095010500
E04	106022	11210490	8095010600

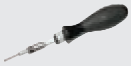
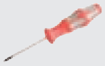
B276

MaxiMill HFC system

GHFC-06/-09/-12



d_1 [mm]	Type, description	l_2 [mm]	d_A [mm]	d_G [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
16	GHFC.16.R.02-06-27	27	8.5	8	0.8	2	20800	1.2	XP.. 06..	E01
20	GHFC.20.R.03-06-33	33	10.5	10	0.8	3	19800	1.2	XP.. 06..	E01
25	GHFC.25.R.04-06-35	35	12.5	12	0.8	4	18700	1.2	XP.. 06..	E01
32	GHFC.32.R.05-06-35	35	17.0	16	0.8	5	22000	1.2	XP.. 06..	E01
25	GHFC.25.R.02-09	35	12.5	12	1	2	30000	3.2	XD.. 09..	E02
25	GHFC.25.R.03-09	35	12.5	12	1	3	30000	3.2	XD.. 09..	E02
32	GHFC.32.R.03-09	35	17.0	16	1	3	27000	3.2	XD.. 09..	E03
32	GHFC.32.R.02-12	35	17.0	16	2	2	21600	5	XO.. 12..	E04
35	GHFC.35.R.03-12	35	17.0	16	2	3	21360	5	XO.. 12..	E04

			
E01	76913	11149541	8095010200
E02	54976	11149570	8095010500
E03	165795	11149570	8095010500
E04	106022	11210490	8095010600

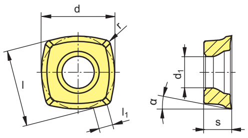
B276

MaxiMill HFC system

XD.. XO.. XP..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-F40		XDLX 09T308ER-F40																		●	●		9.49	9.00	3.97		0.80	4.40
		XOLX 120410ER-F40																		●	●		12.70	12.00	4.76		1.00	5.50
		XPLX 060305ER-F40																		●	●		6.35	6.00	2.75		0.50	2.80
-M50		XDLX 09T308SR-M50			●	●	●	●	●	●	●			●									9.60	9.00	3.97	1.5	0.80	4.40
		XOLX 120410SR-M50			●	●	●	●	●	●	●			●									12.70	12.00	4.76	2.2	1.00	5.50
		XPLX 060305SR-M50			●	●		●	●		●			●									6.35	6.00	2.75	1.0	0.50	2.80
-R50		XOLX 120410SR-R50						●															12.70	12.00	4.76	2.2	1.00	5.50
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	l_1	r	d_1

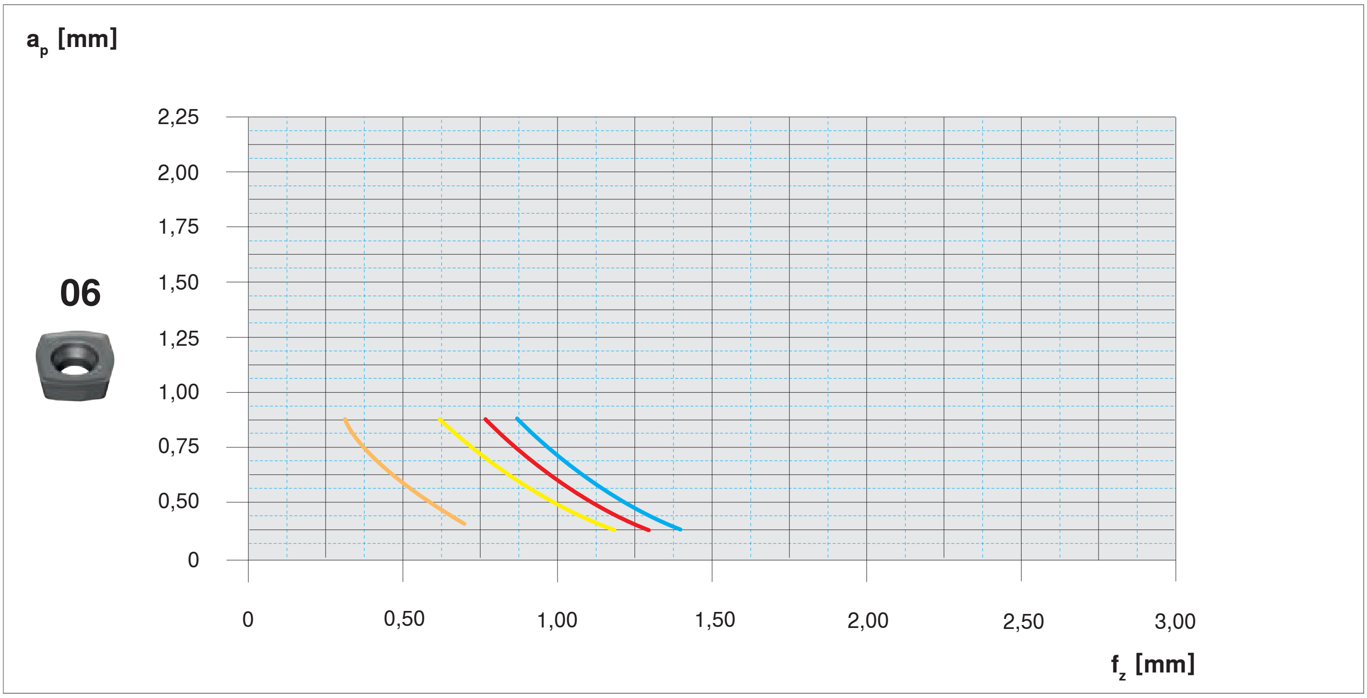


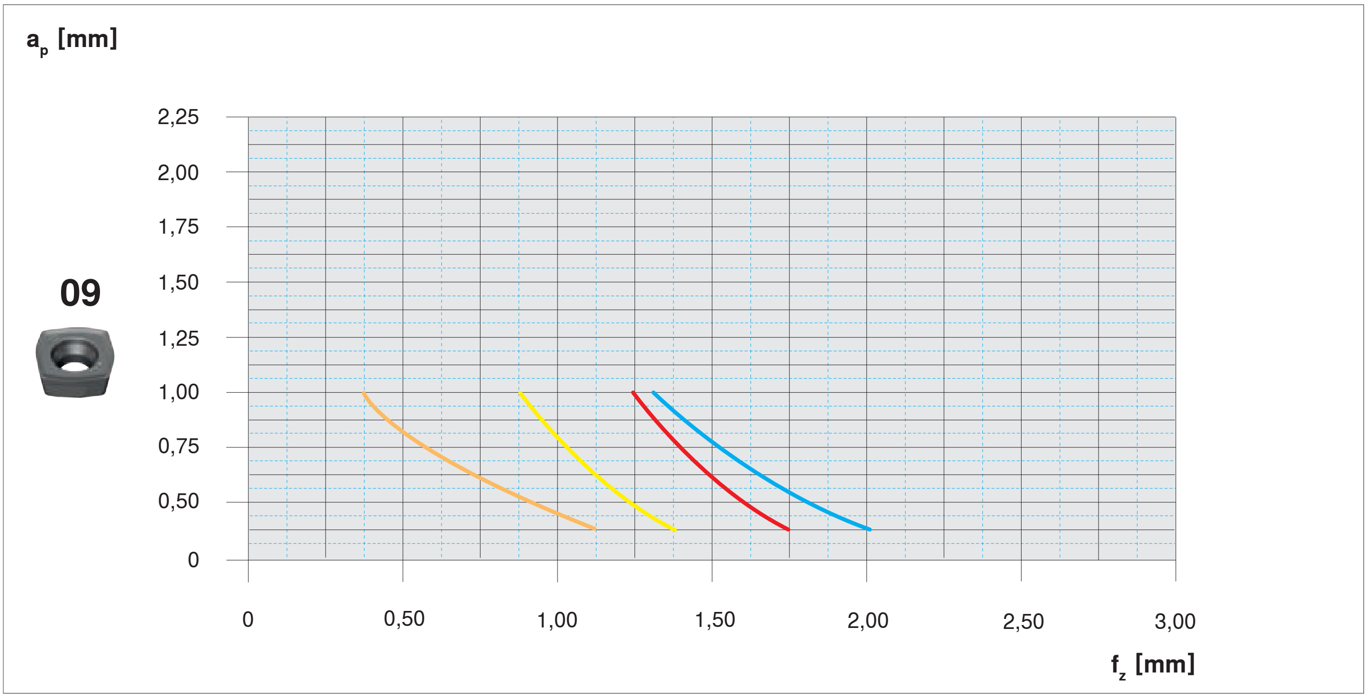
B12-B18
B83
B21
B257-B266

MaxiMill HFC system

Starting parameters for example materials HFC 06/09

Materials				Insert		v_c [m/min]	Coolant
▼	1.2312	40CrMnMoS8-6	1.000 N/mm^2	XPLX 060305SR-M50 XDLX 09T308SR-M50	CTPP235	180	dry
▼	1.4571	X6CrNiMoTi17-12-2	600 N/mm^2	XPLX 060305ER-M40 XDLX 09T308SR-M50	CTPM240	160	dry
▼	5.1301	EN-GJL-250	HB 180	XPLX 060305ER-M50 XDLX 09T308SR-M50	CTCK215	250	dry
▼	2.4856	Inconel 625	1.450 N/mm^2	XPLX 060305ER-F40 XDLX 09T308ER-F40	CTC5235	35	emulsion



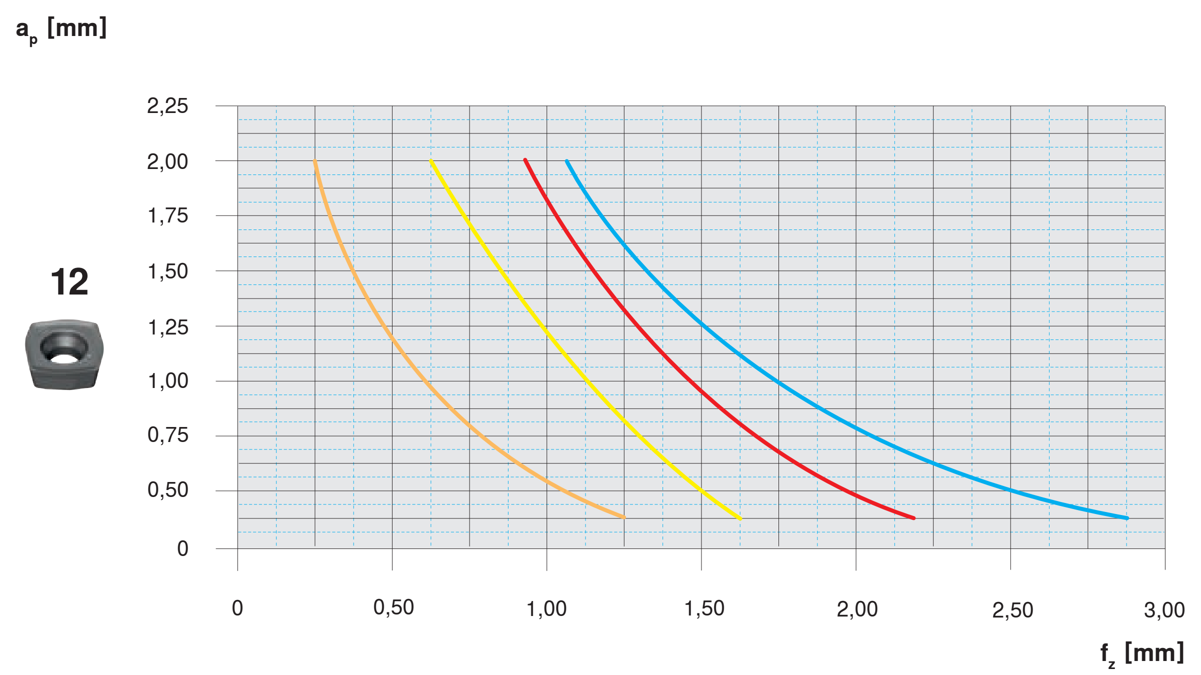


Additional grades and geometries can be used for the application and are illustrated in the respective application range of the system.

MaxiMill HFC system

Starting parameters for example materials HFC 12

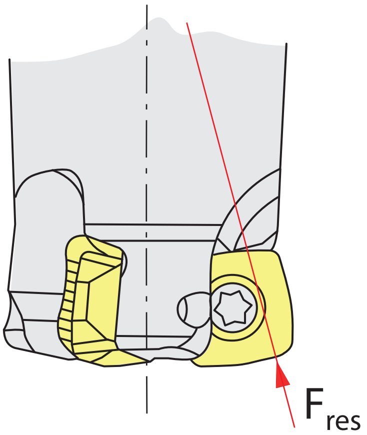
Materials				Insert		v_c [m/min]	Coolant
🟦	1.2312	40CrMnMoS8-6	1.000 N/mm^2	XOLX 120410SR-M50	CTPP235	180	dry
🟨	1.4571	X6CrNiMoTi17-12-2	600 N/mm^2	XOLX 120410ER-M50	CTPM240	160	dry
🟥	5.1301	EN-GJL-250	HB 180	XOLX 120410ER-M50	CTCK215	250	dry
🟧	2.4856	Inconel 625	1.450 N/mm^2	XOLX 120410ER-F40	CTC5235	35	emulsion



Additional grades and geometries can be used for the application and are illustrated in the respective application range of the system.

Minimum vibration

The light cutting geometry and the very positive angle allow for reduced vibration of the milling system. The cutting forces are mainly in axial direction. Even with long tool overhangs the stress on the machine spindle is minimised.



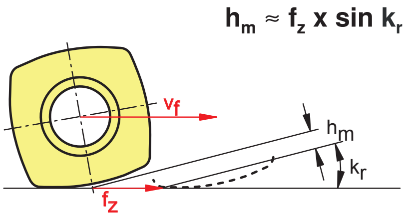
Systems for high feed rates with approach angle $k_r = 15°$
The axial forces produced are directed towards the machine spindle:

$F_r << F_a$

F_a = axial force on the spindle

F_r = radial force on the spindle

F_{res} = resulting force on the spindle



○ Small approach angle k_r

k_r between 15 and 20°!

○ Low to mediume chip thickness h_m

The smaller the approach angle, the lower the medium chip thickness.

○ High feed rate per tooth f_z

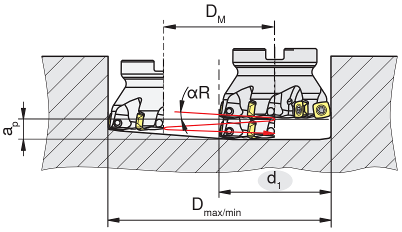
In order to reach a regular medium chip thickness, the feed rate per tooth has to be increased.

Thanks to the small approach angle reducing chip thickness, high feed per tooth and high metal removal rates are possible, even with small depths of cut.

MaxiMill HFC system

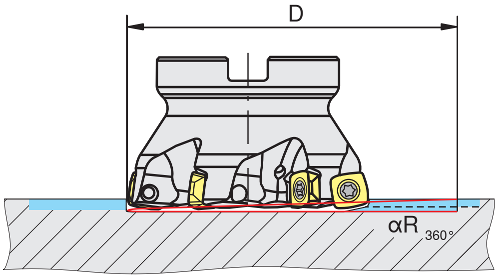
Application data HFC 06

Helical plunge milling



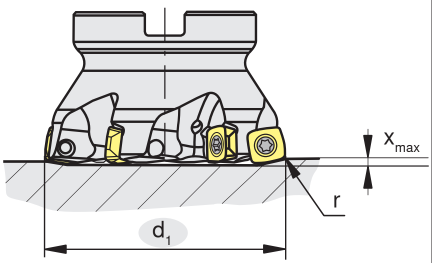
D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

d_1 [mm]	D_{max} [mm]	D_{min} [mm]	$\alpha_{R\,max}$ [°]
16	31	22	4,5
20	39	30	2,3
25	49	40	1,3
32	63	54	0,9
a_p [mm] = D_M x π x tan α_R			



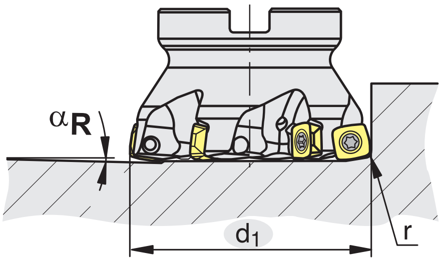
d_1 [mm]	D [mm]	$\alpha_{R\,max}$ 360° [°]
16	22	4,5
20	30	2,3
25	40	1,3
32	54	0,9

Axial plunging



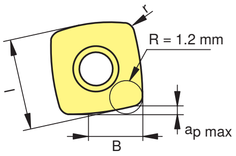
d_1 [mm]	X_{max} [mm]
16 - 32	0,5

Angled ramping



d_1 [mm]	$\alpha_{R\,max}$ [°]
16	5,9
20	3,2
25	2,0
32	1,3

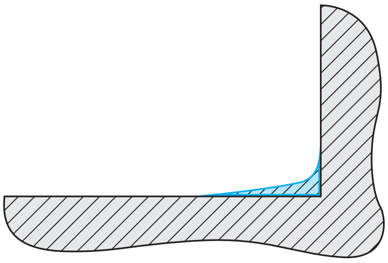
Programming parameters



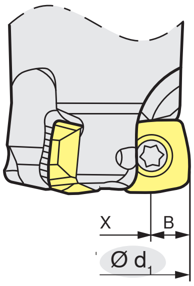
l [mm]	B [mm]	r [mm]	$a_{p\ max}$ [mm]
6,35	5,3	0,5	0,8

R = programmed radius

Profile when shoulder and slot milling

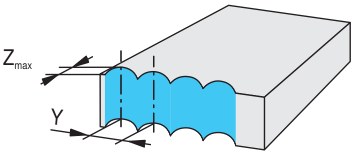


Width of cut for flat surfaces



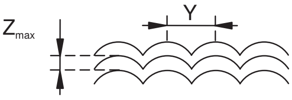
d_1 [mm]	X [mm]	B [mm]
16 - 32	d_1-(2 x B)	4,3

Engagement when plunge milling

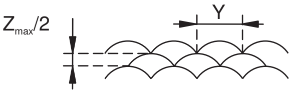


Z_{max}	f_z			Y_{max}
[mm]	initial [mm]	min [mm]	max [mm]	[mm]
5,3	0,10	0,08	0,15	d_1 x < 0,7

Tool offset with optimum overlap



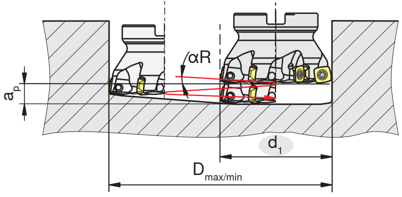
Tool offset for unstable conditions



MaxiMill HFC system

Application data HFC 09

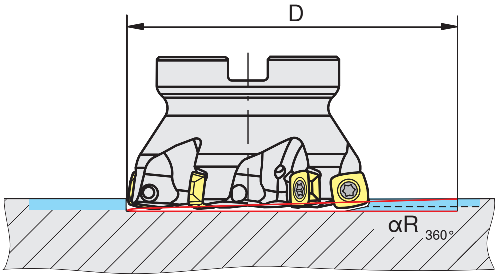
Helical plunge milling



D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

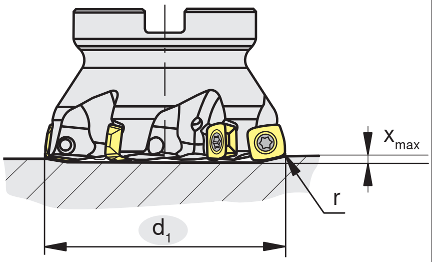
d_1 [mm]	D_{max} [mm]	D_{min} [mm]	$\alpha_{R\,max}$ [°]
25	48	35	3,1
32	62	49	1,7
35	68	55	1,4
40	78	65	1,0
42	82	69	0,9
50	98	85	0,8
52	102	89	0,7
63	124	111	0,7
66	130	117	0,6

a_p [mm] = $D_M \times \pi \times \tan \alpha_R$



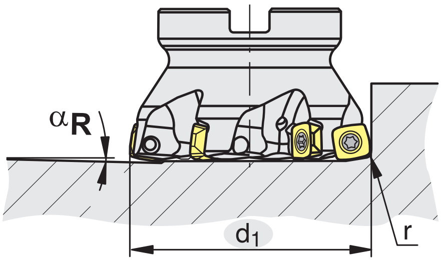
d_1 [mm]	D [mm]	$\alpha_{R\,max}$ 360° [°]
25	35	3,1
32	49	1,7
35	55	1,4
40	65	1,0
42	69	0,9
50	85	0,8
52	89	0,7
63	111	0,7
66	117	0,6

Axial plunging



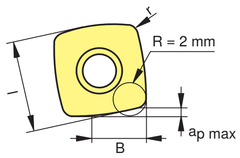
d_1 [mm]	X_{max} [mm]
25 - 66	0,75

Angled ramping



d_1 [mm]	$\alpha_{R\,max}$ [°]
25	3,6
32	2,0
35	1,6
40	1,2
42	1,1
50	0,9
52	0,8
63	0,8
66	0,7

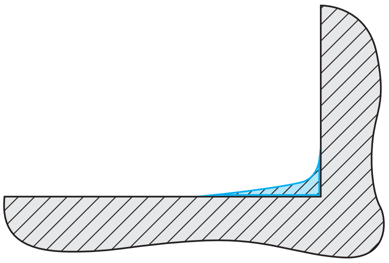
Programming parameters



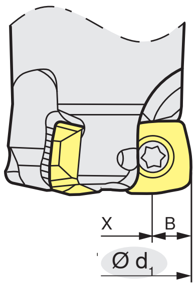
l [mm]	B [mm]	r [mm]	$a_{p\,max}$ [mm]
9	5,9	0,8	1

R = programmed radius

Profile when shoulder and slot milling

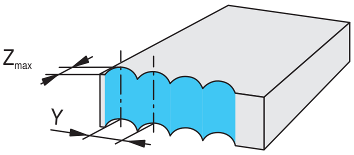


Width of cut for flat surfaces



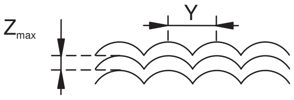
d_1 [mm]	X [mm]	B [mm]
25 - 66	d_1-(2 x B)	5,9

Engagement when plunge milling

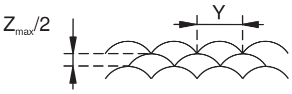


Z_{max}	f_z			Y_{max}
[mm]	initial [mm]	min [mm]	max [mm]	[mm]
7,5	0,10	0,08	0,15	d_1 x < 0,7

Tool offset with optimum overlap



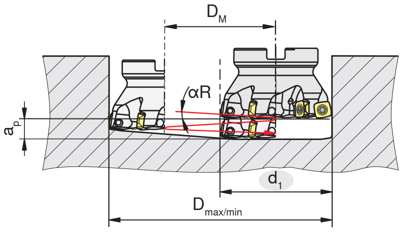
Tool offset for unstable conditions



MaxiMill HFC system

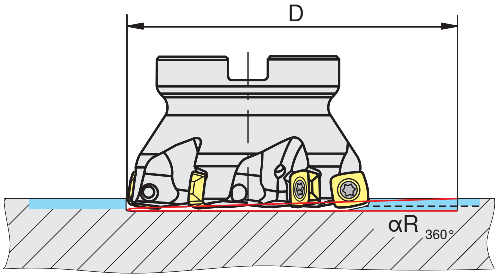
Application data HFC 12

Helical plunge milling



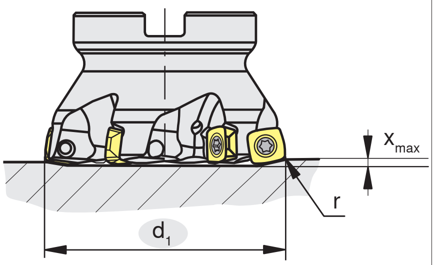
D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

d_1 [mm]	D_{max} [mm]	D_{min} [mm]	$\alpha_{R\ max}$ [°]
32	62	44	6,1
35	68	50	3,7
40	78	60	2,5
42	82	64	2,3
50	98	80	1,3
52	102	84	1,3
63	124	106	0,9
66	130	112	0,9
80	158	140	1,1
100	198	180	0,6
a_p [mm] = $D_M \times \pi \times \tan \alpha_R$			



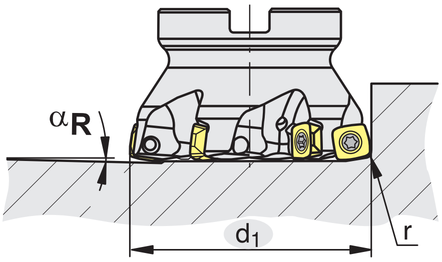
d_1 [mm]	D [mm]	$\alpha_{R\ max}$ 360° [°]
32	44	6,1
35	50	3,7
40	60	2,5
42	64	2,3
50	80	1,3
52	84	1,3
63	106	0,9
66	112	0,9
80	140	1,1
100	180	0,6

Axial plunging



d_1 [mm]	X_{max} [mm]
32 - 100	1,15

Angled ramping

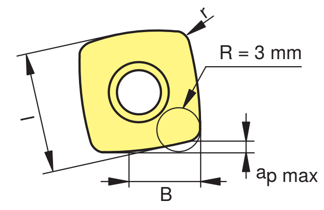


d_1 [mm]	$\alpha_{R\ max}$ [°]
32	7,2
35	4,4
40	2,9
42	2,7
50	1,5
52	1,5
63	1,1
66	1,1
80	1,3
100	0,7

MaxiMill HFC system

Application data HFC 12

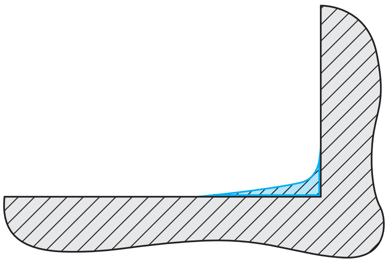
Programming parameters



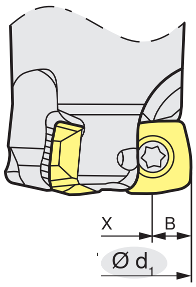
l [mm]	B [mm]	r [mm]	$a_{p\ max}$ [mm]
12	8,3	1,0	2

R = programmed radius

Profile when shoulder and slot milling

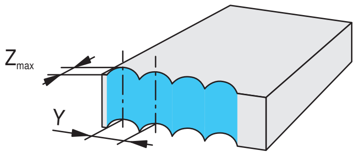


Width of cut for flat surfaces



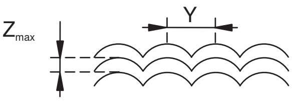
d_1 [mm]	X [mm]	B [mm]
32 - 100	d_1-(2 x B)	8,3

Engagement data when plunge milling

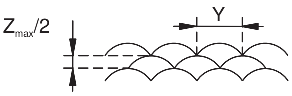


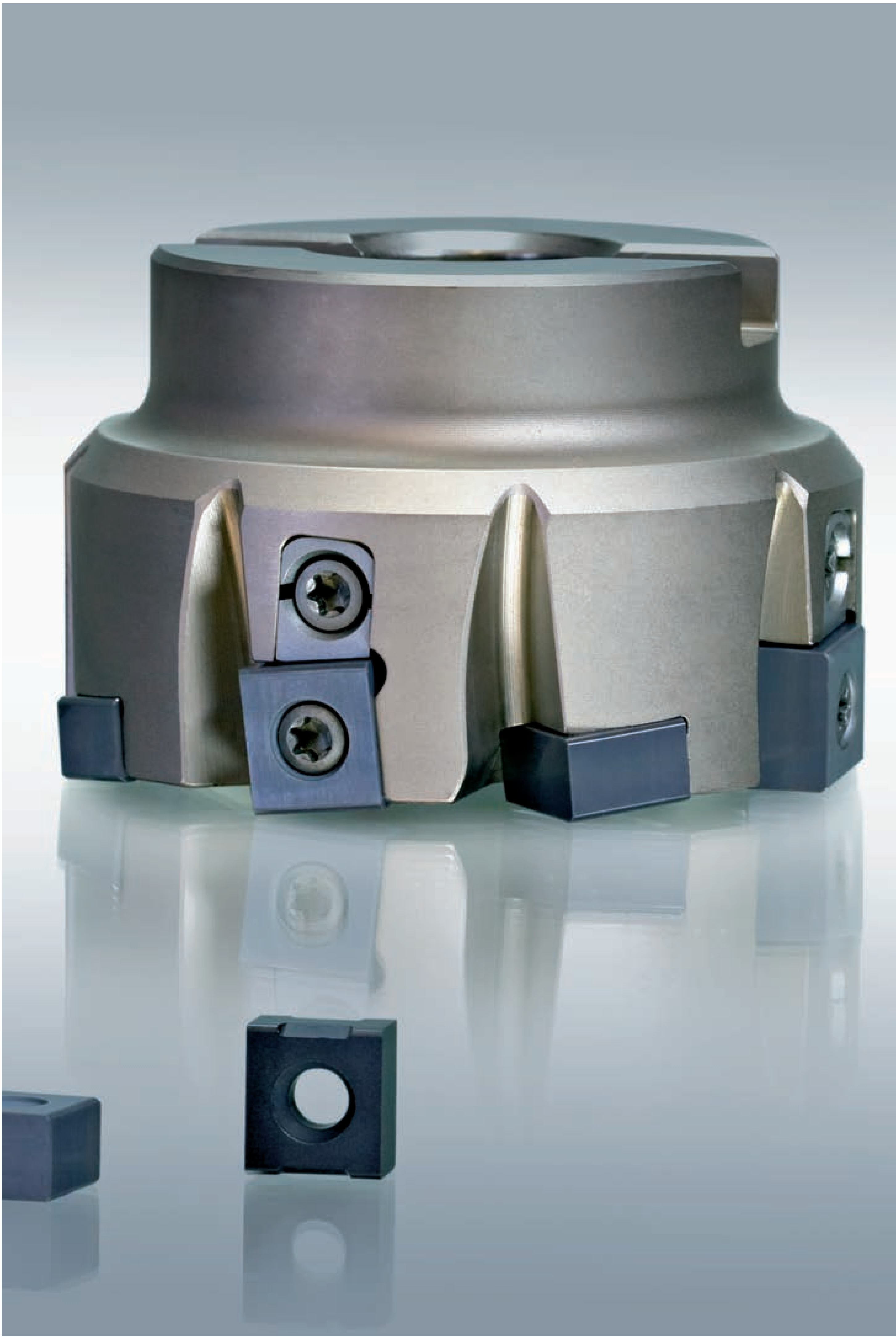
Z_{max} [mm]	f_z initial [mm]	 min [mm]	 max [mm]	Y_{max} [mm]
10	0,15	0,10	0,20	d_1 x < 0,7

Tool offset with optimum overlap



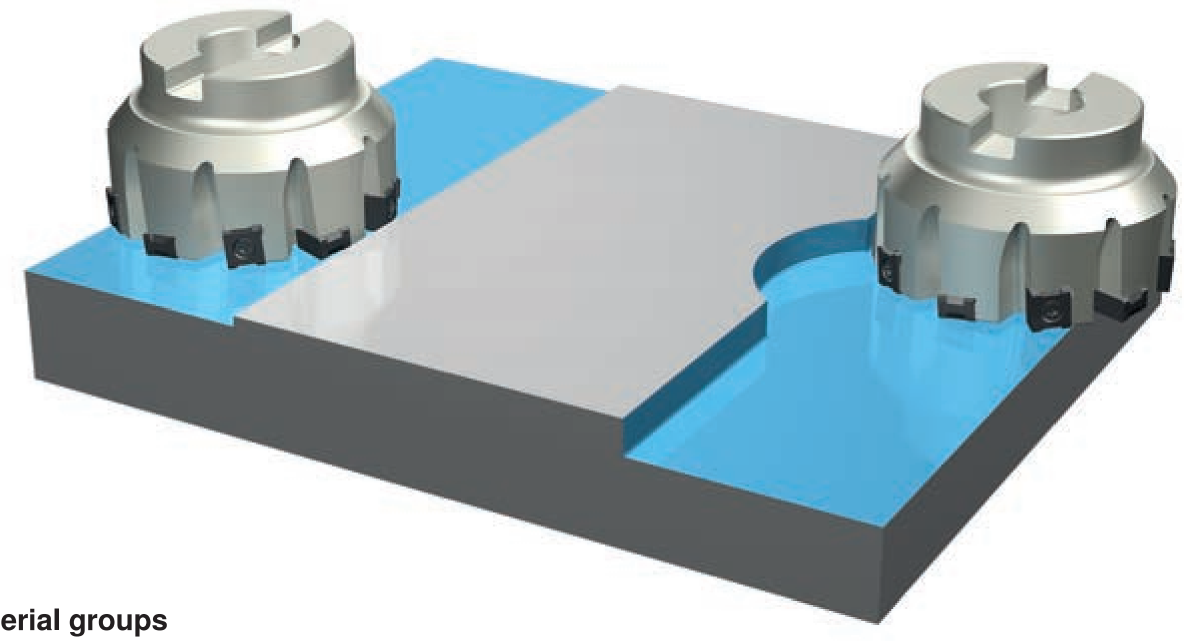
Tool offset for unstable conditions





Cast iron milling without compromise

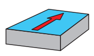
- ○ 8 usable cutting edges
- ○ Optimal solution for cast iron materials

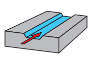


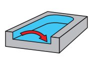
Material groups

P	
M	
K	●
N	
S	
H	

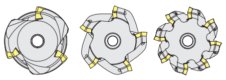
Possible applications


Face milling


Slot milling


Trochoidal slot milling

Detailed information

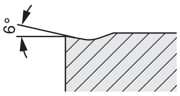
Pitch	Ø range	Inserts
	Ø 50 - 160 mm	LN.. 1106.. LN..1210..

MaxiMill HEC system

Geometry overview

-R50

- ○ Positive geometry
- ○ For thin-walled components
- ○ For machines with limited power
- ○ For cast iron materials



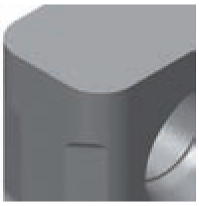
f$_z$ [mm]

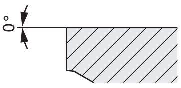
0,08 - 0,25

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥	**CTCK215**	**CTPK220**	
🟩			
🟧			
⬜			

EN

- ○ Stable cutting edges
- ○ Universal application
- ○ For cast iron materials





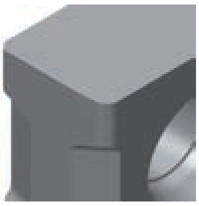
f$_z$ [mm]

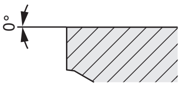
0,08 - 0,30

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥	**CTCK215**	**CTCK215**	
🟩			
🟧			
⬜			

ER

- ○ Stable cutting edges
- ○ Universal application
- ○ High surface quality thanks to wiper facet
- ○ First choice for cast iron materials





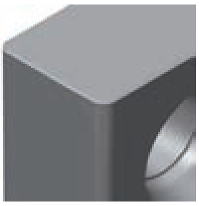
f$_z$ [mm]

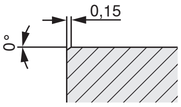
0,08 - 0,30

	Machining conditions		
	👍	👉	👎
🟦	**CTEP210**		
🟨			
🟥	**CTCK215** CTEP210	**CTPK220**	
🟩			
🟧			
⬜			

SR

- ○ Stable cutting edges
- ○ For ceramic & CBN as cutting materials
- ○ Stable component clamping and machine
- ○ For cast iron materials





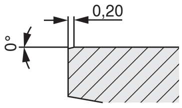
f$_z$ [mm]

0,10 - 0,25

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥	**CTN3105** CTL3215		
🟩			
🟧			
⬜			

SN

○ Stable cutting edges
○ Rough machining
○ Stable component clamping and machine
○ For cast iron materials



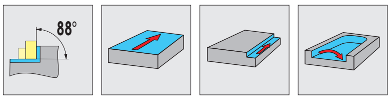
f_z [mm]

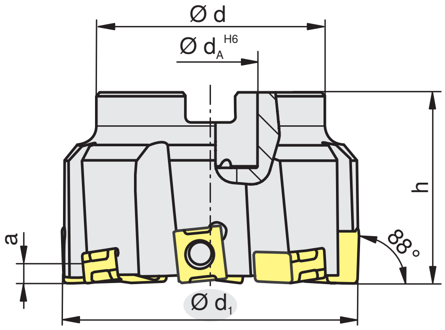
0,10 - 0,45

	Machining conditions		
	👍	✋	👎
🟦			
🟨			
🟥		**CTCK215**	**CTCK215**
🟩			
🟧			
⬜			

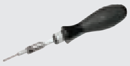
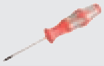
MaxiMill HEC system

AHEC





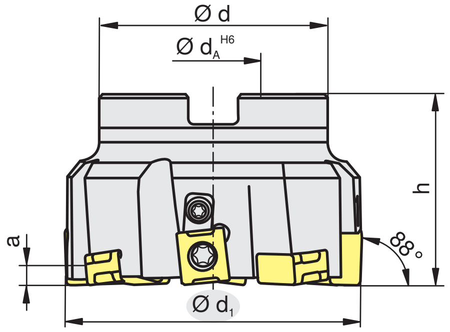
d$_1$ [mm]	Type, description	h [mm]	d [mm]	d$_A$ [mm]	a [mm]	z	n$_{max}$ [min^{-1}]	[Nm]		
50	AHEC.50.R.04B-11	40	48	22	4	4	12700	3.2	LN.X 1106	E01
50	AHEC.50.R.06-11	40	48	22	4	6	12700	3.2	LN.X 1106	E01
63	AHEC.63.R.06B-11	40	48	22	4	6	10100	3.2	LN.X 1106	E01
63	AHEC.63.R.08-11	40	48	22	4	8	10100	3.2	LN.X 1106	E01
80	AHEC.80.R.08B-11	50	58	27	4	8	8000	3.2	LN.X 1106	E02
80	AHEC.80.R.10-11	50	58	27	4	10	8000	3.2	LN.X 1106	E02
100	AHEC.100.R.10B-11	50	78	32	4	10	6400	3.2	LN.X 1106	E03
100	AHEC.100.R.12-11	50	78	32	4	12	6400	3.2	LN.X 1106	E03
125	AHEC.125.R.12B-11	63	88	40	4	12	5100	3.2	LN.X 1106	E04
125	AHEC.125.R.12-11	63	88	40	4	12	5100	3.2	LN.X 1106	E04
125	AHEC.125.R.16-11	63	88	40	4	16	5100	3.2	LN.X 1106	E04
160	AHEC.160.R.14B-11	63	100	40	4	14	4000	3.2	LN.X 1106	E05
160	AHEC.160.R.20-11	63	100	40	4	20	4000	3.2	LN.X 1106	E05
125	AHEC.125.R.12-1210	63	88	40	8	12	5000	3.2	LN.X 1210	E06
160	AHEC.160.R.16-1210	63	88	40	8	16	3900	3.2	LN.X 1210	E07

				
E01	24647	11645528	11149570	8095010500
E02	24647	11645529	11149570	8095010500
E03	24647	11645530	11149570	8095010500
E04	24647	11645531	11149570	8095010500
E05	24647		11149570	8095010500
E06	11684526	11645531	11149570	8095010500
E07	11684526		11149570	8095010500

B276

MaxiMill HEC system

AHEC-11 adjustable (A)



d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
50	AHEC.50.R.06A03-11	40	48	22	4	6	12700	3.2	LN.X 1106	E01
63	AHEC.63.R.08A04-11	40	48	22	4	8	10100	3.2	LN.X 1106	E01
80	AHEC.80.R.10A05-11	50	58	27	4	10	8000	3.2	LN.X 1106	E02
100	AHEC.100.R.12A06-11	50	78	32	4	12	6400	3.2	LN.X 1106	E03
125	AHEC.125.R.16A08-11	63	88	40	4	16	5100	3.2	LN.X 1106	E04
160	AHEC.160.R.20A10-11	63	100	40	4	20	4000	3.2	LN.X 1106	E05

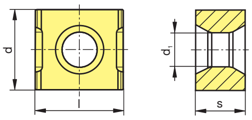
E01	24647	11167992	11645528	11149570	8095018900	8095010500
E02	24647	11167992	11645529	11149570	8095018900	8095010500
E03	24647	11167992	11645530	11149570	8095018900	8095010500
E04	24647	11167992	11645531	11149570	8095018900	8095010500
E05	24647	11167992		11149570	8095018900	8095010500

B276

MaxiMill HEC system

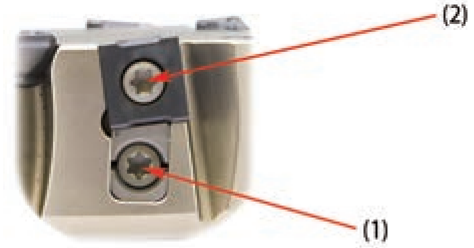
LN..

		CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	d₁ [mm]
	P	●	●	●	●	●	●	○	○	○						○			○						
	M		●			○	○	●	●	●									●						
	K		○	●	●	●					●	●	●	●		○	●	●	○		●				
	N														●	●	●	●							
	S																		●	●					
	H											○									●				
-R50 	LNHX 1106PNER-R50												●	●								10.00	11.00	6.35	4.27
	LNHX 110608EN-R50													●								10.00	11.00	6.35	4.27
	LNHX 121008EN-R50													●								10.00	12.70	10.00	4.40
LNHX 	LNEX 121020EN													●								10.00	12.70	10.00	4.40
	LNHX 1106PNER	●											●	●								10.00	11.00	6.35	4.27
	LNHX 1106PNSR										●	●										10.00	11.00	6.35	4.27
	LNHX 1106ZZER-Q											●	●									10.00	11.00	6.35	4.27
	LNHX 110608SN										●											10.00	11.00	6.35	4.27
	LNHX 110616EN												●									10.00	11.00	6.35	4.27
	LNHX 121020SN												●									10.00	12.70	10.00	4.40
		CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	d₁



B12-B18
B99-B100
B21
B257-B266

Precision setting procedure



1.Mount the setting wedges in the cutter (as supplied) and tighten the setting screw (1), to lightly hold the wedge without deforming it.

2.Mount inserts and tighten clamping screws (2) with 1.0 Nm.

3.Mark 'highest cutting edge' using a presetting device.

4.Change position of PCD insert by 0.02 mm turning the setting screw (1) clockwise.
For this purpose use the TORX key (8095018900 / WS-L-T15-136mm).

5.Set the other cutting edges to this level, maximum deviation of 0.005 mm.

Maximum adjustment = 0.10 mm.

6.Tighten all clamping screws (2) with 3.2 Nm.

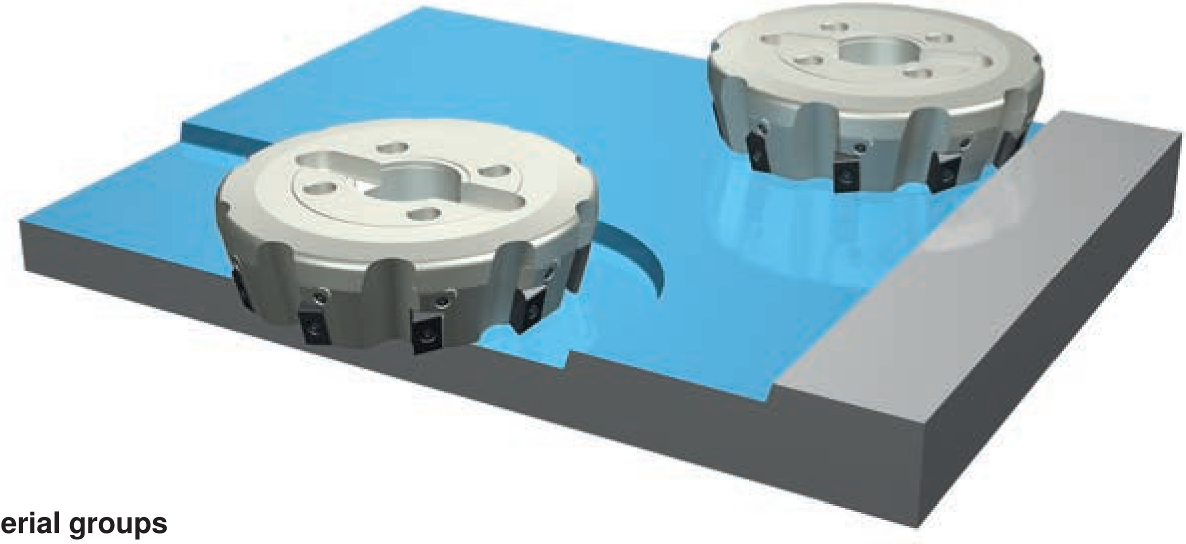
7.Check axial run-out of all inserts
→ target < 0.005 mm.

⚠

When changing the insert, first remove the setting screw (1), turning it counter-clockwise. After the mounting procedure is completed, the setting procedure starts again at point 1.

Maximum stability combined with susbtantial depth of cut

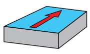
○ High application security
○ Wide application range

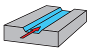


Material groups

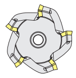
P	●
M	○
K	●
N	
S	
H	

Possible applications


Face milling

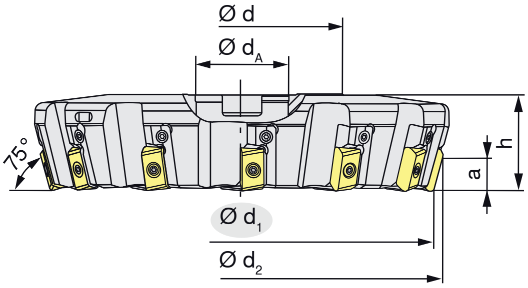

Slot milling

Detailed information

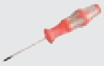
Pitch	Ø range	Inserts
	Ø 160 - 315 mm	LN..22..

MaxiMill HDM system

AHDM



d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[Nm]		
160	AHDM.160.R.08-75-22	160.2	63	110	40	20	8	5	LNUC 22..	E01
200	AHDM.200.R.10-75-22	200.2	63	131	60	20	10	5	LNUC 22..	E01
250	AHDM.250.R.12-75-22	250.2	63	174	60	20	12	5	LNUC 22..	E01
315	AHDM.315.R.14-75-22	315.2	80	226	60	20	14	5	LNUC 22..	E01

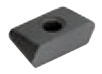
			
E01	11423964	11417922	8095010500

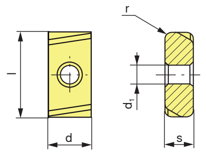
B276

MaxiMill HDM system

LN..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215				
P	●	●	●	●	●	●	○	○	○						○			○						
M		●			○	○	●	●	●									●						
K		○	●	●	●					●	●	●	●		○	●	●	○		●				
N														●	●	●	●							
S																		●	●					
H											○									●				

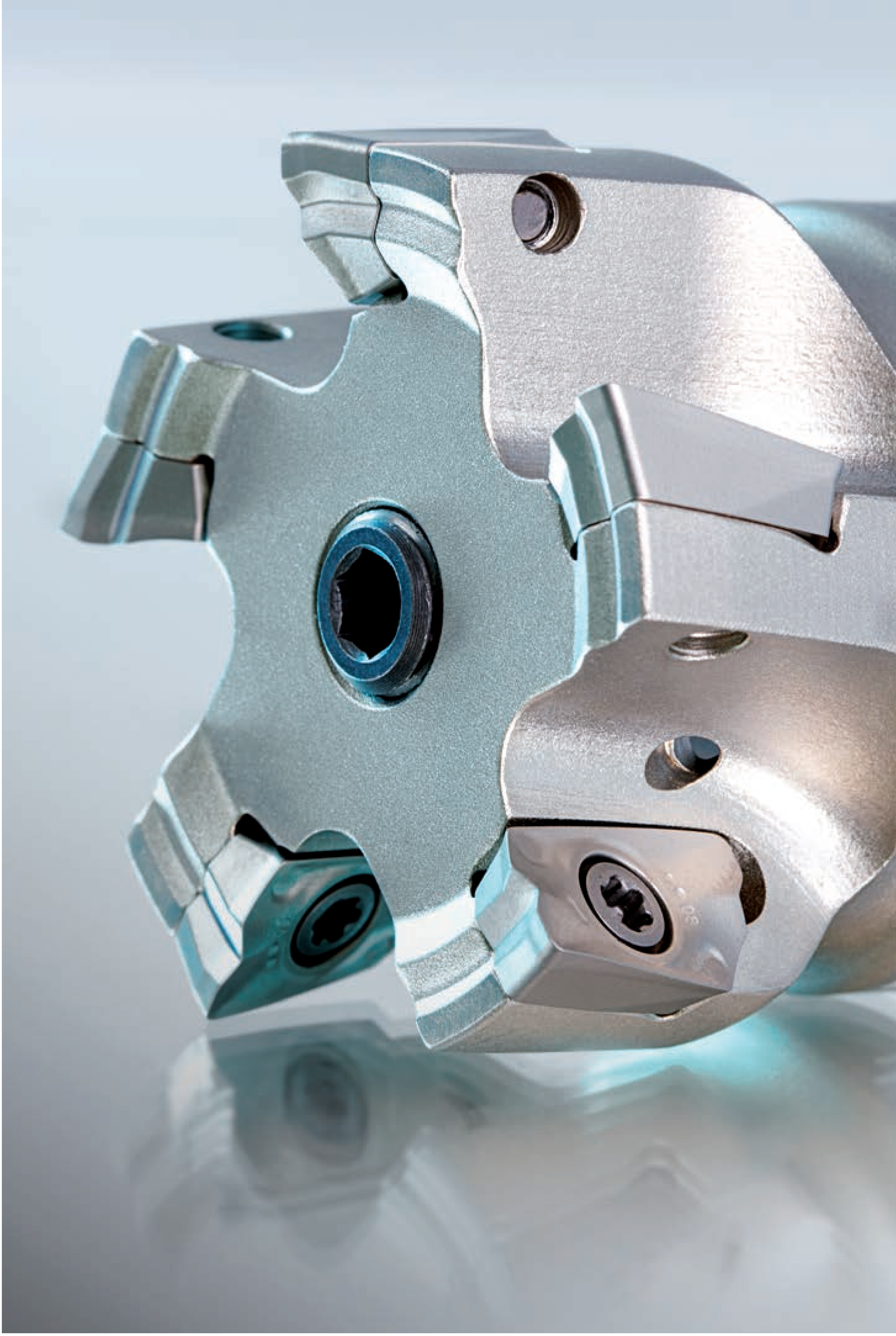
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215					d [mm]	l [mm]	s [mm]	r [mm]	dd_1 [mm]
LNUC		LNUC 220920ER												●													14.28	28.57	9.52	2.00	5.90
LNUJ		LNUJ 220920SR						●																			15.81	27.85	9.52	2.00	5.90
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215					d	l	s	r	d_1



B12-B18

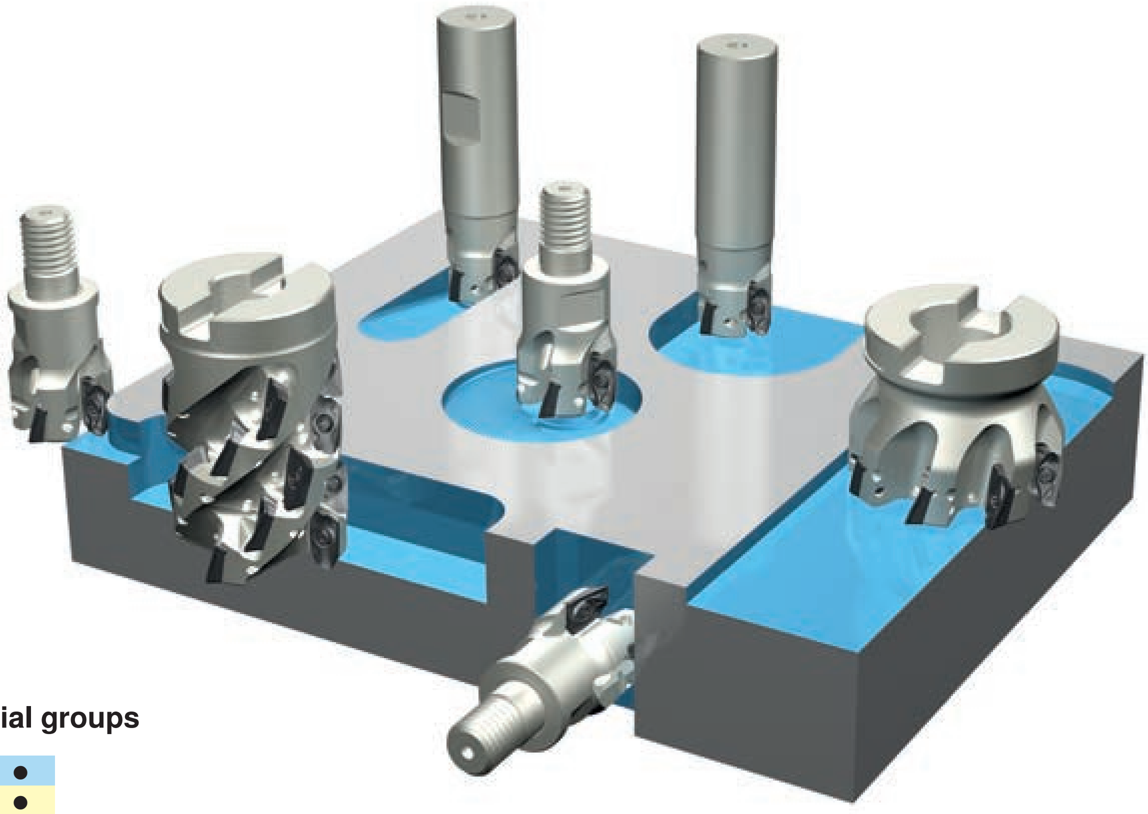
B21

B257-B266



Shoulder milling system for roughing and universal application

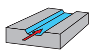
○ Versatile comprehensive tooling concept
○ Milling with radial force compensation

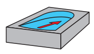


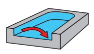
Material groups

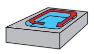
P	●
M	●
K	●
N	○
S	●
H	○

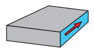
Possible applications

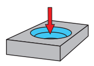

Slot milling

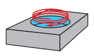

Helical plunge milling


Trochoidal slot milling

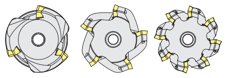

Pocket milling


Peripheral milling


Axial plunging


Helical plunging

Detailed information

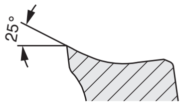
Pitch	Ø range	Inserts
	Ø 32 - 125 mm	XD..07.. XD..11.. XD..15.. XD..20..

MaxiMill 211 system

Geometry overview

-F20

- ○ Highly positive geometry
- ○ First choice for non-ferrous metals



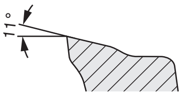
f_z [mm]

0,10 - 0,20

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩	**CTW4615**	**CTW4615**	**CTW4615**
🟧			
⬜			

-F40

- ○ Positive geometry
- ○ Finishing and roughing operations
- ○ For unstable clamping situations
- ○ For heat-resistant materials, titanium and super alloys



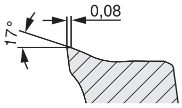
f_z [mm]

0,05 - 0,15

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩			
🟧	CTC5235 **CTC5240**	CTC5235 **CTC5240**	CTC5235 **CTC5240**
⬜			

-F50

- ○ Positive geometry
- ○ Light roughing
- ○ For unstable clamping situations
- ○ First choice for stainless steel materials



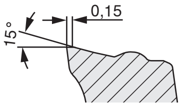
f_z [mm]

0,10 - 0,20

	Machining conditions		
	👍	👉	👎
🟦	**CTCP220** CTPP225	**CTCP230** CTPP235	CTCP230 **CTPP235**
🟨	**CTCM235** CTPM225	CTPM225 **CTPM240**	
🟥			
🟩			
🟧			
⬜			

-M50

- ○ Universal geometry
- ○ Light to medium roughing operations
- ○ First choice for general steel materials



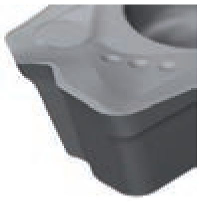
f_z [mm]

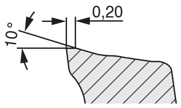
0,10 - 0,25

	Machining conditions		
	👍	👉	👎
🟦		**CTCP230** CTPP235	CTCP230 **CTPP235**
🟨	**CTCM235** CTPM225	CTPM225 **CTPM240**	CTPM225 **CTPM240**
🟥		**CTCK215** CTPK220	CTCK215 **CTPK220**
🟩			
🟧			
⬜			

-R50

- Stable geometry
- Roughing
- For heavily interrupted cut
- First choice for cast iron materials





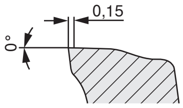
f_z [mm]

0,10 - 0,30

	Machining conditions		
	👍	✋	👎
🟦			CTCP230 **CTPP235**
🟨		CTPM225 **CTPM240**	CTPM225 **CTPM240**
🟥		**CTCK215**	**CTCK215**
🟩			
🟧			
⬜			

-R60

- Geometry with excellent stability
- For stable clamping situations
- First choice for the machining of hard materials



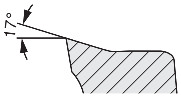
f_z [mm]

0,05 - 0,20

	Machining conditions		
	👍	✋	👎
🟦			
🟨			
🟥			
🟩			
🟧			
⬜	**CTP6215**	**CTP6215**	**CTP6215**

-27P

- Highly positive geometry
- Sharp cutting edge
- Reduced tendency to adhesion
- First choice for non-ferrous metals



f_z [mm]

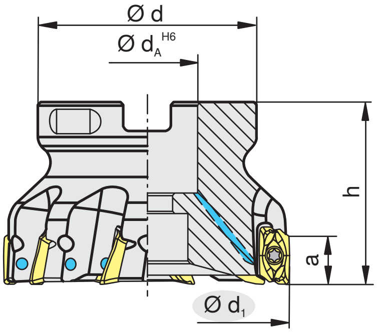
0,05 - 0,30

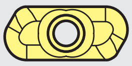
	Machining conditions		
	👍	✋	👎
🟦			
🟨			
🟥	H216T		
🟩	**H216T**	**H216T**	**H216T**
🟧			
⬜			

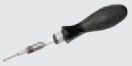
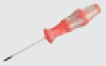
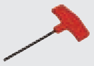
MaxiMill 211 system

A211-07/-11

90°



d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
32	A211.32.R.06-07	40	38	16	6	6	36240	1	XD.. 07..	E01
32	A211.32.R.08-07	40	38	16	6	8	36240	1	XD.. 07..	E01
40	A211.40.R.08-07	40	38	16	6	8	33240	1	XD.. 07..	E02
40	A211.40.R.10-07	40	38	16	6	10	33240	1	XD.. 07..	E02
50	A211.50.R.10-07	40	43	22	6	10	30480	1	XD.. 07..	E02
50	A211.50.R.12-07	40	43	22	6	12	30480	1	XD.. 07..	E02
40	A211.40.R.04-11	40	38	16	10	4	27700	1.6	XD.. 11..	E03
40	A211.40.R.06-11	40	38	16	10	6	27700	1.6	XD.. 11..	E03
50	A211.50.R.05-11	40	43	22	10	5	25400	1.6	XD.. 11..	E04
50	A211.50.R.08-11	40	43	22	10	8	25400	1.6	XD.. 11..	E04
63	A211.63.R.06-11	40	48	22	10	6	23300	1.6	XD.. 11..	E05
63	A211.63.R.10-11	40	48	22	10	10	23300	1.6	XD.. 11..	E05
80	A211.80.R.07-11	50	58	27	10	7	21300	1.6	XD.. 11..	E05
80	A211.80.R.10-11	50	58	27	10	10	21300	1.6	XD.. 11..	E05
80	A211.80.R.12-11	50	58	27	10	12	21300	1.6	XD.. 11..	E05
100	A211.100.R.08-11	50	78	32	10	8	19600	1.6	XD.. 11..	E05
100	A211.100.R.14-11	50	78	32	10	14	19600	1.6	XD.. 11..	E05
125	A211.125.R.10-11	63	88	40	10	10	17900	1.6	XD.. 11..	E05

						
E01	11036880	11450028	11450898		8095011700	4425
E02		11450028	11450898		8095011700	
E03	11036880	11114242	11254598		8095003900	4425
E04	11040298	11114242	11254598	4496	8095003900	
E05		11114242	11254598		8095003900	

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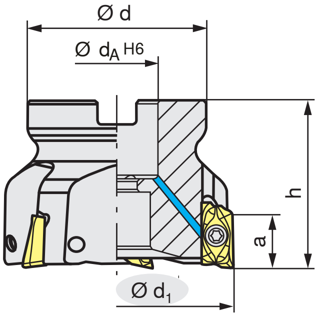
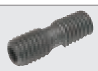
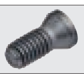
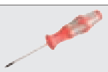
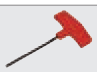
MaxiMill 211 system

A211-15/-20



d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
40	A211.40.R.03-15	40	38	16	14	3	22160	3.2	XD.. 15..	E01
40	A211.40.R.04-15	40	38	16	14	4	22160	3.2	XD.. 15..	E01
50	A211.50.R.03-15	40	43	22	14	3	20320	3.2	XD.. 15..	E02
50	A211.50.R.05-15	40	43	22	14	5	20320	3.2	XD.. 15..	E02
63	A211.63.R.04-15	45	48	22	14	4	18640	3.2	XD.. 15..	E03
63	A211.63.R.06-15	45	48	22	14	6	18640	3.2	XD.. 15..	E03
80	A211.80.R.05-15	50	58	27	14	5	17040	3.2	XD.. 15..	E03
80	A211.80.R.08-15	50	58	27	14	8	17040	3.2	XD.. 15..	E03
100	A211.100.R.06-15	50	78	32	14	6	15680	3.2	XD.. 15..	E03
100	A211.100.R.10-15	50	78	32	14	10	15680	3.2	XD.. 15..	E03
125	A211.125.R.07-15	63	88	40	14	7	14320	3.2	XD.. 15..	E03
125	A211.125.R.11-15	63	88	40	14	11	14320	3.2	XD.. 15..	E03
160	A211.160.R.08-15	63	93	40	14	8	13200	3.2	XD.. 15..	E03
160	A211.160.R.12-15	63	93	40	14	12	13200	3.2	XD.. 15..	E03
63	A211.63.R.05-20	45	48	22	19	5	14400	5	XD.. 20..	E04
80	A211.80.R.06-20	50	58	27	19	6	12400	5	XD.. 20..	E04
100	A211.100.R.07-20	50	78	32	19	7	10900	1	XD.. 20..	E04

						
E01	11036880	11450042	11450867		8095012000	4425
E02	11040298	11450042	11450867	4496	8095012000	
E03		11450042	11450867		8095012000	
E04		106022	11210490		8095010600	

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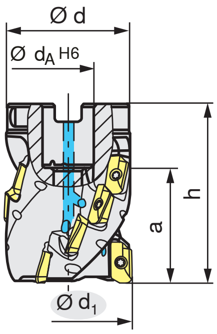
MaxiMill 211 system

A211K-11/-15/-20



d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n	n_{max} [min^{-1}]	[Nm]		
40	A211.40.R.03K4-11	56	38	16	37	3	12	18500	1.6	XD.. 11..	E01
40	A211.40.R.04K4-11	55	38	16	37	4	16	18500	1.6	XD.. 11..	E01
40	A211.40.R.04K5-11	65	38	16	45.5	4	20	18500	1.6	XD.. 11..	E01
50	A211.50.R.04K5-11	65	43	22	45.5	4	20	17000	1.6	XD.. 11..	E02
50	A211.50.R.05K5-11	65	43	22	45.5	5	25	17000	1.6	XD.. 11..	E02
50	A211.50.R.05K6-11	74	43	22	54.5	5	30	17000	1.6	XD.. 11..	E02
50	A211.50.R.03K4-15	74	43	22	50.5	3	12	13600	3.2	XD.. 15..	E03
50	A211.50.R.03K5-15	88	43	22	63.0	3	15	13600	3.2	XD.. 15..	E03
63	A211.63.R.03K4-15	74	58	27	51	3	12	12500	3.2	XD.. 15..	E04
63	A211.63.R.04K6-15	102	58	27	75.5	4	24	12500	3.2	XD.. 15..	E04
80	A211.80.R.04K5-15	88	78	32	63.0	4	20	11360	3.2	XD.. 15..	E05
80	A211.80.R.05K6-15	102	78	32	75.5	5	30	11360	3.2	XD.. 15..	E05
63	A211.63.R.04K4-20	92	58	27	68	4	16	14400	5	XD.. 20..	E06
80	A211.80.R.05K4-20	92	76	32	68	5	20	12400	5	XD.. 20..	E07

E01	11114242	11528772	11254598	8095003900
E02	11114242	11528781	11254598	8095003900
E03	11450042	11528781	11450867	8095012000
E04	11450042	11528790	11450867	8095012000
E05	11450042	11528792	11450867	8095012000
E06	106022	11528790	11210490	8095010600
E07	106022	11528792	11210490	8095010600

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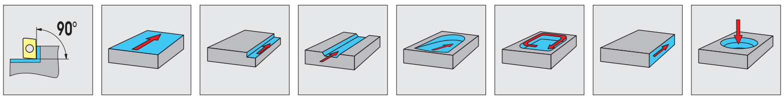
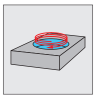
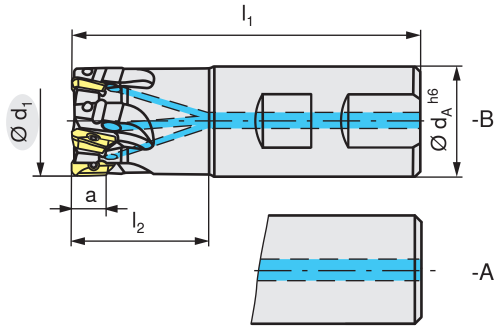
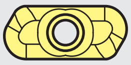
MaxiMill 211 system

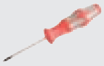
C211-07







d1 [mm]	Type, description	l1 [mm]	l2 [mm]	dA [mm]	a [mm]	z	nmax [min-1]	[Nm]		
10	C211.10.R.01-07-A-20	61	20	10	6	1	72000	1	XD.. 07..	E01
12	C211.12.R.02-07-A-20	66.5	20	12	6	2	66600	1	XD.. 07..	E01
16	C211.16.R.03-07-A-32-165	165	32	16	6	3	17760	1	XD.. 07..	E01
16	C211.16.R.04-07-A-25	74.5	25	16	6	4	50400	1	XD.. 07..	E01
16	C211.16.R.04-07-B-25	74.5	25	16	6	4	50400	1	XD.. 07..	E01
20	C211.20.R.04-07-A-40-200	200	40	20	6	4	12600	1	XD.. 07..	E01
20	C211.20.R.05-07-A-25	77	25	20	6	5	44280	1	XD.. 07..	E01
20	C211.20.R.05-07-B-25	77	25	20	6	5	44280	1	XD.. 07..	E01
25	C211.25.R.05-07-A20-50-225	225	50	20	6	5	11280	1	XD.. 07..	E01
25	C211.25.R.06-07-A20-32	84	32	20	6	6	39840	1	XD.. 07..	E01
25	C211.25.R.06-07-B20-32	84	32	20	6	6	39840	1	XD.. 07..	E01
32	C211.32.R.08-07-A25-40	98	40	25	6	8	36240	1	XD.. 07..	E01
32	C211.32.R.08-07-B25-40	98	40	25	6	8	36240	1	XD.. 07..	E01

			
E01	11450028	11450898	8095011700

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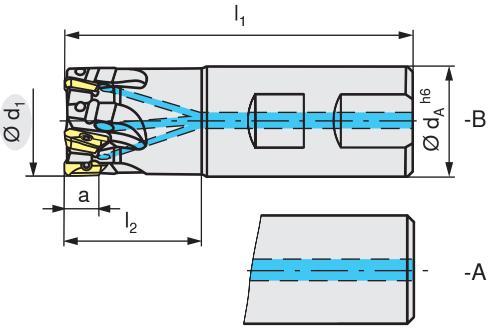
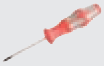
MaxiMill 211 system

C211-11



d1 [mm]	Type, description	l1 [mm]	l2 [mm]	dA [mm]	a [mm]	z	nmax [min-1]	[Nm]		
12	C211.12.R.01-11-B-20	75	20	16	10	1	55500	1.6	XD.. 11..	E01
16	C211.16.R.02-11-A15-32-165	165	32	15	10	2	14800	1.6	XD.. 11..	E02
16	C211.16.R.02-11-A-25	75	25	16	10	2	42000	1.6	XD.. 11..	E02
16	C211.16.R.02-11-A-32-165	165	32	16	10	2	14800	1.6	XD.. 11..	E02
16	C211.16.R.02-11-B-25	75	25	16	10	2	42000	1.6	XD.. 11..	E02
20	C211.20.R.02-11-A19-40-200	200	40	19	10	2	10500	1.6	XD.. 11..	E02
20	C211.20.R.02-11-A-25	77	25	20	10	2	36900	1.6	XD.. 11..	E02
20	C211.20.R.02-11-A-40-200	200	40	20	10	2	10500	1.6	XD.. 11..	E02
20	C211.20.R.02-11-B-25	77	25	20	10	2	36900	1.6	XD.. 11..	E02
20	C211.20.R.03-11-A-25	77	25	20	10	3	36900	1.6	XD.. 11..	E02
20	C211.20.R.03-11-A-32-165	165	32	20	10	3	15800	1.6	XD.. 11..	E02
20	C211.20.R.03-11-B-25	77	25	20	10	3	36900	1.6	XD.. 11..	E02
25	C211.25.R.02-11-A-50-225	225	50	25	10	2	9400	1.6	XD.. 11..	E02
25	C211.25.R.03-11-A24-50-225	225	50	24	10	3	9400	1.6	XD.. 11..	E02
25	C211.25.R.03-11-A-32	90	32	25	10	3	33200	1.6	XD.. 11..	E02
25	C211.25.R.03-11-A-50-225	225	50	25	10	3	9400	1.6	XD.. 11..	E02
25	C211.25.R.03-11-B-32	90	32	25	10	3	33200	1.6	XD.. 11..	E02
25	C211.25.R.04-11-A-32	90	32	25	10	4	33200	1.6	XD.. 11..	E02
25	C211.25.R.04-11-A-40-165	165	40	25	10	4	19900	1.6	XD.. 11..	E02
25	C211.25.R.04-11-B-32	90	32	25	10	4	33200	1.6	XD.. 11..	E02
32	C211.32.R.04-11-A25-40	102	40	25	10	4	30200	1.6	XD.. 11..	E02
32	C211.32.R.04-11-A-40	102	40	32	10	4	30200	1.6	XD.. 11..	E02
32	C211.32.R.04-11-A-64-250	250	64	32	10	4	8500	1.6	XD.. 11..	E02
32	C211.32.R.04-11-B-40	102	40	32	10	4	30200	1.6	XD.. 11..	E02
32	C211.32.R.05-11-A-40	102	40	32	10	5	30200	1.6	XD.. 11..	E02
32	C211.32.R.05-11-A-50-165	165	50	32	10	5	20900	1.6	XD.. 11..	E02
32	C211.32.R.05-11-B25-40	102	40	25	10	5	30200	1.6	XD.. 11..	E02
32	C211.32.R.05-11-B-40	102	40	32	10	5	30200	1.6	XD.. 11..	E02
40	C211.40.R.06-11-B32-50	110	50	32	10	6	27700	1.6	XD.. 11..	E03
40	C211.40.R.06-11-B-50	122	50	40	10	6	27700	1.6	XD.. 11..	E03

			
E01	11368132	11254598	8095003900
E02	11114238	11254598	8095003900
E03	11114242	11254598	8095003900

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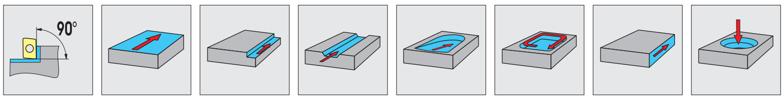
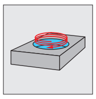
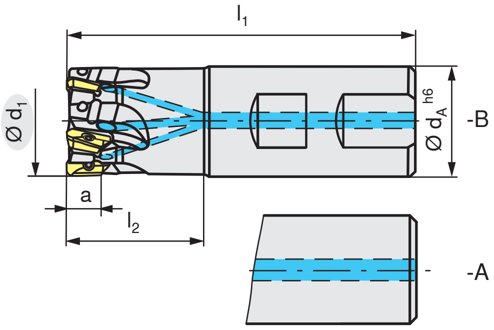
MaxiMill 211 system

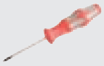
C211-15







d1 [mm]	Type, description	l1 [mm]	l2 [mm]	dA [mm]	a [mm]	z	nmax [min-1]	[Nm]		
25	C211.25.R.02-15-A-32	90	32	25	14	2	26560	3.2	XD.. 15..	E01
25	C211.25.R.02-15-A-50-225	225	50	25	14	2	7520	3.2	XD.. 15..	E01
25	C211.25.R.02-15-B20-32	83	32	20	14	2	26560	3.2	XD.. 15..	E01
25	C211.25.R.02-15-B-32	90	32	25	14	2	26560	3.2	XD.. 15..	E01
32	C211.32.R.03-15-A-40	103	40	32	14	3	24160	3.2	XD.. 15..	E01
32	C211.32.R.03-15-A-63-250	250	63	32	14	3	6800	3.2	XD.. 15..	E01
32	C211.32.R.03-15-B25-40	96	40	25	14	3	24160	3.2	XD.. 15..	E01
32	C211.32.R.03-15-B-40	103	40	32	14	3	24160	3.2	XD.. 15..	E01
40	C211.40.R.03-15-A32-50-275	275	50	32	14	3	6120	3.2	XD.. 15..	E01
40	C211.40.R.04-15-A32-50	110	50	32	14	4	22160	3.2	XD.. 15..	E01
40	C211.40.R.04-15-B32-50	110	50	32	14	4	22160	3.2	XD.. 15..	E01

			
E01	11450042	11450867	8095012000

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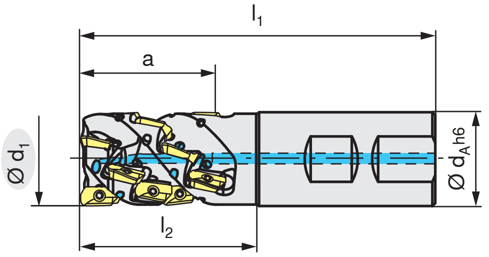
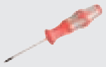
MaxiMill 211 system

C211K-11/15



d1 [mm]	Type, description	l1 [mm]	l2 [mm]	dA [mm]	a [mm]	z	n	n_{max} [min^{-1}]	[Nm]		
25	C211.25.R.02K3-11-B-40	97	40	25	27	2	6	22200	1.6	XD.. 11..	E01
25	C211.25.R.02K4-11-B-50	107	50	25	37	2	8	19400	1.6	XD.. 11..	E01
25	C211.25.R.02K5-11-B-60	117	60	25	45.5	2	10	19400	1.6	XD.. 11..	E01
32	C211.32.R.02K4-11-B-50	111	50	32	37	2	8	20200	1.6	XD.. 11..	E02
32	C211.32.R.03K5-11-B-60	121	60	32	45.5	3	15	20200	1.6	XD.. 11..	E02
40	C211.40.R.03K4-11-B32-50	110	50	32	37	3	12	18500	1.6	XD.. 11..	E02
40	C211.40.R.04K5-11-B32-60	120	60	32	45.5	4	20	18500	1.6	XD.. 11..	E02
40	C211.40.R.02K3-15-B32-60	120	60	32	38	2	6	14800	3.2	XD.. 15..	E03
50	C211.50.R.03K4-15-B40-64	134	64	40	50.5	3	12	13600	3.2	XD.. 15..	E03

			
E01	11114238	11254598	8095003900
E02	11114242	11254598	8095003900
E03	11450042	11450867	8095012000

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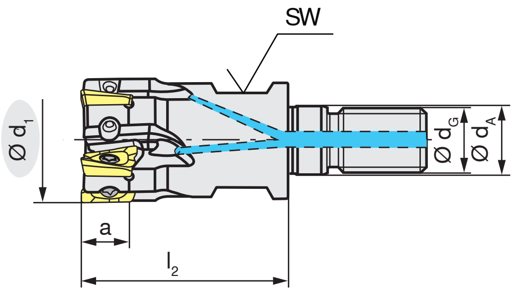
MaxiMill 211 system

G211-07/-11/-15



d_1 [mm]	Type, description	l_2 [mm]	d_G [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
16	G211.16.R.04-07	27	8	8.5	6	4	50400	1	XD.. 07..	E01
20	G211.20.R.05-07	33	10	10.5	6	5	44280	1	XD.. 07..	E01
25	G211.25.R.06-07	35	12	12.5	6	6	39480	1	XD.. 07..	E01
32	G211.32.R.08-07	35	16	17.0	6	8	36240	1	XD.. 07..	E01
16	G211.16.R.02-11	27	8	8.5	10	2	42000	1.6	XD.. 11..	E02
20	G211.20.R.02-11	33	10	10.5	10	2	36900	1.6	XD.. 11..	E02
20	G211.20.R.03-11	33	10	10.5	10	3	36900	1.6	XD.. 11..	E02
25	G211.25.R.03-11	35	12	12.5	10	3	33200	1.6	XD.. 11..	E02
25	G211.25.R.04-11	35	12	12.5	10	4	33200	1.6	XD.. 11..	E02
32	G211.32.R.04-11	35	16	17.0	10	4	30200	1.6	XD.. 11..	E02
32	G211.32.R.05-11	35	16	17.0	10	5	30200	1.6	XD.. 11..	E02
40	G211.40.R.06-11	35	16	17.0	10	6	27700	1.6	XD.. 11..	E03
25	G211.25.R.02-15	35	12	12.5	14	2	26560	3.2	XD.. 15..	E04
32	G211.32.R.03-15	35	16	17.0	14	3	30200	3.2	XD.. 15..	E04
40	G211.40.R.04-15	35	16	17.0	14	4	27700	3.2	XD.. 15..	E04

E01	11450028	11450898	8095011700
E02	11114238	11254598	8095003900
E03	11114242	11254598	8095003900
E04	11450042	11450867	8095012000

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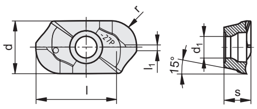
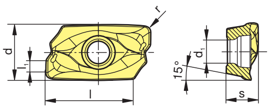
MaxiMill 211 system

XD..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-27P		XDHT 11T302FR-27P																●					6.80	10.60	3.50	2.0	0.20	2.80
		XDHT 11T304FR-27P																●					6.80	10.60	3.50	1.8	0.40	2.80
		XDHT 11T308FR-27P																●					6.80	10.60	3.50	1.4	0.80	2.80
		XDHT 11T312FR-27P																●					6.80	10.60	3.50	1.4	1.20	2.80
		XDHT 11T316FR-27P																●					6.80	10.60	3.50	1.4	1.60	2.80
		XDHT 11T320FR-27P																●					6.80	10.60	3.50	1.4	2.00	2.80
		XDHT 11T325FR-27P																●					6.80	10.60	3.50	1.4	2.50	2.80
		XDHT 11T332FR-27P																●					6.80	10.60	3.50	0.8	3.20	2.80
		XDHT 11T340FR-27P																●					6.80	10.60	3.50		4.00	2.80
		XDHT 11T350FR-27P																●					6.80	10.60	3.50		5.00	2.80
-F20		XDKT 070304FR-F20																	●				4.90	7.80	3.18	1.5	0.40	2.50
		XDKT 070308FR-F20																	●				4.90	7.80	3.18	1.1	0.80	2.50
		XDKT 11T302FR-F20																	●				6.80	10.60	3.80	2.0	0.20	2.80
		XDKT 11T304FR-F20																	●				6.80	10.60	3.80	1.8	0.40	2.80
		XDKT 11T308FR-F20																	●				6.80	10.60	3.80	1.4	0.80	2.80
		XDKT 11T320FR-F20																	●				6.80	10.60	3.80	1.7	2.00	2.80
		XDKT 11T325FR-F20																	●				6.80	10.60	3.80	1.2	2.50	2.80
		XDKT 150508FR-F20																	●				9.30	14.80	5.56	1.6	0.80	4.50
-F40		XDKT 070304ER-F40																		●	●		4.90	7.80	3.18	1.2	0.40	2.50
		XDKT 070308ER-F40																		●	●		4.90	7.80	3.18	0.8	0.80	2.50
		XDKT 11T304ER-F40																		●	●		6.80	10.60	3.80	1.7	0.40	2.80
		XDKT 11T308ER-F40																		●	●		6.80	10.60	3.80	1.4	0.80	2.80
		XDKT 11T312ER-F40																		●	●		6.80	10.60	3.80	1.1	1.20	2.80
		XDKT 11T316ER-F40																		●	●		6.80	10.60	3.80	0.8	1.60	2.80
		XDKT 11T320ER-F40																		●			6.80	10.60	3.80	0.3	2.00	2.80
		XDKT 11T325ER-F40																		●	●		6.80	10.60	3.80	1.6	2.50	2.80
		XDKT 11T332ER-F40																		●	●		6.80	10.60	3.80	1.5	3.20	2.80
		XDKT 11T340ER-F40																		●	●		6.80	10.60	3.80		4.00	2.80
		XDKT 150508ER-F40																		●	●		9.30	14.80	5.56	1.6	0.80	4.50
		XDKT 150532ER-F40																		●	●		9.30	14.80	5.56	1.9	3.20	4.50
		XDKT 150540ER-F40																		●	●		9.30	14.80	5.56	1.2	4.00	4.50
		XDKT 200708ER-F40																		●	●		12.50	18.80	6.93	2.8	0.80	5.50
		XDKT 200732ER-F40																		●	●		12.50	18.80	6.82	0.9	3.20	5.50
-F50		XDKT 070304SR-F50					●	●			●												4.90	7.80	3.18	1.2	0.40	2.50
		XDKT 070308SR-F50					●	●			●												4.90	7.80	3.18	1.0	0.80	2.50
		XDKT 11T304SR-F50					●	●															6.80	10.60	3.80	1.8	0.40	2.80
		XDKT 11T308SR-F50			●	●	●	●	●	●	●												6.80	10.60	3.80	1.4	0.80	2.80
		XDKT 11T312SR-F50									●												6.80	10.60	3.80	1.0	1.20	2.80
		XDKT 11T320SR-F50					●	●			●												6.80	10.60	3.80	2.1	2.00	2.80
		XDKT 11T325SR-F50					●	●															6.80	10.60	3.80	1.6	2.50	2.80
		XDKT 11T332SR-F50									●												6.80	10.60	3.80	1.5	3.20	2.80
		XDKT 150508SR-F50			●	●	●	●	●	●	●												9.30	14.80	5.56	1.6	0.80	4.50
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	l_1	r	d_1





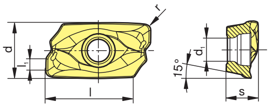
B12-B18
B111-B112
B21
B257-B266

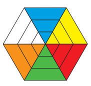
MaxiMill 211 system

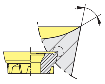
XD..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

		CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-M50 	XDKT 070304SR-M50					●	●			●												4.90	7.80	3.18	1.0	0.40	2.50
	XDKT 070308SR-M50					●	●			●												4.90	7.80	3.18	1.0	0.80	2.50
	XDKT 11T304SR-M50					●	●			●			●									6.80	10.60	3.80	1.8	0.40	2.80
	XDKT 11T308SR-M50			●	●	●	●	●	●	●			●	●								6.80	10.60	3.80	1.4	0.80	2.80
	XDKT 11T312SR-M50					●	●			●												6.80	10.60	3.80	1.0	1.20	2.80
	XDKT 11T312SR-R50									●												6.80	10.60	3.80	1.0	1.20	2.80
	XDKT 11T320SR-M50					●	●			●												6.80	10.60	3.80	2.1	2.00	2.80
	XDKT 11T325SR-M50					●	●															6.80	10.60	3.80	1.6	2.50	2.80
	XDKT 11T332SR-M50									●												6.80	10.60	3.80	1.5	3.20	2.80
	XDKT 150508SR-M50			●	●	●	●	●	●	●			●	●								9.30	14.80	5.56	1.6	0.80	4.50
	XDKT 150512SR-M50					●	●			●												9.30	14.80	5.56	1.2	1.20	4.50
	XDKT 150516SR-M50					●	●			●												9.30	14.80	5.56	0.8	1.60	4.50
	XDKT 150520SR-M50						●															9.30	14.80	5.56	0.6	2.00	4.50
	XDKT 150530SR-M50					●	●			●												9.30	14.80	5.56		3.00	4.50
	XDKT 150540SR-M50					●	●			●												9.30	14.80	5.56		4.00	4.50
-R50 	XDKT 11T304SR-R50					●	●															6.80	10.60	3.80	1.8	0.40	2.80
	XDKT 11T308SR-R50					●	●	●	●	●			●									6.80	10.60	3.80	1.4	0.80	2.80
	XDKT 11T320SR-R50					●	●			●												6.80	10.60	3.80	2.1	2.00	2.80
	XDKT 11T325SR-R50					●	●															6.80	10.60	3.80	1.6	2.50	2.80
	XDKT 11T332SR-R50									●												6.80	10.60	3.80	1.5	3.20	2.80
	XDKT 150508SR-R50					●	●			●			●	●								9.30	14.80	5.56	1.6	0.80	4.50
	XDKT 150520SR-R50					●	●															9.30	14.80	5.56	1.6	2.00	4.50
-R60 	XDKT 11T308SR-R60																				●	6.80	10.60	3.80	1.4	0.80	2.80
	XDKT 150508SR-R60																				●	9.30	14.80	5.56	1.6	0.80	4.50




B12-B18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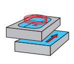

B21


B257-B266

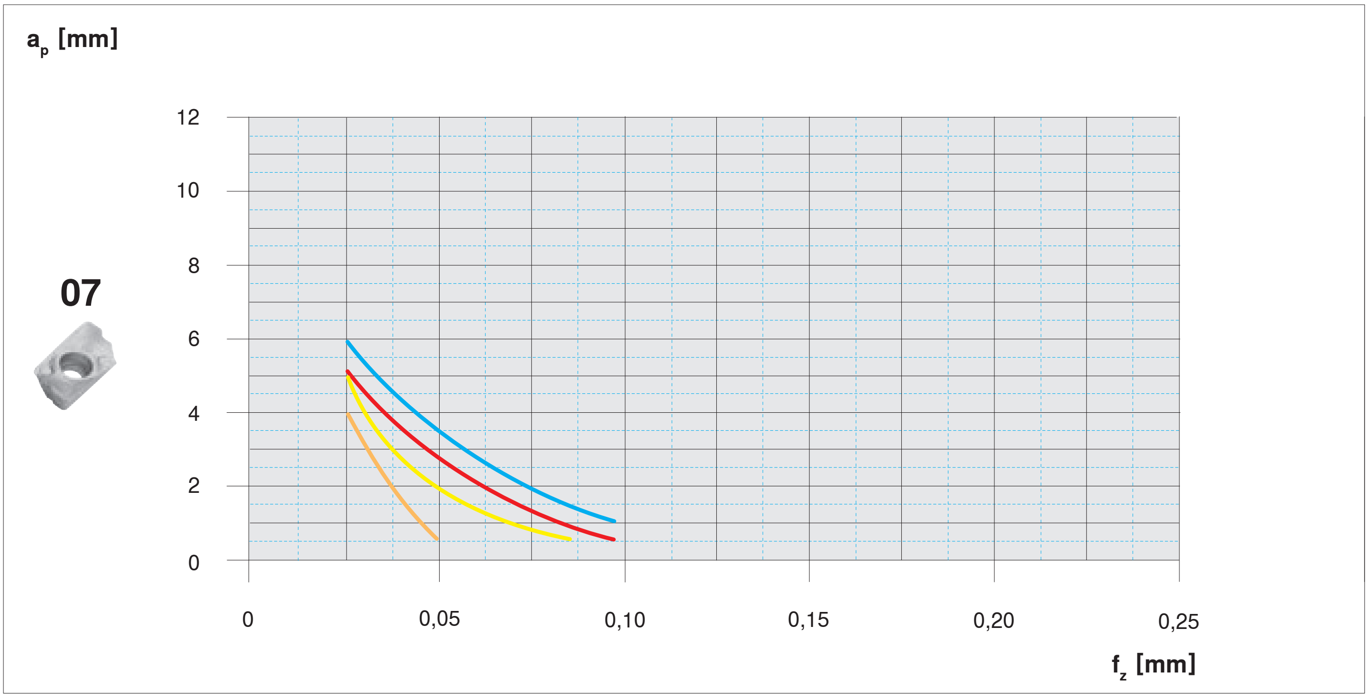
MaxiMill 211 system

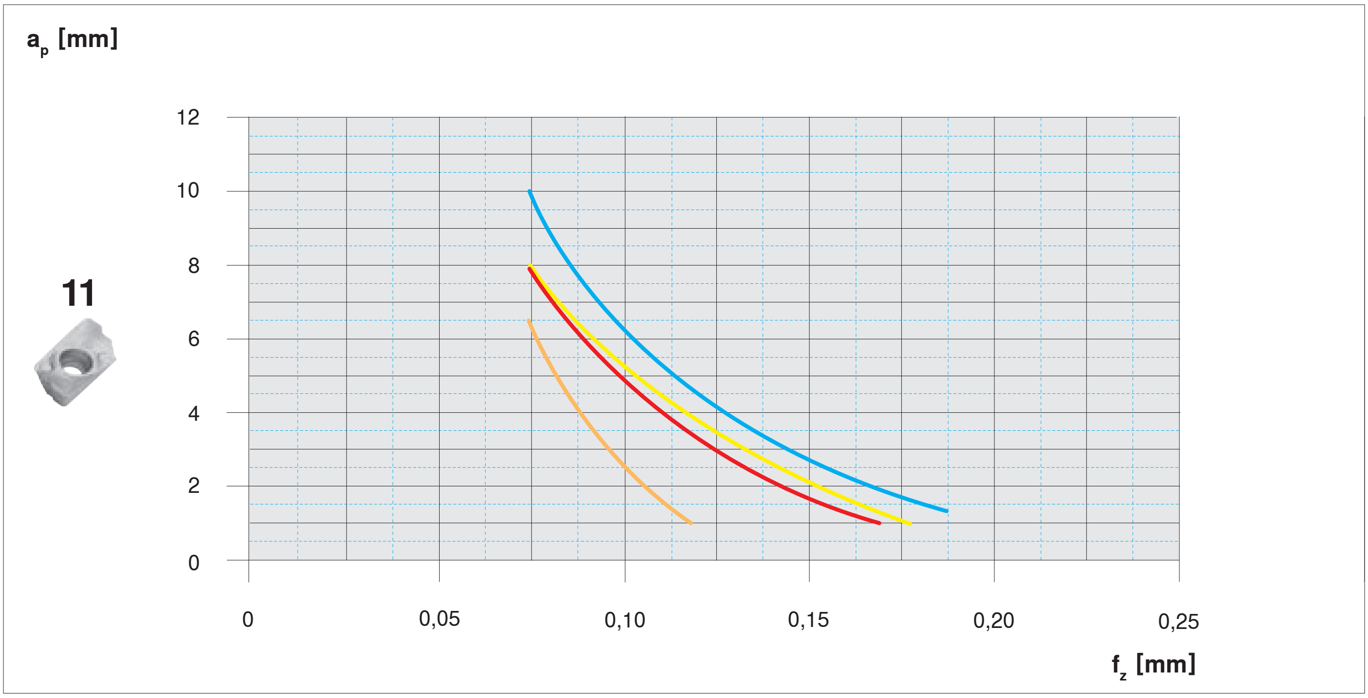
Starting parameters for example materials XD..07/11

Materials				Insert		v_c [m/min]	Coolant
🟦	1.2312	40CrMnMoS8-6	1.000 N/mm^2	XDKT 070308SR-M50 XDKT 11T308SR-M50	CTPP235	200	dry
🟨	1.4571	X6CrNiMoTi17-12-2	600 N/mm^2	XDKT 070308SR-F50 XDKT 11T308SR-F50	CTPM240	180	dry
🟥	5.1301	EN-GJL-250	HB 180	XDKT 11T308SR-R50	CTCK215	250	dry
🟧	2.4856	Inconel 625	1.450 N/mm^2	XDKT 070308ER-F40 XDKT 11T308ER-F50	CTC5235	35	emulsion

⚠ If a_e < 50% use correction list

➔ B129





Additional grades and geometries can be used for the application and are illustrated in the respective application range of the system.

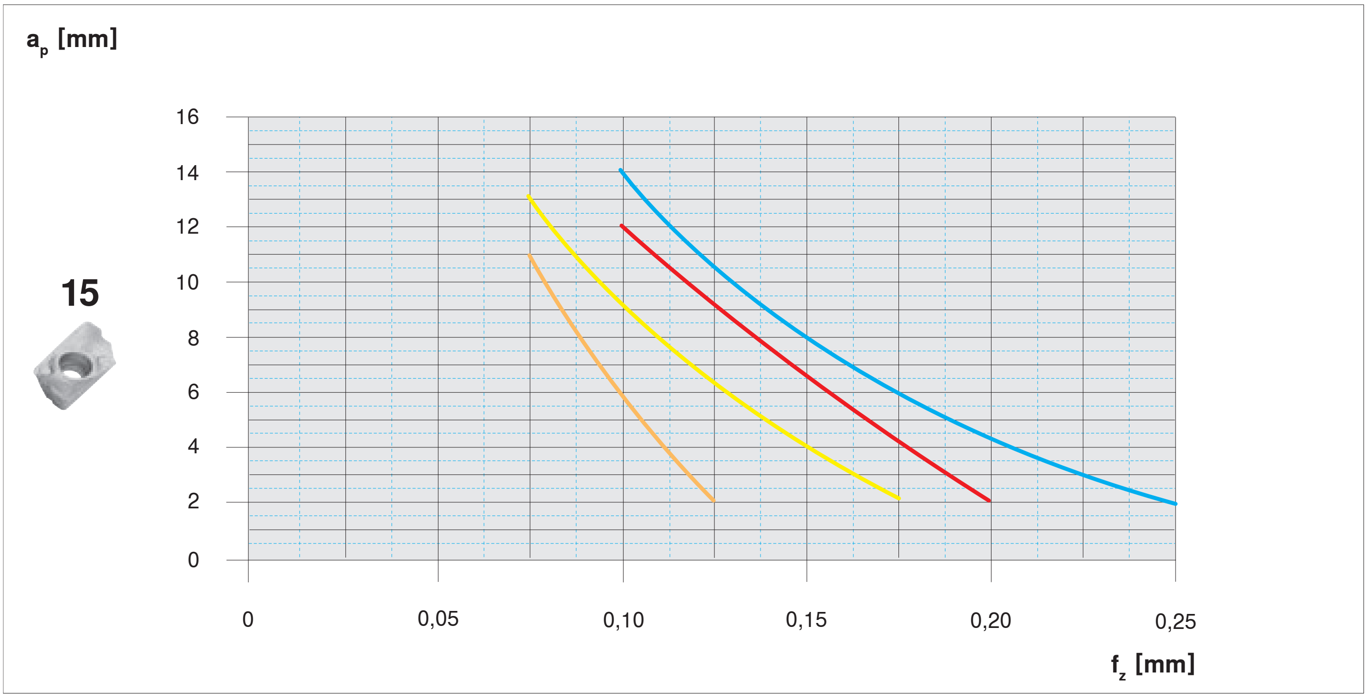
MaxiMill 211 system

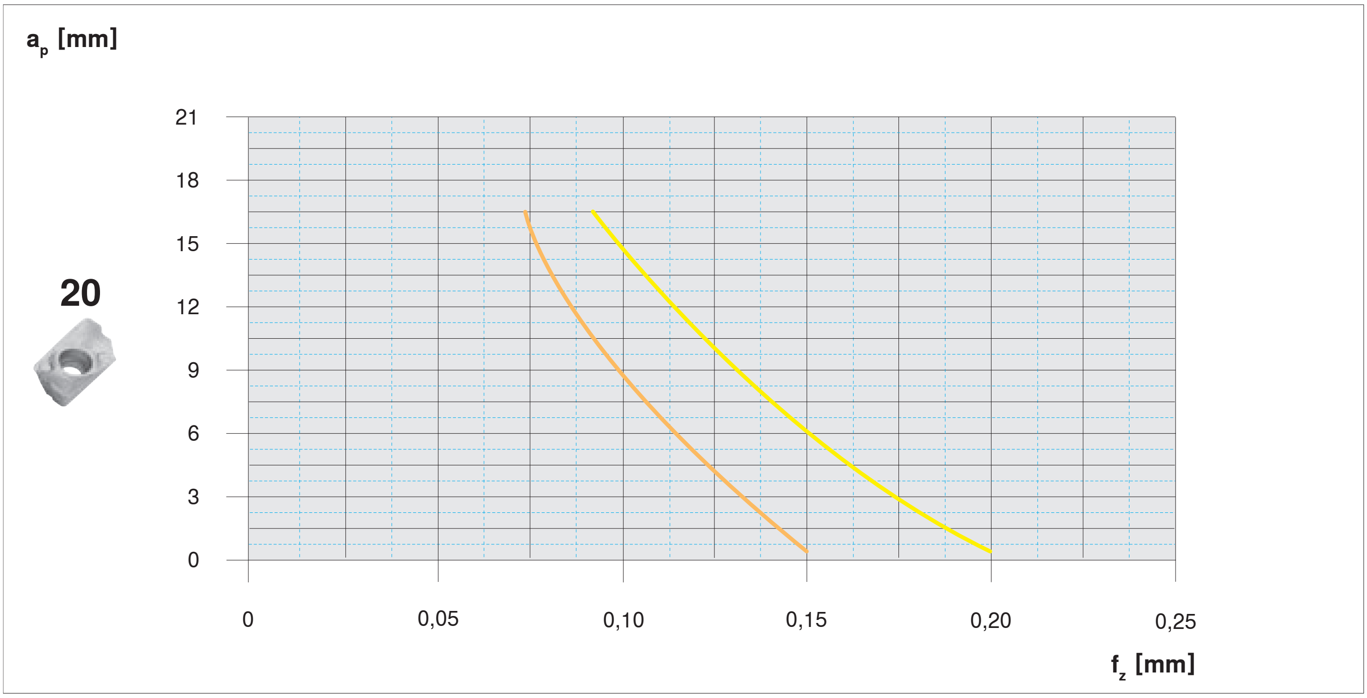
Starting parameters for example materials XD..15/20

Materials				Insert		v_c [m/min]	Coolant
▼	1.2312	40CrMnMoS8-6	1.000 N/mm^2	XDKT 150508SR-M50	CTPP235	200	dry
▼	1.4571	X6CrNiMoTi17-12-2	600 N/mm^2	XDKT 11T308ER-F50 XDKT 200708ER-F40	CTPM240 CTC5235	180	dry
▼	5.1301	EN-GJL-250	HB 180	XDKT 150508SR-R50	CTCK215	250	dry
▼	2.4856	Inconel 625	1.450 N/mm^2	XDKT 150508ER-F40 XDKT 200708ER-F40	CTC5235	35	emulsion

⚠ If a_e < 50% use correction list

B129



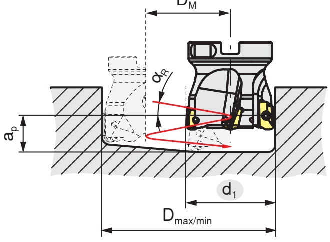


Additional grades and geometries can be used for the application and are illustrated in the respective application range of the system.

MaxiMill 211 system

Application data 211..07..

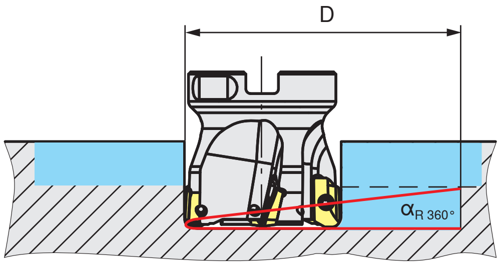
Helical plunge milling



D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

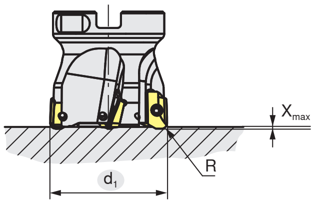
d_1 [mm]	D_{max} / r.4 [mm]	D_{min} [mm]	$\alpha_{R\,max}$ 360° [°]
10	19	13	5,5
12	23	17	6,0
16	31	25	3,0
20	39	33	2,0
25	49	43	1,5
32	63	57	1,2
40	79	73	0,8
50	99	93	0,7

a_p [mm] = $D_M \times \pi \times \tan \alpha_R$



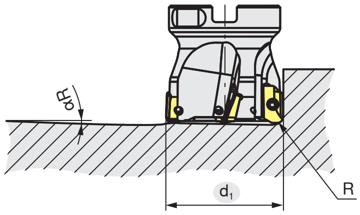
d_1 [mm]	D [mm]	$\alpha_{R\,max}$ 360° [°]
10	13	5,5
12	17	6,0
16	25	3,0
20	33	2,0
25	43	1,5
32	57	1,2
40	73	0,8
50	93	0,7

Axial plunging



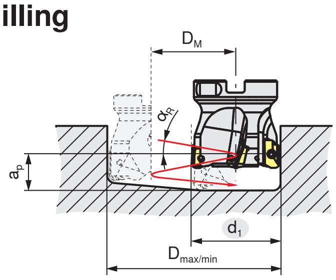
d_1 [mm]	X_{max} [mm]
10	0,8
12	0,8
16	0,8
20	0,8
25	0,8
32	0,8
40	0,8
50	0,8

Angled ramping



d_1 [mm]	αR [°]
10	11,0
12	7,9
16	4,3
20	3,0
25	2,5
32	1,6
40	1,2
50	1,0

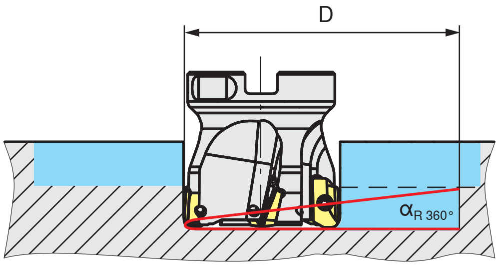
Helical plunge milling



D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

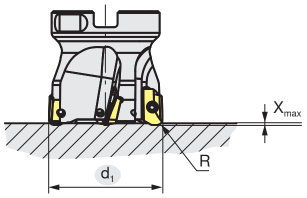
d_1 [mm]	D_{max} / r 0,8 [mm]	D_{min} [mm]	$\alpha_{R\ max}$ [°]
12	21	14	16,0
16	29	18	9,5
20	37	30	7,0
25	47	40	4,5
32	61	53	3,2
40	77	72	2,2
50	98	93	1,7
63	123	118	1,5
80	157	152	1,0
100	197	191	0,8
125	247	242	0,6
160	317	312	0,4

a_p [mm] = $D_M \times \pi \times \tan \alpha_R$



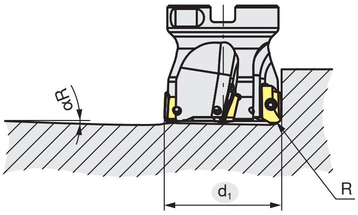
d_1 [mm]	D [mm]	$\alpha_{R\ max\ 360°}$ [°]
12	14	16,0
16	18	9,5
20	30	7,0
25	40	4,5
32	53	3,2
40	72	2,2
50	93	1,7
63	118	1,5
80	152	1,0
100	191	0,8
125	242	0,6
160	312	0,4

Axial plunging



d_1 [mm]	X_{max} [mm]
12	1,3
16	1,5
20	2,0
25	2,0
32	1,8
40	1,6
50	1,6
63	1,6
80	1,6
100	1,6
125	1,6
160	1,6

Angled ramping

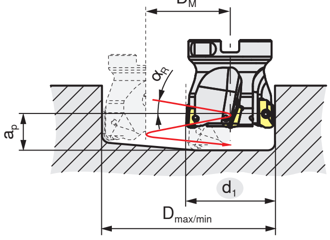


d_1 [mm]	α_R [°]
12	18,0
16	10,8
20	9,8
25	7,5
32	4,8
40	2,9
50	2,2
63	1,8
80	1,4
100	1,1
125	0,8
160	0,65

MaxiMill 211 system

Application data 211..15..

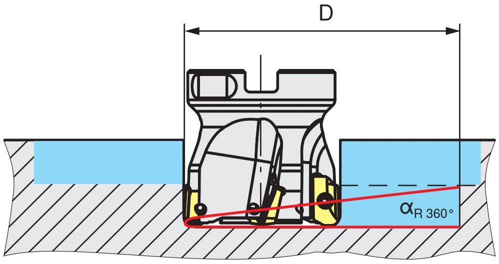
Helical plunge milling



D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

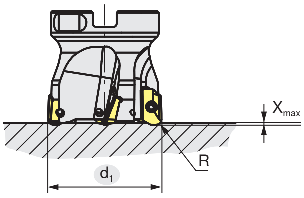
d_1 [mm]	D_{max} / r 0,8 [mm]	D_{min} [mm]	$\alpha_{R\ max}$ [°]
12	21	14	16,0
16	29	18	9,5
20	37	30	7,0
25	47	40	4,5
32	61	53	3,2
40	77	72	2,2
50	98	93	1,7
63	123	118	1,5
80	157	152	1,0
100	197	191	0,8
125	247	242	0,6
160	317	312	0,4

a_p [mm] = $D_M \times \pi \times \tan \alpha_R$



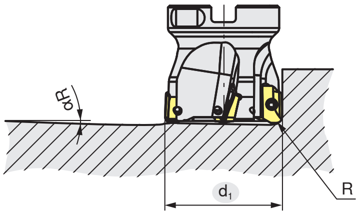
d_1 [mm]	D [mm]	$\alpha_{R\ max\ 360°}$ [°]
12	14	16,0
16	18	9,5
20	30	7,0
25	40	4,5
32	53	3,2
40	72	2,2
50	93	1,7
63	118	1,5
80	152	1,0
100	191	0,8
125	242	0,6
160	312	0,4

Axial plunging



d_1 [mm]	X_{max} [mm]
12	1,3
16	1,5
20	2,0
25	2,0
32	1,8
40	1,6
50	1,6
63	1,6
80	1,6
100	1,6
125	1,6
160	1,6

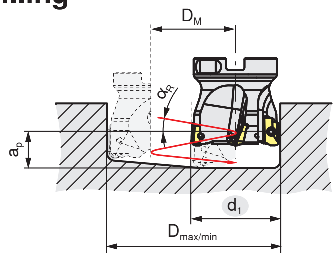
Angled ramping



d_1 [mm]	α_R [°]
12	18,0
16	10,8
20	9,8
25	7,5
32	4,8
40	2,9
50	2,2
63	1,8
80	1,4
100	1,1
125	0,8
160	0,65

Milling / Shoulder milling

Helical plunge milling

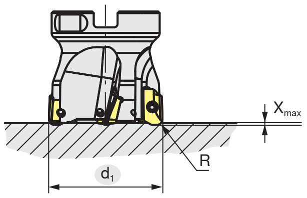


D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

d_1 [mm]	$D_{max / r 0,8}$ [mm]	D_{min} [mm]	$\alpha_{R max}$ [°]
63	124	107	2,2
80	158	143	1,7
100	198	183	1,3

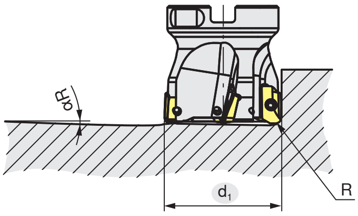
a_p [mm] = D_M x π x tan α_R

Axial plunging



d_1 [mm]	X_{max} [mm]
63	2,0
80	2,0
100	2,0

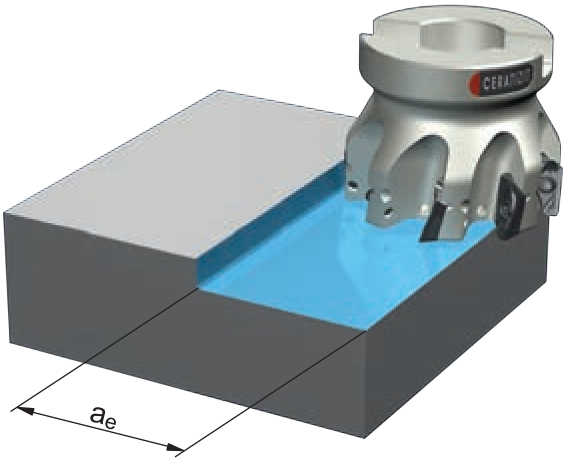
Angled ramping

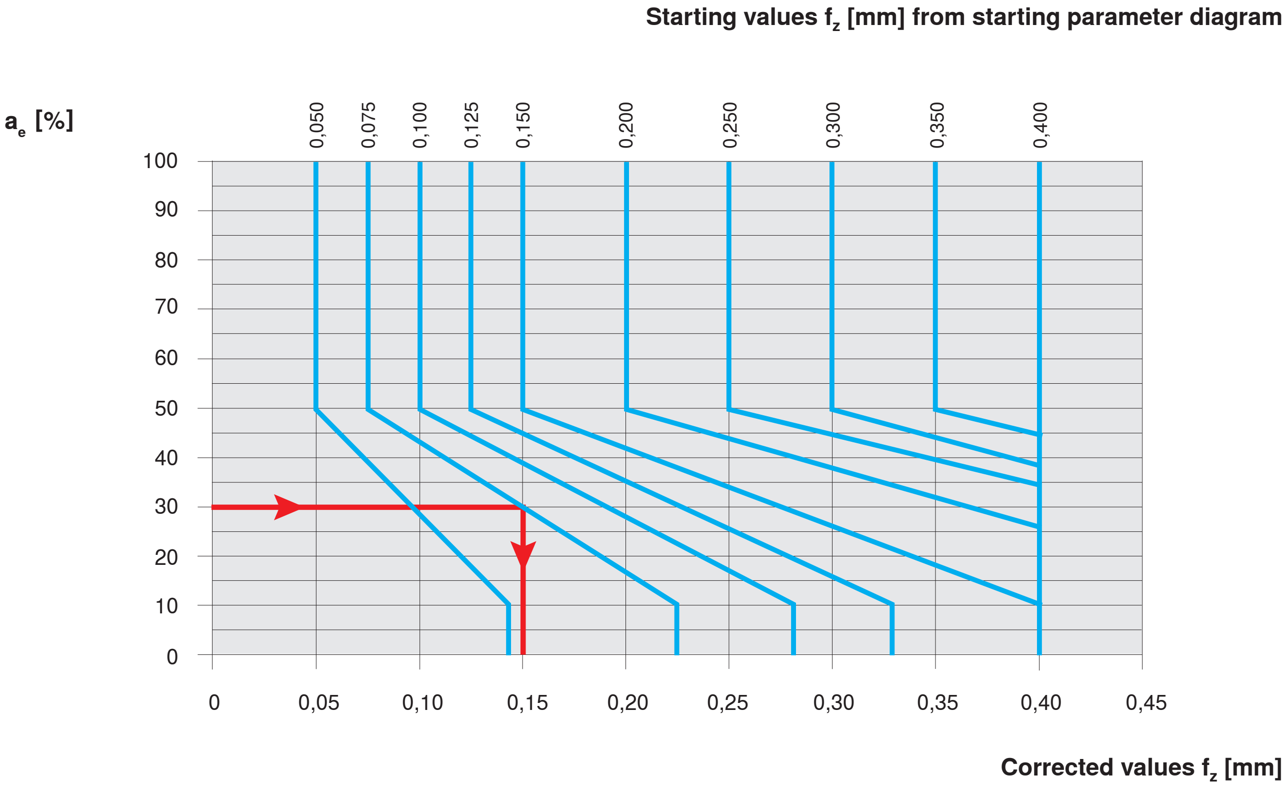


d_1 [mm]	α_R [°]
63	2,2
80	1,7
100	1,3

MaxiMill 211 system

Correction of feed rate f_z





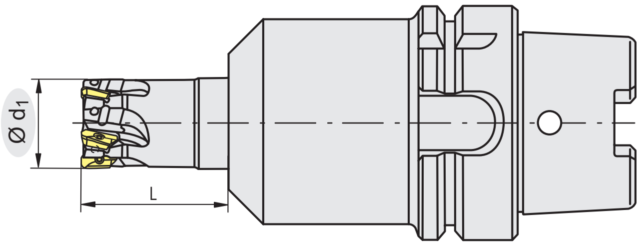
These parameters apply for cutting width (a_e) below 50%

Example:

Starting value [f_z] = 0.075 mm
a_e = 30%
Corrected value [f_z] = 0.15 mm

MaxiMill 211 system

Maximum RPM

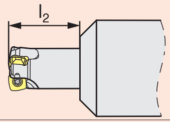
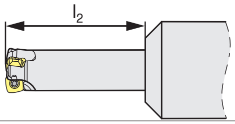
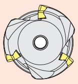
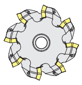
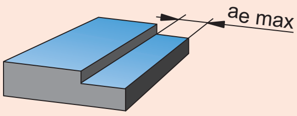
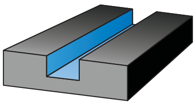
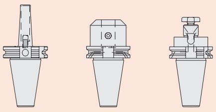
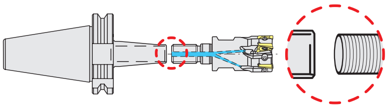
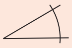


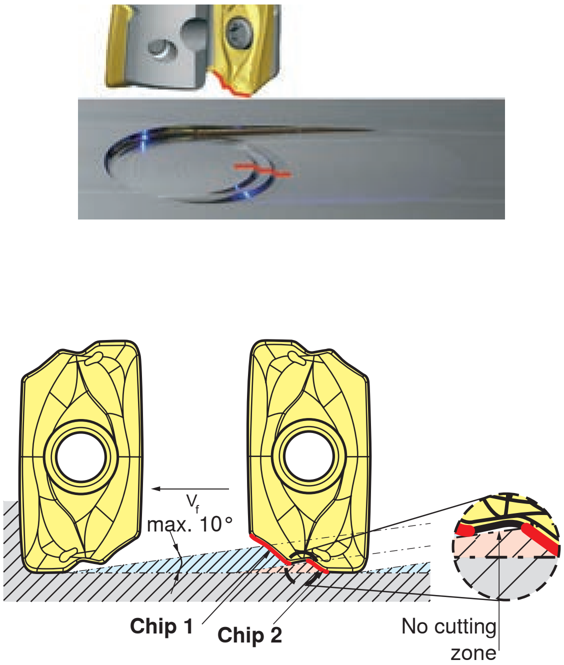
Maximum RPM in relation to overhang length L.

The revolution number must be adapted according to the machining situation and the selected tool shank.

Ø d_1 [mm]	211-07			211-11			211-15		
	n_{max} [min^{-1}]			n_{max} [min^{-1}]			n_{max} [min^{-1}]		
	L = 2xØ	L = 3xØ	L = 5xØ	L = 2xØ	L = 3xØ	L = 5xØ	L = 2xØ	L = 3xØ	L = 5xØ
10	72.000	58.000	46.000	–	–	–		–	–
12	67.000	54.000	38.000	56.000	45.000	32.000	–	–	–
16	50.000	41.000	29.000	42.000	34.000	24.000	–	–	–
20	44.000	34.000	23.000	37.000	29.000	20.000	–	–	–
25	40.000	29.000	18.000	33.000	24.000	15.000	27.000	20.000	12.000
32	36.000	25.000	14.000	30.000	21.000	12.000	24.000	17.000	10.000
40	33.000	22.000	11.000	28.000	18.000	9.000	22.000	14.000	7.000
50	30.000	18.000	7.000	25.000	15.000	6.000	20.000	12.000	5.000
63	–	–	–	23.000	13.000	4.000	19.000	10.000	3.000
80	–	–	–	21.000	11.000	–	17.000	8.000	–
100	–	–	–	20.000	8.000	–	16.000	7.000	–
125	–	–	–	18.000	–	–	14.000	–	–
160	–	–	–	17.000	–	–	13.000	–	–

Milling of hard materials (≥ 45 HRC)

Recommendations for machining	🙂	☹
l_2		
z		
$a_{e\ max}$ = 75%		
Adapter		
Coolant		
Plunging	 α_R: –50%	
Starting values	f_z = 0,05 mm v_c = 30 - 60 m/min a_p = 0,5 - 2,5 mm	



MaxiMill 211-11

Radial force compensation through 'the notch' when helical plunging or ramping: (r < 2.0 mm)

Radial force compensation
- The notch provides additional stability when plunging.
- Reduced machining noise and vibration are therefore guaranteed.

The ADVANTAGE for cutting tool experts
- Increased cutting performance
- Improved surface quality when machining pockets and slots

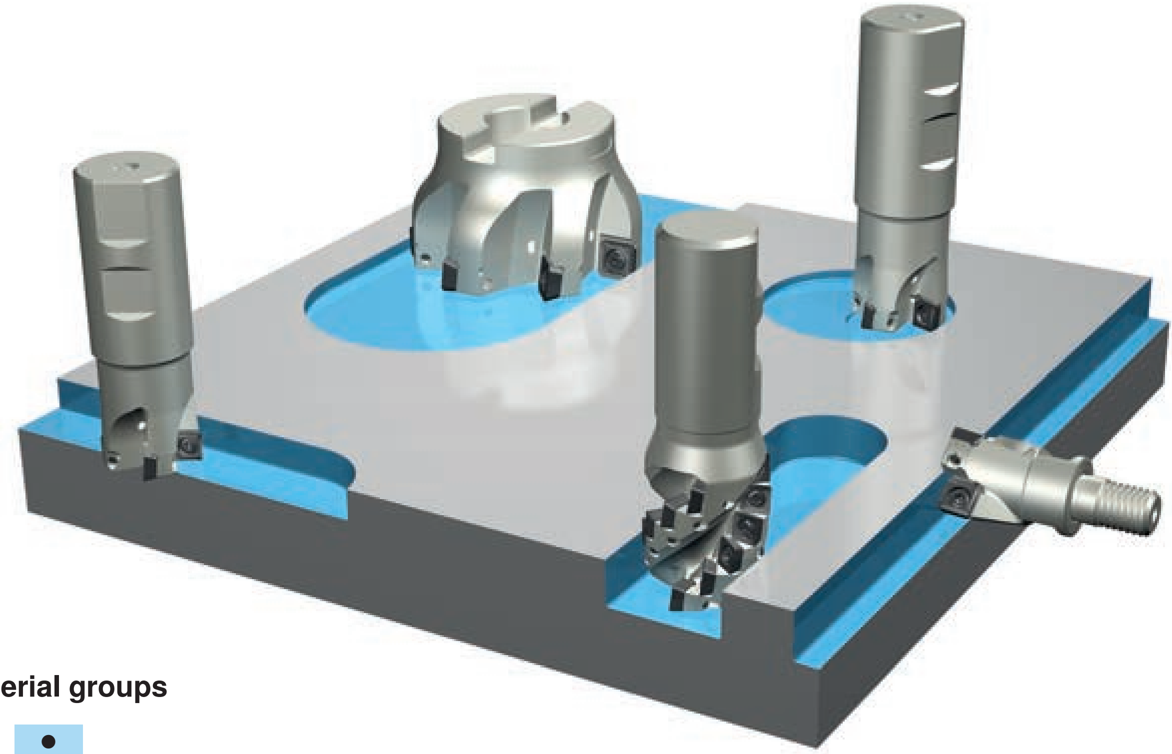
Swarf control
- Low cutting pressure
- Low power consumption
- Optimum chip evacuation
- Minimum vibration
- Very good chip formation

Notes


/ 5.0 Nm
05..

Versatiles shoulder milling system

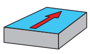
○ 4 cutting edges for universal application
○ Optimal price-performance ratio

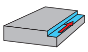


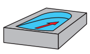
Material groups

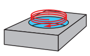
P	●
M	○
K	●
N	○
S	○
H	

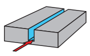
Possible applications

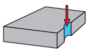

Face milling


Shoulder milling

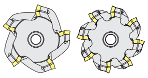

Helical plunge milling


Helical plunging


Slot milling


Plunge milling

Detailed information

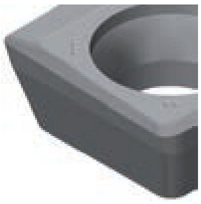
Pitch	Ø range	Inserts
	Ø 25 - 125 mm	SD..09T3.. SD..1205..

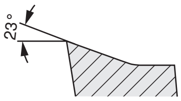
MaxiMill 490 system

Geometry overview

-27

- Highly positive geometry
- Sharp cutting edges
- For the finishing of titanium alloys





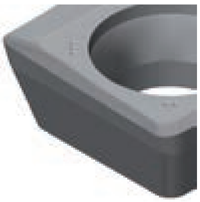
f_z [mm]

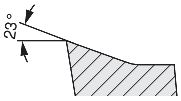
0,10 - 0,20

	Machining conditions		
	👍	🤚	👎
🟦			
🟨			
🟥			
🟩			
🟧		**CTC5240**	**CTC5240**
⬜			

-27P

- Highly positive geometry
- Sharp cutting edges
- Reduced tendency to adhesion
- First choice for non-ferrous metals





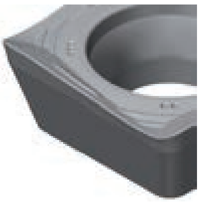
f_z [mm]

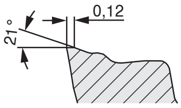
0,08 - 0,35

	Machining conditions		
	👍	🤚	👎
🟦			
🟨			
🟥	**AMZ** H216T		
🟩	AMZ **H216T**	AMZ **H216T**	AMZ **H216T**
🟧			
⬜			

-29

- Universal geometry
- Light to medium roughing
- First choice for general steel materials





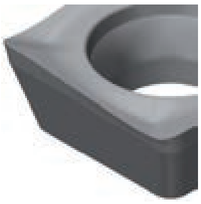
f_z [mm]

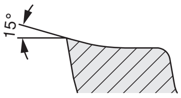
0,10 - 0,25

	Machining conditions		
	👍	🤚	👎
🟦		**CTCP230** CTPP235	CTCP230 **CTPP235**
🟨		**CTPM240**	
🟥			
🟩			
🟧			
⬜			

-M31

- Positive geometry
- Universal application
- Reduced vibration
- For heat-resistant materials, titanium and super alloys





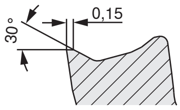
f_z [mm]

0,10 - 0,20

	Machining conditions		
	👍	🤚	👎
🟦			
🟨			
🟥			
🟩			
🟧		**CTC5235** **CTC5240**	**CTC5235** **CTC5240**
⬜			

-33

- ○ Positive geometry
- ○ Light roughing
- ○ First choice for stainless steel materials



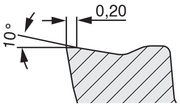
f_z [mm]

0,10 - 0,20

	Machining conditions		
	👍	👉	👎
🟦			
🟨		CTPM240	**CTPM240**
🟥			
🟩			
🟧			

-31

- ○ Stable geometry
- ○ Roughing operations
- ○ For heavily interrupted cut
- ○ First choice for cast iron materials



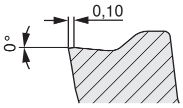
f_z [mm]

0,10 - 0,30

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥		**CTCK215**	**CTCK215**
🟩			
🟧			

-ER

- ○ Stable cutting edges
- ○ Universal application
- ○ For general steel materials



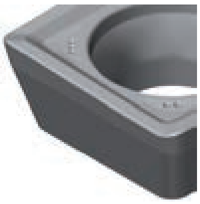
f_z [mm]

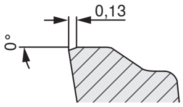
0,10 - 0,30

	Machining conditions		
	👍	👉	👎
🟦	**CTPP235**	**CTPP235**	
🟨			
🟥			
🟩			
🟧			

-SR

- ○ Stable geometry
- ○ Light to medium finishing
- ○ For cermet as cutting material
- ○ For steel materials





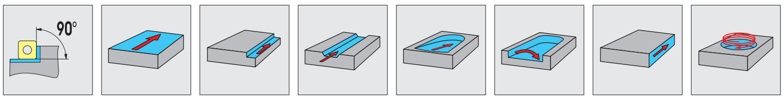
f_z [mm]

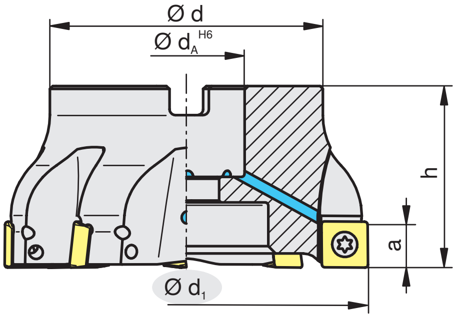
0,05 - 0,25

	Machining conditions		
	👍	👉	👎
🟦	**TCM10**	**TCM10**	
🟨	TCM10		
🟥	TCM10		
🟩			
🟧			

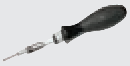
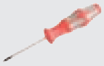
MaxiMill 490 system

A490-09/-12





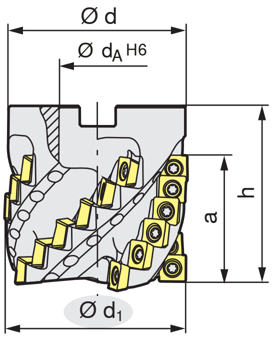
d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
40	A490.40.R.05-09	40	38	16	7.3	5	17000	3.2	SD.. 09T3..	E01
42	A490.42.R.06-09	40	38	16	7.3	6	16500	3.2	SD.. 09T3..	E01
50	A490.50.R.06-09	40	43	22	7.3	6	14800	3.2	SD.. 09T3..	E02
52	A490.52.R.07-09	40	43	22	7.3	7	14450	3.2	SD.. 09T3..	E02
63	A490.63.R.07-09	40	48	22	7.3	7	12850	3.2	SD.. 09T3..	E02
66	A490.66.R.08-09	40	48	22	7.3	8	12550	3.2	SD.. 09T3..	E02
80	A490.80.R.09-09	50	58	27	7.3	9	11250	3.2	SD.. 09T3..	E02
100	A490.100.R.10-09	50	78	32	7.3	10	9900	3.2	SD.. 09T3..	E02
40	A490.40.R.04-12	40	38	16	10.7	4	17000	5	SD.. 1205..	E03
50	A490.50.R.05-12	40	43	22	10.7	5	14800	5	SD.. 1205..	E04
63	A490.63.R.06-12	40	48	22	10.7	6	12850	5	SD.. 1205..	E05
80	A490.80.R.07-12	50	58	27	10.7	7	11250	5	SD.. 1205..	E05
100	A490.100.R.08-12	50	78	32	10.7	8	9900	5	SD.. 1205..	E05
125	A490.125.R.10-12	63	88	40	10.7	10	5500	5	SD.. 1205..	E05

					
E01	11036880	54976	11149570	8095010500	4425
E02		54976	11149570	8095010500	
E03	11036880	106022	11210490	8095010600	
E04	11040298	106022	11210490	8095010600	
E05		106022	11210490	8095010600	

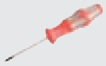
B276

MaxiMill 490 system

A490-09K



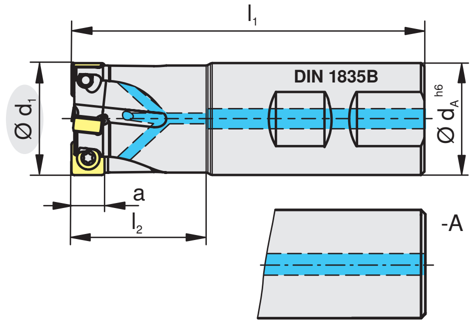
d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n	n_{max} [min^{-1}]	[Nm]		
40	A490.40.R.03K6-09	55	38.2	16	41	3	18	8000	3.2	SD.. 09T3..	E01
50	A490.50.R.04K6-09	55	48	22	41	4	24	7500	3.2	SD.. 09T3..	E01
63	A490.63.R.05K6-09	60	61	27	41	5	30	6500	3.2	SD.. 09T3..	E01

			
E01	54976	11149570	8095010500

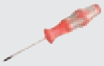
B276

MaxiMill 490 system

C490-09/-12



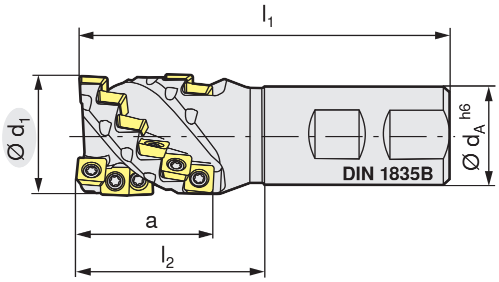
d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
25	C490.25.R.02-09-A20-40-165	165	40	20	7.3	2	17700	3.2	SD.. 09T3..	E01
25	C490.25.R.02-09-A-40-165	165	40	25	7.3	2	17700	3.2	SD.. 09T3..	E01
25	C490.25.R.03-09-B-32	88	32	25	7.3	3	23700	3.2	SD.. 09T3..	E01
32	C490.32.R.04-09-B25-40	96	40	25	7.3	4	19700	3.2	SD.. 09T3..	E01
32	C490.32.R.04-09-B-40	100	40	32	7.3	4	19700	3.2	SD.. 09T3..	E01
32	C490.32.R.03-12-B-40	101	40	32	10.7	3	16300	5	SD.. 1205..	E02
40	C490.40.R.04-12-B32-50	112	50	32	10.7	4	13600	5	SD.. 1205..	E02

			
E01	54976	11149570	8095010500
E02	106022	11210490	8095010600

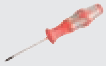
B276

MaxiMill 490 system

C490-09K



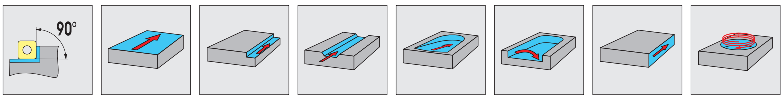
d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n	n_{max} [min^{-1}]	[Nm]		
40	C490.40.R.03K6-09-B32-60	120	60	32	41	3	18	8000	3.2	SD.. 09T3..	E01

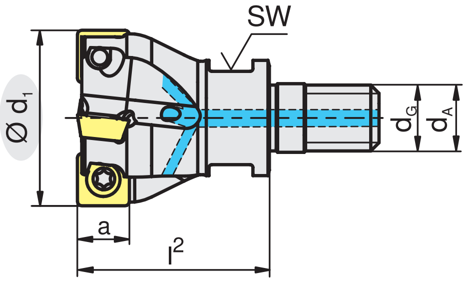
			
E01	54976	11149570	8095010500

B276

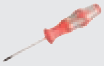
MaxiMill 490 system

G490-09/-12





d_1 [mm]	Type, description	l_2 [mm]	d_G [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
25	G490.25.R.03-09	35	12	12.5	7.3	3	23700	3.2	SD.. 09T3..	E01
32	G490.32.R.04-09	35	16	17.0	7.3	4	19700	3.2	SD.. 09T3..	E01
32	G490.32.R.03-12	35	16	17.0	10.7	3	16300	5	SD.. 1205..	E02
40	G490.40.R.04-12	40	16	17.0	10.7	4	13600	5	SD.. 1205..	E02

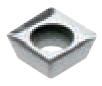
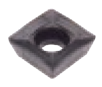
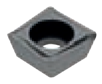
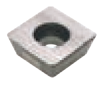
			
E01	54976	11149570	8095010500
E02	106022	11210490	8095010600

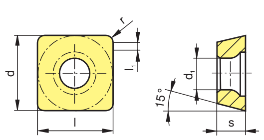
B276

MaxiMill 490 system

SD..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-27		SDHT 09T308ER-27																			●		9.52	9.52	3.97	2.5	0.80	4.40
-27P		SDHT 09T308FR-27P															●	●					9.52	9.52	3.97	2.5	0.80	4.40
		SDHT 120508FR-27P															●	●					12.70	12.70	5.00	2.2	0.80	5.50
		SDHT 120525FR-27P															●	●					12.70	12.70	5.00	1.5	2.50	5.50
-29		SDMT 1205ZZSN-29					●	●			●												12.70	12.70	5.00	0.9	0.80	5.50
		SDNT 09T308SR-29					●	●															9.52	9.52	3.97	2.5	0.80	4.40
-31		SDMT 1205ZZSN-31												●									12.70	12.70	5.00	0.9	0.80	5.50
		SDNT 09T308SR-31												●									9.52	9.52	3.97	2.5	0.80	4.40
-33		SDHT 120512SR-33									●												12.70	12.70	5.00	1.8	1.20	5.50
		SDHT 120520SR-33									●												12.70	12.70	5.00	1.0	2.00	5.50
		SDNT 09T308SR-33									●												9.52	9.52	3.97	2.5	0.80	4.40
-M31		SDMT 120508ER-M31																		●	●		12.70	12.70	5.00		0.80	5.50
		SDNT 09T308ER-M31																		●	●		9.52	9.52	3.97	2.5	0.80	4.40
SD..T		SDHT 09T308SR		●																			9.52	9.52	3.97	2.5	0.80	4.40
		SDNT 09T308ER						●															9.52	9.52	3.97	2.5	0.80	4.40
SD..W		SDHW 120508SR		●																			12.70	12.70	5.00	2.2	0.80	5.50



B12-B18

B135-B136

B21

B257-B266

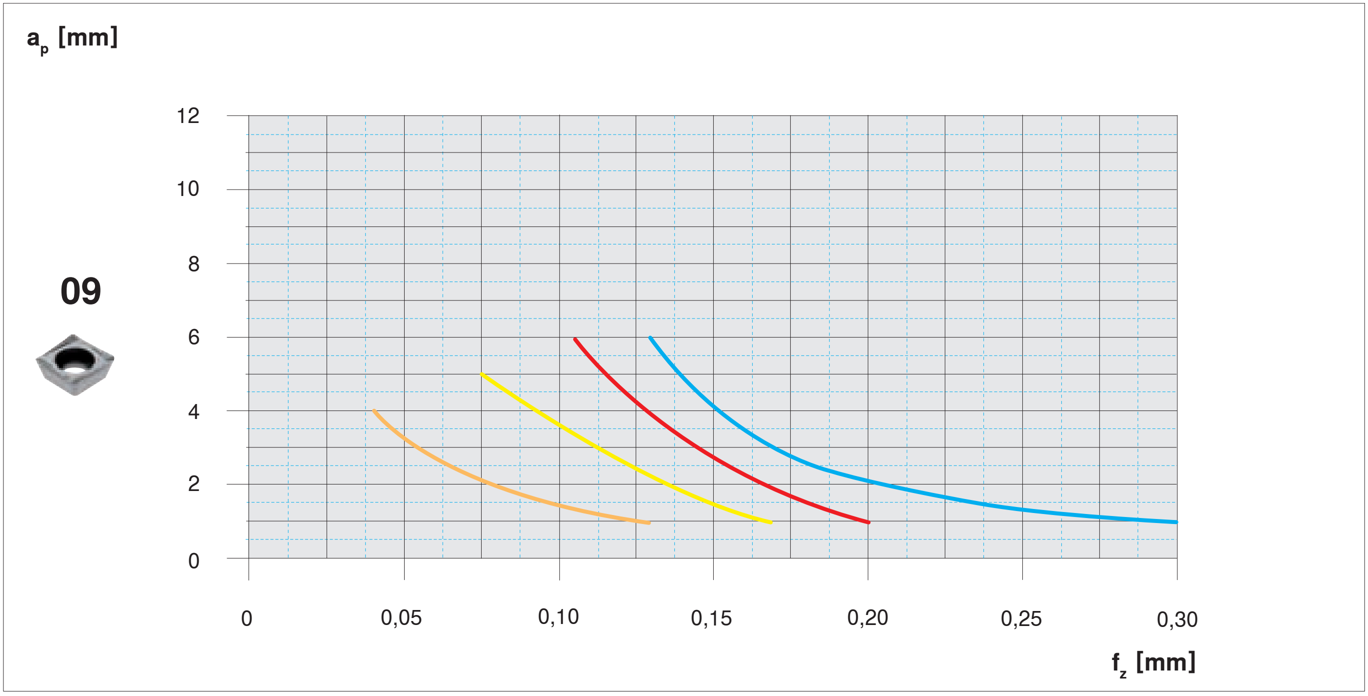
MaxiMill 490 system

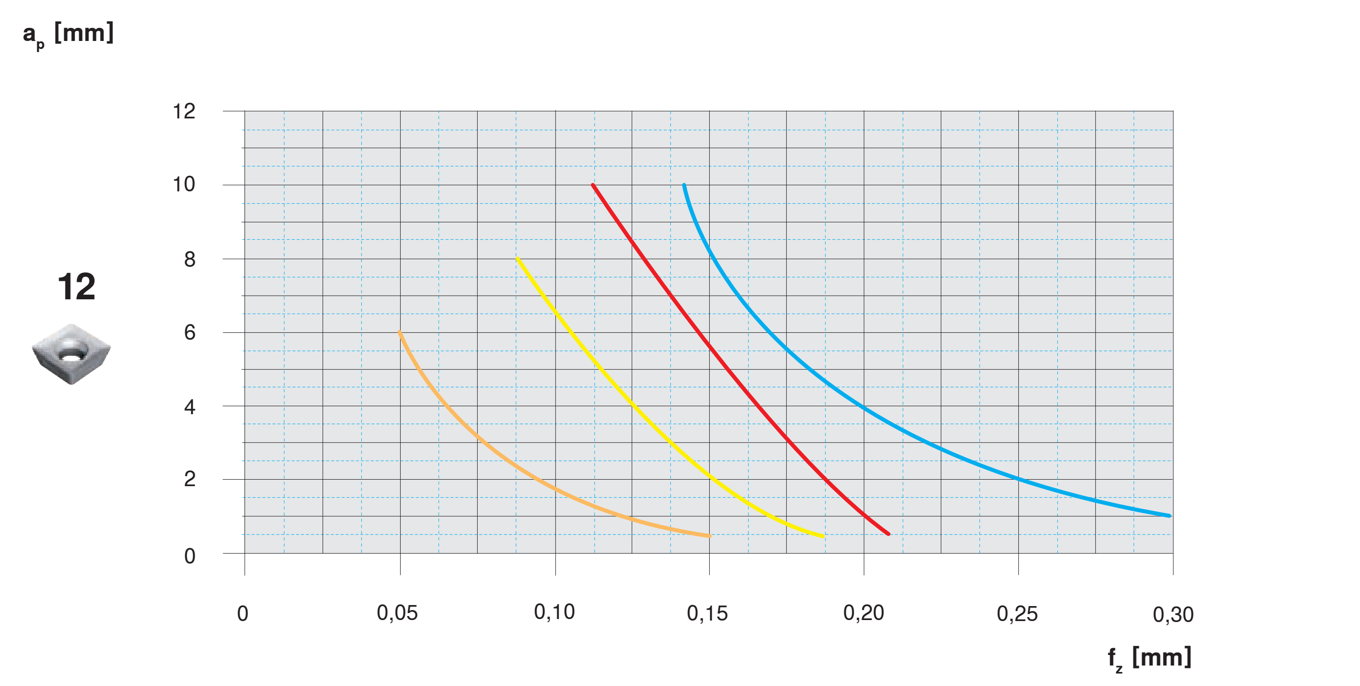
Starting parameters for example materials

Materials				Insert		v_c [m/min]	Coolant
🟦	1.2312	40CrMnMoS8-6	1.000 N/mm²	SDNT 09T308SR-29 SDMT 1205ZZSN-29	CTPP235	200	dry
🟨	1.4571	X6CrNiMoTi17-12-2	600 N/mm²	SDNT 09T308SR-33 SDHT 120512SR-33	CTPM240	160	dry
🟥	5.1301	EN-GJL-250	HB 180	SDNT 09T308SR-31 SDMT 1205ZZSN-31	CTCK215	250	dry
🟧	2.4856	Inconel 625	1.450 N/mm²	SDNT 09T308ER-M31 SDMT 120508ER-M31	CTC5235	35	emulsion

⚠ If a_e < 50% use correction list

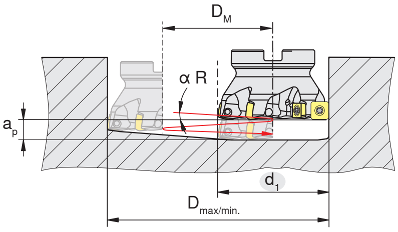
➜ B145





Additional grades and geometries can be used for the application and are illustrated in the respective application range of the system.

Helical plunge milling



D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

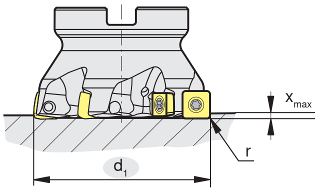
MaxiMill 490-09

d_1 [mm]	D_{max} [mm]	D_{min} [mm]	$\alpha_{R\ max}$ [°]
25	48	37	4,4
32	62	47	2,2
40	78	63	0,75
50	98	83	0,5
63	124	109	0,35
80	158	143	0,25
100	198	183	0,2

MaxiMill 490-12

d_1 [mm]	D_{max} [mm]	D_{min} [mm]	$\alpha_{R\ max\ 360°}$ [°]
32	62	41	2,0
40	78	57	2,0
50	98	77	1,2
63	124	103	0,7
80	158	137	0,6
100	198	177	0,4
125	248	227	0,3

Axial plunging



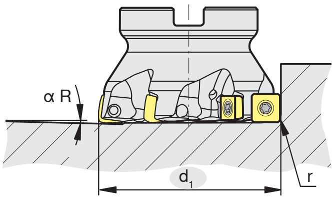
MaxiMill 490-09

d_1 [mm]	X_{max} [mm]
25	0,5
32	0,5
40	0,3
50	0,3
63	0,3
80	0,3
100	0,3

MaxiMill 490-12

d_1 [mm]	X_{max} [mm]
32	0,3
40	0,5
50	0,5
63	0,5
80	0,5
100	0,5
125	0,5

Angled ramping



MaxiMill 490-09

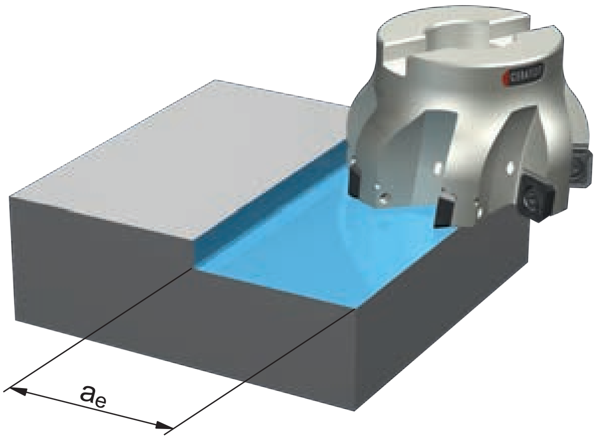
d_1 [mm]	α_R [°]
25	4,4
32	2,2
40	0,75
50	0,5
63	0,35
80	0,25
100	0,2

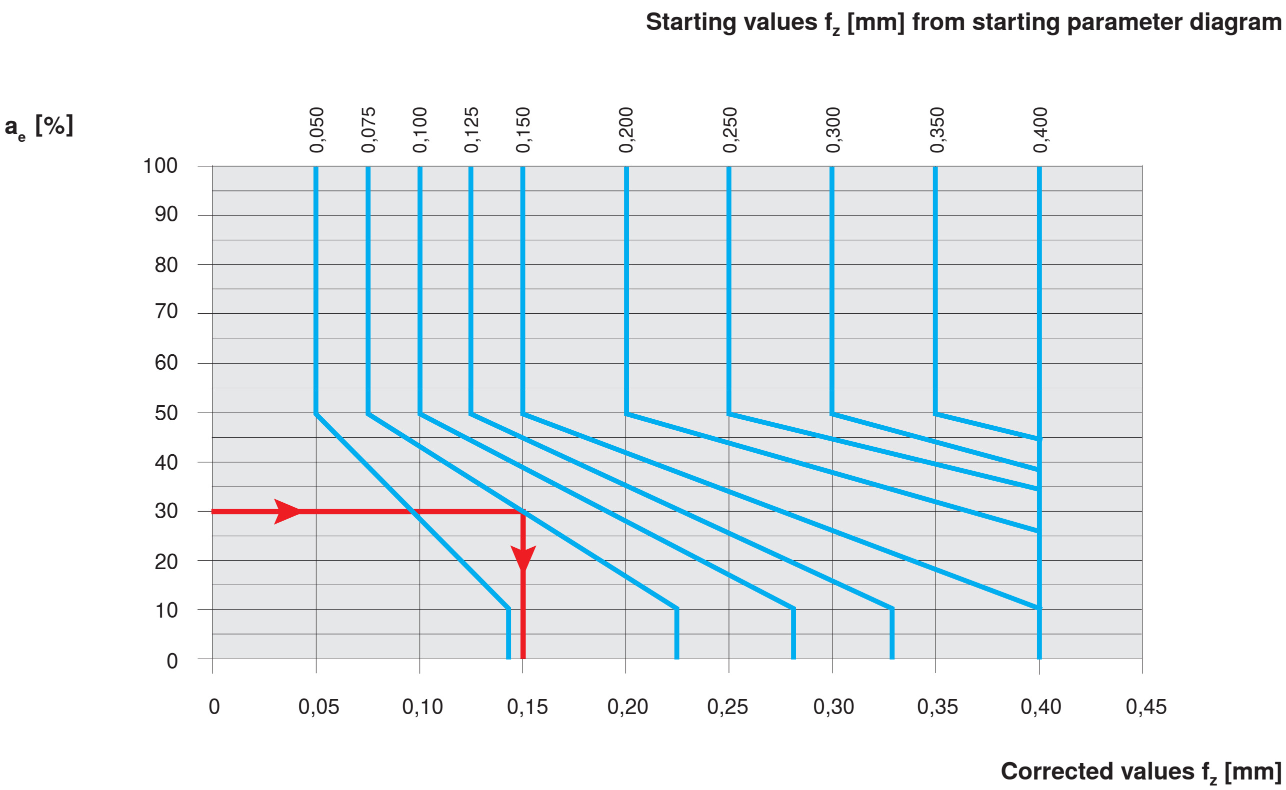
MaxiMill 490-12

d_1 [mm]	α_R [°]
32	2,0
40	2,0
50	1,2
63	0,7
80	0,6
100	0,4
125	0,3

MaxiMill 490 system

Correction of feed rate f_z





These parameters apply for cutting width (a_e) below 50%

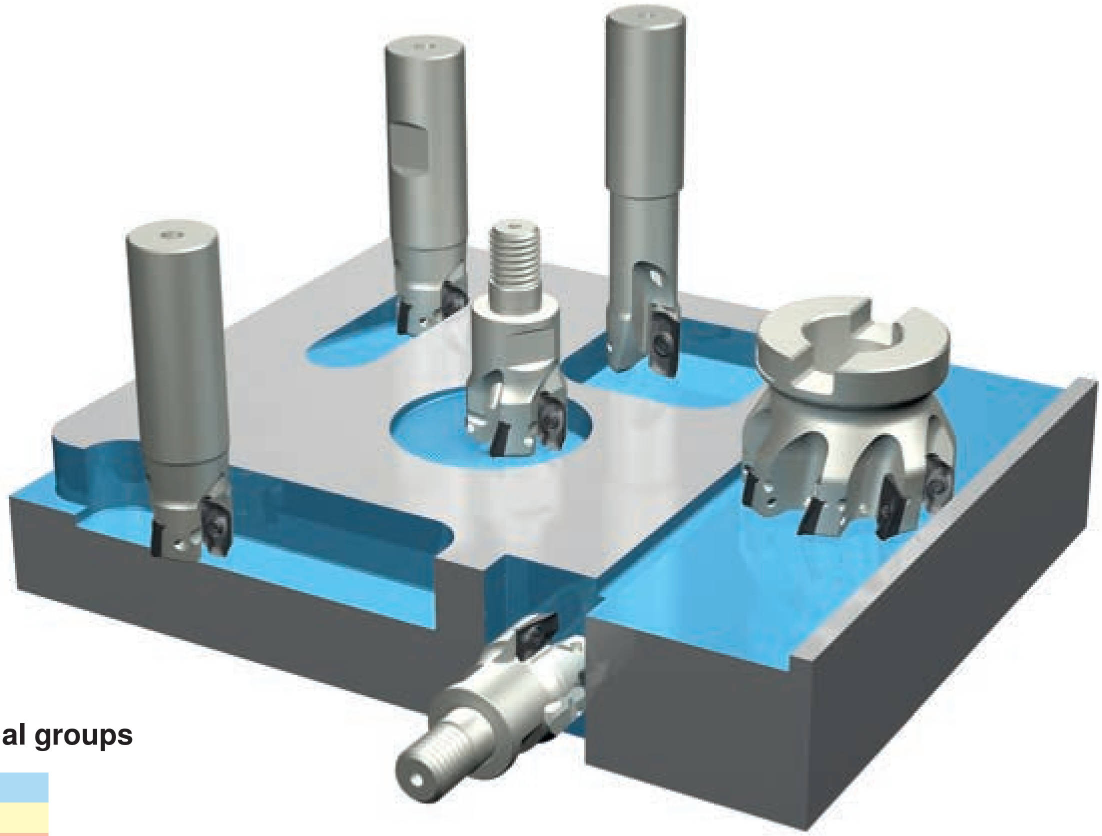
Example:
Starting value [f_z] = 0.075 mm
a_e = 30%
Corrected value [f_z] = 0.15 mm

Notes


XDHX 1904..
R<= 4mm
GHSC.25.R.03-11
4500533697/60
nmax=45000 rpm

High Speed Cutting of light metals

○ Maximum metal removal rates
○ Maximum production and process security



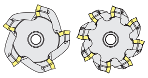
Material groups

P	
M	
K	○
N	●
S	
H	

Possible applications

Face milling	Shoulder milling	Slot milling	Helical plunge milling	Pocket milling	Peripheral milling	Axial plunging

Detailed information

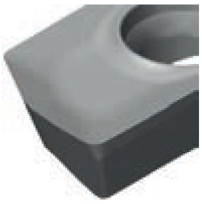
Pitch	Ø range	Inserts
	Ø 16 - 125 mm	XDHT 11.. XDHT 19.. XDHX 19..

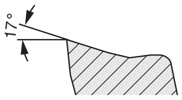
MaxiMill HSC/HPC system

Geometry overview

-27P

- ○ Highly positive geometry
- ○ Sharp cutting edge
- ○ Reduced tendency to adhesion
- ○ First choice for non-ferrous metals





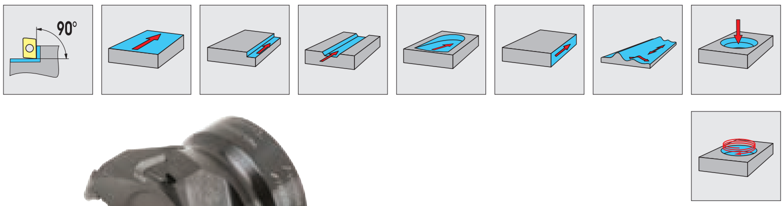
f_z [mm]

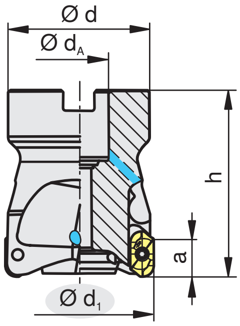
0,05 - 0,35

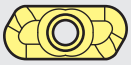
	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥	H216T		
🟩	H216T	H216T	H216T
🟧			
⬜			

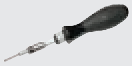
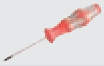
MaxiMill HSC/HPC system

AHSC-11/-19





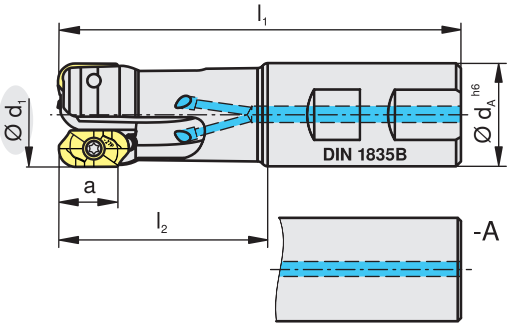
d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
40	AHSC.40.R.04-11	50	38	16	10	4	35500	1.8	XD.. 11..	E01
50	AHSC.50.R.04-11	50	43	22	10	4	31800	1.8	XD.. 11..	E02
63	AHSC.63.R.05-11	50	48	22	10	5	28300	1.8	XD.. 11..	E02
80	AHSC.80.R.05-11	50	58	27	10	5	25100	1.8	XD.. 11..	E03
100	AHSC.100.R.05-11	50	78	32	10	5	22500	1.8	XD.. 11..	E03
40	AHSC.40.R.03-19	50	38	16	18	3	24900	6	XDHT 19..	E04
50	AHSC.50.R.04-19	50	43	22	18	4	21600	6	XDHT 19..	E05
63	AHSC.63.R.04-19	50	48	22	18	4	18800	6	XDHT 19..	E05
63	AHSC.63.R.05-19	50	48	22	18	5	18800	6	XDHT 19..	E05
80	AHSC.80.R.04-19	50	58	27	18	4	16400	6	XDHT 19..	E06
80	AHSC.80.R.05-19	50	58	27	18	5	16400	6	XDHT 19..	E06
100	AHSC.100.R.04-19	50	78	32	18	4	14500	6	XDHT 19..	E06
100	AHSC.100.R.05-19	50	78	32	18	5	14500	6	XDHT 19..	E06
125	AHSC.125.R.05-19	63	88	40	18	5	12800	6	XDHT 19..	E06
125	AHSC.125.R.06-19	63	88	40	18	6	12800	6	XDHT 19..	E06

						
E01	11036880	11114242	11149547		8095003900	4425
E02	11040298	11114242	11149547	4496	8095003900	
E03		11114242	11149547		8095003900	
E04	11036880	11037484	11149572		8095010500	4425
E05	11040298	11042274	11149572	4496	8095010500	
E06		11042274	11149572		8095010500	

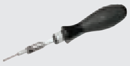
B276

MaxiMill HSC/HPC system

CHSC-11/-19



d1 [mm]	Type, description	l1 [mm]	l2 [mm]	dA [mm]	a [mm]	z	nmax [min-1]	[Nm]		
16	CHSC.16.R.02-11-A-25	75	25	16	10	2	56200	1.8	XD.. 11..	E01
16	CHSC.16.R.02-11-A-32	165	32	16	10	2	18800	1.8	XD.. 11..	E01
16	CHSC.16.R.02-11-B-25	75	25	16	10	2	56200	1.8	XD.. 11..	E01
18	CHSC.18.R.02-11-A-25	77.7	25	20	10	2	53000	1.8	XD.. 11..	E01
18	CHSC.18.R.02-11-A-32	165	32	20	10	2	23900	1.8	XD.. 11..	E01
19	CHSC.19.R.02-11-A-25	77.7	25	20	10	2	51600	1.8	XD.. 11..	E01
19	CHSC.19.R.02-11-A-32	165	32	20	10	2	25400	1.8	XD.. 11..	E01
20	CHSC.20.R.02-11-A-32	84	32	20	10	2	50300	1.8	XD.. 11..	E01
20	CHSC.20.R.02-11-A-40	165	40	20	10	2	26700	1.8	XD.. 11..	E01
20	CHSC.20.R.03-11-B-32	84	32	20	10	3	50300	1.8	XD.. 11..	E01
22	CHSC.22.R.02-11-A-32	91	32	25	10	2	47900	1.8	XD.. 11..	E01
22	CHSC.22.R.02-11-A-40	165	40	25	10	2	30200	1.8	XD.. 11..	E01
25	CHSC.25.R.02-11-A-40	98	40	25	10	2	45000	1.8	XD.. 11..	E01
25	CHSC.25.R.02-11-A-50	165	50	25	10	2	31700	1.8	XD.. 11..	E01
25	CHSC.25.R.03-11-A-40	98	40	25	10	3	45000	1.8	XD.. 11..	E01
25	CHSC.25.R.03-11-A-50	165	50	25	10	3	31700	1.8	XD.. 11..	E01
25	CHSC.25.R.04-11-B-40	98	40	25	10	4	45000	1.8	XD.. 11..	E01
32	CHSC.32.R.03-11-A-50	112	50	32	10	3	39700	1.8	XD.. 11..	E02
32	CHSC.32.R.03-11-A-63	165	63	32	10	3	33400	1.8	XD.. 11..	E02
32	CHSC.32.R.05-11-B-50	112	50	32	10	5	39300	1.8	XD.. 11..	E02
25	CHSC.25.R.02-19	121	65	25	18	2	32400	6	XDHT 19..	E03
25	CHSC.25.R.02-19-A-50	121	50	25	18	2	32400	6	XDHT 19..	E03
25	CHSC.25.R.02-19-A-63	165	63	25	18	2	24700	6	XDHT 19..	E03
32	CHSC.32.R.02-19	125	65	32	18	2	28900	6	XDHT 19..	E04
32	CHSC.32.R.02-19-A-63	125	63	32	18	2	28900	6	XDHT 19..	E04
32	CHSC.32.R.02-19-A-80	165	80	32	18	2	24400	6	XDHT 19..	E04
32	CHSC.32.R.03-19	125	65	32	18	3	28900	6	XDHT 19..	E04
32	CHSC.32.R.03-19-A-63	125	63	32	18	3	28900	6	XDHT 19..	E04
32	CHSC.32.R.03-19-A-80	165	80	32	18	3	24400	6	XDHT 19..	E04

			
E01	11114238	11149547	8095003900
E02	11114242	11149547	8095003900
E03	11042275	11149572	8095010500
E04	11037484	11149572	8095010500

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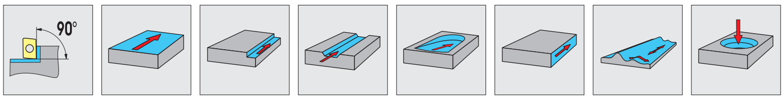
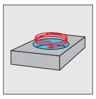
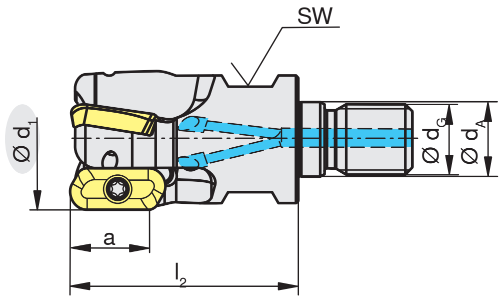
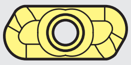
MaxiMill HSC/HPC system

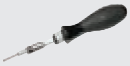
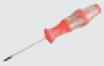
GHSC-11/-19







d₁ [mm]	Type, description	l₂ [mm]	d_G [mm]	d_A [mm]	a [mm]	z	n_max [min⁻¹]	[Nm]		
16	GHSC.16.R.02-11	27	8	8.5	10	2	56200	1.8	XD.. 11..	E01
18	GHSC.18.R.02-11	27	8	8.5	10	2	53000	1.8	XD.. 11..	E01
20	GHSC.20.R.02-11	33	10	10.5	10	2	50300	1.8	XD.. 11..	E01
25	GHSC.25.R.03-11	35	12	12.5	10	3	45000	1.8	XD.. 11..	E01
32	GHSC.32.R.03-11	35	16	17	10	3	39800	1.8	XD.. 11..	E02
40	GHSC.40.R.03-11	35	16	17	10	3	35500	1.8	XD.. 11..	E02
25	GHSC.25.R.02-19	45	12	12.5	18	2	34400	6	XDHT 19..	E03
32	GHSC.32.R.03-19	52	16	17	18	3	29100	6	XDHT 19..	E04
40	GHSC.40.R.03-19	52	16	17	18	3	24900	6	XDHT 19..	E04

			
E01	11114238	11149547	8095003900
E02	11114242	11149547	8095003900
E03	11042275	11149572	8095010500
E04	11037484	11149572	8095010500

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MaxiMill HSC/HPC system

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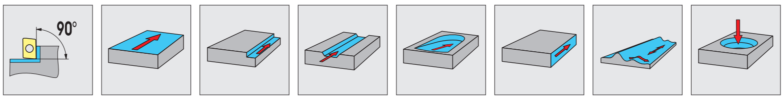
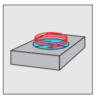
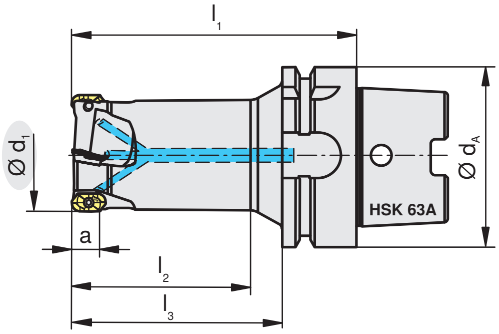
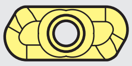






d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	l_3 [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	 [Nm]		
25	MHSC.25.R.03-11-H63A-50	90	50	64	63	10	3	45000	1.8	XD.. 11..	E01
25	MHSC.25.R.03-11-H63A-63	100	63	74	63	10	3	42000	1.8	XD.. 11..	E01
32	MHSC.32.R.03-11-H63A-63	100	63	74	63	10	3	39700	1.8	XD.. 11..	E02
32	MHSC.32.R.03-11-H63A-80	120	80	94	63	10	3	37200	1.8	XD.. 11..	E02
40	MHSC.40.R.04-11-H63A-63	100	63	74	63	10	4	35500	1.8	XD.. 11..	E02
40	MHSC.40.R.04-11-H63A-80	120	80	94	63	10	4	35500	1.8	XD.. 11..	E02
50	MHSC.50.R.04-11-H63A-100	140	100	114	63	10	4	31800	1.8	XD.. 11..	E02
50	MHSC.50.R.04-11-H63A-63	100	63	74	63	10	4	31800	1.8	XD.. 11..	E02
25	MHSC.25.R.02-19-H63A-50	90	50	64	63	18	2	35000	6	XDHT 19..	E03
25	MHSC.25.R.02-19-H63A-63	100	63	74	63	18	2	32700	6	XDHT 19..	E03
32	MHSC.32.R.02-19-H63A-63	100	63	74	63	18	2	29100	6	XDHT 19..	E04
32	MHSC.32.R.02-19-H63A-80	120	80	94	63	18	2	27200	6	XDHT 19..	E04
32	MHSC.32.R.03-19-H63A-63	100	63	74	63	18	3	29100	6	XDHT 19..	E04
32	MHSC.32.R.03-19-H63A-80	120	80	94	63	18	3	27200	6	XDHT 19..	E04
40	MHSC.40.R.03-19-H63A-63	100	63	74	63	18	3	24900	6	XDHT 19..	E04
40	MHSC.40.R.03-19-H63A-80	120	80	94	63	18	3	24900	6	XDHT 19..	E04
50	MHSC.50.R.03-19-H63A-100	140	100	114	63	18	3	21600	6	XDHT 19..	E05

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The tools are pre-balanced to G6.3.

			
E01	11114238	11149547	8095003900
E02	11114242	11149547	8095003900
E03	11042275	11149572	8095010500
E04	11037484	11149572	8095010500
E05	11042274	11149572	8095010500

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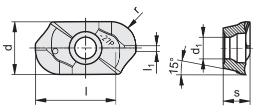
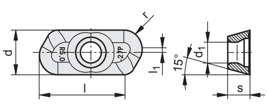
MaxiMill HSC/HPC system

XD..11/19..

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215					d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
		P	●	●	●	●	●	●	○	○	○						○			○												
		M		●			○	○	●	●	●									●												
		K		○	●	●	●					●	●	●	●		○	●	●	○		●										
		N														●	●	●	●													
		S																		●	●											
		H											○									●										
-27P		XDHT 11T302FR-27P																●									6.80	10.60	3.50	2.0	0.20	2.80
		XDHT 11T304FR-27P																●									6.80	10.60	3.50	1.8	0.40	2.80
		XDHT 11T308FR-27P																●									6.80	10.60	3.50	1.4	0.80	2.80
		XDHT 11T312FR-27P																●									6.80	10.60	3.50	1.4	1.20	2.80
		XDHT 11T316FR-27P																●									6.80	10.60	3.50	1.4	1.60	2.80
		XDHT 11T320FR-27P																●									6.80	10.60	3.50	1.4	2.00	2.80
		XDHT 11T325FR-27P																●									6.80	10.60	3.50	1.4	2.50	2.80
		XDHT 11T332FR-27P																●									6.80	10.60	3.50	0.8	3.20	2.80
		XDHT 11T340FR-27P																●									6.80	10.60	3.50		4.00	2.80
		XDHT 11T350FR-27P																●									6.80	10.60	3.50		5.00	2.80
		XDHT 190402FR-27P																●									9.52	19.00	4.76	2.0	0.20	4.65
		XDHT 190404FR-27P																●									9.52	19.00	4.76	2.0	0.40	4.65
		XDHT 190408FR-27P																●									9.52	19.00	4.76	2.0	0.80	4.65
		XDHT 190412FR-27P																●									9.52	19.00	4.76	2.0	1.20	4.65
		XDHT 190416FR-27P																●									9.52	19.00	4.76	2.0	1.60	4.65
		XDHT 190420FR-27P																●									9.52	19.00	4.76	2.0	2.00	4.65
		XDHT 190425FR-27P																●									9.52	19.00	4.76	1.4	2.50	4.65
		XDHT 190432FR-27P																●									9.52	19.00	4.76	1.0	3.20	4.65
		XDHT 190440FR-27P																●									9.52	19.00	4.76	1.0	4.00	4.65
		XDHT 190450FR-27P																●									9.52	19.00	4.76		5.00	4.65
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215					d	l	s	l_1	r	d_1





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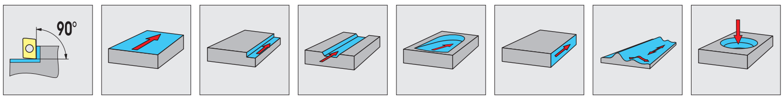
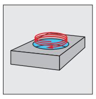
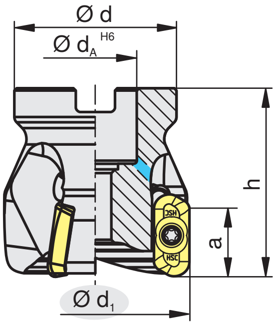
B257-B266

MaxiMill HSC/HPC system

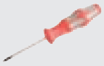
AHPC-19







d$_1$ [mm]	Type, description	h [mm]	d [mm]	d$_A$ [mm]	a [mm]	z	n$_{max}$ [min^{-1}]	[Nm]		
40	AHPC.40.R.03-19	50	38	16	18	3	35700	5	XDHX 19..	E01
50	AHPC.50.R.03-19	50	43	22	18	3	31900	5	XDHX 19..	E02
63	AHPC.63.R.03-19	50	48	22	18	3	28500	5	XDHX 19..	E02
63	AHPC.63.R.04-19	50	48	22	18	4	28500	5	XDHX 19..	E02

						
E01	11036880	11037484	11186812		8095010500	4425
E02	11040298	11042274	11186812	4496	8095010500	

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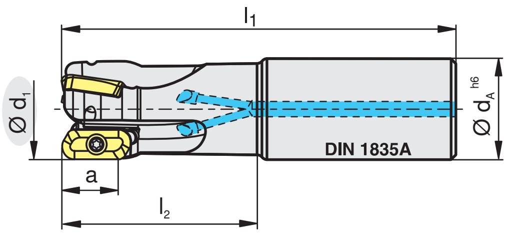
MaxiMill HSC/HPC system

CHPC-19



d1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
22	CHPC.22.R.02-19-A-40	165	40	22	18	2	31900	5	XDHX 19..	E01
25	CHPC.25.R.02-19-A-50	121	65	25	18	2	41800	5	XDHX 19..	E01
25	CHPC.25.R.02-19-A-63	165	63	25	18	2	31900	5	XDHX 19..	E01
32	CHPC.32.R.02-19-A-63	125	63	32	18	2	39800	5	XDHX 19..	E02
32	CHPC.32.R.02-19-A-80	165	80	32	18	2	33500	5	XDHX 19..	E02
32	CHPC.32.R.03-19-A-63	125	63	32	18	3	39800	5	XDHX 19..	E02
32	CHPC.32.R.03-19-A-80	165	80	32	18	3	33500	5	XDHX 19..	E02

E01	11042275	11186812	8095010500
E02	11037484	11186812	8095010500

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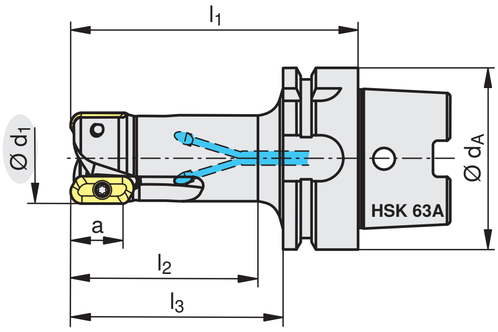
MaxiMill HSC/HPC system

MHPC-19



d₁ [mm]	Type, description	l₁ [mm]	l₂ [mm]	l₃ [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
25	MHPC.25.R.02-19-H63A-100	140	100	114	63	18	2	33900	5	XDHX 19..	E01
25	MHPC.25.R.02-19-H63A-50	90	50	64	63	18	2	45200	5	XDHX 19..	E01
25	MHPC.25.R.02-19-H63A-63	100	63	74	63	18	2	42300	5	XDHX 19..	E01
25	MHPC.25.R.02-19-H63A-80	120	80	94	63	18	2	38400	5	XDHX 19..	E01
32	MHPC.32.R.02-19-H63A-100	140	100	114	63	18	2	34300	5	XDHX 19..	E02
32	MHPC.32.R.02-19-H63A-63	100	63	74	63	18	2	40000	5	XDHX 19..	E02
32	MHPC.32.R.02-19-H63A-80	120	80	94	63	18	2	37500	5	XDHX 19..	E02
32	MHPC.32.R.03-19-H63A-63	100	63	74	63	18	3	40000	5	XDHX 19..	E02
32	MHPC.32.R.03-19-H63A-80	120	80	94	63	18	3	37500	5	XDHX 19..	E02
40	MHPC.40.R.03-19-H63A-100	140	100	114	63	18	3	33500	5	XDHX 19..	E02
40	MHPC.40.R.03-19-H63A-63	100	63	74	63	18	3	35700	5	XDHX 19..	E02
40	MHPC.40.R.03-19-H63A-80	120	80	94	63	18	3	35700	5	XDHX 19..	E02
50	MHPC.50.R.03-19-H63A-100	140	100	114	63	18	3	31900	5	XDHX 19..	E03
50	MHPC.50.R.03-19-H63A-63	100	63	74	63	18	3	31900	5	XDHX 19..	E03
50	MHPC.50.R.03-19-H63A-80	120	80	94	63	18	3	31900	5	XDHX 19..	E03

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The tools are pre-balanced to G6.3.

E01	11042275	11186812	8095010500
E02	11037484	11186812	8095010500
E03	11042274	11186812	8095010500

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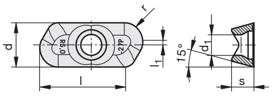
	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-27P		XDHX 190402FR-27P																●					9.52	19.00	4.76	2.0	0.20	4.65
		XDHX 190404FR-27P																●					9.52	19.00	4.76	2.0	0.40	4.65
		XDHX 190408FR-27P																●					9.52	19.00	4.76	2.0	0.80	4.65
		XDHX 190412FR-27P																●					9.52	19.00	4.76	2.0	1.20	4.65
		XDHX 190416FR-27P																●					9.52	19.00	4.76	2.0	1.60	4.65
		XDHX 190420FR-27P																●					9.52	19.00	4.76	2.0	2.00	4.65
		XDHX 190425FR-27P																●					9.52	19.00	4.76	1.4	2.50	4.65
		XDHX 190432FR-27P																●					9.52	19.00	4.76	1.0	3.20	4.65
		XDHX 190440FR-27P																●					9.52	19.00	4.76	1.0	4.00	4.65
		XDHX 190450FR-27P																●					9.52	19.00	4.76		5.00	4.65
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	l_1	r	d_1

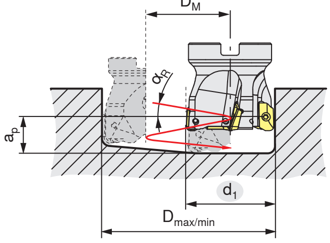


B12-B18 | B149 | B21 | B257-B266

MaxiMill HSC/HPC system

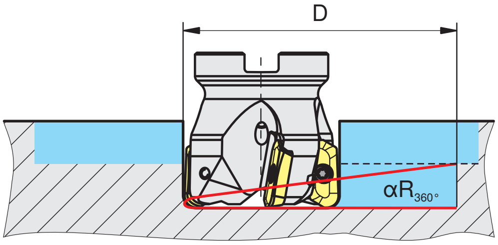
Application data HSC..11..

Helical plunge milling



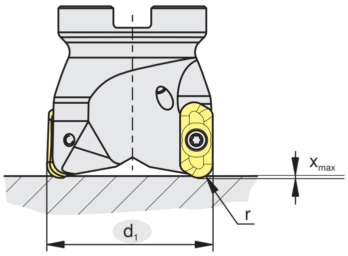
D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

d_1 [mm]	D_{max} [mm]	D_{min} [mm]	α_{Rmax} [°]
16	30	20	10,0
18	34	24	9,1
19	36	26	8,6
20	38	28	8,2
22	42	32	7,4
25	48	38	6,5
32	62	53	4,7
40	78	69	3,3
50	98	89	2,4
63	124	115	1,7
80	158	150	1,1
100	198	189	0,9
a_p [mm] = $D_M \times \pi \times \tan \alpha_R$			



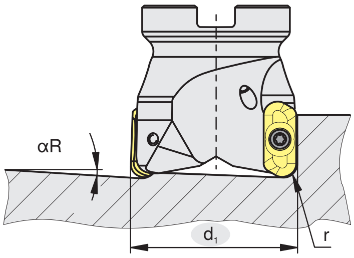
d_1 [mm]	D [mm]	$\alpha_{R\,max}$ 360° [°]
16	20	10,0
18	24	9,1
19	26	8,6
20	28	8,2
22	32	7,4
25	38	6,5
32	53	4,7
40	69	3,3
50	89	2,4
63	115	1,7
80	150	1,1
100	189	0,9

Axial plunging



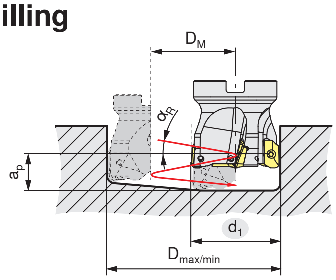
d_1 [mm]	r 0,2 - 4,0 X_{max} [mm]
16	1,7
18	2,11
19	2,24
20	2,39
22	2,70
25	2,55
32	2,40
40	2,28
50	2,26
63	2,10
80	1,75
100	1,79

Angled ramping



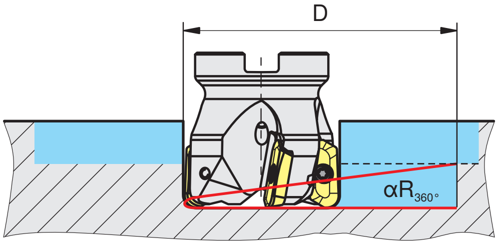
d_1 [mm]	r 0,2 - 4,0 α_R [°]
16	18,8°
18	16,3°
19	15,3°
20	14,8°
22	13,8°
25	10,3°
32	6,8°
40	4,8°
50	3,5°
63	2,5°
80	1,8°
100	1,3°

Helical plunge milling



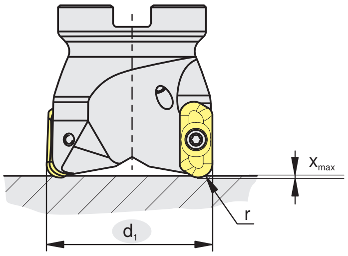
D_{max} [mm] = maximum diameter for flat bottom ground
D_{min} [mm] = minimum hole diameter
$D_M = D_{max} - d_1$ or $D_{min} - d_1$

d_1 [mm]	D_{max} [mm]	D_{min} [mm]	$\alpha_{R\ max}$ 360° [°]
22	33	32	1,4
25	39	32	6,8
32	53	46	3,9
40	69	62	3,3
50	89	81	2,2
63	115	107	1,8
a_p [mm] = $D_M \times \pi \times \tan \alpha_R$			



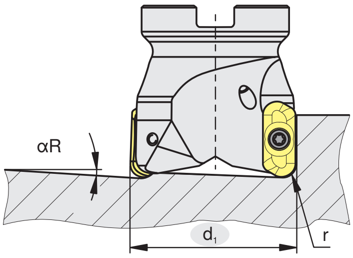
d_1 [mm]	D [mm]	$\alpha_{R\ max}$ 360° [°]
22	32	1,4
25	32	6,8
32	46	3,9
40	62	3,3
50	81	2,2
63	107	1,8

Axial plunging



d_1 [mm]	r 0,2 - 4,0 X_{max} [mm]	r 5,0 X_{max} [mm]
22	0,70	0,28
25	2,230,70	1,45
32	2,120,70	1,39
40	2,380,70	1,53
50	2,540,70	1,57
63	2,610,70	1,86

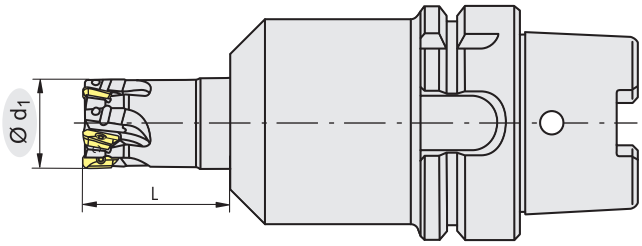
Angled ramping



d_1 [mm]	r 0,2 - 4,0 α_R [°]	r 5,0 α_R [°]
22	3,5	1,8
25	11,0	7,5
32	6,8	4,5
40	5,3	3,5
50	4,0	2,8
63	3,0	2,3

MaxiMill 211 system

Maximum RPM



Maximum RPM in relation to overhang length L.

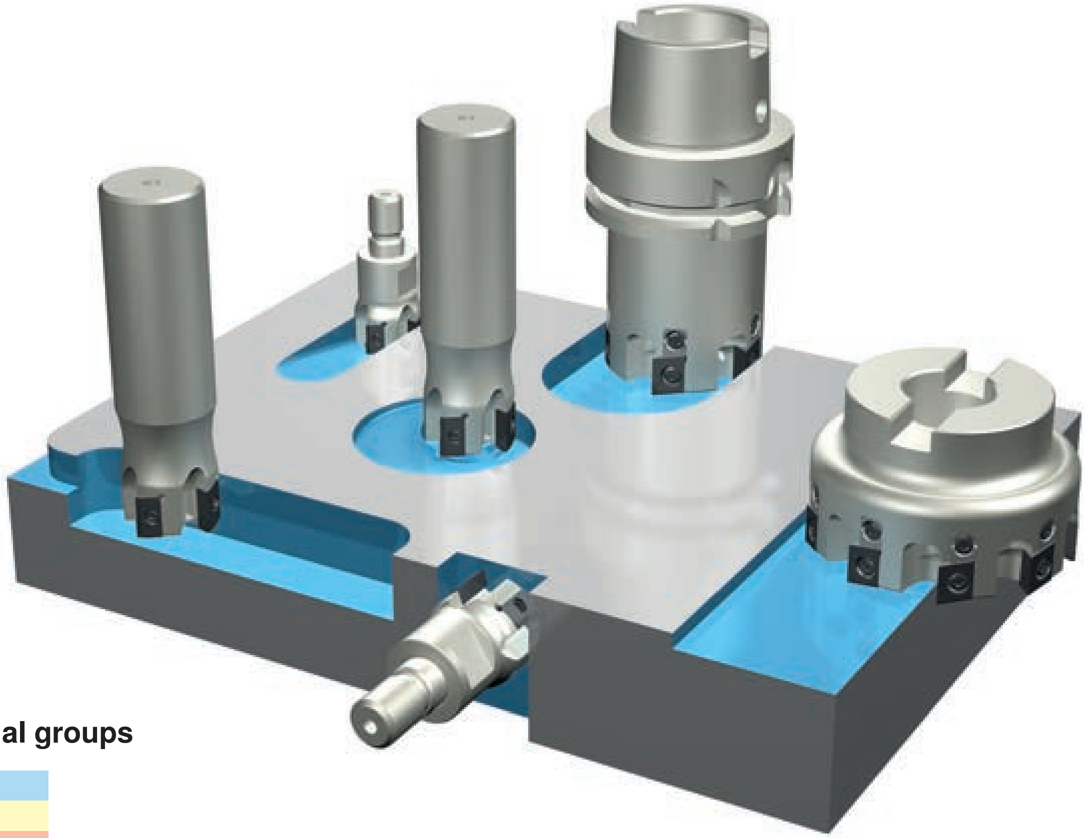
The revolution number must be adapted according to the machining situation and the selected tool shank.

	HSC-11			**HSC-19**			**HPC-19**		
	n_{max} [min^{-1}]			**n_{max} [min^{-1}]**			**n_{max} [min^{-1}]**		
Ø d_1 [mm]	**L = 2xØ**	**L = 3xØ**	**L = 5xØ**	**L = 2xØ**	**L = 3xØ**	**L = 5xØ**	**L = 2xØ**	**L = 3xØ**	**L = 5xØ**
16	56.000	49.000	35.000	–	–	–		–	–
18	53.000	47.000	33.000	–	–	–	–	–	–
19	52.000	45.000	32.000	–	–	–	–	–	–
20	50.000	44.000	31.000	–	–	–	–	–	–
22	48.000	42.000	30.000	–	–	–	45.000	42.000	32.000
25	45.000	39.000	28.000	35.000	31.000	22.000	45.000	40.000	28.000
32	40.000	35.000	25.000	29.000	25.000	18.000	40.000	35.000	25.000
40	36.000	31.000	22.000	25.000	22.000	16.000	36.000	31.000	22.000
50	32.000	28.000	20.000	22.000	19.000	14.000	32.000	28.000	20.000
63	28.000	25.000	18.000	19.000	17.000	–	29.000	25.000	–
80	25.000	22.000	–	16.000	14.000	–	25.000	22.000	–
100	22.000	20.000	–	15.000	–	–	23.000	–	–
125	–	–	–	13.000	–	–	20.000	–	–

Notes

High Performance Cutting - milling with PCD and CBN

○ Process security, long tool life combined with reduced cycle times
○ Low cutting forces



Material groups

P	
M	
K	
N	●
S	
H	○

Possible applications

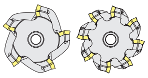
Face milling

Shoulder milling

Slot milling

Peripheral milling

Detailed information

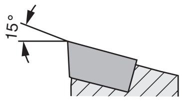
Pitch	Ø range	Inserts
	Ø 20 - 315 mm	ZNHW..04.. ZNHW..12..

MaxiMill HPC system

Geometry overview

ER (HPC04)

- o Universal application
- o Minimal formation of burrs
- o For thin-walled components
- o For long overhangs



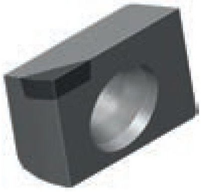
f_z [mm]

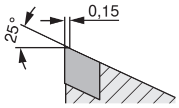
0,05 - 0,20

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥	CTL3215	CTL3215	
🟩	CTD4205	CTD4205	
🟧			
⬜			

SR

- o Highly positive geometry
- o Universal applicaiton
- o Low cutting forces
- o Minimal formation of burrs
- o High surface quality





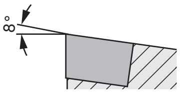
f_z [mm]

0,10 - 0,30

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩	CTD4205	CTD4205	
🟧			
⬜			

ER (HPC12)

- o Positive geometry
- o Medium and rough machining
- o Reduced formation of burrs
- o Finishing of cast iron and hardened steel



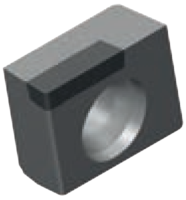
f_z [mm]

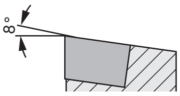
0,10 - 0,35

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥	CTL3215	CTL3215	
🟩	CTD4205	CTD4205	
🟧			
⬜	CTL3215		

FR

- o Positive geometry
- o For medium and rough machining
- o Reduced formation of burrs





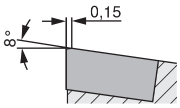
f_z [mm]

0,10 - 0,35

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩	CTD4205	CTD4205	
🟧			
⬜			

SR (1506)

- ○ Stable cutting edges
- ○ Roughing
- ○ For heavily interrupted cut
- ○ Stable machine and component clamping



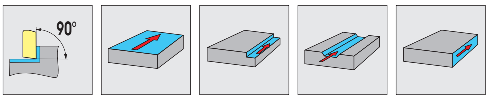
	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩		**CTD4205**	**CTD4205**
🟧			
⬜			

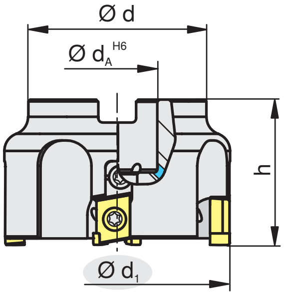
f_z [mm]

0,15 - 0,40

MaxiMill HPC system

AHPC-12





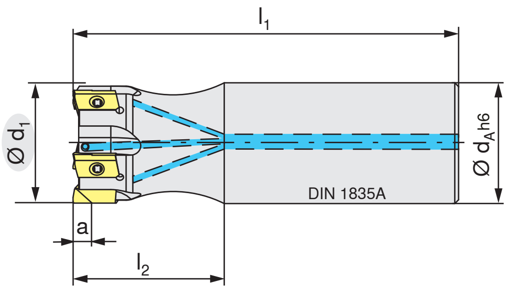
d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	z	n_{max} [min^{-1}]	[Nm]		
40	AHPC.40.R.04-12	40	34	16	4	32000	5	ZNHW 1205..	E01
50	AHPC.50.R.04-12	40	49	22	4	32000	5	ZNHW 1205..	E01
50	AHPC.50.R.05-12	40	49	22	5	32000	5	ZNHW 1205..	E01
63	AHPC.63.R.04-12	40	49	22	4	29000	5	ZNHW 1205..	E01
63	AHPC.63.R.07-12	40	49	22	7	29000	5	ZNHW 1205..	E01
80	AHPC.80.R.05-12	50	60	27	5	26000	5	ZNHW 1205..	E01
80	AHPC.80.R.09-12	50	60	27	9	26000	5	ZNHW 1205..	E01
100	AHPC.100.R.06-12	50	70	32	6	24000	5	ZNHW 1205..	E01
100	AHPC.100.R.12-12	50	70	32	12	24000	5	ZNHW 1205..	E01
125	AHPC.125.R.08-12	63	72	40	8	22000	5	ZNHW 1205..	E02
125	AHPC.125.R.14-12	63	72	40	14	22000	5	ZNHW 1205..	E02
160	AHPC.160.R.10-12	63	72	40	10	18000	5	ZNHW 1205..	E02
160	AHPC.160.R.16-12	63	118	40	16	18000	5	ZNHW 1205..	E01
200	AHPC.200.R.12-12	63	153	60	12	16000	5	ZNHW 1205..	E01
250	AHPC.250.R.14-12	63	200	60	14	14000	5	ZNHW 1205..	E01
315	AHPC.315.R.18-12	80	265	60	18	12000	5	ZNHW 1205..	E01

					
E01		11042274	11167992	11186812	8095018900
E02	11210129	11042274	11167992	11186812	8095018900

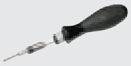
B276

MaxiMill HPC system

CHPC-04



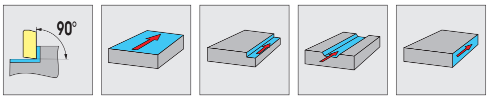
d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
20	CHPC.20.R.03-04-A-25	77	25	20	4	3	52000	1.6	ZNHW 04T3..	E01
25	CHPC.25.R.04-04-A-32	90	32	25	4	4	45000	1.6	ZNHW 04T3..	E01
32	CHPC.32.R.05-04-A-40	102	40	32	4	5	39000	1.6	ZNHW 04T3..	E01
40	CHPC.40.R.06-04-A32-50	122	50	32	4	6	34000	1.6	ZNHW 04T3..	E01

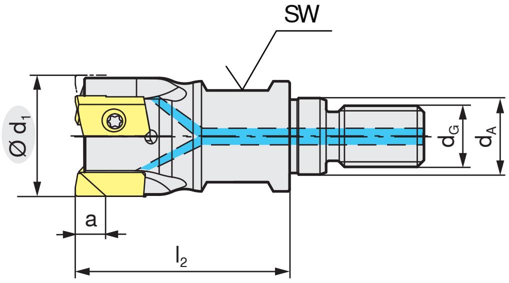
		
E01	11114242	11254598

B276

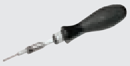
MaxiMill HPC system

GHPC-04





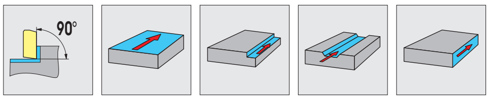
d_1 [mm]	Type, description	l_2 [mm]	d_G [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
20	GHPC.20.R.03-04	35	10	10.5	4	3	52000	1.6	ZNHW 04T3..	E01
25	GHPC.25.R.04-04	35	12	12.5	4	4	45000	1.6	ZNHW 04T3..	E01
32	GHPC.32.R.05-04	35	16	17	4	5	38000	1.6	ZNHW 04T3..	E01
40	GHPC.40.R.06-04	35	16	17	4	6	34000	1.6	ZNHW 04T3..	E01

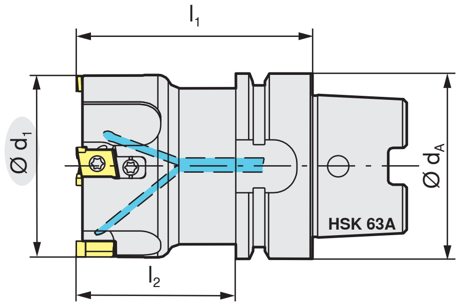
		
E01	11114242	11254598

B276

MaxiMill HPC system

MHPC-12





d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	d_A [mm]	n_{max} [min^{-1}]	z	[Nm]		
40	MHPC.40.R.04-12-H63A-70	70	44	63	32000	4	5	ZNHW 1205..	E01
50	MHPC.50.R.04-12-H63A-80	80	54	63	32000	4	5	ZNHW 1205..	E01
50	MHPC.50.R.05-12-H63A-80	80	54	63	32000	5	5	ZNHW 1205..	E01
63	MHPC.63.R.04-12-H63A-80	80	54	63	29000	4	5	ZNHW 1205..	E01
63	MHPC.63.R.07-12-H63A-80	80	54	63	29000	7	5	ZNHW 1205..	E01
80	MHPC.80.R.05-12-H63A-90	90		63	26000	5	5	ZNHW 1205..	E01
80	MHPC.80.R.09-12-H63A-90	90		63	26000	9	5	ZNHW 1205..	E01
100	MHPC.100.R.06-12-H63A-90	90		63	24000	6	5	ZNHW 1205..	E01
100	MHPC.100.R.12-12-H63A-90	90		63	24000	12	5	ZNHW 1205..	E01
125	MHPC.125.R.08-12-H63A-123	123		63	22000	8	5	ZNHW 1205..	E02
160	MHPC.160.R.10-12-H63A-123	123		63	18000	10	5	ZNHW 1205..	E02

The tools are pre-balanced to G6.3.

					
E01		11042274	11167992	11186812	8095018900
E02	11210129	11042274	11167992	11186812	8095018900

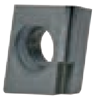
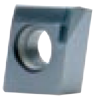
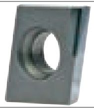
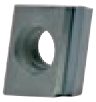
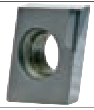
B276

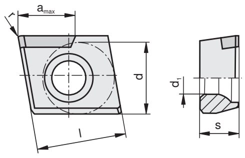
Milling / Shoulder milling

MaxiMill HPC system

ZN..

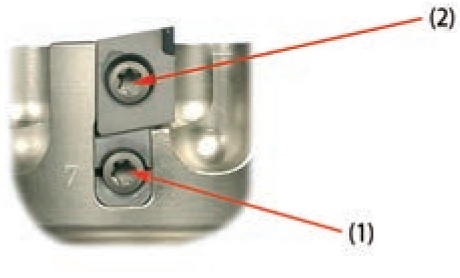
	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]	a_{max} [mm]
1204		ZNHW 04T3POER-1204														●							7.00	11.00	3.97		2.80	4.0
		ZNHW 04T305ER-1204											●										7.00	11.00	3.97	0.50	2.80	4.0
0003		ZNHW 120508SR-0003														●							10.00	12.40	5.40	0.80	4.85	3.0
0007		ZNHW 120504FR-0007														●							10.00	12.40	5.40	0.40	4.85	7.0
1002		ZNHW 1205EOER-1002											●										10.00	12.40	5.40		4.85	2.0
1503		ZNHW 1205POSR-1503														●							10.00	12.40	5.40		4.85	3.0
		ZNHW 120504ER-1503														●							10.00	12.40	5.40	0.40	4.85	3.0
		ZNHW 120508ER-1503														●							10.00	12.40	5.40	0.80	4.85	3.0
1506		ZNHW 1205POSR-1506														●							10.00	12.40	5.40		4.85	6.0
		ZNHW 1205POSR-1506-R														●							10.00	12.40	5.40		4.85	6.0
1511		ZNHW 1205POER-1511														●							10.00	12.40	5.40		4.85	11.0
3003		ZNHW 1205POSR-3003														●							10.00	12.40	5.40		4.85	3.0
5003		ZNHW 1205ZZSR-5003-Q														●							10.00	12.40	5.40		4.85	3.0



B12-B18 B165-B166 B21 B257-B266

Precision setting procedure



1.Mount the setting wedges in the cutter (as supplied) and tighten the setting screw (1), to lightly hold the wedge without deforming it.

2.Mount inserts and tighten clamping screws (2) with 1.0 Nm.

3.Mark 'highest cutting edge' using a presetting device.

4.Change position of PCD insert by 0.02 mm turning the setting screw (1) clockwise.
For this purpose use the TORX key (8095018900 / WS-L-T15-136mm).

5.Set the other cutting edges to this level, maximum deviation of 0.005 mm.

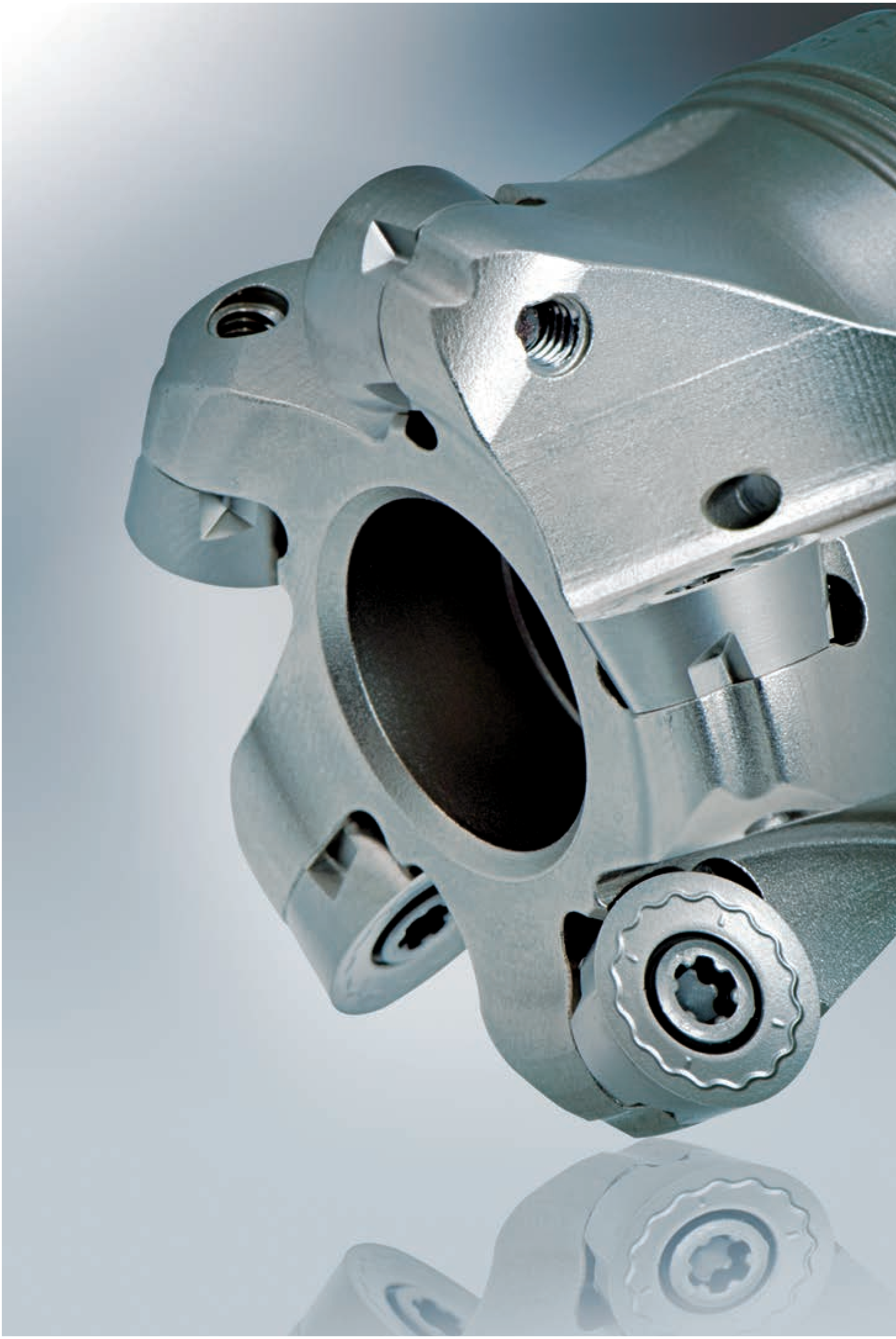
Maximum adjustment = 0,10 mm.

6.Tighten all clamping screws (2) with 5.0 Nm.

7.Check axial run-out of all inserts
→ target < 0.005 mm.

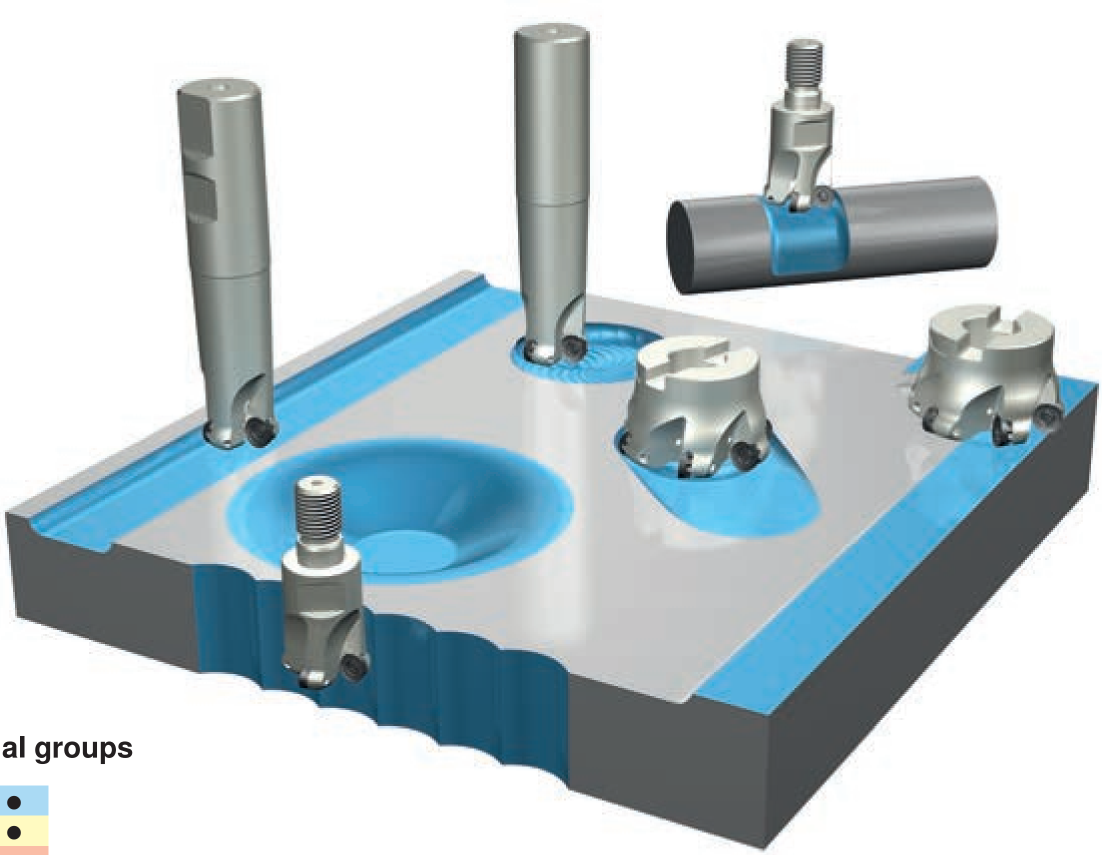
⚠

When changing the insert, first remove the setting screw (1), turning it counter-clockwise. After the mounting procedure is completed, the setting procedure starts again at point 1.



Button insert cutter for form milling and profiling

- ○ Excellent suitability for rough machining and difficult to machine materials
- ○ Very high feed rates combined with maximum stability



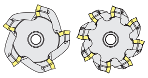
Material groups

P	●
M	●
K	●
N	●
S	●
H	○

Possible applications

Face milling	Slot milling	Helical plunge milling	Pocket milling	Profile milling	Plunge milling	Turn milling

Detailed information

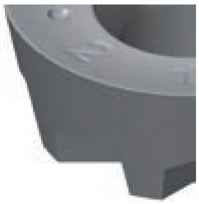
Pitch	Ø range	Inserts
	Ø 10 - 125 mm	RP..10T3.. RP..1204.. RP..1605.. RP..2006..

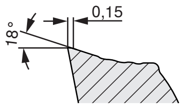
MaxiMill 251 system

Geometry overview

-F50

- ○ Positive geometry
- ○ Low cutting forces
- ○ For unstable clamping situations
- ○ First choice for austenitic stainless steel materials





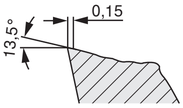
f_z [mm]

0,08 - 0,35

	Machining conditions		
	👍	👉	👎
🟦	CTCP230 **CTPP235**	CTCP230 **CTPP235**	
🟨	CTPM225 **CTPM240**	CTPM225 **CTPM240**	CTPM225 **CTPM240**
🟥			
🟩			
🟧			
⬜			

-M50

- ○ Universal geometry
- ○ Light to medium roughing operations
- ○ First choice for general steel materials



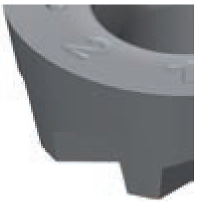
f_z [mm]

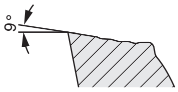
0,10 - 0,40

	Machining conditions		
	👍	👉	👎
🟦	CTCP230 **CTPP235**	CTCP230 **CTPP235**	CTCP230 **CTPP235**
🟨	CTPM240	CTPM240	CTPM240
🟥			
🟩			
🟧	**CTC5235**	**CTC5235**	**CTC5235**
⬜			

-M30

- ○ Medium roughing
- ○ Low cutting forces combined with stability
- ○ First choice for martensitic stainless steel materials





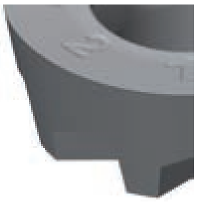
f_z [mm]

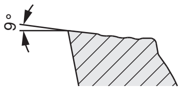
0,08 - 0,35

	Machining conditions		
	👍	👉	👎
🟦		CTCP230 **CTPP235**	CTCP230 **CTPP235**
🟨	**CTCM235** CTPM225	**CTCM235** CTPM225	**CTCM235** CTPM225
🟥			
🟩			
🟧			
⬜			

-R30

- ○ Stable geometry
- ○ Roughing operations
- ○ Heavily interrupted cut
- ○ First choice for high alloyed steels and cast iron materials





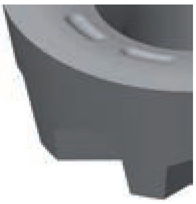
f_z [mm]

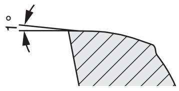
0,10 - 0,40

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥		**CTCK215**	**CTCK215**
🟩			
🟧			**CTC5235**
⬜			

-R60

- Geometry with excellent stability
- For stable clamping situations
- First choice for the machining of hard materials





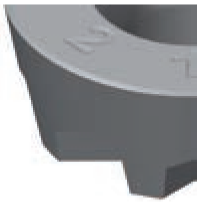
f_z [mm]

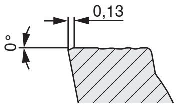
0,05 - 0,35

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩			
🟧			
	CTP6215	**CTP6215**	**CTP6215**

SN

- Robust insert
- For bad machining conditions
- First choice for iron and steel castings





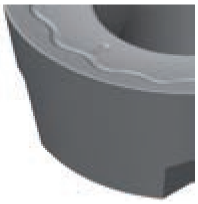
f_z [mm]

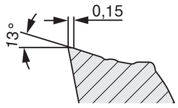
0,10 - 0,40

	Machining conditions		
	👍	👉	👎
🟦		CTCP230 CTPP235	CTCP230 **CTPP235**
🟨			
🟥		**CTCK215** CTPK220	CTCK215 **CTPK220**
🟩			
🟧			

-M31

- Positive geometry
- Universal application
- Reduced vibration
- For heat-resistant materials, titanium and super alloys





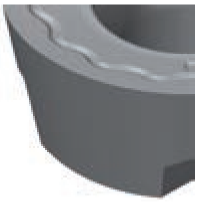
f_z [mm]

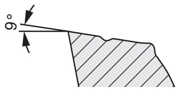
0,08 - 0,35

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩			
🟧	CTC5235 **CTC5240**	CTC5235 **CTC5240**	**CTC5235** CTC5240

-M32

- Medium roughing
- Low cutting forces and good stability
- First choice for martensitic stainless steel materials





f_z [mm]

0,08 - 0,35

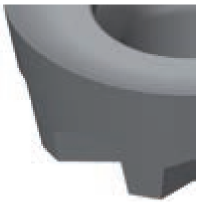
	Machining conditions		
	👍	👉	👎
🟦			
🟨	CTC5235	**CTC5235**	**CTC5235**
🟥			
🟩			
🟧			

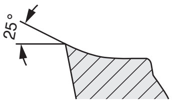
MaxiMill 251 system

Geometry overview

-27P

- ○ Highly positive geometry
- ○ Sharp cutting edges
- ○ Reduced tendency to adhesion
- ○ First choice for non-ferrous metals





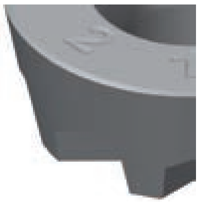
f$_z$ [mm]

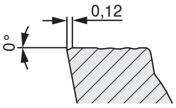
0,05 - 0,40

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥	H216T		
🟩	**H216T**	**H216T**	**H216T**
🟧			
⬜			

SN (Cermet)

- ○ Stable geometry
- ○ For cermet as cutting material
- ○ Light to medium finishing
- ○ For steel materials





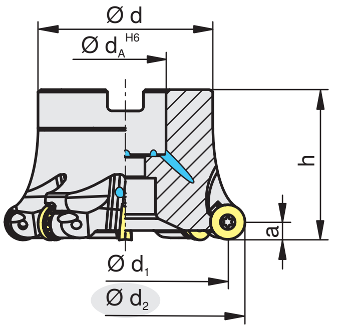
f$_z$ [mm]

0,08 - 0,35

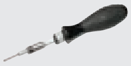
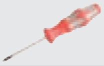
	Machining conditions		
	👍	👉	👎
🟦	**TCM10**	**TCM10**	
🟨	TCM10		
🟥	TCM10		
🟩			
🟧			
⬜			

MaxiMill 251 system

A251-10/-12



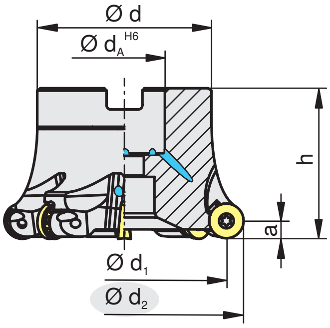
d_2 [mm]	Type, description	d_1 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
40	A251.40.R.03-10-RS	30	40	38	16	5	3	15900	2.0	RP.. 10T3..	E01
40	A251.40.R.05-10-RE	30	40	38	16	5	5	15900	2.0	RP.. 10T3..	E01
40	A251.40.R.05-10-RS	30	40	38	16	5	5	15900	2.0	RP.. 10T3..	E02
42	A251.42.R.06-10-RE	32	40	38	16	5	6	15150	2.0	RP.. 10T3..	E01
42	A251.42.R.06-10-RS	32	40	38	16	5	6	15150	2.0	RP.. 10T3..	E02
50	A251.50.R.04-10-RS	40	40	43	22	5	4	12700	2.0	RP.. 10T3..	E01
50	A251.50.R.06-10-RE	40	40	43	22	5	6	12700	2.0	RP.. 10T3..	E01
50	A251.50.R.06-10-RS	40	40	43	22	5	6	12700	2.0	RP.. 10T3..	E01
52	A251.52.R.06-10-RE	42	40	43	22	5	6	12200	2.0	RP.. 10T3..	E01
52	A251.52.R.06-10-RS	42	40	43	22	5	6	12200	2.0	RP.. 10T3..	E01
40	A251.40.R.04-12-RE	28	40	38	16	6	4	15900	3.2	RP.. 1204..	E03
40	A251.40.R.04-12-RS	28	40	38	16	6	4	15900	3.2	RP.. 1204..	E04
50	A251.50.R.04-12-RS	38	40	43	22	6	4	12700	3.2	RP.. 1204..	E05
50	A251.50.R.05-12-RE	38	40	43	22	6	5	12700	3.2	RP.. 1204..	E03
50	A251.50.R.05-12-RS	38	40	43	22	6	5	12700	3.2	RP.. 1204..	E05
52	A251.52.R.05-12-RE	40	40	43	22	6	5	12200	3.2	RP.. 1204..	E06
52	A251.52.R.05-12-RS	40	40	43	22	6	5	12200	3.2	RP.. 1204..	E05
63	A251.63.R.06-12-RE	51	40	48	22	6	6	10100	3.2	RP.. 1204..	E03
63	A251.63.R.06-12-RS	51	40	48	22	6	6	10100	3.2	RP.. 1204..	E05
66	A251.66.R.07-12-RE	54	40	48	22	6	7	9650	3.2	RP.. 1204..	E03
66	A251.66.R.07-12-RS	54	40	48	22	6	7	9650	3.2	RP.. 1204..	E05
80	A251.80.R.05-12-RS	68	50	58	27	6	5	7950	3.2	RP.. 1204..	E05
80	A251.80.R.07-12-RE	68	45	58	27	6	7	7950	3.2	RP.. 1204..	E03
80	A251.80.R.07-12-RS	68	50	58	27	6	7	7950	3.2	RP.. 1204..	E05
100	A251.100.R.06-12-RS	88	50	78	32	6	6	6350	3.2	RP.. 1204..	E05
100	A251.100.R.10-12-RS	88	50	78	32	6	10	6350	3.2	RP.. 1204..	E05

				
E01		11464141	11464183	8095010400
E02	11036880	11464141	11464183	8095010400
E03		11610311	11450867	8095012000
E04	11036880	165795	11149570	8095010500
E05		165795	11149570	8095010500
E06		11610311	11149570	8095012000

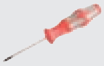
B276

MaxiMill 251 system

A251-16/-20



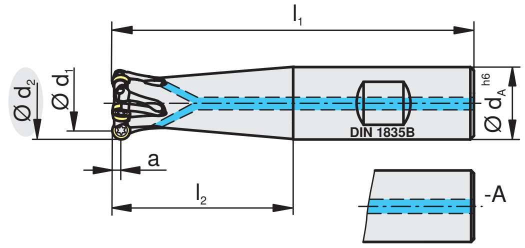
d_2 [mm]	Type, description	d_1 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
50	A251.50.R.04-16-RS	34	40	48	22	8	4	12700	5	RP.. 1605..	E01
52	A251.52.R.04-16-RS	36	40	48	22	8	4	12700	5	RP.. 1605..	E01
63	A251.63.R.05-16-RS	47	40	48	22	8	5	10100	5	RP.. 1605..	E02
80	A251.80.R.06-16-RS	64	50	58	27	8	6	7950	5	RP.. 1605..	E02
100	A251.100.R.07-16-RS	84	50	78	32	8	7	6350	5	RP.. 1605..	E02
80	A251.80.R.05-20-RS	60	50	58	27	10	5	7950	5	RP.. 2006..	E03
100	A251.100.R.06-20-RS	80	50	78	32	10	6	6350	5	RP.. 2006..	E03
125	A251.125.R.06-20-RS	105	63	88	40	10	6	5050	5	RP.. 2006..	E03

				
E01	11040298	106022	11210490	8095010600
E02		106022	11210490	8095010600
E03		11107792	11210490	8095010600

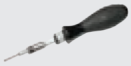
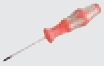
B276

MaxiMill 251 system

C251



d_2 [mm]	Type, description	d_1 [mm]	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
10	C251.10.R.02-05-A-25-165-RS	5	165	25	10	2.5	2	12000	0.7	RD.. 0501..	E01
10	C251.10.R.02-05-B12-20-RS	5	67	20	12	2.5	2	40000	0.7	RD.. 0501..	E01
12	C251.12.R.03-05-A-32-165-RS	7	165	32	12	2.5	3	16000	0.7	RD.. 0501..	E01
12	C251.12.R.03-05-B16-25-RS	7	75	25	16	2.5	3	40000	0.7	RD.. 0501..	E01
16	C251.16.R.04-05-A-40-165-RS	11	165	40	16	2.5	4	18000	0.7	RD.. 0501..	E01
16	C251.16.R.04-05-B-32-RS	11	81	32	16	2.5	4	40000	0.7	RD.. 0501..	E01
20	C251.20.R.05-05-A-50-165-RS	15	165	50	20	2.5	5	18000	0.7	RD.. 0501..	E01
20	C251.20.R.05-05-B-40-RS	15	91	40	20	2.5	5	31800	0.7	RD.. 0501..	E01
16	C251.16.R.02-08-A-40-RS-IN	8	89	40	16	4	2	40000	1.2	RD.. 0802..	E02
16	C251.16.R.02-08-A-40-165-RS	8	165	40	16	4	2	18000	1.2	RD.. 0802..	E02
16	C251.16.R.02-08-B-32-RS	8	81	32	16	4	2	40000	1.2	RD.. 0802..	E02
20	C251.20.R.03-08-A-50-200-RS	12	200	50	20	4	3	25000	1.2	RD.. 0802..	E02
20	C251.20.R.03-08-A-60-RS	12	110	60	20	4	3	27300	1.2	RD.. 0802..	E02
20	C251.20.R.03-08-A-60-RS-IN	12	110	60	20	4	3	27300	1.2	RD.. 0802..	E02
20	C251.20.R.03-08-B-40-RS	12	91	40	20	4	3	31800	1.2	RD.. 0802..	E02
25	C251.25.R.04-08-A-60-RS	17	116	60	25	4	4	20000	1.2	RD.. 0802..	E02
25	C251.25.R.04-08-A-60-RS-IN	17	116	60	25	4	4	20000	1.2	RD.. 0802..	E02
25	C251.25.R.04-08-A-60-225-RS	17	225	60	25	4	4	18000	1.2	RD.. 0802..	E02
25	C251.25.R.04-08-B-50-RS	17	107	50	25	4	4	25500	1.2	RD.. 0802..	E02
32	C251.32.R.06-08-A-70-RS-IN	25	130	70	32	4	6	19000	1.2	RD.. 0802..	E02
20	C251.20.R.02-10-A-50-RS	10	102	50	20	5	2	31800	2.0	RP.. 10T3..	E03
20	C251.20.R.02-10-A-50-200-RS	10	200	50	20	5	2	25000	2.0	RP.. 10T3..	E03
25	C251.25.R.03-10-A-RE	15	117	60	25	5	3	20000	2.0	RP.. 10T3..	E03
25	C251.25.R.03-10-A-60-RS	15	116	60	25	5	3	20000	2.0	RP.. 10T3..	E03
25	C251.25.R.03-10-A-60-225-RS	15	225	60	25	5	3	18000	2.0	RP.. 10T3..	E03
25	C251.25.R.03-10-B-60-RS	15	116	60	25	5	3	20000	2.0	RP.. 10T3..	E03
32	C251.32.R.04-10-A-RE	22	131	70	32	5	4	19000	2.0	RP.. 10T3..	E03
32	C251.32.R.04-10-A-70-RS	22	130	70	32	5	4	19000	2.0	RP.. 10T3..	E03
25	C251.25.R.02-12-B-30-RS	13	86	30	25	6	2	25000	3.2	RP.. 1204..	E04
32	C251.32.R.03-12-A-40-RS	20	100	40	32	6	3	19000	3.2	RP.. 1204..	E04
32	C251.32.R.03-12-B-40-RS	20	100	40	32	6	3	19000	3.2	RP.. 1204..	E04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E02	76913	11149541	8095010200
E03	11464141	11464183	8095010400
E04	165795	11149570	8095010500

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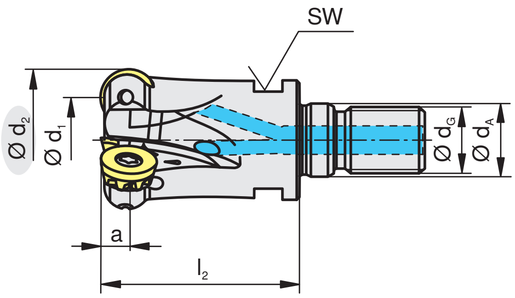
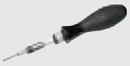
MaxiMill 251 system

G251



d$_2$ [mm]	Type, description	d$_1$ [mm]	l$_2$ [mm]	d$_A$ [mm]	d$_G$ [mm]	a [mm]	z	n$_{max}$ [min^{-1}]	[Nm]		
20	G251.20.R.05-05-RS	15	33	10.5	10	2.5	5	31800	0.7	RD.. 0501..	E01
25	G251.25.R.06-05-RS	20	35	12.5	12	2.5	6	25450	0.7	RD.. 0501..	E01
32	G251.32.R.07-05-RS	27	35	17.0	16	2.5	7	19850	0.7	RD.. 0501..	E01
20	G251.20.R.03-08-RS	12	33	10.5	10	4	3	31800	1.2	RD.. 0802..	E02
25	G251.25.R.04-08-RS	17	35	12.5	12	4	4	25450	1.2	RD.. 0802..	E02
32	G251.32.R.05-08-RS	24	35	17.0	16	4	5	19850	1.2	RD.. 0802..	E02
20	G251.20.R.02-10-RS	10	33	10.5	10	5	2	31800	2.0	RP.. 10T3..	E03
25	G251.25.R.03-10-RE	15	35	12.5	12	5	3	25450	2.0	RP.. 10T3..	E03
25	G251.25.R.03-10-RS	15	35	12.5	12	5	3	25450	2.0	RP.. 10T3..	E03
32	G251.32.R.04-10-RE	22	35	17.0	16	5	4	19850	2.0	RP.. 10T3..	E03
32	G251.32.R.04-10-RS	22	35	17.0	16	5	4	19850	2.0	RP.. 10T3..	E03
35	G251.35.R.05-10-RE	25	35	17.0	16	5	5	19000	2.0	RP.. 10T3..	E03
25	G251.25.R.02-12-35-RS	13	35	12.5	12	6	2	25000	3.2	RP.. 1204..	E04
32	G251.32.R.03-12-35-RS	20	35	17.0	16	6	3	19000	3.2	RP.. 1204..	E04
35	G251.35.R.03-12-35-RS	23	35	17.0	16	6	3	15900	3.2	RP.. 1204..	E04
42	G251.42.R.04-12-42-RS	30	42	17.0	16	6	4	15000	3.2	RP.. 1204..	E04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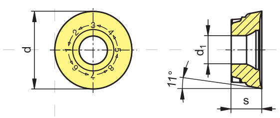
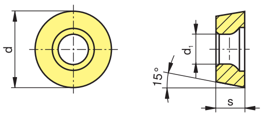
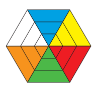
E02	76913	11149541	8095010200
E03	11464141	11464183	8095010400
E04	165795	11149570	8095010500

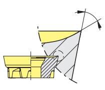
B276

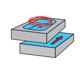
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	s [mm]	d₁ [mm]
		P	●	●	●	●	●	●	○	○	○						○			○					
		M		●			○	○	●	●	●									●					
		K		○	●	●	●					●	●	●	●		○	●	●	○		●			
		N														●	●	●	●						
		S																		●	●				
		H											○									●			
-27P		RPHX 10T3MOFN-27P																●					10.00	3.97	3.40
		RPHX 1204MOFN-27P																●					12.00	4.76	4.40
		RPHX 1605MOFN-27P																●					16.00	5.56	5.50
RDHX-F50		RDHX 0802MOSN-F50									●												8.00	2.38	2.80
-F50		RPHX 10T3MOSN-F50					●	●			●												10.00	3.97	3.40
		RPHX 1204MOSN-F50						●	●	●	●												12.00	4.76	4.40
		RPHX 1605MOSN-F50									●												16.00	5.56	5.50
		RPNX 10T3MOSN-F50						●															10.00	3.97	3.40
		RPNX 1204MOSN-F50					●	●															12.00	4.76	4.40
		RPNX 1605MOSN-F50						●															16.00	5.56	5.50
		RPNX 2006MOSN-F50									●												20.00	6.35	6.00
-M30		RPHX 10T3MOEN-M30						●			●												10.00	3.97	3.40
		RPHX 1204MOEN-M30							●	●	●												12.00	4.76	4.40
		RPHX 1605MOEN-M30									●												16.00	5.56	5.50
		RPNX 2006MOEN-M30						●			●												20.00	6.35	6.00
RDHX -M31		RDHX 0501MOEN-M31																		●			5.00	1.59	2.50
		RDHX 0802MOEN-M31																		●	●		8.00	2.38	2.80
		RDHX 0802M4EN-M31																		●	●		8.00	2.38	2.80
-M31		RPHX 10T3M4EN-M31																		●	●		10.00	3.97	3.40
		RPHX 10T3M8EN-M31																		●	●		10.00	3.97	3.40
		RPHX 1204M4EN-M31																		●	●		12.00	4.76	4.40
		RPHX 1204M6EN-M31																		●	●		12.00	4.76	4.40
		RPHX 1204M8EN-M31																		●	●		12.00	4.76	4.40
		RPHX 1605M8EN-M31																		●	●		16.00	5.56	5.50
		RPHX 2006M4EN-M31																		●			20.00	6.35	6.00
		RPNX 10T3M4EN-M31																		●			10.00	3.97	3.40
		RPNX 10T3M8EN-M31																		●			10.00	3.97	3.40
		RPNX 1204M4EN-M31																		●			12.00	4.76	4.40
		RPNX 1204M8EN-M31																		●			12.00	4.76	4.40
		RPNX 2006M8EN-M31																		●	●		20.00	6.35	6.00
-M32		RPHX 10T3M4EN-M32																		●			10.00	3.97	3.40
		RPHX 1204M4EN-M32																		●			12.00	4.76	4.40
-M50		RPHX 10T3MOSN-M50						●			●									●			10.00	3.97	3.40
		RPHX 1204MOSN-M50									●									●			12.00	4.76	4.40
		RPNX 10T3MOSN-M50					●	●															10.00	3.97	3.40
		RPNX 1204MOSN-M50					●	●															12.00	4.76	4.40
		RPNX 1605MOSN-M50					●	●															16.00	5.56	5.50
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	s	d₁






B12-B18


B175-B177

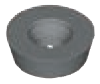

B21

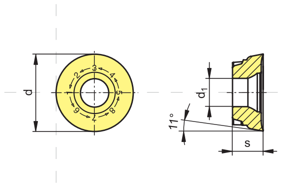

B257-B266

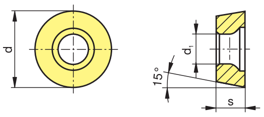
MaxiMill 251 system

RD.. RP..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	s [mm]	d_1 [mm]
-R30		RPHX 10T3MOEN-R30																		●			10.00	3.97	3.40
		RPHX 1204MOEN-R30																		●			12.00	4.76	4.40
		RPNX 10T3MOEN-R30												●									10.00	3.97	3.40
		RPNX 1204MOEN-R30												●									12.00	4.76	4.40
-R60		RPNX 1204M8EN-R60																				●	12.00	4.76	4.40
RDHX		RDHX 0501MOFN																●					5.00	1.59	2.50
		RDHX 0501MOSN					●	●															5.00	1.59	2.50
		RDHX 0802MOEN												●									8.00	2.38	2.80
		RDHX 0802MOFN																●					8.00	2.38	2.80
		RDHX 0802MOSN					●	●															8.00	2.38	2.80
RPHX		RPHX 10T3MOSN		●			●	●						●									10.00	3.97	3.40
		RPHX 1204MOSN		●			●	●	●					●									12.00	4.76	4.40
		RPHX 1204M4EN																		●			12.00	4.76	4.40
		RPHX 1605MOSN					●	●						●									16.00	5.56	5.50
		RPNX 10T3MOSN													●								10.00	3.97	3.40
		RPNX 1204MOSN					●	●						●	●								12.00	4.76	4.40
		RPNX 1605MOSN					●	●						●	●								16.00	5.56	5.50
		RPNX 2006MOSN					●	●						●	●								20.00	6.35	6.00
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	s	d_1





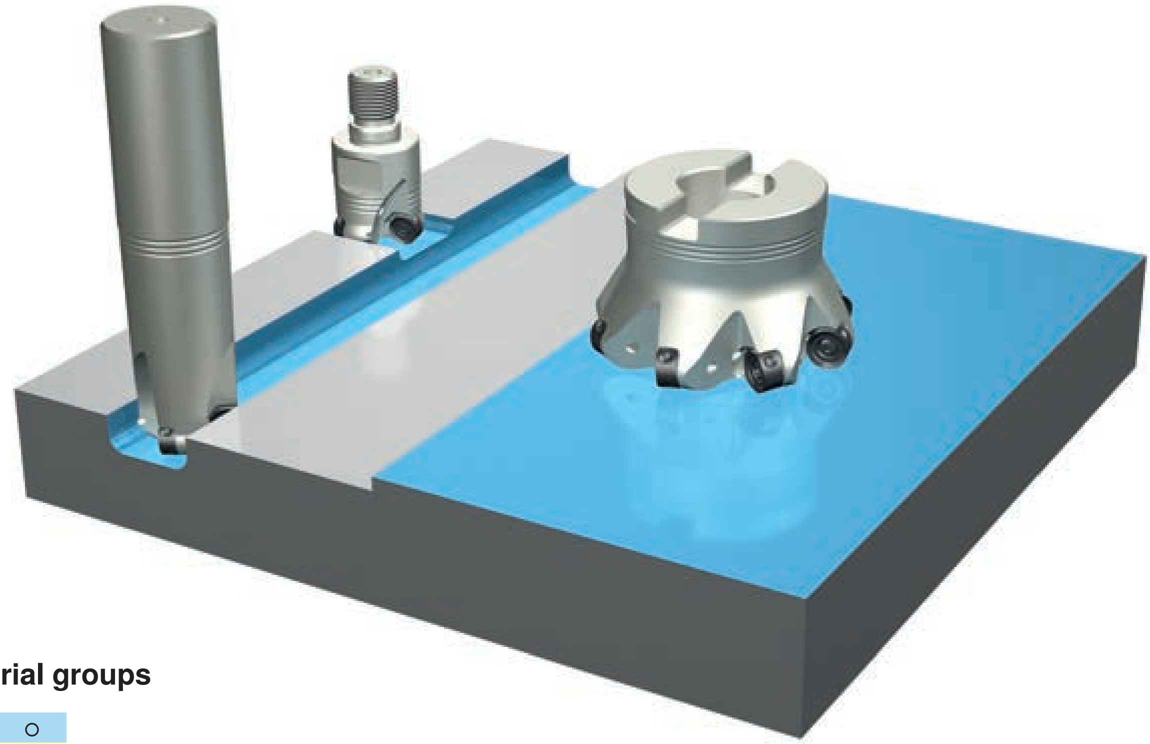
B12-B18
B175-B177
B21
B257-B266

Notes


CERATIZIT

Double-sided inserts with double cost-effectiveness

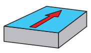
- ○ Double the number of cutting edges combined with the optimal depth of cut
- ○ Quick machining with high metal removal rates



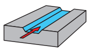
Material groups

P	○
M	●
K	
N	
S	○
H	

Possible applications

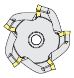


Face milling



Slot milling

Detailed information

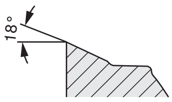
Pitch	Ø range	Inserts
	Ø 22 - 68 mm	RN..1004.. RN..1205..

MaxiMill 252 system

Geometry overview

-M31

- ○ Positive geometry
- ○ Universal applicaition
- ○ Reduced vibration
- ○ For heat-resistant materials, titanium and super alloys



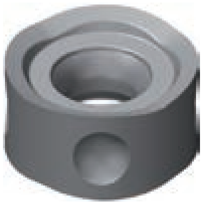
f_z [mm]

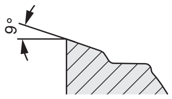
0,08 - 0,35

	Machining conditions		
	👍	👉	👎
🟦			
🟨			
🟥			
🟩			
🟧	CTC5235 **CTC5240**	CTC5235 **CTC5240**	**CTC5235** CTC5240
⬜			

-M32

- ○ Medium roughing
- ○ Low cutting forces and good stability
- ○ First choice for martensitic stainless steel materials





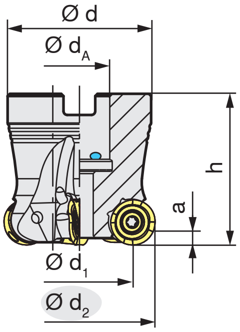
f_z [mm]

0,05 - 0,35

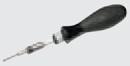
	Machining conditions		
	👍	👉	👎
🟦			
🟨	CTC5235	**CTC5235**	**CTC5235**
🟥			
🟩			
🟧			
⬜			

MaxiMill 252 system

A252



d_2 [mm]	Type, description	d_1 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
40	A252.40.R.05-10	30	40	38	16	2.5	5	15900	2	RN.. 1004..	E01
42	A252.42.R.05-10	32	40	38	16	2.5	5	15150	2	RN.. 1004..	E01
50	A252.50.R.06-10	40	40	43	22	2.5	6	12700	2	RN.. 1004..	E01
52	A252.52.R.07-10	42	40	43	22	2.5	7	12200	2	RN.. 1004..	E01
40	A252.40.R.04-12	28	40	38	16	3.0	4	15900	3.2	RN.. 1205..	E02
50	A252.50.R.05-12	38	40	43	22	3.0	5	12700	3.2	RN.. 1205..	E03
52	A252.52.R.05-12	40	40	43	22	3.0	5	12200	3.2	RN.. 1205..	E03
63	A252.63.R.06-12	51	40	48	22	3.0	6	10100	3.2	RN.. 1205..	E03
66	A252.66.R.07-12	54	40	48	22	3.0	7	9650	3.2	RN.. 1205..	E03
80	A252.80.R.08-12	68	50	58	27	3.0	8	7950	3.2	RN.. 1205..	E03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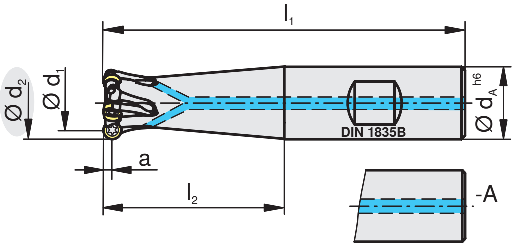
E02	11036880	11610311	11450867
E03		11610311	11450867

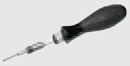
B276

MaxiMill 252 system

C252



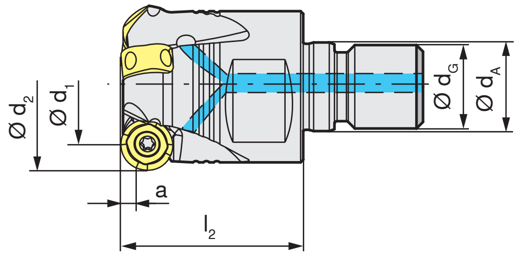
d_2 [mm]	Type, description	d_1 [mm]	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
32	C252.32.R.04-10-A-70	22	131	70	32	2.5	4	19850	2	RN.. 1004..	E01

		
E01	11689894	11696194

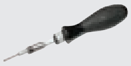
B276

MaxiMill 252 system

G252



d_2 [mm]	Type, description	d_1 [mm]	l_2 [mm]	d_A [mm]	d_G [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]	◎	
32	G252.32.R.04-10	22	35	17.0	16	2.5	4	19850	2	RN.. 1004..	E01

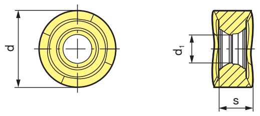
		
E01	11689894	11696194

B276

MaxiMill 252 system

RN..

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	s [mm]	d$_1$ [mm]
P			●	●	●	●	●	●	○	○	○						○			○					
M				●			○	○	●	●	●									●					
K				○	●	●	●					●	●	●	●		○	●	●	○		●			
N																●	●	●	●						
S																				●	●				
H													○									●			
-M31		RNHU 1004M4ER-M31																		●	●		10.00	5.28	3.40
		RNHU 1205M4ER-M31																		●	●		12.00	6.34	4.40
-M32		RNHU 1004M4ER-M32																		●			10.00	5.28	3.40
		RNHU 1205M4ER-M32																		●			12.00	6.34	4.40
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	s	d$_1$



B12-B18

B187

B21

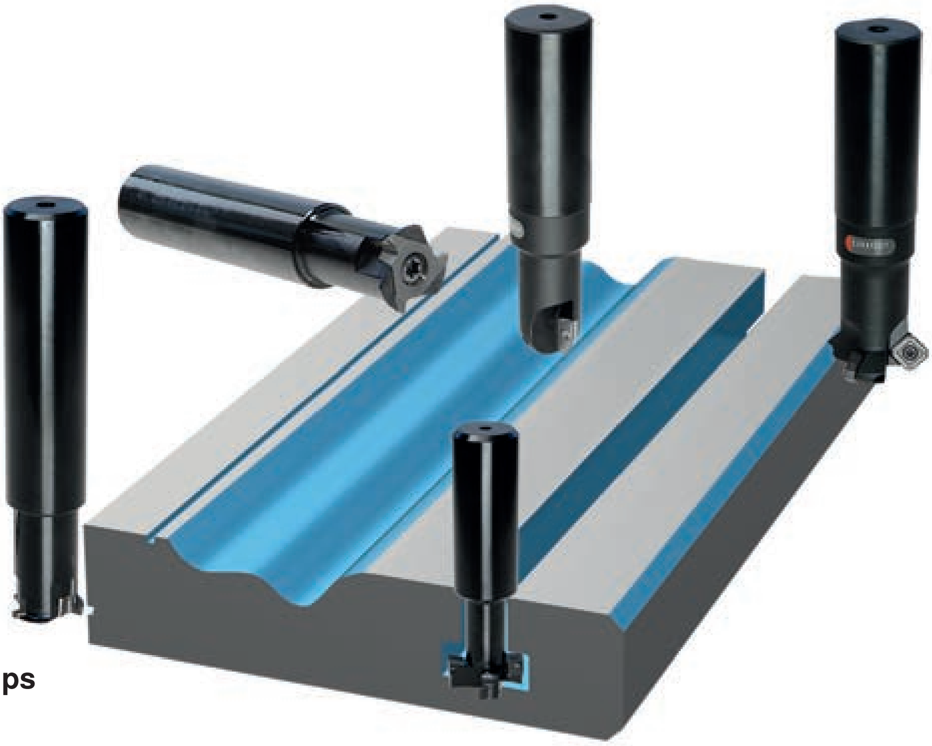
B257-B266

Notes


NF.20.R.01
3489631/01

Milling cutters for profiling, chamfering and slot profiles

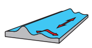
○ For common machining tasks



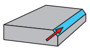
Material groups

P	●
M	○
K	○
N	○
S	
H	

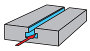
Possible applications



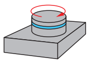
Profile milling



Chamfering

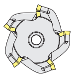


T-slot milling



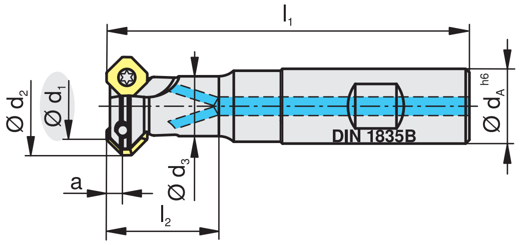
Slot milling (circlip)

Detailed information

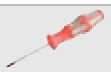
Pitch	Ø range	Inserts
	-	SD..0903.. R06E../R08E../R10D../ R12D../R16D.. SP..05../CP..06../CP..09.. TC 11../TC 16..

MaxiMill 272 system

C272-09



d$_1$ [mm]	Type, description	d$_2$ [mm]	l$_1$ [mm]	l$_2$ [mm]	d$_3$ [mm]	d$_A$ [mm]	a [mm]	z	[Nm]		
6	C272.06.R.01-09	14.4	91	24	10	16	4	1	1.2	SD.. 0903..	E01
8	C272.08.R.01-09	16.4	91	25.5	10	16	4	1	1.2	SD.. 0903..	E01
12	C272.12.R.01-09	20.4	91	26	12	16	4	1	1.2	SD.. 0903..	E01
16	C272.16.R.02-09	24.4	97	30	15	20	4	2	1.2	SD.. 0903..	E02
18	C272.18.R.02-09	26.4	97	30	16	20	4	2	1.2	SD.. 0903..	E02
25	C272.25.R.03-09	33.4	109	35	21	25	4	3	1.2	SD.. 0903..	E02

			
E01	169857	11149541	8095010200
E02	77613	11149541	8095010200

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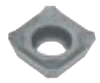
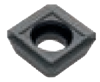
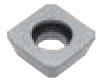
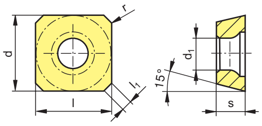
Milling / Profile milling

MaxiMill 272 system

SD..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-27P		SDHT 0903AEFN-27P															●	●					9.52	9.52	3.18	1.68	1.00	3.40
-29		SDNT 0903AESN-29					●	●															9.52	9.52	3.18	1.68	1.00	3.40
-31		SDNT 0903AESN-31												●									9.52	9.52	3.18	1.61	1.00	3.40
-33		SDHT 0903AESN-33									●												9.52	9.52	3.18	1.68	1.00	3.40
		SDHT 0903AESN-33P									●												9.52	9.52	3.18	1.68	1.00	3.40
-M31		SDHT 0903AESN-M31																		●	●		9.52	9.52	3.18	1.68	1.00	3.40
SD..W		SDHW 0903AESN		●																			9.52	9.52	3.18	1.68	1.00	3.40
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	l_1	r	d_1



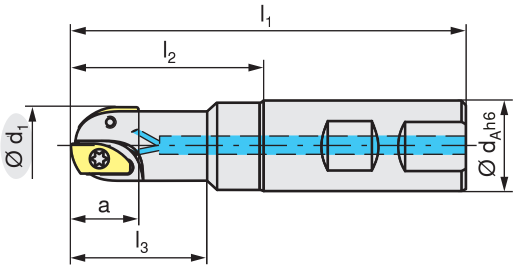
B12-B18

B21

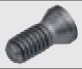
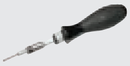
B257-B266

MaxiMill profiling system

CKF



d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	l_3 [mm]	d_A [mm]	a [mm]	z	n	[Nm]		
12	C KF.12.R.01	87	39	24	16	10	1	1	1.2	R06E 0602..	E01
16	C KF.16.R.01	96	46	31	20	12	1	1	1.2	R08E 0803..	E02
20	C KF.20.R.01	109	53	37	25	12	1	2	1.2	R10D 0602..	E03
25	C KF.25.R.01	112	56	56	25	14	1	2	1.2	R12D 0803..	E04
32	C KF.32.R.01	120	60	60	32	16	1	2	3.2	R16D 10T3..	E05

			
E01	157823	11149541	8095010200
E02	169856	11149541	8095010200
E03	76913	11149541	8095010200
E04	77613	11149541	8095010200
E05	54976	11149541	8095010500

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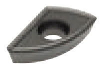
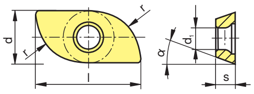
MaxiMill profiling system

R..

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	r [mm]	d1 [mm]
P			●	●	●	●	●	●	○	○	○						○			○							
M				●			○	○	●	●	●									●							
K				○	●	●	●					●	●	●	●		○	●	●	○		●					
N																●	●	●	●								
S																				●	●						
H													○									●					
R..E		R06E 0602ZZER						●															6.35	13.00	2.38	6.00	2.80
		R08E 0803ZZSR						●															8.33	14.93	3.18	8.00	3.40
R..D		R10D 0602ZZER						●															6.35	13.40	2.38	10.00	2.80
		R12D 0803ZZSR						●															8.00	17.00	3.18	12.50	3.40
		R16D 10T3ZZER						●															10.00	17.00	3.97	16.00	4.40



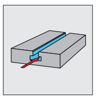
B12-B18

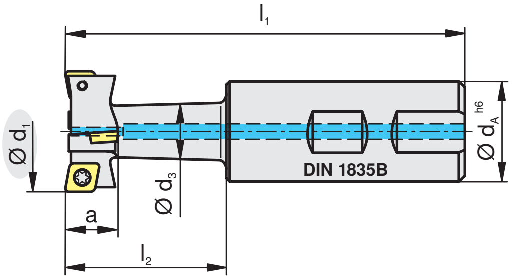
B21

B257-B266

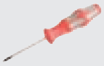
MaxiMill profiling system

CNF





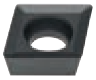
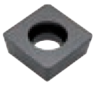
d1 [mm]	Type, description	l1 [mm]	l2 [mm]	d3 [mm]	dA [mm]	a [mm]	z	n	[Nm]		
17.5	C NF.17.R.01	80	25	8.5	16	8	1	2	1.2	SP.. 0502..	E01
20.5	C NF.20.R.01	85	30	10.5	16	9	1	2	1.2	CP.. 0603..	E02
24.0	C NF.23.R.01	95	32	12.5	25	10	1	2	1.2	CP.. 0603..	E02
31.0	C NF.30.R.02	105	40	16	25	12	2	4	1.2	CP.. 0603..	E02
38.5	C NF.37.R.02	115	50	20	32	16	2	4	3.2	CP.. 09T3..	E03
48.0	C NF.47.R.02	125	60	26	32	20	2	4	3.2	CP.. 09T3..	E03

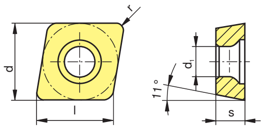
			
E01	76913	11149541	8095010200
E02	24645	11149541	8095010200
E03	54976	11149541	8095010500

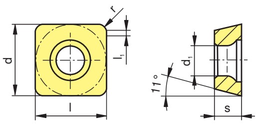
B276

MaxiMill profiling system

CP.. / SP..

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
P			●	●	●	●	●	●	○	○	○						○			○							
M				●			○	○	●	●	●									●							
K				○	●	●	●					●	●	●	●		○	●	●	○		●					
N																●	●	●	●								
S																				●	●						
H												○										●					
CPMT		CPMT 060304EN						●															6.35	6.40	3.18	0.40	2.80
		CPMT 09T308SN						●															9.52	9.70	3.97	0.80	4.40
CPMW		CPMW 060304EN												●									6.35	6.40	3.18	0.40	2.80
		CPMW 09T308EN												●				●					9.52	9.70	3.97	0.80	4.40
SP..W		SPGW 050204EN						●															5.56	5.56	2.38	0.40	2.80

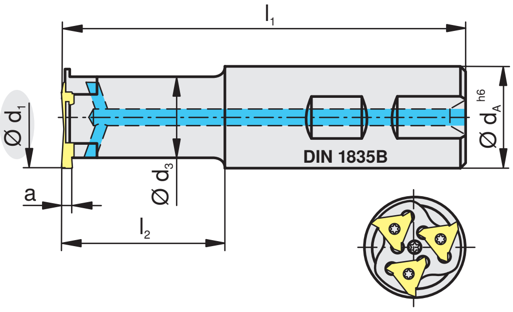




B12-B18
B21
B257-B266

MaxiMill profiling system

CZF



d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	d_3 [mm]	d_A [mm]	a [mm]	z	n	[Nm]		
16	C ZF.16.R.03	84	24	13	16	1.6	3	1	3.2	TC 16T3..	E01
25	C ZF.25.R.03	100	40	20.5	25	2.65	3	3	1.2	TC 1103..	E02

E01	165795	11149570	8095010500
E02	24645	11149541	8095010200

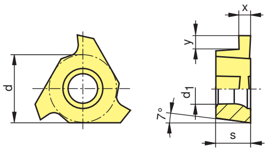
B276

MaxiMill profiling system

TC..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

		CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	s [mm]	d₁ [mm]	y [mm]	x [mm]
TC.. 	TC 1103ER160						●															6.35	3.18	2.80	1.40	1.60
	TC 1103ER185						●															6.35	3.18	2.80	1.70	1.85
	TC 1103ER215						●															6.35	3.18	2.80	2.00	2.15
	TC 1103ER265						●															6.35	3.18	2.80	2.20	2.65
	TC 16T3ER110						●															9.53	3.97	4.20	0.90	1.10
	TC 16T3ER130						●															9.53	3.97	4.20	1.30	1.30
	TC 16T3ER160						●															9.53	3.97	4.20	1.40	1.60
		CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	s	d₁	y	x



B12-B18

B21

B257-B266

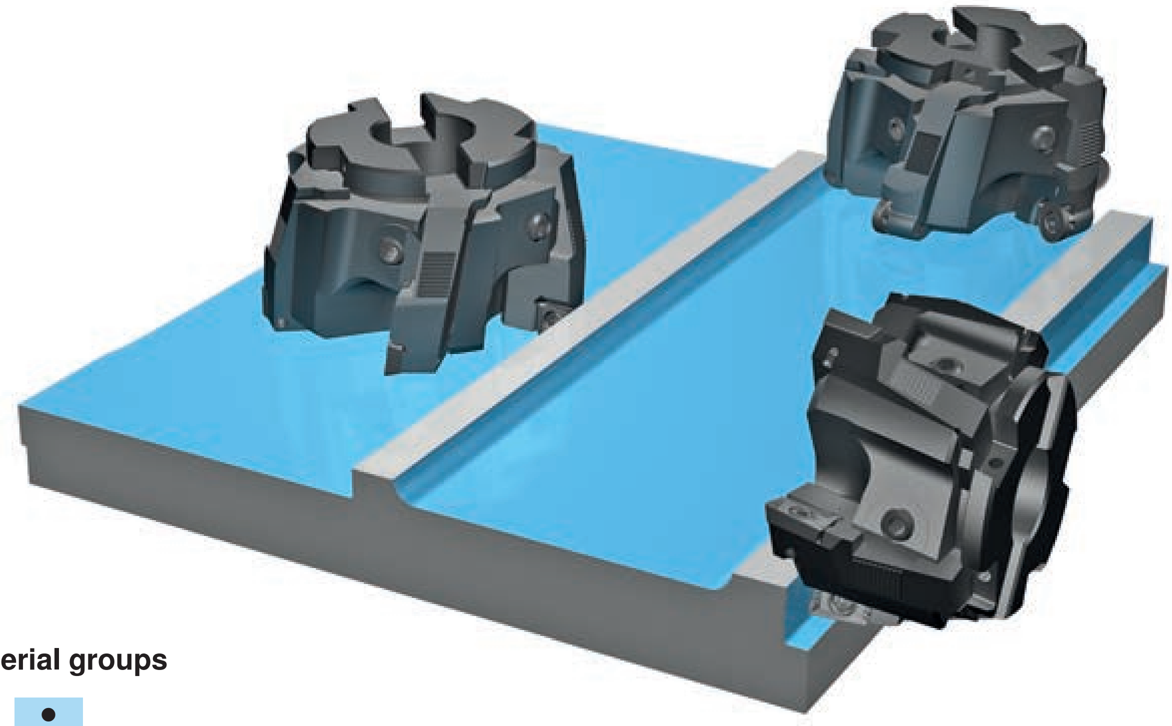

CERATIZIT
18031
18043
18043
A 260.08.R.05

MaxiMill 260 system

System overview

The cassette milling cutter - in particular for large diameters

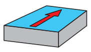
○ Universal application with optimal stability
○ Adjustable Masterfinish edges
○ Versatile application thanks to different cassettes



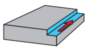
Material groups

P	●
M	●
K	●
N	○
S	○
H	

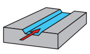
Possible applications



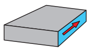
Face milling



Shoulder milling

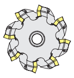


Slot milling



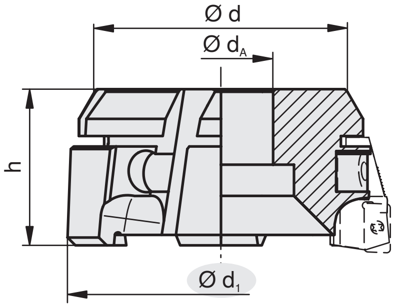
Peripheral milling

Detailed information

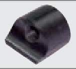
Pitch	Ø range	Inserts
	Ø 80 - 400 mm	see page B206

MaxiMill 260 system

Cutter body



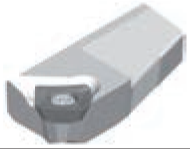
d_1 [mm]	Type, description	h [mm]	d [mm]	[kg]		
80	A260.08.R.05	49	66	0.97	78180..	E01
98	A260.10.R.06	49	86	1.52	78180..	E01
119	A260.12.R.07	60	95	2.99	78180..	E01
154	A260.16.R.10	60	130	5.33	78180..	E01
194	A260.20.R.12	60	172	9.05	78180..	E01
244	A260.25.R.14	60	222	15.75	78180..	E01
309	A260.31.R.18	77	280	30.23	78180..	E01
394	A260.40.R.22	77	365	66.00	78180..	E01

				
E01	106607	106934	112188	4425

B276

MaxiMill 260 system

Cassettes

Cassettes		**Max. depth of cut [mm]**	**Insert**	**Machining method**	**Page(s)**
	Approach angle 45°				
029		6	SE.. 1204..		B212
031	 	6	SD/XD.. 1204..		B211
032		9	SD.. 1504..		B212
041	 	4	SD/XD.. 0903..		B211
057	 	5.5	OA/XA.. 0605..		B213
058		8.4	SAKU 1706..		B214
059	 	6.0	OF..0504.. / SF..1204..		B209

	MaxiMill 260 75° cassette milling cutters				
018	 	9	SP.. 1204..		B215

MaxiMill 260 system

Cassettes

Cassettes		Max. depth of cut [mm]	Insert	Machining method	Page(s)
	Approach angle 90°				
025		18	TP.. 2204..		B218
026		18	LP.. 2004..		B219
039		11	SD.. 1205..		B217
040		14	AD.. 1505..		B219
042		8	AP.. 1003..		B216
051		14	LD.. 1504..		B216
054		10	XD.. 11..		B220
055		8	SD.. 09T3..		B217
056		14	XD.. 15..		B220

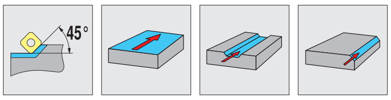
MaxiMill 260 system

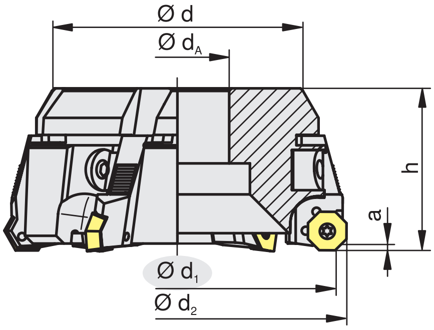
Cassettes

Cassettes		Max. depth of cut [mm]	Insert	Machining method	Page(s)
	Button inserts				
052		6	RP.. 1204..		B221
053		8	RP.. 1605..		B221

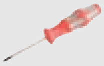
MaxiMill 260 system

A260-059/OF..

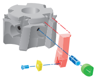




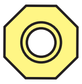
d$_1$ [mm]	Type, description	d$_2$ [mm]	h [mm]	d [mm]	d$_A$ [mm]	a [mm]	z	[kg]	[Nm]		
80.2	A260.08.R.05/059	88.1	52	66	27	3.0	5	1.50	5	OF.. 0504..	E01
100.1	A260.10.R.06/059	108.1	52	86	32	3.0	6	2.00	5	OF.. 0504..	E01
123.1	A260.12.R.07/059	131.1	63	95	40	3.0	7	3.50	5	OF.. 0504..	E01
158	A260.16.R.10/059	166.1	63	130	40	3.0	10	6.00	5	OF.. 0504..	E01
198	A260.20.R.12/059	206.1	63	172	60	3.0	12	10.00	5	OF.. 0504..	E01
247.9	A260.25.R.14/059	256.1	63	222	60	3.0	14	18.00	5	OF.. 0504..	E01
312.9	A260.31.R.18/059	321.1	80	280	60	3.0	18	31.50	5	OF.. 0504..	E01
397.9	A260.40.R.22/059	406.1	80	365	60	3.0	22	68.00	5	OF.. 0504..	E01

							
E01	106607	11803957	106934	112188	11450867	8095012000	4425

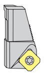
B276



B226



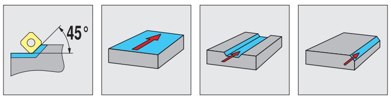
B37

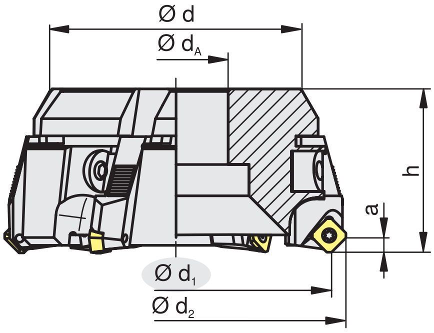


B206-B208

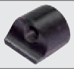
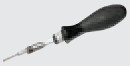
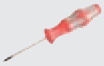
MaxiMill 260 system

A260-059/SF..

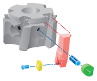




d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[kg]	[Nm]		
77.1	A260.08.R.05/059	91.1	53.5	66	27	6.0	5	1.50	5	SF.. 1204..	E01
97	A260.10.R.06/059	111.1	53.5	86	32	6.0	6	2.00	5	SF.. 1204..	E01
119.9	A260.12.R.07/059	134	64.5	95	40	6.0	7	3.50	5	SF.. 1204..	E01
154.8	A260.16.R.10/059	169	64.5	130	40	6.0	10	6.00	5	SF.. 1204..	E01
194.8	A260.20.R.12/059	209	64.5	172	60	6.0	12	10.00	5	SF.. 1204..	E01
244.8	A260.25.R.14/059	259	64.5	222	60	6.0	14	18.00	5	SF.. 1204..	E01
309.7	A260.31.R.18/059	324	81.5	280	60	6.0	18	31.50	5	SF.. 1204..	E01
394.7	A260.40.R.22/059	409	81.5	365	60	6.0	22	68.00	5	SF.. 1204..	E01

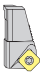
							
E01	106607	11803957	106934	112188	11450867	8095012000	4425

B276



B226

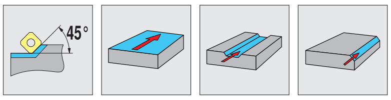
B46

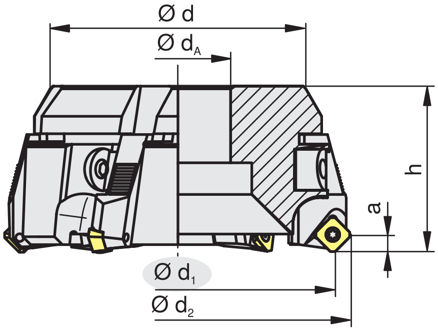


B206-B208

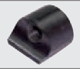
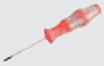
MaxiMill 260 system

A260-031/-041

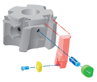




d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[kg]	[Nm]		
80	A260.08.R.05/041	88.4	52	66	27	4	5	1.33	1.2	SD/XD.. 0903..	E01
100	A260.10.R.06/041	108.4	52	86	32	4	6	1.94	1.2	SD/XD.. 0903..	E01
123	A260.12.R.07/041	131.4	63	95	40	4	7	3.49	1.2	SD/XD.. 0903..	E01
158	A260.16.R.10/041	166.4	63	130	40	4	10	6.04	1.2	SD/XD.. 0903..	E01
198	A260.20.R.12/041	206.4	63	172	60	4	12	9.91	1.2	SD/XD.. 0903..	E01
248	A260.25.R.14/041	256.4	63	222	60	4	14	16.74	1.2	SD/XD.. 0903..	E01
313	A260.31.R.18/041	321.4	80	280	60	4	18	31.51	1.2	SD/XD.. 0903..	E01
398	A260.40.R.22/041	406.4	80	365	60	4	22	67.57	1.2	SD/XD.. 0903..	E01
80	A260.08.R.05/031	94.5	52	66	27	6	5	1.31	5	SD/XD.. 1204..	E02
100	A260.10.R.06/031	114.5	52	86	32	6	6	1.93	5	SD/XD.. 1204..	E02
123	A260.12.R.07/031	137.5	63	95	40	6	7	3.47	5	SD/XD.. 1204..	E02
158	A260.16.R.10/031	172.5	63	130	40	6	10	6.02	5	SD/XD.. 1204..	E02
198	A260.20.R.12/031	212.5	63	172	60	6	12	9.88	5	SD/XD.. 1204..	E02
248	A260.25.R.14/031	262.5	63	222	60	6	14	16.71	5	SD/XD.. 1204..	E02
313	A260.31.R.18/031	327.5	80	280	60	6	18	31.45	5	SD/XD.. 1204..	E02
398	A260.40.R.22/031	412.5	80	365	60	6	22	67.51	5	SD/XD.. 1204..	E02

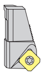
							
E01	106607	77613	106934	112188	11149541	8095010200	4425
E02	106607	106022	106934	112188	11149571	8095010600	4425

B276



B226

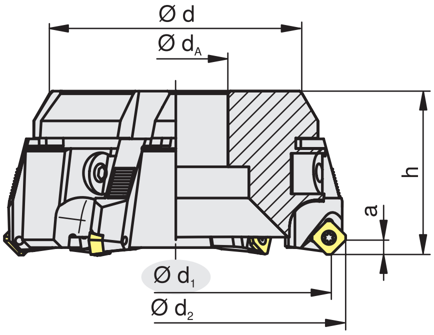
B60-B61



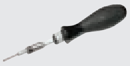
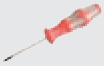
B206-B208

MaxiMill 260 system

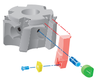
A260-029/-032



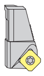
d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[kg]	[Nm]		
80	A260.08.R.05/029	93	52	66	27	6	5	1.30	5	SE.. 1204..	E01
100	A260.10.R.06/029	113	52	86	32	6	6	1.91	5	SE.. 1204..	E01
123	A260.12.R.07/029	136	63	95	40	6	7	3.46	5	SE.. 1204..	E01
158	A260.16.R.10/029	171	63	130	40	6	10	5.99	5	SE.. 1204..	E01
198	A260.20.R.12/029	211	63	172	60	6	12	9.85	5	SE.. 1204..	E01
248	A260.25.R.14/029	261	63	222	60	6	14	16.67	5	SE.. 1204..	E01
313	A260.31.R.18/029	326	80	280	60	6	18	31.41	5	SE.. 1204..	E01
398	A260.40.R.22/029	411	80	365	60	6	22	67.45	5	SE.. 1204..	E01
75	A260.08.R.05/032	94	52	66	27	9	5	1.31	5	SD.. 1504..	E01
95	A260.10.R.06/032	114	52	86	32	9	6	1.77	5	SD.. 1504..	E01
118	A260.12.R.07/032	137	63	95	40	9	7	3.37	5	SD.. 1504..	E01
153	A260.16.R.10/032	172	63	130	40	9	10	5.83	5	SD.. 1504..	E01
193	A260.20.R.12/032	212	63	172	60	9	12	12.67	5	SD.. 1504..	E01
243	A260.25.R.14/032	262	63	222	60	9	14	16.35	5	SD.. 1504..	E01
308	A260.31.R.18/032	327	80	280	60	9	18	32.15	5	SD.. 1504..	E01
393	A260.40.R.22/032	412	80	365	60	9	22	52.07	5	SD.. 1504..	E01

							
E01	106607	106022	106934	112188	11149571	8095010600	4425

B276

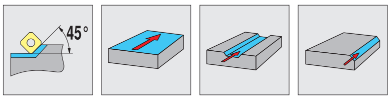

B226

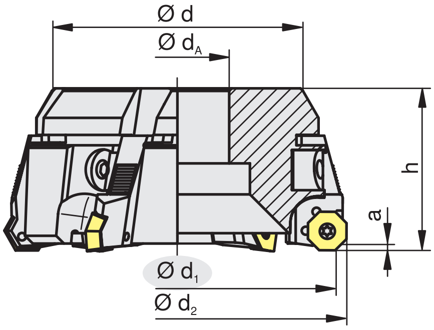
B225


B206-B208

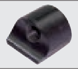
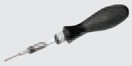
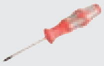
MaxiMill 260 system

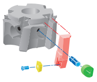
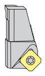
A260-057





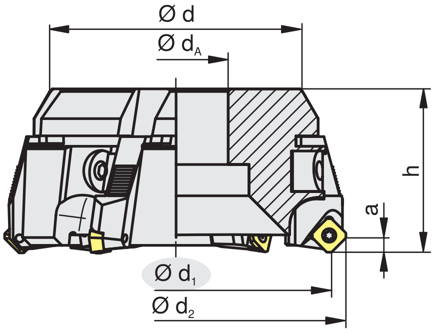
d$_1$ [mm]	Type, description	d$_2$ [mm]	h [mm]	d [mm]	d$_A$ [mm]	a [mm]	z	[kg]	[Nm]		
82	A260.08.R.05/057	92.2	54	66	27	3.5	5	1.52	5	OA/XA.. 0605..	E01
102	A260.10.R.06/057	112.2	54	86	32	3.5	6	1.90	5	OA/XA.. 0605..	E01
125	A260.12.R.07/057	135.2	65	95	40	3.5	7	3.48	5	OA/XA.. 0605..	E01
160	A260.16.R.10/057	170.2	65	130	40	3.5	10	5.98	5	OA/XA.. 0605..	E01
200	A260.20.R.12/057	210.2	65	172	60	3.5	12	9.75	5	OA/XA.. 0605..	E01
250	A260.25.R.14/057	260.2	65	222	60	3.5	14	15.69	5	OA/XA.. 0605..	E01
315	A260.31.R.18/057	325.2	82	280	60	3.5	18	31.38	5	OA/XA.. 0605..	E01
400	A260.40.R.22/057	410.2	82	365	60	3.5	22	67.33	5	OA/XA.. 0605..	E01

							
E01	106607	11107792	106934	112188	11210490	8095010600	4425

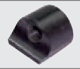
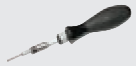
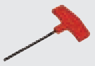
B276	 B226	B70-B71	 B206-B208

MaxiMill 260 system

A260-058



d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[kg]	[Nm]		
77	A260.08.R.05/058	93	56	66	27	8.4	5	1.39	5	SAKU 1706..	E01
97	A260.10.R.06/058	113	56	86	32	8.4	6	2.01	5	SAKU 1706..	E01
120	A260.12.R.07/058	136	67	95	40	8.4	7	3.55	5	SAKU 1706..	E01
155	A260.16.R.10/058	171	67	130	40	8.4	10	6.09	5	SAKU 1706..	E01
195	A260.20.R.12/058	211	67	172	60	8.4	12	9.96	5	SAKU 1706..	E01
245	A260.25.R.14/058	261	67	222	60	8.4	14	16.79	5	SAKU 1706..	E01
310	A260.31.R.18/058	326	84	280	60	8.4	18	31.53	5	SAKU 1706..	E01
395	A260.40.R.22/058	411	84	365	60	8.4	22	67.98	5	SAKU 1706..	E01

							
E01	106607	11107792	106934	112188	11210490	8095010600	4425

B276

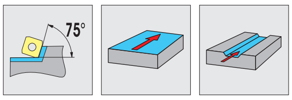
B226

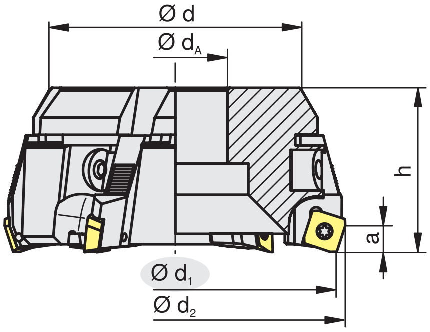
B79

B206-B208

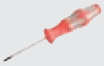
MaxiMill 260 system

A260-018

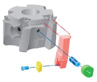




d_1 [mm]	Type, description	d_2 [mm]	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[kg]	[Nm]		
82	A260.08.R.05/018	88	52	66	27	9	5	1.31	5	SP../SPEX.. 1204..	E01
102	A260.10.R.06/018	108	52	86	32	9	6	1.92	5	SP../SPEX.. 1204..	E01
125	A260.12.R.07/018	131	63	95	40	9	7	3.47	5	SP../SPEX.. 1204..	E01
160	A260.16.R.10/018	166	63	130	40	9	10	6.01	5	SP../SPEX.. 1204..	E01
200	A260.20.R.12/018	206	63	172	60	9	12	9.87	5	SP../SPEX.. 1204..	E01
250	A260.25.R.14/018	256	63	222	60	9	14	16.69	5	SP../SPEX.. 1204..	E01
315	A260.31.R.18/018	321	80	280	60	9	18	31.44	5	SP../SPEX.. 1204..	E01
400	A260.40.R.22/018	406	80	365	60	9	22	67.49	5	SP../SPEX.. 1204..	E01

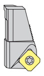
							
E01	106607	106022	106934	112188	11149571	8095010600	4425

B276



B226

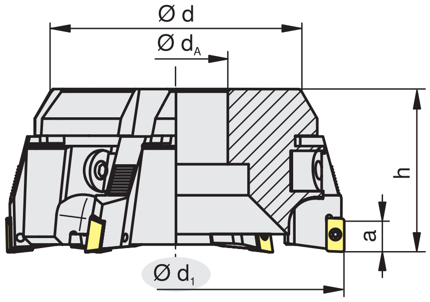
B224



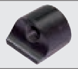
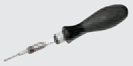
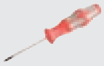
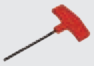
B206-B208

MaxiMill 260 system

A260-042/-051



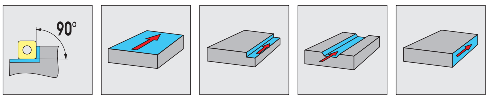
d1 [mm]	Type, description	h [mm]	d [mm]	dA [mm]	a [mm]	z	[kg]	[Nm]		
89	A260.08.R.05/042	52	66	27	8	5	1.33	1.2	AP.. 1003..	E01
109	A260.10.R.06/042	52	86	32	8	6	1.94	1.2	AP.. 1003..	E01
132	A260.12.R.07/042	63	95	40	8	7	3.49	1.2	AP.. 1003..	E01
167	A260.16.R.10/042	63	130	40	8	10	6.04	1.2	AP.. 1003..	E01
207	A260.20.R.12/042	63	172	60	8	12	9.91	1.2	AP.. 1003..	E01
257	A260.25.R.14/042	63	222	60	8	14	16.74	1.2	AP.. 1003..	E01
322	A260.31.R.18/042	80	280	60	8	18	31.50	1.2	AP.. 1003..	E01
407	A260.40.R.22/042	80	365	60	8	22	67.56	1.2	AP.. 1003..	E01
89	A260.08.R.05/051	52	66	27	14	5	1.32	3.2	LD.. 1504..	E02
109	A260.10.R.06/051	52	86	32	14	6	1.94	3.2	LD.. 1504..	E02
132	A260.12.R.07/051	63	95	40	14	7	3.49	3.2	LD.. 1504..	E02
167	A260.16.R.10/051	63	130	40	14	10	6.04	3.2	LD.. 1504..	E02
207	A260.20.R.12/051	63	172	60	14	12	9.90	3.2	LD.. 1504..	E02
257	A260.25.R.14/051	63	222	60	14	14	16.74	3.2	LD.. 1504..	E02
322	A260.31.R.18/051	80	280	60	14	18	31.50	3.2	LD.. 1504..	E02
407	A260.40.R.22/051	80	365	60	14	22	67.56	3.2	LD.. 1504..	E02

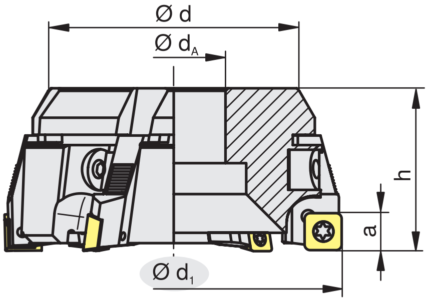
							
E01	106607	24645	106934	112188	11149541	8095010200	4425
E02	106607	165795	106934	112188	11149570	8095010500	4425

B276
B226
B222-B223
B206-B208

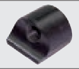
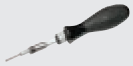
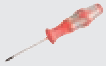
MaxiMill 260 system

A260-039/-055

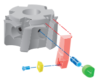




d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[kg]	[Nm]		
89	A260.08.R.05/055	52	66	27	7.3	5	1.34	3.2	SD.. 09T3..	E01
109	A260.10.R.06/055	52	86	32	7.3	6	1.96	3.2	SD.. 09T3..	E01
132	A260.12.R.07/055	63	95	40	7.3	7	3.51	3.2	SD.. 09T3..	E01
167	A260.16.R.10/055	63	130	40	7.3	10	6.07	3.2	SD.. 09T3..	E01
207	A260.20.R.12/055	63	172	60	7.3	12	9.94	3.2	SD.. 09T3..	E01
257	A260.25.R.14/055	63	222	60	7.3	14	16.78	3.2	SD.. 09T3..	E01
322	A260.31.R.18/055	80	280	60	7.3	18	31.55	3.2	SD.. 09T3..	E01
407	A260.40.R.22/055	80	365	60	7.3	22	67.62	3.2	SD.. 09T3..	E01
89	A260.08.R.05/039	52	66	27	10.7	5	1.32	5	SD.. 1205..	E02
109	A260.10.R.06/039	52	86	32	10.7	6	1.94	5	SD.. 1205..	E02
132	A260.12.R.07/039	63	95	40	10.7	7	3.48	5	SD.. 1205..	E02
167	A260.16.R.10/039	63	130	40	10.7	10	6.03	5	SD.. 1205..	E02
207	A260.20.R.12/039	63	172	60	10.7	12	9.89	5	SD.. 1205..	E02
257	A260.25.R.14/039	63	222	60	10.7	14	16.73	5	SD.. 1205..	E02
322	A260.31.R.18/039	80	280	60	10.7	18	31.49	5	SD.. 1205..	E02
407	A260.40.R.22/039	80	365	60	10.7	22	67.54	5	SD.. 1205..	E02

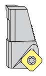
							
E01	106607	54976	106934	112188	11149570	8095010500	4425
E02	106607	106022	106934	112188	11149571	8095010600	4425

B276



B226

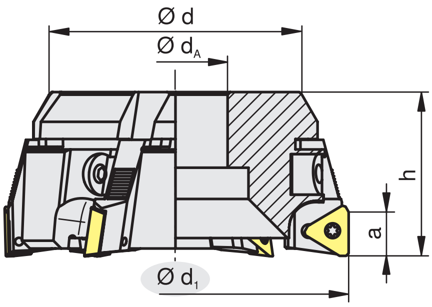
B142



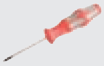
B206-B208

MaxiMill 260 system

A260-025



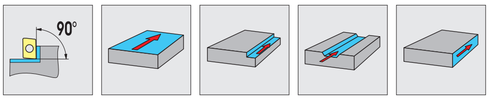
d$_1$ [mm]	Type, description	h [mm]	d [mm]	d$_A$ [mm]	a [mm]	z	[kg]	[Nm]		
89	A260.08.R.05/025	52	66	27	18	5	1.31	5	TP.. 2204..	E01
109	A260.10.R.06/025	52	86	32	18	6	1.93	5	TP.. 2204..	E01
132	A260.12.R.07/025	63	95	40	18	7	3.47	5	TP.. 2204..	E01
167	A260.16.R.10/025	63	130	40	18	10	6.02	5	TP.. 2204..	E01
207	A260.20.R.12/025	63	172	60	18	12	9.88	5	TP.. 2204..	E01
257	A260.25.R.14/025	63	222	60	18	14	16.71	5	TP.. 2204..	E01
322	A260.31.R.18/025	80	280	60	18	18	31.46	5	TP.. 2204..	E01
407	A260.40.R.22/025	80	365	60	18	22	67.51	5	TP.. 2204..	E01

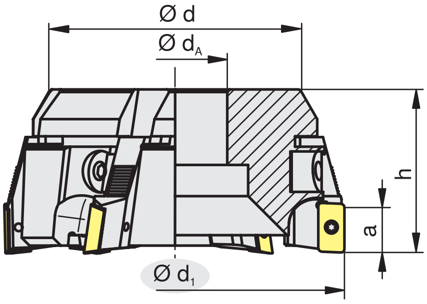
							
E01	106607	106022	106934	112188	11149571	8095010600	4425

B276 B226 B224 B206-B208

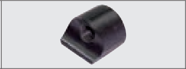
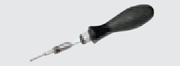
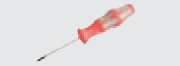
MaxiMill 260 system

A260-026/-040

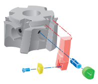




d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	[kg]	[Nm]		
89	A260.08.R.05/040	52	66	27	14	5	1.31	3.2	AD.. 1505..	E01
109	A260.10.R.06/040	52	86	32	14	6	1.92	3.2	AD.. 1505..	E01
132	A260.12.R.07/040	63	95	40	14	7	3.47	3.2	AD.. 1505..	E01
167	A260.16.R.10/040	63	130	40	14	10	6.01	3.2	AD.. 1505..	E01
207	A260.20.R.12/040	63	172	60	14	12	9.87	3.2	AD.. 1505..	E01
257	A260.25.R.14/040	63	222	60	14	14	16.70	3.2	AD.. 1505..	E01
322	A260.31.R.18/040	80	280	60	14	18	31.45	3.2	AD.. 1505..	E01
407	A260.40.R.22/040	80	365	60	14	22	67.50	3.2	AD.. 1505..	E01
89	A260.08.R.05/026	52	66	27	18	5	1.31	5	LP.. 2004..	E02
109	A260.10.R.06/026	52	86	32	18	6	1.93	5	LP.. 2004..	E02
132	A260.12.R.07/026	63	95	40	18	7	3.47	5	LP.. 2004..	E02
167	A260.16.R.10/026	63	130	40	18	10	6.02	5	LP.. 2004..	E02
207	A260.20.R.12/026	63	172	60	18	12	9.88	5	LP.. 2004..	E02
257	A260.25.R.14/026	63	222	60	18	14	16.71	5	LP.. 2004..	E02
322	A260.31.R.18/026	80	280	60	18	18	31.46	5	LP.. 2004..	E02
407	A260.40.R.22/026	80	365	60	18	22	67.51	5	LP.. 2004..	E02

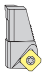
							
E01	106607	165795	106934	112188	11149570	8095010500	4425
E02	106607	106022	106934	112188	11149571	8095010600	4425

B276



B226

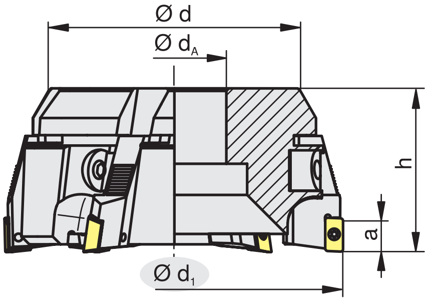
B222+B224



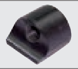
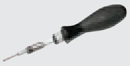
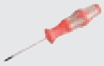
B206-B208

MaxiMill 260 system

A260-054/-056



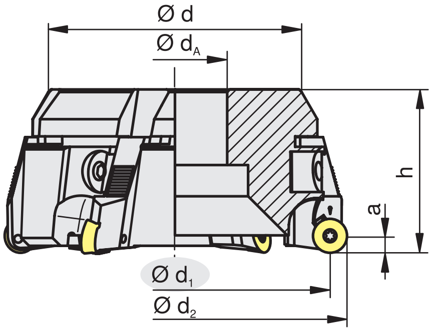
d$_1$ [mm]	Type, description	h [mm]	d [mm]	d$_A$ [mm]	a [mm]	z	[kg]	[Nm]		
89	A260.08.R.05/054	52	66	27	10	5	1.33	1.6	XD.. 11..	E01
109	A260.10.R.06/054	52	89	32	10	6	1.95	1.6	XD.. 11..	E01
132	A260.12.R.07/054	63	95	40	10	7	3.50	1.6	XD.. 11..	E01
167	A260.16.R.10/054	63	130	40	10	10	6.05	1.6	XD.. 11..	E01
207	A260.20.R.12/054	63	172	60	10	12	9.92	1.6	XD.. 11..	E01
257	A260.25.R.14/054	63	222	60	10	14	16.76	1.6	XD.. 11..	E01
322	A260.31.R.18/054	80	280	60	10	18	31.53	1.6	XD.. 11..	E01
407	A260.40.R.22/054	80	365	60	10	22	67.59	1.6	XD.. 11..	E01
89	A260.08.R.05/056	52	66	27	14	5	1.33	3.2	XD.. 15..	E02
109	A260.10.R.06/056	52	89	32	14	6	1.95	3.2	XD.. 15..	E02
132	A260.12.R.07/056	63	95	40	14	7	3.50	3.2	XD.. 15..	E02
167	A260.16.R.10/056	63	130	40	14	10	6.05	3.2	XD.. 15..	E02
207	A260.20.R.12/056	63	172	60	14	12	9.92	3.2	XD.. 15..	E02
257	A260.25.R.14/056	63	222	60	14	14	16.76	3.2	XD.. 15..	E02
322	A260.31.R.18/056	80	280	60	14	18	31.53	3.2	XD.. 15..	E02
407	A260.40.R.22/056	80	365	60	14	22	67.59	3.2	XD.. 15..	E02

							
E01	106607	11114242	106934	112188	11254598	8095003900	4425
E02	106607	11450042	106934	112188	11450867	8095012000	4425

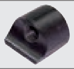
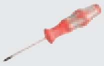
B276
B226
B121-B122
B206-B208

MaxiMill 260 system

A260-052/-053



d$_1$ [mm]	Type, description	d$_2$ [mm]	h [mm]	d [mm]	d$_A$ [mm]	a [mm]	z	[kg]	[Nm]		
80	A260.08.R.05/052	92	52	66	27	6	5	1.33	3.2	RP.. 1204..	E01
100	A260.10.R.06/052	112	52	86	32	6	6	1.94	3.2	RP.. 1204..	E01
123	A260.12.R.07/052	134	63	95	40	6	7	3.49	3.2	RP.. 1204..	E01
158	A260.16.R.10/052	170	63	130	40	6	10	6.04	3.2	RP.. 1204..	E01
198	A260.20.R.12/052	210	63	172	60	6	12	9.91	3.2	RP.. 1204..	E01
248	A260.25.R.14/052	260	63	222	60	6	14	16.74	3.2	RP.. 1204..	E01
313	A260.31.R.18/052	325	80	280	60	6	18	31.51	3.2	RP.. 1204..	E01
398	A260.40.R.22/052	410	80	365	60	6	22	67.56	3.2	RP.. 1204..	E01
80	A260.08.R.05/053	96	52	66	27	8	5	1.30	5	RP.. 1605..	E02
100	A260.10.R.06/053	116	52	86	32	8	6	1.92	5	RP.. 1605..	E02
123	A260.12.R.07/053	139	63	95	40	8	7	3.46	5	RP.. 1605..	E02
158	A260.16.R.10/053	174	63	130	40	8	10	6.00	5	RP.. 1605..	E02
198	A260.20.R.12/053	214	63	172	60	8	12	9.86	5	RP.. 1605..	E02
248	A260.25.R.14/053	264	63	222	60	8	14	16.68	5	RP.. 1605..	E02
313	A260.31.R.18/053	329	80	280	60	8	18	31.43	5	RP.. 1605..	E02
398	A260.40.R.22/053	414	80	365	60	8	22	67.47	5	RP.. 1605..	E02

							
E01	106607	165795	106934	112188	11149570	8095010500	4425
E02	106607	106022	106934	112188	11149571	8095010600	4425

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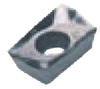
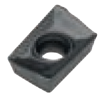
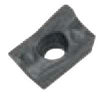
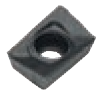
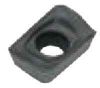
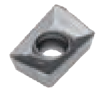
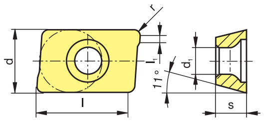
B182-B183
B206-B208

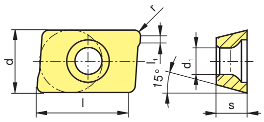
MaxiMill 260 system

AD.. (040) / AP.. (042)

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-27P		APHT 100302FR-27P															●	●					6.65	9.80	3.50	1.7	0.20	2.80
		APHT 100304FR-27P															●	●					6.65	9.80	3.50	1.7	0.40	2.80
		APHT 100308FR-27P															●	●					6.65	9.80	3.50	1.7	0.80	2.80
-29		ADKT 1505PDSR-29					●	●			●												9.57	15.20	5.65	1.2	0.80	4.40
		APKT 1003PDSR-29					●	●												●			6.65	9.80	3.50	1.0	0.50	2.80
-29M		APKT 1003PDSR-29M					●	●															6.65	9.94	3.80	1.6	0.50	2.80
		APKT 100308SR-29M					●																6.65	9.80	3.80	0.8	0.80	2.80
-31		APKT 1003PDSR-31												●	●								6.65	9.80	3.50	1.0	0.50	2.80
-33		APHT 100308SR-33									●												6.65	9.80	3.50	1.7	0.80	2.80
		APHT 100308SR-33P									●												6.65	9.80	3.50	1.7	0.80	2.80
		APHT 100312SR-33									●												6.65	9.80	3.50	2.0	1.20	2.80
		APHT 100320SR-33									●												6.65	9.80	3.50	1.3	2.00	2.80
		APHT 100332SR-33									●												6.65	9.80	3.50		3.20	2.80
APHW		APHW 100308SR		●																			6.65	10.10	3.50	1.4	0.80	2.80





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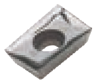
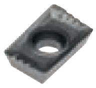
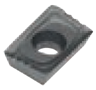
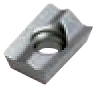
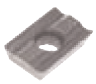
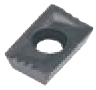
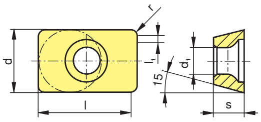
MaxiMill 260 system

LD.. (051)

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-27P		LDFT 150405FR-27P															●						9.52	15.00	4.76	1.2	0.50	4.40
		LDFT 150408FR-27P																●					9.52	15.00	4.76	1.2	0.80	4.40
-29		LDFT 1504PDSR-29					●	●															9.52	15.00	4.76	1.2	0.80	4.40
		LDMT 1504PDSR-29					●	●															9.52	15.00	4.76	1.2	0.80	4.40
-33		LDFT 1504PDSR-33									●												9.52	15.00	4.76	0.8	1.20	4.40
		LDFT 150416SR-33									●												9.52	15.00	4.76	0.9	1.60	4.40
		LDFT 150420SR-33									●												9.52	15.00	4.76	0.9	2.00	4.40
		LDFT 150432SR-33									●												9.52	15.00	4.76	1.0	3.20	4.40
		LDFT 150440SR-33									●												9.52	15.00	4.76		4.00	4.40
LDFT		LDFT 150408ER																			●		9.52	15.00	4.76		0.80	4.40
LDFT-P		LDFT 150408FR-P																●					9.52	15.00	4.76	1.2	0.80	4.40
LDFW		LDFW 1504PDSR					●							●									9.52	15.00	4.76	1.2	0.80	4.40



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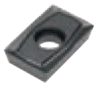
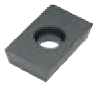
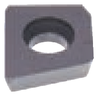
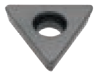
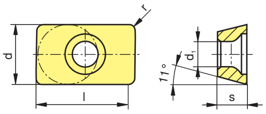
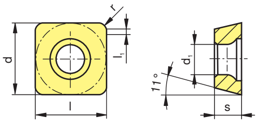
MaxiMill 260 system

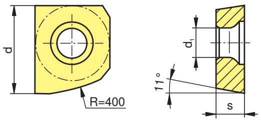
LP.. (026) / TP.. (025) / SP.. (018)

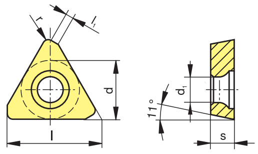
	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-29		LPHT 200408ER-29						●															12.70	20.00	4.76	0.80	5.50
LPHW		LPHW 200408ER																●					12.70	20.00	4.76	0.80	5.50
		LPHW 200408SR						●															12.70	20.00	4.76	0.80	5.50
-29		SPKT 1204EDSR-29					●																12.70	12.70	4.76	0.25	5.50
SPEX		SPEX 1204EETR																●					12.70	12.00	4.76		5.50
SP..W		SPKW 1204EDER												●									12.70	12.70	4.76	0.25	5.50
		SPKW 1204EDSR						●															12.70	12.70	4.76	0.25	5.50
TPKW		TPKW 2204PDER																●					12.70	20.80	4.76	1.20	5.50
		TPKW 2204PDSR						●															12.70	20.80	4.76	1.20	5.50
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	r	d_1









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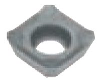
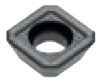
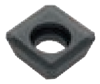
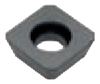
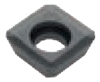
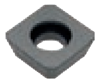
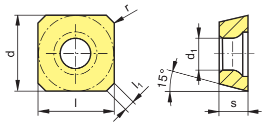
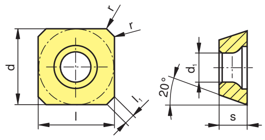
MaxiMill 260 system

SD.. (029) / SE.. (032)

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215				
P	●	●	●	●	●	●	○	○	○						○			○						
M		●			○	○	●	●	●									●						
K		○	●	●	●					●	●	●	●		○	●	●	○		●				
N														●	●	●	●							
S																		●	●					
H											○									●				

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215					d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
-27P		SDHT 1504AEFN-27																●									15.88	15.88	4.76	1.74	0.20	5.50
		SEHT 1204AEFN-27																●									12.70	12.70	4.76	1.60	0.20	5.50
		SEHT 1204AEFN-27P																●									12.70	12.70	4.76	1.60	0.20	5.50
-33		SEHT 1204AFSN-33									●																12.70	12.70	4.76	1.63	1.20	5.50
SD..T		SDHT 1504AESN						●																			15.88	15.88	4.76	1.74	0.20	5.50
SD..W		SDHW 1504AEEN																●									15.88	15.88	4.76	1.74	0.20	5.50
		SDHW 1504AESN					●	●																			15.88	15.88	4.76	1.74	0.20	5.50
SE..T		SEHT 1204AFSN						●																			12.70	12.70	4.76	2.40	0.20	5.50
SE..W		SEHW 1204AFSN						●																			12.70	12.70	4.76	2.30	0.30	5.50
		SEKW 1204AFSN					●	●						●													12.70	12.70	4.76	2.20	2.40	5.50
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215					d	l	s	l_1	r	d_1





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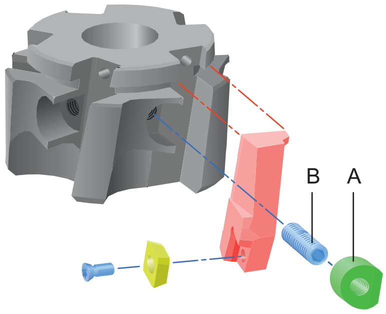
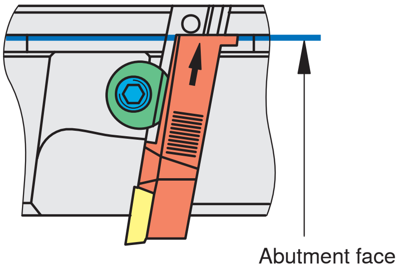


The special construction of the clamping wedge connection ensures that there is no axial movement of the cassette during clamping.

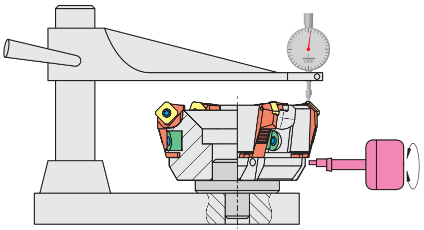
Correct assembly and disassembly of the cassettes

1 Clean the milling tool.
2 Loosen clamping wedge (A) by turning the clamping screw (B) anti-clockwise until the cassette can be removed radially. Screw and wedge remain on the cutter body.
3 Clean all surfaces of both cassette and cutter body.
4 Mount cassette and ease it into the desired position along the groove (e.g. circlip groove).
5 Clamp cassette with wedge.
Screw torque setting: 12 Nm.
Correct assembly of clamping wedge: turn screw once into the clamping wedge with left-handed thread. Screw wedge into cutter body with help of S4 key. Take care to avoid turning of wedge before it is fully engaged with the cutter body.



Setting of axial run-out for roughing

For assembly, simply push the cassettes to the ground abutment face. The total axial run-out will be a maximum of 0.03 mm measured to a master insert (as delivered).



Setting of axial run-out with eccentric key and clock gauge or optical pre-setting equipment

Exact setting of axial run-out up to 0.002 mm

1 Clean milling tool.
2 Mount cutter on appropriate setting equipment.
3 Loosen clamping wedge, push cassette to abutment and tighten wedge lightly.
4 Insert eccentric key into hole and turn until cassette is in desired position.
5 Keep eccentric key permanently in contact with the cassette so that it remains in position. Tighten clamping wedge (torque moment 12 Nm).

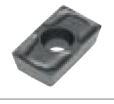
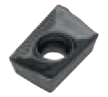
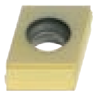
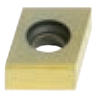
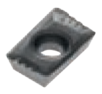
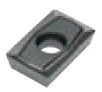
Other inserts

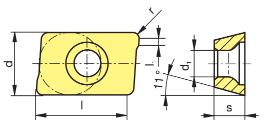
A.. C.. L..	B229
O.. S.. T.. W..	B231

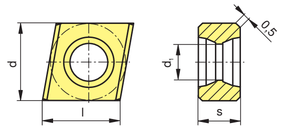
Other systems

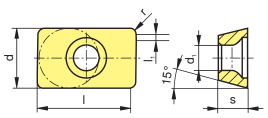
A.. C.. L..

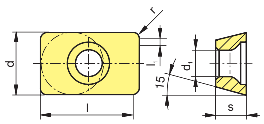
	CTEP210	TCM10	CTCP220	CTPP225	CTP1625	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	●	○	○	○						○			○		
M		●			●	○	○	●	●	●									●		
K		○	●	●	○	●					●	●	●	●		○	●	●	○		●
N															●	●	●	●			
S					○														●	●	
H												○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTP1625	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l1 [mm]	r [mm]	d1 [mm]
APFT..-29		APFT 1604PDSR-29						●	●															9.52	16.39	4.76	1.2	0.80	4.40
APKT..-29		APKT 1604PDSR-29						●	●												●			9.52	16.39	5.26	1.2	0.80	4.40
CNHT		CNHT 1005					●												●					10.00	10.15	5.40		0.50	4.70
		CNHT 1205					●												●					10.00	12.90	5.40		0.50	4.70
CNHW		CNHW 1005					●												●					10.00	10.15	5.40		0.50	4.70
		CNHW 1205					●												●					10.00	12.90	5.40		0.50	4.70
-29		LDHT 100204ER-29							●															6.35	10.00	2.58		0.40	2.80
LDHT..-29		LDHT 15T3PDSR-29							●															9.52	15.00	3.97	1.2	0.80	4.40
		LDHT 15T308FR-29																	●					9.52	15.00	3.97		0.80	4.40



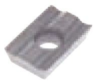
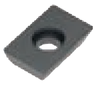
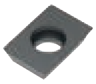


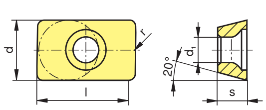


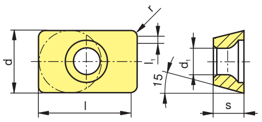


B12-B18
B21
B257-B266

	CTEP210	TCM10	CTCP220	CTPP225	CTP1625	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	●	○	○	○						○			○		
M		●			●	○	○	●	●	●									●		
K		○	●	●	○	●					●	●	●	●		○	●	●	○		●
N															●	●	●	●			
S					○														●	●	
H												○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTP1625	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
LE..-29		LEHT 08T104ER-29							●															5.56	8.00	1.98		0.40	2.50
LDHT		LDHT 15T308FR																	●					9.52	15.00	3.97		0.80	4.40
LDHW		LDHW 15T308ER													●				●					9.52	15.00	3.97		0.80	4.40
		LDHW 15T308SR		●				●	●															9.52	15.00	3.97		0.80	4.40
LEHW		LEHW 08T104ER							●															5.56	8.00	1.98		0.40	2.50
			CTEP210	TCM10	CTCP220	CTPP225	CTP1625	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	l_1	r	d_1





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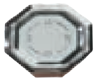
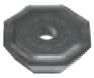
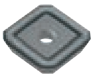
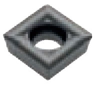
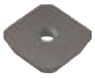
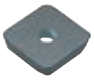
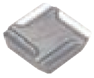
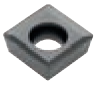
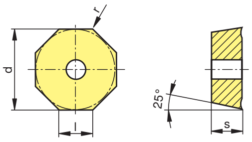
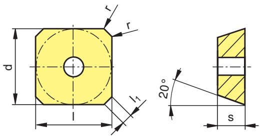
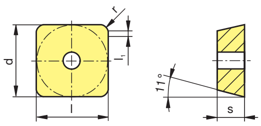
Other systems

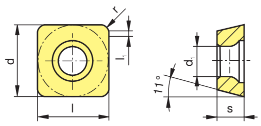
O.. S.. T.. W..

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
P			●	●	●	●	●	●	○	○	○						○			○								
M				●			○	○	●	●	●									●								
K				○	●	●	●					●	●	●	●		○	●	●	○		●						
N																●	●	●	●									
S																				●	●							
H													○									●						
OFHR..-27P		OFHR 070410FN-27P																●					18.18	7.00	4.97	1.5	1.00	
OFHR..-33		OFHR 070410SN-33									●												18.18	7.00	4.97	1.5	1.00	
SEKR..-29		SEKR 1203AFSN-29						●															12.70	12.70	3.18		2.40	
SPKR..-29		SPKR 1203EDSR-29						●															12.70	12.70	3.18		0.30	
SEHR..-33		SEHR 1203AFSN-33									●												12.70	12.70	3.18		1.20	
SPMT..-33		SPMT 070308SN-33									●												7.94	7.94	3.18		0.80	2.80
SEKN		SEKN 1203AFEN									●												12.70	12.70	3.18		2.40	
		SEKN 1203AFSN		●			●	●						●									12.70	12.70	3.18		2.40	
		SEKN 1504AFSN						●			●												15.88	15.88	4.76		2.40	
SPKN		SPKN 1203EDER												●				●					12.70	12.70	3.18			
		SPKN 1203EDSR					●	●															12.70	12.70	3.18			
		SPKN 1504EDSR						●															15.88	15.88	4.76			
SPKR		SPKR 1203EDFR																●					12.70	12.70	3.18			
SPMT		SPMT 090308SN						●															9.52	9.52	3.18		0.80	3.40









B12-B18

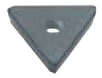
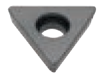
B21

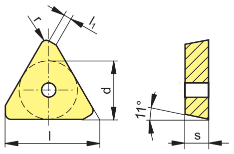
B257-B266

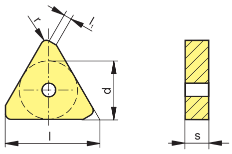
Other systems

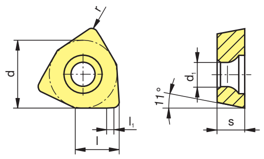
O.. S.. T.. W..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	l_1 [mm]	r [mm]	d_1 [mm]
TPKR..-29		TPKR 1603PPSR-29						●															9.52	15.50	3.18	1.2		
		TPKR 2204PDSR-29					●	●															12.70	20.70	4.76	1.4		
TNHF..-31		TNHF 1204ANSN-31Q												●									12.70	18.90	4.76	2.6		
TPKN		TPKN 1603PPSR						●															9.52	15.50	3.18	1.4		
		TPKN 2204PDER												●									12.70	22.00	4.76	1.4		
		TPKN 2204PDSR					●	●															12.70	22.00	4.76	1.4		
TPKW		TPKW 16T3PPSR						●															9.52	15.50	3.97	1.4	1.10	4.40
-29		WPHT 0603PDSR-29		●			●	●															9.52	6.00	3.18	1.2	0.80	3.40
		WPMT 0603PDSR-29					●																9.52	6.00	3.18	1.2	0.80	3.40
-31		WPHT 0603PDSR-31												●									9.52	6.00	3.18	1.2	0.80	3.40
-33		WPHT 0603PDSR-33									●												9.52	6.00	3.18	1.2	0.80	3.40







B12-B18

B21

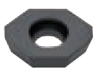
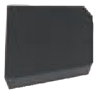
B257-B266

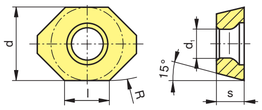
Milling / Other inserts

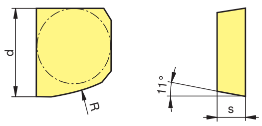
Other systems

OD.. SP..

	CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215
P	●	●	●	●	●	●	○	○	○						○			○		
M		●			○	○	●	●	●									●		
K		○	●	●	●					●	●	●	●		○	●	●	○		●
N														●	●	●	●			
S																		●	●	
H											○									●

			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d [mm]	l [mm]	s [mm]	d_1 [mm]	R [mm]
ODGX		ODGX 1204ADSN					●																12.70	7.17	4.76	5.50	400
SPEX-1		SPEX 1203EDER-1												●									12.70	12.00	3.18		500
			CTEP210	TCM10	CTCP220	CTPP225	CTCP230	CTPP235	CTPM225	CTCM235	CTPM240	CTN3105	CTL3215	CTCK215	CTPK220	CTD4205	AMZ	H216T	CTW4615	CTC5235	CTC5240	CTP6215	d	l	s	d_1	R





B12-B18

B21

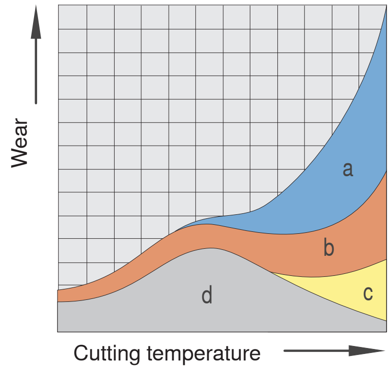
B257-B266

Notes

Causes of wear

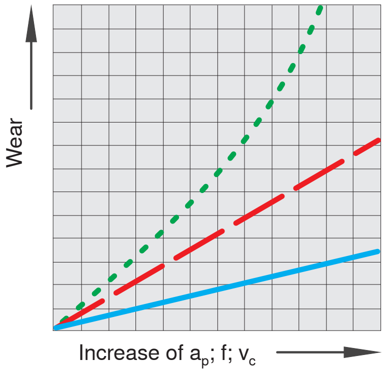
Wear is caused through simultaneous mechanical and thermal stress of the cutting edge.
The most common causes are

- o Mechanical abrasion
- o Damage due to built-up edge (BUE)
- o Oxidation processes
- o Diffusion



With increasing cutting temperature the thermally caused wear types of oxidation and diffusion prevail.

a = diffusion
b = mechanical abrasion
c = oxidation
d = damage due to built-up edge (BUE)



Cutting temperature and wear depend decisively upon the machining conditions.

🟩 Cutting speed
🟥 Feed rate
🟦 Cutting depth

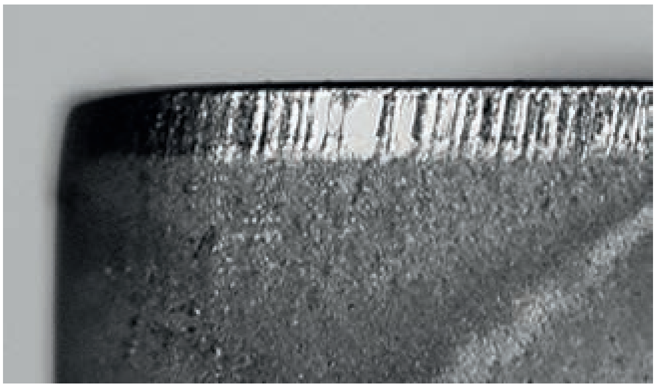
Benefits of hard material coatings

Depositing hard material layers on carbide tools positively influences wear characteristics.

The advantages of hard material layers consist in the reduction of

- o Friction
- o Temperature changes
- o Oxidation
- o Diffusion

Types of wear



Abrasion on flank, normal wear after a certain machining time.

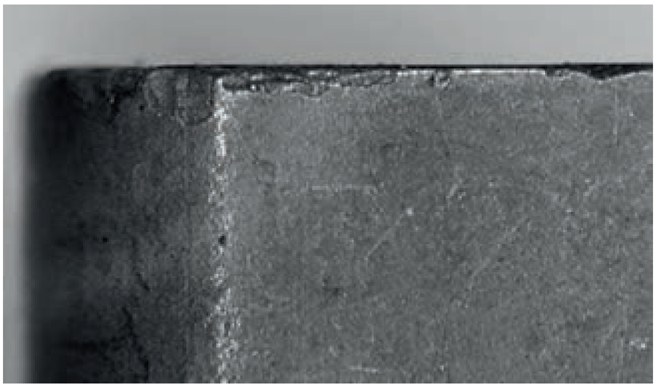
Flank wear

Reasons

- ○ Cutting speed too high
- ○ Carbide grade with insufficient wear resistance
- ○ Incorrect feed rate

Remedies

- ○ Reduce cutting speed
- ○ Select more wear resistant carbide grade
- ○ Adapt feed rate to cutting speed and cutting depth (increase feed rate)



Through excessive mechanical stress at the cutting edge fracture and chipping can occur.

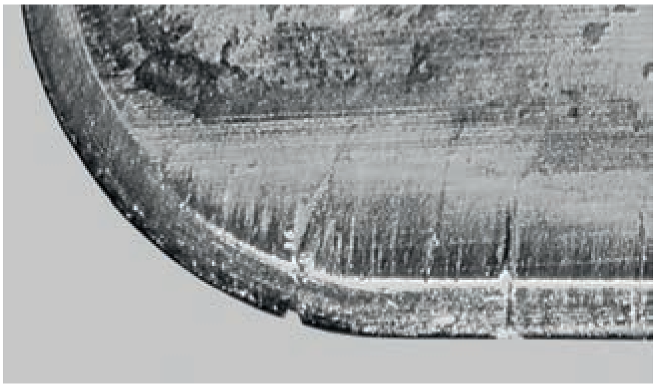
Edge chipping

Reasons

- ○ Grade with too high wear resistance
- ○ Vibration
- ○ Feed rate too high or excessive cutting depth
- ○ Interrupted cut
- ○ Swarf damage

Remedies

- ○ Use tougher grade
- ○ Use negative cutting edge geometry with chip groove
- ○ Increase stability (tool, work piece)



Small cracks at 90° to cutting edge.

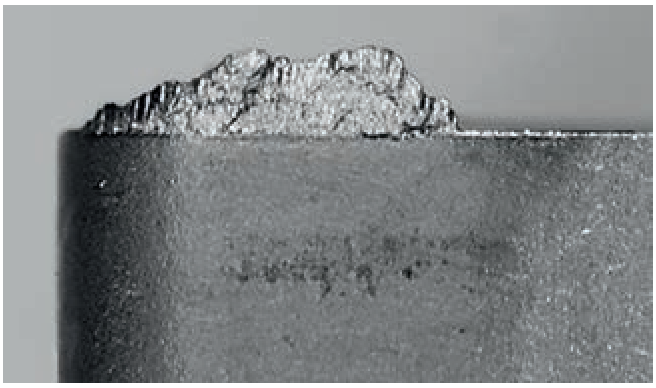
Thermal cracking

Reasons

- ○ Varying temperature of cutting edge, thermal shock
- ○ Incorrect cooling
- ○ High tensile materials
- ○ Cutting speed too high

Remedies

- ○ Use grade that is resistant to thermal cracking
- ○ Apply cooling lubricant abundantly or use dry milling
- ○ Reduce cutting speed
- ○ Decrease feed rate

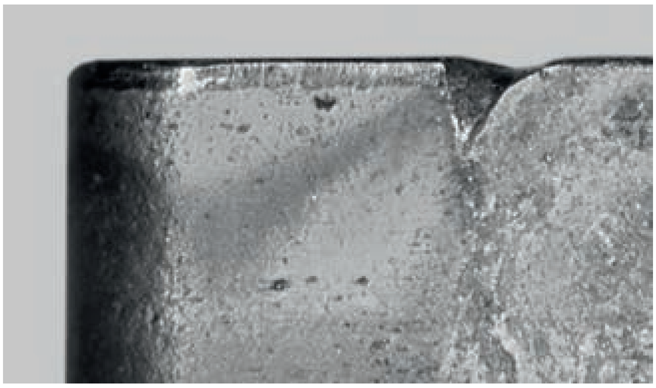


Built-up edge occurs when the chip is not evacuated properly due to insufficient cutting temperature.

Built-up edge

Reasons
- ○ Cutting speed too low
- ○ Rake angle too small
- ○ Wrong cutting material
- ○ Lack of cooling / lubrication

Remedies
- ○ Increase cutting speed
- ○ Increase rake angle
- ○ Apply TiN-coating
- ○ Use emulsion with higher concentration

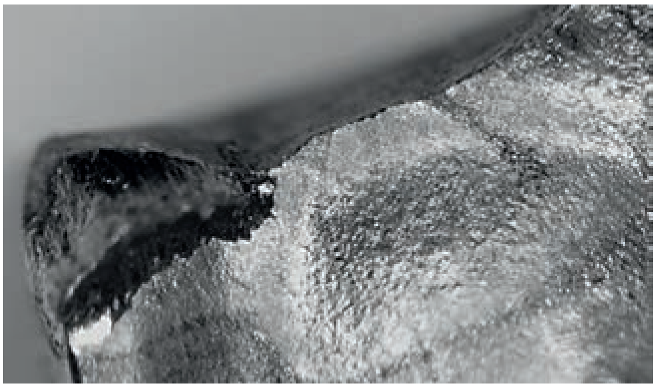


Notch at the maximum cutting depth.

Notching

Reasons
- ○ Cold work hardening materials (e.g. super alloys)
- ○ Cast and forging skin
- ○ Formation of burrs

Remedies
- ○ Decrease cutting speed
- ○ Climb milling
- ○ Change working orientation of the milling cutter
- ○ Reduce approach angle



Excessive stress of the insert causes breakage.

Insert breakage

Reasons
- ○ Excessive stress of the carbide grade
- ○ Lack of stability
- ○ Corner angle too small
- ○ Excessive notching
- ○ Sudden changes of cutting forces

Remedies
- ○ Use tougher cutting material
- ○ Use protective edge chamfer
- ○ Increase edge hone
- ○ Use more stable geometry
- ○ Reduce feed rate

Types of wear

The hot chip which is being evacuated causes cratering at the rake face of the cutting edge.

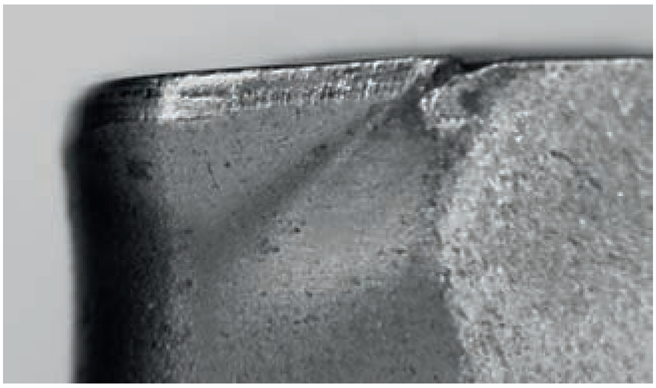
Cratering

Reasons

- Cutting speed and / or feed rate too high
- Rake angle too shallow
- Grade with low wear resistance
- Insufficient coolant supply

Remedies

- Reduce cutting speed and / or feed rate
- Increase coolant quantity and / or pressure, optimise coolant supply
- Use grade with higher resistance to cratering



High machining temperature and simultaneous mechanical stress can lead to plastic deformation.

Plastic deformation

Reasons

- Too high machining temperature, resulting in softening of substrate
- Damaged coatings
- Chip groove too narrow

Remedies

- Reduce cutting speed
- Choose carbide grade with higher wear resistance
- Provide cooling

Measures for milling problems

Type of problem													
Flank wear	Edge chipping	Thermal cracks	Built-up edge	Notching	Insert breakage, edge chipping	Cratering	Deformation of cutting edge	Bad work piece surface	Chattering, vibration	Chip formation, chip jamming	Edge chipping on the work piece	Overstress of the machine	Corrective measures
⇩	⇧	⇩	⇧	⇩		⇩	⇩	⇧	≈			⇩	**Cutting speed**
⇧	⇩	⇩	⇧	⇩	⇩	⇩	⇩	⇩	≈		⇩	⇩	**Feed rate per tooth**
	⇧	≈		⇧	⇧								**Toughness of cutting material**
⇧				≈		⇧	⇧						**Wear resistance of cutting material**
		⇩	≈	⇩					⇩	≈	⇩	⇩	**Approach angle**
	≈		⇧	≈	≈		⇧		⇧	≈			**Rake angle**
	⇧		≈	⇧				⇩			⇩		**Cutting edge facet**
	⇧				⇧			⇧	⇧				**Stability**
								⇧	⇧		≈		**Precision of axial & radial run-out**
≈	≈				≈		≈	≈			≈		**Wear of cutting edge**
					≈			≈	≈		≈		**Positioning of the milling tool**
		⇧	⇧	⇧		⇧	≈	≈		≈			**Cooling, chip removal**
					≈			≈	≈				**Insert, cassette clamping**
	≈			≈	≈			≈	≈		⇩	⇩	**Depth of cut**

⇧ raise, increase

⇩ lower, decrease

≈ check, optimise

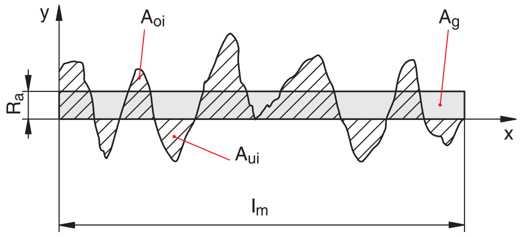
Surface quality

Definition of measured variables for surface quality

The surface quality of milled work pieces is influenced through
- ○ the machine tool (condition, stability)
- ○ the milling tool (cutting edge geometry, construction)
- ○ the application data (v_f, v_c, f_z)
- ○ the work piece (geometry, material, clamping)

The average roughness value R_a is the arithmetical mean of the roughness profile within the entire measured length l_m.

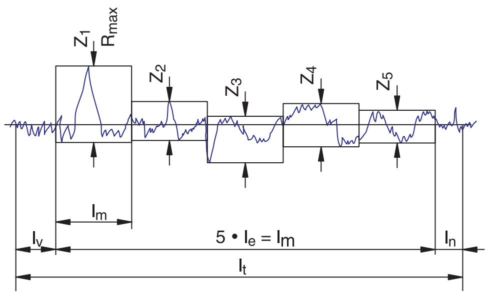
$$R_a = \frac{1}{l_m} \int_{x=0}^{x=l_m} |y| \, dx$$



Average roughness value R_a

Average roughness depth R_z is the arithmetic mean resulting from the single roughness depths Z_i of five successive single measured lengths.

$$R_z = \frac{\sum_{i=1}^{5} Z_i}{5}$$



Determination of the average roughness depth R_z from the roughness profile

Maximum roughness depth R_{max} is the largest single roughness depth Z_i on the measured length l_m.

In order to produce an excellent surface finish with insert milling cutters, inserts with wiper facets are employed.

Maximum profile depth P_t

f [mm]	l_1 [mm]				
	1,0	**1,4**	**1,6**	**2,5**	**9,0**
0,3	0,5	0,5	0,5	0,5	0,5
0,45	0,8	0,8	0,8	0,8	0,8
0,6	1,0	1,0	1,0	1,0	1,0
0,75	1,3	1,3	1,3	1,3	1,3
1,0	1,7	1,7	1,7	1,7	1,7
1,5	20,0	5,0	2,7	2,7	2,7
2,0	30,0	19,0	13,0	4,0	4,0
2,5	37,0	27,0	23,0	6,4	4,4
3,0	40,0	33,0	29,0	12,0	5,0

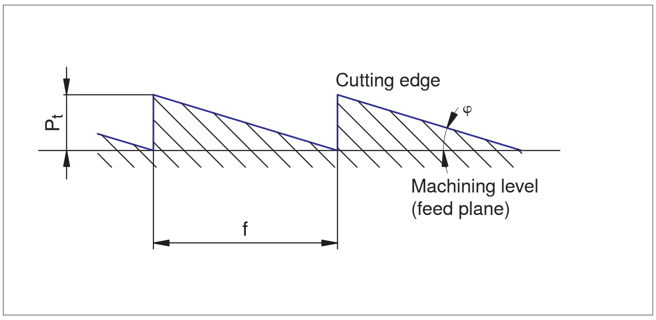
f [mm]	l_1 [mm]				
	1,0	**1,4**	**1,6**	**2,5**	**9,0**
3,5	44,0	37,0	34,0	19,0	6,0
5,0	49,0	44,0	42,0	32,0	8,7
7,5	53,0	50,0	48,0	42,0	13,0
12,0	56,0	54,0	53,0	50,0	23,0
20,0	58,0	57,0	56,0	55,0	41,0
30,0	59,0	58,0	58,0	57,0	50,0
40,0	59,0	59,0	59,0	58,0	54,0
50,0	59,0	59,0	59,0	59,0	57,0
60,0	60,0	60,0	60,0	59,0	60,0

Calculation example:

Type of cutter:	A260.12.R.07/018
Insert:	SPKW 1504AE
Cutter diameter d_1:	125 mm
Number of teeth z:	7
Feed per tooth f_z:	0.125 mm
Feed per revolution f:	0.875 mm
Facet length l_1:	≈ 2.5 mm

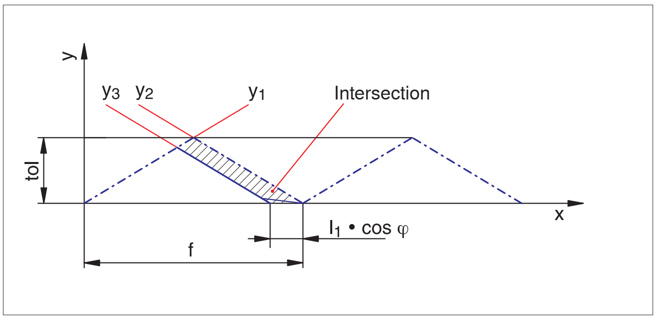
$f = f_z \cdot z = 0{,}125 \cdot 7 = 0.875$ mm

Maximum profile depth Pt ≈ 1.6 *µ*m



$f < l_1$:
Profile is produced by the deepest cutting edge axially.

$$P_t = f \bullet \tan(\varphi)$$



$f > l_1$:
Several cutting edges produce the surface

$$P_t = tol + l_1\left(\frac{\sin\varphi}{z} - \frac{\cos\varphi \bullet tol}{f}\right)$$

E.g.:
tol ≈ axial run-out of cutter (0.04 mm) + adapter run-out (0.02 mm) = 0.06 mm (φ ≈ 6' or 0.1°)

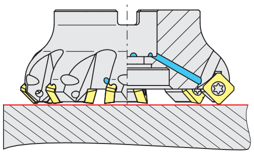
E.g.:
P_t [*µ*m] tol* = 0.04 mm + 0.02 mm
Tool clamping
Tool

*) In most cases considerably more accurate axial run-out values will result. With 0.06 mm an excessive tolerance condition is assumed. If the cutting edges are precisely adjusted, the axial run-out will be negligible.

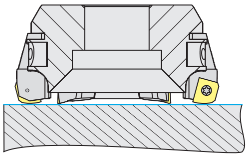
Finishing

Masterfinish MaxiMill 273/270/260

Conventional

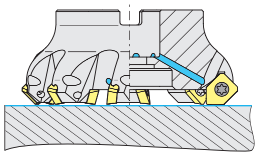


1) Roughing



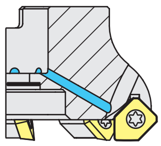
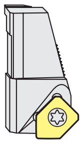
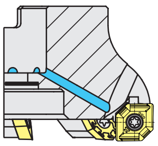
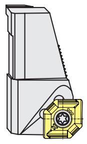
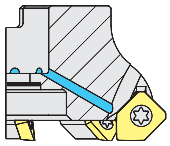
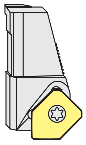
2) Finishing

CERATIZIT Masterfinish

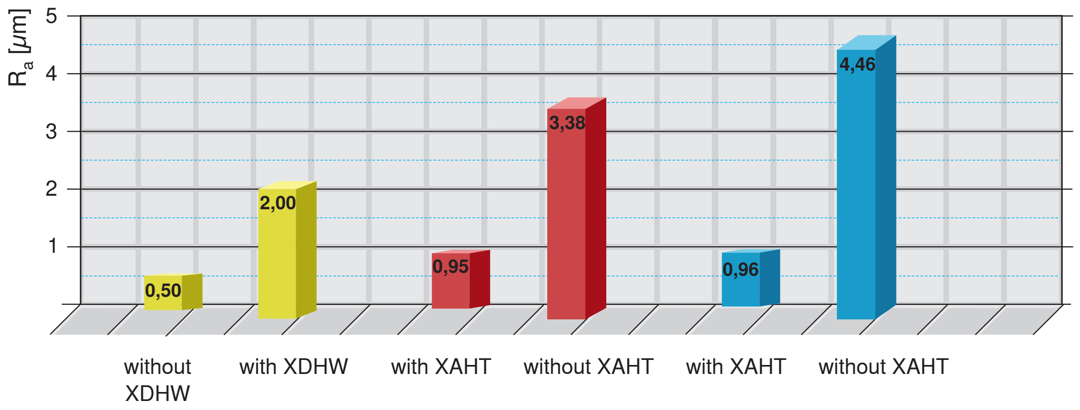


Roughing and finishing in a single operation

Application in the following CERATIZIT milling systems

270-09	260-41	273-06	260-57	270-12	260-31
					
Ø 32 160	Ø 80 - 400	Ø 40 - 315	Ø 80 - 398	Ø 32 - 160	Ø 80 - 400
➔ **B57**	➔ **B211**	➔ **B66**	➔ **B213**	➔ **B58**	➔ **B211**

Examples for economic application (finish milling with XDHW)



🟨 A273.125.R.17-06
OAKU 060508SR-M50 CTP2235
XAHT 060508SR-F50 CTP2235
1.4571 (stainless tempered steel)
X6CrNiMoTi 17 12 2

a_e = 80 mm f_z = 0.25 mm
a_p = 0.5 mm v_c = 200 m/min

🟥 A270.125.R.12-12
SDHT 1204AESN-R SR226+
XDHW 1204AESN SR226+
1.7225 (non alloyed tempered steel)
42CrMo4

a_e = 96 mm f_z = 0.25 mm
a_p = 0.5 mm v_c = 350 m/min

🟦 A270.125.R.12-12
SDHT 1204AESN-R SR226+
XDHW 1204AESN SR226+
1.7225 (non alloyed tempered steel)
42CrMo4

a_e = 96 mm f_z = 0.25 mm
a_p = 0.5 mm v_c = 400 m/min

Cutting speed [m/min]

$$v_c = \frac{d_1 \bullet \pi \bullet n}{1000}$$

Revolutions of spindle [min^{-1}]

$$n = \frac{v_c \bullet 1000}{d_1 \bullet \pi}$$

Feed per tooth [mm]

$$f_z = \frac{v_f}{n \bullet z}$$

Feed rate [mm/min]

$$v_f = f_z \bullet n \bullet z$$

Feed per revolution [mm]

$$f = f_z \bullet z$$

Metal removal rate [cm^3/min]

$$Q = \frac{a_p \bullet a_e \bullet v_f}{1000}$$

Medium chip thickness [mm]:

$$h_m = \frac{\sin(\kappa) \bullet 180 \bullet a_e \bullet f_z}{\pi \bullet d_1 \bullet \arcsin\left(\frac{a_e}{d_1}\right)}$$

Specific cutting force

$$k_c = h_m^{-mc} \bullet k_{c1.1}$$

Power consumption [kW]

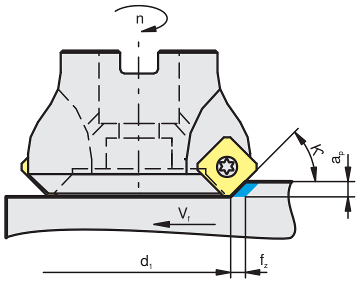
$$P_{mot} = \frac{a_p \bullet a_e \bullet v_f}{60 \bullet 10^6 \bullet \eta_m} \bullet k_c$$

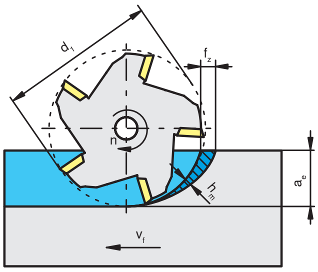
Material designations & dimensions

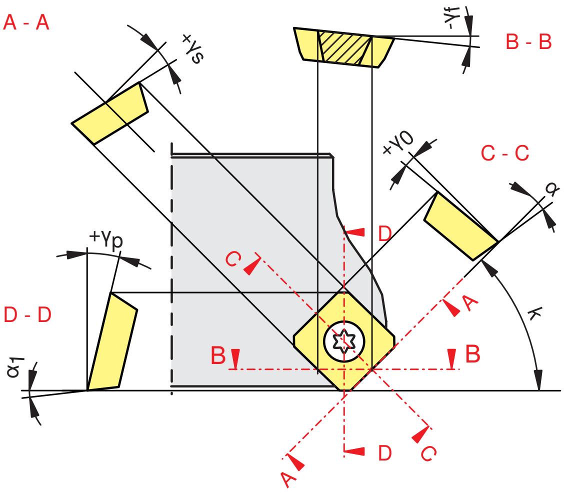
a_e	Cutting width [mm]
a_p	Depth of cut [mm]
d_1	Cutter diameter [mm]
D_w	Work piece diameter [mm]
f_z	Feed per tooth [mm]
h_m	Medium chip thickness [mm]
k	Number of insert rows
k_c	Specific cutting force [N/mm^2]
$k_{c1.1}$	Specific cutting force for 1 mm^2 chip cross section [N/mm^2]
l_1	Length of wiper facet [mm]
m_c	Increase of specific cutting force
n	Revolutions of spindle [min^{-1}]
P_{mot}	Power consumption [kW]
Q	Metal removal rate [cm^3]
v_c	Cutting speed [m/min]
v_f	Feed rate [mm/min]
z	Effective numer of edges [pcs.]
η_m	Mechanical efficiency [%]
γ_0	Perpendicular rake angle (effective rake angle) [°]
γ_f	Lateral rake angle (radial rake anglel) [°]
γ_p	Tool back clearance (axial rake angle) [°]
γ_w	Rake angle of the insert [°]
κ	Cutting edge angle (approach angle) [°]
λ_s	Inclination angle [°]
a	Clearance angle [°]
a_1	Clearance angle of the corner facet [°]

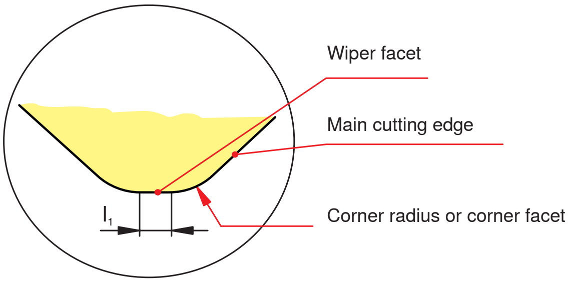
Formula collection

Formulas and examples









Calculation example:

Cutter type: ... A270.40.R.04
Insert: ... SDMT 1204AESN-29R
Cutter diameter: ... 40 mm
Effective number of teeth: ... 4
Depth of cut a_p: ... 2 mm
Cutting width a_e: ... 28 mm
Approach angle κ: ... 45°
Axial rake angle γ_p: ... +13°
Radial rake angle γ_f: ... -6°

Selected cutting speed
v_c: ... 225 m/min

Calculation of rev number:

$$n = \frac{225 \bullet 1000}{40 \bullet \pi} = 1790 \text{ min}^{-1}$$

Selected feed per tooth ... 0.15 mm

Calculation of feed rate:

$$v_f = 0{,}15 \bullet 1790 \bullet 4 = 1074 \text{ mm/min}$$

Calculation of chip removal rate:

$$Q = \frac{2 \bullet 28 \bullet 1074}{1000} = 60 \text{ cm}^3\text{/min}$$

Calculation of the perpendicular rake angle:

$$\gamma_0 = \arctan \begin{bmatrix} \cos(90°) \bullet \tan(13°) \\ + \sin(90°) \bullet \tan(-6°) \end{bmatrix} = -6°$$

Medium chip thickness [mm]:

$$h_m = \frac{\sin(90°) \bullet 180 \bullet 28 \bullet 0{,}15}{\pi \bullet 40 \bullet \arcsin\left(\frac{28}{40}\right)} = 0{,}13 \text{ mm}$$

Specific cutting force

$$k_c = 0{,}13^{-0{,}24} \bullet 1700 = 2774 \text{ N/mm}^2$$

Power consumption [kW]

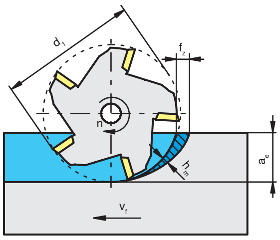
$$P_{mot} = \frac{2 \bullet 28 \bullet 1074}{60 \bullet 10^6 \bullet 0{,}80} \bullet 1700 = 2{,}13 \text{ kW}$$

The following equations give approximate figures in the proportion of a_e/d_1 (a_p/d_1).

Peripheral milling cutters, side and face milling cutters

$$f_z \approx h_m \bullet \sqrt{\frac{d_1}{a_e}}$$

$$h_m \approx f_z \bullet \sqrt{\frac{a_e}{d_1}}$$



Calculation example:

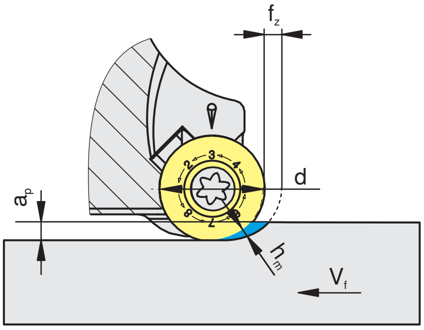
Cutter type: ... C244.25.R.02
Cutter diameter d_1: ... 25 mm
Width of cut a_e: ... 10 mm
Medium chip thickness h_m ... 0.15 mm

$$f_z \approx 0{,}15 \bullet \sqrt{\frac{25}{10}} \approx 0{,}24 \text{ mm}$$

Button insert cutters

$$f_z \approx h_m \bullet \sqrt{\frac{d}{a_p}}$$

$$h_m \approx f_z \bullet \sqrt{\frac{a_p}{d}}$$



Calculation example:

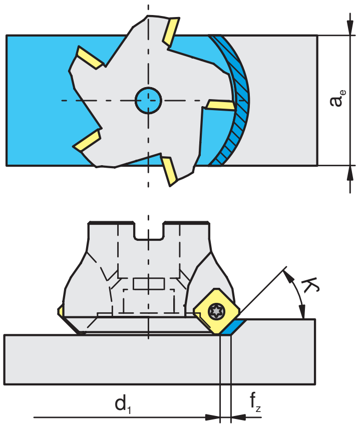
Cutter type: ... A251.63.R.06
Insert: ... RPHX 1204M0SN CTP1235
Insert diameter d: ... 12 mm
Depth of cut a_p: ... 2 mm
Requested medium chip thickness
h_m ... 0.15 mm

$$f_z \approx 0{,}15 \bullet \sqrt{\frac{12}{2}} \approx 0{,}37 \text{ mm}$$

Face milling cutter on centre above work piece

$$h_m = \frac{\sin(\kappa) \bullet 180 \bullet a_e \bullet f_z}{\pi \bullet d_1 \bullet \arcsin\left(\frac{a_e}{d_1}\right)}$$

$$f_z = \frac{h_m \bullet \pi \bullet d_1 \cdot \arcsin\left(\frac{a_e}{d_1}\right)}{\sin(\kappa) \bullet 180 \bullet a_e}$$



Calculation example:

Cutter type: ... A260.08.R.05/018
Cutter diameter d_1: ... 82 mm
Approach angle κ: ... 75°
Cutting width a_e: ... 70 mm
Medium chip thickness h_m ... 0.2 mm

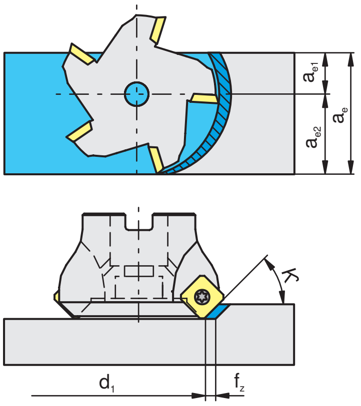
$$f_z = \frac{0{,}2 \bullet \pi \bullet 82 \bullet \arcsin\left(\frac{70}{82}\right)}{\sin(75) \cdot 180 \cdot 70}$$

$$f_z = 0{,}25 \text{ mm}$$

Face milling cutter - off-centre above work piece

$$h_m = \frac{\sin(\kappa) \bullet 360 \bullet a_e \bullet f_z}{\pi \bullet d_1 \bullet \left[\arcsin\left(\frac{2 \bullet a_{e1}}{d_1}\right) + \arcsin\left(\frac{2 \bullet a_{e2}}{d_1}\right)\right]}$$

$$f_z = \frac{h_m \bullet \pi \bullet d_1 \bullet \left[\arcsin\left(\frac{2 \bullet a_{e1}}{d_1}\right) + \arcsin\left(\frac{2 \bullet a_{e2}}{d_1}\right)\right]}{\sin(\kappa) \bullet 360 \bullet a_e}$$



Calculation example:

Cutter type: ... A270.10.R.06/018
Cutter diameter d_1: ... 102 mm
Approach angle κ: ... 75°
Width of cut a_e: ... 70 mm
Width of cut a_{e1}: ... 20 mm
Width of cut a_{e2}: ... 50 mm
Medium chip thickness h_m ... 0.2 mm

$$f_z = \frac{0{,}2 \bullet \pi \bullet 102 \bullet \left[\arcsin\left(\frac{2 \bullet 20}{102}\right) + \arcsin\left(\frac{2 \bullet 50}{102}\right)\right]}{\sin(75°) \cdot 360 \cdot 70}$$

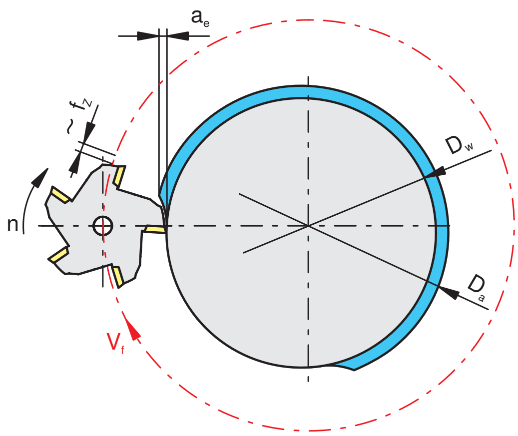
$$f_z = 0{,}27 \text{ mm}$$

Feed rate (speed at centre of milling cutter)

$$v_f = \left(1+\frac{d_1}{D_w}\right) n \cdot f_z \cdot z$$

Actual depth of cut

$$a_e = \frac{D_a^2 - D_w^2}{4 \bullet (D_w + d_1)}$$



Helical milling - external

Calculation example:

Cutter type: ... C210.25.R.04
Cutter diameter d_1: ... 25 mm
Number of teeth z: ... 4
Machined diameter D_w: ... 45 mm
Blank diameter D_a: ... 50 mm
Rev number n: ... 2500 rpm
Feed per tooth f_z: ... 0.05 mm

Feed rate:

$$v_f = \left(1+\frac{25}{45}\right) 2500 \bullet 0{,}05 \bullet 4 = 777 \text{ mm/min}$$

Radial depth of cut:
(50 - 45)/2 = 2,5 mm

Effective radial depth of cut:

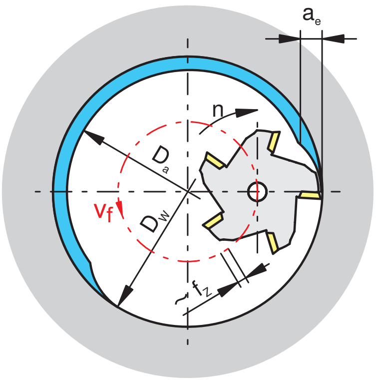
$$a_e = \frac{50^2 - 45^2}{4 \bullet (45 + 25)} = 1{,}7 \text{ mm}$$

Feed rate (speed at centre of milling cutter)

$$v_f = \left(1-\frac{d_1}{D_w}\right) n \cdot f_z \cdot z$$

Actual depth of cut

$$a_e = \frac{D_w^2 - D_a^2}{4 \bullet (D_w + d_1)}$$



Helical milling - internal

Calculation example:

Cutter type: ... C210.25.R.04
Milling cutter diameter d_1: ... 25 mm
Number of teeth z: ... 4
Machined diameter D_w: ... 50 mm
Blank diameter D_a: ... 45 mm
Rev number n: ... 2500 rpm
Feed per tooth f_z: ... 0.05 mm

Feed rate:

$$v_f = \left(1-\frac{25}{50}\right) 2500 \bullet 0{,}05 \bullet 4 = 250 \text{ mm/min}$$

Radial depth of cut:
(50 - 45)/2 = 2,5 mm

Effective radial depth of cut:

$$a_e = \frac{50^2 - 45^2}{4 \bullet (50 - 25)} = 4{,}75 \text{ mm}$$

Hardness values

Comparison table

Tensile strength N/mm²	Vickers HV	Brinell HB	Rockwell HRC	Shore C
575	180	171		
595	185	176		
610	190	181		
625	195	185		
640	200	190	12	
660	205	195	13	
675	210	199	14	
690	215	204	15	
705	220	209	15	28
720	225	214	16	
740	230	219	17	29
755	235	223	18	
770	240	228	20.3	30
785	245	233	21.3	
800	250	238	22.2	31
820	255	242	23.1	32
835	260	247	24	33
850	265	252	24.8	
865	270	257	25.6	
880	275	261	26.4	34
900	280	268	27.1	
915	285	271	27.8	35
930	290	276	28.5	
950	295	280	29.2	36
965	300	285	29.8	37
995	310	295	31	38
1030	320	304	32.2	39
1060	330	314	33.3	40
1095	340	323	34.3	41
1125	350	333	35.5	42
1155	360	342	36.6	43
1190	370	352	37.7	44
1220	380	361	38.8	45
1255	390	371	39.8	46
1290	400	380	40.8	47
1320	410	390	41.8	48
1350	420	399	42.7	
1385	430	409	43.6	49
1420	440	418	44.5	
1455	450	428	45.3	51
1485	460	437	46.1	52
1520	470	447	46.9	53
1555	480	465	47.7	54
1595	490	466	48.4	
1630	500	475	49.1	57
1665	510	485	49.8	58
1700	520	494	50.5	59
1740	530	504	51.1	60
1775	540	513	51.7	61
1810	550	523	52.3	62
1845	560	532	53	63
1880	570	542	53.6	64
1920	580	551	54.1	65
1955	590	561	54.7	66
1995	600	570	55.2	67
2030	610	580	55.7	68
2070	620	589	56.3	69
2105	630	599	56.8	70
2145	640	608	57.3	71
2180	650	618	57.8	72
2210	660	628	58.3	73
2240	665	633	58.8	74
2280	670	638	59.3	
2310	675	643	59.8	75
2350	680	648	60.3	76
2380	685	653	61.1	77
2410	690	658	61.3	78
2450	695	663	61.7	79
2480	710	668	62.2	80
2520	720	678	62.6	81
2550	730	683	63.1	82
2590	740	693	63.5	
2630	750	703	63.9	83
2660	760	708	64.3	84
2700	770	718	64.7	85
2730	780	723	65.1	
2770	790	733	65.5	86
2800	800	738	65.9	
2840	810	748	66.3	87
2870	820	753	66.7	88
2910	830	763	67	
2940	840	768	67.4	89
2980	850		67.7	
3010	860		68.1	90
3050	870		68.4	
3080	880		68.7	91
3120	890		69	
3150	900		69.3	92
3190	910		69.6	
3220	920		69.9	
3260	930		70.1	

The figures given are approximate according to DIN EN ISO18265 (02-2004)

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm^2	mc	VDI 3323 group
10 SPb 20	1.0722		10 PbF 2		11 L 08		1350	0,20	**1**
100 Cr 6	1.2067	BL 3	Y 100 C 6		L 3	SUJ2	1775	0,24	**6/9**
105 WCr 6	1.2419		105 WC 13			SKS31	1775	0,24	**6/9**
12 CrMo 9 10	1.7380	1501-622 Gr. 31; 45	10 CD 9.10	2218	A 182-F22	SPVA,SCMV4	1675	0,24	**6/7**
12 Ni 19	1.5680		Z 18 N 5		2515		2450	0,23	**10/11**
13 CrMo 4 4	1.7335	1501-620 Gr. 27	15 CD 3.5	2216	A 182-F11; F12	SPVAF12	1675	0,24	**6/7**
14 MoV 6 3	1.7715	1503-660-440					1675	0,24	**6/7**
14 Ni 6	1.5622		16 N 6		A 350-LF 5		1675	0,24	**6/7**
14 NiCr 10	1.5732		14 NC 11		3415	SNC415(H)	1675	0,24	**6/7**
14 NiCr 14	1.5752	655 M 13	12 NC 15		3310; 9314	SNC815(H)	1675	0,24	**6/7**
14 NiCrMo 13 4	1.6657						1675	0,24	**6/7**
15 Cr 3	1.7015	523 M 15	12 C 3		5015		1675	0,24	**6/7**
15 CrMo 5	1.7262		12 CD 4			SCM415(H)	1675	0,24	**6/7**
15 Mo 3	1.5415	1501-240	15 D 3	2912	A 204 Gr. A		1675	0,24	**6/7**
16 MnCr 5	1.7131	527 M 17	16 MC 5	2511	5115	SCR415	1675	0,24	**6/7**
16 Mo 5	1.5423	1503-245-420			4520	SB450M	1675	0,24	**6/7**
17 CrNiMo 6	1.6587	820 A 16	18 NCD 6				1675	0,24	**6/7**
21 NiCrMo 2	1.6523	805 M 20	20 NCD 2	2506	8620	SNCM220(H)	1725	0,24	**6/8**
25 CrMo 4	1.7218	1717 CDS 110	25 CD 4 S	2225	4130	SM420;SCM430	1725	0,24	**6/8**
28 Mn 6	1.1170	150 M 28	20 M 5		1330		1500	0,22	**2**
32 CrMo 12	1.7361	722 M 24	30 CD 12	2240			1775	0,24	**6/9**
34 Cr 4	1.7033	530 A 32	32 C 4		5132	SCR430(H)	1725	0,24	**6/8**
34 CrMo 4	1.7220	708 A 37	35 CD 4	2234	4135; 4137	SCM432;SCCRM3	1775	0,24	**6/9**
34 CrNiMo 6	1.6582	817 M 40	35 NCD 6	2541	4340	SNCM447	1775	0,24	**6/9**
35 S 20	1.0726	212 M 36	35 MF 4	1957	1140		1525	0,22	**2/3**
36 CrNiMo 4	1.6511	816 M 40	40 NCD 3		9840	SNCM447	1775	0,24	**6/9**
36 Mn 5	1.1167						1525	0,22	**2/3**
36 NiCr 6	1.5710	640 A 35	35 NC 6		3135	SNC236	1800	0,24	**3/9**
38 MnSi 4	1.5120						1800	0,24	**3/9**
39 CrMoV 13 9	1.8523	897 M 39					1775	0,24	**6/9**
40 Mn 4	1.1157	150 M 36	35 M 5		1039		1525	0,22	**2/3**
40 NiCrMo 2 2	1.6546	311-Type 7	40 NCD 2		8740	SNCM240	1775	0,24	**6/9**
41 Cr 4	1.7035	530 M 40	42 C 4		5140	SCR440(H)	1775	0,24	**6/9**
41 CrAlMo 7	1.8509	905 M 39	40 CAD 6.12	2940	A 355 Cl. A	SACM645	1775	0,24	**6/9**
41 CrMo 4	1.7223	708 M 40	42 CD 4 TS	2244	4142; 4140	SCM440	1775	0,24	**6/9**
42 Cr 4	1.7045	530 A 40	42 C 4 TS	2245	5140	SCr440	1775	0,24	**6/9**
42 CrMo 4	1.7225	708 M 40	42 CD 4	2244	4142; 4140	SCM440(H)	1775	0,24	**6/9**
45 WCrV 7	1.2542	BS 1		2710	S 1		1775	0,24	**6/9**
50 CrV 4	1.8159	735 A 50	50 CV 4	2230	6150	SUP10	1775	0,24	**6/9**
55 Cr 3	1.7176	527 A 60	55 C 3	2253	5155	SUP9(A)	1775	0,24	**6/9**
55 NiCrMoV 6	1.2713		55 NCDV 7		L 6	SKH1;SKT4	1775	0,24	**6/9**
55 Si 7	1.0904	250 A 53	55 S 7	2085; 2090	9255		1775	0,24	**6/9**
58 CrV 4	1.8161						1775	0,24	**6/9**
60 SiCr 7	1.0961		60 SC 7		9262		1775	0,24	**6/9**
9 SMn 28	1.0715	230 M 07	S 250	1912	1213	SUM22	1350	0,21	**1**
9 SMn 36	1.0736	240 M 07	S 300		1215		1350	0,21	**1**
9 SMnPb 28	1.0718		S 250 Pb	1914	12 L 13	SUM22L	1350	0,21	**1**
9 SMnPb 36	1.0737		S 300 Pb	1926	12 L 14		1350	0,21	**1**
Al99	3.0205						700	0,25	**21**
AlCuMg1	3.1325						700	0,25	**22**
AlMg1	3.3315						700	0,25	**21**

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm^2	mc	VDI 3323 group
AlMgSi1	3.2315						700	0,25	**22**
C 105 W1	1.1545		Y1 105	1880	W 110	SK3	1675	0,24	**3**
C 125 W	1.1663		Y2 120		W 112		1675	0,24	**3**
C 15	1.0401	080 M 15	AF3 7 C 12; XC 18	1350	1015	S15C	1350	0,21	**1**
C 22	1.0402	050 A 20	AF 42 C 20	1450	1020	S20C, S22C	1350	0,21	**1**
C 35	1.0501	060 A 35	AF 55 C 35	1550	1035	S35C	1525	0,22	**2/3**
C 45	1.0503	080 M 46	AF 65 C 45	1650	1045	S45C	1525	0,22	**2/3**
C 55	1.0535	070 M 55		1655	1055	S55C	1675	0,24	**3**
C 60	1.0601	080 A 62	CC 55		1060	S60C	1675	0,24	**3**
Cf 35	1.1183					S35C	1525	0,22	**2/3**
Cf 53	1.1213					S50C	1525	0,22	**2/3**
Ck 101	1.1274	060 A 96		1870	1095		1675	0,24	**3**
Ck 15	1.1141	080 M 15	XC 15; XC 18	1370	1015	S15C	1350	0,21	**1**
Ck 55	1.1203	070 M 55	XC 55		1055	S55C	1675	0,24	**3**
Ck 60	1.1221	080 A 62	XC 60	1665; 1678	1060	S58C	1675	0,24	**3**
CoCr20W15Ni	2.4764						3300	0,24	**35**
CuZn15	2.0240						700	0,27	**27**
CuZn36Pb3	2.0375						700	0,27	**26**
E-Cu57	2.0060						700	0,27	**28**
G-AlSi10Mg	3.2381						700	0,25	**24**
G-AlSi12	3.2581						700	0,25	**23**
G-AlSi9Cu3	3.2163						700	0,25	**23**
G-CuSn5ZnPb	2.1096						700	0,27	**26**
G-CuZn40Fe	2.0590						700	0,27	**28**
G-X 120 Mn 12	1.3401	Z 120 M 12	Z 120 M 12		A 128 (A)		3300	0,24	**35**
G-X 20 Cr 14	1.4027	420 C 29	Z 20 C 13 M			SCS2	1875	0,21	**12/13**
G-X 40 NiCrSi 38 18	1.4865	330 C 40					2600	0,24	**31**
G-X 45 CrSi 9 3	1.4718	401 S 45	Z 45 CS 9		HNV 3		2450	.23	**10/11**
G-X 5 CrNi 13 4	1.4313	425 C 11	Z 5 CN 13.4	2385	CA 6-NM		1875	0,21	**12/13**
G-X 5 CrNiMoNb 18 10	1.4581	318 C 17	Z 4 CNDNb 18.12 M				2150	.0,2	**14**
G-X 6 CrNi 18 9	1.4308	304 C 15	Z 6 CN 18.10 M	2333	CF-8		2150	.0,2	**14**
G-X 6 CrNiMo 18 10	1.4408						2150	.0,2	**14**
G-X 7 Cr 13	1.4001						1875	0,21	**12/13**
GG-10	.6010		Ft 10 D	01 10-00	A48-20 B	FC100	1150	.0,2	**15**
GG-15	.6015	Grade 150	Ft 15 D	01 15-00	A48-25 B	FC150	1150	.0,2	**15**
GG-20	.6020	Grade 220	Ft 20 D	01 20-00	A48-30 B	FC200	1150	.0,2	**15**
GG-25	.6025	Grade 260	Ft 25 D	01 25-00	A48-40 B	FC250	1250	0,24	**15/16**
GG-30	.6030	Grade 300	Ft 30 D	01 30-00	A48-45 B	FC300	1350	0,28	**16**
GG-35	.6035	Grade 350	Ft 35 D	01 35-00	A48-50 B	FC350	1350	0,28	**16**
GG-40	.6040	Grade 400	Ft 40 D	01 40-00	A48-60 B	FC400	1350	0,28	**16**
GGG-35.3	.7033					FCD350	1225	0,25	**17**
GGG-40	.7040	SNG 420/12	FGS 400-12	0717-02	60-40-18	FCD400	1225	0,25	**17**
GGG-40.3	.7043	SNG 370/17	FGS 370-17	0717-15		FCD400	1225	0,25	**17**
GGG-50	.7050	SNG 500/7	FGS 500-7	0727-02	65-45-12	FCD500	1350	0,28	**18**
GGG-60	.7060	SNG 600/3	FGS 600-3	0732-03	80-55-06	FCD600	1350	0,28	**18**
GGG-70	.7070	SNG 700/2	FGS 700-2	0737-01	100-70-03	FCD700	1350	0,28	**18**
GGG-NiCr 20 2	.7660	S-NiCr 20 2	S-NC 20 2		A 439 Type D-2		1350	0,28	**18**
GGG-NiMn 13 7	.7652	S-NiMn 13 7	S-NM 13 7				1350	0,28	**18**
GS-Ck 45	1.1191	080 M 46	XC 42	1672	1045	S45C	1525	0,22	**2/3**
GTS-35-10	.8135	B 340/12	MN 35-10				1225	0,25	**19**
GTS-45-06	.8145	P 440/7					1420	0,3	**20**

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm^2	mc	VDI 3323 group
GTS-55-04	.8155	P 510/4	MP 50-5				1420	0,3	**20**
GTS-65-02	.8165	P 570/3	MP 60-3				1420	0,3	**20**
GTS-70-02	.8170	P 690/2	IP 70-2				1420	0,3	**20**
NiCr20TiAl	2.4631	HR 401; 601	Nimonic 80 A				3300	0,24	**33**
NiCr22Mo9Nb	2.4856		Inconel 625				3300	0,24	**33**
NiCu30Al	2.4375		Monel K 500				3300	0,24	**34**
NiFe25Cr20NbTi	2.4955						3300	0,24	**34**
S 18-0-1	1.3355	BT 1	Z 80 WCV 18-04-01		T 1		2450	0,23	**10/11**
S 18-1-2-5	1.3255	BT 4	Z 80 WKCV 18-05-04-0		T 4		2450	0,23	**10/11**
S 2-9-2	1.3348		Z 100 DCWV 09-04-02-	2782	M 7		2450	0,23	**10/11**
S 6-5-2	1.3343	BM 2	Z 85 WDCV 06-05-04-0	2722	M 2	SKH9; SKH51	2450	0,23	**10/11**
S 6-5-2-5	1.3243		Z 85 WDKCV 06-05-05-	2723		SKH55	2450	0,23	**10/11**
TiAl6V4	3.7165	TA 10 bis TA 13	T-A 6 V				2110	0,22	**37**
X 10 Cr 13	1.4006	410 S 21	Z 12 C 13	2302	410; CA-15	SUS410	1875	0,21	**12/13**
X 10 CrNiMoNb 18 12	1.4583				318		2150	0,2	**14**
X 10 CrNiS 18 9	1.4305	303 S 21	Z 10 CNF 18.09	2346	303		2150	0,2	**14**
X 100 CrMoV 5 1	1.2363	BA 2	Z 100 CDV 5	2260	A 2		2450	0,23	**10/11**
X 12 CrMoS 17	1.4104		Z 10 CF 17	2383	430 F	SUS430F	1875	0,21	**12/13**
X 12 CrNi 17 7	1.4310	301 S 21	Z 12 CN 17.07		301		2150	0,2	**14**
X 12 CrNi 22 12	1.4829					SUS301	1350	0,28	**16**
X 12 CrNi 25 21	1.4845	310 S24	Z 12 CN 25.20	2361	310 S	SUH310; SUS310S	2150	0,2	**14**
X 12 CrNiTi 18 9	1.4878	321 S 20	Z 6 CNT 18.12 (B)	2337	321		2150	0,2	**14**
X 12 NiCrSi 36 16	1.4864	NA 17	Z 12 NCS 37.18		330	SUH330	2600	0,24	**31**
X 15 CrNiSi 20 12	1.4828	309 S 24	Z 15 CNS 20.12		309	SUH309	1350	0,28	**16**
X 165 CrMoV 12	1.2601			2310			2450	0,23	**10/11**
X 2 CrNiMo 18 13	1.4440						2150	0,2	**14**
X 2 CrNiMoN 17 13 3	1.4429	316 S 62	Z 2 CND 17.13 Az	2375	316 LN	SUS316LN	2150	0,2	**14**
X 2 CrNiN 18 10	1.4311	304 S 62	Z 2 CN 18 .10	2371	304 LN	SUS304LN	2150	0,2	**14**
X 20 CrNi 17 2	1.4057	431 S 29	Z 15 CN 16.02	2321	431	SUS431	1875	0,21	**12/13**
X 210 Cr 12	1.2080	BD 3	Z 200 C 12		D 3		2450	0,23	**10/11**
X 210 CrW 12	1.2436			2312			2450	0,23	**10/11**
X 30 WCrV 9 3	1.2581	BH 21	Z 30 WCV 9		H 21	SKD5	2450	0,23	**10/11**
X 40 CrMoV 5 1	1.2344	BH 13	Z 40 CDV 5	2242	H 13	SKD61	2450	0,23	**10/11**
X 46 Cr 13	1.4034	420 S 45	Z 40 C 14				1875	0,21	**12/13**
X 5 CrNi 18 9	1.4301	304 S 15	Z 6 CN 18.09	2332; 2333	304; 304 H	SUS304	2150	0,2	**14**
X 5 CrNiMo 17 13 3	1.4436	316 S 16	Z 6 CND 17.12	2343	316	SUS316	2150	0,2	**14**
X 5 CrNiMo 18 10	1.4401	316 S 16	Z 6 CND 17.11	2347	316	SUS316	2150	0,2	**14**
X 53 CrMnNiN 21 9	1.4871	349 S 54	Z 52 CMN 21.09		EV 8		1875	0,21	**12/13**
X 6 Cr 13	1.4000	403 S 17	Z 6 C 13	2301	403	SUS403	1875	0,21	**12/13**
X 6 Cr 17	1.4016	430 S 15	Z 8 C 17	2320	430	SUS430	1875	0,21	**12/13**
X 6 CrMo 17	1.4113	434 S 17	Z 8 CD 17.01	2325	434	SUS434	1875	0,21	**12/13**
X 6 CrNiMoTi 17 12 2	1.4571	320 S 31	Z 6 CNT 17.12	2350	316 Ti		2150	0,2	**14**
X 6 CrNiNb 18 10	1.4550	347 S 17	Z 6 CNNb 18.10	2338	347		2150	0,2	**14**
X 6 CrNiTi 18 10	1.4541	321 S 12	Z 6 CNT 18.10	2337	321		2150	0,2	**14**
X2 CrNi 18-8	1.4317						2150	0,2	**14**

Aluminium - standard materials

Aluminium cast alloys

Alloy group	DIN 1725-2		DIN EN 1706	
	Material		Alloy designation	
	Short designation	Number	Numeric	Chem. symbol
AlCu	G-AlCu4TiMg	3.1371	EN AC-21000	EN AC-Al Cu4MgTi
	G-AlCu4Ti	3.1841	EN AC-21100	EN AC-Al Cu4Ti
AlSiMgTi	–	–	EN AC-4100	EN AC-Al Si2MgTi
AlSi7Mg	–	–	EN AC-42000	EN AC-Al Si7Mg
	G-AlSi7Mg	3.2371	EN AC-42100	EN AC-Al Si7Mg0,3
	–	–	EN AC-42200	EN AC-Al Si7Mg0,6
AlSi10Mg	G-AlSi10Mg	3.2381	EN AC-43000	EN AC-Al Si10Mg/a)
	–	–	EN AC-43100	EN AC-Al Si10Mg(b)
	G-AlSi10Mg(Cu)	3.2383	EN AC-43200	EN AC-Al Si10Mg(Cu)
	G-AlSi9Mg	3.2373	EN AC-43300	EN AC-Al Si9Mg
	GD-AlSi10Mg	3.2382	EN AC-43400	EN AC-Al Si10Mg(Fe)
AlSi	G-AlSi11	3.2211	EN AC-44000	EN AC-Al Si11
	–	–	EN AC-44100	EN AC-Al Si12(b)
	G-AlSi12	3.2581	EN AC-44200	EN AC-Al Si12(a)
	GD-AlSi12	3.2582	EN AC-44300	EN AC-Al Si12(Fe)
	–	–	EN AC-44400	EN AC-Al Si9
AlSi5Cu	G-AlSi6Cu4	3.2151	EN AC-45000	EN AC-Al Si6Cu4
	–	–	EN AC-45100	EN AC-Al Si5Cu3Mg
	–	–	EN AC-45200	EN AC-Al Si5Cu3Mn
	–	–	EN AC-45300	EN AC-Al Si5Cu1Mg
	–	–	EN AC-45400	EN AC-Al Si5Cu3
AlSi9Cu	GD-AlSi9Cu3	3.2163	EN AC-46000	EN AC-Al Si9Cu3(Fe)
	–	–	EN AC-46100	EN AC-Al Si11Cu2(Fe)
	G-AlSi9Cu3	3.2163	EN AC-46200	EN AC-Al Si8Cu3
	–	–	EN AC-46300	EN AC-Al Si7Cu3Mg
	–	–	EN AC-46400	EN AC-Al Si9Cu1Mg
	–	–	EN AC-46500	EN AC-Al Si9Cu3(Fe)(Zn)
	–	–	EN AC-46600	EN AC-Al Si7Cu2
AlSi(Cu)	G-AlSi12(Cu)	3.2583	EN AC-47000	EN AC-Al Si12(Cu)
	GD-AlSi12(Cu)	3.2982	EN AC-47100	EN AC-AlSi12Cu1(Fe)
AlSiCuNiMg	–	–	EN AC-48000	EN AC-Al Si12CuNiMg
AlMg	–	–	EN AC-51000	EN AC-Al Mg3(b)
	G-AlMg3	3.3541	EN AC-51100	EN AC-AlMg3(a)
	GD-AlMg9	3.3292	EN AC-51200	EN AC-Al Mg9
	G-AlMg5	3.3561	EN AC-51300	EN AC-Al Mg5
	G-AlMg5Si	3.3261	EN AC-51400	EN AC-Al Mg5 (Si)
AlZnMg	–	–	EN AC-7100	EN AC-Al Zn5Mg

Aluminium - standard materials

Aluminium wrought alloys - bar, sheet

Aluminuim wrought alloys - bar

DIN 1725-1/DIN 1712-3		DIN EN 573-3	
Material		Alloy designation	
Short designation	Number	Numeric	Chem. symbol
AlCuMgPb	3.1645	EN AW-2007	EN AW-Al Cu4PbMgM
AlCuBiPb	3.1655	EN AW-2011	EN AW-Al Cu6BiPb
–	–	EN AW-2030	EN AW-Al Cu4PbMg
AlMgSiPb	3.0615	EN AW-6012	EN AW-Al MgSiPb
–	–	EN AW-6262	EN AW-Al Mg1SiPb
AlMgSi0,5	3.3206	EN AW-6060	EN AW-Al MgSi
–	–	EN AW-6063	EN AW-Al Mg0,7Si
AlMgSi1	3.2315	EN AW-6082	EN AW-Al Si1MgMn
AlCuSiMn	3.1255	EN AW-2014	EN AW-Al Cu4SiMg
AlCuMg1	3.1325	EN AW-2017A	EN AW-Al Cu4MgSi(A)
AlCuMg2	3.1355	EN AW-2024	EN AW-Al Cu4Mg1
AlZn4,5Mg1	3.4335	EN AW-7020	EN AW-Al Zn4,5Mg1
AlZnMgCu0,5	3.4345	EN AW-7022	EN AW-Al Zn5Mg3Cu
AlZnMgCu1,5	3.4365	EN AW-7075	EN AW-Al Zn5,5MgCu
Al99,5	3.0255	EN AW-1050A	EN AW-Al 99,5
E-Al	3.0257	EN AW-1350	EN AW-Eal 99,5
AlMg3	3.3535	EN AW-5754	EN AW-Al Mg3
AlMg5	3.3555	EN AW-5019	EN AW-Al Mg5
AlMg4,5Mn	3.3547	EN AW-5083	EN AW-Al Mg4,5Mn0,7

Aluminium wrought alloys - sheet

DIN 1725-1/DIN 1712-3		DIN EN 573-3	
Material		Alloy designation	
Short designation	Number	Numeric	Chem. symbol
Al99,5	3.0255	EN AW-1050A	EN AW-Al 99,5
AlMg3	3.3535	EN AW-5754	EN AW-Al Mg3
AlMg4,5Mn	3.3547	EN AW-5083	EN AW-Al Mg4,5Mn0,7
AlMg1SiCu	3.3211	EN AW-6061	EN AW-Al Mg1SiCu
AlMgSi1	3.2315	EN AW-6082	EN AW-Al Si1MgMn
AlCuMg1	3.1325	EN AW-2017A	EN AW-Al Cu4MgSi(A)
AlCuMg2	3.1355	EN AW-2024	EN AW-Al Cu4Mg1
AlZn4,5Mg1	3.4335	EN AW-7020	EN AW-Al Zn4,5Mg1
AlZnMgCu0,5	3.4345	EN AW-7022	EN AW-Al Zn5Mg3Cu
AlZnMgCu1,5	3.4365	EN AW-7075	EN AW-Al Zn5,5MgCu

🟨 = hardened materials

🟧 = naturally hard materials

Aluminium - machinability

It depends on the type of alloy whether aluminium materials are easy to machine or not.
From the easily machined aluminium alloy to the problematic pure aluminium all levels of machinability can be found.

Group		**Alloy type**	**Relative machinability**
Pure Al		Al 99,9	5
Wrought alloys	**non hardened**	Al Mn	4 - 5
		Al Mg	3 - 5
		Al Mg Mn	3 - 4
	hardened	Al Mg Si	3 - 4
		Machining alloy stock	1 - 2
		Al Cu Mg	2 - 3
		Al Cu Si Mg	3
		Al Zn Mg Cu	2
Cast alloys		G - Al Si	3
		G - Al Si Mg	2 - 3
		G - Al Si Cu	2
		G - Al Mg	2
		G - Al Mg Si	2
		G - Al Cu Ti	2
		G - Al Si Cu Mg Ni	2 - 3

1 = very good machinability

5 = bad machinability

Machinability can be defined as the degree of difficulty that a material creates when being machined. In order to assess the machinability of a material basically four parameters have to be taken into consideration:

- ○ Cutting force
- ○ Tool life
- ○ Surface quality
- ○ Chip formation


R.02-09
608840/80

Cutting data

Grades, material

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

Grades, material

CTEP210		TCM10		CTCP220		CTPP225	
🚱	🚰	🚱	🚰	🚱	🚰	🚱	🚰
v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]
350		280		340	170	270	135
300		240		310	155	230	115
280		220		270	135	200	100
300		240		310	155	230	115
250		200		270	135	200	100
180		140		240	120	170	85
				140	70	130	65
				95	50	100	50
300		240					
350		280					
300		240					
300		240					

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Cutting data

Grades, material

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm^2	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

Grades, material

CTCP230		CTPP235		CTPM225		CTCM235	
🚱	🚰	🚱	🚰	🚱	🚰	🚱	🚰
v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]
280	150	240	140	270	190	240	170
250	135	210	120	230	160	210	150
190	110	160	100	180	130	150	105
250	135	220	120	240	170	210	150
190	110	160	100	180	130	150	105
140	100	120	90	140	100	100	70
130	90	110	80	130	90	120	90
80	60	80	60	80	60	100	80
130	90	110	80	110	80	120	90
90	60	80	60	80	60	100	70
130	90	110	80	110	80	120	90
		150	110	160	150	180	140
		150	110	140	120	170	130
		130	90	120	100	140	110
310	190						
160	100						
200	120						
130	80						
190	115						
160	100						

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Cutting data

Grades, material

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

Grades, material

CTPM240		CTN3105		CTL3215		CTCK215	
🚱	🚰	🚱	🚰	🚱	🚰	🚱	🚰
v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]
220	120						
190	110						
140	90						
200	110						
140	90						
100	70						
110	80						
80	60						
110	80						
80	60						
110	80						
170	110						
160	110						
130	90						
		800		800		360	210
		600		600		220	130
						230	140
				450		160	100
						250	150
						210	130
			150				
				280			

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Cutting data

Grades, material

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

🟧		🟩		🟩		🟩	
CTPK220		CTD4205		AMZ		H216T	
🚱 v_c [m/min]	🚰 v_c [m/min]	🚱 v_c [m/min]	🚰 v_c [m/min]	🚱 v_c [m/min]	🚰 v_c [m/min]	🚱 v_c [m/min]	🚰 v_c [m/min]
320	190			200		130	130
170	100			160		110	110
210	130			185		130	130
140	90			150		120	120
200	120			200		130	130
170	100			175		110	110
			3500		1500		1500
			2500		1000		1000
			2500		1200		1100
			2000		1200		1000
			1000		300		280
					350		350
			800		350		350
			800		320		320
			800		320		320
			1000		160	160	160
			350		180	240	240
			350				

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Cutting data

Grades, material

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm^2	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

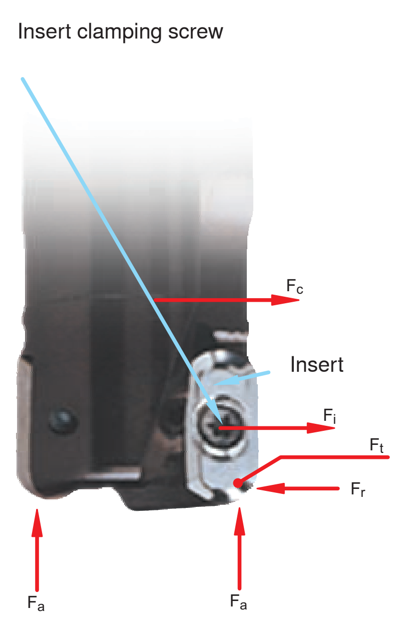
* R_m = ultimate tensile strength, measured in MPa

CTW4615		CTC5235		CTC5240	
🚱	🚰	🚱	🚰	🚱	🚰
v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]	v_c [m/min]
130	130				
110	110				
130	130				
120	120				
130	130				
120	120				
1500	1500				
1000	1000				
1100	1100				
1000	1000				
280	280				
350	350				
350	350				
320	320				
320	320				
160	160				
240	240				
			80		80
			70		70
			35		35
			25		25
			30		30
					80
					50

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Balancing

HSC/HPC



Forces in the tooling system

F_a = axial force

F_r = radial force

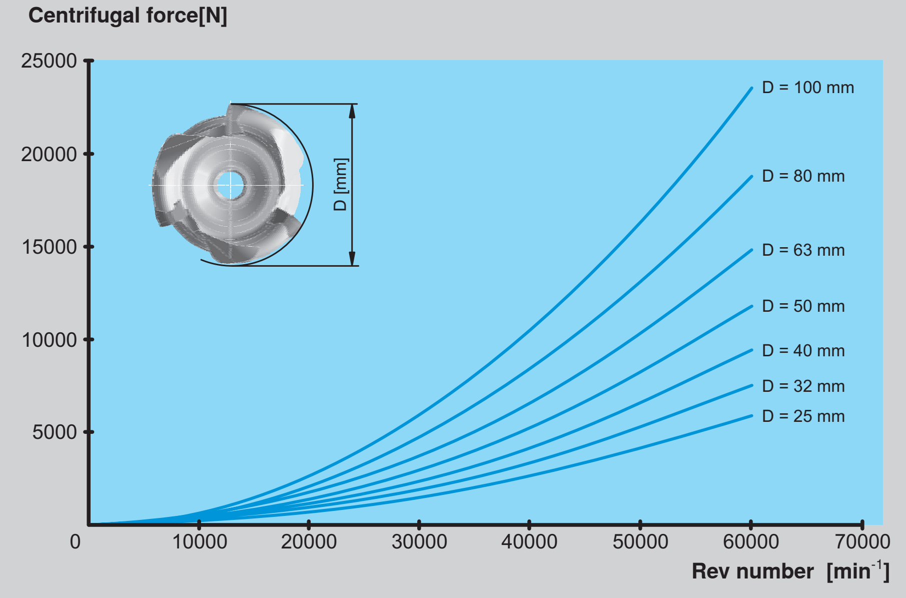
F_t = tangential force

F_c = centrifugal force (tool body)

F_i = centrifugal force (insert)

Forces present in the HSC milling cutter during machining. With HSC machining, the centrifugal forces produce considerably more stress on the tool than the cutting forces.

See also permissible residual unbalance: DIN 1940

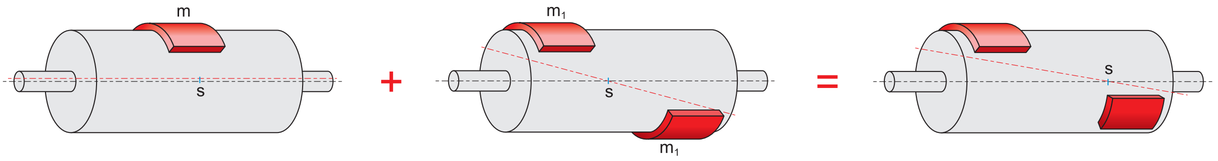


⚠ Note safety rules enclosed to the tool.

⚠ Centrifugal forces generated are dependant upon tool diameter and rotational speed (rpm), example: indexable insert of 12g.

Revolutions per minute increase times two = centrifugal force increase times four.

Balance types



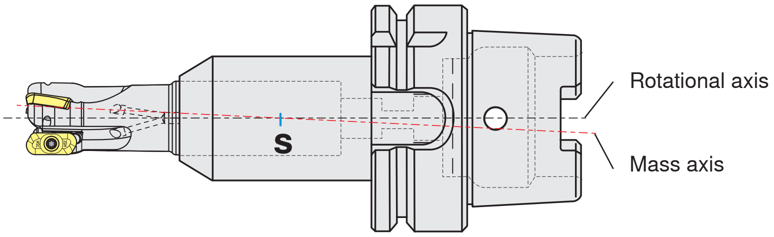
Static unbalance

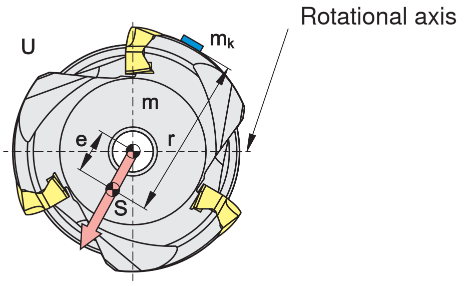
Moment unbalance

Dynamic unbalance is the sum of static unbalance and moment unbalance.

Unbalance is the state of a rotor in which the mass axis does not coincide with the rotational axis.

$$U = m \cdot e \text{ [gmm]}$$





Unbalance is produced by a centrifugal force F which rotates with the rotor.

$$F = u \cdot \omega^2 = m \cdot e \cdot \omega^2 = \frac{m \cdot e\,(2 \cdot x \cdot n)^2}{60^2} \text{ [N]}$$

$$m_k = \frac{m \cdot e}{r} \text{ [g]}$$

m = mass [g]
e = radius of gravity centre [mm]
S = mass axis
m_k = counterweight
U = unbalance
ω = angular velocity [s^{-1}]

Reasons for unsymmetric mass distribution regarding the rotational axis

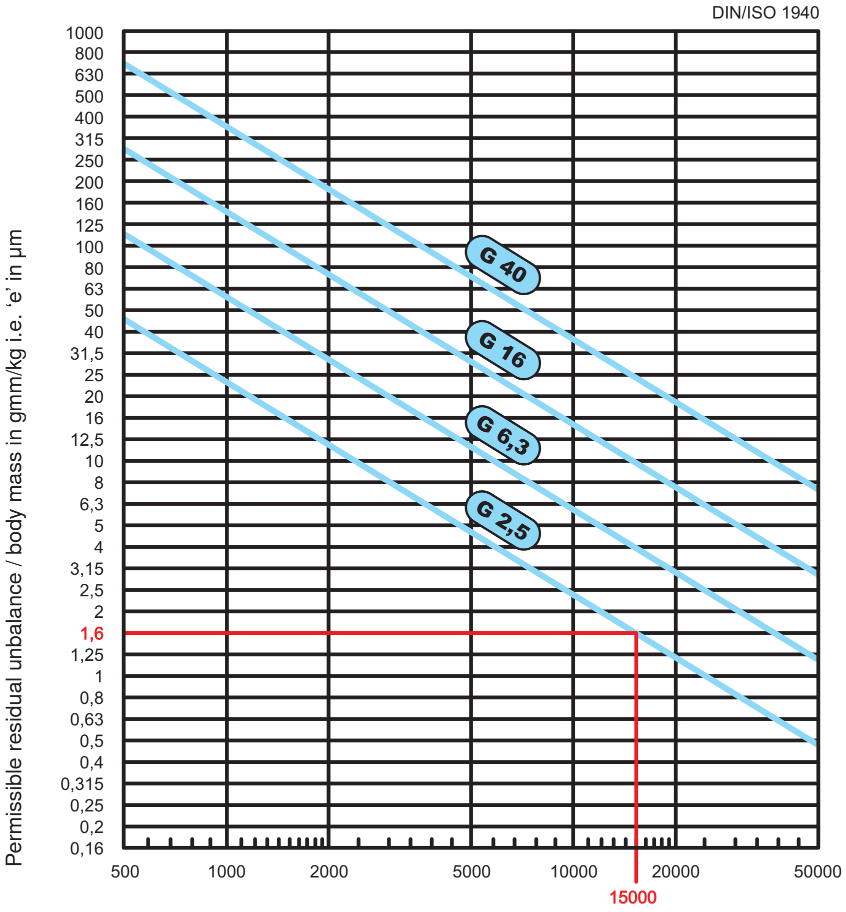
- Manufacturing tolerance (tool and adapter)
- Driving grooves on the SK/BT flange
- Unprocessed ground of the groove
- Driving grooves at HSK A, B, C, D
- Position of radial clamping screw (Weldon, Whistle Notch)
- Collet chuck (radial position of slots)
- Collet and nut
- Shank detail with Weldon and Whistle Notch
- Differential pitch of milling cutter

What is a quality class? - Permissible residual unbalance

Quality class means the permissible speed of the gravity centre

G = speed of gravity centre [mm/s]
e = radius of gravity centre [mm]
ω = angular velocity [s^{-1}]

$$G = e \cdot \omega \text{ [mm/s]}$$

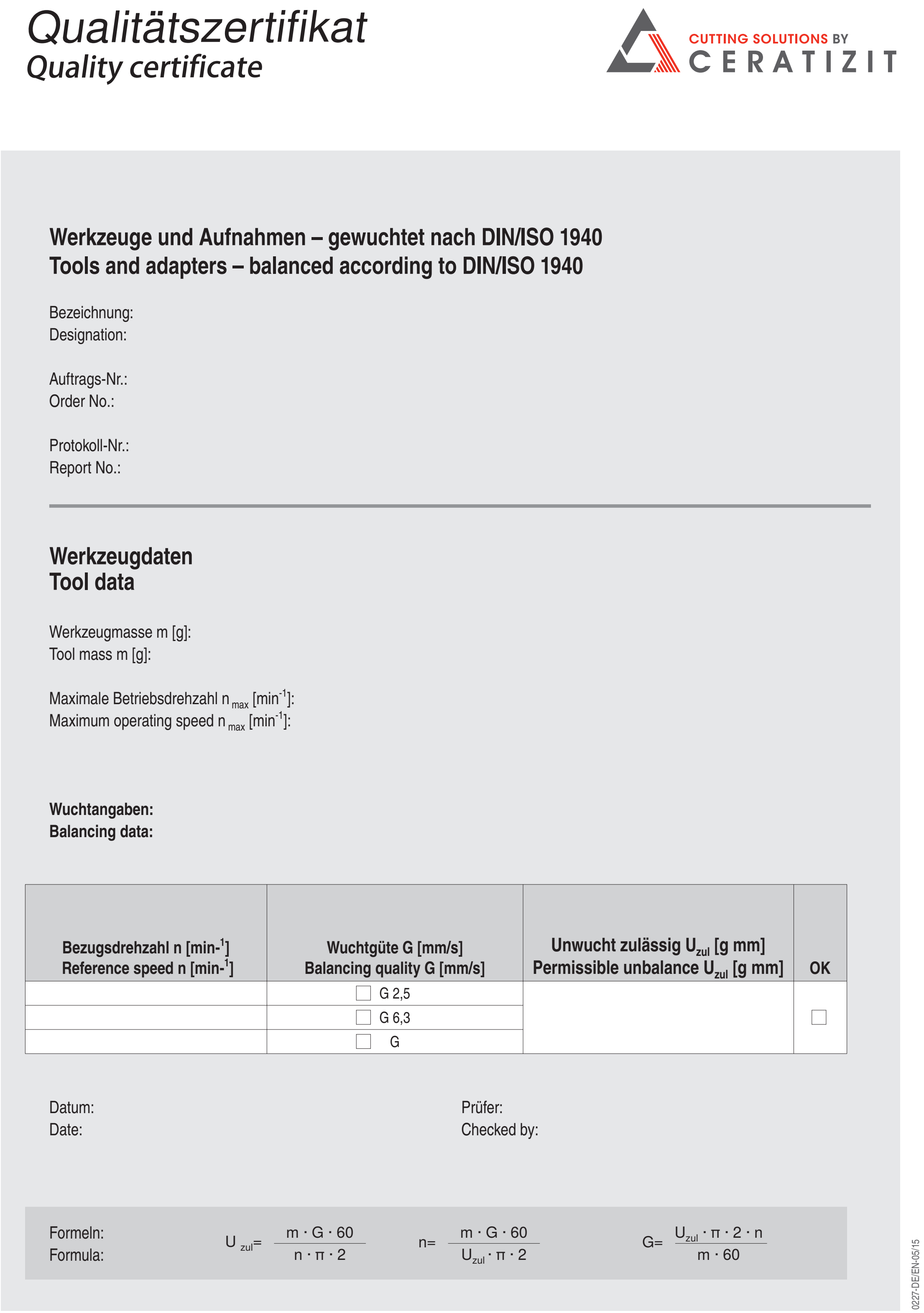


The specific residual unbalance 'e' in μm results from the operating speed and the desired quality class.

As a standard, monoblock tools with HSK connections are pre-balanced.

e.g.:
m = 2 kg
n = 15,000 min^{-1}
G = 2.5 results in
e = 1.6 μm
U_{tol} = 1.6 μm · 2 kg = 3.2 g/mm

All monoblock tools with direct HSK connection are delivered with a test report.



Qualitätszertifikat
Quality certificate

CUTTING SOLUTIONS BY CERATIZIT

Werkzeuge und Aufnahmen – gewuchtet nach DIN/ISO 1940
Tools and adapters – balanced according to DIN/ISO 1940

Bezeichnung:
Designation:

Auftrags-Nr.:
Order No.:

Protokoll-Nr.:
Report No.:

Werkzeugdaten
Tool data

Werkzeugmasse m [g]:
Tool mass m [g]:

Maximale Betriebsdrehzahl n_{max} [min^{-1}]:
Maximum operating speed n_{max} [min^{-1}]:

Wuchtangaben:
Balancing data:

Bezugsdrehzahl n [min^{-1}] Reference speed n [min^{-1}]	Wuchtgüte G [mm/s] Balancing quality G [mm/s]	Unwucht zulässig U_{zul} [g mm] Permissible unbalance U_{zul} [g mm]	OK
	☐ G 2,5		☐
	☐ G 6,3		
	☐ G		

Datum:
Date:

Prüfer:
Checked by:

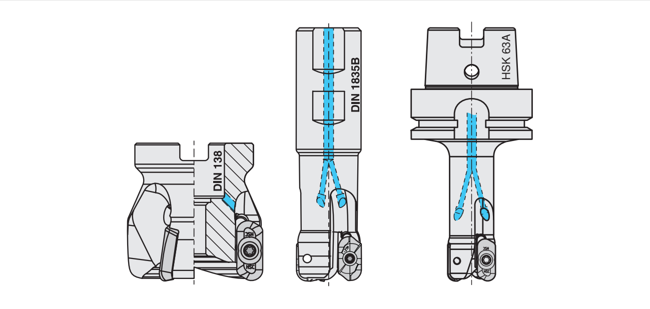
Formeln:
Formula:

$$U_{zul} = \frac{m \cdot G \cdot 60}{n \cdot \pi \cdot 2} \qquad n = \frac{m \cdot G \cdot 60}{U_{zul} \cdot \pi \cdot 2} \qquad G = \frac{U_{zul} \cdot \pi \cdot 2 \cdot n}{m \cdot 60}$$

0227-DE/EN-05/15

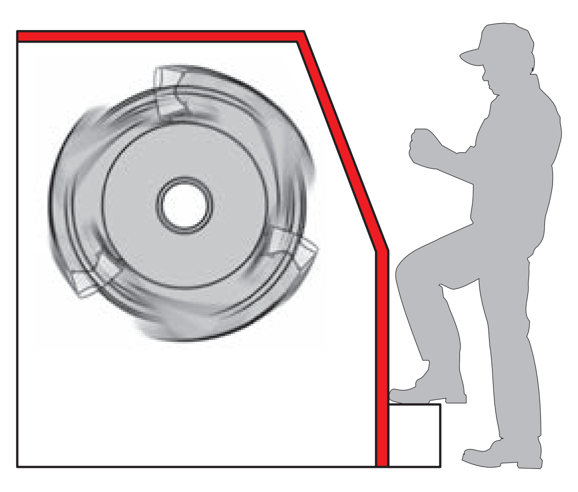
Safety

HSC/HPC



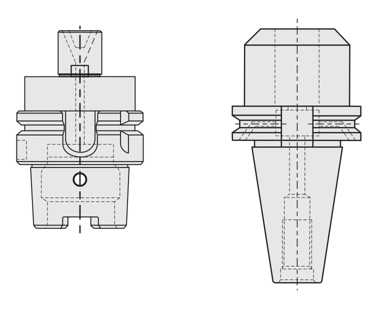
1. Suitability of the tool for HSC machining

HSC tools from CERATIZIT have been especially developed for this machining strategy and guarantee maximum machining safety. They are clearly marked as HSC or HPC tools.



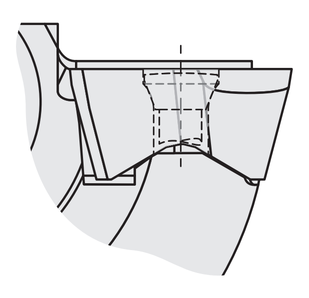
2. Observation of safety precautions of the machine manufacturer

Make sure that all safety precautions of the machine manufacturers are observed (e.g.: enclosed machining units).



3. Suitability of tool adapters for HSC machining

For fast-rotating milling applications it is necessary to balance tool and tool adapter together dynamically (see directives ISO 1940).



4. Mounting the indexable insert with the centrifugal force protection

Insert clamping: EURO-patent EP 1083017A1
Make sure that the insert pocket is cleaned and the threaded bore for the clamping screw is in a top state.
Check the axial and radial contact points of the insert in the pocket.

Torque moments and torque keys
➲ **B276**

6. Maximum permissible number of revolutions

Note the maximum permissible number of revolutions stated on the tool. This number is exclusively valid for the specific tool and must be adapted according to the selected tool shank, overhang length and the respective machining situation.

Maximum rpm determined in centrifugal force tests!

7. Optimum application area of the tool (a_e, a_p, f_z, n)

In order to guarantee productive milling, please observe the recommendations regarding the cutting parameters.

Rev numbers
MaxiMill 211
➲ **B130**

Rev numbers
MaxiMill HSC/HPC
➲ **B161**

Every HSC/HPC tool is provided with an information sheet (‘Safety precautions’). Non observation of these safety precautions results automatically in exclusion of CERATIZIT’s liability.

Mounting procedure

HSC inserts

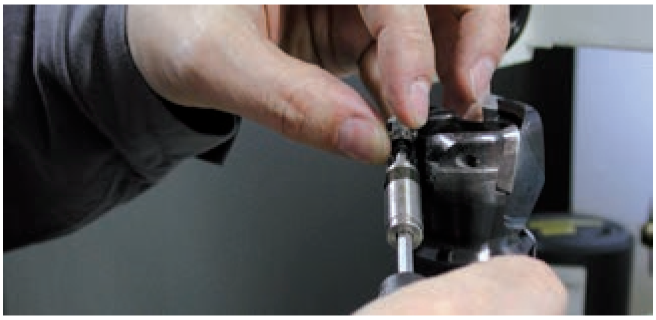
Load milling cutter in presetting device or mounting base. Remove clamping screw of the insert.

Clean insert seat and check for damage.

Clean location and contact faces of the insert.

HSC (high speed cutting system): when mounting a new insert replace clamping screw with a new one!

Put insert into cleaned insert seat and press onto location face using two fingers.



Tighten clamping screw while holding the insert in place.

Clamp insert using recommended torque.

MaxiMill 274 – clamping the insert

Place the screw into the hole of the insert.

Push insert and screw into the insert pocket. Tighten the screw slightly.

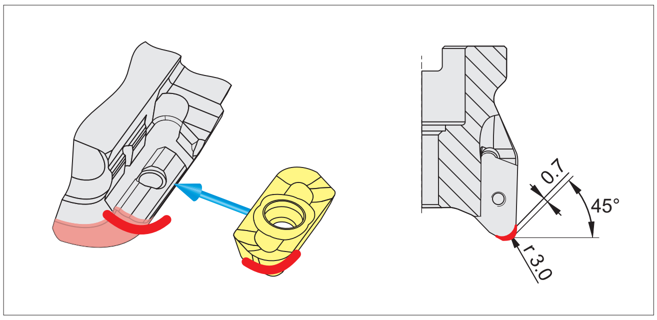
Align the face of the tool with the clearance face of the insert.

Tighten the screw. Position the screwdriver along the centreline of the screw.

Use a torque screwdriver with 1.6 Nm/14.2 in.lbs.: DMSD 1,6Nm/SORT 08IP

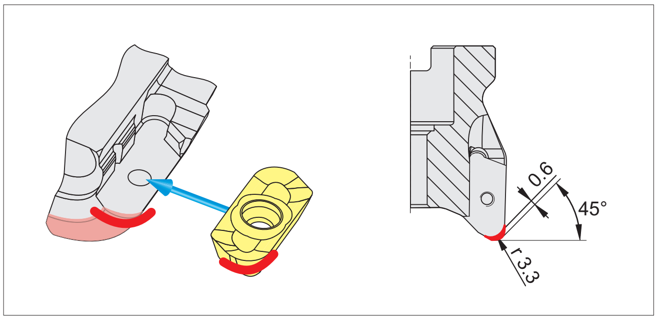
Mounting procedure MaxiMill

Modification of cutter bodies



HSC-11

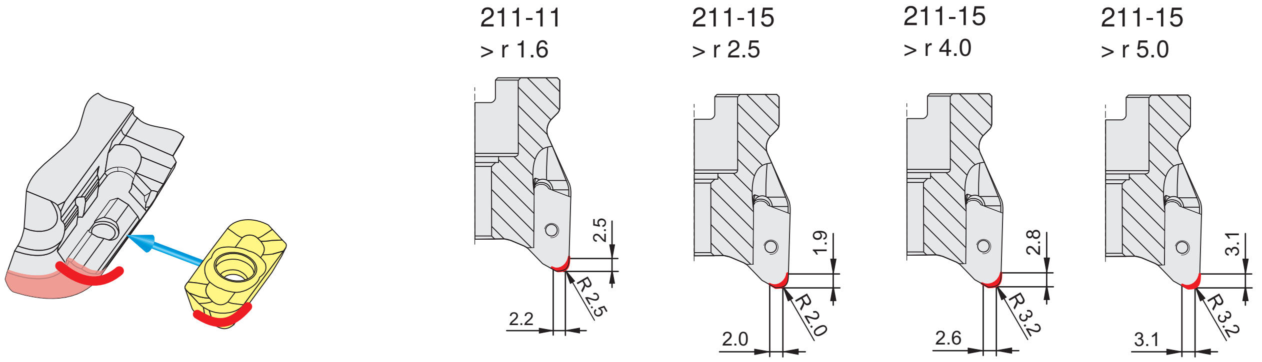
For insert radius r > 3.2 mm



HSC/HPC-19

For insert radius r > 4.0 mm

211-11 / 15



From the second row of teeth the corner radius of the insert must be ≤ 0.8 mm to ensure correct coverage of the cutting edges.

	Material	Type, description
	11417922	CA HDM-22-R
	106934	7818043/K
	11529276	K-10007861/11,8X12,5
	11167992	10002113-0/AW-RH
	11645528	10006791/KMR22
	11645529	10006792/KMR27
	11645530	10006793/KMR32
	11645531	10006794/KMR40
	106607	7818044/M8X21/R-L
	11036880	7818267/M8,0x30,0
	11040298	7818268/M10,0X31,0
	11529282	S-10007860/M6,0X21,0/T15
	11210129	10002611/M20X30/12.9
	11528772	S-10007790/M16,0X6,0/SW06
	11528781	S-10007791/M20,0X7,0/SW08
	11528790	S-10007821/M24,0X9,0/SW10
	11528792	S-10007822/M30,0X9,0/SW14

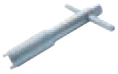
	Material	Type, description	Key size	Torque moment [Nm]	Torque moment [in.lbs]
	11149517	DMSD 0,7Nm/SORT T06	T06	0.7	6,2
	11149541	DMSD 1,2Nm/SORT T08	T08	1.2	10,6
	11149547	DMSD 1,8Nm/SORT 08IP	08IP	1.8	15,9
	11149570	DMSD 3,2Nm/SORT T15	T15	3.2	28,3
	11149571	DMSD 4,0Nm/SORT T20	T20	4.0	35,4
	11149572	DMSD 6,0Nm/SORT T15	T15	6.0	53,1
	11186812	DMSD 5,0Nm/SORT T15	T15	5.0	44,3
	11210474	DMSD 1,0Nm/SORT T15	T15	1.0	8,9
	11210490	DMSD 5,0Nm/SORT T20	T20	5.0	44,3
	11254598	DMSD 1,6Nm/SORT 08IP	08IP	1.6	14,2
	11450867	DMSD 3,2Nm/SORT 15IP	IP15	3.2	28,3
	11450898	DMSD 1,0Nm/SORT 07IP	IP07	1.0	8,9
	11464183	DMSD 2,0Nm/SORT T10	T10	2.0	17,7
	11534870	DMSD 4,0Nm/SORT T15	T15	4.0	35,4
	11696194	DMSD 2,0Nm/SORT 10IP	10IP	2.0	17,7
	11802576	DMSD 5,0Nm/SORT T20-70	T20	5.0	44,3

Spare parts

	Material	Type, description	Key size
	112188	7818048/EXZS	
	4496	7812301/SW 5	SW5
	8095018900	WS-L-T15-136mm	T15
	8095003900	SD-T08IP-60mm	T08IP
	8095010000	SD-T06-60mm	T06
	8095010200	SD-T08-60mm	T08
	8095010400	SD-T10-80mm	T10
	8095010500	SD-T15-80mm	T15
	8095010600	SD-T20-100mm	T20
	8095011700	SD-T07IP-60mm	T07IP
	8095012000	SD-T15IP-80mm	T15IP
	4425	S4/SW4	SW4

	Material	Type, description	Length [mm]	Thread size	Key size
	106022	7822114/M4,5X10,5/T20	10.5	M4,5	T20
	11037484	7818428/M4,0X8,5/T15	8.5	M4	T15
	11042274	7818429/M4,0X11/T15	11	M4	T15
	11042275	7818430/M4,0X7,0/T15	7	M4	T15
	11077874	7801175/M2,0X3,3/T06	3.3	M2	T06
	11107792	10000155/M5,0X14/T20	14	M5	T20
	11114238	10000126/M2,5X5,6/08TP	5.5	M2,5	T08
	11114242	10000125/M2,5X7,3/08TP	7.3	M2,5	T08
	11368132	10005892/M2,5X5,0/08TP	5	M2,5	TP08
	11423964	10006216/M5,0X18/T15	18	M5	T15
	11450028	10006888/M2,2X4,2/07IP	4.2	M2,2	07IP
	11450042	10006887/M3,5X8,6/15IP	8.6	M3,5	15IP
	11464141	10007085/M3,0X7,3/T10	7.3	M3	T10
	11513168	10007562/M2,5X7,6/08TP	7.6	M2,5	08TP
	11610311	M3,5X8,6-15IP/10008749	8.6	M3,5	T15IP
	11684526	10009283/M3,5X14,0/T15	14	M3,5	T15
	11689894	10009229/M3X7,5/10IP	7.5	M3	10IP
	11803957	M3,5x9,0-15TP/10012145	9	M3,5	15TP
	157823	7883212/M2,5X4,2/T08	4.2	M2,5	T08
	165795	7883209/M3,5X8,6/T15	8.6	M3,5	T15
	169856	7883213/M3,0X5,0/T08	5	M3	T08
	169857	7883214/M3,0X5,7/T08	5.7	M3	T08
	228879	7801177/M3,5X6,7/T15	6.7	M3,5	T15
	24645	7815101/M2,5X6,0/T08	6	M2,5	T08
	24647	7815102/M3,5X11,0/T15	11	M3,5	T15
	54976	7722111/M3,5X7,2/T15	7.2	M3,5	T15
	76913	7883204/M2,5X5/T08	5	M2,5	T08
	77613	7883203/M3,0X7,3/T08	7.3	M3	T08

Spare parts

	Material	Type, description
	170382	7730102/GREASE
	8375806300	KRS04.HSK63
	8376006300	KMS.HSK63
	225422	896707/DMS 8-60Nm 3/8"
	8395024300	7896708/SE3/8-SW5
	225424	7896709/SE3/8-SW6
	225425	7896710/SE3/8-SW10
	183348	7722130/SSR D=80
	183349	7722131/SSR D=100
	183350	7722132/SSR D=125
	183351	7722133/SSR D=160
	183344	7722139/SSR D=32
	183345	7722140/SSR D=40
	183346	7722141/SSR D=50
	183347	7722142/SSR D=63

	Material	Type, description	Ø d_1	Ø d_A	Torque moment		Revolution number [1000 min^{-1}]
					Nm	ft.lbs.	
	333935	7818123/M8X25/DIN912-12.9	32	16	30	22,1	16,0
	333935	7818123/M8X25/DIN912-12.9	35	16	30	22,1	16,0
	333935	7818123/M8X25/DIN912-12.9	40	16	30	22,1	16,0
	333935	7818123/M8X25/DIN912-12.9	42	16	30	22,1	16,0
	333937	7818124/M10X25/DIN912-12.9	50	22	50	36,9	12,5
	333937	7818124/M10X25/DIN912-12.9	52	22	50	36,9	12,5
	333937	7818124/M10X25/DIN912-12.9	63	22	50	36,9	10,0
	333937	7818124/M10X25/DIN912-12.9	66	22	50	36,9	9,0
	333940	7818125/M12X30/DIN912-12.9	80	27	80	59,0	8,0
	11128929	10001632/M16X30/DIN912-12.9	100	32	110	81,1	6,5

Contents

Introduction

Application

Inserts

Tools

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Tools

Technical information

Technical information

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Catalogue guidelines

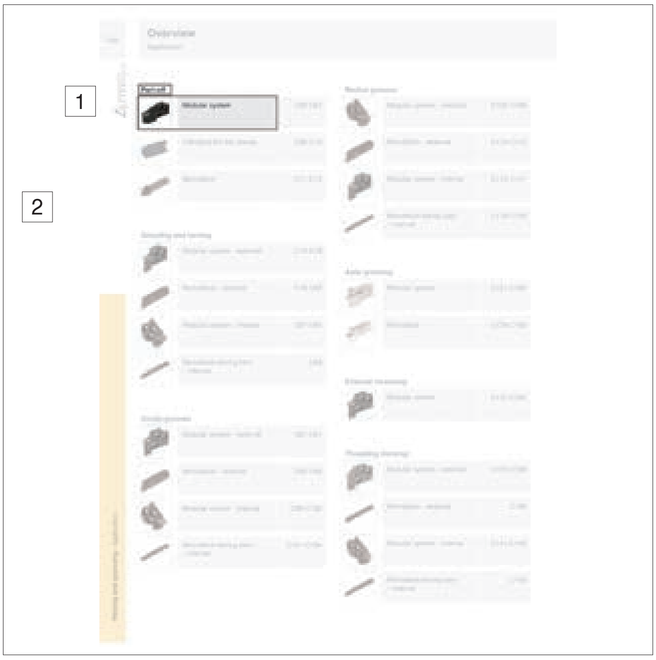
Make the right choice in just a few steps

1

Tool selection in the section on applications

1 Choose the requested application in the overview

2 Choose the requested tooling system



2

Choose the suitable type and size of adapter

3

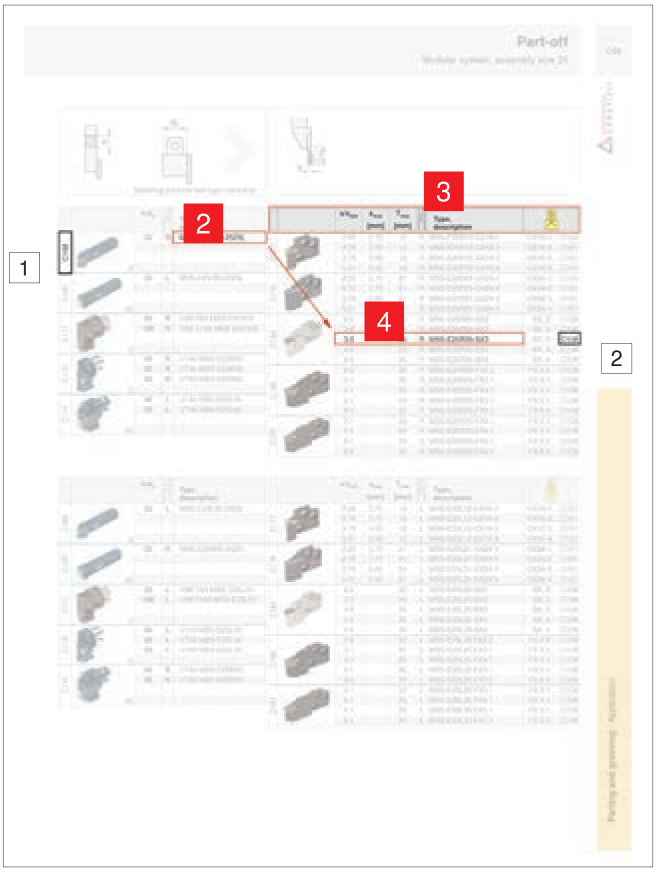
All suitable modules are shown on the right

4

The tool or module can be chosen according to the required parting and grooving depth or width

1 Detailed information on the requested tool

2 Information on the suitable inserts



5

Selection of the insert

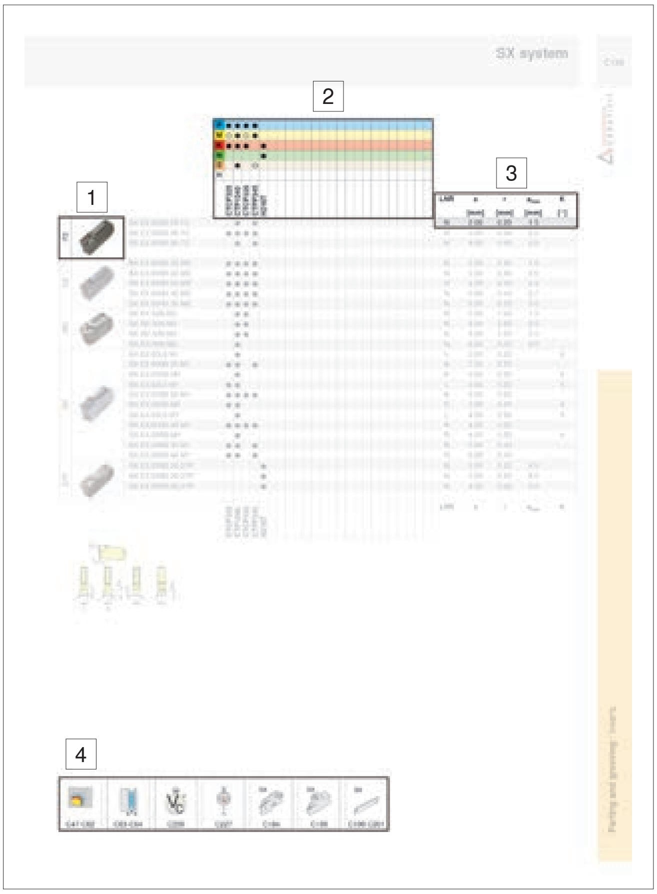
After defining the tooling system the insert is chosen including chip groove and cutting material

1 Chip grooves

2 Possible cutting materials

3 The main dimensions

4 Reference regarding further information



6

Selection of the tool

The product page shows the range of tools/modules with the main dimensions and information on the insert types

1 Possible applications

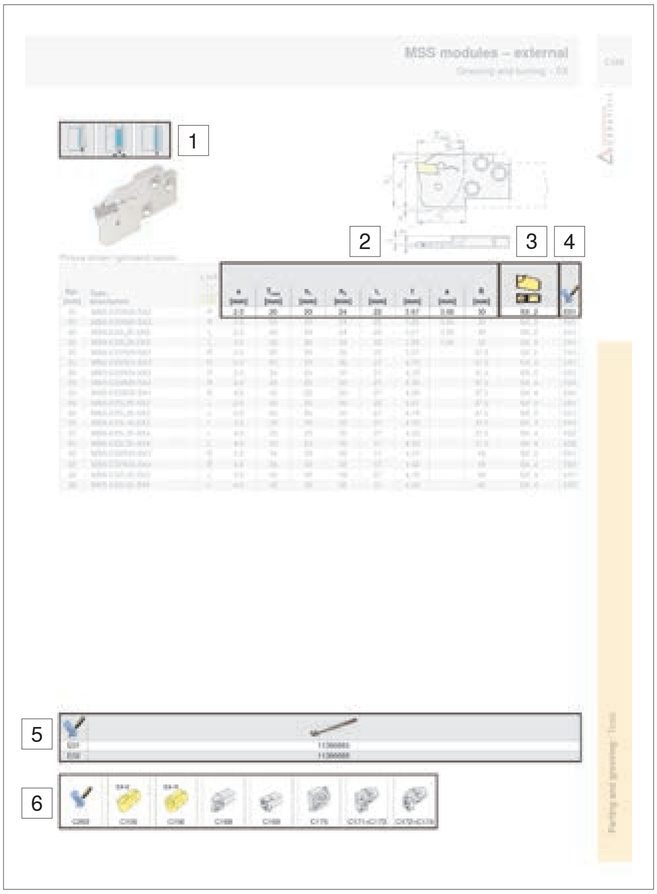
2 The main dimensions

3 Insert reference

4 Spare parts

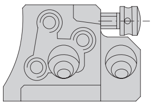
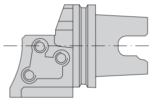
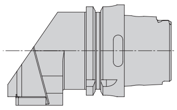
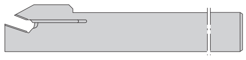
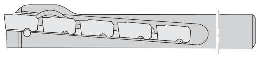
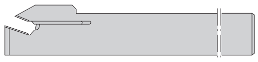
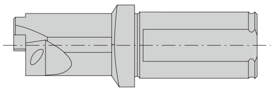
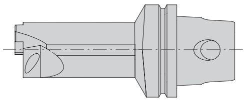
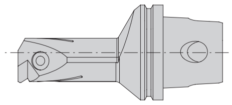
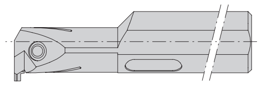
5 Spare parts overview

6 Reference regarding further information



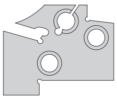
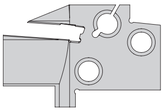
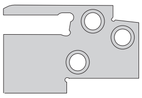
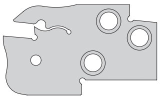
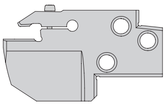
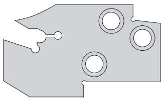
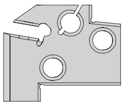
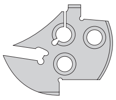
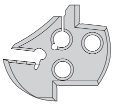
CERATIZIT designation system

Tool holders

	UTS / HSK-T system	Assembly size (system)	MSS system	E = external / I = internal	Assembly size	Hand	Approach angle	Parting and grooving depth	Shank section, type	Shank length	Insert system
			MSS	E	25	R	00		2525	L	
			MSS	E	25	R	00		AD		
	UT	40	MSS	E	25	R	00				
	HSK	T63	MSS	E	32	L	90				
				E	16	R	00	21	1616	K	GX24-1
			MC		05	R			1010	K	
				E	12	R	00	21			TC16
			MSS	I	25	R	90	1.5D			
	UT	40	MSS	I	32	R	90	2D			
	UT	40	MSS	I	32	R	90	2D			TC16
				I	12	R	90	2.5D			GX09

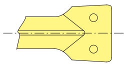
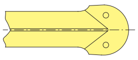
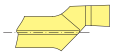
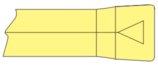
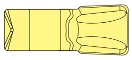
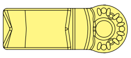
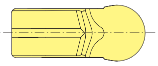
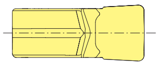
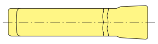
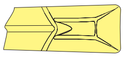
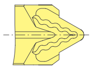
CERATIZIT designation system

Modules

	MSS system	E = external / I = internal	Assembly size	Hand	Max. parting and grooving depth	Insert system	Insert size	Width class	Axial diameter range D_{min} - D_{max}
	MSS	E	25	R	12	GX	16	2	
	MSS	E	25	R	15	GX	24	3	A70-100
	MSS	E	25	R	10	AX	10		
	MSS	E	25	R	25	SX	3		
	MSS	E	32	N	45	LX			
	MSS	E	25	R	20	FX	3.1		
	MSS	E	25	R		TC	16	2	
	MSS	I	25	R	06	GX	09	1	
	MSS	I	32	R		TC	16	2	

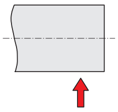
CERATIZIT designation system

Inserts

	Insert system	Insert size	Number of cutting edges	Width class	Insert shape, application	Cutting width, pitch	Hand / thread standard	Corner radius, angle		Chip groove code
	GX	16		2	E	3.00	N	0.30		Code
	GX	16		2	R	1.50	N			Code
	GX	16		2	S	1.00	R			
	AX	10			E	3.00	N	0.30	20	Code
	SX				E	2.00	N	0.20		Code
	SX				R	1.50	N			Code
	LX				E	8.00	N	0.80		Code
	LX				R	4.00	N			Code
	FX					3.10	N	0.20		Code
	MC	05	5			1.00	N	0.10		Code
	TC	16		1	E	1.50	ISO			Code

Diverse range of applications

Parting and grooving covers a diverse range of applications and demands, advanced technology and intelligent tool design.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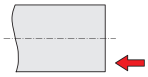
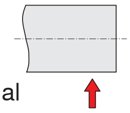
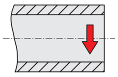

axial


external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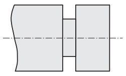
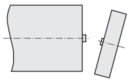
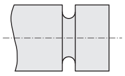
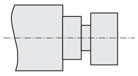
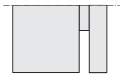

grooving


part-off

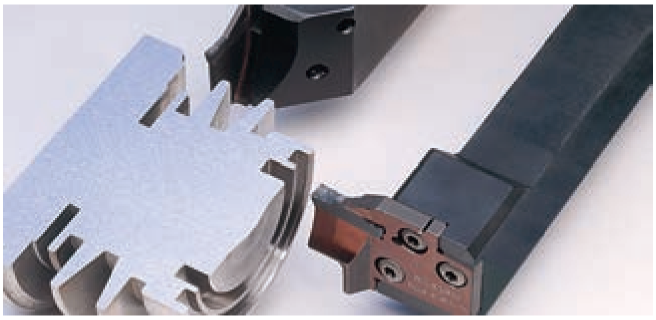

profile grooving


parting, grooving and turning


deep grooving

Advanced technology

- Chip formation
- Chip evacuation
- Parallel - flat parting and grooving surface
- Surface finish
- Formation of burrs when parting off tubes
- Formation of pips in part-off operations
- v_c = 0 in the centre
- Entire main cutting edge applied



Intelligent tool design

- Narrow, long overhang
- Insert clamping
- Rigidity
- Resistant against breakage
- Easy handling
- Economy

The modular system

MSS - the modular parting, grooving and threading system

In order to be able to meet all demands, up-to-date tools have a modular structure.

System features

- ○ Separate shank and tool holder
- ○ Same interface for all parting, grooving and threading applications
- ○ Stable, precise connection
- ○ Extendable through new ‘modules’
- ○ Easy handling
- ○ Clamping features optimised for the various applications

Flexibility

- ○ Adaptable to machining task
- ○ One system only for all parting, grooving and threading operations
- ○ Particularly well-suited for semi-standard tools

Simplicity

- ○ Quick module change in case of tool breakage, short downtime

Precision

- ○ High accuracy and repeatability when changing the module
- ○ Reduced set-up time
- ○ High-quality work pieces

Economy

- ○ Low stock inventory provides a large variety of combination possibilities
- ○ In case of tool breakage only change module

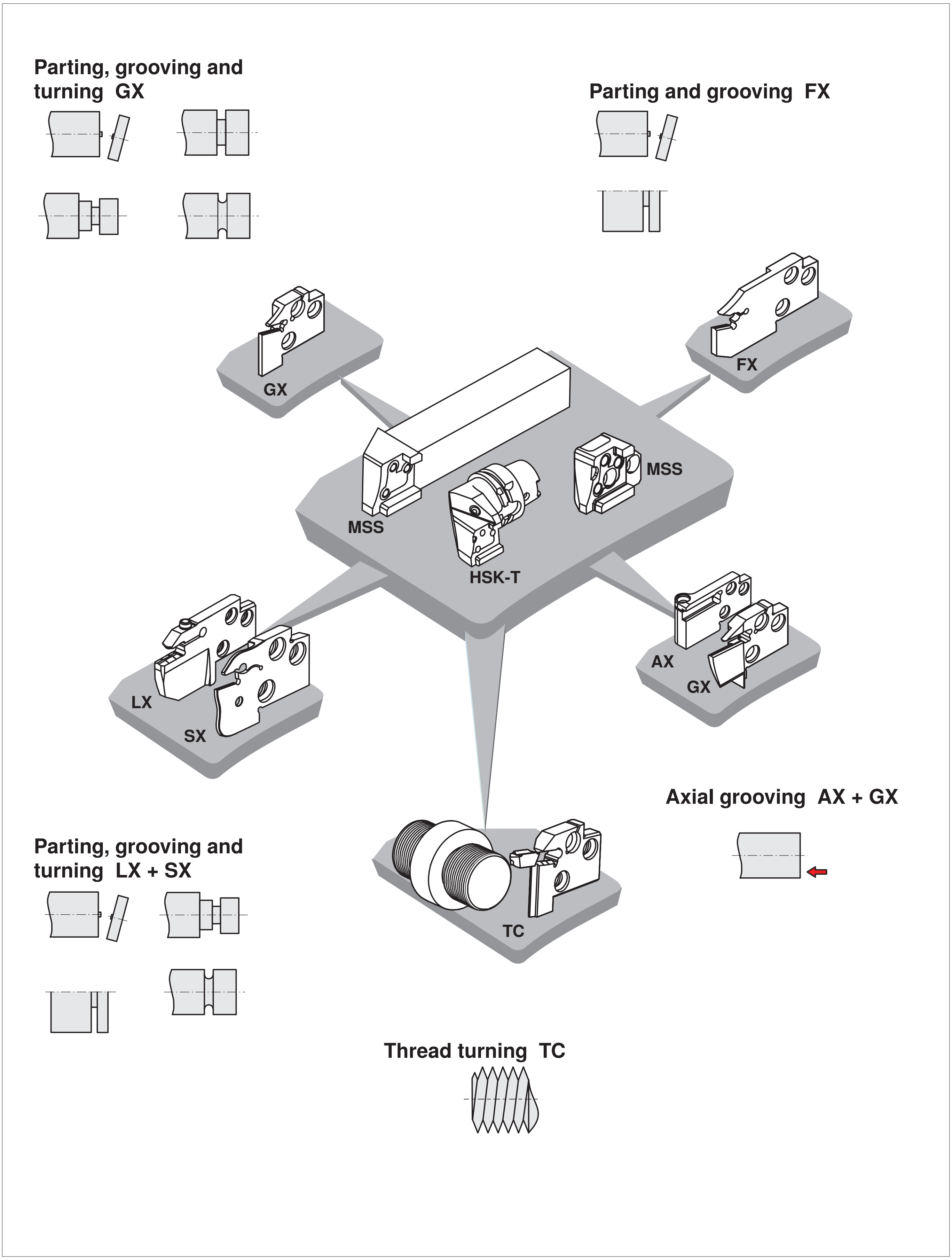
Stability

- ○ Application security
- ○ Parting, grooving and longitudinal turning possible

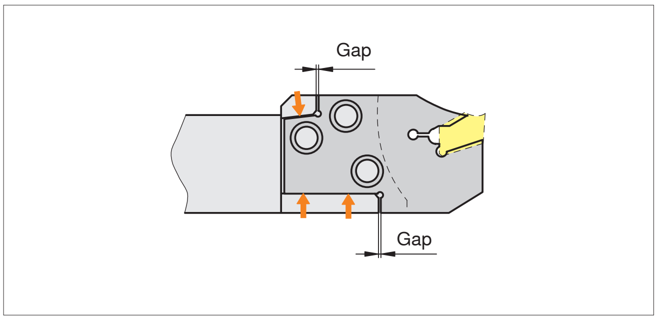
Completeness

- ○ Components for all work pieces and materials

MSS - system components



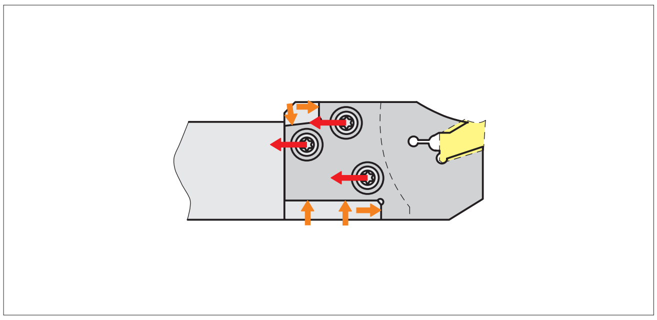
The interface



The strong connection

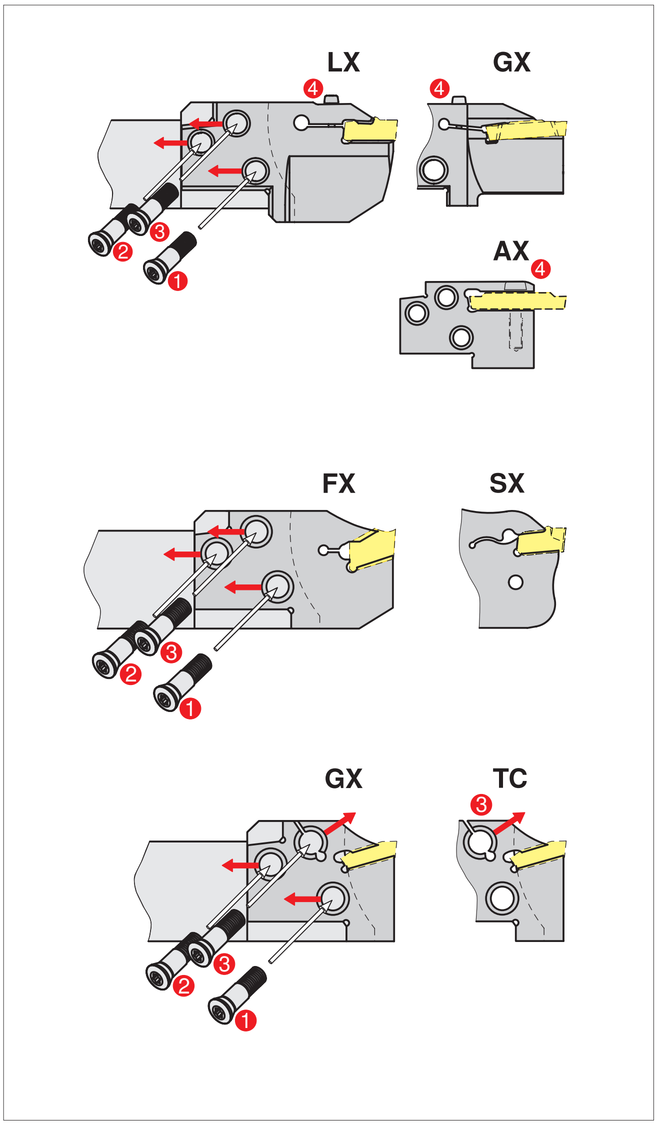
Unclamped module

○ Gap between module and location face for axial clamping



Clamped module

○ Axial clamping with location face
○ Connection without clearance, therefore highest stability



Clamping features LX / GX / AX Active insert clamping

Screws 1, 2 and 3 are used to clamp the module. The insert is self-clamping. The insert is clamped through the elastic deformation of the module through the additional screw 4.

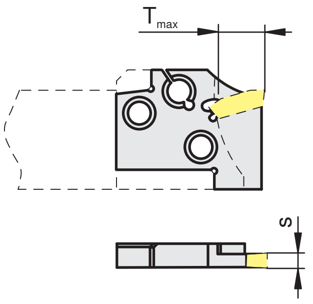
FX / SX Self-clamping inserts

Screws 1, 2 and 3 are used to clamp the module. The insert is self-clamping.

GX / TC Active insert clamping

Screws 1, 2 and 3 are used to clamp the module. **Important:** clamp the module with screw 1, then screw 2. Afterwards the insert is clamped by means of screw 3.

GX external



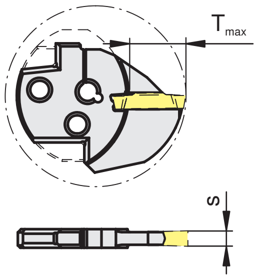
Parting, grooving, longitudinal turning, axial grooving

T_{max} = 7 - 21 mm
s = 2,0 - 8,0 mm

Circlip grooves
T_{max} = 0,75 - 4,0 mm
s = 0,6 - 5,25 mm

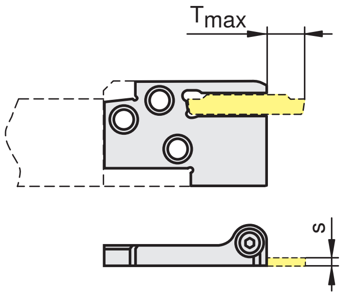
O-ring grooves
T_{max} = 1,78 - 2,58 mm
s = 1,6 - 2,4 mm

GX internal



T_{max} = 4 - 19 mm
s = 2,0 - 6,0 mm

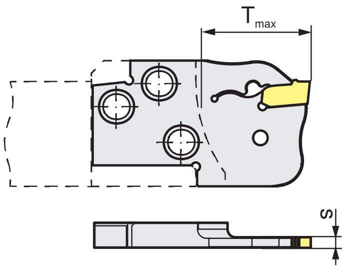
AX



Axial grooving

T_{max} = 5 - 15 mm
s = 3 mm

SX



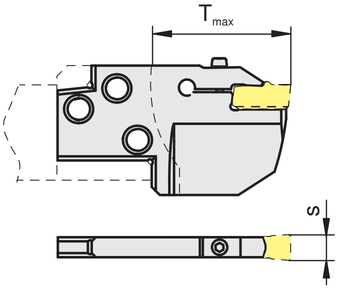
Parting, grooving, longitudinal turning

T_{max} = 20 - 35 mm
s = 2 - 4 mm

The modules

Systems LX / FX / TC

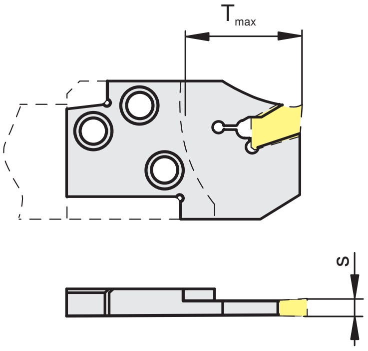
LX



Parting, grooving, longitudinal turning, axial grooving

T_{max} = 25 - 45 mm
s = 8,0 - 10,0 mm

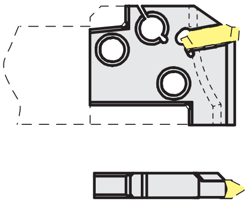
FX



Parting, grooving

T_{max} 20 = 45 mm
s = 2,2 - 6,5 mm

TC



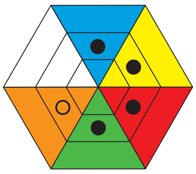
Thread turning and milling

Pitch
ISO 0,5 - 5,0 mm
BSW 28 - 5 TPI

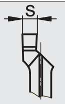
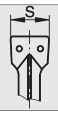
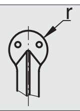
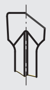
The inserts

Systems GX / AX / SX / LX / FX / TC

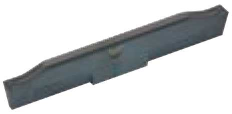
Parting, grooving, longitudinal turning, axial grooving

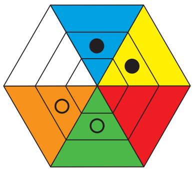


GX

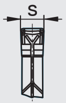
Insert size	 s	 r	 s	 r	
09	0,6-3,25	0,8-1,2	2,0-3,5	1,0-1,2	**Upon request**
16	0,6-5,25	0,8-1,2	2,0-6,0	1,5-3,0	
24			2,0-6,0	1,5-3,0	

Axial grooving

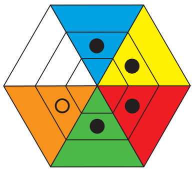




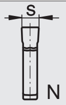
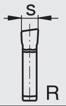
AX

 s
3,0

Parting, grooving, longitudinal turning



SX

 R	 s N	 s L	 s R
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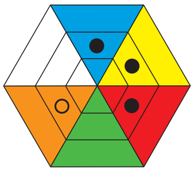
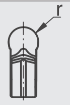
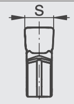
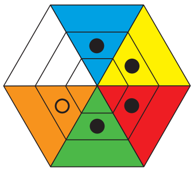
Parting, grooving, longitudinal turning, axial grooving



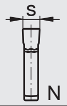
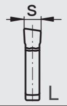
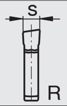
LX

 r	 s
4,0	8,0-10,0

Parting and grooving



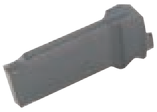
FX

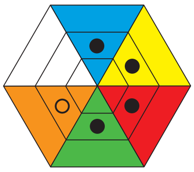
 s N	 s L	 s R
2,2-9,7	2,2-6,5	2,2-5,1

The inserts

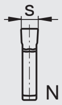
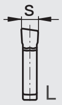
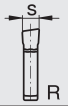
Systems GX / AX / SX / LX / FX / TC

Parting, grooving, longitudinal turning

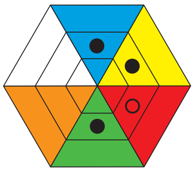




MC

		
1,0-2,5	1,0-2,5	1,0-2,5

Thread turning and milling



TC

	
Full and partial profile external, internal ISO 60°	**Full and partial profile external, internal BSW 55°**
Pitch 0.5 - 5.0 mm	**48 - 5 TPI**

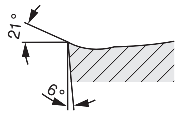
- According to the respective application either precision ground or sintered
- Optimised geometries for all important materials
- Security through ideal combination of substrate and coating
- All inserts for aluminium machining are microfinished

Geometries for GX-E system

Parting, grooving and turning

-F2

- ○ Very positive geometry
- ○ Ground cutting edge
- ○ Small feed rates
- ○ Low cutting forces
- ○ First choice for stainless materials



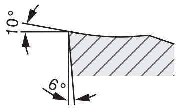
f [mm]

0,05 - 0,15

	Machining conditions		
	○	◐	◌
🟦	**CTCP325**	**CTP1340**	**CTPP345**
🟨	**CTP1340**	**CTP1340** **CTPP345**	**CTPP345**
🟥	CTCP325	CTP1340	
🟩			
🟧	CTP1340	CTP1340	CTPP345
⬜			

-EN

- ○ Very positive geometry
- ○ Small to medium feed rates
- ○ Low cutting forces
- ○ Universal application
- ○ First choice for axial grooving



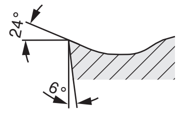
f [mm]

0,05 - 0,17

	Machining conditions		
	○	◐	◌
🟦	**CTCP325**	**CTCP335** **CTP1340**	**CTP1340**
🟨	CTCP335	CTCP335 CTP1340	CTP1340
🟥	**CTCP325**	**CTCP335** **CTP1340**	**CTP1340**
🟩			
🟧	CTP1340	CTP1340	CTP1340
⬜			

-EN (GX24)

- ○ Very positive geometry
- ○ Small to medium feed rates
- ○ Low cutting forces
- ○ Universal application
- ○ First choice for axial grooving



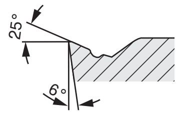
f [mm]

0,05 - 0,17

	Machining conditions		
	○	◐	◌
🟦	**CTCP325**	**CTCP335** **CTP1340**	**CTPP345**
🟨	CTP1340	CTP1340 CTPP345	CTPP345
🟥	**CTCP325**	**CTCP335** **CTP1340**	**CTP1340**
🟩			
🟧	CTP1340	CTP1340	CTPP345
⬜			

-M40

- ○ Stable geometry
- ○ Medium feed rates
- ○ Universal application
- ○ Good chip control



f [mm]

0,075 - 0,20

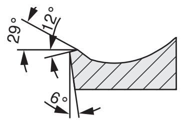
	Machining conditions		
	○	◐	◌
🟦	**CTCP325**	**CTP1340**	**CTPP345**
🟨	CTP1340	CTP1340 CTPP345	CTPP345
🟥	**CTCP325**	**CTCP325** **CTP1340**	**CTP1340**
🟩			
🟧	CTP1340	CTP1340	CTPP345
⬜			

Geometries for the GX-E system

Parting, grooving and turning

-M1

- ○ Very stable cutting edge
- ○ Medium to high feed rates
- ○ For interrupted cut
- ○ For materials with higher tensile strength
- ○ First choice for part-off operations



f [mm]

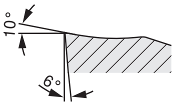
0,10 - 0,20

Machining conditions

	○	◐	◌
🟦	**CTCP325**	**CTP1340**	**CTPP345**
🟨	CTP1340	CTP1340 CTPP345	CTPP345
🟥	**CTCP325**	**CTCP325** **CTP1340**	**CTP1340**
🟩			
🟧	CTP1340	CTP1340	CTPP345
⬜			

-27P

- ○ Highly positive geometry
- ○ Insert with ground periphery
- ○ Sharp cutting edge
- ○ Reduced tendency to adhesion
- ○ First choice for non-ferrous metals



f [mm]

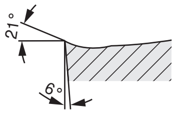
0,05 - 0,25

Machining conditions

	○	◐	◌
🟦			
🟨			
🟥			
🟩	**H216T**	**H216T**	**H216T**
🟧			
⬜			

-27P (GX24)

- ○ Highly positive geometry
- ○ Insert with ground periphery
- ○ Sharp cutting edge
- ○ Reduced tendency to adhesion
- ○ First choice for non-ferrous metals



f [mm]

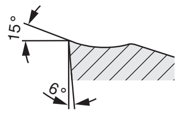
0,05 - 0,25

Machining conditions

	○	◐	◌
🟦			
🟨			
🟥			
🟩	**H216T**	**H216T**	**H216T**
🟧			
⬜			

-ER/-EL

- ○ Positive geometry
- ○ Ground cutting edge
- ○ Small feed rates
- ○ Low cutting forces
- ○ Radius and O-ring grooves



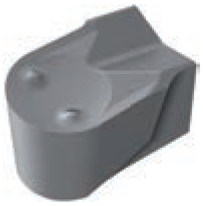
f [mm]

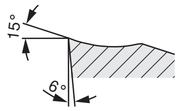
0,05 - 0,15

	Machining conditions		
	●	◐	◌
🟦	**CTCP325**	**CTCP325**	
🟨	CTCP325	CTCP325	
🟥	**CTCP325**	**CTCP325**	
🟩			
🟧			
⬜			

-EN

- ○ Positive geometry
- ○ Ground cutting edge
- ○ Small to medium feed rates
- ○ Low cutting forces
- ○ Radius grooves, profiling





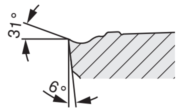
f [mm]

0,05 - 0,20

	Machining conditions		
	●	◐	◌
🟦	**CTCP325**	**CTCP325** **CTP1340**	**CTP1340**
🟨	**CTP1340**	**CTP1340**	**CTP1340**
🟥	**CTCP325**	**CTCP325** **CTP1340**	**CTP1340**
🟩			
🟧	CTP1340	CTP1340	
⬜			

-M3

- ○ Positive geometry
- ○ Medium to high feed rates
- ○ High surface quality
- ○ Radius grooves, profiling



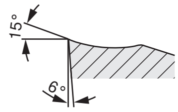
f [mm]

0,07 - 0,20

	Machining conditions		
	●	◐	◌
🟦	**CTCP325**	**CTCP325** **CTCP335**	**CTCP335**
🟨	CTCP335	CTCP335	
🟥	**CTCP325**	**CTCP325** **CTCP335**	**CTCP335**
🟩			
🟧			
⬜			

-27P

- ○ Highly positive geometry
- ○ With ground periphery
- ○ Sharp cutting edges
- ○ Reduced tendency to adhesion
- ○ First choice for non-ferrous metals



f [mm]

0,05 - 0,30

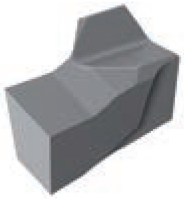
	Machining conditions		
	●	◐	◌
🟦			
🟨			
🟥			
🟩	**H216T**	**H216T**	**H216T**
🟧			
⬜			

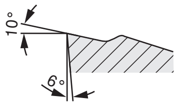
Geometries for GX-S system

Circlip grooves

-ER/-EL

- ○ Positive geometry
- ○ Ground cutting edges
- ○ Small feed rates
- ○ Small corner radii
- ○ Circlip grooves





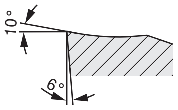
f [mm]

0,025 - 0,125

Machining conditions		
○	◐	◌
CTP1340	**CTP1340**	
CTP1340	**CTP1340**	
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	

-EN

- ○ Positive geometry
- ○ Ground cutting edges
- ○ Small feed rates
- ○ Small corner radii
- ○ Circlip grooves



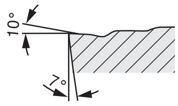
f [mm]

0,025 - 0,125

Machining conditions		
○	◐	◌
CTP1340	**CTP1340**	
CTP1340	**CTP1340**	
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	

-F50

- ○ Positive geometry
- ○ Ground cutting edges
- ○ Small feed rates
- ○ Small cutting forces
- ○ For axial grooving



f [mm]

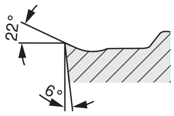
0,025 - 0,125

Machining conditions		
●	◐	◌
CTP1340	**CTP1340**	
CTP1340	**CTP1340**	
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	

Geometries for SX system

-F2

- ○ Very positive geometry
- ○ Ground cutting edges
- ○ Small feed rates
- ○ Low cutting forces
- ○ First choice for stainless materials



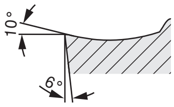
f [mm]

0,05 - 0,15

	Machining conditions		
	○	◒	◌
🟦	**CTP1340**	**CTP1340**	**CTPP345**
🟨	**CTP1340**	**CTP1340** **CTPP345**	**CTPP345**
🟥	CTP1340	CTP1340	
🟩			
🟧	CTP1340	CTP1340 CTPP345	
⬜			

-M2

- ○ Stable geometry
- ○ Medium feed rates
- ○ Universal application
- ○ Good chip control



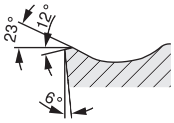
f [mm]

0,075 - 0,20

	Machining conditions		
	○	◒	◌
🟦	**CTCP325**	**CTCP335** **CTP1340**	**CTPP345**
🟨	CTCP335	CTP1340	CTPP345
🟥	**CTCP325**	**CTCP325**	**CTCP335**
🟩			
🟧	CTP1340	CTP1340	CTPP345
⬜			

-M1

- ○ Very stable cutting edges
- ○ Medium to high feed rates
- ○ For interrupted cut
- ○ Materials with higher tensile strength
- ○ First choice for part-off operations



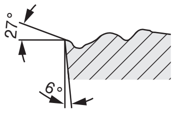
f [mm]

0,10 - 0,20

	Machining conditions		
	○	◒	◌
🟦	**CTCP325**	**CTCP335** **CTP1340**	**CTPP345**
🟨	CTCP335	CTP1340	CTPP345
🟥	**CTCP325**	**CTCP325**	**CTCP335**
🟩			
🟧	CTP1340	CTP1340	CTPP345
⬜			

-M3

- ○ Stable geometry
- ○ Medium to high feed rates
- ○ High surface quality
- ○ Radius grooves, profiling



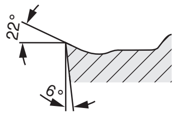
f [mm]

0,05 - 0,20

	Machining conditions		
	○	◒	◌
🟦	**CTCP335**	**CTCP335** **CTP1340**	**CTP1340**
🟨	**CTCP335**	**CTCP335** **CTP1340**	**CTP1340**
🟥	CTCP335	CTCP335 CTP1340	CTP1340
🟩			
🟧	CTP1340	CTP1340	CTP1340
⬜			

-27P

- Highly positive geometry
- With ground periphery
- Sharp cutting edges
- Reduced tendency to adhesion
- First choice for non-ferrous metals

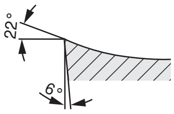


f [mm]		Machining conditions		
		●	◒	◌
	🟦			
	🟨			
	🟥			
0,05 - 0,25	🟩	**H216T**	**H216T**	**H216T**
	🟧			
	⬜			

Geometries for LX system

-M2

- ○ Stable geometry
- ○ Medium feed rates
- ○ Universal application
- ○ Good chip control



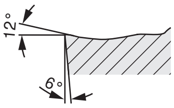
f [mm]

0,20 - 0,50

	Machining conditions		
	●	◐	◌
🟦	**CTCP325**	**CTCP335 CTP1340**	**CTP1340**
🟨	CTCP335	CTP1340	CTP1340
🟥	**CTCP325**	**CTCP325**	**CTCP335**
🟩			
🟧	CTP1340	CTP1340	CTP1340
⬜			

-M3

- ○ Stable geometry
- ○ Medium to high feed rates
- ○ High surface quality
- ○ Radius grooves, profiling



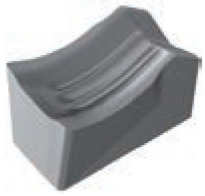
f [mm]

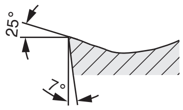
0,15 - 0,35

	Machining conditions		
	●	◐	◌
🟦	**CTCP325**	**CTCP335 CTP1340**	**CTP1340**
🟨	**CTCP335**	**CTCP335 CTP1340**	**CTP1340**
🟥	CTCP325	CTCP335 CTP1340	CTP1340
🟩			
🟧	CTP1340	CTP1340	CTP1340
⬜			

-F1

- ○ Very positive geometry
- ○ Small to medium feed rates
- ○ Low cutting forces
- ○ Good chip control
- ○ Reduced built-up edge





f [mm]

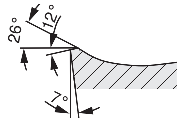
0,05 - 0,15

Machining conditions

	○	◐	◌
🟦	**CTCP325**	**CTP1340**	**CTPP345**
🟨	**CTP1340**	**CTP1340** **CTPP345**	**CTPP345**
🟥	CTCP325	CTCP325 CTP1340	
🟩			
🟧	CTP1340	CTP1340 CTPP345	CTPP345
⬜			

-M1

- ○ Very stable cutting edges
- ○ Medium to high feed rates
- ○ For interrupted cut
- ○ For materials with higher tensile strength
- ○ First choice for part-off operations



f [mm]

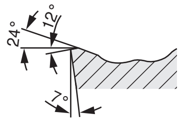
0,08 - 0,20

Machining conditions

	○	◐	◌
🟦	**CTCP325**	**CTCP335** **CTP1340**	**CTPP345**
🟨	CTCP335	CTP1340	CTPP345
🟥	**CTCP325**	**CTCP325**	**CTCP335**
🟩			
🟧	CTP1340	CTP1340	CTPP345
⬜			

-R2

- ○ Very stable cutting edges
- ○ High feed rates
- ○ Good chip control



f [mm]

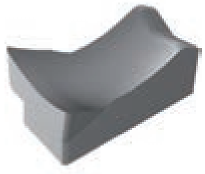
0,10 - 0,27

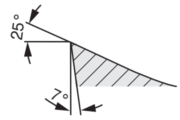
Machining conditions

	○	◐	◌
🟦	**CTCP325**	**CTP1340**	**CTPP345**
🟨	CTP1340	CTP1340 CTPP345	CTPP345
🟥	**CTCP325**	**CTCP325** **CTP1340**	
🟩			
🟧	CTP1340	CTP1340 CTPP345	CTPP345
⬜			

-27P

- ○ Highly positive geometry
- ○ With ground periphery
- ○ Sharp cutting edges
- ○ Reduced tendency to adhesion
- ○ First choice for non-ferrous metals





f [mm]

0,03 - 0,13

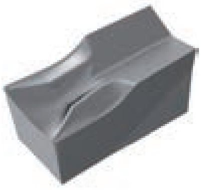
Machining conditions

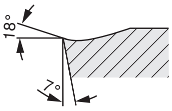
	○	◐	◌
🟦			
🟨			
🟥			
🟩	**H216T**	**H216T**	**H216T**
🟧			
⬜			

Geometries for MaxiClick system

-F2

- o Very positive geometry
- o Ground cutting edges
- o Small feed rates
- o Low cutting forces
- o First choice for stainless materials





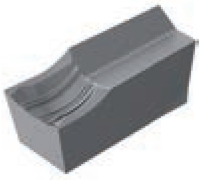
f [mm]

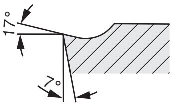
0,05 - 0,10

Machining conditions		
○	◐	◌
CTP1340	**CTP1340**	**CTP1340**
CTP1340	**CTP1340**	**CTP1340**
CTP1340	CTP1340	
CTP1340	CTP1340	CTP1340
CTP1340	CTP1340	

-F3

- o Very positive geometry
- o Ground cutting edges
- o Small feed rates
- o Low cutting forces
- o Reduced formation of pips and burrs





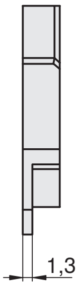
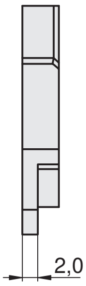
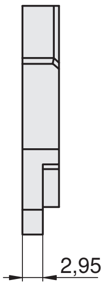
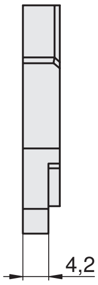
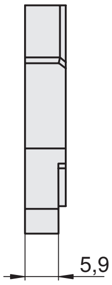
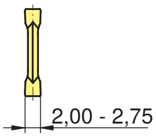
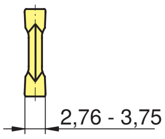
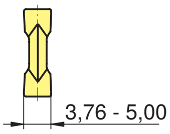
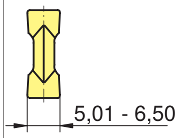
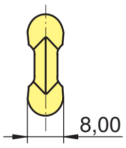
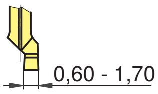
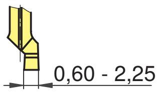
f [mm]

0,02 - 0,06

Machining conditions		
○	◐	◌
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	
CTP1340	CTP1340	

The width classes

GX system

Width classes	1	2	3	4	5
Parting and grooving modules	 1,3	 2,0	 2,95	 4,2	 5,9
Parting and grooving inserts	 2,00 - 2,75	 2,76 - 3,75	 3,76 - 5,00	 5,01 - 6,50	 8,00
Inserts for circlip grooves	 0,60 - 1,70	 0,60 - 2,25			

Module designation

MSS-E20R12-GX16- **2**

1

Insert designation

GX16- **2** E3.00N0.30

1

1 **Width class** 1)

The parting and grooving widths of the MSS system are divided into width classes. Every width class represents a certain range of cutting widths.

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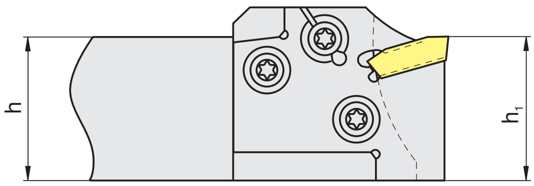
1) Ideally the module and the insert have the same width class. This combination results in the best possible application security.

The assembly size



The assembly size is determined by the shank dimensions of the MSS tool holders.
In this manner the correct tool holder can be assigned to the correct module size and vice versa.
The following tables will give you an overview of the width classes and insert sizes for the available assembly sizes.

Tool designation

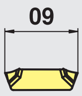
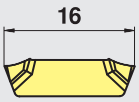
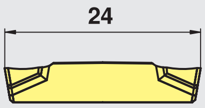
MSS- **E25** R00-2525L
1

Module designation

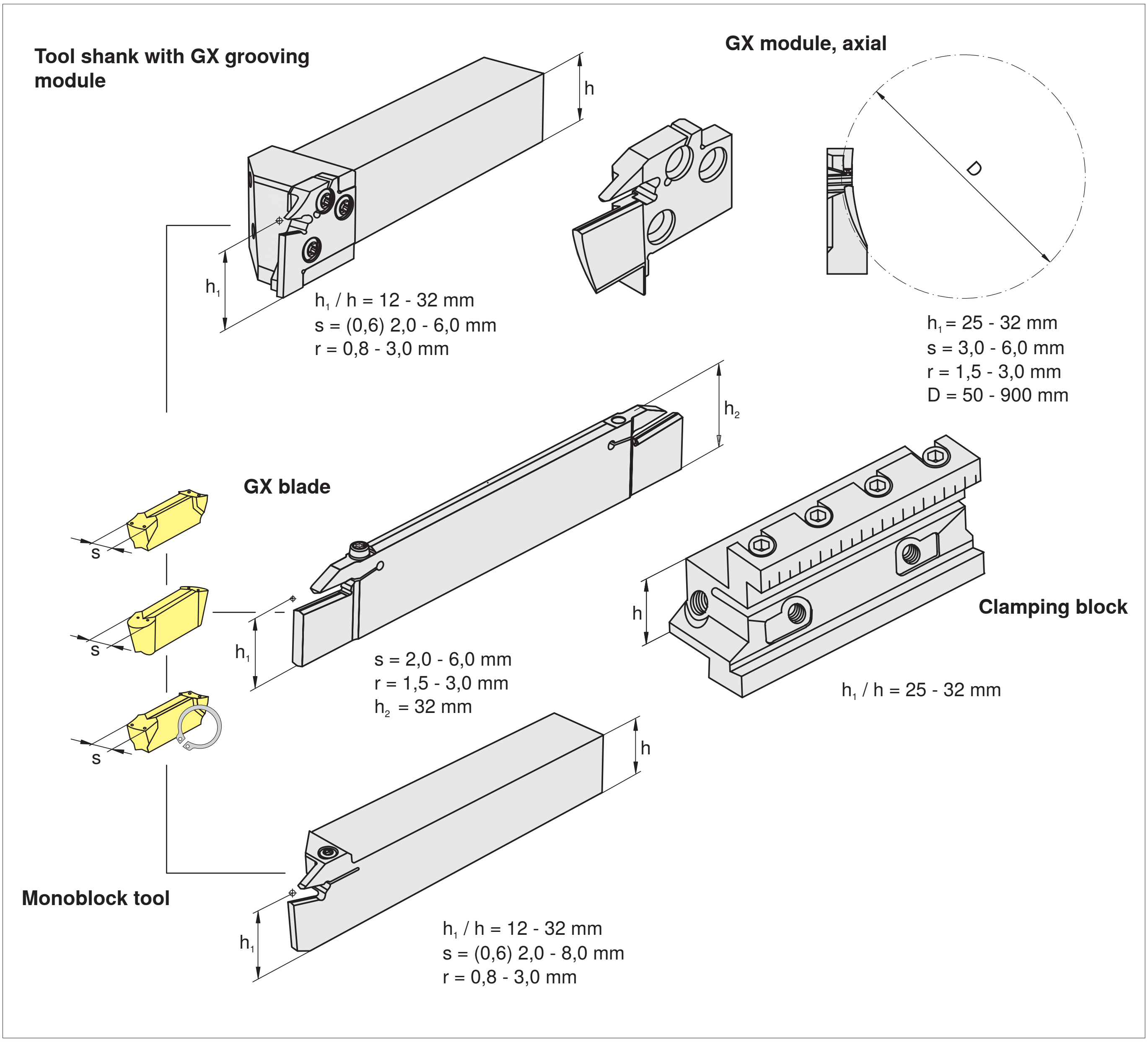
MSS- **E25** R25-GX16-2
1

1 **Assembly size (h)**

Assembly size (h)	GX							
	External machining				Internal machining			
	Width class							
	1	2	3	4	1	2	3	4
10	▒	▒						
12	▒	▒			▓	▓		
16	▒	▒			▓	▓		
20	▒	▒	▒		▓	▓		
25	▒	▒	▒	▒	▓	▓		
32		▒	▒	▒	▓	▓	▓	▓
40					▓	▓	▓	▓

Assembly size (h)	GX					
	Insert size					
	09 		16 		24 	
10	▒					
12	▒	▓	▒			
16	▒	▓	▒	▓	▒	
20		▓	▒	▓	▒	
25		▓	▒	▓	▒	
32			▒	▓	▒	▓
40				▓		▓

The GX system features a double-ended insert with numerous application possibilities. It is mostly applied for radial grooving and turning. Thanks to special modules the system can easily be adapted for axial and circlip grooving. For GX inserts a range of modules and boring bars for internal grooving is available.



System characteristics

- ○ Double-ended insert
- ○ Ground and directly pressed inserts

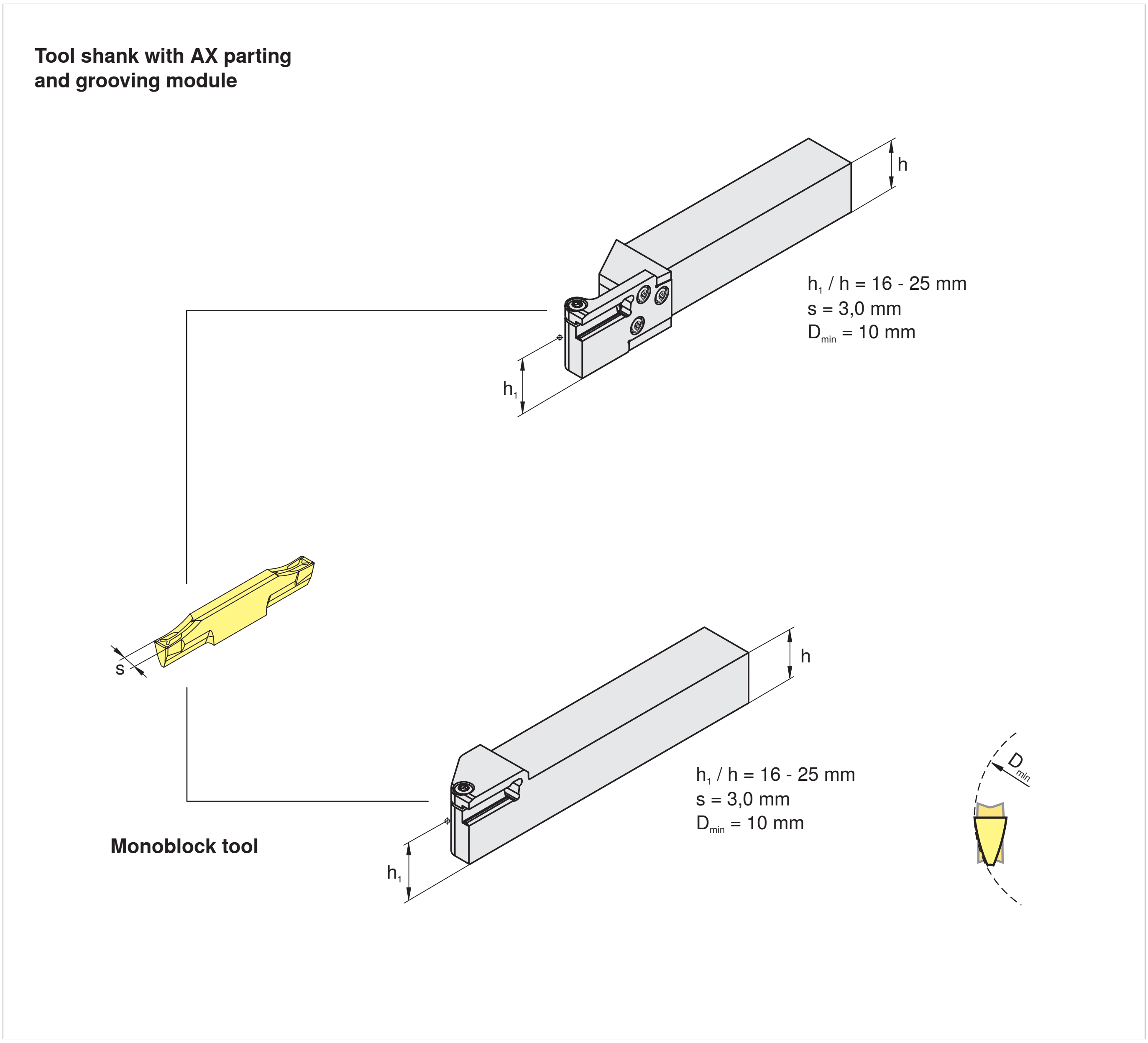
Benefits

- ○ Good economy
- ○ Optimum solution for all situations

System overview

AX system

The AX system is for axial grooving with small diameters. A special characteristic of the design is that the insert needs no support in the cutting area.



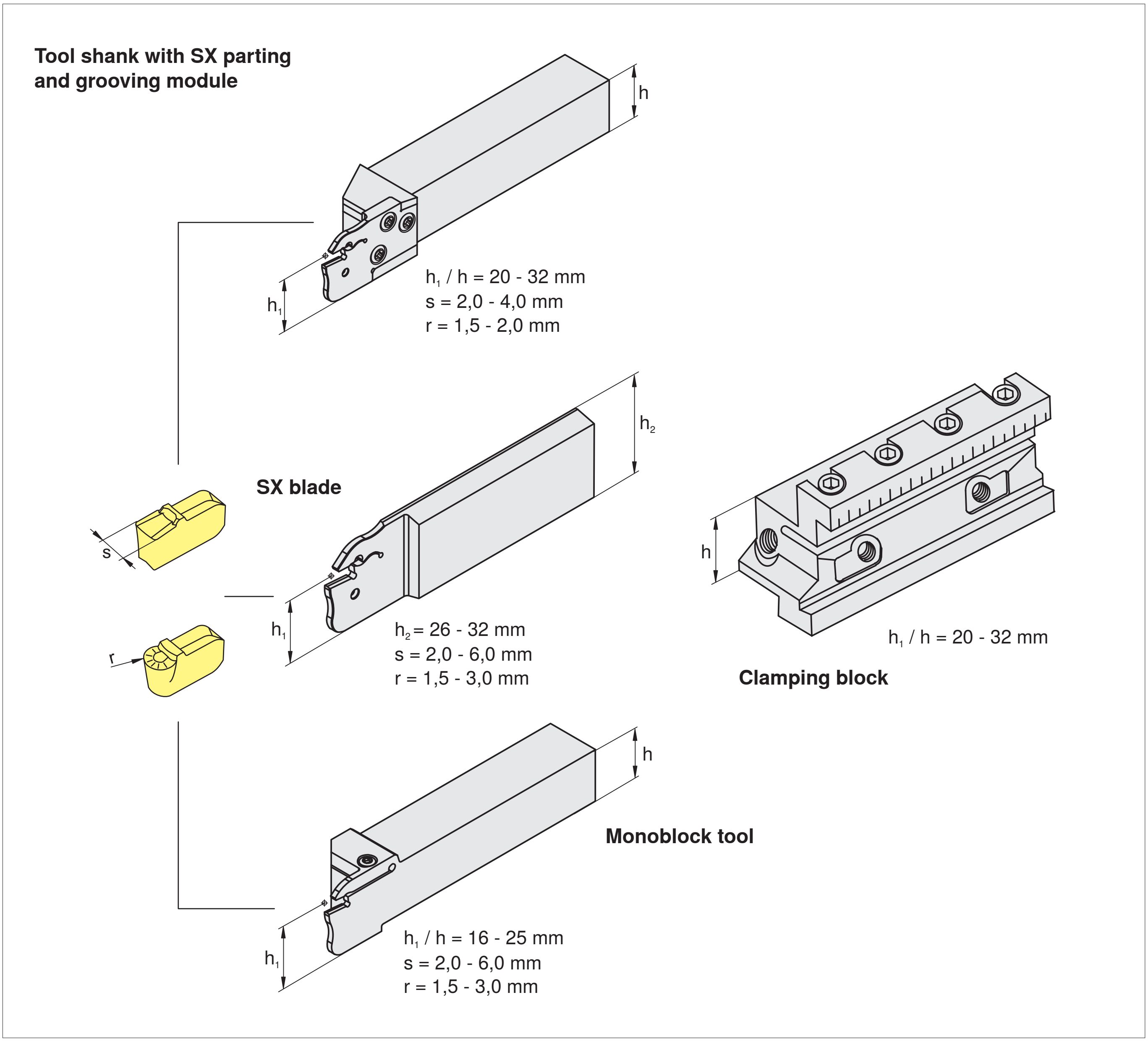
System characteristics

- ○ Neutral insert
- ○ Monoblock and modular tools

Benefits

- ○ May be applied in left-hand and right-hand tools
- ○ Optimum solution in terms of costs for every application

In the SX system the insert is self-clamping and fixed with maximum clamping force in the insert seat. Precise cutting edge positioning and easy handling are guaranteed.



System characteristics

- ○ Active clamping
- ○ Insert seat with fixed stop
- ○ Easy handling
- ○ FEM optimised tool

Benefits

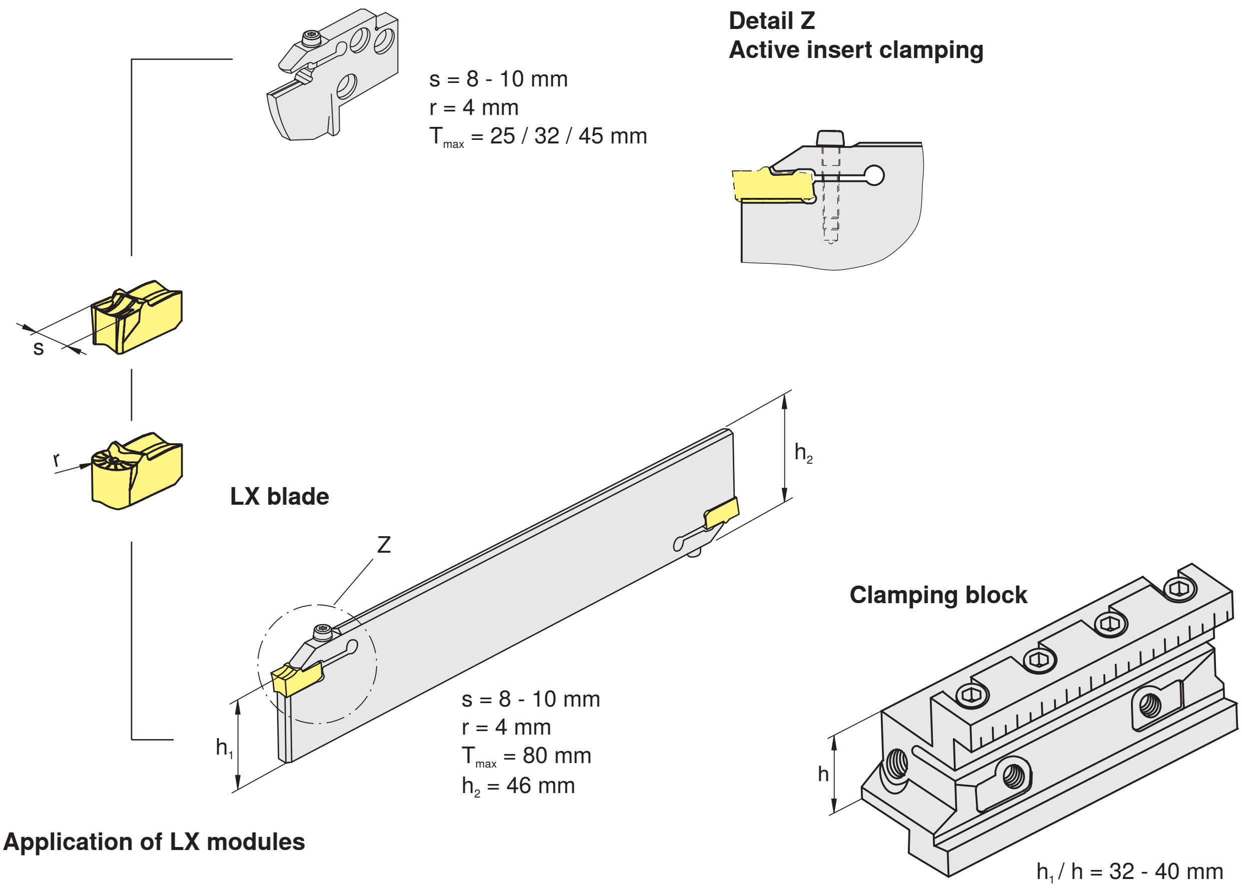
- ○ Inserts will not pull out of the cutting blade
- ○ Exact positioning of the cutting edge
- ○ Quick insert change
- ○ Maximum stability also when longitudinal turning

System overview

LX system

The LX system is characterised by high strength and stability. It is most suitable for the production of wide and deep grooves as well as for parting off large bar diameters.

Parting and grooving module LX



Application of LX modules

- ○ Part-off
- ○ Grooving and turning
- ○ Axial grooving with D > 500 mm
- ○ Internal grooving and turning with D > 200 mm

System characteristics

- ○ Robust construction
- ○ Active insert clamping
- ○ Insert with full radius

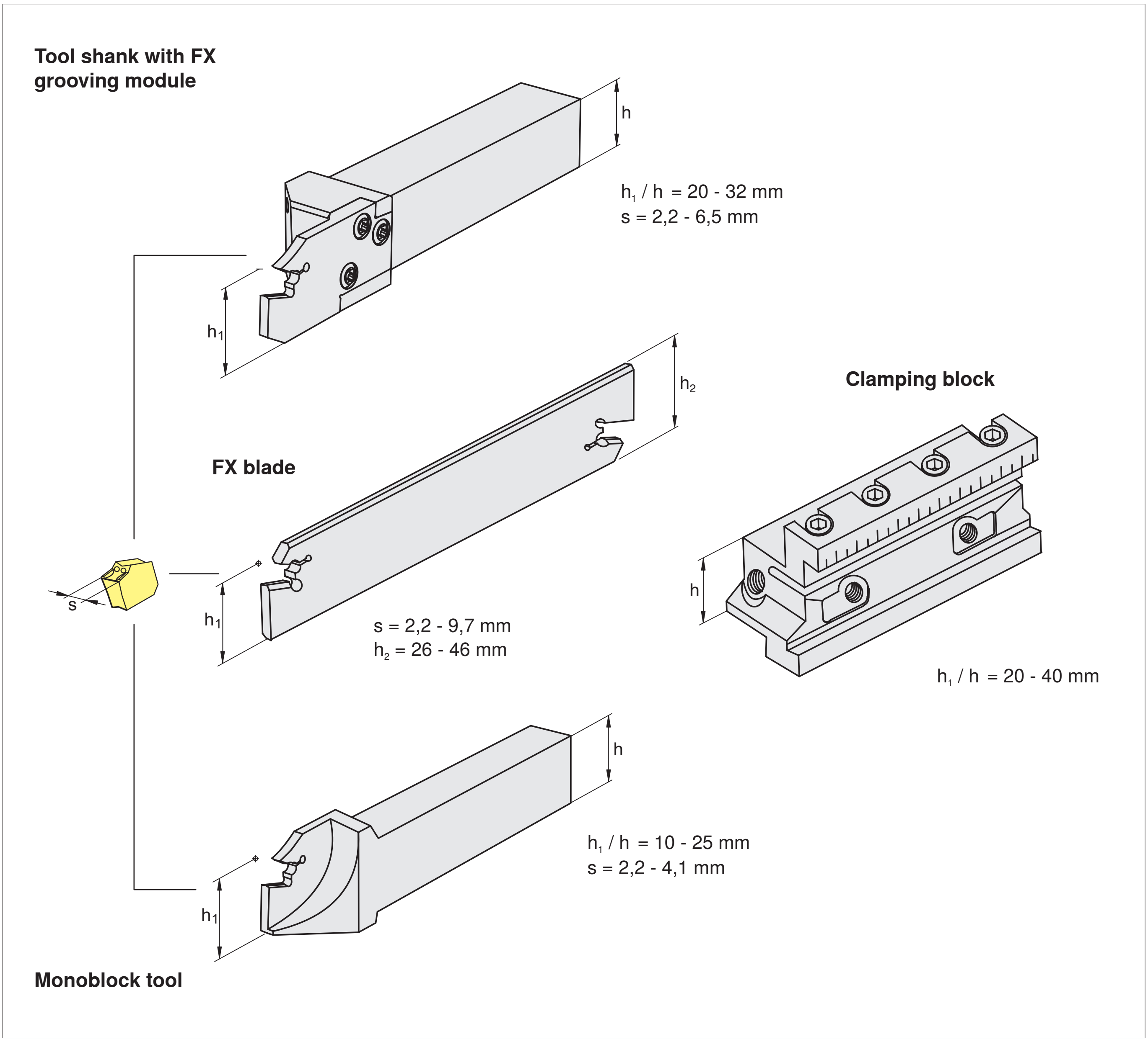
Benefits

- ○ Application security, high strength and stability
- ○ Well-suited for copy turning

System overview

FX system

The FX system is characterised by a self-clamping single blade insert for deep grooving of large diameters. FX is directly integrated in the MSS system by means of the respective modules. Additionally the tried and tested block/blade solutions and monoblock tools are available.



System characteristics

- Self-clamping insert
- Adjustable blade
- Single-blade insert, directly pressed

Benefits

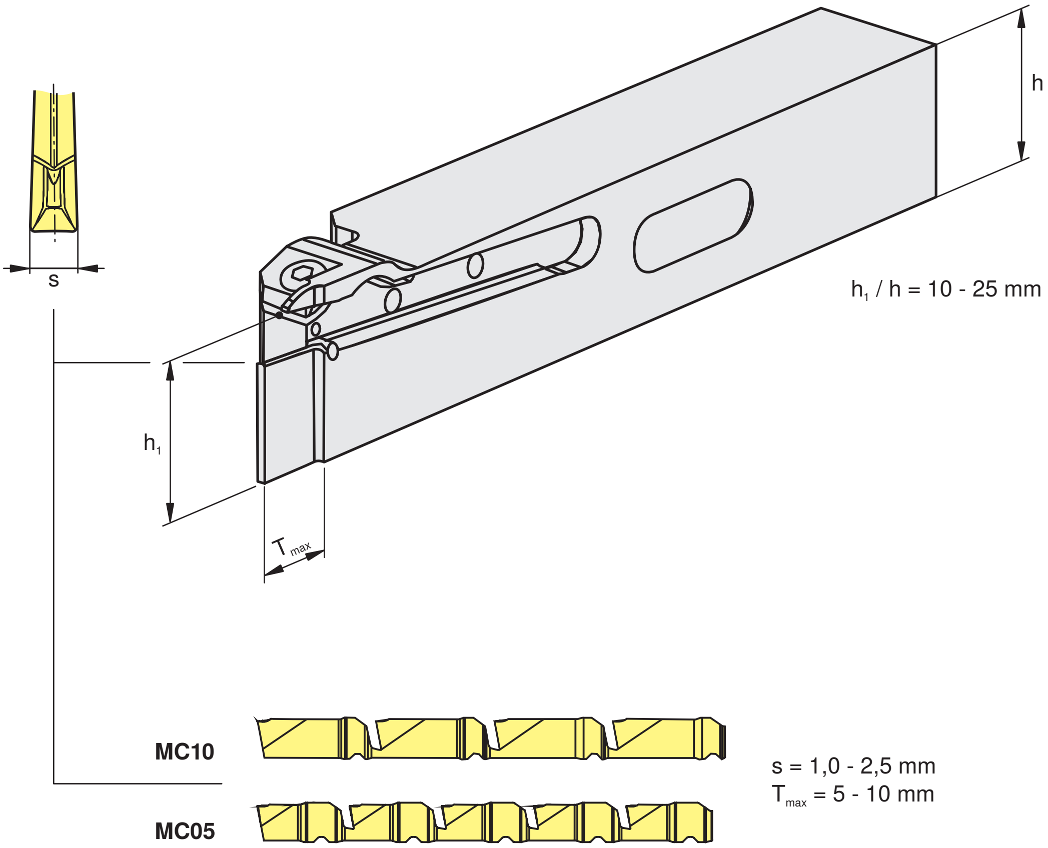
- Easy handling, no clamping parts
- Parting and grooving depth, overhang optimally adjustable
- Economic for deep parting and grooving

System overview

MaxiClick system

MaxiClick is characterised by a cutting insert consisting of 4 or 5 cutting elements. The worn cutting edge is broken off towards the side, like a snap-off knife.

Monoblock tool



System characteristics

- ○ Extremely narrow part-off and grooving widths are possible
- ○ Excellent surface quality can be achieved
- ○ Multiple part-off operations are possible

Benefits

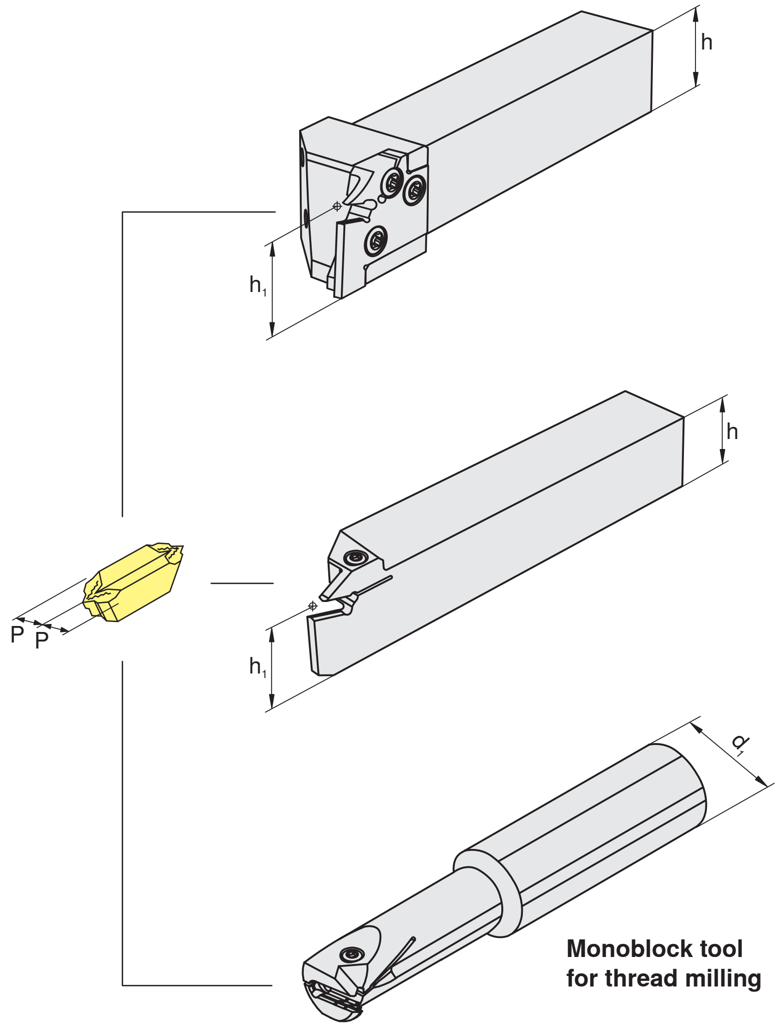
- ○ Less material wastage
- ○ No additional finishing work necessary
- ○ Reduction of machining costs

System overview

TC system

With system TC the same insert can be used to produce threads by turning or milling. TC offers numerous advantages which are of decisive importance for many threading applications.

Tool shank with TC threading module



h_1 / h = 20 - 25 mm

Pitch
P = .5 - 5.0 mm
P = 48 - 5 TPI

Monoblock tool

h_1 / h = 12 mm

Pitch
P = .5 - 3.0 mm
P = 48 - 8 TPI

Monoblock tool for thread milling

d_1 = 25 - 32 mm

Pitch
P = .5 - 5.0 mm
P = 48 - 5 TPI

System characteristics

- ○ Turning and milling with the same insert
- ○ Neutral configuration of insert

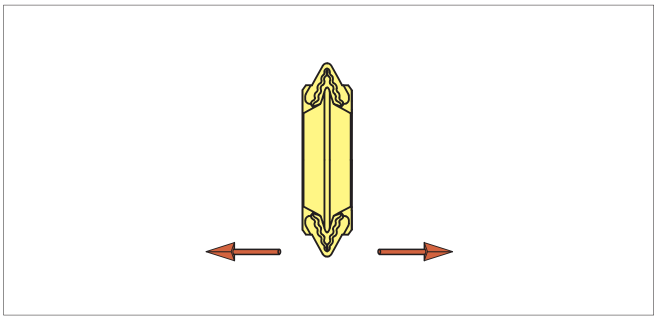
Benefits

- ○ Flexibility, reduced variety and costs
- ○ Right-hand and left-hand threads possible using one insert only
- ○ Reduced storage

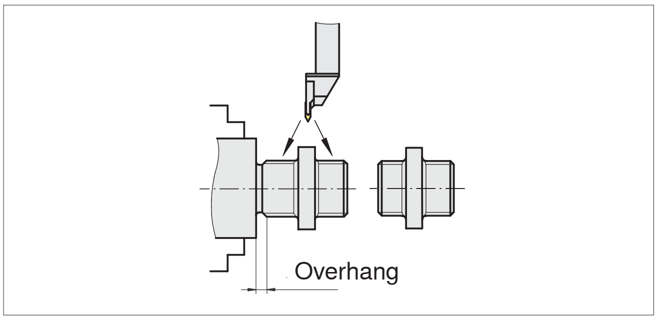
TC system – thread turning

System TC for thread turning is an integrated part of the MSS system. Compared to traditional systems TC offers a series of advantages which are of decisive importance for many threading applications.

System TC

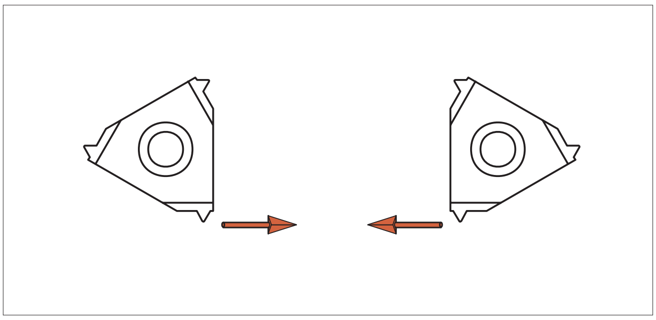


- ○ Neutral configuration of insert makes operation in both directions possible
- ○ Only one threading insert per pitch for partial profile and Whitworth thread; only two threading inserts (internal - external) per pitch for ISO threads
- ○ Reduced storage
- ○ Good chip formation through chip groove with rake angle +10°

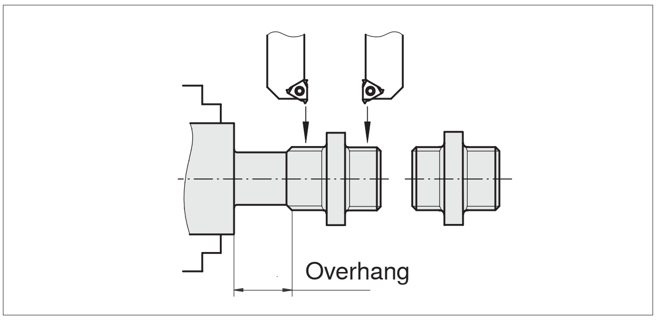


Enhanced economic efficiency through
- ○ reduced machining time
- ○ fewer tool changes
- ○ improved stability, small overhang
- ○ material saving
- ○ thread turning between shoulders possible
- ○ fewer tools and inserts

Conventional system



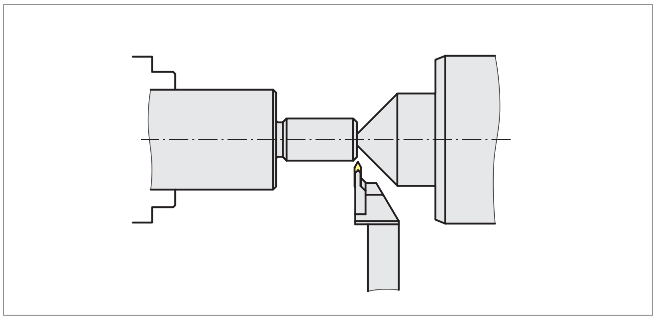
- ○ Right-hand and left-hand version of insert, therefore operation only in one direction
- ○ For every pitch 4 threading inserts are necessary (right- and left-hand, internal - external)



- ○ for this machining method 2 tools are necessary
- ○ additional loss of stability and material caused by large overhangs

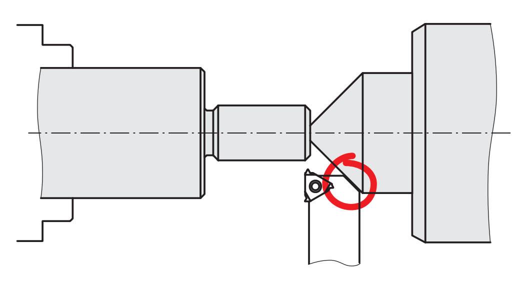
TC system – thread turning

System TC

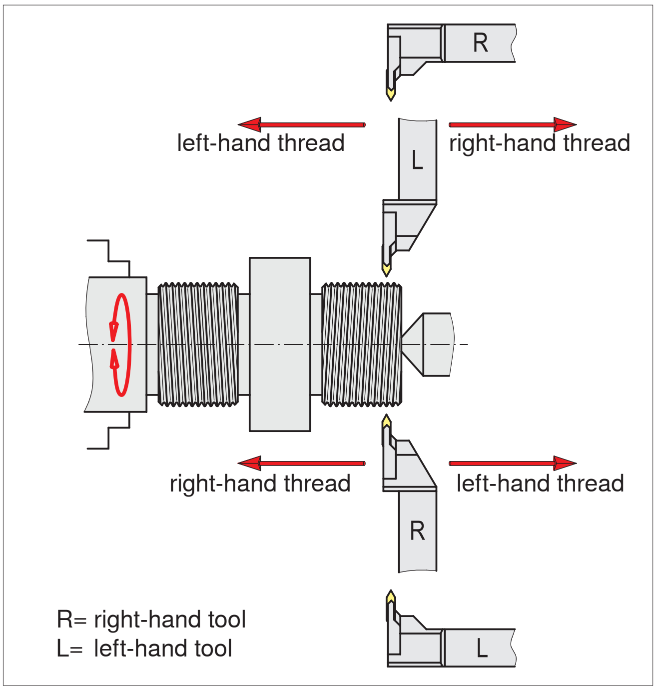


- ○ Easy access to work piece therefore use of tailstock also possible with small thread diameters

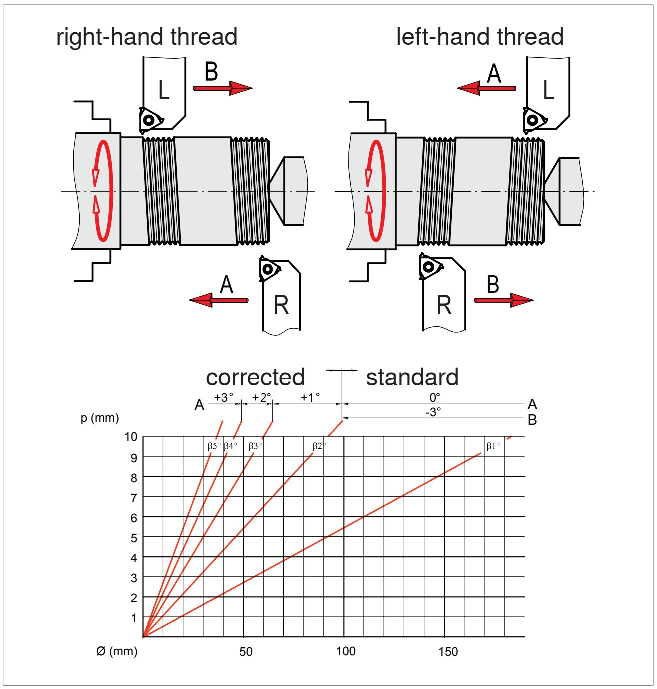
Conventional system



- ○ Difficult component access
- ○ Danger of collision



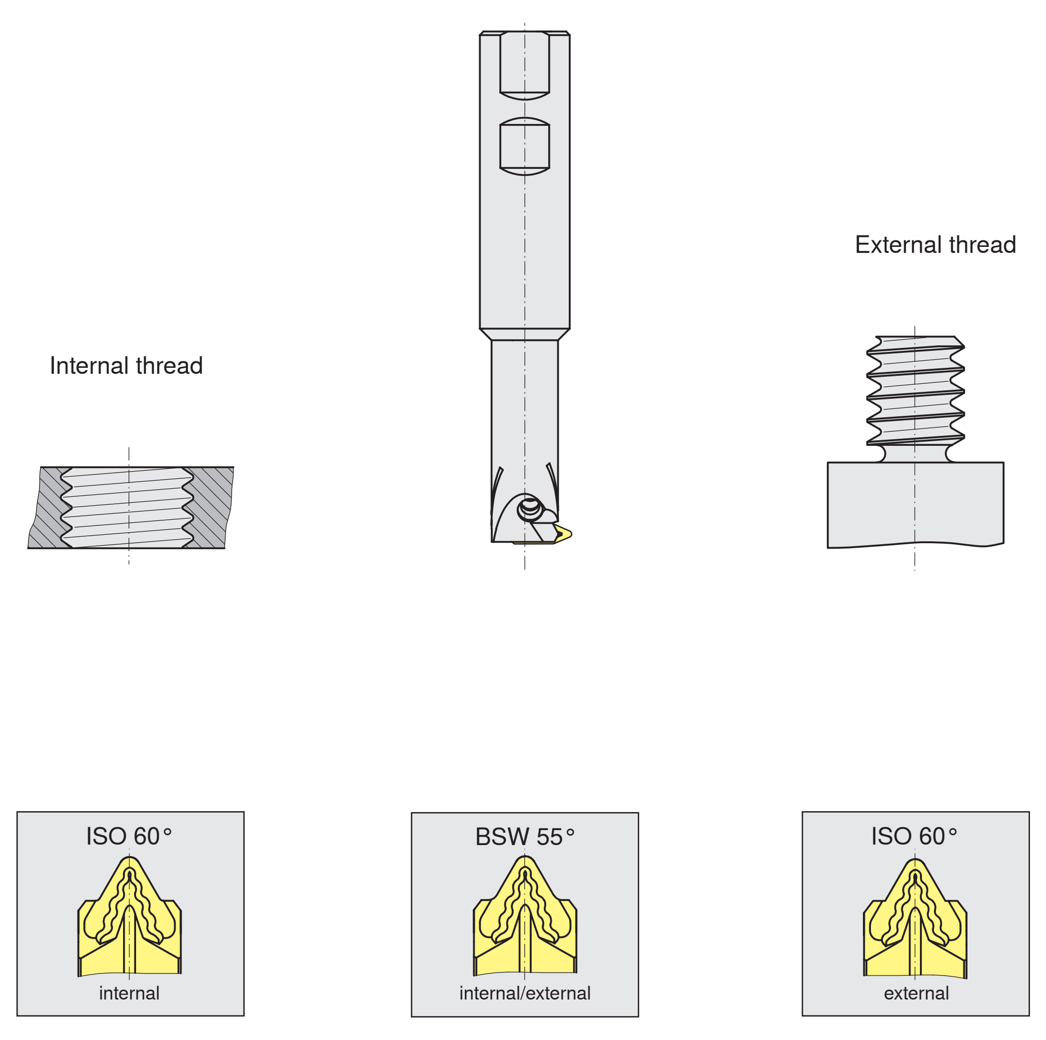
- ○ Easy to apply as the tools can be used in both directions without correcting the helix angle



- ○ Correction of helix angle necessary, therefore high degree of application know-how required
- ○ Can only be operated in one direction

TC system – thread milling

For thread milling and turning the same inserts are applied. With special tool shanks, which are characterised by compact and modular construction, **external as well as internal threads** can be produced on all up-to-date machining centres.

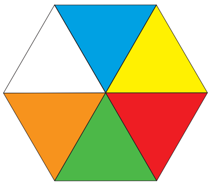


System characteristics

- ○ Turning and milling with the same insert
- ○ Single-tooth thread milling
- ○ Thread is cut in one pass

Benefits

- ○ Flexibility, reduced variety and costs
- ○ Low machining forces, large overhang possible, high cutting data (v_c and f), easy programming
- ○ No interruptions or steps in the thread



Material

Based on VDI 3323 CERATIZIT’s MasterGuide divides materials into six main groups (P, M, K, N, S, H). Each is given a colour, according to the system partly adopted in ISO 513.

P **Steel**

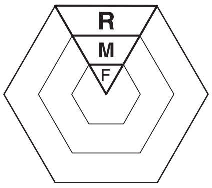
M **Stainless steel**

K **Cast iron**

N **Non-ferrous metals and non-metals**

S **Heat-resistant alloys, titanium**

H **Hard materials**



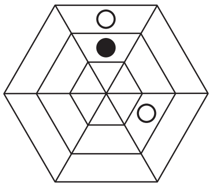
Machining application type

Each coloured segment is divided into three sections, and each section indicates the relevant machining application type:

R = rough machining

M = medium machining

F = fine machining



● **Main application**
o **Extended application**

Application

The ideal application area for each insert is indicated by a black circle. Extended applications are indicated by an open circle. The CERATIZIT MasterGuide provides you with an easily understandable structure for choosing a product and enables you to reduce grade and geometry inventory.

CERATIZIT designation system

Cutting materials

CT	C	P	3	35
1	2	3	4	5

1 Manufacturer: CERATIZIT

2 Cutting material

W Uncoated carbide
C CVD coated carbide
P PVD coated carbide
T Uncoated cermet
E Coated cermet
N Uncoated silicon nitride
M Coated silicon nitride
S Mixed ceramic
I Sialon
D PCD
B CBN
L CBN coated
H Sintered HSS

3 Main application (material) Variant 1: number

1 Steel
2 Stainless steel
3 Cast iron
4 Light and non ferrous metals, non metals
5 Heat resistant alloys, titanium
6 Hard materials
7 Universal grade for a variety of applications

Main application (material) Variant 2: ISO letter

P Steel
M Stainless steel
K Cast iron
N Light and non ferrous metals, non metals
S Heat resistant alloys, titanium
H Hard materials
X Universal grade for a variety of applications

4 Main application (machining method)

1 Turning
2 Milling
3 Parting and grooving
4 Drilling
5 Threading
6 Others
7 Universal grade for a variety of applications

5 ISO 513
Application range

For example:
05
10
15
25
35 ISO P35
.
.
.

ISO 513

Carbide

HW	Uncoated carbide, consisting mainly of tungsten carbide (WC)
HT1)	Uncoated carbide, consisting mainly of titanium carbide (TiC) or titanium nitride (TiN) or both
HC	Carbides as above, but coated

Ceramic

CA	Oxide ceramic, consisting mainly of aluminium oxide (Al_2O_3)
CM	Mixed ceramic, based on aluminium oxide (Al_2O_3), but with different oxide components
CN	Nitride ceramic, consisting mainly of silicon nitride (Si_3N_4)
CC	Ceramics as above, but uncoated

Diamond

DP2)	Polycryistalline diamond

Boron nitride

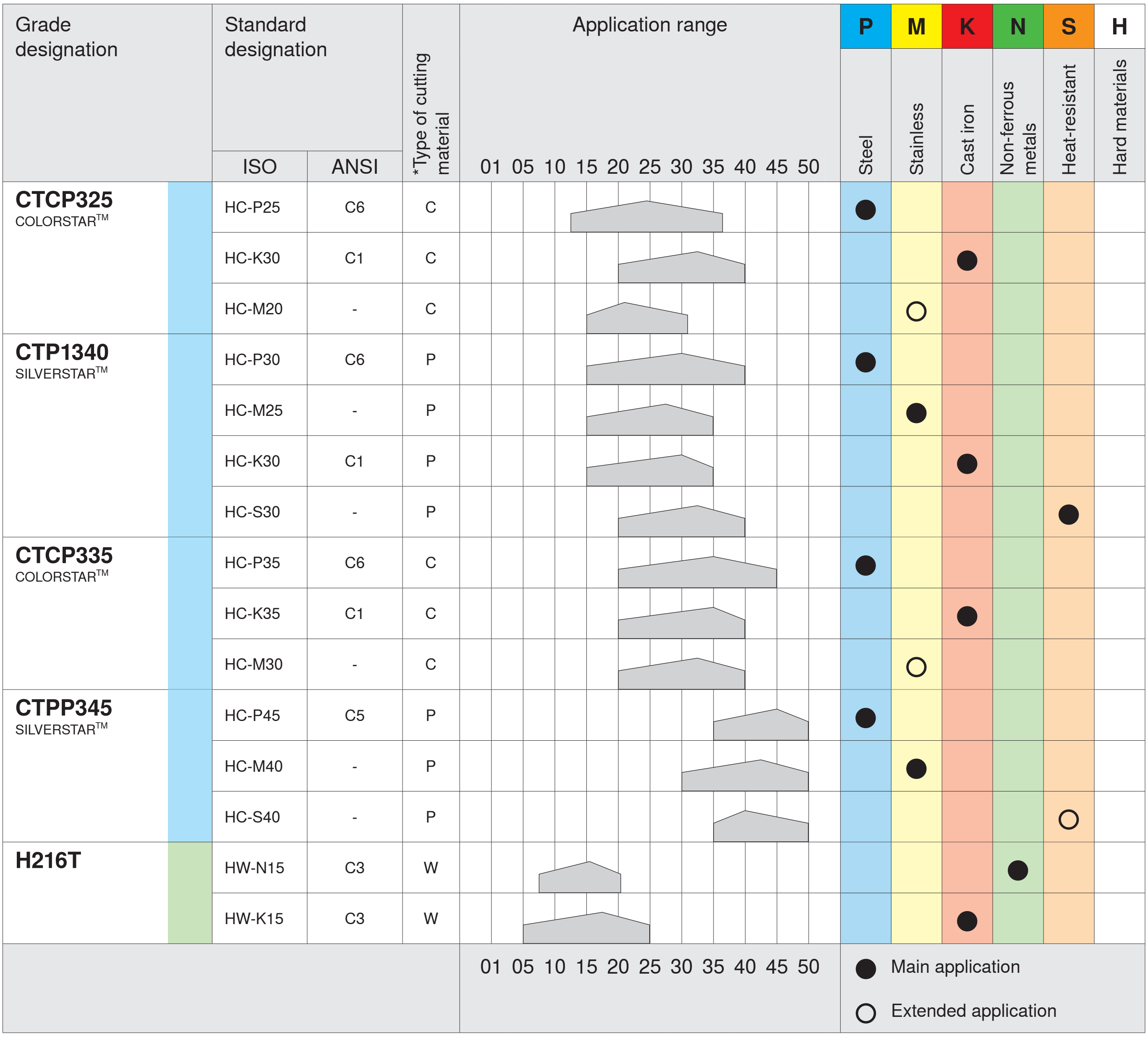
BL2)	Polycrystalline cubic boron nitride with a low CBN content (40% - 65%)
BH2)	Polycrystalline cubic boron nitride with a high CBN content (70% - 95%)
BC2)	Polycrystalline cubic boron nitride with coating

1) These carbides are also called ‘cermets’.

2) Polycrystalline diamond and polycrystalline boron nitride are also called ultra-hard cutting materials.

Grade overview

Parting and grooving



Grade designation	Standard designation ISO	Standard designation ANSI	*Type of cutting material	Application range 01 05 10 15 20 25 30 35 40 45 50	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
CTCP325 COLORSTAR™	HC-P25	C6	C		●					
	HC-K30	C1	C				●			
	HC-M20	-	C			○				
CTP1340 SILVERSTAR™	HC-P30	C6	P		●					
	HC-M25	-	P			●				
	HC-K30	C1	P				●			
	HC-S30	-	P						●	
CTCP335 COLORSTAR™	HC-P35	C6	C		●					
	HC-K35	C1	C				●			
	HC-M30	-	C			○				
CTPP345 SILVERSTAR™	HC-P45	C5	P		●					
	HC-M40	-	P			●				
	HC-S40	-	P						○	
H216T	HW-N15	C3	W					●		
	HW-K15	C3	W				●			
				01 05 10 15 20 25 30 35 40 45 50						

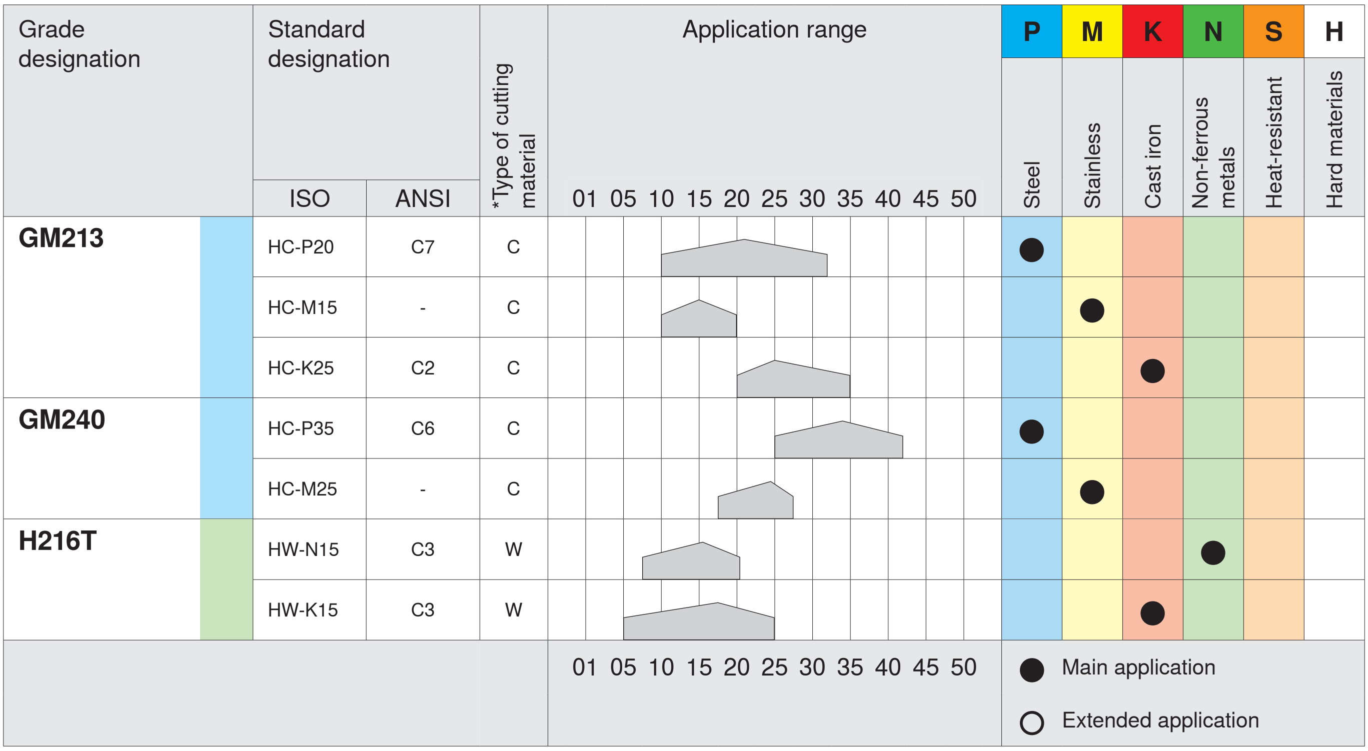
● Main application

○ Extended application

** **to be discontinued**

Grade overview

Threading



Grade designation	Standard designation ISO	Standard designation ANSI	*Type of cutting material	Application range 01 05 10 15 20 25 30 35 40 45 50	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
GM213	HC-P20	C7	C		●					
	HC-M15	-	C			●				
	HC-K25	C2	C				●			
GM240	HC-P35	C6	C		●					
	HC-M25	-	C			●				
H216T	HW-N15	C3	W					●		
	HW-K15	C3	W				●			

01 05 10 15 20 25 30 35 40 45 50

● Main application

○ Extended application

Grade description

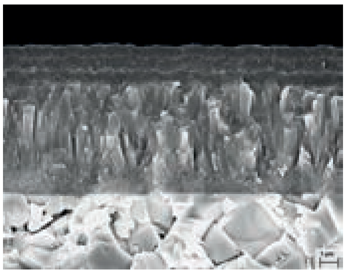
Parting and grooving

CTCP325

COLORSTAR™

HC-P25 | HC-K30 | HC-M20

● ● ○



Specification:
Composition: Co 7.0%; mixed carbide 8.1%; WC balance | Grain size: 1-2 µm | Hardness: HV$_{30}$ 1450 | Coating specification: CVD Ti(C,N) + Al_2O_3 multi-layer

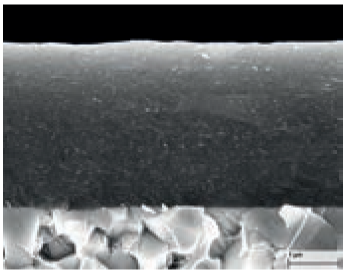
Recommended application:
The wear-resistant solution for steel and cast iron machining with high cutting speeds.

CTP1340

SILVERSTAR™

HC-P30 | HC-M25 | HC-K30 | HC-S30

● ● ● ●



Specification:
Composition: Co 9.0%; mixed carbides 2.0%; WC balance | Grain size: 0.7-1 µm | Hardness: HV$_{30}$ 1590 | Coating specification: PVD TiAIN

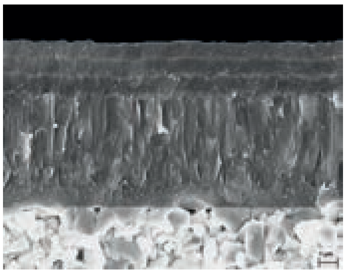
Recommended application:
The universal high-performance grade for steel, austenitic steel, cast iron and heat-resistant alloys.

CTCP335

COLORSTAR™

HC-P35 | HC-K35 | HC-M30

● ● ○



Specification:
Composition: Co 10.5%; mixed carbides 2.0%; WC balance | Grain size: 1 µm | Hardness: HV$_{30}$ 1400 | Coating specification: CVD TiCN-Al_2O_3 multi-layer

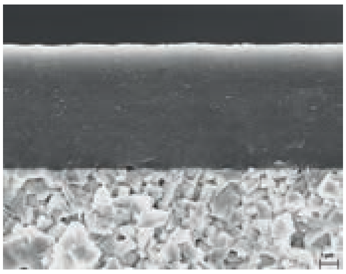
Reommended application:
The reliable choice for the machining of steel and cast iron.

CTPP345

SILVERSTAR™

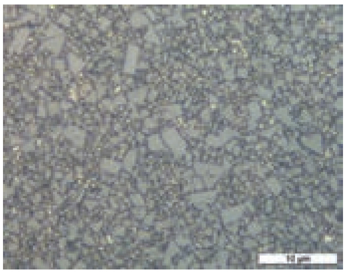
HC-P45 | HC-M40 | HC-S40

● ● ○



Specification:
Composition: Co 12.5%; mixed carbides 2.0%; WC balance | Grain size: 1-1.5 µm | Hardness: HV$_{30}$ 1380 | Coating specification: PVD TiAlTaN

Recommended application:
The reliable solution for steel and austenitic steels under unstable conditions.

H216T	HW-N15 | HW-K15	● ●
	**Specification:** Composition: Co 6.0%; WC balance | Grain size: 1 µm | Hardness: HV$_{30}$ 1630 **Recommended application:** The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.	

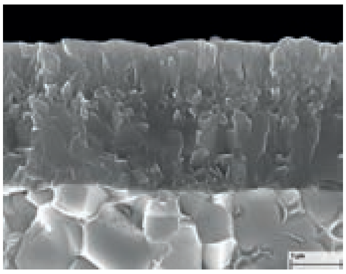
Grade description

Threading

GM213

HC-P20 | HC-M15 | HC-K25

🟦 🟨 🟥



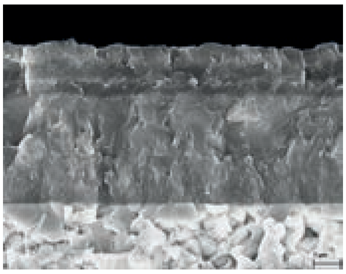
Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 µm | Hardness: HV_{30} 1630 | Coating specification: CVD TiCN-TiN

Recommended application:
The wear-resistant thread-turning grade for high cutting speeds.

GM240

HC-P35 | HC-M25

🟦 🟨



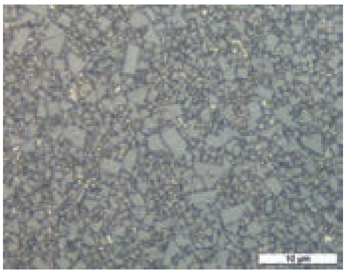
Specification:
Composition: Co 10.0%; mixed carbides 0.6%; WC balance | Grain size: 0.7 µm | Hardness: HV_{30} 1590 | Coating specification: CVD TiCN-Al_2O_3 multi-layer

Recommended application:
The tough thread-turning grade for universal application.

H216T

HW-N15 | HW-K15

🟩 🟥



Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 µm | Hardness: HV_{30} 1630

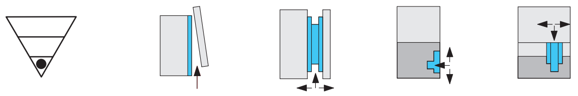
Recommended application:
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

CERATIZIT
CERATIZIT
CERATIZIT

The easy way to success

Recommended application

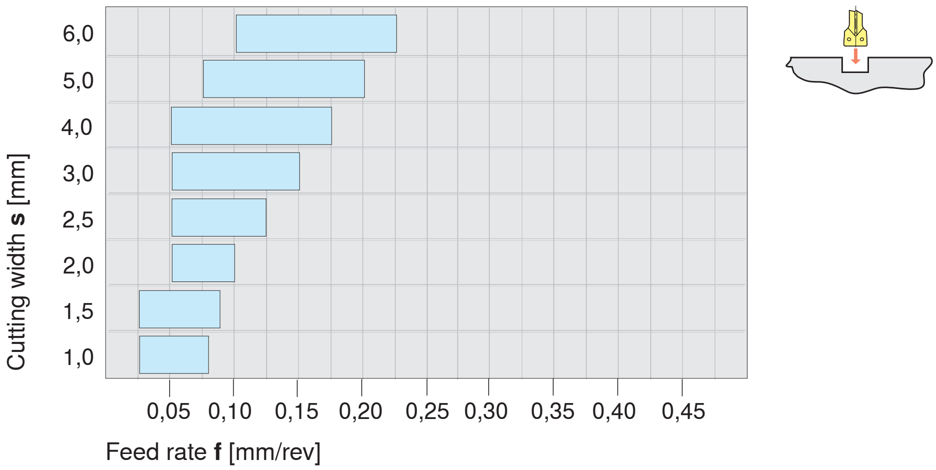
Application



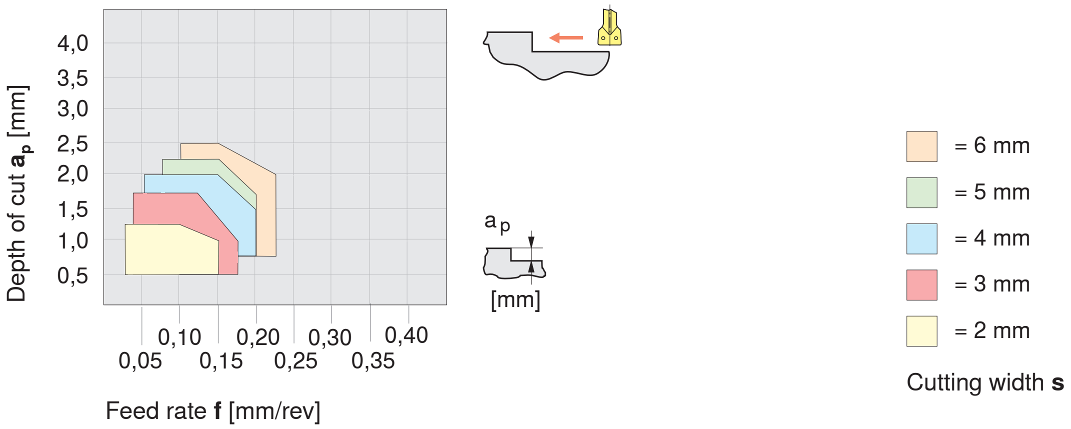
-F2

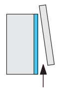
- ○ For steels in general, particularly suitable for **stainless materials**
- ○ Insert with ground periphery
- ○ Tolerance cutting width ± 0.02 mm
- ○ Suitable also for parting off tubes and thin-walled materials
- ○ Special profiles (SX, GX) possible

Feed rate for parting and grooving



Feed rate for longitudinal turning

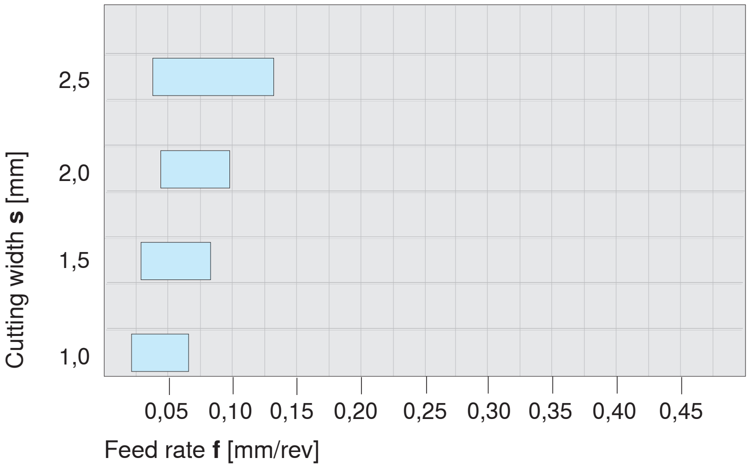


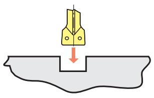


-F3

- ○ Particularly suitable also for parting off tubes and thin-walled materials
- ○ For steels in general, particularly suitable for stainless materials

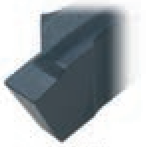
Feed rate for parting and grooving





The easy way to success

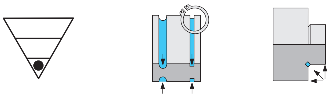
Recommended application



GX-R/L

GX-N

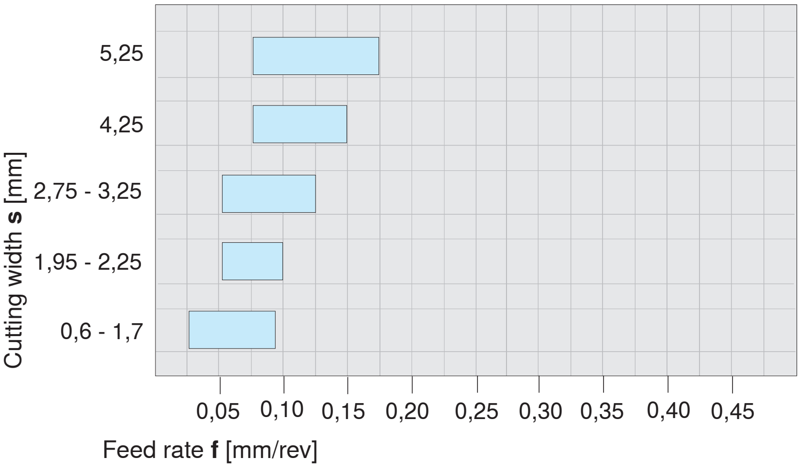
Application

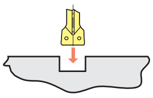


Circlip grooves L/N/R

○ Insert for circlip grooves according to DIN 471-472
○ For internal and external machining

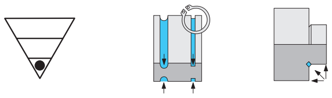
Feed rate for grooving operations





GX R/L

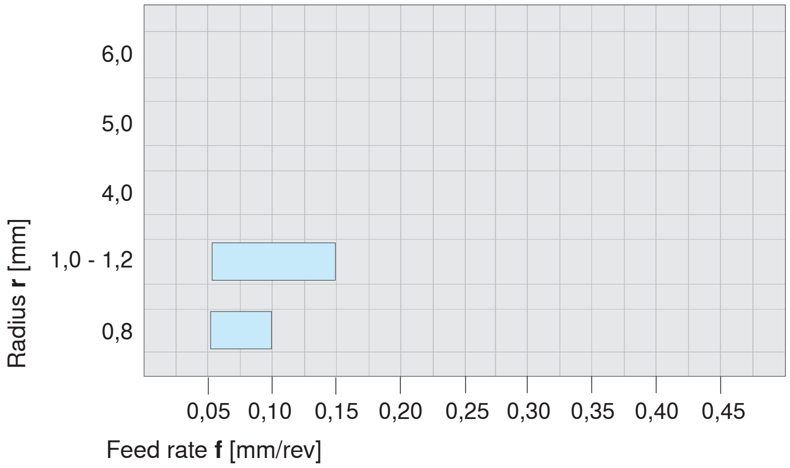
Application

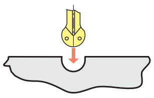


Radius grooves R/L

- ○ Inserts for radius grooves and copy turning
- ○ For all steel materials
- ○ For internal and external machining

Feed rate for grooving operations





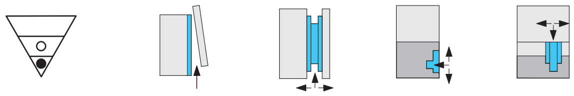
The easy way to success

Recommended application


GX09/
GX16


GX24

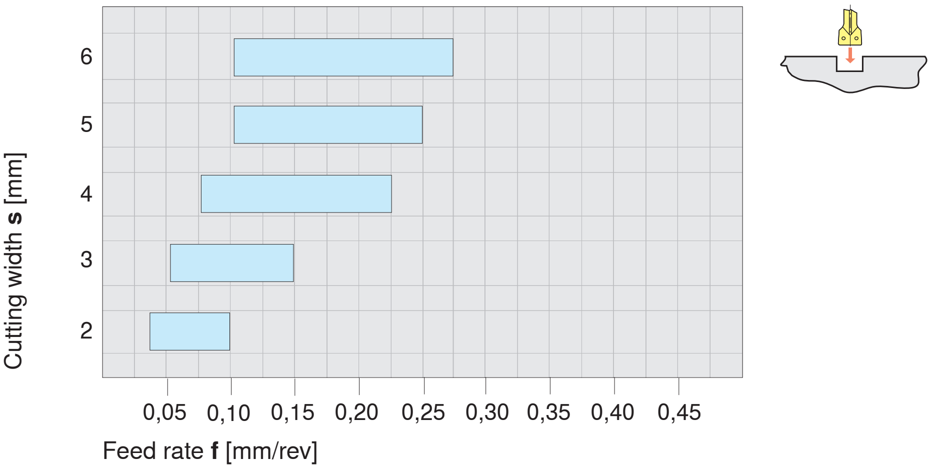
Application



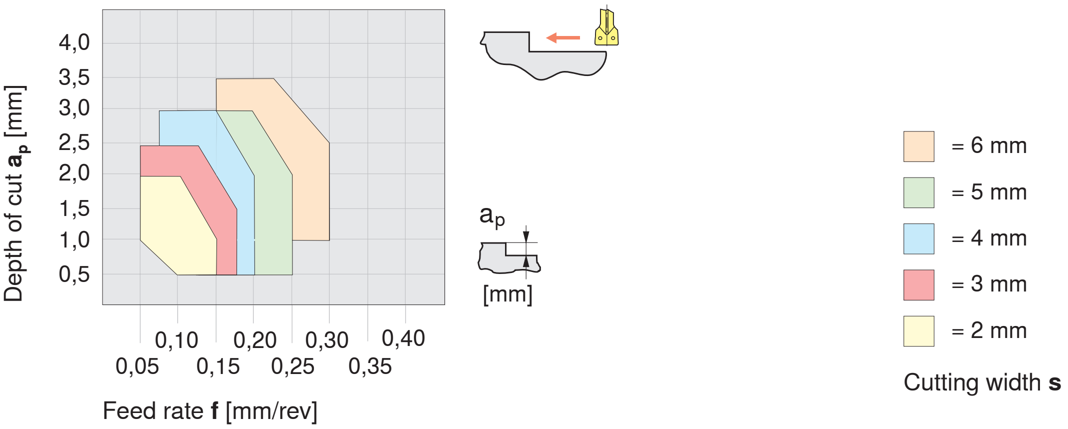
-EN

- ○ For all steel materials
- ○ For universal application
- ○ Wide application range

Feed rate for parting and grooving



Feed rate for longitudinal turning

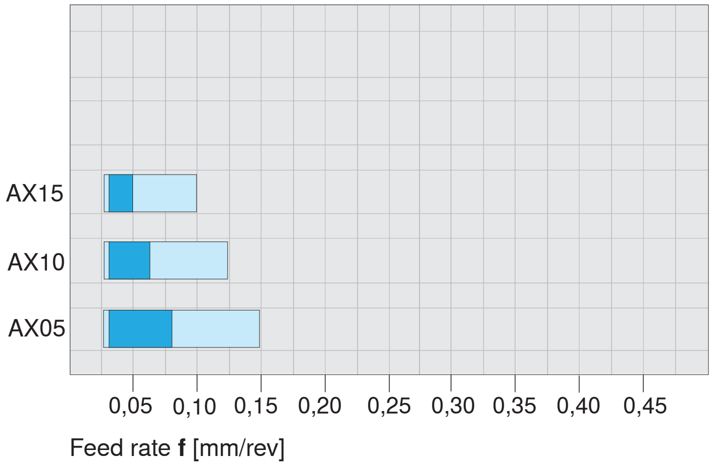


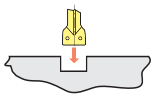
Application

-F50

- ○ Universal geometry for:
  - **Steel**
  - **Stainless steel**
  - Cast iron
  - Non-ferrous metals
- ○ Insert with ground periphery
- ○ Tolerance cutting width ± 0.02 mm

Feed rate for axial grooving

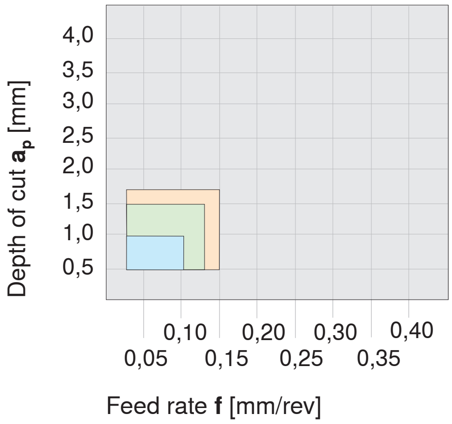


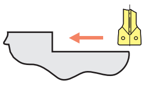


■ ... f feed rate for the first groove

□ ... feed rate range f

Feed rate for face turning





□ = AX15

■ = AX10

□ = AX05

Cutting width **s**

The easy way to success

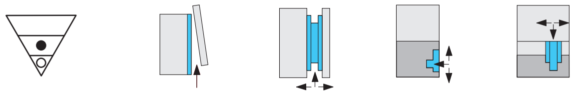
Recommended application

SX/LX

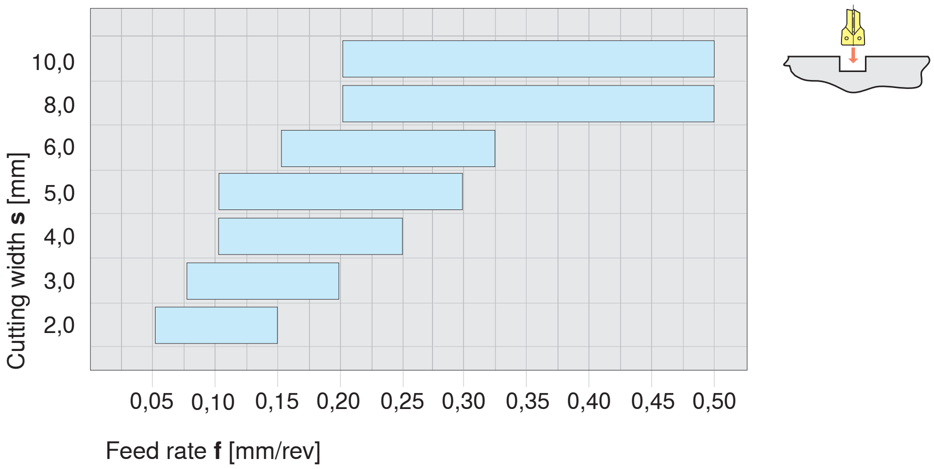
-M2

- ○ For grooving and turning
- ○ Suitable for all steel and cast iron materials
- ○ Very good chip control

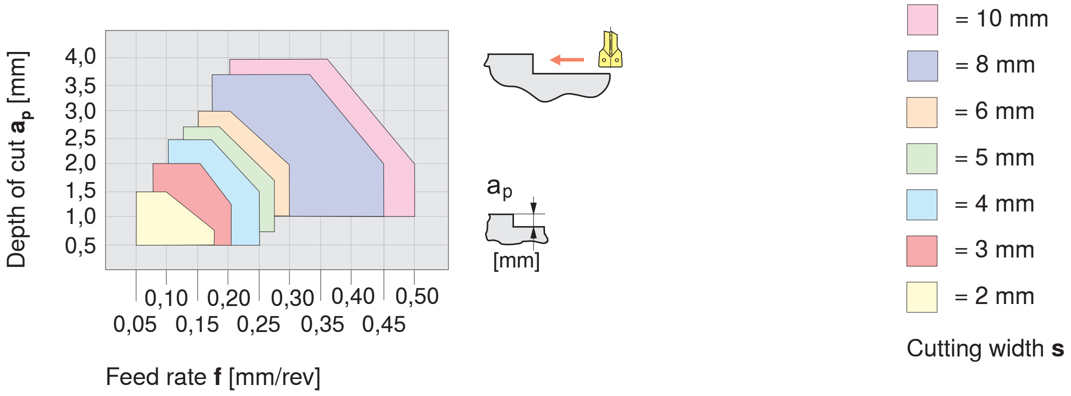
Application



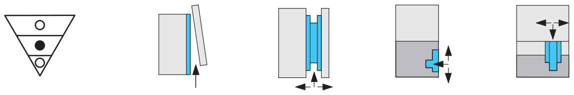
Feed rate for parting and grooving



Feed rate for longitudinal turning



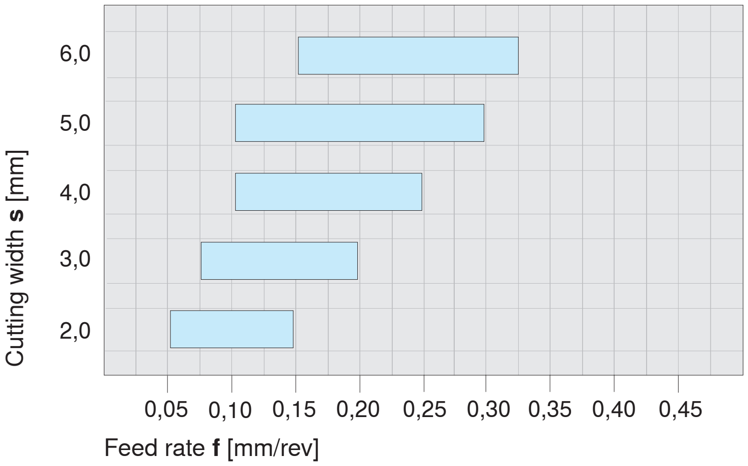
Application

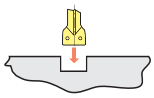


-M40

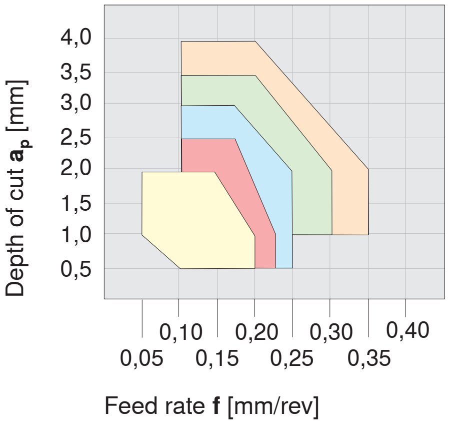
- ○ For grooving and turning
- ○ Suitable for all steel materials
- ○ Very good chip control
- ○ Tolerance cutting width ± 0.05 mm

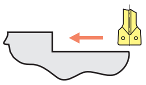
Feed rate for parting and grooving

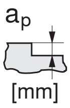




Feed rate for longitudinal turning







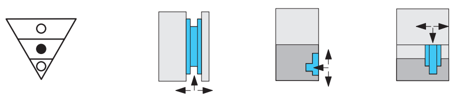
▨ = 6 mm
▨ = 5 mm
▨ = 4 mm
▨ = 3 mm
▨ = 2 mm

Cutting width **s**

The easy way to success

Recommended application

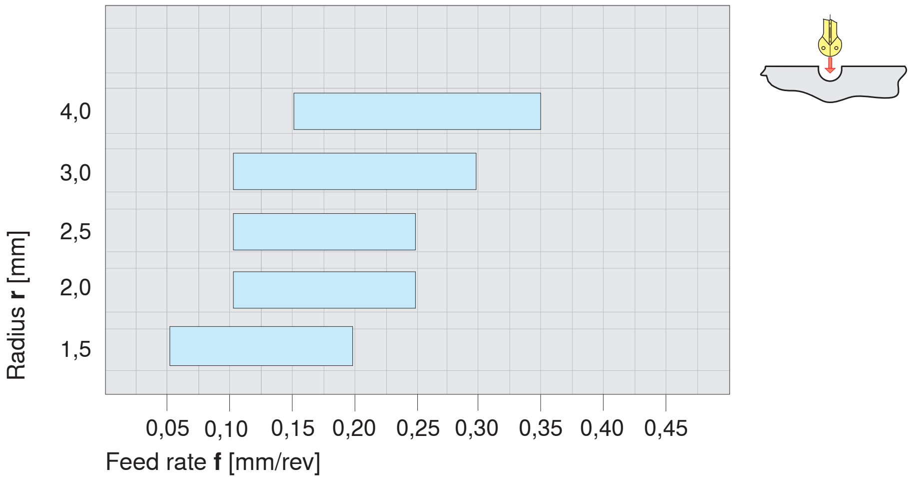
Application



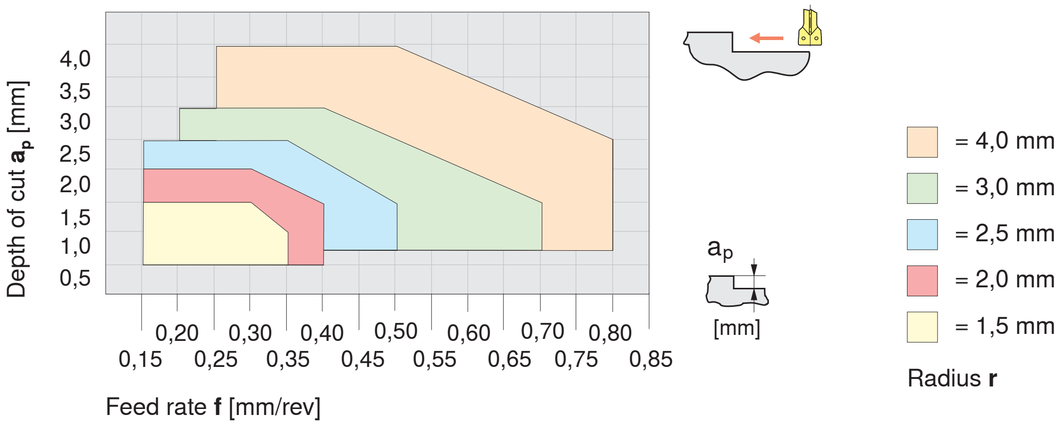
-M3

- ○ Insert for radius grooves and copy turning
- ○ For all steel materials
- ○ For internal and external machining

Feed rate for parting and grooving



Feed rate for longitudinal turning



SX

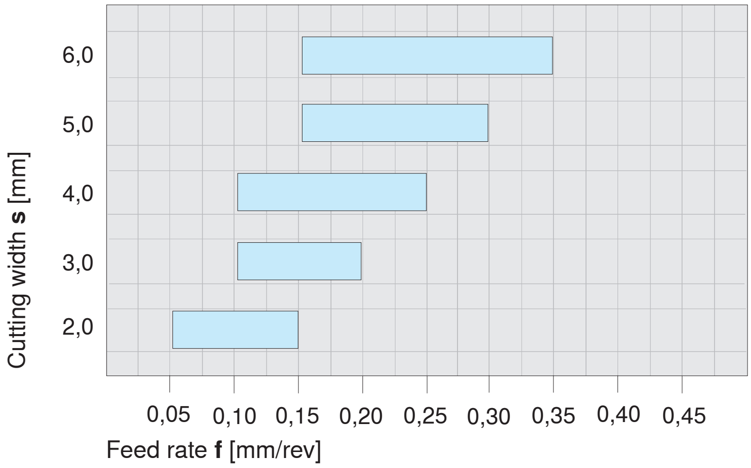
GX16/GX24

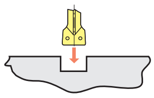
Application

-M1

- ○ Insert with narrow negative chamfer
- ○ Suitable for all steel materials with high strength
- ○ Universally applicable grade
- ○ For steel and grey cast iron

Feed rate for parting and grooving





The easy way to success

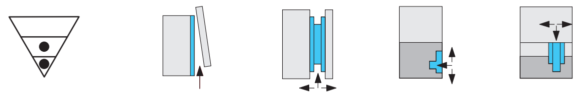
Recommended application


SX


GX16


GX24

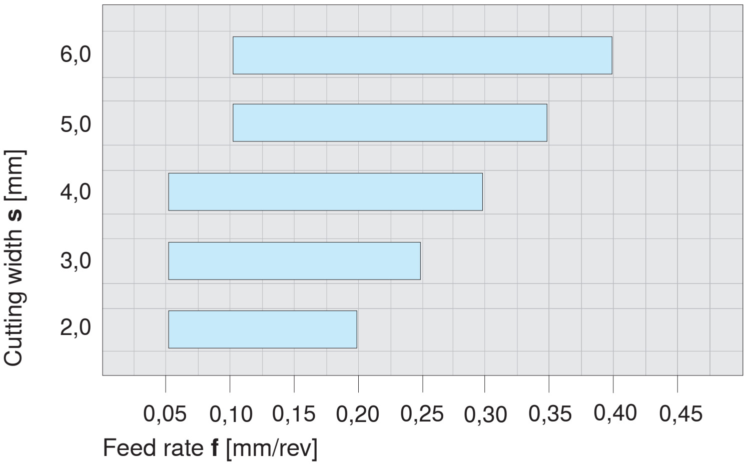
Application

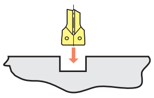


-27P

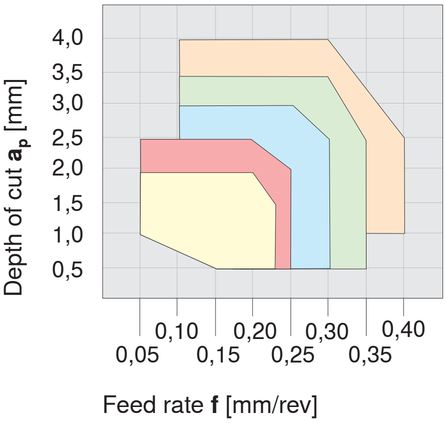
- ○ Particularly suitable for **aluminium and non-ferrous metals**
- ○ Insert with highly positive cutting geometry and sharp cutting edge
- ○ Insert with ground periphery
- ○ Tolerance cutting width ± 0.02 mm
- ○ Extra-smooth rake face through 'microfinish'

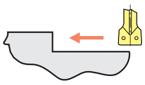
Feed rate for parting and grooving

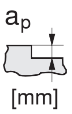




Feed rate for longitudinal turning



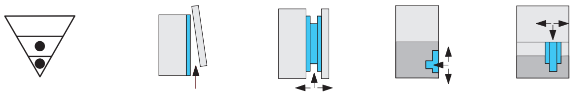




🟧 = 6 mm
🟩 = 5 mm
🟦 = 4 mm
🟥 = 3 mm
🟨 = 2 mm

Cutting width **s**

Application



-27P

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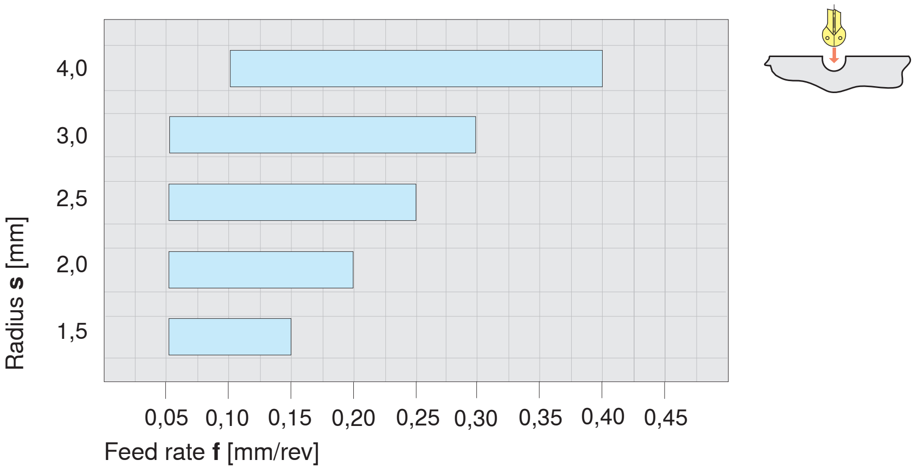
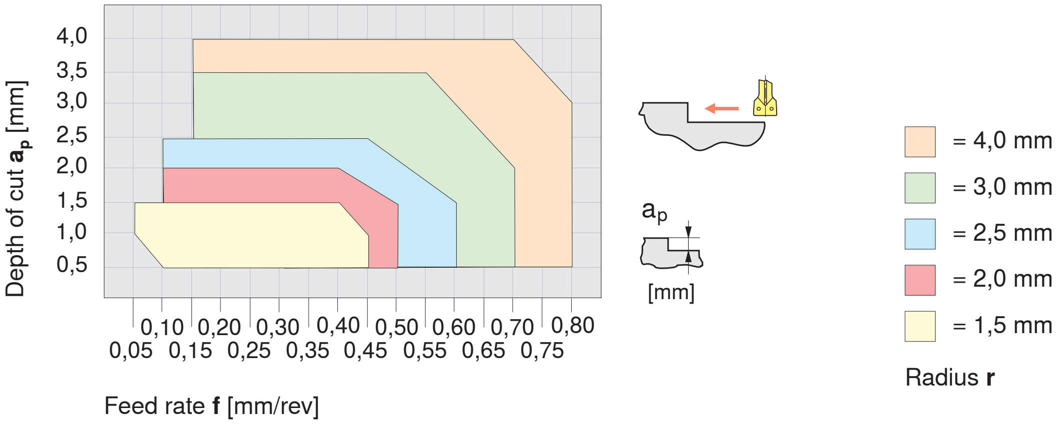
Feed rate for parting and grooving



Feed rate for longitudinal turning



The easy way to success

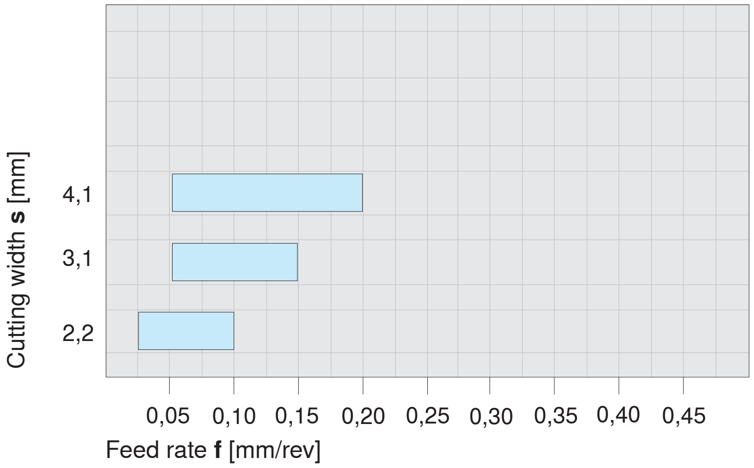
Recommended application

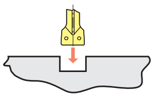
Application

-F1

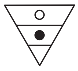
- ○ Excellent cutting geometry with low cutting forces
- ○ For low or medium strength materials
- ○ Particularly suitable for parting off tubes and thin-walled work pieces
- ○ Excellent chip control also with low feed
- ○ Reduced built-up edge

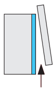
Feed rate for parting and grooving





Application

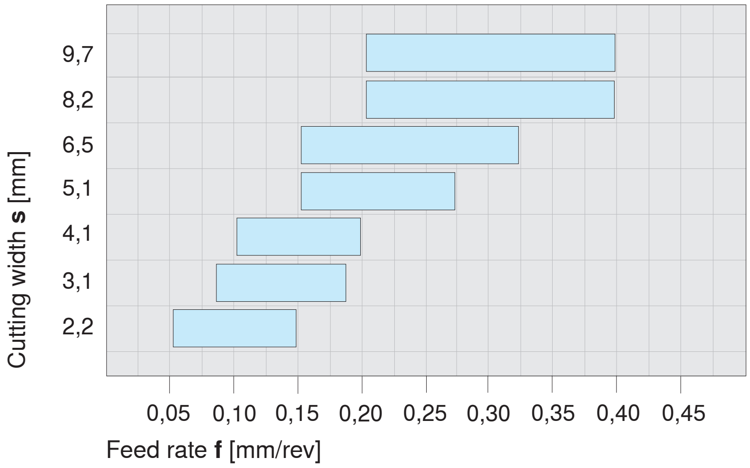


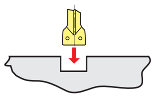


-M1

- ○ Insert with narrow negative chamfer
- ○ Suitable for all steel materials with high strength
- ○ Universal application
- ○ For steel and grey cast iron

Feed rate for parting and grooving





The easy way to success

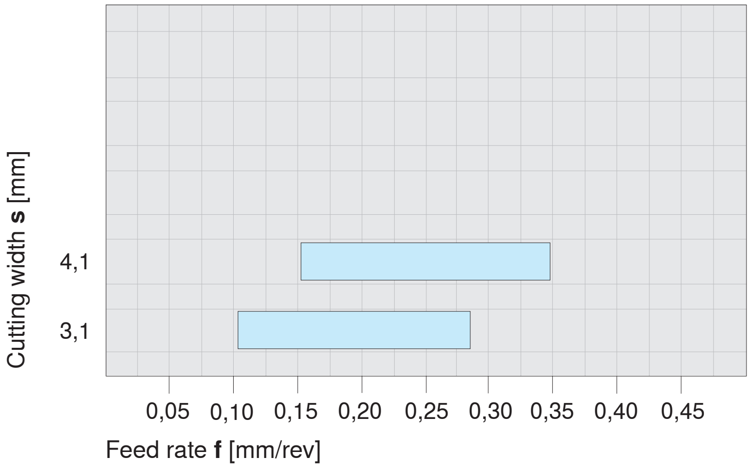
Recommended application

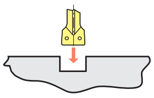
Application

-R2

- ○ Insert with excellent chip formation for a wide feed range
- ○ Very stable cutting edge
- ○ Particularly suitable for economic parting when rather intensive formation of burrs and pips does not cause any problems

Feed rate for parting and grooving



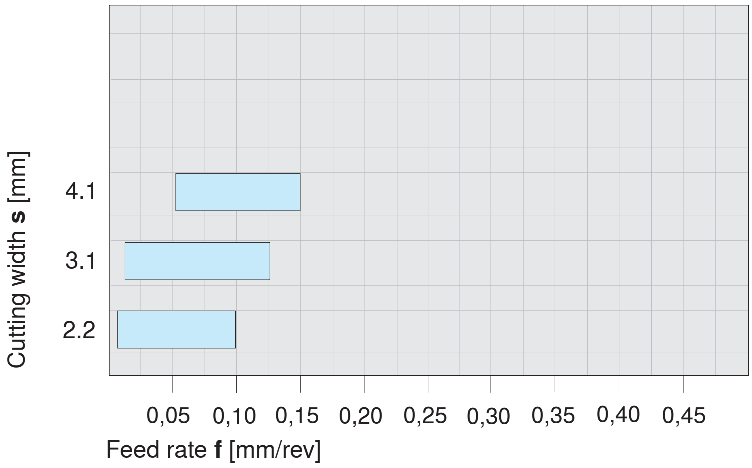


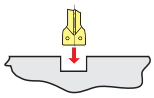
Application

-27P

- ○ Particularly suitable for **aluminium and non-ferrous metals**
- ○ Insert with highly positive cutting geometry and sharp cutting edge
- ○ Extra-smooth rake face through 'microfinish'
- ○ Reduced built-up edge

Feed rate for parting and grooving





Overview

Application

Part-off

	Modular system	C65-C67
	Clamping blocks, blades	C68-C70
	Monoblock	C71-C73

Grooving and turning

	Modular system - external	C74-C78
	Monoblock - external	C79-C80
	Modular system - internal	C81-C85
	Monoblock boring bars – internal	C86

Circlip grooves

	Modular system - external	C87-C91
	Monoblock - external	C92-C95
	Modular system - internal	C96-C100
	Monoblock boring bars – internal	C101-C104

Radius grooves

	Modular system - external	C105-C109
	Monoblock - external	C110-C112
	Modular system - internal	C113-C117
	Monoblock boring bars – internal	C118-C120

Axial grooving

	Modular system	C121-C128
	Monoblock	C129-C130

External recessing

	Modular system	C131-C134

Threading (turning)

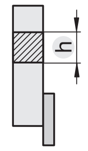
	Modular system - external	C135-C138
	Monoblock - external	C139
	Modular system - internal	C141-C142
	Monoblock boring bars – internal	C143

Threading (milling)

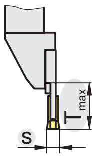
	Boring bars - TC	C145-C146
	Thread milling cutters - TC	C147

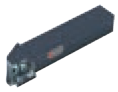
Part-off

Modular system, assembly size 20

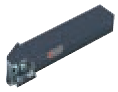


Matching products see right-hand side.



		h/d$_A$	L R	Type, description
C168	 0	**20**	**R**	MSS-E20R00-2020J
		16	**R**	MSS-E20R00-1620G
C169	 90	**20**	**L**	MSS-E20L90-2020J

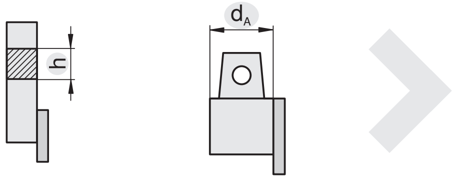
		s/s$_{min}$	s$_{max}$ [mm]	T$_{max}$ [mm]	L R	Type, description		
C177		2.00	2.75	12	R	MSS-E20R12-GX16-1	GX16-1..	C151
		2.76	3.75	12	R	MSS-E20R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E20R12-GX16-3	GX16-3..	C151
C178		2.00	2.75	21	R	MSS-E20R21-GX24-1	GX24-1..	C151
		2.76	3.75	21	R	MSS-E20R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E20R21-GX24-3	GX24-3..	C151
C184		2.0		20	R	MSS-E20R20-SX2	SX..2	C156
		3.0		20	R	MSS-E20R20-SX3	SX..3	C156
C186		2.2		20	R	MSS-E20R20-FX2.2	FX 2.2..	C158
		3.1		20	R	MSS-E20R20-FX3.1	FX 3.1..	C158
		4.1		20	R	MSS-E20R20-FX4.1	FX 4.1..	C158

		h/d$_A$	L R	Type, description
C168	 0	**20**	**L**	MSS-E20L00-2020J
		16	**L**	MSS-E20L00-1620G
C169	 90	**20**	**R**	MSS-E20R90-2020J

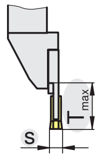
		s/s$_{min}$	s$_{max}$ [mm]	T$_{max}$ [mm]	L R	Type, description		
C177		2.00	2.75	12	L	MSS-E20L12-GX16-1	GX16-1..	C151
		2.76	3.75	12	L	MSS-E20L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E20L12-GX16-3	GX16-3..	C151
C178		2.00	2.75	21	L	MSS-E20L21-GX24-1	GX24-1..	C151
		2.76	3.75	21	L	MSS-E20L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E20L21-GX24-3	GX24-3..	C151
C184		2.0		20	L	MSS-E20L20-SX2	SX..2	C156
		3.0		20	L	MSS-E20L20-SX3	SX..3	C156
C186		2.2		20	L	MSS-E20L20-FX2.2	FX 2.2..	C158
		3.1		20	L	MSS-E20L20-FX3.1	FX 3.1..	C158
		4.1		20	L	MSS-E20L20-FX4.1	FX 4.1..	C158

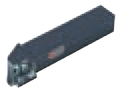
Part-off

Modular system, assembly size 25

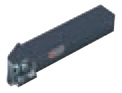


Matching products see right-hand side.



		h/dA	L R	Type, description
C168	 0	25	R	MSS-E25R00-2525L
C169	 90	25	L	MSS-E25L90-2525L
C171	 0	63	R	HSK-T63-MSS-E25R00
		100	R	HSK-T100-MSS-E25R00
C173	 0	40	R	UT40-MSS-E25R00
		50	R	UT50-MSS-E25R00
		63	R	UT63-MSS-E25R00
C174	 90	40	L	UT40-MSS-E25L90
		50	L	UT50-MSS-E25L90

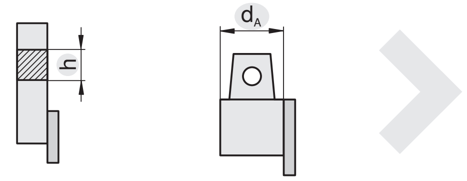
		s/smin	smax [mm]	Tmax [mm]	L R	Type, description		
C177		2.00	2.75	12	R	MSS-E25R12-GX16-1	GX16-1..	C151
		2.76	3.75	12	R	MSS-E25R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E25R12-GX16-3	GX16-3..	C151
		5.01	6.50	12	R	MSS-E25R12-GX16-4	GX16-4..	C151
C178		2.00	2.75	21	R	MSS-E25R21-GX24-1	GX24-1..	C151
		2.76	3.75	21	R	MSS-E25R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E25R21-GX24-3	GX24-3..	C151
		5.01	6.50	21	R	MSS-E25R21-GX24-4	GX24-4..	C151
C184		2.0		20	R	MSS-E25R20-SX2	SX..2	C156
		3.0		25	R	MSS-E25R25-SX3	SX..3	C156
		3.0		35	R	MSS-E25R35-SX3	SX..3	C156
		4.0		25	R	MSS-E25R25-SX4	SX..4	C156
		4.0		35	R	MSS-E25R35-SX4	SX..4	C156
C186		2.2		20	R	MSS-E25R20-FX2.2	FX 2.2..	C158
		3.1		25	R	MSS-E25R25-FX3.1	FX 3.1..	C158
		4.1		25	R	MSS-E25R25-FX4.1	FX 4.1..	C158
		5.1		25	R	MSS-E25R25-FX5.1	FX 5.1..	C158
		6.5		25	R	MSS-E25R25-FX6.5	FX 6.5..	C158
C187		3.1		35	R	MSS-E25R35-FX3.1	FX 3.1..	C158
		4.1		35	R	MSS-E25R35-FX4.1	FX 4.1..	C158
		5.1		35	R	MSS-E25R35-FX5.1	FX 5.1..	C158
		6.5		35	R	MSS-E25R35-FX6.5	FX 6.5..	C158

		h/dA	L R	Type, description
C168	 0	25	L	MSS-E25L00-2525L
C169	 90	25	R	MSS-E25R90-2525L
C171	 0	63	L	HSK-T63-MSS-E25L00
		100	L	HSK-T100-MSS-E25L00
C173	 0	40	L	UT40-MSS-E25L00
		50	L	UT50-MSS-E25L00
		63	L	UT63-MSS-E25L00
C174	 90	40	R	UT40-MSS-E25R90
		50	R	UT50-MSS-E25R90

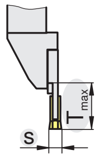
		s/smin	smax [mm]	Tmax [mm]	L R	Type, description		
C177		2.00	2.75	12	L	MSS-E25L12-GX16-1	GX16-1..	C151
		2.76	3.75	12	L	MSS-E25L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E25L12-GX16-3	GX16-3..	C151
		5.01	6.50	12	L	MSS-E25L12-GX16-4	GX16-4..	C151
C178		2.00	2.75	21	L	MSS-E25L21-GX24-1	GX24-1..	C151
		2.76	3.75	21	L	MSS-E25L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E25L21-GX24-3	GX24-3..	C151
		5.01	6.50	21	L	MSS-E25L21-GX24-4	GX24-4..	C151
C184		2.0		20	L	MSS-E25L20-SX2	SX..2	C156
		3.0		25	L	MSS-E25L25-SX3	SX..3	C156
		3.0		35	L	MSS-E25L35-SX3	SX..3	C156
		4.0		25	L	MSS-E25L25-SX4	SX..4	C156
		4.0		35	L	MSS-E25L35-SX4	SX..4	C156
C186		2.2		20	L	MSS-E25L20-FX2.2	FX 2.2..	C158
		3.1		25	L	MSS-E25L25-FX3.1	FX 3.1..	C158
		4.1		25	L	MSS-E25L25-FX4.1	FX 4.1..	C158
		5.1		25	L	MSS-E25L25-FX5.1	FX 5.1..	C158
		6.5		25	L	MSS-E25L25-FX6.5	FX 6.5..	C158
C187		3.1		35	L	MSS-E25L35-FX3.1	FX 3.1..	C158
		4.1		35	L	MSS-E25L35-FX4.1	FX 4.1..	C158
		5.1		35	L	MSS-E25L35-FX5.1	FX 5.1..	C158
		6.5		35	L	MSS-E25L35-FX6.5	FX 6.5..	C158

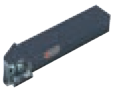
Part-off

Modular system, assembly size 32

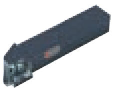


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	32	R	MSS-E32R00-3232Q
		32	R	MSS-E32R00-3225N
C169	 90	32	L	MSS-E32L90-3225N
		32	L	MSS-E32L90-3232R
C171	 0	100	R	HSK-T100-MSS-E32R00
		63	R	HSK-T63-MSS-E32R00
C172	 90	100	L	HSK-T100-MSS-E32L90
		63	L	HSK-T63-MSS-E32L90
C173	 0	50	R	UT50-MSS-E32R00
		63	R	UT63-MSS-E32R00

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.76	3.75	12	R	MSS-E32R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E32R12-GX16-3	GX16-3..	C151
		5.01	6.50	12	R	MSS-E32R12-GX16-4	GX16-4..	C151
C178		2.76	3.75	21	R	MSS-E32R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E32R21-GX24-3	GX24-3..	C151
		5.01	6.50	21	R	MSS-E32R21-GX24-4	GX24-4..	C151
C184		3.0		35	R	MSS-E32R35-SX3	SX..3	C156
		4.0		35	R	MSS-E32R35-SX4	SX..4	C156
C185		8.00	10.00	25	N	MSS-E32N25-LX	LX..	C157
		8.00	10.00	32	N	MSS-E32N32-LX	LX..	C157
		8.00	10.00	45	N	MSS-E32N45-LX	LX..	C157
C186		3.1		32	R	MSS-E32R32-FX3.1	FX 3.1..	C158
		4.1		32	R	MSS-E32R32-FX4.1	FX 4.1..	C158
		5.1		32	R	MSS-E32R32-FX5.1	FX 5.1..	C158
		6.5		32	R	MSS-E32R32-FX6.5	FX 6.5..	C158
C187		3.1		45	R	MSS-E32R45-FX3.1	FX 3.1..	C158
		4.1		45	R	MSS-E32R45-FX4.1	FX 4.1..	C158
		5.1		45	R	MSS-E32R45-FX5.1	FX 5.1..	C158
		6.5		45	R	MSS-E32R45-FX6.5	FX 6.5..	C158

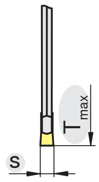
		h/d_A	L R	Type, description
C168	 0	32	L	MSS-E32L00-3225N
		32	L	MSS-E32L00-3232Q
C169	 90	32	R	MSS-E32R90-3232R
		32	R	MSS-E32R90-3225N
C171	 0	100	L	HSK-T100-MSS-E32L00
		63	L	HSK-T63-MSS-E32L00
C172	 90	100	R	HSK-T100-MSS-E32R90
		63	R	HSK-T63-MSS-E32R90
C173	 0	63	L	UT63-MSS-E32L00

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.76	3.75	12	L	MSS-E32L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E32L12-GX16-3	GX16-3..	C151
		5.01	6.50	12	L	MSS-E32L12-GX16-4	GX16-4..	C151
C178		2.76	3.75	21	L	MSS-E32L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E32L21-GX24-3	GX24-3..	C151
		5.01	6.50	21	L	MSS-E32L21-GX24-4	GX24-4..	C151
C184		3.0		35	L	MSS-E32L35-SX3	SX..3	C156
		4.0		35	L	MSS-E32L35-SX4	SX..4	C156
C185		8.00	10.00	25	N	MSS-E32N25-LX	LX..	C157
		8.00	10.00	32	N	MSS-E32N32-LX	LX..	C157
		8.00	10.00	45	N	MSS-E32N45-LX	LX..	C157
C186		3.1		32	L	MSS-E32L32-FX3.1	FX 3.1..	C158
		4.1		32	L	MSS-E32L32-FX4.1	FX 4.1..	C158
		5.1		32	L	MSS-E32L32-FX5.1	FX 5.1..	C158
		6.5		32	L	MSS-E32L32-FX6.5	FX 6.5..	C158
C187		3.1		45	L	MSS-E32L45-FX3.1	FX 3.1..	C158
		4.1		45	L	MSS-E32L45-FX4.1	FX 4.1..	C158
		5.1		45	L	MSS-E32L45-FX5.1	FX 5.1..	C158
		6.5		45	L	MSS-E32L45-FX6.5	FX 6.5..	C158

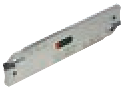
Part-off

Clamping blocks, blades, height 26

Matching products see right-hand side.

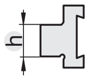


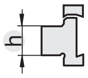
		h/d_A	L R	Type, description
C204			**N**	SBN 2020-26 K
C205			**N**	SBN 2020-26 KS

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C199		2.0		25	L	XLCFL 2602-SX2	SX..2	C156
		2.0		25	R	XLCFR 2602-SX2	SX..2	C156
		3.0		35	N	XLCFN 2603-SX3	SX..3	C156
		4.0		40	N	XLCFN 2604-SX4	SX..4	C156
C200		2.0		22	L	XLCFL 2608-SX2	SX..2	C156
		2.0		22	R	XLCFR 2608-SX2	SX..2	C156
		3.0		22	L	XLCFL 2608-SX3	SX..3	C156
		3.0		22	R	XLCFR 2608-SX3	SX..3	C156
C203		2.2		25	N	XLCEN 2602 J22 FX	FX 2.2..	C158
		3.1		35	N	XLCFN 2603 J31 FX	FX 3.1..	C158
		4.1		40	N	XLCFN 2604 J41 FX	FX 4.1..	C158

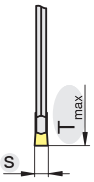
Part-off

Clamping blocks, blades, height 32

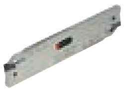
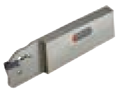




Matching products see right-hand side.

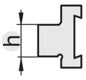


		h/d_A	L R	Type, description
C204			N	SBN 2520-32 K
			N	SBN 3229-32 K
C205			N	SBN 2520-32 KS
			N	SBN 3229-32 KS
C206			R	HSK-T63-KHR00-32
			L	HSK-T63-KHL00-32
			L	HSK-T100-KHL00-32
			R	HSK-T100-KHR00-32

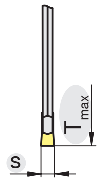
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C198		2.00	2.75	21	N	XLCFN 3202-GX24-1S	GX24-1..	C151
		2.76	3.75	21	N	XLCFN 3203 GX24-2S	GX24-2..	C151
		3.76	5.00	21	N	XLCFN 3204 GX24-3S	GX24-3..	C151
		5.01	6.50	21	N	XLCFN 3206 GX24-4S	GX24-4..	C151
C199		2.0		25	L	XLCFL 3202-SX2	SX..2	C156
		2.0		25	R	XLCFR 3202-SX2	SX..2	C156
		3.0		50	N	XLCFN 3203-SX3	SX..3	C156
		4.0		50	N	XLCFN 3204-SX4	SX..4	C156
		5.0		55	N	XLCFN 3205-SX5	SX..5	C156
		6.0		60	N	XLCFN 3206-SX6	SX..6	C156
C201		3.0		33	L	XLCFL 3208C-SX3	SX..3	C156
		3.0		33	L	XLCFL 3208-SX3	SX..3	C156
		3.0		33	R	XLCFR 3208C-SX3	SX..3	C156
		3.0		33	R	XLCFR 3208-SX3	SX..3	C156
		4.0		33	L	XLCFL 3208-SX4	SX..4	C156
		4.0		33	R	XLCFR 3208-SX4	SX..4	C156
C203		2.2		30	N	XLCEN 3202 M22 FX	FX 2.2..	C158
		3.1		50	N	XLCFN 3203 M31 FX	FX 3.1..	C158
		4.1		50	N	XLCFN 3204 M41 FX	FX 4.1..	C158
		5.1		55	N	XLCFN 3205 M51 FX	FX 5.1..	C158
		6.5		55	N	XLCFN 3206 M65 FX	FX 6.5..	C158

Part-off

Clamping blocks, blades, height 46



Matching products see right-hand side.

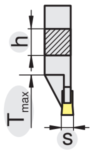


		h/d_A	L R	Type, description
C204			N	SBN 3229-46 K
			N	SBN 4037-46 K

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C202		8.00	10.00	80	N	XLCEN 4608 LX	LX..	C157
C203		8.2		80	N	XLCEN 4608 S82 FX	FX 8.2..	C158
		9.7		80	N	XLCEN 4609 S97 FX	FX 9.7..	C158

Part-off

Monoblock tools – GX

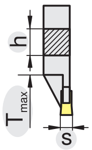


		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C189		12	2.00	2.75	12	R	E12R0012-1212K-GX16-1	GX16-1..	C151
		12	2.76	3.75	12	R	E12R0012-1212K-GX16-2	GX16-2..	C151
		16	2.00	2.75	12	R	E16R0012-1616K-GX16-1	GX16-1..	C151
		16	2.76	3.75	12	R	E16R0012-1616K-GX16-2	GX16-2..	C151
		16	3.76	5.00	12	R	E16R0012-1616K-GX16-3	GX16-3..	C151
		20	2.00	2.75	12	R	E20R0012-2020K-GX16-1	GX16-1..	C151
		20	2.76	3.75	12	R	E20R0012-2020K-GX16-2	GX16-2..	C151
		20	3.76	5.00	12	R	E20R0012-2020K-GX16-3	GX16-3..	C151
		25	2.76	3.75	12	R	E25R0012-2525M-GX16-2	GX16-2..	C151
		25	3.76	5.00	12	R	E25R0012-2525M-GX16-3	GX16-3..	C151
		12	2.00	2.75	12	L	E12L0012-1212K-GX16-1	GX16-1..	C151
		12	2.76	3.75	12	L	E12L0012-1212K-GX16-2	GX16-2..	C151
		16	2.00	2.75	12	L	E16L0012-1616K-GX16-1	GX16-1..	C151
		16	2.76	3.75	12	L	E16L0012-1616K-GX16-2	GX16-2..	C151
		16	3.76	5.00	12	L	E16L0012-1616K-GX16-3	GX16-3..	C151
		20	2.00	2.75	12	L	E20L0012-2020K-GX16-1	GX16-1..	C151
		20	2.76	3.75	12	L	E20L0012-2020K-GX16-2	GX16-2..	C151
		20	3.76	5.00	12	L	E20L0012-2020K-GX16-3	GX16-3..	C151
		25	2.76	3.75	12	L	E25L0012-2525M-GX16-2	GX16-2..	C151
		25	3.76	5.00	12	L	E25L0012-2525M-GX16-3	GX16-3..	C151

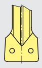
		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C190		16	2.00	2.75	21	R	E16R0021-1616K-GX24-1	GX24-1..	C151
		16	2.76	3.75	21	R	E16R0021-1616K-GX24-2	GX24-2..	C151
		20	2.00	2.75	21	R	E20R0021-2020K-GX24-1	GX24-1..	C151
		20	2.76	3.75	21	R	E20R0021-2020K-GX24-2	GX24-2..	C151
		20	3.76	5.00	21	R	E20R0021-2020K-GX24-3	GX24-3..	C151
		25	2.76	3.75	21	R	E25R0021-2525M-GX24-2	GX24-2..	C151
		25	3.76	5.00	21	R	E25R0021-2525M-GX24-3	GX24-3..	C151
		25	5.01	6.50	21	R	E25R0021-2525M-GX24-4	GX24-4..	C151
		32	2.76	3.75	21	R	E32R0021-3225P-GX24-2	GX24-2..	C151
		32	3.76	5.00	21	R	E32R0021-3225P-GX24-3	GX24-3..	C151
		32	5.01	6.50	21	R	E32R0021-3225P-GX24-4	GX24-4..	C151
		16	2.00	2.75	21	L	E16L0021-1616K-GX24-1	GX24-1..	C151
		16	2.76	3.75	21	L	E16L0021-1616K-GX24-2	GX24-2..	C151
		20	2.00	2.75	21	L	E20L0021-2020K-GX24-1	GX24-1..	C151
		20	2.76	3.75	21	L	E20L0021-2020K-GX24-2	GX24-2..	C151
		20	3.76	5.00	21	L	E20L0021-2020K-GX24-3	GX24-3..	C151
		25	2.76	3.75	21	L	E25L0021-2525M-GX24-2	GX24-2..	C151
		25	3.76	5.00	21	L	E25L0021-2525M-GX24-3	GX24-3..	C151
		25	5.01	6.50	21	L	E25L0021-2525M-GX24-4	GX24-4..	C151
		32	2.76	3.75	21	L	E32L0021-3225P-GX24-2	GX24-2..	C151
		32	3.76	5.00	21	L	E32L0021-3225P-GX24-3	GX24-3..	C151
		32	5.01	6.50	21	L	E32L0021-3225P-GX24-4	GX24-4..	C151

Part-off

Monoblock tools – SX/FX

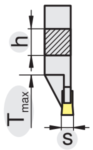


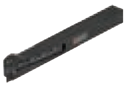
		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C194		16	2.0	16	R	E16R0016-1616K-SX2	SX..2	C158
		16	3.0	20	R	E16R0020-1616K-SX3	SX..3	C158
		20	2.0	16	R	E20R0016-2020K-SX2	SX..2	C158
		20	3.0	20	R	E20R0020-2020K-SX3	SX..3	C158
		20	4.0	25	R	E20R0025-2020K-SX4	SX..4	C158
		25	3.0	20	R	E25R0020-2525M-SX3	SX..3	C158
		25	4.0	25	R	E25R0025-2525M-SX4	SX..4	C158
		25	5.0	25	R	E25R0025-2525M-SX5	SX..5	C158
		25	6.0	32	R	E25R0032-2525M-SX6	SX..6	C158
		16	2.0	16	L	E16L0016-1616K-SX2	SX..2	C158
		16	3.0	20	L	E16L0020-1616K-SX3	SX..3	C158
		20	2.0	16	L	E20L0016-2020K-SX2	SX..2	C158
		20	3.0	20	L	E20L0020-2020K-SX3	SX..3	C158
		20	4.0	25	L	E20L0025-2020K-SX4	SX..4	C158
		25	3.0	20	L	E25L0020-2525M-SX3	SX..3	C158
		25	4.0	25	L	E25L0025-2525M-SX4	SX..4	C158
		25	5.0	25	L	E25L0025-2525M-SX5	SX..5	C158
		25	6.0	32	L	E25L0032-2525M-SX6	SX..6	C158

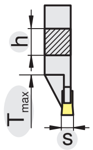
		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C195		10	2.2	15	R	XLCER 1010 M22 FX	FX 2.2..	C158
		12	2.2	15	R	XLCER 1212 M22 FX	FX 2.2..	C158
		12	2.2	15	R	XLCER 1212 F22 FX	FX 2.2..	C158
		14	2.2	15	R	XLCER 1414 M22 FX	FX 2.2..	C158
		16	2.2	15	R	XLCER 1612 H22 FX	FX 2.2..	C158
		16	3.1	17.5	R	XLCFR 1612 H31 FX	FX 3.1..	C158
		20	3.1	20	R	XLCFR 2016 K31 FX	FX 3.1..	C158
		20	4.1	20	R	XLCFR 2016 K41 FX	FX 4.1..	C158
		25	3.1	25	R	XLCFR 2520 M31 FX	FX 3.1..	C158
		25	4.1	25	R	XLCFR 2520 M41 FX	FX 4.1..	C158
		10	2.2	15	L	XLCEL 1010 M22 FX	FX 2.2..	C158
		12	2.2	15	L	XLCEL 1212 M22 FX	FX 2.2..	C158
		12	2.2	15	L	XLCEL 1212 F22 FX	FX 2.2..	C158
		14	2.2	15	L	XLCEL 1414 M22 FX	FX 2.2..	C158
		16	2.2	15	L	XLCEL 1612 H22 FX	FX 2.2..	C158
		16	3.1	17.5	L	XLCFL 1612 H31 FX	FX 3.1..	C158
		20	3.1	20	L	XLCFL 2016 K31 FX	FX 3.1..	C158
		20	4.1	20	L	XLCFL 2016 K41 FX	FX 4.1..	C158
		25	3.1	25	L	XLCFL 2520 M31 FX	FX 3.1..	C158
		25	4.1	25	L	XLCFL 2520 M41 FX	FX 4.1..	C158

Part-off

Monoblock tools – MaxiClick



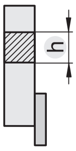
		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C196		10	1.00	1.50	5	R	MC05R-1010K	MC 05..	C158
		12	1.00	1.50	5	R	MC05R-1212K	MC 05..	C158
		16	1.00	1.50	5	R	MC05R-1616K	MC 05..	C158
		20	1.00	1.50	5	R	MC05R-2020K	MC 05..	C158
		25	1.00	1.50	5	R	MC05R-2525M	MC 05..	C158
		10	1.00	1.50	5	L	MC05L-1010K	MC 05..	C158
		12	1.00	1.50	5	L	MC05L-1212K	MC 05..	C158
		16	1.00	1.50	5	L	MC05L-1616K	MC 05..	C158
		20	1.00	1.50	5	L	MC05L-2020K	MC 05..	C158
		25	1.00	1.50	5	L	MC05L-2525M	MC 05..	C158
C197		10	1.50	2.50	10	R	MC10R-1010K	MC 10..	C158
		10	1.50	2.50	10	R	MC10R-1010K-S	MC 10..	C158
		12	1.50	2.50	10	R	MC10R-1212K	MC 10..	C158
		12	1.50	2.50	10	R	MC10R-1212K-S	MC 10..	C158
		16	1.50	2.50	10	R	MC10R-1616K	MC 10..	C158
		20	1.50	2.50	10	R	MC10R-2020K	MC 10..	C158
		25	1.50	2.50	10	R	MC10R-2525M	MC 10..	C158
		10	1.50	2.50	10	L	MC10L-1010K	MC 10..	C158
		10	1.50	2.50	10	L	MC10L-1010K-S	MC 10..	C158
		12	1.50	2.50	10	L	MC10L-1212K	MC 10..	C158
		12	1.50	2.50	10	L	MC10L-1212K-S	MC 10..	C158
		16	1.50	2.50	10	L	MC10L-1616K	MC 10..	C158
		20	1.50	2.50	10	L	MC10L-2020K	MC 10..	C158
		25	1.50	2.50	10	L	MC10L-2525M	MC 10..	C158



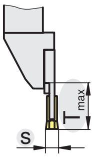
		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C196		10	1.00	1.50	5	R	MC05R-1010K	MC 05..	C158
		12	1.00	1.50	5	R	MC05R-1212K	MC 05..	C158
		16	1.00	1.50	5	R	MC05R-1616K	MC 05..	C158
		20	1.00	1.50	5	R	MC05R-2020K	MC 05..	C158
		25	1.00	1.50	5	R	MC05R-2525M	MC 05..	C158
		10	1.00	1.50	5	L	MC05L-1010K	MC 05..	C158
		12	1.00	1.50	5	L	MC05L-1212K	MC 05..	C158
		16	1.00	1.50	5	L	MC05L-1616K	MC 05..	C158
		20	1.00	1.50	5	L	MC05L-2020K	MC 05..	C158
		25	1.00	1.50	5	L	MC05L-2525M	MC 05..	C158
C197		10	1.50	2.50	10	R	MC10R-1010K	MC 10..	C158
		10	1.50	2.50	10	R	MC10R-1010K-S	MC 10..	C158
		12	1.50	2.50	10	R	MC10R-1212K	MC 10..	C158
		12	1.50	2.50	10	R	MC10R-1212K-S	MC 10..	C158
		16	1.50	2.50	10	R	MC10R-1616K	MC 10..	C158
		20	1.50	2.50	10	R	MC10R-2020K	MC 10..	C158
		25	1.50	2.50	10	R	MC10R-2525M	MC 10..	C158
		10	1.50	2.50	10	L	MC10L-1010K	MC 10..	C158
		10	1.50	2.50	10	L	MC10L-1010K-S	MC 10..	C158
		12	1.50	2.50	10	L	MC10L-1212K	MC 10..	C158
		12	1.50	2.50	10	L	MC10L-1212K-S	MC 10..	C158
		16	1.50	2.50	10	L	MC10L-1616K	MC 10..	C158
		20	1.50	2.50	10	L	MC10L-2020K	MC 10..	C158
		25	1.50	2.50	10	L	MC10L-2525M	MC 10..	C158

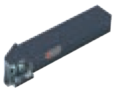
Grooving and turning – external

Modular system – external, assembly size 12

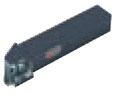


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	**12**	**R**	MSS-E12R00-1212E

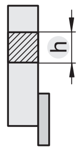
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C176		2.00	2.75	7	R	MSS-E12R07-GX09-1	GX09-1..	C151
		2.76	3.75	7	R	MSS-E12R07-GX09-2	GX09-2..	C151

		h/d_A	L R	Type, description
C168	 0	**12**	**L**	MSS-E12L00-1212E

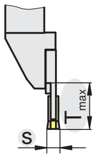
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C176		2.00	2.75	7	L	MSS-E12L07-GX09-1	GX09-1..	C151
		2.76	3.75	7	L	MSS-E12L07-GX09-2	GX09-2..	C151

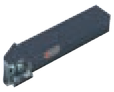
Grooving and turning – external

Modular system – external, assembly size 16

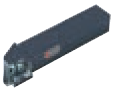


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	**16**	**R**	MSS-E16R00-1616G

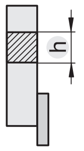
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C176		2.00	2.75	7	R	MSS-E16R07-GX09-1	GX09-1..	C151
		2.76	3.75	7	R	MSS-E16R07-GX09-2	GX09-2..	C151

		h/d_A	L R	Type, description
C168	 0	**16**	**L**	MSS-E16L00-1616G

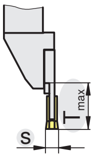
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C176		2.00	2.75	7	L	MSS-E16L07-GX09-1	GX09-1..	C151
		2.76	3.75	7	L	MSS-E16L07-GX09-2	GX09-2..	C151

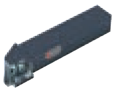
Grooving and turning – external

Modular system – external, assembly size 20

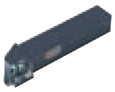


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	**20**	**R**	MSS-E20R00-2020J
		16	**R**	MSS-E20R00-1620G
C169	 90	**20**	**L**	MSS-E20L90-2020J

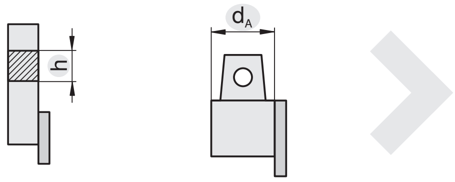
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	R	MSS-E20R12-GX16-1	GX16-1..	C151
		2.76	3.75	12	R	MSS-E20R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E20R12-GX16-3	GX16-3..	C151
C178		2.00	2.75	21	R	MSS-E20R21-GX24-1	GX24-1..	C151
		2.76	3.75	21	R	MSS-E20R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E20R21-GX24-3	GX24-3..	C151
C184		2.0		20	R	MSS-E20R20-SX2	SX..2	C156
		3.0		20	R	MSS-E20R20-SX3	SX..3	C156

		h/d_A	L R	Type, description
C168	 0	**20**	**L**	MSS-E20L00-2020J
		16	**L**	MSS-E20L00-1620G
C169	 90	**20**	**R**	MSS-E20R90-2020J

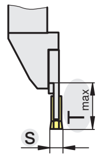
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	L	MSS-E20L12-GX16-1	GX16-1..	C151
		2.76	3.75	12	L	MSS-E20L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E20L12-GX16-3	GX16-3..	C151
C178		2.00	2.75	21	L	MSS-E20L21-GX24-1	GX24-1..	C151
		2.76	3.75	21	L	MSS-E20L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E20L21-GX24-3	GX24-3..	C151
C184		2.0		20	L	MSS-E20L20-SX2	SX..2	C156
		3.0		20	L	MSS-E20L20-SX3	SX..3	C156

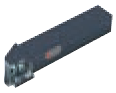
Grooving and turning – external

Modular system – external, assembly size 25

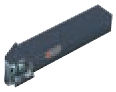


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168		25	R	MSS-E25R00-2525L
	0			
C169		25	L	MSS-E25L90-2525L
	90			
C171		100	R	HSK-T100-MSS-E25R00
		63	R	HSK-T63-MSS-E25R00
	0			
C173		63	R	UT63-MSS-E25R00
		40	R	UT40-MSS-E25R00
		50	R	UT50-MSS-E25R00
	0			
C174		40	L	UT40-MSS-E25L90
		50	L	UT50-MSS-E25L90
	90			

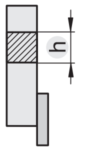
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	R	MSS-E25R12-GX16-1	GX16-1..	C151
		2.76	3.75	12	R	MSS-E25R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E25R12-GX16-3	GX16-3..	C151
		5.01	6.50	12	R	MSS-E25R12-GX16-4	GX16-4..	C151
C178		2.00	2.75	21	R	MSS-E25R21-GX24-1	GX24-1..	C151
		2.76	3.75	21	R	MSS-E25R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E25R21-GX24-3	GX24-3..	C151
		5.01	6.50	21	R	MSS-E25R21-GX24-4	GX24-4..	C151
C184		2.0		20	R	MSS-E25R20-SX2	SX..2	C156
		3.0		25	R	MSS-E25R25-SX3	SX..3	C156
		3.0		35	R	MSS-E25R35-SX3	SX..3	C156
		4.0		25	R	MSS-E25R25-SX4	SX..4	C156
		4.0		35	R	MSS-E25R35-SX4	SX..4	C156

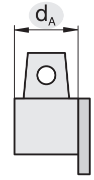
		h/d_A	L R	Type, description
C168		25	L	MSS-E25L00-2525L
	0			
C169		25	R	MSS-E25R90-2525L
	90			
C171		100	L	HSK-T100-MSS-E25L00
		63	L	HSK-T63-MSS-E25L00
	0			
C173		40	L	UT40-MSS-E25L00
		50	L	UT50-MSS-E25L00
		63	L	UT63-MSS-E25L00
	0			
C174		50	R	UT50-MSS-E25R90
		40	R	UT40-MSS-E25R90
	90			

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.00	2.75	12	L	MSS-E25L12-GX16-1	GX16-1..	C151
		2.76	3.75	12	L	MSS-E25L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E25L12-GX16-3	GX16-3..	C151
		5.01	6.50	12	L	MSS-E25L12-GX16-4	GX16-4..	C151
C178		2.00	2.75	21	L	MSS-E25L21-GX24-1	GX24-1..	C151
		2.76	3.75	21	L	MSS-E25L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E25L21-GX24-3	GX24-3..	C151
		5.01	6.50	21	L	MSS-E25L21-GX24-4	GX24-4..	C151
C184		2.0		20	L	MSS-E25L20-SX2	SX..2	C156
		3.0		25	L	MSS-E25L25-SX3	SX..3	C156
		3.0		35	L	MSS-E25L35-SX3	SX..3	C156
		4.0		25	L	MSS-E25L25-SX4	SX..4	C156
		4.0		35	L	MSS-E25L35-SX4	SX..4	C156

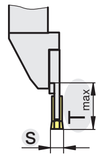
Grooving and turning – external

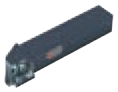
Modular system – external, assembly size 32



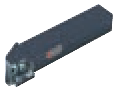


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	32	R	MSS-E32R00-3232Q
		32	R	MSS-E32R00-3225N
C169	 90	32	L	MSS-E32L90-3225N
		32	L	MSS-E32L90-3232R
C171	 0	100	R	HSK-T100-MSS-E32R00
		63	R	HSK-T63-MSS-E32R00
C172	 90	100	L	HSK-T100-MSS-E32L90
		63	L	HSK-T63-MSS-E32L90
C173	 0	50	R	UT50-MSS-E32R00
		63	R	UT63-MSS-E32R00

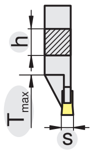
		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.76	3.75	12	R	MSS-E32R12-GX16-2	GX16-2..	C151
		3.76	5.00	12	R	MSS-E32R12-GX16-3	GX16-3..	C151
		5.01	6.50	12	R	MSS-E32R12-GX16-4	GX16-4..	C151
C178		2.76	3.75	21	R	MSS-E32R21-GX24-2	GX24-2..	C151
		3.76	5.00	21	R	MSS-E32R21-GX24-3	GX24-3..	C151
		5.01	6.50	21	R	MSS-E32R21-GX24-4	GX24-4..	C151
C184		3.0		35	R	MSS-E32R35-SX3	SX..3	C156
		4.0		35	R	MSS-E32R35-SX4	SX..4	C156
C185		8.00	10.00	25	N	MSS-E32N25-LX	LX..	C157
		8.00	10.00	32	N	MSS-E32N32-LX	LX..	C157
		8.00	10.00	45	N	MSS-E32N45-LX	LX..	C157

		h/d_A	L R	Type, description
C168	 0	32	L	MSS-E32L00-3225N
		32	L	MSS-E32L00-3232Q
C169	 90	32	R	MSS-E32R90-3232R
		32	R	MSS-E32R90-3225N
C171	 0	100	L	HSK-T100-MSS-E32L00
		63	L	HSK-T63-MSS-E32L00
C172	 90	100	R	HSK-T100-MSS-E32R90
		63	R	HSK-T63-MSS-E32R90
C173	 0	63	L	UT63-MSS-E32L00

		s/s_{min}	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C177		2.76	3.75	12	L	MSS-E32L12-GX16-2	GX16-2..	C151
		3.76	5.00	12	L	MSS-E32L12-GX16-3	GX16-3..	C151
		5.01	6.50	12	L	MSS-E32L12-GX16-4	GX16-4..	C151
C178		2.76	3.75	21	L	MSS-E32L21-GX24-2	GX24-2..	C151
		3.76	5.00	21	L	MSS-E32L21-GX24-3	GX24-3..	C151
		5.01	6.50	21	L	MSS-E32L21-GX24-4	GX24-4..	C151
C184		3.0		35	L	MSS-E32L35-SX3	SX..3	C156
		4.0		35	L	MSS-E32L35-SX4	SX..4	C156
C185		8.00	10.00	25	N	MSS-E32N25-LX	LX..	C157
		8.00	10.00	32	N	MSS-E32N32-LX	LX..	C157
		8.00	10.00	45	N	MSS-E32N45-LX	LX..	C157

Grooving and turning – external

Monoblock tools – GX



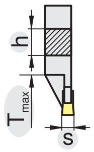
		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	**Type, description**		
C188		10	2.00	3.75	7	R	E10R00-1010M-GX09	GX09..	C151
		10	2.00	3.75	7	L	E10L00-1010M-GX09	GX09..	C151

		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	**Type, description**		
C189		12	2.00	2.75	12	R	E12R0012-1212K-GX16-1	GX16-1..	C151
		12	2.76	3.75	12	R	E12R0012-1212K-GX16-2	GX16-2..	C151
		16	2.00	2.75	12	R	E16R0012-1616K-GX16-1	GX16-1..	C151
		16	2.76	3.75	12	R	E16R0012-1616K-GX16-2	GX16-2..	C151
		16	3.76	5.00	12	R	E16R0012-1616K-GX16-3	GX16-3..	C151
		20	2.00	2.75	12	R	E20R0012-2020K-GX16-1	GX16-1..	C151
		20	2.76	3.75	12	R	E20R0012-2020K-GX16-2	GX16-2..	C151
		20	3.76	5.00	12	R	E20R0012-2020K-GX16-3	GX16-3..	C151
		25	2.76	3.75	12	R	E25R0012-2525M-GX16-2	GX16-2..	C151
		25	3.76	5.00	12	R	E25R0012-2525M-GX16-3	GX16-3..	C151
		12	2.00	2.75	12	L	E12L0012-1212K-GX16-1	GX16-1..	C151
		12	2.76	3.75	12	L	E12L0012-1212K-GX16-2	GX16-2..	C151
		16	2.00	2.75	12	L	E16L0012-1616K-GX16-1	GX16-1..	C151
		16	2.76	3.75	12	L	E16L0012-1616K-GX16-2	GX16-2..	C151
		16	3.76	5.00	12	L	E16L0012-1616K-GX16-3	GX16-3..	C151
		20	2.00	2.75	12	L	E20L0012-2020K-GX16-1	GX16-1..	C151
		20	2.76	3.75	12	L	E20L0012-2020K-GX16-2	GX16-2..	C151
		20	3.76	5.00	12	L	E20L0012-2020K-GX16-3	GX16-3..	C151
		25	2.76	3.75	12	L	E25L0012-2525M-GX16-2	GX16-2..	C151
		25	3.76	5.00	12	L	E25L0012-2525M-GX16-3	GX16-3..	C151

		h [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	**Type, description**		
C190		16	2.00	2.75	21	R	E16R0021-1616K-GX24-1	GX24-1..	C151
		16	2.76	3.75	21	R	E16R0021-1616K-GX24-2	GX24-2..	C151
		20	2.00	2.75	21	R	E20R0021-2020K-GX24-1	GX24-1..	C151
		20	2.76	3.75	21	R	E20R0021-2020K-GX24-2	GX24-2..	C151
		20	3.76	5.00	21	R	E20R0021-2020K-GX24-3	GX24-3..	C151
		25	2.76	3.75	21	R	E25R0021-2525M-GX24-2	GX24-2..	C151
		25	3.76	5.00	21	R	E25R0021-2525M-GX24-3	GX24-3..	C151
		25	5.01	6.50	21	R	E25R0021-2525M-GX24-4	GX24-4..	C151
		32	2.76	3.75	21	R	E32R0021-3225P-GX24-2	GX24-2..	C151
		32	3.76	5.00	21	R	E32R0021-3225P-GX24-3	GX24-3..	C151
		32	5.01	6.50	21	R	E32R0021-3225P-GX24-4	GX24-4..	C151
		16	2.00	2.75	21	L	E16L0021-1616K-GX24-1	GX24-1..	C151
		16	2.76	3.75	21	L	E16L0021-1616K-GX24-2	GX24-2..	C151
		20	2.00	2.75	21	L	E20L0021-2020K-GX24-1	GX24-1..	C151
		20	2.76	3.75	21	L	E20L0021-2020K-GX24-2	GX24-2..	C151
		20	3.76	5.00	21	L	E20L0021-2020K-GX24-3	GX24-3..	C151
		25	2.76	3.75	21	L	E25L0021-2525M-GX24-2	GX24-2..	C151
		25	3.76	5.00	21	L	E25L0021-2525M-GX24-3	GX24-3..	C151
		25	5.01	6.50	21	L	E25L0021-2525M-GX24-4	GX24-4..	C151
		32	2.76	3.75	21	L	E32L0021-3225P-GX24-2	GX24-2..	C151
		32	3.76	5.00	21	L	E32L0021-3225P-GX24-3	GX24-3..	C151
		32	5.01	6.50	21	L	E32L0021-3225P-GX24-4	GX24-4..	C151

Grooving and turning – external

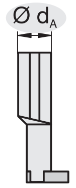
Monoblock tools – SX



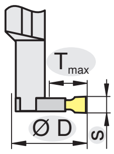
		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C194		16	2.0	16	R	E16R0016-1616K-SX2	SX..2	C158
		16	3.0	20	R	E16R0020-1616K-SX3	SX..3	C158
		20	2.0	16	R	E20R0016-2020K-SX2	SX..2	C158
		20	3.0	20	R	E20R0020-2020K-SX3	SX..3	C158
		20	4.0	25	R	E20R0025-2020K-SX4	SX..4	C158
		25	3.0	20	R	E25R0020-2525M-SX3	SX..3	C158
		25	4.0	25	R	E25R0025-2525M-SX4	SX..4	C158
		25	5.0	25	R	E25R0025-2525M-SX5	SX..5	C158
		25	6.0	32	R	E25R0032-2525M-SX6	SX..6	C158
		16	2.0	16	L	E16L0016-1616K-SX2	SX..2	C158
		16	3.0	20	L	E16L0020-1616K-SX3	SX..3	C158
		20	2.0	16	L	E20L0016-2020K-SX2	SX..2	C158
		20	3.0	20	L	E20L0020-2020K-SX3	SX..3	C158
		20	4.0	25	L	E20L0025-2020K-SX4	SX..4	C158
		25	3.0	20	L	E25L0020-2525M-SX3	SX..3	C158
		25	4.0	25	L	E25L0025-2525M-SX4	SX..4	C158
		25	5.0	25	L	E25L0025-2525M-SX5	SX..5	C158
		25	6.0	32	L	E25L0032-2525M-SX6	SX..6	C158

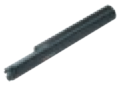
Grooving and turning – internal

Modular system – internal, assembly size 16

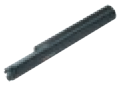


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**20**	**R**	MSS-I16R90-1.5D-N
C208		**20**	**R**	MSS-I16R90-2.5D-N

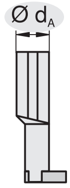
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		20	2.00	2.75	4	R	MSS-I16R04-GX09-1	GX09-1..	C151
		20	2.76	3.75	4	R	MSS-I16R04-GX09-2	GX09-2..	C151

		d_A [mm]	L R	Type, description
C207		**20**	**L**	MSS-I16L90-1.5D-N
C208		**20**	**L**	MSS-I16L90-2.5D-N

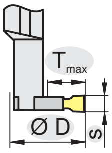
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		20	2.00	2.75	4	L	MSS-I16L04-GX09-1	GX09-1..	C151
		20	2.76	3.75	4	L	MSS-I16L04-GX09-2	GX09-2..	C151

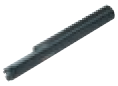
Grooving and turning – internal

Modular system – internal, assembly size 20

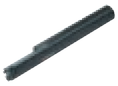


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**20**	**R**	MSS-I20R90-1.5D-N
C208		**25**	**R**	MSS-I20R90-2.5D-N

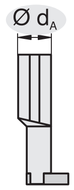
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		25	2.00	2.75	5	R	MSS-I20R05-GX09-1	GX09-1..	C151
		25	2.76	3.75	5	R	MSS-I20R05-GX09-2	GX09-2..	C151

		d_A [mm]	L R	Type, description
C207		**20**	**L**	MSS-I20L90-1.5D-N
C208		**25**	**L**	MSS-I20L90-2.5D-N

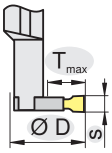
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		25	2.00	2.75	5	L	MSS-I20L05-GX09-1	GX09-1..	C151
		25	2.76	3.75	5	L	MSS-I20L05-GX09-2	GX09-2..	C151

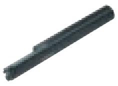
Grooving and turning – internal

Modular system – internal, assembly size 25

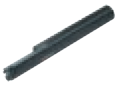


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**25**	**R**	MSS-I25R90-1.5D-N
C208		**32**	**R**	MSS-I25R90-2.5D-N

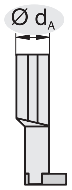
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		32	2.00	2.75	6	R	MSS-I25R06-GX09-1	GX09-1..	C151
		32	2.76	3.75	6	R	MSS-I25R06-GX09-2	GX09-2..	C151

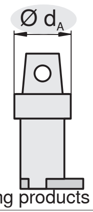
		d_A [mm]	L R	Type, description
C207		**25**	**L**	MSS-I25L90-1.5D-N
C208		**32**	**L**	MSS-I25L90-2.5D-N

		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C210		32	2.00	2.75	6	L	MSS-I25L06-GX09-1	GX09-1..	C151
		32	2.76	3.75	6	L	MSS-I25L06-GX09-2	GX09-2..	C151

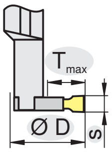
Grooving and turning – internal

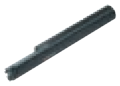
Modular system – internal, assembly size 32



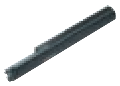


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**32**	**R**	MSS-I32R90-1.5D-N
C208		**40**	**R**	MSS-I32R90-2.5D-N
C209		**40**	**R**	UT40-MSS-I32R90-2D

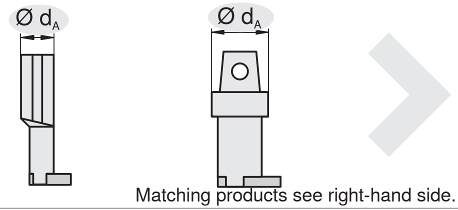
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C211		40	2.00	2.75	9	R	MSS-I32R09-GX16-1	GX16-1..	C151
		40	2.76	3.75	9	R	MSS-I32R09-GX16-2	GX16-2..	C151
		40	3.76	5.00	9	R	MSS-I32R09-GX16-3	GX16-3..	C151
		40	5.01	6.50	9	R	MSS-I32R09-GX16-4	GX16-4..	C151

		d_A [mm]	L R	Type, description
C207		**32**	**L**	MSS-I32L90-1.5D-N
C208		**40**	**L**	MSS-I32L90-2.5D-N
C209		**50**	**L**	UT50-MSS-I32L90-2D

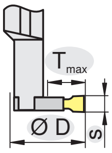
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C211		40	2.00	2.75	9	L	MSS-I32L09-GX16-1	GX16-1..	C151
		40	2.76	3.75	9	L	MSS-I32L09-GX16-2	GX16-2..	C151
		40	3.76	5.00	9	L	MSS-I32L09-GX16-3	GX16-3..	C151
		40	5.01	6.50	9	L	MSS-I32L09-GX16-4	GX16-4..	C151

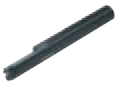
Grooving and turning – internal

Modular system – internal, assembly size 40

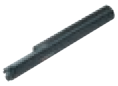


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**40**	**R**	MSS-I40R90-1.5D-N
C208		**50**	**R**	MSS-I40R90-2.5D-N

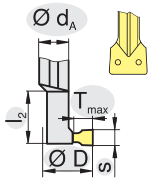
		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C211		50	2.00	2.75	10	R	MSS-I40R10-GX16-1	GX16-1..	C151
		50	2.76	3.75	10	R	MSS-I40R10-GX16-2	GX16-2..	C151
		50	3.76	5.00	10	R	MSS-I40R10-GX16-3	GX16-3..	C151
		50	5.01	6.50	10	R	MSS-I40R10-GX16-4	GX16-4..	C151
C212		60	2.76	3.75	19	N	MSS-I40N19-GX24-2	GX24-2..	C151
		60	3.76	5.00	19	N	MSS-I40N19-GX24-3	GX24-3..	C151
		60	5.01	6.50	19	N	MSS-I40N19-GX24-4	GX24-4..	C151

		d_A [mm]	L R	Type, description
C207		**40**	**L**	MSS-I40L90-1.5D-N
C208		**50**	**L**	MSS-I40L90-2.5D-N
C209		**40**	**L**	UT40-MSS-I40L90-2D

		D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C211		50	2.00	2.75	10	L	MSS-I40L10-GX16-1	GX16-1..	C151
		50	2.76	3.75	10	L	MSS-I40L10-GX16-2	GX16-2..	C151
		50	3.76	5.00	10	L	MSS-I40L10-GX16-3	GX16-3..	C151
		50	5.01	6.50	10	L	MSS-I40L10-GX16-4	GX16-4..	C151
C212		60	2.76	3.75	19	N	MSS-I40N19-GX24-2	GX24-2..	C151
		60	3.76	5.00	19	N	MSS-I40N19-GX24-3	GX24-3..	C151
		60	5.01	6.50	19	N	MSS-I40N19-GX24-4	GX24-4..	C151

Grooving and turning – internal

Monoblock boring bars – GX



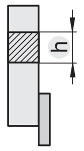
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	2.00	3.75	3	R	I12R90-2.5D-GX09	GX09..	C151
		16	30	16	2.00	3.75	3	L	I12L90-2.5D-GX09	GX09..	C151

		d_A [mm]	l_2 [mm]	D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	2.00	2.75	5.0	R	I16R90-2.0D-GX16-1	GX16-1..	C151
		16	32	20.5	2.76	3.75	5.0	R	I16R90-2.0D-GX16-2	GX16-2..	C151
		20	40	25.0	2.76	3.75	5.5	R	I20R90-2.0D-GX16-2	GX16-2..	C151
		25	50	32.0	2.76	3.75	8.0	R	I25R90-2.0D-GX16-2	GX16-2..	C151
		25	50	32.0	3.76	5.00	10.0	R	I25R90-2.0D-GX16-3	GX16-3..	C151
		32	64	42.0	2.76	3.75	11.0	R	I32R90-2.0D-GX16-2	GX16-2..	C151
		32	64	42.0	3.76	5.00	11.0	R	I32R90-2.0D-GX16-3	GX16-3..	C151
		16	32	20.5	2.00	2.75	5.0	L	I16L90-2.0D-GX16-1	GX16-1..	C151
		16	32	20.5	2.76	3.75	5.0	L	I16L90-2.0D-GX16-2	GX16-2..	C151
		20	40	25.0	2.76	3.75	5.5	L	I20L90-2.0D-GX16-2	GX16-2..	C151
		25	50	32.0	2.76	3.75	8.0	L	I25L90-2.0D-GX16-2	GX16-2..	C151
		25	50	32.0	3.76	5.00	10.0	L	I25L90-2.0D-GX16-3	GX16-3..	C151
		32	64	42.0	2.76	3.75	11.0	L	I32L90-2.0D-GX16-2	GX16-2..	C151
		32	64	42.0	3.76	5.00	11.0	L	I32L90-2.0D-GX16-3	GX16-3..	C151

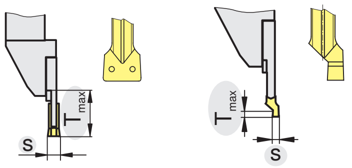
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	L R	Type, description		
C217		32	64	42.0	2.76	3.75	11.0	R	I32R90-2.0D-GX24-2	GX24-2..	C151
		32	64	42.0	3.76	5.00	11.0	R	I32R90-2.0D-GX24-3	GX24-3..	C151
		32	64	47.0	5.01	6.50	17.5	R	I32R90-2.0D-GX24-4	GX24-4..	C151
		40	80	53.0	3.76	5.00	12.0	R	I40R90-2.0D-GX24-3	GX24-3..	C151
		40	80	57.0	5.01	6.50	17.5	R	I40R90-2.0D-GX24-4	GX24-4..	C151
		32	64	42.0	2.76	3.75	11.0	L	I32L90-2.0D-GX24-2	GX24-2..	C151
		32	64	42.0	3.76	5.00	11.0	L	I32L90-2.0D-GX24-3	GX24-3..	C151
		32	64	47.0	5.01	6.50	17.5	L	I32L90-2.0D-GX24-4	GX24-4..	C151
		40	80	53.0	3.76	5.00	12.0	L	I40L90-2.0D-GX24-3	GX24-3..	C151
		40	80	57.0	5.01	6.50	17.5	L	I40L90-2.0D-GX24-4	GX24-4..	C151

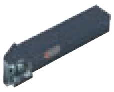
Circlip grooving – external

Modular system – external, assembly size 12

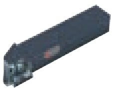


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	**12**	**R**	MSS-E12R00-1212E

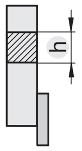
		s [mm]	T_{max} [mm]	L R	Type, description		
C176		1.95	7.00	R	MSS-E12R07-GX09-1	GX09-1..	C153
		2.25	7.00	R	MSS-E12R07-GX09-1	GX09-1..	C153
		2.75	7.00	R	MSS-E12R07-GX09-2	GX09-2..	C153
		3.25	7.00	R	MSS-E12R07-GX09-2	GX09-2..	C153
C179		0.60	0.75	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		0.80	0.94	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		0.90	1.04	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		1.00	1.14	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		1.20	1.34	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		1.40	1.53	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153
		1.70	1.82	R	MSS-E12R02-GX09-1	GX09-1..R/L	C153

		h/d_A	L R	Type, description
C168	 0	**12**	**L**	MSS-E12L00-1212E

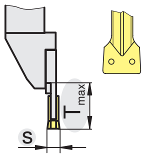
		s [mm]	T_{max} [mm]	L R	Type, description		
C176		1.95	7.00	L	MSS-E12L07-GX09-1	GX09-1..	C153
		2.25	7.00	L	MSS-E12L07-GX09-1	GX09-1..	C153
		2.75	7.00	L	MSS-E12L07-GX09-2	GX09-2..	C153
		3.25	7.00	L	MSS-E12L07-GX09-2	GX09-2..	C153
C179		0.60	0.75	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		0.80	0.94	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		0.90	1.04	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		1.00	1.14	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		1.20	1.34	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		1.40	1.53	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153
		1.70	1.82	L	MSS-E12L02-GX09-1	GX09-1..R/L	C153

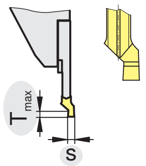
Circlip grooving – external

Modular system – external, assembly size 16



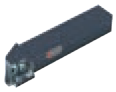
Matching products see right-hand side.





		h/d_A	L R	Type, description
C168	 0	**16**	**R**	MSS-E16R00-1616G

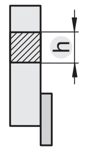
		s [mm]	T_{max} [mm]	L R	Type, description		
C176		1.95	7.00	R	MSS-E16R07-GX09-1	GX09-1..	C153
		2.25	7.00	R	MSS-E16R07-GX09-1	GX09-1..	C153
		2.75	7.00	R	MSS-E16R07-GX09-2	GX09-2..	C153
		3.25	7.00	R	MSS-E16R07-GX09-2	GX09-2..	C153
C179		0.60	0.75	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		0.80	0.94	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		0.90	1.04	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		1.00	1.14	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		1.20	1.34	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		1.40	1.53	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153
		1.70	1.82	R	MSS-E16R02-GX09-1	GX09-1..R/L	C153

		h/d_A	L R	Type, description
C168	 0	**16**	**L**	MSS-E16L00-1616G

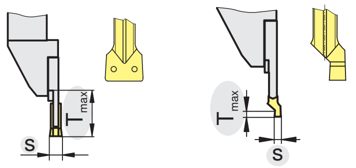
		s [mm]	T_{max} [mm]	L R	Type, description		
C176		1.95	7.00	L	MSS-E16L07-GX09-1	GX09-1..	C153
		2.25	7.00	L	MSS-E16L07-GX09-1	GX09-1..	C153
		2.75	7.00	L	MSS-E16L07-GX09-2	GX09-2..	C153
		3.25	7.00	L	MSS-E16L07-GX09-2	GX09-2..	C153
C179		0.60	0.75	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		0.80	0.94	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		0.90	1.04	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		1.00	1.14	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		1.20	1.34	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		1.40	1.53	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153
		1.70	1.82	L	MSS-E16L02-GX09-1	GX09-1..R/L	C153

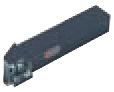
Circlip grooving – external

Modular system – external, assembly size 20

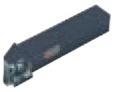


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	20	R	MSS-E20R00-2020J
		16	R	MSS-E20R00-1620G
C169	 90	20	L	MSS-E20L90-2020J

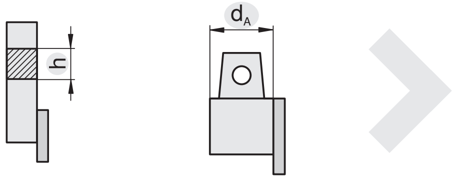
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	R	MSS-E20R12-GX16-2	GX16-2..	C153
		3.25	12.00	R	MSS-E20R12-GX16-2	GX16-2..	C153
		4.25	12.00	R	MSS-E20R12-GX16-3	GX16-3..	C153
C180		0.60	0.75	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153

		h/d_A	L R	Type, description
C168	 0	20	L	MSS-E20L00-2020J
		16	L	MSS-E20L00-1620G
C169	 90	20	R	MSS-E20R90-2020J

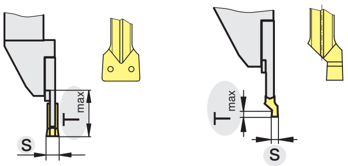
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	L	MSS-E20L12-GX16-2	GX16-2..	C153
		3.25	12.00	L	MSS-E20L12-GX16-2	GX16-2..	C153
		4.25	12.00	L	MSS-E20L12-GX16-3	GX16-3..	C153
C180		0.60	0.75	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153

Circlip grooving – external

Modular system – external, assembly size 25

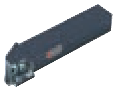


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	25	R	MSS-E25R00-2525L
C169	 90	25	L	MSS-E25L90-2525L
C171	 0	100	R	HSK-T100-MSS-E25R00
		63	R	HSK-T63-MSS-E25R00
C173	 0	63	R	UT63-MSS-E25R00
		40	R	UT40-MSS-E25R00
		50	R	UT50-MSS-E25R00
C174	 90	40	L	UT40-MSS-E25L90
		50	L	UT50-MSS-E25L90

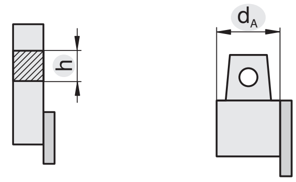
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	R	MSS-E25R12-GX16-2	GX16-2..	C153
		3.25	12.00	R	MSS-E25R12-GX16-2	GX16-2..	C153
		4.25	12.00	R	MSS-E25R12-GX16-3	GX16-3..	C153
		5.25	12.00	R	MSS-E25R12-GX16-4	GX16-4..	C153
C180		0.60	0.75	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153

		h/d_A	L R	Type, description
C168	 0	25	L	MSS-E25L00-2525L
C169	 90	25	R	MSS-E25R90-2525L
C171	 0	100	L	HSK-T100-MSS-E25L00
		63	L	HSK-T63-MSS-E25L00
C173	 0	40	L	UT40-MSS-E25L00
		50	L	UT50-MSS-E25L00
		63	L	UT63-MSS-E25L00
C174	 90	50	R	UT50-MSS-E25R90
		40	R	UT40-MSS-E25R90

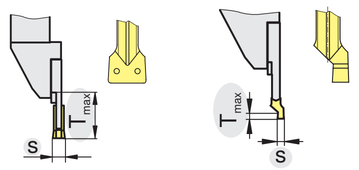
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	L	MSS-E25L12-GX16-2	GX16-2..	C153
		3.25	12.00	L	MSS-E25L12-GX16-2	GX16-2..	C153
		4.25	12.00	L	MSS-E25L12-GX16-3	GX16-3..	C153
		5.25	12.00	L	MSS-E25L12-GX16-4	GX16-4..	C153
C180		0.60	0.75	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153

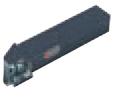
Circlip grooving – external

Modular system – external, assembly size 32

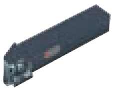


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	32	R	MSS-E32R00-3232Q
		32	R	MSS-E32R00-3225N
C169	 90	32	L	MSS-E32L90-3225N
		32	L	MSS-E32L90-3232R
C171	 0	100	R	HSK-T100-MSS-E32R00
		63	R	HSK-T63-MSS-E32R00
C172	 90	100	L	HSK-T100-MSS-E32L90
		63	L	HSK-T63-MSS-E32L90
C173	 0	50	R	UT50-MSS-E32R00
		63	R	UT63-MSS-E32R00

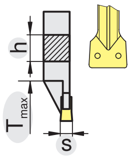
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	R	MSS-E32R12-GX16-2	GX16-2..	C153
		3.25	12.00	R	MSS-E32R12-GX16-2	GX16-2..	C153
		4.25	12.00	R	MSS-E32R12-GX16-3	GX16-3..	C153
		5.25	12.00	R	MSS-E32R12-GX16-4	GX16-4..	C153
C180		0.60	0.75	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	R	MSS-E32R03-GX16-2	GX16-2..R/L	C153

		h/d_A	L R	Type, description
C168	 0	32	L	MSS-E32L00-3225N
		32	L	MSS-E32L00-3232Q
C169	 90	32	R	MSS-E32R90-3232R
		32	R	MSS-E32R90-3225N
C171	 0	100	L	HSK-T100-MSS-E32L00
		63	L	HSK-T63-MSS-E32L00
C172	 90	100	R	HSK-T100-MSS-E32R90
		63	R	HSK-T63-MSS-E32R90
C173	 0	63	L	UT63-MSS-E32L00

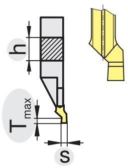
		s [mm]	T_{max} [mm]	L R	Type, description		
C177		2.75	12.00	L	MSS-E32L12-GX16-2	GX16-2..	C153
		3.25	12.00	L	MSS-E32L12-GX16-2	GX16-2..	C153
		4.25	12.00	L	MSS-E32L12-GX16-3	GX16-3..	C153
		5.25	12.00	L	MSS-E32L12-GX16-4	GX16-4..	C153
C180		0.60	0.75	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		0.80	0.94	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		0.90	1.04	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.00	1.14	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		1.95	2.07	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153
		2.25	2.36	L	MSS-E32L03-GX16-2	GX16-2..R/L	C153

Circlip grooving – external

Monoblock tools – GX



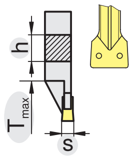
		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C188		10	1.95	7.00	R	E10R00-1010M-GX09	GX09..	C153
		10	2.25	7.00	R	E10R00-1010M-GX09	GX09..	C153
		10	2.75	7.00	R	E10R00-1010M-GX09	GX09..	C153
		10	3.25	7.00	R	E10R00-1010M-GX09	GX09..	C153
		10	1.95	7.00	L	E10L00-1010M-GX09	GX09..	C153
		10	2.25	7.00	L	E10L00-1010M-GX09	GX09..	C153
		10	2.75	7.00	L	E10L00-1010M-GX09	GX09..	C153
		10	3.25	7.00	L	E10L00-1010M-GX09	GX09..	C153



		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C188		10	0.60	0.75	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	0.80	0.94	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	0.90	1.04	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	1.00	1.14	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	1.20	1.34	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	1.40	1.53	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	1.70	1.82	R	E10R00-1010M-GX09	GX09-1..R/L	C153
		10	0.60	0.75	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	0.80	0.94	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	0.90	1.04	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	1.00	1.14	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	1.20	1.34	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	1.40	1.53	L	E10L00-1010M-GX09	GX09-1..R/L	C153
		10	1.70	1.82	L	E10L00-1010M-GX09	GX09-1..R/L	C153

Circlip grooving – external

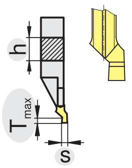
Monoblock tools – GX



		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C189		12	2.75	12.00	R	E12R0012-1212K-GX16-2	GX16-2..	C153
		12	3.25	12.00	R	E12R0012-1212K-GX16-2	GX16-2..	C153
		16	2.75	12.00	R	E16R0012-1616K-GX16-2	GX16-2..	C153
		16	3.25	12.00	R	E16R0012-1616K-GX16-2	GX16-2..	C153
		16	4.25	12.00	R	E16R0012-1616K-GX16-3	GX16-3..	C153
		20	2.75	12.00	R	E20R0012-2020K-GX16-2	GX16-2..	C153
		20	3.25	12.00	R	E20R0012-2020K-GX16-2	GX16-2..	C153
		20	4.25	12.00	R	E20R0012-2020K-GX16-3	GX16-3..	C153
		25	2.75	12.00	R	E25R0012-2525M-GX16-2	GX16-2..	C153
		25	3.25	12.00	R	E25R0012-2525M-GX16-2	GX16-2..	C153
		25	4.25	12.00	R	E25R0012-2525M-GX16-3	GX16-3..	C153
		12	2.75	12.00	L	E12L0012-1212K-GX16-2	GX16-2..	C153
		12	3.25	12.00	L	E12L0012-1212K-GX16-2	GX16-2..	C153
		16	2.75	12.00	L	E16L0012-1616K-GX16-2	GX16-2..	C153
		16	3.25	12.00	L	E16L0012-1616K-GX16-2	GX16-2..	C153
		16	4.25	12.00	L	E16L0012-1616K-GX16-3	GX16-3..	C153
		20	2.75	12.00	L	E20L0012-2020K-GX16-2	GX16-2..	C153
		20	3.25	12.00	L	E20L0012-2020K-GX16-2	GX16-2..	C153
		20	4.25	12.00	L	E20L0012-2020K-GX16-3	GX16-3..	C153
		25	2.75	12.00	L	E25L0012-2525M-GX16-2	GX16-2..	C153
		25	3.25	12.00	L	E25L0012-2525M-GX16-2	GX16-2..	C153
		25	4.25	12.00	L	E25L0012-2525M-GX16-3	GX16-3..	C153

Circlip grooving – external

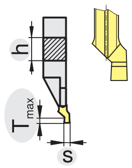
Monoblock tools – GX



		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C189		12	0.60	0.75	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	0.80	0.94	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	0.90	1.04	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.00	1.14	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.20	1.34	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.40	1.53	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.70	1.82	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.95	2.07	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		12	2.25	2.36	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C153
		16	0.60	0.75	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	0.80	0.94	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	0.90	1.04	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.00	1.14	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.20	1.34	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.40	1.53	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.70	1.82	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.95	2.07	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		16	2.25	2.36	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C153
		12	0.60	0.75	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	0.80	0.94	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	0.90	1.04	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.00	1.14	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.20	1.34	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.40	1.53	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.70	1.82	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	1.95	2.07	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		12	2.25	2.36	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C153
		16	0.60	0.75	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	0.80	0.94	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	0.90	1.04	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.00	1.14	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.20	1.34	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.40	1.53	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.70	1.82	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	1.95	2.07	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153
		16	2.25	2.36	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C153

Circlip grooving – external

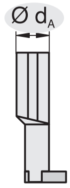
Monoblock tools – GX



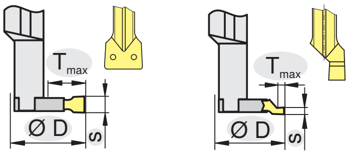
		h [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C189		20	0.60	0.75	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	0.80	0.94	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	0.90	1.04	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.00	1.14	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.20	1.34	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.40	1.53	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.70	1.82	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.95	2.07	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		20	2.25	2.36	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C153
		25	0.60	0.75	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	0.80	0.94	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	0.90	1.04	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.00	1.14	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.20	1.34	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.40	1.53	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.70	1.82	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.95	2.07	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		25	2.25	2.36	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C153
		20	0.60	0.75	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	0.80	0.94	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	0.90	1.04	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.00	1.14	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.20	1.34	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.40	1.53	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.70	1.82	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	1.95	2.07	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		20	2.25	2.36	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C153
		25	0.60	0.75	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	0.80	0.94	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	0.90	1.04	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.00	1.14	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.20	1.34	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.40	1.53	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.70	1.82	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	1.95	2.07	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153
		25	2.25	2.36	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C153

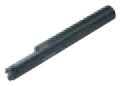
Circlip grooving – internal

Modular system – internal, assembly size 16

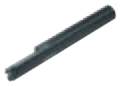


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**20**	**R**	MSS-I16R90-1.5D-N
C208		**20**	**R**	MSS-I16R90-2.5D-N

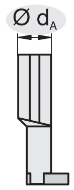
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		20	1.95	4.00	R	MSS-I16R04-GX09-1	GX09-1..	C153
		20	2.25	4.00	R	MSS-I16R04-GX09-1	GX09-1..	C153
		20	2.75	4.00	R	MSS-I16R04-GX09-2	GX09-2..	C153
		20	3.25	4.00	R	MSS-I16R04-GX09-2	GX09-2..	C153
C213		20	0.60	0.75	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	0.80	0.94	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	0.90	1.04	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	1.00	1.14	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	1.20	1.34	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	1.40	1.53	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153
		20	1.70	1.82	R	MSS-I16R02-GX09-1	GX09-1..R/L	C153

		d_A [mm]	L R	Type, description
C207		**20**	**L**	MSS-I16L90-1.5D-N
C208		**20**	**L**	MSS-I16L90-2.5D-N

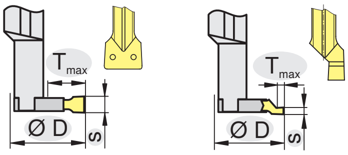
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		20	1.95	4.00	L	MSS-I16L04-GX09-1	GX09-1..	C153
		20	2.25	4.00	L	MSS-I16L04-GX09-1	GX09-1..	C153
		20	2.75	4.00	L	MSS-I16L04-GX09-2	GX09-2..	C153
		20	3.25	4.00	L	MSS-I16L04-GX09-2	GX09-2..	C153
C213		20	0.60	0.75	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	0.80	0.94	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	0.90	1.04	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	1.00	1.14	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	1.20	1.34	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	1.40	1.53	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153
		20	1.70	1.82	L	MSS-I16L02-GX09-1	GX09-1..R/L	C153

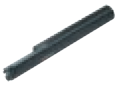
Circlip grooving – internal

Modular system – internal, assembly size 20

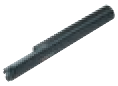


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**20**	**R**	MSS-I20R90-1.5D-N
C208		**25**	**R**	MSS-I20R90-2.5D-N

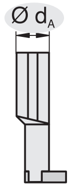
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		25	1.95	5.00	R	MSS-I20R05-GX09-1	GX09-1..	C153
		25	2.25	5.00	R	MSS-I20R05-GX09-1	GX09-1..	C153
		25	2.75	5.00	R	MSS-I20R05-GX09-2	GX09-2..	C153
		25	3.25	5.00	R	MSS-I20R05-GX09-2	GX09-2..	C153
C213		25	0.60	0.75	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	0.80	0.94	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	0.90	1.04	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	1.00	1.14	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	1.20	1.34	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	1.40	1.53	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153
		25	1.70	1.82	R	MSS-I20R02-GX09-1	GX09-1..R/L	C153

		d_A [mm]	L R	Type, description
C207		**20**	**L**	MSS-I20L90-1.5D-N
C208		**25**	**L**	MSS-I20L90-2.5D-N

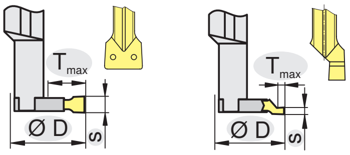
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C210		25	1.95	5.00	L	MSS-I20L05-GX09-1	GX09-1..	C153
		25	2.25	5.00	L	MSS-I20L05-GX09-1	GX09-1..	C153
		25	2.75	5.00	L	MSS-I20L05-GX09-2	GX09-2..	C153
		25	3.25	5.00	L	MSS-I20L05-GX09-2	GX09-2..	C153
C213		25	0.60	0.75	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	0.80	0.94	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	0.90	1.04	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	1.00	1.14	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	1.20	1.34	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	1.40	1.53	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153
		25	1.70	1.82	L	MSS-I20L02-GX09-1	GX09-1..R/L	C153

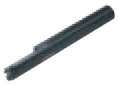
Circlip grooving – internal

Modular system – internal, assembly size 25

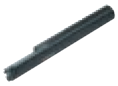


Matching products see right-hand side.



		dA [mm]	L R	Type, description
C207		**25**	**R**	MSS-I25R90-1.5D-N
C208		**32**	**R**	MSS-I25R90-2.5D-N

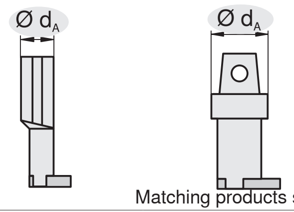
		Dmin [mm]	s [mm]	Tmax [mm]	L R	Type, description		
C210		32	1.95	6.00	R	MSS-I25R06-GX09-1	GX09-1..	C153
		32	2.25	6.00	R	MSS-I25R06-GX09-1	GX09-1..	C153
		32	2.75	6.00	R	MSS-I25R06-GX09-2	GX09-2..	C153
		32	3.25	6.00	R	MSS-I25R06-GX09-2	GX09-2..	C153
C213		32	0.60	0.75	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	0.80	0.94	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	0.90	1.04	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	1.00	1.14	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	1.20	1.34	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	1.40	1.53	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153
		32	1.70	1.82	R	MSS-I25R02-GX09-1	GX09-1..R/L	C153

		dA [mm]	L R	Type, description
C207		**25**	**L**	MSS-I25L90-1.5D-N
C208		**32**	**L**	MSS-I25L90-2.5D-N

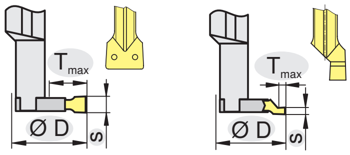
		Dmin [mm]	s [mm]	Tmax [mm]	L R	Type, description		
C210		32	1.95	6.00	L	MSS-I25L06-GX09-1	GX09-1..	C153
		32	2.25	6.00	L	MSS-I25L06-GX09-1	GX09-1..	C153
		32	2.75	6.00	L	MSS-I25L06-GX09-2	GX09-2..	C153
		32	3.25	6.00	L	MSS-I25L06-GX09-2	GX09-2..	C153
C213		32	0.60	0.75	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	0.80	0.94	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	0.90	1.04	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	1.00	1.14	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	1.20	1.34	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	1.40	1.53	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153
		32	1.70	1.82	L	MSS-I25L02-GX09-1	GX09-1..R/L	C153

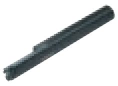
Circlip grooving – internal

Modular system – internal, assembly size 32

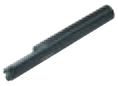


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**32**	**R**	MSS-I32R90-1.5D-N
C208		**40**	**R**	MSS-I32R90-2.5D-N
C209		**40**	**R**	UT40-MSS-I32R90-2D

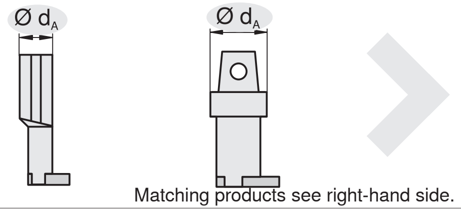
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C211		40	2.75	9.00	R	MSS-I32R09-GX16-2	GX16-2..	C153
		40	3.25	9.00	R	MSS-I32R09-GX16-2	GX16-2..	C153
		40	4.25	9.00	R	MSS-I32R09-GX16-3	GX16-3..	C153
		40	5.25	9.00	R	MSS-I32R09-GX16-4	GX16-4..	C153
C214		40	0.60	0.75	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	0.80	0.94	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	0.90	1.04	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.00	1.14	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.20	1.34	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.40	1.53	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.70	1.82	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	1.95	2.07	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153
		40	2.25	2.36	R	MSS-I32R03-GX16-2	GX16-2..R/L	C153

		d_A [mm]	L R	Type, description
C207		**32**	**L**	MSS-I32L90-1.5D-N
C208		**40**	**L**	MSS-I32L90-2.5D-N
C209		**50**	**L**	UT50-MSS-I32L90-2D

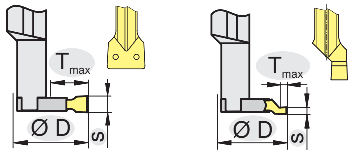
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C211		40	2.75	9.00	L	MSS-I32L09-GX16-2	GX16-2..	C153
		40	3.25	9.00	L	MSS-I32L09-GX16-2	GX16-2..	C153
		40	4.25	9.00	L	MSS-I32L09-GX16-3	GX16-3..	C153
		40	5.25	9.00	L	MSS-I32L09-GX16-4	GX16-4..	C153
C214		40	0.60	0.75	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	0.80	0.94	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	0.90	1.04	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.00	1.14	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.20	1.34	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.40	1.53	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.70	1.82	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	1.95	3.00	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153
		40	2.25	2.36	L	MSS-I32L03-GX16-2	GX16-2..R/L	C153

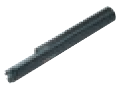
Circlip grooving – internal

Modular system – internal, assembly size 40

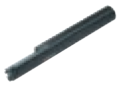


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**40**	**R**	MSS-I40R90-1.5D-N
C208		**50**	**R**	MSS-I40R90-2.5D-N

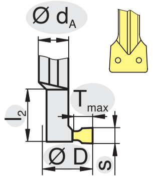
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C211		50	2.75	10.00	R	MSS-I40R10-GX16-2	GX16-2..	C153
		50	3.25	10.00	R	MSS-I40R10-GX16-2	GX16-2..	C153
		50	4.25	10.00	R	MSS-I40R10-GX16-3	GX16-3..	C153
		50	5.25	10.00	R	MSS-I40R10-GX16-4	GX16-4..	C153
C214		50	0.60	0.75	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	0.80	0.94	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	0.90	1.04	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.00	1.14	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.20	1.34	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.40	1.53	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.70	1.82	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	1.95	2.07	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153
		50	2.25	2.36	R	MSS-I40R03-GX16-2	GX16-2..R/L	C153

		d_A [mm]	L R	Type, description
C207		**40**	**L**	MSS-I40L90-1.5D-N
C208		**50**	**L**	MSS-I40L90-2.5D-N
C209		**40**	**L**	UT40-MSS-I40L90-2D

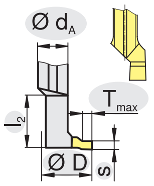
		D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C211		50	2.75	10.00	L	MSS-I40L10-GX16-2	GX16-2..	C153
		50	3.25	10.00	L	MSS-I40L10-GX16-2	GX16-2..	C153
		50	4.25	10.00	L	MSS-I40L10-GX16-3	GX16-3..	C153
		50	5.25	10.00	L	MSS-I40L10-GX16-4	GX16-4..	C153
C214		50	0.60	0.75	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	0.80	0.94	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	0.90	1.04	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.00	1.14	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.20	1.34	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.40	1.53	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.70	1.82	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	1.95	2.07	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153
		50	2.25	2.36	L	MSS-I40L03-GX16-2	GX16-2..R/L	C153

Circlip grooving – internal

Monoblock boring bars – GX



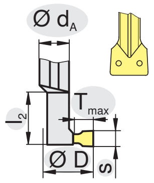
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	1.95	7.00	R	I12R90-2.5D-GX09	GX09..	C153
		16	30	16	2.25	7.00	R	I12R90-2.5D-GX09	GX09..	C153
		16	30	16	2.75	7.00	R	I12R90-2.5D-GX09	GX09..	C153
		16	30	16	3.25	7.00	R	I12R90-2.5D-GX09	GX09..	C153
		16	30	16	1.95	7.00	L	I12L90-2.5D-GX09	GX09..	C153
		16	30	16	2.25	7.00	L	I12L90-2.5D-GX09	GX09..	C153
		16	30	16	2.75	7.00	L	I12L90-2.5D-GX09	GX09..	C153
		16	30	16	3.25	7.00	L	I12L90-2.5D-GX09	GX09..	C153



		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	0.60	0.75	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.80	0.94	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.90	1.04	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.00	1.14	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.20	1.34	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.40	1.53	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.70	1.82	R	I12R90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.60	0.75	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.80	0.94	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	0.90	1.04	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.00	1.14	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.20	1.34	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.40	1.53	L	I12L90-2.5D-GX09	GX09-1..R/L	C153
		16	30	16	1.70	1.82	L	I12L90-2.5D-GX09	GX09-1..R/L	C153

Circlip grooving – internal

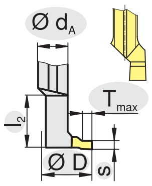
Monoblock boring bars – GX



		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	2.75	12.00	R	I16R90-2.0D-GX16-2	GX16-2..	C153
		16	32	20.5	3.25	12.00	R	I16R90-2.0D-GX16-2	GX16-2..	C153
		20	40	25.0	2.75	12.00	R	I20R90-2.0D-GX16-2	GX16-2..	C153
		20	40	25.0	3.25	12.00	R	I20R90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	2.75	12.00	R	I25R90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	3.25	12.00	R	I25R90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	4.25	12.00	R	I25R90-2.0D-GX16-3	GX16-3..	C153
		32	64	42.0	2.75	12.00	R	I32R90-2.0D-GX16-2	GX16-2..	C153
		32	64	42.0	3.25	12.00	R	I32R90-2.0D-GX16-2	GX16-2..	C153
		32	64	42.0	4.25	12.00	R	I32R90-2.0D-GX16-3	GX16-3..	C153
		16	32	20.5	2.75	12.00	L	I16L90-2.0D-GX16-2	GX16-2..	C153
		16	32	20.5	3.25	12.00	L	I16L90-2.0D-GX16-2	GX16-2..	C153
		20	40	25.0	2.75	12.00	L	I20L90-2.0D-GX16-2	GX16-2..	C153
		20	40	25.0	3.25	12.00	L	I20L90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	2.75	12.00	L	I25L90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	3.25	12.00	L	I25L90-2.0D-GX16-2	GX16-2..	C153
		25	50	32.0	4.25	12.00	L	I25L90-2.0D-GX16-3	GX16-3..	C153
		32	64	42.0	2.75	12.00	L	I32L90-2.0D-GX16-2	GX16-2..	C153
		32	64	42.0	3.25	12.00	L	I32L90-2.0D-GX16-2	GX16-2..	C153
		32	64	42.0	4.25	12.00	L	I32L90-2.0D-GX16-3	GX16-3..	C153

Circlip grooving – internal

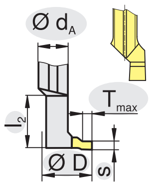
Monoblock boring bars – GX



		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	0.60	0.75	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.80	0.94	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.90	1.04	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.00	1.14	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.20	1.34	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.40	1.53	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.70	1.82	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.95	2.07	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	2.25	2.36	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.60	0.75	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.80	0.94	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.90	1.04	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.00	1.14	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.20	1.34	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.40	1.53	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.70	1.82	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.95	2.07	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	2.25	2.36	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.60	0.75	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.80	0.94	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	0.90	1.04	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.00	1.14	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.20	1.34	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.40	1.53	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.70	1.82	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	1.95	2.07	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		16	32	20.5	2.25	2.36	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.60	0.75	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.80	0.94	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	0.90	1.04	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.00	1.14	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.20	1.34	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.40	1.53	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.70	1.82	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	1.95	2.07	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153
		20	40	25.0	2.25	2.36	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C153

Circlip grooving – internal

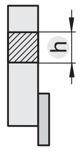
Monoblock boring bars – GX



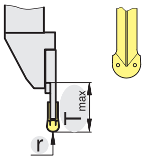
		d_A [mm]	l_2 [mm]	D_{min} [mm]	s [mm]	T_{max} [mm]	L R	Type, description		
C216		25	50	32.0	0.60	0.75	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.80	0.94	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.90	1.04	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.00	1.14	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.20	1.34	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.40	1.53	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.70	1.82	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.95	2.07	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	2.25	2.36	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.60	0.75	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.80	0.94	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.90	1.04	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.00	1.14	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.20	1.34	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.40	1.53	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.70	1.82	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.95	2.07	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	2.25	2.36	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.60	0.75	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.80	0.94	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	0.90	1.04	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.00	1.14	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.20	1.34	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.40	1.53	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.70	1.82	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	1.95	2.07	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		25	50	32.0	2.25	2.36	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.60	0.75	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.80	0.94	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	0.90	1.04	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.00	1.14	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.20	1.34	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.40	1.53	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.70	1.82	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	1.95	2.07	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153
		32	64	42.0	2.25	2.36	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C153

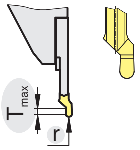
Radius grooves – external

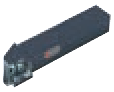
Modular system – external, assembly size 12



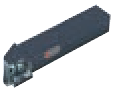
Matching products see right-hand side.





		h/d_A	L R	Type, description
C168	 0	**12**	**R**	MSS-E12R00-1212E

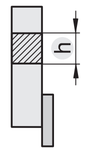
		r [mm]	T_{max} [mm]	L R	Type, description		
C176		1.00	7.00	R	MSS-E12R07-GX09-1	GX09-1..	C154
		1.20	7.00	R	MSS-E12R07-GX09-1	GX09-1..	C154
C179		0.80	1.78	R	MSS-E12R02-GX09-1	GX09-1..R/L	C154

		h/d_A	L R	Type, description
C168	 0	**12**	**L**	MSS-E12L00-1212E

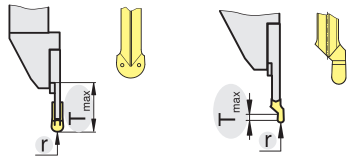
		r [mm]	T_{max} [mm]	L R	Type, description		
C176		1.00	7.00	L	MSS-E12L07-GX09-1	GX09-1..	C154
		1.20	7.00	L	MSS-E12L07-GX09-1	GX09-1..	C154
C179		0.80	1.78	L	MSS-E12L02-GX09-1	GX09-1..R/L	C154

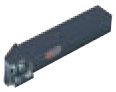
Radius grooves – external

Modular system – external, assembly size 16

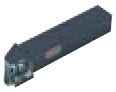


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	16	R	MSS-E16R00-1616G

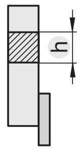
		r [mm]	T_{max} [mm]	L R	Type, description		
C176		1.00	7.00	R	MSS-E16R07-GX09-1	GX09-1..	C154
		1.20	7.00	R	MSS-E16R07-GX09-1	GX09-1..	C154
C179		0.80	1.78	R	MSS-E16R02-GX09-1	GX09-1..R/L	C154

		h/d_A	L R	Type, description
C168	 0	16	L	MSS-E16L00-1616G

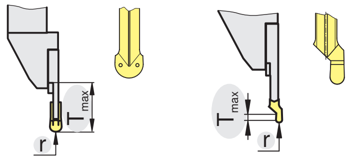
		r [mm]	T_{max} [mm]	L R	Type, description		
C176		1.00	7.00	L	MSS-E16L07-GX09-1	GX09-1..	C154
		1.20	7.00	L	MSS-E16L07-GX09-1	GX09-1..	C154
C179		0.80	1.78	L	MSS-E16L02-GX09-1	GX09-1..R/L	C154

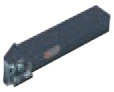
Radius grooves – external

Modular system – external, assembly size 20

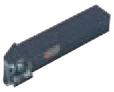


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	**20**	**R**	MSS-E20R00-2020J
		16	**R**	MSS-E20R00-1620G
C169	 90	**20**	**L**	MSS-E20L90-2020J

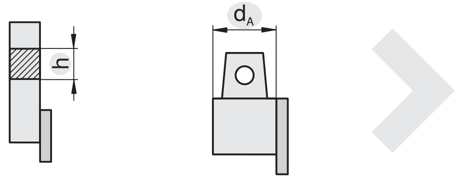
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	R	MSS-E20R12-GX16-2	GX16-2..	C154
		2.00	12.00	R	MSS-E20R12-GX16-3	GX16-3..	C154
		2.50	12.00	R	MSS-E20R12-GX16-3	GX16-3..	C154
C178		1.50	21.00	R	MSS-E20R21-GX24-2	GX24-2..	C154
		2.00	21.00	R	MSS-E20R21-GX24-3	GX24-3..	C154
		2.50	21.00	R	MSS-E20R21-GX24-3	GX24-3..	C154
C180		0.80	1.78	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
C184		1.50	20.00	R	MSS-E20R20-SX3	SX..3	C156

		h/d_A	L R	Type, description
C168	 0	**20**	**L**	MSS-E20L00-2020J
		16	**L**	MSS-E20L00-1620G
C169	 90	**20**	**R**	MSS-E20R90-2020J

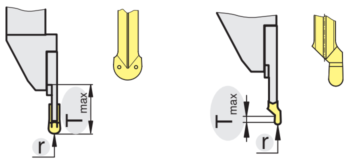
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	L	MSS-E20L12-GX16-2	GX16-2..	C154
		2.00	12.00	L	MSS-E20L12-GX16-3	GX16-3..	C154
		2.50	12.00	L	MSS-E20L12-GX16-3	GX16-3..	C154
C178		1.50	21.00	L	MSS-E20L21-GX24-2	GX24-2..	C154
		2.00	21.00	L	MSS-E20L21-GX24-3	GX24-3..	C154
		2.50	21.00	L	MSS-E20L21-GX24-3	GX24-3..	C154
C180		0.80	1.78	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
C184		1.50	20.00	L	MSS-E20L20-SX3	SX..3	C156

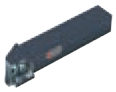
Radius grooves – external

Modular system – external, assembly size 25

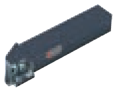


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	25	R	MSS-E25R00-2525L
C169	 90	25	L	MSS-E25L90-2525L
C171	 0	100	R	HSK-T100-MSS-E25R00
		63	R	HSK-T63-MSS-E25R00
C173	 0	63	R	UT63-MSS-E25R00
		40	R	UT40-MSS-E25R00
		50	R	UT50-MSS-E25R00
C174	 90	40	L	UT40-MSS-E25L90
		50	L	UT50-MSS-E25L90

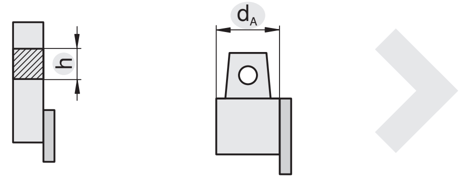
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	R	MSS-E25R12-GX16-2	GX16-2..	C154
		2.00	12.00	R	MSS-E25R12-GX16-3	GX16-3..	C154
		2.50	12.00	R	MSS-E25R12-GX16-3	GX16-3..	C154
		3.00	12.00	R	MSS-E25R12-GX16-4	GX16-4..	C154
C178		1.50	21.00	R	MSS-E25R21-GX24-2	GX24-2..	C154
		2.00	21.00	R	MSS-E25R21-GX24-3	GX24-3..	C154
		2.50	21.00	R	MSS-E25R21-GX24-3	GX24-3..	C154
		3.00	21.00	R	MSS-E25R21-GX24-4	GX24-4..	C154
C180		0.80	1.78	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
C184		1.50	25.00	R	MSS-E25R25-SX3	SX..3	C156
		1.50	35.00	R	MSS-E25R35-SX3	SX..3	C156
		2.00	25.00	R	MSS-E25R25-SX4	SX..4	C156
		2.00	35.00	R	MSS-E25R35-SX4	SX..4	C156

		h/d_A	L R	Type, description
C168	 0	25	L	MSS-E25L00-2525L
C169	 90	25	R	MSS-E25R90-2525L
C171	 0	100	L	HSK-T100-MSS-E25L00
		63	L	HSK-T63-MSS-E25L00
C173	 0	40	L	UT40-MSS-E25L00
		50	L	UT50-MSS-E25L00
		63	L	UT63-MSS-E25L00
C174	 90	50	R	UT50-MSS-E25R90
		40	R	UT40-MSS-E25R90

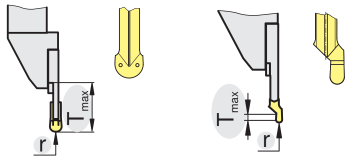
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	L	MSS-E25L12-GX16-2	GX16-2..	C154
		2.00	12.00	L	MSS-E25L12-GX16-3	GX16-3..	C154
		2.50	12.00	L	MSS-E25L12-GX16-3	GX16-3..	C154
		3.00	12.00	L	MSS-E25L12-GX16-4	GX16-4..	C154
C178		1.50	21.00	L	MSS-E25L21-GX24-2	GX24-2..	C154
		2.00	21.00	L	MSS-E25L21-GX24-3	GX24-3..	C154
		2.50	21.00	L	MSS-E25L21-GX24-3	GX24-3..	C154
		3.00	21.00	L	MSS-E25L21-GX24-4	GX24-4..	C154
C180		0.80	1.78	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
C184		1.50	25.00	L	MSS-E25L25-SX3	SX..3	C156
		1.50	35.00	L	MSS-E25L35-SX3	SX..3	C156
		2.00	25.00	L	MSS-E25L25-SX4	SX..4	C156
		2.00	35.00	L	MSS-E25L35-SX4	SX..4	C156

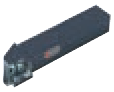
Radius grooves – external

Modular system – external, assembly size 32

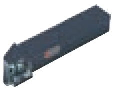


Matching products see right-hand side.



		h/d_A	L R	Type, description
C168	 0	32	R	MSS-E32R00-3232Q
		32	R	MSS-E32R00-3225N
C169	 90	32	L	MSS-E32L90-3225N
		32	L	MSS-E32L90-3232R
C171	 0	100	R	HSK-T100-MSS-E32R00
		63	R	HSK-T63-MSS-E32R00
C172	 90	100	L	HSK-T100-MSS-E32L90
		63	L	HSK-T63-MSS-E32L90
C173	 0	50	R	UT50-MSS-E32R00
		63	R	UT63-MSS-E32R00

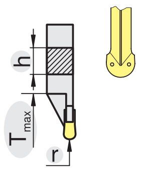
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	R	MSS-E32R12-GX16-2	GX16-2..	C154
		2.00	12.00	R	MSS-E32R12-GX16-3	GX16-3..	C154
		2.50	12.00	R	MSS-E32R12-GX16-3	GX16-3..	C154
		3.00	12.00	R	MSS-E32R12-GX16-4	GX16-4..	C154
C178		1.50	21.00	R	MSS-E32R21-GX24-2	GX24-2..	C154
		2.00	21.00	R	MSS-E32R21-GX24-3	GX24-3..	C154
		2.50	21.00	R	MSS-E32R21-GX24-3	GX24-3..	C154
		3.00	21.00	R	MSS-E32R21-GX24-4	GX24-4..	C154
C180		0.80	1.78	R	MSS-E32R03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	R	MSS-E32R03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	R	MSS-E32R03-GX16-2	GX16-2..R/L	C154
C184		1.50	35.00	R	MSS-E32R35-SX3	SX..3	C156
		2.00	35.00	R	MSS-E32R35-SX4	SX..4	C156
C185		4.00	25.00	N	MSS-E32N25-LX	LX..	C157
		4.00	32.00	N	MSS-E32N32-LX	LX..	C157
		4.00	45.00	N	MSS-E32N45-LX	LX..	C157

		h/d_A	L R	Type, description
C168	 0	32	L	MSS-E32L00-3225N
		32	L	MSS-E32L00-3232Q
C169	 90	32	R	MSS-E32R90-3232R
		32	R	MSS-E32R90-3225N
C171	 0	100	L	HSK-T100-MSS-E32L00
		63	L	HSK-T63-MSS-E32L00
C172	 90	100	R	HSK-T100-MSS-E32R90
		63	R	HSK-T63-MSS-E32R90
C173	 0	63	L	UT63-MSS-E32L00

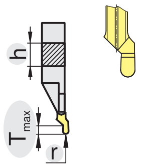
		r [mm]	T_{max} [mm]	L R	Type, description		
C177		1.50	12.00	L	MSS-E32L12-GX16-2	GX16-2..	C154
		2.00	12.00	L	MSS-E32L12-GX16-3	GX16-3..	C154
		2.50	12.00	L	MSS-E32L12-GX16-3	GX16-3..	C154
		3.00	12.00	L	MSS-E32L12-GX16-4	GX16-4..	C154
C178		1.50	21.00	L	MSS-E32L21-GX24-2	GX24-2..	C154
		2.00	21.00	L	MSS-E32L21-GX24-3	GX24-3..	C154
		2.50	21.00	L	MSS-E32L21-GX24-3	GX24-3..	C154
		3.00	21.00	L	MSS-E32L21-GX24-4	GX24-4..	C154
C180		0.80	1.78	L	MSS-E32L03-GX16-2	GX16-2..R/L	C154
		1.00	2.18	L	MSS-E32L03-GX16-2	GX16-2..R/L	C154
		1.20	2.58	L	MSS-E32L03-GX16-2	GX16-2..R/L	C154
C184		1.50	35.00	L	MSS-E32L35-SX3	SX..3	C156
		2.00	35.00	L	MSS-E32L35-SX4	SX..4	C156
C185		4.00	25.00	N	MSS-E32N25-LX	LX..	C157
		4.00	32.00	N	MSS-E32N32-LX	LX..	C157
		4.00	45.00	N	MSS-E32N45-LX	LX..	C157

Radius grooves – external

Monoblock tools – GX



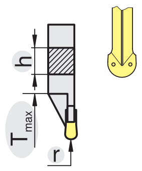
		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C188		10	1.00	7.00	R	E10R00-1010M-GX09	GX09-1..	C154
		10	1.20	7.00	R	E10R00-1010M-GX09	GX09-1..	C154
		10	1.00	7.00	L	E10L00-1010M-GX09	GX09-1..	C154
		10	1.20	7.00	L	E10L00-1010M-GX09	GX09-1..	C154



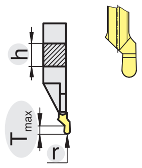
		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C188		10	0.80	1.78	R	E10R00-1010M-GX09	GX09-1..R/L	C154
		10	0.80	1.78	L	E10L00-1010M-GX09	GX09-1..R/L	C154

Radius grooves – external

Monoblock tools – GX



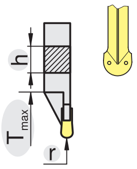
		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C189		16	1.50	12.00	R	E16R0012-1616K-GX16-2	GX16-2..	C154
		16	2.00	12.00	R	E16R0012-1616K-GX16-3	GX16-3..	C154
		16	2.50	12.00	R	E16R0012-1616K-GX16-3	GX16-3..	C154
		20	1.50	12.00	R	E20R0012-2020K-GX16-2	GX16-2..	C154
		20	2.00	12.00	R	E20R0012-2020K-GX16-3	GX16-3..	C154
		20	2.50	12.00	R	E20R0012-2020K-GX16-3	GX16-3..	C154
		25	1.50	12.00	R	E25R0012-2525M-GX16-2	GX16-2..	C154
		25	2.00	12.00	R	E25R0012-2525M-GX16-3	GX16-3..	C154
		25	2.50	12.00	R	E25R0012-2525M-GX16-3	GX16-3..	C154
		16	1.50	12.00	L	E16L0012-1616K-GX16-2	GX16-2..	C154
		16	2.00	12.00	L	E16L0012-1616K-GX16-3	GX16-3..	C154
		16	2.50	12.00	L	E16L0012-1616K-GX16-3	GX16-3..	C154
		20	1.50	12.00	L	E20L0012-2020K-GX16-2	GX16-2..	C154
		20	2.00	12.00	L	E20L0012-2020K-GX16-3	GX16-3..	C154
		20	2.50	12.00	L	E20L0012-2020K-GX16-3	GX16-3..	C154
		25	1.50	12.00	L	E25L0012-2525M-GX16-2	GX16-2..	C154
		25	2.00	12.00	L	E25L0012-2525M-GX16-3	GX16-3..	C154
		25	2.50	12.00	L	E25L0012-2525M-GX16-3	GX16-3..	C154



		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C189		12	0.80	1.78	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.00	2.18	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.20	2.58	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.50	12.00	R	E12R0012-1212K-GX16-2	GX16-2..R/L	C154
		16	0.80	1.78	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C154
		16	1.00	2.18	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C154
		16	1.20	2.58	R	E16R0012-1616K-GX16-2	GX16-2..R/L	C154
		20	0.80	1.78	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C154
		20	1.00	2.18	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C154
		20	1.20	2.58	R	E20R0012-2020K-GX16-2	GX16-2..R/L	C154
		25	0.80	1.78	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C154
		25	1.00	2.18	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C154
		25	1.20	2.58	R	E25R0012-2525M-GX16-2	GX16-2..R/L	C154
		12	0.80	1.78	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.00	2.18	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.20	2.58	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C154
		12	1.50	12.00	L	E12L0012-1212K-GX16-2	GX16-2..R/L	C154
		16	0.80	1.78	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C154
		16	1.00	2.18	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C154
		16	1.20	2.58	L	E16L0012-1616K-GX16-2	GX16-2..R/L	C154
		20	0.80	1.78	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C154
		20	1.00	2.18	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C154
		20	1.20	2.58	L	E20L0012-2020K-GX16-2	GX16-2..R/L	C154
		25	0.80	1.78	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C154
		25	1.00	2.18	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C154
		25	1.20	2.58	L	E25L0012-2525M-GX16-2	GX16-2..R/L	C154

Radius grooves – external

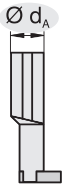
Monoblock tools – GX



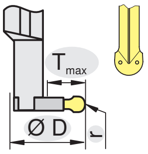
		h [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C190		16	1.50	21.00	R	E16R0021-1616K-GX24-2	GX24-2..	C154
		20	1.50	21.00	R	E20R0021-2020K-GX24-2	GX24-2..	C154
		20	2.00	21.00	R	E20R0021-2020K-GX24-3	GX24-3..	C154
		20	2.50	21.00	R	E20R0021-2020K-GX24-3	GX24-3..	C154
		25	1.50	21.00	R	E25R0021-2525M-GX24-2	GX24-2..	C154
		25	2.00	21.00	R	E25R0021-2525M-GX24-3	GX24-3..	C154
		25	2.50	21.00	R	E25R0021-2525M-GX24-3	GX24-3..	C154
		25	3.00	21.00	R	E25R0021-2525M-GX24-4	GX24-4..	C154
		32	1.50	21.00	R	E32R0021-3225P-GX24-2	GX24-2..	C154
		32	2.00	21.00	R	E32R0021-3225P-GX24-3	GX24-3..	C154
		32	2.50	21.00	R	E32R0021-3225P-GX24-3	GX24-3..	C154
		32	3.00	21.00	R	E32R0021-3225P-GX24-4	GX24-4..	C154
		16	1.50	21.00	L	E16L0021-1616K-GX24-2	GX24-2..	C154
		20	1.50	21.00	L	E20L0021-2020K-GX24-2	GX24-2..	C154
		20	2.00	21.00	L	E20L0021-2020K-GX24-3	GX24-3..	C154
		20	2.50	21.00	L	E20L0021-2020K-GX24-3	GX24-3..	C154
		25	1.50	21.00	L	E25L0021-2525M-GX24-2	GX24-2..	C154
		25	2.00	21.00	L	E25L0021-2525M-GX24-3	GX24-3..	C154
		25	2.50	21.00	L	E25L0021-2525M-GX24-3	GX24-3..	C154
		25	3.00	21.00	L	E25L0021-2525M-GX24-4	GX24-4..	C154
		32	1.50	21.00	L	E32L0021-3225P-GX24-2	GX24-2..	C154
		32	2.00	21.00	L	E32L0021-3225P-GX24-3	GX24-3..	C154
		32	2.50	21.00	L	E32L0021-3225P-GX24-3	GX24-3..	C154
		32	3.00	21.00	L	E32L0021-3225P-GX24-4	GX24-4..	C154

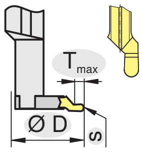
Radius grooves – internal

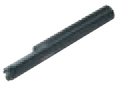
Modular system – internal, assembly size 16



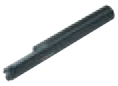
Matching products see right-hand side.





		d$_A$ [mm]	L R	Type, description
C207		**20**	**R**	MSS-I16R90-1.5D-N
C208		**20**	**R**	MSS-I16R90-2.5D-N

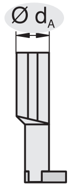
		D$_{min}$ [mm]	r [mm]	T$_{max}$ [mm]	L R	Type, description		
C210		20	1.00	4.00	R	MSS-I16R04-GX09-1	GX09-1..	C154
		20	1.20	4.00	R	MSS-I16R04-GX09-1	GX09-1..	C154
C213		20	0.80	1.78	R	MSS-I16R02-GX09-1	GX09-1..R/L	C154

		d$_A$ [mm]	L R	Type, description
C207		**20**	**L**	MSS-I16L90-1.5D-N
C208		**20**	**L**	MSS-I16L90-2.5D-N

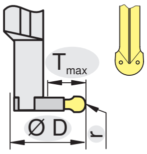
		D$_{min}$ [mm]	r [mm]	T$_{max}$ [mm]	L R	Type, description		
C210		20	1.00	4.00	L	MSS-I16L04-GX09-1	GX09-1..	C154
		20	1.20	4.00	L	MSS-I16L04-GX09-1	GX09-1..	C154
C213		20	0.80	1.78	L	MSS-I16L02-GX09-1	GX09-1..R/L	C154

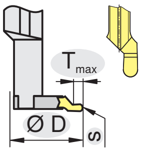
Radius grooves – internal

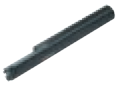
Modular system – internal, assembly size 20



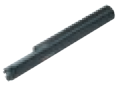
Matching products see right-hand side.





		d_A [mm]	L R	Type, description
C207		**20**	**R**	MSS-I20R90-1.5D-N
C208		**25**	**R**	MSS-I20R90-2.5D-N

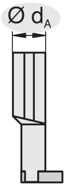
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		25	1.00	5.00	R	MSS-I20R05-GX09-1	GX09-1..	C154
		25	1.20	5.00	R	MSS-I20R05-GX09-1	GX09-1..	C154
C213		25	0.80	1.78	R	MSS-I20R02-GX09-1	GX09-1..R/L	C154

		d_A [mm]	L R	Type, description
C207		**20**	**L**	MSS-I20L90-1.5D-N
C208		**25**	**L**	MSS-I20L90-2.5D-N

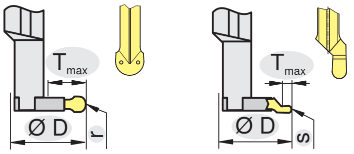
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		25	1.00	5.00	L	MSS-I20L05-GX09-1	GX09-1..	C154
		25	1.20	5.00	L	MSS-I20L05-GX09-1	GX09-1..	C154
C213		25	0.80	1.78	L	MSS-I20L02-GX09-1	GX09-1..R/L	C154

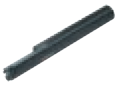
Radius grooves – internal

Modular system – internal, assembly size 25

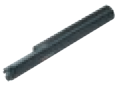


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**25**	**R**	MSS-I25R90-1.5D-N
C208		**32**	**R**	MSS-I25R90-2.5D-N

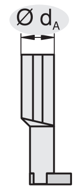
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		32	1.00	6.00	R	MSS-I25R06-GX09-1	GX09-1..	C154
		32	1.20	6.00	R	MSS-I25R06-GX09-1	GX09-1..	C154
C213		32	0.80	1.78	R	MSS-I25R02-GX09-1	GX09-1..R/L	C154

		d_A [mm]	L R	Type, description
C207		**25**	**L**	MSS-I25L90-1.5D-N
C208		**32**	**L**	MSS-I25L90-2.5D-N

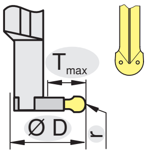
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C210		32	1.00	6.00	L	MSS-I25L06-GX09-1	GX09-1..	C154
		32	1.20	6.00	L	MSS-I25L06-GX09-1	GX09-1..	C154
C213		32	0.80	1.78	L	MSS-I25L02-GX09-1	GX09-1..R/L	C154

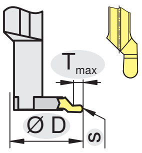
Radius grooves – internal

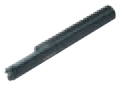
Modular system – internal, assembly size 32



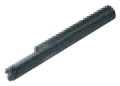
Matching products see right-hand side.





		d_A [mm]	L R	Type, description
C207		32	R	MSS-I32R90-1.5D-N
C208		40	R	MSS-I32R90-2.5D-N
C209		40	R	UT40-MSS-I32R90-2D

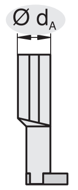
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C211		40	1.50	9.00	R	MSS-I32R09-GX16-2	GX16-2..	C154
		40	2.00	9.00	R	MSS-I32R09-GX16-3	GX16-3..	C154
		40	2.50	9.00	R	MSS-I32R09-GX16-3	GX16-3..	C154
		40	3.00	9.00	R	MSS-I32R09-GX16-4	GX16-4..	C154
C214		40	0.80	1.78	R	MSS-I32R03-GX16-2	GX16-2..R/L	C154
		40	1.00	2.18	R	MSS-I32R03-GX16-2	GX16-2..R/L	C154
		40	1.20	2.58	R	MSS-I32R03-GX16-2	GX16-2..R/L	C154

		d_A [mm]	L R	Type, description
C207		32	L	MSS-I32L90-1.5D-N
C208		40	L	MSS-I32L90-2.5D-N
C209		50	L	UT50-MSS-I32L90-2D

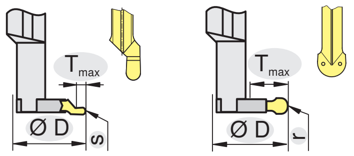
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C211		40	1.50	9.00	L	MSS-I32L09-GX16-2	GX16-2..	C154
		40	2.00	9.00	L	MSS-I32L09-GX16-3	GX16-3..	C154
		40	2.50	9.00	L	MSS-I32L09-GX16-3	GX16-3..	C154
		40	3.00	9.00	L	MSS-I32L09-GX16-4	GX16-4..	C154
C214		40	0.80	1.78	L	MSS-I32L03-GX16-2	GX16-2..R/L	C154
		40	1.00	2.18	L	MSS-I32L03-GX16-2	GX16-2..R/L	C154
		40	1.20	2.58	L	MSS-I32L03-GX16-2	GX16-2..R/L	C154

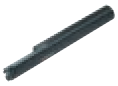
Radius grooves – internal

Modular system – internal, assembly size 40

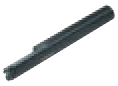


Matching products see right-hand side.



		d_A [mm]	L R	Type, description
C207		**40**	**R**	MSS-I40R90-1.5D-N
C208		**50**	**R**	MSS-I40R90-2.5D-N

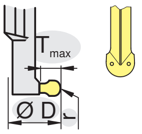
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C211		50	1.50	10.00	R	MSS-I40R10-GX16-2	GX16-2..	C154
		50	2.00	10.00	R	MSS-I40R10-GX16-3	GX16-3..	C154
		50	2.50	10.00	R	MSS-I40R10-GX16-3	GX16-3..	C154
		50	3.00	10.00	R	MSS-I40R10-GX16-4	GX16-4..	C154
C212		60	1.50	19.00	N	MSS-I40N19-GX24-2	GX24-2..	C154
		60	2.00	19.00	N	MSS-I40N19-GX24-3	GX24-3..	C154
		60	2.50	19.00	N	MSS-I40N19-GX24-3	GX24-3..	C154
		60	3.00	19.00	N	MSS-I40N19-GX24-4	GX24-4..	C154
C214		50	0.80	1.78	R	MSS-I40R03-GX16-2	GX16-2..R/L	C154
		50	1.00	2.18	R	MSS-I40R03-GX16-2	GX16-2..R/L	C154
		50	1.20	2.58	R	MSS-I40R03-GX16-2	GX16-2..R/L	C154

		d_A [mm]	L R	Type, description
C207		**40**	**L**	MSS-I40L90-1.5D-N
C208		**50**	**L**	MSS-I40L90-2.5D-N
C209		**40**	**L**	UT40-MSS-I40L90-2D

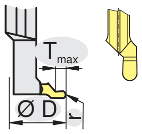
		D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C211		50	1.50	10.00	L	MSS-I40L10-GX16-2	GX16-2..	C154
		50	2.00	10.00	L	MSS-I40L10-GX16-3	GX16-3..	C154
		50	2.50	10.00	L	MSS-I40L10-GX16-3	GX16-3..	C154
		50	3.00	10.00	L	MSS-I40L10-GX16-4	GX16-4..	C154
C212		60	1.50	19.00	N	MSS-I40N19-GX24-2	GX24-2..	C154
		60	2.00	19.00	N	MSS-I40N19-GX24-3	GX24-3..	C154
		60	2.50	19.00	N	MSS-I40N19-GX24-3	GX24-3..	C154
		60	3.00	19.00	N	MSS-I40N19-GX24-4	GX24-4..	C154
C214		50	0.80	1.78	L	MSS-I40L03-GX16-2	GX16-2..R/L	C154
		50	1.00	2.18	L	MSS-I40L03-GX16-2	GX16-2..R/L	C154
		50	1.20	2.58	L	MSS-I40L03-GX16-2	GX16-2..R/L	C154

Radius grooves – internal

Monoblock boring bars – GX09



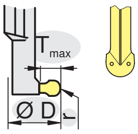
		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	1.00	7.00	R	I12R90-2.5D-GX09	GX09-1..	C154
		16	30	16	1.20	7.00	R	I12R90-2.5D-GX09	GX09-1..	C154
		16	30	16	1.00	7.00	L	I12L90-2.5D-GX09	GX09-1..	C154
		16	30	16	1.20	7.00	L	I12L90-2.5D-GX09	GX09-1..	C154



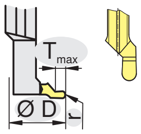
		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C215		16	30	16	0.80	1.78	R	I12R90-2.5D-GX09	GX09-1..R/L	C154
		16	30	16	0.80	1.78	L	I12L90-2.5D-GX09	GX09-1..R/L	C154

Radius grooves – internal

Monoblock boring bars – GX16



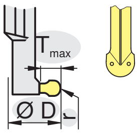
		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	1.50	12.00	R	I16R90-2.0D-GX16-2	GX16-2..	C154
		20	40	25.0	1.50	12.00	R	I20R90-2.0D-GX16-2	GX16-2..	C154
		25	50	32.0	1.50	12.00	R	I25R90-2.0D-GX16-2	GX16-2..	C154
		25	50	32.0	2.00	12.00	R	I25R90-2.0D-GX16-3	GX16-3..	C154
		25	50	32.0	2.50	12.00	R	I25R90-2.0D-GX16-3	GX16-3..	C154
		32	64	42.0	1.50	12.00	R	I32R90-2.0D-GX16-2	GX16-2..	C154
		32	64	42.0	2.00	12.00	R	I32R90-2.0D-GX16-3	GX16-3..	C154
		32	64	42.0	2.50	12.00	R	I32R90-2.0D-GX16-3	GX16-3..	C154
		16	32	20.5	1.50	12.00	L	I16L90-2.0D-GX16-2	GX16-2..	C154
		20	40	25.0	1.50	12.00	L	I20L90-2.0D-GX16-2	GX16-2..	C154
		25	50	32.0	1.50	12.00	L	I25L90-2.0D-GX16-2	GX16-2..	C154
		25	50	32.0	2.00	12.00	L	I25L90-2.0D-GX16-3	GX16-3..	C154
		25	50	32.0	2.50	12.00	L	I25L90-2.0D-GX16-3	GX16-3..	C154
		32	64	42.0	1.50	12.00	L	I32L90-2.0D-GX16-2	GX16-2..	C154
		32	64	42.0	2.00	12.00	L	I32L90-2.0D-GX16-3	GX16-3..	C154
		32	64	42.0	2.50	12.00	L	I32L90-2.0D-GX16-3	GX16-3..	C154



		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C216		16	32	20.5	0.80	1.78	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	1.00	2.18	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	1.20	2.58	R	I16R90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	0.80	1.78	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	1.00	2.18	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	1.20	2.58	R	I20R90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	0.80	1.78	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	1.00	2.18	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	1.20	2.58	R	I25R90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	0.80	1.78	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	1.00	2.18	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	1.20	2.58	R	I32R90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	0.80	1.78	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	1.00	2.18	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C154
		16	32	20.5	1.20	2.58	L	I16L90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	0.80	1.78	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	1.00	2.18	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C154
		20	40	25.0	1.20	2.58	L	I20L90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	0.80	1.78	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	1.00	2.18	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C154
		25	50	32.0	1.20	2.58	L	I25L90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	0.80	1.78	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	1.00	2.18	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C154
		32	64	42.0	1.20	2.58	L	I32L90-2.0D-GX16-2	GX16-2..R/L	C154

Radius grooves – internal

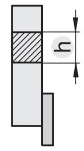
Monoblock boring bars – GX24



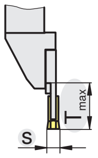
		d_A [mm]	l_2 [mm]	D_{min} [mm]	r [mm]	T_{max} [mm]	L R	Type, description		
C217		32	64	42.0	1.50	21.00	R	I32R90-2.0D-GX24-2	GX24-2..	C154
		32	64	42.0	2.00	21.00	R	I32R90-2.0D-GX24-3	GX24-3..	C154
		32	64	42.0	2.50	21.00	R	I32R90-2.0D-GX24-3	GX24-3..	C154
		32	64	47.0	3.00	21.00	R	I32R90-2.0D-GX24-4	GX24-4..	C154
		40	80	53.0	2.00	21.00	R	I40R90-2.0D-GX24-3	GX24-3..	C154
		40	80	53.0	2.50	21.00	R	I40R90-2.0D-GX24-3	GX24-3..	C154
		40	80	57.0	3.00	21.00	R	I40R90-2.0D-GX24-4	GX24-4..	C154
		32	64	42.0	1.50	21.00	L	I32L90-2.0D-GX24-2	GX24-2..	C154
		32	64	42.0	2.00	21.00	L	I32L90-2.0D-GX24-3	GX24-3..	C154
		32	64	42.0	2.50	21.00	L	I32L90-2.0D-GX24-3	GX24-3..	C154
		32	64	47.0	3.00	21.00	L	I32L90-2.0D-GX24-4	GX24-4..	C154
		40	80	53.0	2.00	21.00	L	I40L90-2.0D-GX24-3	GX24-3..	C154
		40	80	53.0	2.50	21.00	L	I40L90-2.0D-GX24-3	GX24-3..	C154
		40	80	57.0	3.00	21.00	L	I40L90-2.0D-GX24-4	GX24-4..	C154

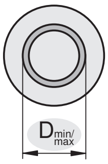
Axial grooving

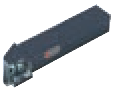
Modular system – external, assembly size 16

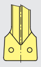


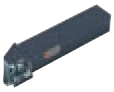
Matching products see right-hand side.

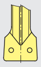




		h/d_A	L R	Type, description
C168	 0	**16**	**R**	MSS-E16R00-1616G

		s/s_{min}	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C183		3.00	10	5	R	MSS-E16R05-AX05	AX05..	C155

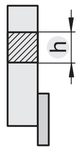
		h/d_A	L R	Type, description
C168	 0	**16**	**L**	MSS-E16L00-1616G

		s/s_{min}	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C183		3.00	10	5	L	MSS-E16L05-AX05	AX05..	C155

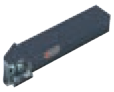
Notes

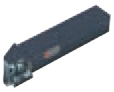
Axial grooving

Modular system – external, assembly size 20



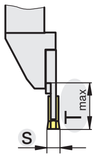
Matching products see right-hand side.

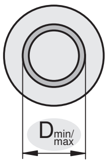
		h/d_A	L R	Type, description
C168	 0	16	R	MSS-E20R00-1620G
		20	R	MSS-E20R00-2020J
C169	 90	20	L	MSS-E20L90-2020J

		h/d_A	L R	Type, description
C168	 0	16	L	MSS-E20L00-1620G
		20	L	MSS-E20L00-2020J
C169	 90	20	R	MSS-E20R90-2020J

Axial grooving

Modular system – external, assembly size 20



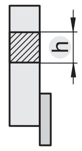


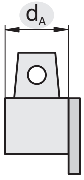
		s/s_{min}	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	L R	Type, description		
C181		2.76	3.75	50	70	14	R	MSS-E20R14-GX24-2 A50-70	GX24-2..	C151
		2.76	3.75	70	100	14	R	MSS-E20R14-GX24-2 A70-100	GX24-2..	C151
		2.76	3.75	100	150	14	R	MSS-E20R14-GX24-2 A100-150	GX24-2..	C151
C183		3.00	3.00	10		5	R	MSS-E20R05-AX05	AX05..	C155
		3.00	3.00	20		10	R	MSS-E20R10-AX10	AX10..	C155
		3.00	3.00	30		15	R	MSS-E20R15-AX15	AX15..	C155

		s/s_{min}	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	L R	Type, description		
C181		2.76	3.75	50	70	14	L	MSS-E20L14-GX24-2 A50-70	GX24-2..	C151
		2.76	3.75	70	100	14	L	MSS-E20L14-GX24-2 A70-100	GX24-2..	C151
		2.76	3.75	100	150	14	L	MSS-E20L14-GX24-2 A100-150	GX24-2..	C151
C183		3.00	3.00	10		5	L	MSS-E20L05-AX05	AX05..	C155
		3.00	3.00	20		10	L	MSS-E20L10-AX10	AX10..	C155
		3.00	3.00	30		15	L	MSS-E20L15-AX15	AX15..	C155

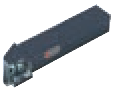
Axial grooving

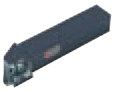
Modular system – external, assembly size 25





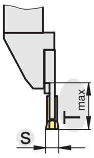
Matching products see right-hand side.

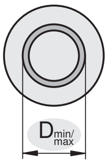
		h/d_A	L R	Type, description
C168	 0	25	R	MSS-E25R00-2525L
C169	 90	25	L	MSS-E25L90-2525L
C171	 0	100	R	HSK-T100-MSS-E25R00
		63	R	HSK-T63-MSS-E25R00
C173	 0	40	R	UT40-MSS-E25R00
		50	R	UT50-MSS-E25R00
		63	R	UT63-MSS-E25R00
C174	 90	40	L	UT40-MSS-E25L90
		50	L	UT50-MSS-E25L90

		h/d_A	L R	Type, description
C168	 0	25	L	MSS-E25L00-2525L
C169	 90	25	R	MSS-E25R90-2525L
C171	 0	100	L	HSK-T100-MSS-E25L00
		63	L	HSK-T63-MSS-E25L00
C173	 0	40	L	UT40-MSS-E25L00
		50	L	UT50-MSS-E25L00
		63	L	UT63-MSS-E25L00
C174	 90	40	R	UT40-MSS-E25R90
		50	R	UT50-MSS-E25R90

Axial grooving

Modular system – external, assembly size 25



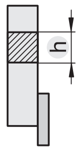


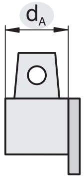
		s/s_{min}	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	L R	Type, description		
C181		2.76	3.75	50	70	15	R	MSS-E25R15-GX24-2 A50-70	GX24-2..	C151
		2.76	3.75	70	100	15	R	MSS-E25R15-GX24-2 A70-100	GX24-2..	C151
		2.76	3.75	100	150	15	R	MSS-E25R15-GX24-2 A100-150	GX24-2..	C151
		3.76	5.00	50	70	15	R	MSS-E25R15-GX24-3 A50-70	GX24-3..	C151
		3.76	5.00	70	100	15	R	MSS-E25R15-GX24-3 A70-100	GX24-3..	C151
		3.76	5.00	100	150	15	R	MSS-E25R15-GX24-3 A100-150	GX24-3..	C151
		3.76	5.00	150	300	15	R	MSS-E25R15-GX24-3 A150-300	GX24-3..	C151
		5.01	6.50	50	70	15	R	MSS-E25R15-GX24-4 A50-70	GX24-4..	C151
		5.01	6.50	70	100	15	R	MSS-E25R15-GX24-4 A70-100	GX24-4..	C151
		5.01	6.50	100	150	15	R	MSS-E25R15-GX24-4 A100-150	GX24-4..	C151
		5.01	6.50	150	300	15	R	MSS-E25R15-GX24-4 A150-300	GX24-4..	C151
C182		3.76	5.00	50	70	21	R	MSS-E25R21-GX24-3 AS50-70	GX24-3..	C151
		3.76	5.00	70	100	21	R	MSS-E25R21-GX24-3 AS70-100	GX24-3..	C151
		3.76	5.00	100	150	21	R	MSS-E25R21-GX24-3 AS100-150	GX24-3..	C151
		3.76	5.00	150	300	21	R	MSS-E25R21-GX24-3 AS150-300	GX24-3..	C151
		5.01	6.50	50	70	25	R	MSS-E25R25-GX24-4 AS50-70	GX24-4..	C151
		5.01	6.50	70	100	25	R	MSS-E25R25-GX24-4 AS70-100	GX24-4..	C151
		5.01	6.50	100	150	25	R	MSS-E25R25-GX24-4 AS100-150	GX24-4..	C151
		5.01	6.50	150	300	25	R	MSS-E25R25-GX24-4 AS150-300	GX24-4..	C151
C183		3.00	3.00	10		5	R	MSS-E25R05-AX05	AX05..	C155
		3.00	3.00	20		10	R	MSS-E25R10-AX10	AX10..	C155
		3.00	3.00	30		15	R	MSS-E25R15-AX15	AX15..	C155

		s/s_{min}	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	L R	Type, description		
C181		2.76	3.75	50	70	15	L	MSS-E25L15-GX24-2 A50-70	GX24-2..	C151
		2.76	3.75	70	100	15	L	MSS-E25L15-GX24-2 A70-100	GX24-2..	C151
		2.76	3.75	100	150	15	L	MSS-E25L15-GX24-2 A100-150	GX24-2..	C151
		3.76	5.00	50	70	15	L	MSS-E25L15-GX24-3 A50-70	GX24-3..	C151
		3.76	5.00	70	100	15	L	MSS-E25L15-GX24-3 A70-100	GX24-3..	C151
		3.76	5.00	100	150	15	L	MSS-E25L15-GX24-3 A100-150	GX24-3..	C151
		3.76	5.00	150	300	15	L	MSS-E25L15-GX24-3 A150-300	GX24-3..	C151
		5.01	6.50	50	70	15	L	MSS-E25L15-GX24-4 A50-70	GX24-4..	C151
		5.01	6.50	70	100	15	L	MSS-E25L15-GX24-4 A70-100	GX24-4..	C151
		5.01	6.50	100	150	15	L	MSS-E25L15-GX24-4 A100-150	GX24-4..	C151
		5.01	6.50	150	300	15	L	MSS-E25L15-GX24-4 A150-300	GX24-4..	C151
C182		3.76	5.00	50	70	21	L	MSS-E25L21-GX24-3 AS50-70	GX24-3..	C151
		3.76	5.00	70	100	21	L	MSS-E25L21-GX24-3 AS70-100	GX24-3..	C151
		3.76	5.00	100	150	21	L	MSS-E25L21-GX24-3 AS100-150	GX24-3..	C151
		3.76	5.00	150	300	21	L	MSS-E25L21-GX24-3 AS150-300	GX24-3..	C151
		5.01	6.50	50	70	25	L	MSS-E25L25-GX24-4 AS50-70	GX24-4..	C151
		5.01	6.50	70	100	25	L	MSS-E25L25-GX24-4 AS70-100	GX24-4..	C151
		5.01	6.50	100	150	25	L	MSS-E25L25-GX24-4 AS100-150	GX24-4..	C151
		5.01	6.50	150	300	25	L	MSS-E25L25-GX24-4 AS150-300	GX24-4..	C151
C183		3.00	3.00	10		5	L	MSS-E25L05-AX05	AX05..	C155
		3.00	3.00	20		10	L	MSS-E25L10-AX10	AX10..	C155
		3.00	3.00	30		15	L	MSS-E25L15-AX15	AX15..	C155

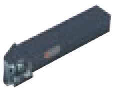
Axial grooving

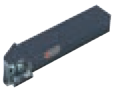
Modular system – external, assembly size 32





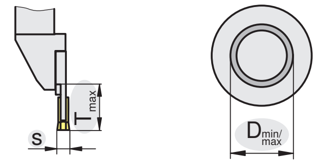
Matching products see right-hand side.

		h/d_A	L R	Type, description
C168	 0	**32**	**R**	MSS-E32R00-3232Q
		32	**R**	MSS-E32R00-3225N
C169	 90	**32**	**L**	MSS-E32L90-3225N
		32	**L**	MSS-E32L90-3232R
C171	 0	**100**	**R**	HSK-T100-MSS-E32R00
		63	**R**	HSK-T63-MSS-E32R00
C172	 90	**100**	**L**	HSK-T100-MSS-E32L90
		63	**L**	HSK-T63-MSS-E32L90
C173	 0	**50**	**R**	UT50-MSS-E32R00
		63	**R**	UT63-MSS-E32R00

		h/d_A	L R	Type, description
C168	 0	**32**	**L**	MSS-E32L00-3232Q
		32	**L**	MSS-E32L00-3225N
C169	 90	**32**	**R**	MSS-E32R90-3232R
		32	**R**	MSS-E32R90-3225N
C171	 0	**100**	**L**	HSK-T100-MSS-E32L00
		63	**L**	HSK-T63-MSS-E32L00
C172	 90	**100**	**R**	HSK-T100-MSS-E32R90
		63	**R**	HSK-T63-MSS-E32R90
C173	 0	**63**	**L**	UT63-MSS-E32L00

Axial grooving

Modular system – external, assembly size 32

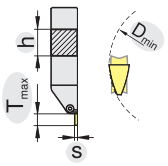


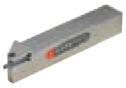
		s/s$_{min}$	s$_{max}$ [mm]	D$_{min}$ [mm]	D$_{max}$ [mm]	T$_{max}$ [mm]	L R	Type, description		
C181		3.76	5.00	70	100	15	R	MSS-E32R15-GX24-3 A70-100	GX24-3..	C151
		3.76	5.00	100	150	15	R	MSS-E32R15-GX24-3 A100-150	GX24-3..	C151
		3.76	5.00	150	300	15	R	MSS-E32R15-GX24-3 A150-300	GX24-3..	C151
		5.01	6.50	70	100	15	R	MSS-E32R15-GX24-4 A70-100	GX24-4..	C151
		5.01	6.50	100	150	15	R	MSS-E32R15-GX24-4 A100-150	GX24-4..	C151
		5.01	6.50	150	300	15	R	MSS-E32R15-GX24-4 A150-300	GX24-4..	C151
		5.01	6.50	300	900	15	R	MSS-E32R15-GX24-4 A300-900	GX24-4..	C151

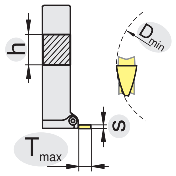
		s/s$_{min}$	s$_{max}$ [mm]	D$_{min}$ [mm]	D$_{max}$ [mm]	T$_{max}$ [mm]	L R	Type, description		
C181		3.76	5.00	70	100	15	L	MSS-E32L15-GX24-3 A70-100	GX24-3..	C151
		3.76	5.00	100	150	15	L	MSS-E32L15-GX24-3 A100-150	GX24-3..	C151
		3.76	5.00	150	300	15	L	MSS-E32L15-GX24-3 A150-300	GX24-3..	C151
		5.01	6.50	70	100	15	L	MSS-E32L15-GX24-4 A70-100	GX24-4..	C151
		5.01	6.50	100	150	15	L	MSS-E32L15-GX24-4 A100-150	GX24-4..	C151
		5.01	6.50	150	300	15	L	MSS-E32L15-GX24-4 A150-300	GX24-4..	C151
		5.01	6.50	300	900	15	L	MSS-E32L15-GX24-4 A300-900	GX24-4..	C151

Axial grooving

Monoblock tools – AX



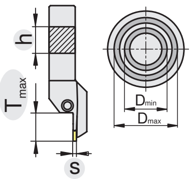
		h [mm]	s [mm]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C192		16	3.0	10	5	R	E16R0005-1616L-AX05	AX05..	C155
		16	3.0	20	10	R	E16R0010-1616L-AX10	AX10..	C155
		20	3.0	10	5	R	E20R0005-2020L-AX05	AX05..	C155
		20	3.0	20	10	R	E20R0010-2020L-AX10	AX10..	C155
		20	3.0	30	15	R	E20R0015-2020L-AX15	AX15..	C155
		25	3.0	10	5	R	E25R0005-2525N-AX05	AX05..	C155
		25	3.0	20	10	R	E25R0010-2525N-AX10	AX10..	C155
		25	3.0	30	15	R	E25R0015-2525N-AX15	AX15..	C155
		16	3.0	10	5	L	E16L0005-1616L-AX05	AX05..	C155
		16	3.0	20	10	L	E16L0010-1616L-AX10	AX10..	C155
		20	3.0	10	5	L	E20L0005-2020L-AX05	AX05..	C155
		20	3.0	20	10	L	E20L0010-2020L-AX10	AX10..	C155
		20	3.0	30	15	L	E20L0015-2020L-AX15	AX15..	C155
		25	3.0	10	5	L	E25L0005-2525N-AX05	AX05..	C155
		25	3.0	20	10	L	E25L0010-2525N-AX10	AX10..	C155
		25	3.0	30	15	L	E25L0015-2525N-AX15	AX15..	C155



		h [mm]	s [mm]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C193		16	3.0	10	5	R	E16R9005-1616J-AX05	AX05..	C155
		16	3.0	20	10	R	E16R9010-1616J-AX10	AX10..	C155
		20	3.0	10	5	R	E20R9005-2020J-AX05	AX05..	C155
		20	3.0	20	10	R	E20R9010-2020J-AX10	AX10..	C155
		20	3.0	30	15	R	E20R9015-2020J-AX15	AX15..	C155
		25	3.0	10	5	R	E25R9005-2525L-AX05	AX05..	C155
		25	3.0	20	10	R	E25R9010-2525J-AX10	AX10..	C155
		25	3.0	30	15	R	E25R9015-2525L-AX15	AX15..	C155
		16	3.0	10	5	L	E16L9005-1616J-AX05	AX05..	C155
		16	3.0	20	10	L	E16L9010-1616J-AX10	AX10..	C155
		20	3.0	10	5	L	E20L9005-2020J-AX05	AX05..	C155
		20	3.0	20	10	L	E20L9010-2020J-AX10	AX10..	C155
		20	3.0	30	15	L	E20L9015-2020J-AX15	AX15..	C155
		25	3.0	10	5	L	E25L9005-2525L-AX05	AX05..	C155
		25	3.0	20	10	L	E25L9010-2525J-AX10	AX10..	C155
		25	3.0	30	15	L	E25L9015-2525L-AX15	AX15..	C155

Axial grooving

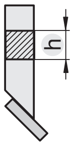
Monoblock tools – GX



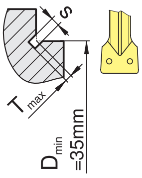
		h [mm]	s_{min} [mm]	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	L R	Type, description		
C191		25	2.76	3.75	40	45	12	R	E25R0012-2525X-GX24-2 AS40-45	GX24-2..	C151
		25	2.76	3.75	45	50	12	R	E25R0012-2525X-GX24-2 AS45-50	GX24-2..	C151
		25	2.76	3.75	50	60	16	R	E25R0016-2525X-GX24-2 AS50-60	GX24-2..	C151
		25	2.76	3.75	60	75	19	R	E25R0019-2525X-GX24-2 AS60-75	GX24-2..	C151
		25	2.76	3.75	75	100	19	R	E25R0019-2525X-GX24-2 AS75-100	GX24-2..	C151
		25	2.76	3.75	100	130	22	R	E25R0022-2525X-GX24-2 AS100-130	GX24-2..	C151
		25	2.76	3.75	130	180	22	R	E25R0022-2525X-GX24-2 AS130-180	GX24-2..	C151
		25	2.76	3.75	180	300	22	R	E25R0022-2525X-GX24-2 AS180-300	GX24-2..	C151
		25	3.76	5.00	40	45	12	R	E25R0012-2525X-GX24-3 AS40-45	GX24-3..	C151
		25	3.76	5.00	45	50	12	R	E25R0012-2525X-GX24-3 AS45-50	GX24-3..	C151
		25	3.76	5.00	50	60	20	R	E25R0020-2525X-GX24-3 AS50-60	GX24-3..	C151
		25	3.76	5.00	60	75	20	R	E25R0020-2525X-GX24-3 AS60-75	GX24-3..	C151
		25	3.76	5.00	75	100	22	R	E25R0022-2525X-GX24-3 AS75-100	GX24-3..	C151
		25	3.76	5.00	100	150	22	R	E25R0022-2525X-GX24-3 AS100-150	GX24-3..	C151
		25	3.76	5.00	150	300	22	R	E25R0022-2525X-GX24-3 AS150-300	GX24-3..	C151
		25	5.01	6.50	40	50	20	R	E25R0020-2525X-GX24-4 AS40-50	GX24-4..	C151
		25	5.01	6.50	50	70	22	R	E25R0022-2525X-GX24-4 AS50-70	GX24-4..	C151
		25	5.01	6.50	70	100	25	R	E25R0025-2525X-GX24-4 AS70-100	GX24-4..	C151
		25	5.01	6.50	100	150	25	R	E25R0025-2525X-GX24-4 AS100-150	GX24-4..	C151
		25	5.01	6.50	150	300	25	R	E25R0025-2525X-GX24-4 AS150-300	GX24-4..	C151
		25	2.76	3.75	40	45	12	L	E25L0012-2525X-GX24-2 AS40-45	GX24-2..	C151
		25	2.76	3.75	45	50	12	L	E25L0012-2525X-GX24-2 AS45-50	GX24-2..	C151
		25	2.76	3.75	50	60	16	L	E25L0016-2525X-GX24-2 AS50-60	GX24-2..	C151
		25	2.76	3.75	60	75	19	L	E25L0019-2525X-GX24-2 AS60-75	GX24-2..	C151
		25	2.76	3.75	75	100	19	L	E25L0019-2525X-GX24-2 AS75-100	GX24-2..	C151
		25	2.76	3.75	100	130	22	L	E25L0022-2525X-GX24-2 AS100-130	GX24-2..	C151
		25	2.76	3.75	130	180	22	L	E25L0022-2525X-GX24-2 AS130-180	GX24-2..	C151
		25	2.76	3.75	180	300	22	L	E25L0022-2525X-GX24-2 AS180-300	GX24-2..	C151
		25	3.76	5.00	40	45	12	L	E25L0012-2525X-GX24-3 AS40-45	GX24-3..	C151
		25	3.76	5.00	45	50	12	L	E25L0012-2525X-GX24-3 AS45-50	GX24-3..	C151
		25	3.76	5.00	50	60	20	L	E25L0020-2525X-GX24-3 AS50-60	GX24-3..	C151
		25	3.76	5.00	60	75	20	L	E25L0020-2525X-GX24-3 AS60-75	GX24-3..	C151
		25	3.76	5.00	75	100	22	L	E25L0022-2525X-GX24-3 AS75-100	GX24-3..	C151
		25	3.76	5.00	100	150	22	L	E25L0022-2525X-GX24-3 AS100-150	GX24-3..	C151
		25	3.76	5.00	150	300	22	L	E25L0022-2525X-GX24-3 AS150-300	GX24-3..	C151
		25	5.01	6.50	40	50	20	L	E25L0020-2525X-GX24-4 AS40-50	GX24-4..	C151
		25	5.01	6.50	50	70	22	L	E25L0022-2525X-GX24-4 AS50-70	GX24-4..	C151
		25	5.01	6.50	70	100	25	L	E25L0025-2525X-GX24-4 AS70-100	GX24-4..	C151
		25	5.01	6.50	100	150	25	L	E25L0025-2525X-GX24-4 AS100-150	GX24-4..	C151
		25	5.01	6.50	150	300	25	L	E25L0025-2525X-GX24-4 AS150-300	GX24-4..	C151

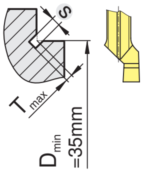
External recessing

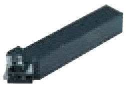
Modular system – external, assembly size 20



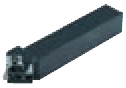
Matching products see right-hand side.





		h/d_A	L R	Type, description
C170	 45	20	R	MSS-E20R45-2020J

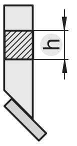
		s [mm]	T_{max} [mm]	L R	Type, description		
C180		1.00	1.14	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		1.95	2.00	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		2.25	2.00	L	MSS-E20L03-GX16-2	GX16-2..R/L	C153
		3.00	2.00	L	MSS-E20L03-GX16-2	GX16-2..	C151
		3.25	2.00	L	MSS-E20L03-GX16-2	GX16-2..	C151
		3.50	2.00	L	MSS-E20L03-GX16-2	GX16-2..	C151
		4.00	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C151
		4.25	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C151
		4.50	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C151
		5.00	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C151

		h/d_A	L R	Type, description
C170	 45	20	L	MSS-E20L45-2020J

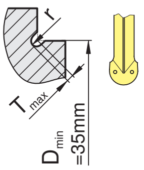
		s [mm]	T_{max} [mm]	L R	Type, description		
C180		1.00	1.14	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		1.95	2.00	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		2.25	2.00	R	MSS-E20R03-GX16-2	GX16-2..R/L	C153
		3.00	2.00	R	MSS-E20R03-GX16-2	GX16-2..	C151
		3.25	2.00	R	MSS-E20R03-GX16-2	GX16-2..	C151
		3.50	2.00	R	MSS-E20R03-GX16-2	GX16-2..	C151
		4.00	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C151
		4.25	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C151
		4.50	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C151
		5.00	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C151

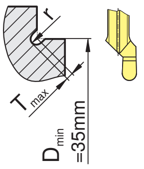
External recessing

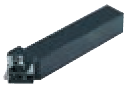
Modular system – external, assembly size 20



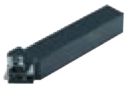
Matching products see right-hand side.





		h/d_A	L R	Type, description
C170	 45	**20**	**R**	MSS-E20R45-2020J

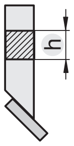
		r [mm]	T_{max} [mm]	L R	Type, description		
C180		0.80	1.78	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.00	2.00	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.20	2.00	L	MSS-E20L03-GX16-2	GX16-2..R/L	C154
		1.50	2.00	L	MSS-E20L03-GX16-2	GX16-2..	C154
		2.00	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C154
		2.50	2.00	L	MSS-E20L03-GX16-2	GX16-3..	C154

		h/d_A	L R	Type, description
C170	 45	**20**	**L**	MSS-E20L45-2020J

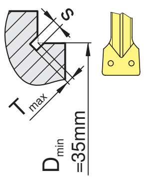
		r [mm]	T_{max} [mm]	L R	Type, description		
C180		0.80	1.78	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.00	2.00	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.20	2.00	R	MSS-E20R03-GX16-2	GX16-2..R/L	C154
		1.50	2.00	R	MSS-E20R03-GX16-2	GX16-2..	C154
		2.00	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C154
		2.50	2.00	R	MSS-E20R03-GX16-2	GX16-3..	C154

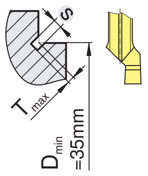
External recessing

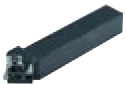
Modular system – external, assembly size 25



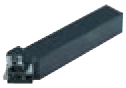
Matching products see right-hand side.





		h/d$_A$	L R	Type, description
C170	 45	25	R	MSS-E25R45-2525L

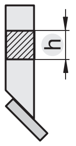
		s [mm]	T$_{max}$ [mm]	L R	Type, description		
C180		1.00	1.14	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		1.95	2.00	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		2.25	2.00	L	MSS-E25L03-GX16-2	GX16-2..R/L	C153
		3.00	2.00	L	MSS-E25L03-GX16-2	GX16-2..	C151
		3.25	2.00	L	MSS-E25L03-GX16-2	GX16-2..	C151
		3.50	2.00	L	MSS-E25L03-GX16-2	GX16-2..	C151
		4.00	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C151
		4.25	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C151
		4.50	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C151
		5.00	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C151
		5.25	2.00	L	MSS-E25L03-GX16-2	GX16-4..	C151
		6.00	2.00	L	MSS-E25L03-GX16-2	GX16-4..	C151

		h/d$_A$	L R	Type, description
C170	 45	25	L	MSS-E25L45-2525L

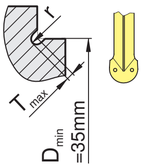
		s [mm]	T$_{max}$ [mm]	L R	Type, description		
C180		1.00	1.14	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.20	1.34	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.40	1.53	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.70	1.82	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		1.95	2.00	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		2.25	2.00	R	MSS-E25R03-GX16-2	GX16-2..R/L	C153
		3.00	2.00	R	MSS-E25R03-GX16-2	GX16-2..	C151
		3.25	2.00	R	MSS-E25R03-GX16-2	GX16-2..	C151
		3.50	2.00	R	MSS-E25R03-GX16-2	GX16-2..	C151
		4.00	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C151
		4.25	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C151
		4.50	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C151
		5.00	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C151
		5.25	2.00	R	MSS-E25R03-GX16-2	GX16-4..	C151
		6.00	2.00	R	MSS-E25R03-GX16-2	GX16-4..	C151

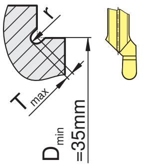
External recessing

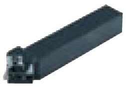
Modular system – external, assembly size 25



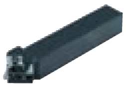
Matching products see right-hand side.





		h/d$_A$	L R	Type, description
C170	 45	**25**	**R**	MSS-E25R45-2525L

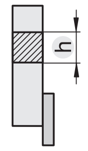
		r [mm]	T$_{max}$ [mm]	L R	Type, description		
C180		0.80	1.78	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.00	2.00	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.20	2.00	L	MSS-E25L03-GX16-2	GX16-2..R/L	C154
		1.50	2.00	L	MSS-E25L03-GX16-2	GX16-2..	C154
		2.00	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C154
		2.50	2.00	L	MSS-E25L03-GX16-2	GX16-3..	C154
		3.00	2.00	L	MSS-E25L03-GX16-2	GX16-4..	C154

		h/d$_A$	L R	Type, description
C170	 45	**25**	**L**	MSS-E25L45-2525L

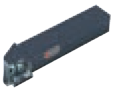
		r [mm]	T$_{max}$ [mm]	L R	Type, description		
C180		0.80	1.78	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.00	2.00	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.20	2.00	R	MSS-E25R03-GX16-2	GX16-2..R/L	C154
		1.50	2.00	R	MSS-E25R03-GX16-2	GX16-2..	C154
		2.00	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C154
		2.50	2.00	R	MSS-E25R03-GX16-2	GX16-3..	C154
		3.00	2.00	R	MSS-E25R03-GX16-2	GX16-4..	C154

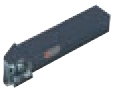
Thread turning – external

Modular system – external, assembly size 20



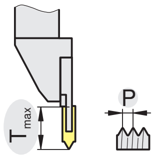
Matching products see right-hand side.

		h/d_A	L R	Type, description
C168	 0	**20**	**R**	MSS-E20R00-2020J
		16	**R**	MSS-E20R00-1620G
C169	 90	**20**	**L**	MSS-E20L90-2020J

		h/d_A	L R	Type, description
C168	 0	**20**	**L**	MSS-E20L00-2020J
		16	**L**	MSS-E20L00-1620G
C169	 90	**20**	**R**	MSS-E20R90-2020J

Thread turning – external

Modular system – external, assembly size 20

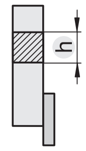


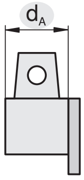
		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C218		0.50	1.50	48	16	8	R	MSS-E20R-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	12	N	MSS-E20N-TC16-2	TC16-2..	C161

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C218		0.50	1.50	48	16	8	L	MSS-E20L-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	12	N	MSS-E20N-TC16-2	TC16-2..	C161

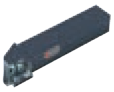
Thread turning – external

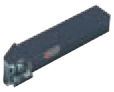
Modular system – external, assembly size 25





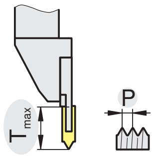
Matching products see right-hand side.

		h/d_A	L R	Type, description
C168	 0	25	R	MSS-E25R00-2525L
C169	 90	25	L	MSS-E25L90-2525L
C171	 0	100	R	HSK-T100-MSS-E25R00
		63	R	HSK-T63-MSS-E25R00
C173	 0	63	R	UT63-MSS-E25R00
		40	R	UT40-MSS-E25R00
		50	R	UT50-MSS-E25R00
C174	 90	40	L	UT40-MSS-E25L90
		50	L	UT50-MSS-E25L90

		h/d_A	L R	Type, description
C168	 0	25	L	MSS-E25L00-2525L
C169	 90	25	R	MSS-E25R90-2525L
C171	 0	100	L	HSK-T100-MSS-E25L00
		63	L	HSK-T63-MSS-E25L00
C173	 0	40	L	UT40-MSS-E25L00
		50	L	UT50-MSS-E25L00
		63	L	UT63-MSS-E25L00
C174	 90	50	R	UT50-MSS-E25R90
		40	R	UT40-MSS-E25R90

Thread turning – external

Modular system – external, assembly size 25

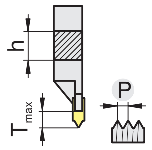


		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C218		0.50	1.50	48	16	8	R	MSS-E25R-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	10	R	MSS-E25R-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	12	N	MSS-E25N-TC16-3	TC16-3..	C161

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C218		0.50	1.50	48	16	8	L	MSS-E25L-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	10	L	MSS-E25L-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	12	N	MSS-E25N-TC16-3	TC16-3..	C161

Thread turning – external

Monoblock tools – TC



		h [mm]	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	L R	Type, description		
C219		12	0.50	3.00	48	8	10	R	E12R00-1212-TC16	TC16-1/2..	C161
		12	0.50	3.00	48	8	10	L	E12L00-1212-TC16	TC16-1/2..	C161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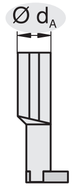
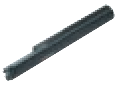
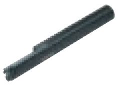
Thread turning – internal

Modular system – internal, assembly size 32



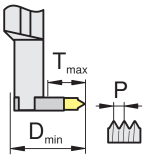
Matching products see right-hand side.

		d_A [mm]	L R	Type, description
C207		32	R	MSS-I32R90-1.5D-N
C208		40	R	MSS-I32R90-2.5D-N
C209		40	R	UT40-MSS-I32R90-2D

		d_A [mm]	L R	Type, description
C207		32	L	MSS-I32L90-1.5D-N
C208		40	L	MSS-I32L90-2.5D-N
C209		50	L	UT50-MSS-I32L90-2D

Thread turning – internal

Modular system – internal, assembly size 32

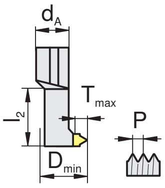


		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C220		0.50	1.50	48	16	40	7	R	MSS-I32R-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	40	7	R	MSS-I32R-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	40	7	N	MSS-I32N-TC16-3	TC16-3..	C161

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C220		0.50	1.50	48	16	40	7	L	MSS-I32L-TC16-1	TC16-1..	C161
		1.75	3.00	14	8	40	7	L	MSS-I32L-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	40	7	N	MSS-I32N-TC16-3	TC16-3..	C161

Thread turning – internal

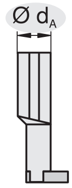
Monoblock boring bars – TC



		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	d_A [mm]	l_2 [mm]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C221		0.50	3.00	48	8	20	32	20	4	R	I16R90-2D-TC16	TC16-1/2..	C161
		0.50	5.00	48	5	25	40	25	5	R	I20R90-2D-TC16	TC16-..	C161
		0.50	5.00	48	5	32	50	32	6	R	I25R90-2D-TC16	TC16-..	C161
		0.50	3.00	48	8	20	32	20	4	L	I16L90-2D-TC16	TC16-1/2..	C161
		0.50	5.00	48	5	25	40	25	5	L	I20L90-2D-TC16	TC16-..	C161
		0.50	5.00	48	5	32	50	32	6	L	I25L90-2D-TC16	TC16-..	C161

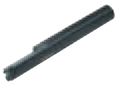
Thread milling – external / internal

Boring bars – TC



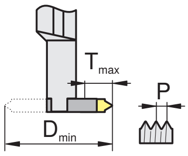
Matching products see right-hand side.

		d_A [mm]	L R	Type, description
C207		**32**	**R**	MSS-I32R90-1.5D-N

		d_A [mm]	L R	Type, description
C208		**40**	**R**	MSS-I32R90-2.5D-N

Thread milling – external / internal

Boring bars – TC

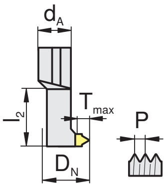


		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C220		1.75	3.00	14	8	44	7	R	MSS-I32R-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	44	7	N	MSS-I32N-TC16-3	TC16-3..	C161

		P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	D_{min} [mm]	T_{max} [mm]	L R	Type, description		
C220		1.75	3.00	14	8	59	7	R	MSS-I32R-TC16-2	TC16-2..	C161
		3.50	5.00	7	5	59	7	N	MSS-I32N-TC16-3	TC16-3..	C161

Thread milling – external / internal

TC thread milling cutters



		P_{min} [mm]	**P_{max} [mm]**	**P_{min} [TPI]**	**P_{max} [TPI]**	**d_A [mm]**	**l_2 [mm]**	**D_N [mm]**	**T_{max} [mm]**	L R	**Type, description**		
C222		0.50	5.00	28	5	25	54	25	3.0	R	I25R90-2D-TC16-W	TC16-..	C161
		0.50	5.00	28	5	32	68	32	3.5	R	I32R90-2D-TC16-W	TC16-..	C161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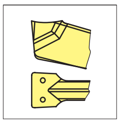
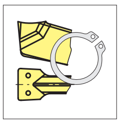
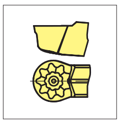
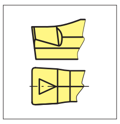
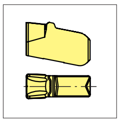
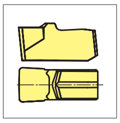
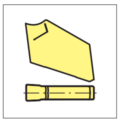
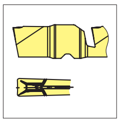
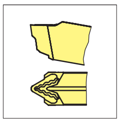
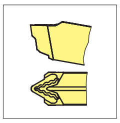
XLCE

Parting and grooving inserts

	GX-E system	C151-C152
	GX-S system	C153
	GX-R system	C154
	AX system	C155
	SX system	C156
	LX system	C157
	FX system	C158
	MaxiClick system	C159

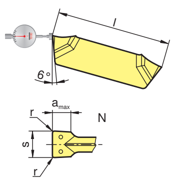
Threading inserts

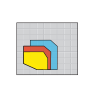
	Partial profile 60° / 55°	C160-C161
	Full profile 60° / 55°	C162-C163

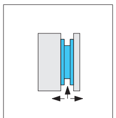
GX-E system

	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

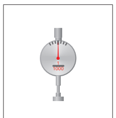
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]
-F2		GX09-1E2.00N0.20-F2		●				N	2.00	9.0	0.20	2.0
		GX09-1E2.50N0.20-F2		●				N	2.50	9.0	0.20	2.0
		GX09-2E3.00N0.30-F2		●				N	3.00	9.0	0.30	2.5
		GX16-1E2.00N0.20-F2		●				N	2.00	16.0	0.20	2.0
		GX16-2E3.00N0.30-F2		●				N	3.00	16.0	0.30	2.5
		GX16-3E4.00N0.40-F2		●				N	4.00	16.0	0.40	3.0
		GX16-3E5.00N0.40-F2		●				N	5.00	16.0	0.40	3.0
		GX24-2E3.00N0.30-F2	●	●		●		N	3.00	24.0	0.30	2.5
		GX24-2E3.50N0.30-F2				●		N	3.50	24.0	0.30	2.5
		GX24-3E4.00N0.40-F2	●	●		●		N	4.00	24.0	0.40	3.0
		GX24-3E5.00N0.40-F2	●	●		●		N	5.00	24.0	0.40	3.0
		GX24-4E6.00N0.50-F2		●		●		N	6.00	24.0	0.50	3.5
EN		GX09-1E2.00N0.20	●	●				N	2.00	9.0	0.20	1.5
		GX09-1E2.50N0.20	●	●				N	2.50	9.0	0.20	1.5
		GX09-2E3.00N0.30	●	●				N	3.00	9.0	0.30	2.0
		GX16-1E2.00N0.20	●	●	●			N	2.00	16.0	0.20	2.0
		GX16-1E2.50N0.20	●	●	●			N	2.50	16.0	0.20	2.0
		GX16-2E3.00N0.30	●	●	●			N	3.00	16.0	0.30	2.5
		GX16-2E3.00N0.50	●					N	3.00	16.0	0.50	2.5
		GX16-2E3.50N0.30	●	●	●			N	3.50	16.0	0.30	2.5
		GX16-3E4.00N0.40	●	●	●			N	4.00	16.0	0.40	3.0
		GX16-3E4.00N0.60	●					N	4.00	16.0	0.60	3.0
		GX16-3E5.00N0.40	●	●	●			N	5.00	16.0	0.40	3.0
		GX16-4E6.00N0.50	●	●				N	6.00	16.0	0.50	3.5
		GX16-4E6.00N0.80	●					N	6.00	16.0	0.80	3.5
		GX24-2E3.00N0.30	●	●	●	●		N	3.00	24.0	0.30	2.5
		GX24-3E4.00N0.40	●	●	●	●		N	4.00	24.0	0.40	3.0
		GX24-3E5.00N0.40	●	●	●	●		N	5.00	24.0	0.40	3.0
		GX24-4E6.00N0.50	●	●	●	●		N	6.00	24.0	0.50	3.5
-M40		GX09-1E2.00N0.20-M40	●	●		●		N	2.00	9.0	0.20	1.5
		GX09-2E3.00N0.30-M40	●	●		●		N	3.00	9.0	0.30	2.0
		GX16-1E2.00N0.20-M40	●	●		●		N	2.00	16.0	0.20	2.0
		GX16-2E3.00N0.30-M40	●	●		●		N	3.00	16.0	0.30	3.0
		GX16-3E4.00N0.40-M40	●	●		●		N	4.00	16.0	0.40	3.5
		GX16-3E5.00N0.40-M40	●	●		●		N	5.00	16.0	0.40	3.5
		GX16-4E6.00N0.50-M40	●	●		●		N	6.00	16.0	0.50	4.0
		GX24-2E3.00N0.30-M40	●	●		●		N	3.00	24.0	0.30	3.5
		GX24-3E4.00N0.40-M40	●	●		●		N	4.00	24.0	0.40	4.0
		GX24-3E5.00N0.40-M40	●	●		●		N	5.00	24.0	0.40	4.0
		GX24-4E6.00N0.50-M40	●	●		●		N	6.00	24.0	0.50	4.0
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	l	r	a_{max}

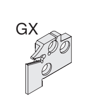



C47-C62

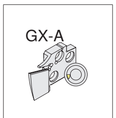

C63-C64


C239

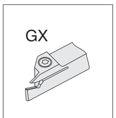

C227



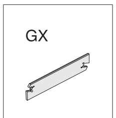
C176-C178



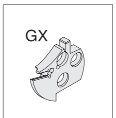
C181-C182



C188-C190



C198



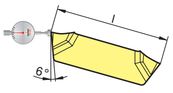
C210-C212

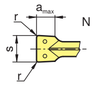
C215-C217

GX-E system

	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]
-M1		GX16-1E2.00N0.20-M1		●		●		N	2.00	16.0	0.20	2.0
		GX16-2E3.00N0.20-M1	●	●		●		N	3.00	16.0		2.5
		GX16-3E4.00N0.30-M1	●	●				N	4.00	16.0	0.30	3.0
		GX24-1E2.00N0.20-M1	●	●		●		N	2.00	24.0	0.20	2.5
		GX24-2E3.00N0.20-M1	●	●		●		N	3.00	24.0	0.20	2.5
		GX24-3E4.00N0.30-M1	●	●		●		N	4.00	24.0	0.30	3.0
-27P		GX16-1E2.00N0.20-27P					●	N	2.00	16.0	0.20	2.0
		GX16-2E3.00N0.30-27P					●	N	3.00	16.0	0.30	2.5
		GX16-3E4.00N0.40-27P					●	N	4.00	16.0	0.40	3.0
		GX16-4E6.00N0.50-27P					●	N	6.00	16.0	0.50	3.5
		GX24-2E3.00N0.30-27P					●	N	3.00	24.0	0.30	2.5
		GX24-3E4.00N0.40-27P					●	N	4.00	24.0	0.40	3.0
		GX24-3E5.00N0.40-27P					●	N	5.00	24.0	0.40	3.0
		GX24-4E6.00N0.50-27P					●	N	6.00	24.0	0.50	3.5
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	l	r	a_{max}



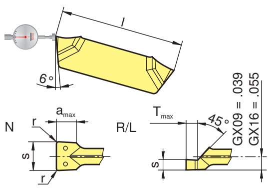


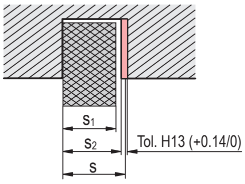
C47-C62
C63-C64
C239
C227
GX C176-C178
GX-A C181-C182
GX C188-C190
GX C198
GX C210-C212
GX C215-C217

GX-S system

	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	s₁ [mm]	s₂ [mm]	l [mm]	r [mm]	T_max [mm]	a_max [mm]
ER-EL		GX09-1S0.60L		●				L	0.60	0.40	0.50	9.0		0.75	
		GX09-1S0.60R		●				R	0.60	0.40	0.50	9.0		0.75	
		GX09-1S0.80L		●				L	0.80	0.60	0.70	9.0		0.94	
		GX09-1S0.80R		●				R	0.80	0.60	0.70	9.0		0.94	
		GX09-1S0.90L		●				L	0.90	0.70	0.80	9.0		1.04	
		GX09-1S0.90R		●				R	0.90	0.70	0.80	9.0		1.04	
		GX09-1S1.00L		●				L	1.00	0.80	0.90	9.0		1.14	
		GX09-1S1.00R		●				R	1.00	0.80	0.90	9.0		1.14	
		GX09-1S1.20L		●				L	1.20	1.00	1.10	9.0		1.34	
		GX09-1S1.20R		●				R	1.20	1.00	1.10	9.0		1.34	
		GX09-1S1.40L		●				L	1.40	1.20	1.30	9.0		1.53	
		GX09-1S1.40R		●				R	1.40	1.20	1.30	9.0		1.53	
		GX09-1S1.70L		●				L	1.70	1.50	1.60	9.0		1.82	
		GX09-1S1.70R		●				R	1.70	1.50	1.60	9.0		1.82	
		GX16-2S0.60L		●				L	0.60	0.40	0.50	16.0		0.75	
		GX16-2S0.60R		●				R	0.60	0.40	0.50	16.0		0.75	
		GX16-2S0.80L		●				L	0.80	0.60	0.70	16.0		0.94	
		GX16-2S0.80R		●				R	0.80	0.60	0.70	16.0		0.94	
		GX16-2S0.90L		●				L	0.90	0.70	0.80	16.0		1.04	
		GX16-2S0.90R		●				R	0.90	0.70	0.80	16.0		1.04	
		GX16-2S1.00L		●				L	1.00	0.80	0.90	16.0		1.14	
		GX16-2S1.00R		●				R	1.00	0.80	0.90	16.0		1.14	
		GX16-2S1.20L		●				L	1.20	1.00	1.10	16.0		1.34	
		GX16-2S1.20R		●				R	1.20	1.00	1.10	16.0		1.34	
		GX16-2S1.40L		●				L	1.40	1.20	1.30	16.0		1.53	
		GX16-2S1.40R		●				R	1.40	1.20	1.30	16.0		1.53	
		GX16-2S1.70L		●				L	1.70	1.50	1.60	16.0		1.82	
		GX16-2S1.70R		●				R	1.70	1.50	1.60	16.0		1.82	
		GX16-2S1.95L		●				L	1.95	1.75	1.85	16.0		2.07	
		GX16-2S1.95R		●				R	1.95	1.75	1.85	16.0		2.07	
		GX16-2S2.25L		●				L	2.25	2.00	2.15	16.0		2.36	
		GX16-2S2.25R		●				R	2.25	2.00	2.15	16.0		2.36	
EN		GX09-1S1.95N		●				N	1.95	1.75	1.85	9.0	0.10	7.00	2.0
		GX09-1S2.25N		●				N	2.25	2.00	2.15	9.0	0.10	7.00	2.0
		GX09-2S2.75N		●				N	2.75	2.50	2.65	9.0	0.10	7.00	2.0
		GX09-2S3.25N		●				N	3.25	3.00	3.15	9.0	0.10	7.00	2.0
		GX16-2S2.75N		●				N	2.75	2.50	2.65	16.0	0.10	12.00	3.0
		GX16-2S3.25N		●				N	3.25	3.00	3.15	16.0	0.10	12.00	3.0
		GX16-3S4.25N		●				N	4.25	4.00	4.15	16.0	0.20	12.00	3.5
		GX16-4S5.25N		●				N	5.25	5.00	5.15	16.0	0.20	12.00	4.0
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	s₁	s₂	l	r	T_max	a_max





DIN 471 - 472: DIN standard for circlip grooves

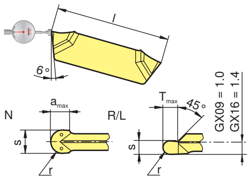
s:	insert width
s_1:	circlip width
s_2:	standard groove width H13 (+0.14/0)

C47-C62 | C63-C64 | C239 | C227 | GX C179-C180 | GX C188-C189 | GX C213-C214 | GX C215-C216

GX-R system

	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	T_{max} [mm]	a_{max} [mm]
ER-EL		GX09-1R0.80L	●					L	1.60	9.0	0.80	1.78	
		GX09-1R0.80R	●					R	1.60	9.0	0.80	1.78	
		GX16-2R0.80L	●					L	1.60	16.0	0.80	1.78	
		GX16-2R0.80R	●					R	1.60	16.0	0.80	1.78	
		GX16-2R1.00L	●					L	2.00	16.0	1.00	2.18	
		GX16-2R1.00R	●					R	2.00	16.0	1.00	2.18	
		GX16-2R1.20L	●					L	2.40	16.0	1.20	2.58	
		GX16-2R1.20R	●					R	2.40	16.0	1.20	2.58	
EN		GX09-1R1.00N	●					N	2.00	9.0	1.00	7.00	1.0
		GX09-1R1.20N	●					N	2.40	9.0	1.20	7.00	1.0
		GX16-2R1.50N	●	●				N	3.00	16.0	1.50	12.00	1.5
		GX16-3R2.00N	●	●				N	4.00	16.0	2.00	12.00	2.0
		GX16-3R2.50N	●	●				N	5.00	16.0	2.50	12.00	2.5
		GX16-4R3.00N	●	●				N	6.00	16.0	3.00	12.00	3.0
-M3		GX24-2R1.50N-M3	●		●			N	3.00	24.4	1.50	21.00	1.5
		GX24-3R2.00N-M3	●		●			N	4.00	24.4	2.00	21.00	2.5
		GX24-3R2.50N-M3	●		●			N	5.00	24.4	2.50	21.00	3.0
		GX24-4R3.00N-M3	●		●			N	6.00	24.4	3.00	21.00	4.0
-27P		GX16-2R1.50N-27P					●	N	3.00	16.0	1.50	12.00	1.5
		GX16-3R2.00N-27P					●	N	4.00	16.0	2.00	12.00	2.0
		GX16-3R2.50N-27P					●	N	5.00	16.0	2.50	12.00	2.5
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	l	r	T_{max}	a_{max}

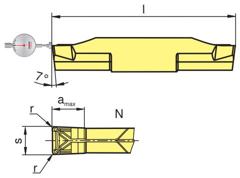


C47-C62
C63-C64
C239
C227
GX C181-C182
GX-A C181-C182
GX C188-C190
GX C198
GX C210-C214
GX C215-C217

AX system

	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]
-F50		AX05-E3.00N0.30-10-F50		●				N	3.00	24.0	0.30	5.0
		AX10-E3.00N0.30-20-F50		●				N	3.00	34.0	0.30	10.0
		AX15-E3.00N0.30-30-F50		●				N	3.00	44.0	0.30	15.0

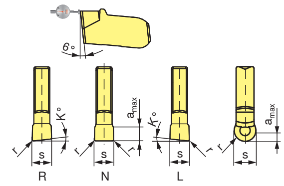


C47-C62
C63-C64
C239
C227
AX C183
AX C192-C193

SX system

	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	r [mm]	a_{max} [mm]	K [°]
-F2		SX E2.00N0.20-F2		●		●		N	2.00	0.20	1.5	
		SX E3.00N0.30-F2	●	●	●	●		N	3.00	0.30	2.0	
		SX E4.00N0.40-F2		●		●		N	4.00	0.40	2.5	
-M2		SX E2.00N0.20-M2	●	●	●	●		N	2.00	0.20	1.5	
		SX E3.00N0.30-M2	●	●	●	●		N	3.00	0.30	2.0	
		SX E4.00N0.40-M2	●	●	●	●		N	4.00	0.40	2.5	
		SX E5.00N0.40-M2	●	●	●	●		N	5.00	0.40	2.7	
		SX E6.00N0.50-M2	●	●	●	●		N	6.00	0.50	3.0	
-M3		SX R1.50N-M3		●	●			N	3.00	1.50	1.5	
		SX R2.00N-M3		●	●			N	4.00	2.00	2.0	
		SX R2.50N-M3		●	●			N	5.00	2.50	2.5	
		SX R3.00N-M3		●				N	6.00	3.00	3.0	
-M1		SX E2.00L6-M1		●				L	2.00	0.20		6
		SX E2.00N0.20-M1	●	●		●		N	2.00	0.20		
		SX E2.00R6-M1		●				R	2.00	0.20		6
		SX E3.00L6-M1	●	●				L	3.00	0.20		6
		SX E3.00N0.20-M1	●	●	●	●		N	3.00	0.20		
		SX E3.00R6-M1	●	●				R	3.00	0.20		6
		SX E4.00L6-M1		●				L	4.00	0.30		6
		SX E4.00N0.30-M1	●	●	●	●		N	4.00	0.30		
		SX E4.00R6-M1		●				R	4.00	0.30		6
		SX E5.00N0.30-M1	●	●		●		N	5.00	0.30		
		SX E6.00N0.40-M1	●	●		●		N	6.00	0.40		
-27P		SX E2.00N0.20-27P					●	N	2.00	0.20	2.0	
		SX E3.00N0.30-27P					●	N	3.00	0.30	2.5	
		SX E4.00N0.40-27P					●	N	4.00	0.40	3.0	
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	r	a_{max}	K



C47-C62

C63-C64

C239

C227

SX C184

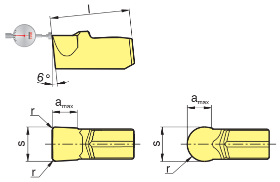
SX C199

SX C199-C201

LX system

	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]
-M2		LX E10.00N0.80-M2	●	●	●			N	10.00	19.0	0.80	5.0
		LX E8.00N0.80-M2	●	●	●			N	8.00	19.0	0.80	5.0
-M3		LX R4.00N-M3	●	●	●			N	8.00	19.0	4.00	5.0

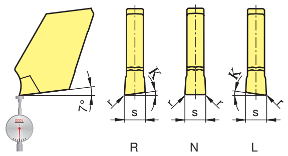


C47-C62
C63-C64
C239
C227
LX C185
LX C202

FX system

	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	r [mm]	K [°]
-F1		FX 2.2L5-F1		●		●		L	2.20	0.15	5
		FX 2.2N0.15-F1	●	●		●		N	2.20	0.15	
		FX 2.2R5-F1		●		●		R	2.20	0.15	5
		FX 3.1L5-F1		●		●		L	3.10	0.20	5
		FX 3.1L8-F1				●		L	3.10	0.20	8
		FX 3.1N0.20-F1	●	●		●		N	3.10	0.20	
		FX 3.1N0.40-F1	●	●		●		N	3.10	0.40	
		FX 3.1R5-F1		●		●		R	3.10	0.20	5
		FX 3.1R8-F1				●		R	3.10	0.20	8
		FX 4.1N0.20-F1		●		●		N	4.10	0.20	
		FX 4.1N0.50-F1				●		N	4.10	0.50	
-M1		FX 2.2L4-M1		●	●	●		L	2.20	0.10	4
		FX 2.2N0.10-M1	●	●	●	●		N	2.20	0.10	
		FX 2.2R4-M1		●	●	●		R	2.20	0.10	4
		FX 3.1L6-M1	●	●	●	●		L	3.10	0.15	6
		FX 3.1N0.15-M1	●	●	●	●		N	3.10	0.15	
		FX 3.1R6-M1	●	●	●	●		R	3.10	0.15	6
		FX 4.1L6-M1		●	●	●		L	4.10	0.20	6
		FX 4.1N0.20-M1	●	●	●	●		N	4.10	0.20	
		FX 4.1R6-M1		●	●	●		R	4.10	0.20	6
		FX 5.1N0.25-M1	●	●	●	●		N	5.10	0.25	
		FX 5.1R6-M1				●		R	5.10	0.25	6
		FX 6.5N0.30-M1	●	●	●			N	6.50	0.30	
		FX 8.2N0.40-M1	●	●	●			N	8.20	0.40	
		FX 9.7N0.40-M1	●	●	●			N	9.70	0.40	
-R2		FX 3.1N0.40-R2	●	●		●		N	3.10	0.40	
		FX 4.1N0.50-R2	●	●		●		N	4.10	0.50	
-27P		FX 2.2N0.10-27P					●	N	2.20	0.10	
		FX 3.1N0.15-27P					●	N	3.10	0.15	
		FX 4.1N0.15-27P					●	N	4.10	0.20	
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	r	K

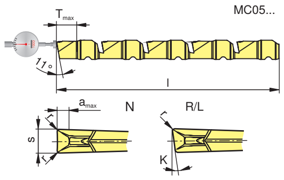


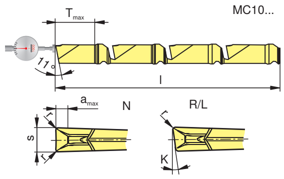
C47-C62 | C63-C64 | C239 | C227 | FX C186-C187 | FX C195 | FX C203

MaxiClick system

	CTCP325	CTP1340	CTCP335	CTPP345	H216T
P	●	●	●	●	
M	○	●	○	●	
K	●	●	●		●
N					●
S		●		○	
H					

			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s [mm]	l [mm]	r [mm]	a_{max} [mm]	T_{max} [mm]	K [°]
-F2		MC 05-5-1.00L07-F2		●				L	1.00	59.2	0.10		5.00	7
		MC 05-5-1.00N0.10-F2		●				N	1.00	59.2	0.10	0.5	5.00	
		MC 05-5-1.00R07-F2		●				R	1.00	59.2	0.10		5.00	7
		MC 05-5-1.50L07-F2		●				L	1.50	59.2	0.10		5.00	7
		MC 05-5-1.50N0.10-F2		●				N	1.50	59.2	0.10	0.7	5.00	
		MC 05-5-1.50R07-F2		●				R	1.50	59.2	0.10		5.00	7
		MC 10-4-1.50L07-F2		●				L	1.50	59.2	0.10		10.00	7
		MC 10-4-1.50N0.10-F2		●				N	1.50	59.2	0.10	1.0	10.00	
		MC 10-4-1.50R07-F2		●				R	1.50	59.2	0.10		10.00	7
		MC 10-4-2.00L07-F2		●				L	2.00	59.2	0.10		10.00	7
		MC 10-4-2.00N0.10-F2		●				N	2.00	59.2	0.10	1.2	10.00	
		MC 10-4-2.00R07-F2		●				R	2.00	59.2	0.10		10.00	7
		MC 10-4-2.50L07-F2		●				L	2.50	59.2	0.10		10.00	7
		MC 10-4-2.50N0.10-F2		●				N	2.50	59.2	0.10	1.5	10.00	
		MC 10-4-2.50R07-F2		●				R	2.50	59.2	0.10		10.00	7
-F3		MC 10-4-1.50L12-F3		●				L	1.50	59.2	0.10		10.00	12
		MC 10-4-1.50R12-F3		●				R	1.50	59.2	0.10		10.00	12
		MC 10-4-2.00L12-F3		●				L	2.00	59.2	0.10		10.00	12
		MC 10-4-2.00R12-F3		●				R	2.00	59.2	0.10		10.00	12
		MC 10-4-2.50L12-F3		●				L	2.50	59.2	0.10		10.00	12
		MC 10-4-2.50R12-F3		●				R	2.50	59.2	0.10		10.00	12
			CTCP325	CTP1340	CTCP335	CTPP345	H216T	LNR	s	l	r	a_{max}	T_{max}	K





C47-C62

C63-C64

C239

C227

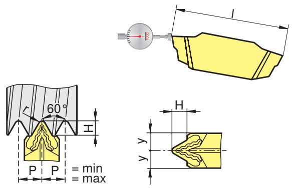
MaxiClick C196-C197

TC system

Partial profile 60°

	H216T	GM213	GM240
P		●	●
M		●	●
K	●	●	
N	●		
S			
H			

			H216T	GM213	GM240	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	l [mm]	r [mm]	H [mm]	y [mm]
-27P		TC16-1 EI-A60-27P	●			0.50	1.50	16	48	16.0	0.05	1.28	1.05
		TC16-2 EI-AG60-27P	●			0.50	3.00	8	48	16.0	0.05	2.58	2.15
		TC16-2 EI-G60-27P	●			1.75	3.00	8	14	16.0	0.15	2.49	2.15
		TC16-3 EI-N60-27P	●			3.50	5.00	5	7	16.0	0.25	4.11	3.10
EN		TC16-1 EI-A60		●	●	0.50	1.50	16	48	16.0	0.05	1.28	1.05
		TC16-2 EI-AG60		●	●	0.50	3.00	8	48	16.0	0.05	2.58	2.15
		TC16-2 EI-G60		●	●	1.75	3.00	8	14	16.0	0.15	2.49	2.15
		TC16-3 EI-N60		●	●	3.50	5.00	5	7	16.0	0.25	4.11	3.10
			H216T	GM213	GM240	P_{min}	P_{max}	P_{min}	P_{max}	l	r	H	y

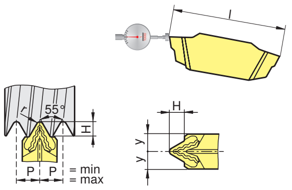


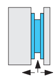
TC system

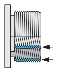
Partial profile 55°

	H216T	GM213	GM240
P		●	●
M		●	●
K	●	●	
N	●		
S			
H			

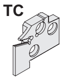
			H216T	GM213	GM240	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	l [mm]	r [mm]	H [mm]	y [mm]
EN		TC16-1 EI-A55		●	●	0.50	1.50	16	48	16.0	0.12	1.39	1.05
		TC16-2 EI-AG55		●	●	0.50	3.00	8	48	16.0	0.12	2.92	2.15
		TC16-2 EI-G55		●	●	1.75	3.00	8	14	16.0	0.23	2.78	2.15
		TC16-3 EI-N55		●	●	3.50	5.00	5	7	16.0	0.46	4.34	3.10
			H216T	GM213	GM240	P_{min}	P_{max}	P_{min}	P_{max}	l	r	H	y



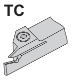

C135-C137


C247-C259

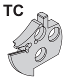

C227



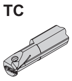
C218



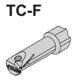
C219



C219



C221



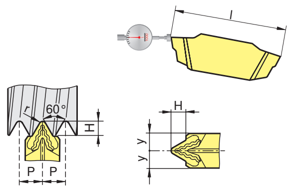
C222

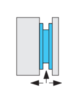
TC system

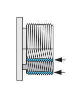
Full profile 60°

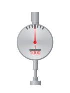
	H216T	GM213	GM240
P		●	●
M		●	●
K	●	●	
N	●		
S			
H			

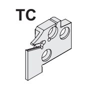
			H216T	GM213	GM240	Pmin [mm]	l [mm]	r [mm]	H [mm]	y [mm]
-27P		TC16-1 E 0,5 ISO-27P	●			0.50	16.0	0.05	0.33	1.05
		TC16-1 E 0,75 ISO-27P	●			0.75	16.0	0.08	0.49	1.05
		TC16-1 E 1,0 ISO-27P	●			1.00	16.0	0.12	0.64	1.05
		TC16-1 E 1,25 ISO-27P	●			1.25	16.0	0.15	0.80	1.05
		TC16-1 E 1,5 ISO-27P	●			1.50	16.0	0.18	0.96	1.05
		TC16-1 I 1,0 ISO-27P	●			1.00	16.0	0.05	0.60	1.05
		TC16-1 I 1,5 ISO-27P	●			1.50	16.0	0.08	0.89	1.05
		TC16-2 E 1,75 ISO-27P	●			1.75	16.0	0.22	1.11	2.15
		TC16-2 E 2,0 ISO-27P	●			2.00	16.0	0.25	1.27	2.15
		TC16-2 E 2,5 ISO-27P	●			2.50	16.0	0.31	1.58	2.15
		TC16-2 E 3,0 ISO-27P	●			3.00	16.0	0.38	1.90	2.15
		TC16-2 I 2,0 ISO-27P	●			2.00	16.0	0.12	1.18	2.15
		TC16-2 I 3,0 ISO-27P	●			3.00	16.0	0.19	1.76	2.15
EN		TC16-1 E 0,5 ISO		●	●	0.50	16.0	0.05	0.33	1.05
		TC16-1 E 0,75 ISO		●	●	0.75	16.0	0.08	0.49	1.05
		TC16-1 E 1,0 ISO		●	●	1.00	16.0	0.12	0.64	1.05
		TC16-1 E 1,25 ISO		●	●	1.25	16.0	0.15	0.80	1.05
		TC16-1 E 1,5 ISO		●	●	1.50	16.0	0.18	0.96	1.05
		TC16-1 I 0,5 ISO		●	●	0.50	16.0	0.02	0.30	1.05
		TC16-1 I 0,75 ISO		●	●	0.75	16.0	0.04	0.45	1.05
		TC16-1 I 1,0 ISO		●	●	1.00	16.0	0.05	0.60	1.05
		TC16-1 I 1,25 ISO		●	●	1.25	16.0	0.07	0.75	1.05
		TC16-1 I 1,5 ISO		●	●	1.50	16.0	0.08	0.89	1.05
		TC16-2 E 1,75 ISO		●	●	1.75	16.0	0.22	1.11	2.15
		TC16-2 E 2,0 ISO		●	●	2.00	16.0	0.25	1.27	2.15
		TC16-2 E 2,5 ISO		●	●	2.50	16.0	0.31	1.58	2.15
		TC16-2 E 3,0 ISO		●	●	3.00	16.0	0.38	1.90	2.15
		TC16-2 I 1,75 ISO		●	●	1.75	16.0	0.11	1.03	2.15
		TC16-2 I 2,0 ISO		●	●	2.00	16.0	0.12	1.18	2.15
		TC16-2 I 2,5 ISO		●	●	2.50	16.0	0.16	1.47	2.15
		TC16-2 I 3,0 ISO		●	●	3.00	16.0	0.19	1.76	2.15
		TC16-3 E 3,5 ISO		●	●	3.50	16.0	0.44	2.22	3.10
		TC16-3 E 4,0 ISO		●	●	4.00	16.0	0.50	2.53	3.10
		TC16-3 E 4,5 ISO		●	●	4.50	16.0	0.56	2.85	3.10
		TC16-3 E 5,0 ISO		●	●	5.00	16.0	0.63	3.16	3.10
		TC16-3 I 3,5 ISO		●	●	3.50	16.0	0.22	2.06	3.10
		TC16-3 I 4,0 ISO		●	●	4.00	16.0	0.25	2.35	3.10
		TC16-3 I 4,5 ISO		●	●	4.50	16.0	0.28	2.64	3.10
		TC16-3 I 5,0 ISO		●	●	5.00	16.0	0.31	2.94	3.10
			H216T	GM213	GM240	Pmin	l	r	H	y



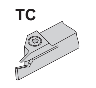

C135-C137


C247-C259

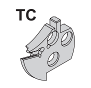

C227



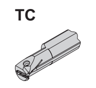
C218



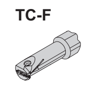
C219



C219



C221

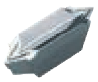


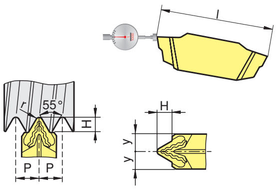
C222

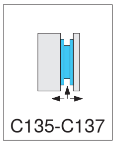
TC system

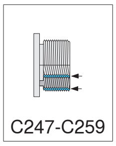
Full profile 55°

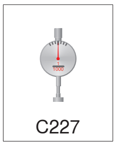
	H216T	GM213	GM240
P		●	●
M		●	●
K	●	●	
N	●		
S			
H			

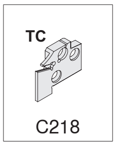
			H216T	GM213	GM240	P_{min} [TPI]	l [mm]	r [mm]	H [mm]	y [mm]
-27P		TC16-1 EI 19 W-27P	●			19	16.0	0.17	0.89	1.05
		TC16-2 EI 11 W-27P	●			11	16.0	0.29	1.54	2.15
		TC16-2 EI 14 W-27P	●			14	16.0	0.23	1.21	2.15
EN		TC16-1 EI 16 W		●	●	16	16.0	0.20	1.06	1.05
		TC16-1 EI 18 W		●	●	18	16.0	0.18	0.94	1.05
		TC16-1 EI 19 W		●	●	19	16.0	0.17	0.89	1.05
		TC16-1 EI 20 W		●	●	20	16.0	0.16	0.84	1.05
		TC16-1 EI 24 W		●	●	24	16.0	0.13	0.70	1.05
		TC16-1 EI 26 W		●	●	26	16.0	0.12	0.65	1.05
		TC16-1 EI 28 W		●	●	28	16.0	0.12	0.60	1.05
		TC16-2 EI 10 W		●	●	10	16.0	0.32	1.69	2.15
		TC16-2 EI 11 W		●	●	11	16.0	0.29	1.54	2.15
		TC16-2 EI 12 W		●	●	12	16.0	0.27	1.41	2.15
		TC16-2 EI 14 W		●	●	14	16.0	0.23	1.21	2.15
		TC16-2 EI 8 W		●	●	8	16.0	0.40	2.11	2.15
		TC16-2 EI 9 W		●	●	9	16.0	0.36	1.88	2.15
		TC16-3 EI 5 W		●	●	5	16.0	0.64	3.38	3.10
		TC16-3 EI 6 W		●		6	16.0	0.54	2.82	3.10
		TC16-3 EI 7 W		●	●	7	16.0	0.46	2.41	3.10
			H216T	GM213	GM240	P_{min}	l	r	H	y



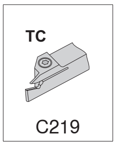

C135-C137


C247-C259

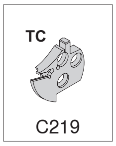

C227



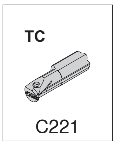
C218



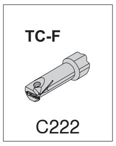
C219



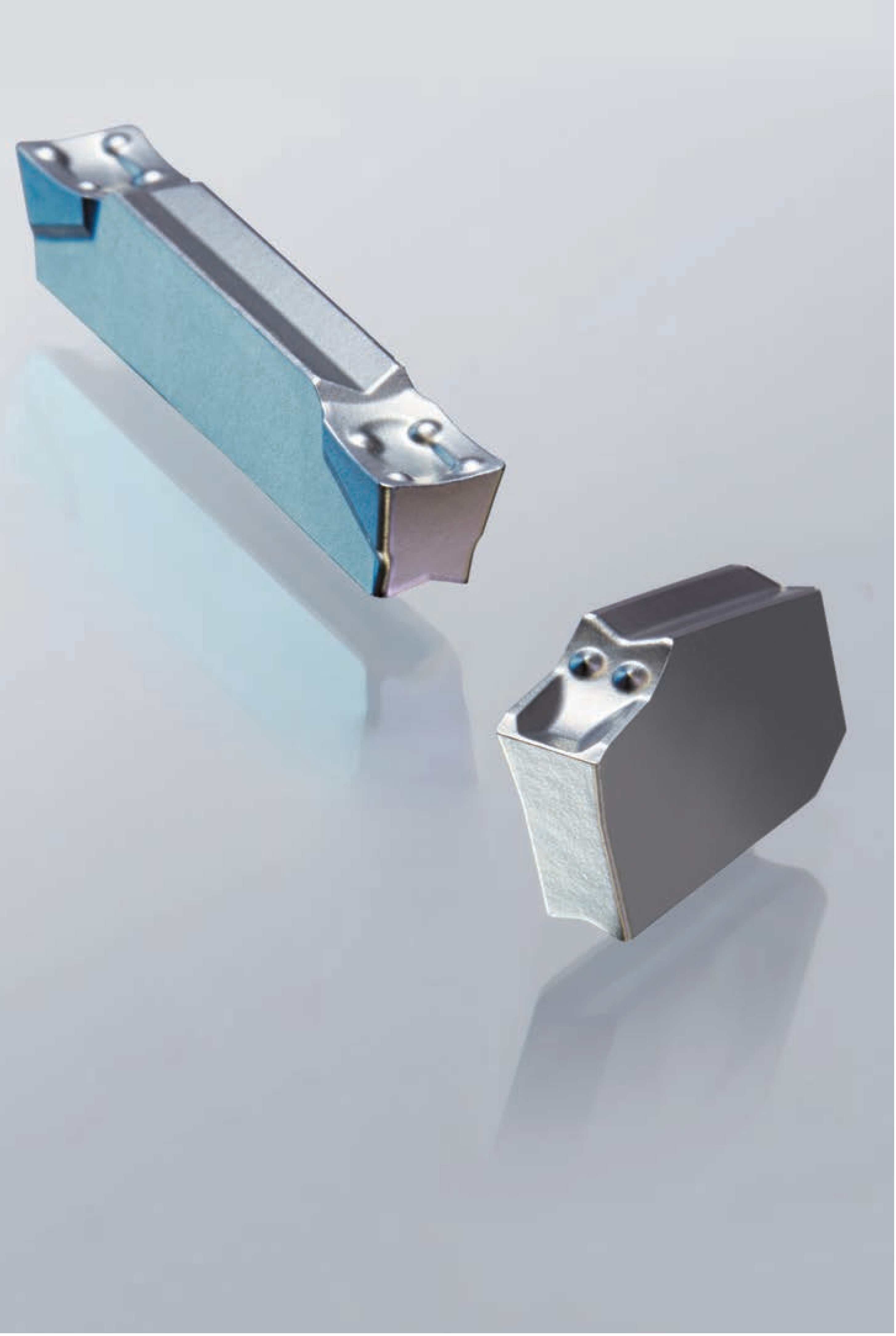
C219



C221



C222



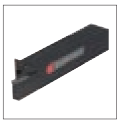
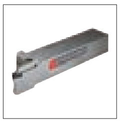
Overview

Tools

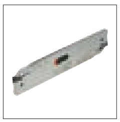
Overview

Tools

Monoblock tool holders

	GX09	C188
	GX16	C189
	GX24	C190
	AX	C192-C193
	SX	C194
	FX	C195
	MaxiClick	C196-C197

Blades

	GX24	C198
	SX	C199
	SX reinforced	C200-C201
	LX	C202
	FX	C203

Clamping blocks

	SBN...K	C204
	SBN...KS	C205
	HSK-T...KH	C206

Boring bars

	1.5 x D	C207
	2.5 x D	C208
	UTS 2.0 x D	C209

Modules - internal

	GX09	C210
	GX16	C211
	GX24	C212
	GX09	C213
	GX16	C214

Overview

Tools

Monoblock boring bars

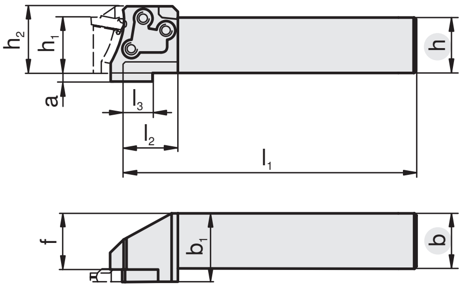
	GX09	C215
	GX16	C216
	GX24	C217

Threading - monoblock tools and modules

	TC16	C218
	TC monoblock	C219
	TC16	C220
	TC monoblock	C221
	TC milling cutters	C222

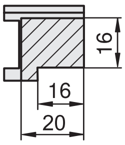
MSS shanks

0 °



Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	h [mm]	b [mm]	h_1 [mm]	h_2 [mm]	b_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	a [mm]	f [mm]		
12	MSS-E12R00-1212E	R	12	12	12	14.5	15.25	70	12			11.75	MSS-E12R..	E01
12	MSS-E12L00-1212E	L	12	12	12	14.5	15.25	70	12			11.75	MSS-E12L..	E01
16	MSS-E16R00-1616G	R	16	16	16	19.5	19.25	90	16			15.75	MSS-E16R..	E02
16	MSS-E16L00-1616G	L	16	16	16	19.5	19.25	90	16			15.75	MSS-E16L..	E02
20	MSS-E20R00-1620G	R	16	20	16	24.0	24.25	90	20			20.15	MSS-E20R..	E03
20	MSS-E20R00-2020J	R	20	20	20	24.0	24.25	110	20			20.15	MSS-E20R..	E03
20	MSS-E20L00-1620G	L	16	20	16	24.0	24.25	90	20			20.15	MSS-E20L..	E03
20	MSS-E20L00-2020J	L	20	20	20	24.0	24.25	110	20			20.15	MSS-E20L..	E03
25	MSS-E25R00-2525L	R	25	25	25	30.0	31.00	140	25			25.50	MSS-E25R..	E04
25	MSS-E25L00-2525L	L	25	25	25	30.0	31.00	140	25			25.50	MSS-E25L..	E04
32	MSS-E32R00-3232Q	R	32	32	32	38.8	38.00	180	32	16.0	3.00	32.50	MSS-E32R..	E05
32	MSS-E32R00-3225N	R	32	25	32	38.0	31.00	160	32			25.50	MSS-E32R..	E05
32	MSS-E32L00-3232Q	L	32	32	32	38.8	38.00	180	32	16.0	3.00	32.50	MSS-E32L..	E05
32	MSS-E32L00-3225N	L	32	25	32	38.0	31.00	160	32			25.50	MSS-E32L..	E05



valid only for:
MSS-E20R/L00-10-E

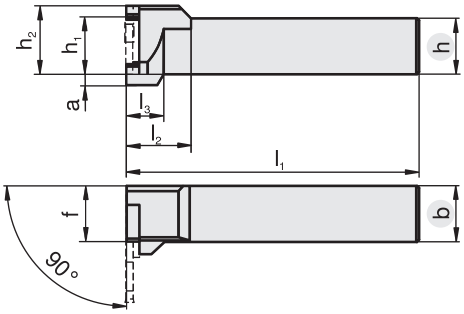
			
E01	228617	8095010200	
E02	228620		220983
E03	195068		220983
E04	195069		220985
E05	195070		200317

	GX	GX	GX-A	AX	SX	LX	FX	**TC**
C269	C176-C178	C179-C180	C181-C182	C183	C184	C185	C186-C187	C218

MSS shanks

90°

Picture shows right-hand version



Bgr. [mm]	Type, description	L N R	h [mm]	b [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	a [mm]	f [mm]		
20	MSS-E20R90-2020J	R	20	20	20	24.0	110	20			20.00	MSS-E20L..	E01
20	MSS-E20L90-2020J	L	20	20	20	24.0	110	20			20.00	MSS-E20R..	E01
25	MSS-E25R90-2525L	R	25	25	25	30.0	140	28			25.00	MSS-E25L..	E02
25	MSS-E25L90-2525L	L	25	25	25	30.0	140	28			25.00	MSS-E25R..	E02
32	MSS-E32R90-3232R	R	32	32	32	38.8	200	34	19.2	3.00	32.00	MSS-E32L..	E03
32	MSS-E32R90-3225N	R	32	25	32	38.0	160	34			32.00	MSS-E32L..	E03
32	MSS-E32L90-3225N	L	32	25	32	38.0	160	34			32.00	MSS-E32R..	E03
32	MSS-E32L90-3232R	L	32	32	32	38.8	200	34	19.2	3.00	32.00	MSS-E32R..	E03

⚠

Right-hand shank - left-hand module
Left-hand shank - right-hand module

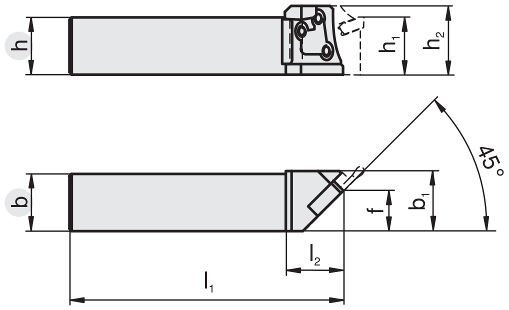
E01	195068	220983
E02	195069	220985
E03	195070	200317

C269
GX C176-C178
GX C179-C180
GX-A C181-C182
AX C183
SX C184
LX C185
FX C186-C187
TC C218

MSS shanks

45°

Picture shows left-hand version



Bgr. [mm]	Type, description	L N R	h [mm]	b [mm]	h1 [mm]	h2 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	a [mm]	f [mm]		
20	MSS-E20R45-2020J	R	20	20	20	24.0	110	20			14.50	MSS-E20L..	E01
20	MSS-E20L45-2020J	L	20	20	20	24.0	110	20			14.50	MSS-E20R..	E01
25	MSS-E25R45-2525L	R	25	25	25	30.0	140	25			18.00	MSS-E25L..	E02
25	MSS-E25L45-2525L	L	25	25	25	30.0	140	25			18.00	MSS-E25R..	E02

⚠

Right-hand shank - left-hand module
Left-hand shank - right-hand module

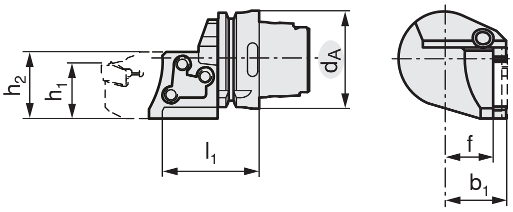
E01	219981	195068	220983
E02	219982	195069	220985

C269

GX
C179

MSS tool holders

HSK-T 0°



Picture shows right-hand version

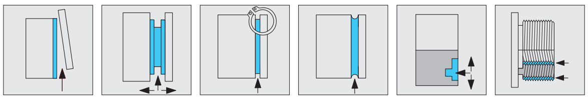
Bgr. [mm]	Type, description	L N R	d_A [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	b_1 [mm]	f [mm]		
25	HSK-T63-MSS-E25R00	R	63	25	31.3	67	44.20	38.70	MSS-E25R..	E01
25	HSK-T100-MSS-E25R00	R	100	31.2	49.0	100	54.50	49.00	MSS-E25R..	E01
25	HSK-T63-MSS-E25L00	L	63	25	31.3	67	44.20	38.70	MSS-E25L..	E01
25	HSK-T100-MSS-E25L00	L	100	31.2	49.0	100	54.50	49.00	MSS-E25L..	E01
32	HSK-T63-MSS-E32R00	R	63	35	41.0	74	44.20	38.70	MSS-E32R..	E02
32	HSK-T100-MSS-E32R00	R	100	43.8	49.8	77	54.20	48.70	MSS-E32R..	E02
32	HSK-T63-MSS-E32L00	L	63	35	41.0	74	44.20	38.70	MSS-E32L..	E02
32	HSK-T100-MSS-E32L00	L	100	43.8	49.8	77	54.20	48.70	MSS-E32L..	E02

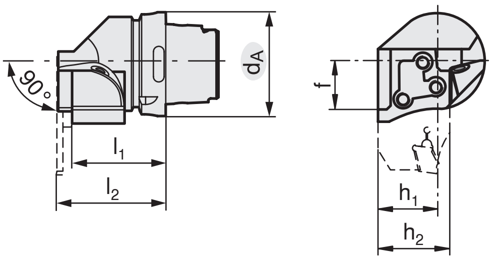
			
E01	11848510	195069	220985
E02	11848510	195070	200317

C269
GX C176-C178
GX C179-C180
GX-A C181-C182
AX C183
SX C184
LX C185
FX C186-C187
TC C218

MSS tool holders

HSK-T 90°





Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	d_A [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
32	HSK-T63-MSS-E32R90	R	63	34.8	40.9	63.7	69.2	31.50	MSS-E32L..	E01
32	HSK-T100-MSS-E32R90	R	100	43.8	49.8	73.7	79.2	50.00	MSS-E32L..	E01
32	HSK-T63-MSS-E32L90	L	63	34.8	40.9	63.7	69.2	31.50	MSS-E32R..	E01
32	HSK-T100-MSS-E32L90	L	100	43.8	49.8	73.7	79.2	50.00	MSS-E32R..	E01

⚠

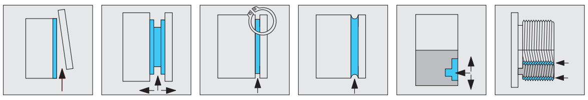
Right-hand shank - left-hand module
Left-hand shank - right-hand module

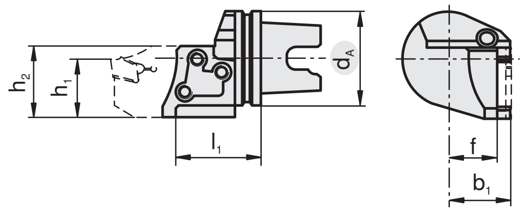
			
E01	11848510	195070	200317

	GX	GX	GX-A	AX	SX	LX	FX	TC
C269	C176-C178	C179-C180	C181-C182	C183	C184	C185	C186-C187	C218

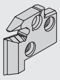
MSS tool holders

UTS 0°





Picture shows right-hand version

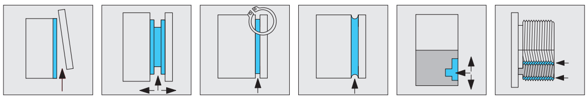
Bgr. [mm]	Type, description	L N R	d_A [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	b_1 [mm]	f [mm]		
25	UT40-MSS-E25R00	R	40	25	30.0	36	26.40	20.50	MSS-E25R..	E01
25	UT50-MSS-E25R00	R	50	25	30.0	42	31.40	25.50	MSS-E25R..	E02
25	UT63-MSS-E25R00	R	63	25	30.0	50	37.40	31.50	MSS-E25R..	E03
25	UT40-MSS-E25L00	L	40	25	30.0	36	26.40	20.50	MSS-E25L..	E01
25	UT50-MSS-E25L00	L	50	25	30.0	42	31.40	25.50	MSS-E25L..	E02
25	UT63-MSS-E25L00	L	63	25	30.0	50	37.40	31.50	MSS-E25L..	E03
32	UT50-MSS-E32R00	R	50	35	41.8	49	31.40	25.50	MSS-E32R..	E04
32	UT63-MSS-E32R00	R	63	35	41.8	50	37.40	31.50	MSS-E32R..	E05
32	UT63-MSS-E32L00	L	63	35	41.8	50	37.40	31.50	MSS-E32L..	E05

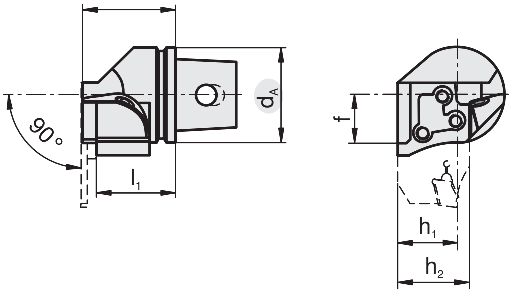
				
E01	201850	195069	194263	220985
E02	201850	195069	225429	220985
E03	231176	195069	225430	220985
E04	201850	195070	225429	200317
E05	231176	195070	225430	200317

	GX	GX	GX-A	AX	LX	FX	TC
C269	C176-C178	C179-C180	C181-C182	C183	C185	C186-C187	C218

MSS tool holders

UTS 90°





Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	d_A [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
25	UT40-MSS-E25R90	R	40	25	30.0	33.5	39	20.00	MSS-E25L..	E01
25	UT50-MSS-E25R90	R	50	25	30.0	43.5	49	25.00	MSS-E25L..	E02
25	UT40-MSS-E25L90	L	40	25	30.0	33.5	39	20.00	MSS-E25R..	E01
25	UT50-MSS-E25L90	L	50	25	30.0	43.5	49	25.00	MSS-E25R..	E02

⚠

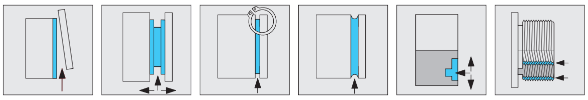
Right-hand shank - left-hand module
Left-hand shank - right-hand module

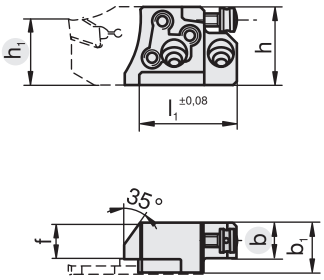
				
E01	201850	195069	194263	220985
E02	201850	195069	225429	220985

	GX	GX	GX-A	AX	SX	LX	FX	TC
C269	C176-C178	C179-C180	C181-C182	C183	C184	C185	C186-C187	C218

MSS tool holders

Adapters





Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	h_1 [mm]	b [mm]	h [mm]	b_1 [mm]	l_1 [mm]	f [mm]		
20	MSS-E20R00-AD	R	20	10.7	24	15.3	30	11.2	MSS-E20R..	E01
20	MSS-E20L00-AD	L	20	10.7	24	15.3	30	11.2	MSS-E20L..	E01
25	MSS-E25R00-AD	R	25	12.6	30	18.6	37	13.1	MSS-E25R..	E02
25	MSS-E25L00-AD	L	25	12.6	30	18.6	37	13.1	MSS-E25L..	E02
32	MSS-E32R00-AD	R	32	14.6	38	20.6	46	15.1	MSS-E32R..	E03
32	MSS-E32L00-AD	L	32	14.6	38	20.6	46	15.1	MSS-E32L..	E03

⚠

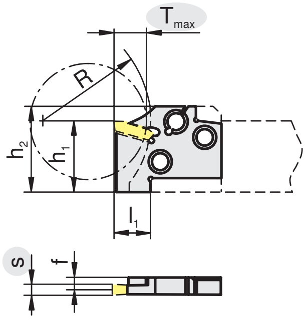
For additional assembly dimensions see C267-C268

			
E01	195068	229131	220983
E02	195069	284518	220985
E03	195070	229126	200317

	GX	GX	GX-A	AX	SX	LX	FX	TC
C269	C176	C179	C181-C182	C183	C184	C185	C186-C187	C218

MSS modules – external

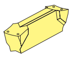
Grooving and turning – GX09



Picture shows right-hand version

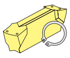
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
12	MSS-E12R07-GX09-1	R	2.00	2.75	7	12	14.5	8	3.15	18	GX09-1..
12	MSS-E12R07-GX09-2	R	2.76	3.75	7	12	14.5	8	3.15	18	GX09-2..
12	MSS-E12L07-GX09-1	L	2.00	2.75	7	12	14.5	8	3.15	18	GX09-1..
12	MSS-E12L07-GX09-2	L	2.76	3.75	7	12	14.5	8	3.15	18	GX09-2..
16	MSS-E16R07-GX09-1	R	2.00	2.75	7	16	19.5	8	3.15	24	GX09-1..
16	MSS-E16R07-GX09-2	R	2.76	3.75	7	16	19.5	8	3.15	24	GX09-2..
16	MSS-E16L07-GX09-1	L	2.00	2.75	7	16	19.5	8	3.15	24	GX09-1..
16	MSS-E16L07-GX09-2	L	2.76	3.75	7	16	19.5	8	3.15	24	GX09-2..

GX-E



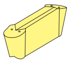
C151-C152

GX-S

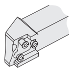


C153

GX-R



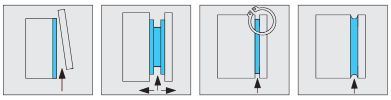
C154

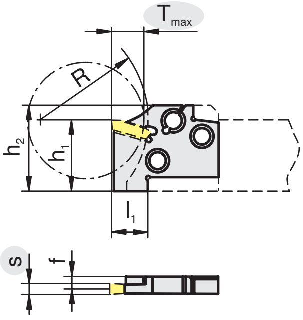


C168

MSS modules – external

Grooving and turning – GX16

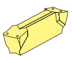




Picture shows right-hand version

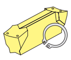
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
20	MSS-E20R12-GX16-1	R	2.00	2.75	12	20	24	13	3.75	30	GX16-1..
20	MSS-E20R12-GX16-2	R	2.76	3.75	12	20	24	13	3.40	30	GX16-2..
20	MSS-E20R12-GX16-3	R	3.76	5.00	12	20	24	13	2.93	30	GX16-3..
20	MSS-E20L12-GX16-1	L	2.00	2.75	12	20	24	13	3.75	30	GX16-1..
20	MSS-E20L12-GX16-2	L	2.76	3.75	12	20	24	13	3.40	30	GX16-2..
20	MSS-E20L12-GX16-3	L	3.76	5.00	12	20	24	13	2.93	30	GX16-3..
25	MSS-E25R12-GX16-1	R	2.00	2.75	12	25	30	13	5.25	37.5	GX16-1..
25	MSS-E25R12-GX16-2	R	2.76	3.75	12	25	30	13	4.90	37.5	GX16-2..
25	MSS-E25R12-GX16-3	R	3.76	5.00	12	25	30	13	4.43	37.5	GX16-3..
25	MSS-E25R12-GX16-4	R	5.01	6.50	12	25	30	13	3.80	37.5	GX16-4..
25	MSS-E25L12-GX16-1	L	2.00	2.75	12	25	30	13	5.25	37.5	GX16-1..
25	MSS-E25L12-GX16-2	L	2.76	3.75	12	25	30	13	4.90	37.5	GX16-2..
25	MSS-E25L12-GX16-3	L	3.76	5.00	12	25	30	13	4.43	37.5	GX16-3..
25	MSS-E25L12-GX16-4	L	5.01	6.50	12	25	30	13	3.80	37.5	GX16-4..
32	MSS-E32R12-GX16-2	R	2.76	3.75	12	32	38	13	4.90	48	GX16-2..
32	MSS-E32R12-GX16-3	R	3.76	5.00	12	32	38	13	4.43	48	GX16-3..
32	MSS-E32R12-GX16-4	R	5.01	6.50	12	32	38	13	3.80	48	GX16-4..
32	MSS-E32L12-GX16-2	L	2.76	3.75	12	32	38	13	4.90	48	GX16-2..
32	MSS-E32L12-GX16-3	L	3.76	5.00	12	32	38	13	4.43	48	GX16-3..
32	MSS-E32L12-GX16-4	L	5.01	6.50	12	32	38	13	3.80	48	GX16-4..

GX-E



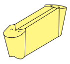
C151

GX-S

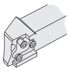


C153

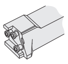
GX-R



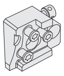
C154



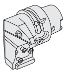
C168



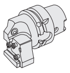
C169



C175



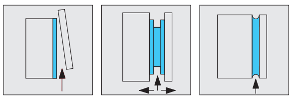
C171+C173



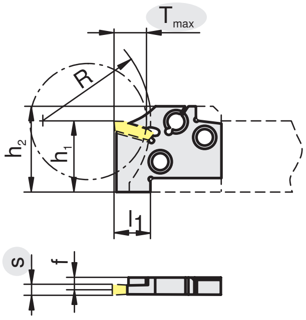
C172+C174

MSS modules – external

Grooving and turning – GX24

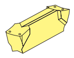


Picture shows right-hand version



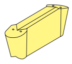
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
20	MSS-E20R21-GX24-1	R	2.00	2.75	21	20	24	22	3.85	30	GX24-1..
20	MSS-E20R21-GX24-2	R	2.76	3.75	21	20	24	22	3.40	30	GX24-2..
20	MSS-E20R21-GX24-3	R	3.76	5.00	21	20	24	22	3.00	30	GX24-3..
20	MSS-E20L21-GX24-1	L	2.00	2.75	21	20	24	22	3.85	30	GX24-1..
20	MSS-E20L21-GX24-2	L	2.76	3.75	21	20	24	22	3.40	30	GX24-2..
20	MSS-E20L21-GX24-3	L	3.76	5.00	21	20	24	22	3.00	30	GX24-3..
25	MSS-E25R21-GX24-1	R	2.00	2.75	21	25	30	22	5.35	37.5	GX24-1..
25	MSS-E25R21-GX24-2	R	2.76	3.75	21	25	30	22	4.90	37.5	GX24-2..
25	MSS-E25R21-GX24-3	R	3.76	5.00	21	25	30	22	4.43	37.5	GX24-3..
25	MSS-E25R21-GX24-4	R	5.01	6.50	21	25	30	22	3.80	37.5	GX24-4..
25	MSS-E25R21-GX24-5	R	8.00	8.00	21	25	30	23	2.95	37.5	GX24-5..
25	MSS-E25L21-GX24-1	L	2.00	2.75	21	25	30	22	5.35	37.5	GX24-1..
25	MSS-E25L21-GX24-2	L	2.76	3.75	21	25	30	22	4.90	37.5	GX24-2..
25	MSS-E25L21-GX24-3	L	3.76	5.00	21	25	30	22	4.43	37.5	GX24-3..
25	MSS-E25L21-GX24-4	L	5.01	6.50	21	25	30	22	3.80	37.5	GX24-4..
25	MSS-E25L21-GX24-5	L	8.00	8.00	21	25	30	23	2.95	37.5	GX24-5..
32	MSS-E32R21-GX24-2	R	2.76	3.75	21	32	38	22	4.95	48	GX24-2..
32	MSS-E32R21-GX24-3	R	3.76	5.00	21	32	38	22	4.43	48	GX24-3..
32	MSS-E32R21-GX24-4	R	5.01	6.50	21	32	38	22	3.80	48	GX24-4..
32	MSS-E32L21-GX24-2	L	2.76	3.75	21	32	38	22	4.95	48	GX24-2..
32	MSS-E32L21-GX24-3	L	3.76	5.00	21	32	38	22	4.43	48	GX24-3..
32	MSS-E32L21-GX24-4	L	5.01	6.50	21	32	38	22	3.80	48	GX24-4..

GX-E

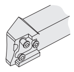


C151-C152

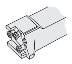
GX-R



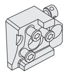
C154



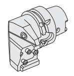
C168



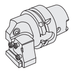
C169



C175



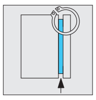
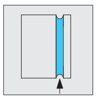
C171+C173

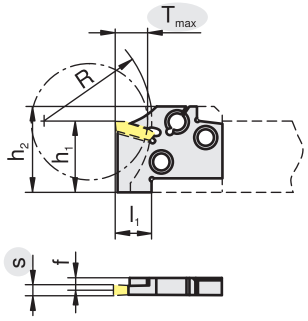


C172+C174

MSS modules – external

Circlip and radius grooves – GX09



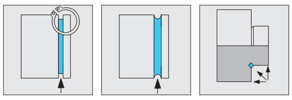
Picture shows right-hand version

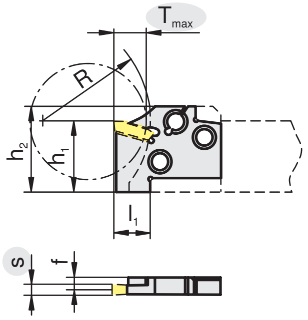
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
12	MSS-E12R02-GX09-1	R	0.60	1.95	2	12	14.5	8	3.15	18	GX09-1..R/L
12	MSS-E12L02-GX09-1	L	0.60	1.95	2	12	14.5	8	3.15	18	GX09-1..R/L
16	MSS-E16R02-GX09-1	R	0.60	1.95	2	16	19.5	8	3.15	24	GX09-1..R/L
16	MSS-E16L02-GX09-1	L	0.60	1.95	2	16	19.5	8	3.15	24	GX09-1..R/L

GX-S
C153
GX-R
C154
C168

MSS modules – external

Circlip and radius grooves – GX16





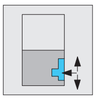
Picture shows right-hand version

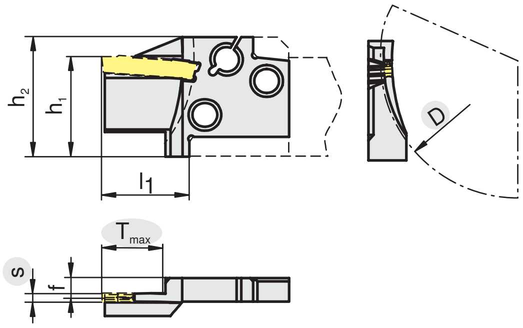
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
20	MSS-E20R03-GX16-2	R	0.60	2.75	3	20	24	13	3.40	30	GX16-2..R/L
20	MSS-E20L03-GX16-2	L	0.60	2.75	3	20	24	13	3.40	30	GX16-2..R/L
25	MSS-E25R03-GX16-2	R	0.60	2.75	3	25	30	13	4.90	37.5	GX16-2..R/L
25	MSS-E25L03-GX16-2	L	0.60	2.75	3	25	30	13	4.90	37.5	GX16-2..R/L
32	MSS-E32R03-GX16-2	R	0.60	2.75	3	32	38	13	4.90	48	GX16-2..R/L
32	MSS-E32L03-GX16-2	L	0.60	2.75	3	32	38	13	4.90	48	GX16-2..R/L

GX-S C153
GX-R C154
C168
C170
C169
C175
C171+C173
C172+C174

MSS modules – external

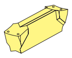
Axial grooves – GX24

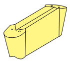


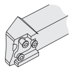


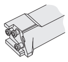
Picture shows right-hand version

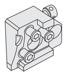
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	D_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	
20	MSS-E20R14-GX24-2 A50-70	R	2.76	3.75	14	50	70	20	24	22	3.40	GX24-2..
20	MSS-E20R14-GX24-2 A70-100	R	2.76	3.75	14	70	100	20	24	22	3.40	GX24-2..
20	MSS-E20R14-GX24-2 A100-150	R	2.76	3.75	14	100	150	20	24	22	3.40	GX24-2..
20	MSS-E20L14-GX24-2 A50-70	L	2.76	3.75	14	50	70	20	24	22	3.40	GX24-2..
20	MSS-E20L14-GX24-2 A70-100	L	2.76	3.75	14	70	100	20	24	22	3.40	GX24-2..
20	MSS-E20L14-GX24-2 A100-150	L	2.76	3.75	14	100	150	20	24	22	3.40	GX24-2..
25	MSS-E25R15-GX24-2 A50-70	R	2.76	3.75	15	50	70	25	30	22	4.90	GX24-2..
25	MSS-E25R15-GX24-2 A100-150	R	2.76	3.75	15	100	150	25	30	22	4.90	GX24-2..
25	MSS-E25R15-GX24-2 A70-100	R	2.76	3.75	15	70	100	25	30	22	4.90	GX24-2..
25	MSS-E25R15-GX24-3 A100-150	R	3.76	5.00	15	100	150	25	30	22	4.43	GX24-3..
25	MSS-E25R15-GX24-3 A70-100	R	3.76	5.00	15	70	100	25	30	22	4.43	GX24-3..
25	MSS-E25R15-GX24-3 A150-300	R	3.76	5.00	15	150	300	25	30	22	4.43	GX24-3..
25	MSS-E25R15-GX24-3 A50-70	R	3.76	5.00	15	50	70	25	30	22	4.43	GX24-3..
25	MSS-E25R15-GX24-4 A50-70	R	5.01	6.50	15	50	70	25	30	22	3.80	GX24-4..
25	MSS-E25R15-GX24-4 A150-300	R	5.01	6.50	15	150	300	25	30	22	3.80	GX24-4..
25	MSS-E25R15-GX24-4 A100-150	R	5.01	6.50	15	100	150	25	30	22	3.80	GX24-4..
25	MSS-E25R15-GX24-4 A70-100	R	5.01	6.50	15	70	100	25	30	22	3.80	GX24-4..
25	MSS-E25L15-GX24-2 A50-70	L	2.76	3.75	15	50	70	25	30	22	4.90	GX24-2..
25	MSS-E25L15-GX24-2 A100-150	L	2.76	3.75	15	100	150	25	30	22	4.90	GX24-2..
25	MSS-E25L15-GX24-2 A70-100	L	2.76	3.75	15	70	100	25	30	22	4.90	GX24-2..
25	MSS-E25L15-GX24-3 A100-150	L	3.76	5.00	15	100	150	25	30	22	4.43	GX24-3..
25	MSS-E25L15-GX24-3 A70-100	L	3.76	5.00	15	70	100	25	30	22	4.43	GX24-3..
25	MSS-E25L15-GX24-3 A150-300	L	3.76	5.00	15	150	300	25	30	22	4.43	GX24-3..
25	MSS-E25L15-GX24-3 A50-70	L	3.76	5.00	15	50	70	25	30	22	4.43	GX24-3..
25	MSS-E25L15-GX24-4 A100-150	L	5.01	6.50	15	100	150	25	30	22	3.80	GX24-4..
25	MSS-E25L15-GX24-4 A70-100	L	5.01	6.50	15	70	100	25	30	22	3.80	GX24-4..
25	MSS-E25L15-GX24-4 A50-70	L	5.01	6.50	15	50	70	25	30	22	3.80	GX24-4..
25	MSS-E25L15-GX24-4 A150-300	L	5.01	6.50	15	150	300	25	30	22	3.80	GX24-4..
32	MSS-E32R15-GX24-3 A70-100	R	3.76	5.00	15	70	100	32	38	22	4.43	GX24-3..
32	MSS-E32R15-GX24-3 A150-300	R	3.76	5.00	15	150	300	32	38	22	4.43	GX24-3..
32	MSS-E32R15-GX24-3 A100-150	R	3.76	5.00	15	100	150	32	38	22	4.43	GX24-3..
32	MSS-E32R15-GX24-4 A70-100	R	5.01	6.50	15	70	100	32	38	22	3.80	GX24-4..
32	MSS-E32R15-GX24-4 A150-300	R	5.01	6.50	15	150	300	32	38	22	3.80	GX24-4..
32	MSS-E32R15-GX24-4 A100-150	R	5.01	6.50	15	100	150	32	38	22	4.43	GX24-4..
32	MSS-E32R15-GX24-4 A300-900	R	5.01	6.50	15	300	900	32	38	22	3.80	GX24-4..
32	MSS-E32L15-GX24-3 A150-300	L	3.76	5.00	15	150	300	32	38	22	4.43	GX24-3..
32	MSS-E32L15-GX24-3 A70-100	L	3.76	5.00	15	70	100	32	38	22	4.43	GX24-3..
32	MSS-E32L15-GX24-3 A100-150	L	3.76	5.00	15	100	150	32	38	22	4.43	GX24-3..
32	MSS-E32L15-GX24-4 A70-100	L	5.01	6.50	15	70	100	32	38	22	3.80	GX24-4..
32	MSS-E32L15-GX24-4 A300-900	L	5.01	6.50	15	300	900	32	38	22	3.80	GX24-4..
32	MSS-E32L15-GX24-4 A100-150	L	5.01	6.50	15	100	150	32	38	22	3.80	GX24-4..
32	MSS-E32L15-GX24-4 A150-300	L	5.01	6.50	15	150	300	32	38	22	3.80	GX24-4..

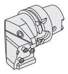
GX-E

C151-C152

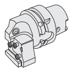
GX-R

C154


C168


C169

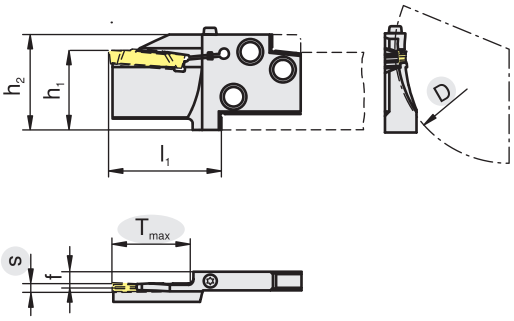

C175


C171+C173


C172+C174

MSS modules – external

Axial grooves – GX24



Picture shows right-hand version

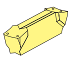
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	D_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]		
25	MSS-E25R21-GX24-3 AS100-150	R	3.76	5.00	21	100	150	25	30	35	4.43	GX24-3..	E01
25	MSS-E25R21-GX24-3 AS70-100	R	3.76	5.00	21	70	100	25	30	35	4.43	GX24-3..	E01
25	MSS-E25R21-GX24-3 AS50-70	R	3.76	5.00	21	50	70	25	30	35	4.43	GX24-3..	E01
25	MSS-E25R21-GX24-3 AS150-300	R	3.76	5.00	21	150	300	25	30	35	4.43	GX24-3..	E01
25	MSS-E25R25-GX24-4 AS100-150	R	5.01	6.50	25	100	150	25	30	35	3.80	GX24-4..	E01
25	MSS-E25R25-GX24-4 AS70-100	R	5.01	6.50	25	70	100	25	30	35	3.80	GX24-4..	E01
25	MSS-E25R25-GX24-4 AS50-70	R	5.01	6.50	25	50	70	25	30	35	3.80	GX24-4..	E01
25	MSS-E25R25-GX24-4 AS150-300	R	5.01	6.50	25	150	300	25	30	35	3.80	GX24-4..	E01
25	MSS-E25L21-GX24-3 AS50-70	L	3.76	5.00	21	50	70	25	30	35	4.43	GX24-3..	E01
25	MSS-E25L21-GX24-3 AS70-100	L	3.76	5.00	21	70	100	25	30	35	4.43	GX24-3..	E01
25	MSS-E25L21-GX24-3 AS100-150	L	3.76	5.00	21	100	150	25	30	35	4.43	GX24-3..	E01
25	MSS-E25L21-GX24-3 AS150-300	L	3.76	5.00	21	150	300	25	30	35	4.43	GX24-3..	E01
25	MSS-E25L25-GX24-4 AS50-70	L	5.01	6.50	25	50	70	25	30	35	3.80	GX24-4..	E01
25	MSS-E25L25-GX24-4 AS70-100	L	5.01	6.50	25	70	100	25	30	35	3.80	GX24-4..	E01
25	MSS-E25L25-GX24-4 AS100-150	L	5.01	6.50	25	100	150	25	30	35	3.80	GX24-4..	E01
25	MSS-E25L25-GX24-4 AS150-300	L	5.01	6.50	25	150	300	25	30	35	3.80	GX24-4..	E01

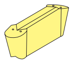
⚠

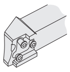
Axial modules in long version can be clamped from either side.
See pages C241-C244

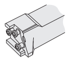
			
E01	11081190	11149570	220983

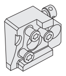
C269

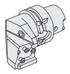
GX-E

C151-C152

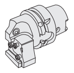
GX-R

C154


C168


C169

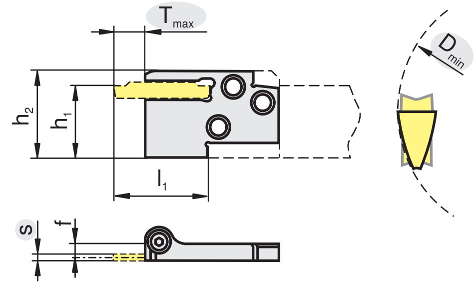

C175


C171+C173


C172+C174

MSS modules – external

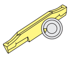
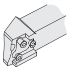
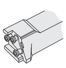
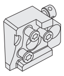
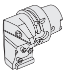
Axial grooves – AX



Picture shows right-hand version

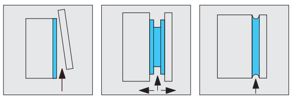
Bgr. [mm]	Type, description	L N R	s [mm]	D_{min} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]		
16	MSS-E16R05-AX05	R	3.0	10	5	16	20.5	24	2.50	AX05..	E01
16	MSS-E16L05-AX05	L	3.0	10	5	16	20.5	24	2.50	AX05..	E01
20	MSS-E20R10-AX10	R	3.0	20	10	20	25	33	3.10	AX10..	E02
20	MSS-E20R15-AX15	R	3.0	30	15	20	25	44	3.10	AX15..	E02
20	MSS-E20R05-AX05	R	3.0	10	5	20	25	28	3.10	AX05..	E02
20	MSS-E20L15-AX15	L	3.0	30	15	20	25	44	3.10	AX15..	E02
20	MSS-E20L10-AX10	L	3.0	20	10	20	25	33	3.10	AX10..	E02
20	MSS-E20L05-AX05	L	3.0	10	5	20	25	28	3.10	AX05..	E02
25	MSS-E25R10-AX10	R	3.0	20	10	25	30	32.5	4.60	AX10..	E03
25	MSS-E25R05-AX05	R	3.0	10	5	25	30	27.5	4.60	AX05..	E03
25	MSS-E25R15-AX15	R	3.0	30	15	25	30	43.5	4.60	AX15..	E03
25	MSS-E25L15-AX15	L	3.0	30	15	25	30	43.5	4.60	AX15..	E03
25	MSS-E25L10-AX10	L	3.0	20	10	25	30	32.5	4.60	AX10..	E03
25	MSS-E25L05-AX05	L	3.0	10	5	25	30	27.5	4.60	AX05..	E03

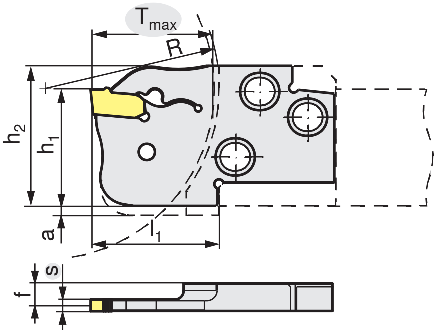
		
E01	228620	220983
E02	195068	220983
E03	195069	220985

	AX				
					
C269	C155	C168	C169	C175	C171+C173

MSS modules – external

Grooving and turning – SX



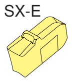


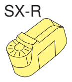
Picture shows right-hand version

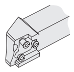
Bgr. [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	a [mm]	R [mm]		
20	MSS-E20R20-SX2	R	2.0	20	20	24	22	3.57	3.00	30	SX..2	E01
20	MSS-E20R20-SX3	R	3.0	20	20	24	22	3.20	3.00	30	SX..3	E01
20	MSS-E20L20-SX2	L	2.0	20	20	24	22	3.57	3.00	30	SX..2	E01
20	MSS-E20L20-SX3	L	3.0	20	20	24	22	3.20	3.00	30	SX..3	E01
25	MSS-E25R20-SX2	R	2.0	20	25	30	22	5.07		37.5	SX..2	E01
25	MSS-E25R25-SX3	R	3.0	25	25	30	27	4.70		37.5	SX..3	E01
25	MSS-E25R35-SX3	R	3.0	35	25	30	37	4.70		37.5	SX..3	E01
25	MSS-E25R25-SX4	R	4.0	25	25	30	27	4.30		37.5	SX..4	E02
25	MSS-E25R35-SX4	R	4.0	35	25	30	37	4.30		37.5	SX..4	E02
25	MSS-E25L20-SX2	L	2.0	20	25	30	22	5.07		37.5	SX..2	E01
25	MSS-E25L25-SX3	L	3.0	25	25	30	27	4.70		37.5	SX..3	E01
25	MSS-E25L35-SX3	L	3.0	35	25	30	37	4.70		37.5	SX..3	E01
25	MSS-E25L25-SX4	L	4.0	25	25	30	27	4.30		37.5	SX..4	E02
25	MSS-E25L35-SX4	L	4.0	35	25	30	37	4.30		37.5	SX..4	E02
32	MSS-E32R35-SX3	R	3.0	35	32	38	37	4.70		48	SX..3	E01
32	MSS-E32R35-SX4	R	4.0	35	32	38	37	4.30		48	SX..4	E02
32	MSS-E32L35-SX3	L	3.0	35	32	38	37	4.70		48	SX..3	E01
32	MSS-E32L35-SX4	L	4.0	35	32	38	37	4.30		48	SX..4	E02

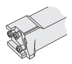
	
E01	11366865
E02	11366866

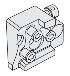

C269

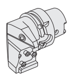
SX-E

C156

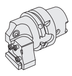
SX-R

C156


C168


C169

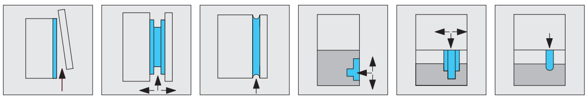

C175

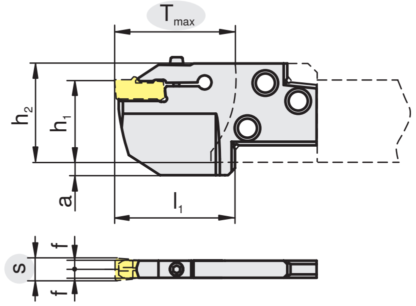

C171+C173


C172+C174

MSS modules – external

Grooving and turning – LX

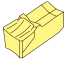
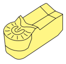
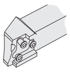
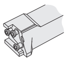
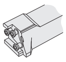
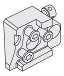
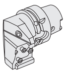
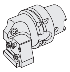




Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	a [mm]		
32	MSS-E32N25-LX	N	8.00	10.00	25	32	38.75	27	3.40	5.25	LX..	E01
32	MSS-E32N32-LX	N	8.00	10.00	32	32	38.75	34	3.40	5.25	LX..	E01
32	MSS-E32N45-LX	N	8.00	10.00	45	32	38.75	47	3.40	5.25	LX..	E01

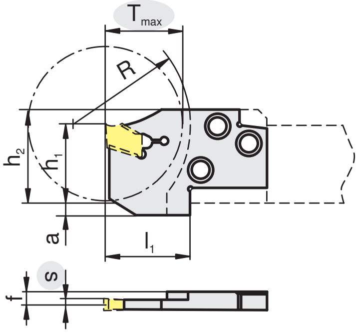
			
E01	11007006	11149571	220985

C269	LX-E  C157	LX-R  C157	 C168	 C169	 C175	 C175	 C171+C173	 C172+C174

MSS modules – external

Part-off – FX

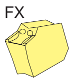
Picture shows right-hand version



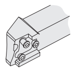
Bgr. [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	a [mm]	R [mm]		
20	MSS-E20R20-FX2.2	R	2.2	20	20	24	22	3.58	3.00	30	FX 2.2..	E01
20	MSS-E20R20-FX3.1	R	3.1	20	20	24	22	3.20	3.00	30	FX 3.1..	E02
20	MSS-E20R20-FX4.1	R	4.1	20	20	24	22	2.80	3.00	30	FX 4.1..	E02
20	MSS-E20L20-FX2.2	L	2.2	20	20	24	22	3.58	3.00	30	FX 2.2..	E01
20	MSS-E20L20-FX3.1	L	3.1	20	20	24	22	3.20	3.00	30	FX 3.1..	E02
20	MSS-E20L20-FX4.1	L	4.1	20	20	24	22	2.80	3.00	30	FX 4.1..	E02
25	MSS-E25R20-FX2.2	R	2.2	20	25	30	22	5.08		37.5	FX 2.2..	E01
25	MSS-E25R25-FX3.1	R	3.1	25	25	30	27	4.70		37.5	FX 3.1..	E02
25	MSS-E25R25-FX4.1	R	4.1	25	25	30	27	4.30		37.5	FX 4.1..	E02
25	MSS-E25R25-FX5.1	R	5.1	25	25	30	27	3.90		37.5	FX 5.1..	E02
25	MSS-E25R25-FX6.5	R	6.5	25	25	30	27	3.30		37.5	FX 6.5..	E02
25	MSS-E25L20-FX2.2	L	2.2	20	25	30	22	5.08		37.5	FX 2.2..	E01
25	MSS-E25L25-FX3.1	L	3.1	25	25	30	27	4.70		37.5	FX 3.1..	E02
25	MSS-E25L25-FX4.1	L	4.1	25	25	30	27	4.30		37.5	FX 4.1..	E02
25	MSS-E25L25-FX5.1	L	5.1	25	25	30	27	3.90		37.5	FX 5.1..	E02
25	MSS-E25L25-FX6.5	L	6.5	25	25	30	27	3.30		37.5	FX 6.5..	E02
32	MSS-E32R32-FX3.1	R	3.1	32	32	38	34	4.70		48	FX 3.1..	E02
32	MSS-E32R32-FX4.1	R	4.1	32	32	38	34	4.30		48	FX 4.1..	E02
32	MSS-E32R32-FX5.1	R	5.1	32	32	38	34	3.90		48	FX 5.1..	E02
32	MSS-E32R32-FX6.5	R	6.5	32	32	38	34	3.30		48	FX 6.5..	E02
32	MSS-E32L32-FX3.1	L	3.1	32	32	38	34	4.70		48	FX 3.1..	E02
32	MSS-E32L32-FX4.1	L	4.1	32	32	38	34	4.30		48	FX 4.1..	E02
32	MSS-E32L32-FX5.1	L	5.1	32	32	38	34	3.90		48	FX 5.1..	E02
32	MSS-E32L32-FX6.5	L	6.5	32	32	38	34	3.30		48	FX 6.5..	E02

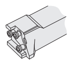
E01	154461
E02	154463

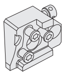

C269

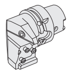


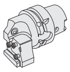
C158


C168


C169

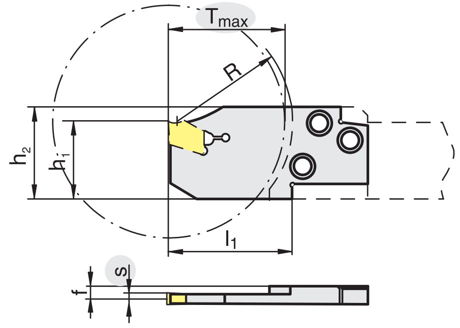

C175


C171+C173


C172+C174

MSS modules – external

Part-off – FX long



Picture shows right-hand version

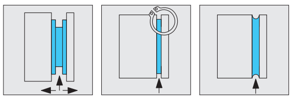
Bgr. [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]		
25	MSS-E25R35-FX3.1	R	3.1	35	25	30	37	4.70	37.5	FX 3.1..	E01
25	MSS-E25R35-FX4.1	R	4.1	35	25	30	37	4.30	37.5	FX 4.1..	E01
25	MSS-E25R35-FX5.1	R	5.1	35	25	30	37	3.90	37.5	FX 5.1..	E01
25	MSS-E25R35-FX6.5	R	6.5	35	25	30	37	3.30	37.5	FX 6.5..	E01
25	MSS-E25L35-FX3.1	L	3.1	35	25	30	37	4.70	37.5	FX 3.1..	E01
25	MSS-E25L35-FX4.1	L	4.1	35	25	30	37	4.30	37.5	FX 4.1..	E01
25	MSS-E25L35-FX5.1	L	5.1	35	25	30	37	3.90	37.5	FX 5.1..	E01
25	MSS-E25L35-FX6.5	L	6.5	35	25	30	37	3.30	37.5	FX 6.5..	E01
32	MSS-E32R45-FX3.1	R	3.1	45	32	38	47	4.70	48	FX 3.1..	E01
32	MSS-E32R45-FX4.1	R	4.1	45	32	38	47	4.30	48	FX 4.1..	E01
32	MSS-E32R45-FX5.1	R	5.1	45	32	38	47	3.90	48	FX 5.1..	E01
32	MSS-E32R45-FX6.5	R	6.5	45	32	38	47	3.30	48	FX 6.5..	E01
32	MSS-E32L45-FX3.1	L	3.1	45	32	38	47	4.70	48	FX 3.1..	E01
32	MSS-E32L45-FX4.1	L	4.1	45	32	38	47	4.30	48	FX 4.1..	E01
32	MSS-E32L45-FX5.1	L	5.1	45	32	38	47	3.90	48	FX 5.1..	E01
32	MSS-E32L45-FX6.5	L	6.5	45	32	38	47	3.30	48	FX 6.5..	E01

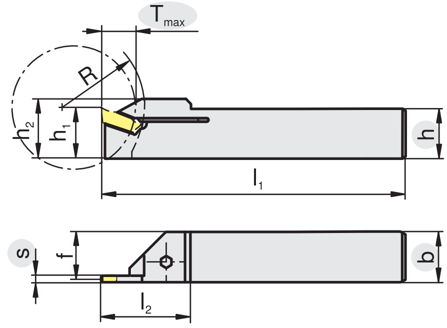
E01	154463

C269 FX C158 C168 C169 C175 C171+C173 C172+C174

Monoblock tool holders

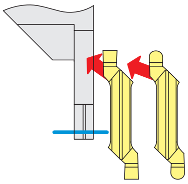
GX09





Picture shows right-hand version

h [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_2 [mm]	b [mm]	h_1 [mm]	l_1 [mm]	l_2 [mm]	f [mm]	R [mm]		
10	E10R00-1010M-GX09	R	2.00	3.75	7	12.0	10	10	150	18	9.35	15	GX09..	E01
10	E10L00-1010M-GX09	L	2.00	3.75	7	12.0	10	10	150	18	9.35	15	GX09..	E01



Attention:
When using right-hand or left-hand inserts (GX-S and GX-R), the tool requires modification to prevent the insert fouling.

		
E01	219981	220983

C269

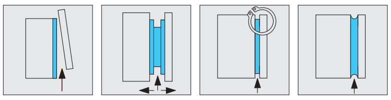
GX-E C151-C152

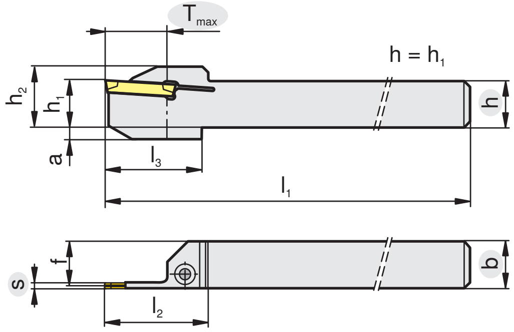
GX-S C153

GX-R C154

Monoblock tool holders

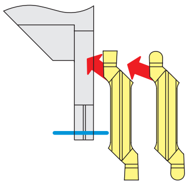
GX16





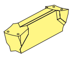
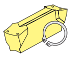
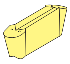
Picture shows right-hand version

h [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_2 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	a [mm]		
12	E12R0012-1212K-GX16-1	R	2.00	2.75	12	17.0	12	125	26	24.0	11.35	4.00	GX16-1..	E01
12	E12R0012-1212K-GX16-2	R	2.76	3.75	12	17.0	12	125	26	24.0	11.00	4.00	GX16-2..	E01
12	E12L0012-1212K-GX16-1	L	2.00	2.75	12	17.0	12	125	26	24.0	11.35	4.00	GX16-1..	E01
12	E12L0012-1212K-GX16-2	L	2.76	3.75	12	17.0	12	125	26	24.0	11.00	4.00	GX16-2..	E01
16	E16R0012-1616K-GX16-1	R	2.00	2.75	12	21.0	16	125	26	24.0	15.35	4.00	GX16-1..	E01
16	E16R0012-1616K-GX16-2	R	2.76	3.75	12	21.0	16	125	26	24.0	15.00	4.00	GX16-2..	E01
16	E16R0012-1616K-GX16-3	R	3.76	5.00	12	21.0	16	125	26	24.0	14.53	4.00	GX16-3..	E01
16	E16L0012-1616K-GX16-1	L	2.00	2.75	12	21.0	16	125	26	24.0	15.35	4.00	GX16-1..	E01
16	E16L0012-1616K-GX16-2	L	2.76	3.75	12	21.0	16	125	26	24.0	15.00	4.00	GX16-2..	E01
16	E16L0012-1616K-GX16-3	L	3.76	5.00	12	21.0	16	125	26	24.0	14.53	4.00	GX16-3..	E01
20	E20R0012-2020K-GX16-1	R	2.00	2.75	12	25.0	20	125	26		19.35		GX16-1..	E01
20	E20R0012-2020K-GX16-2	R	2.76	3.75	12	25.0	20	125	26		19.00		GX16-2..	E01
20	E20R0012-2020K-GX16-3	R	3.76	5.00	12	25.0	20	125	26		18.53		GX16-3..	E01
20	E20L0012-2020K-GX16-1	L	2.00	2.75	12	25.0	20	125	26		19.35		GX16-1..	E01
20	E20L0012-2020K-GX16-2	L	2.76	3.75	12	25.0	20	125	26		19.00		GX16-2..	E01
20	E20L0012-2020K-GX16-3	L	3.76	5.00	12	25.0	20	125	26		18.53		GX16-3..	E01
25	E25R0012-2525M-GX16-2	R	2.76	3.75	12	30.0	25	150	26		24.00		GX16-2..	E01
25	E25R0012-2525M-GX16-3	R	3.76	5.00	12	30.0	25	150	26		23.53		GX16-3..	E01
25	E25L0012-2525M-GX16-2	L	2.76	3.75	12	30.0	25	150	26		24.00		GX16-2..	E01
25	E25L0012-2525M-GX16-3	L	3.76	5.00	12	30.0	25	150	26		23.53		GX16-3..	E01



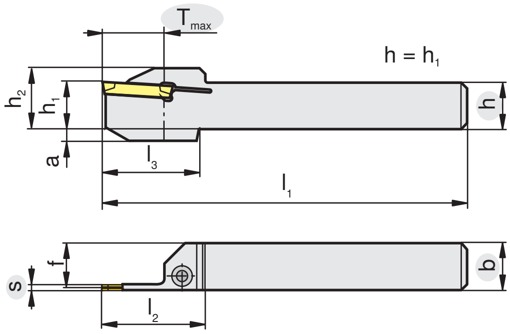
Attention:
When using right-hand or left-hand inserts (GX-S and GX-R), the tool requires modification to prevent the insert fouling.

		
E01	11081190	220983

	GX-E	GX-S	GX-R
			
C269	C151-C152	C153	C154

Monoblock tool holders

GX24



Picture shows right-hand version

h [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_2 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	a [mm]		
16	E16R0021-1616K-GX24-1	R	2.00	2.75	21	21.0	16	125	35	32.0	15.20	4.00	GX24-1..	E01
16	E16R0021-1616K-GX24-2	R	2.76	3.75	21	21.0	16	125	35	32.0	15.00	4.00	GX24-2..	E01
16	E16L0021-1616K-GX24-1	L	2.00	2.75	21	21.0	16	125	35	32.0	15.20	4.00	GX24-1..	E01
16	E16L0021-1616K-GX24-2	L	2.76	3.75	21	21.0	16	125	35	32.0	15.00	4.00	GX24-2..	E01
20	E20R0021-2020K-GX24-1	R	2.00	2.75	21	25.0	20	125	35		19.20		GX24-1..	E01
20	E20R0021-2020K-GX24-2	R	2.76	3.75	21	25.0	20	125	35		19.00		GX24-2..	E01
20	E20R0021-2020K-GX24-3	R	3.76	5.00	21	25.0	20	125	35		18.53		GX24-3..	E01
20	E20L0021-2020K-GX24-1	L	2.00	2.75	21	25.0	20	125	35		19.20		GX24-1..	E01
20	E20L0021-2020K-GX24-2	L	2.76	3.75	21	25.0	20	125	35		19.00		GX24-2..	E01
20	E20L0021-2020K-GX24-3	L	3.76	5.00	21	25.0	20	125	35		18.53		GX24-3..	E01
25	E25R0021-2525M-GX24-2	R	2.76	3.75	21	30.0	25	150	35		24.00		GX24-2..	E01
25	E25R0021-2525M-GX24-3	R	3.76	5.00	21	30.0	25	150	35		23.53		GX24-3..	E01
25	E25R0021-2525M-GX24-4	R	5.01	6.50	21	30.0	25	150	35		22.90		GX24-4..	E01
25	E25L0021-2525M-GX24-2	L	2.76	3.75	21	30.0	25	150	35		24.00		GX24-2..	E01
25	E25L0021-2525M-GX24-3	L	3.76	5.00	21	30.0	25	150	35		23.53		GX24-3..	E01
25	E25L0021-2525M-GX24-4	L	5.01	6.50	21	30.0	25	150	35		22.90		GX24-4..	E01
32	E32R0021-3225P-GX24-2	R	2.76	3.75	21	37.0	25	170	35		24.00		GX24-2..	E01
32	E32R0021-3225P-GX24-3	R	3.76	5.00	21	37.0	25	170	35		23.53		GX24-3..	E01
32	E32R0021-3225P-GX24-4	R	5.01	6.50	21	37.0	25	170	35		22.90		GX24-4..	E01
32	E32L0021-3225P-GX24-2	L	2.76	3.75	21	37.0	25	170	35		24.00		GX24-2..	E01
32	E32L0021-3225P-GX24-3	L	3.76	5.00	21	37.0	25	170	35		23.53		GX24-3..	E01
32	E32L0021-3225P-GX24-4	L	5.01	6.50	21	37.0	25	170	35		22.90		GX24-4..	E01

		
E01	11007006	220985

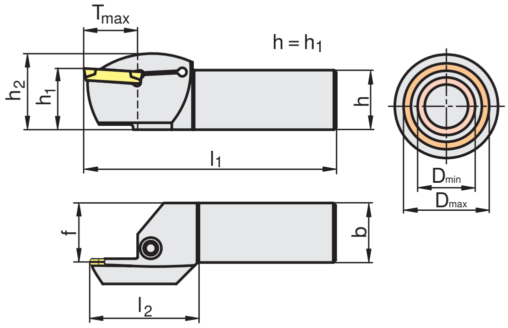
C269

GX-E C151

GX-R C154

Monoblock tool holders

Axial grooves GX24



Picture shows right-hand version

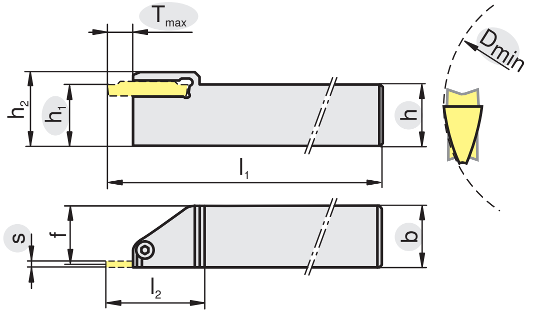
h [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	D_{min} [mm]	D_{max} [mm]	T_{max} [mm]	h_2 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
25	E25R0012-2525X-GX24-2 AS40-45	R	2.76	3.75	40	45	12	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0012-2525X-GX24-2 AS45-50	R	2.76	3.75	45	50	12	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0016-2525X-GX24-2 AS50-60	R	2.76	3.75	50	60	16	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0019-2525X-GX24-2 AS60-75	R	2.76	3.75	60	75	19	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0019-2525X-GX24-2 AS75-100	R	2.76	3.75	75	100	19	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0022-2525X-GX24-2 AS100-130	R	2.76	3.75	100	130	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0022-2525X-GX24-2 AS130-180	R	2.76	3.75	130	180	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0022-2525X-GX24-2 AS180-300	R	2.76	3.75	180	300	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25R0012-2525X-GX24-3 AS40-45	R	3.76	5.00	40	45	12	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0012-2525X-GX24-3 AS45-50	R	3.76	5.00	45	50	12	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0020-2525X-GX24-3 AS50-60	R	3.76	5.00	50	60	20	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0020-2525X-GX24-3 AS60-75	R	3.76	5.00	60	75	20	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0022-2525X-GX24-3 AS75-100	R	3.76	5.00	75	100	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0022-2525X-GX24-3 AS100-150	R	3.76	5.00	100	150	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0022-2525X-GX24-3 AS150-300	R	3.76	5.00	150	300	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25R0020-2525X-GX24-4 AS40-50	R	5.01	6.50	40	50	20	32.0	25	115	45	23.20	GX24-4..	E01
25	E25R0022-2525X-GX24-4 AS50-70	R	5.01	6.50	50	70	22	32.0	25	115	45	23.20	GX24-4..	E01
25	E25R0025-2525X-GX24-4 AS70-100	R	5.01	6.50	70	100	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25R0025-2525X-GX24-4 AS100-150	R	5.01	6.50	100	150	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25R0025-2525X-GX24-4 AS150-300	R	5.01	6.50	150	300	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0012-2525X-GX24-2 AS40-45	L	2.76	3.75	40	45	12	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0012-2525X-GX24-2 AS45-50	L	2.76	3.75	45	50	12	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0016-2525X-GX24-2 AS50-60	L	2.76	3.75	50	60	16	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0019-2525X-GX24-2 AS60-75	L	2.76	3.75	60	75	19	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0019-2525X-GX24-2 AS75-100	L	2.76	3.75	75	100	19	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0022-2525X-GX24-2 AS100-130	L	2.76	3.75	100	130	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0022-2525X-GX24-2 AS130-180	L	2.76	3.75	130	180	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0022-2525X-GX24-2 AS180-300	L	2.76	3.75	180	300	22	32.0	25	115	45	24.70	GX24-2..	E01
25	E25L0012-2525X-GX24-3 AS40-45	L	3.76	5.00	40	45	12	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0012-2525X-GX24-3 AS45-50	L	3.76	5.00	45	50	12	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0020-2525X-GX24-3 AS50-60	L	3.76	5.00	50	60	20	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0020-2525X-GX24-3 AS60-75	L	3.76	5.00	60	75	20	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0022-2525X-GX24-3 AS75-100	L	3.76	5.00	75	100	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0022-2525X-GX24-3 AS100-150	L	3.76	5.00	100	150	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0022-2525X-GX24-3 AS150-300	L	3.76	5.00	150	300	22	32.0	25	115	45	24.20	GX24-3..	E01
25	E25L0020-2525X-GX24-4 AS40-50	L	5.01	6.50	40	50	20	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0022-2525X-GX24-4 AS50-70	L	5.01	6.50	50	70	22	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0025-2525X-GX24-4 AS70-100	L	5.01	6.50	70	100	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0025-2525X-GX24-4 AS100-150	L	5.01	6.50	100	150	25	32.0	25	115	45	23.20	GX24-4..	E01
25	E25L0025-2525X-GX24-4 AS150-300	L	5.01	6.50	150	300	25	32.0	25	115	45	23.20	GX24-4..	E01

		
E01	11207638	11224503

	GX-E	GX-R
C269	C151	C154

Monoblock tool holders

AX 0°



Picture shows right-hand version

h [mm]	Type, description	L N R	b [mm]	s [mm]	D_{min} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
16	E16R0005-1616L-AX05	R	16	3.0	10	5	16	21.0	140	28	14.70	AX05..	E01
16	E16R0010-1616L-AX10	R	16	3.0	20	10	16	21.0	140	38	14.70	AX10..	E01
16	E16L0005-1616L-AX05	L	16	3.0	10	5	16	21.0	140	28	14.70	AX05..	E01
16	E16L0010-1616L-AX10	L	16	3.0	20	10	16	21.0	140	38	14.70	AX10..	E01
20	E20R0005-2020L-AX05	R	20	3.0	10	5	20	25.0	140	28	18.70	AX05..	E02
20	E20R0010-2020L-AX10	R	20	3.0	20	10	20	25.0	140	38	18.70	AX10..	E02
20	E20R0015-2020L-AX15	R	20	3.0	30	15	20	25.0	140	49	18.70	AX15..	E02
20	E20L0005-2020L-AX05	L	20	3.0	10	5	20	25.0	140	28	18.70	AX05..	E02
20	E20L0010-2020L-AX10	L	20	3.0	20	10	20	25.0	140	38	18.70	AX10..	E02
20	E20L0015-2020L-AX15	L	20	3.0	30	15	20	25.0	140	49	18.70	AX15..	E02
25	E25R0005-2525N-AX05	R	25	3.0	10	5	25	30.0	160	28	23.70	AX05..	E02
25	E25R0010-2525N-AX10	R	25	3.0	20	10	25	30.0	160	38	23.70	AX10..	E02
25	E25R0015-2525N-AX15	R	25	3.0	30	15	25	30.0	160	49	23.70	AX15..	E02
25	E25L0005-2525N-AX05	L	25	3.0	10	5	25	30.0	160	28	23.70	AX05..	E02
25	E25L0010-2525N-AX10	L	25	3.0	20	10	25	30.0	160	38	23.70	AX10..	E02
25	E25L0015-2525N-AX15	L	25	3.0	30	15	25	30.0	160	49	23.70	AX15..	E02

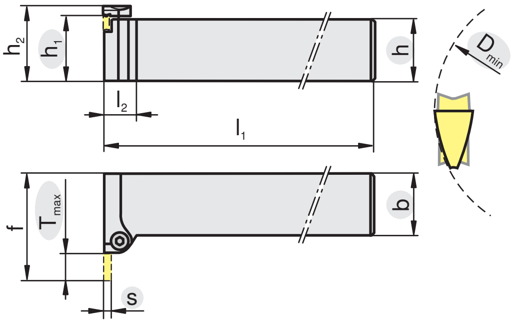
		
E01	195068	220983
E02	195069	220985

C269

AX C155

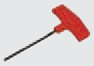
Monoblock tool holders

AX 90°



Picture shows right-hand version

h [mm]	Type, description	L N R	b [mm]	s [mm]	D_{min} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
16	E16R9005-1616J-AX05	R	16	3.0	10	5	16	21.0	110	13.5	28.00	AX05..	E01
16	E16R9010-1616J-AX10	R	16	3.0	20	10	16	21.0	110	13.0	38.00	AX10..	E01
16	E16L9005-1616J-AX05	L	16	3.0	10	5	16	21.0	110	13.5	28.00	AX05..	E01
16	E16L9010-1616J-AX10	L	16	3.0	20	10	16	21.0	110	13.0	38.00	AX10..	E01
20	E20R9005-2020J-AX05	R	20	3.0	10	5	20	25.0	110	12.0	28.00	AX05..	E01
20	E20R9010-2020J-AX10	R	20	3.0	20	10	20	25.0	110	13.0	38.00	AX10..	E02
20	E20R9015-2020J-AX15	R	20	3.0	30	15	20	25.0	110	13.0	49.00	AX15..	E02
20	E20L9005-2020J-AX05	L	20	3.0	10	5	20	25.0	110	12.0	28.00	AX05..	E01
20	E20L9010-2020J-AX10	L	20	3.0	20	10	20	25.0	110	13.0	38.00	AX10..	E02
20	E20L9015-2020J-AX15	L	20	3.0	30	15	20	25.0	110	13.0	49.00	AX15..	E02
25	E25R9005-2525L-AX05	R	25	3.0	10	5	25	30.0	140	12.0	33.00	AX05..	E01
25	E25R9010-2525J-AX10	R	25	3.0	20	10	25	30.0	110	13.0	43.00	AX10..	E02
25	E25R9015-2525L-AX15	R	25	3.0	30	15	25	30.0	140	13.0	49.00	AX15..	E02
25	E25L9005-2525L-AX05	L	25	3.0	10	5	25	30.0	140	12.0	33.00	AX05..	E01
25	E25L9010-2525J-AX10	L	25	3.0	20	10	25	30.0	110	13.0	43.00	AX10..	E02
25	E25L9015-2525L-AX15	L	25	3.0	30	15	25	30.0	140	13.0	49.00	AX15..	E02

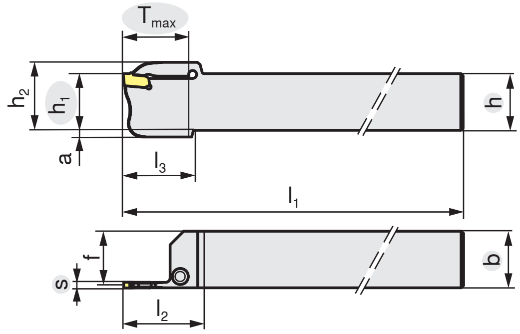
		
E01	195068	220983
E02	195069	220985

C269

AX C155

Monoblock tool holders

SX



Picture shows right-hand version

h [mm]	Type, description	L N R	b [mm]	s [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]		
16	E16R0016-1616K-SX2	R	16	2.0	16	16	21.0	125	31	26.0	15.20	SX..2	E01
16	E16R0020-1616K-SX3	R	16	3.0	20	16	21.0	125	36	30.0	14.75	SX..3	E01
16	E16L0016-1616K-SX2	L	16	2.0	16	16	21.0	125	31	26.0	15.20	SX..2	E01
16	E16L0020-1616K-SX3	L	16	3.0	20	16	21.0	125	36	30.0	14.75	SX..3	E01
20	E20R0016-2020K-SX2	R	20	2.0	16	20	25.0	125	31	26.0	19.20	SX..2	E01
20	E20R0020-2020K-SX3	R	20	3.0	20	20	25.0	125	38	30.0	18.75	SX..3	E01
20	E20R0025-2020K-SX4	R	20	4.0	25	20	27.0	125	44	35.0	18.35	SX..4	E01
20	E20L0016-2020K-SX2	L	20	2.0	16	20	25.0	125	31	26.0	19.20	SX..2	E01
20	E20L0020-2020K-SX3	L	20	3.0	20	20	25.0	125	38	30.0	18.75	SX..3	E01
20	E20L0025-2020K-SX4	L	20	4.0	25	20	27.0	125	44	35.0	18.35	SX..4	E01
25	E25R0020-2525M-SX3	R	25	3.0	20	25	30.0	150	40	30.0	23.75	SX..3	E01
25	E25R0025-2525M-SX4	R	25	4.0	25	25	32.0	150	46	35.0	23.35	SX..4	E01
25	E25R0025-2525M-SX5	R	25	5.0	25	25	32.0	150	46	35.0	22.85	SX..5	E01
25	E25R0032-2525M-SX6	R	25	6.0	32	25	33.0	150	54	43.0	22.40	SX..6	E01
25	E25L0020-2525M-SX3	L	25	3.0	20	25	30.0	150	40	30.0	23.75	SX..3	E01
25	E25L0025-2525M-SX4	L	25	4.0	25	25	32.0	150	46	35.0	23.35	SX..4	E01
25	E25L0025-2525M-SX5	L	25	5.0	25	25	32.0	150	46	35.0	22.85	SX..5	E01
25	E25L0032-2525M-SX6	L	25	6.0	32	25	33.0	150	54	43.0	22.40	SX..6	E01

		
E01	11007006	220985

C269

SX-E
C156

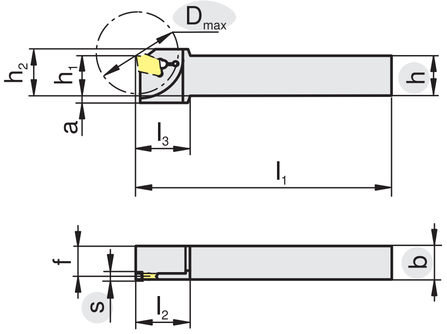
SX-R
C156

Parting and grooving / Tools

Monoblock tool holders

FX

Picture shows left-hand version



h [mm]	Type, description	L N R	s [mm]	D_{max} [mm]	b [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	a [mm]		
10	XLCER 1010 M22 FX	R	2.2	30	10	10	19.5	150	19	19.0	9.18	6.50	FX 2.2..	E01
10	XLCEL 1010 M22 FX	L	2.2	30	10	10	19.5	150	19	19.0	9.18	6.50	FX 2.2..	E01
12	XLCER 1212 M22 FX	R	2.2	30	12	12	19.5	150	19	19.0	11.18	4.50	FX 2.2..	E01
12	XLCER 1212 F22 FX	R	2.2	30	12	12	19.5	80	19	19.0	11.18	4.50	FX 2.2..	E01
12	XLCEL 1212 M22 FX	L	2.2	30	12	12	19.5	150	19	19.0	11.18	4.50	FX 2.2..	E01
12	XLCEL 1212 F22 FX	L	2.2	30	12	12	19.5	80	19	19.0	11.18	4.50	FX 2.2..	E01
14	XLCER 1414 M22 FX	R	2.2	30	14	14	19.5	150	19	19.0	13.18	2.50	FX 2.2..	E01
14	XLCEL 1414 M22 FX	L	2.2	30	14	14	19.5	150	19	19.0	13.18	2.50	FX 2.2..	E01
16	XLCER 1612 H22 FX	R	2.2	30	12	16	19.5	100	19	19.0	11.18	0.50	FX 2.2..	E01
16	XLCFR 1612 H31 FX	R	3.1	35	12	16	22.5	100	22	22.0	10.80	3.50	FX 3.1..	E02
16	XLCEL 1612 H22 FX	L	2.2	30	12	16	19.5	100	19	19.0	11.18	0.50	FX 2.2..	E01
16	XLCFL 1612 H31 FX	L	3.1	35	12	16	22.5	100	22	22.0	10.80	3.50	FX 3.1..	E02
20	XLCFR 2016 K31 FX	R	3.1	40	16	20	26.0	125	26	26.0	14.80	3.00	FX 3.1..	E02
20	XLCFR 2016 K41 FX	R	4.1	40	16	20	26.0	125	26	26.0	14.40	3.00	FX 4.1..	E02
20	XLCFL 2016 K31 FX	L	3.1	40	16	20	26.0	125	26	26.0	14.80	3.00	FX 3.1..	E02
20	XLCFL 2016 K41 FX	L	4.1	40	16	20	26.0	125	26	26.0	14.40	3.00	FX 4.1..	E02
25	XLCFR 2520 M31 FX	R	3.1	50	20	25	31.5	150	32	32.0	18.80	3.50	FX 3.1..	E02
25	XLCFR 2520 M41 FX	R	4.1	50	20	25	31.5	150	32	32.0	18.40	3.50	FX 4.1..	E02
25	XLCFL 2520 M31 FX	L	3.1	50	20	25	31.5	150	32	32.0	18.80	3.50	FX 3.1..	E02
25	XLCFL 2520 M41 FX	L	4.1	50	20	25	31.5	150	32	32.0	18.40	3.50	FX 4.1..	E02

E01	154461
E02	154463

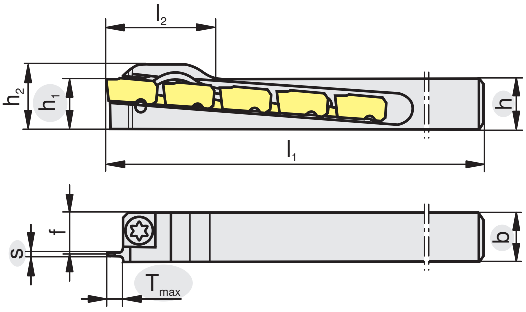
C269

FX

C158

Monoblock tool holders

MaxiClick MC05



Picture shows right-hand version

h [mm]	Type, description	L N R	b [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
10	MC05R-1010K	R	10	1.00	1.50	5	10	13.0	125	23	8.50	MC 05..	E01
10	MC05L-1010K	L	10	1.00	1.50	5	10	13.0	125	23	8.50	MC 05..	E01
12	MC05R-1212K	R	12	1.00	1.50	5	12	15.0	125	23	10.50	MC 05..	E01
12	MC05L-1212K	L	12	1.00	1.50	5	12	15.0	125	23	10.50	MC 05..	E01
16	MC05R-1616K	R	16	1.00	1.50	5	16	19.0	125	23	14.50	MC 05..	E01
16	MC05L-1616K	L	16	1.00	1.50	5	16	19.0	125	23	14.50	MC 05..	E01
20	MC05R-2020K	R	20	1.00	1.50	5	20	23.0	125	23	18.50	MC 05..	E01
20	MC05L-2020K	L	20	1.00	1.50	5	20	23.0	125	23	18.80	MC 05..	E01
25	MC05R-2525M	R	25	1.00	1.50	5	25	28.0	150	23	23.50	MC 05..	E01
25	MC05L-2525M	L	25	1.00	1.50	5	25	28.0	150	23	23.50	MC 05..	E01

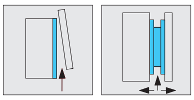
		
E01	11042274	220983

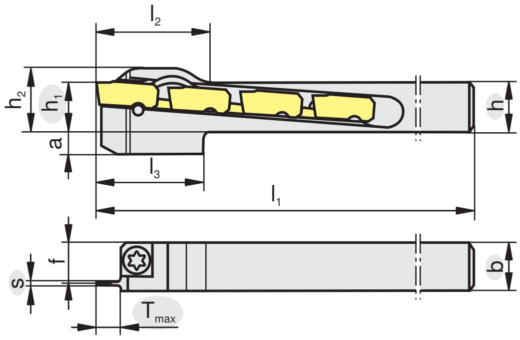
C269

MaxiClick
C159

Monoblock tool holders

MaxiClick MC10





Picture shows right-hand version

h [mm]	Type, description	L N R	b [mm]	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
10	MC10R-1010K	R	10	1.50	2.50	10	10	13.0	125	28	8.50	MC 10..	E01
10	MC10R-1010K-S	R	10	1.50	2.50	10	10	19.0	125	28	8.50	MC 10..	E01
10	MC10L-1010K	L	10	1.50	2.50	10	10	13.0	125	28	8.50	MC 10..	E01
10	MC10L-1010K-S	L	10	1.50	2.50	10	10	19.0	125	28	8.50	MC 10..	E01
12	MC10R-1212K	R	12	1.50	2.50	10	12	15.0	125	28	10.50	MC 10..	E01
12	MC10R-1212K-S	R	12	1.50	2.50	10	12	19.0	125	28	10.50	MC 10..	E01
12	MC10L-1212K	L	12	1.50	2.50	10	12	15.0	125	28	10.50	MC 10..	E01
12	MC10L-1212K-S	L	12	1.50	2.50	10	12	19.0	125	28	10.50	MC 10..	E01
16	MC10R-1616K	R	16	1.50	2.50	10	16	19.0	125	28	14.50	MC 10..	E01
16	MC10L-1616K	L	16	1.50	2.50	10	16	19.0	125	28	14.50	MC 10..	E01
20	MC10R-2020K	R	20	1.50	2.50	10	20	23.0	125	28	18.50	MC 10..	E01
20	MC10L-2020K	L	20	1.50	2.50	10	20	23.0	125	28	18.50	MC 10..	E01
25	MC10R-2525M	R	25	1.50	2.50	10	25	28.0	152	28	23.50	MC 10..	E01
25	MC10L-2525M	L	25	1.50	2.50	10	25	28.0	152	28	23.50	MC 10..	E01

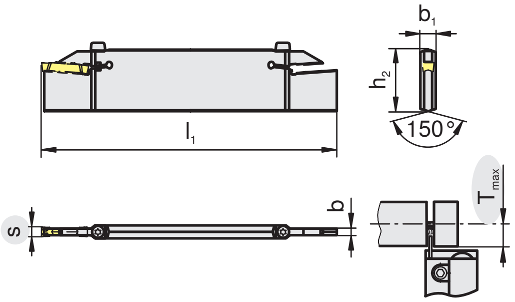
		
E01	11042274	220983

C269

MaxiClick
C159

Blades

GX



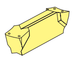
Picture shows right-hand version

h_2 [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	b [mm]	b_1 [mm]	l_1 [mm]		
32	XLCFN 3202-GX24-1S	N	2.00	2.75	21	1.60	6.2	180	GX24-1..	E01
32	XLCFN 3203 GX24-2S	N	2.76	3.75	21	2.10	6.2	180	GX24-2..	E01
32	XLCFN 3204 GX24-3S	N	3.76	5.00	21	3.05	6.2	180	GX24-3..	E01
32	XLCFN 3206 GX24-4S	N	5.01	6.50	21	4.20	6.2	180	GX24-4..	E01

			
E01	11081190	11149570	220983

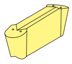
C269

GX-E

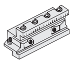


C151

GX-R



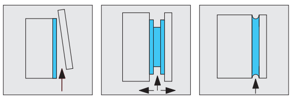
C154

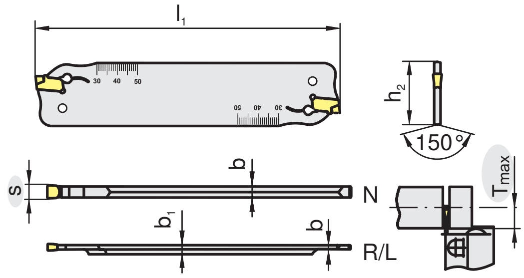


C204-C205

Blades

SX



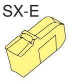


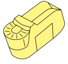
Picture shows right-hand version

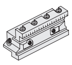
h₂ [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	b [mm]	b_1 [mm]	l_1 [mm]		
26	XLCFR 2602-SX2	R	2.0	25	1.50	2.4	110	SX..2	E01
26	XLCFN 2603-SX3	N	3.0	35	2.40		110	SX..3	E01
26	XLCFN 2604-SX4	N	4.0	40	3.20		110	SX..4	E02
26	XLCFL 2602-SX2	L	2.0	25	1.50	2.4	110	SX..2	E01
32	XLCFR 3202-SX2	R	2.0	25	1.50	2.4	150	SX..2	E01
32	XLCFN 3203-SX3	N	3.0	50	2.40		150	SX..3	E01
32	XLCFN 3204-SX4	N	4.0	50	3.20		150	SX..4	E02
32	XLCFN 3205-SX5	N	5.0	55	4.20		150	SX..5	E02
32	XLCFN 3206-SX6	N	6.0	60	5.20		150	SX..6	E02
32	XLCFL 3202-SX2	L	2.0	25	1.50	2.4	150	SX..2	E01

	
E01	11366865
E02	11366866

C269

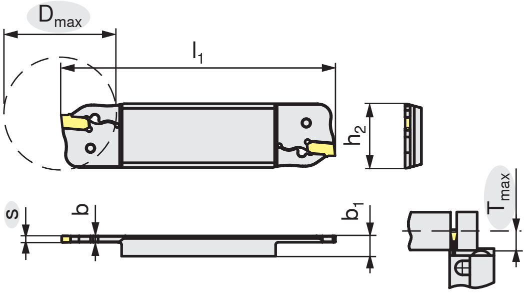
SX-E

C156

SX-R

C156


C204-C205

Blades

SX, reinforced blades



Picture shows right-hand version

h_2 [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	D_{max} [mm]	b [mm]	b_1 [mm]	l_1 [mm]		
26	XLCFR 2608-SX2	R	2.0	22	44	1.50	8.0	110	SX..2	E01
26	XLCFR 2608-SX3	R	3.0	22	44	2.50	8.0	110	SX..3	E01
26	XLCFL 2608-SX2	L	2.0	22	44	1.50	8.0	110	SX..2	E01
26	XLCFL 2608-SX3	L	3.0	22	44	2.50	8.0	110	SX..3	E01

	
E01	11366865

C269

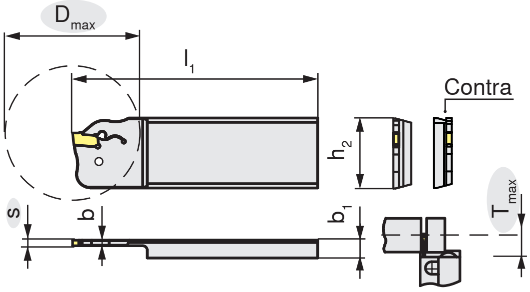
SX-E C156

SX-R C156

C204-C205

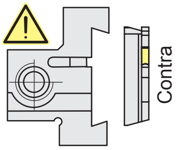
Blades

SX, reinforced blades



Picture shows right-hand version

h_2 [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	D_{max} [mm]	b [mm]	b_1 [mm]	l_1 [mm]		
32	XLCFR 3208-SX3	R	3.0	33	66	2.50	8.0	110	SX..3	E01
32	XLCFR 3208C-SX3	R	3.0	33	66	2.50	8.0	110	SX..3	E01
32	XLCFR 3208-SX4	R	4.0	33	66	3.40	8.0	110	SX..4	E02
32	XLCFL 3208-SX3	L	3.0	33	66	2.50	8.0	110	SX..3	E01
32	XLCFL 3208C-SX3	L	3.0	33	66	2.50	8.0	110	SX..3	E01
32	XLCFL 3208-SX4	L	4.0	33	66	3.40	8.0	110	SX..4	E02



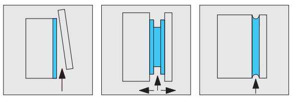
XLCFR 3208**C**-SX3 **->** **C**=CONTRA
Additional information see page(s) C262

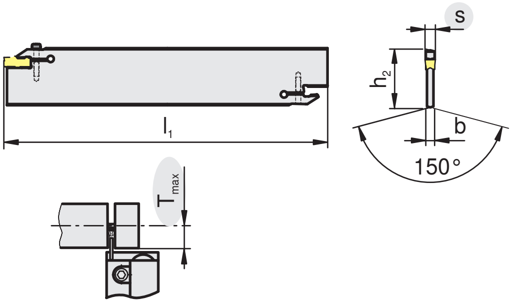
	
E01	11366865
E02	11366866

	SX-E	SX-R	
C269	C156	C156	C204-C205

Blades

LX



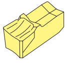


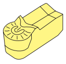
Picture shows right-hand version

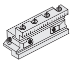
h2 [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	b [mm]	l_1 [mm]		
46	XLCEN 4608 LX	N	8.00	10.00	80	6.80	250	LX..	E01

			
E01	11007006	11149571	220985

C269

LX-E  C157

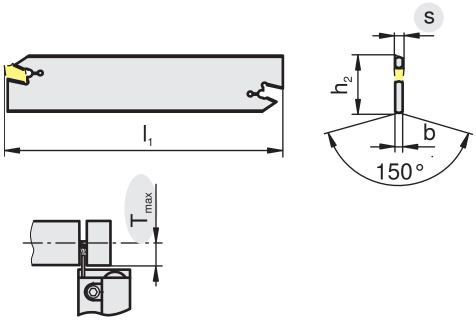
LX-R  C157

 C204

Blades

FX

Picture shows right-hand version



h_2 [mm]	Type, description	L N R	s [mm]	T_{max} [mm]	b [mm]	l_1 [mm]		
26	XLCEN 2602 J22 FX	N	2.2	25	1.65	110	FX 2.2..	E01
26	XLCFN 2603 J31 FX	N	3.1	35	2.40	110	FX 3.1..	E02
26	XLCFN 2604 J41 FX	N	4.1	40	3.20	110	FX 4.1..	E02
32	XLCEN 3202 M22 FX	N	2.2	30	1.65	150	FX 2.2..	E01
32	XLCFN 3203 M31 FX	N	3.1	50	2.40	150	FX 3.1..	E02
32	XLCFN 3204 M41 FX	N	4.1	50	3.20	150	FX 4.1..	E02
32	XLCFN 3205 M51 FX	N	5.1	55	4.00	150	FX 5.1..	E02
32	XLCFN 3206 M65 FX	N	6.5	55	5.20	150	FX 6.5..	E02
46	XLCEN 4608 S82 FX	N	8.2	80	6.80	250	FX 8.2..	E03
46	XLCEN 4609 S97 FX	N	9.7	80	8.00	250	FX 9.7..	E03

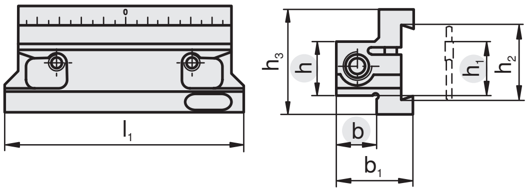
E01	154461
E02	154463
E03	154464

C269

FX C158

C204-C205

Clamping blocks



Picture shows right-hand version

h2 [mm]	Type, description	L N R	h [mm]	h1 [mm]	h3 [mm]	l1 [mm]	b [mm]	b1 [mm]		
26	SBN 2020-26 K	N	20	20	39	90	20	33.0	XLC.. 26..	E01
32	SBN 2520-32 K	N	25	25	48	110	20	36.0	XLC.. 32..	E01
32	SBN 3229-32 K	N	32	32	48	120	29	44.5	XLC.. 32..	E01
46	SBN 3229-46 K	N	32	32	70	150	29	52.0	XLC.. 46..	E02
46	SBN 4037-46 K	N	40	40	70	150	37	60.0	XLC.. 46..	E02

⚠

The blocks are delivered without coolant set.
When applying through-tool coolant, order the additional coolant set separately.

			
E01	22485	4496	82952
E02	81158	4497	82954

C269

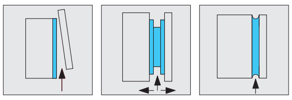
GX C198

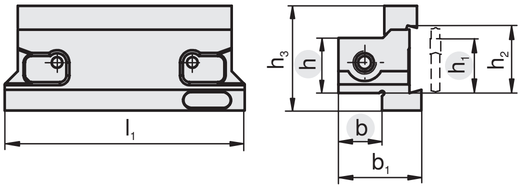
SX C199-C201

LX C202

FX C203

Split clamping blocks





Picture shows right-hand version

h$_2$ [mm]	Type, description	L N R	h [mm]	h$_1$ [mm]	h$_3$ [mm]	l$_1$ [mm]	b [mm]	b$_1$ [mm]		
26	SBN 2020-26 KS	N	20	20	43	90	20	37	XLC.. 26..	E01
32	SBN 2520-32 KS	N	25	25	49	110	20	38	XLC.. 32..	E01
32	SBN 3229-32 KS	N	32	32	52	120	29	47	XLC.. 32..	E01

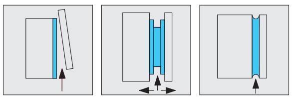
⚠

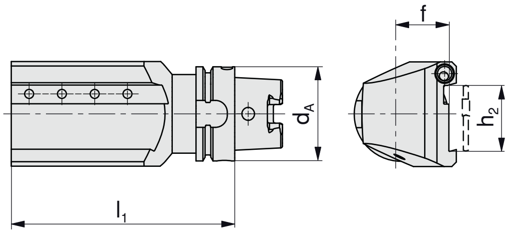
The blocks are delivered without coolant set.
When applying through-tool coolant, order the additional coolant set separately.

			
E01	22485	4496	82952

	GX	SX	LX	FX
C269	C198	C199	C202	C203

HSK-T clamping blocks





h_2 [mm]	Type, description	L N R	d_A [mm]	h_1 [mm]	l_1 [mm]		
32	HSK-T63-KHR00-32	R	63	32	150	XLC.. 32..	E01
32	HSK-T100-KHR00-32	R	100	32	160	XLC.. 32..	E01
32	HSK-T63-KHL00-32	L	63	32	150	XLC.. 32..	E01
32	HSK-T100-KHL00-32	L	100	32	160	XLC.. 32..	E01

			
E01	11848510	11776816	11776756

C269

GX C198

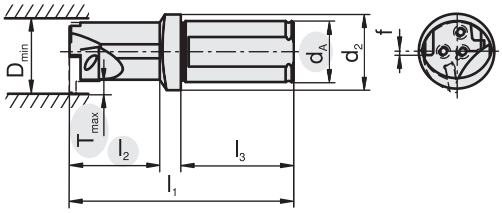
SX C199

LX C202

FX C203

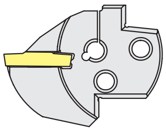
MSS boring bars

1.5 D



Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	T_{max} [mm]	D_{min} [mm]	d_A [mm]	d_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]		
16	MSS-I16R90-1.5D-N	R	4	20	20	25	82	24	50	1.00	MSS-I16R..	E01
16	MSS-I16L90-1.5D-N	L	4	20	20	25	82	24	50	1.00	MSS-I16L..	E01
20	MSS-I20R90-1.5D-N	R	5	25	20	25	87	30	50	1.00	MSS-I20R..	E02
20	MSS-I20L90-1.5D-N	L	5	25	20	25	87	30	50	1.00	MSS-I20L..	E02
25	MSS-I25R90-1.5D-N	R	6	32	25	32	102	38	56	1.50	MSS-I25R..	E03
25	MSS-I25L90-1.5D-N	L	6	32	25	32	102	38	56	1.50	MSS-I25L..	E03
32	MSS-I32R90-1.5D-N	R	9	40	32	40	119	48	60	2.00	MSS-I32R..	E04
32	MSS-I32L90-1.5D-N	L	9	40	32	40	119	48	60	2.00	MSS-I32L..	E04
40	MSS-I40R90-1.5D-N	R	10	50	40	50	142	60	70	2.50	MSS-I40R..	E05
40	MSS-I40L90-1.5D-N	L	10	50	40	50	142	60	70	2.50	MSS-I40L..	E05



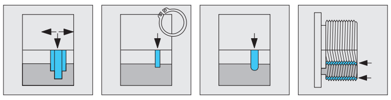
When using module **MSS-I40N19-GX24..** :
T_{max} + 9 mm / D_{min} + 10 mm

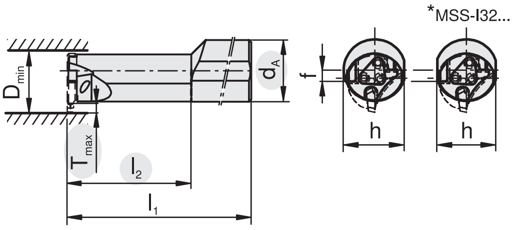
E01	228617	8095010200	
E02	228619	8095010400	
E03	228620		220983
E04	228621		220985
E05	195069		220985

	GX	GX	TC
C269	C210-C178	C213-C214	C220

MSS boring bars

2.5 D

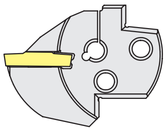




* 2 clamping faces applies only for MSS-I32R/L90-2.5D-N

Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	T_{max} [mm]	D_{min} [mm]	d_A [mm]	l_1 [mm]	l_2 [mm]	h [mm]	f [mm]		
16	MSS-I16R90-2.5D-N	R	4	20	20	180	40	19	4.50	MSS-I16R..	E01
16	MSS-I16L90-2.5D-N	L	4	20	20	180	40	19	4.50	MSS-I16L..	E01
20	MSS-I20R90-2.5D-N	R	5	25	25	200	50	24	6.00	MSS-I20R..	E02
20	MSS-I20L90-2.5D-N	L	5	25	25	200	50	24	6.00	MSS-I20L..	E02
25	MSS-I25R90-2.5D-N	R	6	32	32	250	63	31	7.00	MSS-I25R..	E03
25	MSS-I25L90-2.5D-N	L	6	32	32	250	63	31	7.00	MSS-I25L..	E03
32	MSS-I32R90-2.5D-N	R	9	40	40	300	80	38	9.50	MSS-I32R..	E04
32	MSS-I32L90-2.5D-N	L	9	40	40	300	80	38	9.50	MSS-I32L..	E04
40	MSS-I40R90-2.5D-N	R	10	50	50	350	100	48.5	11.00	MSS-I40R..	E05
40	MSS-I40L90-2.5D-N	L	10	50	50	350	100	48.5	11.00	MSS-I40L..	E05



When using module **MSS-I40N19-GX24..** :
T_{max} + 9 mm / D_{min} + 10 mm

			
E01	228617	8095010200	
E02	228619	8095010400	
E03	228620		220983
E04	228621		220985
E05	195069		220985

C269

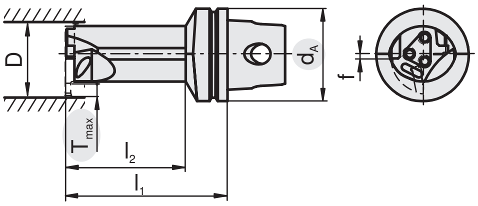
GX C210-C212

GX C213-C214

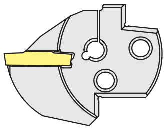
TC C220

MSS boring bars

UTS 2.0 D



Bgr. [mm]	Type, description	L N R	T_{max} [mm]	D_{min} [mm]	d_A [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
32	UT40-MSS-I32R90-2D	R	9	40	40	80	64	2.00	MSS-I32R..	E01
32	UT50-MSS-I32L90-2D	L	9	40	50	90	64	2.00	MSS-I32L..	E01
40	UT40-MSS-I40L90-2D	L	10	50	40	92	80	2.50	MSS-I40L..	E02



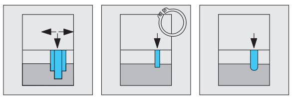
When using module **MSS-I40N19-GX24..** :
T_{max} + 9 mm / D_{min} + 10 mm

		
E01	228621	220985
E02	195069	220985

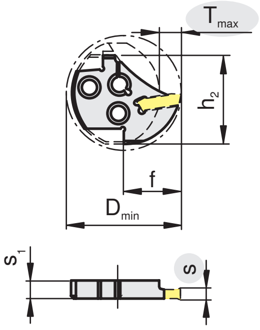
C269
GX C210-C212
GX C213-C214
TC C220

MSS modules – internal

Grooving and turning – GX09

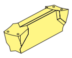


Picture shows right-hand version



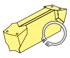
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
16	MSS-I16R04-GX09-1	R	2.00	2.75	4	20	16.4	3.8	10.00	GX09-1..
16	MSS-I16R04-GX09-2	R	2.76	3.75	4	20	16.4	3.8	10.00	GX09-2..
16	MSS-I16L04-GX09-1	L	2.00	2.75	4	20	16.4	3.8	10.00	GX09-1..
16	MSS-I16L04-GX09-2	L	2.76	3.75	4	20	16.4	3.8	10.00	GX09-2..
20	MSS-I20R05-GX09-1	R	2.00	2.75	5	25	20.3	3.8	12.00	GX09-1..
20	MSS-I20R05-GX09-2	R	2.76	3.75	5	25	20.3	3.8	12.00	GX09-2..
20	MSS-I20L05-GX09-1	L	2.00	2.75	5	25	20.3	3.8	12.00	GX09-1..
20	MSS-I20L05-GX09-2	L	2.76	3.75	5	25	20.3	3.8	12.00	GX09-2..
25	MSS-I25R06-GX09-1	R	2.00	2.75	6	32	24.9	3.8	15.50	GX09-1..
25	MSS-I25R06-GX09-2	R	2.76	3.75	6	32	24.9	3.8	15.50	GX09-2..
25	MSS-I25L06-GX09-1	L	2.00	2.75	6	32	24.9	3.8	15.50	GX09-1..
25	MSS-I25L06-GX09-2	L	2.76	3.75	6	32	24.9	3.8	15.50	GX09-2..

GX-E



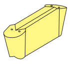
C151

GX-S



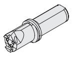
C153

GX-R



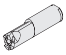
C154

1.5D



C207

2.5D

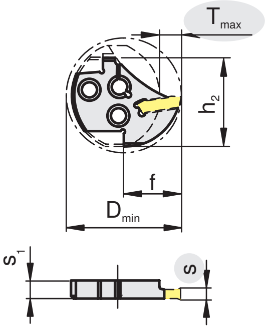


C208

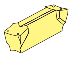
MSS modules – internal

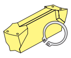
Grooving and turning – GX16

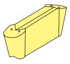
Picture shows right-hand version

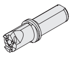


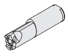
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
32	MSS-I32R09-GX16-1	R	2.00	2.75	9	40	32.2	5.9	20.00	GX16-1..
32	MSS-I32R09-GX16-2	R	2.76	3.75	9	40	32.2	5.9	20.00	GX16-2..
32	MSS-I32R09-GX16-3	R	3.76	5.00	9	40	32.2	5.9	20.00	GX16-3..
32	MSS-I32R09-GX16-4	R	5.01	6.50	9	40	32.2	5.9	20.00	GX16-4..
32	MSS-I32L09-GX16-1	L	2.00	2.75	9	40	32.2	5.9	20.00	GX16-1..
32	MSS-I32L09-GX16-2	L	2.76	3.75	9	40	32.2	5.9	20.00	GX16-2..
32	MSS-I32L09-GX16-3	L	3.76	5.00	9	40	32.2	5.9	20.00	GX16-3..
32	MSS-I32L09-GX16-4	L	5.01	6.50	9	40	32.2	5.9	20.00	GX16-4..
40	MSS-I40R10-GX16-1	R	2.00	2.75	10	50	39.6	5.9	24.50	GX16-1..
40	MSS-I40R10-GX16-2	R	2.76	3.75	10	50	39.6	5.9	24.50	GX16-2..
40	MSS-I40R10-GX16-3	R	3.76	5.00	10	50	39.6	5.9	24.50	GX16-3..
40	MSS-I40R10-GX16-4	R	5.01	6.50	10	50	39.6	5.9	24.50	GX16-4..
40	MSS-I40L10-GX16-1	L	2.00	2.75	10	50	39.6	5.9	24.50	GX16-1..
40	MSS-I40L10-GX16-2	L	2.76	3.75	10	50	39.6	5.9	24.50	GX16-2..
40	MSS-I40L10-GX16-3	L	3.76	5.00	10	50	39.6	5.9	24.50	GX16-3..
40	MSS-I40L10-GX16-4	L	5.01	6.50	10	50	39.6	5.9	24.50	GX16-4..

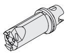
GX-E

C151

GX-S

C153

GX-R

C154

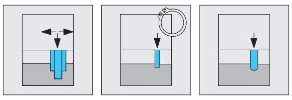
1.5D

C207

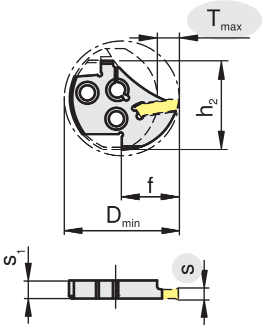
2.5D

C208

UTS

C209

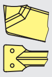
MSS modules – internal

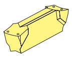
Grooving and turning – GX24

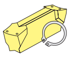


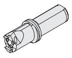


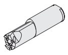
Picture shows right-hand version

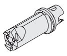
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
40	MSS-I40N19-GX24-2	N	2.76	3.75	19	60	40.7	6.2	33.50	GX24-2..
40	MSS-I40N19-GX24-3	N	3.76	5.00	19	60	40.7	6.2	33.50	GX24-3..
40	MSS-I40N19-GX24-4	N	5.01	6.50	19	60	40.7	6.2	33.50	GX24-4..

GX-E

C151

GX-S

C153

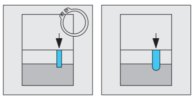
1.5D

C207

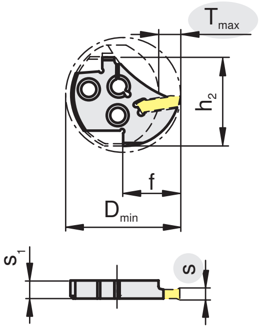
2.5D

C208

UTS

C209

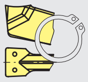
MSS modules – internal

Circlip and radius grooves – GX09

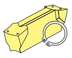




Picture shows right-hand version

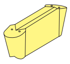
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
16	MSS-I16R02-GX09-1	R	0.60	1.95	2	20	16.45	3.8	10.00	GX09-1..R/L
16	MSS-I16L02-GX09-1	L	0.60	1.95	2	20	16.45	3.8	10.00	GX09-1..R/L
20	MSS-I20R02-GX09-1	R	0.60	1.95	2	25	20.35	3.8	12.00	GX09-1..R/L
20	MSS-I20L02-GX09-1	L	0.60	1.95	2	25	20.35	3.8	12.00	GX09-1..R/L
25	MSS-I25R02-GX09-1	R	0.60	1.95	2	32	24.95	3.8	15.50	GX09-1..R/L
25	MSS-I25L02-GX09-1	L	0.60	1.95	2	32	24.95	3.8	15.50	GX09-1..R/L

GX-S



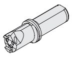
C153

GX-R



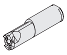
C154

1.5D



C207

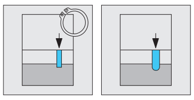
2.5D

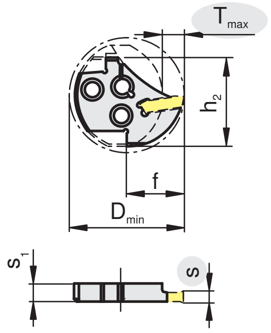


C208

MSS modules – internal

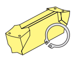
Circlip and radius grooves – GX16

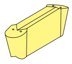


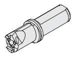


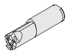
Picture shows right-hand version

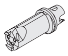
Bgr. [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
32	MSS-I32R03-GX16-2	R	0.60	2.75	3	40	32.2	5.9	20.00	GX16-2..R/L
32	MSS-I32L03-GX16-2	L	0.60	2.75	3	40	32.2	5.9	20.00	GX16-2..R/L
40	MSS-I40R03-GX16-2	R	0.60	2.75	3	50	39.6	5.9	24.50	GX16-2..R/L
40	MSS-I40L03-GX16-2	L	0.60	2.75	3	50	39.6	5.9	24.50	GX16-2..R/L


GX-S C153

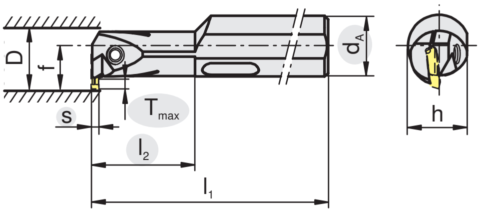

GX-R C154


1.5D C207


2.5D C208

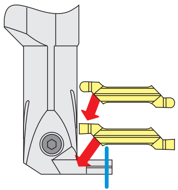

UTS C209

Monoblock boring bars – GX09



Picture shows right-hand version

d_A [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	l_2 [mm]	l_1 [mm]	h [mm]	f [mm]		
16	I12R90-2.5D-GX09	R	2.00	3.75	3	16	30	150	15.25	11	GX09..	E01
16	I12L90-2.5D-GX09	L	2.00	3.75	3	16	30	150	15.25	11	GX09..	E01

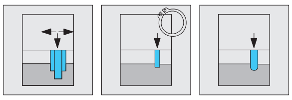


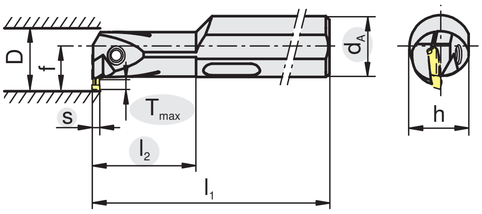
Attention:
When using right-hand or left-hand inserts (GX-S and GX-R), the tool requires modification to prevent the insert fouling.

		
E01	228620	220983

GX-E C151
GX-S C153
GX-R C154
C269

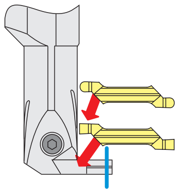
Monoblock boring bars – GX16





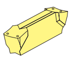
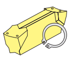
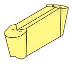
Picture shows right-hand version

d_A [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	l_2 [mm]	l_1 [mm]	h [mm]	f [mm]		
16	I16R90-2.0D-GX16-1	R	2.00	2.75	5.0	20.5	32	150	15.25	13.5	GX16-1..	E01
16	I16R90-2.0D-GX16-2	R	2.76	3.75	5.0	20.5	32	150	15.25	13.5	GX16-2..	E01
16	I16L90-2.0D-GX16-1	L	2.00	2.75	5.0	20.5	32	150	15.25	13.5	GX16-1..	E01
16	I16L90-2.0D-GX16-2	L	2.76	3.75	5.0	20.5	32	150	15.25	13.5	GX16-2..	E01
20	I20R90-2.0D-GX16-2	R	2.76	3.75	5.5	25.0	40	180	19	15.5	GX16-2..	E01
20	I20L90-2.0D-GX16-2	L	2.76	3.75	5.5	25.0	40	180	19	15.5	GX16-2..	E01
25	I25R90-2.0D-GX16-2	R	2.76	3.75	8.0	32.0	50	200	24	20.5	GX16-2..	E01
25	I25R90-2.0D-GX16-3	R	3.76	5.00	10.0	32.0	50	200	24	22.5	GX16-3..	E01
25	I25L90-2.0D-GX16-2	L	2.76	3.75	8.0	32.0	50	200	24	20.5	GX16-2..	E01
25	I25L90-2.0D-GX16-3	L	3.76	5.00	10.0	32.0	50	200	24	22.5	GX16-3..	E01
32	I32R90-2.0D-GX16-2	R	2.76	3.75	11.0	42.0	64	250	31	27.5	GX16-2..	E01
32	I32R90-2.0D-GX16-3	R	3.76	5.00	11.0	42.0	64	250	31	27.5	GX16-3..	E01
32	I32L90-2.0D-GX16-2	L	2.76	3.75	11.0	42.0	64	250	31	27.5	GX16-2..	E01
32	I32L90-2.0D-GX16-3	L	3.76	5.00	11.0	42.0	64	250	31	27.5	GX16-3..	E01

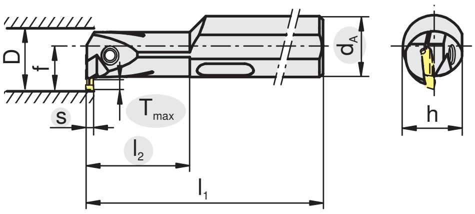


Attention:
When using right-hand or left-hand inserts (GX-S and GX-R), the tool requires modification to prevent the insert fouling.

		
E01	195068	220983

	GX-E	GX-S	GX-R
			
C269	C151-C152	C153	C154

Monoblock boring bars – GX24



Picture shows right-hand version

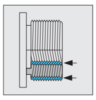
d_A [mm]	Type, description	L N R	s_{min} [mm]	s_{max} [mm]	T_{max} [mm]	D_{min} [mm]	l_2 [mm]	l_1 [mm]	h [mm]	f [mm]		
32	I32R90-2.0D-GX24-2	R	2.76	3.75	11.0	42	64	250	31.0	27.5	GX24-2..	E01
32	I32R90-2.0D-GX24-3	R	3.76	5.00	11.0	42	64	250	31.0	27.5	GX24-3..	E01
32	I32R90-2.0D-GX24-4	R	5.01	6.50	17.5	47	64	250	31.0	30.4	GX24-4..	E01
32	I32L90-2.0D-GX24-2	L	2.76	3.75	11.0	42	64	250	31.0	27.5	GX24-2..	E01
32	I32L90-2.0D-GX24-3	L	3.76	5.00	11.0	42	64	250	31.0	27.5	GX24-3..	E01
32	I32L90-2.0D-GX24-4	L	5.01	6.50	17.5	47	64	250	31.0	30.4	GX24-4..	E01
40	I40R90-2.0D-GX24-3	R	3.76	5.00	12.0	53	80	300	38.5	32.5	GX24-3..	E01
40	I40R90-2.0D-GX24-4	R	5.01	6.50	17.5	57	80	300	38.5	34.4	GX24-4..	E01
40	I40L90-2.0D-GX24-3	L	3.76	5.00	12.0	53	80	300	38.5	32.5	GX24-3..	E01
40	I40L90-2.0D-GX24-4	L	5.01	6.50	17.5	57	80	300	38.5	34.4	GX24-4..	E01

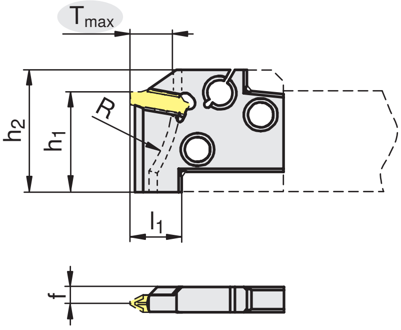
		
E01	195069	220985

C269
GX-E C151-C152
GX-R C154

MSS modules – external

Thread turning – TC

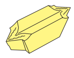




Picture shows right-hand version

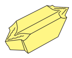
Bgr. [mm]	Type, description	L N R	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	l_1 [mm]	f [mm]	R [mm]	
20	MSS-E20R-TC16-1	R	0.50	1.50	48	16	8	20	24	20	3.45	30	TC16-1..
20	MSS-E20N-TC16-2	N	1.75	3.00	14	8	12	20	24	20	2.20		TC16-2..
20	MSS-E20L-TC16-1	L	0.50	1.50	48	16	8	20	24	20	3.45	30	TC16-1..
25	MSS-E25R-TC16-1	R	0.50	1.50	48	16	8	25	30	25	5.20	37.5	TC16-1..
25	MSS-E25R-TC16-2	R	1.75	3.00	14	8	10	25	30	25	4.10	37.5	TC16-2..
25	MSS-E25N-TC16-3	N	3.50	5.00	7	5	12	25	30	25	3.10		TC16-3..
25	MSS-E25L-TC16-1	L	0.50	1.50	48	16	8	25	30	25	5.20	37.5	TC16-1..
25	MSS-E25L-TC16-2	L	1.75	3.00	14	8	10	25	30	25	4.10	37.5	TC16-2..

TC60°

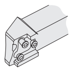


C160

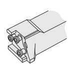
TC55°



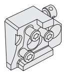
C161



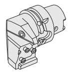
C168



C169



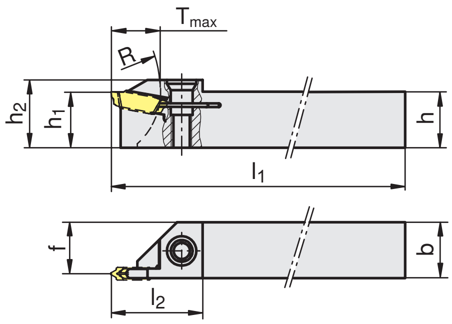
C175



C171+C173

Monoblock tool holders

Thread turning – TC



Picture shows right-hand version

h [mm]	Type, description	L N R	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	h_1 [mm]	h_2 [mm]	b [mm]	l_1 [mm]	l_2 [mm]	f [mm]	R [mm]		
12	E12R00-1212-TC16	R	0.50	3.00	48	8	10	12	14.5	12	150	20	11.00	15	TC16-1/2..	E01
12	E12L00-1212-TC16	L	0.50	3.00	48	8	10	12	14.5	12	150	20	11.00	15	TC16-1/2..	E01

		
E01	219981	220983

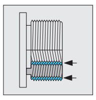
C269

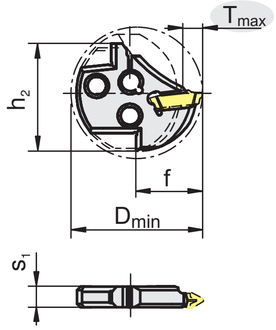
TC60° C160

TC55° C161

MSS modules – internal

Thread turning – TC





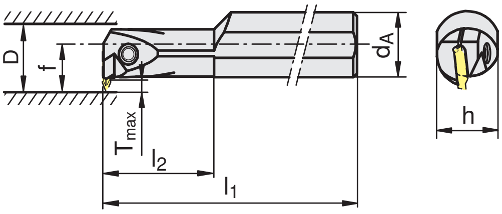
Picture shows right-hand version

Bgr. [mm]	Type, description	L N R	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	D_{min} [mm]	h_2 [mm]	s_1 [mm]	f [mm]	
32	MSS-I32R-TC16-1	R	0.50	1.50	48	16	7	40	32.2	6.2	20.00	TC16-1..
32	MSS-I32R-TC16-2	R	1.75	3.00	14	8	7	40	32.2	6.2	20.00	TC16-2..
32	MSS-I32N-TC16-3	N	3.50	5.00	7	5	7	40	32.2	6.2	20.00	TC16-3..
32	MSS-I32L-TC16-1	L	0.50	1.50	48	16	7	40	32.2	6.2	20.00	TC16-1..
32	MSS-I32L-TC16-2	L	1.75	3.00	14	8	7	40	32.2	6.2	20.00	TC16-2..

TC60° C160
TC55° C161
1.5D C207
2.5D C208
UTS C209

Monoblock boring bars

Thread turning – TC



Picture shows right-hand version

d_A [mm]	Type, description	L N R	P_{min} [mm]	P_{max} [mm]	P_{min} [TPI]	P_{max} [TPI]	T_{max} [mm]	D_{min} [mm]	h [mm]	l_1 [mm]	l_2 [mm]	f [mm]		
20	I16R90-2D-TC16	R	0.50	3.00	48	8	4	20	18	181	32	14	TC16-1/2..	E01
20	I16L90-2D-TC16	L	0.50	3.00	48	8	4	20	18	181	32	14	TC16-1/2..	E01
25	I20R90-2D-TC16	R	0.50	5.00	48	5	5	25	23	200	40	17.5	TC16-..	E02
25	I20L90-2D-TC16	L	0.50	5.00	48	5	5	25	23	200	40	17.5	TC16-..	E02
32	I25R90-2D-TC16	R	0.50	5.00	48	5	6	32	30	250	50	22	TC16-..	E03
32	I25L90-2D-TC16	L	0.50	5.00	48	5	6	32	30	250	50	22	TC16-..	E03

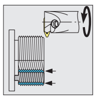
		
E01	195068	220983
E02	195069	220985
E03	195070	200317

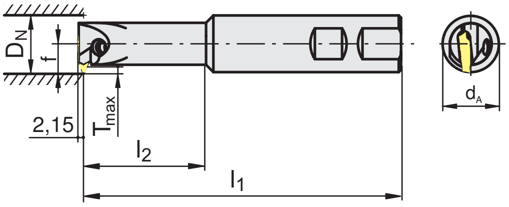
C269

TC60°
C160

TC55°
C161

TC milling cutters





d_A [mm]	Type, description	L N R	l_1 [mm]	l_2 [mm]	T_{max} [mm]	D_N [mm]	f [mm]		
25	I25R90-2D-TC16-W	R	140	54	3.0	25	12.5	TC16-..	E01
32	I32R90-2D-TC16-W	R	166	68	3.5	32	16.0	TC16-..	E02

		
E01	228621	220985
E02	195070	200317

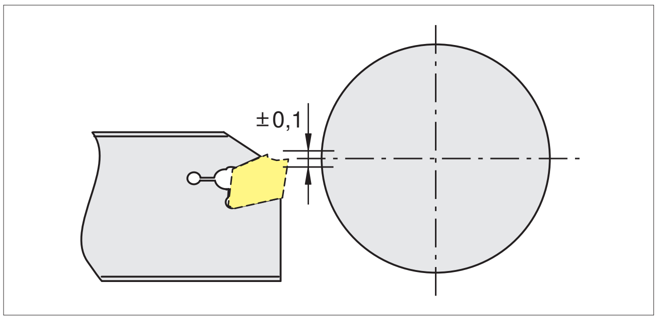
C269

TC60°
C160

TC55°
C161

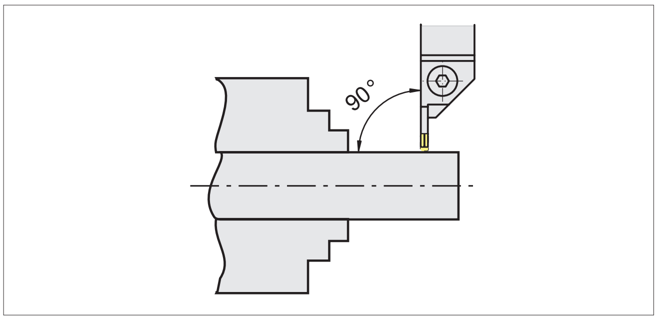
Tool - setting

Recommended application



Centre height

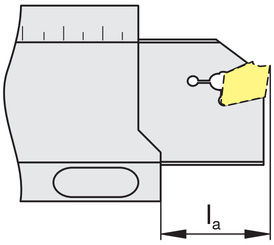
The centre height should be set within a tolerance of ± 0.1 mm to the work piece axis. This is especially important when parting into centre.

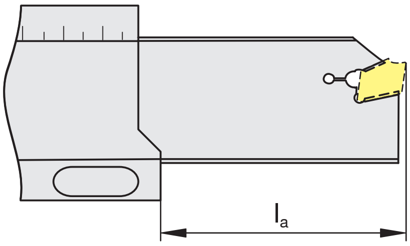


Tool setting

The parting and grooving tool must be mounted with a 90° angle to the axis of the work piece.

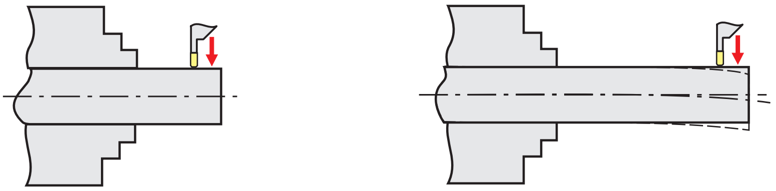
Tool overhang





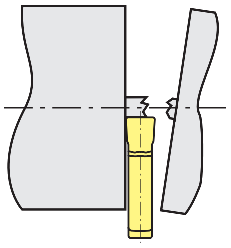
For optimum stability the tool overhang has to be kept as short as possible. The following rule can be applied: overhang l_a should not be larger than 8 x s (cutting width).

Tool overhang



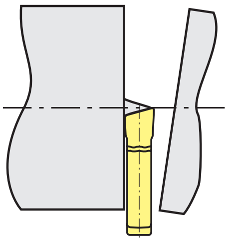
In order to avoid vibration the work piece should be clamped with the minimum overhang possible.

Advice for part-off operations



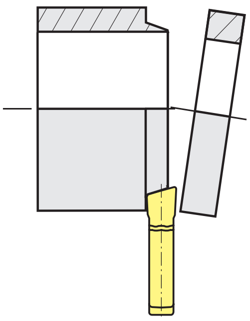
From dia. 5 mm on, reduce feed rate ‘f’ by approx. 50%.

No part-off across centre (risk of breakage).



For parting pip-free, use R or L inserts.

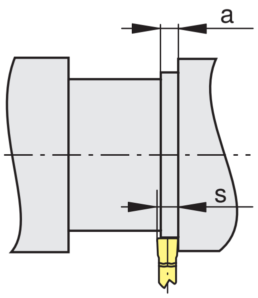
Reduce feed rate ‘f’ by approx. 20% - 50% to minimise lateral deflection.



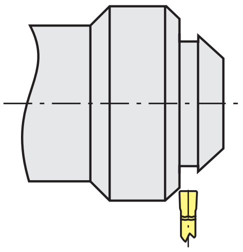
In order to prevent ring formation, use R or L inserts.

Reduce feed rate ‘f’ by approx. 20% - 50% to minimise lateral deflection.

Advice for grooving operations



When grooving with an axial displacement the width ‘a’ should be at least 70% of the cutting width ‘s’.



When grooving inclined surfaces the feed should be reduced by approx. 20% - 50% at the beginning.

Inserts

Tolerances

GX09-E

Chip groove	Tolerances (mm) x	s	r
-F2 / -EN	±0,02	±0,02	±0,05
-M40	±0,1	±0,05	

GX16-E

Chip groove	**Tolerances (mm)** x	s	r
-27P / -F2 / -EN	±0,02	±0,02	±0,05
-M40 / -M1	±0,15	±0,05	

GX24-E

Chip groove	Tolerances (mm) x	s	r
-27P / -F2	±0,02	±0,02	±0,05
-M40 / -M1 / -EN	±0,15	±0,05	

GX09-S / GX 16-S

Chip groove	Tolerances (mm) x	s	r
-ER/-EL	±0,02	±0,02	–
-EN			±0,05

GX09-R

Chip groove	Tolerances (mm) x	s	r
-EN / -ER / -EL	±0,02	±0,02	±0,05

GX 16-R

Chip groove	Tolerances (mm) x	s	r
-27P / -EN	±0,02	±0,02	±0,05

GX 24-R

Chip groove	Tolerances (mm) x	s	r
-27P	±0,02	±0,02	±0,05
-M3	±0,15	±0,05	±0,05

AX

Chip groove	Tolerances (mm) x	s	r
-F50	±0,02	±0,02	±0,05

SX

Chip groove	Tolerances (mm) x	s	r
-27P / -F2	±0,02	±0,02	±0,05
-M1 / -M2 / -M3	±0,1	±0,05	±0,05

LX

Chip groove	Tolerances (mm) x	s	r
-M2 / -M3	±0,15	±0,08	±0,08

FX

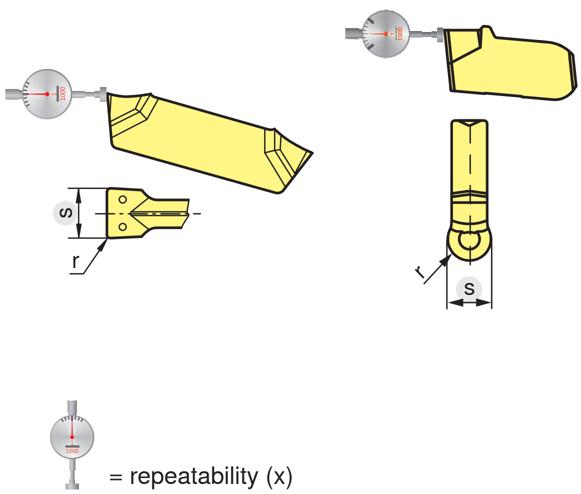
Chip groove	Width	Tolerances (mm) x	s	r
-27P	2,2 - 4,1	±0,05	±0,05	±0,05
-F1	2,2 - 4,1	±0,13	±0,05	±0,05
-M1	2,2 - 4,1	±0,13	-0,1	±0,05
	5,1 - 6,5		-0,15	
	8,2 - 9,7	±0,15	-0,2	±0,1
-R2	3,1 - 4,1	±0,13	±0,05	±0,05

MaxiClick

Chip groove	Tolerances (mm) x	s	r
-F2 / -F3	±0,025	±0,03	–

TC

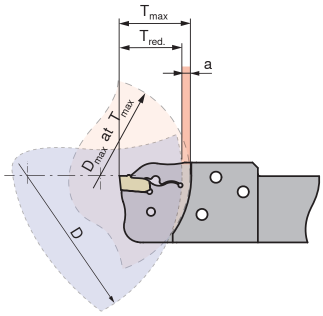
Chip groove	Tolerances (mm) x	s	r
-27P / -EN	±0,02	–	–



= repeatability (x)

Reduced parting and grooving depth

The MSS parting and grooving modules are selected by size to suit a certain work piece diameter (D_{max}). If the diameter of the work piece is bigger than D_{max} of the module, then the achievable parting and grooving depth is reduced by dimension ‘a’. The extent of the reduction is established by reference to the following table.



T_{max} = maximum grooving depth
D_{max} = maximum work piece diameter with full grooving depth T_{max} (a = 0)
a = reduction of grooving depth

$$T_{red.} = T_{max} - a$$

Assembly size	**Work piece diameter (mm)**																
E12	**35**	40	45	60	75	115	>250										
E16	**50**	55	60	70	80	100	130	200	>420								
E20	**60**	65	70	75	85	95	110	130	165	220	>330						
E25	**75**	80	85	90	100	110	125	140	160	190	240	320	>500				
E32	**95**	100	105	110	120	125	135	145	160	180	200	225	270	320	400	530	>800
		0,5	**1,0**	**1,5**	**2,0**	**2,5**	**3,0**	**3,5**	**4,0**	**4,5**	**5,0**	**5,5**	**6,0**	**6,5**	**7,0**	**7,5**	**8,0**

Reduction of the maximum grooving depth a (mm)

Maximum work piece diameter (D_{max}) in case of full parting and grooving depth (T_{max}) in mm

Calculation example: module

MSS-E25R21-GX24-3

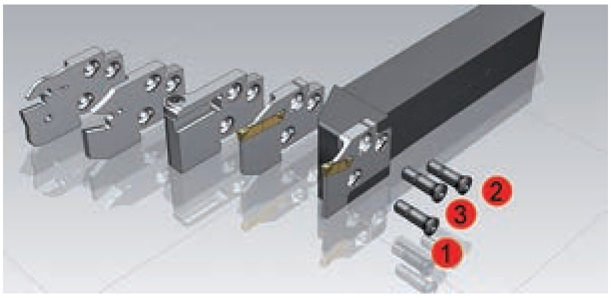
E25 **assembly size 25**

21 T_{max} = 21 mm, Ø 75 mm

D = Ø 100 mm => $T_{max} - a = T_{red.}$
21 – 2 = 19 mm

Torque moments

MSS module clamping screws



MSS tool shanks

Note the order in which screws must be clamped!

C11

MSS tool shanks	Screw	Torx	Torque moments	
			Nm	in.lbs
MSS-E12...	7897200/M2,5x10,0/T08	T08	1,2	10,6
MSS-E16...	7897202/M3,5x12,5/T15	T15	3,2	28,3
MSS-E20...	7897203/M4,0x14,0/T15	T15	4	35,4
MSS-E25...	7897205/M5,0x18,0/T20	T20	5	44,3
MSS-E32...	7897206/M6,0x20,0/T25	T25	6	53,1

MSS tool shanks

Note the order in which screws must be clamped!

C11

MSS boring bars	Screw	Torx	Torque moments	
			Nm	in.lbs
MSS-I16...	7897200/M2,5x10,0/T08	T08	1,2	10,6
MSS-I20...	7897201/M3,0x11,0/T10	T10	2	17,7
MSS-I25...	7897202/M3,5x12,5/T15	T15	3,2	28,3
MSS-I32...	7897204/M4,5x17,0/T20	T20	4	35,4
MSS-I40...	7897205/M5,0x18,0/T20	T20	5	44,3

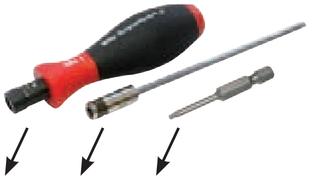
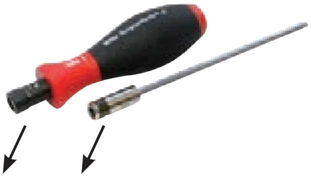
Torque moments

for insert clamping

Recommended torque moments

Tool	Screw	Torx	Torque moments	
			Nm	in.lbs
SX 	7897218/M4,0X18/T20	T20	4,0	35,4
AX 	7897202/M3,5X12,5/T15 7897203/M4,0X14/T15 7897205/M5,0X18/T20	T15 T15 T20	3,2 4,0 5,0	28,3 35,4 44,3
GX 	M5x18-15IP/10002133	T15IP	5,0	44,3

Torque key (inserts/bits)

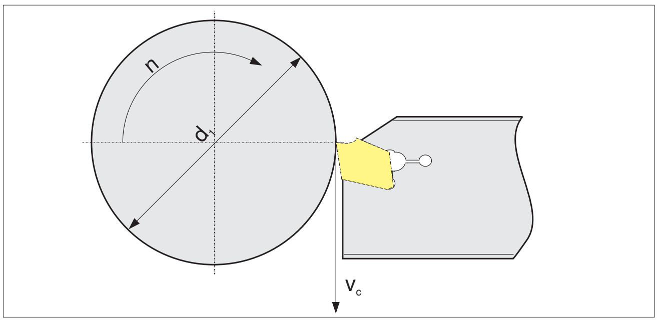
 **1 + 1 + 5 pcs. (incl. in delivery)**	DMSD 1,2Nm/SORT T08 DMSD 2,0Nm/SORT T10 DMSD 3,2Nm/SORT T15 DMSD 4,0Nm/SORT T15 DMSD 4,0Nm/SORT T20 DMSD 5,0Nm/SORT T20 DMSD 6,0Nm/SORT T25	**Torque moment set to: 1.2 - 6.0 Nm**
 **1 + 1 piece (incl. in delivery)**	DMSD 1-5Nm/SORT	**Torque moment can be adjusted flexibly: 1.0-5.0 Nm**
	DMSD 2-8Nm/SORT	**Torque moment can be adjusted flexibly: 2.0-8.0 Nm**
	DMSD-B T08-50MM DMSD-B T10-50MM DMSD-B T15-50MM DMSD-B T20-50MM DMSD-B T25-50MM	

Measures for parting and grooving problems

Type of problem												
Type of wear				**Work piece problems**				**Chip control**				
Edge chipping	Built-up edge	Flank wear	Plastic deformation	Vibration	Formation of pips and burrs	Chattered surface	Surface quality	Chip too long (tangled swarf)	Chip too short (fragmented chip)	**Corrective measures**		
	⬆	⬇	⬇	⇩			⇧	⇩		Cutting speed		**Cutting values**
⬇		≈	⇩	⇧		⬇	⬇	⬆	⬇	Feed rate		
⬇		⇩	⇩		⬇	⇩	⇩			Feed - centre area		
⬆	⬆		≈	≈	⬇	⬇	⇩	⬇	⬆	Chip groove	↓ -R -M -F ↑	**Selection of inserts**
					▢					R / L - right-hand / left-hand version		
⬆		⬆	⬆	⇩	⬇	⇩	⇧			Corner radius	larger ↓ ↑ smaller	
⬇		⬆	⬆							Cutting material	wear resistance ↓ ↑ toughness	
				⬇		⇧	⇧			Cutting width		
≈				≈		≈	≈			Clamping of tool		**General criteria**
≈				≈		≈	≈			Clamping of work piece		
≈				≈			⇩			Overhang		
≈		≈		≈	≈		≈			Tip height		
	▢	▢	▢		▢		▢	▢		Cooling lubricant		

⬆	raise, increase, large influence	⬇	avoid, reduce large influence	≈	check, optimise
⇧	raise, increase low influence	⇩	avoid, reduce low influence	▢	use

General formula



Cutting speed (v_c)

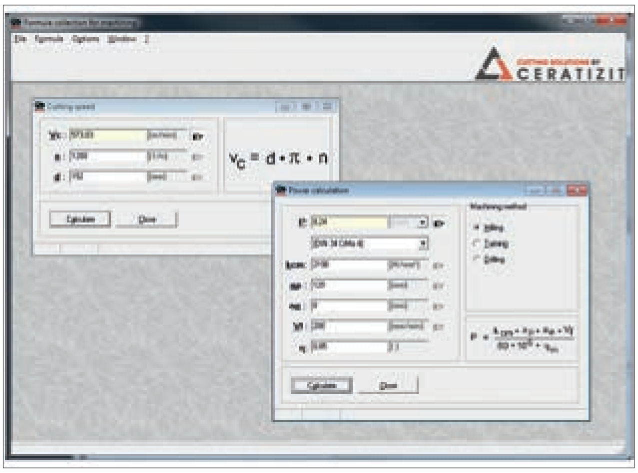
$$v_c = \frac{d_1 \cdot \pi \cdot n}{1000} \quad [\text{m/min}]$$

Revolutions per minute (n)

$$n = \frac{v_c \cdot 1000}{d_1 \cdot \pi} \quad [\text{rev./min}]$$

Feed rate (v_f)

$$v_f = f \cdot n \quad [\text{mm/min}]$$



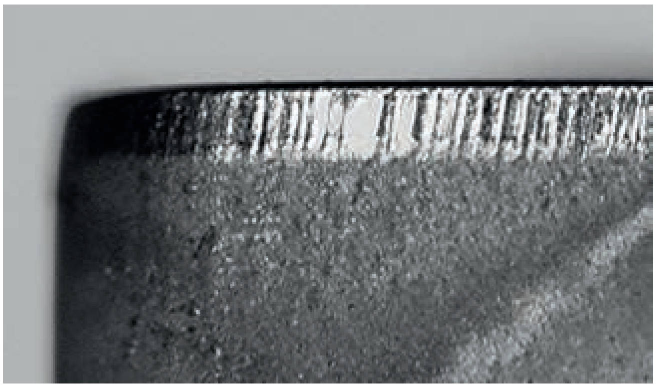
The CERATIZIT formula collection CT-CALC

PC - aided calculation of machining parameters
○ Cutting speed
○ Chip removal rate
○ Power consumption
○ Medium chip thickness

Languages
DE, EN, FR, IT, ES, DA, SE, FI

Free-of-charge download from
www.ceratizit.com

Types of wear



Abrasion on flank, normal wear after a certain machining time.

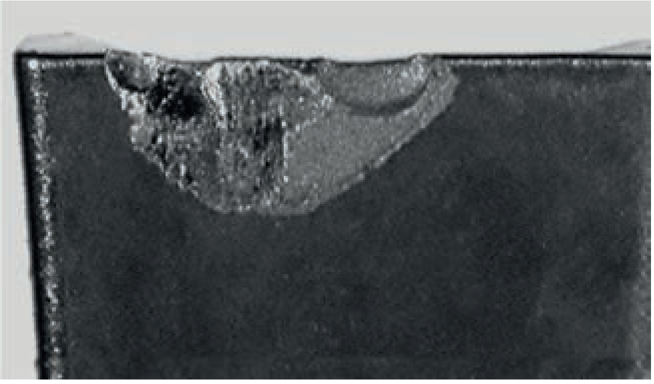
Flank wear

Reasons

○ Cutting speed too high
○ Carbide grade with insufficient wear resistance
○ Incorrect feed rate

Remedies

○ Reduce cutting speed
○ Select more wear resistant carbide grade
○ Adapt feed rate to cutting speed and cutting depth (increase feed rate)



Through excessive mechanical stress at the cutting edge fracture and chipping may occur.

Edge chipping

Reasons

○ Grade with too high wear resistance
○ Vibration
○ Feed rate too high or excessive depth of cut
○ Swarf damage

Remedies

○ Use tougher grade
○ Use negative cutting edge geometry with chip groove
○ Reduce overhang; check centre height
○ Increase stability of cutting edge

The hot chip which is being evacuated causes cratering at the rake face of the cutting edge.

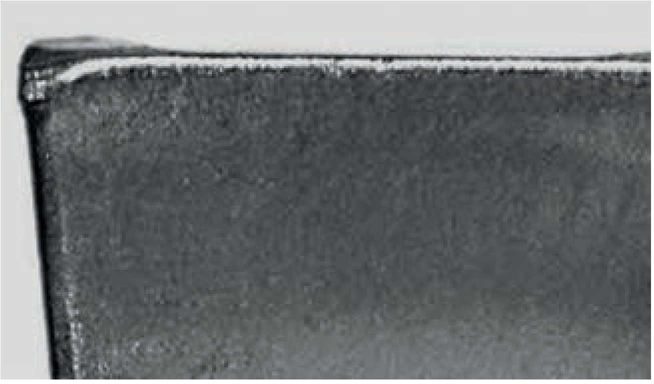
Cratering

Reasons

○ Cutting speed and / or feed rate too high
○ Rake angle too shallow
○ Grade with low wear resistance
○ Insufficient coolant supply

Remedies

○ Reduce cutting speed and / or feed rate
○ Increase coolant quantity and / or pressure, optimise coolant supply
○ Use grade with higher resistance to cratering



High machining temperature and simultaneous mechanical stress may lead to plastic deformation.

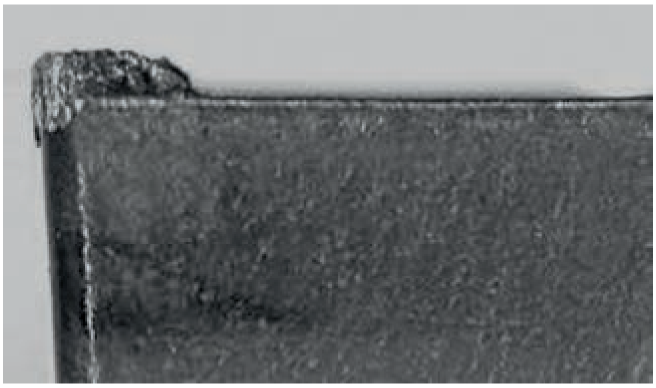
Plastic deformation

Reasons

- o Too high machining temperature resulting in softening of substrate
- o Wear / heat resistance of carbide grade too low
- o Insufficient coolant supply

Remedies

- o Reduce cutting speed
- o Choose carbide grade with higher wear resistance
- o Provide cooling



Built-up edge occurs when the chip is not evacuated properly due to insufficient cutting temperature.

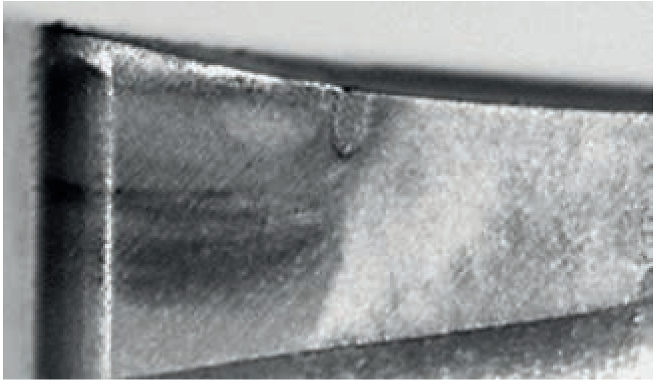
Built-up edge

Reasons

- o Cutting speed too low
- o Rake angle too small
- o Wrong cutting material
- o Lack of cooling / lubrication

Remedies

- o Increase cutting speed
- o Enlarge rake angle
- o Apply TiN-coating
- o Use emulsion with higher concentration



Notch at the maximum depth of cut

Notching

Reasons

- o Oxidation of the cutting edge
- o Excessive heat on the cutting edge

Remedies

- o Use various depths of cut
- o Reduce cutting speed
- o Improve coolant supply

Hardness values

Comparison table

Tensile strength N/mm^2	Vickers HV	Brinell HB	Rockwell HRC	Shore C
575	180	171		
595	185	176		
610	190	181		
625	195	185		
640	200	190	12	
660	205	195	13	
675	210	199	14	
690	215	204	15	
705	220	209	15	28
720	225	214	16	
740	230	219	17	29
755	235	223	18	
770	240	228	20.3	30
785	245	233	21.3	
800	250	238	22.2	31
820	255	242	23.1	32
835	260	247	24	33
850	265	252	24.8	
865	270	257	25.6	
880	275	261	26.4	34
900	280	268	27.1	
915	285	271	27.8	35
930	290	276	28.5	
950	295	280	29.2	36
965	300	285	29.8	37
995	310	295	31	38
1030	320	304	32.2	39
1060	330	314	33.3	40
1095	340	323	34.3	41
1125	350	333	35.5	42
1155	360	342	36.6	43
1190	370	352	37.7	44
1220	380	361	38.8	45
1255	390	371	39.8	46
1290	400	380	40.8	47
1320	410	390	41.8	48
1350	420	399	42.7	
1385	430	409	43.6	49
1420	440	418	44.5	
1455	450	428	45.3	51
1485	460	437	46.1	52
1520	470	447	46.9	53
1555	480	465	47.7	54
1595	490	466	48.4	
1630	500	475	49.1	57
1665	510	485	49.8	58
1700	520	494	50.5	59
1740	530	504	51.1	60
1775	540	513	51.7	61
1810	550	523	52.3	62
1845	560	532	53	63
1880	570	542	53.6	64
1920	580	551	54.1	65
1955	590	561	54.7	66
1995	600	570	55.2	67
2030	610	580	55.7	68
2070	620	589	56.3	69
2105	630	599	56.8	70
2145	640	608	57.3	71
2180	650	618	57.8	72
2210	660	628	58.3	73
2240	665	633	58.8	74
2280	670	638	59.3	
2310	675	643	59.8	75
2350	680	648	60.3	76
2380	685	653	61.1	77
2410	690	658	61.3	78
2450	695	663	61.7	79
2480	710	668	62.2	80
2520	720	678	62.6	81
2550	730	683	63.1	82
2590	740	693	63.5	
2630	750	703	63.9	83
2660	760	708	64.3	84
2700	770	718	64.7	85
2730	780	723	65.1	
2770	790	733	65.5	86
2800	800	738	65.9	
2840	810	748	66.3	87
2870	820	753	66.7	88
2910	830	763	67	
2940	840	768	67.4	89
2980	850		67.7	
3010	860		68.1	90
3050	870		68.4	
3080	880		68.7	91
3120	890		69	
3150	900		69.3	92
3190	910		69.6	
3220	920		69.9	
3260	930		70.1	

The figures given are approximate according to DIN EN ISO18265 (02-2004)

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm^2	mc	VDI 3323 group
10 SPb 20	1.0722		10 PbF 2		11 L 08		1350	0,20	**1**
100 Cr 6	1.2067	BL 3	Y 100 C 6		L 3	SUJ2	1775	0,24	**6/9**
105 WCr 6	1.2419		105 WC 13			SKS31	1775	0,24	**6/9**
12 CrMo 9 10	1.7380	1501-622 Gr. 31; 45	10 CD 9.10	2218	A 182-F22	SPVA,SCMV4	1675	0,24	**6/7**
12 Ni 19	1.5680		Z 18 N 5		2515		2450	0,23	**10/11**
13 CrMo 4 4	1.7335	1501-620 Gr. 27	15 CD 3.5	2216	A 182-F11; F12	SPVAF12	1675	0,24	**6/7**
14 MoV 6 3	1.7715	1503-660-440					1675	0,24	**6/7**
14 Ni 6	1.5622		16 N 6		A 350-LF 5		1675	0,24	**6/7**
14 NiCr 10	1.5732		14 NC 11		3415	SNC415(H)	1675	0,24	**6/7**
14 NiCr 14	1.5752	655 M 13	12 NC 15		3310; 9314	SNC815(H)	1675	0,24	**6/7**
14 NiCrMo 13 4	1.6657						1675	0,24	**6/7**
15 Cr 3	1.7015	523 M 15	12 C 3		5015		1675	0,24	**6/7**
15 CrMo 5	1.7262		12 CD 4			SCM415(H)	1675	0,24	**6/7**
15 Mo 3	1.5415	1501-240	15 D 3	2912	A 204 Gr. A		1675	0,24	**6/7**
16 MnCr 5	1.7131	527 M 17	16 MC 5	2511	5115	SCR415	1675	0,24	**6/7**
16 Mo 5	1.5423	1503-245-420			4520	SB450M	1675	0,24	**6/7**
17 CrNiMo 6	1.6587	820 A 16	18 NCD 6				1675	0,24	**6/7**
21 NiCrMo 2	1.6523	805 M 20	20 NCD 2	2506	8620	SNCM220(H)	1725	0,24	**6/8**
25 CrMo 4	1.7218	1717 CDS 110	25 CD 4 S	2225	4130	SM420;SCM430	1725	0,24	**6/8**
28 Mn 6	1.1170	150 M 28	20 M 5		1330		1500	0,22	**2**
32 CrMo 12	1.7361	722 M 24	30 CD 12	2240			1775	0,24	**6/9**
34 Cr 4	1.7033	530 A 32	32 C 4		5132	SCR430(H)	1725	0,24	**6/8**
34 CrMo 4	1.7220	708 A 37	35 CD 4	2234	4135; 4137	SCM432;SCCRM3	1775	0,24	**6/9**
34 CrNiMo 6	1.6582	817 M 40	35 NCD 6	2541	4340	SNCM447	1775	0,24	**6/9**
35 S 20	1.0726	212 M 36	35 MF 4	1957	1140		1525	0,22	**2/3**
36 CrNiMo 4	1.6511	816 M 40	40 NCD 3		9840	SNCM447	1775	0,24	**6/9**
36 Mn 5	1.1167						1525	0,22	**2/3**
36 NiCr 6	1.5710	640 A 35	35 NC 6		3135	SNC236	1800	0,24	**3/9**
38 MnSi 4	1.5120						1800	0,24	**3/9**
39 CrMoV 13 9	1.8523	897 M 39					1775	0,24	**6/9**
40 Mn 4	1.1157	150 M 36	35 M 5		1039		1525	0,22	**2/3**
40 NiCrMo 2 2	1.6546	311-Type 7	40 NCD 2		8740	SNCM240	1775	0,24	**6/9**
41 Cr 4	1.7035	530 M 40	42 C 4		5140	SCR440(H)	1775	0,24	**6/9**
41 CrAlMo 7	1.8509	905 M 39	40 CAD 6.12	2940	A 355 Cl. A	SACM645	1775	0,24	**6/9**
41 CrMo 4	1.7223	708 M 40	42 CD 4 TS	2244	4142; 4140	SCM440	1775	0,24	**6/9**
42 Cr 4	1.7045	530 A 40	42 C 4 TS	2245	5140	SCr440	1775	0,24	**6/9**
42 CrMo 4	1.7225	708 M 40	42 CD 4	2244	4142; 4140	SCM440(H)	1775	0,24	**6/9**
45 WCrV 7	1.2542	BS 1		2710	S 1		1775	0,24	**6/9**
50 CrV 4	1.8159	735 A 50	50 CV 4	2230	6150	SUP10	1775	0,24	**6/9**
55 Cr 3	1.7176	527 A 60	55 C 3	2253	5155	SUP9(A)	1775	0,24	**6/9**
55 NiCrMoV 6	1.2713		55 NCDV 7		L 6	SKH1;SKT4	1775	0,24	**6/9**
55 Si 7	1.0904	250 A 53	55 S 7	2085; 2090	9255		1775	0,24	**6/9**
58 CrV 4	1.8161						1775	0,24	**6/9**
60 SiCr 7	1.0961		60 SC 7		9262		1775	0,24	**6/9**
9 SMn 28	1.0715	230 M 07	S 250	1912	1213	SUM22	1350	0,21	**1**
9 SMn 36	1.0736	240 M 07	S 300		1215		1350	0,21	**1**
9 SMnPb 28	1.0718		S 250 Pb	1914	12 L 13	SUM22L	1350	0,21	**1**
9 SMnPb 36	1.0737		S 300 Pb	1926	12 L 14		1350	0,21	**1**
Al99	3.0205						700	0,25	**21**
AlCuMg1	3.1325						700	0,25	**22**
AlMg1	3.3315						700	0,25	**21**

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm^2	mc	VDI 3323 group
AlMgSi1	3.2315						700	0,25	**22**
C 105 W1	1.1545		Y1 105	1880	W 110	SK3	1675	0,24	**3**
C 125 W	1.1663		Y2 120		W 112		1675	0,24	**3**
C 15	1.0401	080 M 15	AF3 7 C 12; XC 18	1350	1015	S15C	1350	0,21	**1**
C 22	1.0402	050 A 20	AF 42 C 20	1450	1020	S20C, S22C	1350	0,21	**1**
C 35	1.0501	060 A 35	AF 55 C 35	1550	1035	S35C	1525	0,22	**2/3**
C 45	1.0503	080 M 46	AF 65 C 45	1650	1045	S45C	1525	0,22	**2/3**
C 55	1.0535	070 M 55		1655	1055	S55C	1675	0,24	**3**
C 60	1.0601	080 A 62	CC 55		1060	S60C	1675	0,24	**3**
Cf 35	1.1183					S35C	1525	0,22	**2/3**
Cf 53	1.1213					S50C	1525	0,22	**2/3**
Ck 101	1.1274	060 A 96		1870	1095		1675	0,24	**3**
Ck 15	1.1141	080 M 15	XC 15; XC 18	1370	1015	S15C	1350	0,21	**1**
Ck 55	1.1203	070 M 55	XC 55		1055	S55C	1675	0,24	**3**
Ck 60	1.1221	080 A 62	XC 60	1665; 1678	1060	S58C	1675	0,24	**3**
CoCr20W15Ni	2.4764						3300	0,24	**35**
CuZn15	2.0240						700	0,27	**27**
CuZn36Pb3	2.0375						700	0,27	**26**
E-Cu57	2.0060						700	0,27	**28**
G-AlSi10Mg	3.2381						700	0,25	**24**
G-AlSi12	3.2581						700	0,25	**23**
G-AlSi9Cu3	3.2163						700	0,25	**23**
G-CuSn5ZnPb	2.1096						700	0,27	**26**
G-CuZn40Fe	2.0590						700	0,27	**28**
G-X 120 Mn 12	1.3401	Z 120 M 12	Z 120 M 12		A 128 (A)		3300	0,24	**35**
G-X 20 Cr 14	1.4027	420 C 29	Z 20 C 13 M			SCS2	1875	0,21	**12/13**
G-X 40 NiCrSi 38 18	1.4865	330 C 40					2600	0,24	**31**
G-X 45 CrSi 9 3	1.4718	401 S 45	Z 45 CS 9		HNV 3		2450	.23	**10/11**
G-X 5 CrNi 13 4	1.4313	425 C 11	Z 5 CN 13.4	2385	CA 6-NM		1875	0,21	**12/13**
G-X 5 CrNiMoNb 18 10	1.4581	318 C 17	Z 4 CNDNb 18.12 M				2150	.0,2	**14**
G-X 6 CrNi 18 9	1.4308	304 C 15	Z 6 CN 18.10 M	2333	CF-8		2150	.0,2	**14**
G-X 6 CrNiMo 18 10	1.4408						2150	.0,2	**14**
G-X 7 Cr 13	1.4001						1875	0,21	**12/13**
GG-10	.6010		Ft 10 D	01 10-00	A48-20 B	FC100	1150	.0,2	**15**
GG-15	.6015	Grade 150	Ft 15 D	01 15-00	A48-25 B	FC150	1150	.0,2	**15**
GG-20	.6020	Grade 220	Ft 20 D	01 20-00	A48-30 B	FC200	1150	.0,2	**15**
GG-25	.6025	Grade 260	Ft 25 D	01 25-00	A48-40 B	FC250	1250	0,24	**15/16**
GG-30	.6030	Grade 300	Ft 30 D	01 30-00	A48-45 B	FC300	1350	0,28	**16**
GG-35	.6035	Grade 350	Ft 35 D	01 35-00	A48-50 B	FC350	1350	0,28	**16**
GG-40	.6040	Grade 400	Ft 40 D	01 40-00	A48-60 B	FC400	1350	0,28	**16**
GGG-35.3	.7033					FCD350	1225	0,25	**17**
GGG-40	.7040	SNG 420/12	FGS 400-12	0717-02	60-40-18	FCD400	1225	0,25	**17**
GGG-40.3	.7043	SNG 370/17	FGS 370-17	0717-15		FCD400	1225	0,25	**17**
GGG-50	.7050	SNG 500/7	FGS 500-7	0727-02	65-45-12	FCD500	1350	0,28	**18**
GGG-60	.7060	SNG 600/3	FGS 600-3	0732-03	80-55-06	FCD600	1350	0,28	**18**
GGG-70	.7070	SNG 700/2	FGS 700-2	0737-01	100-70-03	FCD700	1350	0,28	**18**
GGG-NiCr 20 2	.7660	S-NiCr 20 2	S-NC 20 2		A 439 Type D-2		1350	0,28	**18**
GGG-NiMn 13 7	.7652	S-NiMn 13 7	S-NM 13 7				1350	0,28	**18**
GS-Ck 45	1.1191	080 M 46	XC 42	1672	1045	S45C	1525	0,22	**2/3**
GTS-35-10	.8135	B 340/12	MN 35-10				1225	0,25	**19**
GTS-45-06	.8145	P 440/7					1420	0,3	**20**

Comparison of materials

Germany DIN	Mat. no.	United Kingdom BS	France AFNOR	Sweden SS	United States AISI	Japan JIS	Kc1.1 N/mm^2	mc	VDI 3323 group
GTS-55-04	.8155	P 510/4	MP 50-5				1420	0,3	**20**
GTS-65-02	.8165	P 570/3	MP 60-3				1420	0,3	**20**
GTS-70-02	.8170	P 690/2	IP 70-2				1420	0,3	**20**
NiCr20TiAl	2.4631	HR 401; 601	Nimonic 80 A				3300	0,24	**33**
NiCr22Mo9Nb	2.4856		Inconel 625				3300	0,24	**33**
NiCu30Al	2.4375		Monel K 500				3300	0,24	**34**
NiFe25Cr20NbTi	2.4955						3300	0,24	**34**
S 18-0-1	1.3355	BT 1	Z 80 WCV 18-04-01		T 1		2450	0,23	**10/11**
S 18-1-2-5	1.3255	BT 4	Z 80 WKCV 18-05-04-0		T 4		2450	0,23	**10/11**
S 2-9-2	1.3348		Z 100 DCWV 09-04-02-	2782	M 7		2450	0,23	**10/11**
S 6-5-2	1.3343	BM 2	Z 85 WDCV 06-05-04-0	2722	M 2	SKH9; SKH51	2450	0,23	**10/11**
S 6-5-2-5	1.3243		Z 85 WDKCV 06-05-05-	2723		SKH55	2450	0,23	**10/11**
TiAl6V4	3.7165	TA 10 bis TA 13	T-A 6 V				2110	0,22	**37**
X 10 Cr 13	1.4006	410 S 21	Z 12 C 13	2302	410; CA-15	SUS410	1875	0,21	**12/13**
X 10 CrNiMoNb 18 12	1.4583				318		2150	0,2	**14**
X 10 CrNiS 18 9	1.4305	303 S 21	Z 10 CNF 18.09	2346	303		2150	0,2	**14**
X 100 CrMoV 5 1	1.2363	BA 2	Z 100 CDV 5	2260	A 2		2450	0,23	**10/11**
X 12 CrMoS 17	1.4104		Z 10 CF 17	2383	430 F	SUS430F	1875	0,21	**12/13**
X 12 CrNi 17 7	1.4310	301 S 21	Z 12 CN 17.07		301		2150	0,2	**14**
X 12 CrNi 22 12	1.4829					SUS301	1350	0,28	**16**
X 12 CrNi 25 21	1.4845	310 S24	Z 12 CN 25.20	2361	310 S	SUH310; SUS310S	2150	0,2	**14**
X 12 CrNiTi 18 9	1.4878	321 S 20	Z 6 CNT 18.12 (B)	2337	321		2150	0,2	**14**
X 12 NiCrSi 36 16	1.4864	NA 17	Z 12 NCS 37.18		330	SUH330	2600	0,24	**31**
X 15 CrNiSi 20 12	1.4828	309 S 24	Z 15 CNS 20.12		309	SUH309	1350	0,28	**16**
X 165 CrMoV 12	1.2601			2310			2450	0,23	**10/11**
X 2 CrNiMo 18 13	1.4440						2150	0,2	**14**
X 2 CrNiMoN 17 13 3	1.4429	316 S 62	Z 2 CND 17.13 Az	2375	316 LN	SUS316LN	2150	0,2	**14**
X 2 CrNiN 18 10	1.4311	304 S 62	Z 2 CN 18 .10	2371	304 LN	SUS304LN	2150	0,2	**14**
X 20 CrNi 17 2	1.4057	431 S 29	Z 15 CN 16.02	2321	431	SUS431	1875	0,21	**12/13**
X 210 Cr 12	1.2080	BD 3	Z 200 C 12		D 3		2450	0,23	**10/11**
X 210 CrW 12	1.2436			2312			2450	0,23	**10/11**
X 30 WCrV 9 3	1.2581	BH 21	Z 30 WCV 9		H 21	SKD5	2450	0,23	**10/11**
X 40 CrMoV 5 1	1.2344	BH 13	Z 40 CDV 5	2242	H 13	SKD61	2450	0,23	**10/11**
X 46 Cr 13	1.4034	420 S 45	Z 40 C 14				1875	0,21	**12/13**
X 5 CrNi 18 9	1.4301	304 S 15	Z 6 CN 18.09	2332; 2333	304; 304 H	SUS304	2150	0,2	**14**
X 5 CrNiMo 17 13 3	1.4436	316 S 16	Z 6 CND 17.12	2343	316	SUS316	2150	0,2	**14**
X 5 CrNiMo 18 10	1.4401	316 S 16	Z 6 CND 17.11	2347	316	SUS316	2150	0,2	**14**
X 53 CrMnNiN 21 9	1.4871	349 S 54	Z 52 CMN 21.09		EV 8		1875	0,21	**12/13**
X 6 Cr 13	1.4000	403 S 17	Z 6 C 13	2301	403	SUS403	1875	0,21	**12/13**
X 6 Cr 17	1.4016	430 S 15	Z 8 C 17	2320	430	SUS430	1875	0,21	**12/13**
X 6 CrMo 17	1.4113	434 S 17	Z 8 CD 17.01	2325	434	SUS434	1875	0,21	**12/13**
X 6 CrNiMoTi 17 12 2	1.4571	320 S 31	Z 6 CNT 17.12	2350	316 Ti		2150	0,2	**14**
X 6 CrNiNb 18 10	1.4550	347 S 17	Z 6 CNNb 18.10	2338	347		2150	0,2	**14**
X 6 CrNiTi 18 10	1.4541	321 S 12	Z 6 CNT 18.10	2337	321		2150	0,2	**14**
X2 CrNi 18-8	1.4317						2150	0,2	**14**

Cutting data

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

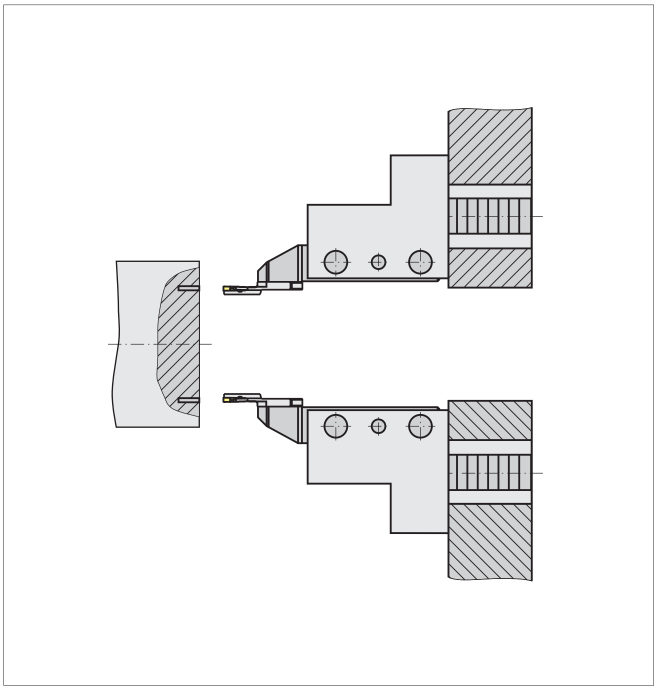
CTCP325	CTP1340	CTCP335	CTPP345	H216T
v_c	v_c	v_c	v_c	v_c
[m/min]	[m/min]	[m/min]	[m/min]	[m/min]
150 - 280	120 - 250	130 - 250	110 - 190	
130 - 240	80 - 180	110 - 190	80 - 150	
100 - 200	60 - 150	70 - 170	70 - 140	
140 - 220	80 - 180	120 - 200	70 - 140	
130 - 180	60 - 150	110 - 180	70 - 120	
100 - 160	60 - 120	70 - 150	60 - 120	
120 - 170	80 - 160	90 - 170	60 - 100	
100 - 150	50 - 120	70 - 160	60 - 100	
150 - 250	50 - 200	120 - 200	90 - 160	
60 - 100	50 - 150	60 - 100	60 - 100	
140 - 220	50 - 200	120 - 200	100 - 180	
120 - 200	50 - 180	100 - 170	80 - 150	
80 - 130	50 - 100	70 - 110	70 - 110	
60 - 100	50 - 80	60 - 90	60 - 90	
120 - 220	100 - 200	90 - 180		120 - 160
100 - 200	90 - 160	80 - 150		90 - 140
130 - 190	100 - 180	100 - 160		130 - 170
100 - 190	80 - 160	70 - 140		90 - 130
140 - 280	110 - 230	100 - 200		140 - 200
90 - 190	80 - 160	80 - 150		120 - 160
	100 - 500			300 - 2500
	100 - 300			200 - 2000
	100 - 500			400 - 1500
	100 - 300			400 - 1500
	100 - 200			200 - 800
	100 - 500			250 - 600
	100 - 500			200 - 600
	100 - 300			150 - 400
	100 - 300			150 - 300
	80 - 180			80 - 180
	60 - 150			60 - 150
	100 - 250			100 - 250
25 - 45	20 - 50			30 - 45
20 - 40	20 - 40		20 - 40	20 - 35
15 - 25	15 - 25		20 - 30	20 - 35
10 - 20	10 - 20			18 - 30
10 - 20	10 - 20			15 - 25
	50 - 120			60 - 120
	30 - 50			30 - 80
10 - 20				
10 - 20				
10 - 20				

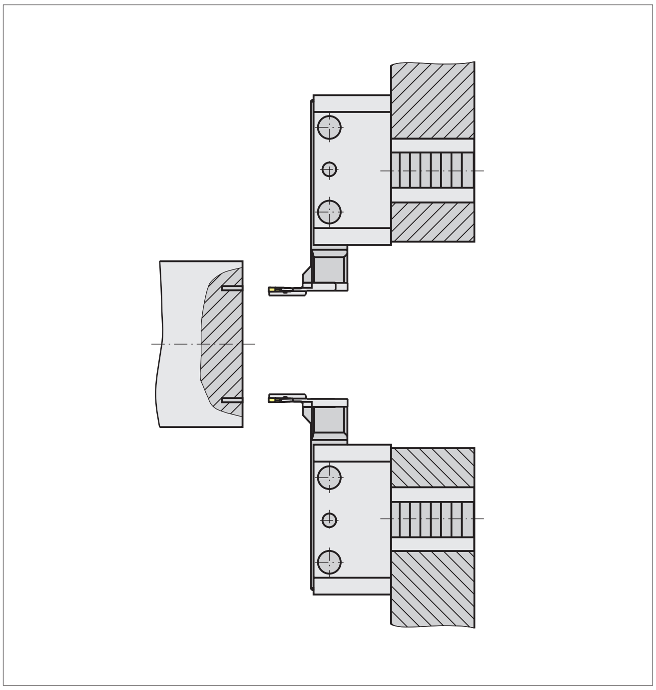
The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Possible applications

System GX

Tool configuration





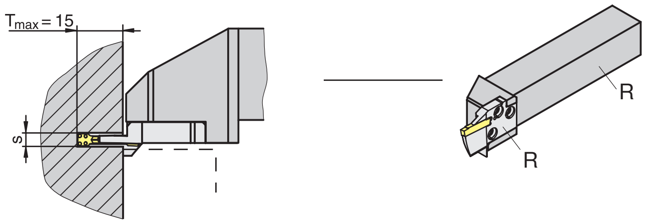
MSS tools 0°

- Large overhang
- Danger of collision
- Special VDI adapter necessary

MSS tools 90°

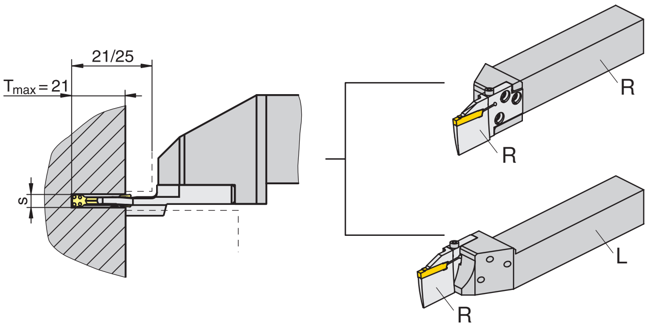
- Short overhang
- Increased stability
- Normal clamping in VDI shank possible

Parting and grooving depth



Short axial module

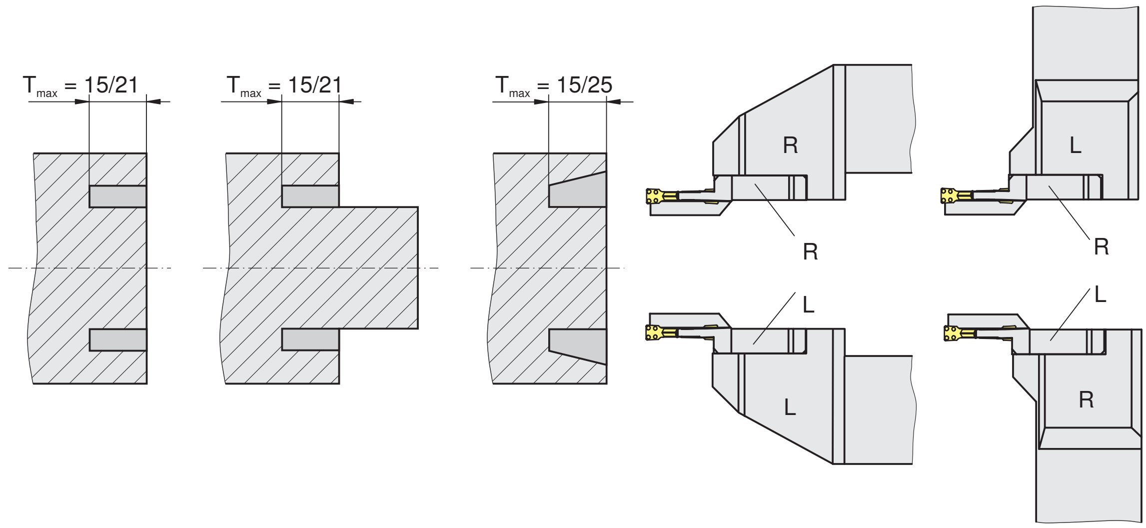
- Can be clamped on one side only
- Parting and grooving depth max. 15 mm

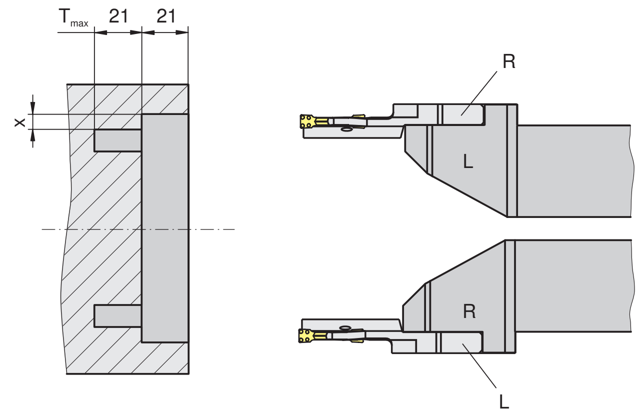


Long axial module

- Can be clamped from either side
- Parting and grooving depth max. 21 mm

Machining possibilities with short/long axial module



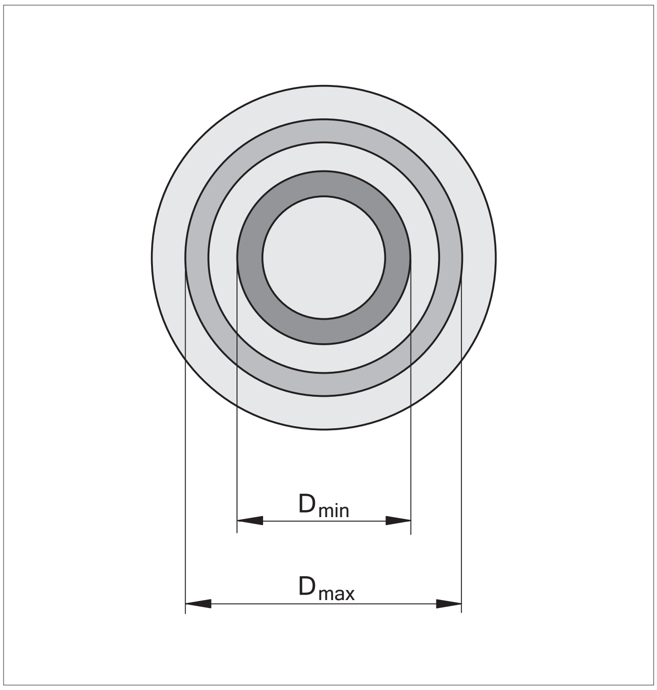


Machining possibilities with long axial module only

Depending on the diameter range or width class an axial displacement (dimension ‘x’) might be necessary when producing the second groove.
The dimension ‘x’ depends on the groove diameter and shank height.

Application advice

GX system

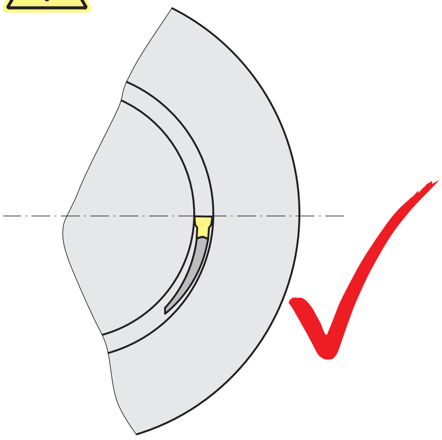


Diameter range **(D$_{min}$ - D$_{max}$)**
50 - 70 mm
70 - 100 mm
100 - 150 mm
150 - 300 mm
300 - 900 mm

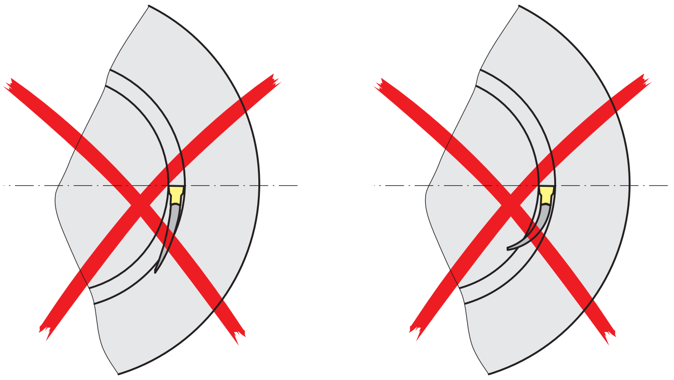
Important: the indicated diameter refers to the outside diameter of the groove.

	MSS assembly size							
	20	**25**					**32**	
	Cutting width	Cutting width					Cutting width	
		Short module			Long module			
Diameter range	2,76 - 3,75	2,76 - 3,75	3,76 - 5,00	5,01 - 6,50	3,76 - 5,00	5,01 - 6,50	3,76 - 5,00	5,01 - 6,50
50 - 70	●	●	●	●				
70 - 100	●	●	●	●	●	●	●	●
100 - 150	●	●	●	●	●	●	●	●
150 - 300			●	●	●	●	●	●
300 - 900								●
max. grooving depth	14	15			21		15	

Please note: the diameter of face grooves must lie within the diameter range indicated on the module. Otherwise the tool may be damaged or destroyed.

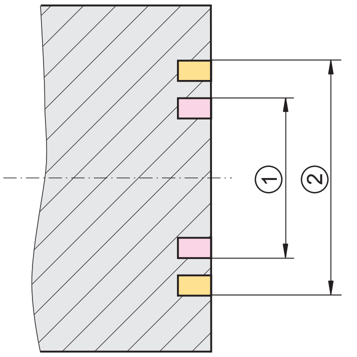


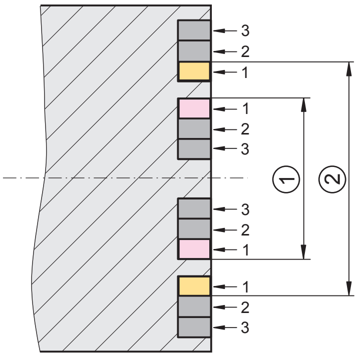
Correct axial grooving module

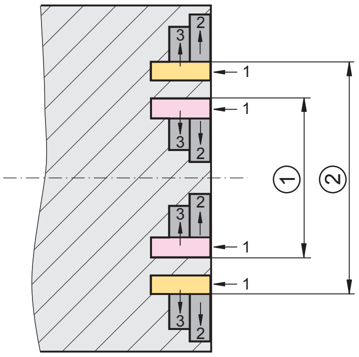


Incorrect axial grooving module

Application advice for axial grooving and face turning







① Minimum grooving diameter

② Maximum grooving diameter

Axial grooving

is only possible within the diameter range for that module (e.g. 50 - 70 mm).

Please note: the indicated diameter range refers to the outside diameter of the groove.

Axial grooving - groove widening

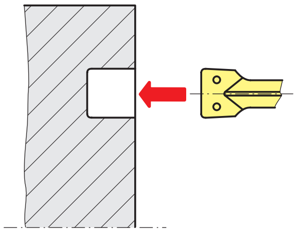
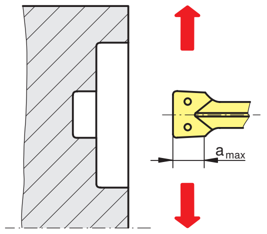
Groove widening is possible above and below the diameter range indicated on the module.

Please note: only the first groove must lie within the diameter range of the module. The depth of the widening groove must not be larger than the depth of the original groove.

Axial grooving and face turning

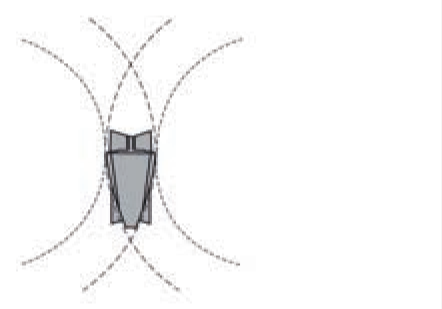
When face turning it is possible to widen the groove above and below the diameter range indicated on the module.

Please note: only the first groove must lie within the diameter range of the module.

Axial grooving and face turning			
			
Designation	**f [mm/rev]**	**a_{max} [mm]**	**f [mm/rev]**
GX24-2E3.00N0.30	0,05 - 0,15	2,5	0,05 - 0,20
GX24-3E4.00N0.40	0,05 - 0,15	3,0	0,05 - 0,25
GX24-3E5.00N0.40	0,05 - 0,15	3,0	0,10 - 0,25
GX24-4E6.00N0.50	0,05 - 0,20	3,5	0,10 - 0,30
GX24-2E3.00N0.30-F2	0,025 - 0,125	2,5	0,05 - 0,15
GX24-2E3.50N0.30-F2	0,025 - 0,125	2,5	0,05 - 0,15
GX24-3E4.00N0.40-F2	0,05 - 0,15	3,0	0,10 - 0,20
GX24-3E4.50N0.40-F2	0,05 - 0,15	3,0	0,10 - 0,20
GX24-3E5.00N0.40-F2	0,075 - 0,20	3,5	0,10 - 0,20
GX24-4E6.00N0.50-F2	0,05 - 0,15	4,0	0,10 - 0,25

MSS-AX

Product characteristics, customer benefits



Neutral insert

- May be applied in left-hand and right-hand tools
- Application is indenpent on the groove diameter (tool position is possible in x+ or x-)
- Only limited by D_{min} for first grooving operation

Geometry -F50

- Universal application, suitable for all materials
- Suitable for grooving and turning

Tools provided with ‘hard & tough’ coating

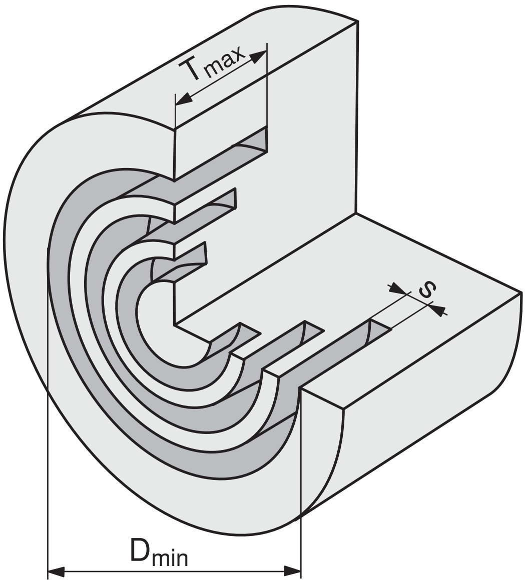
- Maximum wear protection
- Maximum corrosion resistance

Monoblock and modular tools

- High flexibility
- Cost-optimised solution for every application

Axial grooving

Diameter range



GX system

T_{max} / $D_{min} – D_{max}$	15 [mm]	21 [mm]
50 - 70	x	x
70 - 100	x	x
100 - 150	x	x
150 - 300	x	x
300 - 900	x	
S [mm]	2,76 - 6,5	3,76 - 6,5

AX system

	AX05	AX10	AX15
$D_{min} – D_{max}$	10 – ∞	20 – ∞	30 – ∞
T_{max}	5,0	10,0	15,0
S [mm]	3,0	3,0	3,0

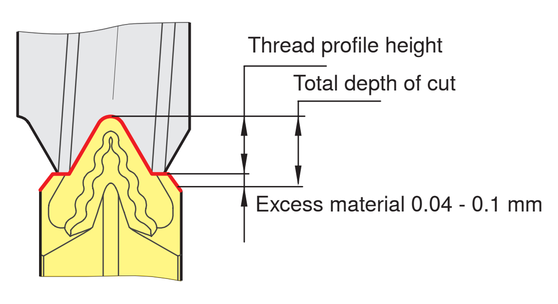
LX system

	E32N25	E32N32	E32N45
$D_{min} – D_{max}$	500 – ∞	500 – ∞	500 – ∞
T_{max}	19	26	39
S [mm]	8 - 10	8 - 10	8 - 10

TC - threading

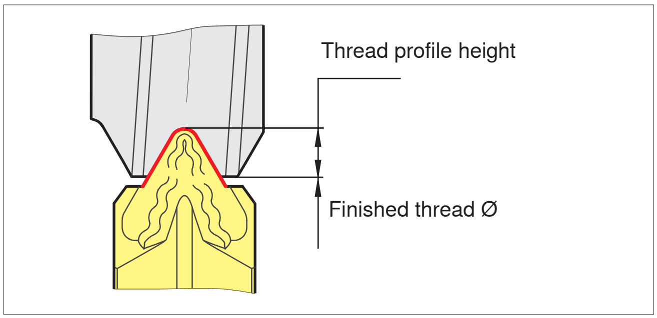
Basics of threading

Differences between full and partial profile inserts



Full profile insert

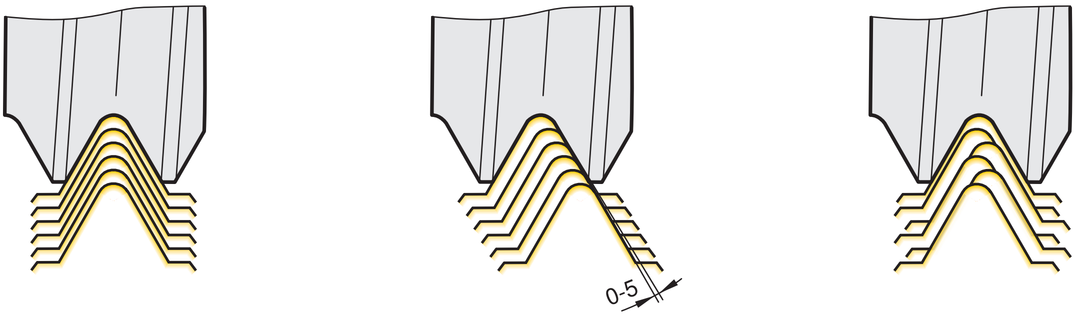
- \+ The entire thread profile including the external dia. is machined (excess material 0.04 - 0.1 mm over finished diameter) + high profile precision
- \+ Increased tool life thanks to larger point radii
- \+ Burr-free thread
- \- One insert per pitch



Partial profile insert

- \+ One insert for several pitches
- \- Therefore the thread profile does not exactly meet the standard
- \- The external dia. (or the core dia. in case of internal threads) is not machined

Approach selection



Radial approach

- \+ Conventional lathes
- \+ With pitches < 2 mm
- \+ With short chipping materials
- \- Reduced chip control

Flank approach

- \+ Preferred approach on CNC-machines
- \+ With pitches from 2 to 4 mm
- \+ Long chipping materials
- \+ Good chip control

Alternating approach

- \+ With pitches > 4 mm
- \+ Long chipping materials
- \+ Uniform insert wear
- \+ Long tool life
- \+ Good chip control
- \- More complex NC programming

TC - threading

Corrective actions for thread turning problems

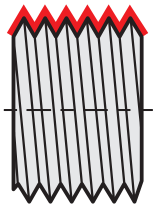
Type of problem													
Type of wear				**Work piece problems**				**Chip control**					
Flank wear	Edge chipping	Plastic deformation	Built-up edge	Burr formation at external thread Ø	Profile precision	Surface quality	Chatter marks, vibration	Chip cross section too large	Chip cross section too small	Chip shape (tangled swarf)	**Corrective measures**		
⇓		⇓	⇑			⇑	⇩				Cutting speed		**Cutting values**
a,b	a,b		a,b	a,b		a,b	a,b	a,b		a,b	Feed motion	a) via the flanks b) alternating via the flanks	
⇧	⇓	⇓		⇩	⇩	⇩	⇩	⇓	⇑	≈	Approach (depth of cut)		
⇩	⇑	⇧		≈	≈	⇧	≈	⇑	⇓	⇩	Number of passes		**Selection of inserts**
				▢	▢	▢					Finish cut (idle cut)		
			▢			▢	▢			▢	Chip groove		
⇑	⇓	⇑									Cutting material	↓ wear resistance toughness ↑	
				▢	▢	▢					Full profile		
											Partial profile		**General criteria**
	≈					≈	≈				Stability tool - insert		
	≈					≈	≈				Stability - work piece		
	⇩					⇩	⇩				Overhang		
≈	≈	≈			≈	≈	≈				Tip height		
▢	▢	▢	▢	▢		▢					Cooling lubricant		

⇑	raise, increase, large influence	⇓	avoid, reduce large influence	≈	check, optimise
⇧	raise, increase low influence	⇩	avoid, reduce low influence	▢	use

TC - thread turning

Recommended values for depth and number of cuts

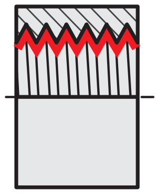
Full profile



Metric ISO 60° external threads

Pitch [mm]	0,5	0,75	1,0	1,25	1,5	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0
Number of cuts	4 ↓ 6	4 ↓ 7	5 ↓ 8	5 ↓ 9	6 ↓ 10	7 ↓ 11	8 ↓ 12	9 ↓ 14	10 ↓ 18	10 ↓ 18	12 ↓ 20	12 ↓ 20	12 ↓ 20
Thread profile height	0,32	0,48	0,64	0,80	0,95	1,10	1,26	1,58	1,89	2,21	2,53	2,84	3,16

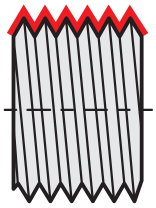
These are recommended values for steel machining

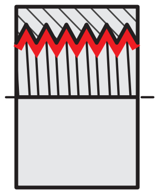


Metric ISO 60° internal threads

Pitch [mm]	0,5	0,75	1,0	1,25	1,5	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0
Number of cuts	4 ↓ 6	4 ↓ 7	5 ↓ 8	5 ↓ 9	6 ↓ 10	7 ↓ 11	8 ↓ 12	9 ↓ 14	10 ↓ 18	10 ↓ 18	12 ↓ 20	12 ↓ 20	12 ↓ 20
Thread profile height	0,30	0,45	0,59	0,74	0,89	1,02	1,17	1,46	1,76	2,02	2,35	2,64	2,93

These are recommended values for steel machining





Whitworth 55° external and internal threads

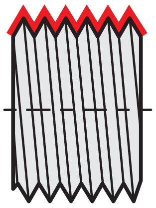
Pitch [passes/inch]	28	26	24	20	19	18	16	14	12	11	10	9	8	7	6	5
Number of cuts	5 ↓ 8	5 ↓ 8	5 ↓ 9	5 ↓ 9	6 ↓ 10	6 ↓ 10	7 ↓ 11	8 ↓ 12	9 ↓ 14	9 ↓ 14	10 ↓ 17	10 ↓ 18	10 ↓ 18	12 ↓ 20	12 ↓ 20	12 ↓ 20
Thread profile height	0,60	0,65	0,70	0,84	0,88	0,93	1,05	1,20	1,40	1,53	1,68	1,87	2,11	2,41	2,81	3,37

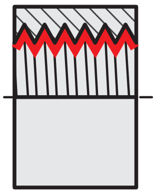
These are recommended values for steel machining

TC - thread turning

Recommended values for depth and number of cuts

Partial profile

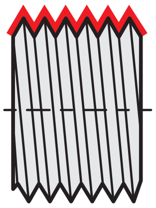




60° external and internal threads

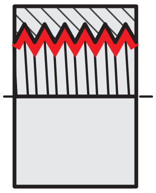
Threading insert	TC16-2EI-AG60																
	TC16-1EI-A60									TC16-2EI-G60				TC16-3EI-N60			
Pitch [mm]	0,5	0,75	1,0	1,25	1,5	1,75	2,0	2,5	3,0	1,75	2,0	2,5	3,0	3,5	4,0	4,5	5,0
Number of cuts	4 ↓ 6	4 ↓ 7	5 ↓ 9	6 ↓ 10	7 ↓ 11	8 ↓ 12	9 ↓ 14	10 ↓ 15	12 ↓ 19	8 ↓ 12	9 ↓ 14	10 ↓ 15	12 ↓ 20	12 ↓ 20	13 ↓ 21	14 ↓ 22	14 ↓ 22
Thread profile height external	0,33	0,52	0,71	0,90	1,09	1,28	1,47	1,84	2,22	1,23	1,42	1,79	2,17	2,45	2,83	3,21	3,59
Thread profile height internal	0,27	0,44	0,60	0,76	0,92	1,09	1,25	1,57	1,90	1,04	1,20	1,52	1,85	2,07	2,4	2,72	3,05

These are recommended values for steel machining



55° external threads

	TC16-2EI-AG55												
	TC16-1EI-A55												
Pitch [passes/inch]	28	26	24	20	19	18	16	14	12	11	10	9	8
Number of cuts	5 ↓ 8	5 ↓ 8	6 - 9	6 ↓ 9	7 ↓ 12	7 ↓ 12	8 ↓ 14	9 ↓ 14	10 ↓ 16	10 ↓ 16	11 ↓ 18	12 ↓ 20	12 ↓ 20
Thread profile height	0,66	0,72	0,79	0,95	1,01	1,07	1,21	1,39	1,63	1,79	1,97	2,20	2,48

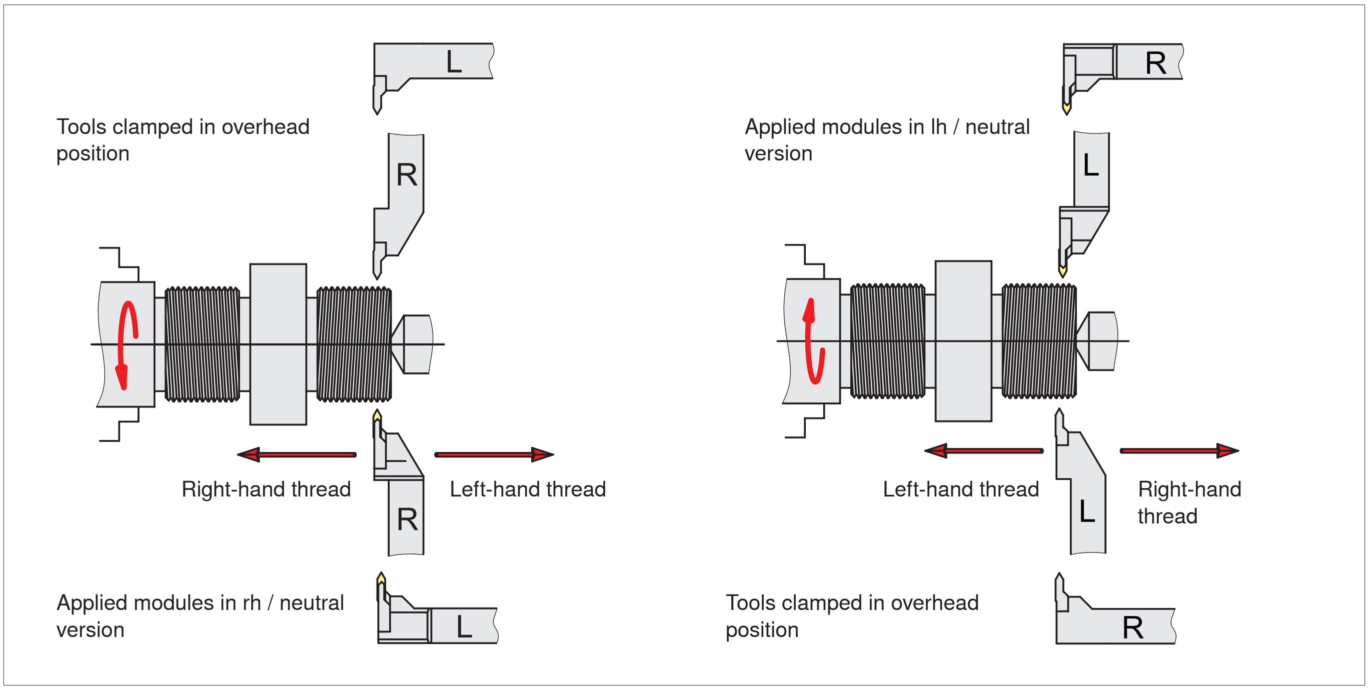


55° internal threads

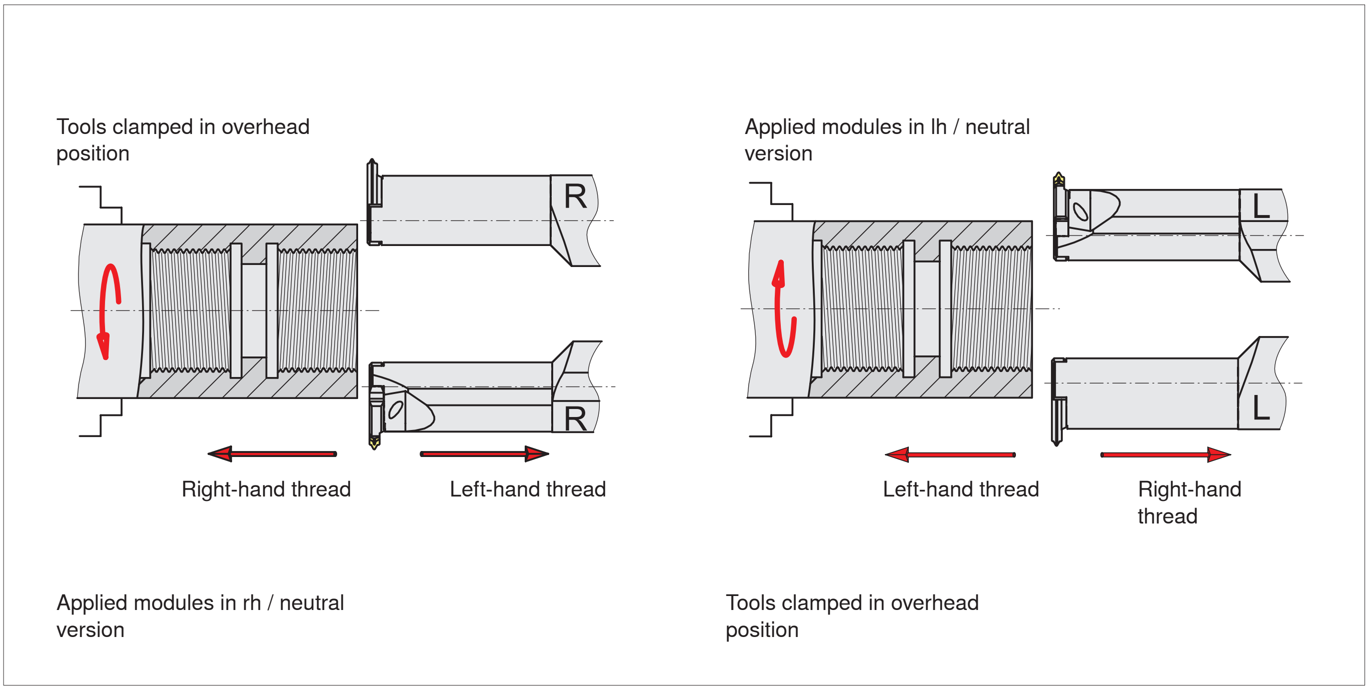
Threading insert	TC16-2EI-G55						TC16-3EI-N55		
Pitch [passes/inch]	14	12	11	10	9	8	7	6	5
Number of cuts	8 ↓ 12	9 ↓ 14	10 ↓ 15	11 ↓ 18	12 ↓ 20	12 ↓ 20	12 ↓ 20	12 ↓ 20	14 ↓ 22
Thread profile height	1,22	1,46	1,56	1,80	2,03	2,31	2,40	2,89	3,56

These are recommended values for steel machining

Application methods for external machining



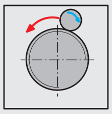
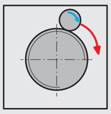
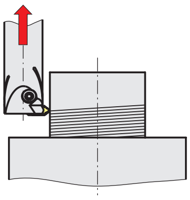
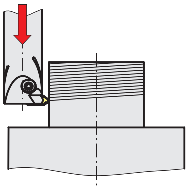
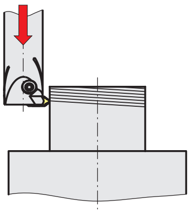
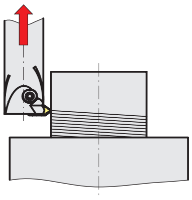
Application methods for internal machining



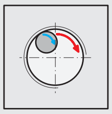
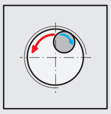
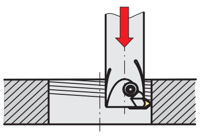
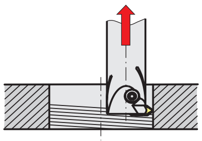
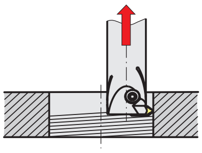
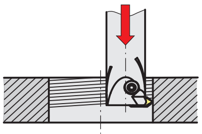
MSS - TC

Machining method thread milling

External thread

	Conventional milling 	Climb milling 
Right-hand thread		
Left-hand thread		

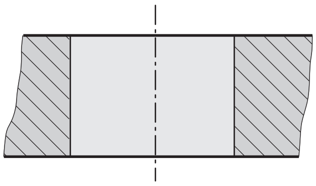
Internal thread

	Conventional milling 	Climb milling 
Right-hand thread		
Left-hand thread		

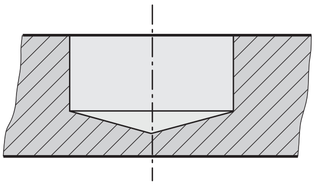
MSS - TC

Machining method thread milling

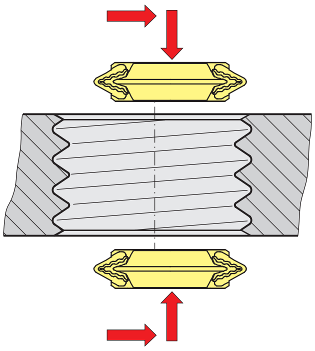
Drilling - through-hole thread



Drilling - bottom hole thread

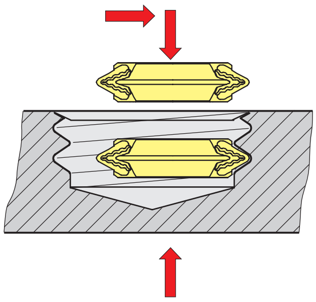


Through-hole thread



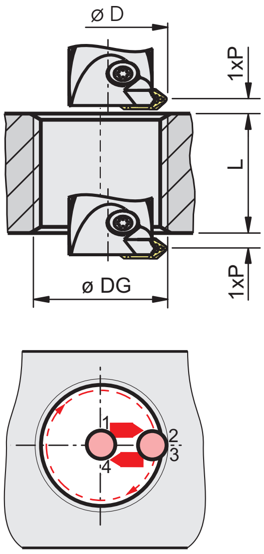
No radial plunging necessary, radial approach above or below work piece + spiral movement

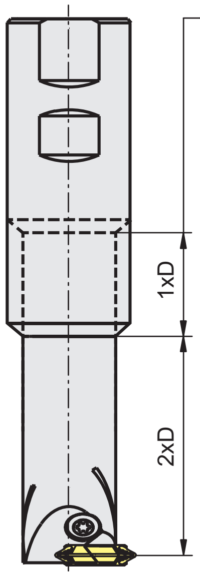
Bottom hole thread



Radial approach until total profile depth + spiral movement
Radial plunging + spiral movement

Advantages compared to multi-tooth threading inserts



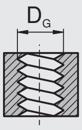
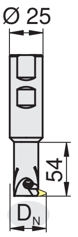


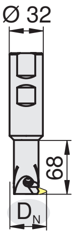
- ○ Same insert for thread turning and milling
- ○ Considerably lower cost of TC inserts
- ○ Thread is cut in a single feed from outside inwards or vice versa, so no step in the thread
- ○ Low cutting forces possible through single-tooth thread milling
- ○ Stable conditions
- ○ Standard reach is 2xD. Tools may be modified up to 3xD.
- ○ Higher cutting values (vc + f) in this manner machining times are similar to multi-tooth insert machining
- ○ Easy programming


CERATIZIT
XLCFR 3208C SX3
CE
XLCFR

Thread milling

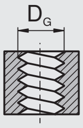
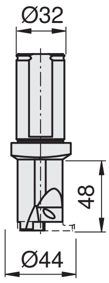
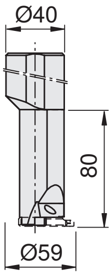
Milling tool system MSS-TC

			Full profile metric ISO 60° TC threading inserts 												Full profile Whitworth 55° TC threading inserts 								
D_N	Type, description	D_G [mm]	TC16-1 **I 0,5** ISO	TC16-1 **I 0,75** ISO	TC16-1 **I 1,0** ISO	TC16-1 **I 1,5** ISO	TC16-1 **I 2,0** ISO	TC16-1 **I 2,5** ISO	TC16-1 **I 3,0** ISO	TC16-1 **I 3,5** ISO	TC16-1 **I 4,0** ISO	TC16-1 **I 4,5** ISO	TC16-1 **I 5,0** ISO	D_G [inch]	TC16-2 **EI** 14W	TC16-2 **EI** 12W	TC16-2 **EI** 11W	TC16-2 **EI** 10W	TC16-2 **EI** 9W	TC16-2 **EI** 8W	TC16-3 **EI** 7W	TC16-3 **EI** 6W	TC16-3 **EI** 5W
25	**I25**R90-2D-TC16-W  	M27	x	x																			
		M28	x	x	x																		
		M30	x	x	x	x																	
		M32	x	x	x	x	x							R 1¹/₄			x						
		M33	x	x	x	x	x																
		M34	x	x	x	x	x		x														
		M35	x	x	x	x	x		x														
		M36	x	x	x	x	x		x		x												
		M38	x	x	x	x	x		x					1¹/₂								x	
		M39	x	x	x	x	x		x		x												
		M40	x	x	x	x	x		x		x			R 1¹/₂			x						
		M42	x	x	x	x	x		x		x	x		1⁵/₈									x
		M45	x	x	x	x	x		x		x	x		1³/₄									x
		M48	x	x	x	x	x		x		x		x										

D_N	Type, description	D_G [mm]	TC16-1 **I 0,5** ISO	TC16-1 **I 0,75** ISO	TC16-1 **I 1,0** ISO	TC16-1 **I 1,5** ISO	TC16-1 **I 2,0** ISO	TC16-1 **I 2,5** ISO	TC16-1 **I 3,0** ISO	TC16-1 **I 3,5** ISO	TC16-1 **I 4,0** ISO	TC16-1 **I 4,5** ISO	TC16-1 **I 5,0** ISO	D_G [inch]	TC16-2 **EI** 14W	TC16-2 **EI** 12W	TC16-2 **EI** 11W	TC16-2 **EI** 10W	TC16-2 **EI** 9W	TC16-2 **EI** 8W	TC16-3 **EI** 7W	TC16-3 **EI** 6W	TC16-3 **EI** 5W
32	**I32**R90-2D-TC16-W  	**M36**	x	x	x																		
		M38	x	x	x	x																	
		M39	x	x	x	x	x																
		M40	x	x	x	x	x																
		M42	x	x	x	x	x		x														
		M45	x	x	x	x	x		x														
		M48	x	x	x	x	x		x		x												
		M50	x	x	x	x	x		x		x			R2			x						
		M52		x	x	x	x		x		x		x										
		M55		x	x	x	x		x		x												
		M56		x	x	x	x		x		x												
		M58		x	x	x	x		x		x												
		M60		x	x	x	x		x		x												
		M62		x	x	x	x		x		x												
		M64		x	x	x	x		x		x												
		M65		x	x	x	x		x		x			R2¹/₄			x						
		M68		x	x	x	x		x		x												
		M70		x	x	x	x		x		x												
		M72		x	x	x	x		x		x												
		M75		x	x	x	x		x		x			R2¹/₂			x						
		M76		x	x	x	x		x		x												
		M78		x	x	x	x		x		x												
		M80		x	x	x	x		x		x												

D_N = nominal milling Ø

▨ = standard thread

			Full profile metric ISO 60°		
			MSS-**I32R**-TC16-2		MSS-**I32N**-TC16-3
Bgr.	**Type, description**	**D_G** [mm]	TC16-2 **I 2,0** ISO	TC16-2 **I 3,0** ISO	TC16-3 **I 4,0** ISO
32	**1.5D** MSS-**I32R**90-1.5D	M82	x	x	x
		M85	x	x	x
		M90	x	x	x
		M95	x	x	x
		M100	x	x	x
		M105	x	x	x
		M110	x	x	x
		M115	x	x	x
		M120	x	x	x
		M125	x	x	x
		M130	x	x	x
		M135	x	x	x
		M140	x	x	x
		M145	x	x	x
		M150	x	x	x
		M155		x	x
		M160		x	x
		M165		x	x
		M170		x	x
	2.5D MSS-**I32R**90-2.5D	M175		x	x
		M180		x	x
		M185		x	x
		M190		x	x
		M195		x	x
		M200		x	x
		M205		x	x
		M210		x	x
		M215		x	x
		M220		x	x
		M225		x	x
		M230		x	x
		M235		x	x
		M240		x	x
		M245		x	x
		M250		x	x
		↓		↓	↓
		M300		x	x

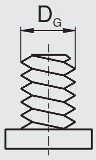
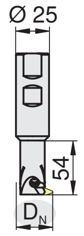
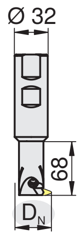
	Full profile Whitworth 55°
	MSS-**I32R**-TC16-2
D_G [inch]	TC16-2 **EI** 11W
R $2^3/_4$	x
R3	x
R$3^1/_4$	x
R$3^1/_2$	x
R$3^3/_4$	x
R4	x
R$4^1/_2$	x
R5	x
R$5^1/_2$	x
R6	x

Bgr. = assembly size

Parting and grooving / Technical information

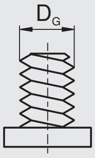
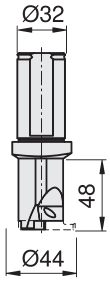
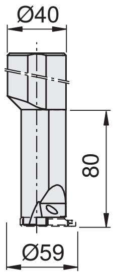
Thread milling

Milling tool system MSS-TC

		Full profile metric ISO 60°											
			TC threading inserts 										
D_N	Type, description	D_G [mm]	TC16-1 **I 0,5** ISO	TC16-1 **I 0,75** ISO	TC16-1 **I 1,0** ISO	TC16-1 **I 1,5** ISO	TC16-1 **I 2,0** ISO	TC16-1 **I 2,5** ISO	TC16-1 **I 3,0** ISO	TC16-1 **I 3,5** ISO	TC16-1 **I 4,0** ISO	TC16-1 **I 4,5** ISO	TC16-1 **I 5,0** ISO
25	**I25**R90-2D-TC16-W	↓ M16											
		↓											
				External threads in the range between M16 and M80 can be milled with both tools, I25... or I32.... Choose the adequate threading inserts with the required pitch.									
32	**I32**R90-2D-TC16-W	↓											
		↓											
		M80											

Full profile Whitworth 55°									
	TC threading inserts 								
D_G [inch]	TC16-2 **EI** 14W	TC16-2 **EI** 12W	TC16-2 **EI** 11W	TC16-2 **EI** 10W	TC16-2 **EI** 9W	TC16-2 **EI** 8W	TC16-3 **EI** 7W	TC16-3 **EI** 6W	TC16-3 **EI** 5W
↓									
$^5/_8$			x						
$^3/_4$				x					
$^7/_8$					x				
1						x			
$1^1/_8$							x		
$1^3/_8$								x	
$1^1/_2$								x	
$1^5/_8$									x
$1^3/_4$									x

D_N = nominal milling Ø

		**Full profile** **metric ISO 60°**			
					
			MSS-**I32R**-TC16-2		MSS-**I32N**-TC16-3
Bgr.	**Type,** **description**	**D_G** [mm]	TC16-2 **I 2,0** ISO	TC16-2 **I 3,0** ISO	TC16-3 **I 4,0** ISO
32	**1.5D** MSS-**I32R**90-1.5D	M82	x	x	x
		M85	x	x	x
		M90	x	x	x
		M95	x	x	x
		M100	x	x	x
		M105	x	x	x
		M110	x	x	x
		M115	x	x	x
		M120	x	x	x
		M125	x	x	x
		M130	x	x	x
		M135	x	x	x
		M140	x	x	x
		M145	x	x	x
		M150	x	x	x
		M155		x	x
		M160		x	x
		M165		x	x
		M170		x	x
	2.5D MSS-**I32R**90-2.5D	M175		x	x
		M180		x	x
		M185		x	x
		M190		x	x
		M195		x	x
		M200		x	x
		M205		x	x
		M210		x	x
		M215		x	x
		M220		x	x
		M225		x	x
		M230		x	x
		M235		x	x
		M240		x	x
		M245		x	x
		M250		x	x
		↓		↓	↓
		M300		x	x

Bgr. = assembly size

Cutting data – threading

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

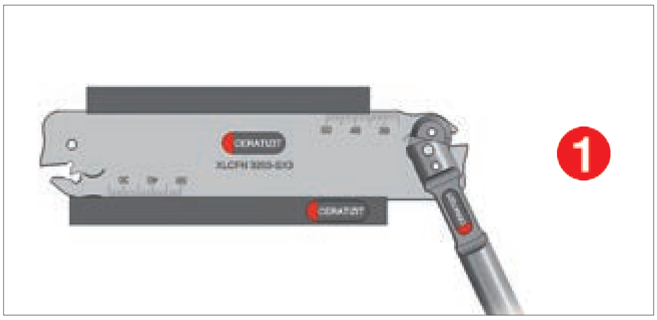
Cutting data – threading

🟦	🟦	🟩
GM213 v_c **[m/min]**	**GM240** v_c **[m/min]**	**H216T** v_c **[m/min]**
150 - 250	200 - 270	
110 - 180	180 - 230	
90 - 160	140 - 190	
100 - 170	180 - 240	
80 - 150	120 - 190	
70 - 120	120 - 160	
90 - 130	140 - 200	
70 - 110	100 -160	
110 - 170	170 - 230	
90 - 140	130 - 190	
110 - 180	150 - 200	
80 - 140		
70 - 100		
70 - 120		
120 - 160	130 - 200	
100 - 130	120 - 180	
160 - 200	120 - 170	
90 - 140	120 - 190	
120 - 140	150 - 230	
90 - 130	120 - 170	
		100 - 800
		100 - 800
		100 - 500
		100 - 500
		100 - 350
		80 - 300
		80 - 500
		80 - 500
		80 - 500
		80 - 500
		80 - 500
		80 - 500
30 - 50	20 - 40	
25 - 35	20 - 30	
15 - 25	10 - 20	
10 - 20	10 - 20	
10 - 25	10 - 20	
100 - 150	70 - 100	
40 - 60	25 - 45	
35 - 45		30 - 40
10 - 20		5 - 15
35 - 45		30 - 40

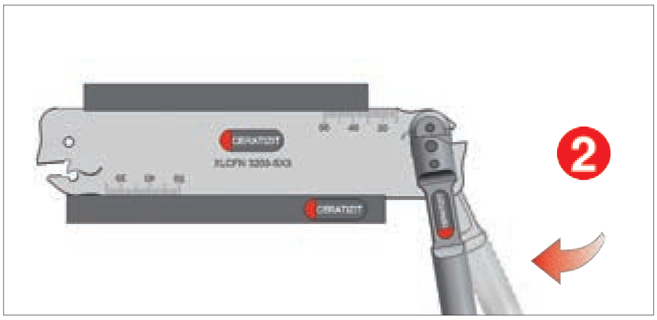
The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

MSS-SX

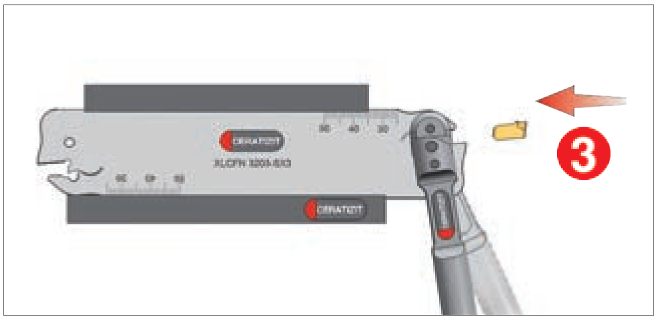
How to use the system



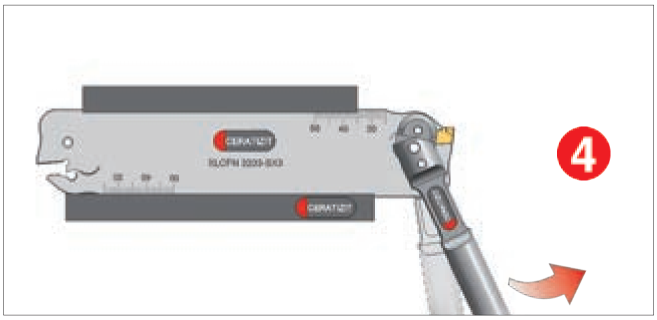
Insert mounting key with handle towards the front into the 2 tool location points.



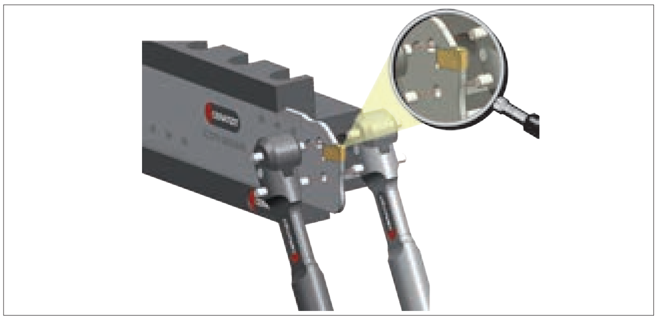
When moving the mounting key in the direction of the arrows the insert seat is opened.



Position the insert pressing it against the location face.

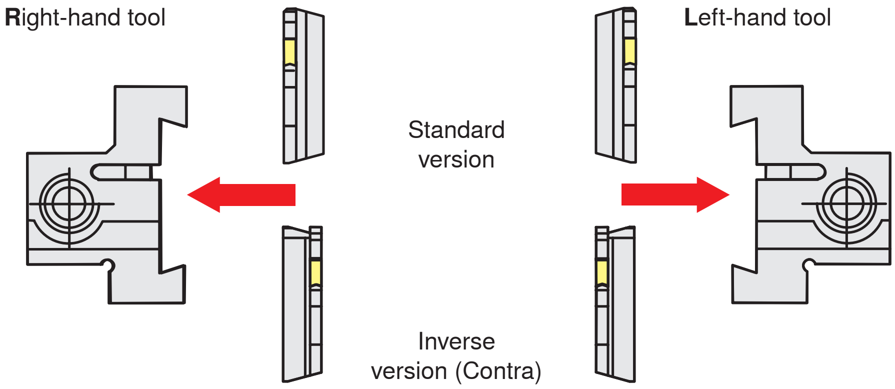


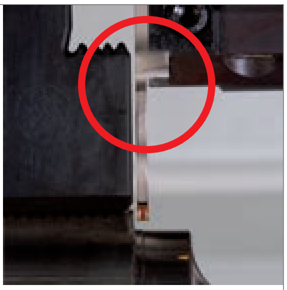
Moving the mounting key forward the insert seat locks and the insert is clamped securely.

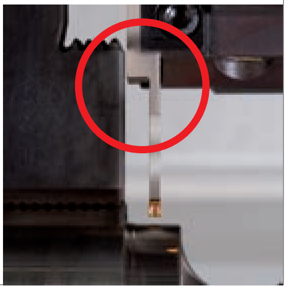


The clamping system is designed in such a way that the mounting key can be inserted into the blade from either side.

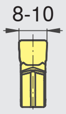
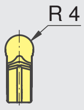
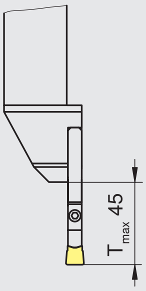
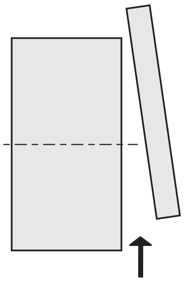
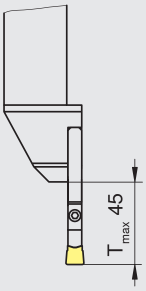
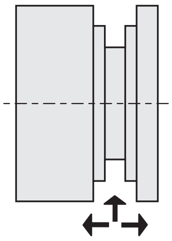
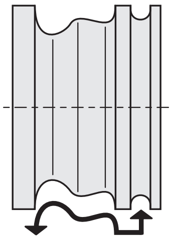
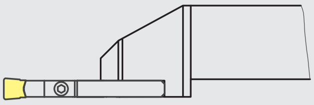
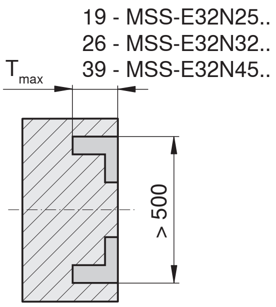
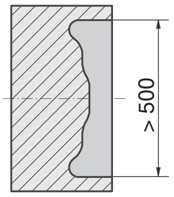
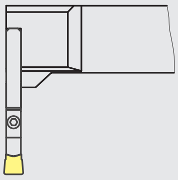
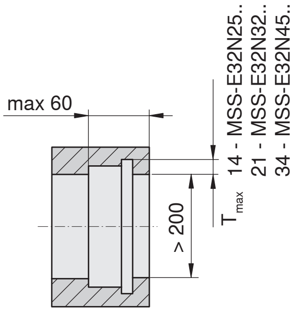
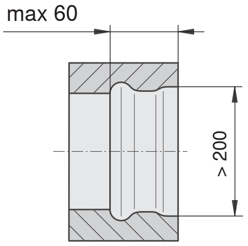
The correct tool selection

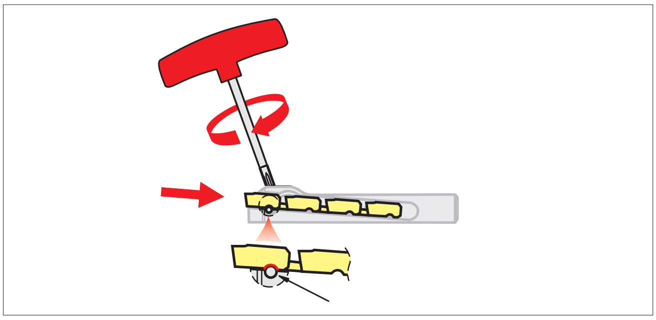




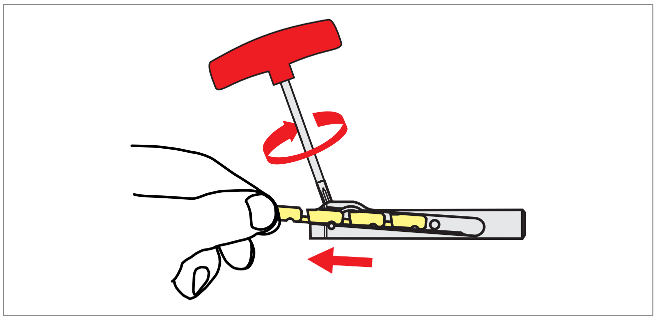


LX - possible applications

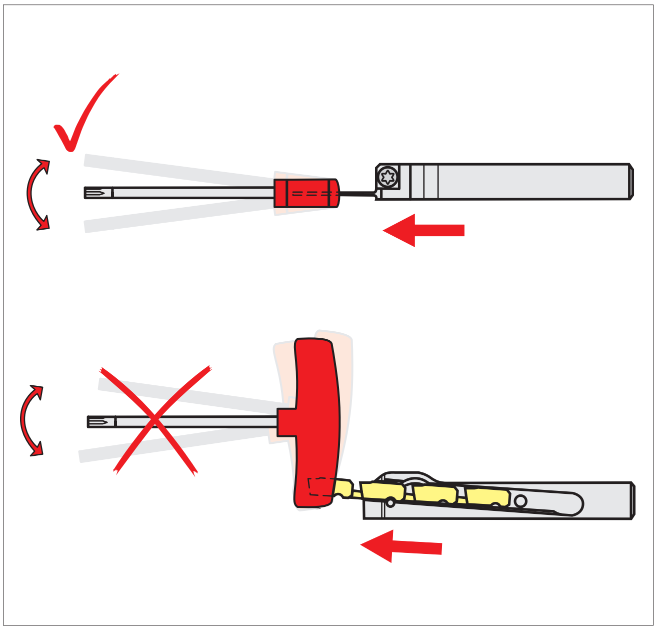
Insert / **Application**		
Part-off 		
Grooving and turning 		
Axial grooving 		
Internal grooving and turning 		



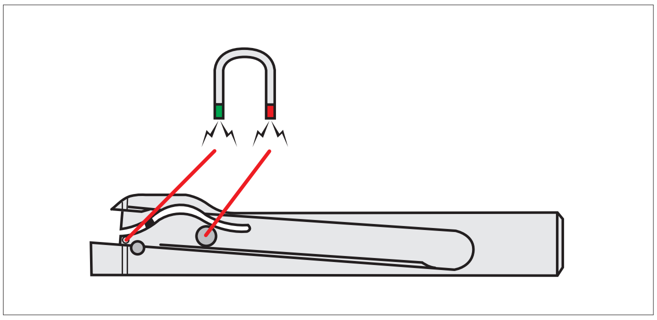
Important: ensure insert is correctly located on pin.



To change to the next cutting edge draw the insert forward.



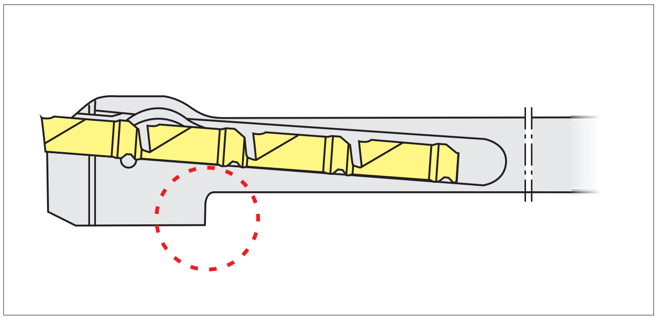
Worn cutting edge must be broken off to left or right



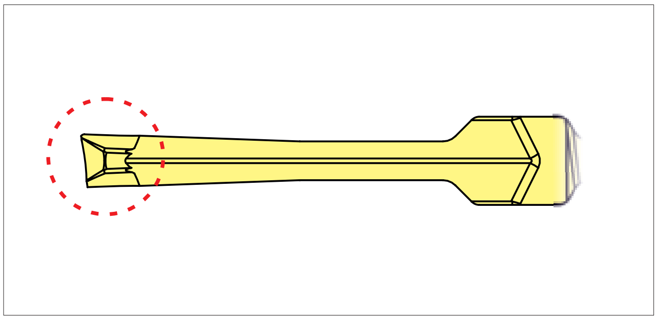
Information: during the positioning procedure, the magnets prevent the cutting inserts from falling out of the tool holder

MaxiClick

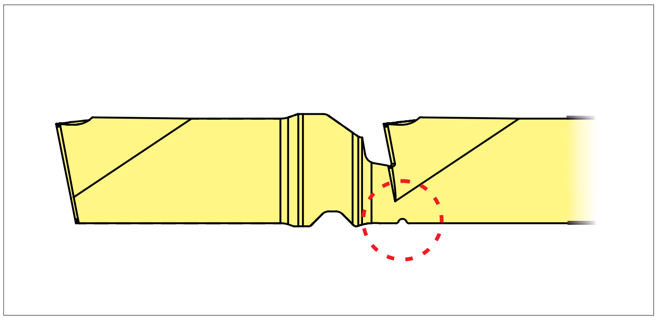
Product characteristics



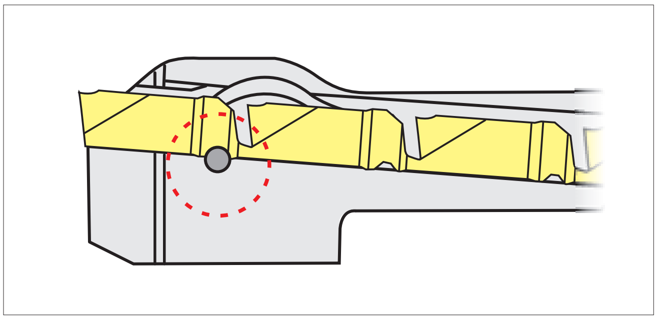
Reinforced tool head for additional stability



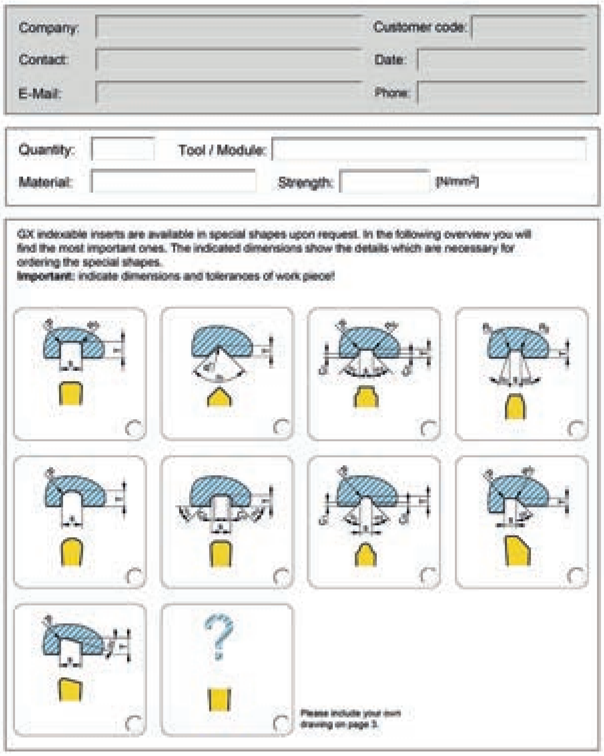
12° angle for part-off operations without burrs



'Break-off notch' for a clean breakage line



Carbide positioning pin for accurate repeatability



Company:		Customer code:	
Contact:		Date:	
E-Mail:		Phone:	

Quantity:		Tool / Module:	
Material:		Strength:	[N/mm²]

GX indexable inserts are available in special shapes upon request. In the following overview you will find the most important ones. The indicated dimensions show the details which are necessary for ordering the special shapes.

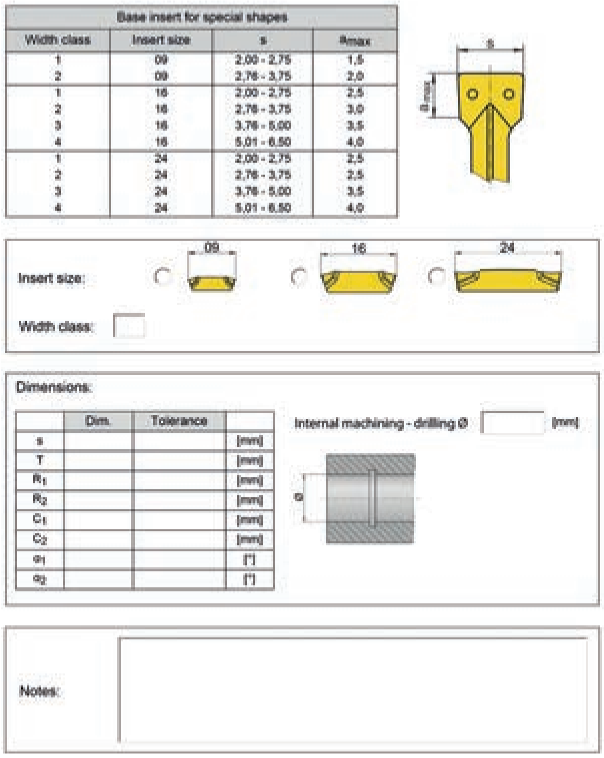
Important: indicate dimensions and tolerances of work piece!

○ ○ ○ ○

○ ○ ○ ○

○ ○

Please include your own drawing on page 3.



Base insert for special shapes			
Width class	Insert size	s	a_{max}
1	09	2,00 - 2,75	1,5
2	09	2,76 - 3,75	2,0
1	16	2,00 - 2,75	2,5
2	16	2,76 - 3,75	3,0
3	16	3,76 - 5,00	3,5
4	16	5,01 - 6,50	4,0
1	24	2,00 - 2,75	2,5
2	24	2,76 - 3,75	2,5
3	24	3,76 - 5,00	3,5
4	24	5,01 - 6,50	4,0

Insert size: ○ 09 ○ 16 ○ 24

Width class: ☐

Dimensions:

	Dim.	Tolerance	
s			[mm]
T			[mm]
R_1			[mm]
R_2			[mm]
C_1			[mm]
C_2			[mm]
$α_1$			[°]
$α_2$			[°]

Internal machining - drilling Ø ☐ [mm]

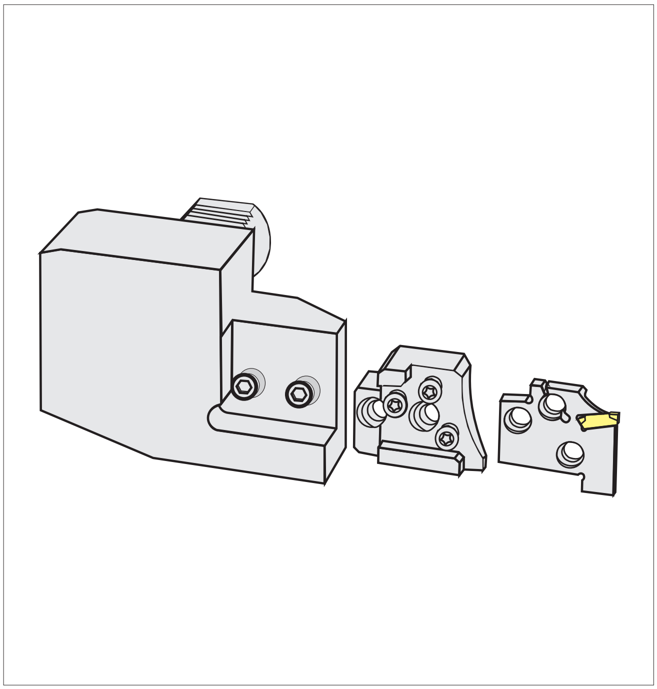
Notes:

You can download the form above at our website **https://www.e-techstore.com/ALLG/CT-BUZ-103.zip** or using the QR code.

Possible applications

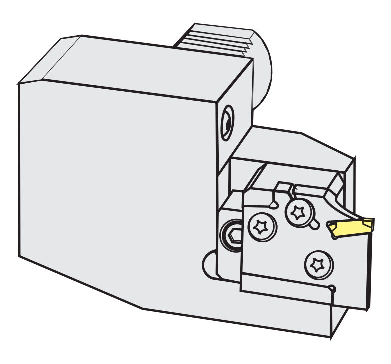
Possible applications for MSS adapters

MSS adapters offer the possibility to apply the modular parting and grooving system where conventional tool shanks or Maxiflex UTS tool heads cannot be used.



Examples

- ○ Special solutions of all kinds
- ○ Special tools and shanks
- ○ Rotating tools for circular milling
- ○ Special machines
- ○ Limited space

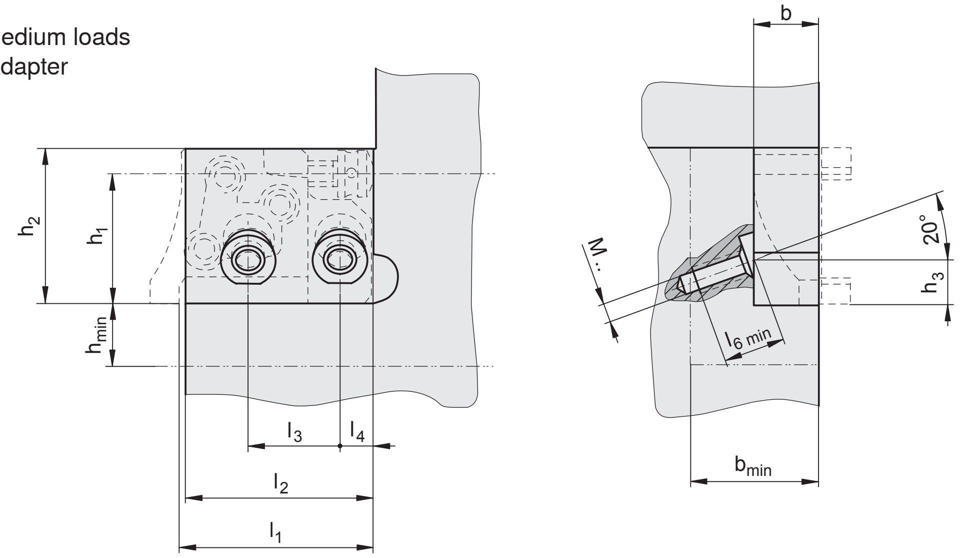


Assembly example

Adapters in combination with VDI shank

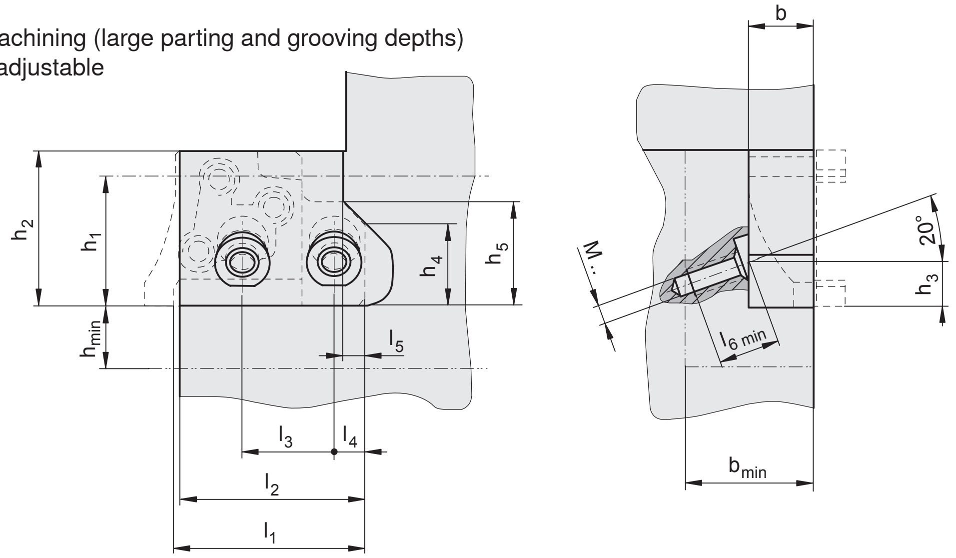
Assembly type A

- ○ For low or medium loads
- ○ Adjustable adapter



Assembly type B

- ○ For heavy machining (large parting and grooving depths)
- ○ Adapter not adjustable



	h_1	h_2	$h_3^{\pm0,1}$	h_4	h_5	$h_{min.}$	b	$b_{min.}$	l_1	l_2	l_3	l_4	l_5	$l_{6\,min.}$	M..
MSS-E20R00-AD MSS-E20L00-AD	20	24	6,0	13	16	10	10,7	19	30	29,0	14,25	5,0	3	8	M4
MSS-E25R00-AD MSS-E25L00-AD	25	30	8,5	16	20	12	12,6	25	37	36,0	18,00	6,5	4	12	M5
MSS-E32R00-AD MSS-E32L00-AD	32	38	13,5	22	26	16	14,6	30	46	44,5	23,50	7,5	4	15	M6

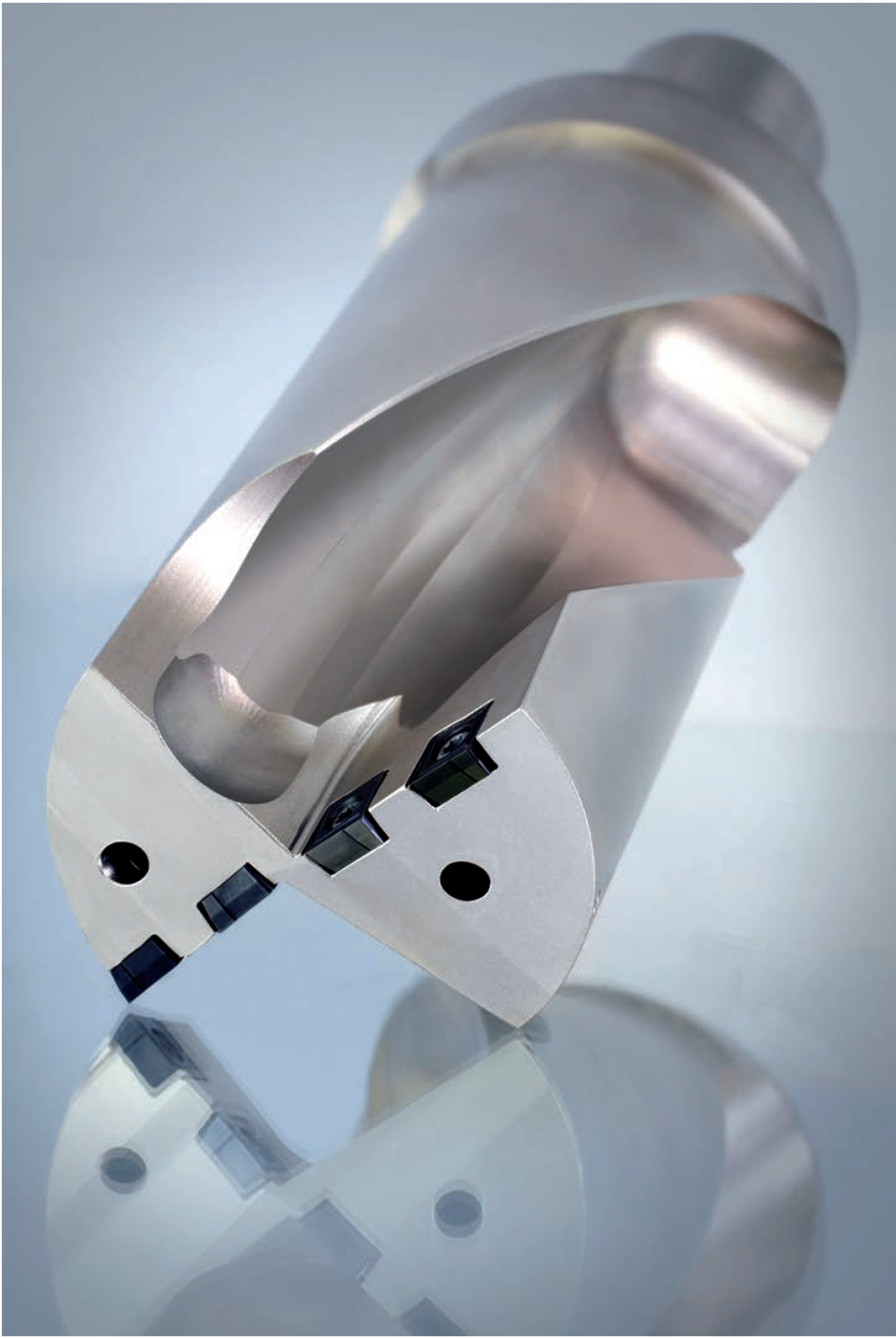
Spare parts

	Material	Type, description	Key size	Torque moment [Nm]	Torque moment [in.lbs]
	11149570	DMSD 3,2Nm/SORT T15	T15	3.2	28,3
	11149571	DMSD 4,0Nm/SORT T20	T20	4.0	35,4

	Material	Type, description	Key size
	154461	7802180/A 2,2	A2,2
	154463	7802181/A 3,1	A3,1
	154464	7802182/A 8,2	A8,2
	11366865	10005884/S12-3	S12-3
	11366866	10001365/S15-4	S15-4
	4496	7812301/SW 5	SW5
	4497	7812302/SW 6	SW6
	8095010200	SD-T08-60mm	T08
	8095010400	SD-T10-80mm	T10
	11224503	S-15IP-T	T15IP
	200317	7883304/TORX T25 T	T25
	220983	7897208/TORX T15 T	T15
	220985	7897207/TORX T20 T	T20

	Material	Type, description	Length [mm]	Thread size	Key size
	219981	7897209/M4,0X11/T15	11	M4	T15
	219982	7897210/M5,0X13,5/T20	13.5	M5	T20
	195068	7897203/M4,0X14/T15	14	M4	T15
	195069	7897205/M5,0X18/T20	18	M5	T20
	195070	7897206/M6,0X20/T25	20	M6	T25
	228617	7897200/M2,5X10/T08	10	M2,5	T08
	228619	7897201/M3,0X11/T10	11	M3	T15
	228620	7897202/M3,5X12,5/T15	12.5	M3,5	T15
	228621	7897204/M4,5X17/T20	17	M4,5	T20
	11042274	7818429/M4,0X11/T15	11	M4	T15
	11007006	7897218/M4,0X18/T20	18	M4	T20
	11081190	7897221/M3,5X14,0/T15	16.5	M3,5	T15
	11187405	10001938/M5X20/T25	20	M5	T25
	11207638	M5x18-15IP/10002133	20.5	M5	T15IP
	11776816	10010029/M6X12 DIN912- 12.9	12	M12	SW10
	22485	7802115/M6X25 DIN 912	25	M6	SW5
	229126	7897213/M6X20 12.9 DIN 912	20	M6	SW5
	229131	7897211/M4X12 DIN 912 - 12.9	12	M4	SW3
	284518	7818319/M5,0X16,0/DIN912-12.9	16	M5	SW4
	81158	7802133/M8X35 DIN 912	35	M8	SW6

Notes



Contents

Introduction

MaxiDrill 900

MaxiDrill Classic

MaxiDrill Classic

Technical information

Index

C 900 . 5D . 260 . R . 08

1 2 3 4 5 6

3D . 260 . R . 05

3 4 5 6

1

Connection/interface

C = round shank
UT40 = UTS adapter

2

System

MaxiDrill 900

3

Length

2D
3D
4D
5D

4

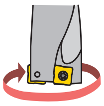
Drilling diameter

260 = 26,0 mm

5

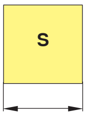
Direction of rotation

R = right-hand



6

Insert size



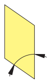
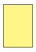
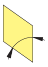
CERATIZIT designation system

Inserts

S	O	N	T	06	25	06	E	R	-	M30
1	2	3	4	5	6	7	8	9		10

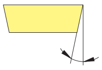
1

Insert shape

A **B** **K**	85° 82° 55°	
H	120°	
L	90°	
O	135°	
P	108°	
C **D** **E** **M** **V**	80° 55° 75° 86° 35°	
R	-	
S	90°	
T	60°	
W	80°	
X **Z**	Special shapes	

2

Clearance angle

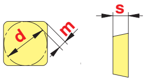


	α
A	3°
B	5°
C	7°
D	15°
E	20°
F	25°
G	30°
N	0°
P	11°
O	Special version

3

Tolerances

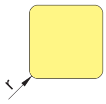
	d [±mm]	m [±mm]	s [±mm]	d=6,35/9,52	d=12,7	d=15,8/19,05
A	0,025	0,005	0,025	●	●	●
C	0,025	0,013	0,025	●	●	●
E	0,025	0,025	0,025	●	●	●
F	0,013	0,005	0,025	●	●	●
G	0,025	0,025	0,13	●	●	●
H	0,013	0,013	0,025	●	●	●
	0,05	0,005	0,025	●		
J	0,08	0,005	0,025		●	
	0,10	0,005	0,025			●
	0,05	0,013	0,025	●		
K	0,08	0,013	0,02		●	
	0,10	0,013	0,02			●



	d [±mm]	m [±mm]	s [±mm]	d=6,35/9,52	d=12,7	d=15,8/19,05
	0,05	0,08	0,13	●		
M	0,08	0,13	0,13		●	
	0,10	0,15	0,13			●
	0,05	0,08	0,025	●		
N	0,08	0,13	0,025		●	
	0,10	0,15	0,025			●
	0,08	0,13	0,13	●		
U	0,13	0,20	0,13		●	
	0,18	0,27	0,13			●

7

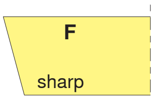
Corner radius

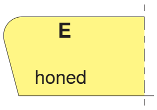


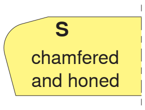
Index	r [mm]
04	0,4
05	0,5
06	0,6
07	0,7
08	0,8
10	1,0
12	1,2

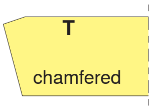
8

Cutting edge



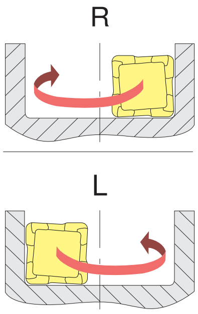






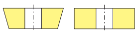
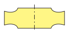
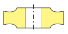
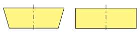
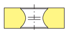
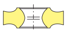
9

Cutting direction



4

Form of top surface

A	
F	
G	
M	
N	
Q	
R	
T	
U	
W	
X	Special shapes

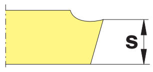
5

Insert size

Type	Index	[mm]
W 	**02**	3,39
	03	3,97
	05	5,29
	06	6,62
	07	7,94
S 	**03**	4,30
	04	4,20
	05	4,80
	06	5,50
	07	6,10
	08	7,30
	09	8,90
	10	9,60
	12	11,60
	13	12,20
	15	14,40
	17	16,70

6

Insert thickness



Index	s [mm]
02	2,3
02	2,5
03	3,0
T3	3,8
18	1,8
21	2,1
23	2,3
25	2,5
29	2,9
33	3,3
38	3,8
44	4,4
48	4,8
50	5,0
53	5,3
56	5,6

10

Chip groove

Chip groove designation
F.. = Fine machining
M.. = Medium machining
R.. = Rough machining

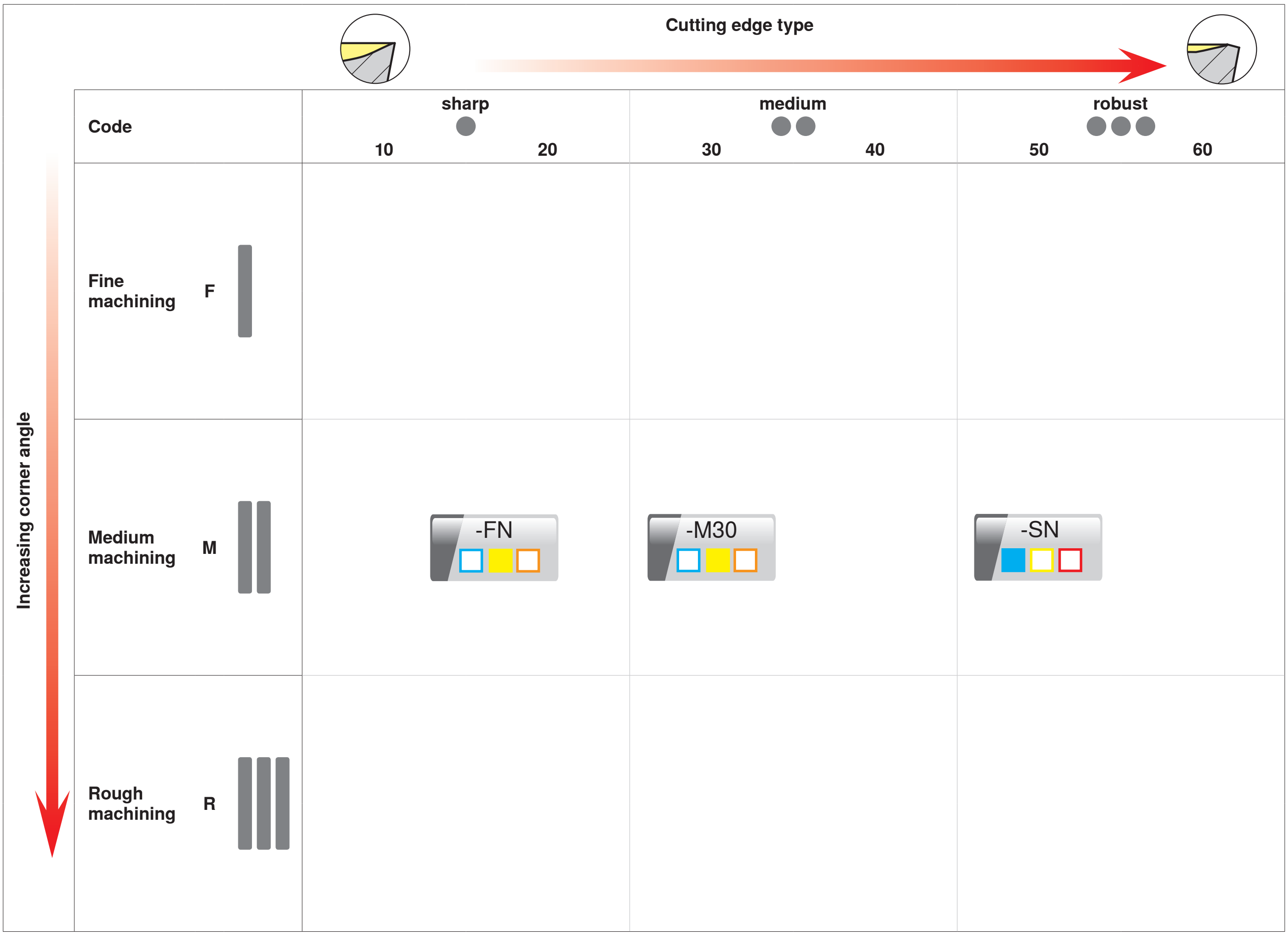
Additional characteristics:
R = Blend radius main/secondary cutting edge
Q = Masterfinish

Geometries

M 30

1 Corner angle

2 Cutting edge type



Cutting edge type

Increasing corner angle

Code		**sharp** ● **10** **20**	**medium** ●● **30** **40**	**robust** ●●● **50** **60**
Fine machining	**F**			
Medium machining	**M**	-FN ☐ 🟨 ☐	-M30 ☐ 🟨 ☐	-SN 🟦 ☐ ☐
Rough machining	**R**			

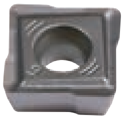
	1	2	
P	🟦	☐	Steel
M	🟨	☐	Stainless steel
K	🟥	☐	Cast iron
N	🟩	☐	Non-ferrous metals
S	🟧	☐	Difficult to machine materials
H	⬛	☐	Hard materials

1 Main application

2 Extended application

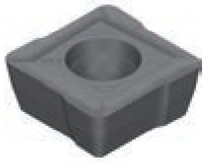
Example:

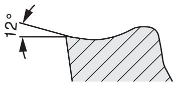
SONT 083308ER-M30



-M30

- Universal application
- For general steel materials





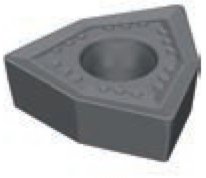
f [mm]

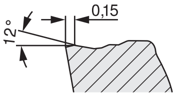
0,05 - 0,20

	Machining conditions		
	○	◐	◌
🟦	CTPP430 CTCP420	CTPP430 CTCP420	CTPP430
🟨	CTPP430	CTPP430	CTPP430
🟥	CTPP430 CTCP420	CTPP430 CTCP420	CTPP430
🟩	CTPP430	CTPP430	CTPP430
🟧	CTPP430	CTPP430	CTPP430
⬜			

-SN

- Universal application
- For general steel materials





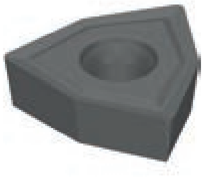
f [mm]

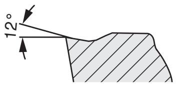
0,05 - 0,15

	Machining conditions		
	○	◐	◌
🟦	CTPP430	CTPP430	CTPP430
🟨	CTPP430	CTPP430	CTPP430
🟥	CTPP430	CTPP430	CTPP430
🟩			
🟧	CTPP430	CTPP430	CTPP430
⬜			

-FN

- Sharp cutting edge
- First choice for non ferrous materials





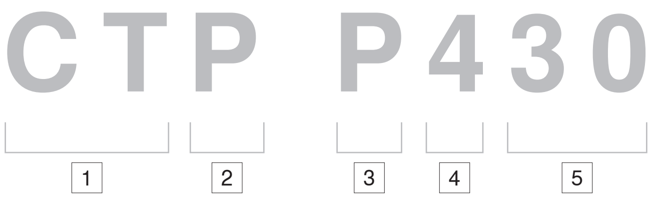
f [mm]

0,05 - 0,15

	Machining conditions		
	○	◐	◌
🟦			
🟨			
🟥			
🟩	CTWN415	CTWN415	CTWN415
🟧			
⬜			

CERATIZIT designation system

Cutting materials



1 Manufacturer: CERATIZIT

2 Cutting material

- W Uncoated carbide
- C CVD coated carbide
- P PVD coated carbide
- T Uncoated cermet
- E Coated cermet
- N Uncoated silicon nitride
- M Coated silicon nitride
- S Mixed ceramic
- I Sialon
- D PCD
- B CBN
- L CBN coated
- H Sintered HSS

3 Main application (material) Variant 1: number

- 1 Steel
- 2 Stainless steel
- 3 Cast iron
- 4 Light and non ferrous metals, non metals
- 5 Heat resistant alloys, titanium
- 6 Hard materials
- 7 Universal grade for a variety of applications

Main application (material) Variant 2: ISO letter

- P Steel
- M Stainless steel
- K Cast iron
- N Light and non ferrous metals, non metals
- S Heat resistant alloys, titanium
- H Hard materials
- X Universal grade for a variety of applications

4 Main application (machining method)

- 1 Turning
- 2 Milling
- 3 Parting and grooving
- 4 Drilling
- 5 Threading
- 6 Others
- 7 Universal grade for a variety of applications

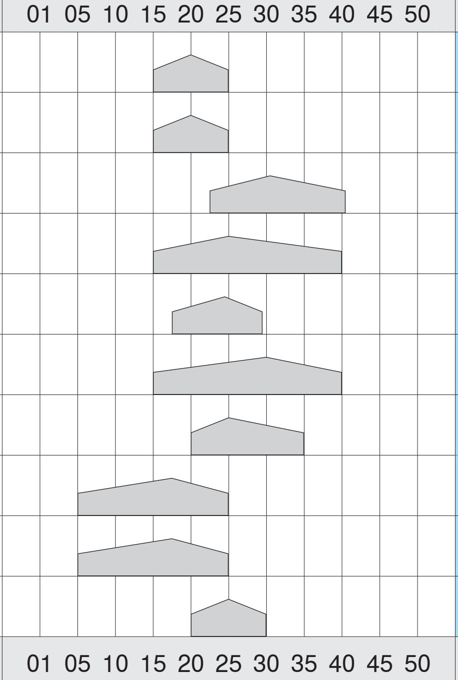
5 ISO 513

Application range

For example:
05
10
15
25
35 ISO P35
.
.
.

Grade overview

Grade designation	Standard designation ISO	Standard designation ANSI	*Type of cutting material	Application range	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
CTCP420 BLACKSTAR™	HC-P20	C7	C		●					
	HC-K20	C2	C				●			
CTPP430 SILVERSTAR™	HC-P30	C6	P		●					
	HC-M25	-	P			●				
	HC-S25	-	P						●	
	HC-K30	C1	P				○			
	HC-N25	C2	P					○		
CTWN415	HW-N15	C3	W					●		
	HW-K15	C3	W				●			
	HW-S25	-	W						○	



● Main application

○ Extended application

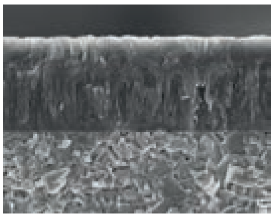
Grade description

CTCP420

BLACKSTAR™

HC-P20 | HC-K20

● ●



Specification:
Composition: Co 8.0%; mixed carbides 2.0%; WC balance | Grain size: 1-2 μm | Hardness: HV_{30} 1500 | Coating specification: CVD TiCN-Al_2O_3

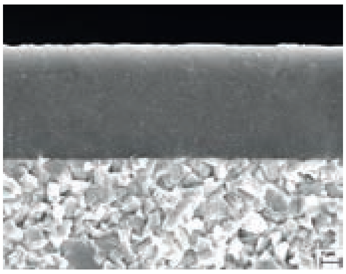
Recommended application:
The wear-resistant solution for steel and cast iron for high cutting speeds.

CTPP430

SILVERSTAR™

HC-P30 | HC-M25 | HC-S25 | HC-K30 | HC-N25

● ● ● ○ ○



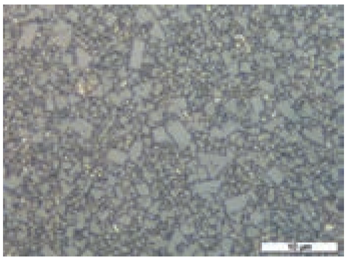
Specification:
Composition: Co 9.0%; others 0.75%; WC balance | Grain size: 0.85 μm | Hardness: HV_{30} 1590 | Coating specification: PVD TiAlN

Recommended application:
The universal high-performance grade for steel, austenitic steel and heat-resistant alloys.

CTWN415

HW-N15 | HW-K15 | HW-S25

● ● ○



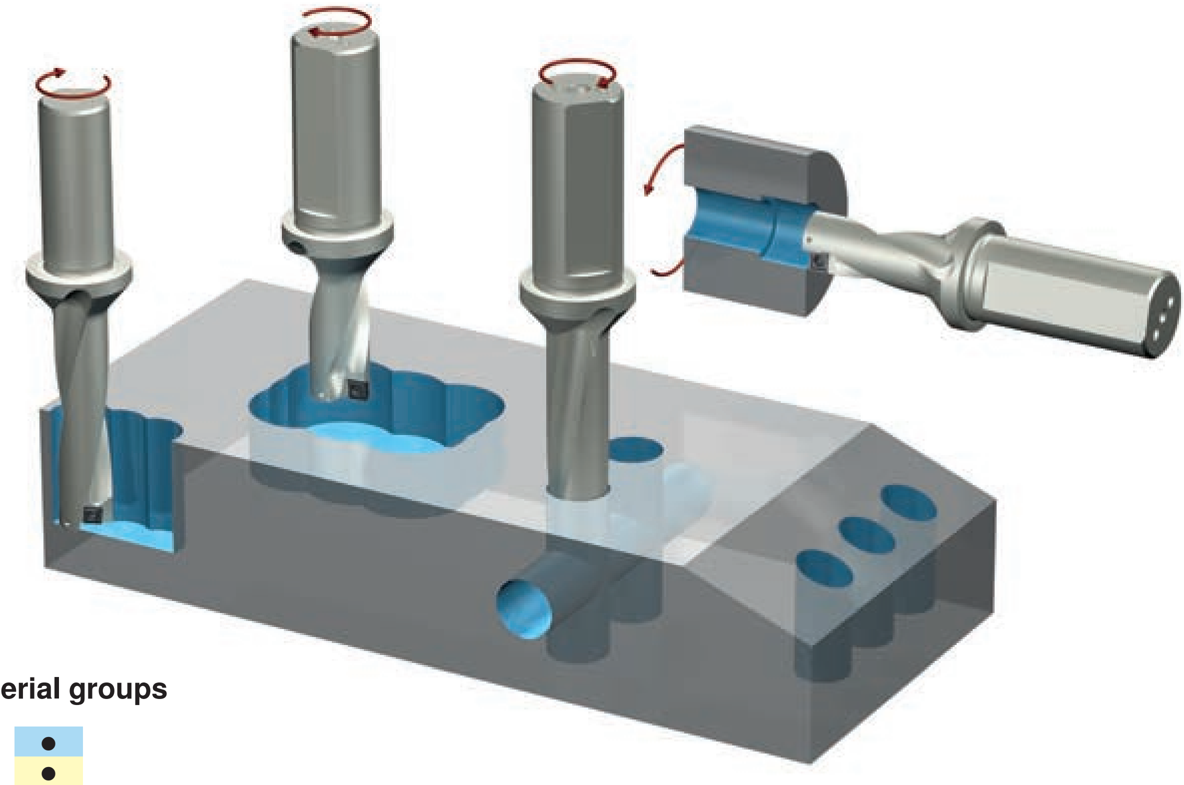
Specification:
Composition: Co 6.0%; others 0.2%; WC balance | Grain size: submicron | Hardness: HV_{30} 1650

Recommended application:
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

Notes

High productivity and process security

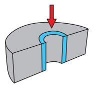
- ○ High feed rates for holes with 5xD
- ○ High economic efficiency thanks to inserts with 4 usable cutting edges
- ○ One insert only for the central and peripheral cutting edge

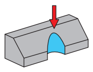


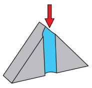
Material groups

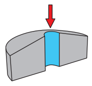
P	●
M	●
K	●
N	○
S	●
H	

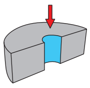
Possible applications

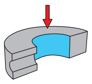

Reboring

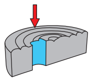

Drilling on inclined surfaces

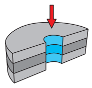

Drilling on a ridge

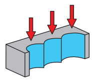

Drilling of a convex surface

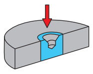

Drilling into solid material

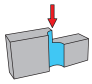

Producing a transverse through hole


Drilling on an uneven surface


Stack drilling


Chain drilling


Spot drilling in a central hole

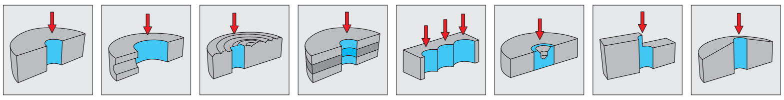

Drilling on a stepped surface

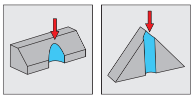
Detailed information

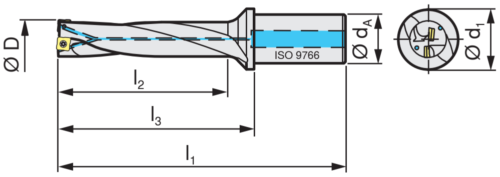
Diameter / length ratio	Ø range	Inserts
2 x D 3 x D 4 x D 5 x D	Ø 12 - 63 mm Ø 12 - 63 mm Ø 12 - 54 mm Ø 12 - 41 mm	SONT 03.. .. SONT 17..

MaxiDrill 900 – 2D

Ø 12 – 36 mm







D [mm]	Type, description	L N R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
12.0	C900.2D.120.R.03	R	20	28	90	24	40	SONT 03..	E01
12.5	C900.2D.125.R.03	R	20	28	91	25	41	SONT 03..	E01
13.0	C900.2D.130.R.03	R	20	28	92	26	42	SONT 03..	E01
13.5	C900.2D.135.R.03	R	20	28	93	27	43	SONT 03..	E01
14.0	C900.2D.140.R.04	R	20	30	96	28	46	SONT 04..	E02
14.5	C900.2D.145.R.04	R	20	30	97	29	47	SONT 04..	E02
15.0	C900.2D.150.R.04	R	20	30	98	30	48	SONT 04..	E02
15.5	C900.2D.155.R.04	R	20	30	99	31	49	SONT 04..	E02
16.0	C900.2D.160.R.05	R	20	30	100	32	50	SONT 05..	E02
16.5	C900.2D.165.R.05	R	20	30	101	33	51	SONT 05..	E02
17.0	C900.2D.170.R.05	R	20	30	102	34	52	SONT 05..	E02
17.5	C900.2D.175.R.05	R	20	30	103	35	53	SONT 05..	E02
18.0	C900.2D.180.R.06	R	25	32	111	36	55	SONT 06..	E03
18.5	C900.2D.185.R.06	R	25	32	112	37	56	SONT 06..	E03
19.0	C900.2D.190.R.06	R	25	32	113	38	57	SONT 06..	E03
19.5	C900.2D.195.R.06	R	25	32	114	39	58	SONT 06..	E03
20.0	C900.2D.200.R.06	R	25	32	115	40	59	SONT 06..	E03
20.5	C900.2D.205.R.06	R	25	32	116	41	60	SONT 06..	E03
21.0	C900.2D.210.R.07	R	25	32	118	42	62	SONT 07..	E03
22.0	C900.2D.220.R.07	R	25	32	120	44	64	SONT 07..	E03
23.0	C900.2D.230.R.07	R	25	32	122	46	66	SONT 07..	E03
24.0	C900.2D.240.R.08	R	32	40	132	48	72	SONT 08..	E04
25.0	C900.2D.250.R.08	R	32	40	134	50	74	SONT 08..	E04
26.0	C900.2D.260.R.08	R	32	40	136	52	76	SONT 08..	E04
27.0	C900.2D.270.R.08	R	32	40	138	54	78	SONT 08..	E04
28.0	C900.2D.280.R.09	R	32	40	140	56	80	SONT 09..	E05
29.0	C900.2D.290.R.09	R	32	40	142	58	82	SONT 09..	E05
30.0	C900.2D.300.R.09	R	32	40	144	60	84	SONT 09..	E05
31.0	C900.2D.310.R.09	R	32	40	146	62	86	SONT 09..	E05
32.0	C900.2D.320.R.09	R	32	40	148	64	88	SONT 09..	E05
33.0	C900.2D.330.R.10	R	40	50	163	66	93	SONT 10..	E06
34.0	C900.2D.340.R.10	R	40	50	165	68	95	SONT 10..	E06
35.0	C900.2D.350.R.10	R	40	50	167	70	97	SONT 10..	E06
36.0	C900.2D.360.R.10	R	40	50	169	72	99	SONT 10..	E06

E01	11807484	12016459	8095011600
E02	11807480	11817562	8095011600
E03	11684214	11450898	8095011700
E04	11684216	11690144	8095003900
E05	11227305	11690146	8095011800
E06	11610311	11450867	8095012000

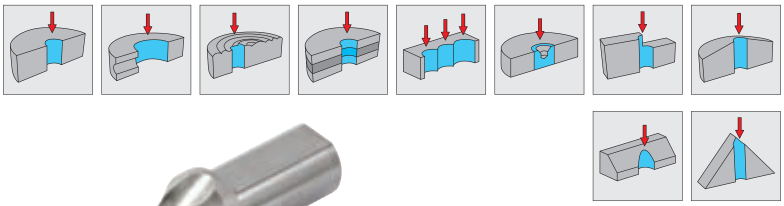
D37-D38

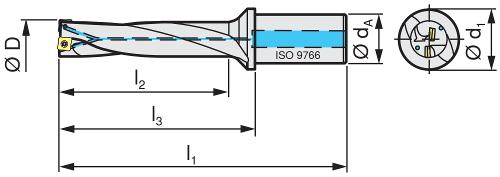
D51

D23

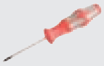
MaxiDrill 900 – 2D

Ø 37 – 63 mm





D [mm]	Type, description	L N R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
37.0	C900.2D.370.R.12	R	40	56	174	74	104	SONT 12..	E01
38.0	C900.2D.380.R.12	R	40	56	176	76	106	SONT 12..	E01
39.0	C900.2D.390.R.12	R	40	56	178	78	108	SONT 12..	E01
40.0	C900.2D.400.R.12	R	40	56	180	80	110	SONT 12..	E01
41.0	C900.2D.410.R.12	R	40	56	182	82	112	SONT 12..	E01
42.0	C900.2D.420.R.13	R	40	60	187	84	117	SONT 13..	E02
43.0	C900.2D.430.R.13	R	40	60	189	86	119	SONT 13..	E02
44.0	C900.2D.440.R.13	R	40	60	191	88	121	SONT 13..	E02
45.0	C900.2D.450.R.13	R	40	60	193	90	123	SONT 13..	E02
46.0	C900.2D.460.R.13	R	40	60	195	92	125	SONT 13..	E02
47.0	C900.2D.470.R.15	R	40	60	198	94	128	SONT 15..	E02
48.0	C900.2D.480.R.15	R	40	60	200	96	130	SONT 15..	E02
49.0	C900.2D.490.R.15	R	40	60	202	98	132	SONT 15..	E02
50.0	C900.2D.500.R.15	R	40	60	204	100	134	SONT 15..	E02
51.0	C900.2D.510.R.15	R	40	60	206	102	136	SONT 15..	E02
52.0	C900.2D.520.R.15	R	40	60	208	104	138	SONT 15..	E02
53.0	C900.2D.530.R.15	R	40	60	210	106	140	SONT 15..	E02
54.0	C900.2D.540.R.15	R	40	60	212	108	142	SONT 15..	E02
55.0	C900.2D.550.R.17	R	40	60	215	110	145	SONT 17..	E02
56.0	C900.2D.560.R.17	R	40	60	217	112	147	SONT 17..	E02
57.0	C900.2D.570.R.17	R	40	60	219	114	149	SONT 17..	E02
58.0	C900.2D.580.R.17	R	40	60	221	116	151	SONT 17..	E02
59.0	C900.2D.590.R.17	R	40	60	223	118	153	SONT 17..	E02
60.0	C900.2D.600.R.17	R	40	62	225	120	155	SONT 17..	E02
61.0	C900.2D.610.R.17	R	40	62	227	122	157	SONT 17..	E02
62.0	C900.2D.620.R.17	R	40	64	229	124	159	SONT 17..	E02
63.0	C900.2D.630.R.17	R	40	64	231	126	161	SONT 17..	E02

			
E01	11610311	11450867	8095012000
E02	11801441	11816987	8095012100

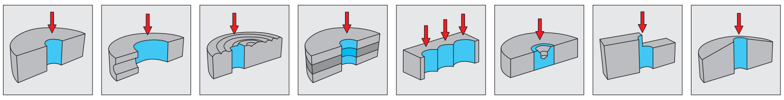
D37-D38

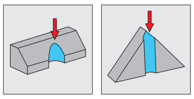
D51

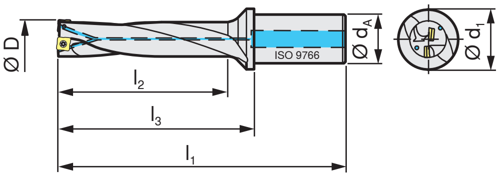
D23

MaxiDrill 900 – 3D

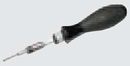
Ø 12 – 28,5 mm







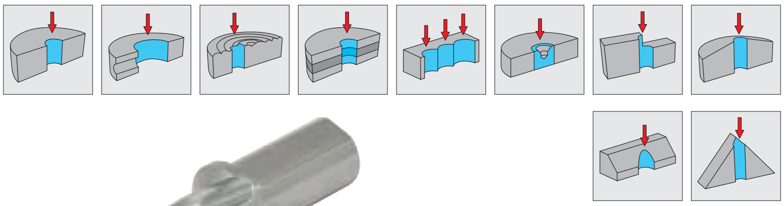
D [mm]	Type, description	L N R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
12.0	C900.3D.120.R.03	R	20	28	102	36	52	SONT 03..	E01
12.5	C900.3D.125.R.03	R	20	28	104	37.5	54	SONT 03..	E01
13.0	C900.3D.130.R.03	R	20	28	105	39	55	SONT 03..	E01
13.5	C900.3D.135.R.03	R	20	28	107	40.5	57	SONT 03..	E01
14.0	C900.3D.140.R.04	R	20	30	109	42	59	SONT 04..	E02
14.5	C900.3D.145.R.04	R	20	30	111	44	61	SONT 04..	E02
15.0	C900.3D.150.R.04	R	20	30	112	45	62	SONT 04..	E02
15.5	C900.3D.155.R.04	R	20	30	114	47	64	SONT 04..	E02
16.0	C900.3D.160.R.05	R	20	30	115	48	65	SONT 05..	E02
16.5	C900.3D.165.R.05	R	20	30	117	50	67	SONT 05..	E02
17.0	C900.3D.170.R.05	R	20	30	118	51	68	SONT 05..	E02
17.5	C900.3D.175.R.05	R	20	30	120	53	70	SONT 05..	E02
18.0	C900.3D.180.R.06	R	25	32	128	54	72	SONT 06..	E03
18.5	C900.3D.185.R.06	R	25	32	130	56	74	SONT 06..	E03
19.0	C900.3D.190.R.06	R	25	32	131	57	75	SONT 06..	E03
19.5	C900.3D.195.R.06	R	25	32	133	59	77	SONT 06..	E03
20.0	C900.3D.200.R.06	R	25	32	134	60	78	SONT 06..	E03
20.5	C900.3D.205.R.06	R	25	32	136	62	80	SONT 06..	E03
21.0	C900.3D.210.R.07	R	25	32	138	63	82	SONT 07..	E03
21.5	C900.3D.215.R.07	R	25	32	140	65	84	SONT 07..	E03
22.0	C900.3D.220.R.07	R	25	32	141	66	85	SONT 07..	E03
22.5	C900.3D.225.R.07	R	25	32	143	68	87	SONT 07..	E03
23.0	C900.3D.230.R.07	R	25	32	144	69	88	SONT 07..	E03
23.5	C900.3D.235.R.07	R	25	32	146	71	90	SONT 07..	E03
24.0	C900.3D.240.R.08	R	32	40	155	72	95	SONT 08..	E04
24.5	C900.3D.245.R.08	R	32	40	157	74	97	SONT 08..	E04
25.0	C900.3D.250.R.08	R	32	40	158	75	98	SONT 08..	E04
25.5	C900.3D.255.R.08	R	32	40	160	77	100	SONT 08..	E04
26.0	C900.3D.260.R.08	R	32	40	161	78	101	SONT 08..	E04
26.5	C900.3D.265.R.08	R	32	40	163	80	103	SONT 08..	E04
27.0	C900.3D.270.R.08	R	32	40	164	81	104	SONT 08..	E04
27.5	C900.3D.275.R.08	R	32	40	166	83	106	SONT 08..	E04
28.0	C900.3D.280.R.09	R	32	40	167	84	107	SONT 09..	E05
28.5	C900.3D.285.R.09	R	32	40	169	86	109	SONT 09..	E05

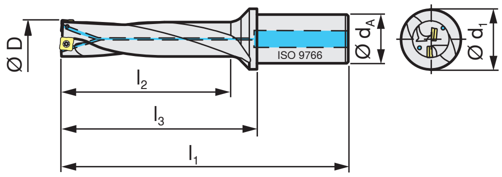
			
E01	11807484	12016459	8095011600
E02	11807480	11817562	8095011600
E03	11684214	11450898	8095011700
E04	11684216	11690144	8095003900
E05	11227305	11690146	8095011800

D37-D38
D51
D23

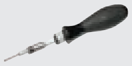
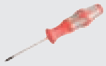
MaxiDrill 900 – 3D

Ø 29 – 58 mm





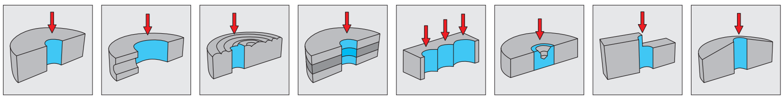
D [mm]	Type, description	L N R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
29.0	C900.3D.290.R.09	R	32	40	170	87	110	SONT 09..	E01
29.5	C900.3D.295.R.09	R	32	40	172	89	112	SONT 09..	E01
30.0	C900.3D.300.R.09	R	32	40	173	90	113	SONT 09..	E01
30.5	C900.3D.305.R.09	R	32	40	175	92	115	SONT 09..	E01
31.0	C900.3D.310.R.09	R	32	40	176	93	116	SONT 09..	E01
31.5	C900.3D.315.R.09	R	32	40	178	95	118	SONT 09..	E01
32.0	C900.3D.320.R.09	R	32	40	179	96	119	SONT 09..	E01
32.5	C900.3D.325.R.10	R	40	50	192	98	124	SONT 10..	E02
33.0	C900.3D.330.R.10	R	40	50	193	99	125	SONT 10..	E02
33.5	C900.3D.335.R.10	R	40	50	195	101	127	SONT 10..	E02
34.0	C900.3D.340.R.10	R	40	50	196	102	128	SONT 10..	E02
34.5	C900.3D.345.R.10	R	40	50	198	104	130	SONT 10..	E02
35.0	C900.3D.350.R.10	R	40	50	199	105	131	SONT 10..	E02
35.5	C900.3D.355.R.10	R	40	50	201	107	133	SONT 10..	E02
36.0	C900.3D.360.R.10	R	40	50	202	108	134	SONT 10..	E02
36.5	C900.3D.365.R.10	R	40	50	204	110	136	SONT 10..	E02
37.0	C900.3D.370.R.12	R	40	56	211	111	141	SONT 12..	E02
38.0	C900.3D.380.R.12	R	40	56	214	114	144	SONT 12..	E02
39.0	C900.3D.390.R.12	R	40	56	217	117	147	SONT 12..	E02
40.0	C900.3D.400.R.12	R	40	56	220	120	150	SONT 12..	E02
41.0	C900.3D.410.R.12	R	40	56	223	123	153	SONT 12..	E02
42.0	C900.3D.420.R.13	R	40	60	229	126	159	SONT 13..	E03
43.0	C900.3D.430.R.13	R	40	60	232	129	162	SONT 13..	E03
44.0	C900.3D.440.R.13	R	40	60	235	132	165	SONT 13..	E03
45.0	C900.3D.450.R.13	R	40	60	238	135	168	SONT 13..	E03
46.0	C900.3D.460.R.13	R	40	60	241	138	171	SONT 13..	E03
47.0	C900.3D.470.R.15	R	40	60	245	141	175	SONT 15..	E03
48.0	C900.3D.480.R.15	R	40	60	248	144	178	SONT 15..	E03
49.0	C900.3D.490.R.15	R	40	60	251	147	181	SONT 15..	E03
50.0	C900.3D.500.R.15	R	40	60	254	150	184	SONT 15..	E03
51.0	C900.3D.510.R.15	R	40	60	257	153	187	SONT 15..	E03
52.0	C900.3D.520.R.15	R	40	60	260	156	190	SONT 15..	E03
53.0	C900.3D.530.R.15	R	40	60	263	159	193	SONT 15..	E03
54.0	C900.3D.540.R.15	R	40	60	266	162	196	SONT 15..	E03
55.0	C900.3D.550.R.17	R	40	60	270	165	200	SONT 17..	E03
56.0	C900.3D.560.R.17	R	40	60	273	168	203	SONT 17..	E03
57.0	C900.3D.570.R.17	R	40	60	276	171	206	SONT 17..	E03
58.0	C900.3D.580.R.17	R	40	60	279	174	209	SONT 17..	E03

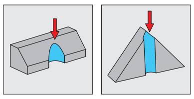
			
E01	11227305	11690146	8095011800
E02	11610311	11450867	8095012000
E03	11801441	11816987	8095012100

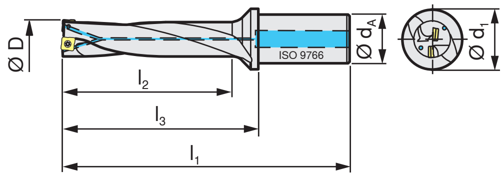
D37-D38
D51
D23

MaxiDrill 900 – 3D

Ø 59 – 63 mm







D [mm]	Type, description	L N R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
59.0	C900.3D.590.R.17	R	40	60	282	177	212	SONT 17..	E01
60.0	C900.3D.600.R.17	R	40	62	285	180	215	SONT 17..	E01
61.0	C900.3D.610.R.17	R	40	62	288	183	218	SONT 17..	E01
62.0	C900.3D.620.R.17	R	40	64	291	186	221	SONT 17..	E01
63.0	C900.3D.630.R.17	R	40	64	294	189	224	SONT 17..	E01

			
E01	11801441	11816987	8095012100

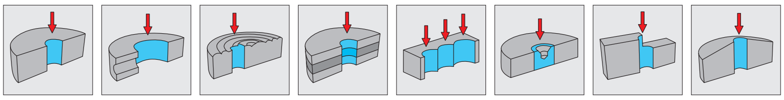
D37-D38

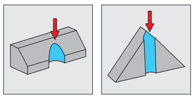
D51

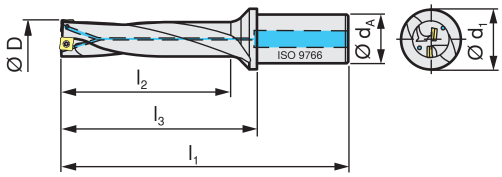
D23

MaxiDrill 900 – 4D

Ø 12 – 36 mm







D [mm]	Type, description	L N R	dA [mm]	d1 [mm]	l1 [mm]	l2 [mm]	l3 [mm]		
12.0	C900.4D.120.R.03	R	20	28	114	48	64	SONT 03..	E01
13.0	C900.4D.130.R.03	R	20	28	118	52	68	SONT 03..	E01
14.0	C900.4D.140.R.04	R	20	30	123	56	73	SONT 04..	E02
15.0	C900.4D.150.R.04	R	20	30	127	60	77	SONT 04..	E02
16.0	C900.4D.160.R.05	R	20	30	131	64	81	SONT 05..	E02
17.0	C900.4D.170.R.05	R	20	30	135	68	85	SONT 05..	E02
18.0	C900.4D.180.R.06	R	25	32	146	72	90	SONT 06..	E03
19.0	C900.4D.190.R.06	R	25	32	150	76	94	SONT 06..	E03
20.0	C900.4D.200.R.06	R	25	32	154	80	98	SONT 06..	E03
21.0	C900.4D.210.R.07	R	25	40	159	84	103	SONT 07..	E03
22.0	C900.4D.220.R.07	R	25	40	163	88	107	SONT 07..	E03
23.0	C900.4D.230.R.07	R	25	40	167	92	111	SONT 07..	E03
24.0	C900.4D.240.R.08	R	32	40	179	96	119	SONT 08..	E04
25.0	C900.4D.250.R.08	R	32	40	183	100	123	SONT 08..	E04
26.0	C900.4D.260.R.08	R	32	40	187	104	127	SONT 08..	E04
27.0	C900.4D.270.R.08	R	32	40	191	108	131	SONT 08..	E04
28.0	C900.4D.280.R.09	R	32	40	195	112	135	SONT 09..	E05
29.0	C900.4D.290.R.09	R	32	40	199	116	139	SONT 09..	E05
30.0	C900.4D.300.R.09	R	32	40	203	120	143	SONT 09..	E05
31.0	C900.4D.310.R.09	R	32	40	207	124	147	SONT 09..	E05
32.0	C900.4D.320.R.09	R	32	40	211	128	151	SONT 09..	E05
33.0	C900.4D.330.R.10	R	40	50	226	132	159	SONT 10..	E06
34.0	C900.4D.340.R.10	R	40	50	230	136	162	SONT 10..	E06
35.0	C900.4D.350.R.10	R	40	50	234	140	166	SONT 10..	E06
36.0	C900.4D.360.R.10	R	40	50	238	144	170	SONT 10..	E06

E01	11807484	12016459	8095011600
E02	11807480	11817562	8095011600
E03	11684214	11450898	8095011700
E04	11684216	11690144	8095003900
E05	11227305	11690146	8095011800
E06	11610311	11450867	8095012000

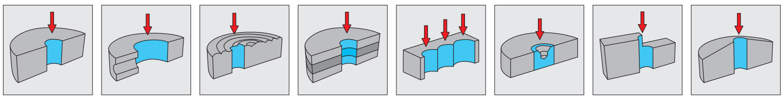
D39-D40

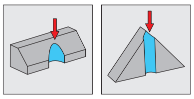
D51

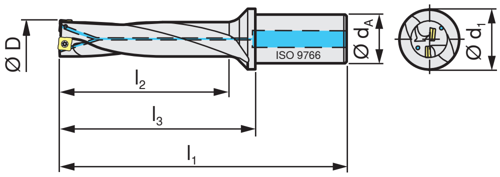
D23

MaxiDrill 900 – 4D

Ø 37 – 54 mm







D [mm]	Type, description	L N R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
37.0	C900.4D.370.R.12	R	40	56	248	148	178	SONT 12..	E01
38.0	C900.4D.380.R.12	R	40	56	252	152	182	SONT 12..	E01
39.0	C900.4D.390.R.12	R	40	56	256	156	186	SONT 12..	E01
40.0	C900.4D.400.R.12	R	40	56	260	160	190	SONT 12..	E01
41.0	C900.4D.410.R.12	R	40	56	264	164	194	SONT 12..	E01
42.0	C900.4D.420.R.13	R	40	60	271	168	201	SONT 13..	E02
43.0	C900.4D.430.R.13	R	40	60	275	172	205	SONT 13..	E02
44.0	C900.4D.440.R.13	R	40	60	279	176	209	SONT 13..	E02
45.0	C900.4D.450.R.13	R	40	60	283	180	213	SONT 13..	E02
46.0	C900.4D.460.R.13	R	40	60	287	184	217	SONT 13..	E02
47.0	C900.4D.470.R.15	R	40	60	292	188	222	SONT 15..	E02
48.0	C900.4D.480.R.15	R	40	60	296	192	226	SONT 15..	E02
49.0	C900.4D.490.R.15	R	40	60	300	196	230	SONT 15..	E02
50.0	C900.4D.500.R.15	R	40	60	304	200	234	SONT 15..	E02
51.0	C900.4D.510.R.15	R	40	60	308	204	238	SONT 15..	E02
52.0	C900.4D.520.R.15	R	40	60	312	208	242	SONT 15..	E02
53.0	C900.4D.530.R.15	R	40	60	316	212	246	SONT 15..	E02
54.0	C900.4D.540.R.15	R	40	60	320	216	250	SONT 15..	E02

			
E01	11610311	11450867	8095012000
E02	11801441	11816987	8095012100

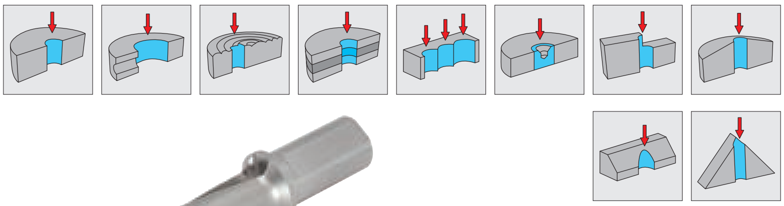
D39-D40

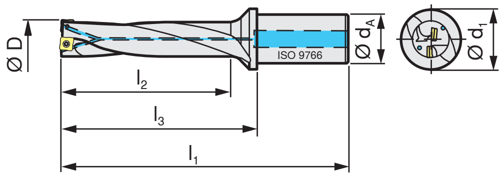
D51

D23

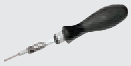
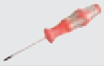
MaxiDrill 900 – 5D

Ø 12 – 41 mm





D [mm]	Type, description	L N R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
12.0	C900.5D.120.R.03	R	20	28	126	60	76	SONT 03..	E01
13.0	C900.5D.130.R.03	R	20	28	131	65	81	SONT 03..	E01
14.0	C900.5D.140.R.04	R	20	30	137	70	87	SONT 04..	E02
15.0	C900.5D.150.R.04	R	20	30	142	75	92	SONT 04..	E02
16.0	C900.5D.160.R.05	R	20	30	147	80	97	SONT 05..	E02
17.0	C900.5D.170.R.05	R	20	30	152	85	102	SONT 05..	E02
18.0	C900.5D.180.R.06	R	25	32	164	90	108	SONT 06..	E03
19.0	C900.5D.190.R.06	R	25	32	169	95	113	SONT 06..	E03
20.0	C900.5D.200.R.06	R	25	32	174	100	118	SONT 06..	E03
21.0	C900.5D.210.R.07	R	25	32	180	105	124	SONT 07..	E03
22.0	C900.5D.220.R.07	R	25	32	184	110	128	SONT 07..	E03
23.0	C900.5D.230.R.07	R	25	32	189	115	133	SONT 07..	E03
24.0	C900.5D.240.R.08	R	32	40	203	120	143	SONT 08..	E04
25.0	C900.5D.250.R.08	R	32	40	208	125	148	SONT 08..	E04
26.0	C900.5D.260.R.08	R	32	40	212	130	152	SONT 08..	E04
27.0	C900.5D.270.R.08	R	32	40	217	135	157	SONT 08..	E04
28.0	C900.5D.280.R.09	R	32	40	221	140	161	SONT 09..	E05
29.0	C900.5D.290.R.09	R	32	40	226	145	166	SONT 09..	E05
30.0	C900.5D.300.R.09	R	32	40	230	150	170	SONT 09..	E05
31.0	C900.5D.310.R.09	R	32	40	235	155	175	SONT 09..	E05
32.0	C900.5D.320.R.09	R	32	40	239	160	179	SONT 09..	E05
33.0	C900.5D.330.R.10	R	40	50	259	165	191	SONT 10..	E06
34.0	C900.5D.340.R.10	R	40	50	264	170	196	SONT 10..	E06
35.0	C900.5D.350.R.10	R	40	50	269	175	201	SONT 10..	E06
36.0	C900.5D.360.R.10	R	40	50	274	180	206	SONT 10..	E06
37.0	C900.5D.370.R.12	R	40	56	285	185	215	SONT 12..	E06
38.0	C900.5D.380.R.12	R	40	56	290	190	220	SONT 12..	E06
39.0	C900.5D.390.R.12	R	40	56	295	195	225	SONT 12..	E06
40.0	C900.5D.400.R.12	R	40	56	300	200	230	SONT 12..	E06
41.0	C900.5D.410.R.12	R	40	56	305	205	235	SONT 12..	E06

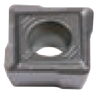
			
E01	11807484	12016459	8095011600
E02	11807480	11817562	8095011600
E03	11684214	11450898	8095011700
E04	11684216	11690144	8095003900
E05	11227305	11690146	8095011800
E06	11610311	11450867	8095012000

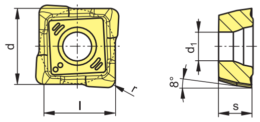
D41-D42 D51 D23

MaxiDrill 900

SO..

	CTCP420	CTPP430
P	●	●
M		●
K	●	○
N		○
S		●
H		

			CTCP420	CTPP430	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-M30		SONT 031804ER-M30	●	●	5.40	4.30	1.80	0.40	2.10
		SONT 042105ER-M30	●	●	4.60	4.20	2.10	0.50	2.25
		SONT 052306ER-M30	●	●	5.30	4.80	2.30	0.60	2.25
		SONT 062506ER-M30	●	●	5.90	5.50	2.50	0.60	2.50
		SONT 072907ER-M30	●	●	6.50	6.10	2.90	0.70	2.50
		SONT 083308ER-M30	●	●	7.70	7.30	3.30	0.80	2.90
		SONT 093808ER-M30	●	●	8.90	8.50	3.80	0.80	3.50
		SONT 104408ER-M30	●	●	10.10	9.60	4.40	0.80	4.10
		SONT 124810ER-M30	●	●	11.60	11.00	4.80	1.00	4.10
		SONT 135012ER-M30	●	●	13.00	12.20	5.00	1.20	5.30
		SONT 155312ER-M30	●	●	15.20	14.40	5.30	1.20	5.30
		SONT 175612ER-M30	●	●	17.50	16.70	5.60	1.20	5.30



⚠

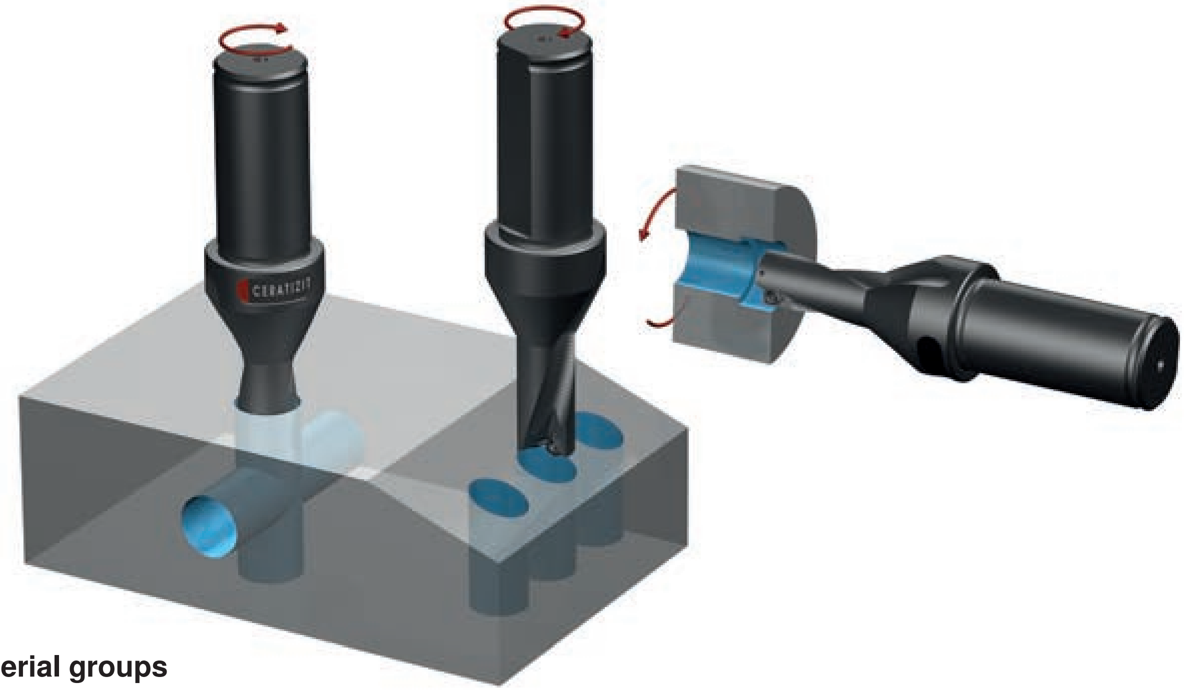
CTCP420 is exclusively recommended for application on the peripheral cutting edge!

D11 | D35-D36 | D15-D22

Notes

Universal tool for drilling into solid material

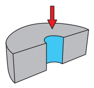
- ○ Ideal for the application on low power machines
- ○ Inserts with 3 usable cutting edges

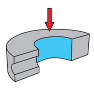


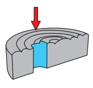
Material groups

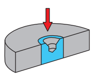
P	●
M	●
K	●
N	●
S	●
H	

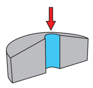
Possible applications

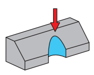

Drilling into solid material

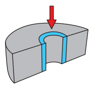

Producing a transverse through hole


Drilling on an uneven surface


Spot drilling in a central hole


Drilling of a convex surface


Drilling on inclined surfaces

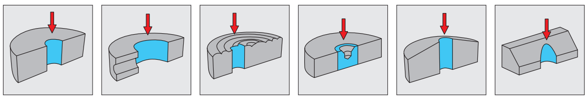

Reboring

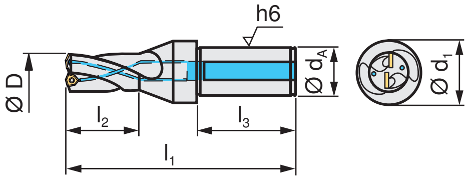
Detailed information

Diameter / length ratio	Ø range	Inserts
2 x D 3 x D 4 x D	Ø 14 - 53 mm Ø 14 - 53 mm Ø 18 - 50 mm	WC.. XO.. 02.. .. WC.. / XO.. 07..

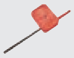
MaxiDrill Classic – 2D

Ø 14 – 36 mm





D [mm]	Type, description	L N R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
14.0	2D.140.R.02	R	25	32	114	30	60	WC.. / XO.. 02..	E01
14.5	2D.145.R.02	R	25	32	115	31	61	WC.. / XO.. 02..	E01
15.0	2D.150.R.02	R	25	32	116	32	62	WC.. / XO.. 02..	E01
15.5	2D.155.R.02	R	25	32	117	33	63	WC.. / XO.. 02..	E01
16.0	2D.160.R.02	R	25	32	118	34	64	WC.. / XO.. 02..	E01
16.5	2D.165.R.02	R	25	32	119	35	65	WC.. / XO.. 02..	E01
17.0	2D.170.R.02	R	25	32	120	36	66	WC.. / XO.. 02..	E01
17.5	2D.175.R.02	R	25	32	121	37	67	WC.. / XO.. 02..	E01
18.0	2D.180.R.03	R	25	32	122	38	68	WC.. / XO.. 03..	E02
19.0	2D.190.R.03	R	25	32	124	40	70	WC.. / XO.. 03..	E02
20.0	2D.200.R.03	R	25	32	126	42	72	WC.. / XO.. 03..	E02
21.0	2D.210.R.03	R	25	32	128	44	74	WC.. / XO.. 03..	E02
22.0	2D.220.R.03	R	25	32	130	46	76	WC.. / XO.. 03..	E02
23.0	2D.230.R.03	R	25	32	132	48	78	WC.. / XO.. 03..	E02
24.0	2D.240.R.05	R	25	32	134	50	80	WC.. / XO.. 05..	E03
25.0	2D.250.R.05	R	25	32	136	52	82	WC.. / XO.. 05..	E03
26.0	2D.260.R.05	R	25	32	138	54	84	WC.. / XO.. 05..	E03
27.0	2D.270.R.05	R	25	32	140	56	86	WC.. / XO.. 05..	E03
28.0	2D.280.R.05	R	25	32	142	58	88	WC.. / XO.. 05..	E03
29.0	2D.290.R.05	R	25	32	144	60	90	WC.. / XO.. 05..	E03
30.0	2D.300.R.06	R	32	49	150	62	92	WC.. / XO.. 06..	E04
31.0	2D.310.R.06	R	32	49	152	64	94	WC.. / XO.. 06..	E04
32.0	2D.320.R.06	R	32	49	154	66	96	WC.. / XO.. 06..	E04
34.0	2D.340.R.06	R	32	49	158	70	100	WC.. / XO.. 06..	E04
35.0	2D.350.R.06	R	32	49	160	72	102	WC.. / XO.. 06..	E04
36.0	2D.360.R.06	R	32	49	162	74	104	WC.. / XO.. 06..	E04

			
E01	256680		256924
E02	56652	8095010100	
E03	24645	8095010200	
E04	24647	8095010500	

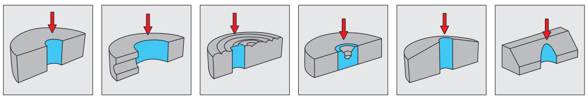
D43-D44

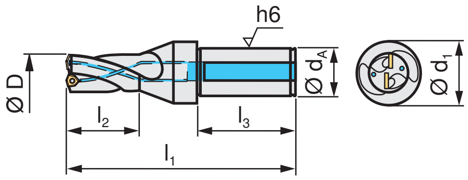
D51

D34

MaxiDrill Classic – 2D

Ø 37 – 53 mm





D [mm]	Type, description	L N R	dA [mm]	d1 [mm]	l1 [mm]	l2 [mm]	l3 [mm]		
37.0	2D.370.R.06	R	32	49	164	76	106	WC.. / XO.. 06..	E01
38.0	2D.380.R.07	R	32	49	166	78	108	WC.. / XO.. 07..	E01
39.0	2D.390.R.07	R	32	49	168	80	110	WC.. / XO.. 07..	E01
40.0	2D.400.R.07	R	32	49	170	82	112	WC.. / XO.. 07..	E01
42.0	2D.420.R.07	R	32	49	174	86	116	WC.. / XO.. 07..	E01
44.0	2D.440.R.07	R	32	49	178	90	120	WC.. / XO.. 07..	E01
46.0	2D.460.R.07	R	40	59	197	94	129	WC.. / XO.. 07..	E01
48.0	2D.480.R.07	R	40	59	201	98	133	WC.. / XO.. 07..	E01
50.0	2D.500.R.07	R	40	59	205	102	137	WC.. / XO.. 07..	E01
53.0	2D.530.R.07	R	40	59	211	108	143	WC.. / XO.. 07..	E01

		
E01	24647	8095010500

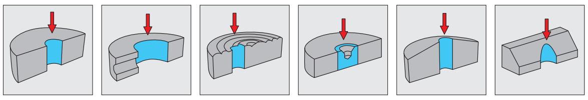
D43-D44

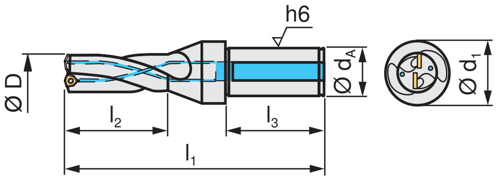
D51

D34

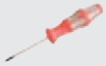
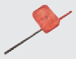
MaxiDrill Classic – 3D

Ø 14 – 30 mm





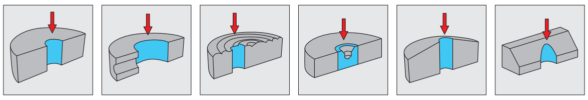
D [mm]	Type, description	L N R	d_A [mm]	d_1 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
14.0	3D.140.R.02	R	25	32	128	44	74	WC.. / XO.. 02..	E01
14.5	3D.145.R.02	R	25	32	129.5	45.5	75.5	WC.. / XO.. 02..	E01
15.0	3D.150.R.02	R	25	32	131	47	77	WC.. / XO.. 02..	E01
15.5	3D.155.R.02	R	25	32	132.5	48.5	78.5	WC.. / XO.. 02..	E01
16.0	3D.160.R.02	R	25	32	134	50	80	WC.. / XO.. 02..	E01
16.5	3D.165.R.02	R	25	32	135.5	51.5	81.5	WC.. / XO.. 02..	E01
17.0	3D.170.R.02	R	25	32	137	53	83	WC.. / XO.. 02..	E01
17.5	3D.175.R.02	R	25	32	138.5	54.5	84.5	WC.. / XO.. 02..	E01
18.0	3D.180.R.03	R	25	32	140	56	86	WC.. / XO.. 03..	E02
18.5	3D.185.R.03	R	25	32	140.5	57.5	87.5	WC.. / XO.. 03..	E02
19.0	3D.190.R.03	R	25	32	143	59	89	WC.. / XO.. 03..	E02
19.5	3D.195.R.03	R	25	32	144.5	60.5	90.5	WC.. / XO.. 03..	E02
20.0	3D.200.R.03	R	25	32	146	62	92	WC.. / XO.. 03..	E02
20.5	3D.205.R.03	R	25	32	147.5	63.5	93.5	WC.. / XO.. 03..	E02
21.0	3D.210.R.03	R	25	32	149	65	95	WC.. / XO.. 03..	E02
21.5	3D.215.R.03	R	25	32	150.5	66.5	96.5	WC.. / XO.. 03..	E02
22.0	3D.220.R.03	R	25	32	152	68	98	WC.. / XO.. 03..	E02
22.5	3D.225.R.03	R	25	32	153.5	69.5	99.5	WC.. / XO.. 03..	E02
23.0	3D.230.R.03	R	25	32	155	71	101	WC.. / XO.. 03..	E02
23.5	3D.235.R.03	R	25	32	156.5	72.5	102.5	WC.. / XO.. 03..	E02
24.0	3D.240.R.05	R	25	32	158	74	104	WC.. / XO.. 05..	E03
24.5	3D.245.R.05	R	25	32	159.5	75.5	105.5	WC.. / XO.. 05..	E03
25.0	3D.250.R.05	R	25	32	161	77	107	WC.. / XO.. 05..	E03
25.5	3D.255.R.05	R	25	32	162.5	78.5	108.5	WC.. / XO.. 05..	E03
26.0	3D.260.R.05	R	25	32	164	80	110	WC.. / XO.. 05..	E03
26.5	3D.265.R.05	R	25	32	165.5	81.5	111.5	WC.. / XO.. 05..	E03
27.0	3D.270.R.05	R	25	32	167	83	113	WC.. / XO.. 05..	E03
28.0	3D.280.R.05	R	25	32	170	86	116	WC.. / XO.. 05..	E03
29.0	3D.290.R.05	R	25	32	173	89	119	WC.. / XO.. 05..	E03
30.0	3D.300.R.06	R	32	49	180	92	122	WC.. / XO.. 06..	E04

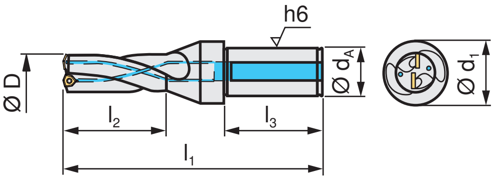
			
E01	256680		256924
E02	56652	8095010100	
E03	24645	8095010200	
E04	24647	8095010500	

D43-D44
D51
D34

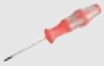
MaxiDrill Classic – 3D

Ø 31 – 53 mm





D [mm]	Type, description	L N R	d$_A$ [mm]	d$_1$ [mm]	l$_1$ [mm]	l$_2$ [mm]	l$_3$ [mm]		
31.0	3D.310.R.06	R	32	49	183	95	125	WC.. / XO.. 06..	E01
32.0	3D.320.R.06	R	32	49	186	98	128	WC.. / XO.. 06..	E01
33.0	3D.330.R.06	R	32	49	189	101	131	WC.. / XO.. 06..	E01
34.0	3D.340.R.06	R	32	49	192	104	134	WC.. / XO.. 06..	E01
35.0	3D.350.R.06	R	32	49	195	107	137	WC.. / XO.. 06..	E01
36.0	3D.360.R.06	R	32	49	198	110	140	WC.. / XO.. 06..	E01
37.0	3D.370.R.06	R	32	49	201	113	143	WC.. / XO.. 06..	E01
38.0	3D.380.R.07	R	32	49	204	116	146	WC.. / XO.. 07..	E01
39.0	3D.390.R.07	R	32	49	207	119	149	WC.. / XO.. 07..	E01
40.0	3D.400.R.07	R	32	49	210	122	152	WC.. / XO.. 07..	E01
41.0	3D.410.R.07	R	32	49	213	125	155	WC.. / XO.. 07..	E01
42.0	3D.420.R.07	R	32	49	216	128	158	WC.. / XO.. 07..	E01
43.0	3D.430.R.07	R	32	49	219	131	161	WC.. / XO.. 07..	E01
44.0	3D.440.R.07	R	32	49	222	134	164	WC.. / XO.. 07..	E01
45.0	3D.450.R.07	R	40	59	240	137	172	WC.. / XO.. 07..	E01
46.0	3D.460.R.07	R	40	59	243	140	175	WC.. / XO.. 07..	E01
47.0	3D.470.R.07	R	40	59	246	143	178	WC.. / XO.. 07..	E01
48.0	3D.480.R.07	R	40	59	249	146	181	WC.. / XO.. 07..	E01
49.0	3D.490.R.07	R	40	59	252	149	184	WC.. / XO.. 07..	E01
50.0	3D.500.R.07	R	40	59	255	152	187	WC.. / XO.. 07..	E01
51.0	3D.510.R.07	R	40	59	258	155	190	WC.. / XO.. 07..	E01
52.0	3D.520.R.07	R	40	59	261	158	193	WC.. / XO.. 07..	E01
53.0	3D.530.R.07	R	40	59	264	161	196	WC.. / XO.. 07..	E01

		
E01	24647	8095010500

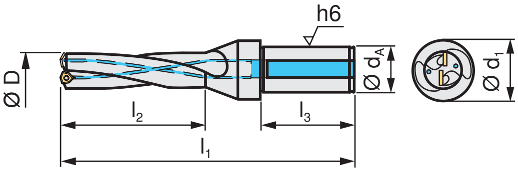
D43-D44

D51

D34

MaxiDrill Classic – 4D

Ø 18 – 36 mm



D [mm]	Type, description	L N R	d$_A$ [mm]	d$_1$ [mm]	l$_1$ [mm]	l$_2$ [mm]	l$_3$ [mm]		
18.0	4D.180.R.03	R	25	32	158	74	104	WC.. / XO.. 03..	E01
18.5	4D.185.R.03	R	25	32	160	76	106	WC.. / XO.. 03..	E01
19.0	4D.190.R.03	R	25	32	162	78	108	WC.. / XO.. 03..	E01
19.5	4D.195.R.03	R	25	32	164	80	110	WC.. / XO.. 03..	E01
20.0	4D.200.R.03	R	25	32	166	82	112	WC.. / XO.. 03..	E01
20.5	4D.205.R.03	R	25	32	168	84	114	WC.. / XO.. 03..	E01
21.0	4D.210.R.03	R	25	32	170	86	116	WC.. / XO.. 03..	E01
21.5	4D.215.R.03	R	25	32	172	88	118	WC.. / XO.. 03..	E01
22.0	4D.220.R.03	R	25	32	174	90	120	WC.. / XO.. 03..	E01
22.5	4D.225.R.03	R	25	32	176	92	122	WC.. / XO.. 03..	E01
23.0	4D.230.R.03	R	25	32	178	94	124	WC.. / XO.. 03..	E01
23.5	4D.235.R.03	R	25	32	180	96	126	WC.. / XO.. 03..	E01
24.0	4D.240.R.05	R	25	32	182	98	128	WC.. / XO.. 05..	E02
24.5	4D.245.R.05	R	25	32	184	100	130	WC.. / XO.. 05..	E02
25.0	4D.250.R.05	R	25	32	186	102	132	WC.. / XO.. 05..	E02
25.5	4D.255.R.05	R	25	32	188	104	134	WC.. / XO.. 05..	E02
26.0	4D.260.R.05	R	25	32	190	106	136	WC.. / XO.. 05..	E02
26.5	4D.265.R.05	R	25	32	192	108	138	WC.. / XO.. 05..	E02
27.0	4D.270.R.05	R	25	32	194	110	140	WC.. / XO.. 05..	E02
28.0	4D.280.R.05	R	25	32	198	114	144	WC.. / XO.. 05..	E02
29.0	4D.290.R.05	R	25	32	202	118	148	WC.. / XO.. 05..	E02
30.0	4D.300.R.06	R	32	49	210	122	152	WC.. / XO.. 06..	E03
31.0	4D.310.R.06	R	32	49	214	126	156	WC.. / XO.. 06..	E03
32.0	4D.320.R.06	R	32	49	218	130	160	WC.. / XO.. 06..	E03
33.0	4D.330.R.06	R	32	49	222	134	164	WC.. / XO.. 06..	E03
34.0	4D.340.R.06	R	32	49	226	138	168	WC.. / XO.. 06..	E03
35.0	4D.350.R.06	R	32	49	230	142	172	WC.. / XO.. 06..	E03
36.0	4D.360.R.06	R	32	49	234	146	176	WC.. / XO.. 06..	E03

E01	56652	8095010100
E02	24645	8095010200
E03	24647	8095010500

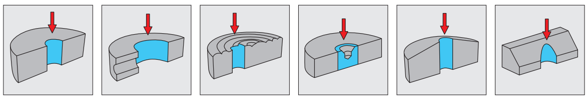
D43-D44

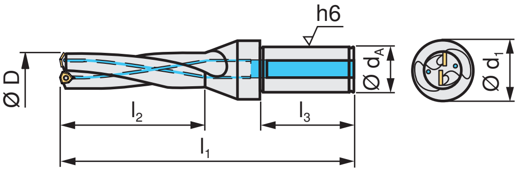
D51

D34

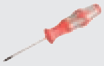
MaxiDrill Classic – 4D

Ø 37 – 50 mm





D [mm]	Type, description	L N R	dA [mm]	d1 [mm]	l1 [mm]	l2 [mm]	l3 [mm]		
37.0	4D.370.R.06	R	32	49	238	150	180	WC.. / XO.. 06..	E01
38.0	4D.380.R.07	R	32	49	242	154	184	WC.. / XO.. 07..	E01
39.0	4D.390.R.07	R	32	49	246	158	188	WC.. / XO.. 07..	E01
40.0	4D.400.R.07	R	32	49	250	162	192	WC.. / XO.. 07..	E01
41.0	4D.410.R.07	R	32	49	254	166	196	WC.. / XO.. 07..	E01
42.0	4D.420.R.07	R	32	49	258	170	200	WC.. / XO.. 07..	E01
43.0	4D.430.R.07	R	32	49	262	174	204	WC.. / XO.. 07..	E01
44.0	4D.440.R.07	R	32	49	266	178	208	WC.. / XO.. 07..	E01
45.0	4D.450.R.07	R	40	59	285	182	217	WC.. / XO.. 07..	E01
46.0	4D.460.R.07	R	40	59	289	186	221	WC.. / XO.. 07..	E01
47.0	4D.470.R.07	R	40	59	293	190	225	WC.. / XO.. 07..	E01
48.0	4D.480.R.07	R	40	59	297	194	229	WC.. / XO.. 07..	E01
49.0	4D.490.R.07	R	40	59	301	198	233	WC.. / XO.. 07..	E01
50.0	4D.500.R.07	R	40	59	305	202	237	WC.. / XO.. 07..	E01

		
E01	24647	8095010500

D43-D44

D51

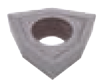
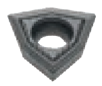
D34

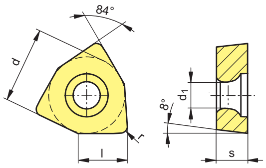
Notes

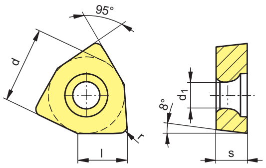
MaxiDrill Classic

WC.. XO..

	CTPP430	CTWN415
P	●	
M	●	
K		●
N		●
S	●	○
H		

			CTPP430	CTWN415	d [mm]	l [mm]	s [mm]	r [mm]	d₁ [mm]
-FN		WCGT 030204FN		●	6.00	3.97	2.50	0.40	2.50
		WCGT 050304FN		●	8.00	5.29	3.00	0.40	2.80
		WCGT 060304FN		●	10.00	6.62	3.00	0.40	4.40
		WCGT 07T304FN		●	12.00	7.94	3.80	0.40	4.40
-SN		XOMT 020204SN	●		5.50	3.39	2.30	0.40	2.25
		XOMT 030204SN	●		6.00	3.97	2.50	0.40	2.50
		XOMT 050304SN	●		8.00	5.29	3.00	0.40	2.80
		XOMT 060304SN	●		10.00	6.62	3.00	0.40	4.00
		XOMT 07T304SN	●		12.00	3.97	3.80	0.40	4.40
			CTPP430	CTWN415	d	l	s	r	d₁





D11
D35-D36
D27-D32

Cutting data

Grades, material

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

Grades, material

🟦	🟦	🟩
CTCP420 **v_c** **[m/min]**	**CTPP430** **v_c** **[m/min]**	**CTWN415** **v_c** **[m/min]**
240 - 390	155- 310	-
200 - 325	120 - 240	-
190 - 310	120 - 240	-
190 - 310	120 - 240	-
175 - 285	110 - 215	-
110 - 180	70 - 145	-
145 - 235	95 - 190	-
130 - 210	85 - 170	-
175 - 285	110 - 215	-
120 - 195	70 - 145	-
160 - 260	85 - 170	-
145 - 235	85 - 170	-
	60 - 120	-
	65 - 130	-
190 - 310	95 - 190	100 - 150
175 - 285	85 - 170	100 - 500
175 - 285	95 - 190	100 - 140
160 - 260	95 - 190	100 - 140
145 - 235	70 - 145	100 - 160
130 - 210	65 - 130	100 - 160
	200 - 395	200 - 500
	210 - 420	200 - 500
	180 - 360	200 - 500
	160 - 325	200 - 500
	120 - 240	200 - 500
	140 - 275	180 - 500
	140 - 275	180 - 500
	140 - 275	180 - 500
	140 - 275	180 - 500
		-
		-
		-
	40 - 85	30 - 50
	35 - 70	20 - 40
	30 - 60	20 - 40
	25 - 50	20 - 30
	25 - 50	15 - 25
	40 - 85	40 - 120
	35 - 70	40 - 100
		-
		-
		-
		-

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Cutting data

MaxiDrill 900 2xD/3xD

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

MaxiDrill 900 2xD/3xD

SONT 03	SONT 04	SONT05	SONT 06	SONT 07	SONT 08	SONT 09	SONT 10	SONT 12	SONT 13	SONT 15	SONT 17
Ø12-13,5	Ø14-15,5	Ø16-17,5	Ø19-20,5	Ø21-23,5	Ø24-27,5	Ø28-32	Ø32,5-36,5	Ø37-41	Ø41,5-46	Ø46,5-54	Ø54,5-63
f [mm/rev.]	f [mm/rev.]	f [mm/rev.]	f [mm/rev.]	f [mm/rev.]	f [mm/rev.]	f [mm/rev.]	f [mm/rev.]	f [mm/rev.]	f [mm/rev.]	f [mm/rev.]	f [mm/rev.]
0,04-0,13	0,04-0,13	0,04-0,14	0,05-0,15	0,07-0,15	0,08-0,17	0,08-0,18	0,09-0,19	0,09-0,19	0,09-0,20	0,10-0,22	0,10-0,22
0,04-0,15	0,04-0,15	0,04-0,15	0,05-0,16	0,07-0,17	0,08-0,19	0,08-0,20	0,09-0,21	0,09-0,22	0,09-0,24	0,10-0,26	0,10-0,26
0,04-0,16	0,04-0,16	0,05-0,17	0,05-0,18	0,08-0,20	0,09-0,22	0,09-0,23	0,10-0,24	0,10-0,25	0,10-0,27	0,10-0,30	0,10-0,30
0,04-0,17	0,04-0,17	0,05-0,18	0,05-0,20	0,08-0,22	0,09-0,23	0,09-0,24	0,10-0,25	0,10-0,27	0,10-0,30	0,10-0,32	0,10-0,32
0,04-0,16	0,04-0,16	0,04-0,17	0,05-0,18	0,08-0,20	0,09-0,21	0,09-0,22	0,10-0,23	0,10-0,25	0,10-0,28	0,10-0,30	0,10-0,30
0,04-0,16	0,04-0,16	0,04-0,17	0,05-0,18	0,08-0,20	0,09-0,21	0,09-0,22	0,10-0,23	0,10-0,25	0,10-0,27	0,10-0,29	0,10-0,29
0,04-0,15	0,04-0,15	0,05-0,16	0,05-0,18	0,08-0,20	0,09-0,21	0,09-0,22	0,10-0,23	0,10-0,25	0,10-0,27	0,10-0,29	0,10-0,29
0,04-0,15	0,04-0,15	0,05-0,16	0,05-0,18	0,08-0,20	0,09-0,21	0,09-0,22	0,10-0,23	0,10-0,25	0,10-0,27	0,10-0,29	0,10-0,29
0,04-0,13	0,04-0,13	0,05-0,14	0,05-0,15	0,08-0,15	0,08-0,17	0,08-0,18	0,09-0,19	0,10-0,21	0,10-0,23	0,10-0,23	0,10-0,23
0,04-0,13	0,04-0,13	0,05-0,14	0,05-0,15	0,08-0,15	0,08-0,17	0,08-0,18	0,09-0,19	0,10-0,21	0,10-0,23	0,10-0,23	0,10-0,23
0,04-0,12	0,04-0,12	0,04-0,13	0,05-0,14	0,05-0,16	0,05-0,18	0,07-0,18	0,08-0,21	0,10-0,23	0,10-0,23	0,10-0,23	0,10-0,23
0,04-0,11	0,04-0,11	0,04-0,12	0,05-0,13	0,05-0,15	0,06-0,16	0,07-0,16	0,08-0,20	0,10-0,22	0,10-0,22	0,10-0,22	0,10-0,22
0,04-0,10	0,04-0,10	0,04-0,11	0,05-0,13	0,05-0,15	0,06-0,15	0,07-0,16	0,08-0,20	0,08-0,20	0,08-0,20	0,08-0,20	0,08-0,20
0,04-0,10	0,04-0,10	0,04-0,11	0,05-0,12	0,05-0,14	0,05-0,15	0,06-0,15	0,07-0,19	0,08-0,20	0,08-0,20	0,08-0,20	0,08-0,20
0,07-0,20	0,07-0,20	0,07-0,22	0,08-0,24	0,10-0,25	0,1-0,28	0,1-0,28	0,1-0,30	0,1-0,32	0,1-0,32	0,1-0,34	0,1-0,34
0,07-0,19	0,07-0,19	0,07-0,20	0,08-0,22	0,10-0,24	0,1-0,26	0,1-0,26	0,1-0,28	0,1-0,30	0,1-0,30	0,1-0,32	0,1-0,32
0,07-0,20	0,07-0,20	0,07-0,20	0,08-0,22	0,10-0,25	0,1-0,28	0,1-0,28	0,1-0,28	0,1-0,30	0,1-0,30	0,1-0,32	0,1-0,32
0,07-0,18	0,07-0,18	0,07-0,18	0,08-0,20	0,10-0,23	0,1-0,25	0,1-0,25	0,1-0,25	0,1-0,27	0,1-0,27	0,1-0,29	0,1-0,29
0,07-0,19	0,07-0,19	0,07-0,20	0,08-0,21	0,10-0,25	0,1-0,28	0,1-0,28	0,1-0,30	0,1-0,32	0,1-0,32	0,1-0,34	0,1-0,34
0,07-0,19	0,07-0,19	0,07-0,20	0,08-0,21	0,10-0,25	0,1-0,28	0,1-0,28	0,1-0,30	0,1-0,32	0,1-0,32	0,1-0,34	0,1-0,34
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,15	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,18	0,10-0,18	0,10-0,18	0,10-0,18	0,10-0,18
0,06-0,13	0,06-0,13	0,07-0,14	0,08-0,15	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,19	0,10-0,20	0,10-0,20	0,10-0,20	0,10-0,20
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,15	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19	0,10-0,20	0,10-0,20	0,10-0,20	0,10-0,20
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,15	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,23	0,10-0,25	0,10-0,25	0,10-0,25	0,10-0,25
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,15	0,13-0,20	0,13-0,20	0,13-0,22	0,13-0,25	0,13-0,25	0,13-0,25	0,13-0,25	0,13-0,25
0,06-0,13	0,06-0,13	0,07-0,14	0,08-0,15	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,18	0,10-0,19	0,10-0,19	0,10-0,19	0,10-0,19
0,06-0,15	0,06-0,15	0,07-0,16	0,08-0,18	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,23	0,10-0,25	0,10-0,25	0,10-0,25	0,10-0,25
0,06-0,15	0,06-0,15	0,07-0,16	0,08-0,18	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,23	0,10-0,25	0,10-0,25	0,10-0,25	0,10-0,25
0,06-0,14	0,06-0,14	0,07-0,15	0,08-0,16	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,19	0,10-0,20	0,10-0,20	0,10-0,20	0,10-0,20
0,04-0,09	0,04-0,09	0,04-0,10	0,05-0,10	0,05-0,12	0,05-0,12	0,05-0,12	0,05-0,12	0,05-0,12	0,05-0,12	0,05-0,12	0,05-0,12
0,06-0,14	0,06-0,14	0,07-0,14	0,08-0,15	0,10-0,16	0,10-0,16	0,10-0,16	0,10-0,16	0,10-0,18	0,10-0,18	0,10-0,18	0,10-0,18
0,05-0,10	0,05-0,10	0,05-0,10	0,06-0,12	0,08-0,14	0,08-0,14	0,08-0,14	0,08-0,14	0,10-0,15	0,10-0,15	0,10-0,15	0,10-0,15
0,03-0,07	0,03-0,07	0,04-0,08	0,04-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12	0,05-0,12	0,05-0,12	0,06-0,15	0,06-0,15
0,03-0,07	0,03-0,07	0,04-0,08	0,04-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12	0,05-0,12	0,05-0,12	0,06-0,15	0,06-0,15
0,03-0,07	0,03-0,07	0,04-0,08	0,04-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12	0,05-0,12	0,05-0,12	0,06-0,15	0,06-0,15
0,03-0,07	0,03-0,07	0,04-0,08	0,04-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12	0,05-0,12	0,05-0,12	0,06-0,15	0,06-0,15
0,03-0,07	0,03-0,07	0,04-0,08	0,04-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12	0,05-0,12	0,05-0,12	0,06-0,15	0,06-0,15
0,04-0,10	0,04-0,10	0,04-0,10	0,05-0,10	0,05-0,12	0,06-0,12	0,07-0,15	0,07-0,15	0,08-0,16	0,08-0,16	0,08-0,18	0,08-0,18
0,04-0,10	0,04-0,10	0,04-0,10	0,05-0,10	0,05-0,12	0,06-0,12	0,07-0,15	0,07-0,15	0,08-0,16	0,08-0,16	0,08-0,18	0,08-0,18
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The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Cutting data

MaxiDrill 900 4xD

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

MaxiDrill 900 4xD

SONT 03 Ø12-13,5 f [mm/rev.]	SONT 04 Ø14-15,5 f [mm/rev.]	SONT 05 Ø16-17,5 f [mm/rev.]	SONT 06 Ø19-20 f [mm/rev.]	SONT 07 Ø21-23 f [mm/rev.]	SONT 08 Ø24-27 f [mm/rev.]	SONT 09 Ø28-32 f [mm/rev.]	SONT 10 Ø33-36 f [mm/rev.]	SONT 12 Ø37-41 f [mm/rev.]	SONT 13 Ø41,5-46 f [mm/rev.]	SONT15 Ø46,5-54 f [mm/rev.]
0,04-0,11	0,04-0,11	0,04-0,12	0,05-0,12	0,05-0,13	0,06-0,15	0,06-0,17	0,06-0,17	0,06-0,17	0,07-0,17	0,07-0,19
0,04-0,13	0,04-0,13	0,04-0,14	0,05-0,14	0,05-0,15	0,06-0,17	0,06-0,19	0,06-0,19	0,06-0,20	0,07-0,22	0,07-0,24
0,04-0,14	0,04-0,14	0,04-0,15	0,05-0,16	0,06-0,18	0,07-0,20	0,07-0,22	0,07-0,22	0,07-0,23	0,08-0,25	0,08-0,27
0,04-0,17	0,04-0,17	0,04-0,18	0,05-0,18	0,06-0,20	0,07-0,20	0,07-0,23	0,07-0,23	0,07-0,24	0,08-0,26	0,08-0,28
0,04-0,14	0,04-0,14	0,04-0,15	0,05-0,15	0,06-0,17	0,07-0,20	0,07-0,23	0,07-0,23	0,07-0,23	0,08-0,25	0,08-0,27
0,04-0,14	0,04-0,14	0,04-0,15	0,05-0,15	0,06-0,18	0,07-0,21	0,07-0,23	0,07-0,23	0,07-0,23	0,08-0,25	0,08-0,27
0,04-0,14	0,04-0,14	0,04-0,15	0,05-0,15	0,06-0,18	0,07-0,20	0,07-0,23	0,07-0,23	0,07-0,23	0,08-0,25	0,08-0,27
0,04-0,14	0,04-0,14	0,04-0,15	0,05-0,15	0,06-0,18	0,07-0,20	0,07-0,23	0,07-0,23	0,07-0,23	0,08-0,25	0,08-0,27
0,04-0,11	0,04-0,11	0,04-0,12	0,05-0,12	0,06-0,12	0,06-0,15	0,06-0,17	0,08-0,20	0,08-0,22	0,08-0,22	0,08-0,22
0,04-0,11	0,04-0,11	0,04-0,12	0,05-0,12	0,06-0,12	0,06-0,15	0,06-0,17	0,08-0,20	0,08-0,22	0,08-0,22	0,08-0,22
0,04-0,12	0,04-0,12	0,04-0,12	0,05-0,13	0,05-0,15	0,05-0,16	0,07-0,16	0,08-0,20	0,08-0,22	0,08-0,22	0,08-0,22
0,04-0,10	0,04-0,10	0,04-0,10	0,05-0,11	0,05-0,13	0,06-0,14	0,07-0,15	0,08-0,18	0,08-0,20	0,08-0,20	0,08-0,20
0,04-0,10	0,04-0,10	0,04-0,10	0,05-0,11	0,05-0,12	0,06-0,12	0,07-0,14	0,08-0,16	0,08-0,17	0,08-0,17	0,08-0,17
0,04-0,10	0,04-0,10	0,04-0,10	0,05-0,10	0,05-0,11	0,05-0,12	0,06-0,13	0,07-0,14	0,07-0,16	0,07-0,16	0,07-0,16
0,07-0,18	0,07-0,18	0,07-0,20	0,08-0,22	0,10-0,24	0,10-0,25	0,10-0,25	0,10-0,28	0,10-0,30	0,10-0,30	0,10-0,32
0,07-0,17	0,07-0,17	0,07-0,18	0,08-0,20	0,10-0,22	0,10-0,25	0,10-0,25	0,10-0,27	0,10-0,29	0,10-0,29	0,10-0,30
0,07-0,18	0,07-0,18	0,07-0,18	0,08-0,20	0,10-0,24	0,10-0,26	0,10-0,26	0,10-0,26	0,10-0,28	0,10-0,28	0,10-0,30
0,07-0,17	0,07-0,17	0,07-0,18	0,08-0,18	0,10-0,22	0,10-0,22	0,10-0,22	0,10-0,23	0,10-0,25	0,10-0,25	0,10-0,27
0,07-0,17	0,07-0,17	0,07-0,18	0,08-0,18	0,10-0,22	0,10-0,25	0,10-0,25	0,10-0,28	0,10-0,30	0,10-0,30	0,10-0,32
0,07-0,17	0,07-0,17	0,07-0,18	0,08-0,18	0,10-0,22	0,01-0,25	0,10-0,25	0,10-0,28	0,10-0,30	0,01-0,30	0,10-0,32
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,15	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17	0,10-0,17	0,10-0,17	0,10-0,17
0,06-0,13	0,06-0,13	0,07-0,14	0,08-0,15	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17	0,10-0,18	0,10-0,18	0,10-0,18
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,15	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19	0,10-0,20	0,10-0,20	0,10-0,20
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,15	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19	0,10-0,21	0,10-0,21	0,10-0,21
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,15	0,13-0,20	0,13-0,20	0,13-0,22	0,13-0,22	0,13-0,22	0,13-0,22	0,13-0,22
0,06-0,13	0,06-0,13	0,07-0,14	0,08-0,15	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17	0,10-0,18	0,10-0,18	0,10-0,18
0,06-0,15	0,06-0,15	0,07-0,16	0,08-0,18	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22
0,06-0,15	0,06-0,15	0,07-0,16	0,08-0,18	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22
0,06-0,14	0,06-0,14	0,07-0,15	0,08-0,16	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17	0,10-0,18	0,10-0,18	0,10-0,18
0,04-0,09	0,04-0,09	0,04-0,10	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,12	0,05-0,12	0,05-0,12	0,05-0,12	0,05-0,12
0,06-0,14	0,06-0,14	0,07-0,14	0,08-0,14	0,10-0,15	0,10-0,16	0,10-0,16	0,10-0,16	0,10-0,18	0,10-0,18	0,10-0,18
0,05-0,10	0,05-0,10	0,05-0,10	0,06-0,10	0,08-0,12	0,08-0,14	0,08-0,14	0,08-0,14	0,08-0,15	0,08-0,15	0,08-0,15
0,03-0,07	0,03-0,07	0,04-0,07	0,04-0,07	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,10	0,05-0,12
0,03-0,07	0,03-0,07	0,04-0,07	0,04-0,07	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,10	0,05-0,12
0,03-0,07	0,03-0,07	0,04-0,07	0,04-0,07	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,10	0,05-0,12
0,03-0,07	0,03-0,07	0,04-0,07	0,04-0,07	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,10	0,05-0,12
0,03-0,07	0,03-0,07	0,04-0,07	0,04-0,07	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,10	0,05-0,10	0,05-0,10	0,05-0,12
0,04-0,10	0,04-0,10	0,04-0,10	0,05-0,10	0,05-0,12	0,05-0,12	0,06-0,15	0,07-0,15	0,07-0,15	0,07-0,15	0,07-0,16
0,04-0,10	0,04-0,10	0,04-0,10	0,05-0,10	0,05-0,12	0,05-0,12	0,06-0,15	0,07-0,15	0,07-0,15	0,07-0,15	0,07-0,16
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–	–	–	–	–	–	–	–	–	–	–

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Cutting data

MaxiDrill 900 5xD

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm^2	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

MaxiDrill 900 5xD

SONT 03 Ø12-13,5 f [mm/rev.]	SONT 04 Ø14-15,5 f [mm/rev.]	SONT 05 Ø16-17,5 f [mm/rev.]	SONT 06 Ø19-20 f [mm/rev.]	SONT 07 Ø21-23 f [mm/rev.]	SONT 08 Ø24-27 f [mm/rev.]	SONT 09 Ø28-32 f [mm/rev.]	SONT 10 Ø33-36 f [mm/rev.]	SONT 12 Ø37-41 f [mm/rev.]
0,04-0,09	0,04-0,09	0,04-0,09	0,04-0,09	0,04-0,10	0,06-0,12	0,06-0,13	0,08-0,17	0,08-0,18
0,04-0,10	0,04-0,10	0,04-0,11	0,05-0,11	0,05-0,12	0,06-0,14	0,06-0,15	0,08-0,19	0,08-0,20
0,04-0,12	0,04-0,12	0,04-0,13	0,05-0,13	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22	0,10-0,25
0,04-0,15	0,04-0,15	0,04-0,16	0,05-0,16	0,05-0,17	0,07-0,18	0,08-0,19	0,10-0,23	0,10-0,25
0,04-0,13	0,04-0,13	0,04-0,14	0,05-0,14	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22	0,10-0,23
0,04-0,13	0,04-0,13	0,04-0,14	0,05-0,14	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22	0,10-0,23
0,04-0,13	0,04-0,13	0,04-0,14	0,05-0,14	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22	0,10-0,23
0,04-0,13	0,04-0,13	0,04-0,14	0,05-0,14	0,05-0,15	0,07-0,17	0,08-0,18	0,10-0,22	0,10-0,23
0,04-0,09	0,04-0,09	0,04-0,09	0,04-0,09	0,04-0,10	0,06-0,12	0,07-0,14	0,09-0,18	0,09-0,20
0,04-0,09	0,04-0,09	0,04-0,09	0,04-0,09	0,04-0,10	0,06-0,12	0,07-0,14	0,09-0,18	0,09-0,20
0,04-0,11	0,04-0,11	0,04-0,11	0,05-0,12	0,05-0,13	0,05-0,14	0,06-0,15	0,08-0,18	0,08-0,20
0,04-0,09	0,04-0,09	0,04-0,09	0,05-0,09	0,05-0,11	0,05-0,12	0,06-0,13	0,08-0,17	0,08-0,18
0,04-0,08	0,04-0,08	0,04-0,08	0,05-0,08	0,05-0,09	0,05-0,10	0,06-0,11	0,07-0,14	0,08-0,15
0,04-0,08	0,04-0,08	0,04-0,08	0,05-0,08	0,05-0,09	0,05-0,10	0,06-0,11	0,07-0,14	0,08-0,15
0,07-0,18	0,07-0,18	0,07-0,20	0,08-0,22	0,10-0,23	0,10-0,25	0,10-0,25	0,10-0,25	0,10-0,25
0,07-0,17	0,07-0,17	0,07-0,18	0,08-0,18	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22	0,10-0,22
0,07-0,18	0,07-0,18	0,07-0,18	0,08-0,18	0,10-0,23	0,10-0,25	0,10-0,25	0,10-0,25	0,10-0,25
0,07-0,17	0,07-0,17	0,07-0,18	0,08-0,16	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22	0,10-0,22
0,07-0,17	0,07-0,17	0,07-0,18	0,08-0,16	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22	0,10-0,22
0,07-0,17	0,07-0,17	0,07-0,18	0,08-0,16	0,10-0,20	0,10-0,22	0,10-0,22	0,10-0,22	0,10-0,22
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,14	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17	0,10-0,17
0,06-0,13	0,06-0,13	0,07-0,14	0,08-0,14	0,10-0,15	0,10-0,15	0,10-0,17	0,10-0,17	0,10-0,17
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,14	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19	0,10-0,19
0,06-0,12	0,06-0,12	0,07-0,14	0,08-0,14	0,10-0,18	0,10-0,18	0,10-0,19	0,10-0,19	0,10-0,19
0,06-0,12	0,06-0,12	0,07-0,14	0,10-0,15	0,13-0,20	0,13-0,20	0,13-0,22	0,13-0,22	0,13-0,22
0,06-0,13	0,06-0,13	0,07-0,14	0,08-0,15	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17	0,10-0,17
0,06-0,15	0,06-0,15	0,07-0,16	0,08-0,16	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20	0,10-0,20
0,06-0,15	0,06-0,15	0,07-0,16	0,08-0,16	0,10-0,18	0,10-0,18	0,10-0,20	0,10-0,20	0,10-0,20
0,06-0,14	0,06-0,14	0,07-0,15	0,08-0,14	0,10-0,16	0,10-0,16	0,10-0,17	0,10-0,17	0,10-0,17
0,04-0,09	0,04-0,09	0,04-0,10	0,04-0,08	0,05-0,10	0,05-0,10	0,05-0,10	0,05-0,10	0,05-0,10
0,06-0,14	0,06-0,14	0,07-0,14	0,08-0,14	0,10-0,15	0,10-0,15	0,10-0,15	0,10-0,15	0,10-0,15
0,05-0,10	0,05-0,10	0,05-0,10	0,06-0,10	0,08-0,12	0,08-0,12	0,08-0,12	0,08-0,12	0,08-0,12
0,03-0,06	0,03-0,06	0,04-0,06	0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,09
0,03-0,06	0,03-0,06	0,04-0,06	0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,09
0,03-0,06	0,03-0,06	0,04-0,06	0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,09
0,03-0,06	0,03-0,06	0,04-0,06	0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,09
0,03-0,06	0,03-0,06	0,04-0,06	0,04-0,06	0,04-0,06	0,04-0,07	0,05-0,08	0,05-0,08	0,05-0,09
0,04-0,08	0,04-0,08	0,04-0,08	0,04-0,08	0,05-0,11	0,05-0,11	0,06-0,12	0,07-0,12	0,07-0,12
0,04-0,08	0,04-0,08	0,04-0,08	0,04-0,08	0,05-0,11	0,05-0,11	0,06-0,12	0,07-0,12	0,07-0,12
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The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Cutting data

MaxiDrill Classic

	Work piece material	Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

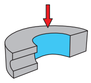
MaxiDrill Classic

Drill diameter [mm]				
Ø 14 - 17,5	**Ø 18 - 23,5**	**Ø 24 - 29**	**Ø 30 - 42**	**Ø 38 - 53**
f [mm/rev]	**f [mm/rev]**	**f [mm/rev]**	**f [mm/rev]**	**f [mm/rev]**
–	–	–	–	–
0,03 - 0,10	0,05 - 0,12	0,08 - 0,12	0,08 - 0,15	0,1 - 0,25
0,03 - 0,10	0,05 - 0,12	0,08 - 0,12	0,08 - 0,15	0,1 - 0,25
0,03 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
0,03 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
0,03 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
00,3 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
00,3 - 0,10	0,05 - 0,14	0,08 - 0,14	0,10 - 0,17	0,1 - 0,20
0,03 - 0,10	0,04 - 0,14	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20
0,03 - 0,10	0,04 - 0,14	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20
0,03 - 0,10	0,04 - 0,14	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20
0,03 - 0,10	0,04 - 0,12	0,08 - 0,14	0,10 - 0,16	0,1 - 0,18
0,03 - 0,10	0,04 - 0,12	0,08 - 0,14	0,10 - 0,16	0,1 - 0,18
0,03 - 0,10	0,04 - 0,12	0,08 - 0,14	0,10 - 0,16	0,1 - 0,18
0,04 - 0,12	0,06 - 0,16	0,12 - 0,18	0,14 - 0,22	0,15 - 0,25
0,04 - 0,12	0,06 - 0,16	0,12 - 0,18	0,14 - 0,22	0,15 - 0,25
0,04 - 0,10	0,08 - 0,14	0,12 - 0,18	0,14 - 0,20	0,15 - 0,22
0,04 - 0,10	0,08 - 0,14	0,12 - 0,18	0,14 - 0,20	0,15 - 0,22
0,04 - 0,12	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20	0,15 - 0,25
0,04 - 0,12	0,08 - 0,16	0,10 - 0,18	0,12 - 0,20	0,15 - 0,25
–	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
–	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
–	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
–	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
–	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
–	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
–	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
–	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
–	0,06 - 0,16	0,10 - 0,18	0,12 - 0,22	0,14 - 0,25
–	0,05 - 0,10	0,08 - 0,12	0,10 - 0,15	0,10 - 0,20
–	0,05 - 0,10	0,08 - 0,12	0,10 - 0,15	0,10 - 0,20
–	0,05 - 0,10	0,08 - 0,12	0,10 - 0,15	0,10 - 0,20
–	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14
–	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14
–	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14
–	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14
–	0,04 - 0,08	0,06 - 0,10	0,08 - 0,12	0,09 - 0,14
–	0,05 - 0,12	0,08 - 0,12	0,10 - 0,15	0,1 - 0,20
–	0,05 - 0,12	0,08 - 0,12	0,10 - 0,15	0,1 - 0,20
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–
–	–	–	–	–

The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

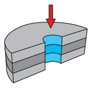
Application - rotating tools

Insert drills with helical chip flutes



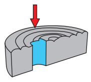
Producing a transverse through hole

Reduce the feed when the drill enters the transverse hole. With transverse bores you should drill from both sides if possible. Reduce feed rate between 30 and 60% (depending on the proportion of hole to transverse hole).



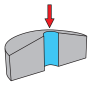
Stack drilling

When stack drilling ensure that there is either no gap or the maximum gap possible. Good work piece clamping is required.



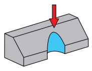
Drilling on an uneven surface

Depending on the surface quality, reduce the feed rate when drilling.



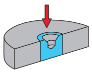
Drilling of a convex surface

When the drill enters the convex work piece surface, the central insert cuts first.



Drilling on inclined surfaces

When the drill enters or exits at an angle to the work piece surface, reduce the feed rate by 30 to 60%.

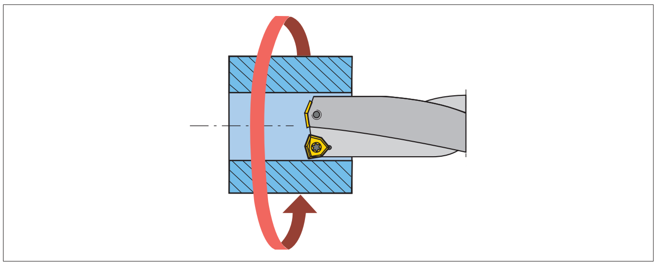


Spot drilling in a central hole

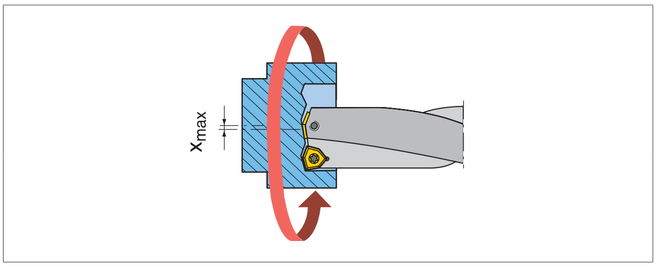
When spot drilling in a bead or central hole, reduce the feed rate by up to 50 %.

Application advice - stationary tools

Insert drills with helical chip flutes



Drilling into solid material



Off-centre drilling into solid material

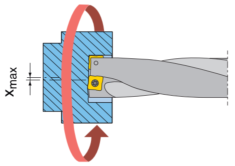
X_{max} = see pages D47 - D48

Safety precautions
Using a fixed drill and a rotating work piece in case of bores a sharp disc will result. Safety precautions must be observed. A safety guard has to be provided as protection.

Off-centre drilling

MaxiDrill 900

In order to guarantee that four cutting edges of the insert are utilised, the following offset dimensions X must be observed:



With the maximum offset X_{max} the hole becomes:
$D_{max} = D + 2X_{max}$

e.g. D = 20 mm, $X_{max} = 0{,}20$ mm
$D_{max} = D + 0{,}4 = 20{,}4$ mm

Type, description	Ø [mm]	max. offset x_{max} [mm]	D_{max} [mm]
SONT 031804ER	12,0	0,5	13,0
	12,5	0,4	13,3
	13,0	0,35	13,7
	13,5	0,3	14,1
SONT 042105ER	14,0	0,35	14,7
	14,5	0,25	15,0
	15,0	0,20	15,4
	15,5	0,15	15,8
SONT 052306ER	16,0	0,40	16,8
	16,5	0,35	17,2
	17,0	0,30	17,6
	17,5	0,25	18,0
SONT 062506ER	18,0	0,50	19,0
	18,5	0,40	19,3
	19,0	0,35	19,7
	19,5	0,25	20,0
	20,0	0,20	20,4
	20,5	0,15	20,8
SONT 072907ER	21,0	0,35	21,7
	21,5	0,30	22,1
	22,0	0,25	22,5
	22,5	0,15	22,8
	23,0	0,15	23,3
	23,5	0,10	23,7
SONT 083308ER	24,0	0,65	25,3
	24,5	0,55	25,6
	25,0	0,55	26,1
	25,5	0,40	26,3
	26,0	0,35	26,7
	26,5	0,30	27,1
	27,0	0,25	27,5
	27,5	0,15	27,8
SONT 093808ER	28,0	0,90	29,8
	28,5	0,80	30,1
	29,0	0,75	30,5
	29,5	0,70	30,9
	30,0	0,60	31,2
	30,5	0,55	31,6
	31,0	0,45	31,9

Type, description	Ø [mm]	max. offset x_{max} [mm]	D_{max} [mm]
SONT 093808ER	31,5	0,40	32,3
	32,0	0,30	32,6
SONT 104408ER	32,5	0,80	34,1
	33,0	0,80	34,6
	33,5	0,65	34,8
	34,0	0,60	35,2
	34,5	0,50	35,5
	35,0	0,45	35,9
	35,5	0,35	36,2
	36,0	0,35	36,7
	36,5	0,20	36,9
SONT 124810ER	37,0	1,00	39,0
	38,0	0,85	39,7
	39,0	0,70	40,4
	40,0	0,50	41,0
	41,0	0,35	41,7
SONT 135012ER	42,0	0,95	43,9
	43,0	0,80	44,6
	44,0	0,60	45,2
	45,0	0,45	45,9
	46,0	0,30	46,6
SONT 155312ER	47,0	1,80	50,6
	48,0	1,65	51,3
	49,0	1,50	52,0
	50,0	1,35	52,7
	51,0	1,15	53,3
	52,0	0,95	53,9
	53,0	0,80	54,6
	54,0	0,60	55,2
SONT 175612ER	55,0	2,10	59,2
	56,0	1,90	59,8
	57,0	1,75	60,5
	58,0	1,55	61,1
	59,0	1,35	61,7
	60,0	1,15	62,3
	61,0	1,00	63,0
	62,0	0,85	63,7
	63,0	0,65	64,3

The maximum radial offset dimension X influences the force compensation of the drill, therefore a low feed rate is recommended.

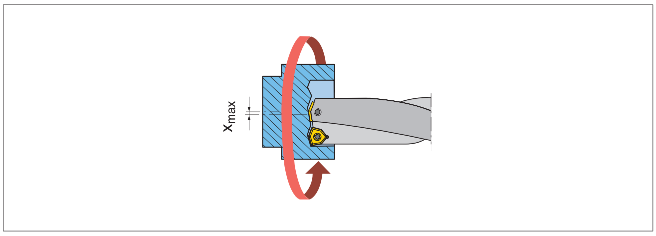
⚠ When drilling off-centre the radial forces are not compensated, which results in instability.

Hole tolerances	2xD	3xD	4xD	5xD	
Drilling diameter [mm]	12-63	12-63	12-54	12-41	
Drilling tolerance [mm]	0/+0,3	0/+0,3	0/+0,35	0/+0,4	

Off-centre drilling

MaxiDrill Classic

In order to guarantee that four cutting edges of the insert are utilised, the following offset dimensions X must be observed:



Permissible feed rates for X_{max}:
f x .05 - .08 mm/rev.

With the maximum offset X_{max} the hole becomes
$D_{max} = D + 2X_{max}$

for example for D = 38 mm, X_{max} = 1.6 mm
D_{max} = D + 3.2 = 41.2 mm

Insert size	Ø [mm]	max. offset x_{max} [mm]	D_{max} [mm]
02	14	2.0	18.0
02	15	1.8	18.6
02	16	1.5	19.0
02	17	1.2	19.4
03	18	2.0	22.0
03	19	1.8	22.6
03	20	1.6	23.2
03	21	1.3	23.6
03	22	1.0	24.0
03	23	0.8	24.6
05	24	2.3	28.6
05	25	2.2	29.4
05	26	2.0	30.0
05	27	1.8	30.6
05	28	1.6	31.2
05	29	1.5	32.0
06	30	3.2	36.4
06	31	3.2	37.4
06	32	3.2	38.4
06	33	3.0	39.0
06	34	2.7	39.4
06	35	2.5	40.0
06	36	2.2	40.4

Insert size	Ø [mm]	max. offset x_{max} [mm]	D_{max} [mm]
06	37	1.9	40.8
06	38	1.6	41.2
06	39	1.4	41.8
06	40	1.2	42.4
06	41	1.0	43.0
06	42	0.6	43.2
07	38	3.5	45.0
07	39	3.3	45.6
07	40	3.0	46.0
07	41	2.8	46.6
07	42	2.5	47.0
07	43	2.3	47.6
07	44	2.0	48.0
07	45	1.9	48.8
07	46	1.8	49.6
07	47	1.5	50.0
07	48	1.4	50.8
07	49	1.2	51.4
07	50	1.0	52.0
07	51	0.7	52.4
07	52	0.6	53.2
07	53	0.5	54.0

The maximum radial offset dimension X influences the force compensation of the drill, therefore a low feed rate is recommended.

⚠ When drilling off-centre the radial forces are not compensated, which results in instability.

Coolant pressure

Recommended coolant pressure and coolant flow

⚠ In order to guarantee efficient chip evacuation from the hole, a minimum coolant pressure of 5 bar is required. The optimal coolant pressure is >15 bar.

Formula collection

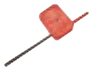
Revolution number	$n = \frac{vc \cdot 1000}{\pi \cdot D}$	[min^{-1}]
Cutting speed	$v_c = \frac{\pi \cdot D \cdot n}{1000}$	[m/min]
Feed rate	f	[mm/rev.]
Feed rate	$v_f = f \cdot n$	[m/min]
Machining cross section	$A_T = \frac{\pi \cdot D^2}{4}$	[mm^2]
Metal removal rate	$Q = \frac{vf \cdot AT}{1000}$	[cm^3/min]
Specific cutting force	$k_c =$ see table	[N/mm^2]
Power requirements	$P_c = \frac{Q}{60 \cdot 1000 \cdot \eta} \cdot k_c$	[kW]
Torque moment	$M_c = \frac{f \cdot kc}{1000} \cdot \frac{D^2}{8}$	[Nm]
Feed force (approx.)	$F_f \approx 0{,}7 \frac{D}{2} \cdot f \cdot k_c$	[N]
Drilling time	$T_c = \frac{L + h}{vf}$	[min]
Clearance	h	[mm]
Drilling depth	L	[mm]

Material	**Specific cutting force k_c (N/mm^2)**
St 37.11; St 42.11	1740
St 50.11	1950
St 60.11	2070
St 70.11	2220
C 35, C 45, Ck 45	2060/2175
C 60, Ck 60	2090
16 Mn Cr 5	2060
18 Cr Ni 6	2220
34 Cr Mo 4	2190
50 Cr V 4	2175
tempered 100 Cr 6	2335
Mn, Cr Ni alloyed steel	2335
Cr Mo alloyed steel	2570
Corrosion resistant steel	2530
Hot working steel	2570
Nitriding steel	2570
GS 45	1570
GS 52	1765
GG 22, GG 25	1140
GGG 42	1370
Aluminium cast alloys	640

Please note! The k_c-values depend on the feed. Therefore the table contains their upper limit values. The calculated power is possibly higher than the power actually needed (~ 10 - 20%).

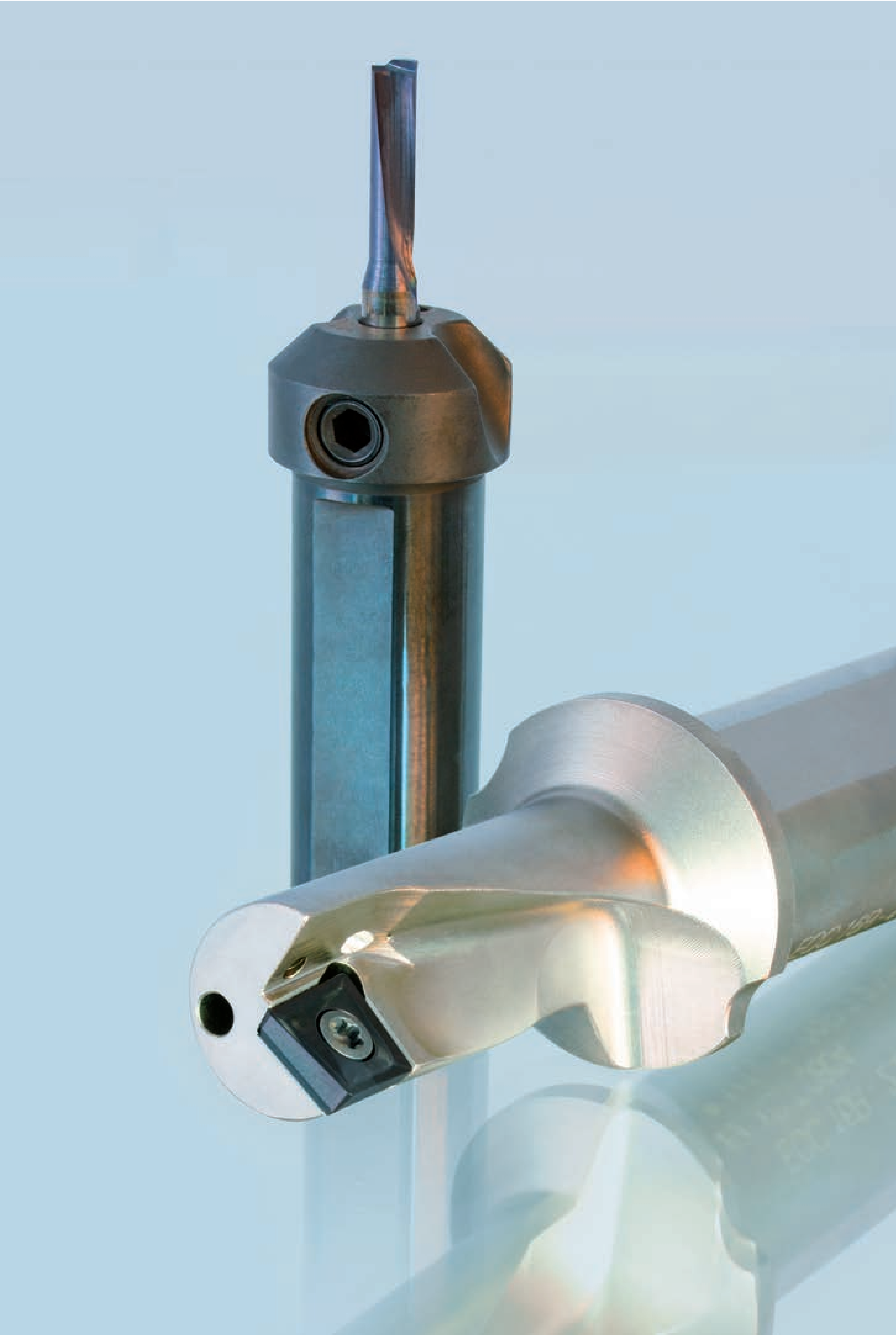
Spare parts

	Material	Type, description	Key size	Torque moment [Nm]	Torque moment [in.lbs]
	11450867	DMSD 3,2Nm/SORT 15IP	IP15	3.2	28,3
	11450898	DMSD 1,0Nm/SORT 07IP	IP07	1.0	8,9
	11690144	DMSD 1,2NM/SORT 08IP	08IP	1.2	10,6
	11690146	DMSD 2,2NM/SORT 09IP	09IP	2.2	19,5
	11816987	DMSD 5,0Nm/SORT 20IP	20IP	5.0	44,3
	11817562	DMSD 0,7Nm/SORT 06IP	06IP	0.7	6,2
	12016459	DMSD 0,4Nm/SORT 06IP	06IP	0.4	3,5

	Material	Type, description	Key size
	256924	7729112/TORX T06 F	T06
	8095003900	SD-T08IP-60mm	T08IP
	8095010100	SD-T07-60mm	T07
	8095010200	SD-T08-60mm	T08
	8095010500	SD-T15-80mm	T15
	8095011600	SD-T06IP-60mm	T06IP
	8095011700	SD-T07IP-60mm	T07IP
	8095011800	SD-T09IP-60mm	T09IP
	8095012000	SD-T15IP-80mm	T15IP
	8095012100	SD-T20IP-100mm	T20IP

	Material	Type, description	Length [mm]	Thread size	Key size
	11227305	M3,0x7,0-09IP/10003007	7.0	M3,0	T09IP
	11610311	M3,5X8,6-15IP/10008749	8.6	M3,5	T15IP
	11684214	M2,2x5,0-07IP/10009244	5.0	M2,2	T07IP
	11684216	M2,5x6,0-08IP/10009243	6.0	M2,5	T08IP
	11801441	M4,5X10,5-20IP/10013040	10.5	M4,5	T20IP
	11807480	M2,0x4,3-06IP/10013332	4.3	M2,0	T06IP
	11807484	M1,8x3,6-06IP/10013338	3.6	M1,8	T06IP
	24645	7815101/M2,5X6,0/T08	6	M2,5	T08
	24647	7815102/M3,5X11,0/T15	11	M3,5	T15
	256680	7729113/M2,0X4,8/T06	4.8	M2	T06
	56652	7722113/M2,2X5/T07	5	M2,2	T07

Notes



Contents

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EcoCut

ProfileMaster

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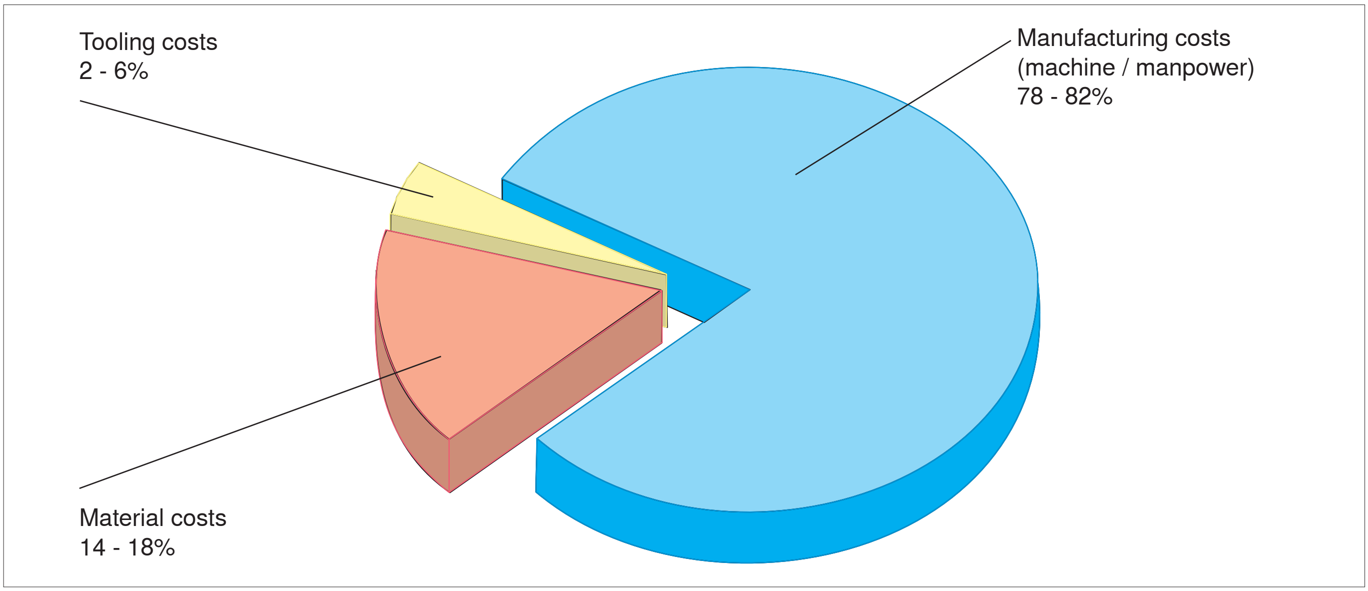
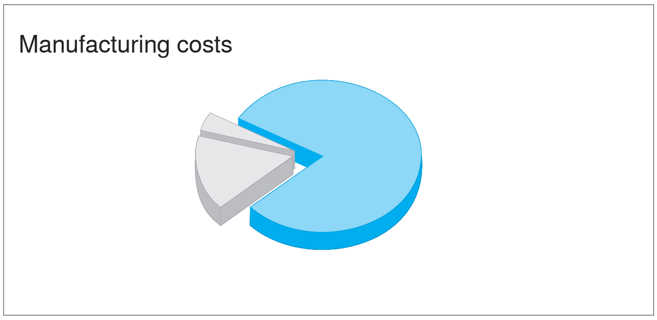
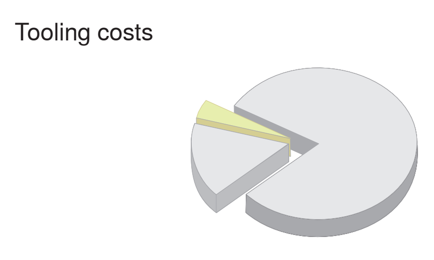
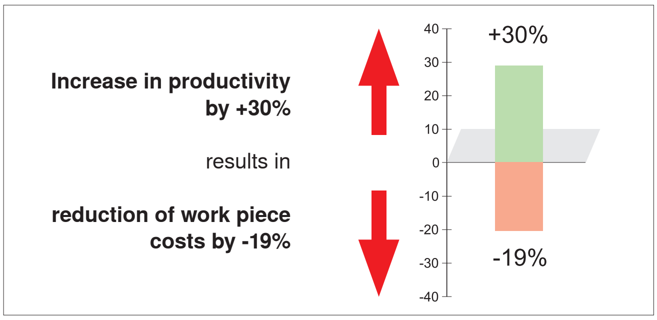
Turn the cost screw together with CERATIZIT





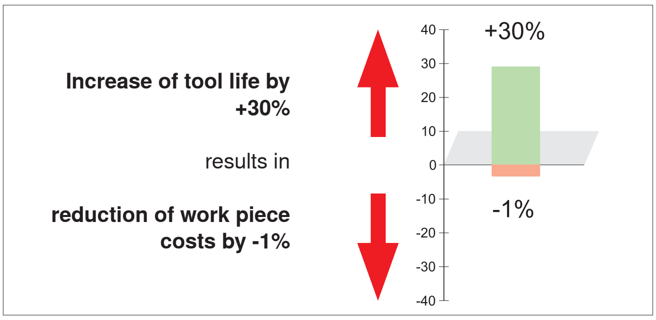




Increase in productivity by +30%

results in

reduction of work piece costs by -19%



Increase of tool life by +30%

results in

reduction of work piece costs by -1%

Increase in productivity (parts produced per time unit)

Improved utilisation of the available machine capacity leads to considerable cost reduction per work piece. In this context CERATIZIT EcoCut makes a decisive contribution through:

○ fewer tool changes
○ increase of v_c
○ increase of f
○ increase of a_p

Increased tool life

As the average tool costs amount to only 2 - 6 % of the work piece costs, improving tool life typically can reduce total costs minimally (below 1%).

Four machining operations with only one tool

- Drilling into solid material with flat bottom holes
- Boring applications
- Turning of face profiles
- External turning applications

Conventional

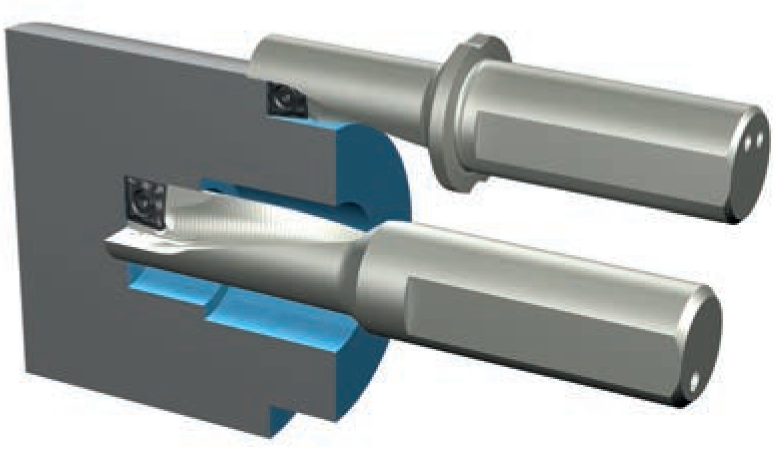
EcoCut

Advantages of EcoCut

- Problem solver for insufficient tool storage
- Less programming effort
- Produces a flat bottom hole
- Reduced tool and insert inventory costs. Considerable tool acquisition cost savings
- Shorter set-up times. Reduced pre-setting time

4 machining operations – 1 tool

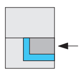
- Turning of face profiles, internal and external profiles as well as drilling into solid material
- Thanks to the multi-function tool, more turret positions on the machine are kept free
- Using EcoCut you will achieve larger depths of cut (a_p) compared to conventional boring bars



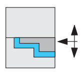
Material groups

P	●
M	●
K	●
N	●
S	○
H	

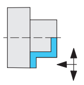
Possible applications



Drilling into solid material



Boring applications



External turning applications

Detailed information

Diameter / length ratio	Ø range	Inserts
1,5 x D 2,25 x D 3 x D 4 x D	Ø 8 - 32 mm Ø 4 - 32 mm Ø 8 - 32 mm Ø 4 - 8 mm	XCET 04.. : XCET 17..

CERATIZIT designation system

EcoCut Classic and EcoCut Mini

X C E T 17 05 08 F N - 27P

X	C	E	T	17	05	08	F	N	-	27P
1	2	3	4	5	6	7	8	9		10

1 Insert shape

2 Clearance angle

3 Tolerances

4 Form of top surface

5 Cutting edge length

6 Insert thickness

7 Corner radius

8 Cutting edge

9 Cutting direction

10 Chip groove

ECC 32 R - 3.0D 17 H

ECC	32	R	-	3.0D	17	H
1	2	3		4	5	6

1 System

2 Nominal diameter [mm]

3 Cutting direction

4 Maximum drilling depth,
for example: 3.0 x diameter

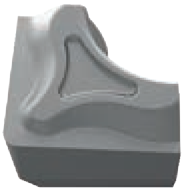
5 Insert size

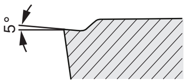
6 Tool holder in Densimet

Chip grooves

-EN

- ○ Positive geometry
- ○ Universal application
- ○ Small to medium feed rates





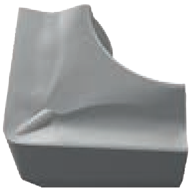
f [mm]

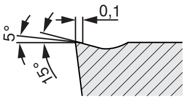
0,05 - 0,275

Machining conditions		
●	◐	◌
CTCP425	**CTCP435**	**CTPP430**
CTCP435	**CTPP430**	**CTPP430**
CTCP425	**CTCP435**	
CTCP435	CTPP430	CTPP430

-M50

- ○ Positive geometry
- ○ Masterfinish cutting edge
- ○ Medium to high feed rates





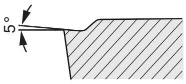
f [mm]

0,2 - 0,425

Machining conditions		
●	◐	◌
CTCP425	**CTCP425**	
CTCP425		
CTCP425	CTCP425	

-27P

- ○ Positive geometry
- ○ Ground periphery
- ○ Sharp cutting edges
- ○ Reduced tendency to adhesion
- ○ First choice for non-ferrous metals



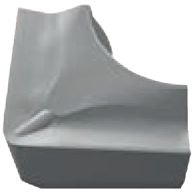
f [mm]

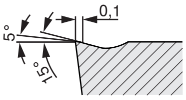
0,1 - 0,4

Machining conditions		
●	◐	◌
H216T	**H216T**	**H216T**

-27Q

- ○ Highly positive geometry
- ○ Masterfinish cutting edge
- ○ Ground periphery
- ○ Sharp cutting edge
- ○ Reduced tendency to adhesion



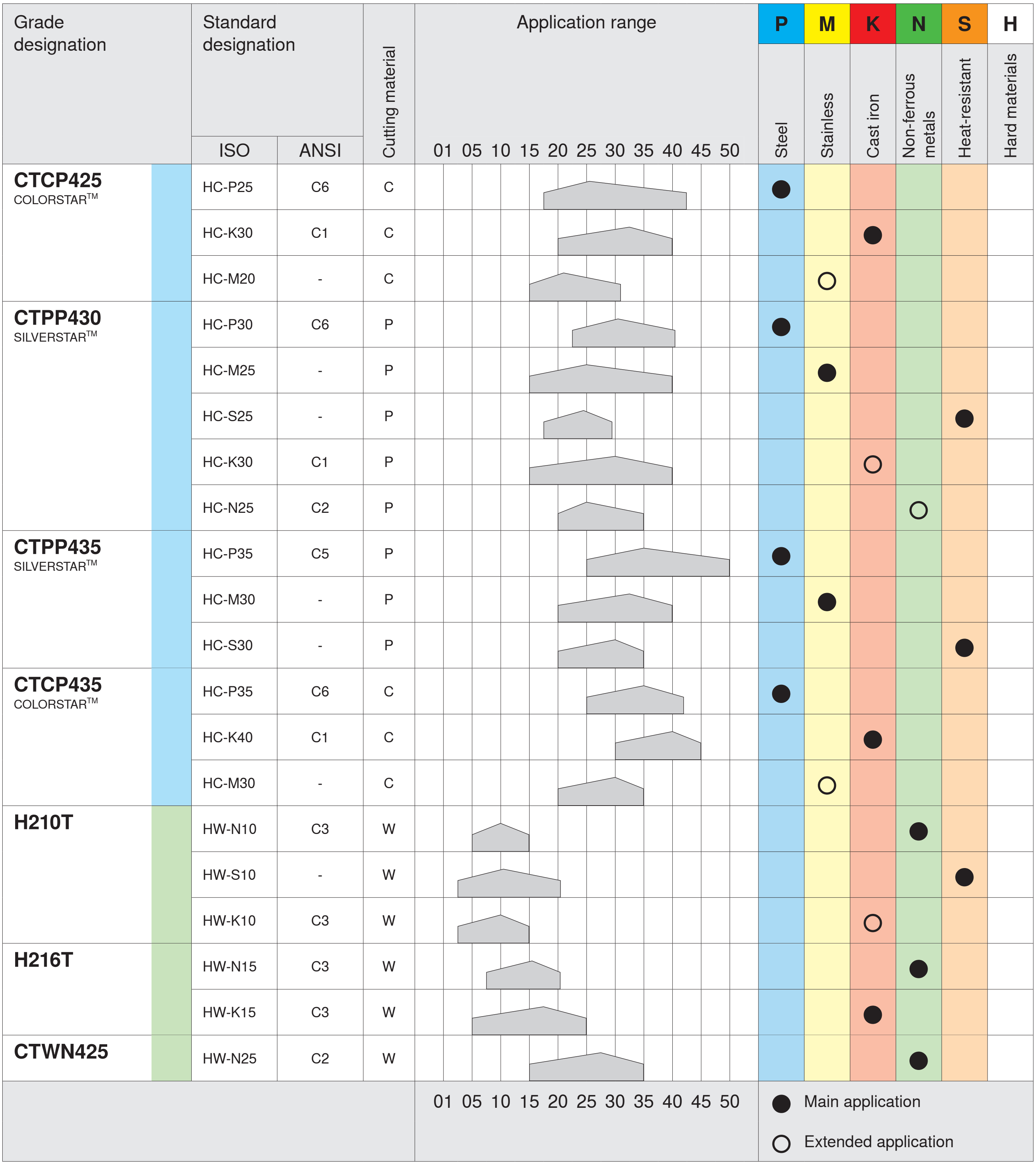


f [mm]

0,2 - 0,5

Machining conditions		
●	◐	◌
H210T	**H210T**	

Grade overview



Grade designation	Standard designation ISO	Standard designation ANSI	Cutting material	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
CTCP425 COLORSTAR™	HC-P25	C6	C	●					
	HC-K30	C1	C			●			
	HC-M20	-	C		○				
CTPP430 SILVERSTAR™	HC-P30	C6	P	●					
	HC-M25	-	P		●				
	HC-S25	-	P					●	
	HC-K30	C1	P			○			
	HC-N25	C2	P				○		
CTPP435 SILVERSTAR™	HC-P35	C5	P	●					
	HC-M30	-	P		●				
	HC-S30	-	P					●	
CTCP435 COLORSTAR™	HC-P35	C6	C	●					
	HC-K40	C1	C			●			
	HC-M30	-	C		○				
H210T	HW-N10	C3	W				●		
	HW-S10	-	W					●	
	HW-K10	C3	W			○			
H216T	HW-N15	C3	W				●		
	HW-K15	C3	W			●			
CTWN425	HW-N25	C2	W				●		

● Main application

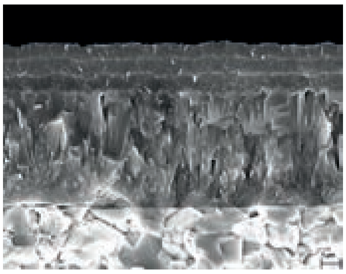
○ Extended application

CTWN425 / CTPP435 for EcoCut Mini

CTCP425
COLORSTAR™

HC-P25 | HC-K30 | HC-M20

● ● ○



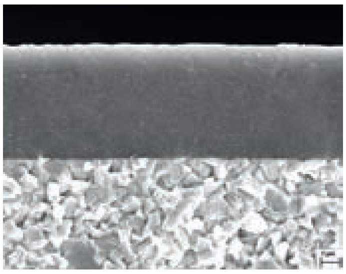
Specification:
Composition: Co 7.0%; mixed carbides 8.1%; WC balance | Grain size: 1-2 μm | Hardness: HV_{30} 1450 | Coating specification: CVD Ti(CnN) + Al_2O_3 multi-layer

Recommended application:
The wear-resistant solution for steel and cast iron under stable conditions and with high cutting speed.

CTPP430
SILVERSTAR™

HC-P30 | HC-M25 | HC-S25 | HC-K30 | HC-N25

● ● ● ○ ○



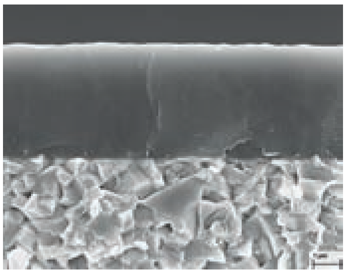
Specification:
Composition: Co 9.0%; others 0.75%; WC balance | Grain size: 0.85 μm | Hardness: HV_{30} 1590 | Coating specification: PVD TiAlN

Recommended application:
The universal high-performance grade for steel, austenitic steel and heat-resistant alloys.

CTPP435
SILVERSTAR™

HC-P35 | HC-M30 | HC-S30

● ● ●



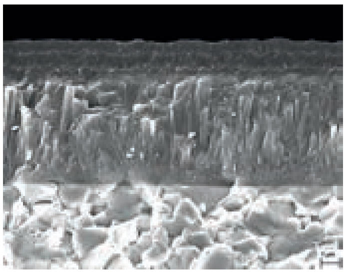
Specification:
Composition: Co 10.3%; others 1.2%; WC balance | Grain size: 0.7 μm | Hardness: HV_{30} 1600 | Coating specification: PVD TiN / TiAlN

Recommended application:
The universal high-performance grade for steel, austenitic steel and heat-resistant alloys.

CTCP435
COLORSTAR™

HC-P35 | HC-K40 | HC-M30

● ● ○



Specification:
Composition: Co 9.6%; mixed carbides 7.8%; others 0.4%; WC balance | Grain size: 1-2 μm | Hardness: HV_{30} 1400 | Coating specification: CVD Ti(C,N) + Al_2O_3 multi-layer

Recommended application:
The reliable choice when machining steel and cast iron under unstable conditions.

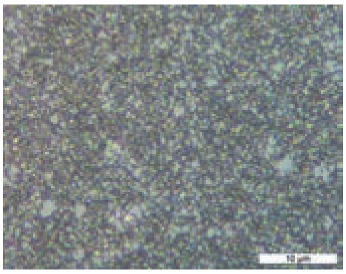
CTWN425 / CTPP435 for EcoCut Mini

Grade description

H210T

HW-N10 | HW-S10 | HW-K10

● ● ○



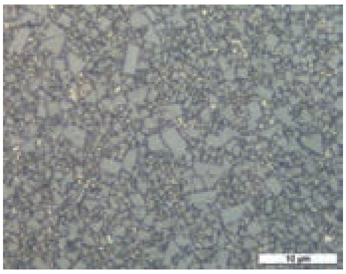
Specification:
Composition: Co 6.0%; WC balance | Grain size: 0.8 μm | Hardness: HV$_{30}$ 1850

Recommended application:
The wear-resistant uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

H216T

HW-N15 | HW-K15

● ●



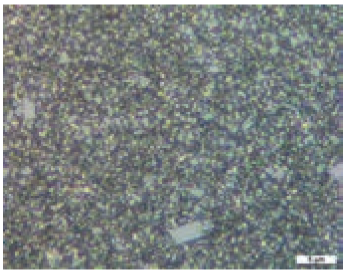
Specification:
Composition: Co 6.0%; WC balance | Grain size: 1 μm | Hardness: HV$_{30}$ 1630

Recommended application:
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

CTWN425

HW-N25

●



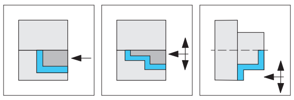
Specification:
Composition: Co 10.3%; others 1.2%; WC balance | Grain size: 0.7 μm (submicron grade) | Hardness: HV$_{30}$ 1600

Recommended application:
The uncoated carbide grade for the machining of aluminium and other non-ferrous metals.

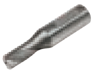
CTWN425 / CTPP435 for EcoCut Mini

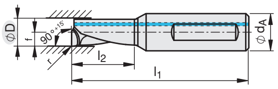
EcoCut Mini

ECM..



	CTPP435	CTWN425
P	●	
M	●	
K		
N		●
S	●	
H		

			CTPP435	CTWN425	RL	D_{min} [mm]	d_A [mm]	l₁ [mm]	l₂ [mm]	r [mm]	f [mm]
-27		ECM 04L-2.25D-27		●	L	4	6	35	9	0.2	2
		ECM 04L-4.00D-27		●	L	4	6	41	16	0.2	2
		ECM 04R-2.25D-27		●	R	4	6	35	9	0.2	2
		ECM 04R-4.00D-27		●	R	4	6	41	16	0.2	2
		ECM 05L-2.25D-27		●	L	5	6	37	11.25	0.2	2.5
		ECM 05L-4.00D-27		●	L	5	6	45	20	0.2	2.5
		ECM 05R-2.25D-27		●	R	5	6	37	11.25	0.2	2.5
		ECM 05R-4.00D-27		●	R	5	6	45	20	0.2	2.5
		ECM 06L-2.25D-27		●	L	6	8	38	13.5	0.2	3
		ECM 06L-4.00D-27		●	L	6	8	49	24	0.2	3
		ECM 06R-2.25D-27		●	R	6	8	38	13.5	0.2	3
		ECM 06R-4.00D-27		●	R	6	8	49	24	0.2	3
		ECM 07L-2.25D-27		●	L	7	8	42	15.75	0.2	3.5
		ECM 07L-4.00D-27		●	L	7	8	53	28	0.2	3.5
		ECM 07R-2.25D-27		●	R	7	8	42	15.75	0.2	3.5
		ECM 07R-4.00D-27		●	R	7	8	53	28	0.2	3.5
		ECM 08L-2.25D-27		●	L	8	8	45	18	0.2	4
		ECM 08L-4.00D-27		●	L	8	8	57	32	0.2	4
		ECM 08R-2.25D-27		●	R	8	8	45	18	0.2	4
		ECM 08R-4.00D-27		●	R	8	8	57	32	0.2	4
EN		ECM 04L-2.25D	●		L	4	6	35	9	0.2	2
		ECM 04L-4.00D	●		L	4	6	41	16	0.2	2
		ECM 04R-2.25D	●		R	4	6	35	9	0.2	2
		ECM 04R-4.00D	●		R	4	6	41	16	0.2	2
		ECM 05L-2.25D	●		L	5	6	37	11.25	0.2	2.5
		ECM 05L-4.00D	●		L	5	6	45	20	0.2	2.5
		ECM 05R-2.25D	●		R	5	6	37	11.25	0.2	2.5
		ECM 05R-4.00D	●		R	5	6	45	20	0.2	2.5
		ECM 06L-2.25D	●		L	6	8	38	13.5	0.2	3
		ECM 06L-4.00D	●		L	6	8	49	24	0.2	3
		ECM 06R-2.25D	●		R	6	8	38	13.5	0.2	3
		ECM 06R-4.00D	●		R	6	8	49	24	0.2	3
		ECM 07L-2.25D	●		L	7	8	42	15.75	0.2	3.5
		ECM 07L-4.00D	●		L	7	8	53	28	0.2	3.5
		ECM 07R-2.25D	●		R	7	8	42	15.75	0.2	3.5
		ECM 07R-4.00D	●		R	7	8	53	28	0.2	3.5
		ECM 08L-2.25D	●		L	8	8	45	18	0.2	4
		ECM 08L-4.00D	●		L	8	8	57	32	0.2	4
		ECM 08R-2.25D	●		R	8	8	45	18	0.2	4
		ECM 08R-4.00D	●		R	8	8	57	32	0.2	4
			CTPP435	CTWN425	RL	D_{min}	d_A	l₁	l₂	r	f

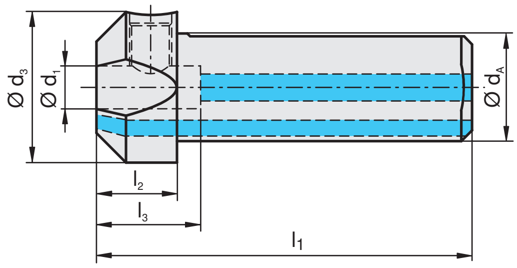


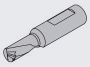
E21-E22

E23-E25

EcoCut Mini

Adapters



d_1 [mm]	Type, description	L N R	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]		
6	EC-ADX20-06	N	20	25	65	14	18	ECM..	E01
8	EC-ADX20-08	N	20	25	65	14	18	ECM..	E01

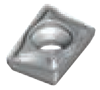
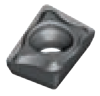
	
E01	310720

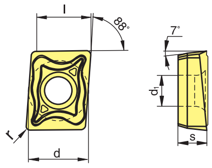
E38

EcoCut

XC.. 04..

	CTCP425	CTPP430	CTCP435	H210T	H216T
P	●	●	●		
M	○	●	○		
K	●	○	●	○	●
N		○		●	●
S		●		●	
H					

			CTCP425	CTPP430	CTCP435	H210T	H216T	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-27P		XCET 040102FL-27P					●	4.50	4.00	1.80	0.20	2.10
		XCET 040102FR-27P					●	4.50	4.00	1.80	0.20	2.10
		XCET 040104FL-27P					●	4.50	4.00	1.80	0.40	2.10
		XCET 040104FR-27P					●	4.50	4.00	1.80	0.40	2.10
-27Q		XCET 040102FL-27Q				●		4.50	4.00	1.80	0.20	2.10
		XCET 040102FR-27Q				●		4.50	4.00	1.80	0.20	2.10
		XCET 040104FL-27Q				●		4.50	4.00	1.80	0.40	2.10
		XCET 040104FR-27Q				●		4.50	4.00	1.80	0.40	2.10
ER-EL		XCNT 040102EL	●	●	●			4.50	4.00	1.80	0.20	2.10
		XCNT 040102ER	●	●	●			4.50	4.00	1.80	0.20	2.10
		XCNT 040104EL	●	●	●			4.50	4.00	1.80	0.40	2.10
		XCNT 040104ER	●	●	●			4.50	4.00	1.80	0.40	2.10
-M50Q		XCNT 040104EL-M50Q	●					4.50	4.00	1.80	0.40	2.10
		XCNT 040104ER-M50Q	●					4.50	4.00	1.80	0.40	2.10
			CTCP425	CTPP430	CTCP435	H210T	H216T	d	l	s	r	d_1



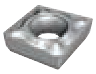
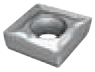
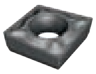
E21-E22

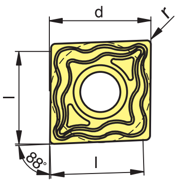
E18-E20

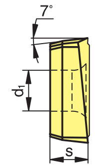
EcoCut

XC..

	CTCP425	CTPP430	CTCP435	H210T	H216T
P	●	●	●		
M	○	●	○		
K	●	○	●	○	●
N		○		●	●
S		●		●	
H					

			CTCP425	CTPP430	CTCP435	H210T	H216T	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-27P		XCET 050202FN-27P					●	5.80	5.00	2.10	0.20	2.25
		XCET 050204FN-27P					●	5.80	5.00	2.10	0.40	2.25
		XCET 060202FN-27P					●	6.50	6.00	2.38	0.20	2.50
		XCET 060204FN-27P					●	6.50	6.00	2.38	0.40	2.50
		XCET 070304FN-27P					●	7.60	7.00	3.18	0.40	2.80
		XCET 080304FN-27P					●	8.50	8.00	3.18	0.40	3.40
		XCET 09T304FN-27P					●	9.60	9.00	3.97	0.40	3.40
		XCET 10T304FN-27P					●	10.60	10.00	3.97	0.40	4.40
		XCET 10T308FN-27P					●	10.60	10.00	3.97	0.80	4.40
		XCET 130404FN-27P					●	13.50	12.50	4.76	0.40	5.30
		XCET 130408FN-27P					●	13.50	12.50	4.76	0.80	5.30
		XCET 170508FN-27P					●	17.50	16.00	5.56	0.80	5.30
-27Q		XCET 050202FN-27Q				●		5.80	5.00	2.10	0.20	2.25
		XCET 050204FN-27Q				●		5.80	5.00	2.10	0.40	2.25
		XCET 060202FN-27Q				●		6.50	6.00	2.38	0.20	2.50
		XCET 060204FN-27Q				●		6.50	6.00	2.38	0.40	2.50
		XCET 070304FN-27Q				●		7.60	7.00	3.18	0.40	2.80
		XCET 080304FN-27Q				●		8.50	8.00	3.18	0.40	3.40
		XCET 09T304FN-27Q				●		9.60	9.00	3.97	0.40	3.40
		XCET 10T304FN-27Q				●		10.60	10.00	3.97	0.40	4.40
		XCET 10T308FN-27Q				●		10.60	10.00	3.97	0.80	4.40
		XCET 130404FN-27Q				●		13.50	12.50	4.76	0.40	5.30
		XCET 130408FN-27Q				●		13.50	12.50	4.76	0.80	5.30
		XCET 170508FN-27Q				●		17.50	16.00	5.56	0.80	5.30
EN		XCNT 050202EN	●	●	●			5.80	5.00	2.10	0.20	2.25
		XCNT 050204EN	●	●	●			5.80	5.00	2.10	0.40	2.25
		XCNT 060202EN	●	●	●			6.50	6.00	2.38	0.20	2.50
		XCNT 060204EN	●	●	●			6.50	6.00	2.38	0.40	2.50
		XCNT 070304EN	●	●	●			7.60	7.00	3.18	0.40	2.80
		XCNT 080304EN	●	●	●			8.50	8.00	3.18	0.40	3.40
		XCNT 09T304EN	●	●	●			9.60	9.00	3.97	0.40	3.40
		XCNT 10T304EN	●	●	●			10.60	10.00	3.97	0.40	4.40
		XCNT 10T308EN	●	●	●			10.60	10.00	3.97	0.80	4.40
		XCNT 130404EN	●	●	●			13.50	12.50	4.76	0.40	5.30
		XCNT 130408EN	●	●	●			13.50	12.50	4.76	0.80	5.30
		XCNT 170508EN	●	●	●			17.50	16.00	5.56	0.80	5.30
			CTCP425	CTPP430	CTCP435	H210T	H216T	d	l	s	r	d_1





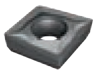
E21-E22

E18-E20

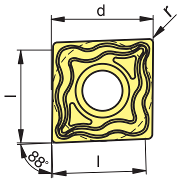
EcoCut

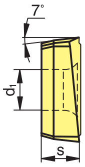
XC..

	CTCP425	CTPP430	CTCP435	H210T	H216T
P	●	●	●		
M	○	●	○		
K	●	○	●	○	●
N		○		●	●
S		●		●	
H					



	Designation	CTCP425	CTPP430	CTCP435	H210T	H216T	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-M50Q	XCNT 050204EN-M50Q	●					5.80	5.00	2.10	0.40	2.25
	XCNT 060204EN-M50Q	●					6.50	6.00	2.38	0.40	2.50
	XCNT 070304EN-M50Q	●					7.60	7.00	3.18	0.40	2.80
	XCNT 080304EN-M50Q	●					8.50	8.00	3.18	0.40	3.40
	XCNT 09T304EN-M50Q	●					9.60	9.00	3.97	0.40	3.40
	XCNT 10T304EN-M50Q	●					10.60	10.00	3.97	0.40	4.40
	XCNT 10T308EN-M50Q	●					10.60	10.00	3.97	0.80	4.40
	XCNT 130404EN-M50Q	●					13.50	12.50	4.76	0.40	5.30
	XCNT 130408EN-M50Q	●					13.50	12.50	4.76	0.80	5.30
	XCNT 170508EN-M50Q	●					17.50	16.00	5.56	0.80	5.30
		CTCP425	CTPP430	CTCP435	H210T	H216T	d	l	s	r	d_1



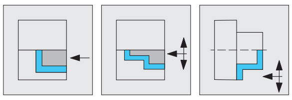


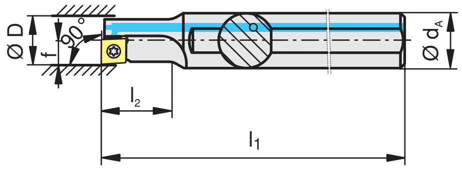
E21-E22

E18-E20

EcoCut Classic

1.5D





D_{min} [mm]	Type, description	L N R	d_A [mm]	l_1 [mm]	l_2 [mm]	f [mm]	[Nm]		
8	ECC 08L-1.5D 04	L	12	80	12	4	0.4	XC.. 0401..	E01
8	ECC 08R-1.5D 04	R	12	80	12	4	0.4	XC.. 0401..	E01
10	ECC 10L-1.5D 05	L	12	90	15	5	0.7	XC.. 0502..	E02
10	ECC 10R-1.5D 05	R	12	90	15	5	0.7	XC.. 0502..	E02
12	ECC 12L-1.5D 06	L	16	100	18	6	1.0	XC.. 0602..	E03
12	ECC 12R-1.5D 06	R	16	100	18	6	1.0	XC.. 0602..	E03
14	ECC 14L-1.5D 07	L	16	110	21	7	1.2	XC.. 0703..	E04
14	ECC 14R-1.5D 07	R	16	110	21	7	1.2	XC.. 0703..	E04
16	ECC 16L-1.5D 08	L	20	125	24	8	2.2	XC.. 0803..	E05
16	ECC 16R-1.5D 08	R	20	125	24	8	2.2	XC.. 0803..	E05
18	ECC 18L-1.5D 09	L	25	135	27	9	2.2	XC.. 09T3..	E05
18	ECC 18R-1.5D 09	R	25	135	27	9	2.2	XC.. 09T3..	E05
20	ECC 20L-1.5D 10	L	25	150	30	10	3.2	XC.. 10T3..	E06
20	ECC 20R-1.5D 10	R	25	150	30	10	3.2	XC.. 10T3..	E06
25	ECC 25L-1.5D 13	L	32	180	37.5	12.5	5.0	XC.. 1304..	E07
25	ECC 25R-1.5D 13	R	32	180	37.5	12.5	5.0	XC.. 1304..	E07
32	ECC 32L-1.5D 17	L	40	200	48	16	5.0	XC.. 1705..	E07
32	ECC 32R-1.5D 17	R	40	200	48	16	5.0	XC.. 1705..	E07

E01	11807484		11843205
E02	11807480		11843205
E03	11684214		11488748
E04	11684216		11206195
E05	11227305		11843208
E06	11610311	8095012000	
E07	11801441	8095012100	

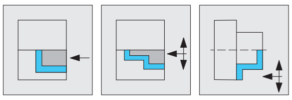
E26+E29

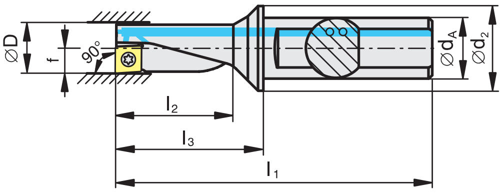
E38

E15-E17

EcoCut Classic

2.25D





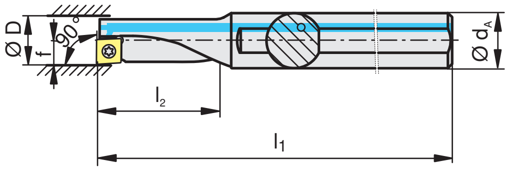
Dmin [mm]	Type, description	L N R	d_A [mm]	d_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	[Nm]		
8	ECC 08L-2.25D 04	L	10	15	60	18	22.0	4	0.4	XC.. 0401..	E01
8	ECC 08R-2.25D 04	R	10	15	60	18	22.0	4	0.4	XC.. 0401..	E01
10	ECC 10L-2.25D 05	L	12	18	69.5	22.5	27.5	5	0.7	XC.. 0502..	E02
10	ECC 10R-2.25D 05	R	12	18	69.5	22.5	27.5	5	0.7	XC.. 0502..	E02
12	ECC 12L-2.25D 06	L	16	22	78	27	33.0	6	1.0	XC.. 0602..	E03
12	ECC 12R-2.25D 06	R	16	22	78	27	33.0	6	1.0	XC.. 0602..	E03
14	ECC 14L-2.25D 07	L	16	23	83.5	31.5	38.5	7	1.2	XC.. 0703..	E04
14	ECC 14R-2.25D 07	R	16	23	83.5	31.5	38.5	7	1.2	XC.. 0703..	E04
16	ECC 16L-2.25D 08	L	20	28	94	36	44.0	8	2.2	XC.. 0803..	E05
16	ECC 16R-2.25D 08	R	20	28	94	36	44.0	8	2.2	XC.. 0803..	E05
18	ECC 18L-2.25D 09	L	25	36	109.5	40.5	53.5	9	2.2	XC.. 09T3..	E05
18	ECC 18R-2.25D 09	R	25	36	109.5	40.5	53.5	9	2.2	XC.. 09T3..	E05
20	ECC 20L-2.25D 10	L	25	35	111	45	55.0	10	3.2	XC.. 10T3..	E06
20	ECC 20R-2.25D 10	R	25	35	111	45	55.0	10	3.2	XC.. 10T3..	E06
25	ECC 25L-2.25D 13	L	32	44	129	56.5	69.0	12.5	5.0	XC.. 1304..	E07
25	ECC 25R-2.25D 13	R	32	44	129	56.5	69.0	12.5	5.0	XC.. 1304..	E07
32	ECC 32L-2.25D 17	L	40	54	158	72	88.0	16	5.0	XC.. 1705..	E07
32	ECC 32R-2.25D 17	R	40	54	158	72	88.0	16	5.0	XC.. 1705..	E07

E01	11807484		11843205
E02	11807480		11843205
E03	11684214		11488748
E04	11684216		11206195
E05	11227305		11843208
E06	11610311	8095012000	
E07	11801441	8095012100	

E27+E29
E38
E15-E17

EcoCut Classic

3D



D_{min} [mm]	Type, description	L N R	d_A [mm]	l_1 [mm]	l_2 [mm]	f [mm]	[Nm]		
8	ECC 08L-3.0D 04 H	L	12	80	24	4	0.4	XC.. 0401..	E01
8	ECC 08R-3.0D 04 H	R	12	80	24	4	0.4	XC.. 0401..	E01
10	ECC 10L-3.0D 05 H	L	12	85	30	5	0.7	XC.. 0502..	E02
10	ECC 10R-3.0D 05 H	R	12	85	30	5	0.7	XC.. 0502..	E02
12	ECC 12L-3.0D 06 H	L	16	95	36	6	1.0	XC.. 0602..	E03
12	ECC 12R-3.0D 06 H	R	16	95	36	6	1.0	XC.. 0602..	E03
14	ECC 14L-3.0D 07 H	L	16	100	42	7	1.2	XC.. 0703..	E04
14	ECC 14R-3.0D 07 H	R	16	100	42	7	1.2	XC.. 0703..	E04
16	ECC 16L-3.0D 08 H	L	20	110	48	8	2.2	XC.. 0803..	E05
16	ECC 16R-3.0D 08 H	R	20	110	48	8	2.2	XC.. 0803..	E05
18	ECC 18L-3.0D 09 H	L	25	125	54	9	2.2	XC.. 09T3..	E05
18	ECC 18R-3.0D 09 H	R	25	125	54	9	2.2	XC.. 09T3..	E05
20	ECC 20L-3.0D 10 H	L	25	130	60	10	3.2	XC.. 10T3..	E06
20	ECC 20R-3.0D 10 H	R	25	130	60	10	3.2	XC.. 10T3..	E06
25	ECC 25L-3.0D 13 H	L	32	150	75	12.5	5.0	XC.. 1304..	E07
25	ECC 25R-3.0D 13 H	R	32	150	75	12.5	5.0	XC.. 1304..	E07
32	ECC 32L-3.0D 17 H	L	40	185	96	16	5.0	XC.. 1705..	E07
32	ECC 32R-3.0D 17 H	R	40	185	96	16	5.0	XC.. 1705..	E07

E01	11807484		11843205
E02	11807480		11843205
E03	11684214		11488748
E04	11684216		11206195
E05	11227305		11843208
E06	11610311	8095012000	
E07	11801441	8095012100	

E28+E29

E38

E15-E17

Cutting data

Grades, material

Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm^2	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

Cutting data

Grades, material

🟦	🟦	🟦	🟦	🟩	🟩	🟩
CTCP425	**CTPP430**	**CTPP435***	**CTCP435**	**H210T**	**H216T**	**CTWN425***
v_c [m/min]	**v_c [m/min]**	**v_c [m/min]**	**v_c [m/min]**	**v_c [m/min]**	**v_c [m/min]**	**v_c [m/min]**
150 - 300	120 - 250	60 - 230	140 - 280			
120 - 220	80 - 180	60 - 160	100 - 200			
100 - 200	60 - 160	50 - 130	80 - 180			
120 - 220	80 - 180	60 - 160	100 - 200			
100 - 180	60 - 150	50 - 130	80 - 160			
80 - 150	60 - 130	50 - 100	70 - 140			
110 - 190	80 - 170	60 - 140	100 - 180			
70 - 150	50 - 130	40 - 100	60 - 140			
110 - 220	50 - 200	40 - 200	100 - 200			
100 - 180	50 - 150	40 - 150	80 - 150			
120 - 220	50 - 160	40 - 200	100 - 200			
100 - 200	50 - 180	40 - 180	100 - 180			
	50 - 130	40 - 100				
	50 - 120	40 - 80				
130 - 280	120 - 200	100 - 180	120 - 250	140 - 200	120 - 160	80 - 140
130 - 280	100 - 180	80 - 160	120 - 250	100 - 160	90 - 140	60 - 120
120 - 280	120 - 200	100 - 180	110 - 250	160 - 200	130 - 170	90 - 150
120 - 280	100 - 180	80 - 160	110 - 250	110 - 150	90 - 130	60 - 110
110 - 280	90 - 160	100 - 200	100 - 250	160 - 220	140 - 200	100 - 180
110 - 280	70 - 150	90 - 160	100 - 250	140 - 180	120 - 160	80 - 140
	80 - 2000	80 - 2000	80 - 2000	120 - 3000	100 - 2500	80 - 2000
	80 - 1500	80 - 1500	80 - 1500	120 - 2500	100 - 2000	80 - 1500
	80 - 1500	80 - 1500	80 - 1500	120 - 2000	100 - 1500	80 - 1500
	80 - 1300	80 - 1300	80 - 1300	120 - 1800	100 - 1500	80 - 1300
	80 - 600	80 - 600	80 - 600	120 - 1000	100 - 800	80 - 600
	80 - 400	80 - 400	80 - 400	120 - 800	100 - 600	80 - 400
	80 - 400	80 - 400	80 - 400	120 - 800	100 - 600	80 - 400
	80 - 300	80 - 300	80 - 300	120 - 600	100 - 400	80 - 300
	80 - 200	80 - 200	80 - 200	120 - 400	100 - 300	80 - 200
	60 - 160	60 - 160	60 - 160	90 - 220	80 - 180	60 - 160
	50 - 140	50 - 140	50 - 140	80 - 200	60 - 150	50 - 140
	80 - 200	80 - 200	80 - 200	120 - 300	100 - 250	80 - 200
	20 - 90	20 - 50	20 - 50	35 - 50	30 - 45	25 - 40
	20 - 90	20 - 40	20 - 40	25 - 40	20 - 35	20 - 30
	20 - 90	15 - 20	15 - 20	25 - 40	20 - 35	20 - 30
	20 - 90	10 - 20	10 - 20	20 - 30	18 - 30	15 - 25
	20 - 90	10 - 20	10 - 20	15 - 25	15 - 25	15 - 25
	40 - 100	50 - 120	50 - 120	80 - 140	60 - 120	30 - 100
	30 - 90	30 - 50	30 - 50	40 - 100	30 - 80	25 - 60

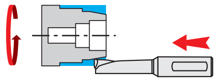
The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

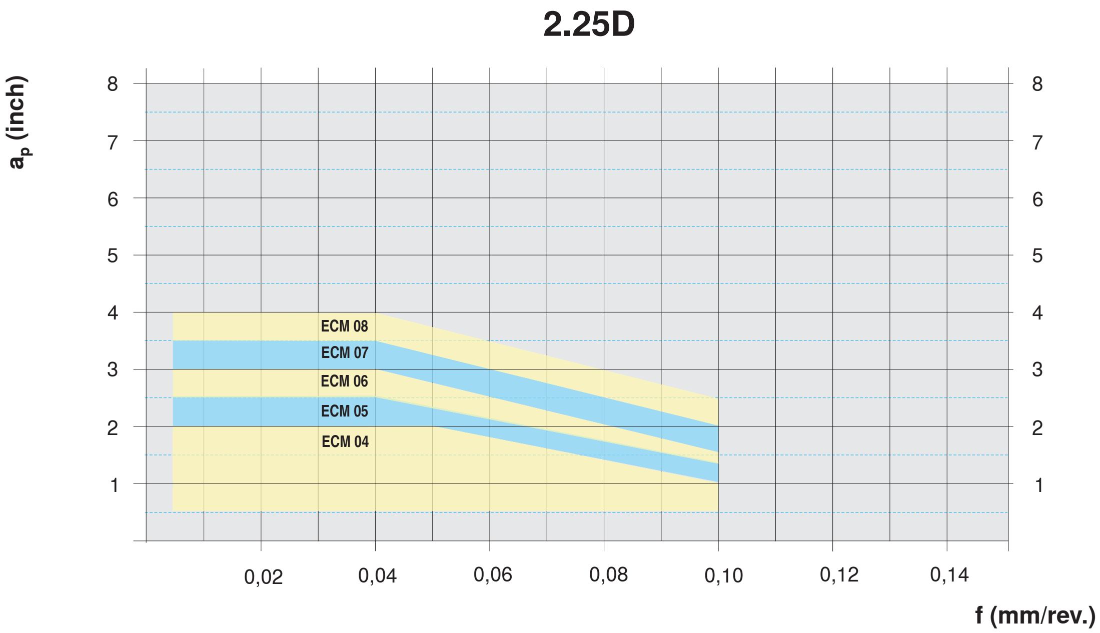
* EcoCut Mini

Depth of cut / feed rate

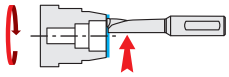
EcoCut Mini

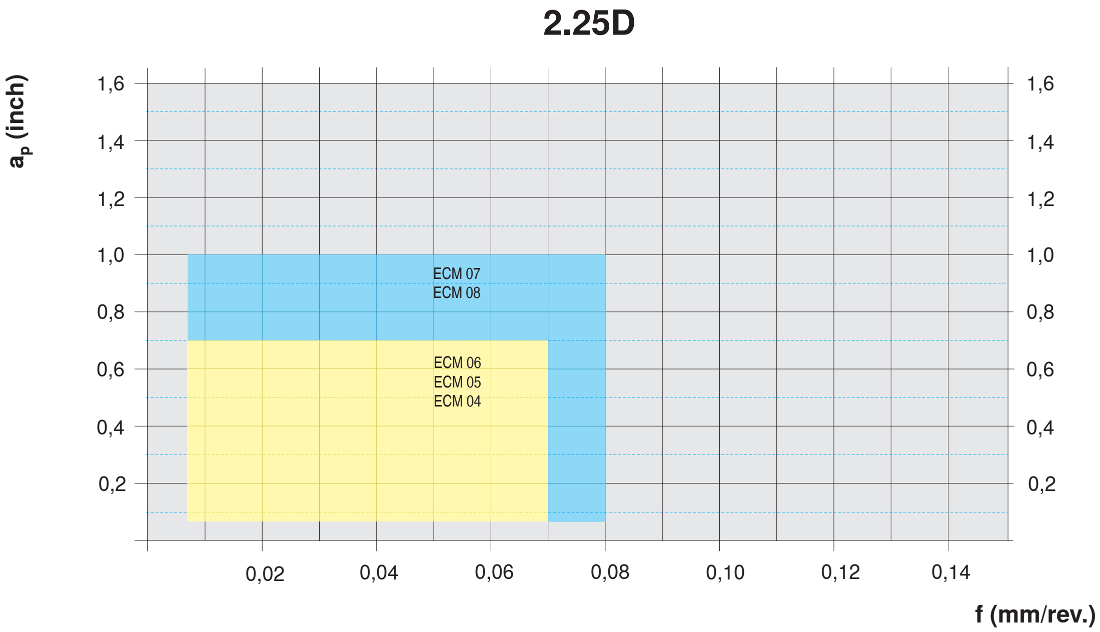
Longitudinal turning



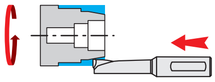


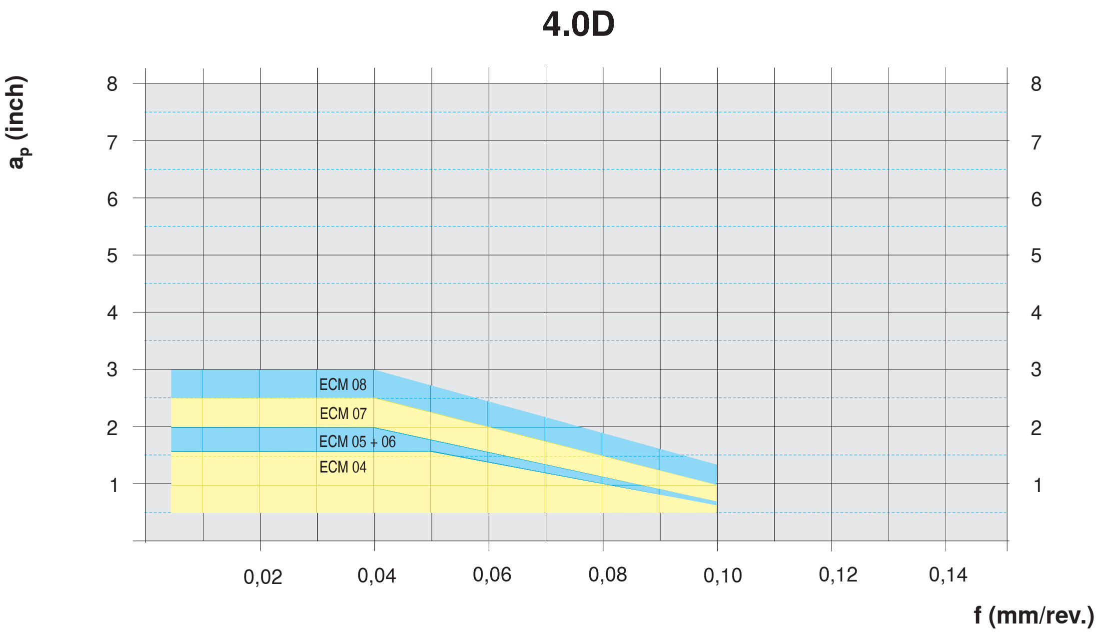
Face turning



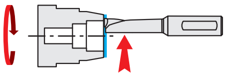


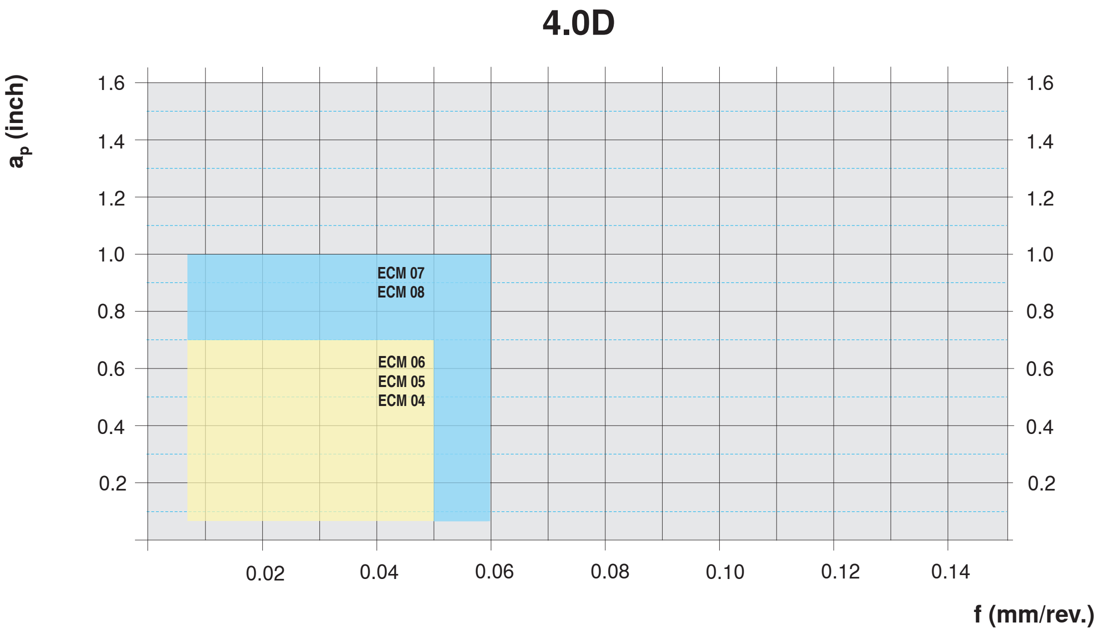
Longitudinal turning





Face turning

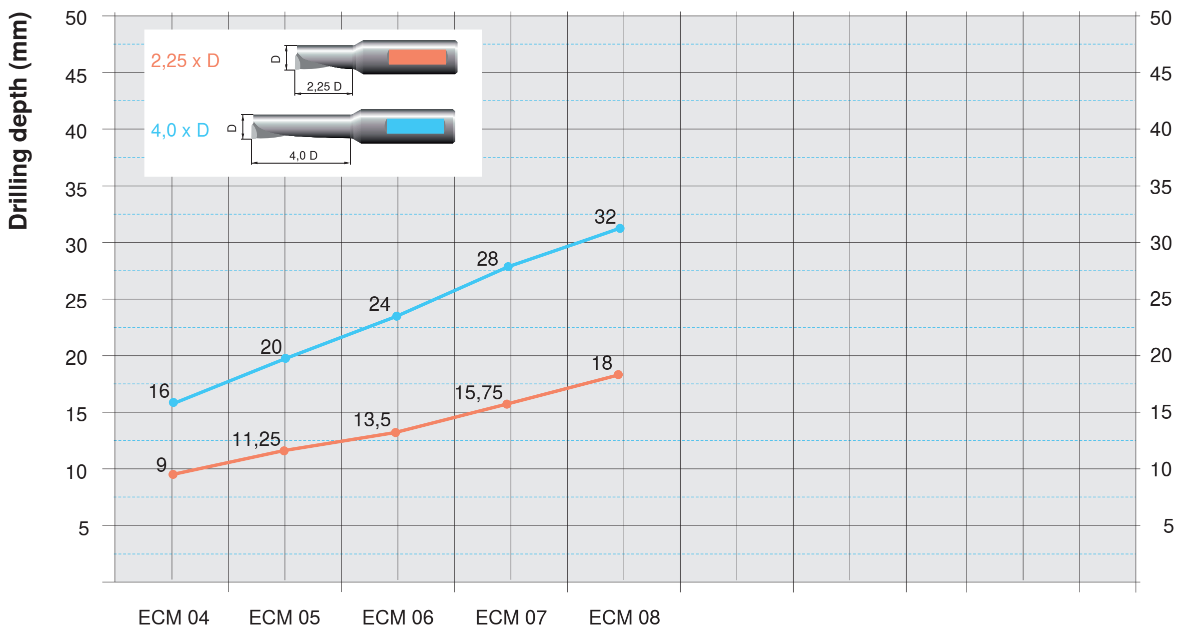




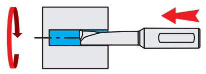
Drilling depth / feed rate

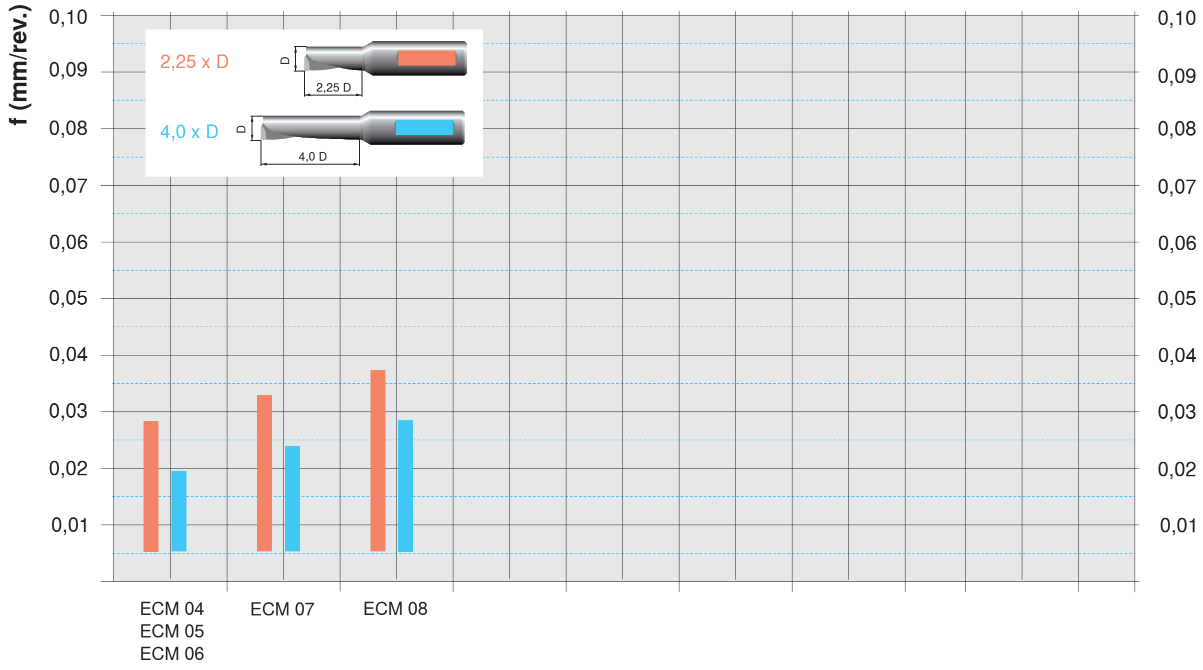
EcoCut Mini

Drilling depth

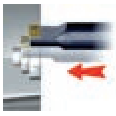


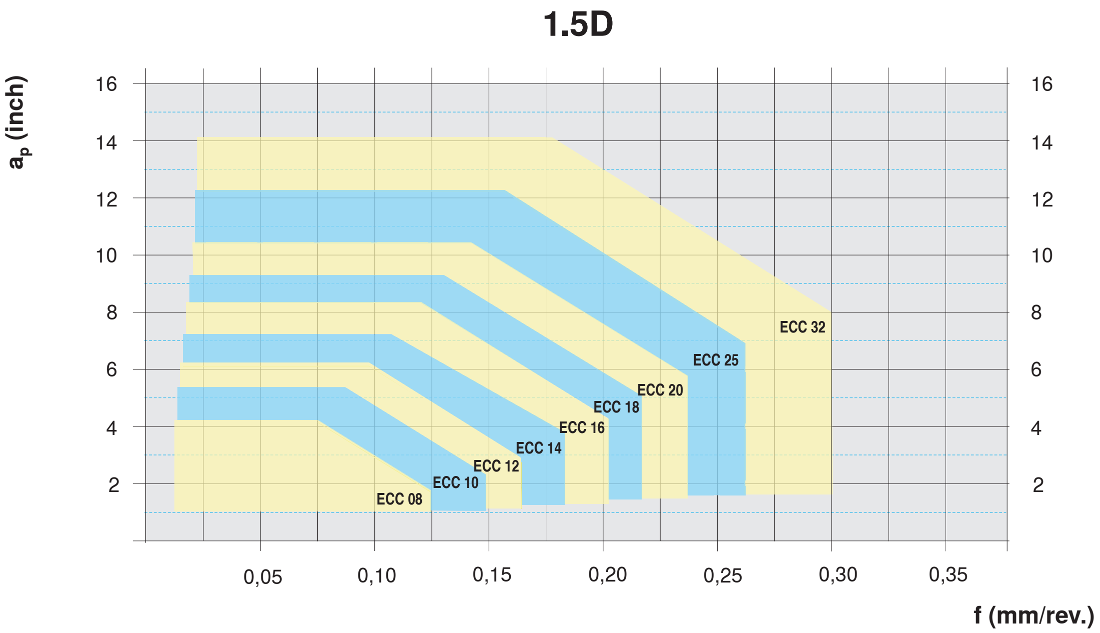
Drilling feed rate



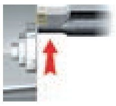


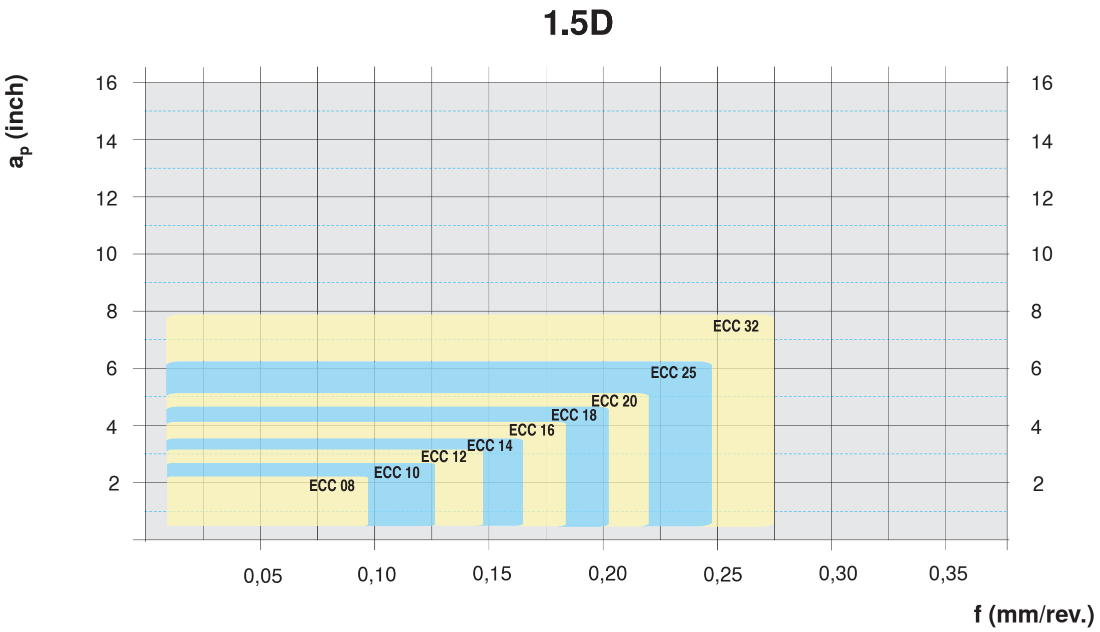
Longitudinal turning





Face turning

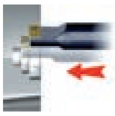


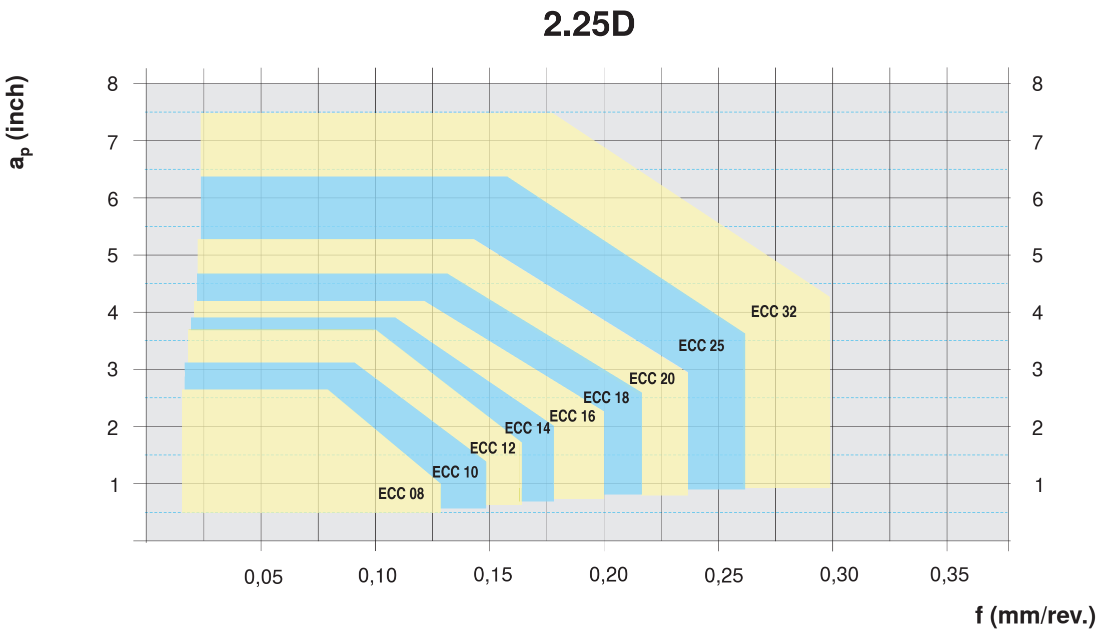


Depth of cut / feed rate

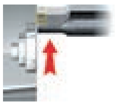
EcoCut Classic

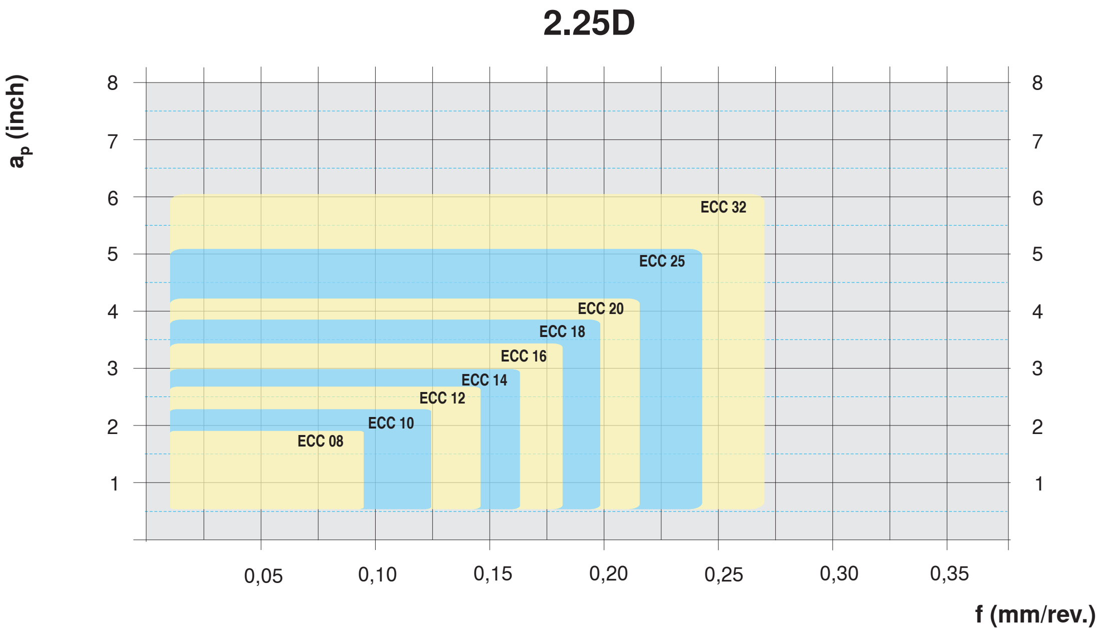
Longitudinal turning





Face turning

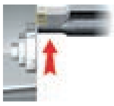


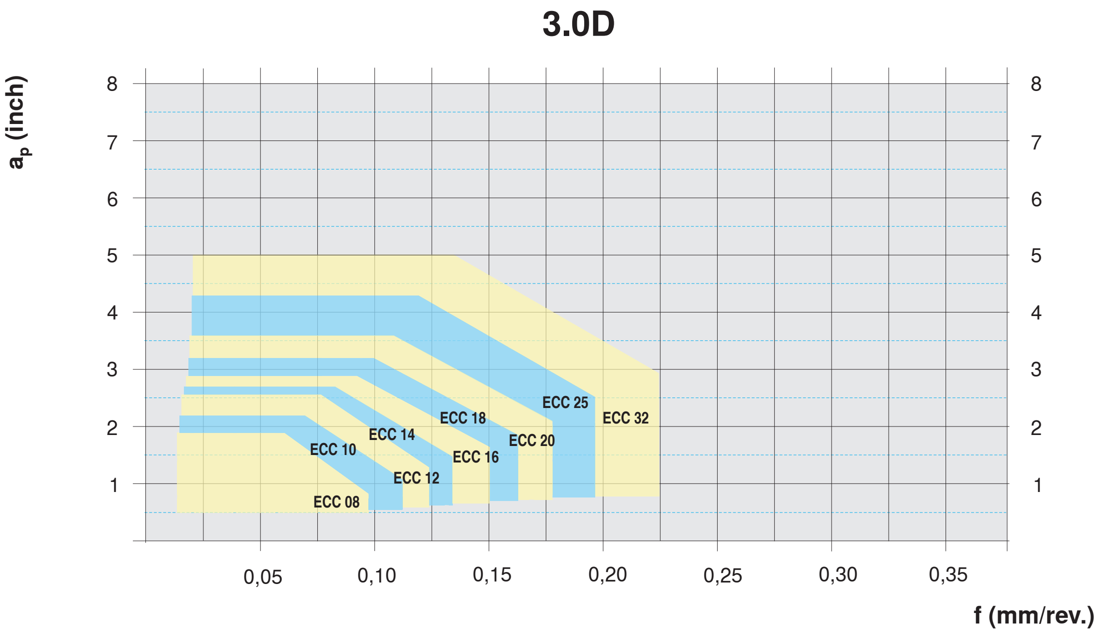


Depth of cut / feed rate

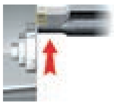
EcoCut Classic

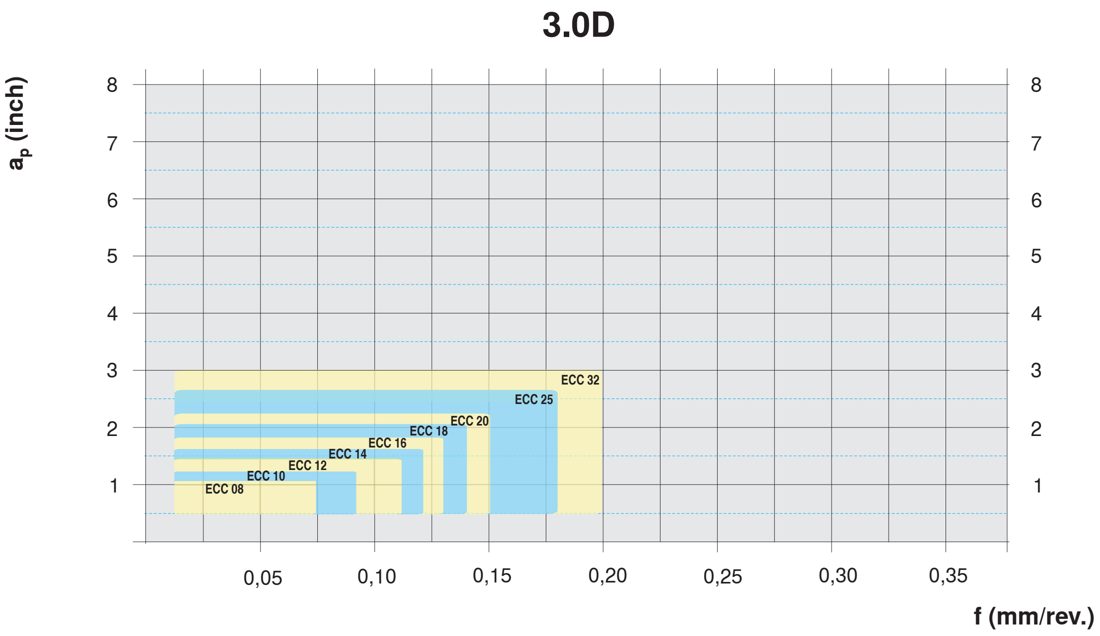
Longitudinal turning





Face turning

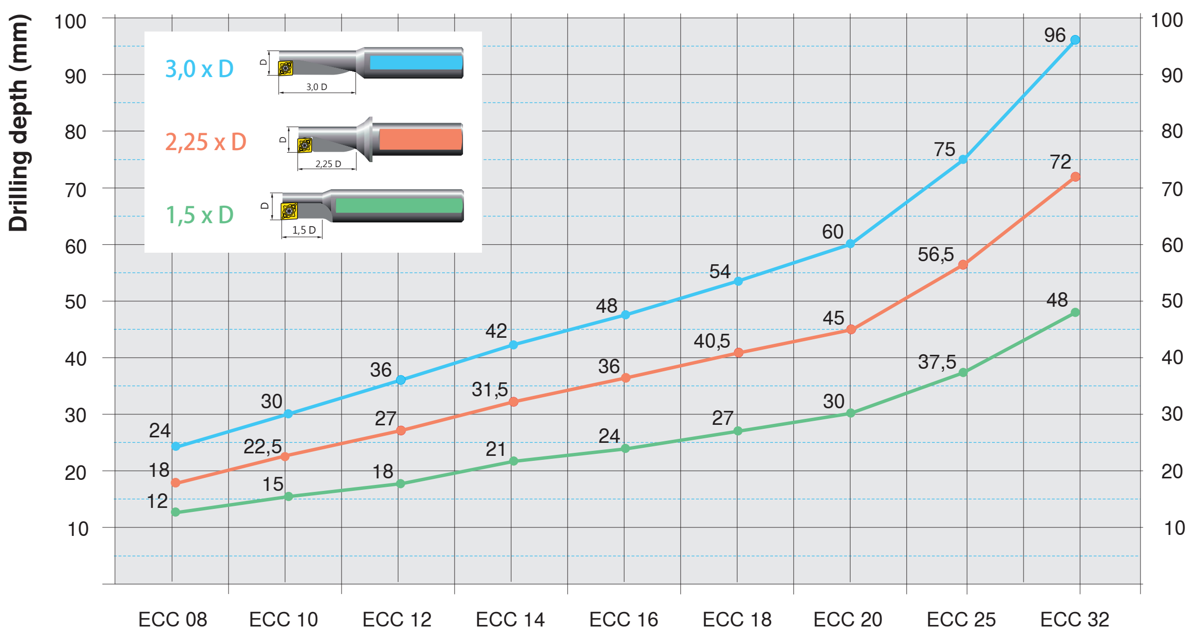




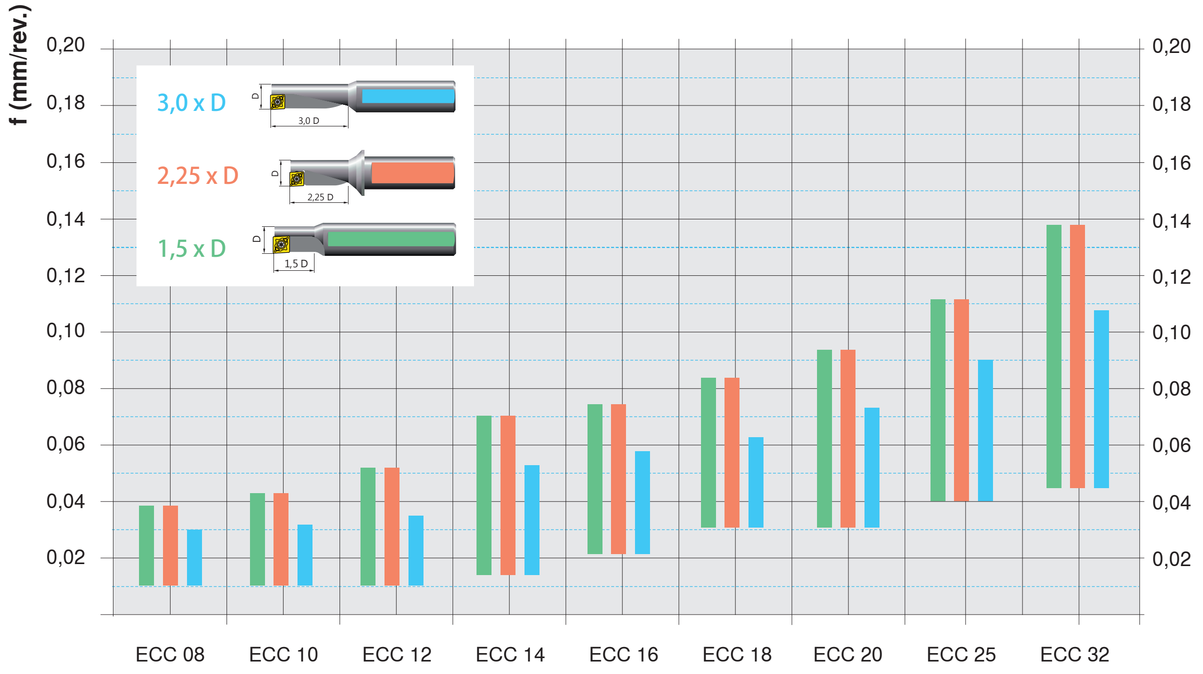
Drilling depth / feed rate

EcoCut Classic

Drilling depth

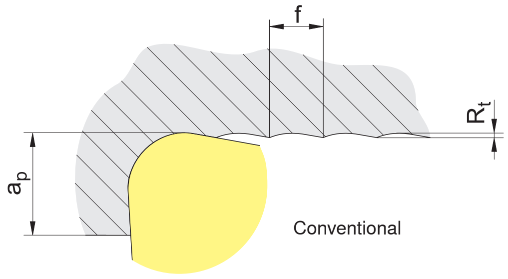


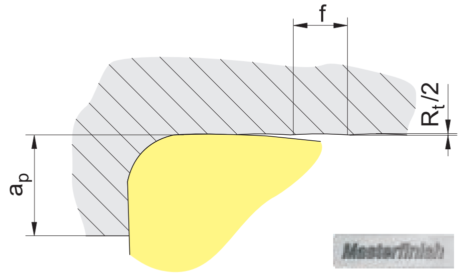
Drilling feed rate



Improved surface finish

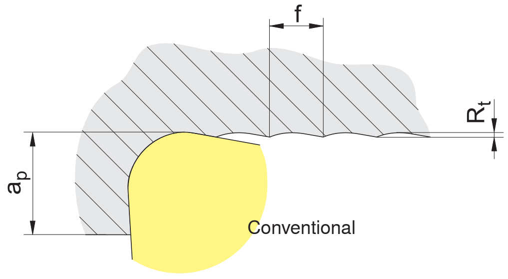
With the same feed rate an insert with 'Masterfinish' cutting edge reaches a roughness value R_a which is many times higher than the one of a conventional insert.

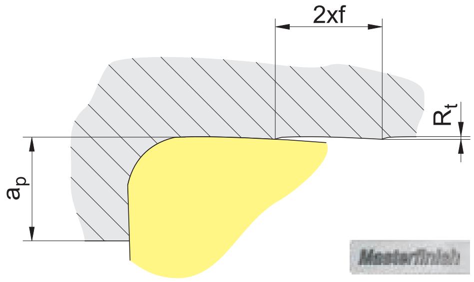


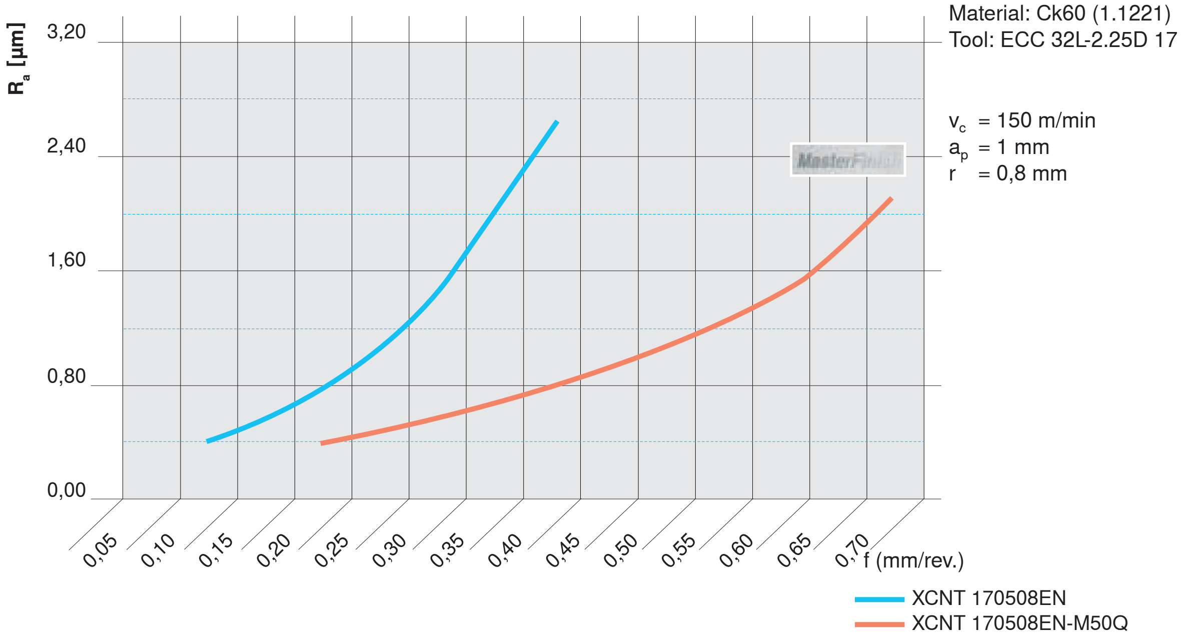


Reduced machining time

If you want to reach the same R_a value as with a standard insert, a twice as high feed rate can be applied for the insert with 'Masterfinish' cutting edge (= shorter production time per component!).





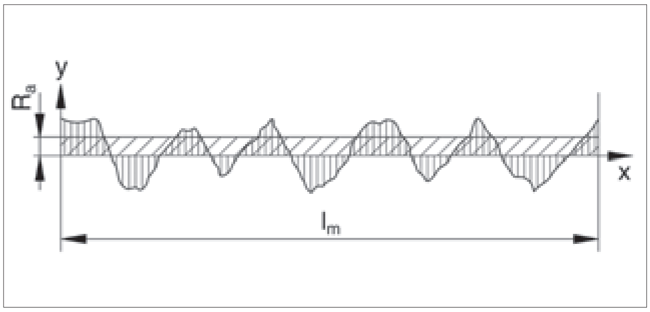


Material: Ck60 (1.1221)
Tool: ECC 32L-2.25D 17

v_c = 150 m/min
a_p = 1 mm
r = 0,8 mm

Surface quality

Surface roughness

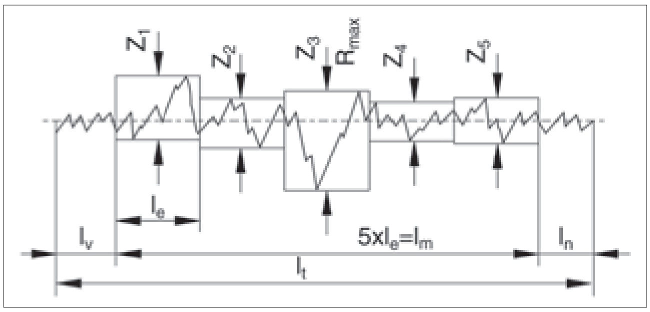


Average roughness value R_a DIN (4768)

This is defined as the arithmetical mean of the absolute sums of the roughness profile R within the entire measured length l_m.

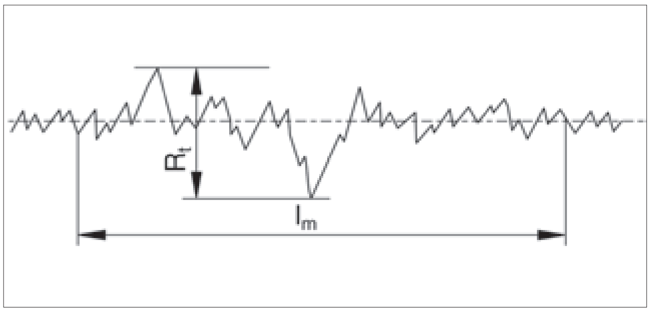
Average roughness depth R_z (DIN 4768)

This is defined as the average value resulting from the single roughness depths of five successive single measured lengths l_e.



Single surface roughness depth Z_1 ... Z_5

This is the vertical distance between the highest and the lowest point of the roughness profile R within a single measured length l_e.



Maximum surface roughness depth R_t (DIN 4768/1)

This is the distance between the elevation and depression of the line within the measured length (reference distance) of profile filtered according to DIN 4768 sheet 1.

Surface symbol according to ISO 1302 **new**	**0,025** √	**0,05** √	**0,1** √	**0,2** √	**0,4** √	**0,8** √	**1,6** √	**3,2** √	**6,3** √	**12,5** √	**25** √	**50** √
Surface symbol according to ISO 3141 **until now**	▽▽▽▽					▽▽▽		▽▽		▽		
Roughness index	**N 1**	**N 2**	**N 3**	**N 4**	**N 5**	**N 6**	**N 7**	**N 8**	**N 9**	**N 10**	**N 11**	**N 12**
Arithmetic mean value R_a [μm]	**0,025**	**0,05**	**0,1**	**0,2**	**0,4**	**0,8**	**1,6**	**3,2**	**6,3**	**12,5**	**25**	**50**
Surface roughness depth R_z [μm]	**0,25**	**0,63**	**1**	**1,6**	**2,5**	**4-6,3**	**10**	**16-25**	**40**	**63**	**100**	**160**
Longitudinal turning **Face turning**							░	▓	▓	▓	▒	▒
Longitudinal turning **Face turning**					MasterFinish							
Longitudinal grinding **Surface grinding**				░	░▓	▓	▓	▒	▒			

░ ≙ Surface roughness (produced through special methods)

▓ ≙ Surface roughness (produced through normal workshop methods)

▒ ≙ Surface roughness (produced through rough machining methods)

Type of problem										
Type of wear				**Work piece problems**		**Chip control**				
Edge chipping	Built-up edge	Flank wear	Plastic deformation	Vibration	Surface quality	Chip too long (tangled swarf)	Chip too short (fragmented chip)	**Corrective measures**		
	⬆	⬇	⬇	⇩ ⇧	⇩ ⇧	⇩		Cutting speed		**Cutting values**
⬇		≈	⇩	⇩ ⇧	⬇	⬆	⬇	Feed rate		
⬆		⬆	⬆	⇩	⇧			Corner radius	larger ↓ ↑ smaller	**Selection of inserts**
⬇		⬆	⬆					Cutting material	wear resistance ↓ ↑ toughness	
≈				≈	≈			Clamping of tool		**General criteria**
≈				≈	≈			Clamping of work piece		
≈				≈	≈			Overhang		
≈		≈		≈	≈			Tip height		
	▢	▢	▢		▢			Cooling lubricant		

⬆	raise, increase, large influence	⬇	avoid, reduce large influence	≈	check, optimise
⇧	raise, increase low influence	⇩	avoid, reduce low influence	▢	use

Application

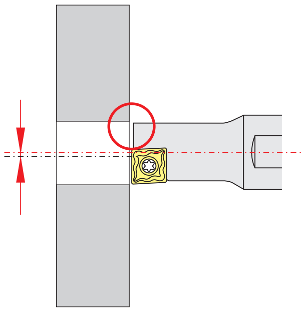
Mounting of the insert

For tools Ø 8 mm right-hand or left-hand inserts are required. From Ø 10-32 mm neutral inserts are applied.

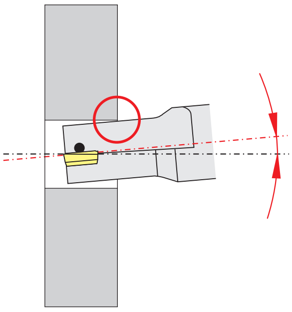
Through hole

With through holes a **sharp-edged disk** is created as tool break-out occurs. Safety measures are necessary.

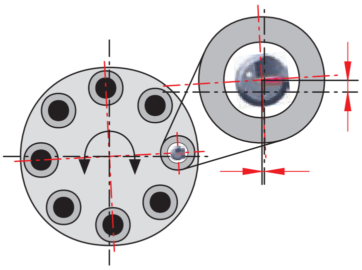
Axial displacement of the machine



Displacement in x-direction

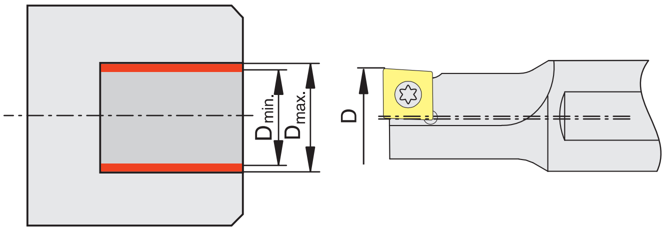


Angular error



Turret position error

Off-centre drilling



Thanks to the special construction of EcoCut tools and inserts off-center drilling is possible. Thus desired deviations from the tool’s nominal diameter can be obtained (see table below).

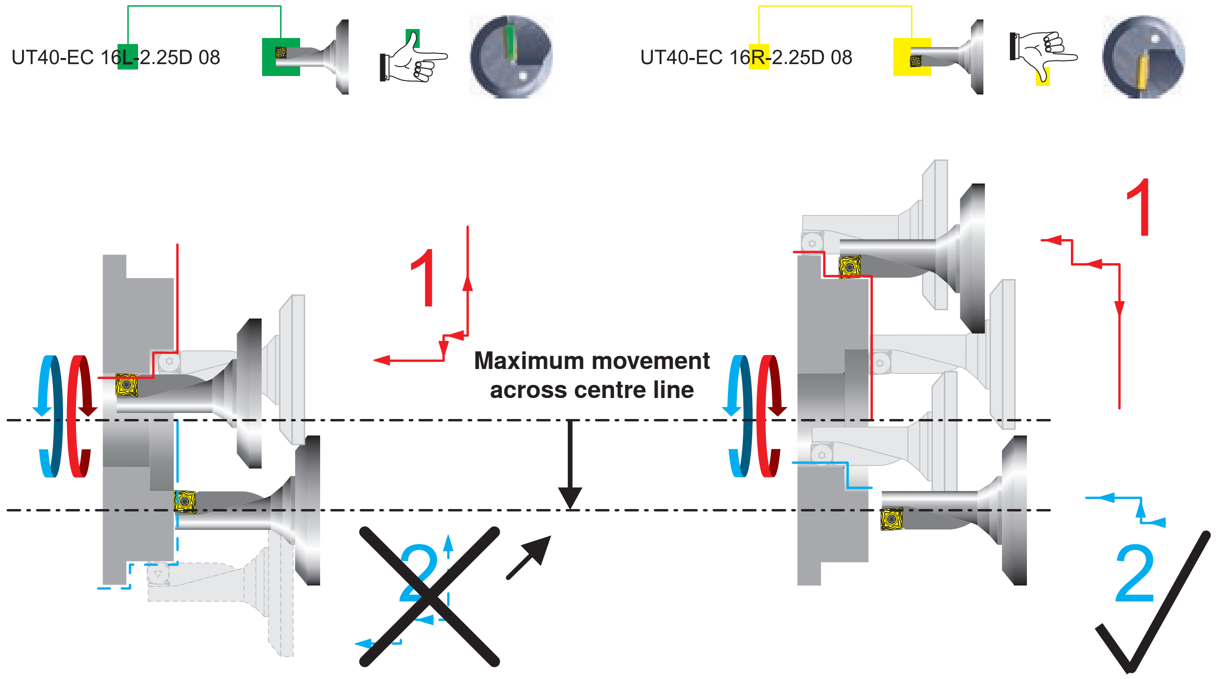
Type of tool Solid carbide	Nominal tool	Work piece bore diameter	
	D [mm]	D_{min} [mm]	D_{max} [mm]
ECM 04 L/R - ...D	4	3,90	4,20
ECM 05 L/R - ...D	5	4,90	5,20
ECM 06 L/R - ...D	6	5,90	6,20
ECM 07 L/R - ...D	7	6,90	7,20
ECM 08 L/R - ...D	8	7,90	8,20

	Nominal tool	Work piece bore diameter	
Type of tool	D [mm]	D_{min} [mm]	D_{max} [mm]
ECC 08 L/R - ... 04	8	7,85	8,30
ECC 10 L/R - ... 05	10	9,85	10,50
ECC 12 L/R - ... 06	12	11,85	12,50
ECC 14 L/R - ... 07	14	13,85	14,50
ECC 16 L/R - ... 08	16	15,85	16,50
ECC 18 L/R - ... 09	18	17,85	18,50
ECC 20 L/R - ... 10	20	19,80	20,50
ECC 25 L/R - ... 13	25	24,80	25,80
ECC 32 L/R - ... 17	32	31,80	33,00

Application

Machining across centre line

Machining across centre line



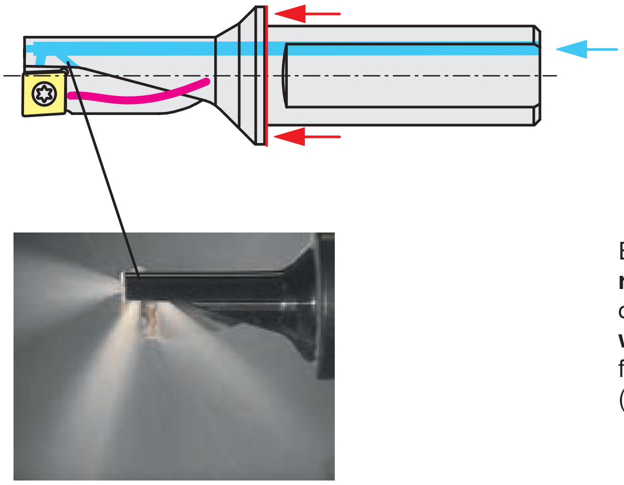
Situation

In case of insufficient movement of the machine across the centre line the external diameter cannot be machined with the same tool.

Solution

Use a right-hand EcoCut tool.

Chip booster/coolant pressure

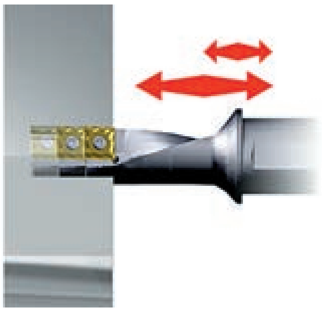


🟦 Internal coolant supply (chip booster)

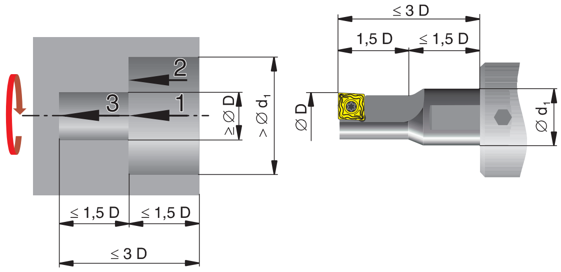
🟪 Helical chip pocket (stability)

🟥 Axial abutment face (stability)

EcoCut offers an innovative detail solution for **range 2.25D**, namely additional bidirectional coolant supply for better chip evacuation. An additional **backwards directed coolant stream** improves chip evacuation from the flute area. A minimum coolant pressure of 1.5-3 bar (optimum 5-7 bar) is required.



If the necessary coolant pressure is not available, it can be advantageous to interrupt the cutting action in order to clear the bore.



Deep bores up to 3xD

With a stepped bore approach EcoCut tools EC..1.5D can be machined with holes of up to three times the nominal diameter (see picture). Operation sequences 1, 2 and 3 respectively should be followed.

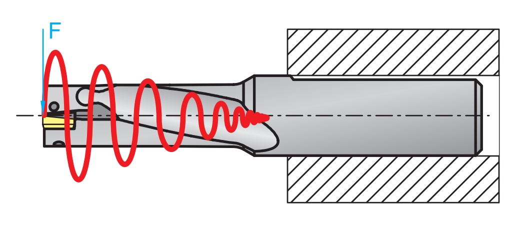
Application

Densimet

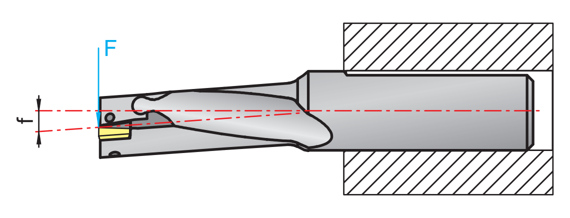
The advantages of DENSIMET compared to steel

The new generation of our EcoCut 3.0D series with the new designation offers maximised performance. The tools are classified with the new designation **ECC .. R/L-3.0D .. H** and have particularly been developed for bigger drilling depths and maximum precision requirements. The material used here is DENSIMET, a PLANSEE tungsten heavy metal alloy. The high modulus of elasticity as well as its density give this alloy very good vibration-damping properties. The result is highest precision, excellent surface quality and improved tool life.

Material	Nominal tool Ø Modulus of elasticity (N/mm^2)	Density (g/mm^3)
Steel	210 000	7,85
DENSIMET	360 000	17,50

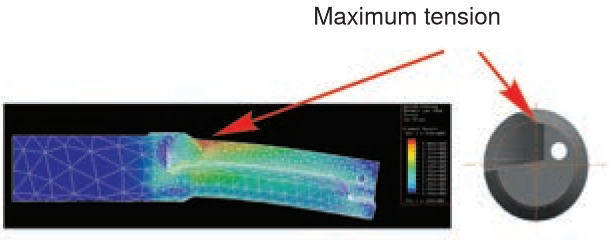


Vibration-damping



40% lower deflection than steel

The new chip flute design

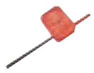


Version with straight chip flute

Version with helical chip flute

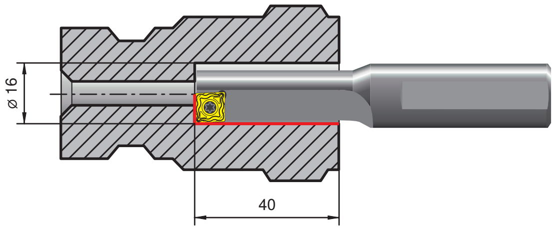
Up to 50% reduced tensions in the tool through Finite Element Modelling (FEM), optimised chip pocket design.

Spare parts

	Material	Type, description	Key size
	11206195	10002494/TORX 08IP F	T08IP
	11488748	10007404/TORX 07IP F	T07IP
	11843205	10014921/TORX 06IP F	T06IP
	11843208	10014922/TORX 09IP F	T09IP
	8095012000	SD-T15IP-80mm	T15IP
	8095012100	SD-T20IP-100mm	T20IP

	Material	Type, description	Length [mm]	Thread size	Key size
	310720	7897990/M8X1X8 DIN913	8.0	M8	SW4
	11227305	M3,0x7,0-09IP/10003007	7.0	M3,0	T09IP
	11610311	M3,5X8,6-15IP/10008749	8.6	M3,5	T15IP
	11684214	M2,2x5,0-07IP/10009244	5.0	M2,2	T07IP
	11684216	M2,5x6,0-08IP/10009243	6.0	M2,5	T08IP
	11801441	M4,5X10,5-20IP/10013040	10.5	M4,5	T20IP
	11807480	M2,0x4,3-06IP/10013332	4.3	M2,0	T06IP
	11807484	M1,8x3,6-06IP/10013338	3.6	M1,8	T06IP

Machining example



Technical data

Work piece	bush
Material	C45 ANSI 1045
Tensile strength	730 - 900 N/mm^2
Tool	ECC 16L-3.0D 08 H
Insert	XCNT 080304EN CTCP435
Competitor	2 tools

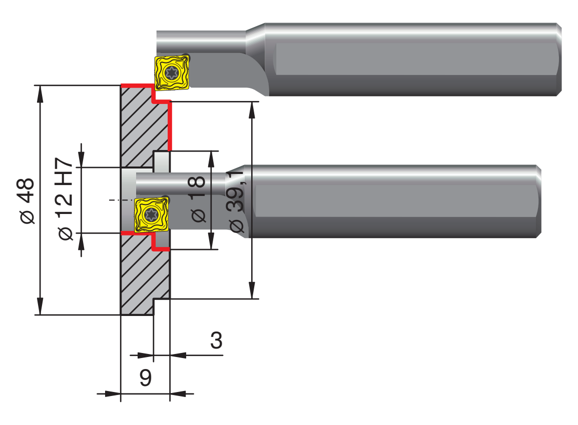
		Drilling	
V_c	[m/min]	176	
f	[mm]	0.06	
a_p	[Ø mm]	16	

Criteria

○ Deep hole with 90° shoulder applying only one tool

Result

○ Machining time reduced by 50% compared to original machining method



Technical data

Work piece	flange
Material	16 MnCr5 / 1.7131 ANSI 5115
Tensile strength	800 - 900 N/mm^2
Tool	ECC 12L-1.5D 06
Insert	XCNT 060204EN CTCP435
Competitor	3 tools

		Drilling	Boring	Face turning	External turning
V_c	[m/min]	150	150	200	150
f	[mm]	0.03	0.1	0.1	0.1

Criteria

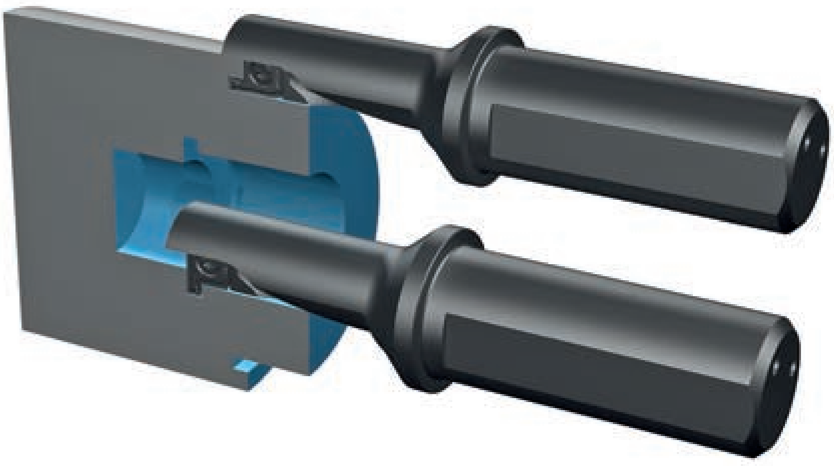
- Increase in productivity
- Fewer tools in the turret
- Reduction of tooling costs

Result

- 1 tool instead of 3
- Machining time reduced by 45%
- 2 additional tools in the turret

Drilling, turning, parting and grooving with only one tool

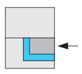
- The ProfileMaster is excellently suited for profiles that are so complex that they can normally only be produced with the use of several tools
- In addition, it helps free up valuable positions on the machine and minimise the need to change tools
- Thanks to the Masterfinish effect, the ProfileMaster produces an excellent surface finish in the shortest possible time

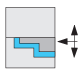


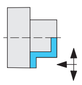
Material groups

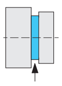
P	●
M	●
K	
N	○
S	●
H	

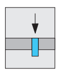
Possible applications

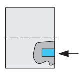

Drilling into solid material


Boring applications


External turning applications


External radial grooving


Internal radial grooving


Axial grooving

Detailed information

Diameter / length ratio	Ø range	Inserts
1,5 x D 2,25 x D	Ø 10 - 32 mm	PM 10.. .. PM 32..

CERATIZIT designation system

PM 25 R G 35 30 04 - M20

1 2 3 4 5 6 7 8

1
ProfileMaster

2
Nominal diameter [mm]

3
Cutting direction

4
Version

5
Parting and grooving width $[^{mm}/_{10}]$

6
Parting and grooving depth $[^{mm}/_{10}]$

7
Corner radius

8
Chip groove

PM 25 R - 2.25D

1 2 3 4

1
ProfileMaster

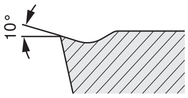
2
Nominal diameter [mm]

3
Cutting direction

4
Maximum drilling depth,
for example: 3.0 x diameter

-M20

- ○ Positive geometry
- ○ Universal application
- ○ Small to medium feed rates

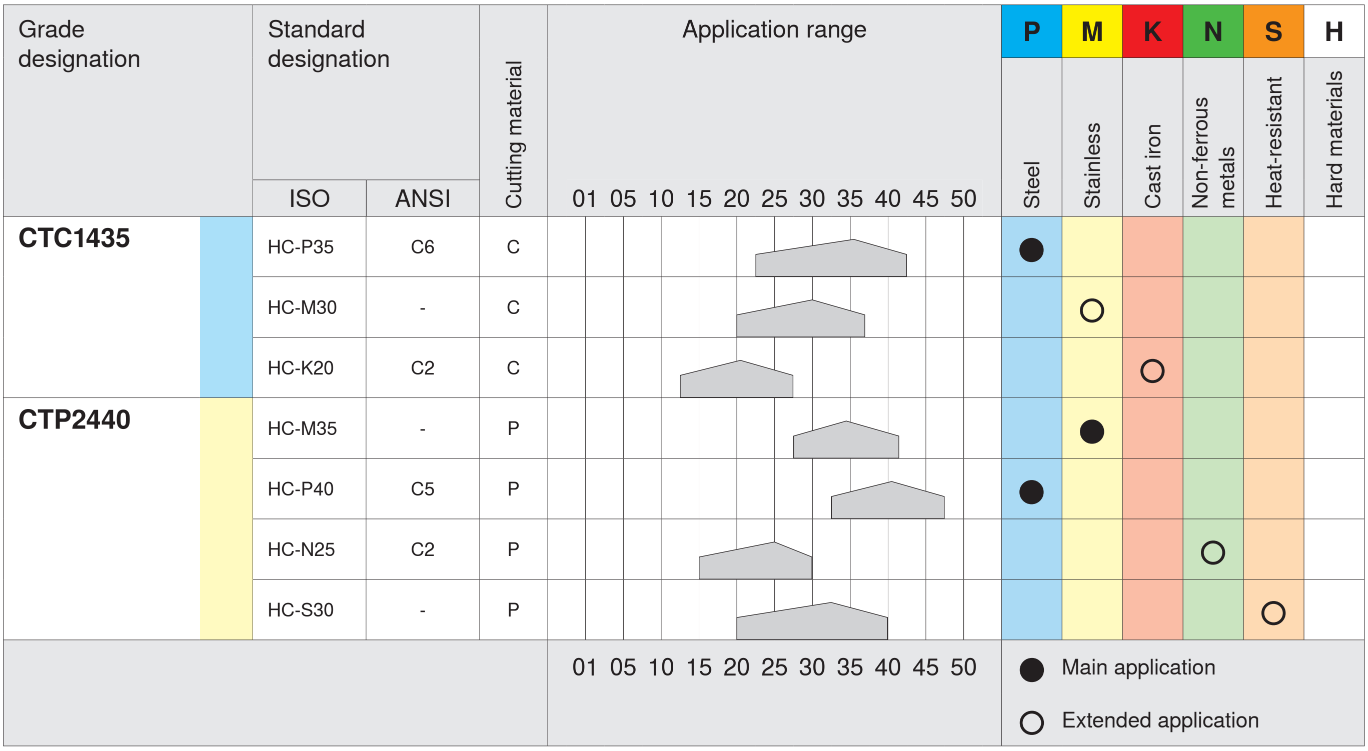


f [mm]

0,05 - 0,25

	Machining conditions		
	●	◓	◌
🟦	**CTC1435**	**CTC1435**	**CTP2440**
🟨	**CTC1435**	**CTP2440**	**CTP2440**
🟥	CTC1435	CTC1435	CTC1435
🟩			
🟧	CTP2440		
⬜			

Grade overview

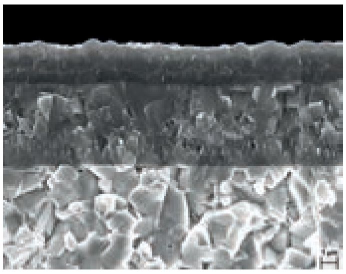


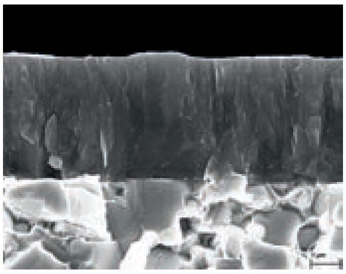
Grade designation		Standard designation ISO	Standard designation ANSI	Cutting material	Application range 01 05 10 15 20 25 30 35 40 45 50	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
CTC1435		HC-P35	C6	C		●					
		HC-M30	-	C			○				
		HC-K20	C2	C				○			
CTP2440		HC-M35	-	P			●				
		HC-P40	C5	P		●					
		HC-N25	C2	P					○		
		HC-S30	-	P						○	
					01 05 10 15 20 25 30 35 40 45 50						

● Main application

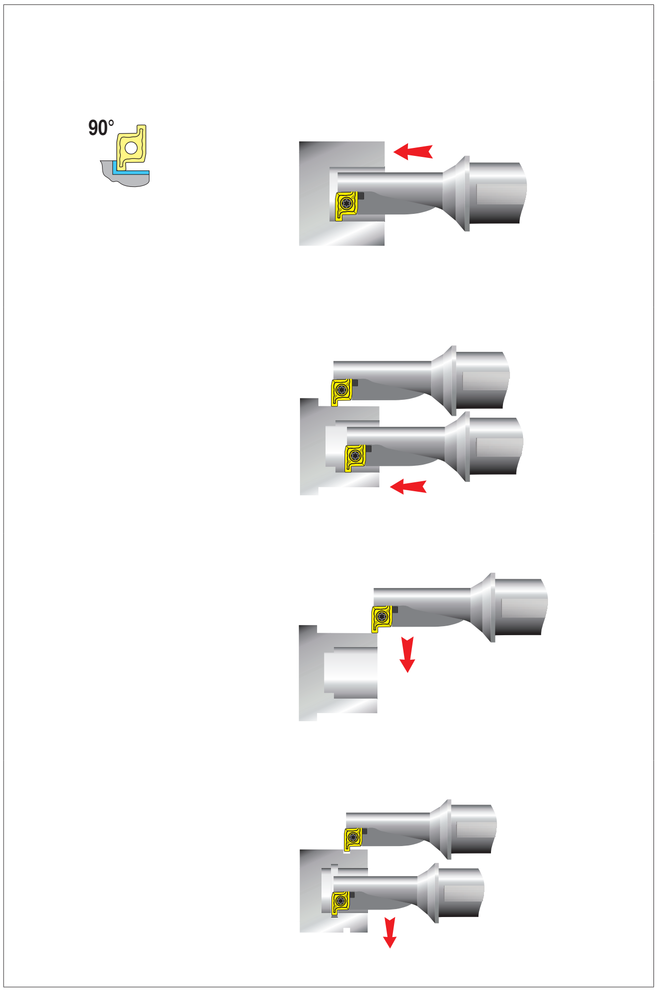
○ Extended application

Grade description

CTC1435	HC-P35 | HC-M30 | HC-K20	● ○ ○
	**Specification:** Composition: Co 9.6%; mixed carbide 7.4%; WC balance | Grain size: 1 - 2 *µ*m | Hardness: HV_{30} 1400 | Coating specification: CVD TiCN-Al_2O_3 multi-layer **Recommended application:** First choice for steel and cast iron materials.	

CTP2440	HC-M35 | HC-P40 | HC-N25 | HC-S30	● ● ○ ○
	**Specification:** Composition: Co 9.6%; mixed carbides 7.4%; WC balance | Grain size: 1 - 2 *µ*m | Hardness: HV_{30} 1400 | Coating specification: PVD TiAlN **Recommended application:** First choice for stainless and steel materials under unstable conditions.	

Machining methods - radial application 90°



Drilling into solid material with flat bottom holes

Boring applications

External turning applications

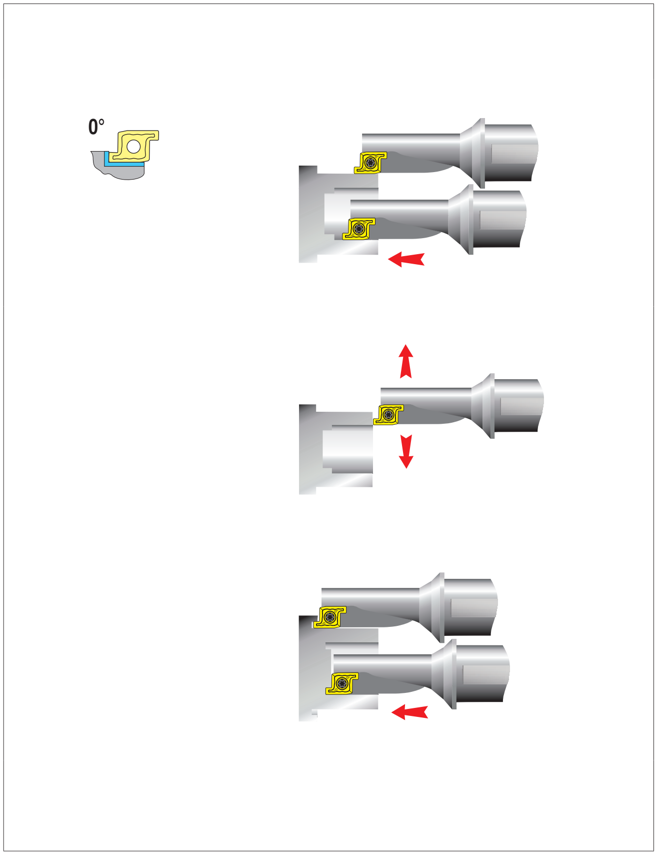
Internal turning applications

Turning of face profiles

External radial grooving

Internal radial grooving

Machining methods - radial application 0°



External turning applications

Boring applications

Turning of face profiles

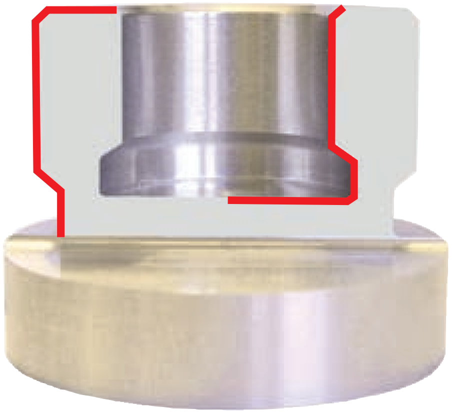
External radial grooving

Internal radial grooving

⚠ When changing from internal to external machining, reverse direction of rotation

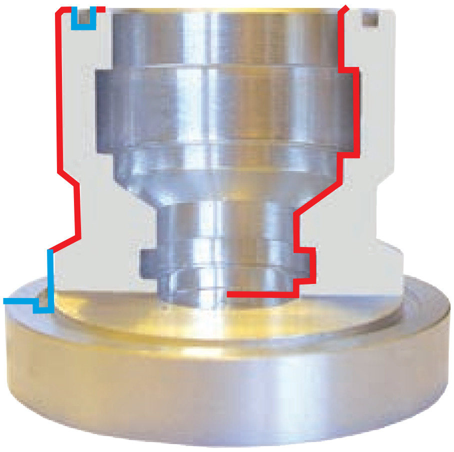
ProfileMaster

Machining methods



right-hand tool

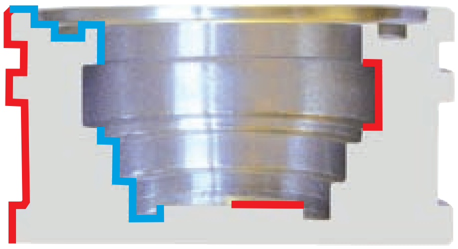
🔴 right-hand insert



right-hand tool

🔵 left-hand insert

🔴 right-hand insert



left-hand tool

right-hand tool

🔵 right-hand insert

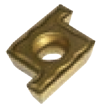
🔴 right-hand insert

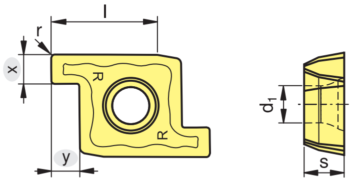
ProfileMaster

PM..

	CTC1435	CTP2440
P	●	●
M	○	●
K	○	
N		○
S		○
H		

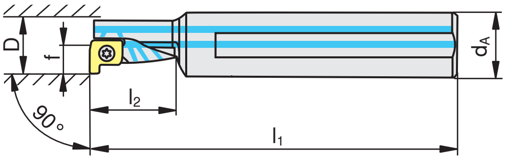
		CTC1435	CTP2440	x [mm]	y [mm]	l [mm]	s [mm]	d_1 [mm]	r [mm]
-M20	PM 10LG 201504-M20	●	●	2.00	1.50	5.00	2.10	2.10	0.40
	PM 10RG 201504-M20	●	●	2.00	1.50	5.00	2.10	2.10	0.40
	PM 12LG 201804-M20	●	●	2.00	1.80	6.00	2.30	2.50	0.40
	PM 12RG 201804-M20	●	●	2.00	1.80	6.00	2.30	2.50	0.40
	PM 16LG 252004-M20	●	●	2.50	2.00	8.00	2.80	3.40	0.40
	PM 16RG 252004-M20	●	●	2.50	2.00	8.00	2.80	3.40	0.40
	PM 20LG 302504-M20	●	●	3.00	2.50	10.00	3.80	4.10	0.40
	PM 20RG 302504-M20	●	●	3.00	2.50	10.00	3.80	4.10	0.40
	PM 25LG 353004-M20	●	●	3.50	3.00	12.50	4.50	4.40	0.40
	PM 25RG 353004-M20	●	●	3.50	3.00	12.50	4.50	4.40	0.40
	PM 32LG 404004-M20	●	●	4.00	4.00	16.00	5.50	6.00	0.40
	PM 32RG 404004-M20	●	●	4.00	4.00	16.00	5.50	6.00	0.40
		CTC1435	CTP2440	x	y	l	s	d_1	r





E55-E56

E50-E53



D_{min} [mm]	Type, description	L N R	d_A [mm]	l_1 [mm]	l_2 [mm]	f [mm]	[Nm]		
10	PM 10R-1.5D	R	12	80	15	5	0.4	PM 10..	E01
10	PM 10L-1.5D	L	12	80	15	5	0.4	PM 10..	E01
12	PM 12R-1.5D	R	16	90	18	6	1.0	PM 12..	E02
12	PM 12L-1.5D	L	16	90	18	6	1.0	PM 12..	E02
16	PM 16R-1.5D	R	20	125	24	8	2.2	PM 16..	E03
16	PM 16L-1.5D	L	20	125	24	8	2.2	PM 16..	E03
20	PM 20R-1.5D	R	25	150	30	10	3.2	PM 20..	E04
20	PM 20L-1.5D	L	25	150	30	10	3.2	PM 20..	E04
25	PM 25R-1.5D	R	32	180	37.5	12.5	3.2	PM 25..	E05
25	PM 25L-1.5D	L	32	180	37.5	12.5	3.2	PM 25..	E05
32	PM 32R-1.5D	R	40	200	48	16	5.0	PM 32..	E06
32	PM 32L-1.5D	L	40	200	48	16	5.0	PM 32..	E06

E01	11161940	8095010000
E02	169858	8095010100
E03	169857	8095010200
E04	54976	8095010500
E05	165795	8095010500
E06	11185832	8095010600

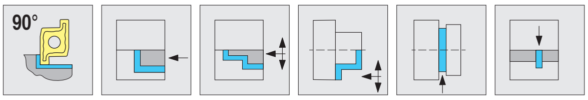
E57-E59

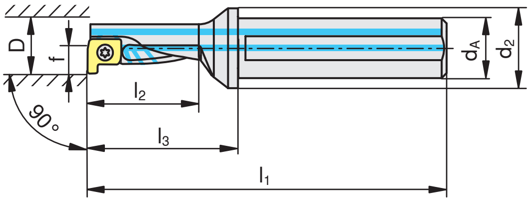
E68

E49

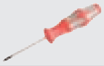
ProfileMaster

90° / 2.25D





Dmin [mm]	Type, description	L N R	dA [mm]	d2 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	f [mm]	[Nm]		
10	PM 10R-2.25D	R	12	16	72.4	22.5	30.4	5	0.4	PM 10..	E01
10	PM 10L-2.25D	L	12	16	72.4	22.5	30.4	5	0.4	PM 10..	E01
12	PM 12R-2.25D	R	16	20	78	27	33.0	6	1.0	PM 12..	E02
12	PM 12L-2.25D	L	16	20	78	27	33.0	6	1.0	PM 12..	E02
16	PM 16R-2.25D	R	20	25	96.5	36	46.5	8	2.2	PM 16..	E03
16	PM 16L-2.25D	L	20	25	96.5	36	46.5	8	2.2	PM 16..	E03
20	PM 20R-2.25D	R	25	32	111	45	55.0	10	3.2	PM 20..	E04
20	PM 20L-2.25D	L	25	32	111	45	55.0	10	3.2	PM 20..	E04
25	PM 25R-2.25D	R	32	40	132.6	56.3	72.6	12.5	3.2	PM 25..	E05
25	PM 25L-2.25D	L	32	40	132.6	56.3	72.6	12.5	3.2	PM 25..	E05
32	PM 32R-2.25D	R	40	50	158	72	88.0	16	5.0	PM 32..	E06
32	PM 32L-2.25D	L	40	50	158	72	88.0	16	5.0	PM 32..	E06

		
E01	11161940	8095010000
E02	169858	8095010100
E03	169857	8095010200
E04	54976	8095010500
E05	165795	8095010500
E06	11185832	8095010600

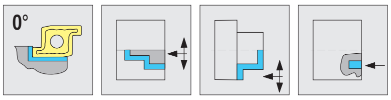
E57-E59

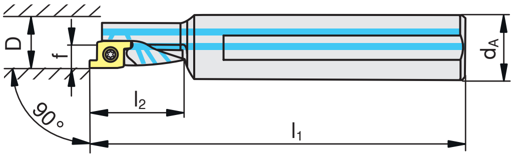
E68

E49

ProfileMaster

0° / 1.5D





D_{min} [mm]	Type, description	L N R	d_A [mm]	l_1 [mm]	l_2 [mm]	f [mm]	[Nm]		
16	PM 16R-1.5D	R	20	127.3	26.3	5.70	2.2	PM 16..	E01
16	PM 16L-1.5D	L	20	127.3	26.3	5.70	2.2	PM 16..	E01
20	PM 20R-1.5D	R	25	152.8	32.8	7.20	3.2	PM 20..	E02
20	PM 20L-1.5D	L	25	152.8	32.8	7.20	3.2	PM 20..	E02
25	PM 25R-1.5D	R	32	183.3	40.8	9.20	3.2	PM 25..	E03
25	PM 25L-1.5D	L	32	183.3	40.8	9.20	3.2	PM 25..	E03
32	PM 32R-1.5D	R	40	204.3	52.3	11.70	5.0	PM 32..	E04
32	PM 32L-1.5D	L	40	204.3	52.3	11.70	5.0	PM 32..	E04

E01	169857	8095010200
E02	54976	8095010500
E03	165795	8095010500
E04	11185832	8095010600

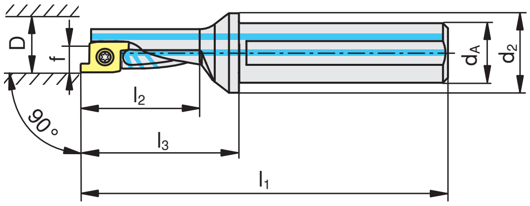
E60-E61

E68

E49

ProfileMaster

0° / 2.25D



D_{min} [mm]	Type, description	L N R	d_A [mm]	d_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	[Nm]		
16	PM 16R-2.25D	R	20	25	98.8	38.3	48.8	5.70	2.2	PM 16..	E01
16	PM 16L-2.25D	L	20	25	98.8	38.3	48.8	5.70	2.2	PM 16..	E01
20	PM 20R-2.25D	R	25	32	113.8	47.8	57.8	7.20	3.2	PM 20..	E02
20	PM 20L-2.25D	L	25	32	113.8	47.8	57.8	7.20	3.2	PM 20..	E02
25	PM 25R-2.25D	R	32	40	135.9	59.6	75.9	9.20	3.2	PM 25..	E03
25	PM 25L-2.25D	L	32	40	135.9	59.6	75.9	9.20	3.2	PM 25..	E03
32	PM 32R-2.25D	R	40	50	162.3	76.3	92.3	11.70	5.0	PM 32..	E04
32	PM 32L-2.25D	L	40	50	162.3	76.3	92.3	11.70	5.0	PM 32..	E04

E01	169857	8095010200
E02	54976	8095010500
E03	165795	8095010500
E04	11185832	8095010600

E60-E61

E68

E49

Cutting data

Grades, material

Work piece material		Type of treatment / alloy		VDI 3323 group	Hardness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		10	200
		tempered		11	350
	Stainless steel	annealed	ferritic / martensitic	12	200
		tempered	martensitic	13	325
		heat-treated	ferritic / martensitic	13	200
M	Stainless steel	quenched	austenitic	14	180
		quenched	ferritic / austenitic (Duplex)	14	230 - 260
		hardened	austenitc, precipitation hardened (PH)	14	330
K	Grey cast iron		pearlitic / ferritic	15	180
			pearlitic / martensitic	16	260
	Spheroidal cast iron		ferritic	17	160
			pearlitic	18	250
	Malleable cast iron		ferritic	19	130
			pearlitic	20	230
N	Aluminium wrought alloys	non hardened		21	60
		hardened		22	100
	Aluminium cast alloys	non hardened	< 12 % Si	23	75
		hardened	< 12 % Si	24	90
		non hardened	> 12 % Si	25	130
	Copper and copper alloys (bronze, brass)		machining alloy stock (1% Pb)	26	(110)
			brass, red bronze	27	90
			bronze	28	100
			lead-free copper and electrolytic copper	28	100
	Non-metallic materials		thermosetting plastics	29	–
			fibre-reinforced plastics	29	–
			hard rubber	30	–
S	Heat-resistant alloys	annealed	Fe-base	31	200
		hardened	Fe-base	32	280
		annealed	Ni or Co-base	33	250
		hardened	Ni or Co-base 30 - 58 HRC	34	(350)
		cast	Ni or Co-base 1500 - 2200 N/mm²	35	(320)
	Titanium alloys		pure titanium	36	R_m 440*
			alpha + beta alloys	37	R_m 1050*
H	Tempered steel	hardened and tempered		38	55 HRC
		hardened and tempered		39	60 HRC
	Chilled castings	cast		40	400
	Tempered cast iron	hardened and tempered		41	55 HRC

* R_m = ultimate tensile strength, measured in MPa

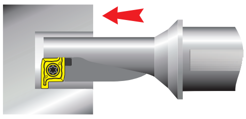
CTC1435	CTP2440
v_c [m/min]	v_c [m/min]
140 - 280	120 - 250
100 - 200	80 - 180
80 - 180	60 - 150
100 - 200	80 - 180
80 - 160	60 - 150
70 - 140	60 - 120
100 - 180	80 - 160
60 - 140	50 - 120
100 - 200	50 - 200
80 - 150	50 - 150
100 - 200	50 - 200
100 - 180	50 - 180
	50 - 100
	50 - 80
120 - 250	
120 - 250	
110 - 250	
110 - 250	
100 - 250	
100 - 250	
	100 - 500
	100 - 300
	100 - 500
	100 - 300
	100 - 200
	100 - 500
	100 - 500
	100 - 300
	100 - 300
	80 - 180
	60 - 150
	100 - 250
	20 - 50
	20 - 40
	15 - 25
	10 - 20
	10 - 20
	50 - 120
	30 - 50

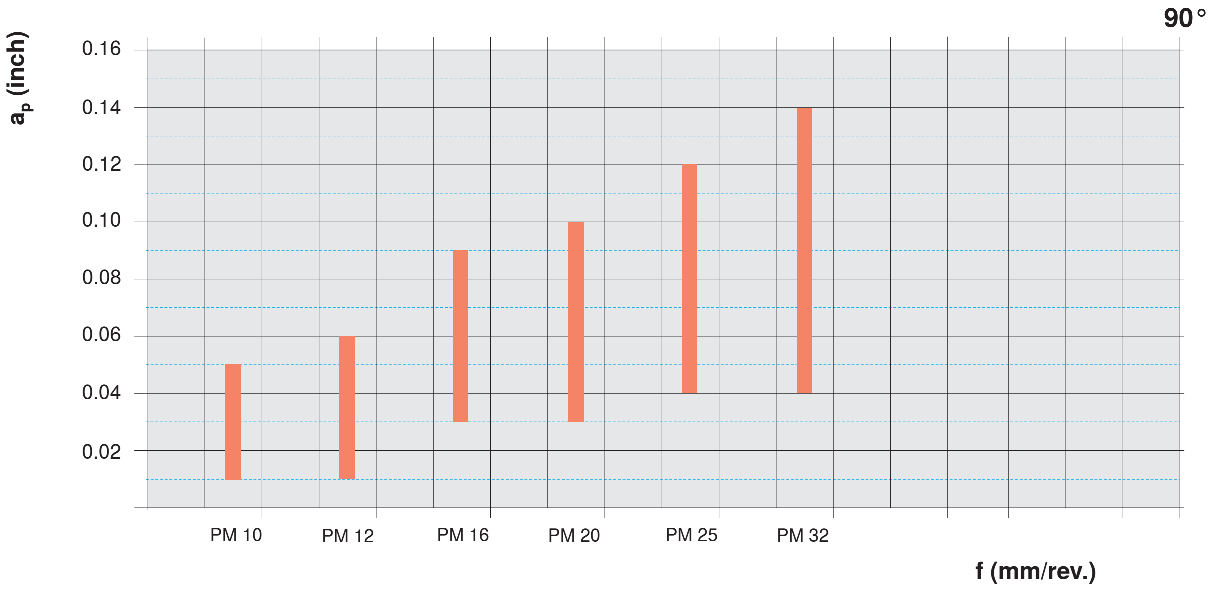
The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

ProfileMaster

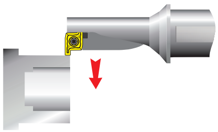
90° depth of cut/feed rate

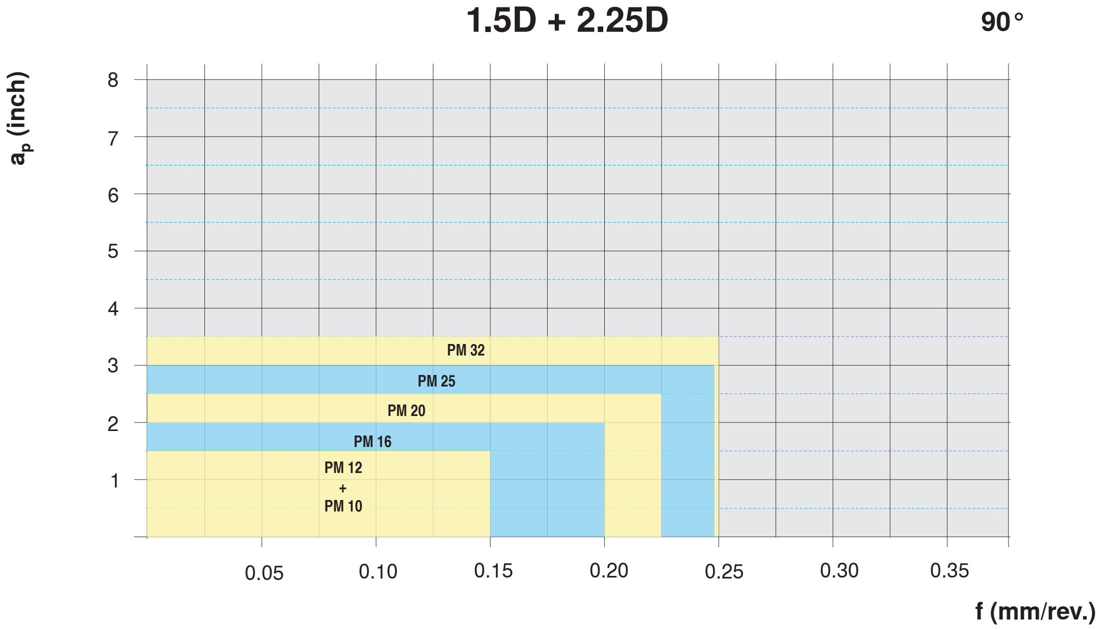
Drilling



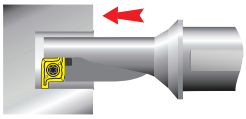


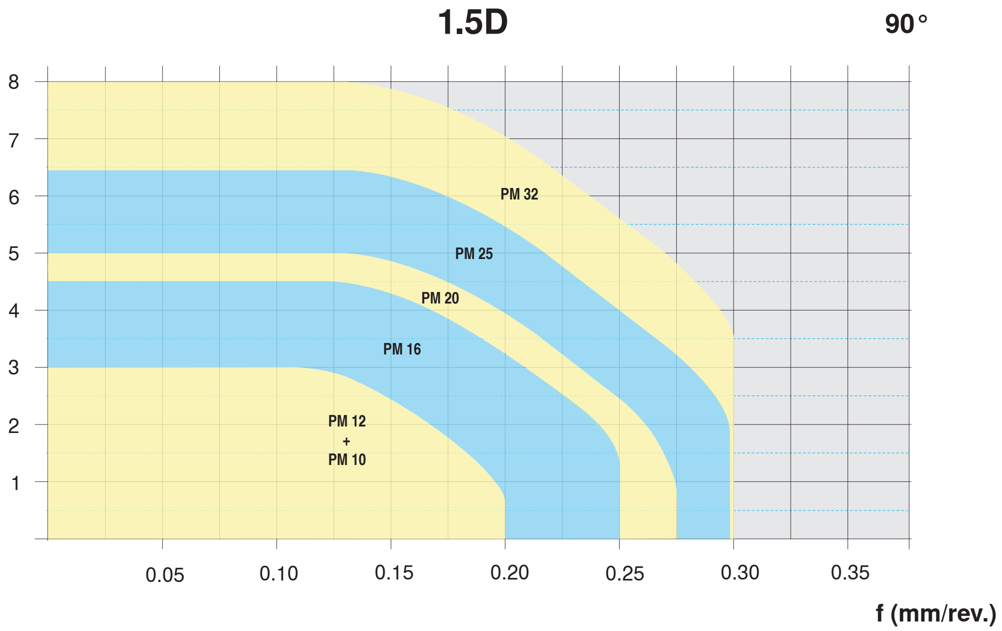
Face turning



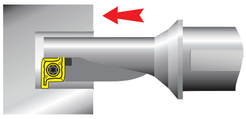


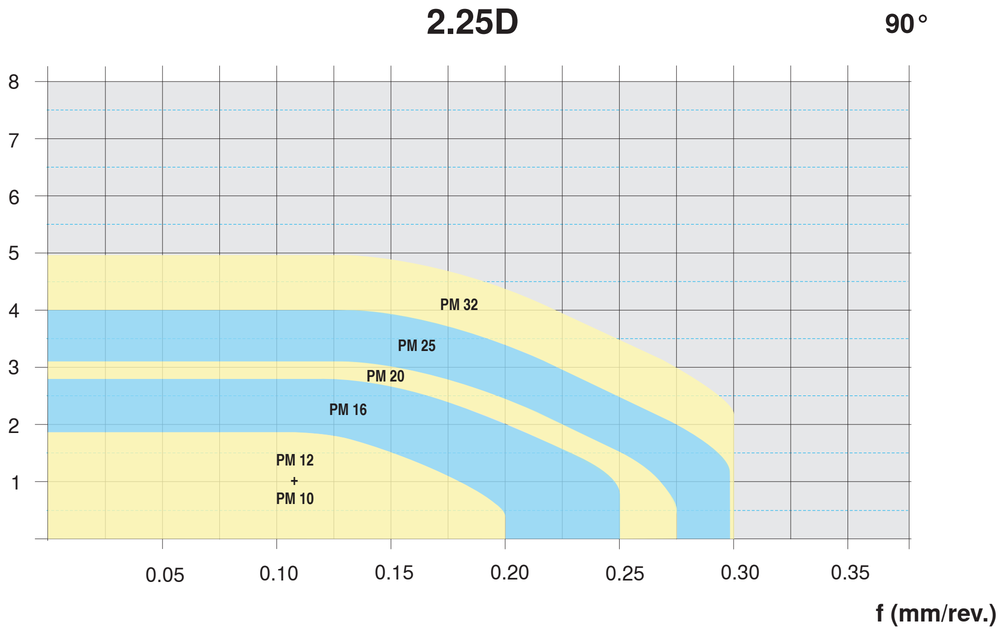
Longitudinal turning





Longitudinal turning

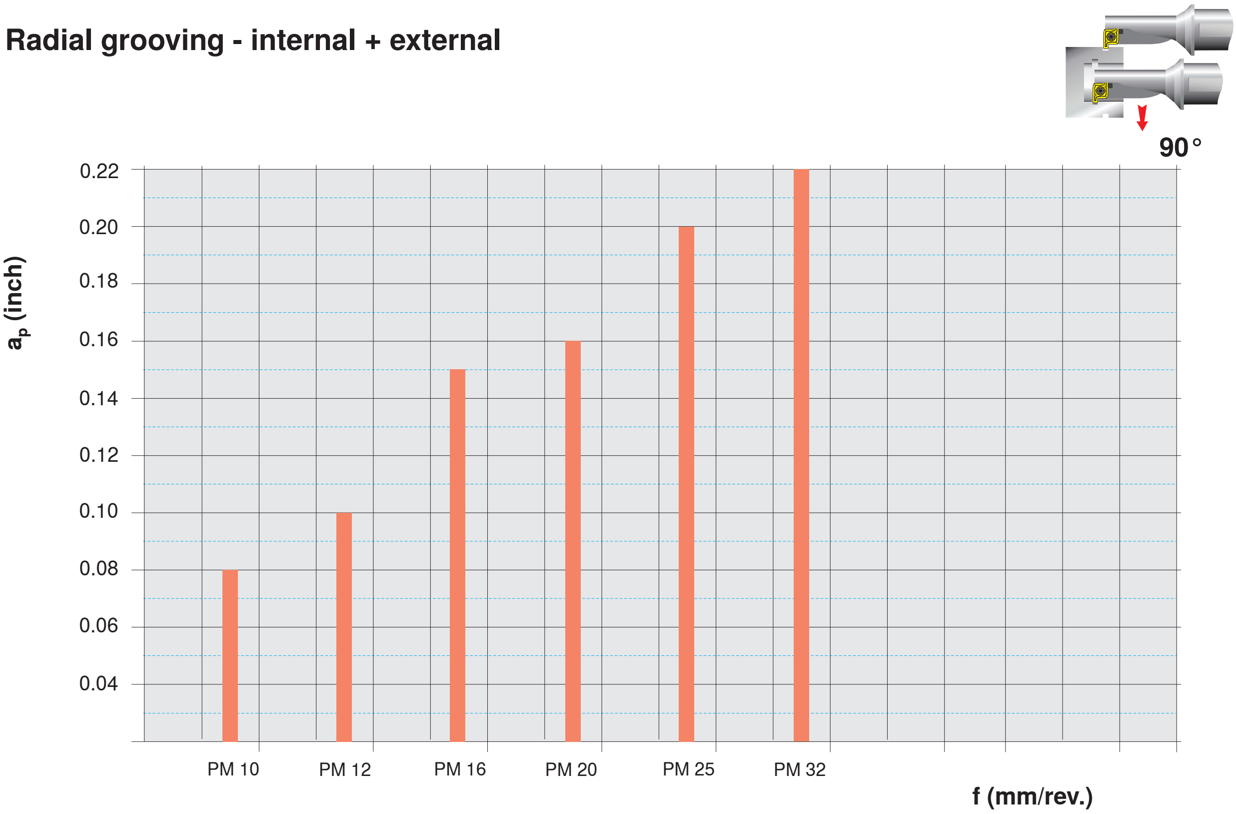




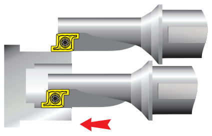
ProfileMaster

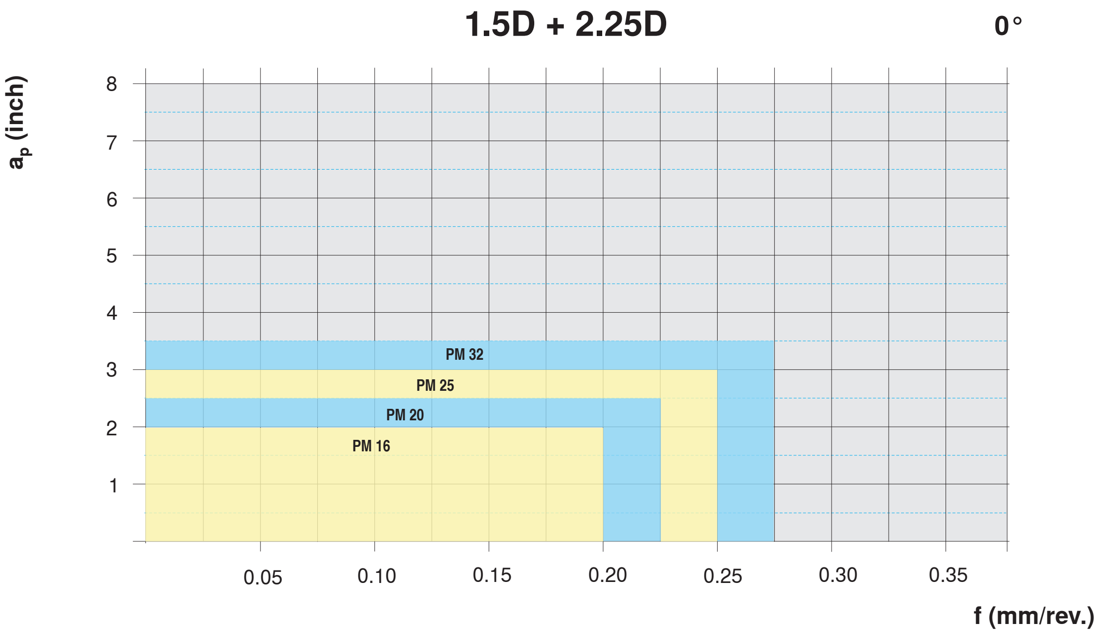
90° depth of cut/feed rate

Radial grooving - internal + external

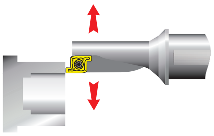


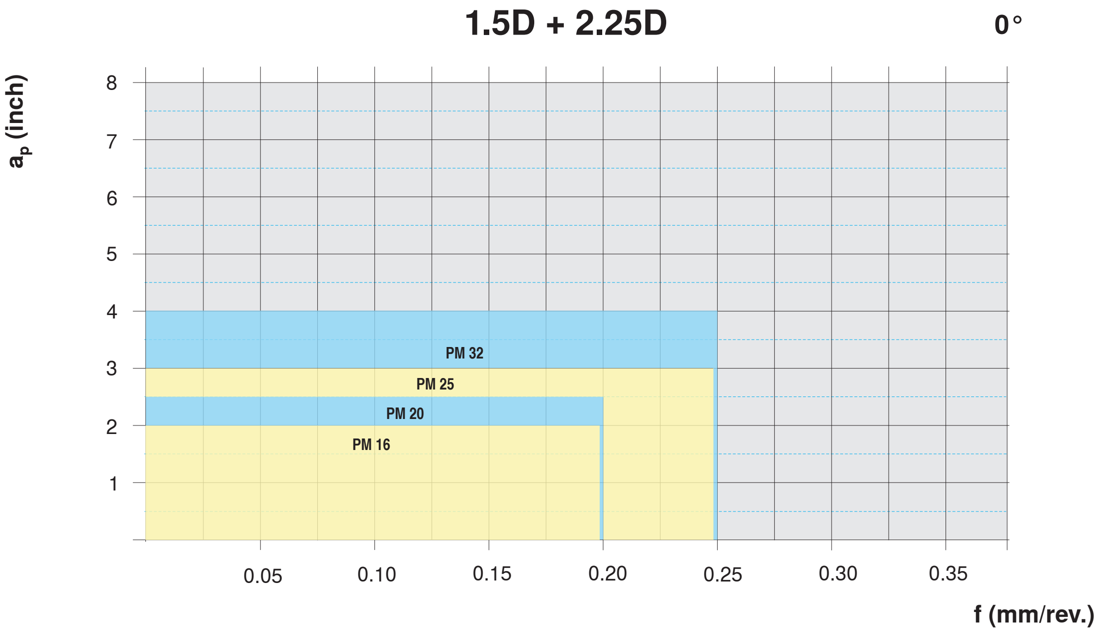
Longitudinal turning





Face turning

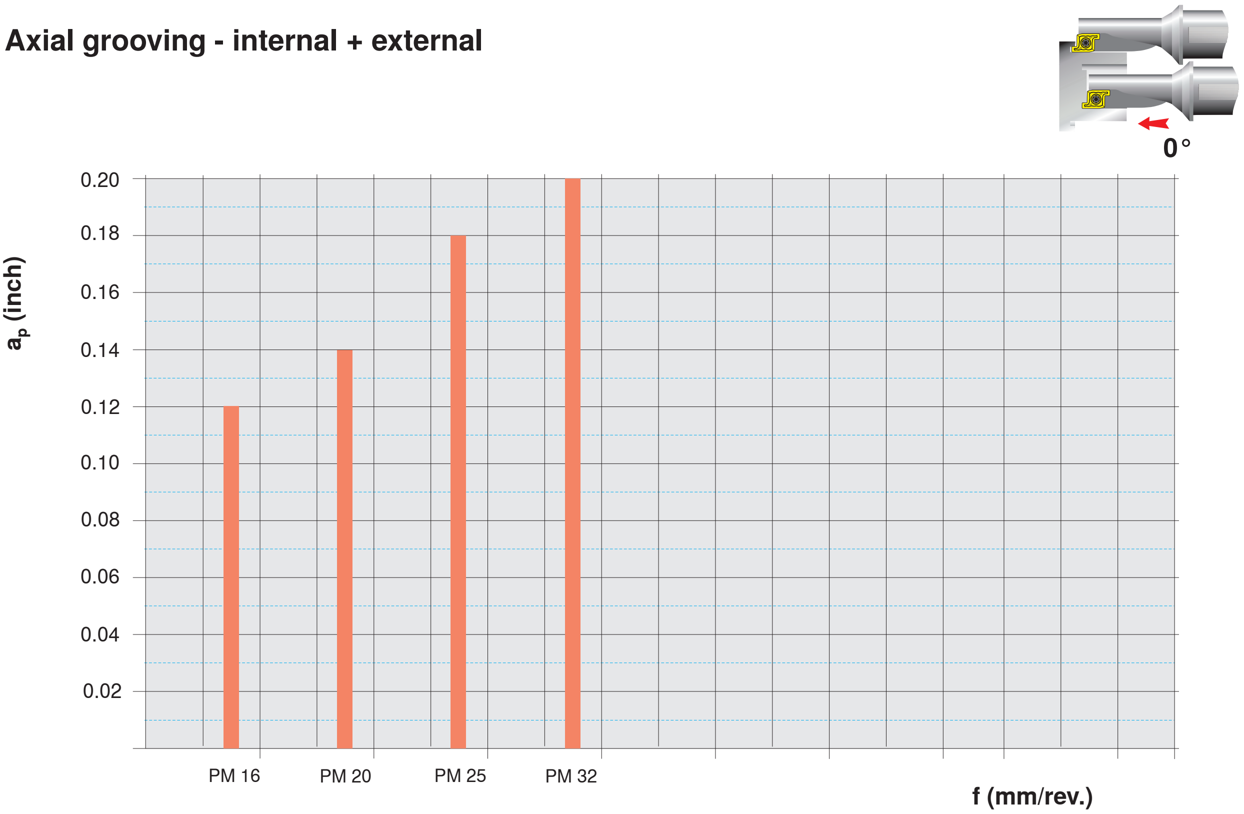




ProfileMaster

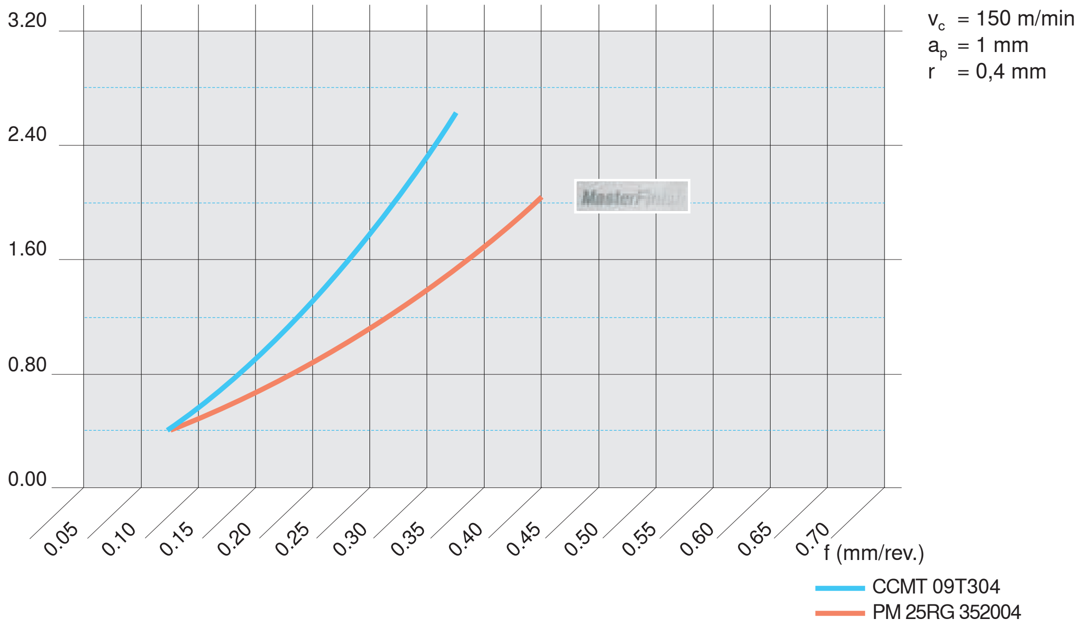
0° depth of cut/feed rate

Axial grooving - internal + external



Surface quality / feed rate

Material: Ck60 (1.1221)
with a standard boring bar and ProfileMaster



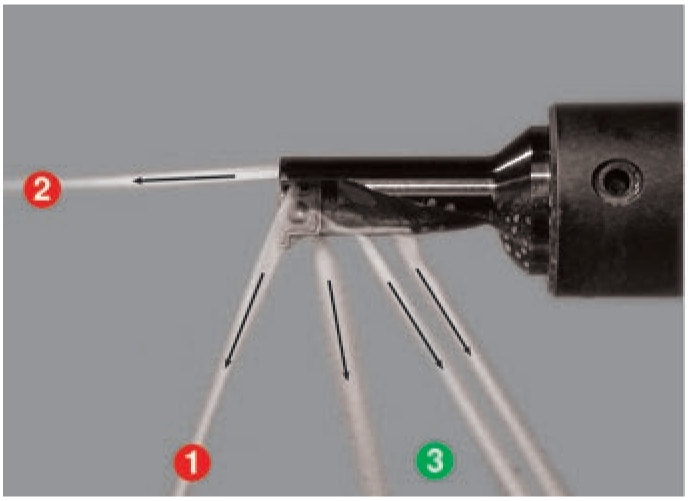
ProfileMaster

Problems, corrective measures

Type of problem										
Type of wear				Work piece problems		Chip control				
Edge chipping	Built-up edge	Flank wear	Plastic deformation	Vibration	Surface quality	Chip too long (tangled swarf)	Chip too short (fragmented chip)	**Corrective measures**		
	⇑	⇓	⇓	⇩ ⇧	⇩ ⇧	⇩		Cutting speed		**Cutting values**
⇓		≈	⇩	⇩ ⇧	⇓	⇑	⇓	Feed rate		
⇑		⇑	⇑	⇩	⇧			Corner radius	larger ↓ ↑ smaller	**Selection of inserts**
⇓		⇑	⇑					Cutting material	wear resistance ↓ ↑ toughness	
≈				≈	≈			Clamping of tool		**General criteria**
≈				≈	≈			Clamping of work piece		
≈				≈	≈			Overhang		
≈		≈		≈	≈			Tip height		
	▢	▢	▢		▢			Cooling lubricant		

⇑	raise, increase, large influence	⇓	avoid, reduce large influence	≈	check, optimise
⇧	raise, increase low influence	⇩	avoid, reduce low influence	▢	use

ProfileMaster is equipped with a unique coolant and chip removal system.



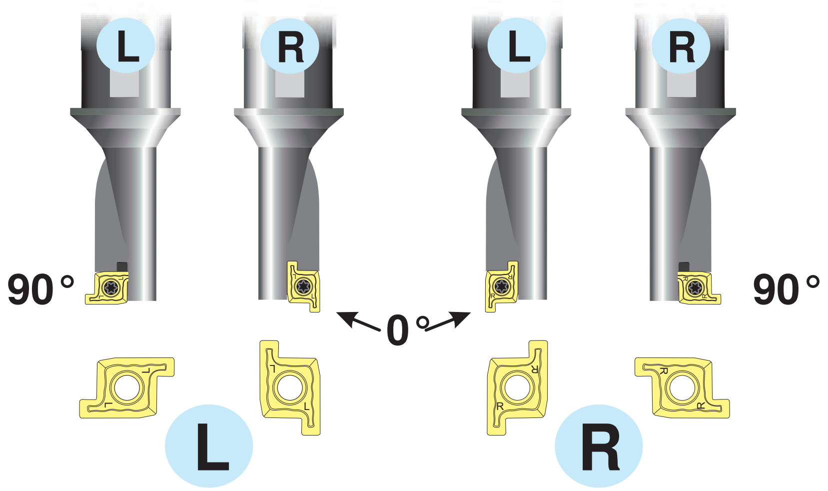
①	Cooling of the inserts
②	General coolant stream
③	Chipbooster prevents chips from getting stuck between tool and work piece

⚠ In order to guarantee efficient chip evacuation from a hole, a minimum coolant pressure of 3 - 6 bar (optimum 7 - 10 bar) is required.

ProfileMaster

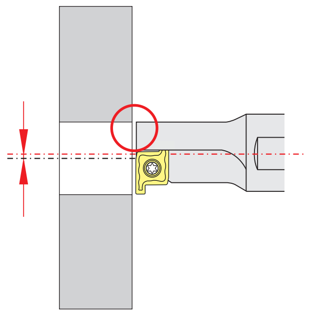
Application

Mounting of the insert

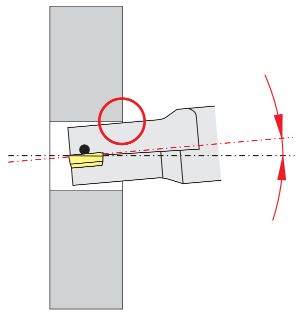


Axial displacement of the machine

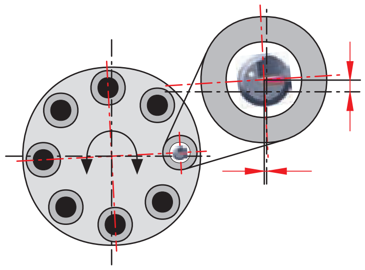
Displacement in x-direction



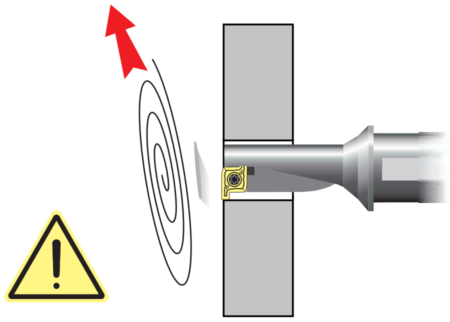
Angular error



Turret position error

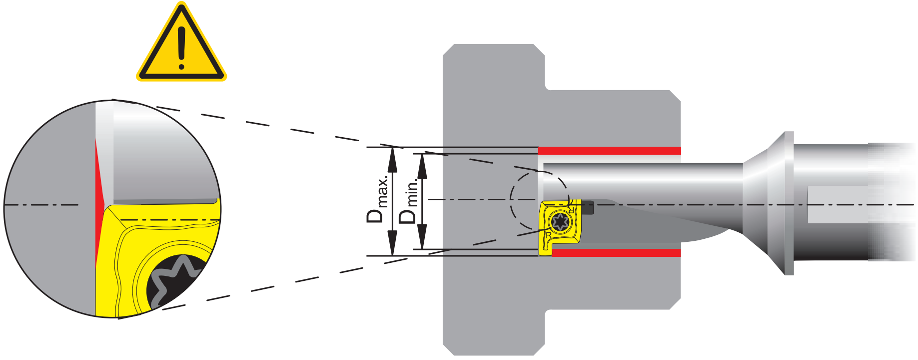


Through hole



With through holes a **sharp-edged disk** as tool break-out occurs. Safety measures are necessary.

Off-centre drilling



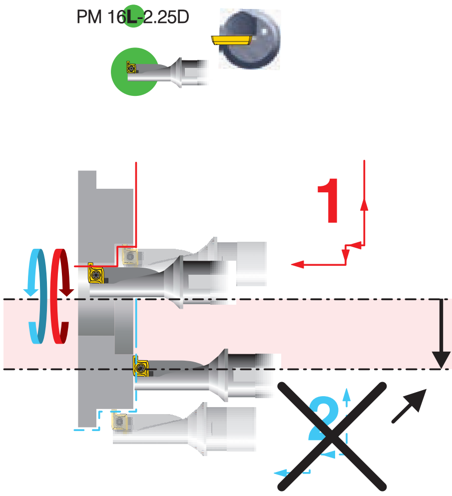
Due to the special construction of ProfileMaster tools and inserts off-centre drilling is possible. Thus desired devations from the tool's nominal diameter can be obtained (see table below).

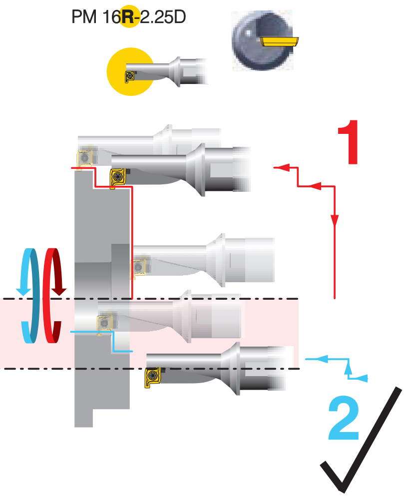
Type of tool	Nominal tool diameter	Drilling diameter (work piece)	
	D [mm]	D_{min} [mm]	D_{max} [mm]
PM 10R/L ...	10	9,85	12
PM 12R/L ...	12	11,85	15
PM 16R/L ...	16	15,85	19
PM 20R/L ...	20	19,80	24
PM 25R/L ...	25	24,80	29
PM 32R/L ...	32	31,80	38

Machining across centre line

Situation:
In case of insufficient movement of the machine across the centre line the external diameter can not be machined with the same tool.

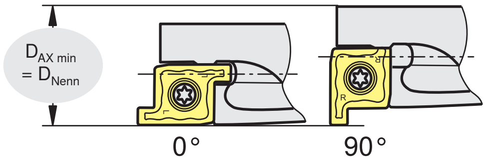
Solution:
Use a right-hand ProfileMaster tool.





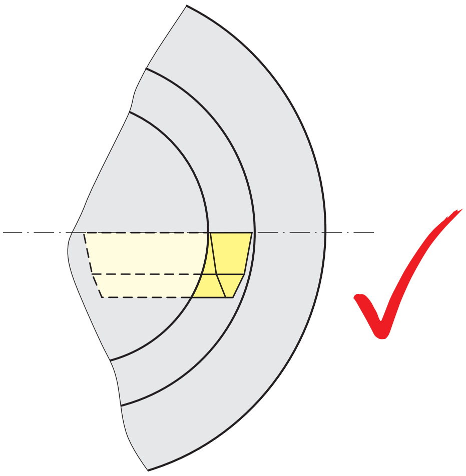
ProfileMaster

Axial grooving - application 0°

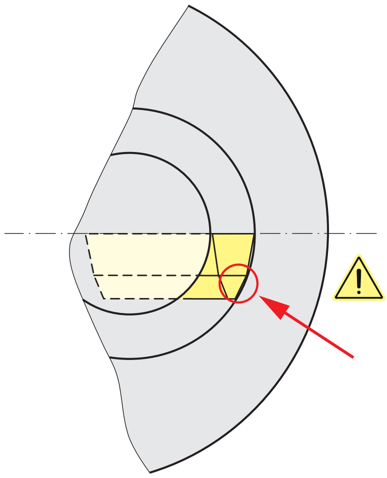


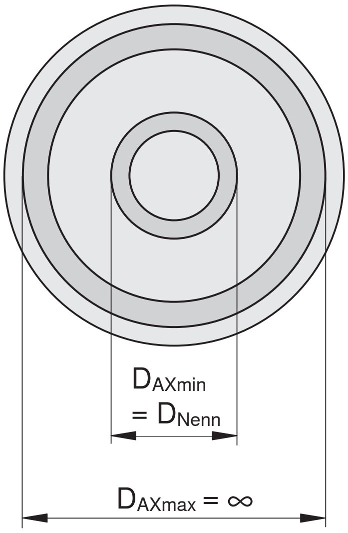
D_{Nenn}	D_{AXmin}	D_{AXmax}
16	16	∞
20	20	∞
25	25	∞
32	32	∞

$D_{AX} >= D_{Nenn}$



$D_{AX} < D_{Nenn}$





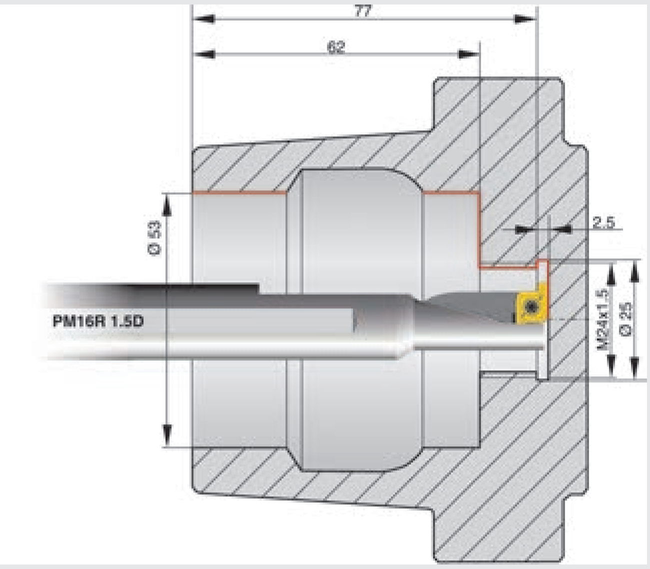
⚠ If the first cut is carried out with a diameter which is smaller than the nominal tool diameter D_{Nenn} (90° application), collision will result.

Spare parts

	Material	Type, description	Key size
	8095010000	SD-T06-60mm	T06
	8095010100	SD-T07-60mm	T07
	8095010200	SD-T08-60mm	T08
	8095010500	SD-T15-80mm	T15
	8095010600	SD-T20-100mm	T20

	Material	Type, description	Length [mm]	Thread size	Key size
	11161940	10001230/M1,8X3,8/T06	3.8	M1,8	T6
	11185832	10001785/M5,0X10,8/T20	10.8	M5	T20
	165795	7883209/M3,5X8,6/T15	8.6	M3,5	T15
	169857	7883214/M3,0X5,7/T08	5.7	M3	T08
	169858	7883215/M2,2X4,0/T07	4	M2,2	T07
	54976	7722111/M3,5X7,2/T15	7.2	M3,5	T15

Machining example



Technical data

Work piece	HSK100 adapter
Material	1.2342 X38 CrMoV 5 1
Tensile strength	approx. 1100 N/mm^2
Tool	PM 16R-1.5D
Insert	PM 16RG 252004-M20 CTP2440
Competitor	2 tools

		CERATIZIT	
v_c	[m/min]	150	
f	[mm]	0.15	
a_p	[Ø mm]	1	

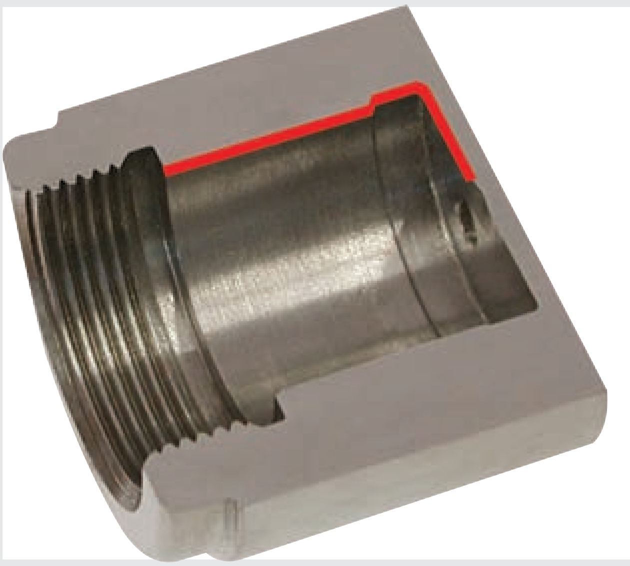
Criteria

○ Problems due to lack of turret positions
○ Optimisation of machining time

Result

○ Only 1 tool instead of 2
○ 1 free turret position

Machining example



Technical data

Work piece	piston
Material	1.756 35SPb20+C
Tensile strength	-
Tool	PM 16R-1.5D
Insert	PM 16RG 252004-M20 CTC1435
Competitor	2 tools

		CERATIZIT	Competitor
v_c	[m/min]	105	105
a_p	[mm]	0,03 - 5,0	0,3 - 5,0
$f_{turning}$	[mm]	0,15	0,1
$f_{grooving}$	[mm]	0,06	0,06

Criteria

○ Increase in productivity
○ Insufficient quality of groove surface

Result

○ Machining time reduced by 50%
○ Enhanced groove quality

Solid carbide tools

Contents

Introduction

Solid carbide tools for milling

Solid carbide tools for drilling

Solid carbide tools for reaming

Technical information

Index

Catalogue guidelines

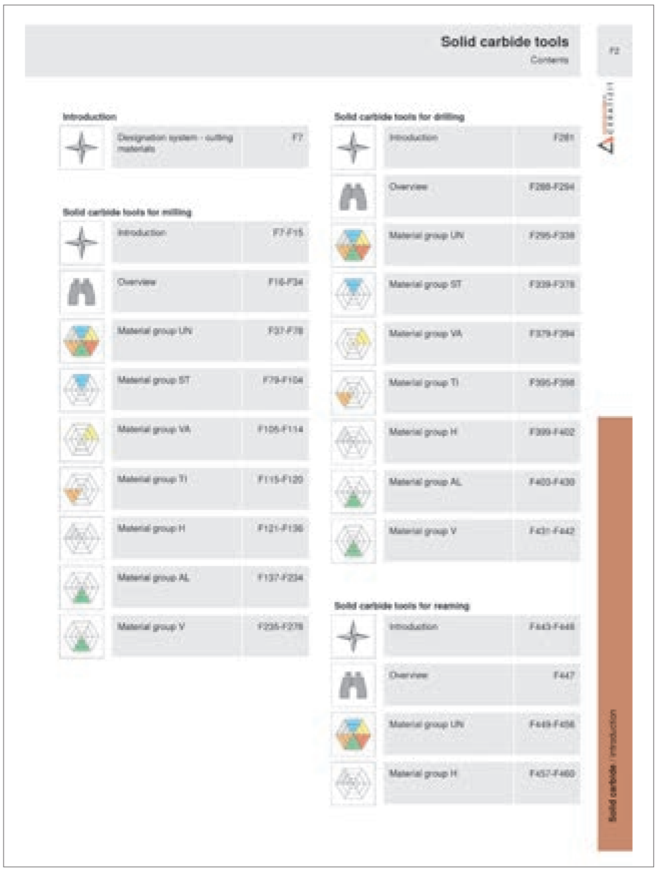
Make the right choice in just a few steps

1

Selection of the tool group

The index provides a first overview of the tools

○ Milling
○ Drilling
○ Reaming



Solid carbide tools
Contents

F2

Introduction

Designation system - cutting materials	F7

Solid carbide tools for milling

Introduction	F7-F15
Overview	F16-F34
Material group UN	F37-F78
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Material group TI	F115-F120
Material group H	F121-F136
Material group AL	F137-F234
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Solid carbide tools for drilling

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Material group H	F399-F402
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Solid carbide tools for reaming

Introduction	F443-F446
Overview	F447
Material group UN	F449-F456
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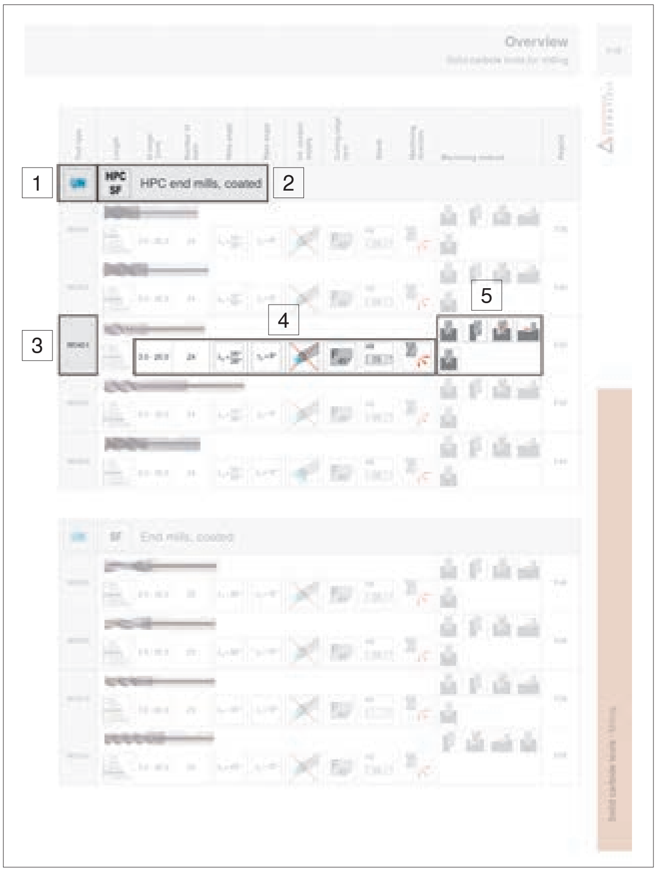
Solid carbide / Introduction

2

Selection of the tool type

The overview makes it easier to choose the suitable tool



1 Material group

2 Type of tool

3 Tool type designation

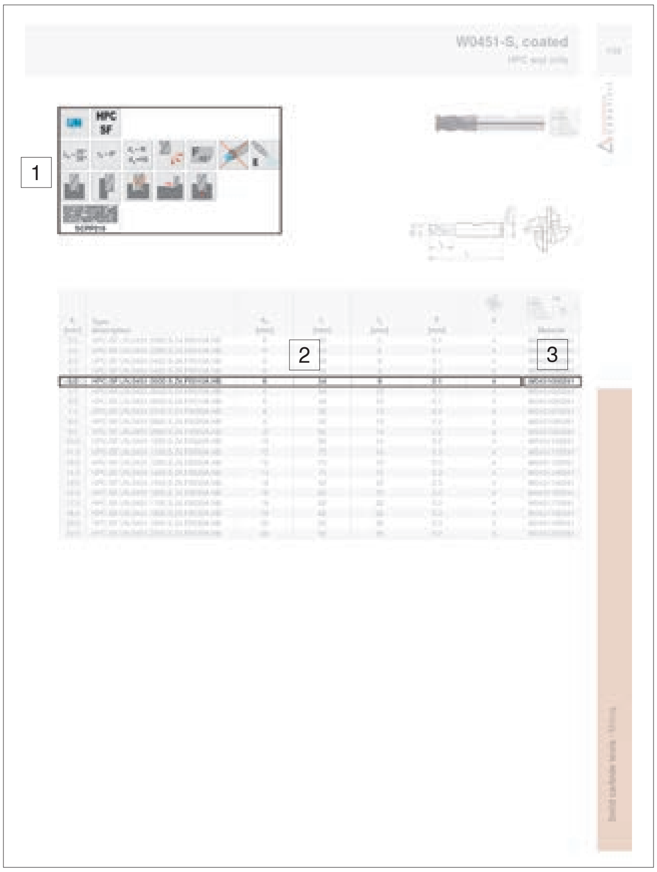
4 Tool characteristics

5 Machining methods

3

Choosing the tool

The product page shows the range with the main dimensions



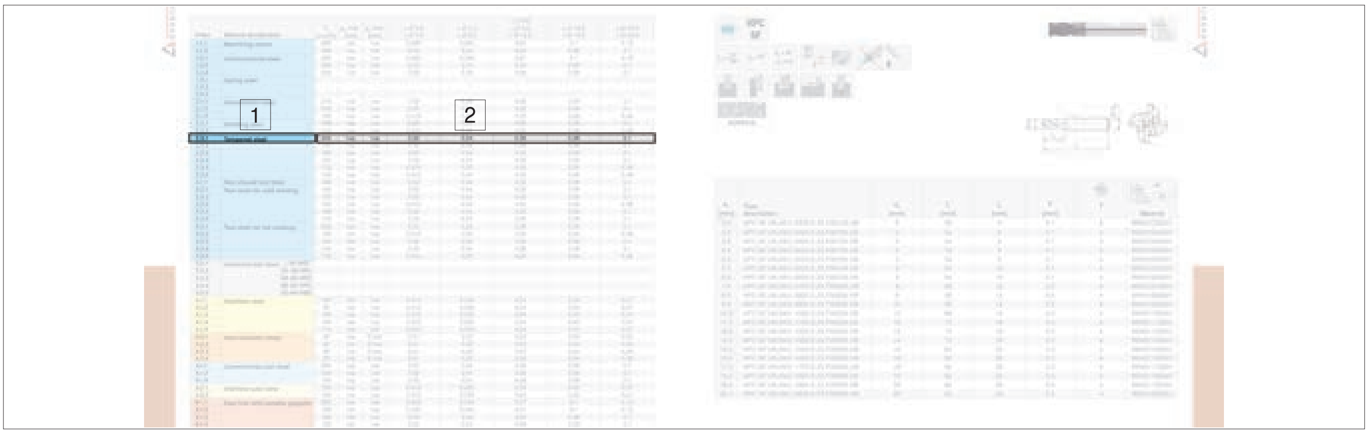
1	Possible applications and characteristics
2	The main dimensions
3	The article number

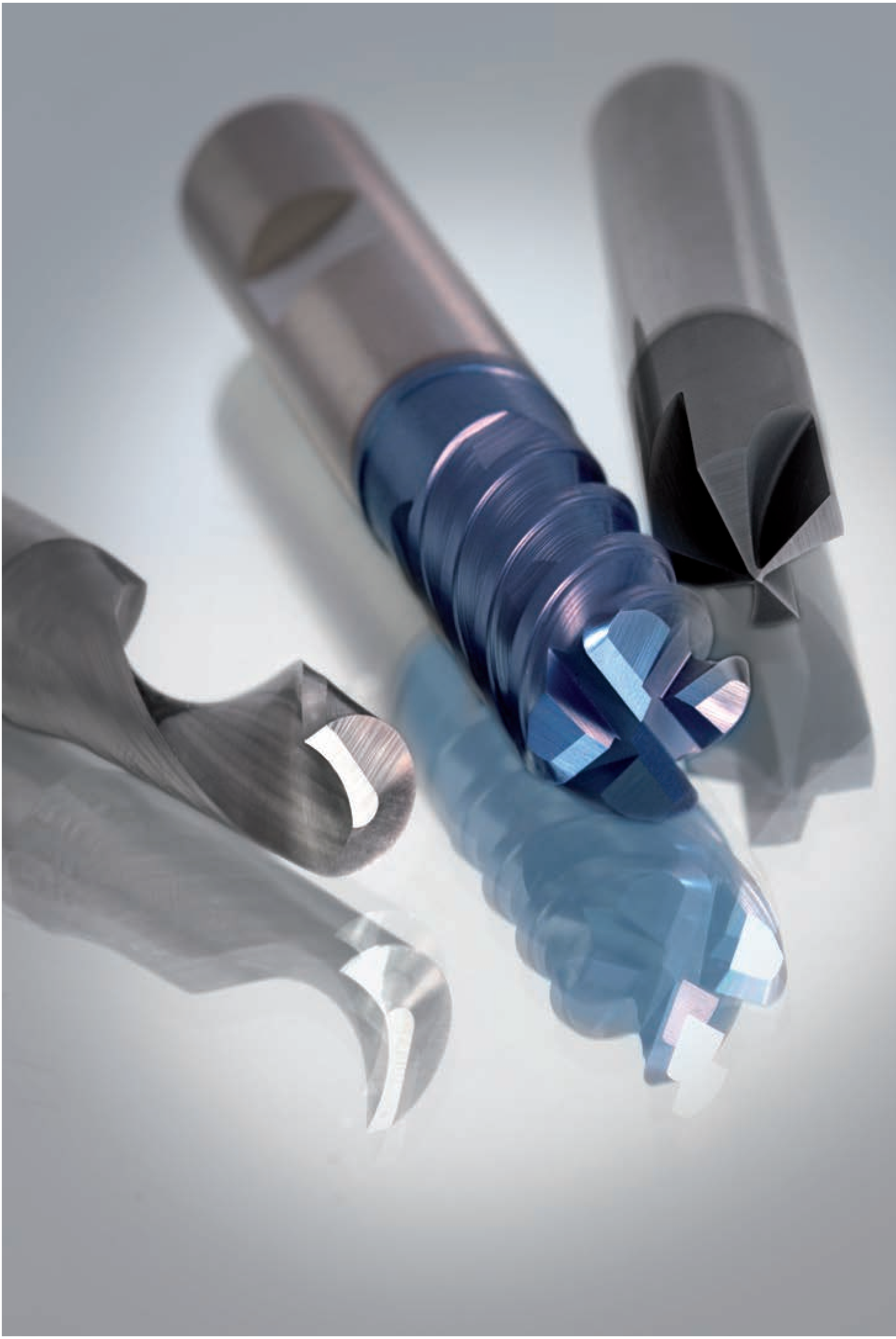
4

Choosing the starting parameters

Right on the opposite of the product page the recommended starting values can be determined

1	Material to be machined
2	The recommended starting parameters





SCP P235

1 2 3 4 5

1 Solid carbide

2 Cutting material

W	Uncoated carbide
C	CVD coated carbide
P	PVD coated carbide
T	Uncoated cermet
E	Coated cermet
N	Uncoated silicon nitride
M	Coated silicon nitride
S	Mixed ceramic
I	Sialon
D	PCD
B	CBN
L	CBN coated
H	Sintered HSS

3 Main application (material)

P	Steel
M	Stainless steel
K	Cast iron
N	Light and non-ferrous metals, non-metals
S	Heat-resistant alloys, titanium
H	Hard materials
X	Universal grade for a variety of applications

4 Main application (machining method)

1	Turning
2	Milling
3	Parting and grooving
4	Drilling
5	Threading
6	Others
7	Universal grade for a variety of applications

5 ISO 513
Application range

For example:
05
10
15
25
35 ISO P35
.
.
.

Designation system - tools

Solid carbide tools - milling

MRO	.	V	.	0839	.	0800	.	L
1		2		3		4		5

1

Tool group

HPC-SF – HPC end mills
SF – end mills
SFM – mini end mills
CPC-SF – CPC end mills (Circle Power Cutting)
HPC-SR – HPC rough milling cutters
SR – rough milling cutters
SRS – rough and finish milling cutters
VR – ball nose milling cutters
HPC-TF – HPC torus milling cutters
TF – torus milling cutters
MSF – micro end mills
MVR – micro ball nose milling cutters
MTF – micro torus milling cutters
HG-SC – high-precision finish milling cutters
SC – finish milling cutters
EZ – single flute milling cutters
E – deburring cutters
FF – chamfer milling cutters
R – solid carbide milling cutters for plastics
MRO – multiple milling cutters for plastics

2

Material main application

UN – universal
ST – steel
VA – stainless steel
TI – titanium
H – hardened steel
AL – aluminium
V – composite materials

3

Type

4

Ø d_1

0600 ➢ Ød1 = 6,00 mm

5

Length

XS – extra-short
S – short
L – long
LS – long S
OL – very long
OLS – very long S
XL – extra-long

Designation system - tools

Solid carbide tools for milling

Z6 . F0020A . HA | SCPX215

6 7 8 9

6

Number of teeth

7

Corner radius, chamfer					
F	chamfer	1st to 4th position	size	0040	0.40 mm
		5th position	angle	A	45°
				D	60°
				E	75°
				F	85°
R	radius	0005	R = 0.05		
		0400	R = 4.00		
S	sharp				

8

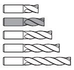
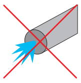
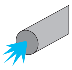
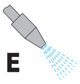
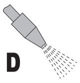
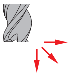
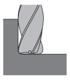
Shank
HE
HA
HB

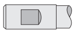
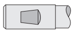
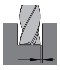
9

Grade

Explanation of symbols

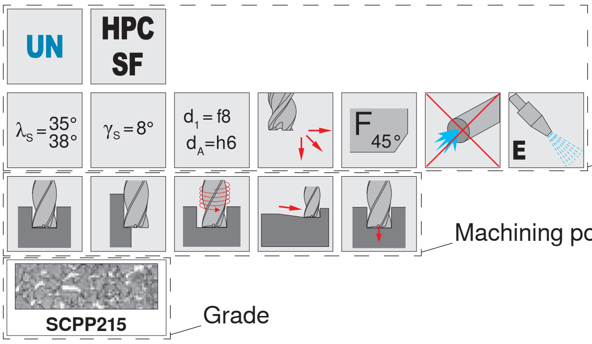
Solid carbide tools for milling

UN	Material group, e.g. UN = universal
	Length, e.g. short
EZ	Tool group, e.g. EZ = single flute milling cutters
σ 120°	Cutting edge angle, e.g. for chamfer milling cutters
	without through coolant
	with through coolant
 **E**	Emulsion recommended
 **D**	Compressed air recommended
 **E/D**	Emulsion or compressed air recommended
	Possible machining directions
	Machining example
$\lambda_s=\substack{44{,}5^\circ\\46{,}5^\circ}$	Helix angle

	Number of teeth
HA 	Shanks to DIN6535-HA
HB 	Shanks to DIN6535-HB
HE 	Shanks to DIN6535-HE
$\gamma_s=20°$	Rake angle
S	Sharp cutting edge
F 45°	Cutting edge with chamfer F = chamfer width [mm]
R	Radius corner bull nose R = radius [mm]
R	Fully radiused end ball nose R = radius [mm]
$d_1=e8$ $d_A=h6$	Tolerance cutting edge diameter Tolerance shank diameter
	Undersize milling cutters

Explanation of the table

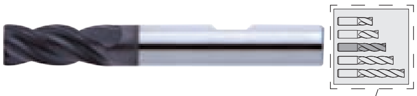
Solid carbide tools for milling



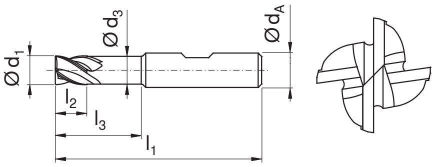
Application/ geometry

Machining possibilities

Grade



Shank length



Length/shank type

d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material
6.0	HPC-SF.UN.0451.0600.LS.Z4.F0010A.HB	6	5.8	57	7	19	0.1	4	W0451060R41

Material short text

Dimensions

Material number

Grade overview

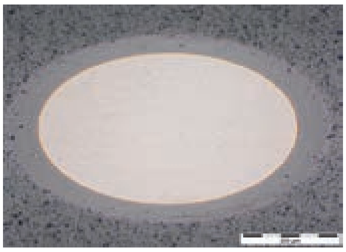
Solid carbide tools for milling

Grade designation		Standard designation ISO	Standard designation ANSI	*Type of cutting material	Application range 01	05	10	15	20	25	30	35	40	45	50	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
SCPP215	🟦	HC-P15	C7	P				▲								●	○	○	○	○	○
SCPP220	🟦	HC-P20	C6	P					▲							●	○	○	○	○	
SCPP225	🟦	HC-P25	C6	P						▲						●	○	○	○	○	
SCWP225	🟦	HW-P25	C6	W						▲						●			○		
SCPP230	🟦	HC-P30	C6	P							▲					●	○	○			
SCPP235	🟦	HC-P35	C6	P								▲				●	○	○			
SCPP240	🟦	HC-P40	C5	P									▲			●	○	○	○	○	
SCPM225	🟨	HC-M25		P						▲						○	●	○	○	○	
SCPM240	🟨	HC-M40		P									▲			○	●	○			
SCPX210	🟩	HC-N10	C3	P			▲												●		
SCWX210	🟩	HW-N10	C4	W			▲												●		
SCPX215	🟩	HC-N15	C3	P				▲											●		
SCWN225	🟩	HW-N25	C2	W						▲									●	○	
SCWX225	🟩	HW-N25	C2	W						▲									●		
SCPX230	🟩	HC-N30	C1	P							▲								●		
SCPN235	🟩	HC-N30	C1	P							▲								●		
SCPS240	🟧	HC-S30		P									▲				○			●	
SCPH205	⬛	HC-H05	C4	P		▲										○		○			●
SCPH215	⬛	HC-H15	C3	P				▲								○					●
					01	05	10	15	20	25	30	35	40	45	50						

● Main application

○ Extended application

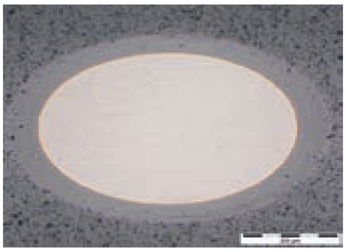
SCPP215	HC-P15	● ○ ○ ○ ○ ○



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1660 | Coating specification: Ti Al Cr X N | Coating structure: gradient nanostructure with doping element

Recommended application:
Good combination of carbide and coating for universal application.

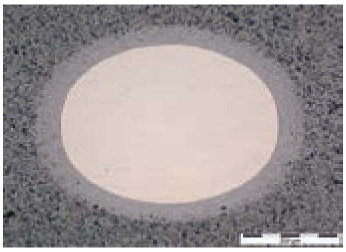
SCPP220	HC-P20	● ○ ○ ○ ○



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1600 | Coating specification: Ti Al Cr X N | Coating structure: gradient nanostructure with doping element

Recommended application:
Good combination of carbide and coating for universal application, optimised chip evacuation.

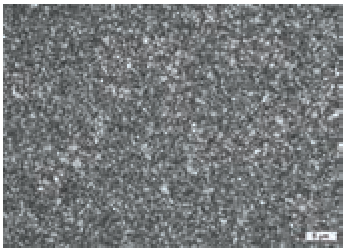
SCPP225	HC-P25	● ○ ○ ○ ○



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1600 | Coating specification: Ti Al C N | Coating structure: multi-layer (stacked structure)

Recommended application:
Good combination of carbide and coating for universal application.

SCWP225	HW-P25	● ○



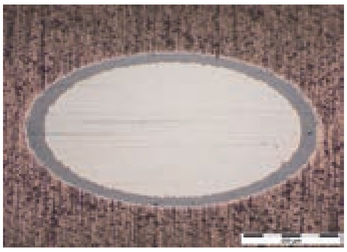
Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1600

Recommended application:
Submicron carbide for the machining of non-ferrous metals, plastics and composite materials (CFRP, GFRP).

Grade description

Solid carbide tools for milling

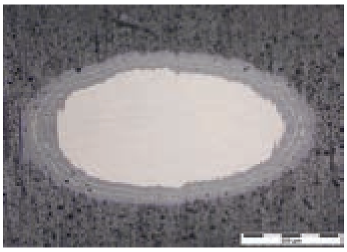
SCPP230	HC-P30	● ○ ○



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Coating specification: Ti Al C N | Coating structure: multi-layer

Recommended application:
Good combination of carbide and coating for universal application, optimised chip evacuation & low coefficient of friction.

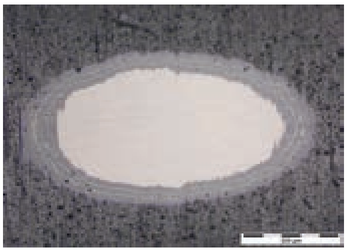
SCPP235	HC-P35	● ○ ○



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Coating specification: Ti Al C N | Coating structure: multi-layer (stacked structure)

Recommended application:
Good combination of carbide and coating for the machining of steels.

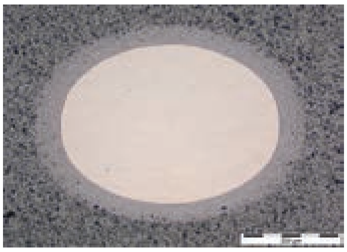
SCPP240	HC-P40	● ○ ○ ○ ○



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Coating specification: Ti Al C N | Coating structure: multi-layer (stacked structure)

Recommended application:
Good combination of carbide and coating for universal application, optimised chip evacuation.

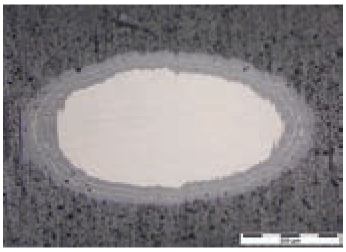
SCPM225	HC-M25	○ ● ○ ○ ○



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Coating specification: Ti Al C N | Coating structure: multi-layer (stacked structure)

Recommended application:
Submicron carbide for the universal machining of alloyed and non alloyed steels, titanium alloys and nickel-base alloys.

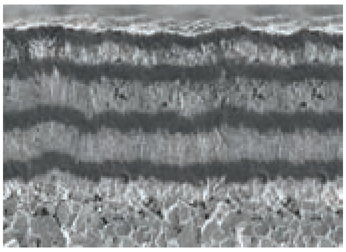
SCPM240	HC-M40	○ ● ○



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1600 | Coating specification: Ti Al C N | Coating structure: multi-layer (stacked structure)

Recommended application:
Good combination of carbide and coating for the machining of stainless steel, dry machining is also possible.

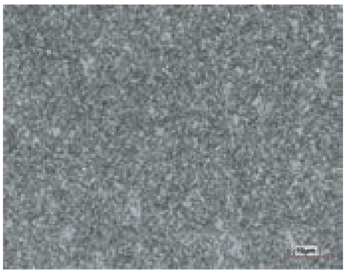
SCPX210	HC-N10	●



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1660 | Coating specification: diamond | Coating structure: multi-layer, crystalline

Recommended application:
Good combination of carbide and diamond coating, for the machining of fibre composites.

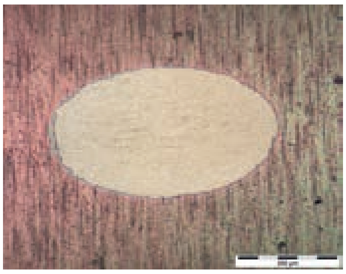
SCWX210	HW-N10	●



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1800

Recommended application:
Submicron carbide for the machining of aluminium alloys, fibre-reinforced plastics (CFRP, GFRP), composite materials and graphite.

SCPX215	HC-N15	●

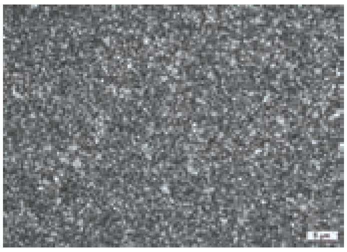


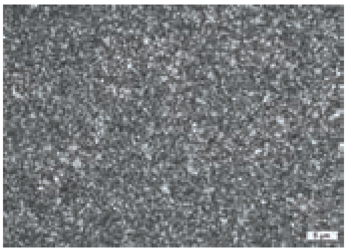
Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1800 | Coating specification: DLC | Coating structure: amorph, hydrogen-free carbon layer

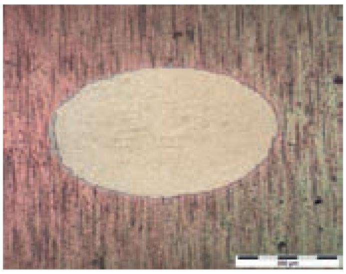
Recommended application:
Excellent combination of carbide and DLC coating, for the machining of fibre composites.

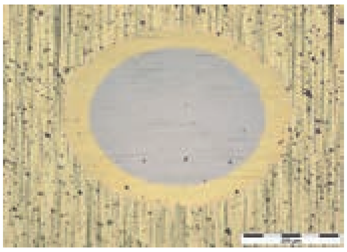
Grade description

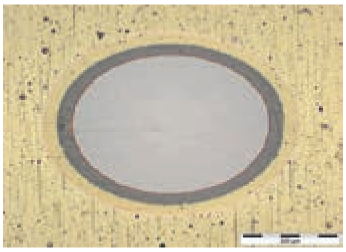
Solid carbide tools for milling

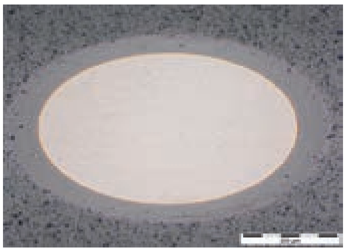
SCWN225	HW-N25	● ○
	**Specification:** Grain size: submicron / 0.7 μm | Hardness: HV$_{30}$ 1600 **Recommended application:** Submicron carbide for the universal machining of alloyed and non alloyed steels, titanium alloys and nickel-base alloys.	

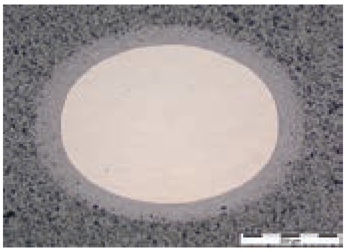
SCWX225	HW-N25	●
	**Specification:** Grain size: submicron / 0.7 μm | Hardness: HV$_{30}$ 1600 **Recommended application:** Submicron carbide for the machining of non-ferrous metals, plastics and composite materials (CFRP, GFRP).	

SCPX230	HC-N30	●
	**Specification:** Grain size: submicron / 0.7 μm | Hardness: HV$_{30}$ 1660 | Coating specification: DLC | Coating structure: amorph, hydrogen-free carbon layer **Recommended application:** Good combination of carbide and DLC coating, for the machining of fibre composites.	

SCPN235	HC-N30	●
	**Specification:** Grain size: submicron / 0.7 μm | Hardness: HV$_{30}$ 1600 | Coating specification: based on Zr N | Coating structure: multi-layer **Recommended application:** Excellent combination of carbide and coating for the machining of non-ferrous metals.	

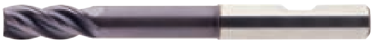
SCPS240	HC-S40	○ ●
	**Specification:** Grain size: submicron / 0.7 *µ*m | Hardness: HV_{30} 1600 | Coating specification: Ti Al Zr N | Coating structure: multi-layer **Recommended application:** Excellent combination of carbide and coating for the machining of nickel-base alloys.	

SCPH205	HC-H05	○ ○ ●
	**Specification:** Grain size: submicron / 0.7 *µ*m | Hardness: HV_{30} 1600 | Coating specification: Ti Al Cr X N | Coating structure: gradient nanostructure with doping element **Recommended application:** Good combination of carbide and coating for the machining of hard materials, dry machining is also possible.	

SCPH215	HC-H15	○ ●
	**Specification:** Grain size: submicron / 0.7 *µ*m | Hardness: HV_{30} 1600 | Coating specification: Ti Al C N | Coating structure: multi-layer (stacked structure) **Recommended application:** Good combination of carbide and coating for hard machining.	

Overview

Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
UN	**HPC SF**	HPC end mills, coated									
W0451		3.0 - 20.0	Z4	$\lambda_s = 35°/38°$	$\gamma_s = 8°$	✗	F 45°	HB			F38
W0451		3.0 - 20.0	Z4	$\lambda_s = 35°/38°$	$\gamma_s = 8°$	✗	F 45°	HB			F40
W0451		3.0 - 20.0	Z4	$\lambda_s = 35°/38°$	$\gamma_s = 8°$	✗	F 45°	HB			F40
W0451		6.0 - 20.0	Z4	$\lambda_s = 35°/38°$	$\gamma_s = 8°$	✗	F 45°	HB			F42
W0459		6.0 - 20.0	Z4	$\lambda_s = 35°/38°$	$\gamma_s = 12°$	✓	F 45°	HB			F44

UN	**SF**	End mills, coated									
W0264		2.8 - 20.0	Z2	$\lambda_s = 30°$	$\gamma_s = 13°$	✗	F 45°	HB			F46
W0306		2.8 - 20.0	Z3	$\lambda_s = 30°$	$\gamma_s = 13°$	✗	F 45°	HB			F48
W0314		3.0 - 20.0	Z3	$\lambda_s = 45°$	$\gamma_s = 13°$	✗	F 45°	HA HB			F50
W0314		3.5 - 20.0	Z3	$\lambda_s = 45°$	$\gamma_s = 13°$	✗	F 45°	HB			F52

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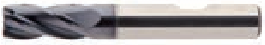
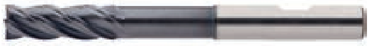
Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
UN	**SF**	End mills, coated									
W0316		3.0 - 20.0	Z3	$\lambda_s = 45°$	$\gamma_s = 13°$		F 45°	HA HB			F54
W0406		2.0 - 20.0	Z4	$\lambda_s = 30°$	$\gamma_s = 6°$		S	HA HB			F56
W0406		8.0 - 20.0	Z4	$\lambda_s = 30°$	$\gamma_s = 6°$		S	HA			F58

UN	**SFM**	Mini-mini end mills, coated									
W0318		2.0 - 20.0	Z3	$\lambda_s = 30°$	$\gamma_s = 5°$		S	HB			F60

UN	**CPC SF**	CPC end mills (Circle Power Cutting), coated									
W0444		3.0 - 20.0	Z4	$\lambda_s = 35° / 36{,}5°$	$\gamma_s = 8°$		F 45°	HB			F62
W0444		6.0 - 20.0	Z4	$\lambda_s = 35° / 36{,}5°$	$\gamma_s = 8°$		F 45°	HB			F64
W0444		6.0 - 20.0	Z4	$\lambda_s = 35° / 36{,}5°$	$\gamma_s = 8°$		F 45°	HB			F66

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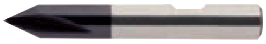
Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
UN	**HPC SR**	HPC rough milling cutters, coated									
W0422		4.0 - 20.0	Z3 Z4	$\lambda_s = 45°$	$\gamma_s = 8°$	✗	F 45°	HB			F68
W0422		4.0 - 20.0	Z3 Z4	$\lambda_s = 45°$	$\gamma_s = 8°$	✗	F 45°	HB			F68
UN	**VR**	Ball nose milling cutters, coated									
W0216		3.0 - 20.0	Z2	$\lambda_s = 30°$	$\gamma_s = 13°$	✗	R	HB			F70
UN	**HPC TF**	HPC rough milling cutters, coated									
W0448		3.0 - 20.0	Z4	$\lambda_s = 35° / 38°$	$\gamma_s = 8°$	✗	R	HB			F72
UN	**E**	Deburring cutters, coated									
W0740		4.0 - 12.0	Z4	$\lambda_s = 0°$	$\gamma_s = 0°$	✗	σ 90°	HA HB			F74
W0741		4.0 - 12.0	Z4	$\lambda_s = 0°$	$\gamma_s = 0°$	✗	σ 60°	HA HB			F76
W0742		4.0 - 12.0	Z4	$\lambda_s = 0°$	$\gamma_s = 0°$	✗	σ 120°	HA HB			F78

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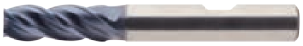
Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
ST	**HPC SF**	HPC end mills, coated									
W0450		3.0 - 20.0	Z4	$\lambda_s = 35°/38°$	$\gamma_s = 12°$		F 45°	HB			F80
W0450		3.0 - 20.0	Z4	$\lambda_s = 35°/38°$	$\gamma_s = 12°$		F 45°	HB			F80
W0452		3.0 - 20.0	Z4	$\lambda_s = 44{,}5°/46{,}5°$	$\gamma_s = 12°$		F 45°	HB			F82
W0452		3.0 - 20.0	Z4	$\lambda_s = 44{,}5°/46{,}5°$	$\gamma_s = 12°$		F 45°	HB			F82
W0452		6.0 - 20.0	Z4	$\lambda_s = 44{,}5°/46{,}5°$	$\gamma_s = 12°$		F 45°	HB			F84
W0550		6.0 - 20.0	Z5	$\lambda_s = 38°$	$\gamma_s = 6°$		F 45°	HB			F86

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
ST	**CPC SF**	CPC end mills (Circle Power Cutting), coated									
W0446		3.0 - 20.0	Z4	$\lambda_s = 35°/36{,}5°$	$\gamma_s = 12°$		F 45°	HB			F88
W0446		6.0 - 20.0	Z4	$\lambda_s = 35°/36{,}5°$	$\gamma_s = 12°$		F 45°	HB			F90
W0446		6.0 - 20.0	Z4	$\lambda_s = 35°/36{,}5°$	$\gamma_s = 12°$		F 45°	HB			F92

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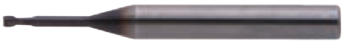
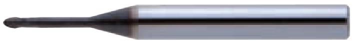
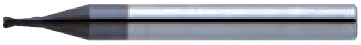
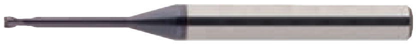
Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
ST	**HPC SR**	HPC rough milling cutters, coated									
W0421		6.0 - 20.0	Z5	$\lambda_s = 38°$	$\gamma_s = 6°$	✗	F 45°	HB			F94
ST	**MSF**	Micro end mills, coated									
W0286		0.5 - 2.0	Z2	$\lambda_s = 30°$	$\gamma_s = 5°$	✗	F 45°	HA			F96
W0286		0.5 - 2.0	Z2	$\lambda_s = 30°$	$\gamma_s = 5°$	✗	F 45°	HA			F96
ST	**MVR**	Micro ball nose milling cutters, coated									
W0285		0.5 - 2.0	Z2	$\lambda_s = 30°$	$\gamma_s = 5°$	✗	R	HA			F98
W0285		0.5 - 2.0	Z2	$\lambda_s = 30°$	$\gamma_s = 5°$	✗	R	HA			F98
ST	**MTF**	Micro torus milling cutters, coated									
W0289		0.5 - 2.0	Z2	$\lambda_s = 30°$	$\gamma_s = 5°$	✗	R	HA			F100
W0289		0.5 - 2.0	Z2	$\lambda_s = 30°$	$\gamma_s = 5°$	✗	R	HA			F100

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
ST	**HG SC**	High-precision finish milling cutters, coated									
W0374		6.0 - 20.0	Z6	$\lambda_s = 48°$ $49,5°$	$\gamma_s = 12°$	✗	S	HA			F102
W0374		6.0 - 20.0	Z6 Z8	$\lambda_s = 48°$ $49,5°$	$\gamma_s = 12°$	✗	S	HA			F104
W0374		6.0 - 20.0	Z6 Z8	$\lambda_s = 48°$ $49,5°$	$\gamma_s = 12°$	✗	S	HA			F104

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
VA	**HPC SF**	HPC end mills, coated									
W0340		1.0 - 20.0	Z3	$\lambda_s = 42,5°$ $45°$ $47,5°$	$\gamma_s = 4°$	✗	F 45°	HB			F106
W0340		1.0 - 20.0	Z3	$\lambda_s = 42,5°$ $45°$ $47,5°$	$\gamma_s = 4°$	✗	F 45°	HB			F106
W0340		4.0 - 20.0	Z3	$\lambda_s = 43,5°$ $45°$ $46,5°$	$\gamma_s = 4°$	✗	F 45°	HB			F108
W0345		3.0 - 20.0	Z3	$\lambda_s = 33°$ $34°$ $35°$	$\gamma_s = 12°$	✗	F 45°	HB			F110
W0445		4.0 - 20.0	Z4	$\lambda_s = 35°$ $38°$	$\gamma_s = 12°$	✗	F 45°	HB			F112

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Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
VA	**HPC TF**	HPC rough milling cutters, coated									
W0342		4.0 - 20.0	Z3	λ_s = 42,5° 45° 47,5°	γ_s = 4°	☒	R	HB			F114
W0342		4.0 - 20.0	Z3	λ_s = 42,5° 45° 47,5°	γ_s = 4°	☒	R	HB			F114
TI	**HPC SF**	HPC end mills, coated									
W0456		4.0 - 20.0	Z4	λ_s = 35° 38°	γ_s = 12°	☒	R	HB			F116
W0556		4.0 - 20.0	Z5	λ_s = 38°	γ_s = 6°	☒	R	HB			F118
TI	**HPC TF**	HPC rough milling cutters, coated									
W0457		4.0 - 20.0	Z4	λ_s = 35° 38°	γ_s = 12°	☒	R	HB			F120

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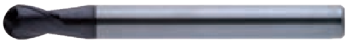
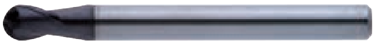
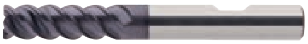
Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
H	**HPC SF**	HPC end mills, coated									
W0453		3.0 - 20.0	Z4	$\lambda_s = 44°$ $47°$	$\gamma_s = 2°$	✗	F 45°	HB			F122
W0453		3.0 - 20.0	Z4	$\lambda_s = 44°$ $47°$	$\gamma_s = 2°$	✗	F 45°	HB			F122
W0453		4.0 - 20.0	Z4	$\lambda_s = 44°$ $46°$	$\gamma_s = 2°$	✗	F 45°	HB			F124
H	**VR**	Ball nose milling cutters, coated									
W0281		3.0 - 12.0	Z2	$\lambda_s = 30°$	$\gamma_s = -15°$	✗	R	HA			F126
W0281		3.0 - 12.0	Z2	$\lambda_s = 30°$	$\gamma_s = -15°$	✗	R	HA			F128
W0281		3.0 - 12.0	Z2	$\lambda_s = 30°$	$\gamma_s = -15°$	✗	R	HA			F128
H	**TF**	Torus milling cutters, coated									
W0441		4.0 - 20.0	Z4	$\lambda_s = 52°$	$\gamma_s = -10°$	✗	R	HB			F130
W0441		4.0 - 20.0	Z4	$\lambda_s = 52°$	$\gamma_s = -10°$	✗	R	HB			F132

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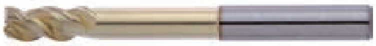
Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
H	**SC**	Finish milling cutters, coated									
W0367		3.0 - 32.0	Z6 Z8	$\lambda_s = 50°$	$\gamma_s = -5°$	✗	S	HA			F134
W0367		3.0 - 32.0	Z6 Z8	$\lambda_s = 50°$	$\gamma_s = -5°$	✗	S	HA			F136
AL	**HPC** **SF**	HPC end mills, coated									
W0360		3.0 - 20.0	Z3	$\lambda_s = 42{,}5° / 45° / 47{,}5°$	$\gamma_s = 12°$	✗	F 45°	HA HB			F138
W0360		6.0 - 20.0	Z3	$\lambda_s = 42{,}5° / 45° / 47{,}5°$	$\gamma_s = 12°$	✗	F 45°	HA HB			F140
W0360		3.0 - 20.0	Z3	$\lambda_s = 42{,}5° / 45° / 47{,}5°$	$\gamma_s = 12°$	✗	F 45°	HA HB			F142
W0361		6.0 - 20.0	Z3	$\lambda_s = 42{,}5° / 45° / 47{,}5°$	$\gamma_s = 12°$	✓	F 45°	HA HB			F144
W0361		6.0 - 12.0	Z3	$\lambda_s = 42{,}5° / 45° / 47{,}5°$	$\gamma_s = 12°$	✓	F 45°	HA			F146
W0460		3.0 - 20.0	Z4	$\lambda_s = 44° / 47°$	$\gamma_s = 12°$	✗	F 45°	HA HB			F148
W0460		4.0 - 20.0	Z4	$\lambda_s = 44° / 47°$	$\gamma_s = 12°$	✗	F 45°	HA HB			F150

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Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**SF**	End mills, uncoated									
W0224 		2.0 - 20.0	Z2	$\lambda_s = 45°$	$\gamma_s = 20°$	✗	F 45°	HA			F152
W0306 		2.8 - 20.0	Z3	$\lambda_s = 30°$	$\gamma_s = 13°$	✗	F 45°	HB			F154
W0314 		3.0 - 20.0	Z3	$\lambda_s = 45°$	$\gamma_s = 13°$	✗	S	HB			F156
W0316 		3.0 - 20.0	Z3	$\lambda_s = 45°$	$\gamma_s = 13°$	✗	F 45°	HB			F158
W0319 		4.0 - 20.0	Z3	$\lambda_s = 45°$	$\gamma_s = 8°$	✗	F 45°	HA HB			F160
W0320 		4.0 - 20.0	Z3	$\lambda_s = 45°$	$\gamma_s = 8°$	✗	S	HA HB			F162

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**SF**	End mills, coated									
W0305 		5.0 - 20.0	Z3	$\lambda_s = 5°$	$\gamma_s = 15°$	✗	R	HA HB			F164
W0305 		5.0 - 20.0	Z3	$\lambda_s = 5°$	$\gamma_s = 15°$	✗	R	HA HB			F166
W0305 		5.0 - 20.0	Z3	$\lambda_s = 5°$	$\gamma_s = 15°$	✗	R	HA HB			F168

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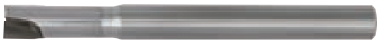
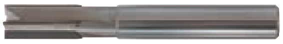
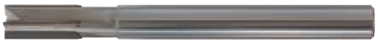
Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**PKD SF**	End mills, with PCD									
WP200		3.0 - 10.0	Z2	$\lambda_s=0°$	$\gamma_s=0°$	✗	F 45°	HA			F170
WP200		3.0 - 10.0	Z2	$\lambda_s=0°$	$\gamma_s=0°$	✗	F 45°	HA			F172
WP201		3.0 - 10.0	Z2	$\lambda_s=0°$	$\gamma_s=0°$	✓	F 45°	HA			F174
WP201		3.0 - 10.0	Z2	$\lambda_s=0°$	$\gamma_s=0°$	✓	F 45°	HA			F176
WP202		2.0 - 12.0	Z1 Z2	$\lambda_s=0°$	$\gamma_s=0°$	✗	S	HA			F178
WP400		6.0 - 20.0	Z4	$\lambda_s=0°$	$\gamma_s=0°$	✗	S	HA			F180
WP400		6.0 - 20.0	Z4	$\lambda_s=0°$	$\gamma_s=0°$	✗	S	HA			F182
WP401		6.0 - 20.0	Z4	$\lambda_s=0°$	$\gamma_s=0°$	✓	S	HA			F184
WP401		6.0 - 20.0	Z4	$\lambda_s=0°$	$\gamma_s=0°$	✓	S	HA			F186

Overview

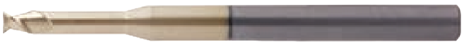
Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**SFM**	Mini end mills, uncoated									
W0318		2.0 - 20.0	Z3	$\lambda_s = 30°$	$\gamma_s = 5°$	✗	S	HB			F188
AL	**HPC SR**	HPC rough milling cutters, coated									
W0363		6.0 - 20.0	Z3	37,5° $\lambda_s = 40°$ 42,5°	$\gamma_s = 10°$	✗	F 45°	HA HB			F190
W0369		6.0 - 20.0	Z3	37,5° $\lambda_s = 40°$ 42,5°	$\gamma_s = 10°$	✓	F 45°	HA HB			F192
AL	**VR**	Ball nose milling cutters, uncoated									
W0216		3.0 - 20.0	Z2	$\lambda_s = 30°$	$\gamma_s = 13°$	✗	R	HB			F194
AL	**VR**	Ball nose milling cutters, coated									
W0238		3.0 - 20.0	Z2	$\lambda_s = 45°$	$\gamma_s = 13°$	✗	R	HA			F196
W0238		3.0 - 20.0	Z2	$\lambda_s = 45°$	$\gamma_s = 13°$	✗	R	HA			F196
W0238		3.0 - 16.0	Z2	$\lambda_s = 45°$	$\gamma_s = 13°$	✗	R	HA			F198

Overview

Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**PKD VR**	Ball nose milling cutters, with PCD									
WP488 		2.0 - 20.0	Z1 Z2	$\lambda_s = 0°$	$\gamma_s = 0°$	✗	R	HA			F200
AL	**HPC TF**	HPC rough milling cutters, coated									
W0362 		3.0 - 20.0	Z3	42,5° $\lambda_s = 45°$ 47,5°	$\gamma_s = 12°$	✗	R	HA			F202
W0362 		6.0 - 20.0	Z3	42,5° $\lambda_s = 45°$ 47,5°	$\gamma_s = 12°$	✗	R	HA			F204
W0362 		6.0 - 20.0	Z3	42,5° $\lambda_s = 45°$ 47,5°	$\gamma_s = 12°$	✗	R	HA			F204
AL	**TF**	Torus milling cutters, uncoated									
W0321 		5.0 - 20.0	Z3	$\lambda_s = 45°$	$\gamma_s = 8°$	✗	R	HA HB			F206
W0321 		6.0 - 20.0	Z3	$\lambda_s = 45°$	$\gamma_s = 8°$	✗	R	HA HB			F208
AL	**PKD TF**	Torus milling cutters, with PCD									
WP288 		2.0 - 20.0	Z1 Z2	$\lambda_s = 0°$	$\gamma_s = 0°$	✗	R	HA			F210

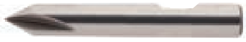
Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**MSF**	Micro end mills, coated									
W0242											F214
	▨	0.5 - 2.0	Z2	$\lambda_s=45°$	$\gamma_s=13°$	☒	F 45°	HA			
W0242											F214
	▨	0.5 - 2.0	Z2	$\lambda_s=45°$	$\gamma_s=13°$	☒	F 45°	HA			

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**MVR**	Micro ball nose milling cutters, coated									
W0239											F216
	▨	0.5 - 2.0	Z2	$\lambda_s=45°$	$\gamma_s=13°$	☒	R	HA			
W0239											F216
	▨	0.5 - 2.0	Z2	$\lambda_s=45°$	$\gamma_s=13°$	☒	R	HA			

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**MTF**	Micro torus milling cutters, coated									
W0249											F218
	▨	0.5 - 2.0	Z2	$\lambda_s=45°$	$\gamma_s=13°$	☒	R	HA			
W0249											F218
	▨	0.5 - 2.0	Z2	$\lambda_s=45°$	$\gamma_s=13°$	☒	R	HA			

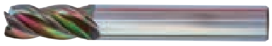
Overview

Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**HG SC**	High-precision finish milling cutters, coated									
W0376		6.0 - 20.0	Z6	λ_s=43,5° 46,5°	γ_s=20°	✗	S	HA			F220
W0376		6.0 - 20.0	Z6	λ_s=43,5° 46,5°	γ_s=20°	✗	S	HA			F222
W0376		6.0 - 20.0	Z6	λ_s=43,5° 46,5°	γ_s=20°	✗	S	HA			F222
AL	**EZ**	Single flute milling cutters, uncoated									
W0228		3.0 - 12.0	Z1	λ_s=30°	γ_s=13°	✗	S	HA			F224
AL	**E**	Deburring cutters, uncoated									
W0740		4.0 - 12.0	Z4	λ_s=0°	γ_s=0°	✗	σ 90°	HA HB			F226
W0741		4.0 - 12.0	Z4	λ_s=0°	γ_s=0°	✗	σ 60°	HA HB			F228
W0742		4.0 - 12.0	Z4	λ_s=0°	γ_s=0°	✗	σ 120°	HA HB			F230

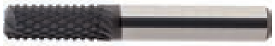
Overview

Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
AL	**FF**	Chamfer milling cutters, uncoated									
W0750		3.0 - 20.0	Z2	$\lambda_s = 30°$	$\gamma_s = 15°$	✗	σ 120°	HA			F232
W0751		3.0 - 20.0	Z2	$\lambda_s = 30°$	$\gamma_s = 15°$	✗	σ 90°	HA			F234
V	**HPC** **SF**	HPC end mills, coated									
W0451		3.0 - 20.0	Z4	$\lambda_s =$ 35° 38°	$\gamma_s = 8°$	✗	F 45°	HA			F236
WD451		3.0 - 20.0	Z4	$\lambda_s =$ 35° 38°	$\gamma_s = 8°$	✗	F 45°	HA			F238
V	**SRS**	Rough and finish milling cutters, uncoated									
W0860		4.0 - 20.0	Z6	$\lambda_s = 0°$	$\gamma_s = 15°$	✗	F 45°	HA			F240
V	**SRS**	Rough and finish milling cutters, coated									
WD860		4.0 - 20.0	Z6	$\lambda_s = 0°$	$\gamma_s = 15°$	✗	F 45°	HA			F242

Overview

Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
V	**EZ**	Single flute milling cutters, uncoated									
W0810		3.0 - 10.0	Z1	$\lambda_s = 30°$	$\gamma_s = 22°$	☒	F 45°	HA			F244
W0815		3.0 - 10.0	Z1	$\lambda_s = 0°$	$\gamma_s = 22°$	☒	F 45°	HA			F246
V	**R**	Solid carbide milling cutters for plastics, uncoated									
W0828		4.0 - 20.0		$\lambda_s = 25°$	$\gamma_s = 8°$	☒	S	HA			F248
W0830		4.0 - 20.0		$\lambda_s = 25°$	$\gamma_s = 8°$	☒	σ 135°	HA			F250
V	**R**	Solid carbide milling cutters for plastics, coated									
W0828		4.0 - 20.0		$\lambda_s = 25°$	$\gamma_s = 8°$	☒	S	HA			F252
WD828		4.0 - 20.0		$\lambda_s = 25°$	$\gamma_s = 8°$	☒	S	HA			F254
W0830		4.0 - 20.0		$\lambda_s = 25°$	$\gamma_s = 8°$	☒	σ 135°	HA			F256
WD830		4.0 - 20.0		$\lambda_s = 25°$	$\gamma_s = 8°$	☒	σ 135°	HA			F258

Overview

Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
V	**MRO**	Multiple milling cutters for plastics, uncoated									
W0835		3.0 - 12.0	Z4 Z6	$\lambda_s = 0°$	$\gamma_s = 15°$	☒	F 45°	HA			F260
W0837		3.0 - 12.0	Z4 Z6	$\lambda_s = 0°$	$\gamma_s = 15°$	☒	R	HA			F262
W0839		6.0 - 12.0	Z6	$\lambda_s = 10°$	$\gamma_s = 15°$	☒	F 45°	HA			F264
W0841		6.0 - 12.0	Z6	$\lambda_s = 10°$	$\gamma_s = 15°$	☒	F 45°	HA			F266
W0843		6.0 - 12.0	Z6	$\lambda_s = 10°$	$\gamma_s = 15°$	☒	σ 135°	HA			F268

Overview

Solid carbide tools for milling

Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
V	**MRO**	Multiple milling cutters for plastics, coated									
W0835		3.0 - 12.0	Z4 Z6	$\lambda_s = 0°$	$\gamma_s = 15°$	✗	F 45°	HA			F270
W0837		3.0 - 12.0	Z4 Z6	$\lambda_s = 0°$	$\gamma_s = 15°$	✗	R	HA			F272
W0839		6.0 - 12.0	Z6	$\lambda_s = 10°$	$\gamma_s = 15°$	✗	F 45°	HA			F274
W0841		6.0 - 12.0	Z6	$\lambda_s = 10°$	$\gamma_s = 15°$	✗	F 45°	HA			F276
W0843		6.0 - 12.0	Z6	$\lambda_s = 10°$	$\gamma_s = 15°$	✗	σ 135°	HA			F278

W0451-S, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	260	1xø	1xø	0,025	0,045	0,07	0,1	0,12
1.1.2		240	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.1	**Constructional steel**	250	1xø	1xø	0,025	0,045	0,07	0,1	0,12
1.2.2		230	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.3		220	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**	210	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.3		190	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.2.1	**Nitriding steel**	190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.2.2		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.1	**Tempered steel**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.2		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.3		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.4		180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.5		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.6		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.1.1	**Non alloyed tool steel**	185	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.1	**Tool steel for cold working**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.3		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.2.4		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.5		140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.1	**Tool steel for hot working**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.2		180	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.3.3		150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.4		140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.5		130	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.5.1	**Hardened tool steel** **< 55 HRC**								
3.5.2	**55–58 HRC**								
3.5.3	**58–60 HRC**								
3.5.4	**60–62 HRC**								
3.5.5	**62–64 HRC**								
4.1.1	**Stainless steel**	100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.2		80	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.3		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.4		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.5		110	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.2.1	**Heat-resistant alloys**	30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.2		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.3		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.4		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.3		120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**	100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
5.2.2		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
6.1.1	**Cast iron with lamellar graphite**	200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.2		180	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.3		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.1.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.1	**Spheroidal cast iron**	190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.3		150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.1	**GTW (white malleable cast iron)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.1	**GTS (black malleable cast iron)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.2		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.3		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.4		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.5		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.6		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**	300	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.2		350	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**	240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.2		280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**	140	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.2		160	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.8.1	**Titanium**	90	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.8.2		80	1xø	1xø	0,015	0,03	0,05	0,06	0,08
7.8.3		50	1xø	1xø	0,012	0,025	0,04	0,05	0,07

W0451-S, coated

HPC end mills

UN

HPC SF

$\lambda_S = 35° / 38°$

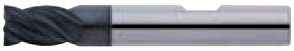
$\gamma_S = 8°$

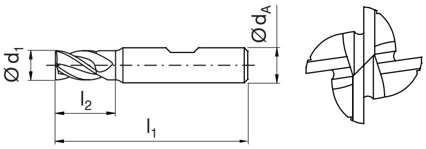
$d_1 = f8$
$d_A = h6$

F 45°

E

SCPP215





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HB Material
3.0	HPC-SF.UN.0451.0300.S.Z4.F0010A.HB	6	50	5	0.1	4	W0451030241
3.5	HPC-SF.UN.0451.0350.S.Z4.F0010A.HB	6	54	8	0.1	4	W0451035241
4.0	HPC-SF.UN.0451.0400.S.Z4.F0010A.HB	6	54	8	0.1	4	W0451040241
4.5	HPC-SF.UN.0451.0450.S.Z4.F0010A.HB	6	54	9	0.1	4	W0451045241
5.0	HPC-SF.UN.0451.0500.S.Z4.F0010A.HB	6	54	9	0.1	4	W0451050241
5.5	HPC-SF.UN.0451.0550.S.Z4.F0010A.HB	6	54	10	0.1	4	W0451055241
6.0	HPC-SF.UN.0451.0600.S.Z4.F0010A.HB	6	54	10	0.1	4	W0451060241
7.0	HPC-SF.UN.0451.0700.S.Z4.F0020A.HB	8	58	12	0.2	4	W0451070241
8.0	HPC-SF.UN.0451.0800.S.Z4.F0020A.HB	8	58	12	0.2	4	W0451080241
9.0	HPC-SF.UN.0451.0900.S.Z4.F0020A.HB	10	66	14	0.2	4	W0451090241
10.0	HPC-SF.UN.0451.1000.S.Z4.F0020A.HB	10	66	14	0.2	4	W0451100241
11.0	HPC-SF.UN.0451.1100.S.Z4.F0030A.HB	12	73	16	0.3	4	W0451110241
12.0	HPC-SF.UN.0451.1200.S.Z4.F0030A.HB	12	73	16	0.3	4	W0451120241
14.0	HPC-SF.UN.0451.1400.S.Z4.F0030A.HB	14	73	16	0.3	4	W0451140241
15.0	HPC-SF.UN.0451.1500.S.Z4.F0030A.HB	16	82	22	0.3	4	W0451150241
16.0	HPC-SF.UN.0451.1600.S.Z4.F0030A.HB	16	82	22	0.3	4	W0451160241
17.0	HPC-SF.UN.0451.1700.S.Z4.F0030A.HB	18	82	22	0.3	4	W0451170241
18.0	HPC-SF.UN.0451.1800.S.Z4.F0030A.HB	18	82	22	0.3	4	W0451180241
19.0	HPC-SF.UN.0451.1900.S.Z4.F0030A.HB	20	92	26	0.3	4	W0451190241
20.0	HPC-SF.UN.0451.2000.S.Z4.F0030A.HB	20	92	26	0.3	4	W0451200241

W0451-L and W0451-LS, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
						= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		260	1xø	1xø	0,025	0,045	0,07	0,1	0,12
1.1.2			240	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.1	**Constructional steel**		250	1xø	1xø	0,025	0,045	0,07	0,1	0,12
1.2.2			230	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.3			220	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.3.1	**Spring steel**									
1.3.2										
1.3.3										
2.1.1	**Cementation steel**		210	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.2			200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.3			190	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.2.1	**Nitriding steel**		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.2.2			170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.1	**Tempered steel**		200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.2			190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.3			190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.4			180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.5			170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.6			150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.1.1	**Non alloyed tool steel**		185	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.1	**Tool steel for cold working**		180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.2			170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.3			150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.2.4			160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.5			140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.1	**Tool steel for hot working**		200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.2			180	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.3.3			150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.4			140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.5			130	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.5.1	**Hardened tool steel**	**< 55 HRC**								
3.5.2		**55–58 HRC**								
3.5.3		**58–60 HRC**								
3.5.4		**60–62 HRC**								
3.5.5		**62–64 HRC**								
4.1.1	**Stainless steel**		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.2			80	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.3			100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.4			100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.5			110	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.2.1	**Heat-resistant alloys**		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.2			30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.3			30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.4			30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**		200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.2			160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.3			120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
5.2.2			100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
6.1.1	**Cast iron with lamellar graphite**		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.2			180	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.3			160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.1.4			120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.1	**Spheroidal cast iron**		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.2			170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.3			150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.1	**GTW (white malleable cast iron)**		180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.2			160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.1	**GTS (black malleable cast iron)**		180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.2			160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.1.1	**Aluminium**									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**		280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.2			240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.3			200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.4			240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.5			200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.6			240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**		300	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.2			350	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.2			280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**		140	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.2			160	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.8.1	**Titanium**		90	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.8.2			80	1xø	1xø	0,015	0,03	0,05	0,06	0,08
7.8.3			50	1xø	1xø	0,012	0,025	0,04	0,05	0,07

W0451-L and W0451-LS, coated

HPC end mills

UN

HPC SF

$\lambda_S = 35° 38°$

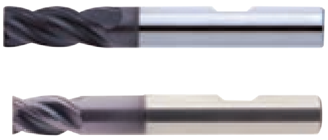
$\gamma_S = 8°$

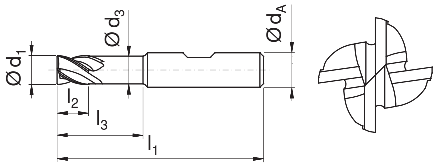
$d_1 = f8$ $d_A = h6$

F 45°

E

SCPP215





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material	HB Material
3.0	HPC-SF.UN.0451.0300.LS.Z4.F0010A.HB	6	2.8	57	4	13	0.1	4		W0451030R41
3.0	HPC-SF.UN.0451.0300.L.Z4.F0010A.HB	6		57	8		0.1	4	W0451030341	
3.5	HPC-SF.UN.0451.0350.L.Z4.F0010A.HB	6		57	11		0.1	4	W0451035341	
4.0	HPC-SF.UN.0451.0400.LS.Z4.F0010A.HB	6	3.8	57	5	17	0.1	4		W0451040R41
4.0	HPC-SF.UN.0451.0400.L.Z4.F0010A.HB	6		57	11		0.1	4	W0451040341	
4.5	HPC-SF.UN.0451.0450.L.Z4.F0010A.HB	6		57	13		0.1	4	W0451045341	
5.0	HPC-SF.UN.0451.0500.LS.Z4.F0010A.HB	6	4.8	57	6	19	0.1	4		W0451050R41
5.0	HPC-SF.UN.0451.0500.L.Z4.F0010A.HB	6		57	13		0.1	4	W0451050341	
5.5	HPC-SF.UN.0451.0550.L.Z4.F0010A.HB	6		57	13		0.1	4	W0451055341	
6.0	HPC-SF.UN.0451.0600.LS.Z4.F0010A.HB	6	5.8	57	7	19	0.1	4		W0451060R41
6.0	HPC-SF.UN.0451.0600.L.Z4.F0010A.HB	6		57	13		0.1	4	W0451060341	
7.0	HPC-SF.UN.0451.0700.L.Z4.F0020A.HB	8		63	21		0.2	4	W0451070341	
8.0	HPC-SF.UN.0451.0800.LS.Z4.F0020A.HB	8	7.7	63	9	25	0.2	4		W0451080R41
8.0	HPC-SF.UN.0451.0800.L.Z4.F0020A.HB	8		63	21		0.2	4	W0451080341	
9.0	HPC-SF.UN.0451.0900.L.Z4.F0020A.HB	10		72	22		0.2	4	W0451090341	
10.0	HPC-SF.UN.0451.1000.LS.Z4.F0020A.HB	10	9.7	72	11	30	0.2	4		W0451100R41
10.0	HPC-SF.UN.0451.1000.L.Z4.F0020A.HB	10		72	22		0.2	4	W0451100341	
11.0	HPC-SF.UN.0451.1100.L.Z4.F0030A.HB	12		83	26		0.3	4	W0451110341	
12.0	HPC-SF.UN.0451.1200.LS.Z4.F0030A.HB	12	11.6	83	13	36	0.3	4		W0451120R41
12.0	HPC-SF.UN.0451.1200.L.Z4.F0030A.HB	12		83	26		0.3	4	W0451120341	
14.0	HPC-SF.UN.0451.1400.L.Z4.F0030A.HB	14		83	26		0.3	4	W0451140341	
15.0	HPC-SF.UN.0451.1500.L.Z4.F0030A.HB	16		92	36		0.3	4	W0451150341	
16.0	HPC-SF.UN.0451.1600.LS.Z4.F0030A.HB	16	15.5	92	17	42	0.3	4		W0451160R41
16.0	HPC-SF.UN.0451.1600.L.Z4.F0030A.HB	16		92	36		0.3	4	W0451160341	
17.0	HPC-SF.UN.0451.1700.L.Z4.F0030A.HB	18		92	36		0.3	4	W0451170341	
18.0	HPC-SF.UN.0451.1800.L.Z4.F0030A.HB	18		92	36		0.3	4	W0451180341	
19.0	HPC-SF.UN.0451.1900.L.Z4.F0030A.HB	20		104	41		0.3	4	W0451190341	
20.0	HPC-SF.UN.0451.2000.LS.Z4.F0030A.HB	20	19.5	104	21	52	0.3	4		W0451200R41
20.0	HPC-SF.UN.0451.2000.L.Z4.F0030A.HB	20		104	41		0.3	4	W0451200341	

W0451-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	100	1xø	0,7xø	0,04	0,05	0,06	0,07
1.1.2		90	1xø	0,7xø	0,04	0,05	0,06	0,07
1.2.1	Constructional steel	100	1xø	0,7xø	0,045	0,05	0,07	0,08
1.2.2		90	1xø	0,7xø	0,045	0,05	0,07	0,08
1.2.3		90	1xø	0,7xø	0,04	0,05	0,06	0,07
1.3.1	Spring steel							
1.3.2								
1.3.3								
2.1.1	Cementation steel	100	1xø	0,7xø	0,04	0,05	0,06	0,07
2.1.2		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.1.3		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.2.1	Nitriding steel	90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.2.2		80	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.1	Tempered steel	90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.2		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.3		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.4		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.5		80	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.6								
3.1.1	Non alloyed tool steel	90	1xø	0,7xø	0,03	0,04	0,05	0,06
3.2.1	Tool steel for cold working	80	1xø	0,7xø	0,03	0,04	0,05	0,06
3.2.2		80	1xø	0,7xø	0,03	0,04	0,05	0,06
3.2.3								
3.2.4		80	1xø	0,7xø	0,03	0,04	0,05	0,06
3.2.5								
3.3.1	Tool steel for hot working							
3.3.2								
3.3.3		80	1xø	0,7xø	0,03	0,04	0,05	0,06
3.3.4								
3.3.5								
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel	95	1xø	0,7xø	0,03	0,04	0,05	0,06
4.1.2		85	1xø	0,7xø	0,03	0,04	0,05	0,06
4.1.3		90	1xø	0,7xø	0,03	0,04	0,05	0,06
4.1.4		90	1xø	0,7xø	0,03	0,04	0,05	0,06
4.1.5		95	1xø	0,7xø	0,03	0,04	0,05	0,06
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel	100	1xø	0,7xø	0,04	0,05	0,06	0,07
5.1.2		90	1xø	0,7xø	0,03	0,04	0,05	0,06
5.1.3								
5.2.1	Stainless cast steel	80	1xø	0,7xø	0,02	0,03	0,04	0,05
5.2.2		80	1xø	0,7xø	0,02	0,03	0,04	0,05
6.1.1	Cast iron with lamellar graphite	110	1xø	0,7xø	0,06	0,07	0,09	0,12
6.1.2		100	1xø	0,7xø	0,06	0,07	0,09	0,12
6.1.3		100	1xø	0,7xø	0,03	0,04	0,05	0,06
6.1.4		90	1xø	0,7xø	0,03	0,04	0,05	0,06
6.2.1	Spheroidal cast iron	110	1xø	0,7xø	0,045	0,05	0,07	0,08
6.2.2		100	1xø	0,7xø	0,045	0,05	0,07	0,08
6.2.3		100	1xø	0,7xø	0,02	0,03	0,04	0,05
6.3.1	GTW (white malleable cast iron)	110	1xø	0,7xø	0,06	0,07	0,09	0,12
6.3.2		100	1xø	0,7xø	0,06	0,07	0,09	0,12
6.4.1	GTS (black malleable cast iron)	110	1xø	0,7xø	0,06	0,07	0,09	0,12
6.4.2		100	1xø	0,7xø	0,06	0,07	0,09	0,12
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

W0451-OL, coated

HPC end mills

UN

HPC SF

λ_S = 35° 38°

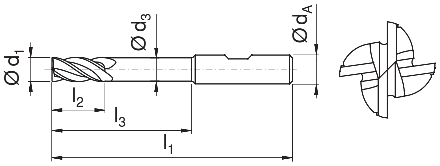
γ_S = 8°

d_1 = f8
d_A = h6

F 45°

E

SCPP215



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material
6.0	HPC-SF.UN.0451.0600.OL.Z4.F0010A.HB	6	5.8	80	13	42	0.1	4	W0451060441
8.0	HPC-SF.UN.0451.0800.OL.Z4.F0020A.HB	8	7.7	100	21	62	0.2	4	W0451080441
10.0	HPC-SF.UN.0451.1000.OL.Z4.F0020A.HB	10	9.7	100	22	58	0.2	4	W0451100441
12.0	HPC-SF.UN.0451.1200.OL.Z4.F0030A.HB	12	11.6	120	26	73	0.3	4	W0451120441
16.0	HPC-SF.UN.0451.1600.OL.Z4.F0030A.HB	16	15.5	150	36	100	0.3	4	W0451160441
20.0	HPC-SF.UN.0451.2000.OL.Z4.F0030A.HB	20	19.5	150	41	98	0.3	4	W0451200441

W0459-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	260	1xø	1xø	0,045	0,07	0,1	0,12
1.1.2		240	1xø	1xø	0,04	0,06	0,08	0,1
1.2.1	**Constructional steel**	250	1xø	1xø	0,045	0,07	0,1	0,12
1.2.2		230	1xø	1xø	0,04	0,06	0,08	0,1
1.2.3		220	1xø	1xø	0,04	0,06	0,08	0,1
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**	210	1xø	1xø	0,04	0,06	0,08	0,1
2.1.2		200	1xø	1xø	0,04	0,06	0,08	0,1
2.1.3		190	1xø	1xø	0,03	0,05	0,06	0,08
2.2.1	**Nitriding steel**	190	1xø	1xø	0,04	0,06	0,08	0,1
2.2.2		170	1xø	1xø	0,03	0,05	0,06	0,08
2.3.1	**Tempered steel**	200	1xø	1xø	0,04	0,06	0,08	0,1
2.3.2		190	1xø	1xø	0,04	0,06	0,08	0,1
2.3.3		190	1xø	1xø	0,04	0,06	0,08	0,1
2.3.4		180	1xø	1xø	0,04	0,06	0,08	0,1
2.3.5		170	1xø	1xø	0,03	0,05	0,06	0,08
2.3.6		150	1xø	1xø	0,03	0,05	0,06	0,08
3.1.1	**Non alloyed tool steel**	185	1xø	1xø	0,04	0,06	0,08	0,1
3.2.1	**Tool steel for cold working**	180	1xø	1xø	0,04	0,06	0,08	0,1
3.2.2		170	1xø	1xø	0,04	0,06	0,08	0,1
3.2.3		150	1xø	1xø	0,03	0,05	0,06	0,08
3.2.4		160	1xø	1xø	0,04	0,06	0,08	0,1
3.2.5		140	1xø	1xø	0,04	0,06	0,08	0,1
3.3.1	**Tool steel for hot working**	200	1xø	1xø	0,04	0,06	0,08	0,1
3.3.2		180	1xø	1xø	0,03	0,05	0,06	0,08
3.3.3		150	1xø	1xø	0,04	0,06	0,08	0,1
3.3.4		140	1xø	1xø	0,04	0,06	0,08	0,1
3.3.5		130	1xø	1xø	0,03	0,05	0,06	0,08
3.5.1	**Hardened tool steel** **< 55 HRC**							
3.5.2	**55–58 HRC**							
3.5.3	**58–60 HRC**							
3.5.4	**60–62 HRC**							
3.5.5	**62–64 HRC**							
4.1.1	**Stainless steel**	120	1xø	1xø	0,025	0,04	0,05	0,07
4.1.2		100	1xø	1xø	0,025	0,04	0,05	0,07
4.1.3		120	1xø	1xø	0,025	0,04	0,05	0,07
4.1.4		120	1xø	1xø	0,025	0,04	0,05	0,07
4.1.5		130	1xø	1xø	0,025	0,04	0,05	0,07
4.2.1	**Heat-resistant alloys**	35	1xø	0,5xø	0,02	0,03	0,04	0,05
4.2.2		35	1xø	0,5xø	0,02	0,03	0,04	0,05
4.2.3		35	1xø	0,5xø	0,02	0,03	0,04	0,05
4.2.4		35	1xø	0,5xø	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**	200	1xø	1xø	0,04	0,06	0,08	0,1
5.1.2		160	1xø	1xø	0,04	0,06	0,08	0,1
5.1.3		120	1xø	1xø	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**	140	1xø	1xø	0,025	0,04	0,05	0,07
5.2.2		140	1xø	1xø	0,025	0,04	0,05	0,07
6.1.1	**Cast iron with lamellar graphite**	200	1xø	1xø	0,045	0,07	0,1	0,12
6.1.2		180	1xø	1xø	0,045	0,07	0,1	0,12
6.1.3		160	1xø	1xø	0,04	0,06	0,08	0,1
6.1.4		120	1xø	1xø	0,04	0,06	0,08	0,1
6.2.1	**Spheroidal cast iron**	190	1xø	1xø	0,04	0,06	0,08	0,1
6.2.2		170	1xø	1xø	0,04	0,06	0,08	0,1
6.2.3		150	1xø	1xø	0,04	0,06	0,08	0,1
6.3.1	**GTW (white malleable cast iron)**	180	1xø	1xø	0,04	0,06	0,08	0,1
6.3.2		160	1xø	1xø	0,04	0,06	0,08	0,1
6.4.1	**GTS (black malleable cast iron)**	180	1xø	1xø	0,04	0,06	0,08	0,1
6.4.2		160	1xø	1xø	0,04	0,06	0,08	0,1
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**	280	1xø	1xø	0,045	0,07	0,1	0,12
7.3.2		240	1xø	1xø	0,045	0,07	0,1	0,12
7.3.3		200	1xø	1xø	0,045	0,07	0,1	0,12
7.3.4		240	1xø	1xø	0,045	0,07	0,1	0,12
7.3.5		200	1xø	1xø	0,045	0,07	0,1	0,12
7.3.6		240	1xø	1xø	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**	300	1xø	1xø	0,045	0,07	0,1	0,12
7.4.2		350	1xø	1xø	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**	240	1xø	1xø	0,045	0,07	0,1	0,12
7.5.2		280	1xø	1xø	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**	140	1xø	1xø	0,045	0,07	0,1	0,12
7.6.2		160	1xø	1xø	0,045	0,07	0,1	0,12
7.8.1	**Titanium**	90	1xø	1xø	0,04	0,06	0,08	0,1
7.8.2		80	1xø	1xø	0,03	0,05	0,06	0,08
7.8.3		50	1xø	1xø	0,025	0,04	0,05	0,07

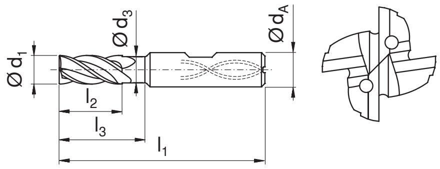
W0459-L, coated

HPC end mills

UN **HPC SF**

$\lambda_S = 35° 38°$ $\gamma_S = 12°$ $d_1 = f8$ $d_A = h6$ F 45° E

SCPP240



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material
6.0	HPC-SF.UN.0459.0600.L.Z4.F0010A.HB	6	5.8	57	13	19	0.1	4	W0459060341
8.0	HPC-SF.UN.0459.0800.L.Z4.F0020A.HB	8	7.7	63	21	25	0.2	4	W0459080341
10.0	HPC-SF.UN.0459.1000.L.Z4.F0020A.HB	10	9.7	72	22	30	0.2	4	W0459100341
12.0	HPC-SF.UN.0459.1200.L.Z4.F0030A.HB	12	11.6	83	26	36	0.3	4	W0459120341
16.0	HPC-SF.UN.0459.1600.L.Z4.F0030A.HB	16	15.5	92	36	42	0.3	4	W0459160341
20.0	HPC-SF.UN.0459.2000.L.Z4.F0030A.HB	20	19.5	104	41	52	0.3	4	W0459200341

W0264-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 2,8 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	140	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.1.2		100	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.2.1	**Constructional steel**	140	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.2		100	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.3		80	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**	110	1xø	1xø	0,02	0,04	0,05	0,06	0,07
2.1.2		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.1.3		70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.1	**Nitriding steel**	80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.2		55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**	90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.2		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.3		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.4		70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.5		55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.6									
3.1.1	**Non alloyed tool steel**								
3.2.1	**Tool steel for cold working**								
3.2.2									
3.2.3									
3.2.4									
3.2.5									
3.3.1	**Tool steel for hot working**								
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	**Hardened tool steel** **< 55 HRC**								
3.5.2	**55–58 HRC**								
3.5.3	**58–60 HRC**								
3.5.4	**60–62 HRC**								
3.5.5	**62–64 HRC**								
4.1.1	**Stainless steel**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.2		40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.3		50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.4		40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.5		60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.1	**Heat-resistant alloys**	30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.2		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.3		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.4		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**	120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.2		90	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.3		70	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.2.1	**Stainless cast steel**	60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
5.2.2		60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.1.1	**Cast iron with lamellar graphite**	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.3		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.1.4		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.2.1	**Spheroidal cast iron**	130	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.2		120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.3		90	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.3.1	**GTW (white malleable cast iron)**	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.3.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.1	**GTS (black malleable cast iron)**	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.2		35	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.3		20	1xø	1xø	0,01	0,02	0,03	0,04	0,05

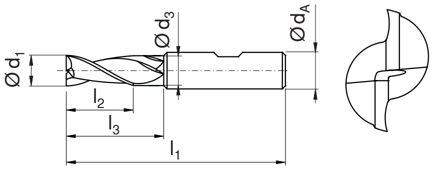
W0264-L, coated

End mills

UN **SF**

$\lambda_S = 30°$ $\gamma_S = 13°$ $d_1 = e8$ $d_A = h6$ F 45° E

SCPP225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material
2.8	SF.UN.0264.0280.L.Z2.F0005A.HB	6	2.6	57	8	15	0.05	2	W0264028391
3.0	SF.UN.0264.0300.L.Z2.F0010A.HB	6	2.8	57	8	15	0.1	2	W0264030391
3.5	SF.UN.0264.0350.L.Z2.F0010A.HB	6	3.3	57	11	15	0.1	2	W0264035391
3.8	SF.UN.0264.0380.L.Z2.F0010A.HB	6	3.6	57	11	15	0.1	2	W0264038391
4.0	SF.UN.0264.0400.L.Z2.F0010A.HB	6	3.8	57	11	15	0.1	2	W0264040391
4.8	SF.UN.0264.0480.L.Z2.F0010A.HB	6	4.6	57	13	21	0.1	2	W0264048391
5.0	SF.UN.0264.0500.L.Z2.F0010A.HB	6	4.8	57	13	21	0.1	2	W0264050391
5.75	SF.UN.0264.0575.L.Z2.F0010A.HB	6	5.6	57	13	21	0.1	2	W0264057591
6.0	SF.UN.0264.0600.L.Z2.F0010A.HB	6	5.8	57	13	21	0.1	2	W0264060391
6.75	SF.UN.0264.0675.L.Z2.F0010A.HB	8	6.6	63	16	27	0.1	2	W0264067591
7.0	SF.UN.0264.0700.L.Z2.F0010A.HB	8	6.8	63	16	27	0.1	2	W0264070391
7.75	SF.UN.0264.0775.L.Z2.F0010A.HB	8	7.6	63	19	27	0.1	2	W0264077591
8.0	SF.UN.0264.0800.L.Z2.F0010A.HB	8	7.8	63	19	27	0.1	2	W0264080391
8.7	SF.UN.0264.0870.L.Z2.F0010A.HB	10	8.5	72	19	32	0.1	2	W0264087391
9.0	SF.UN.0264.0900.L.Z2.F0010A.HB	10	8.8	72	19	32	0.1	2	W0264090391
9.7	SF.UN.0264.0970.L.Z2.F0010A.HB	10	9.5	72	22	32	0.1	2	W0264097391
10.0	SF.UN.0264.1000.L.Z2.F0010A.HB	10	9.8	72	22	32	0.1	2	W0264100391
10.7	SF.UN.0264.1070.L.Z2.F0010A.HB	12	10.5	83	26	38	0.1	2	W0264107391
11.0	SF.UN.0264.1100.L.Z2.F0010A.HB	12	10.8	83	26	38	0.1	2	W0264110391
11.7	SF.UN.0264.1170.L.Z2.F0010A.HB	12	11.5	83	26	38	0.1	2	W0264117391
12.0	SF.UN.0264.1200.L.Z2.F0010A.HB	12	11.8	83	26	38	0.1	2	W0264120391
13.7	SF.UN.0264.1370.L.Z2.F0010A.HB	14	13.5	83	26	38	0.1	2	W0264137391
14.0	SF.UN.0264.1400.L.Z2.F0010A.HB	14	13.8	83	26	38	0.1	2	W0264140391
15.7	SF.UN.0264.1570.L.Z2.F0010A.HB	16	15.4	92	32	44	0.1	2	W0264157391
16.0	SF.UN.0264.1600.L.Z2.F0010A.HB	16	15.7	92	32	44	0.1	2	W0264160391
17.7	SF.UN.0264.1770.L.Z2.F0010A.HB	18	17.4	92	32	44	0.1	2	W0264177391
18.0	SF.UN.0264.1800.L.Z2.F0010A.HB	18	17.7	92	32	44	0.1	2	W0264180391
19.7	SF.UN.0264.1970.L.Z2.F0010A.HB	20	19.4	104	38	54	0.1	2	W0264197391
20.0	SF.UN.0264.2000.L.Z2.F0010A.HB	20	19.7	104	38	54	0.1	2	W0264200391

W0306-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 2,8 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	140	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.1.2		100	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.2.1	**Constructional steel**	140	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.2		100	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.3		80	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**	110	1xø	1xø	0,02	0,04	0,05	0,06	0,07
2.1.2		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.1.3		70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.1	**Nitriding steel**	80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.2		55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**	90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.2		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.3		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.4		70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.5		55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.6									
3.1.1	**Non alloyed tool steel**								
3.2.1	**Tool steel for cold working**								
3.2.2									
3.2.3									
3.2.4									
3.2.5									
3.3.1	**Tool steel for hot working**								
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	**Hardened tool steel** **< 55 HRC**								
3.5.2	**55–58 HRC**								
3.5.3	**58–60 HRC**								
3.5.4	**60–62 HRC**								
3.5.5	**62–64 HRC**								
4.1.1	**Stainless steel**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.2		40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.3		50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.4		40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.5		60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.1	**Heat-resistant alloys**	30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.2		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.3		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.4		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**	120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.2		90	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.3		70	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.2.1	**Stainless cast steel**	60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
5.2.2		60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.1.1	**Cast iron with lamellar graphite**	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.3		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.1.4		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.2.1	**Spheroidal cast iron**	130	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.2		120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.3		90	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.3.1	**GTW (white malleable cast iron)**	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.3.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.1	**GTS (black malleable cast iron)**	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.2		35	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.3		20	1xø	1xø	0,01	0,02	0,03	0,04	0,05

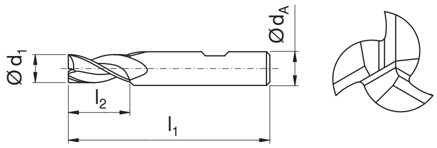
W0306-L, coated

End mills

UN **SF**

$\lambda_S = 30°$ $\gamma_S = 13°$ $d_1 = e8$ $d_A = h6$ F 45° E

SCPP225



d1 [mm]	Type, description	dA [mm]	l1 [mm]	l2 [mm]	F [mm]	z	HB Material
2.8	SF.AL.0306.0280.L.Z3.F0005A.HB	6	57	8	0.05	3	W0306028341
3.0	SF.UN.0306.0300.L.Z3.F0010A.HB	6	57	8	0.1	3	W0306030341
3.8	SF.UN.0306.0380.L.Z3.F0010A.HB	6	57	11	0.1	3	W0306038341
4.0	SF.UN.0306.0400.L.Z3.F0010A.HB	6	57	11	0.1	3	W0306040341
4.8	SF.UN.0306.0480.L.Z3.F0010A.HB	6	57	13	0.1	3	W0306048341
5.0	SF.UN.0306.0500.L.Z3.F0010A.HB	6	57	13	0.1	3	W0306050341
5.8	SF.UN.0306.0580.L.Z3.F0010A.HB	6	57	13	0.1	3	W0306058341
6.0	SF.UN.0306.0600.L.Z3.F0010A.HB	6	57	13	0.1	3	W0306060341
6.8	SF.UN.0306.0680.L.Z3.F0010A.HB	8	63	16	0.1	3	W0306068341
7.0	SF.UN.0306.0700.L.Z3.F0010A.HB	8	63	16	0.1	3	W0306070341
7.8	SF.UN.0306.0780.L.Z3.F0010A.HB	8	63	19	0.1	3	W0306078341
8.0	SF.UN.0306.0800.L.Z3.F0010A.HB	8	63	19	0.1	3	W0306080341
8.7	SF.UN.0306.0870.L.Z3.F0010A.HB	10	72	19	0.1	3	W0306087341
9.0	SF.UN.0306.0900.L.Z3.F0010A.HB	10	72	19	0.1	3	W0306090341
9.7	SF.UN.0306.0970.L.Z3.F0010A.HB	10	72	22	0.1	3	W0306097341
10.0	SF.UN.0306.1000.L.Z3.F0010A.HB	10	72	22	0.1	3	W0306100341
10.7	SF.UN.0306.1070.L.Z3.F0010A.HB	12	83	26	0.1	3	W0306107341
11.0	SF.UN.0306.1100.L.Z3.F0010A.HB	12	83	26	0.1	3	W0306110341
11.7	SF.UN.0306.1170.L.Z3.F0010A.HB	12	83	26	0.1	3	W0306117341
12.0	SF.UN.0306.1200.L.Z3.F0010A.HB	12	83	26	0.1	3	W0306120341
12.7	SF.UN.0306.1270.L.Z3.F0010A.HB	14	83	26	0.1	3	W0306127341
13.7	SF.UN.0306.1370.L.Z3.F0010A.HB	14	83	26	0.1	3	W0306137341
14.0	SF.UN.0306.1400.L.Z3.F0010A.HB	14	83	26	0.1	3	W0306140341
15.7	SF.UN.0306.1570.L.Z3.F0010A.HB	16	92	32	0.1	3	W0306157341
16.0	SF.UN.0306.1600.L.Z3.F0010A.HB	16	92	32	0.1	3	W0306160341
17.7	SF.UN.0306.1770.L.Z3.F0010A.HB	18	92	32	0.1	3	W0306177341
18.0	SF.UN.0306.1800.L.Z3.F0010A.HB	18	92	32	0.1	3	W0306180341
19.7	SF.UN.0306.1970.L.Z3.F0010A.HB	20	104	38	0.1	3	W0306197341
20.0	SF.UN.0306.2000.L.Z3.F0010A.HB	20	104	38	0.1	3	W0306200341

W0314-L, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]			f_z [mm]		
						= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		140	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.1.2			100	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.2.1	**Constructional steel**		140	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.2			100	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.3			80	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.3.1	**Spring steel**									
1.3.2										
1.3.3										
2.1.1	**Cementation steel**		110	1xø	1xø	0,02	0,04	0,05	0,06	0,07
2.1.2			90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.1.3			70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.1	**Nitriding steel**		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.2			55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.2			80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.3			80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.4			70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.5			55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.6										
3.1.1	**Non alloyed tool steel**									
3.2.1	**Tool steel for cold working**									
3.2.2										
3.2.3										
3.2.4										
3.2.5										
3.3.1	**Tool steel for hot working**									
3.3.2										
3.3.3										
3.3.4										
3.3.5										
3.5.1	**Hardened tool steel**	**< 55 HRC**								
3.5.2		**55–58 HRC**								
3.5.3		**58–60 HRC**								
3.5.4		**60–62 HRC**								
3.5.5		**62–64 HRC**								
4.1.1	**Stainless steel**		50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.2			40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.3			50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.4			40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.5			60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.1	**Heat-resistant alloys**		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.2			30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.3			30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.4			30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**		120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.2			90	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.3			70	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.2.1	**Stainless cast steel**		60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
5.2.2			60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.1.1	**Cast iron with lamellar graphite**		130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.2			120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.3			90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.1.4			80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.2.1	**Spheroidal cast iron**		130	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.2			120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.3			90	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.3.1	**GTW (white malleable cast iron)**		130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.3.2			120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.1	**GTS (black malleable cast iron)**		130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.2			120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.1	**Aluminium**									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2			120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3			100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4			120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5			100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6			120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**		150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2			200	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2			140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2			140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**		50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.2			35	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.3			20	1xø	1xø	0,01	0,02	0,03	0,04	0,05

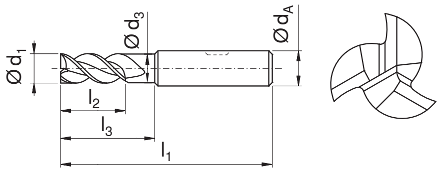
W0314-L, coated

End mills

UN **SF**

$\lambda_S = 45°$ $\gamma_S = 13°$ $d_1 = e8$ $d_A = h6$ F 45° E

SCPP225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material	HB Material
3.0	SF.UN.0314.0300.L.Z3.F0010A.HA	6	2.8	57	8	15	0.1	3	W0314030390	
3.0	SF.UN.0314.0300.L.Z3.F0010A.HB	6	2.8	57	8	15	0.1	3		W0314030391
3.5	SF.UN.0314.0350.L.Z3.F0010A.HA	6	3.3	57	11	15	0.1	3	W0314035390	
3.5	SF.UN.0314.0350.L.Z3.F0010A.HB	6	3.3	57	11	15	0.1	3		W0314035391
4.0	SF.UN.0314.0400.L.Z3.F0010A.HA	6	3.8	57	11	15	0.1	3	W0314040390	
4.0	SF.UN.0314.0400.L.Z3.F0010A.HB	6	3.8	57	11	15	0.1	3		W0314040391
4.5	SF.UN.0314.0450.L.Z3.F0010A.HA	6	4.3	57	13	21	0.1	3	W0314045390	
4.5	SF.UN.0314.0450.L.Z3.F0010A.HB	6	4.3	57	13	21	0.1	3		W0314045391
5.0	SF.UN.0314.0500.L.Z3.F0010A.HA	6	4.8	57	13	21	0.1	3	W0314050390	
5.0	SF.UN.0314.0500.L.Z3.F0010A.HB	6	4.8	57	13	21	0.1	3		W0314050391
5.5	SF.UN.0314.0550.L.Z3.F0010A.HA	6	5.3	57	13	21	0.1	3	W0314055390	
5.5	SF.UN.0314.0550.L.Z3.F0010A.HB	6	5.3	57	13	21	0.1	3		W0314055391
6.0	SF.UN.0314.0600.L.Z3.F0010A.HA	6	5.8	57	13	21	0.1	3	W0314060390	
6.0	SF.UN.0314.0600.L.Z3.F0010A.HB	6	5.8	57	13	21	0.1	3		W0314060391
6.5	SF.UN.0314.0650.L.Z3.F0010A.HA	8	6.3	63	16	27	0.1	3	W0314065390	
6.5	SF.UN.0314.0650.L.Z3.F0010A.HB	8	6.3	63	16	27	0.1	3		W0314065391
7.0	SF.UN.0314.0700.L.Z3.F0010A.HA	8	6.8	63	16	27	0.1	3	W0314070390	
7.0	SF.UN.0314.0700.L.Z3.F0010A.HB	8	6.8	63	16	27	0.1	3		W0314070391
7.5	SF.UN.0314.0750.L.Z3.F0010A.HA	8	7.3	63	19	27	0.1	3	W0314075390	
7.5	SF.UN.0314.0750.L.Z3.F0010A.HB	8	7.3	63	19	27	0.1	3		W0314075391
8.0	SF.UN.0314.0800.L.Z3.F0010A.HA	8	7.8	63	21	27	0.1	3	W0314080390	
8.0	SF.UN.0314.0800.L.Z3.F0010A.HB	8	7.8	63	21	27	0.1	3		W0314080391
8.5	SF.UN.0314.0850.L.Z3.F0010A.HA	10	8.3	72	21	32	0.1	3	W0314085390	
8.5	SF.UN.0314.0850.L.Z3.F0010A.HB	10	8.3	72	21	32	0.1	3		W0314085391
9.0	SF.UN.0314.0900.L.Z3.F0010A.HA	10	8.8	72	21	32	0.1	3	W0314090390	
9.0	SF.UN.0314.0900.L.Z3.F0010A.HB	10	8.8	72	21	32	0.1	3		W0314090391
9.5	SF.UN.0314.0950.L.Z3.F0010A.HA	10	9.3	72	22	32	0.1	3	W0314095390	
9.5	SF.UN.0314.0950.L.Z3.F0010A.HB	10	9.3	72	22	32	0.1	3		W0314095391
10.0	SF.UN.0314.1000.L.Z3.F0010A.HA	10	9.8	72	22	32	0.1	3	W0314100390	
10.0	SF.UN.0314.1000.L.Z3.F0010A.HB	10	9.8	72	22	32	0.1	3		W0314100391
11.0	SF.UN.0314.1100.L.Z3.F0010A.HB	12	10.8	83	26	38	0.1	3		W0314110391
12.0	SF.UN.0314.1200.L.Z3.F0010A.HA	12	11.8	83	26	38	0.1	3	W0314120390	
12.0	SF.UN.0314.1200.L.Z3.F0010A.HB	12	11.8	83	26	38	0.1	3		W0314120391
14.0	SF.UN.0314.1400.L.Z3.F0010A.HA	14	13.8	83	26	38	0.1	3	W0314140390	
14.0	SF.UN.0314.1400.L.Z3.F0010A.HB	14	13.8	83	26	38	0.1	3		W0314140391
16.0	SF.UN.0314.1600.L.Z3.F0010A.HA	16	15.7	92	36	44	0.1	3	W0314160390	
16.0	SF.UN.0314.1600.L.Z3.F0010A.HB	16	15.7	92	36	44	0.1	3		W0314160391
18.0	SF.UN.0314.1800.L.Z3.F0010A.HA	18	17.7	92	36	44	0.1	3	W0314180390	
18.0	SF.UN.0314.1800.L.Z3.F0010A.HB	18	17.7	92	36	44	0.1	3		W0314180391
20.0	SF.UN.0314.2000.L.Z3.F0010A.HA	20	19.7	104	41	54	0.1	3	W0314200390	
20.0	SF.UN.0314.2000.L.Z3.F0010A.HB	20	19.7	104	41	54	0.1	3		W0314200391

W0314-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 3,5 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	85	0,1xø	1,5xø	0,02	0,04	0,05	0,06	0,07
1.1.2		60	0,1xø	1,5xø	0,02	0,04	0,05	0,06	0,07
1.2.1	Constructional steel	85	0,1xø	1,5xø	0,03	0,045	0,05	0,07	0,08
1.2.2		60	0,1xø	1,5xø	0,03	0,045	0,05	0,07	0,08
1.2.3		50	0,1xø	1,5xø	0,02	0,04	0,05	0,06	0,07
1.3.1	Spring steel								
1.3.2									
1.3.3									
2.1.1	Cementation steel	65	0,1xø	1,5xø	0,02	0,04	0,05	0,06	0,07
2.1.2		55	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
2.1.3		40	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
2.2.1	Nitriding steel	50	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
2.2.2		35	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
2.3.1	Tempered steel	55	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
2.3.2		50	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
2.3.3		50	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
2.3.4		40	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
2.3.5		35	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
2.3.6									
3.1.1	Non alloyed tool steel								
3.2.1	Tool steel for cold working								
3.2.2									
3.2.3									
3.2.4									
3.2.5									
3.3.1	Tool steel for hot working								
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	Hardened tool steel < 55 HRC								
3.5.2	55–58 HRC								
3.5.3	58–60 HRC								
3.5.4	60–62 HRC								
3.5.5	62–64 HRC								
4.1.1	Stainless steel	30	0,1xø	1,5xø	0,01	0,02	0,03	0,04	0,05
4.1.2		25	0,1xø	1,5xø	0,01	0,02	0,03	0,04	0,05
4.1.3		30	0,1xø	1,5xø	0,01	0,02	0,03	0,04	0,05
4.1.4		25	0,1xø	1,5xø	0,01	0,02	0,03	0,04	0,05
4.1.5		35	0,1xø	1,5xø	0,01	0,02	0,03	0,04	0,05
4.2.1	Heat-resistant alloys								
4.2.2									
4.2.3									
4.2.4									
5.1.1	Conventional cast steel	75	0,1xø	1,5xø	0,03	0,045	0,05	0,07	0,08
5.1.2		55	0,1xø	1,5xø	0,03	0,045	0,05	0,07	0,08
5.1.3		45	0,1xø	1,5xø	0,03	0,045	0,05	0,07	0,08
5.2.1	Stainless cast steel	35	0,1xø	1,5xø	0,01	0,02	0,03	0,04	0,05
5.2.2		45	0,1xø	1,5xø	0,01	0,02	0,03	0,04	0,05
6.1.1	Cast iron with lamellar graphite	80	0,1xø	1,5xø	0,035	0,06	0,07	0,09	0,12
6.1.2		70	0,1xø	1,5xø	0,035	0,06	0,07	0,09	0,12
6.1.3		55	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
6.1.4		50	0,1xø	1,5xø	0,015	0,03	0,04	0,05	0,06
6.2.1	Spheroidal cast iron	80	0,1xø	1,5xø	0,03	0,045	0,05	0,07	0,08
6.2.2		70	0,1xø	1,5xø	0,03	0,045	0,05	0,07	0,08
6.2.3		55	0,1xø	1,5xø	0,01	0,02	0,03	0,04	0,05
6.3.1	GTW (white malleable cast iron)	80	0,1xø	1,5xø	0,035	0,06	0,07	0,09	0,12
6.3.2		70	0,1xø	1,5xø	0,035	0,06	0,07	0,09	0,12
6.4.1	GTS (black malleable cast iron)	80	0,1xø	1,5xø	0,035	0,06	0,07	0,09	0,12
6.4.2		70	0,1xø	1,5xø	0,035	0,06	0,07	0,09	0,12
7.1.1	Aluminium								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	Magnesium								
7.2.2									
7.3.1	Copper	85	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.3.2		70	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.3.3		60	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.3.4		70	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.3.5		60	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.3.6		70	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.4.1	CuZn (brass)	90	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.4.2		120	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.5.1	CuSn (bronze)	70	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.5.2		85	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.6.1	CuAlFe (Ampco)	70	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.6.2		85	0,1xø	1,5xø	0,02	0,04	0,06	0,08	0,12
7.8.1	Titanium								
7.8.2									
7.8.3									

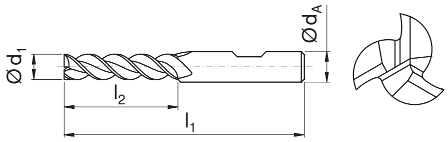
W0314-OL, coated

End mills

UN **SF**

$\lambda_S = 45°$ $\gamma_S = 13°$ $d_1 = e8$ $d_A = h6$ F 45° E

SCPP225



d1 [mm]	Type, description	dA [mm]	l1 [mm]	l2 [mm]	F [mm]	z	HB Material
3.5	SF.UN.0314.0350.OL.Z3.F0010A.HB	6	59	15	0.1	3	W0314035441
4.0	SF.UN.0314.0400.OL.Z3.F0010A.HB	6	63	19	0.1	3	W0314040441
4.5	SF.UN.0314.0450.OL.Z3.F0010A.HB	6	63	19	0.1	3	W0314045441
5.0	SF.UN.0314.0500.OL.Z3.F0010A.HB	6	68	24	0.1	3	W0314050441
5.5	SF.UN.0314.0550.OL.Z3.F0010A.HB	6	68	24	0.1	3	W0314055441
6.0	SF.UN.0314.0600.OL.Z3.F0010A.HB	6	68	24	0.1	3	W0314060441
6.5	SF.UN.0314.0650.OL.Z3.F0010A.HB	8	80	30	0.1	3	W0314065441
7.0	SF.UN.0314.0700.OL.Z3.F0010A.HB	8	80	30	0.1	3	W0314070441
7.5	SF.UN.0314.0750.OL.Z3.F0010A.HB	8	80	30	0.1	3	W0314075441
8.0	SF.UN.0314.0800.OL.Z3.F0010A.HB	8	88	38	0.1	3	W0314080441
10.0	SF.UN.0314.1000.OL.Z3.F0010A.HB	10	95	45	0.1	3	W0314100441
12.0	SF.UN.0314.1200.OL.Z3.F0010A.HB	12	110	53	0.1	3	W0314120441
14.0	SF.UN.0314.1400.OL.Z3.F0010A.HB	14	110	53	0.1	3	W0314140441
16.0	SF.UN.0314.1600.OL.Z3.F0010A.HB	16	123	63	0.1	3	W0314160441
20.0	SF.UN.0314.2000.OL.Z3.F0010A.HB	20	141	75	0.1	3	W0314200441

W0316-S, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 3,0 = Ø 4,0	 > Ø 4,0 = Ø 8,0	 > Ø 8,0 = Ø 12,0	 > Ø 12,0 = Ø 16,0	 > Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	140	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.1.2		100	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.2.1	**Constructional steel**	140	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.2		100	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.3		80	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**	110	1xø	1xø	0,02	0,04	0,05	0,06	0,07
2.1.2		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.1.3		70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.1	**Nitriding steel**	80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.2		55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**	90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.2		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.3		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.4		70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.5		55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.6									
3.1.1	**Non alloyed tool steel**								
3.2.1	**Tool steel for cold working**								
3.2.2									
3.2.3									
3.2.4									
3.2.5									
3.3.1	**Tool steel for hot working**								
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	**Hardened tool steel** **< 55 HRC**								
3.5.2	**55–58 HRC**								
3.5.3	**58–60 HRC**								
3.5.4	**60–62 HRC**								
3.5.5	**62–64 HRC**								
4.1.1	**Stainless steel**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.2		40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.3		50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.4		40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.5		60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.1	**Heat-resistant alloys**	30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.2		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.3		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.4		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**	120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.2		90	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.3		70	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.2.1	**Stainless cast steel**	60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
5.2.2		60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.1.1	**Cast iron with lamellar graphite**	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.3		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.1.4		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.2.1	**Spheroidal cast iron**	130	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.2		120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.3		90	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.3.1	**GTW (white malleable cast iron)**	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.3.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.1	**GTS (black malleable cast iron)**	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.2		35	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.3		20	1xø	1xø	0,01	0,02	0,03	0,04	0,05

W0316-S, coated

End mills

UN **SF**

$\lambda_S = 45°$

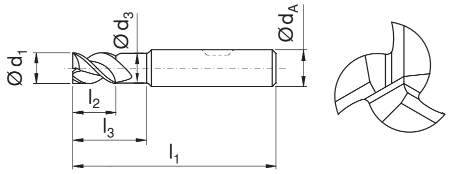
$\gamma_S = 13°$

$d_1 = e8$
$d_A = h6$

F 45°

E

SCPP225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material	HB Material
3.0	SF.UN.0316.0300.S.Z3.F0010A.HA	6	2.9	50	5	12	0.1	3	W0316030180	
3.0	SF.UN.0316.0300.S.Z3.F0010A.HB	6	2.9	50	5	12	0.1	3		W0316030181
3.5	SF.UN.0316.0350.S.Z3.F0010A.HA	6	3.4	50	6	13	0.1	3	W0316035180	
3.5	SF.UN.0316.0350.S.Z3.F0010A.HB	6	3.4	50	6	13	0.1	3		W0316035181
4.0	SF.UN.0316.0400.S.Z3.F0010A.HA	6	3.9	54	8	15	0.1	3	W0316040180	
4.0	SF.UN.0316.0400.S.Z3.F0010A.HB	6	3.9	54	8	15	0.1	3		W0316040181
4.5	SF.UN.0316.0450.S.Z3.F0010A.HA	6	4.4	54	8	15	0.1	3	W0316045180	
4.5	SF.UN.0316.0450.S.Z3.F0010A.HB	6	4.4	54	8	15	0.1	3		W0316045181
5.0	SF.UN.0316.0500.S.Z3.F0010A.HA	6	4.9	54	9	16	0.1	3	W0316050180	
5.0	SF.UN.0316.0500.S.Z3.F0010A.HB	6	4.9	54	9	16	0.1	3		W0316050181
5.5	SF.UN.0316.0550.S.Z3.F0010A.HA	6	5.4	54	10	17	0.1	3	W0316055180	
5.5	SF.UN.0316.0550.S.Z3.F0010A.HB	6	5.4	54	10	17	0.1	3		W0316055181
6.0	SF.UN.0316.0600.S.Z3.F0010A.HA	6	5.9	54	10	17	0.1	3	W0316060180	
6.0	SF.UN.0316.0600.S.Z3.F0010A.HB	6	5.9	54	10	17	0.1	3		W0316060181
6.5	SF.UN.0316.0650.S.Z3.F0010A.HA	8	6.3	58	11	19	0.1	3	W0316065180	
6.5	SF.UN.0316.0650.S.Z3.F0010A.HB	8	6.3	58	11	19	0.1	3		W0316065181
7.0	SF.UN.0316.0700.S.Z3.F0010A.HA	8	6.8	58	11	19	0.1	3	W0316070180	
7.0	SF.UN.0316.0700.S.Z3.F0010A.HB	8	6.8	58	11	19	0.1	3		W0316070181
7.5	SF.UN.0316.0750.S.Z3.F0010A.HA	8	7.3	58	12	20	0.1	3	W0316075180	
7.5	SF.UN.0316.0750.S.Z3.F0010A.HB	8	7.3	58	12	20	0.1	3		W0316075181
8.0	SF.UN.0316.0800.S.Z3.F0010A.HA	8	7.8	58	12	20	0.1	3	W0316080180	
8.0	SF.UN.0316.0800.S.Z3.F0010A.HB	8	7.8	58	12	20	0.1	3		W0316080181
8.5	SF.UN.0316.0850.S.Z3.F0010A.HA	10	8.3	66	13	23	0.1	3	W0316085180	
8.5	SF.UN.0316.0850.S.Z3.F0010A.HB	10	8.3	66	13	23	0.1	3		W0316085181
9.0	SF.UN.0316.0900.S.Z3.F0010A.HA	10	8.8	66	13	23	0.1	3	W0316090180	
9.0	SF.UN.0316.0900.S.Z3.F0010A.HB	10	8.8	66	13	23	0.1	3		W0316090181
9.5	SF.UN.0316.0950.S.Z3.F0010A.HA	10	9.3	66	14	24	0.1	3	W0316095180	
9.5	SF.UN.0316.0950.S.Z3.F0010A.HB	10	9.3	66	14	24	0.1	3		W0316095181
10.0	SF.UN.0316.1000.S.Z3.F0010A.HA	10	9.7	66	14	24	0.1	3	W0316100180	
10.0	SF.UN.0316.1000.S.Z3.F0010A.HB	10	9.7	66	14	24	0.1	3		W0316100181
12.0	SF.UN.0316.1200.S.Z3.F0010A.HA	12	11.7	73	16	26	0.1	3	W0316120180	
12.0	SF.UN.0316.1200.S.Z3.F0010A.HB	12	11.7	73	16	26	0.1	3		W0316120181
16.0	SF.UN.0316.1600.S.Z3.F0010A.HA	16	15.5	82	22	32	0.1	3	W0316160180	
16.0	SF.UN.0316.1600.S.Z3.F0010A.HB	16	15.5	82	22	32	0.1	3		W0316160181
20.0	SF.UN.0316.2000.S.Z3.F0010A.HA	20	19.5	92	26	40	0.1	3	W0316200180	
20.0	SF.UN.0316.2000.S.Z3.F0010A.HB	20	19.5	92	26	40	0.1	3		W0316200181

W0406-S, coated

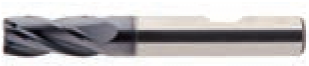
Cutting data

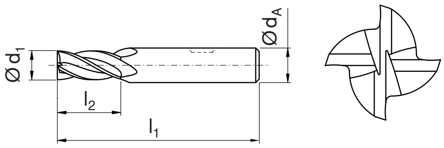
Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
						= Ø 2,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels									
1.1.2										
1.2.1	Constructional steel									
1.2.2										
1.2.3										
1.3.1	Spring steel									
1.3.2										
1.3.3										
2.1.1	Cementation steel									
2.1.2										
2.1.3										
2.2.1	Nitriding steel		60	0,5xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.2			45	0,5xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.1	Tempered steel		70	0,5xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.2			60	0,5xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.3			60	0,5xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.4			50	0,5xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.5			45	0,5xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.6			40	0,5xø	1xø	0,015	0,03	0,04	0,05	0,06
3.1.1	Non alloyed tool steel									
3.2.1	Tool steel for cold working									
3.2.2										
3.2.3										
3.2.4										
3.2.5										
3.3.1	Tool steel for hot working									
3.3.2										
3.3.3										
3.3.4										
3.3.5										
3.5.1	Hardened tool steel	< 55 HRC								
3.5.2		55–58 HRC								
3.5.3		58–60 HRC								
3.5.4		60–62 HRC								
3.5.5		62–64 HRC								
4.1.1	Stainless steel		50	0,5xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.2			40	0,5xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.3			35	0,5xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.4			50	0,5xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.5			60	0,5xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.1	Heat-resistant alloys									
4.2.2										
4.2.3										
4.2.4										
5.1.1	Conventional cast steel									
5.1.2										
5.1.3										
5.2.1	Stainless cast steel									
5.2.2										
6.1.1	Cast iron with lamellar graphite									
6.1.2										
6.1.3										
6.1.4										
6.2.1	Spheroidal cast iron									
6.2.2										
6.2.3										
6.3.1	GTW (white malleable cast iron)									
6.3.2										
6.4.1	GTS (black malleable cast iron)									
6.4.2										
7.1.1	Aluminium									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	Magnesium									
7.2.2										
7.3.1	Copper									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	CuZn (brass)									
7.4.2										
7.5.1	CuSn (bronze)									
7.5.2										
7.6.1	CuAlFe (Ampco)									
7.6.2										
7.8.1	Titanium									
7.8.2										
7.8.3										

UN **SF**

$\lambda_S = 30°$ $\gamma_S = 6°$ $d_1 = e8$ $d_A = h6$ S E

SCPP225





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	z	HA Material	HB Material
2.0	SF.UN.0406.0200.S.Z4.S.HA	2	32	8	4	W0406020240	
3.0	SF.UN.0406.0300.S.Z4.S.HA	3	32	12	4	W0406030240	
4.0	SF.UN.0406.0400.S.Z4.S.HA	4	40	12	4	W0406040240	
5.0	SF.UN.0406.0500.S.Z4.S.HA	5	50	14	4	W0406050240	
6.0	SF.UN.0406.0600.S.Z4.S.HB	6	50	16	4		W0406060241
8.0	SF.UN.0406.0800.S.Z4.S.HB	8	60	20	4		W0406080241
10.0	SF.UN.0406.1000.S.Z4.S.HB	10	70	22	4		W0406100241
12.0	SF.UN.0406.1200.S.Z4.S.HB	12	70	22	4		W0406120241
16.0	SF.UN.0406.1600.S.Z4.S.HB	16	75	25	4		W0406160241
20.0	SF.UN.0406.2000.S.Z4.S.HB	20	100	32	4		W0406200241

W0406-OL, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
						= Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**							
1.1.2								
1.2.1	**Constructional steel**							
1.2.2								
1.2.3								
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**							
2.1.2								
2.1.3								
2.2.1	**Nitriding steel**		35	0,05xø	1,5xø	0,04	0,05	0,06
2.2.2			28	0,05xø	1,5xø	0,04	0,05	0,06
2.3.1	**Tempered steel**		40	0,05xø	1,5xø	0,04	0,05	0,06
2.3.2			35	0,05xø	1,5xø	0,04	0,05	0,06
2.3.3			35	0,05xø	1,5xø	0,04	0,05	0,06
2.3.4			30	0,05xø	1,5xø	0,04	0,05	0,06
2.3.5			28	0,05xø	1,5xø	0,04	0,05	0,06
2.3.6			25	0,05xø	1,5xø	0,04	0,05	0,06
3.1.1	**Non alloyed tool steel**							
3.2.1	**Tool steel for cold working**							
3.2.2								
3.2.3								
3.2.4								
3.2.5								
3.3.1	**Tool steel for hot working**							
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel**	**< 55 HRC**						
3.5.2		**55–58 HRC**						
3.5.3		**58–60 HRC**						
3.5.4		**60–62 HRC**						
3.5.5		**62–64 HRC**						
4.1.1	**Stainless steel**		30	0,05xø	1,5xø	0,03	0,04	0,05
4.1.2			25	0,05xø	1,5xø	0,03	0,04	0,05
4.1.3			30	0,05xø	1,5xø	0,03	0,04	0,05
4.1.4			30	0,05xø	1,5xø	0,03	0,04	0,05
4.1.5			35	0,05xø	1,5xø	0,03	0,04	0,05
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**							
5.1.2								
5.1.3								
5.2.1	**Stainless cast steel**							
5.2.2								
6.1.1	**Cast iron with lamellar graphite**							
6.1.2								
6.1.3								
6.1.4								
6.2.1	**Spheroidal cast iron**							
6.2.2								
6.2.3								
6.3.1	**GTW (white malleable cast iron)**							
6.3.2								
6.4.1	**GTS (black malleable cast iron)**							
6.4.2								
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								

W0406-OL, coated

End mills

UN **SF**

$\lambda_S = 30°$

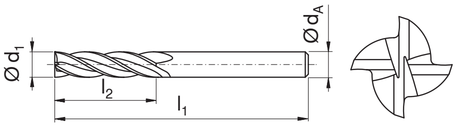
$\gamma_S = 6°$

$d_1 = e8$
$d_A = h6$

S

E

SCPP225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	z	HA Material
8.0	SF.UN.0406.0800.OL.Z4.S.HA	8	100	40	4	W0406080440
10.0	SF.UN.0406.1000.OL.Z4.S.HA	10	100	40	4	W0406100440
12.0	SF.UN.0406.1200.OL.Z4.S.HA	12	100	45	4	W0406120440
16.0	SF.UN.0406.1600.OL.Z4.S.HA	16	150	75	4	W0406160440
20.0	SF.UN.0406.2000.OL.Z4.S.HA	20	150	75	4	W0406200440

W0318-XS, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 2,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	140	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.1.2		100	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.2.1	Constructional steel	140	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.2		100	1xø	1xø	0,03	0,045	0,05	0,07	0,08
1.2.3		80	1xø	1xø	0,02	0,04	0,05	0,06	0,07
1.3.1	Spring steel								
1.3.2									
1.3.3									
2.1.1	Cementation steel	110	1xø	1xø	0,02	0,04	0,05	0,06	0,07
2.1.2		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.1.3		70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.1	Nitriding steel	80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.2.2		55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.1	Tempered steel	90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.2		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.3		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.4		70	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.5		55	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.6									
3.1.1	Non alloyed tool steel								
3.2.1	Tool steel for cold working								
3.2.2									
3.2.3									
3.2.4									
3.2.5									
3.3.1	Tool steel for hot working								
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	Hardened tool steel < 55 HRC								
3.5.2	55–58 HRC								
3.5.3	58–60 HRC								
3.5.4	60–62 HRC								
3.5.5	62–64 HRC								
4.1.1	Stainless steel	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.2		40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.3		50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.4		40	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.1.5		60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.1	Heat-resistant alloys	30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.2		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.3		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
4.2.4		30	0,3xø	1xø	0,01	0,02	0,03	0,04	0,05
5.1.1	Conventional cast steel	120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.2		90	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.1.3		70	1xø	1xø	0,03	0,045	0,05	0,07	0,08
5.2.1	Stainless cast steel	60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
5.2.2		60	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.1.1	Cast iron with lamellar graphite	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.1.3		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.1.4		80	1xø	1xø	0,015	0,03	0,04	0,05	0,06
6.2.1	Spheroidal cast iron	130	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.2		120	1xø	1xø	0,03	0,045	0,05	0,07	0,08
6.2.3		90	1xø	1xø	0,01	0,02	0,03	0,04	0,05
6.3.1	GTW (white malleable cast iron)	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.3.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.1	GTS (black malleable cast iron)	130	1xø	1xø	0,035	0,06	0,07	0,09	0,12
6.4.2		120	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.1	Aluminium								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	Magnesium								
7.2.2									
7.3.1	Copper	140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	CuZn (brass)	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	CuSn (bronze)	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	CuAlFe (Ampco)	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	Titanium	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.2		35	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.3		20	1xø	1xø	0,01	0,02	0,03	0,04	0,05

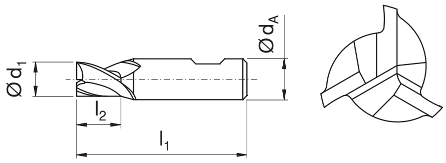
W0318-XS, coated

Mini end mills

UN **SFM**

$\lambda_S = 30°$ $\gamma_S = 5°$ $d_1 = e8$ $d_A = h6$ S E

SCPP225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	z	HB Material
2.0	SFM.UN.0318.0200.XS.Z3.S.HB	6	35	4	3	W0318020041
2.5	SFM.UN.0318.0250.XS.Z3.S.HB	6	35	4	3	W0318025041
3.0	SFM.UN.0318.0300.XS.Z3.S.HB	6	36	5	3	W0318030041
3.5	SFM.UN.0318.0350.XS.Z3.S.HB	6	36	5	3	W0318035041
4.0	SFM.UN.0318.0400.XS.Z3.S.HB	6	38	7	3	W0318040041
4.5	SFM.UN.0318.0450.XS.Z3.S.HB	6	38	7	3	W0318045041
5.0	SFM.UN.0318.0500.XS.Z3.S.HB	6	39	8	3	W0318050041
5.5	SFM.UN.0318.0550.XS.Z3.S.HB	6	39	8	3	W0318055041
5.75	SFM.UN.0318.0575.XS.Z3.S.HB	6	39	8	3	W0318057041
6.0	SFM.UN.0318.0600.XS.Z3.S.HB	6	39	8	3	W0318060041
6.75	SFM.UN.0318.0675.XS.Z3.S.HB	8	43	11	3	W0318067041
7.0	SFM.UN.0318.0700.XS.Z3.S.HB	8	43	11	3	W0318070041
7.75	SFM.UN.0318.0775.XS.Z3.S.HB	8	43	11	3	W0318077041
8.0	SFM.UN.0318.0800.XS.Z3.S.HB	8	43	11	3	W0318080041
8.7	SFM.UN.0318.0870.XS.Z3.S.HB	10	50	13	3	W0318087041
9.0	SFM.UN.0318.0900.XS.Z3.S.HB	10	50	13	3	W0318090041
9.7	SFM.UN.0318.0970.XS.Z3.S.HB	10	50	13	3	W0318097041
10.0	SFM.UN.0318.1000.XS.Z3.S.HB	10	50	13	3	W0318100041
12.0	SFM.UN.0318.1200.XS.Z3.S.HB	12	55	15	3	W0318120041
14.0	SFM.UN.0318.1400.XS.Z3.S.HB	14	58	15	3	W0318140041
16.0	SFM.UN.0318.1600.XS.Z3.S.HB	16	62	18	3	W0318160041
18.0	SFM.UN.0318.1800.XS.Z3.S.HB	18	70	20	3	W0318180041
20.0	SFM.UN.0318.2000.XS.Z3.S.HB	20	75	22	3	W0318200041

W0444-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	260	1xø	1xø	0,025	0,045	0,07	0,1	0,12
1.1.2		240	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.1	**Constructional steel**	250	1xø	1xø	0,025	0,045	0,07	0,1	0,12
1.2.2		230	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.3		220	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**	210	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.3		190	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.2.1	**Nitriding steel**	190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.2.2		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.1	**Tempered steel**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.2		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.3		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.4		180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.5		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.6		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.1.1	**Non alloyed tool steel**	185	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.1	**Tool steel for cold working**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.3		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.2.4		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.5		140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.1	**Tool steel for hot working**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.2		180	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.3.3		150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.4		140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.5		130	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.5.1	**Hardened tool steel** **< 55 HRC**								
3.5.2	**55–58 HRC**								
3.5.3	**58–60 HRC**								
3.5.4	**60–62 HRC**								
3.5.5	**62–64 HRC**								
4.1.1	**Stainless steel**	100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.2		80	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.3		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.4		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.5		110	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.2.1	**Heat-resistant alloys**	30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.2		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.3		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.4		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.3		120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**	100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
5.2.2		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
6.1.1	**Cast iron with lamellar graphite**	200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.2		180	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.3		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.1.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.1	**Spheroidal cast iron**	190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.3		150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.1	**GTW (white malleable cast iron)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.1	**GTS (black malleable cast iron)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.2		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.3		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.4		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.5		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.6		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**	300	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.2		350	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**	240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.2		280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**	140	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.2		160	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.8.1	**Titanium**	90	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.8.2		80	1xø	1xø	0,015	0,03	0,05	0,06	0,08
7.8.3		50	1xø	1xø	0,012	0,025	0,04	0,05	0,07

W0444-L, coated

CPC end mills (Circle Power Cutting)

UN

CPC SF

λ_s=35° 36,5°

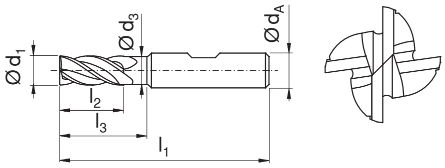
γ_s=8°

d_1 = f8 d_A=h6

F 45°

E

SCPP220



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material
3.0	CPC-SF.UN.0444.0300.L.Z4.F0010A.HB	6	2.8	57	8	13	0.1	4	W0444030341
4.0	CPC-SF.UN.0444.0400.L.Z4.F0010A.HB	6	3.8	57	11	17	0.1	4	W0444040341
5.0	CPC-SF.UN.0444.0500.L.Z4.F0010A.HB	6	4.8	57	13	19	0.1	4	W0444050341
6.0	CPC-SF.UN.0444.0600.L.Z4.F0010A.HB	6	5.8	57	13	19	0.1	4	W0444060341
8.0	CPC-SF.UN.0444.0800.L.Z4.F0020A.HB	8	7.7	63	21	25	0.2	4	W0444080341
10.0	CPC-SF.UN.0444.1000.L.Z4.F0020A.HB	10	9.7	72	22	30	0.2	4	W0444100341
12.0	CPC-SF.UN.0444.1200.L.Z4.F0030A.HB	12	11.6	83	26	36	0.3	4	W0444120341
16.0	CPC-SF.UN.0444.1600.L.Z4.F0030A.HB	16	15.5	92	36	42	0.3	4	W0444160341
20.0	CPC-SF.UN.0444.2000.L.Z4.F0030A.HB	20	19.5	104	41	52	0.3	4	W0444200341

W0444-OL, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
						= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		100	0,1xø	4,5xø	0,04	0,05	0,06	0,07
1.1.2			90	0,1xø	4,5xø	0,04	0,05	0,06	0,07
1.2.1	**Constructional steel**		100	0,1xø	4,5xø	0,045	0,05	0,07	0,08
1.2.2			90	0,1xø	4,5xø	0,045	0,05	0,07	0,08
1.2.3			90	0,1xø	4,5xø	0,04	0,05	0,06	0,07
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**		100	0,1xø	4,5xø	0,04	0,05	0,06	0,07
2.1.2			90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.1.3			90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.2.1	**Nitriding steel**		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.2.2			80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.2			90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.3			90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.4			90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.5			80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.6									
3.1.1	**Non alloyed tool steel**		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.2.1	**Tool steel for cold working**		80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.2.2			80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.2.3									
3.2.4			80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.2.5									
3.3.1	**Tool steel for hot working**								
3.3.2									
3.3.3			80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.3.4									
3.3.5									
3.5.1	**Hardened tool steel**	**< 55 HRC**							
3.5.2		**55–58 HRC**							
3.5.3		**58–60 HRC**							
3.5.4		**60–62 HRC**							
3.5.5		**62–64 HRC**							
4.1.1	**Stainless steel**		95	0,1xø	4,5xø	0,03	0,04	0,05	0,06
4.1.2			85	0,1xø	4,5xø	0,03	0,04	0,05	0,06
4.1.3			90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
4.1.4			90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
4.1.5			95	0,1xø	4,5xø	0,03	0,04	0,05	0,06
4.2.1	**Heat-resistant alloys**								
4.2.2									
4.2.3									
4.2.4									
5.1.1	**Conventional cast steel**		100	0,1xø	4,5xø	0,04	0,05	0,06	0,07
5.1.2			90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
5.1.3									
5.2.1	**Stainless cast steel**		80	0,1xø	4,5xø	0,02	0,03	0,04	0,05
5.2.2			80	0,1xø	4,5xø	0,02	0,03	0,04	0,05
6.1.1	**Cast iron with lamellar graphite**		110	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.1.2			100	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.1.3			100	0,1xø	4,5xø	0,03	0,04	0,05	0,06
6.1.4			90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
6.2.1	**Spheroidal cast iron**		110	0,1xø	4,5xø	0,045	0,05	0,07	0,08
6.2.2			100	0,1xø	4,5xø	0,045	0,05	0,07	0,08
6.2.3			100	0,1xø	4,5xø	0,02	0,03	0,04	0,05
6.3.1	**GTW (white malleable cast iron)**		110	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.3.2			100	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.4.1	**GTS (black malleable cast iron)**		110	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.4.2			100	0,1xø	4,5xø	0,06	0,07	0,09	0,12
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									

W0444-OL, coated

CPC end mills (Circle Power Cutting)

UN

CPC SF

λ_S=35° 36,5°

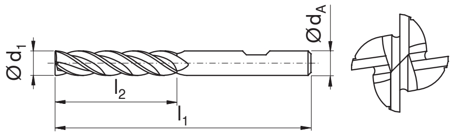
γ_S=8°

d_1 = f8
d_A=h6

F 45°

D

SCPP220



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HB Material
6.0	CPC-SF.UN.0444.0600.OL.Z4.F0010A.HB	6	80	33	0.1	4	W0444060541
8.0	CPC-SF.UN.0444.0800.OL.Z4.F0020A.HB	8	100	40	0.2	4	W0444080541
10.0	CPC-SF.UN.0444.1000.OL.Z4.F0020A.HB	10	105	50	0.2	4	W0444100541
12.0	CPC-SF.UN.0444.1200.OL.Z4.F0030A.HB	12	125	60	0.3	4	W0444120541
16.0	CPC-SF.UN.0444.1600.OL.Z4.F0030A.HB	16	150	80	0.3	4	W0444160541
20.0	CPC-SF.UN.0444.2000.OL.Z4.F0030A.HB	20	160	90	0.3	4	W0444200541

W0444-OLS, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	f_z [mm] > Ø 8,0 = Ø 12,0	f_z [mm] > Ø 12,0 = Ø 16,0	f_z [mm] > Ø 16,0 = Ø 20,0
1.1.1	Machining steels	100	0,1xø	2xø	0,04	0,05	0,06	0,07
1.1.2		90	0,1xø	2xø	0,04	0,05	0,06	0,07
1.2.1	Constructional steel	100	0,1xø	2xø	0,045	0,05	0,07	0,08
1.2.2		90	0,1xø	2xø	0,045	0,05	0,07	0,08
1.2.3		90	0,1xø	2xø	0,04	0,05	0,06	0,07
1.3.1	Spring steel							
1.3.2								
1.3.3								
2.1.1	Cementation steel	100	0,1xø	2xø	0,04	0,05	0,06	0,07
2.1.2		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.1.3		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.2.1	Nitriding steel	90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.2.2		80	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.1	Tempered steel	90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.2		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.3		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.4		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.5		80	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.6								
3.1.1	Non alloyed tool steel	90	0,1xø	2xø	0,03	0,04	0,05	0,06
3.2.1	Tool steel for cold working	80	0,1xø	2xø	0,03	0,04	0,05	0,06
3.2.2		80	0,1xø	2xø	0,03	0,04	0,05	0,06
3.2.3								
3.2.4		80	0,1xø	2xø	0,03	0,04	0,05	0,06
3.2.5								
3.3.1	Tool steel for hot working							
3.3.2								
3.3.3		80	0,1xø	2xø	0,03	0,04	0,05	0,06
3.3.4								
3.3.5								
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel	95	0,1xø	2xø	0,03	0,04	0,05	0,06
4.1.2		85	0,1xø	2xø	0,03	0,04	0,05	0,06
4.1.3		90	0,1xø	2xø	0,03	0,04	0,05	0,06
4.1.4		90	0,1xø	2xø	0,03	0,04	0,05	0,06
4.1.5		95	0,1xø	2xø	0,03	0,04	0,05	0,06
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel	100	0,1xø	2xø	0,04	0,05	0,06	0,07
5.1.2		90	0,1xø	2xø	0,03	0,04	0,05	0,06
5.1.3								
5.2.1	Stainless cast steel	80	0,1xø	2xø	0,02	0,03	0,04	0,05
5.2.2		80	0,1xø	2xø	0,02	0,03	0,04	0,05
6.1.1	Cast iron with lamellar graphite	110	0,1xø	2xø	0,06	0,07	0,09	0,12
6.1.2		100	0,1xø	2xø	0,06	0,07	0,09	0,12
6.1.3		100	0,1xø	2xø	0,03	0,04	0,05	0,06
6.1.4		90	0,1xø	2xø	0,03	0,04	0,05	0,06
6.2.1	Spheroidal cast iron	110	0,1xø	2xø	0,045	0,05	0,07	0,08
6.2.2		100	0,1xø	2xø	0,045	0,05	0,07	0,08
6.2.3		100	0,1xø	2xø	0,02	0,03	0,04	0,05
6.3.1	GTW (white malleable cast iron)	110	0,1xø	2xø	0,06	0,07	0,09	0,12
6.3.2		100	0,1xø	2xø	0,06	0,07	0,09	0,12
6.4.1	GTS (black malleable cast iron)	110	0,1xø	2xø	0,06	0,07	0,09	0,12
6.4.2		100	0,1xø	2xø	0,06	0,07	0,09	0,12
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

W0444-OLS, coated

CPC end mills (Circle Power Cutting)

UN

CPC SF

λ_S=35° 36,5°

γ_S=8°

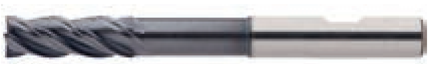
d_1 = f8

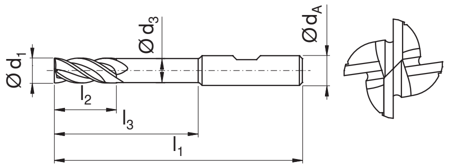
d_A=h6

F 45°

E

SCPP220





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material
6.0	CPC-SF.UN.0444.0600.OLS.Z4.F0010A.HB	6	5.8	80	15	42	0.1	4	W0444060441
8.0	CPC-SF.UN.0444.0800.OLS.Z4.F0020A.HB	8	7.7	100	20	62	0.2	4	W0444080441
10.0	CPC-SF.UN.0444.1000.OLS.Z4.F0020A.HB	10	9.7	100	25	58	0.2	4	W0444100441
12.0	CPC-SF.UN.0444.1200.OLS.Z4.F0030A.HB	12	11.6	120	30	73	0.3	4	W0444120441
16.0	CPC-SF.UN.0444.1600.OLS.Z4.F0030A.HB	16	15.5	150	40	100	0.3	4	W0444160441
20.0	CPC-SF.UN.0444.2000.OLS.Z4.F0030A.HB	20	19.5	150	50	98	0.3	4	W0444200441

W0422-L and W0422-LS, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	180	1xø	1xø	0,04	0,05	0,06	0,07
1.1.2		130	1xø	1xø	0,04	0,05	0,06	0,07
1.2.1	**Constructional steel**	180	1xø	1xø	0,045	0,05	0,07	0,08
1.2.2		130	1xø	1xø	0,045	0,05	0,07	0,08
1.2.3		110	1xø	1xø	0,04	0,05	0,06	0,07
1.3.1	**Spring steel**	110	1xø	1xø	0,03	0,04	0,05	0,06
1.3.2								
1.3.3								
2.1.1	**Cementation steel**	170	1xø	1xø	0,04	0,05	0,06	0,07
2.1.2		140	1xø	1xø	0,03	0,04	0,05	0,06
2.1.3		110	1xø	1xø	0,03	0,04	0,05	0,06
2.2.1	**Nitriding steel**	130	1xø	1xø	0,03	0,04	0,05	0,06
2.2.2		100	1xø	1xø	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**	140	1xø	1xø	0,03	0,04	0,05	0,06
2.3.2		130	1xø	1xø	0,03	0,04	0,05	0,06
2.3.3		130	1xø	1xø	0,03	0,04	0,05	0,06
2.3.4		110	1xø	1xø	0,03	0,04	0,05	0,06
2.3.5		90	1xø	1xø	0,03	0,04	0,05	0,06
2.3.6								
3.1.1	**Non alloyed tool steel**	110	1xø	1xø	0,03	0,04	0,05	0,06
3.2.1	**Tool steel for cold working**	100	1xø	1xø	0,03	0,04	0,05	0,06
3.2.2		80	1xø	1xø	0,03	0,04	0,05	0,06
3.2.3								
3.2.4		80	1xø	1xø	0,03	0,04	0,05	0,06
3.2.5								
3.3.1	**Tool steel for hot working**							
3.3.2								
3.3.3		80	1xø	1xø	0,03	0,04	0,05	0,06
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel** **< 55 HRC**							
3.5.2	**55–58 HRC**							
3.5.3	**58–60 HRC**							
3.5.4	**60–62 HRC**							
3.5.5	**62–64 HRC**							
4.1.1	**Stainless steel**	100	1xø	1xø	0,02	0,03	0,04	0,05
4.1.2		80	1xø	1xø	0,02	0,03	0,04	0,05
4.1.3		100	1xø	1xø	0,02	0,03	0,04	0,05
4.1.4		100	1xø	1xø	0,02	0,03	0,04	0,05
4.1.5		110	1xø	1xø	0,02	0,03	0,04	0,05
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**	180	1xø	1xø	0,04	0,05	0,06	0,07
5.1.2		130	1xø	1xø	0,03	0,04	0,05	0,06
5.1.3								
5.2.1	**Stainless cast steel**	80	1xø	1xø	0,02	0,03	0,04	0,05
5.2.2		100	1xø	1xø	0,02	0,03	0,04	0,05
6.1.1	**Cast iron with lamellar graphite**	220	1xø	1xø	0,06	0,07	0,09	0,12
6.1.2		190	1xø	1xø	0,06	0,07	0,09	0,12
6.1.3		160	1xø	1xø	0,03	0,04	0,05	0,06
6.1.4		130	1xø	1xø	0,03	0,04	0,05	0,06
6.2.1	**Spheroidal cast iron**	220	1xø	1xø	0,045	0,05	0,07	0,08
6.2.2		190	1xø	1xø	0,045	0,05	0,07	0,08
6.2.3		160	1xø	1xø	0,02	0,03	0,04	0,05
6.3.1	**GTW (white malleable cast iron)**	220	1xø	1xø	0,06	0,07	0,09	0,12
6.3.2		190	1xø	1xø	0,06	0,07	0,09	0,12
6.4.1	**GTS (black malleable cast iron)**	220	1xø	1xø	0,06	0,07	0,09	0,12
6.4.2		190	1xø	1xø	0,06	0,07	0,09	0,12
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								

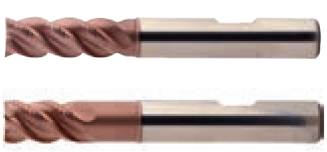
W0422-L and W0422-LS, coated

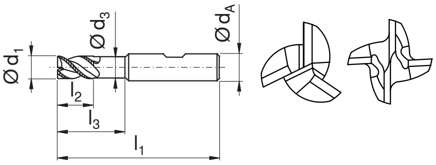
HPC rough milling cutters

UN **HPC SR**

$\lambda_S = 45°$ $\gamma_S = 8°$ $d_1 = d11$ $d_A = h6$ F 45° E

SCPP230





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material	HB Material
4.0	HPC-SR.UN.0422.0400.LS.Z3.F0010A.HB	6	3.8	57	8	18	0.1	3		W0422040351
4.0	HPC-SR.UN.0422.0400.L.Z3.F0010A.HB	6	3.8	57	11	18	0.1	3	W0422040451	
5.0	HPC-SR.UN.0422.0500.LS.Z3.F0010A.HB	6	4.8	57	9	20	0.1	3		W0422050351
5.0	HPC-SR.UN.0422.0500.L.Z3.F0010A.HB	6	4.8	57	13	20	0.1	3	W0422050451	
6.0	HPC-SR.UN.0422.0600.LS.Z4.F0010A.HB	6	5.8	57	10	20	0.1	4		W0422060351
6.0	HPC-SR.UN.0422.0600.L.Z4.F0010A.HB	6	5.8	57	13	20	0.1	4	W0422060451	
8.0	HPC-SR.UN.0422.0800.LS.Z4.F0020A.HB	8	7.7	63	12	25	0.2	4		W0422080351
8.0	HPC-SR.UN.0422.0800.L.Z4.F0020A.HB	8	7.7	63	19	25	0.2	4	W0422080451	
10.0	HPC-SR.UN.0422.1000.LS.Z4.F0020A.HB	10	9.5	72	15	30	0.2	4		W0422100351
10.0	HPC-SR.UN.0422.1000.L.Z4.F0020A.HB	10	9.5	72	22	30	0.2	4	W0422100451	
12.0	HPC-SR.UN.0422.1200.LS.Z4.F0030A.HB	12	11.5	83	18	35	0.3	4		W0422120351
12.0	HPC-SR.UN.0422.1200.L.Z4.F0030A.HB	12	11.5	83	26	35	0.3	4	W0422120451	
16.0	HPC-SR.UN.0422.1600.LS.Z4.F0030A.HB	16	15.5	92	24	40	0.3	4		W0422160351
16.0	HPC-SR.UN.0422.1600.L.Z4.F0030A.HB	16	15.5	92	32	40	0.3	4	W0422160451	
20.0	HPC-SR.UN.0422.2000.LS.Z4.F0030A.HB	20	19.5	104	30	50	0.3	4		W0422200351
20.0	HPC-SR.UN.0422.2000.L.Z4.F0030A.HB	20	19.5	104	38	50	0.3	4	W0422200451	

W0216-S, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
						= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		200	0,05xø	0,08xø	0,02	0,04	0,05	0,06	0,07
1.1.2			180	0,05xø	0,08xø	0,02	0,04	0,05	0,06	0,07
1.2.1	**Constructional steel**		200	0,05xø	0,08xø	0,03	0,045	0,05	0,07	0,08
1.2.2			180	0,05xø	0,08xø	0,03	0,045	0,05	0,07	0,08
1.2.3			150	0,05xø	0,08xø	0,02	0,04	0,05	0,06	0,07
1.3.1	**Spring steel**									
1.3.2										
1.3.3										
2.1.1	**Cementation steel**		180	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.1.2			170	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.1.3			140	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.2.1	**Nitriding steel**		150	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.2.2			130	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**		160	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.3.2			150	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.3.3			150	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.3.4			140	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.3.5			130	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
2.3.6										
3.1.1	**Non alloyed tool steel**									
3.2.1	**Tool steel for cold working**									
3.2.2										
3.2.3										
3.2.4										
3.2.5										
3.3.1	**Tool steel for hot working**									
3.3.2										
3.3.3										
3.3.4										
3.3.5										
3.5.1	**Hardened tool steel**	**< 55 HRC**								
3.5.2		**55–58 HRC**								
3.5.3		**58–60 HRC**								
3.5.4		**60–62 HRC**								
3.5.5		**62–64 HRC**								
4.1.1	**Stainless steel**		100	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
4.1.2			40	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
4.1.3			50	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
4.1.4			50	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
4.1.5			60	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
4.2.1	**Heat-resistant alloys**		30	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
4.2.2			30	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
4.2.3			30	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
4.2.4			30	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**		100	0,05xø	0,08xø	0,03	0,045	0,05	0,07	0,08
5.1.2			80	0,05xø	0,08xø	0,03	0,045	0,05	0,07	0,08
5.1.3			60	0,05xø	0,08xø	0,03	0,045	0,05	0,07	0,08
5.2.1	**Stainless cast steel**		50	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
5.2.2			50	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
6.1.1	**Cast iron with lamellar graphite**		120	0,05xø	0,08xø	0,035	0,06	0,07	0,09	0,12
6.1.2			80	0,05xø	0,08xø	0,035	0,06	0,07	0,09	0,12
6.1.3			80	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
6.1.4			70	0,05xø	0,08xø	0,015	0,03	0,04	0,05	0,06
6.2.1	**Spheroidal cast iron**		120	0,05xø	0,08xø	0,03	0,045	0,05	0,07	0,08
6.2.2			200	0,05xø	0,08xø	0,03	0,045	0,05	0,07	0,08
6.2.3			80	0,05xø	0,08xø	0,01	0,02	0,03	0,04	0,05
6.3.1	**GTW (white malleable cast iron)**		120	0,05xø	0,08xø	0,035	0,06	0,07	0,09	0,12
6.3.2			100	0,05xø	0,08xø	0,035	0,06	0,07	0,09	0,12
6.4.1	**GTS (black malleable cast iron)**		120	0,05xø	0,08xø	0,035	0,06	0,07	0,09	0,12
6.4.2			100	0,05xø	0,08xø	0,035	0,06	0,07	0,09	0,12
7.1.1	**Aluminium**									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**		140	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.2			120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.3			100	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.4			120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.5			100	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.6			120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**		150	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.4.2			200	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**		120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.5.2			140	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**		120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.6.2			140	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**		50	1xø	0,03xø	0,01	0,02	0,03	0,04	0,05
7.8.2			60	1xø	0,03xø	0,01	0,02	0,03	0,04	0,05
7.8.3			20	1xø	0,03xø	0,01	0,02	0,03	0,04	0,05

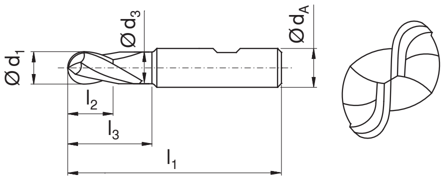
W0216-S, coated

Ball nose milling cutters

UN **VR**

$\lambda_S = 30°$ $\gamma_S = 13°$ $d_1 = e8$ $d_A = h6$ R E

SCPP225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HB Material
3.0	VR.UN.0216.0300.S.Z2.R0150.HB	6	2.9	50	5	9	1.5	2	W0216030141
4.0	VR.UN.0216.0400.S.Z2.R0200.HB	6	3.9	54	8	12	2	2	W0216040141
5.0	VR.UN.0216.0500.S.Z2.R0250.HB	6	4.9	54	9	15	2.5	2	W0216050141
6.0	VR.UN.0216.0600.S.Z2.R0300.HB	6	5.9	54	10	17	3	2	W0216060141
7.0	VR.UN.0216.0700.S.Z2.R0350.HB	8	6.8	58	11	19	3.5	2	W0216070141
8.0	VR.UN.0216.0800.S.Z2.R0400.HB	8	7.8	58	12	20	4	2	W0216080141
9.0	VR.UN.0216.0900.S.Z2.R0450.HB	10	8.8	66	13	23	4.5	2	W0216090141
10.0	VR.UN.0216.1000.S.Z2.R0500.HB	10	9.8	66	14	26	5	2	W0216100141
12.0	VR.UN.0216.1200.S.Z2.R0600.HB	12	11.8	73	16	28	6	2	W0216120141
14.0	VR.UN.0216.1400.S.Z2.R0700.HB	14	13.8	75	18	30	7	2	W0216140141
16.0	VR.UN.0216.1600.S.Z2.R0800.HB	16	15.7	82	22	32	8	2	W0216160141
18.0	VR.UN.0216.1800.S.Z2.R0900.HB	18	17.7	84	24	35	9	2	W0216180141
20.0	VR.UN.0216.2000.S.Z2.R1000.HB	20	19.7	92	26	40	10	2	W0216200141

W0448-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	260	1xø	1xø	0,025	0,045	0,07	0,1	0,12
1.1.2		240	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.1	**Constructional steel**	250	1xø	1xø	0,025	0,045	0,07	0,1	0,12
1.2.2		230	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.3		220	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**	210	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.3		190	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.2.1	**Nitriding steel**	190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.2.2		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.1	**Tempered steel**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.2		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.3		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.4		180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.5		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.6		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.1.1	**Non alloyed tool steel**	185	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.1	**Tool steel for cold working**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.3		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.2.4		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.5		140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.1	**Tool steel for hot working**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.2		180	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.3.3		150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.4		140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.5		130	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.5.1	**Hardened tool steel** **< 55 HRC**								
3.5.2	**55–58 HRC**								
3.5.3	**58–60 HRC**								
3.5.4	**60–62 HRC**								
3.5.5	**62–64 HRC**								
4.1.1	**Stainless steel**	100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.2		80	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.3		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.4		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.1.5		110	1xø	1xø	0,012	0,025	0,04	0,05	0,07
4.2.1	**Heat-resistant alloys**	30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.2		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.3		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
4.2.4		30	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.3		120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**	100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
5.2.2		100	1xø	1xø	0,012	0,025	0,04	0,05	0,07
6.1.1	**Cast iron with lamellar graphite**	200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.2		180	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.3		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.1.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.1	**Spheroidal cast iron**	190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.3		150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.1	**GTW (white malleable cast iron)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.1	**GTS (black malleable cast iron)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.2		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.3		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.4		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.5		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.6		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**	300	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.2		350	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**	240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.2		280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**	140	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.2		160	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.8.1	**Titanium**	90	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.8.2		80	1xø	1xø	0,015	0,03	0,05	0,06	0,08
7.8.3		50	1xø	1xø	0,012	0,025	0,04	0,05	0,07

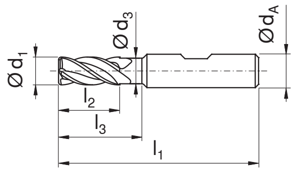
W0448-L, coated

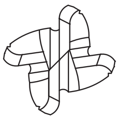
HPC torus milling cutters

UN **HPC TF**

$\lambda_S = 35°\ 38°$ $\gamma_S = 8°$ $d_1 = f8$ $d_A = h6$ R E

SCPP215





d1 [mm]	Type, description	dA [mm]	d3 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	R [mm]	z	HB Material
3.0	HPC-TF.UN.0448.0300.L.Z4.R0010.HB	6	2.8	57	8	13	0.1	4	W0448030641
3.0	HPC-TF.UN.0448.0300.L.Z4.R0040.HB	6	2.8	57	8	13	0.4	4	W0448030741
3.0	HPC-TF.UN.0448.0300.L.Z4.R0050.HB	6	2.8	57	8	13	0.5	4	W0448030841
3.0	HPC-TF.UN.0448.0300.L.Z4.R0100.HB	6	2.8	57	8	13	1	4	W0448030941
4.0	HPC-TF.UN.0448.0400.L.Z4.R0010.HB	6	3.8	57	11	17	0.1	4	W0448040641
4.0	HPC-TF.UN.0448.0400.L.Z4.R0040.HB	6	3.8	57	11	17	0.4	4	W0448040741
4.0	HPC-TF.UN.0448.0400.L.Z4.R0050.HB	6	3.8	57	11	17	0.5	4	W0448040841
4.0	HPC-TF.UN.0448.0400.L.Z4.R0100.HB	6	3.8	57	11	17	1	4	W0448040941
5.0	HPC-TF.UN.0448.0500.L.Z4.R0010.HB	6	4.8	57	13	19	0.1	4	W0448050641
5.0	HPC-TF.UN.0448.0500.L.Z4.R0040.HB	6	4.8	57	13	19	0.4	4	W0448050741
5.0	HPC-TF.UN.0448.0500.L.Z4.R0050.HB	6	4.8	57	13	19	0.5	4	W0448050841
5.0	HPC-TF.UN.0448.0500.L.Z4.R0100.HB	6	4.8	57	13	19	1	4	W0448050941
6.0	HPC-TF.UN.0448.0600.L.Z4.R0010.HB	6	5.8	57	13	19	0.1	4	W0448060641
6.0	HPC-TF.UN.0448.0600.L.Z4.R0050.HB	6	5.8	57	13	19	0.5	4	W0448060741
6.0	HPC-TF.UN.0448.0600.L.Z4.R0100.HB	6	5.8	57	13	19	1	4	W0448060841
6.0	HPC-TF.UN.0448.0600.L.Z4.R0150.HB	6	5.8	57	13	19	1.5	4	W0448060941
8.0	HPC-TF.UN.0448.0800.L.Z4.R0015.HB	8	7.7	63	21	25	0.15	4	W0448080541
8.0	HPC-TF.UN.0448.0800.L.Z4.R0050.HB	8	7.7	63	21	25	0.5	4	W0448080641
8.0	HPC-TF.UN.0448.0800.L.Z4.R0100.HB	8	7.7	63	21	25	1	4	W0448080741
8.0	HPC-TF.UN.0448.0800.L.Z4.R0150.HB	8	7.7	63	21	25	1.5	4	W0448080841
8.0	HPC-TF.UN.0448.0800.L.Z4.R0200.HB	8	7.7	63	21	25	2	4	W0448080941
10.0	HPC-TF.UN.0448.1000.L.Z4.R0015.HB	10	9.7	72	22	30	0.15	4	W0448100541
10.0	HPC-TF.UN.0448.1000.L.Z4.R0050.HB	10	9.7	72	22	30	0.5	4	W0448100641
10.0	HPC-TF.UN.0448.1000.L.Z4.R0100.HB	10	9.7	72	22	30	1	4	W0448100741
10.0	HPC-TF.UN.0448.1000.L.Z4.R0150.HB	10	9.7	72	22	30	1.5	4	W0448100841
10.0	HPC-TF.UN.0448.1000.L.Z4.R0200.HB	10	9.7	72	22	30	2	4	W0448100941
12.0	HPC-TF.UN.0448.1200.L.Z4.R0020.HB	12	11.6	83	26	36	0.2	4	W0448120641
12.0	HPC-TF.UN.0448.1200.L.Z4.R0050.HB	12	11.6	83	26	36	0.5	4	W0448120741
12.0	HPC-TF.UN.0448.1200.L.Z4.R0100.HB	12	11.6	83	26	36	1	4	W0448120841
12.0	HPC-TF.UN.0448.1200.L.Z4.R0150.HB	12	11.6	83	26	36	1.5	4	W0448120941
12.0	HPC-TF.UN.0448.1200.L.Z4.R0200.HB	12	11.6	83	26	36	2	4	W0448120A41
12.0	HPC-TF.UN.0448.1200.L.Z4.R0400.HB	12	11.6	83	26	36	4	4	W0448120C41
14.0	HPC-TF.UN.0448.1400.L.Z4.R0030.HB	14	13.6	83	26	36	0.3	4	W0448140641
14.0	HPC-TF.UN.0448.1400.L.Z4.R0100.HB	14	13.6	83	26	36	1	4	W0448140741
14.0	HPC-TF.UN.0448.1400.L.Z4.R0200.HB	14	13.6	83	26	36	2	4	W0448140841
14.0	HPC-TF.UN.0448.1400.L.Z4.R0400.HB	14	13.6	83	26	36	4	4	W0448140941
16.0	HPC-TF.UN.0448.1600.L.Z4.R0030.HB	16	15.5	92	36	42	0.3	4	W0448160641
16.0	HPC-TF.UN.0448.1600.L.Z4.R0100.HB	16	15.5	92	36	42	1	4	W0448160741
16.0	HPC-TF.UN.0448.1600.L.Z4.R0200.HB	16	15.5	92	36	42	2	4	W0448160841
16.0	HPC-TF.UN.0448.1600.L.Z4.R0400.HB	16	15.5	92	36	42	4	4	W0448160941
18.0	HPC-TF.UN.0448.1800.L.Z4.R0100.HB	18	17.5	92	36	42	1	4	W0448180641
18.0	HPC-TF.UN.0448.1800.L.Z4.R0200.HB	18	17.5	92	36	42	2	4	W0448180741
18.0	HPC-TF.UN.0448.1800.L.Z4.R0400.HB	18	17.5	92	36	42	4	4	W0448180841
20.0	HPC-TF.UN.0448.2000.L.Z4.R0030.HB	20	19.5	104	41	52	0.3	4	W0448200641
20.0	HPC-TF.UN.0448.2000.L.Z4.R0100.HB	20	19.5	104	41	52	1	4	W0448200741
20.0	HPC-TF.UN.0448.2000.L.Z4.R0200.HB	20	19.5	104	41	52	2	4	W0448200841
20.0	HPC-TF.UN.0448.2000.L.Z4.R0400.HB	20	19.5	104	41	52	4	4	W0448200941

W0740-S, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 4,0 = Ø 8,0	 > Ø 8,0 = Ø 12,0
1.1.1	**Machining steels**	100	0,2xø	0,2xø	0,04	0,05
1.1.2		70	0,2xø	0,2xø	0,04	0,05
1.2.1	**Constructional steel**	100	0,2xø	0,2xø	0,045	0,05
1.2.2		70	0,2xø	0,2xø	0,045	0,05
1.2.3		60	0,2xø	0,2xø	0,04	0,05
1.3.1	**Spring steel**					
1.3.2						
1.3.3						
2.1.1	**Cementation steel**	95	0,2xø	0,2xø	0,03	0,04
2.1.2		75	0,2xø	0,2xø	0,03	0,04
2.1.3		60	0,2xø	0,2xø	0,03	0,04
2.2.1	**Nitriding steel**	70	0,2xø	0,2xø	0,03	0,04
2.2.2		55	0,2xø	0,2xø	0,03	0,04
2.3.1	**Tempered steel**	80	0,2xø	0,2xø	0,03	0,04
2.3.2		70	0,2xø	0,2xø	0,03	0,04
2.3.3		70	0,2xø	0,2xø	0,03	0,04
2.3.4		60	0,2xø	0,2xø	0,03	0,04
2.3.5		55	0,2xø	0,2xø	0,03	0,04
2.3.6						
3.1.1	**Non alloyed tool steel**					
3.2.1	**Tool steel for cold working**					
3.2.2						
3.2.3						
3.2.4						
3.2.5						
3.3.1	**Tool steel for hot working**					
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**					
4.1.2						
4.1.3						
4.1.4						
4.1.5						
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**	100	0,2xø	0,2xø	0,045	0,05
5.1.2		80	0,2xø	0,2xø	0,045	0,05
5.1.3		60	0,2xø	0,2xø	0,045	0,05
5.2.1	**Stainless cast steel**					
5.2.2						
6.1.1	**Cast iron with lamellar graphite**	120	0,2xø	0,2xø	0,06	0,07
6.1.2		100	0,2xø	0,2xø	0,06	0,07
6.1.3		80	0,2xø	0,2xø	0,03	0,04
6.1.4						
6.2.1	**Spheroidal cast iron**	120	0,2xø	0,2xø	0,045	0,05
6.2.2		100	0,2xø	0,2xø	0,045	0,05
6.2.3		80	0,2xø	0,2xø	0,02	0,03
6.3.1	**GTW (white malleable cast iron)**	120	0,2xø	0,2xø	0,06	0,07
6.3.2		100	0,2xø	0,2xø	0,06	0,07
6.4.1	**GTS (black malleable cast iron)**	120	0,2xø	0,2xø	0,06	0,07
6.4.2		100	0,2xø	0,2xø	0,06	0,07
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						

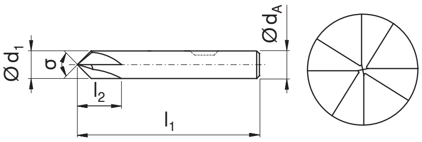
W0740-S, coated

Deburring cutters

UN **E**

$\lambda_s = 0°$ $\gamma_s = 0°$ $d_1 = h6$ $d_A = h6$ σ 90° E/D

SCPP225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	z	HA Material	HB Material
4.0	E.UN.0740.0400.S.Z4.HA	4	54	9	90	4	W0740040340	
6.0	E.UN.0740.0600.S.Z4.HA	6	54	12	90	4	W0740060340	
6.0	E.UN.0740.0600.S.Z4.HB	6	54	12	90	4		W0740060341
8.0	E.UN.0740.0800.S.Z4.HA	8	58	15	90	4	W0740080340	
8.0	E.UN.0740.0800.S.Z4.HB	8	58	15	90	4		W0740080341
10.0	E.UN.0740.1000.S.Z4.HA	10	66	16	90	4	W0740100340	
10.0	E.UN.0740.1000.S.Z4.HB	10	66	16	90	4		W0740100341
12.0	E.UN.0740.1200.S.Z4.HA	12	73	18	90	4	W0740120340	
12.0	E.UN.0740.1200.S.Z4.HB	12	73	18	90	4		W0740120341

W0741-S, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]	
						= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
1.1.1	Machining steels		100	0,2xø	0,2xø	0,04	0,05
1.1.2			70	0,2xø	0,2xø	0,04	0,05
1.2.1	Constructional steel		100	0,2xø	0,2xø	0,045	0,05
1.2.2			70	0,2xø	0,2xø	0,045	0,05
1.2.3			60	0,2xø	0,2xø	0,04	0,05
1.3.1	Spring steel						
1.3.2							
1.3.3							
2.1.1	Cementation steel		95	0,2xø	0,2xø	0,03	0,04
2.1.2			75	0,2xø	0,2xø	0,03	0,04
2.1.3			60	0,2xø	0,2xø	0,03	0,04
2.2.1	Nitriding steel		70	0,2xø	0,2xø	0,03	0,04
2.2.2			55	0,2xø	0,2xø	0,03	0,04
2.3.1	Tempered steel		80	0,2xø	0,2xø	0,03	0,04
2.3.2			70	0,2xø	0,2xø	0,03	0,04
2.3.3			70	0,2xø	0,2xø	0,03	0,04
2.3.4			60	0,2xø	0,2xø	0,03	0,04
2.3.5			55	0,2xø	0,2xø	0,03	0,04
2.3.6							
3.1.1	Non alloyed tool steel						
3.2.1	Tool steel for cold working						
3.2.2							
3.2.3							
3.2.4							
3.2.5							
3.3.1	Tool steel for hot working						
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	Hardened tool steel	< 55 HRC					
3.5.2		55–58 HRC					
3.5.3		58–60 HRC					
3.5.4		60–62 HRC					
3.5.5		62–64 HRC					
4.1.1	Stainless steel						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	Heat-resistant alloys						
4.2.2							
4.2.3							
4.2.4							
5.1.1	Conventional cast steel		100	0,2xø	0,2xø	0,045	0,05
5.1.2			80	0,2xø	0,2xø	0,045	0,05
5.1.3			60	0,2xø	0,2xø	0,045	0,05
5.2.1	Stainless cast steel						
5.2.2							
6.1.1	Cast iron with lamellar graphite		120	0,2xø	0,2xø	0,06	0,07
6.1.2			100	0,2xø	0,2xø	0,06	0,07
6.1.3			80	0,2xø	0,2xø	0,03	0,04
6.1.4							
6.2.1	Spheroidal cast iron		120	0,2xø	0,2xø	0,045	0,05
6.2.2			100	0,2xø	0,2xø	0,045	0,05
6.2.3			80	0,2xø	0,2xø	0,02	0,03
6.3.1	GTW (white malleable cast iron)		120	0,2xø	0,2xø	0,06	0,07
6.3.2			100	0,2xø	0,2xø	0,06	0,07
6.4.1	GTS (black malleable cast iron)		120	0,2xø	0,2xø	0,06	0,07
6.4.2			100	0,2xø	0,2xø	0,06	0,07
7.1.1	Aluminium						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	Magnesium						
7.2.2							
7.3.1	Copper						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	CuZn (brass)						
7.4.2							
7.5.1	CuSn (bronze)						
7.5.2							
7.6.1	CuAlFe (Ampco)						
7.6.2							
7.8.1	Titanium						
7.8.2							
7.8.3							

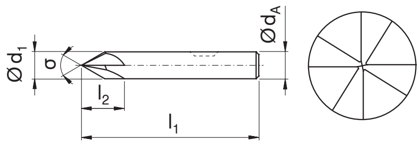
W0741-S, coated

Deburring cutters

UN **E**

$\lambda_S = 0°$ $\gamma_S = 0°$ $d_1 = h6$ $d_A = h6$ σ 60° E/D

SCPP225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	z	HA Material	HB Material
4.0	E.UN.0741.0400.S.Z4.HA	4	54	9	60	4	W0741040340	
6.0	E.UN.0741.0600.S.Z4.HB	6	54	12	60	4		W0741060341
8.0	E.UN.0741.0800.S.Z4.HB	8	58	15	60	4		W0741080341
10.0	E.UN.0741.1000.S.Z4.HB	10	66	16	60	4		W0741100341
12.0	E.UN.0741.1200.S.Z4.HB	12	73	18	60	4		W0741120341

W0742-S, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 4,0 = Ø 8,0	f_z [mm] > Ø 8,0 = Ø 12,0
1.1.1	Machining steels	100	0,2xø	0,2xø	0,04	0,05
1.1.2		70	0,2xø	0,2xø	0,04	0,05
1.2.1	Constructional steel	100	0,2xø	0,2xø	0,045	0,05
1.2.2		70	0,2xø	0,2xø	0,045	0,05
1.2.3		60	0,2xø	0,2xø	0,04	0,05
1.3.1	Spring steel					
1.3.2						
1.3.3						
2.1.1	Cementation steel	95	0,2xø	0,2xø	0,03	0,04
2.1.2		75	0,2xø	0,2xø	0,03	0,04
2.1.3		60	0,2xø	0,2xø	0,03	0,04
2.2.1	Nitriding steel	70	0,2xø	0,2xø	0,03	0,04
2.2.2		55	0,2xø	0,2xø	0,03	0,04
2.3.1	Tempered steel	80	0,2xø	0,2xø	0,03	0,04
2.3.2		70	0,2xø	0,2xø	0,03	0,04
2.3.3		70	0,2xø	0,2xø	0,03	0,04
2.3.4		60	0,2xø	0,2xø	0,03	0,04
2.3.5		55	0,2xø	0,2xø	0,03	0,04
2.3.6						
3.1.1	Non alloyed tool steel					
3.2.1	Tool steel for cold working					
3.2.2						
3.2.3						
3.2.4						
3.2.5						
3.3.1	Tool steel for hot working					
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	Hardened tool steel < 55 HRC					
3.5.2	55–58 HRC					
3.5.3	58–60 HRC					
3.5.4	60–62 HRC					
3.5.5	62–64 HRC					
4.1.1	Stainless steel					
4.1.2						
4.1.3						
4.1.4						
4.1.5						
4.2.1	Heat-resistant alloys					
4.2.2						
4.2.3						
4.2.4						
5.1.1	Conventional cast steel	100	0,2xø	0,2xø	0,045	0,05
5.1.2		80	0,2xø	0,2xø	0,045	0,05
5.1.3		60	0,2xø	0,2xø	0,045	0,05
5.2.1	Stainless cast steel					
5.2.2						
6.1.1	Cast iron with lamellar graphite	120	0,2xø	0,2xø	0,06	0,07
6.1.2		100	0,2xø	0,2xø	0,06	0,07
6.1.3		80	0,2xø	0,2xø	0,03	0,04
6.1.4						
6.2.1	Spheroidal cast iron	120	0,2xø	0,2xø	0,045	0,05
6.2.2		100	0,2xø	0,2xø	0,045	0,05
6.2.3		80	0,2xø	0,2xø	0,02	0,03
6.3.1	GTW (white malleable cast iron)	120	0,2xø	0,2xø	0,06	0,07
6.3.2		100	0,2xø	0,2xø	0,06	0,07
6.4.1	GTS (black malleable cast iron)	120	0,2xø	0,2xø	0,06	0,07
6.4.2		100	0,2xø	0,2xø	0,06	0,07
7.1.1	Aluminium					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	CuZn (brass)					
7.4.2						
7.5.1	CuSn (bronze)					
7.5.2						
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium					
7.8.2						
7.8.3						

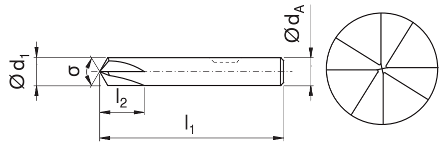
W0742-S, coated

Deburring cutters

UN E

$\lambda_S = 0°$ $\gamma_S = 0°$ $d_1 = h6$ $d_A = h6$ σ 120° E/D

SCPP225



d1 [mm]	Type, description	dA [mm]	l1 [mm]	l2 [mm]	σ [°]	z	HA Material	HB Material
4.0	E.UN.0742.0400.S.Z4.HA	4	54	9	120	4	W0742040340	
6.0	E.UN.0742.0600.S.Z4.HB	6	54	12	120	4		W0742060341
8.0	E.UN.0742.0800.S.Z4.HB	8	58	15	120	4		W0742080341
10.0	E.UN.0742.1000.S.Z4.HB	10	66	16	120	4		W0742100341
12.0	E.UN.0742.1200.S.Z4.HB	12	73	18	120	4		W0742120341

W0450-S and W0450-L, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels									
1.1.2			240	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
1.2.1	Constructional steel		250	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
1.2.2			230	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
1.2.3			220	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
1.3.1	Spring steel		130	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
1.3.2			120	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
1.3.3			110	1xø	1,5xø	0,012	0,025	0,04	0,05	0,07
2.1.1	Cementation steel		210	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.1.2			200	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.1.3			190	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
2.2.1	Nitriding steel		190	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.2.2			170	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
2.3.1	Tempered steel		200	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.3.2			190	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.3.3			190	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.3.4			180	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.3.5			170	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
2.3.6			150	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
3.1.1	Non alloyed tool steel		185	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.2.1	Tool steel for cold working		180	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.2.2			170	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.2.3			150	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
3.2.4			160	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.2.5			140	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.3.1	Tool steel for hot working		200	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.3.2			180	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
3.3.3			150	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.3.4			140	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.3.5			130	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
3.5.1	Hardened tool steel	< 55 HRC								
3.5.2		55–58 HRC								
3.5.3		58–60 HRC								
3.5.4		60–62 HRC								
3.5.5		62–64 HRC								
4.1.1	Stainless steel									
4.1.2										
4.1.3										
4.1.4										
4.1.5										
4.2.1	Heat-resistant alloys									
4.2.2										
4.2.3										
4.2.4										
5.1.1	Conventional cast steel		200	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
5.1.2			160	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
5.1.3			120	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
5.2.1	Stainless cast steel		120	1xø	1,5xø	0,012	0,025	0,04	0,05	0,07
5.2.2			120	1xø	1,5xø	0,012	0,025	0,04	0,05	0,07
6.1.1	Cast iron with lamellar graphite		200	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.1.2			180	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.1.3			160	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
6.1.4			120	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
6.2.1	Spheroidal cast iron		190	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
6.2.2			170	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
6.2.3			150	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
6.3.1	GTW (white malleable cast iron)		180	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
6.3.2			160	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
6.4.1	GTS (black malleable cast iron)		180	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
6.4.2			160	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
7.1.1	Aluminium									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	Magnesium									
7.2.2										
7.3.1	Copper									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	CuZn (brass)									
7.4.2										
7.5.1	CuSn (bronze)									
7.5.2										
7.6.1	CuAlFe (Ampco)									
7.6.2										
7.8.1	Titanium									
7.8.2										
7.8.3										

W0450-S and W0450-L, coated

HPC end mills

ST

HPC SF

$\lambda_S = 35°$ / $38°$

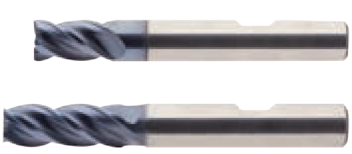
$\gamma_S = 12°$

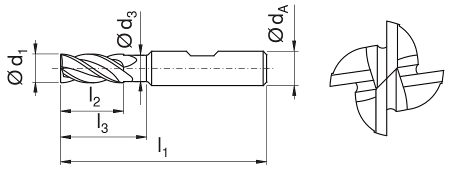
$d_1 = f8$
$d_A = h6$

F 45°

E

SCPP215





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material	HB Material
3.0	HPC-SF.ST.0450.0300.L.Z4.F0010A.HB	6	2.8	57	8	13	0.1	4		W0450030341
3.0	HPC-SF.ST.0450.0300.S.Z4.F0010A.HB	6		50	5		0.1	4	W0450030241	
4.0	HPC-SF.ST.0450.0400.L.Z4.F0010A.HB	6	3.8	57	11	17	0.1	4		W0450040341
4.0	HPC-SF.ST.0450.0400.S.Z4.F0010A.HB	6		54	8		0.1	4	W0450040241	
5.0	HPC-SF.ST.0450.0500.L.Z4.F0010A.HB	6	4.8	57	13	19	0.1	4		W0450050341
5.0	HPC-SF.ST.0450.0500.S.Z4.F0010A.HB	6		54	9		0.1	4	W0450050241	
6.0	HPC-SF.ST.0450.0600.L.Z4.F0010A.HB	6	5.8	57	13	19	0.1	4		W0450060341
6.0	HPC-SF.ST.0450.0600.S.Z4.F0010A.HB	6		54	10		0.1	4	W0450060241	
8.0	HPC-SF.ST.0450.0800.L.Z4.F0020A.HB	8	7.7	63	21	25	0.2	4		W0450080341
8.0	HPC-SF.ST.0450.0800.S.Z4.F0020A.HB	8		58	12		0.2	4	W0450080241	
10.0	HPC-SF.ST.0450.1000.L.Z4.F0020A.HB	10	9.7	72	22	30	0.2	4		W0450100341
10.0	HPC-SF.ST.0450.1000.S.Z4.F0020A.HB	10		66	14		0.2	4	W0450100241	
12.0	HPC-SF.ST.0450.1200.L.Z4.F0030A.HB	12	11.6	83	26	36	0.3	4		W0450120341
12.0	HPC-SF.ST.0450.1200.S.Z4.F0030A.HB	12		73	16		0.3	4	W0450120241	
14.0	HPC-SF.ST.0450.1400.L.Z4.F0030A.HB	14	13.6	83	26	36	0.3	4		W0450140341
14.0	HPC-SF.ST.0450.1400.S.Z4.F0030A.HB	14		73	16		0.3	4	W0450140241	
16.0	HPC-SF.ST.0450.1600.L.Z4.F0030A.HB	16	15.5	92	36	42	0.3	4		W0450160341
16.0	HPC-SF.ST.0450.1600.S.Z4.F0030A.HB	16		82	22		0.3	4	W0450160241	
18.0	HPC-SF.ST.0450.1800.S.Z4.F0030A.HB	18		82	22		0.3	4	W0450180241	
20.0	HPC-SF.ST.0450.2000.L.Z4.F0030A.HB	20	19.5	104	41	52	0.3	4		W0450200341
20.0	HPC-SF.ST.0450.2000.S.Z4.F0030A.HB	20		92	26		0.3	4	W0450200241	

W0452-S and W0452-L, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
						= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**									
1.1.2			240	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
1.2.1	**Constructional steel**		250	1xø	1,5xø	0,028	0,05	0,08	0,12	0,14
1.2.2			230	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
1.2.3			220	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
1.3.1	**Spring steel**		130	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
1.3.2			120	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
1.3.3			110	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
2.1.1	**Cementation steel**		210	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
2.1.2			200	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
2.1.3			190	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.2.1	**Nitriding steel**		190	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
2.2.2			170	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.3.1	**Tempered steel**		200	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
2.3.2			190	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
2.3.3			190	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
2.3.4			180	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
2.3.5			170	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
2.3.6			150	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.1.1	**Non alloyed tool steel**		185	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
3.2.1	**Tool steel for cold working**		180	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
3.2.2			170	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
3.2.3			150	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.2.4			160	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
3.2.5			140	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
3.3.1	**Tool steel for hot working**		200	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
3.3.2			180	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.3.3			150	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
3.3.4			140	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
3.3.5			130	1xø	1,5xø	0,02	0,04	0,06	0,08	0,1
3.5.1	**Hardened tool steel**	**< 55 HRC**								
3.5.2		**55–58 HRC**								
3.5.3		**58–60 HRC**								
3.5.4		**60–62 HRC**								
3.5.5		**62–64 HRC**								
4.1.1	**Stainless steel**									
4.1.2										
4.1.3										
4.1.4										
4.1.5										
4.2.1	**Heat-resistant alloys**									
4.2.2										
4.2.3										
4.2.4										
5.1.1	**Conventional cast steel**		200	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
5.1.2			160	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
5.1.3			120	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
5.2.1	**Stainless cast steel**		120	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
5.2.2			120	1xø	1,5xø	0,015	0,03	0,05	0,06	0,08
6.1.1	**Cast iron with lamellar graphite**		200	1xø	1,5xø	0,028	0,05	0,08	0,12	0,14
6.1.2			180	1xø	1,5xø	0,028	0,05	0,08	0,12	0,14
6.1.3			160	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.1.4			120	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.2.1	**Spheroidal cast iron**		190	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.2.2			170	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.2.3			150	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.3.1	**GTW (white malleable cast iron)**		180	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.3.2			160	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.4.1	**GTS (black malleable cast iron)**		180	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
6.4.2			160	1xø	1,5xø	0,025	0,045	0,07	0,1	0,12
7.1.1	**Aluminium**									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	**CuZn (brass)**									
7.4.2										
7.5.1	**CuSn (bronze)**									
7.5.2										
7.6.1	**CuAlFe (Ampco)**									
7.6.2										
7.8.1	**Titanium**									
7.8.2										
7.8.3										

W0452-S and W0452-L, coated

HPC end mills

ST

HPC SF

$\lambda_S = 44.5° / 46.5°$

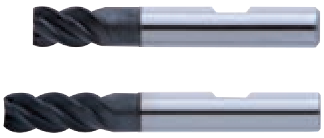
$\gamma_S = 12°$

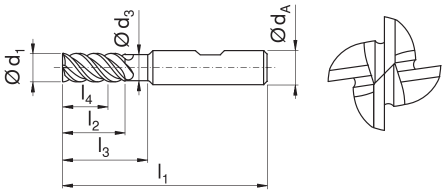
$d_1 = e8$
$d_A = h6$

F 45°

E

SCPP235





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	F [mm]	z	HB Material	HB Material
3.0	HPC-SF.ST.0452.0300.L.Z4.F0010A.HB	6	2.8	57	8	13	4.8	0.1	4		W0452030341
3.0	HPC-SF.ST.0452.0300.S.Z4.F0010A.HB	6	2.8	50	5	10	3.0	0.1	4	W0452030241	
4.0	HPC-SF.ST.0452.0400.L.Z4.F0010A.HB	6	3.8	57	11	17	6.4	0.1	4		W0452040341
4.0	HPC-SF.ST.0452.0400.S.Z4.F0010A.HB	6	3.8	54	8	14	4.0	0.1	4	W0452040241	
5.0	HPC-SF.ST.0452.0500.L.Z4.F0010A.HB	6	4.8	57	13	19	8.0	0.1	4		W0452050341
5.0	HPC-SF.ST.0452.0500.S.Z4.F0010A.HB	6	4.8	54	9	16	5.0	0.1	4	W0452050241	
6.0	HPC-SF.ST.0452.0600.L.Z4.F0010A.HB	6	5.8	57	13	19	9.6	0.1	4		W0452060341
6.0	HPC-SF.ST.0452.0600.S.Z4.F0010A.HB	6	5.8	54	10	16	6.0	0.1	4	W0452060241	
8.0	HPC-SF.ST.0452.0800.L.Z4.F0020A.HB	8	7.7	63	21	25	12.8	0.2	4		W0452080341
8.0	HPC-SF.ST.0452.0800.S.Z4.F0020A.HB	8	7.7	58	12	20	8.0	0.2	4	W0452080241	
10.0	HPC-SF.ST.0452.1000.L.Z4.F0020A.HB	10	9.7	72	22	30	16.0	0.2	4		W0452100341
10.0	HPC-SF.ST.0452.1000.S.Z4.F0020A.HB	10	9.7	66	14	24	10.0	0.2	4	W0452100241	
12.0	HPC-SF.ST.0452.1200.L.Z4.F0030A.HB	12	11.6	83	26	36	19.2	0.3	4		W0452120341
12.0	HPC-SF.ST.0452.1200.S.Z4.F0030A.HB	12	11.6	73	16	26	12.0	0.3	4	W0452120241	
14.0	HPC-SF.ST.0452.1400.L.Z4.F0030A.HB	14	13.6	83	26	36	22.4	0.3	4		W0452140341
14.0	HPC-SF.ST.0452.1400.S.Z4.F0030A.HB	14	13.6	73	16	26	14.0	0.3	4	W0452140241	
16.0	HPC-SF.ST.0452.1600.L.Z4.F0030A.HB	16	15.5	92	36	42	25.6	0.3	4		W0452160341
16.0	HPC-SF.ST.0452.1600.S.Z4.F0030A.HB	16	15.5	82	22	32	16.0	0.3	4	W0452160241	
18.0	HPC-SF.ST.0452.1800.L.Z4.F0030A.HB	18	17.5	92	36	42	28.8	0.3	4		W0452180341
18.0	HPC-SF.ST.0452.1800.S.Z4.F0030A.HB	18	17.5	82	22	32	18.0	0.3	4	W0452180241	
20.0	HPC-SF.ST.0452.2000.L.Z4.F0030A.HB	20	19.5	104	41	52	32.0	0.3	4		W0452200341
20.0	HPC-SF.ST.0452.2000.S.Z4.F0030A.HB	20	19.5	92	26	40	20.0	0.3	4	W0452200241	

W0452-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	100	1xø	0,7xø	0,04	0,05	0,06	0,07
1.1.2		90	1xø	0,7xø	0,04	0,05	0,06	0,07
1.2.1	Constructional steel	100	1xø	0,7xø	0,045	0,05	0,07	0,08
1.2.2		90	1xø	0,7xø	0,045	0,05	0,07	0,08
1.2.3		90	1xø	0,7xø	0,04	0,05	0,06	0,07
1.3.1	Spring steel	90	1xø	0,7xø	0,03	0,04	0,05	0,06
1.3.2								
1.3.3								
2.1.1	Cementation steel	100	1xø	0,7xø	0,04	0,05	0,06	0,07
2.1.2		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.1.3		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.2.1	Nitriding steel	90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.2.2		80	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.1	Tempered steel	90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.2		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.3		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.4		90	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.5		80	1xø	0,7xø	0,03	0,04	0,05	0,06
2.3.6								
3.1.1	Non alloyed tool steel	90	1xø	0,7xø	0,03	0,04	0,05	0,06
3.2.1	Tool steel for cold working	80	1xø	0,7xø	0,03	0,04	0,05	0,06
3.2.2		80	1xø	0,7xø	0,03	0,04	0,05	0,06
3.2.3								
3.2.4		80	1xø	0,7xø	0,03	0,04	0,05	0,06
3.2.5								
3.3.1	Tool steel for hot working							
3.3.2								
3.3.3		80	1xø	0,7xø	0,03	0,04	0,05	0,06
3.3.4								
3.3.5								
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel	100	1xø	0,7xø	0,04	0,05	0,06	0,07
5.1.2		90	1xø	0,7xø	0,03	0,04	0,05	0,06
5.1.3								
5.2.1	Stainless cast steel	80	1xø	0,7xø	0,02	0,03	0,04	0,05
5.2.2		80	1xø	0,7xø	0,02	0,03	0,04	0,05
6.1.1	Cast iron with lamellar graphite	110	1xø	0,7xø	0,06	0,07	0,09	0,12
6.1.2		100	1xø	0,7xø	0,06	0,07	0,09	0,12
6.1.3		100	1xø	0,7xø	0,03	0,04	0,05	0,06
6.1.4		90	1xø	0,7xø	0,03	0,04	0,05	0,06
6.2.1	Spheroidal cast iron	110	1xø	0,7xø	0,045	0,05	0,07	0,08
6.2.2		100	1xø	0,7xø	0,045	0,05	0,07	0,08
6.2.3		100	1xø	0,7xø	0,02	0,03	0,04	0,05
6.3.1	GTW (white malleable cast iron)	110	1xø	0,7xø	0,06	0,07	0,09	0,12
6.3.2		100	1xø	0,7xø	0,06	0,07	0,09	0,12
6.4.1	GTS (black malleable cast iron)	110	1xø	0,7xø	0,06	0,07	0,09	0,12
6.4.2		100	1xø	0,7xø	0,06	0,07	0,09	0,12
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

W0452-OL, coated

HPC end mills

ST

HPC SF

$\lambda_S = 44.5° / 46.5°$

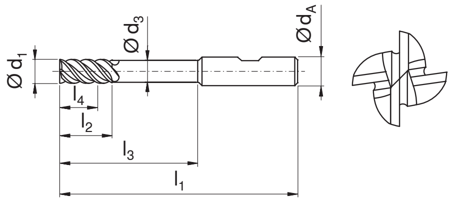
$\gamma_S = 12°$

$d_1 = e8$
$d_A = h6$

F 45°

E

SCPP235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	F [mm]	z	HB Material
6.0	HPC-SF.ST.0452.0600.OL.Z4.F0010A.HB	6	5.8	80	13	42	9.6	0.1	4	W0452060441
8.0	HPC-SF.ST.0452.0800.OL.Z4.F0020A.HB	8	7.7	100	21	62	12.8	0.2	4	W0452080441
10.0	HPC-SF.ST.0452.1000.OL.Z4.F0020A.HB	10	9.7	100	22	58	16.0	0.2	4	W0452100441
12.0	HPC-SF.ST.0452.1200.OL.Z4.F0030A.HB	12	11.6	120	26	73	19.2	0.3	4	W0452120441
16.0	HPC-SF.ST.0452.1600.OL.Z4.F0030A.HB	16	15.5	150	36	100	25.6	0.3	4	W0452160441
20.0	HPC-SF.ST.0452.2000.OL.Z4.F0030A.HB	20	19.5	150	41	98	32.0	0.3	4	W0452200441

W0550-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels							
1.1.2		240	1xø	1xø	0,04	0,06	0,08	0,1
1.2.1	Constructional steel	250	1xø	1xø	0,045	0,07	0,1	0,12
1.2.2		230	1xø	1xø	0,04	0,06	0,08	0,1
1.2.3		220	1xø	1xø	0,04	0,06	0,08	0,1
1.3.1	Spring steel							
1.3.2								
1.3.3								
2.1.1	Cementation steel	210	1xø	1xø	0,04	0,06	0,08	0,1
2.1.2		200	1xø	1xø	0,04	0,06	0,08	0,1
2.1.3		190	1xø	1xø	0,03	0,05	0,06	0,08
2.2.1	Nitriding steel	190	1xø	1xø	0,04	0,06	0,08	0,1
2.2.2		170	1xø	1xø	0,03	0,05	0,06	0,08
2.3.1	Tempered steel	200	1xø	1xø	0,04	0,06	0,08	0,1
2.3.2		190	1xø	1xø	0,04	0,06	0,08	0,1
2.3.3		190	1xø	1xø	0,04	0,06	0,08	0,1
2.3.4		180	1xø	1xø	0,04	0,06	0,08	0,1
2.3.5		170	1xø	1xø	0,03	0,05	0,06	0,08
2.3.6		150	1xø	1xø	0,03	0,05	0,06	0,08
3.1.1	Non alloyed tool steel	185	1xø	1xø	0,04	0,06	0,08	0,1
3.2.1	Tool steel for cold working	180	1xø	1xø	0,04	0,06	0,08	0,1
3.2.2		170	1xø	1xø	0,04	0,06	0,08	0,1
3.2.3		150	1xø	1xø	0,03	0,05	0,06	0,08
3.2.4		160	1xø	1xø	0,04	0,06	0,08	0,1
3.2.5		140	1xø	1xø	0,04	0,06	0,08	0,1
3.3.1	Tool steel for hot working	200	1xø	1xø	0,04	0,06	0,08	0,1
3.3.2		180	1xø	1xø	0,03	0,05	0,06	0,08
3.3.3		150	1xø	1xø	0,04	0,06	0,08	0,1
3.3.4		140	1xø	1xø	0,04	0,06	0,08	0,1
3.3.5		130	1xø	1xø	0,03	0,05	0,06	0,08
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel	100	1xø	1xø	0,025	0,04	0,05	0,07
4.1.2		80	1xø	1xø	0,025	0,04	0,05	0,07
4.1.3		100	1xø	1xø	0,025	0,04	0,05	0,07
4.1.4		100	1xø	1xø	0,025	0,04	0,05	0,07
4.1.5		110	1xø	1xø	0,025	0,04	0,05	0,07
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel	200	1xø	1xø	0,04	0,06	0,08	0,1
5.1.2		160	1xø	1xø	0,04	0,06	0,08	0,1
5.1.3		120	1xø	1xø	0,04	0,06	0,08	0,1
5.2.1	Stainless cast steel	100	1xø	1xø	0,025	0,04	0,05	0,07
5.2.2		100	1xø	1xø	0,025	0,04	0,05	0,07
6.1.1	Cast iron with lamellar graphite	200	1xø	1xø	0,045	0,07	0,1	0,12
6.1.2		180	1xø	1xø	0,045	0,07	0,1	0,12
6.1.3		160	1xø	1xø	0,04	0,06	0,08	0,1
6.1.4		120	1xø	1xø	0,04	0,06	0,08	0,1
6.2.1	Spheroidal cast iron	190	1xø	1xø	0,04	0,06	0,08	0,1
6.2.2		170	1xø	1xø	0,04	0,06	0,08	0,1
6.2.3		150	1xø	1xø	0,04	0,06	0,08	0,1
6.3.1	GTW (white malleable cast iron)	180	1xø	1xø	0,04	0,06	0,08	0,1
6.3.2		160	1xø	1xø	0,04	0,06	0,08	0,1
6.4.1	GTS (black malleable cast iron)	180	1xø	1xø	0,04	0,06	0,08	0,1
6.4.2		160	1xø	1xø	0,04	0,06	0,08	0,1
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

W0550-L, coated

HPC end mills

ST

HPC SF

$\lambda_S = 38°$

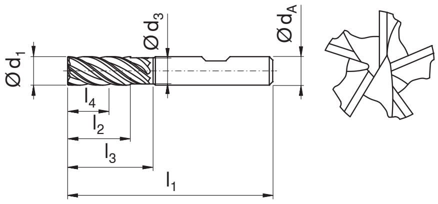
$\gamma_S = 6°$

$d_1 = e7$
$d_A = h6$

F 45°

E

SCPP240



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	F [mm]	z	HB Material
6.0	HPC-SF.ST.0550.0600.L.Z5.F0010A.HB	6	5.8	57	13	19	8.5	0.1	5	W0550060341
8.0	HPC-SF.ST.0550.0800.L.Z5.F0020A.HB	8	7.7	63	19	25	12.5	0.2	5	W0550080341
10.0	HPC-SF.ST.0550.1000.L.Z5.F0020A.HB	10	9.7	72	22	30	14.5	0.2	5	W0550100341
12.0	HPC-SF.ST.0550.1200.L.Z5.F0030A.HB	12	11.6	83	26	36	17.1	0.3	5	W0550120341
16.0	HPC-SF.ST.0550.1600.L.Z5.F0030A.HB	16	15.5	92	32	42	21.1	0.3	5	W0550160341
20.0	HPC-SF.ST.0550.2000.L.Z5.F0030A.HB	20	19.5	104	38	52	25.0	0.3	5	W0550200341

W0446-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**								
1.1.2		240	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.1	**Constructional steel**	250	1xø	1xø	0,025	0,045	0,07	0,1	0,12
1.2.2		230	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.3		220	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**	210	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.1.3		190	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.2.1	**Nitriding steel**	190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.2.2		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.1	**Tempered steel**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.2		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.3		190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.4		180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
2.3.5		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.6		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.1.1	**Non alloyed tool steel**	185	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.1	**Tool steel for cold working**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.3		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.2.4		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.2.5		140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.1	**Tool steel for hot working**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.2		180	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.3.3		150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.4		140	1xø	1xø	0,02	0,04	0,06	0,08	0,1
3.3.5		130	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.5.1	**Hardened tool steel** **< 55 HRC**								
3.5.2	**55–58 HRC**								
3.5.3	**58–60 HRC**								
3.5.4	**60–62 HRC**								
3.5.5	**62–64 HRC**								
4.1.1	**Stainless steel**								
4.1.2									
4.1.3									
4.1.4									
4.1.5									
4.2.1	**Heat-resistant alloys**								
4.2.2									
4.2.3									
4.2.4									
5.1.1	**Conventional cast steel**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.3		120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**								
5.2.2									
6.1.1	**Cast iron with lamellar graphite**	200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.2		180	1xø	1xø	0,025	0,045	0,07	0,1	0,12
6.1.3		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.1.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.1	**Spheroidal cast iron**	190	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.2.3		150	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.1	**GTW (white malleable cast iron)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.3.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.1	**GTS (black malleable cast iron)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.4.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.2		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.3		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.4		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.5		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.6		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**	300	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.2		350	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**	240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.2		280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**	140	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.2		160	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.8.1	**Titanium**	90	1xø	1xø	0,02	0,04	0,06	0,08	0,1
7.8.2		80	1xø	1xø	0,015	0,03	0,05	0,06	0,08
7.8.3		50	1xø	1xø	0,012	0,025	0,04	0,05	0,07

W0446-L, coated

CPC end mills (Circle Power Cutting)

ST

CPC SF

$\lambda_S = 35° / 36,5°$

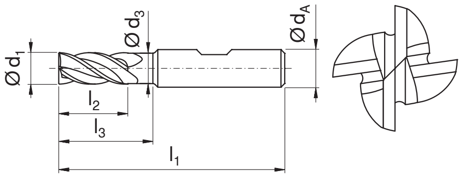
$\gamma_S = 12°$

$d_1 = f8$, $d_A = h6$

F 45°

E

SCPP220



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material
3.0	CPC-SF.ST.0446.0300.L.Z4.F0010A.HB	6	2.8	57	8	13	0.1	4	W0446030341
4.0	CPC-SF.ST.0446.0400.L.Z4.F0010A.HB	6	3.8	57	11	17	0.1	4	W0446040341
5.0	CPC-SF.ST.0446.0500.L.Z4.F0010A.HB	6	4.8	57	13	19	0.1	4	W0446050341
6.0	CPC-SF.ST.0446.0600.L.Z4.F0010A.HB	6	5.8	57	13	19	0.1	4	W0446060341
8.0	CPC-SF.ST.0446.0800.L.Z4.F0020A.HB	8	7.7	63	21	25	0.2	4	W0446080341
10.0	CPC-SF.ST.0446.1000.L.Z4.F0020A.HB	10	9.7	72	22	30	0.2	4	W0446100341
12.0	CPC-SF.ST.0446.1200.L.Z4.F0030A.HB	12	11.6	83	26	36	0.3	4	W0446120341
16.0	CPC-SF.ST.0446.1600.L.Z4.F0030A.HB	16	15.5	92	36	42	0.3	4	W0446160341
20.0	CPC-SF.ST.0446.2000.L.Z4.F0030A.HB	20	19.5	104	41	52	0.3	4	W0446200341

W0446-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	100	0,1xø	4,5xø	0,04	0,05	0,06	0,07
1.1.2		90	0,1xø	4,5xø	0,04	0,05	0,06	0,07
1.2.1	Constructional steel	100	0,1xø	4,5xø	0,045	0,05	0,07	0,08
1.2.2		90	0,1xø	4,5xø	0,045	0,05	0,07	0,08
1.2.3		90	0,1xø	4,5xø	0,04	0,05	0,06	0,07
1.3.1	Spring steel							
1.3.2								
1.3.3								
2.1.1	Cementation steel	100	0,1xø	4,5xø	0,04	0,05	0,06	0,07
2.1.2		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.1.3		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.2.1	Nitriding steel	90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.2.2		80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.1	Tempered steel	90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.2		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.3		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.4		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.5		80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
2.3.6								
3.1.1	Non alloyed tool steel	90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.2.1	Tool steel for cold working	80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.2.2		80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.2.3								
3.2.4		80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.2.5								
3.3.1	Tool steel for hot working							
3.3.2								
3.3.3		80	0,1xø	4,5xø	0,03	0,04	0,05	0,06
3.3.4								
3.3.5								
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel	100	0,1xø	4,5xø	0,04	0,05	0,06	0,07
5.1.2		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
5.1.3								
5.2.1	Stainless cast steel	80	0,1xø	4,5xø	0,02	0,03	0,04	0,05
5.2.2		80	0,1xø	4,5xø	0,02	0,03	0,04	0,05
6.1.1	Cast iron with lamellar graphite	110	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.1.2		100	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.1.3		100	0,1xø	4,5xø	0,03	0,04	0,05	0,06
6.1.4		90	0,1xø	4,5xø	0,03	0,04	0,05	0,06
6.2.1	Spheroidal cast iron	110	0,1xø	4,5xø	0,045	0,05	0,07	0,08
6.2.2		100	0,1xø	4,5xø	0,045	0,05	0,07	0,08
6.2.3		100	0,1xø	4,5xø	0,02	0,03	0,04	0,05
6.3.1	GTW (white malleable cast iron)	110	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.3.2		100	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.4.1	GTS (black malleable cast iron)	110	0,1xø	4,5xø	0,06	0,07	0,09	0,12
6.4.2		100	0,1xø	4,5xø	0,06	0,07	0,09	0,12
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

W0446-OL, coated

CPC end mills (Circle Power Cutting)

ST **CPC SF**

λ_S=35° 36,5°

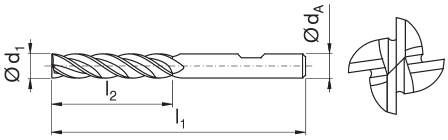
γ_S = 12°

d_1 = f8 d_A=h6

F 45°

D

SCPP220



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HB Material
6.0	CPC-SF.ST.0446.0600.OL.Z4.F0010A.HB	6	80	33	0.1	4	W0446060541
8.0	CPC-SF.ST.0446.0800.OL.Z4.F0020A.HB	8	100	40	0.2	4	W0446080541
10.0	CPC-SF.ST.0446.1000.OL.Z4.F0020A.HB	10	105	50	0.2	4	W0446100541
12.0	CPC-SF.ST.0446.1200.OL.Z4.F0030A.HB	12	125	60	0.3	4	W0446120541
16.0	CPC-SF.ST.0446.1600.OL.Z4.F0030A.HB	16	150	80	0.3	4	W0446160541
20.0	CPC-SF.ST.0446.2000.OL.Z4.F0030A.HB	20	160	90	0.3	4	W0446200541

W0446-OLS, coated

Cutting data

					f_z [mm]			
Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	100	0,1xø	2xø	0,04	0,05	0,06	0,07
1.1.2		90	0,1xø	2xø	0,04	0,05	0,06	0,07
1.2.1	**Constructional steel**	100	0,1xø	2xø	0,045	0,05	0,07	0,08
1.2.2		90	0,1xø	2xø	0,045	0,05	0,07	0,08
1.2.3		90	0,1xø	2xø	0,04	0,05	0,06	0,07
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**	100	0,1xø	2xø	0,04	0,05	0,06	0,07
2.1.2		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.1.3		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.2.1	**Nitriding steel**	90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.2.2		80	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**	90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.2		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.3		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.4		90	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.5		80	0,1xø	2xø	0,03	0,04	0,05	0,06
2.3.6								
3.1.1	**Non alloyed tool steel**	90	0,1xø	2xø	0,03	0,04	0,05	0,06
3.2.1	**Tool steel for cold working**	80	0,1xø	2xø	0,03	0,04	0,05	0,06
3.2.2		80	0,1xø	2xø	0,03	0,04	0,05	0,06
3.2.3								
3.2.4		80	0,1xø	2xø	0,03	0,04	0,05	0,06
3.2.5								
3.3.1	**Tool steel for hot working**							
3.3.2								
3.3.3		80	0,1xø	2xø	0,03	0,04	0,05	0,06
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel** **< 55 HRC**							
3.5.2	**55–58 HRC**							
3.5.3	**58–60 HRC**							
3.5.4	**60–62 HRC**							
3.5.5	**62–64 HRC**							
4.1.1	**Stainless steel**							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**	100	0,1xø	2xø	0,04	0,05	0,06	0,07
5.1.2		90	0,1xø	2xø	0,03	0,04	0,05	0,06
5.1.3								
5.2.1	**Stainless cast steel**	80	0,1xø	2xø	0,02	0,03	0,04	0,05
5.2.2		80	0,1xø	2xø	0,02	0,03	0,04	0,05
6.1.1	**Cast iron with lamellar graphite**	110	0,1xø	2xø	0,06	0,07	0,09	0,12
6.1.2		100	0,1xø	2xø	0,06	0,07	0,09	0,12
6.1.3		100	0,1xø	2xø	0,03	0,04	0,05	0,06
6.1.4		90	0,1xø	2xø	0,03	0,04	0,05	0,06
6.2.1	**Spheroidal cast iron**	110	0,1xø	2xø	0,045	0,05	0,07	0,08
6.2.2		100	0,1xø	2xø	0,045	0,05	0,07	0,08
6.2.3		100	0,1xø	2xø	0,02	0,03	0,04	0,05
6.3.1	**GTW (white malleable cast iron)**	110	0,1xø	2xø	0,06	0,07	0,09	0,12
6.3.2		100	0,1xø	2xø	0,06	0,07	0,09	0,12
6.4.1	**GTS (black malleable cast iron)**	110	0,1xø	2xø	0,06	0,07	0,09	0,12
6.4.2		100	0,1xø	2xø	0,06	0,07	0,09	0,12
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								

W0446-OLS, coated

CPC end mills (Circle Power Cutting)

ST **CPC SF**

λ_S=35° 36,5°

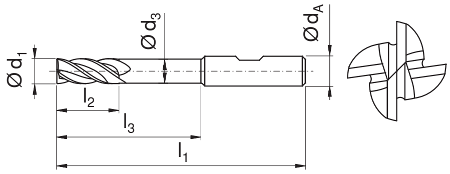
γ_S = 12°

d_1 = f8 d_A=h6

F 45°

E

SCPP220



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material
6.0	CPC-SF.ST.0446.0600.OLS.Z4.F0010A.HB	6	5.8	80	15	42	0.1	4	W0446060441
8.0	CPC-SF.ST.0446.0800.OLS.Z4.F0020A.HB	8	7.7	100	20	62	0.2	4	W0446080441
10.0	CPC-SF.ST.0446.1000.OLS.Z4.F0020A.HB	10	9.7	100	25	58	0.2	4	W0446100441
12.0	CPC-SF.ST.0446.1200.OLS.Z4.F0030A.HB	12	11.6	120	30	73	0.3	4	W0446120441
16.0	CPC-SF.ST.0446.1600.OLS.Z4.F0030A.HB	16	15.5	150	40	100	0.3	4	W0446160441
20.0	CPC-SF.ST.0446.2000.OLS.Z4.F0030A.HB	20	19.5	150	50	98	0.3	4	W0446200441

W0421-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	175	1xø	1xø	0,04	0,05	0,06	0,07
1.1.2		150	1xø	1xø	0,04	0,05	0,06	0,07
1.2.1	Constructional steel	175	1xø	1xø	0,045	0,05	0,07	0,08
1.2.2		150	1xø	1xø	0,045	0,05	0,07	0,08
1.2.3		150	1xø	1xø	0,04	0,05	0,06	0,07
1.3.1	Spring steel	150	1xø	1xø	0,03	0,04	0,05	0,06
1.3.2								
1.3.3								
2.1.1	Cementation steel	175	1xø	1xø	0,04	0,05	0,06	0,07
2.1.2		150	1xø	1xø	0,03	0,04	0,05	0,06
2.1.3		150	1xø	1xø	0,03	0,04	0,05	0,06
2.2.1	Nitriding steel	150	1xø	1xø	0,03	0,04	0,05	0,06
2.2.2		140	1xø	1xø	0,03	0,04	0,05	0,06
2.3.1	Tempered steel	150	1xø	1xø	0,03	0,04	0,05	0,06
2.3.2		150	1xø	1xø	0,03	0,04	0,05	0,06
2.3.3		150	1xø	1xø	0,03	0,04	0,05	0,06
2.3.4		150	1xø	1xø	0,03	0,04	0,05	0,06
2.3.5		140	1xø	1xø	0,03	0,04	0,05	0,06
2.3.6								
3.1.1	Non alloyed tool steel	150	1xø	1xø	0,03	0,04	0,05	0,06
3.2.1	Tool steel for cold working	140	1xø	1xø	0,03	0,04	0,05	0,06
3.2.2		140	1xø	1xø	0,03	0,04	0,05	0,06
3.2.3								
3.2.4		140	1xø	1xø	0,03	0,04	0,05	0,06
3.2.5								
3.3.1	Tool steel for hot working							
3.3.2								
3.3.3		140	1xø	1xø	0,03	0,04	0,05	0,06
3.3.4								
3.3.5								
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel	100	1xø	1xø	0,02	0,03	0,04	0,05
4.1.2		80	1xø	1xø	0,02	0,03	0,04	0,05
4.1.3		100	1xø	1xø	0,02	0,03	0,04	0,05
4.1.4		100	1xø	1xø	0,02	0,03	0,04	0,05
4.1.5		105	1xø	1xø	0,02	0,03	0,04	0,05
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel	175	1xø	1xø	0,04	0,05	0,06	0,07
5.1.2		150	1xø	1xø	0,03	0,04	0,05	0,06
5.1.3								
5.2.1	Stainless cast steel	100	1xø	1xø	0,02	0,03	0,04	0,05
5.2.2		100	1xø	1xø	0,02	0,03	0,04	0,05
6.1.1	Cast iron with lamellar graphite	190	1xø	1xø	0,06	0,07	0,09	0,12
6.1.2		175	1xø	1xø	0,06	0,07	0,09	0,12
6.1.3		175	1xø	1xø	0,03	0,04	0,05	0,06
6.1.4		150	1xø	1xø	0,03	0,04	0,05	0,06
6.2.1	Spheroidal cast iron	190	1xø	1xø	0,045	0,05	0,07	0,08
6.2.2		175	1xø	1xø	0,045	0,05	0,07	0,08
6.2.3		175	1xø	1xø	0,02	0,03	0,04	0,05
6.3.1	GTW (white malleable cast iron)	190	1xø	1xø	0,06	0,07	0,09	0,12
6.3.2		175	1xø	1xø	0,06	0,07	0,09	0,12
6.4.1	GTS (black malleable cast iron)	190	1xø	1xø	0,06	0,07	0,09	0,12
6.4.2		175	1xø	1xø	0,06	0,07	0,09	0,12
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

W0421-L, coated

HPC rough milling cutters

ST

HPC SR

$\lambda_S = 38°$

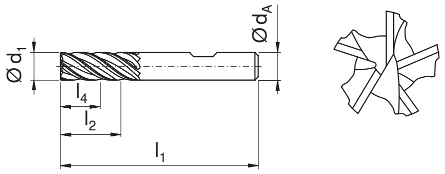
$\gamma_S = 6°$

$d_1 = d11$
$d_A = h6$

F 45°

E

SCPP240



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	F [mm]	z	HB Material
6.0	HPC-SR.ST.0421.0600.L.Z5.F0040A.HB	6	57	13	8.6	0.4	5	W0421060341
8.0	HPC-SR.ST.0421.0800.L.Z5.F0040A.HB	8	63	19	12.5	0.4	5	W0421080341
10.0	HPC-SR.ST.0421.1000.L.Z5.F0040A.HB	10	72	22	14.5	0.4	5	W0421100341
12.0	HPC-SR.ST.0421.1200.L.Z5.F0040A.HB	12	83	26	17.2	0.4	5	W0421120341
14.0	HPC-SR.ST.0421.1400.L.Z5.F0040A.HB	14	83	26	17.2	0.4	5	W0421140341
16.0	HPC-SR.ST.0421.1600.L.Z5.F0040A.HB	16	92	32	21.1	0.4	5	W0421160341
18.0	HPC-SR.ST.0421.1800.L.Z5.F0040A.HB	18	92	32	21.1	0.4	5	W0421180341
20.0	HPC-SR.ST.0421.2000.L.Z5.F0040A.HB	20	104	38	25.1	0.4	5	W0421200341

W0286-L and W0286-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 0,5 = Ø 0,6	 > Ø 0,6 = Ø 0,8	 > Ø 0,8 = Ø 1,0	 > Ø 1,0 = Ø 1,2	 > Ø 1,2 = Ø 1,5	 > Ø 1,5 = Ø 2,0
1.1.1	Machining steels	130	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.1.2		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.2.1	Constructional steel	130	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.2.2		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.2.3		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.3.1	Spring steel	115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.3.2		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.3.3		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
2.1.1	Cementation steel	130	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.1.2		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.1.3		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.2.1	Nitriding steel	90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.2.2		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.1	Tempered steel	115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.2		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.3		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.4		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.5		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
2.3.6		60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.1.1	Non alloyed tool steel	90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.2.1	Tool steel for cold working	90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.2.2		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.2.3		60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.2.4		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.2.5		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.1	Tool steel for hot working	70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.2		60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.3		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.3.4		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.5		60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.5.1	Hardened tool steel < 55 HRC	50	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.5.2	55–58 HRC									
3.5.3	58–60 HRC									
3.5.4	60–62 HRC									
3.5.5	62–64 HRC									
4.1.1	Stainless steel									
4.1.2										
4.1.3										
4.1.4										
4.1.5										
4.2.1	Heat-resistant alloys									
4.2.2										
4.2.3										
4.2.4										
5.1.1	Conventional cast steel									
5.1.2										
5.1.3										
5.2.1	Stainless cast steel									
5.2.2										
6.1.1	Cast iron with lamellar graphite									
6.1.2										
6.1.3										
6.1.4										
6.2.1	Spheroidal cast iron									
6.2.2										
6.2.3										
6.3.1	GTW (white malleable cast iron)									
6.3.2										
6.4.1	GTS (black malleable cast iron)									
6.4.2										
7.1.1	Aluminium									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	Magnesium									
7.2.2										
7.3.1	Copper									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	CuZn (brass)									
7.4.2										
7.5.1	CuSn (bronze)									
7.5.2										
7.6.1	CuAlFe (Ampco)									
7.6.2										
7.8.1	Titanium									
7.8.2										
7.8.3										

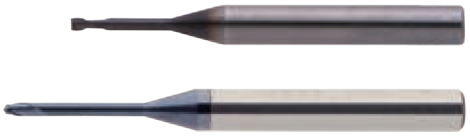
W0286-L and W0286-OL, coated

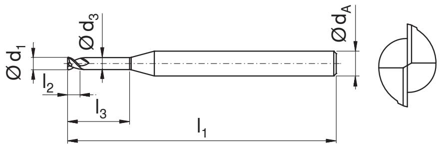
Micro end mills

ST **MSF**

$\lambda_S = 30°$ $\gamma_S = 5°$ $d_1 =$ 0/-0,01 d_A=h6 F 45° E/D

SCPP215





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material	HA Material
0.5	MSF.ST.0286.0050.L03D.Z2.F0005A.HA	6	0.45	55	0.5	1.5	0.05	2	W0286005140	
0.5	MSF.ST.0286.0050.L05D.Z2.F0005A.HA	6	0.45	55	1.2	2.5	0.05	2	W0286005340	
0.5	MSF.ST.0286.0050.L08D.Z2.F0005A.HA	6	0.45	55	1.2	4	0.05	2	W0286005540	
0.5	MSF.ST.0286.0050.L10D.Z2.F0005A.HA	6	0.45	55	1.2	5	0.05	2	W0286005740	
1.0	MSF.ST.0286.0100.L03D.Z2.F0010A.HA	6	0.95	55	1.5	3	0.1	2	W0286010140	
1.0	MSF.ST.0286.0100.L05D.Z2.F0010A.HA	6	0.95	55	1.5	5	0.1	2	W0286010340	
1.0	MSF.ST.0286.0100.OL08D.Z2.F0010A.HA	6	0.95	65	1.5	8	0.1	2		W0286010D40
1.0	MSF.ST.0286.0100.OL10D.Z2.F0010A.HA	6	0.95	65	1.5	10	0.1	2		W0286010G40
1.0	MSF.ST.0286.0100.OL12D.Z2.F0010A.HA	6	0.95	65	1.5	12	0.1	2		W0286010440
1.5	MSF.ST.0286.0150.L03D.Z2.F0010A.HA	6	1.44	55	1.8	5	0.1	2	W0286015140	
1.5	MSF.ST.0286.0150.L05D.Z2.F0010A.HA	6	1.44	55	1.8	7.5	0.1	2	W0286015340	
1.5	MSF.ST.0286.0150.OL08D.Z2.F0010A.HA	6	1.44	65	1.8	12	0.1	2		W0286015D40
1.5	MSF.ST.0286.0150.OL10D.Z2.F0010A.HA	6	1.44	65	1.8	15	0.1	2		W0286015440
2.0	MSF.ST.0286.0200.L03D.Z2.F0010A.HA	6	1.92	55	2	6	0.1	2	W0286020140	
2.0	MSF.ST.0286.0200.L05D.Z2.F0010A.HA	6	1.92	55	2	10	0.1	2	W0286020340	
2.0	MSF.ST.0286.0200.L07D.Z2.F0010A.HA	6	1.92	55	2	14	0.1	2	W0286020D40	
2.0	MSF.ST.0286.0200.OL08D.Z2.F0010A.HA	6	1.92	65	2	16	0.1	2		W0286020G40
2.0	MSF.ST.0286.0200.OL10D.Z2.F0010A.HA	6	1.92	65	2	20	0.1	2		W0286020440

W0285-L and W0285-OL, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]					
						= Ø 0,5 = Ø 0,6	> Ø 0,6 = Ø 0,8	> Ø 0,8 = Ø 1,0	> Ø 1,0 = Ø 1,2	> Ø 1,2 = Ø 1,5	> Ø 1,5 = Ø 2,0
1.1.1	**Machining steels**		130	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.1.2			115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.2.1	**Constructional steel**		130	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.2.2			115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.2.3			90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.3.1	**Spring steel**		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.3.2			90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.3.3			70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
2.1.1	**Cementation steel**		130	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.1.2			115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.1.3			90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.2.1	**Nitriding steel**		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.2.2			90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.1	**Tempered steel**		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.2			90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.3			115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.4			90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.5			70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
2.3.6			60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.1.1	**Non alloyed tool steel**		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.2.1	**Tool steel for cold working**		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.2.2			70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.2.3			60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.2.4			90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.2.5			70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.1	**Tool steel for hot working**		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.2			60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.3			90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.3.4			70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.5			60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.5.1	**Hardened tool steel**	**< 55 HRC**	50	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.5.2		**55–58 HRC**									
3.5.3		**58–60 HRC**									
3.5.4		**60–62 HRC**									
3.5.5		**62–64 HRC**									
4.1.1	**Stainless steel**										
4.1.2											
4.1.3											
4.1.4											
4.1.5											
4.2.1	**Heat-resistant alloys**										
4.2.2											
4.2.3											
4.2.4											
5.1.1	**Conventional cast steel**										
5.1.2											
5.1.3											
5.2.1	**Stainless cast steel**										
5.2.2											
6.1.1	**Cast iron with lamellar graphite**										
6.1.2											
6.1.3											
6.1.4											
6.2.1	**Spheroidal cast iron**										
6.2.2											
6.2.3											
6.3.1	**GTW (white malleable cast iron)**										
6.3.2											
6.4.1	**GTS (black malleable cast iron)**										
6.4.2											
7.1.1	**Aluminium**										
7.1.2											
7.1.3											
7.1.4											
7.1.5											
7.1.6											
7.2.1	**Magnesium**										
7.2.2											
7.3.1	**Copper**										
7.3.2											
7.3.3											
7.3.4											
7.3.5											
7.3.6											
7.4.1	**CuZn (brass)**										
7.4.2											
7.5.1	**CuSn (bronze)**										
7.5.2											
7.6.1	**CuAlFe (Ampco)**										
7.6.2											
7.8.1	**Titanium**										
7.8.2											
7.8.3											

W0285-L and W0285-OL, coated

Micro ball nose milling cutters

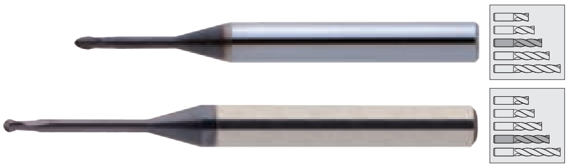
ST **MVR**

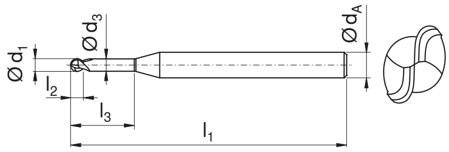
$\lambda_S = 30°$ $\gamma_S = 5°$ $d_1 = 0/-0{,}01$ $d_A = h6$

R

E/D

SCPP215





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HA Material
0.5	MVR.ST.0285.0050.L03D.Z2.R0025.HA	6	0.45	55	0.5	1.5	0.25	2	W0285005140	
0.5	MVR.ST.0285.0050.L05D.Z2.R0025.HA	6	0.45	55	1.2	2.5	0.25	2	W0285005340	
0.5	MVR.ST.0285.0050.L08D.Z2.R0025.HA	6	0.45	55	1.2	4	0.25	2	W0285005540	
0.5	MVR.ST.0285.0050.L10D.Z2.R0025.HA	6	0.45	55	1.2	5	0.25	2	W0285005740	
1.0	MVR.ST.0285.0100.L03D.Z2.R0050.HA	6	0.95	55	1.5	3	0.5	2	W0285010140	
1.0	MVR.ST.0285.0100.L05D.Z2.R0050.HA	6	0.95	55	1.5	5	0.5	2	W0285010340	
1.0	MVR.ST.0285.0100.OL08D.Z2.R0050.HA	6	0.95	65	1.5	8	0.5	2		W0285010D40
1.0	MVR.ST.0285.0100.OL10D.Z2.R0050.HA	6	0.95	65	1.5	10	0.5	2		W0285010G40
1.0	MVR.ST.0285.0100.OL12D.Z2.R0050.HA	6	0.95	65	1.5	12	0.5	2		W0285010440
1.5	MVR.ST.0285.0150.L03D.Z2.R0075.HA	6	1.44	55	1.8	5	0.75	2	W0285015140	
1.5	MVR.ST.0285.0150.L05D.Z2.R0075.HA	6	1.44	55	1.8	7.5	0.75	2	W0285015340	
1.5	MVR.ST.0285.0150.OL08D.Z2.R0075.HA	6	1.44	65	1.8	12	0.75	2		W0285015D40
1.5	MVR.ST.0285.0150.OL10D.Z2.R0075.HA	6	1.44	65	1.8	15	0.75	2		W0285015440
2.0	MVR.ST.0285.0200.L03D.Z2.R0100.HA	6	1.92	55	2	6	1	2	W0285020140	
2.0	MVR.ST.0285.0200.L05D.Z2.R0100.HA	6	1.92	55	2	10	1	2	W0285020340	
2.0	MVR.ST.0285.0200.L07D.Z2.R0100.HA	6	1.92	55	2	14	1	2	W0285020D40	
2.0	MVR.ST.0285.0200.OL08D.Z2.R0100.HA	6	1.92	65	2	16	1	2		W0285020G40
2.0	MVR.ST.0285.0200.OL10D.Z2.R0100.HA	6	1.92	65	2	20	1	2		W0285020440

W0289-L and W0289-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]					
					= Ø 0,5 = Ø 0,6	> Ø 0,6 = Ø 0,8	> Ø 0,8 = Ø 1,0	> Ø 1,0 = Ø 1,2	> Ø 1,2 = Ø 1,5	> Ø 1,5 = Ø 2,0
1.1.1	**Machining steels**	130	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.1.2		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.2.1	**Constructional steel**	130	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.2.2		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.2.3		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.3.1	**Spring steel**	115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.3.2		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
1.3.3		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
2.1.1	**Cementation steel**	130	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.1.2		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.1.3		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.2.1	**Nitriding steel**	90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.2.2		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.1	**Tempered steel**	115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.2		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.3		115	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.4		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
2.3.5		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
2.3.6		60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.1.1	**Non alloyed tool steel**	90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.2.1	**Tool steel for cold working**	90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.2.2		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.2.3		60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.2.4		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.2.5		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.1	**Tool steel for hot working**	70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.2		60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.3		90	1xø	0,04xø	0,006	0,008	0,011	0,013	0,016	0,006
3.3.4		70	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.3.5		60	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.5.1	**Hardened tool steel** **< 55 HRC**	50	1xø	0,03xø	0,005	0,007	0,009	0,011	0,014	0,005
3.5.2	**55–58 HRC**									
3.5.3	**58–60 HRC**									
3.5.4	**60–62 HRC**									
3.5.5	**62–64 HRC**									
4.1.1	**Stainless steel**									
4.1.2										
4.1.3										
4.1.4										
4.1.5										
4.2.1	**Heat-resistant alloys**									
4.2.2										
4.2.3										
4.2.4										
5.1.1	**Conventional cast steel**									
5.1.2										
5.1.3										
5.2.1	**Stainless cast steel**									
5.2.2										
6.1.1	**Cast iron with lamellar graphite**									
6.1.2										
6.1.3										
6.1.4										
6.2.1	**Spheroidal cast iron**									
6.2.2										
6.2.3										
6.3.1	**GTW (white malleable cast iron)**									
6.3.2										
6.4.1	**GTS (black malleable cast iron)**									
6.4.2										
7.1.1	**Aluminium**									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	**CuZn (brass)**									
7.4.2										
7.5.1	**CuSn (bronze)**									
7.5.2										
7.6.1	**CuAlFe (Ampco)**									
7.6.2										
7.8.1	**Titanium**									
7.8.2										
7.8.3										

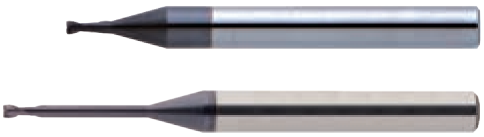
W0289-L and W0289-OL, coated

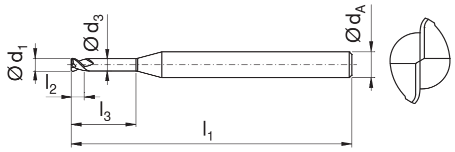
Micro torus milling cutters

ST **MTF**

$\lambda_S = 30°$ $\gamma_S = 5°$ $d_1 =$ 0/-0,01 $d_A = h6$ R E/D

SCPP215





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HA Material
0.5	MTF.ST.0289.0050.L03D.Z2.R0005.HA	6	0.45	55	0.5	1.5	0.05	2	W0289005140	
0.5	MTF.ST.0289.0050.L05D.Z2.R0005.HA	6	0.45	55	1.2	2.5	0.05	2	W0289005340	
0.5	MTF.ST.0289.0050.L08D.Z2.R0005.HA	6	0.45	55	1.2	4	0.05	2	W0289005540	
0.5	MTF.ST.0289.0050.L10D.Z2.R0005.HA	6	0.45	55	1.2	5	0.05	2	W0289005740	
1.0	MTF.ST.0289.0100.L03D.Z2.R0010.HA	6	0.95	55	1.5	3	0.1	2	W0289010140	
1.0	MTF.ST.0289.0100.L05D.Z2.R0010.HA	6	0.95	55	1.5	5	0.1	2	W0289010340	
1.0	MTF.ST.0289.0100.OL08D.Z2.R0010.HA	6	0.95	65	1.5	8	0.1	2		W0289010D40
1.0	MTF.ST.0289.0100.OL10D.Z2.R0010.HA	6	0.95	65	1.5	10	0.1	2		W0289010440
1.0	MTF.ST.0289.0100.OL12D.Z2.R0010.HA	6	0.95	65	1.5	12	0.1	2		W0289010640
1.5	MTF.ST.0289.0150.L03D.Z2.R0015.HA	6	1.44	55	1.8	5	0.15	2	W0289015140	
1.5	MTF.ST.0289.0150.L05D.Z2.R0015.HA	6	1.44	55	1.8	7.5	0.15	2	W0289015340	
1.5	MTF.ST.0289.0150.OL08D.Z2.R0015.HA	6	1.44	65	1.8	12	0.15	2		W0289015D40
1.5	MTF.ST.0289.0150.OL10D.Z2.R0015.HA	6	1.44	65	1.8	15	0.15	2		W0289015440
2.0	MTF.ST.0289.0200.L03D.Z2.R0020.HA	6	1.92	55	2	6	0.2	2	W0289020140	
2.0	MTF.ST.0289.0200.L05D.Z2.R0020.HA	6	1.92	55	2	10	0.2	2	W0289020240	
2.0	MTF.ST.0289.0200.L07D.Z2.R0020.HA	6	1.92	55	2	14	0.2	2	W0289020340	
2.0	MTF.ST.0289.0200.OL08D.Z2.R0020.HA	6	1.92	65	2	16	0.2	2		W0289020D40
2.0	MTF.ST.0289.0200.OL10D.Z2.R0020.HA	6	1.92	65	2	20	0.2	2		W0289020440

W0374-L, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
						= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		325	0,05xø	2xø	0,045	0,07	0,1	0,12
1.1.2			300	0,05xø	2xø	0,04	0,06	0,08	0,1
1.2.1	**Constructional steel**		310	0,05xø	2xø	0,045	0,07	0,1	0,12
1.2.2			290	0,05xø	2xø	0,04	0,06	0,08	0,1
1.2.3			280	0,05xø	2xø	0,04	0,06	0,08	0,1
1.3.1	**Spring steel**		160	0,05xø	2xø	0,03	0,05	0,06	0,08
1.3.2			150	0,05xø	2xø	0,03	0,05	0,06	0,08
1.3.3			140	0,05xø	2xø	0,025	0,04	0,05	0,07
2.1.1	**Cementation steel**		260	0,05xø	2xø	0,04	0,06	0,08	0,1
2.1.2			250	0,05xø	2xø	0,04	0,06	0,08	0,1
2.1.3			230	0,05xø	2xø	0,03	0,05	0,06	0,08
2.2.1	**Nitriding steel**		230	0,05xø	2xø	0,04	0,06	0,08	0,1
2.2.2			210	0,05xø	2xø	0,03	0,05	0,06	0,08
2.3.1	**Tempered steel**		250	0,05xø	2xø	0,04	0,06	0,08	0,1
2.3.2			230	0,05xø	2xø	0,04	0,06	0,08	0,1
2.3.3			230	0,05xø	2xø	0,04	0,06	0,08	0,1
2.3.4			220	0,05xø	2xø	0,04	0,06	0,08	0,1
2.3.5			210	0,05xø	2xø	0,03	0,05	0,06	0,08
2.3.6			190	0,05xø	2xø	0,03	0,05	0,06	0,08
3.1.1	**Non alloyed tool steel**		230	0,05xø	2xø	0,04	0,06	0,08	0,1
3.2.1	**Tool steel for cold working**		220	0,05xø	2xø	0,04	0,06	0,08	0,1
3.2.2			210	0,05xø	2xø	0,04	0,06	0,08	0,1
3.2.3			185	0,05xø	2xø	0,03	0,05	0,06	0,08
3.2.4			200	0,05xø	2xø	0,04	0,06	0,08	0,1
3.2.5			175	0,05xø	2xø	0,04	0,06	0,08	0,1
3.3.1	**Tool steel for hot working**		205	0,05xø	2xø	0,04	0,06	0,08	0,1
3.3.2			185	0,05xø	2xø	0,03	0,05	0,06	0,08
3.3.3			185	0,05xø	2xø	0,04	0,06	0,08	0,1
3.3.4			175	0,05xø	2xø	0,04	0,06	0,08	0,1
3.3.5			160	0,05xø	2xø	0,03	0,05	0,06	0,08
3.5.1	**Hardened tool steel**	**< 55 HRC**							
3.5.2		**55–58 HRC**							
3.5.3		**58–60 HRC**							
3.5.4		**60–62 HRC**							
3.5.5		**62–64 HRC**							
4.1.1	**Stainless steel**		120	0,05xø	2xø	0,025	0,04	0,05	0,07
4.1.2			100	0,05xø	2xø	0,025	0,04	0,05	0,07
4.1.3			120	0,05xø	2xø	0,025	0,04	0,05	0,07
4.1.4			120	0,05xø	2xø	0,025	0,04	0,05	0,07
4.1.5			130	0,05xø	2xø	0,025	0,04	0,05	0,07
4.2.1	**Heat-resistant alloys**		40	0,05xø	2xø	0,02	0,03	0,04	0,05
4.2.2			40	0,05xø	2xø	0,02	0,03	0,04	0,05
4.2.3			40	0,05xø	2xø	0,02	0,03	0,04	0,05
4.2.4			40	0,05xø	2xø	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**		250	0,05xø	2xø	0,04	0,06	0,08	0,1
5.1.2			200	0,05xø	2xø	0,04	0,06	0,08	0,1
5.1.3			150	0,05xø	2xø	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**		120	0,05xø	2xø	0,025	0,04	0,05	0,07
5.2.2			120	0,05xø	2xø	0,025	0,04	0,05	0,07
6.1.1	**Cast iron with lamellar graphite**		250	0,05xø	2xø	0,045	0,07	0,1	0,12
6.1.2			220	0,05xø	2xø	0,045	0,07	0,1	0,12
6.1.3			200	0,05xø	2xø	0,04	0,06	0,08	0,1
6.1.4			150	0,05xø	2xø	0,04	0,06	0,08	0,1
6.2.1	**Spheroidal cast iron**		230	0,05xø	2xø	0,04	0,06	0,08	0,1
6.2.2			210	0,05xø	2xø	0,04	0,06	0,08	0,1
6.2.3			185	0,05xø	2xø	0,04	0,06	0,08	0,1
6.3.1	**GTW (white malleable cast iron)**		220	0,05xø	2xø	0,04	0,06	0,08	0,1
6.3.2			200	0,05xø	2xø	0,04	0,06	0,08	0,1
6.4.1	**GTS (black malleable cast iron)**		220	0,05xø	2xø	0,04	0,06	0,08	0,1
6.4.2			200	0,05xø	2xø	0,04	0,06	0,08	0,1
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**		350	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.2			300	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.3			250	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.4			300	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.5			250	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.6			300	0,05xø	2xø	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**		370	0,05xø	2xø	0,045	0,07	0,1	0,12
7.4.2			430	0,05xø	2xø	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**		300	0,05xø	2xø	0,045	0,07	0,1	0,12
7.5.2			350	0,05xø	2xø	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**		175	0,05xø	2xø	0,045	0,07	0,1	0,12
7.6.2			200	0,05xø	2xø	0,045	0,07	0,1	0,12
7.8.1	**Titanium**		200	0,05xø	2xø	0,04	0,06	0,08	0,1
7.8.2			175	0,05xø	2xø	0,03	0,05	0,06	0,08
7.8.3			125	0,05xø	2xø	0,025	0,04	0,05	0,07

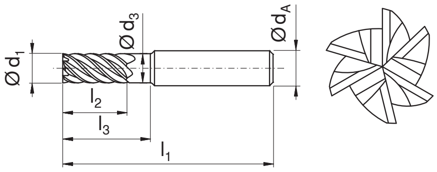
W0374-L, coated

High-precision finish milling cutters

ST **HG SC**

λ_S=48° 49,5° | γ_S = 12° | d_1 = f8 d_A=h6 | S | E

SCPP225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
6.0	HG-SC.ST.0374.0600.L.Z6.S.HA	6	5.6	57	13	19	6	W0374060340
8.0	HG-SC.ST.0374.0800.L.Z6.S.HA	8	7.6	63	19	25	6	W0374080340
10.0	HG-SC.ST.0374.1000.L.Z6.S.HA	10	9.6	72	22	30	6	W0374100340
12.0	HG-SC.ST.0374.1200.L.Z6.S.HA	12	11.5	83	26	36	6	W0374120340
16.0	HG-SC.ST.0374.1600.L.Z6.S.HA	16	15	92	32	42	6	W0374160340
20.0	HG-SC.ST.0374.2000.L.Z6.S.HA	20	19	104	38	52	6	W0374200340

W0374-OL and W0374-OLS, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
						= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		230	0,05xø	2xø	0,045	0,07	0,1	0,12
1.1.2			210	0,05xø	2xø	0,04	0,06	0,08	0,1
1.2.1	**Constructional steel**		215	0,05xø	2xø	0,045	0,07	0,1	0,12
1.2.2			205	0,05xø	2xø	0,04	0,06	0,08	0,1
1.2.3			195	0,05xø	2xø	0,04	0,06	0,08	0,1
1.3.1	**Spring steel**		110	0,05xø	2xø	0,03	0,05	0,06	0,08
1.3.2			105	0,05xø	2xø	0,03	0,05	0,06	0,08
1.3.3			100	0,05xø	2xø	0,025	0,04	0,05	0,07
2.1.1	**Cementation steel**		180	0,05xø	2xø	0,04	0,06	0,08	0,1
2.1.2			175	0,05xø	2xø	0,04	0,06	0,08	0,1
2.1.3			160	0,05xø	2xø	0,03	0,05	0,06	0,08
2.2.1	**Nitriding steel**		160	0,05xø	2xø	0,04	0,06	0,08	0,1
2.2.2			145	0,05xø	2xø	0,03	0,05	0,06	0,08
2.3.1	**Tempered steel**		175	0,05xø	2xø	0,04	0,06	0,08	0,1
2.3.2			160	0,05xø	2xø	0,04	0,06	0,08	0,1
2.3.3			160	0,05xø	2xø	0,04	0,06	0,08	0,1
2.3.4			155	0,05xø	2xø	0,04	0,06	0,08	0,1
2.3.5			145	0,05xø	2xø	0,03	0,05	0,06	0,08
2.3.6			135	0,05xø	2xø	0,03	0,05	0,06	0,08
3.1.1	**Non alloyed tool steel**		160	0,05xø	2xø	0,04	0,06	0,08	0,1
3.2.1	**Tool steel for cold working**		155	0,05xø	2xø	0,04	0,06	0,08	0,1
3.2.2			145	0,05xø	2xø	0,04	0,06	0,08	0,1
3.2.3			130	0,05xø	2xø	0,03	0,05	0,06	0,08
3.2.4			140	0,05xø	2xø	0,04	0,06	0,08	0,1
3.2.5			120	0,05xø	2xø	0,04	0,06	0,08	0,1
3.3.1	**Tool steel for hot working**		145	0,05xø	2xø	0,04	0,06	0,08	0,1
3.3.2			130	0,05xø	2xø	0,03	0,05	0,06	0,08
3.3.3			130	0,05xø	2xø	0,04	0,06	0,08	0,1
3.3.4			120	0,05xø	2xø	0,04	0,06	0,08	0,1
3.3.5			110	0,05xø	2xø	0,03	0,05	0,06	0,08
3.5.1	**Hardened tool steel**	**< 55 HRC**							
3.5.2		**55–58 HRC**							
3.5.3		**58–60 HRC**							
3.5.4		**60–62 HRC**							
3.5.5		**62–64 HRC**							
4.1.1	**Stainless steel**		80	0,05xø	2xø	0,025	0,04	0,05	0,07
4.1.2			70	0,05xø	2xø	0,025	0,04	0,05	0,07
4.1.3			80	0,05xø	2xø	0,025	0,04	0,05	0,07
4.1.4			80	0,05xø	2xø	0,025	0,04	0,05	0,07
4.1.5			90	0,05xø	2xø	0,025	0,04	0,05	0,07
4.2.1	**Heat-resistant alloys**		30	0,05xø	2xø	0,02	0,03	0,04	0,05
4.2.2			30	0,05xø	2xø	0,02	0,03	0,04	0,05
4.2.3			30	0,05xø	2xø	0,02	0,03	0,04	0,05
4.2.4			30	0,05xø	2xø	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**		175	0,05xø	2xø	0,04	0,06	0,08	0,1
5.1.2			140	0,05xø	2xø	0,04	0,06	0,08	0,1
5.1.3			105	0,05xø	2xø	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**		80	0,05xø	2xø	0,025	0,04	0,05	0,07
5.2.2			80	0,05xø	2xø	0,025	0,04	0,05	0,07
6.1.1	**Cast iron with lamellar graphite**		175	0,05xø	2xø	0,045	0,07	0,1	0,12
6.1.2			155	0,05xø	2xø	0,045	0,07	0,1	0,12
6.1.3			140	0,05xø	2xø	0,04	0,06	0,08	0,1
6.1.4			105	0,05xø	2xø	0,04	0,06	0,08	0,1
6.2.1	**Spheroidal cast iron**		160	0,05xø	2xø	0,04	0,06	0,08	0,1
6.2.2			145	0,05xø	2xø	0,04	0,06	0,08	0,1
6.2.3			130	0,05xø	2xø	0,04	0,06	0,08	0,1
6.3.1	**GTW (white malleable cast iron)**		155	0,05xø	2xø	0,04	0,06	0,08	0,1
6.3.2			140	0,05xø	2xø	0,04	0,06	0,08	0,1
6.4.1	**GTS (black malleable cast iron)**		155	0,05xø	2xø	0,04	0,06	0,08	0,1
6.4.2			140	0,05xø	2xø	0,04	0,06	0,08	0,1
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**		245	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.2			210	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.3			175	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.4			210	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.5			175	0,05xø	2xø	0,045	0,07	0,1	0,12
7.3.6			210	0,05xø	2xø	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**		260	0,05xø	2xø	0,045	0,07	0,1	0,12
7.4.2			300	0,05xø	2xø	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**		210	0,05xø	2xø	0,045	0,07	0,1	0,12
7.5.2			245	0,05xø	2xø	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**		120	0,05xø	2xø	0,045	0,07	0,1	0,12
7.6.2			140	0,05xø	2xø	0,045	0,07	0,1	0,12
7.8.1	**Titanium**		140	0,05xø	2xø	0,04	0,06	0,08	0,1
7.8.2			120	0,05xø	2xø	0,03	0,05	0,06	0,08
7.8.3			85	0,05xø	2xø	0,025	0,04	0,05	0,07

W0374-OL and W0374-OLS, coated

High-precision finish milling cutters

ST

HG SC

λ_S=48° 49,5°

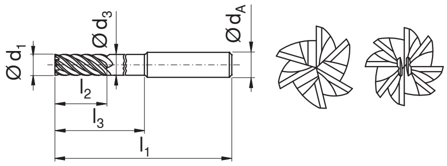
γ_S = 12°

d_1 = f8 d_A=h6

S

E

SCPP225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material	HA Material
6.0	HG-SC.ST.0374.0600.OLS.Z6.S.HA	6	5.6	80	15	42	6		W0374060440
6.0	HG-SC.ST.0374.0600.OL.Z6.S.HA	6		80	33		6	W0374060540	
8.0	HG-SC.ST.0374.0800.OLS.Z6.S.HA	8	7.6	100	20	62	6		W0374080440
8.0	HG-SC.ST.0374.0800.OL.Z6.S.HA	8		100	40		6	W0374080540	
10.0	HG-SC.ST.0374.1000.OLS.Z6.S.HA	10	9.6	100	25	58	6		W0374100440
10.0	HG-SC.ST.0374.1000.OL.Z6.S.HA	10		100	55		6	W0374100540	
12.0	HG-SC.ST.0374.1200.OLS.Z6.S.HA	12	11.5	120	30	73	6		W0374120440
12.0	HG-SC.ST.0374.1200.OL.Z6.S.HA	12		120	65		6	W0374120540	
16.0	HG-SC.ST.0374.1600.OLS.Z6.S.HA	16	15	150	40	100	6		W0374160440
16.0	HG-SC.ST.0374.1600.OL.Z8.S.HA	16		150	85		8	W0374160540	
20.0	HG-SC.ST.0374.2000.OLS.Z6.S.HA	20	19	150	50	98	6		W0374200440
20.0	HG-SC.ST.0374.2000.OL.Z8.S.HA	20		160	100		8	W0374200540	

W0340-S and W0340-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 1,0 = Ø 1,2	> Ø 1,2 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	260	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
1.1.2		240	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
1.2.1	Constructional steel	250	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
1.2.2		230	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
1.2.3		220	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
1.3.1	Spring steel											
1.3.2												
1.3.3												
2.1.1	Cementation steel	210	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
2.1.2		200	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
2.1.3		190	1xø	1xø			0,007	0,015	0,03	0,05	0,06	0,08
2.2.1	Nitriding steel	190	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
2.2.2		170	1xø	1xø			0,007	0,015	0,03	0,05	0,06	0,08
2.3.1	Tempered steel	200	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
2.3.2		190	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
2.3.3		190	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
2.3.4		180	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
2.3.5		170	1xø	1xø			0,007	0,015	0,03	0,05	0,06	0,08
2.3.6												
3.1.1	Non alloyed tool steel											
3.2.1	Tool steel for cold working											
3.2.2												
3.2.3												
3.2.4												
3.2.5												
3.3.1	Tool steel for hot working											
3.3.2												
3.3.3												
3.3.4												
3.3.5												
3.5.1	Hardened tool steel < 55 HRC											
3.5.2	55–58 HRC											
3.5.3	58–60 HRC											
3.5.4	60–62 HRC											
3.5.5	62–64 HRC											
4.1.1	Stainless steel	100	1xø	1xø			0,006	0,012	0,025	0,04	0,05	0,07
4.1.2		80	1xø	1xø			0,006	0,012	0,025	0,04	0,05	0,07
4.1.3		100	1xø	1xø			0,006	0,012	0,025	0,04	0,05	0,07
4.1.4		100	1xø	1xø			0,006	0,012	0,025	0,04	0,05	0,07
4.1.5		110	1xø	1xø			0,006	0,012	0,025	0,04	0,05	0,07
4.2.1	Heat-resistant alloys	25	1xø	0,5xø	0,004	0,004	0,005	0,01	0,02	0,03	0,04	0,05
4.2.2		25	1xø	0,5xø	0,004	0,004	0,005	0,01	0,02	0,03	0,04	0,05
4.2.3		25	1xø	0,5xø	0,004	0,004	0,005	0,01	0,02	0,03	0,04	0,05
4.2.4		25	1xø	0,5xø	0,004	0,004	0,005	0,01	0,02	0,03	0,04	0,05
5.1.1	Conventional cast steel	200	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
5.1.2		160	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
5.1.3		120	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
5.2.1	Stainless cast steel	100	1xø	1xø			0,006	0,012	0,025	0,04	0,05	0,07
5.2.2		100	1xø	1xø			0,006	0,012	0,025	0,04	0,05	0,07
6.1.1	Cast iron with lamellar graphite	200	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
6.1.2		180	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
6.1.3		160	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
6.1.4		120	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
6.2.1	Spheroidal cast iron	190	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
6.2.2		170	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
6.2.3		150	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
6.3.1	GTW (white malleable cast iron)	180	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
6.3.2		160	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
6.4.1	GTS (black malleable cast iron)	180	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
6.4.2		160	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
7.1.1	Aluminium											
7.1.2												
7.1.3												
7.1.4												
7.1.5												
7.1.6												
7.2.1	Magnesium											
7.2.2												
7.3.1	Copper	280	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.3.2		240	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.3.3		200	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.3.4		240	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.3.5		200	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.3.6		240	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.4.1	CuZn (brass)	300	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.4.2		350	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.5.1	CuSn (bronze)	240	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.5.2		280	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.6.1	CuAlFe (Ampco)	140	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.6.2		160	1xø	1xø			0,012	0,025	0,045	0,07	0,1	0,12
7.8.1	Titanium	90	1xø	1xø			0,01	0,02	0,04	0,06	0,08	0,1
7.8.2		80	1xø	1xø			0,007	0,015	0,03	0,05	0,06	0,08
7.8.3		50	1xø	1xø			0,006	0,012	0,025	0,04	0,05	0,07

W0340-S and W0340-L, coated

HPC end mills

VA **HPC SF**

λ_S = 42,5° / 45° / 47,5°

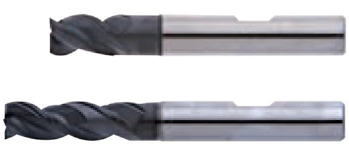
γ_S = 4°

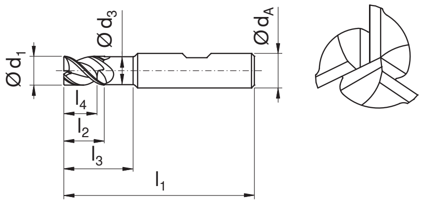
d_1 = f8
d_A = h6

F 45°

E

SCPM225





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	F [mm]	z	HB Material	HB Material
1.0	HPC-SF.VA.0340.0100.L.Z3.S.HB	6	0.95	57	2.5	5	1.3	0	3		W0340010341
1.5	HPC-SF.VA.0340.0150.L.Z3.S.HB	6	1.44	57	4	7.5	1.9	0	3		W0340015341
2.0	HPC-SF.VA.0340.0200.L.Z3.F0005A.HB	6	1.92	57	5	10	2.6	0.05	3		W0340020341
2.5	HPC-SF.VA.0340.0250.L.Z3.F0005A.HB	6	2.4	57	6.5	12.5	3.2	0.05	3		W0340025341
3.0	HPC-SF.VA.0340.0300.L.Z3.F0010A.HB	6	2.9	57	8	15	3.9	0.1	3		W0340030341
3.5	HPC-SF.VA.0340.0350.L.Z3.F0010A.HB	6	3.4	57	11	16	4.5	0.1	3		W0340035341
4.0	HPC-SF.VA.0340.0400.L.Z3.F0010A.HB	6	3.9	57	11	16	5.2	0.1	3		W0340040341
4.0	HPC-SF.VA.0340.0400.S.Z3.F0010A.HB	6	3.9	54	8	15	4.4	0.1	3	W0340040241	
4.5	HPC-SF.VA.0340.0450.L.Z3.F0010A.HB	6	4.4	57	13	19	5.8	0.1	3		W0340045341
5.0	HPC-SF.VA.0340.0500.L.Z3.F0010A.HB	6	4.9	57	13	19	6.5	0.1	3		W0340050341
5.0	HPC-SF.VA.0340.0500.S.Z3.F0010A.HB	6	4.9	54	9	16	5.5	0.1	3	W0340050241	
5.5	HPC-SF.VA.0340.0550.L.Z3.F0010A.HB	6	5.4	57	13	19	7.1	0.1	3		W0340055341
6.0	HPC-SF.VA.0340.0600.L.Z3.F0020A.HB	6	5.9	57	13	19	7.8	0.2	3		W0340060341
6.0	HPC-SF.VA.0340.0600.S.Z3.F0020A.HB	6	5.9	54	10	17	6.6	0.2	3	W0340060241	
6.5	HPC-SF.VA.0340.0650.L.Z3.F0020A.HB	8	6.3	63	19	25	8.4	0.2	3		W0340065341
7.0	HPC-SF.VA.0340.0700.L.Z3.F0020A.HB	8	6.8	63	19	25	9.1	0.2	3		W0340070341
7.5	HPC-SF.VA.0340.0750.L.Z3.F0020A.HB	8	7.3	63	19	25	9.7	0.2	3		W0340075341
8.0	HPC-SF.VA.0340.0800.L.Z3.F0020A.HB	8	7.8	63	19	25	10.4	0.2	3		W0340080341
8.0	HPC-SF.VA.0340.0800.S.Z3.F0020A.HB	8	7.8	58	12	20	8.8	0.2	3	W0340080241	
8.5	HPC-SF.VA.0340.0850.L.Z3.F0020A.HB	10	8.2	72	22	30	11.0	0.2	3		W0340085341
9.0	HPC-SF.VA.0340.0900.L.Z3.F0020A.HB	10	8.7	72	22	30	11.7	0.2	3		W0340090341
9.5	HPC-SF.VA.0340.0950.L.Z3.F0020A.HB	10	9.2	72	22	30	12.3	0.2	3		W0340095341
10.0	HPC-SF.VA.0340.1000.L.Z3.F0020A.HB	10	9.7	72	22	30	13.0	0.2	3		W0340100341
10.0	HPC-SF.VA.0340.1000.S.Z3.F0020A.HB	10	9.7	66	14	24	11.0	0.2	3	W0340100241	
12.0	HPC-SF.VA.0340.1200.L.Z3.F0020A.HB	12	11.7	83	26	36	15.6	0.2	3		W0340120341
12.0	HPC-SF.VA.0340.1200.S.Z3.F0020A.HB	12	11.7	73	16	26	13.2	0.2	3	W0340120241	
14.0	HPC-SF.VA.0340.1400.L.Z3.F0020A.HB	14	13.7	83	26	36	18.2	0.2	3		W0340140341
14.0	HPC-SF.VA.0340.1400.S.Z3.F0020A.HB	14	13.7	75	18	28	15.4	0.2	3	W0340140241	
16.0	HPC-SF.VA.0340.1600.L.Z3.F0020A.HB	16	15.5	92	32	42	20.8	0.2	3		W0340160341
16.0	HPC-SF.VA.0340.1600.S.Z3.F0020A.HB	16	15.5	82	22	32	17.6	0.2	3	W0340160241	
18.0	HPC-SF.VA.0340.1800.L.Z3.F0020A.HB	18	17.5	92	32	42	23.4	0.2	3		W0340180341
18.0	HPC-SF.VA.0340.1800.S.Z3.F0020A.HB	18	17.5	84	24	34	19.8	0.2	3	W0340180241	
20.0	HPC-SF.VA.0340.2000.L.Z3.F0020A.HB	20	19.5	104	38	52	26.0	0.2	3		W0340200341
20.0	HPC-SF.VA.0340.2000.S.Z3.F0020A.HB	20	19.5	92	26	40	22.0	0.2	3	W0340200241	

W0340-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	140	1xø	0,8xø	0,045	0,07	0,1	0,12
1.1.2		120	1xø	0,8xø	0,04	0,06	0,08	0,1
1.2.1	Constructional steel	130	1xø	0,8xø	0,045	0,07	0,1	0,12
1.2.2		110	1xø	0,8xø	0,04	0,06	0,08	0,1
1.2.3		100	1xø	0,8xø	0,04	0,06	0,08	0,1
1.3.1	Spring steel							
1.3.2								
1.3.3								
2.1.1	Cementation steel	105	1xø	0,8xø	0,04	0,06	0,08	0,1
2.1.2		100	1xø	0,8xø	0,04	0,06	0,08	0,1
2.1.3		95	1xø	0,8xø	0,03	0,05	0,06	0,08
2.2.1	Nitriding steel	95	1xø	0,8xø	0,04	0,06	0,08	0,1
2.2.2		85	1xø	0,8xø	0,03	0,05	0,06	0,08
2.3.1	Tempered steel	100	1xø	0,8xø	0,04	0,06	0,08	0,1
2.3.2		95	1xø	0,8xø	0,04	0,06	0,08	0,1
2.3.3		95	1xø	0,8xø	0,04	0,06	0,08	0,1
2.3.4		90	1xø	0,8xø	0,04	0,06	0,08	0,1
2.3.5		85	1xø	0,8xø	0,03	0,05	0,06	0,08
2.3.6								
3.1.1	Non alloyed tool steel							
3.2.1	Tool steel for cold working							
3.2.2								
3.2.3								
3.2.4								
3.2.5								
3.3.1	Tool steel for hot working							
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel	60	1xø	0,8xø	0,025	0,04	0,05	0,07
4.1.2		50	1xø	0,8xø	0,025	0,04	0,05	0,07
4.1.3		60	1xø	0,8xø	0,025	0,04	0,05	0,07
4.1.4		60	1xø	0,8xø	0,025	0,04	0,05	0,07
4.1.5		65	1xø	0,8xø	0,025	0,04	0,05	0,07
4.2.1	Heat-resistant alloys	15	1xø	0,8xø	0,02	0,03	0,04	0,05
4.2.2		15	1xø	0,8xø	0,02	0,03	0,04	0,05
4.2.3		15	1xø	0,8xø	0,02	0,03	0,04	0,05
4.2.4		15	1xø	0,8xø	0,02	0,03	0,04	0,05
5.1.1	Conventional cast steel	100	1xø	0,8xø	0,04	0,06	0,08	0,1
5.1.2		80	1xø	0,8xø	0,04	0,06	0,08	0,1
5.1.3		60	1xø	0,8xø	0,04	0,06	0,08	0,1
5.2.1	Stainless cast steel	60	1xø	0,8xø	0,025	0,04	0,05	0,07
5.2.2		60	1xø	0,8xø	0,025	0,04	0,05	0,07
6.1.1	Cast iron with lamellar graphite	100	1xø	0,8xø	0,045	0,07	0,1	0,12
6.1.2		90	1xø	0,8xø	0,045	0,07	0,1	0,12
6.1.3		80	1xø	0,8xø	0,04	0,06	0,08	0,1
6.1.4		60	1xø	0,8xø	0,04	0,06	0,08	0,1
6.2.1	Spheroidal cast iron	60	1xø	0,8xø	0,04	0,06	0,08	0,1
6.2.2		85	1xø	0,8xø	0,04	0,06	0,08	0,1
6.2.3		75	1xø	0,8xø	0,04	0,06	0,08	0,1
6.3.1	GTW (white malleable cast iron)	90	1xø	0,8xø	0,04	0,06	0,08	0,1
6.3.2		80	1xø	0,8xø	0,04	0,06	0,08	0,1
6.4.1	GTS (black malleable cast iron)	90	1xø	0,8xø	0,04	0,06	0,08	0,1
6.4.2		80	1xø	0,8xø	0,04	0,06	0,08	0,1
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper	140	1xø	0,8xø	0,045	0,07	0,1	0,12
7.3.2		120	1xø	0,8xø	0,045	0,07	0,1	0,12
7.3.3		100	1xø	0,8xø	0,045	0,07	0,1	0,12
7.3.4		120	1xø	0,8xø	0,045	0,07	0,1	0,12
7.3.5		100	1xø	0,8xø	0,045	0,07	0,1	0,12
7.3.6		120	1xø	0,8xø	0,045	0,07	0,1	0,12
7.4.1	CuZn (brass)	150	1xø	0,8xø	0,045	0,07	0,1	0,12
7.4.2		175	1xø	0,8xø	0,045	0,07	0,1	0,12
7.5.1	CuSn (bronze)	120	1xø	0,8xø	0,045	0,07	0,1	0,12
7.5.2		140	1xø	0,8xø	0,045	0,07	0,1	0,12
7.6.1	CuAlFe (Ampco)	120	1xø	0,8xø	0,045	0,07	0,1	0,12
7.6.2		80	1xø	0,8xø	0,045	0,07	0,1	0,12
7.8.1	Titanium	45	1xø	0,8xø	0,04	0,06	0,08	0,1
7.8.2		40	1xø	0,8xø	0,03	0,05	0,06	0,08
7.8.3		25	1xø	0,8xø	0,025	0,04	0,05	0,07

W0340-OL, coated

HPC end mills

VA **HPC SF**

λ_S = 43,5° / 45° / 46,5°

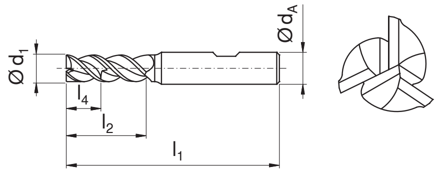
γ_S = 4°

d_1 = f8
d_A = h6

F 45°

E

SCPM225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	F [mm]	z	HB Material
4.0	HPC-SF.VA.0340.0400.OL.Z3.F0010A.HB	6	62	16	5.2	0.1	3	W0340040441
5.0	HPC-SF.VA.0340.0500.OL.Z3.F0010A.HB	6	62	17	6.5	0.1	3	W0340050441
6.0	HPC-SF.VA.0340.0600.OL.Z3.F0020A.HB	6	62	18	7.8	0.2	3	W0340060441
8.0	HPC-SF.VA.0340.0800.OL.Z3.F0020A.HB	8	68	24	10.4	0.2	3	W0340080441
10.0	HPC-SF.VA.0340.1000.OL.Z3.F0020A.HB	10	80	30	13.0	0.2	3	W0340100441
12.0	HPC-SF.VA.0340.1200.OL.Z3.F0020A.HB	12	93	36	15.6	0.2	3	W0340120441
14.0	HPC-SF.VA.0340.1400.OL.Z3.F0020A.HB	14	99	42	18.2	0.2	3	W0340140441
16.0	HPC-SF.VA.0340.1600.OL.Z3.F0020A.HB	16	108	48	20.8	0.2	3	W0340160441
18.0	HPC-SF.VA.0340.1800.OL.Z3.F0020A.HB	18	114	54	23.4	0.2	3	W0340180441
20.0	HPC-SF.VA.0340.2000.OL.Z3.F0020A.HB	20	126	60	26.0	0.2	3	W0340200441

W0345-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**								
1.1.2		240	1xø	1xø	0,015	0,03	0,05	0,06	0,08
1.2.1	**Constructional steel**	250	1xø	1xø	0,02	0,04	0,06	0,08	0,1
1.2.2		230	1xø	1xø	0,015	0,03	0,05	0,06	0,08
1.2.3		220	1xø	1xø	0,015	0,03	0,05	0,06	0,08
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**	210	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.1.2		200	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.1.3		190	1xø	1xø	0,012	0,025	0,04	0,05	0,07
2.2.1	**Nitriding steel**	190	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.2.2		170	1xø	1xø	0,012	0,025	0,04	0,05	0,07
2.3.1	**Tempered steel**	200	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.2		190	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.3		190	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.4		180	1xø	1xø	0,015	0,03	0,05	0,06	0,08
2.3.5		170	1xø	1xø	0,012	0,025	0,04	0,05	0,07
2.3.6		150	1xø	1xø	0,012	0,025	0,04	0,05	0,07
3.1.1	**Non alloyed tool steel**	185	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.2.1	**Tool steel for cold working**	180	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.2.2		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.2.3		150	1xø	1xø	0,012	0,025	0,04	0,05	0,07
3.2.4		160	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.2.5		140	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.3.1	**Tool steel for hot working**	200	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.3.2		180	1xø	1xø	0,012	0,025	0,04	0,05	0,07
3.3.3		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.3.4		140	1xø	1xø	0,015	0,03	0,05	0,06	0,08
3.3.5		130	1xø	1xø	0,012	0,025	0,04	0,05	0,07
3.5.1	**Hardened tool steel** **< 55 HRC**								
3.5.2	**55–58 HRC**								
3.5.3	**58–60 HRC**								
3.5.4	**60–62 HRC**								
3.5.5	**62–64 HRC**								
4.1.1	**Stainless steel**	100	1xø	1xø	0,015	0,02	0,03	0,05	0,06
4.1.2		80	1xø	1xø	0,015	0,02	0,03	0,05	0,06
4.1.3		100	1xø	1xø	0,015	0,02	0,03	0,05	0,06
4.1.4		100	1xø	1xø	0,015	0,02	0,03	0,05	0,06
4.1.5		110	1xø	1xø	0,015	0,02	0,03	0,05	0,06
4.2.1	**Heat-resistant alloys**								
4.2.2									
4.2.3									
4.2.4									
5.1.1	**Conventional cast steel**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.2		160	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.1.3		120	1xø	1xø	0,02	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**	100	1xø	1xø	0,015	0,02	0,03	0,05	0,06
5.2.2		100	1xø	1xø	0,015	0,02	0,03	0,05	0,06
6.1.1	**Cast iron with lamellar graphite**	200	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.1.2		180	1xø	1xø	0,02	0,04	0,06	0,08	0,1
6.1.3		160	1xø	1xø	0,015	0,03	0,05	0,06	0,08
6.1.4		120	1xø	1xø	0,015	0,03	0,05	0,06	0,08
6.2.1	**Spheroidal cast iron**	190	1xø	1xø	0,015	0,03	0,05	0,06	0,08
6.2.2		170	1xø	1xø	0,015	0,03	0,05	0,06	0,08
6.2.3		150	1xø	1xø	0,015	0,03	0,05	0,06	0,08
6.3.1	**GTW (white malleable cast iron)**	180	1xø	1xø	0,015	0,03	0,05	0,06	0,08
6.3.2		160	1xø	1xø	0,015	0,03	0,05	0,06	0,08
6.4.1	**GTS (black malleable cast iron)**	180	1xø	1xø	0,015	0,03	0,05	0,06	0,08
6.4.2		160	1xø	1xø	0,015	0,03	0,05	0,06	0,08
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									

W0345-L, coated

HPC end mills

VA **HPC SF**

λ_S = 33° 34° 35°

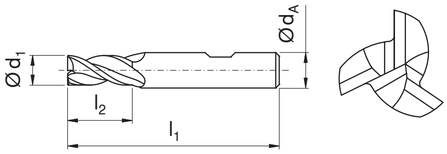
γ_S = 12°

d_1 = e8
d_A = h6

F 45°

E/D

SCPM240



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HB Material
3.0	HPC-SF.VA.0345.0300.L.Z3.F0010A.HB	6	57	8	0.1	3	W0345030341
4.0	HPC-SF.VA.0345.0400.L.Z3.F0010A.HB	6	57	11	0.1	3	W0345040341
5.0	HPC-SF.VA.0345.0500.L.Z3.F0010A.HB	6	57	13	0.1	3	W0345050341
6.0	HPC-SF.VA.0345.0600.L.Z3.F0010A.HB	6	57	13	0.1	3	W0345060341
8.0	HPC-SF.VA.0345.0800.L.Z3.F0020A.HB	8	63	21	0.2	3	W0345080341
10.0	HPC-SF.VA.0345.1000.L.Z3.F0020A.HB	10	72	22	0.2	3	W0345100341
12.0	HPC-SF.VA.0345.1200.L.Z3.F0030A.HB	12	83	26	0.3	3	W0345120341
16.0	HPC-SF.VA.0345.1600.L.Z3.F0030A.HB	16	92	36	0.3	3	W0345160341
20.0	HPC-SF.VA.0345.2000.L.Z3.F0030A.HB	20	104	41	0.3	3	W0345200341

W0445-L, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
						= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels								
1.1.2			240	0,8xø	1xø	0,03	0,05	0,06	0,08
1.2.1	Constructional steel		250	0,8xø	1xø	0,04	0,06	0,08	0,1
1.2.2			230	0,8xø	1xø	0,03	0,05	0,06	0,08
1.2.3			220	0,8xø	1xø	0,03	0,05	0,06	0,08
1.3.1	Spring steel								
1.3.2									
1.3.3									
2.1.1	Cementation steel		210	0,8xø	1xø	0,03	0,05	0,06	0,08
2.1.2			200	0,8xø	1xø	0,03	0,05	0,06	0,08
2.1.3			190	0,8xø	1xø	0,025	0,04	0,05	0,07
2.2.1	Nitriding steel		190	0,8xø	1xø	0,03	0,05	0,06	0,08
2.2.2			170	0,8xø	1xø	0,025	0,04	0,05	0,07
2.3.1	Tempered steel		200	0,8xø	1xø	0,03	0,05	0,06	0,08
2.3.2			190	0,8xø	1xø	0,03	0,05	0,06	0,08
2.3.3			190	0,8xø	1xø	0,03	0,05	0,06	0,08
2.3.4			180	0,8xø	1xø	0,03	0,05	0,06	0,08
2.3.5			170	0,8xø	1xø	0,025	0,04	0,05	0,07
2.3.6			150	0,8xø	1xø	0,025	0,04	0,05	0,07
3.1.1	Non alloyed tool steel		185	0,8xø	1xø	0,03	0,05	0,06	0,08
3.2.1	Tool steel for cold working		180	0,8xø	1xø	0,03	0,05	0,06	0,08
3.2.2			170	0,8xø	1xø	0,03	0,05	0,06	0,08
3.2.3			150	0,8xø	1xø	0,025	0,04	0,05	0,07
3.2.4			160	0,8xø	1xø	0,03	0,05	0,06	0,08
3.2.5			140	0,8xø	1xø	0,03	0,05	0,06	0,08
3.3.1	Tool steel for hot working		200	0,8xø	1xø	0,03	0,05	0,06	0,08
3.3.2			180	0,8xø	1xø	0,025	0,04	0,05	0,07
3.3.3			150	0,8xø	1xø	0,03	0,05	0,06	0,08
3.3.4			140	0,8xø	1xø	0,03	0,05	0,06	0,08
3.3.5			130	0,8xø	1xø	0,025	0,04	0,05	0,07
3.5.1	Hardened tool steel	< 55 HRC							
3.5.2		55–58 HRC							
3.5.3		58–60 HRC							
3.5.4		60–62 HRC							
3.5.5		62–64 HRC							
4.1.1	Stainless steel		100	0,8xø	1xø	0,02	0,03	0,05	0,06
4.1.2			80	0,8xø	1xø	0,02	0,03	0,05	0,06
4.1.3			100	0,8xø	1xø	0,02	0,03	0,05	0,06
4.1.4			100	0,8xø	1xø	0,02	0,03	0,05	0,06
4.1.5			110	0,8xø	1xø	0,02	0,03	0,05	0,06
4.2.1	Heat-resistant alloys								
4.2.2									
4.2.3									
4.2.4									
5.1.1	Conventional cast steel		200	0,8xø	1xø	0,04	0,06	0,08	0,1
5.1.2			160	0,8xø	1xø	0,04	0,06	0,08	0,1
5.1.3			120	0,8xø	1xø	0,04	0,06	0,08	0,1
5.2.1	Stainless cast steel		100	0,8xø	1xø	0,02	0,03	0,05	0,06
5.2.2			100	0,8xø	1xø	0,02	0,03	0,05	0,06
6.1.1	Cast iron with lamellar graphite		200	0,8xø	1xø	0,04	0,06	0,08	0,1
6.1.2			180	0,8xø	1xø	0,04	0,06	0,08	0,1
6.1.3			160	0,8xø	1xø	0,03	0,05	0,06	0,08
6.1.4			120	0,8xø	1xø	0,03	0,05	0,06	0,08
6.2.1	Spheroidal cast iron		190	0,8xø	1xø	0,03	0,05	0,06	0,08
6.2.2			170	0,8xø	1xø	0,03	0,05	0,06	0,08
6.2.3			150	0,8xø	1xø	0,03	0,05	0,06	0,08
6.3.1	GTW (white malleable cast iron)		180	0,8xø	1xø	0,03	0,05	0,06	0,08
6.3.2			160	0,8xø	1xø	0,03	0,05	0,06	0,08
6.4.1	GTS (black malleable cast iron)		180	0,8xø	1xø	0,03	0,05	0,06	0,08
6.4.2			160	0,8xø	1xø	0,03	0,05	0,06	0,08
7.1.1	Aluminium								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	Magnesium								
7.2.2									
7.3.1	Copper								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	CuZn (brass)								
7.4.2									
7.5.1	CuSn (bronze)								
7.5.2									
7.6.1	CuAlFe (Ampco)								
7.6.2									
7.8.1	Titanium								
7.8.2									
7.8.3									

W0445-L, coated

HPC end mills

VA

HPC SF

$\lambda_S = 35° / 38°$

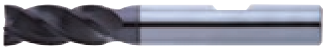
$\gamma_S = 12°$

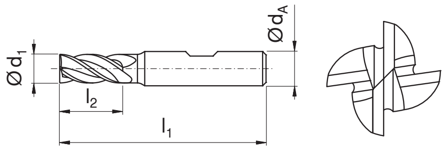
$d_1 = e8$
$d_A = h6$

F 45°

E/D

SCPM240





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HB Material
4.0	HPC-SF.VA.0445.0400.L.Z4.F0010A.HB	6	57	11	0.1	4	W0445040341
5.0	HPC-SF.VA.0445.0500.L.Z4.F0010A.HB	6	57	13	0.1	4	W0445050341
6.0	HPC-SF.VA.0445.0600.L.Z4.F0010A.HB	6	57	13	0.1	4	W0445060341
8.0	HPC-SF.VA.0445.0800.L.Z4.F0020A.HB	8	63	21	0.2	4	W0445080341
10.0	HPC-SF.VA.0445.1000.L.Z4.F0020A.HB	10	72	22	0.2	4	W0445100341
12.0	HPC-SF.VA.0445.1200.L.Z4.F0030A.HB	12	83	26	0.3	4	W0445120341
16.0	HPC-SF.VA.0445.1600.L.Z4.F0030A.HB	16	92	36	0.3	4	W0445160341
20.0	HPC-SF.VA.0445.2000.L.Z4.F0030A.HB	20	104	41	0.3	4	W0445200341

W0342-S and W0342-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	260	1xø	1xø	0,045	0,07	0,1	0,12
1.1.2		240	1xø	1xø	0,04	0,06	0,08	0,1
1.2.1	**Constructional steel**	250	1xø	1xø	0,045	0,07	0,1	0,12
1.2.2		230	1xø	1xø	0,04	0,06	0,08	0,1
1.2.3		220	1xø	1xø	0,04	0,06	0,08	0,1
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**	210	1xø	1xø	0,04	0,06	0,08	0,1
2.1.2		200	1xø	1xø	0,04	0,06	0,08	0,1
2.1.3		190	1xø	1xø	0,03	0,05	0,06	0,08
2.2.1	**Nitriding steel**	190	1xø	1xø	0,04	0,06	0,08	0,1
2.2.2		170	1xø	1xø	0,03	0,05	0,06	0,08
2.3.1	**Tempered steel**	200	1xø	1xø	0,04	0,06	0,08	0,1
2.3.2		190	1xø	1xø	0,04	0,06	0,08	0,1
2.3.3		190	1xø	1xø	0,04	0,06	0,08	0,1
2.3.4		180	1xø	1xø	0,04	0,06	0,08	0,1
2.3.5		170	1xø	1xø	0,03	0,05	0,06	0,08
2.3.6								
3.1.1	**Non alloyed tool steel**							
3.2.1	**Tool steel for cold working**							
3.2.2								
3.2.3								
3.2.4								
3.2.5								
3.3.1	**Tool steel for hot working**							
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel** **< 55 HRC**							
3.5.2	**55–58 HRC**							
3.5.3	**58–60 HRC**							
3.5.4	**60–62 HRC**							
3.5.5	**62–64 HRC**							
4.1.1	**Stainless steel**	100	1xø	1xø	0,025	0,04	0,05	0,07
4.1.2		80	1xø	1xø	0,025	0,04	0,05	0,07
4.1.3		100	1xø	1xø	0,025	0,04	0,05	0,07
4.1.4		100	1xø	1xø	0,025	0,04	0,05	0,07
4.1.5		110	1xø	1xø	0,025	0,04	0,05	0,07
4.2.1	**Heat-resistant alloys**	25	1xø	0,5xø	0,02	0,03	0,04	0,05
4.2.2		25	1xø	0,5xø	0,02	0,03	0,04	0,05
4.2.3		25	1xø	0,5xø	0,02	0,03	0,04	0,05
4.2.4		25	1xø	0,5xø	0,02	0,03	0,04	0,05
5.1.1	**Conventional cast steel**	200	1xø	1xø	0,04	0,06	0,08	0,1
5.1.2		160	1xø	1xø	0,04	0,06	0,08	0,1
5.1.3		120	1xø	1xø	0,04	0,06	0,08	0,1
5.2.1	**Stainless cast steel**	100	1xø	1xø	0,025	0,04	0,05	0,07
5.2.2		100	1xø	1xø	0,025	0,04	0,05	0,07
6.1.1	**Cast iron with lamellar graphite**	200	1xø	1xø	0,045	0,07	0,1	0,12
6.1.2		180	1xø	1xø	0,045	0,07	0,1	0,12
6.1.3		160	1xø	1xø	0,04	0,06	0,08	0,1
6.1.4		120	1xø	1xø	0,04	0,06	0,08	0,1
6.2.1	**Spheroidal cast iron**	190	1xø	1xø	0,04	0,06	0,08	0,1
6.2.2		170	1xø	1xø	0,04	0,06	0,08	0,1
6.2.3		150	1xø	1xø	0,04	0,06	0,08	0,1
6.3.1	**GTW (white malleable cast iron)**	180	1xø	1xø	0,04	0,06	0,08	0,1
6.3.2		160	1xø	1xø	0,04	0,06	0,08	0,1
6.4.1	**GTS (black malleable cast iron)**	180	1xø	1xø	0,04	0,06	0,08	0,1
6.4.2		160	1xø	1xø	0,04	0,06	0,08	0,1
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**	280	1xø	1xø	0,045	0,07	0,1	0,12
7.3.2		240	1xø	1xø	0,045	0,07	0,1	0,12
7.3.3		200	1xø	1xø	0,045	0,07	0,1	0,12
7.3.4		240	1xø	1xø	0,045	0,07	0,1	0,12
7.3.5		200	1xø	1xø	0,045	0,07	0,1	0,12
7.3.6		240	1xø	1xø	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**	300	1xø	1xø	0,045	0,07	0,1	0,12
7.4.2		350	1xø	1xø	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**	240	1xø	1xø	0,045	0,07	0,1	0,12
7.5.2		280	1xø	1xø	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**	140	1xø	1xø	0,045	0,07	0,1	0,12
7.6.2		160	1xø	1xø	0,045	0,07	0,1	0,12
7.8.1	**Titanium**	90	1xø	1xø	0,04	0,06	0,08	0,1
7.8.2		80	1xø	1xø	0,03	0,05	0,06	0,08
7.8.3		50	1xø	1xø	0,025	0,04	0,05	0,07

W0342-S and W0342-L, coated

HPC torus milling cutters

VA

HPC TF

$\lambda_S = 42,5° / 45° / 47,5°$

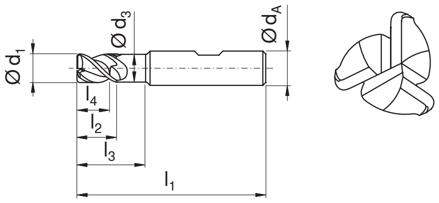
$\gamma_S = 4°$

$d_1 = f8$
$d_A = h6$

R

E

SCPM225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	R [mm]	z	HB Material	HB Material
4.0	HPC-TF.VA.0342.0400.L.Z3.R0050.HB	6	3.9	57	11	16	5.2	0.5	3		W0342040341
4.0	HPC-TF.VA.0342.0400.S.Z3.R0050.HB	6	3.9	54	8	15	4.4	0.5	3	W0342040241	
5.0	HPC-TF.VA.0342.0500.L.Z3.R0050.HB	6	4.9	57	13	19	6.5	0.5	3		W0342050341
5.0	HPC-TF.VA.0342.0500.S.Z3.R0050.HB	6	4.9	54	9	16	5.5	0.5	3	W0342050241	
6.0	HPC-TF.VA.0342.0600.L.Z3.R0050.HB	6	5.9	57	13	19	7.8	0.5	3		W0342060341
6.0	HPC-TF.VA.0342.0600.S.Z3.R0050.HB	6	5.9	54	10	17	6.6	0.5	3	W0342060241	
8.0	HPC-TF.VA.0342.0800.L.Z3.R0100.HB	8	7.8	63	19	25	10.4	1	3		W0342080341
8.0	HPC-TF.VA.0342.0800.S.Z3.R0100.HB	8	7.8	58	12	20	8.8	1	3	W0342080241	
10.0	HPC-TF.VA.0342.1000.L.Z3.R0100.HB	10	9.7	72	22	30	13.0	1	3		W0342100341
10.0	HPC-TF.VA.0342.1000.S.Z3.R0100.HB	10	9.7	66	14	24	11.0	1	3	W0342100241	
12.0	HPC-TF.VA.0342.1200.L.Z3.R0150.HB	12	11.7	83	26	36	15.6	1.5	3		W0342120341
12.0	HPC-TF.VA.0342.1200.S.Z3.R0150.HB	12	11.7	73	16	26	13.2	1.5	3	W0342120241	
16.0	HPC-TF.VA.0342.1600.L.Z3.R0200.HB	16	15.5	92	32	42	20.8	2	3		W0342160341
16.0	HPC-TF.VA.0342.1600.S.Z3.R0200.HB	16	15.5	82	22	32	17.6	2	3	W0342160241	
20.0	HPC-TF.VA.0342.2000.L.Z3.R0200.HB	20	19.5	104	38	52	26.0	2	3		W0342200341
20.0	HPC-TF.VA.0342.2000.S.Z3.R0200.HB	20	19.5	92	26	40	22.0	2	3	W0342200241	

W0456-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**							
1.1.2								
1.2.1	**Constructional steel**							
1.2.2								
1.2.3								
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**							
2.1.2								
2.1.3								
2.2.1	**Nitriding steel**							
2.2.2								
2.3.1	**Tempered steel**							
2.3.2								
2.3.3								
2.3.4								
2.3.5								
2.3.6								
3.1.1	**Non alloyed tool steel**							
3.2.1	**Tool steel for cold working**							
3.2.2								
3.2.3								
3.2.4								
3.2.5								
3.3.1	**Tool steel for hot working**							
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel** **< 55 HRC**							
3.5.2	**55–58 HRC**							
3.5.3	**58–60 HRC**							
3.5.4	**60–62 HRC**							
3.5.5	**62–64 HRC**							
4.1.1	**Stainless steel**							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	**Heat-resistant alloys**	55	1xø	0,5xø	0,04	0,05	0,06	0,07
4.2.2		55	1xø	0,5xø	0,04	0,05	0,06	0,07
4.2.3		55	1xø	0,5xø	0,04	0,05	0,06	0,07
4.2.4		55	1xø	0,5xø	0,04	0,05	0,06	0,07
5.1.1	**Conventional cast steel**							
5.1.2								
5.1.3								
5.2.1	**Stainless cast steel**							
5.2.2								
6.1.1	**Cast iron with lamellar graphite**							
6.1.2								
6.1.3								
6.1.4								
6.2.1	**Spheroidal cast iron**							
6.2.2								
6.2.3								
6.3.1	**GTW (white malleable cast iron)**							
6.3.2								
6.4.1	**GTS (black malleable cast iron)**							
6.4.2								
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**	120	1xø	0,5xø	0,045	0,07	0,1	0,12
7.8.2		100	1xø	0,5xø	0,04	0,06	0,08	0,1
7.8.3		80	1xø	0,5xø	0,03	0,05	0,06	0,08

W0456-L, coated

HPC end mills

TI

HPC SF

λ_S = 35° 38°

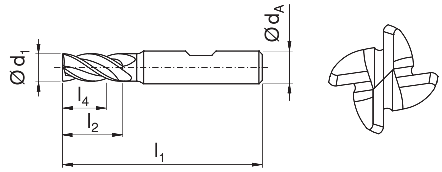
γ_S = 12°

d_1 = f8 d_A=h6

R

E

SCPS240



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	R [mm]	z	HB Material
4.0	HPC-SF.TI.0456.0400.L.Z4.R0010.HB	6	57	11	6.4	0.1	4	W0456040341
5.0	HPC-SF.TI.0456.0500.L.Z4.R0010.HB	6	57	13	8.0	0.1	4	W0456050341
6.0	HPC-SF.TI.0456.0600.L.Z4.R0010.HB	6	57	13	9.6	0.1	4	W0456060341
8.0	HPC-SF.TI.0456.0800.L.Z4.R0020.HB	8	63	21	12.8	0.2	4	W0456080341
10.0	HPC-SF.TI.0456.1000.L.Z4.R0020.HB	10	72	22	16.0	0.2	4	W0456100341
12.0	HPC-SF.TI.0456.1200.L.Z4.R0020.HB	12	83	26	19.2	0.2	4	W0456120341
16.0	HPC-SF.TI.0456.1600.L.Z4.R0030.HB	16	92	36	25.6	0.3	4	W0456160341
20.0	HPC-SF.TI.0456.2000.L.Z4.R0030.HB	20	104	41	32.0	0.3	4	W0456200341

W0556-L, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
						= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**								
1.1.2									
1.2.1	**Constructional steel**								
1.2.2									
1.2.3									
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**								
2.1.2									
2.1.3									
2.2.1	**Nitriding steel**								
2.2.2									
2.3.1	**Tempered steel**								
2.3.2									
2.3.3									
2.3.4									
2.3.5									
2.3.6									
3.1.1	**Non alloyed tool steel**								
3.2.1	**Tool steel for cold working**								
3.2.2									
3.2.3									
3.2.4									
3.2.5									
3.3.1	**Tool steel for hot working**								
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	**Hardened tool steel**	**< 55 HRC**							
3.5.2		**55–58 HRC**							
3.5.3		**58–60 HRC**							
3.5.4		**60–62 HRC**							
3.5.5		**62–64 HRC**							
4.1.1	**Stainless steel**		100	0,5xø	1xø	0,025	0,04	0,05	0,07
4.1.2			80	0,5xø	1xø	0,025	0,04	0,05	0,07
4.1.3			100	0,5xø	1xø	0,025	0,04	0,05	0,07
4.1.4			100	0,5xø	1xø	0,025	0,04	0,05	0,07
4.1.5			110	0,5xø	1xø	0,025	0,04	0,05	0,07
4.2.1	**Heat-resistant alloys**		55	0,5xø	1xø	0,04	0,05	0,06	0,07
4.2.2			55	0,5xø	1xø	0,04	0,05	0,06	0,07
4.2.3			55	0,5xø	1xø	0,04	0,05	0,06	0,07
4.2.4			55	0,5xø	1xø	0,04	0,05	0,06	0,07
5.1.1	**Conventional cast steel**								
5.1.2									
5.1.3									
5.2.1	**Stainless cast steel**		100	0,5xø	1xø	0,025	0,04	0,05	0,07
5.2.2			100	0,5xø	1xø	0,025	0,04	0,05	0,07
6.1.1	**Cast iron with lamellar graphite**								
6.1.2									
6.1.3									
6.1.4									
6.2.1	**Spheroidal cast iron**								
6.2.2									
6.2.3									
6.3.1	**GTW (white malleable cast iron)**								
6.3.2									
6.4.1	**GTS (black malleable cast iron)**								
6.4.2									
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**		120	0,5xø	1xø	0,045	0,07	0,1	0,12
7.8.2			100	0,5xø	1xø	0,04	0,06	0,08	0,1
7.8.3			80	0,5xø	1xø	0,03	0,05	0,06	0,08

W0556-L, coated

HPC end mills

TI

HPC SF

$\lambda_S = 38°$

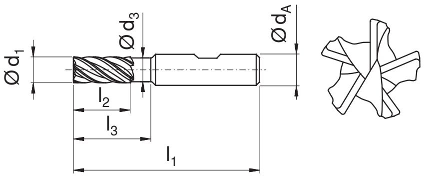
$\gamma_S = 6°$

$d_1 = e8$
$d_A = h6$

R

E

SCPS240



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HB Material
4.0	HPC-SF.TI.0556.0400.L.Z5.R0010.HB	6	3.8	57	11	17	0.1	5	W0556040341
5.0	HPC-SF.TI.0556.0500.L.Z5.R0010.HB	6	4.8	57	13	19	0.1	5	W0556050341
6.0	HPC-SF.TI.0556.0600.L.Z5.R0010.HB	6	5.8	57	13	19	0.1	5	W0556060341
8.0	HPC-SF.TI.0556.0800.L.Z5.R0020.HB	8	7.7	63	21	25	0.2	5	W0556080341
10.0	HPC-SF.TI.0556.1000.L.Z5.R0020.HB	10	9.7	72	22	30	0.2	5	W0556100341
12.0	HPC-SF.TI.0556.1200.L.Z5.R0020.HB	12	11.6	83	26	36	0.2	5	W0556120341
16.0	HPC-SF.TI.0556.1600.L.Z5.R0030.HB	16	15.5	92	36	42	0.3	5	W0556160341
20.0	HPC-SF.TI.0556.2000.L.Z5.R0030.HB	20	19.5	104	41	52	0.3	5	W0556200341

W0457-L, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
						= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels								
1.1.2									
1.2.1	Constructional steel								
1.2.2									
1.2.3									
1.3.1	Spring steel								
1.3.2									
1.3.3									
2.1.1	Cementation steel								
2.1.2									
2.1.3									
2.2.1	Nitriding steel								
2.2.2									
2.3.1	Tempered steel								
2.3.2									
2.3.3									
2.3.4									
2.3.5									
2.3.6									
3.1.1	Non alloyed tool steel								
3.2.1	Tool steel for cold working								
3.2.2									
3.2.3									
3.2.4									
3.2.5									
3.3.1	Tool steel for hot working								
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	Hardened tool steel	< 55 HRC							
3.5.2		55–58 HRC							
3.5.3		58–60 HRC							
3.5.4		60–62 HRC							
3.5.5		62–64 HRC							
4.1.1	Stainless steel								
4.1.2									
4.1.3									
4.1.4									
4.1.5									
4.2.1	Heat-resistant alloys		55	1xø	0,5xø	0,04	0,05	0,06	0,07
4.2.2			55	1xø	0,5xø	0,04	0,05	0,06	0,07
4.2.3			55	1xø	0,5xø	0,04	0,05	0,06	0,07
4.2.4			55	1xø	0,5xø	0,04	0,05	0,06	0,07
5.1.1	Conventional cast steel								
5.1.2									
5.1.3									
5.2.1	Stainless cast steel								
5.2.2									
6.1.1	Cast iron with lamellar graphite								
6.1.2									
6.1.3									
6.1.4									
6.2.1	Spheroidal cast iron								
6.2.2									
6.2.3									
6.3.1	GTW (white malleable cast iron)								
6.3.2									
6.4.1	GTS (black malleable cast iron)								
6.4.2									
7.1.1	Aluminium								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	Magnesium								
7.2.2									
7.3.1	Copper								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	CuZn (brass)								
7.4.2									
7.5.1	CuSn (bronze)								
7.5.2									
7.6.1	CuAlFe (Ampco)								
7.6.2									
7.8.1	Titanium		120	1xø	0,5xø	0,045	0,07	0,1	0,12
7.8.2			100	1xø	0,5xø	0,04	0,06	0,08	0,1
7.8.3			80	1xø	0,5xø	0,03	0,05	0,06	0,08

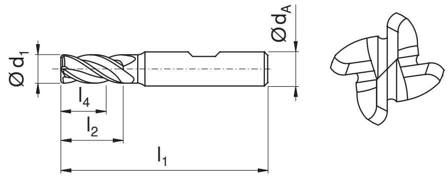
W0457-L, coated

HPC torus milling cutters

TI **HPC TF**

$\lambda_S = 35°/38°$ $\gamma_S = 12°$ $d_1 = f8$ $d_A = h6$ R E

SCPS240



d1 [mm]	Type, description	dA [mm]	l1 [mm]	l2 [mm]	l4 [mm]	R [mm]	z	HB Material
4.0	HPC-TF.TI.0457.0400.L.Z4.R0020.HB	6	57	11	6.4	0.2	4	W0457040041
4.0	HPC-TF.TI.0457.0400.L.Z4.R0040.HB	6	57	11	6.4	0.4	4	W0457040641
4.0	HPC-TF.TI.0457.0400.L.Z4.R0050.HB	6	57	11	6.4	0.5	4	W0457040241
4.0	HPC-TF.TI.0457.0400.L.Z4.R0100.HB	6	57	11	6.4	1	4	W0457040341
5.0	HPC-TF.TI.0457.0500.L.Z4.R0050.HB	6	57	13	8.0	0.5	4	W0457050241
5.0	HPC-TF.TI.0457.0500.L.Z4.R0100.HB	6	57	13	8.0	1	4	W0457050341
6.0	HPC-TF.TI.0457.0600.L.Z4.R0040.HB	6	57	13	9.6	0.4	4	W0457060641
6.0	HPC-TF.TI.0457.0600.L.Z4.R0050.HB	6	57	13	9.6	0.5	4	W0457060241
6.0	HPC-TF.TI.0457.0600.L.Z4.R0060.HB	6	57	13	9.6	0.6	4	W0457060A41
6.0	HPC-TF.TI.0457.0600.L.Z4.R0080.HB	6	57	13	9.6	0.8	4	W0457060B41
6.0	HPC-TF.TI.0457.0600.L.Z4.R0100.HB	6	57	13	9.6	1	4	W0457060341
8.0	HPC-TF.TI.0457.0800.L.Z4.R0050.HB	8	63	21	12.8	0.5	4	W0457080241
8.0	HPC-TF.TI.0457.0800.L.Z4.R0080.HB	8	63	21	12.8	0.8	4	W0457080B41
8.0	HPC-TF.TI.0457.0800.L.Z4.R0100.HB	8	63	21	12.8	1	4	W0457080341
8.0	HPC-TF.TI.0457.0800.L.Z4.R0120.HB	8	63	21	12.8	1.2	4	W0457080C41
8.0	HPC-TF.TI.0457.0800.L.Z4.R0150.HB	8	63	21	12.8	1.5	4	W0457080741
8.0	HPC-TF.TI.0457.0800.L.Z4.R0200.HB	8	63	21	12.8	2	4	W0457080441
10.0	HPC-TF.TI.0457.1000.L.Z4.R0030.HB	10	72	22	16.0	0.3	4	W0457100141
10.0	HPC-TF.TI.0457.1000.L.Z4.R0050.HB	10	72	22	16.0	0.5	4	W0457100241
10.0	HPC-TF.TI.0457.1000.L.Z4.R0100.HB	10	72	22	16.0	1	4	W0457100341
10.0	HPC-TF.TI.0457.1000.L.Z4.R0120.HB	10	72	22	16.0	1.2	4	W0457100C41
10.0	HPC-TF.TI.0457.1000.L.Z4.R0150.HB	10	72	22	16.0	1.5	4	W0457100741
10.0	HPC-TF.TI.0457.1000.L.Z4.R0160.HB	10	72	22	16.0	1.6	4	W0457100D41
10.0	HPC-TF.TI.0457.1000.L.Z4.R0200.HB	10	72	22	16.0	2	4	W0457100441
12.0	HPC-TF.TI.0457.1200.L.Z4.R0030.HB	12	83	26	19.2	0.3	4	W0457120141
12.0	HPC-TF.TI.0457.1200.L.Z4.R0050.HB	12	83	26	19.2	0.5	4	W0457120241
12.0	HPC-TF.TI.0457.1200.L.Z4.R0100.HB	12	83	26	19.2	1	4	W0457120341
12.0	HPC-TF.TI.0457.1200.L.Z4.R0120.HB	12	83	26	19.2	1.2	4	W0457120C41
12.0	HPC-TF.TI.0457.1200.L.Z4.R0150.HB	12	83	26	19.2	1.5	4	W0457120741
12.0	HPC-TF.TI.0457.1200.L.Z4.R0160.HB	12	83	26	19.2	1.6	4	W0457120D41
12.0	HPC-TF.TI.0457.1200.L.Z4.R0200.HB	12	83	26	19.2	2	4	W0457120441
12.0	HPC-TF.TI.0457.1200.L.Z4.R0250.HB	12	83	26	19.2	2.5	4	W0457120E41
12.0	HPC-TF.TI.0457.1200.L.Z4.R0400.HB	12	83	26	19.2	4	4	W0457120541
16.0	HPC-TF.TI.0457.1600.L.Z4.R0100.HB	16	92	36	25.6	1	4	W0457160341
16.0	HPC-TF.TI.0457.1600.L.Z4.R0160.HB	16	92	36	25.6	1.6	4	W0457160D41
16.0	HPC-TF.TI.0457.1600.L.Z4.R0200.HB	16	92	36	25.6	2	4	W0457160441
16.0	HPC-TF.TI.0457.1600.L.Z4.R0250.HB	16	92	36	25.6	2.5	4	W0457160E41
16.0	HPC-TF.TI.0457.1600.L.Z4.R0320.HB	16	92	36	25.6	3.2	4	W0457160F41
16.0	HPC-TF.TI.0457.1600.L.Z4.R0400.HB	16	92	36	25.6	4	4	W0457160541
20.0	HPC-TF.TI.0457.2000.L.Z4.R0100.HB	20	104	41	32.0	1	4	W0457200341
20.0	HPC-TF.TI.0457.2000.L.Z4.R0200.HB	20	104	41	32.0	2	4	W0457200441
20.0	HPC-TF.TI.0457.2000.L.Z4.R0400.HB	20	104	41	32.0	4	4	W0457200541
20.0	HPC-TF.TI.0457.2000.L.Z4.R0500.HB	20	104	41	32.0	5	4	W0457200G41
20.0	HPC-TF.TI.0457.2000.L.Z4.R0630.HB	20	104	41	32.0	6.3	4	W0457200H41

W0453-S and W0453-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**								
1.1.2									
1.2.1	**Constructional steel**								
1.2.2									
1.2.3									
1.3.1	**Spring steel**	160	1xø	1xø	0,015	0,03	0,04	0,05	0,06
1.3.2		135	1xø	1xø	0,015	0,03	0,04	0,05	0,06
1.3.3		100	1xø	1xø	0,01	0,02	0,03	0,04	0,05
2.1.1	**Cementation steel**								
2.1.2									
2.1.3									
2.2.1	**Nitriding steel**								
2.2.2		160	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**								
2.3.2									
2.3.3									
2.3.4		160	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.5		135	1xø	1xø	0,015	0,03	0,04	0,05	0,06
2.3.6		115	1xø	1xø	0,015	0,03	0,04	0,05	0,06
3.1.1	**Non alloyed tool steel**								
3.2.1	**Tool steel for cold working**	160	1xø	1xø	0,015	0,03	0,04	0,05	0,06
3.2.2		115	1xø	1xø	0,015	0,03	0,04	0,05	0,06
3.2.3		90	1xø	1xø	0,015	0,03	0,04	0,05	0,06
3.2.4		135	1xø	1xø	0,01	0,02	0,03	0,04	0,05
3.2.5		130	1xø	1xø	0,01	0,02	0,03	0,04	0,05
3.3.1	**Tool steel for hot working**	125	1xø	1xø	0,015	0,03	0,04	0,05	0,06
3.3.2		115	1xø	1xø	0,015	0,03	0,04	0,05	0,06
3.3.3		135	1xø	1xø	0,015	0,03	0,04	0,05	0,06
3.3.4		125	1xø	1xø	0,01	0,02	0,03	0,04	0,05
3.3.5		115	1xø	1xø	0,01	0,02	0,03	0,04	0,05
3.5.1	**Hardened tool steel** **< 55 HRC**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
3.5.2	**55–58 HRC**	35	1xø	0,5xø	0,01	0,02	0,03	0,04	0,05
3.5.3	**58–60 HRC**	25	1xø	0,5xø	0,008	0,01	0,02	0,03	0,04
3.5.4	**60–62 HRC**	20	1xø	0,5xø	0,008	0,01	0,02	0,03	0,04
3.5.5	**62–64 HRC**	15	1xø	0,5xø	0,008	0,01	0,02	0,03	0,04
4.1.1	**Stainless steel**								
4.1.2									
4.1.3									
4.1.4									
4.1.5									
4.2.1	**Heat-resistant alloys**								
4.2.2									
4.2.3									
4.2.4									
5.1.1	**Conventional cast steel**								
5.1.2									
5.1.3									
5.2.1	**Stainless cast steel**								
5.2.2									
6.1.1	**Cast iron with lamellar graphite**								
6.1.2									
6.1.3									
6.1.4									
6.2.1	**Spheroidal cast iron**								
6.2.2									
6.2.3									
6.3.1	**GTW (white malleable cast iron)**								
6.3.2									
6.4.1	**GTS (black malleable cast iron)**								
6.4.2									
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									

W0453-S and W0453-L, coated

HPC end mills

H

HPC SF

$\lambda_S = 44° / 47°$

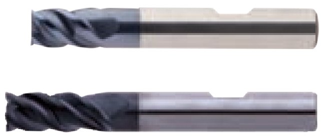
$\gamma_S = 2°$

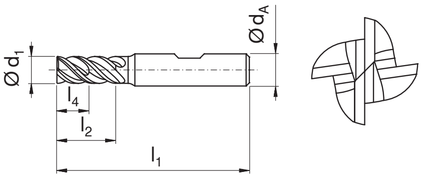
$d_1 = f8$
$d_A = h6$

F 45°

D

SCPH205





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	F [mm]	z	HB Material	HB Material
3.0	HPC-SF.H.0453.0300.L.Z4.F0010A.HB	6	57	8	3.6	0.1	4		W0453030341
3.0	HPC-SF.H.0453.0300.S.Z4.F0010A.HB	6	50	5	3.0	0.1	4	W0453030241	
4.0	HPC-SF.H.0453.0400.L.Z4.F0010A.HB	6	57	11	4.8	0.1	4		W0453040341
4.0	HPC-SF.H.0453.0400.S.Z4.F0010A.HB	6	54	8	4.0	0.1	4	W0453040241	
5.0	HPC-SF.H.0453.0500.L.Z4.F0010A.HB	6	57	13	6.0	0.1	4		W0453050341
5.0	HPC-SF.H.0453.0500.S.Z4.F0010A.HB	6	54	9	5.0	0.1	4	W0453050241	
6.0	HPC-SF.H.0453.0600.L.Z4.F0010A.HB	6	57	13	7.2	0.1	4		W0453060341
6.0	HPC-SF.H.0453.0600.S.Z4.F0010A.HB	6	54	10	6.0	0.1	4	W0453060241	
8.0	HPC-SF.H.0453.0800.L.Z4.F0020A.HB	8	63	21	9.6	0.2	4		W0453080341
8.0	HPC-SF.H.0453.0800.S.Z4.F0020A.HB	8	58	12	8.0	0.2	4	W0453080241	
10.0	HPC-SF.H.0453.1000.L.Z4.F0020A.HB	10	72	22	12.0	0.2	4		W0453100341
10.0	HPC-SF.H.0453.1000.S.Z4.F0020A.HB	10	66	14	10.0	0.2	4	W0453100241	
12.0	HPC-SF.H.0453.1200.L.Z4.F0030A.HB	12	83	26	14.4	0.3	4		W0453120341
12.0	HPC-SF.H.0453.1200.S.Z4.F0030A.HB	12	73	16	12.0	0.3	4	W0453120241	
14.0	HPC-SF.H.0453.1400.L.Z4.F0030A.HB	14	83	26	16.8	0.3	4		W0453140341
14.0	HPC-SF.H.0453.1400.S.Z4.F0030A.HB	14	73	16	14.0	0.3	4	W0453140241	
16.0	HPC-SF.H.0453.1600.L.Z4.F0030A.HB	16	92	36	19.2	0.3	4		W0453160341
16.0	HPC-SF.H.0453.1600.S.Z4.F0030A.HB	16	82	22	16.0	0.3	4	W0453160241	
18.0	HPC-SF.H.0453.1800.S.Z4.F0030A.HB	18	82	22	18.0	0.3	4	W0453180241	
20.0	HPC-SF.H.0453.2000.L.Z4.F0030A.HB	20	104	41	24.0	0.3	4		W0453200341
20.0	HPC-SF.H.0453.2000.S.Z4.F0030A.HB	20	92	26	20.0	0.3	4	W0453200241	

W0453-OL, coated

Cutting data

						f_z [mm]			
Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**								
1.1.2									
1.2.1	**Constructional steel**								
1.2.2									
1.2.3									
1.3.1	**Spring steel**		80	1xø	0,5xø	0,03	0,04	0,05	0,06
1.3.2			70	1xø	0,5xø	0,03	0,04	0,05	0,06
1.3.3			50	1xø	0,5xø	0,02	0,03	0,04	0,05
2.1.1	**Cementation steel**								
2.1.2									
2.1.3									
2.2.1	**Nitriding steel**								
2.2.2			80	1xø	0,5xø	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**								
2.3.2									
2.3.3									
2.3.4			80	1xø	0,5xø	0,03	0,04	0,05	0,06
2.3.5			70	1xø	0,5xø	0,03	0,04	0,05	0,06
2.3.6			60	1xø	0,5xø	0,03	0,04	0,05	0,06
3.1.1	**Non alloyed tool steel**								
3.2.1	**Tool steel for cold working**		80	1xø	0,5xø	0,03	0,04	0,05	0,06
3.2.2			60	1xø	0,5xø	0,03	0,04	0,05	0,06
3.2.3			45	1xø	0,5xø	0,03	0,04	0,05	0,06
3.2.4			70	1xø	0,5xø	0,02	0,03	0,04	0,05
3.2.5			65	1xø	0,5xø	0,02	0,03	0,04	0,05
3.3.1	**Tool steel for hot working**		60	1xø	0,5xø	0,03	0,04	0,05	0,06
3.3.2			55	1xø	0,5xø	0,03	0,04	0,05	0,06
3.3.3			70	1xø	0,5xø	0,03	0,04	0,05	0,06
3.3.4			60	1xø	0,5xø	0,02	0,03	0,04	0,05
3.3.5			55	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.1	**Hardened tool steel**	**< 55 HRC**	35	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.2		**55–58 HRC**	20	1xø	0,4xø	0,02	0,03	0,04	0,05
3.5.3		**58–60 HRC**	15	1xø	0,4xø	0,01	0,02	0,03	0,04
3.5.4		**60–62 HRC**							
3.5.5		**62–64 HRC**							
4.1.1	**Stainless steel**								
4.1.2									
4.1.3									
4.1.4									
4.1.5									
4.2.1	**Heat-resistant alloys**								
4.2.2									
4.2.3									
4.2.4									
5.1.1	**Conventional cast steel**								
5.1.2									
5.1.3									
5.2.1	**Stainless cast steel**								
5.2.2									
6.1.1	**Cast iron with lamellar graphite**								
6.1.2									
6.1.3									
6.1.4									
6.2.1	**Spheroidal cast iron**								
6.2.2									
6.2.3									
6.3.1	**GTW (white malleable cast iron)**								
6.3.2									
6.4.1	**GTS (black malleable cast iron)**								
6.4.2									
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									

W0453-OL, coated

HPC end mills

H

HPC SF

λ_S = 44° 46°

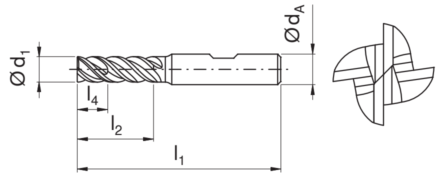
γ_S = 2°

d_1 = f8
d_A = h6

F 45°

D

SCPH205



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	F [mm]	z	HB Material
4.0	HPC-SF.H.0453.0400.OL.Z4.F0010A.HB	6	62	16	4.8	0.1	4	W0453040441
5.0	HPC-SF.H.0453.0500.OL.Z4.F0010A.HB	6	62	17	6.0	0.1	4	W0453050441
6.0	HPC-SF.H.0453.0600.OL.Z4.F0010A.HB	6	62	18	7.2	0.1	4	W0453060441
8.0	HPC-SF.H.0453.0800.OL.Z4.F0020A.HB	8	68	24	9.6	0.2	4	W0453080441
10.0	HPC-SF.H.0453.1000.OL.Z4.F0020A.HB	10	80	30	12.0	0.2	4	W0453100441
12.0	HPC-SF.H.0453.1200.OL.Z4.F0030A.HB	12	93	36	14.4	0.3	4	W0453120441
14.0	HPC-SF.H.0453.1400.OL.Z4.F0030A.HB	14	99	42	16.8	0.3	4	W0453140441
16.0	HPC-SF.H.0453.1600.OL.Z4.F0030A.HB	16	108	48	19.2	0.3	4	W0453160441
18.0	HPC-SF.H.0453.1800.OL.Z4.F0030A.HB	18	114	54	21.6	0.3	4	W0453180441
20.0	HPC-SF.H.0453.2000.OL.Z4.F0030A.HB	20	126	60	24.0	0.3	4	W0453200441

W0281-S, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 3,0 = Ø 4,0	 > Ø 4,0 = Ø 8,0	 > Ø 8,0 = Ø 12,0
1.1.1	**Machining steels**						
1.1.2							
1.2.1	**Constructional steel**						
1.2.2							
1.2.3							
1.3.1	**Spring steel**						
1.3.2							
1.3.3							
2.1.1	**Cementation steel**						
2.1.2							
2.1.3		400	0,05xø	0,08xø	0,04	0,08	0,12
2.2.1	**Nitriding steel**						
2.2.2		350	0,05xø	0,08xø	0,04	0,06	0,08
2.3.1	**Tempered steel**						
2.3.2							
2.3.3							
2.3.4							
2.3.5		350	0,05xø	0,08xø	0,04	0,06	0,08
2.3.6		290	0,04xø	0,05xø	0,035	0,06	0,07
3.1.1	**Non alloyed tool steel**	460	0,05xø	0,08xø	0,04	0,08	0,12
3.2.1	**Tool steel for cold working**	390	0,05xø	0,08xø	0,04	0,08	0,12
3.2.2		330	0,04xø	0,05xø	0,04	0,06	0,08
3.2.3		260	0,04xø	0,05xø	0,035	0,06	0,07
3.2.4		330	0,05xø	0,08xø	0,04	0,06	0,08
3.2.5		230	0,04xø	0,05xø	0,035	0,06	0,07
3.3.1	**Tool steel for hot working**	330	0,04xø	0,05xø	0,04	0,08	0,12
3.3.2		260	0,04xø	0,05xø	0,04	0,06	0,08
3.3.3		330	0,05xø	0,08xø	0,04	0,06	0,08
3.3.4		230	0,04xø	0,05xø	0,035	0,06	0,07
3.3.5		210	0,04xø	0,05xø	0,035	0,06	0,07
3.5.1	**Hardened tool steel** **< 55 HRC**	230	0,04xø	0,05xø	0,035	0,06	0,07
3.5.2	**55–58 HRC**	200	0,04xø	0,05xø	0,035	0,06	0,07
3.5.3	**58–60 HRC**	180	0,03xø	0,03xø	0,035	0,06	0,07
3.5.4	**60–62 HRC**	150	0,03xø	0,03xø	0,035	0,06	0,07
3.5.5	**62–64 HRC**	130	0,02xø	0,02xø	0,035	0,06	0,07
4.1.1	**Stainless steel**						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**						
5.1.2							
5.1.3							
5.2.1	**Stainless cast steel**						
5.2.2							
6.1.1	**Cast iron with lamellar graphite**	610	0,05xø	0,08xø	0,04	0,08	0,12
6.1.2		520	0,05xø	0,08xø	0,04	0,08	0,12
6.1.3		460	0,05xø	0,08xø	0,04	0,06	0,08
6.1.4		330	0,05xø	0,08xø	0,04	0,06	0,08
6.2.1	**Spheroidal cast iron**	610	0,05xø	0,08xø	0,04	0,08	0,12
6.2.2		520	0,05xø	0,08xø	0,04	0,06	0,08
6.2.3		430	0,05xø	0,08xø	0,04	0,06	0,08
6.3.1	**GTW (white malleable cast iron)**	610	0,05xø	0,08xø	0,04	0,08	0,12
6.3.2		520	0,05xø	0,08xø	0,04	0,06	0,08
6.4.1	**GTS (black malleable cast iron)**	610	0,05xø	0,08xø	0,04	0,08	0,12
6.4.2		520	0,05xø	0,08xø	0,04	0,06	0,08
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							

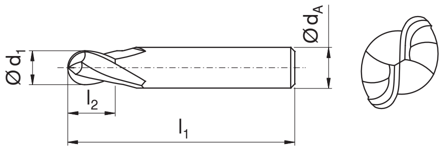
W0281-S, coated

Ball nose milling cutters

H **VR**

$\lambda_S = 30°$ $\gamma_S = -15°$ R D

SCPH205



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	R [mm]	d_1-Tol. [mm]	z	HA Material
3.0	VR.H.0281.0300.S.Z2.R0150.HA	6	54	5	1.5	0/-0.02	2	W0281030640
4.0	VR.H.0281.0400.S.Z2.R0200.HA	6	54	8	2	0/-0.02	2	W0281040640
5.0	VR.H.0281.0500.S.Z2.R0250.HA	6	54	9	2.5	0/-0.02	2	W0281050640
6.0	VR.H.0281.0600.S.Z2.R0300.HA	6	54	10	3	0/-0.02	2	W0281060240
8.0	VR.H.0281.0800.S.Z2.R0400.HA	8	64	12	4	0/-0.025	2	W0281080340
10.0	VR.H.0281.1000.S.Z2.R0500.HA	10	67	14	5	0/-0.025	2	W0281100340
12.0	VR.H.0281.1200.S.Z2.R0600.HA	12	75	16	6	0/-0.025	2	W0281120440

W0281-OL and W0281-XL, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
						= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
1.1.1	Machining steels							
1.1.2								
1.2.1	Constructional steel							
1.2.2								
1.2.3								
1.3.1	Spring steel							
1.3.2								
1.3.3								
2.1.1	Cementation steel							
2.1.2								
2.1.3			240	0,05xø	0,08xø	0,04	0,08	0,12
2.2.1	Nitriding steel							
2.2.2			210	0,05xø	0,08xø	0,04	0,06	0,08
2.3.1	Tempered steel							
2.3.2								
2.3.3								
2.3.4								
2.3.5			210	0,05xø	0,08xø	0,04	0,06	0,08
2.3.6			175	0,04xø	0,05xø	0,035	0,06	0,07
3.1.1	Non alloyed tool steel		280	0,05xø	0,08xø	0,04	0,08	0,12
3.2.1	Tool steel for cold working		230	0,05xø	0,08xø	0,04	0,08	0,12
3.2.2			200	0,04xø	0,05xø	0,04	0,06	0,08
3.2.3			155	0,04xø	0,05xø	0,035	0,06	0,07
3.2.4			200	0,05xø	0,08xø	0,04	0,06	0,08
3.2.5			140	0,04xø	0,05xø	0,035	0,06	0,07
3.3.1	Tool steel for hot working		200	0,04xø	0,05xø	0,04	0,08	0,12
3.3.2			155	0,04xø	0,05xø	0,04	0,06	0,08
3.3.3			200	0,05xø	0,08xø	0,04	0,06	0,08
3.3.4			140	0,04xø	0,05xø	0,035	0,06	0,07
3.3.5			130	0,04xø	0,05xø	0,035	0,06	0,07
3.5.1	Hardened tool steel	< 55 HRC	120	0,04xø	0,05xø	0,035	0,06	0,07
3.5.2		55–58 HRC	110	0,04xø	0,05xø	0,035	0,06	0,07
3.5.3		58–60 HRC	100	0,03xø	0,03xø	0,035	0,06	0,07
3.5.4		60–62 HRC	80	0,03xø	0,03xø	0,035	0,06	0,07
3.5.5		62–64 HRC	70	0,02xø	0,02xø	0,035	0,06	0,07
4.1.1	Stainless steel							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel							
5.1.2								
5.1.3								
5.2.1	Stainless cast steel							
5.2.2								
6.1.1	Cast iron with lamellar graphite		370	0,05xø	0,08xø	0,04	0,08	0,12
6.1.2			310	0,05xø	0,08xø	0,04	0,08	0,12
6.1.3			275	0,05xø	0,08xø	0,04	0,06	0,08
6.1.4			200	0,05xø	0,08xø	0,04	0,06	0,08
6.2.1	Spheroidal cast iron		365	0,05xø	0,08xø	0,04	0,08	0,12
6.2.2			310	0,05xø	0,08xø	0,04	0,06	0,08
6.2.3			260	0,05xø	0,08xø	0,04	0,06	0,08
6.3.1	GTW (white malleable cast iron)		365	0,05xø	0,08xø	0,04	0,08	0,12
6.3.2			310	0,05xø	0,08xø	0,04	0,06	0,08
6.4.1	GTS (black malleable cast iron)		365	0,05xø	0,08xø	0,04	0,08	0,12
6.4.2			310	0,05xø	0,08xø	0,04	0,06	0,08
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

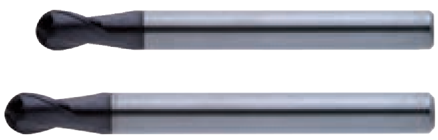
W0281-OL and W0281-XL, coated

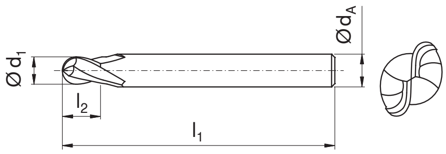
Ball nose milling cutters

H **VR**

$\lambda_S = 30°$ $\gamma_S = -15°$ R D

SCPH205





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	R [mm]	d_1-Tol. [mm]	z	HA Material	HA Material
3.0	VR.H.0281.0300.XL.Z2.R0150.HA	6	100	8	1.5	0/-0.02	2		W0281030940
4.0	VR.H.0281.0400.XL.Z2.R0200.HA	6	100	8	2	0/-0.02	2		W0281040940
5.0	VR.H.0281.0500.XL.Z2.R0250.HA	6	100	9	2.5	0/-0.02	2		W0281050940
6.0	VR.H.0281.0600.XL.Z2.R0300.HA	6	100	10	3	0/-0.02	2		W0281060540
8.0	VR.H.0281.0800.OL.Z2.R0400.HA	8	100	12	4	0/-0.025	2	W0281080540	
10.0	VR.H.0281.1000.OL.Z2.R0500.HA	10	100	14	5	0/-0.025	2	W0281100540	
12.0	VR.H.0281.1200.OL.Z2.R0600.HA	12	100	16	6	0/-0.025	2	W0281120540	

W0441-L, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
						= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**								
1.1.2									
1.2.1	**Constructional steel**								
1.2.2									
1.2.3									
1.3.1	**Spring steel**		85	1xø	0,5xø	0,03	0,04	0,05	0,06
1.3.2			75	1xø	0,5xø	0,03	0,04	0,05	0,06
1.3.3			60	1xø	0,5xø	0,02	0,03	0,04	0,05
2.1.1	**Cementation steel**								
2.1.2									
2.1.3									
2.2.1	**Nitriding steel**								
2.2.2			130	1xø	0,5xø	0,03	0,04	0,05	0,06
2.3.1	**Tempered steel**								
2.3.2									
2.3.3									
2.3.4			140	1xø	0,5xø	0,03	0,04	0,05	0,06
2.3.5			130	1xø	0,5xø	0,03	0,04	0,05	0,06
2.3.6			120	1xø	0,5xø	0,03	0,04	0,05	0,06
3.1.1	**Non alloyed tool steel**								
3.2.1	**Tool steel for cold working**		140	1xø	0,5xø	0,03	0,04	0,05	0,06
3.2.2			135	1xø	0,5xø	0,03	0,04	0,05	0,06
3.2.3			125	1xø	0,5xø	0,03	0,04	0,05	0,06
3.2.4			115	1xø	0,5xø	0,02	0,03	0,04	0,05
3.2.5			130	1xø	0,5xø	0,02	0,03	0,04	0,05
3.3.1	**Tool steel for hot working**		135	1xø	0,5xø	0,03	0,04	0,05	0,06
3.3.2			125	1xø	0,5xø	0,03	0,04	0,05	0,06
3.3.3			135	1xø	0,5xø	0,03	0,04	0,05	0,06
3.3.4			125	1xø	0,5xø	0,02	0,03	0,04	0,05
3.3.5			115	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.1	**Hardened tool steel**	**< 55 HRC**	50	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.2		**55–58 HRC**	30	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.3		**58–60 HRC**	25	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.4		**60–62 HRC**							
3.5.5		**62–64 HRC**							
4.1.1	**Stainless steel**								
4.1.2									
4.1.3									
4.1.4									
4.1.5									
4.2.1	**Heat-resistant alloys**								
4.2.2									
4.2.3									
4.2.4									
5.1.1	**Conventional cast steel**								
5.1.2									
5.1.3									
5.2.1	**Stainless cast steel**								
5.2.2									
6.1.1	**Cast iron with lamellar graphite**								
6.1.2									
6.1.3									
6.1.4									
6.2.1	**Spheroidal cast iron**								
6.2.2									
6.2.3									
6.3.1	**GTW (white malleable cast iron)**								
6.3.2									
6.4.1	**GTS (black malleable cast iron)**								
6.4.2									
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									

W0441-L, coated

Torus milling cutters

H

TF

$\lambda_S = 52°$

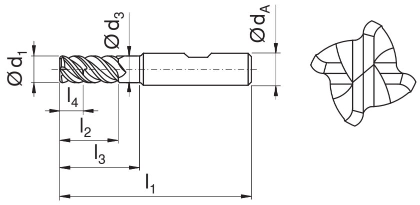
$\gamma_S = -10°$

$d_1 = f8$
$d_A = h6$

R

D

SCPH215



d₁ [mm]	Type, description	dA [mm]	d₃ [mm]	l₁ [mm]	l₂ [mm]	l₃ [mm]	l₄ [mm]	R [mm]	z	HB Material
4.0	TF.H.0441.0400.L.Z4.R0050.HB	6	3.9	57	11	18	4.4	0.5	4	W0441040341
5.0	TF.H.0441.0500.L.Z4.R0050.HB	6	4.9	57	13	19	4.8	0.5	4	W0441050341
6.0	TF.H.0441.0600.L.Z4.R0050.HB	6	5.9	57	13	19	5.2	0.5	4	W0441060341
8.0	TF.H.0441.0800.L.Z4.R0100.HB	8	7.7	63	19	25	7.6	1	4	W0441080341
10.0	TF.H.0441.1000.L.Z4.R0100.HB	10	9.7	72	22	30	8.8	1	4	W0441100341
12.0	TF.H.0441.1200.L.Z4.R0150.HB	12	11.7	83	26	36	10.4	1.5	4	W0441120341
14.0	TF.H.0441.1400.L.Z4.R0150.HB	14	13.7	83	26	36	10.4	1.5	4	W0441140341
16.0	TF.H.0441.1600.L.Z4.R0200.HB	16	15.5	92	32	42	12.8	2	4	W0441160341
18.0	TF.H.0441.1800.L.Z4.R0200.HB	18	17.5	92	32	42	12.8	2	4	W0441180341
20.0	TF.H.0441.2000.L.Z4.R0200.HB	20	19.5	104	38	52	15.2	2	4	W0441200341

W0441-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels							
1.1.2								
1.2.1	Constructional steel							
1.2.2								
1.2.3								
1.3.1	Spring steel	55	1xø	0,5xø	0,03	0,04	0,05	0,06
1.3.2		45	1xø	0,5xø	0,03	0,04	0,05	0,06
1.3.3		30	1xø	0,5xø	0,02	0,03	0,04	0,05
2.1.1	Cementation steel							
2.1.2								
2.1.3								
2.2.1	Nitriding steel							
2.2.2		90	1xø	0,5xø	0,03	0,04	0,05	0,06
2.3.1	Tempered steel							
2.3.2								
2.3.3								
2.3.4		100	1xø	0,5xø	0,03	0,04	0,05	0,06
2.3.5		90	1xø	0,5xø	0,03	0,04	0,05	0,06
2.3.6		80	1xø	0,5xø	0,03	0,04	0,05	0,06
3.1.1	Non alloyed tool steel							
3.2.1	Tool steel for cold working	100	1xø	0,5xø	0,03	0,04	0,05	0,06
3.2.2		95	1xø	0,5xø	0,03	0,04	0,05	0,06
3.2.3		85	1xø	0,5xø	0,03	0,04	0,05	0,06
3.2.4		75	1xø	0,5xø	0,02	0,03	0,04	0,05
3.2.5		90	1xø	0,5xø	0,02	0,03	0,04	0,05
3.3.1	Tool steel for hot working	100	1xø	0,5xø	0,03	0,04	0,05	0,06
3.3.2		90	1xø	0,5xø	0,03	0,04	0,05	0,06
3.3.3		100	1xø	0,5xø	0,03	0,04	0,05	0,06
3.3.4		90	1xø	0,5xø	0,02	0,03	0,04	0,05
3.3.5		80	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.1	Hardened tool steel < 55 HRC	35	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.2	55–58 HRC	20	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.3	58–60 HRC	15	1xø	0,5xø	0,02	0,03	0,04	0,05
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel							
5.1.2								
5.1.3								
5.2.1	Stainless cast steel							
5.2.2								
6.1.1	Cast iron with lamellar graphite							
6.1.2								
6.1.3								
6.1.4								
6.2.1	Spheroidal cast iron							
6.2.2								
6.2.3								
6.3.1	GTW (white malleable cast iron)							
6.3.2								
6.4.1	GTS (black malleable cast iron)							
6.4.2								
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

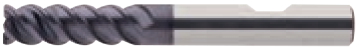
W0441-OL, coated

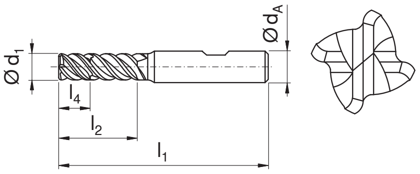
Torus milling cutters

H **TF**

$\lambda_S = 52°$ | $\gamma_S = -10°$ | $d_1 = f8$, $d_A = h6$ | R | D

SCPH215





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	R [mm]	z	HB Material
4.0	TF.H.0441.0400.OL.Z4.R0050.HB	6	62	16	6.4	0.5	4	W0441040441
5.0	TF.H.0441.0500.OL.Z4.R0050.HB	6	62	17	6.8	0.5	4	W0441050441
6.0	TF.H.0441.0600.OL.Z4.R0050.HB	6	62	18	7.2	0.5	4	W0441060441
8.0	TF.H.0441.0800.OL.Z4.R0100.HB	8	68	24	9.6	1	4	W0441080441
10.0	TF.H.0441.1000.OL.Z4.R0100.HB	10	80	30	12.0	1	4	W0441100441
12.0	TF.H.0441.1200.OL.Z4.R0150.HB	12	93	36	14.4	1.5	4	W0441120441
14.0	TF.H.0441.1400.OL.Z4.R0150.HB	14	99	42	16.8	1.5	4	W0441140441
16.0	TF.H.0441.1600.OL.Z4.R0200.HB	16	108	48	19.2	2	4	W0441160441
18.0	TF.H.0441.1800.OL.Z4.R0200.HB	18	114	54	21.6	2	4	W0441180441
20.0	TF.H.0441.2000.OL.Z4.R0200.HB	20	126	60	24.0	2	4	W0441200441

W0367-L, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]						
						= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0	> Ø 20,0 = Ø 25,0	> Ø 25,0 = Ø 30,0
1.1.1	**Machining steels**											
1.1.2												
1.2.1	**Constructional steel**											
1.2.2												
1.2.3												
1.3.1	**Spring steel**		130	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
1.3.2			120	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
1.3.3			115	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
2.1.1	**Cementation steel**											
2.1.2												
2.1.3												
2.2.1	**Nitriding steel**											
2.2.2			120	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
2.3.1	**Tempered steel**											
2.3.2												
2.3.3												
2.3.4												
2.3.5			120	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
2.3.6			110	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.1.1	**Non alloyed tool steel**		135	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.1	**Tool steel for cold working**		130	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.2			120	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.3			110	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.4			100	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.5			90	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.1	**Tool steel for hot working**		120	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.2			110	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.3			100	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.4			90	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.5			85	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.1	**Hardened tool steel**	**< 55 HRC**	80	0,05xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.2		**55–58 HRC**	70	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.3		**58–60 HRC**	60	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.4		**60–62 HRC**	45	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.5		**62–64 HRC**	35	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
4.1.1	**Stainless steel**											
4.1.2												
4.1.3												
4.1.4												
4.1.5												
4.2.1	**Heat-resistant alloys**											
4.2.2												
4.2.3												
4.2.4												
5.1.1	**Conventional cast steel**											
5.1.2												
5.1.3												
5.2.1	**Stainless cast steel**											
5.2.2												
6.1.1	**Cast iron with lamellar graphite**											
6.1.2												
6.1.3												
6.1.4												
6.2.1	**Spheroidal cast iron**											
6.2.2												
6.2.3												
6.3.1	**GTW (white malleable cast iron)**											
6.3.2												
6.4.1	**GTS (black malleable cast iron)**											
6.4.2												
7.1.1	**Aluminium**											
7.1.2												
7.1.3												
7.1.4												
7.1.5												
7.1.6												
7.2.1	**Magnesium**											
7.2.2												
7.3.1	**Copper**											
7.3.2												
7.3.3												
7.3.4												
7.3.5												
7.3.6												
7.4.1	**CuZn (brass)**											
7.4.2												
7.5.1	**CuSn (bronze)**											
7.5.2												
7.6.1	**CuAlFe (Ampco)**											
7.6.2												
7.8.1	**Titanium**											
7.8.2												
7.8.3												

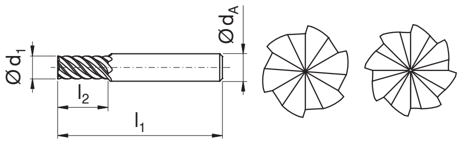
W0367-L, coated

Finish milling cutters

H **SC**

$\lambda_S = 50°$ $\gamma_S = -5°$ $d_1 = f8$ $d_A = h6$ S D

SCPH205



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	z	HA Material
3.0	SC.H.0367.0300.L.Z6.S.HA	6	57	8	6	W0367030340
4.0	SC.H.0367.0400.L.Z6.S.HA	6	57	11	6	W0367040340
5.0	SC.H.0367.0500.L.Z6.S.HA	6	57	13	6	W0367050340
6.0	SC.H.0367.0600.L.Z6.S.HA	6	57	13	6	W0367060340
8.0	SC.H.0367.0800.L.Z6.S.HA	8	63	19	6	W0367080340
10.0	SC.H.0367.1000.L.Z6.S.HA	10	72	22	6	W0367100340
12.0	SC.H.0367.1200.L.Z6.S.HA	12	83	26	6	W0367120340
14.0	SC.H.0367.1400.L.Z6.S.HA	14	83	26	6	W0367140340
16.0	SC.H.0367.1600.L.Z8.S.HA	16	92	32	8	W0367160340
18.0	SC.H.0367.1800.L.Z8.S.HA	18	92	32	8	W0367180340
20.0	SC.H.0367.2000.L.Z8.S.HA	20	104	38	8	W0367200340
25.0	SC.H.0367.2500.L.Z8.S.HA	25	150	75	8	W0367250340
32.0	SC.H.0367.3200.L.Z8.S.HA	32	150	75	8	W0367320340

W0367-OL, coated

Cutting data

Index	Material designation		V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]						
						= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0	> Ø 20,0 = Ø 25,0	> Ø 25,0 = Ø 30,0
1.1.1	**Machining steels**											
1.1.2												
1.2.1	**Constructional steel**											
1.2.2												
1.2.3												
1.3.1	**Spring steel**		110	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
1.3.2			100	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
1.3.3			90	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
2.1.1	**Cementation steel**											
2.1.2												
2.1.3												
2.2.1	**Nitriding steel**											
2.2.2			95	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
2.3.1	**Tempered steel**											
2.3.2												
2.3.3												
2.3.4												
2.3.5			95	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
2.3.6			90	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.1.1	**Non alloyed tool steel**		120	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.1	**Tool steel for cold working**		110	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.2			100	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.3			90	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.4			80	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.2.5			60	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.1	**Tool steel for hot working**		100	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.2			90	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.3			80	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.4			70	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.3.5			60	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.1	**Hardened tool steel**	**< 55 HRC**	55	0,03xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.2		**55–58 HRC**	50	0,02xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.3		**58–60 HRC**	40	0,02xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.4		**60–62 HRC**	30	0,02xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
3.5.5		**62–64 HRC**	25	0,02xø	1,5xø	0,04	0,045	0,06	0,07	0,1	0,125	0,16
4.1.1	**Stainless steel**											
4.1.2												
4.1.3												
4.1.4												
4.1.5												
4.2.1	**Heat-resistant alloys**											
4.2.2												
4.2.3												
4.2.4												
5.1.1	**Conventional cast steel**											
5.1.2												
5.1.3												
5.2.1	**Stainless cast steel**											
5.2.2												
6.1.1	**Cast iron with lamellar graphite**											
6.1.2												
6.1.3												
6.1.4												
6.2.1	**Spheroidal cast iron**											
6.2.2												
6.2.3												
6.3.1	**GTW (white malleable cast iron)**											
6.3.2												
6.4.1	**GTS (black malleable cast iron)**											
6.4.2												
7.1.1	**Aluminium**											
7.1.2												
7.1.3												
7.1.4												
7.1.5												
7.1.6												
7.2.1	**Magnesium**											
7.2.2												
7.3.1	**Copper**											
7.3.2												
7.3.3												
7.3.4												
7.3.5												
7.3.6												
7.4.1	**CuZn (brass)**											
7.4.2												
7.5.1	**CuSn (bronze)**											
7.5.2												
7.6.1	**CuAlFe (Ampco)**											
7.6.2												
7.8.1	**Titanium**											
7.8.2												
7.8.3												

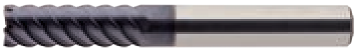
W0367-OL, coated

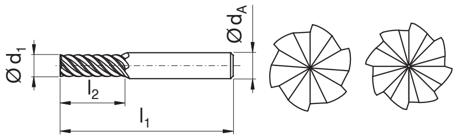
Finish milling cutters

H **SC**

$\lambda_S = 50°$ $\gamma_S = -5°$ $d_1 = f8$ $d_A = h6$ S D

SCPH205





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	z	HA Material
3.0	SC.H.0367.0300.OL.Z6.S.HA	6	62	12	6	W0367030440
4.0	SC.H.0367.0400.OL.Z6.S.HA	6	62	16	6	W0367040440
5.0	SC.H.0367.0500.OL.Z6.S.HA	6	62	18	6	W0367050440
6.0	SC.H.0367.0600.OL.Z6.S.HA	6	62	18	6	W0367060440
8.0	SC.H.0367.0800.OL.Z6.S.HA	8	68	24	6	W0367080440
10.0	SC.H.0367.1000.OL.Z6.S.HA	10	80	30	6	W0367100440
12.0	SC.H.0367.1200.OL.Z6.S.HA	12	93	36	6	W0367120440
14.0	SC.H.0367.1400.OL.Z6.S.HA	14	99	42	6	W0367140440
16.0	SC.H.0367.1600.OL.Z8.S.HA	16	108	48	8	W0367160440
18.0	SC.H.0367.1800.OL.Z8.S.HA	18	114	54	8	W0367180440
20.0	SC.H.0367.2000.OL.Z8.S.HA	20	126	60	8	W0367200440
25.0	SC.H.0367.2500.OL.Z8.S.HA	25	160	95	8	W0367250440
32.0	SC.H.0367.3200.OL.Z8.S.HA	32	160	95	8	W0367320440

W0360-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	Aluminium	600	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.1	Magnesium	220	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.3.1	Copper	170	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	CuZn (brass)	180	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	CuSn (bronze)	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	CuAlFe (Ampco)	55	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	Titanium								
7.8.2									
7.8.3									
8.1.1	Thermoplastics								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	Thermosetting plastics								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	Fibre-reinforced plastics								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	Sandwich								
8.4.2									
8.4.3									
9.1.1	Standard graphite								
9.1.2									

W0360-L, coated

HPC end mills

AL **HPC SF**

42,5° λ_S = 45° 47,5°

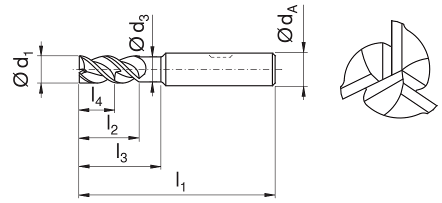
γ_S = 12°

d_1 = f8 d_A = h6

F 45°

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	F [mm]	z	HA Material	HB Material
3.0	HPC-SF.AL.0360.0300.L.Z3.F0010A.HA	6	2.7	57	8	12	3.9	0.1	3	W0360030360	
4.0	HPC-SF.AL.0360.0400.L.Z3.F0010A.HA	6	3.7	57	11	18	5.2	0.1	3	W0360040360	
5.0	HPC-SF.AL.0360.0500.L.Z3.F0010A.HA	6	4.7	57	13	18	6.5	0.1	3	W0360050360	
6.0	HPC-SF.AL.0360.0600.L.Z3.F0020A.HA	6	5.7	57	13	18	7.8	0.2	3	W0360060360	
8.0	HPC-SF.AL.0360.0800.L.Z3.F0020A.HA	8	7.4	63	21	25	10.4	0.2	3	W0360080360	
10.0	HPC-SF.AL.0360.1000.L.Z3.F0020A.HA	10	9.2	72	22	30	13.0	0.2	3	W0360100360	
12.0	HPC-SF.AL.0360.1200.L.Z3.F0020A.HA	12	11	83	26	36	15.6	0.2	3	W0360120360	
16.0	HPC-SF.AL.0360.1600.L.Z3.F0020A.HB	16	15	92	36	42	20.8	0.2	3		W0360160361
18.0	HPC-SF.AL.0360.1800.L.Z3.F0020A.HB	18	17	92	36	42	23.4	0.2	3		W0360180361
20.0	HPC-SF.AL.0360.2000.L.Z3.F0020A.HB	20	19	104	41	52	26.0	0.2	3		W0360200361

W0360-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	Aluminium	300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		260	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		200	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		140	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	Magnesium	130	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		120	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	Copper	110	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		90	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		90	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	CuZn (brass)	100	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		140	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	CuSn (bronze)	90	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	CuAlFe (Ampco)	35	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		45	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	Titanium							
7.8.2								
7.8.3								
8.1.1	Thermoplastics							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	Thermosetting plastics							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	Fibre-reinforced plastics							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	Sandwich							
8.4.2								
8.4.3								
9.1.1	Standard graphite							
9.1.2								

W0360-OL, coated

HPC end mills

AL **HPC SF**

λ_S = 42,5° / 45° / 47,5°

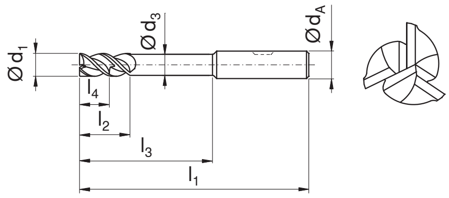
γ_S = 12°

d_1 = f8
d_A = h6

F 45°

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	F [mm]	z	HA Material	HB Material
6.0	HPC-SF.AL.0360.0600.OL.Z3.F0020A.HA	6	5.7	80	13	42	7.8	0.2	3	W0360060460	
8.0	HPC-SF.AL.0360.0800.OL.Z3.F0020A.HA	8	7.4	100	21	62	10.4	0.2	3	W0360080460	
10.0	HPC-SF.AL.0360.1000.OL.Z3.F0020A.HA	10	9.2	100	22	58	13.0	0.2	3	W0360100460	
12.0	HPC-SF.AL.0360.1200.OL.Z3.F0020A.HA	12	11	120	26	73	15.6	0.2	3	W0360120460	
16.0	HPC-SF.AL.0360.1600.OL.Z3.F0020A.HB	16	15	150	36	100	20.8	0.2	3		W0360160461
18.0	HPC-SF.AL.0360.1800.OL.Z3.F0020A.HB	18	17	150	36	100	23.4	0.2	3		W0360180461
20.0	HPC-SF.AL.0360.2000.OL.Z3.F0020A.HB	20	19	150	41	98	26.0	0.2	3		W0360200461

W0360-OLS, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	300	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.2		300	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.3		300	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.4		260	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.5		200	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.1.6		140	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	130	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.2		120	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	110	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		80	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		90	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		80	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		90	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	90	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	35	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		45	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

W0360-OLS, coated

HPC end mills

AL **HPC SF**

λ_S = 42,5° 45° 47,5°

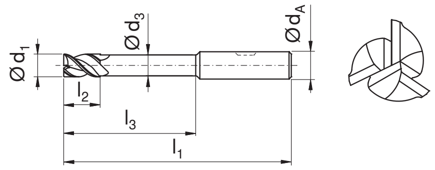
γ_S = 12°

d_1 = f8 d_A = h6

F 45°

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	F [mm]	z	HA Material	HB Material
3.0	HPC-SF.AL.0360.0300.OLS.Z3.F0010A.HA	6	2.7	80	5	18		0.1	3	W0360030R60	
4.0	HPC-SF.AL.0360.0400.OLS.Z3.F0010A.HA	6	3.7	80	6.5	24		0.1	3	W0360040R60	
5.0	HPC-SF.AL.0360.0500.OLS.Z3.F0010A.HA	6	4.7	80	8	30		0.1	3	W0360050R60	
6.0	HPC-SF.AL.0360.0600.OLS.Z3.F0020A.HA	6	5.7	80	10	42		0.2	3	W0360060R60	
8.0	HPC-SF.AL.0360.0800.OLS.Z3.F0020A.HA	8	7.4	100	13	62		0.2	3	W0360080R60	
10.0	HPC-SF.AL.0360.1000.OLS.Z3.F0020A.HA	10	9.2	100	16	58		0.2	3	W0360100R60	
12.0	HPC-SF.AL.0360.1200.OLS.Z3.F0020A.HA	12	11	120	19	73		0.2	3	W0360120R60	
16.0	HPC-SF.AL.0360.1600.OLS.Z3.F0020A.HB	16	15	150	25	100		0.2	3		W0360160R61
20.0	HPC-SF.AL.0360.2000.OLS.Z3.F0020A.HB	20	19	150	32	98		0.2	3		W0360200R61

W0361-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0361-L, coated

HPC end mills

AL **HPC SF**

λ_S = 42,5° / 45° / 47,5°

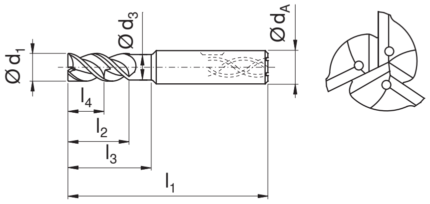
γ_S = 12°

d_1 = f8
d_A = h6

F 45°

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	F [mm]	z	HA Material	HB Material
6.0	HPC-SF.AL.0361.0600.L.Z3.F0020A.HA	6	5.7	57	13	18	7.8	0.2	3	W0361060360	
8.0	HPC-SF.AL.0361.0800.L.Z3.F0020A.HA	8	7.4	63	21	25	10.4	0.2	3	W0361080360	
10.0	HPC-SF.AL.0361.1000.L.Z3.F0020A.HA	10	9.2	72	22	30	13.0	0.2	3	W0361100360	
12.0	HPC-SF.AL.0361.1200.L.Z3.F0020A.HA	12	11	83	26	36	15.6	0.2	3	W0361120360	
16.0	HPC-SF.AL.0361.1600.L.Z3.F0020A.HB	16	15	92	36	42	20.8	0.2	3		W0361160361
20.0	HPC-SF.AL.0361.2000.L.Z3.F0020A.HB	20	19	104	41	52	26.0	0.2	3		W0361200361

W0361-OLS, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	f_z [mm] > Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	300	1xø	1xø	0,06	0,07
7.1.2		300	1xø	1xø	0,06	0,07
7.1.3		300	1xø	1xø	0,06	0,07
7.1.4		260	1xø	1xø	0,06	0,07
7.1.5		200	1xø	1xø	0,05	0,07
7.1.6		140	1xø	1xø	0,05	0,07
7.2.1	**Magnesium**	130	1xø	1xø	0,05	0,07
7.2.2		120	1xø	1xø	0,05	0,07
7.3.1	**Copper**	110	1xø	1xø	0,04	0,06
7.3.2		100	1xø	1xø	0,04	0,06
7.3.3		80	1xø	1xø	0,04	0,06
7.3.4		90	1xø	1xø	0,04	0,06
7.3.5		80	1xø	1xø	0,04	0,06
7.3.6		90	1xø	1xø	0,04	0,06
7.4.1	**CuZn (brass)**	100	1xø	1xø	0,04	0,06
7.4.2		140	1xø	1xø	0,04	0,06
7.5.1	**CuSn (bronze)**	90	1xø	1xø	0,04	0,06
7.5.2		100	1xø	1xø	0,04	0,06
7.6.1	**CuAlFe (Ampco)**	35	1xø	1xø	0,04	0,06
7.6.2		45	1xø	1xø	0,04	0,06
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

W0361-OLS, coated

HPC end mills

AL

HPC SF

λ_S = 42,5° 45° 47,5°

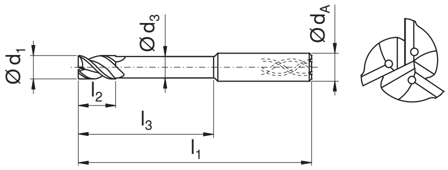
γ_S = 12°

d_1 = f8
d_A = h6

F 45°

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material
6.0	HPC-SF.AL.0361.0600.OLS.Z3.F0020A.HA	6	5.7	80	10	42	0.2	3	W0361060R60
8.0	HPC-SF.AL.0361.0800.OLS.Z3.F0020A.HA	8	7.4	100	13	62	0.2	3	W0361080R60
10.0	HPC-SF.AL.0361.1000.OLS.Z3.F0020A.HA	10	9.2	100	16	58	0.2	3	W0361100R60
12.0	HPC-SF.AL.0361.1200.OLS.Z3.F0020A.HA	12	11	120	19	73	0.2	3	W0361120R60

W0460-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

W0460-L, coated

HPC end mills

AL

HPC SF

$\lambda_S = 44° / 47°$

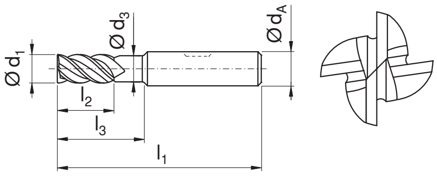
$\gamma_S = 12°$

$d_1 = f8$
$d_A = h6$

F 45°

E

SCPN235



d1 [mm]	Type, description	dA [mm]	d3 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	F [mm]	z	HA Material	HB Material
3.0	HPC-SF.AL.0460.0300.L.Z4.F0010A.HA	6	2.7	57	6	10	0.1	4	W0460030360	
4.0	HPC-SF.AL.0460.0400.L.Z4.F0010A.HA	6	3.7	57	8	14	0.1	4	W0460040360	
5.0	HPC-SF.AL.0460.0500.L.Z4.F0010A.HA	6	4.7	57	10	16	0.1	4	W0460050360	
6.0	HPC-SF.AL.0460.0600.L.Z4.F0020A.HA	6	5.5	57	12	19	0.2	4	W0460060360	
8.0	HPC-SF.AL.0460.0800.L.Z4.F0020A.HA	8	7.4	63	16	25	0.2	4	W0460080360	
10.0	HPC-SF.AL.0460.1000.L.Z4.F0020A.HA	10	9.2	72	20	30	0.2	4	W0460100360	
12.0	HPC-SF.AL.0460.1200.L.Z4.F0020A.HA	12	11	83	24	36	0.2	4	W0460120360	
16.0	HPC-SF.AL.0460.1600.L.Z4.F0020A.HB	16	15	92	32	42	0.2	4		W0460160361
20.0	HPC-SF.AL.0460.2000.L.Z4.F0020A.HB	20	19	104	40	52	0.2	4		W0460200361

W0460-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		260	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		200	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		140	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	130	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		120	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	110	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		90	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		90	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	100	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		140	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	90	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	35	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		45	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0460-OL, coated

HPC end mills

AL

HPC SF

λs = 44° 47°

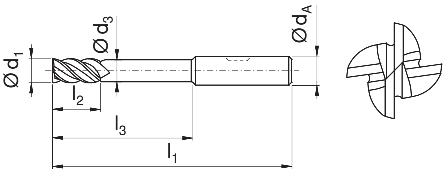
γs = 12°

d1 = f8 dA=h6

F 45°

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material	HB Material
4.0	HPC-SF.AL.0460.0400.M.Z4.F0010A.HA	6	3.7	64	16	22		4	W0460040460	
5.0	HPC-SF.AL.0460.0500.M.Z4.F0010A.HA	6	4.7	64	17	24		4	W0460050460	
6.0	HPC-SF.AL.0460.0600.OL.Z4.F0020A.HA	6	5.5	80	12	42	0.2	4	W0460060460	
8.0	HPC-SF.AL.0460.0800.OL.Z4.F0020A.HA	8	7.4	100	16	62	0.2	4	W0460080460	
10.0	HPC-SF.AL.0460.1000.OL.Z4.F0020A.HA	10	9.2	100	20	58	0.2	4	W0460100460	
12.0	HPC-SF.AL.0460.1200.OL.Z4.F0020A.HA	12	11	120	24	73	0.2	4	W0460120460	
16.0	HPC-SF.AL.0460.1600.OL.Z4.F0020A.HB	16	15	150	32	100	0.2	4		W0460160461
20.0	HPC-SF.AL.0460.2000.OL.Z4.F0020A.HB	20	19	150	40	98	0.2	4		W0460200461

W0224-L, uncoated

Cutting data

					f_z [mm]				
Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	= Ø 2,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	300	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.2		300	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.3		300	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.4		250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.5		200	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.1.6		150	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	140	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.2		130	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	110	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		90	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		75	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		90	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		75	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		90	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	130	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	90	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		110	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	90	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		110	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**	210	1xø	1xø	0,075	0,15	0,25	0,35	0,45
8.1.2		210	1xø	1xø	0,075	0,15	0,25	0,35	0,45
8.1.3		210	1xø	1xø	0,075	0,15	0,25	0,35	0,45
8.1.4		90	1xø	1xø	0,075	0,15	0,25	0,35	0,45
8.1.5		70	1xø	1xø	0,075	0,15	0,25	0,35	0,45
8.1.6		120	1xø	1xø	0,075	0,15	0,25	0,35	0,45
8.1.7		210	1xø	1xø	0,075	0,15	0,25	0,35	0,45
8.1.8		180	1xø	1xø	0,125	0,25	0,35	0,45	0,55
8.1.9		50	1xø	1xø	0,05	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	60	1xø	1xø	0,05	0,1	0,2	0,3	0,4
8.2.2		60	1xø	1xø	0,05	0,1	0,2	0,3	0,4
8.2.3		60	1xø	1xø	0,05	0,1	0,2	0,3	0,4
8.2.4		90	1xø	1xø	0,05	0,1	0,2	0,3	0,4
8.2.5		60	1xø	1xø	0,05	0,1	0,2	0,3	0,4
8.2.6		50	1xø	1xø	0,05	0,1	0,2	0,3	0,4
8.2.7		60	1xø	1xø	0,05	0,1	0,2	0,3	0,4
8.2.8		60	1xø	1xø	0,05	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

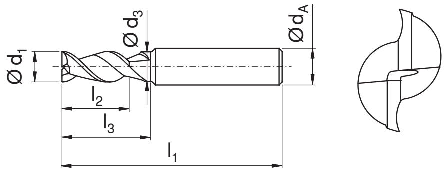
W0224-L, uncoated

End mills

AL **SF**

$\lambda_S = 45°$ $\gamma_S = 20°$ $d_1 = e8$ $d_A = h6$ F 45° E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material
2.0	SF.AL.0224.0200.L.Z2.F0005A.HA	6	1.9	57	8	16	0.05	2	W0224020300
3.0	SF.AL.0224.0300.L.Z2.F0010A.HA	6	2.9	57	8	18	0.1	2	W0224030300
4.0	SF.AL.0224.0400.L.Z2.F0010A.HA	6	3.9	57	11	18	0.1	2	W0224040300
5.0	SF.AL.0224.0500.L.Z2.F0010A.HA	6	4.9	57	13	20	0.1	2	W0224050300
6.0	SF.AL.0224.0600.L.Z2.F0010A.HA	6	5.9	57	13	20	0.1	2	W0224060300
8.0	SF.AL.0224.0800.L.Z2.F0010A.HA	8	7.7	63	19	26	0.1	2	W0224080300
10.0	SF.AL.0224.1000.L.Z2.F0010A.HA	10	9.7	72	22	29	0.1	2	W0224100300
12.0	SF.AL.0224.1200.L.Z2.F0010A.HA	12	11.7	83	26	36	0.1	2	W0224120300
14.0	SF.AL.0224.1400.L.Z2.F0010A.HA	14	13.7	83	26	36	0.1	2	W0224140300
16.0	SF.AL.0224.1600.L.Z2.F0010A.HA	16	15.5	92	32	42	0.1	2	W0224160300
18.0	SF.AL.0224.1800.L.Z2.F0010A.HA	18	17.5	92	32	42	0.1	2	W0224180300
20.0	SF.AL.0224.2000.L.Z2.F0010A.HA	20	19.5	104	38	52	0.1	2	W0224200300

W0306-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 2,8 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.2		250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.3		250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.4		200	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.5		180	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.1.6		150	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	180	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.2		160	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.2		35	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.3		20	1xø	1xø	0,01	0,02	0,03	0,04	0,05
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

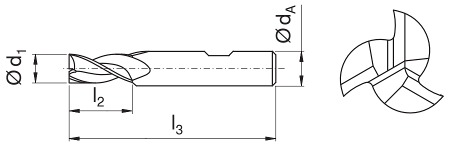
W0306-L, uncoated

End mills

AL **SF**

$\lambda_S = 30°$ $\gamma_S = 13°$ $d_1 = e8$ $d_A = h6$ F 45° E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HB Material
2.8	SF.AL.0306.0280.L.Z3.F0005A.HB	6	57	8	0.05	3	W0306028301
3.0	SF.AL.0306.0300.L.Z3.F0010A.HB	6	57	8	0.1	3	W0306030301
3.8	SF.AL.0306.0380.L.Z3.F0010A.HB	6	57	11	0.1	3	W0306038301
4.0	SF.AL.0306.0400.L.Z3.F0010A.HB	6	57	11	0.1	3	W0306040301
4.8	SF.AL.0306.0480.L.Z3.F0010A.HB	6	57	13	0.1	3	W0306048301
5.0	SF.AL.0306.0500.L.Z3.F0010A.HB	6	57	13	0.1	3	W0306050301
5.8	SF.AL.0306.0580.L.Z3.F0010A.HB	6	57	13	0.1	3	W0306058301
6.0	SF.AL.0306.0600.L.Z3.F0010A.HB	6	57	13	0.1	3	W0306060301
6.8	SF.AL.0306.0680.L.Z3.F0010A.HB	8	63	16	0.1	3	W0306068301
7.0	SF.AL.0306.0700.L.Z3.F0010A.HB	8	63	16	0.1	3	W0306070301
7.8	SF.AL.0306.0780.L.Z3.F0010A.HB	8	63	19	0.1	3	W0306078301
8.0	SF.AL.0306.0800.L.Z3.F0010A.HB	8	63	19	0.1	3	W0306080301
8.7	SF.AL.0306.0870.L.Z3.F0010A.HB	10	72	19	0.1	3	W0306087301
9.0	SF.AL.0306.0900.L.Z3.F0010A.HB	10	72	19	0.1	3	W0306090301
9.7	SF.AL.0306.0970.L.Z3.F0010A.HB	10	72	22	0.1	3	W0306097301
10.0	SF.AL.0306.1000.L.Z3.F0010A.HB	10	72	22	0.1	3	W0306100301
10.7	SF.AL.0306.1070.L.Z3.F0010A.HB	12	83	26	0.1	3	W0306107301
11.0	SF.AL.0306.1100.L.Z3.F0010A.HB	12	83	26	0.1	3	W0306110301
11.7	SF.AL.0306.1170.L.Z3.F0010A.HB	12	83	26	0.1	3	W0306117301
12.0	SF.AL.0306.1200.L.Z3.F0010A.HB	12	83	26	0.1	3	W0306120301
12.7	SF.AL.0306.1270.L.Z3.F0010A.HB	14	83	26	0.1	3	W0306127301
13.7	SF.AL.0306.1370.L.Z3.F0010A.HB	14	83	26	0.1	3	W0306137301
14.0	SF.AL.0306.1400.L.Z3.F0010A.HB	14	83	26	0.1	3	W0306140301
15.7	SF.AL.0306.1570.L.Z3.F0010A.HB	16	92	32	0.1	3	W0306157301
16.0	SF.AL.0306.1600.L.Z3.F0010A.HB	16	92	32	0.1	3	W0306160301
17.7	SF.AL.0306.1770.L.Z3.F0010A.HB	18	92	32	0.1	3	W0306177301
18.0	SF.AL.0306.1800.L.Z3.F0010A.HB	18	92	32	0.1	3	W0306180301
19.7	SF.AL.0306.1970.L.Z3.F0010A.HB	20	104	38	0.1	3	W0306197301
20.0	SF.AL.0306.2000.L.Z3.F0010A.HB	20	104	38	0.1	3	W0306200301

W0314-L, uncoated

Cutting data

					f_z [mm]				
Index	**Material designation**	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.2		250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.3		250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.4		200	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.5		180	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.1.6		150	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	180	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.2		160	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.2		35	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.3		20	1xø	1xø	0,01	0,02	0,03	0,04	0,05
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

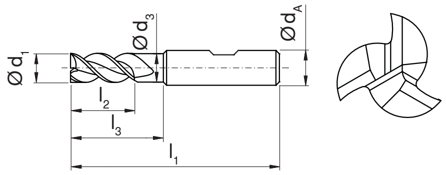
W0314-L, uncoated

End mills

AL **SF**

$\lambda_S = 45°$ $\gamma_S = 13°$ $d_1 = e8$ $d_A = h6$ S E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HB Material
3.0	SF.AL.0314.0300.L.Z3.S.HB	6	2.8	57	8	15	3	W0314030301
3.5	SF.AL.0314.0350.L.Z3.S.HB	6	3.3	57	11	15	3	W0314035301
4.0	SF.AL.0314.0400.L.Z3.S.HB	6	3.8	57	11	15	3	W0314040301
4.5	SF.AL.0314.0450.L.Z3.S.HB	6	4.3	57	13	21	3	W0314045301
5.0	SF.AL.0314.0500.L.Z3.S.HB	6	4.8	57	13	21	3	W0314050301
5.5	SF.AL.0314.0550.L.Z3.S.HB	6	5.3	57	13	21	3	W0314055301
6.0	SF.AL.0314.0600.L.Z3.S.HB	6	5.8	57	13	21	3	W0314060301
6.5	SF.AL.0314.0650.L.Z3.S.HB	8	6.3	63	16	27	3	W0314065301
7.0	SF.AL.0314.0700.L.Z3.S.HB	8	6.8	63	16	27	3	W0314070301
7.5	SF.AL.0314.0750.L.Z3.S.HB	8	7.3	63	19	27	3	W0314075301
8.0	SF.AL.0314.0800.L.Z3.S.HB	8	7.8	63	21	27	3	W0314080301
8.5	SF.AL.0314.0850.L.Z3.S.HB	10	8.3	72	21	32	3	W0314085301
9.0	SF.AL.0314.0900.L.Z3.S.HB	10	8.8	72	21	32	3	W0314090301
9.5	SF.AL.0314.0950.L.Z3.S.HB	10	9.3	72	22	32	3	W0314095301
10.0	SF.AL.0314.1000.L.Z3.S.HB	10	9.8	72	22	32	3	W0314100301
11.0	SF.AL.0314.1100.L.Z3.S.HB	12	10.8	83	26	38	3	W0314110301
12.0	SF.AL.0314.1200.L.Z3.S.HB	12	11.8	83	26	38	3	W0314120301
14.0	SF.AL.0314.1400.L.Z3.S.HB	14	13.8	83	26	38	3	W0314140301
16.0	SF.AL.0314.1600.L.Z3.S.HB	16	15.7	92	36	44	3	W0314160301
18.0	SF.AL.0314.1800.L.Z3.S.HB	18	17.7	92	36	44	3	W0314180301
20.0	SF.AL.0314.2000.L.Z3.S.HB	20	19.7	104	41	54	3	W0314200301

W0316-S, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.2		250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.3		250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.4		200	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.5		180	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.1.6		150	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	180	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.2		160	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.2		35	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.3		20	1xø	1xø	0,01	0,02	0,03	0,04	0,05
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

W0316-S, uncoated

End mills

AL **SF**

$\lambda_S = 45°$

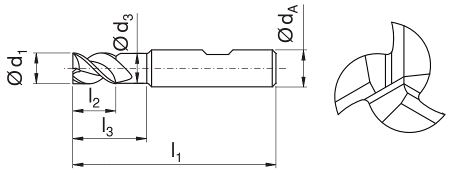
$\gamma_S = 13°$

$d_1 = e8$
$d_A = h6$

F 45°

E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HB Material
3.0	SF.AL.0316.0300.S.Z3.F0010A.HB	6	2.9	50	5	12	0.1	3	W0316030101
3.5	SF.AL.0316.0350.S.Z3.F0010A.HB	6	3.4	50	6	13	0.1	3	W0316035101
4.0	SF.AL.0316.0400.S.Z3.F0010A.HB	6	3.9	54	8	15	0.1	3	W0316040101
4.5	SF.AL.0316.0450.S.Z3.F0010A.HB	6	4.4	54	8	15	0.1	3	W0316045101
5.0	SF.AL.0316.0500.S.Z3.F0010A.HB	6	4.9	54	9	16	0.1	3	W0316050101
5.5	SF.AL.0316.0550.S.Z3.F0010A.HB	6	5.4	54	10	17	0.1	3	W0316055101
6.0	SF.AL.0316.0600.S.Z3.F0010A.HB	6	5.9	54	10	17	0.1	3	W0316060101
6.5	SF.AL.0316.0650.S.Z3.F0010A.HB	8	6.3	58	11	19	0.1	3	W0316065101
7.0	SF.AL.0316.0700.S.Z3.F0010A.HB	8	6.8	58	11	19	0.1	3	W0316070101
7.5	SF.AL.0316.0750.S.Z3.F0010A.HB	8	7.3	58	12	20	0.1	3	W0316075101
8.0	SF.AL.0316.0800.S.Z3.F0010A.HB	8	7.8	58	12	20	0.1	3	W0316080101
8.5	SF.AL.0316.0850.S.Z3.F0010A.HB	10	8.3	66	13	23	0.1	3	W0316085101
9.0	SF.AL.0316.0900.S.Z3.F0010A.HB	10	8.8	66	13	23	0.1	3	W0316090101
9.5	SF.AL.0316.0950.S.Z3.F0010A.HB	10	9.3	66	14	24	0.1	3	W0316095101
10.0	SF.AL.0316.1000.S.Z3.F0010A.HB	10	9.7	66	14	24	0.1	3	W0316100101
12.0	SF.AL.0316.1200.S.Z3.F0010A.HB	12	11.7	73	16	26	0.1	3	W0316120101
16.0	SF.AL.0316.1600.S.Z3.F0010A.HB	16	15.5	82	22	32	0.1	3	W0316160101
20.0	SF.AL.0316.2000.S.Z3.F0010A.HB	20	19.5	92	26	40	0.1	3	W0316200101

W0319-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 4,0 = Ø 8,0	 > Ø 8,0 = Ø 12,0	 > Ø 12,0 = Ø 16,0	 > Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

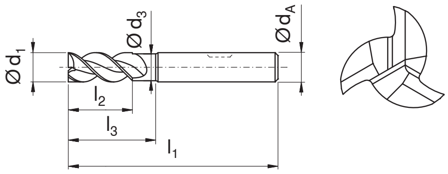
W0319-L, uncoated

End mills

AL **SF**

$\lambda_S = 45°$ $\gamma_S = 8°$ $d_1 = h6$ $d_A = h6$ F 45° E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material	HB Material
4.0	SF.AL.0319.0400.L.Z3.F0010A.HA	6	3.7	57	11	17	0.1	3	W0319040300	
6.0	SF.AL.0319.0600.L.Z3.F0020A.HA	6	5.7	57	13	19	0.2	3	W0319060300	
8.0	SF.AL.0319.0800.L.Z3.F0020A.HA	8	7.4	63	21	25	0.2	3	W0319080300	
10.0	SF.AL.0319.1000.L.Z3.F0020A.HA	10	9.2	72	22	30	0.2	3	W0319100300	
12.0	SF.AL.0319.1200.L.Z3.F0020A.HA	12	11	83	26	36	0.2	3	W0319120300	
14.0	SF.AL.0319.1400.L.Z3.F0020A.HA	14	13	83	26	36	0.2	3	W0319140300	
16.0	SF.AL.0319.1600.L.Z3.F0020A.HB	16	15	92	36	42	0.2	3		W0319160301
18.0	SF.AL.0319.1800.L.Z3.F0020A.HB	18	17	92	36	42	0.2	3		W0319180301
20.0	SF.AL.0319.2000.L.Z3.F0020A.HB	20	19	104	41	52	0.2	3		W0319200301

W0320-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

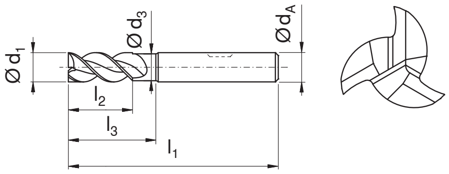
W0320-L, uncoated

End mills

AL **SF**

$\lambda_S = 45°$ $\gamma_S = 8°$ $d_1 = h6$ $d_A = h6$ S E

SCWN225



d1 [mm]	Type, description	dA [mm]	d3 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	z	HA Material	HB Material
4.0	SF.AL.0320.0400.L.Z3.S.HA	6	3.7	57	11	17	3	W0320040300	
5.0	SF.AL.0320.0500.L.Z3.S.HA	6	4.7	57	13	19	3	W0320050300	
6.0	SF.AL.0320.0600.L.Z3.S.HA	6	5.7	57	13	19	3	W0320060300	
8.0	SF.AL.0320.0800.L.Z3.S.HA	8	7.4	63	21	25	3	W0320080300	
10.0	SF.AL.0320.1000.L.Z3.S.HA	10	9.2	72	22	30	3	W0320100300	
12.0	SF.AL.0320.1200.L.Z3.S.HA	12	11	83	26	36	3	W0320120300	
14.0	SF.AL.0320.1400.L.Z3.S.HA	14	13	83	26	36	3	W0320140300	
16.0	SF.AL.0320.1600.L.Z3.S.HB	16	15	92	36	42	3		W0320160301
18.0	SF.AL.0320.1800.L.Z3.S.HB	18	17	92	36	42	3		W0320180301
20.0	SF.AL.0320.2000.L.Z3.S.HB	20	19	104	41	52	3		W0320200301

W0305-S, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

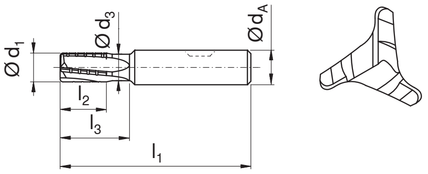
W0305-S, coated

End mills

AL **SF**

$\lambda_s = 5°$ | $\gamma_s = 15°$ | $d_1 = e8$ $d_A = h6$ | R | E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HB Material
5.0	SF.AL.0305.0500.S.Z3.R0015.HA	6	4.7	54	8	16	0.15	3	W0305050160	
6.0	SF.AL.0305.0600.S.Z3.R0020.HA	6	5.7	54	10	17	0.2	3	W0305060160	
8.0	SF.AL.0305.0800.S.Z3.R0025.HA	8	7.4	58	13	20	0.25	3	W0305080160	
10.0	SF.AL.0305.1000.S.Z3.R0030.HA	10	9.2	66	16	24	0.3	3	W0305100160	
12.0	SF.AL.0305.1200.S.Z3.R0035.HA	12	11	73	19	26	0.35	3	W0305120160	
16.0	SF.AL.0305.1600.S.Z3.R0050.HB	16	15	82	25	32	0.5	3		W0305160161
20.0	SF.AL.0305.2000.S.Z3.R0060.HB	20	19	92	32	40	0.6	3		W0305200161

W0305-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

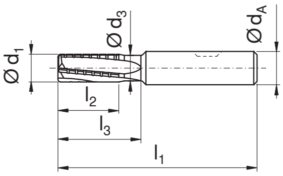
W0305-L, coated

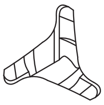
End mills

AL **SF**

$\lambda_S = 5°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ R E

SCPN235





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HB Material
5.0	SF.AL.0305.0500.L.Z3.R0015.HA	6	4.7	57	13	18	0.15	3	W0305050360	
6.0	SF.AL.0305.0600.L.Z3.R0020.HA	6	5.7	57	13	18	0.2	3	W0305060360	
8.0	SF.AL.0305.0800.L.Z3.R0025.HA	8	7.4	63	21	25	0.25	3	W0305080360	
10.0	SF.AL.0305.1000.L.Z3.R0030.HA	10	9.2	72	22	30	0.3	3	W0305100360	
12.0	SF.AL.0305.1200.L.Z3.R0035.HA	12	11	83	26	36	0.35	3	W0305120360	
16.0	SF.AL.0305.1600.L.Z3.R0050.HB	16	15	92	36	42	0.5	3		W0305160361
20.0	SF.AL.0305.2000.L.Z3.R0060.HB	20	19	104	41	52	0.6	3		W0305200361

W0305-OLS, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		260	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		200	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		140	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	130	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		120	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	110	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		90	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		90	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	100	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		140	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	90	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	35	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		45	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

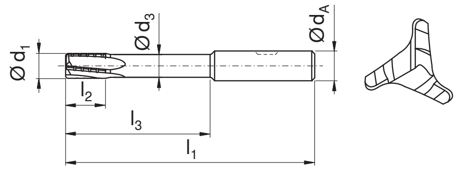
W0305-OLS, coated

End mills

AL **SF**

$\lambda_S = 5°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ R E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HB Material
5.0	SF.AL.0305.0500.OLS.Z3.R0015.HA	6	4.7	80	8	30	0.15	3	W0305050460	
6.0	SF.AL.0305.0600.OLS.Z3.R0020.HA	6	5.7	80	10	42	0.2	3	W0305060460	
8.0	SF.AL.0305.0800.OLS.Z3.R0025.HA	8	7.4	100	13	62	0.25	3	W0305080460	
10.0	SF.AL.0305.1000.OLS.Z3.R0030.HA	10	9.2	100	16	58	0.3	3	W0305100460	
12.0	SF.AL.0305.1200.OLS.Z3.R0035.HA	12	11	120	19	73	0.35	3	W0305120460	
16.0	SF.AL.0305.1600.OLS.Z3.R0050.HB	16	15	150	25	100	0.5	3		W0305160461
20.0	SF.AL.0305.2000.OLS.Z3.R0060.HB	20	19	150	32	98	0.6	3		W0305200461

WP200-L, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 10,0
7.1.1	**Aluminium**	700	0,1xø	1xø	0,035	0,06	0,07
7.1.2		600	0,1xø	1xø	0,035	0,06	0,07
7.1.3		450	0,1xø	1xø	0,035	0,06	0,07
7.1.4		500	0,1xø	1xø	0,035	0,06	0,07
7.1.5		450	0,1xø	1xø	0,035	0,06	0,07
7.1.6		250	0,1xø	1xø	0,035	0,06	0,07
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**	400	0,1xø	1xø	0,035	0,06	0,07
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**	350	0,1xø	1xø	0,04	0,06	0,08
8.1.2		350	0,1xø	1xø	0,075	0,15	0,25
8.1.3		350	0,1xø	1xø	0,075	0,15	0,25
8.1.4		150	0,1xø	1xø	0,075	0,15	0,25
8.1.5		120	0,1xø	1xø	0,075	0,15	0,25
8.1.6		200	0,1xø	1xø	0,075	0,15	0,25
8.1.7		350	0,1xø	1xø	0,075	0,15	0,25
8.1.8		300	0,1xø	1xø	0,125	0,25	0,35
8.1.9		80	0,1xø	1xø	0,05	0,1	0,2
8.2.1	**Thermosetting plastics**	100	0,1xø	1xø	0,05	0,1	0,2
8.2.2		100	0,1xø	1xø	0,05	0,1	0,2
8.2.3		100	0,1xø	1xø	0,05	0,1	0,2
8.2.4		150	0,1xø	1xø	0,05	0,1	0,2
8.2.5		100	0,1xø	1xø	0,05	0,1	0,2
8.2.6		80	0,1xø	1xø	0,05	0,1	0,2
8.2.7		100	0,1xø	1xø	0,05	0,1	0,2
8.2.8		100	0,1xø	1xø	0,05	0,1	0,2
8.3.1	**Fibre-reinforced plastics**	105	0,1xø	1xø	0,04	0,06	0,08
8.3.2		100	0,1xø	1xø	0,03	0,05	0,06
8.3.3		150	0,1xø	1xø	0,03	0,05	0,06
8.3.4		100	0,1xø	1xø	0,03	0,05	0,06
8.3.5							
8.3.6		120	0,1xø	1xø	0,03	0,05	0,06
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**	800	0,1xø	1xø	0,04	0,06	0,08
9.1.2		550	0,1xø	1xø	0,04	0,06	0,08

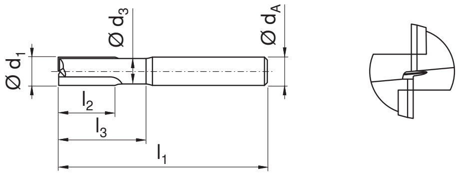
WP200-L, with PCD

End mills

AL **PKD SF**

$\lambda_s = 0°$ $\gamma_s = 0°$ $d_1 = h7$ $d_A = h6$ F 45° E/D

PKD



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material
3.0	SF.AL.P200.0300.L.Z2.F0010A.HA	6	2.8	57	6	11	0.1	2	WP200030300
4.0	SF.AL.P200.0400.L.Z2.F0010A.HA	6	3.5	57	8	13	0.1	2	WP200040300
5.0	SF.AL.P200.0500.L.Z2.F0010A.HA	6	4.4	57	10	15	0.1	2	WP200050300
6.0	SF.AL.P200.0600.L.Z2.F0010A.HA	6	5.4	57	12	19	0.1	2	WP200060300
8.0	SF.AL.P200.0800.L.Z2.F0010A.HA	8	7.2	64	16	26	0.1	2	WP200080300
10.0	SF.AL.P200.1000.L.Z2.F0010A.HA	10	9	74	20	31	0.1	2	WP200100300

WP200-OL, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 10,0
7.1.1	**Aluminium**	700	0,1xø	1xø	0,035	0,06	0,07
7.1.2		600	0,1xø	1xø	0,035	0,06	0,07
7.1.3		450	0,1xø	1xø	0,035	0,06	0,07
7.1.4		500	0,1xø	1xø	0,035	0,06	0,07
7.1.5		450	0,1xø	1xø	0,035	0,06	0,07
7.1.6		250	0,1xø	1xø	0,035	0,06	0,07
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**	400	0,1xø	1xø	0,035	0,06	0,07
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**	350	0,1xø	1xø	0,04	0,06	0,08
8.1.2		350	0,1xø	1xø	0,075	0,15	0,25
8.1.3		350	0,1xø	1xø	0,075	0,15	0,25
8.1.4		150	0,1xø	1xø	0,075	0,15	0,25
8.1.5		120	0,1xø	1xø	0,075	0,15	0,25
8.1.6		200	0,1xø	1xø	0,075	0,15	0,25
8.1.7		350	0,1xø	1xø	0,075	0,15	0,25
8.1.8		300	0,1xø	1xø	0,125	0,25	0,35
8.1.9		80	0,1xø	1xø	0,05	0,1	0,2
8.2.1	**Thermosetting plastics**	100	0,1xø	1xø	0,05	0,1	0,2
8.2.2		100	0,1xø	1xø	0,05	0,1	0,2
8.2.3		100	0,1xø	1xø	0,05	0,1	0,2
8.2.4		150	0,1xø	1xø	0,05	0,1	0,2
8.2.5		100	0,1xø	1xø	0,05	0,1	0,2
8.2.6		80	0,1xø	1xø	0,05	0,1	0,2
8.2.7		100	0,1xø	1xø	0,05	0,1	0,2
8.2.8		100	0,1xø	1xø	0,05	0,1	0,2
8.3.1	**Fibre-reinforced plastics**	105	0,1xø	1xø	0,04	0,06	0,08
8.3.2		100	0,1xø	1xø	0,03	0,05	0,06
8.3.3		150	0,1xø	1xø	0,03	0,05	0,06
8.3.4		100	0,1xø	1xø	0,03	0,05	0,06
8.3.5							
8.3.6		120	0,1xø	1xø	0,03	0,05	0,06
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**	800	0,1xø	1xø	0,04	0,06	0,08
9.1.2		550	0,1xø	1xø	0,04	0,06	0,08

WP200-OL, with PCD

End mills

AL

PKD SF

$\lambda_s = 0°$

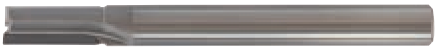
$\gamma_s = 0°$

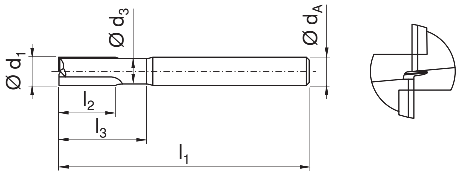
$d_1 = h7$
$d_A = h6$

F 45°

E/D

PKD





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material
3.0	SF.AL.P200.0300.OL.Z2.F0010A.HA	6	2.8	100	6	11	0.1	2	WP200030400
4.0	SF.AL.P200.0400.OL.Z2.F0010A.HA	6	3.5	100	8	13	0.1	2	WP200040400
5.0	SF.AL.P200.0500.OL.Z2.F0010A.HA	6	4.4	100	10	15	0.1	2	WP200050400
6.0	SF.AL.P200.0600.OL.Z2.F0010A.HA	6	5.4	100	12	19	0.1	2	WP200060400
8.0	SF.AL.P200.0800.OL.Z2.F0010A.HA	8	7.2	100	16	26	0.1	2	WP200080400
10.0	SF.AL.P200.1000.OL.Z2.F0010A.HA	10	9	100	20	31	0.1	2	WP200100400

WP201-L, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 10,0
7.1.1	**Aluminium**	700	0,1xø	1xø	0,035	0,06	0,07
7.1.2		600	0,1xø	1xø	0,035	0,06	0,07
7.1.3		450	0,1xø	1xø	0,035	0,06	0,07
7.1.4		500	0,1xø	1xø	0,035	0,06	0,07
7.1.5		450	0,1xø	1xø	0,035	0,06	0,07
7.1.6		250	0,1xø	1xø	0,035	0,06	0,07
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**	400	0,1xø	1xø	0,035	0,06	0,07
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**	350	0,1xø	1xø	0,04	0,06	0,08
8.1.2		350	0,1xø	1xø	0,075	0,15	0,25
8.1.3		350	0,1xø	1xø	0,075	0,15	0,25
8.1.4		150	0,1xø	1xø	0,075	0,15	0,25
8.1.5		120	0,1xø	1xø	0,075	0,15	0,25
8.1.6		200	0,1xø	1xø	0,075	0,15	0,25
8.1.7		350	0,1xø	1xø	0,075	0,15	0,25
8.1.8		300	0,1xø	1xø	0,125	0,25	0,35
8.1.9		80	0,1xø	1xø	0,05	0,1	0,2
8.2.1	**Thermosetting plastics**	100	0,1xø	1xø	0,05	0,1	0,2
8.2.2		100	0,1xø	1xø	0,05	0,1	0,2
8.2.3		100	0,1xø	1xø	0,05	0,1	0,2
8.2.4		150	0,1xø	1xø	0,05	0,1	0,2
8.2.5		100	0,1xø	1xø	0,05	0,1	0,2
8.2.6		80	0,1xø	1xø	0,05	0,1	0,2
8.2.7		100	0,1xø	1xø	0,05	0,1	0,2
8.2.8		100	0,1xø	1xø	0,05	0,1	0,2
8.3.1	**Fibre-reinforced plastics**	105	0,1xø	1xø	0,04	0,06	0,08
8.3.2		100	0,1xø	1xø	0,03	0,05	0,06
8.3.3		150	0,1xø	1xø	0,03	0,05	0,06
8.3.4		100	0,1xø	1xø	0,03	0,05	0,06
8.3.5							
8.3.6		120	0,1xø	1xø	0,03	0,05	0,06
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**	800	0,1xø	1xø	0,04	0,06	0,08
9.1.2		550	0,1xø	1xø	0,04	0,06	0,08

WP201-L, with PCD

End mills

AL

PKD SF

$\lambda_S = 0°$

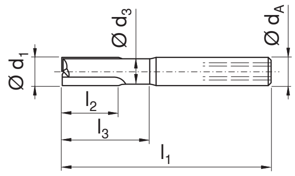
$\gamma_S = 0°$

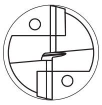
$d_1 = h7$
$d_A = h6$

F 45°

E/D

PKD





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material
3.0	SF.AL.P201.0300.L.Z2.F0010A.HA	6	2.8	57	6	11	0.1	2	WP201030300
4.0	SF.AL.P201.0400.L.Z2.F0010A.HA	6	3.5	57	8	13	0.1	2	WP201040300
5.0	SF.AL.P201.0500.L.Z2.F0010A.HA	6	4.4	57	10	15	0.1	2	WP201050300
6.0	SF.AL.P201.0600.L.Z2.F0010A.HA	6	5.4	57	12	19	0.1	2	WP201060300
8.0	SF.AL.P201.0800.L.Z2.F0010A.HA	8	7.2	64	16	26	0.1	2	WP201080300
10.0	SF.AL.P201.1000.L.Z2.F0010A.HA	10	9	74	20	31	0.1	2	WP201100300

WP201-OL, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 10,0
7.1.1	**Aluminium**	700	0,1xø	1xø	0,035	0,06	0,07
7.1.2		600	0,1xø	1xø	0,035	0,06	0,07
7.1.3		450	0,1xø	1xø	0,035	0,06	0,07
7.1.4		500	0,1xø	1xø	0,035	0,06	0,07
7.1.5		450	0,1xø	1xø	0,035	0,06	0,07
7.1.6		250	0,1xø	1xø	0,035	0,06	0,07
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**	400	0,1xø	1xø	0,035	0,06	0,07
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**	350	0,1xø	1xø	0,04	0,06	0,08
8.1.2		350	0,1xø	1xø	0,075	0,15	0,25
8.1.3		350	0,1xø	1xø	0,075	0,15	0,25
8.1.4		150	0,1xø	1xø	0,075	0,15	0,25
8.1.5		120	0,1xø	1xø	0,075	0,15	0,25
8.1.6		200	0,1xø	1xø	0,075	0,15	0,25
8.1.7		350	0,1xø	1xø	0,075	0,15	0,25
8.1.8		300	0,1xø	1xø	0,125	0,25	0,35
8.1.9		80	0,1xø	1xø	0,05	0,1	0,2
8.2.1	**Thermosetting plastics**	100	0,1xø	1xø	0,05	0,1	0,2
8.2.2		100	0,1xø	1xø	0,05	0,1	0,2
8.2.3		100	0,1xø	1xø	0,05	0,1	0,2
8.2.4		150	0,1xø	1xø	0,05	0,1	0,2
8.2.5		100	0,1xø	1xø	0,05	0,1	0,2
8.2.6		80	0,1xø	1xø	0,05	0,1	0,2
8.2.7		100	0,1xø	1xø	0,05	0,1	0,2
8.2.8		100	0,1xø	1xø	0,05	0,1	0,2
8.3.1	**Fibre-reinforced plastics**	105	0,1xø	1xø	0,04	0,06	0,08
8.3.2		100	0,1xø	1xø	0,03	0,05	0,06
8.3.3		150	0,1xø	1xø	0,03	0,05	0,06
8.3.4		100	0,1xø	1xø	0,03	0,05	0,06
8.3.5							
8.3.6		120	0,1xø	1xø	0,03	0,05	0,06
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**	800	0,1xø	1xø	0,04	0,06	0,08
9.1.2		550	0,1xø	1xø	0,04	0,06	0,08

WP201-OL, with PCD

End mills

AL

PKD SF

$\lambda_S = 0°$

$\gamma_S = 0°$

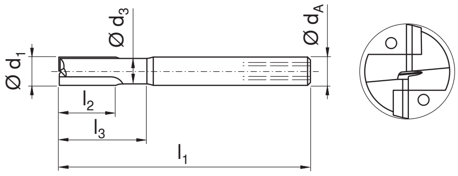
$d_1 = h7$

$d_A = h6$

F 45°

E/D

PKD



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material
3.0	SF.AL.P201.0300.OL.Z2.F0010A.HA	6	2.8	100	6	11	0.1	2	WP201030400
4.0	SF.AL.P201.0400.OL.Z2.F0010A.HA	6	3.5	100	8	13	0.1	2	WP201040400
5.0	SF.AL.P201.0500.OL.Z2.F0010A.HA	6	4.4	100	10	15	0.1	2	WP201050400
6.0	SF.AL.P201.0600.OL.Z2.F0010A.HA	6	5.4	100	12	19	0.1	2	WP201060400
8.0	SF.AL.P201.0800.OL.Z2.F0010A.HA	8	7.2	100	16	26	0.1	2	WP201080400
10.0	SF.AL.P201.1000.OL.Z2.F0010A.HA	10	9	100	20	31	0.1	2	WP201100400

WP202-L, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 2,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	700	1xø	0,15xø	0,035	0,06	0,07
7.1.2		600	1xø	0,15xø	0,035	0,06	0,07
7.1.3		450	1xø	0,15xø	0,035	0,06	0,07
7.1.4		500	1xø	0,15xø	0,035	0,06	0,07
7.1.5		450	1xø	0,15xø	0,035	0,06	0,07
7.1.6		250	1xø	0,15xø	0,035	0,06	0,07
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**	400	1xø	0,15xø	0,035	0,06	0,07
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**	350	1xø	0,2xø	0,04	0,06	0,08
8.1.2		350	1xø	0,2xø	0,075	0,15	0,25
8.1.3		350	1xø	0,2xø	0,075	0,15	0,25
8.1.4		150	1xø	0,2xø	0,075	0,15	0,25
8.1.5		120	1xø	0,2xø	0,075	0,15	0,25
8.1.6		200	1xø	0,2xø	0,075	0,15	0,25
8.1.7		350	1xø	0,2xø	0,075	0,15	0,25
8.1.8		300	1xø	0,2xø	0,125	0,25	0,35
8.1.9		80	1xø	0,2xø	0,05	0,1	0,2
8.2.1	**Thermosetting plastics**	100	1xø	0,2xø	0,05	0,1	0,2
8.2.2		100	1xø	0,2xø	0,05	0,1	0,2
8.2.3		100	1xø	0,2xø	0,05	0,1	0,2
8.2.4		150	1xø	0,2xø	0,05	0,1	0,2
8.2.5		100	1xø	0,2xø	0,05	0,1	0,2
8.2.6		80	1xø	0,2xø	0,05	0,1	0,2
8.2.7		100	1xø	0,2xø	0,05	0,1	0,2
8.2.8		100	1xø	0,2xø	0,05	0,1	0,2
8.3.1	**Fibre-reinforced plastics**	105	1xø	0,2xø	0,04	0,06	0,08
8.3.2		100	1xø	0,2xø	0,03	0,05	0,06
8.3.3		150	1xø	0,2xø	0,03	0,05	0,06
8.3.4		100	1xø	0,2xø	0,03	0,05	0,06
8.3.5							
8.3.6		120	1xø	0,2xø	0,03	0,05	0,06
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**	800	1xø	0,2xø	0,04	0,06	0,08
9.1.2		550	1xø	0,2xø	0,04	0,06	0,08

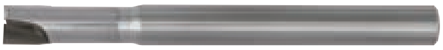
WP202-L, with PCD

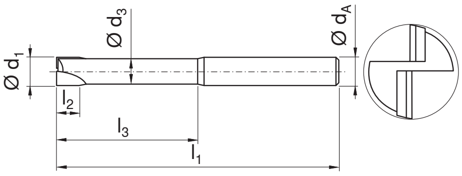
End mills

AL **PKD SF**

$\lambda_s = 0°$ $\gamma_s = 0°$ $d_1 = h7$ $d_A = h6$ S E/D

PKD





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
2.0	SF.AL.P202.0200.L.Z1.S.HA	6	1.7	75	2	6	1	WP202020100
2.0	SF.AL.P202.0200.L.Z1.S.HA	6	1.7	75	2	10	1	WP202020200
2.0	SF.AL.P202.0200.L.Z1.S.HA	6	1.7	75	2	14	1	WP202020300
3.0	SF.AL.P202.0300.L.Z2.S.HA	6	2.5	75	2.5	10	2	WP202030100
3.0	SF.AL.P202.0300.L.Z2.S.HA	6	2.5	75	2.5	15	2	WP202030200
3.0	SF.AL.P202.0300.L.Z2.S.HA	6	2.5	75	2.5	21	2	WP202030300
4.0	SF.AL.P202.0400.L.Z2.S.HA	6	3.5	75	2.5	12	2	WP202040100
4.0	SF.AL.P202.0400.L.Z2.S.HA	6	3.5	75	2.5	20	2	WP202040200
4.0	SF.AL.P202.0400.L.Z2.S.HA	6	3.5	75	2.5	28	2	WP202040300
5.0	SF.AL.P202.0500.L.Z2.S.HA	6	4.4	75	3	15	2	WP202050100
5.0	SF.AL.P202.0500.L.Z2.S.HA	6	4.4	75	3	25	2	WP202050200
5.0	SF.AL.P202.0500.L.Z2.S.HA	6	4.4	75	3	35	2	WP202050300
6.0	SF.AL.P202.0600.L.Z2.S.HA	6	5.4	100	6	18	2	WP202060100
6.0	SF.AL.P202.0600.L.Z2.S.HA	6	5.4	100	6	30	2	WP202060200
6.0	SF.AL.P202.0600.L.Z2.S.HA	6	5.4	100	6	42	2	WP202060300
8.0	SF.AL.P202.0800.L.Z2.S.HA	8	7.2	100	7	24	2	WP202080100
8.0	SF.AL.P202.0800.L.Z2.S.HA	8	7.2	100	7	40	2	WP202080200
10.0	SF.AL.P202.1000.L.Z2.S.HA	10	9	100	8	30	2	WP202100100
10.0	SF.AL.P202.1000.L.Z2.S.HA	10	9	100	8	50	2	WP202100200
12.0	SF.AL.P202.1200.L.Z2.S.HA	12	11	105	9	36	2	WP202120100
12.0	SF.AL.P202.1200.L.Z2.S.HA	12	11	105	9	60	2	WP202120200

WP400-L, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	700	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		450	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		500	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		450	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.6		250	0,1xø	1xø	0,06	0,07	0,09	0,12
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**	400	0,1xø	1xø	0,06	0,07	0,09	0,12
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**	350	0,1xø	1xø	0,06	0,08	0,15	0,2
8.1.2		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.3		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.4		150	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.5		120	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.6		200	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.7		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.8		300	0,1xø	1xø	0,25	0,35	0,45	0,55
8.1.9		80	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.2		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.3		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.4		150	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.5		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.6		80	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.7		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**	105	0,1xø	1xø	0,06	0,08	0,15	0,2
8.3.2		100	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.3		150	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.4		100	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.5								
8.3.6		120	0,1xø	1xø	0,05	0,06	0,08	0,1
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**	800	0,1xø	1xø	0,06	0,08	0,15	0,2
9.1.2		550	0,1xø	1xø	0,06	0,08	0,15	0,2

WP400-L, with PCD

End mills

AL

PKD SF

$\lambda_S = 0°$

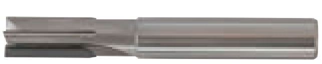
$\gamma_S = 0°$

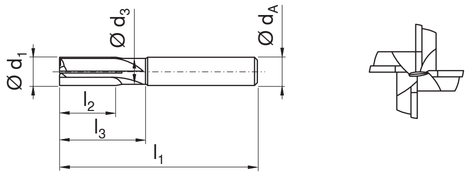
d_1=h7
d_A=h6

S

E/D

PKD





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
6.0	SF.AL.P400.0600.L.Z4.S.HA	6	5.4	57	12	19	4	WP400060300
8.0	SF.AL.P400.0800.L.Z4.S.HA	8	7.2	64	16	26	4	WP400080300
10.0	SF.AL.P400.1000.L.Z4.S.HA	10	9	74	20	31	4	WP400100300
12.0	SF.AL.P400.1200.L.Z4.S.HA	12	11	84	24	36.5	4	WP400120300
16.0	SF.AL.P400.1600.L.Z4.S.HA	16	15	93	32	44	4	WP400160300
20.0	SF.AL.P400.2000.L.Z4.S.HA	20	19	104	38	52.5	4	WP400200300

WP400-OL, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	700	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		450	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		500	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		450	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.6		250	0,1xø	1xø	0,06	0,07	0,09	0,12
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**	400	0,1xø	1xø	0,06	0,07	0,09	0,12
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**	350	0,1xø	1xø	0,06	0,08	0,15	0,2
8.1.2		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.3		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.4		150	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.5		120	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.6		200	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.7		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.8		300	0,1xø	1xø	0,25	0,35	0,45	0,55
8.1.9		80	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.2		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.3		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.4		150	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.5		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.6		80	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.7		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**	105	0,1xø	1xø	0,06	0,08	0,15	0,2
8.3.2		100	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.3		150	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.4		100	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.5								
8.3.6		120	0,1xø	1xø	0,05	0,06	0,08	0,1
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**	800	0,1xø	1xø	0,06	0,08	0,15	0,2
9.1.2		550	0,1xø	1xø	0,06	0,08	0,15	0,2

WP400-OL, with PCD

End mills

AL

PKD SF

$\lambda_s = 0°$

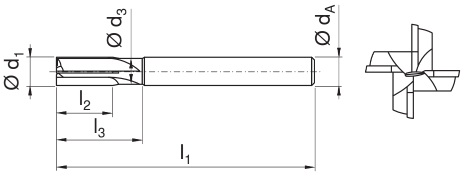
$\gamma_s = 0°$

d_1=h7 d_A=h6

S

E/D

PKD



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
6.0	SF.AL.P400.0600.OL.Z4.S.HA	6	5.4	100	12	19	4	WP400060400
8.0	SF.AL.P400.0800.OL.Z4.S.HA	8	7.2	100	16	26	4	WP400080400
10.0	SF.AL.P400.1000.OL.Z4.S.HA	10	9	100	20	31	4	WP400100400
12.0	SF.AL.P400.1200.OL.Z4.S.HA	12	11	115	24	36.5	4	WP400120400
16.0	SF.AL.P400.1600.OL.Z4.S.HA	16	15	130	32	44	4	WP400160400
20.0	SF.AL.P400.2000.OL.Z4.S.HA	20	19	160	38	52.5	4	WP400200400

WP401-L, with PCD

Cutting data

					f_z [mm]			
Index	**Material designation**	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	700	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		450	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		500	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		450	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.6		250	0,1xø	1xø	0,06	0,07	0,09	0,12
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**	400	0,1xø	1xø	0,06	0,07	0,09	0,12
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**	350	0,1xø	1xø	0,06	0,08	0,15	0,2
8.1.2		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.3		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.4		150	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.5		120	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.6		200	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.7		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.8		300	0,1xø	1xø	0,25	0,35	0,45	0,55
8.1.9		80	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.2		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.3		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.4		150	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.5		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.6		80	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.7		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**	105	0,1xø	1xø	0,06	0,08	0,15	0,2
8.3.2		100	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.3		150	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.4		100	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.5								
8.3.6		120	0,1xø	1xø	0,05	0,06	0,08	0,1
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**	800	0,1xø	1xø	0,06	0,08	0,15	0,2
9.1.2		550	0,1xø	1xø	0,06	0,08	0,15	0,2

WP401-L, with PCD

End mills

AL

PKD SF

$\lambda_S = 0°$

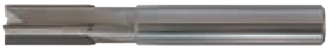
$\gamma_S = 0°$

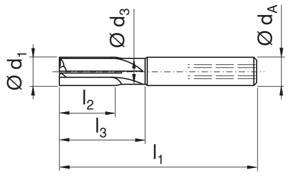
$d_1 = h7$
$d_A = h6$

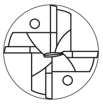
S

E/D

PKD







d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
6.0	SF.AL.P401.0600.L.Z4.S.HA	6	5.4	57	12	19	4	WP401060300
8.0	SF.AL.P401.0800.L.Z4.S.HA	8	7.2	64	16	26	4	WP401080300
10.0	SF.AL.P401.1000.L.Z4.S.HA	10	9	74	20	31	4	WP401100300
12.0	SF.AL.P401.1200.L.Z4.S.HA	12	11	84	24	36.5	4	WP401120300
16.0	SF.AL.P401.1600.L.Z4.S.HA	16	15	93	32	44	4	WP401160300
20.0	SF.AL.P401.2000.L.Z4.S.HA	20	19	104	38	52.5	4	WP401200300

WP401-OL, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	700	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		450	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		500	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		450	0,1xø	1xø	0,06	0,07	0,09	0,12
7.1.6		250	0,1xø	1xø	0,06	0,07	0,09	0,12
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**	400	0,1xø	1xø	0,06	0,07	0,09	0,12
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**	350	0,1xø	1xø	0,06	0,08	0,15	0,2
8.1.2		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.3		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.4		150	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.5		120	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.6		200	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.7		350	0,1xø	1xø	0,15	0,25	0,35	0,45
8.1.8		300	0,1xø	1xø	0,25	0,35	0,45	0,55
8.1.9		80	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.2		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.3		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.4		150	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.5		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.6		80	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.7		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	0,1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**	105	0,1xø	1xø	0,06	0,08	0,15	0,2
8.3.2		100	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.3		150	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.4		100	0,1xø	1xø	0,05	0,06	0,08	0,1
8.3.5								
8.3.6		120	0,1xø	1xø	0,05	0,06	0,08	0,1
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**	800	0,1xø	1xø	0,06	0,08	0,15	0,2
9.1.2		550	0,1xø	1xø	0,06	0,08	0,15	0,2

WP401-OL, with PCD

End mills

AL

PKD SF

$\lambda_s = 0°$

$\gamma_s = 0°$

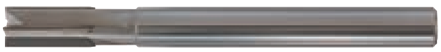
$d_1 = h7$

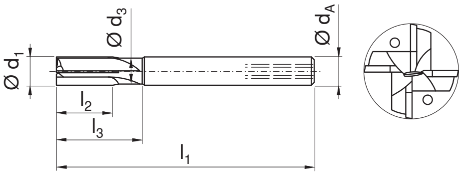
$d_A = h6$

S

E/D

PKD





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
6.0	SF.AL.P401.0600.OL.Z4.S.HA	6	5.4	100	12	19	4	WP401060400
8.0	SF.AL.P401.0800.OL.Z4.S.HA	8	7.2	100	16	26	4	WP401080400
10.0	SF.AL.P401.1000.OL.Z4.S.HA	10	9	100	20	31	4	WP401100400
12.0	SF.AL.P401.1200.OL.Z4.S.HA	12	11	115	24	36.5	4	WP401120400
16.0	SF.AL.P401.1600.OL.Z4.S.HA	16	15	130	32	44	4	WP401160400
20.0	SF.AL.P401.2000.OL.Z4.S.HA	20	19	160	38	52.5	4	WP401200400

W0318-XS, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 2,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.2		250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.3		250	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.4		200	1xø	1xø	0,04	0,06	0,08	0,15	0,2
7.1.5		180	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.1.6		150	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	180	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.2		160	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**	50	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.2		35	1xø	1xø	0,01	0,02	0,03	0,04	0,05
7.8.3		20	1xø	1xø	0,01	0,02	0,03	0,04	0,05
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

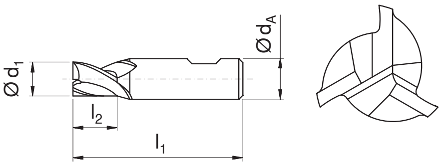
W0318-XS, uncoated

Mini end mills

AL **SFM**

$\lambda_S = 30°$ $\gamma_S = 5°$ $d_1 = e8$ $d_A = h6$ S E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	z	HB Material
2.0	SFM.AL.0318.0200.XS.Z3.S.HB	6	35	4	3	W0318020001
2.5	SFM.AL.0318.0250.XS.Z3.S.HB	6	35	4	3	W0318025001
3.0	SFM.AL.0318.0300.XS.Z3.S.HB	6	36	5	3	W0318030001
3.5	SFM.AL.0318.0350.XS.Z3.S.HB	6	36	5	3	W0318035001
4.0	SFM.AL.0318.0400.XS.Z3.S.HB	6	38	7	3	W0318040001
4.5	SFM.AL.0318.0450.XS.Z3.S.HB	6	38	7	3	W0318045001
5.0	SFM.AL.0318.0500.XS.Z3.S.HB	6	39	8	3	W0318050001
5.5	SFM.AL.0318.0550.XS.Z3.S.HB	6	39	8	3	W0318055001
5.75	SFM.AL.0318.0575.XS.Z3.S.HB	6	39	8	3	W0318057001
6.0	SFM.AL.0318.0600.XS.Z3.S.HB	6	39	8	3	W0318060001
6.75	SFM.AL.0318.0675.XS.Z3.S.HB	8	43	11	3	W0318067001
7.0	SFM.AL.0318.0700.XS.Z3.S.HB	8	43	11	3	W0318070001
7.75	SFM.AL.0318.0775.XS.Z3.S.HB	8	43	11	3	W0318077001
8.0	SFM.AL.0318.0800.XS.Z3.S.HB	8	43	11	3	W0318080001
8.7	SFM.AL.0318.0870.XS.Z3.S.HB	10	50	13	3	W0318087001
9.0	SFM.AL.0318.0900.XS.Z3.S.HB	10	50	13	3	W0318090001
9.7	SFM.AL.0318.0970.XS.Z3.S.HB	10	50	13	3	W0318097001
10.0	SFM.AL.0318.1000.XS.Z3.S.HB	10	50	13	3	W0318100001
12.0	SFM.AL.0318.1200.XS.Z3.S.HB	12	55	15	3	W0318120001
14.0	SFM.AL.0318.1400.XS.Z3.S.HB	14	58	15	3	W0318140001
16.0	SFM.AL.0318.1600.XS.Z3.S.HB	16	62	18	3	W0318160001
18.0	SFM.AL.0318.1800.XS.Z3.S.HB	18	70	20	3	W0318180001
20.0	SFM.AL.0318.2000.XS.Z3.S.HB	20	75	22	3	W0318200001

W0363-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0363-L, coated

HPC rough milling cutters

AL

HPC SR

λ_S = 37,5° / 40° / 42,5°

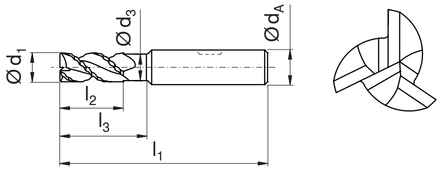
γ_S = 10°

d_1 = d11
d_A = h6

F 45°

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material	HB Material
6.0	HPC-SR.AL.0363.0600.L.Z3.F0040A.HA	6	5.7	57	13	18	0.4	3	W0363060360	
8.0	HPC-SR.AL.0363.0800.L.Z3.F0040A.HA	8	7.4	63	21	25	0.4	3	W0363080360	
10.0	HPC-SR.AL.0363.1000.L.Z3.F0040A.HA	10	9.2	72	22	30	0.4	3	W0363100360	
12.0	HPC-SR.AL.0363.1200.L.Z3.F0040A.HA	12	11	83	26	36	0.4	3	W0363120360	
16.0	HPC-SR.AL.0363.1600.L.Z3.F0040A.HB	16	15	92	36	42	0.4	3		W0363160361
20.0	HPC-SR.AL.0363.2000.L.Z3.F0040A.HB	20	19	104	41	52	0.4	3		W0363200361

W0369-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0369-L, coated

HPC rough milling cutters

AL **HPC SR**

λ_S = 37,5° / 40° / 42,5°

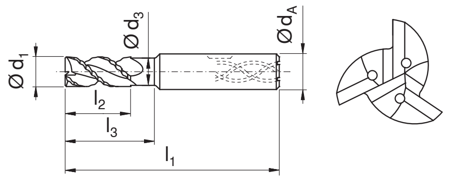
γ_S = 10°

d_1 = d11
d_A = h6

F 45°

E

SCPN235



d1 [mm]	Type, description	dA [mm]	d3 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	F [mm]	z	HA Material	HB Material
6.0	HPC-SR.AL.0369.0600.L.Z3.F0040A.HA	6	5.7	57	13	18	0.4	3	W0369060360	
8.0	HPC-SR.AL.0369.0800.L.Z3.F0040A.HA	8	7.4	63	21	25	0.4	3	W0369080360	
10.0	HPC-SR.AL.0369.1000.L.Z3.F0040A.HA	10	9.2	72	22	30	0.4	3	W0369100360	
12.0	HPC-SR.AL.0369.1200.L.Z3.F0040A.HA	12	11	83	26	36	0.4	3	W0369120360	
16.0	HPC-SR.AL.0369.1600.L.Z3.F0040A.HA	16	15	92	36	42	0.4	3	W0369160360	
16.0	HPC-SR.AL.0369.1600.L.Z3.F0040A.HB	16	15	92	36	42	0.4	3		W0369160361
20.0	HPC-SR.AL.0369.2000.L.Z3.F0040A.HA	20	19	104	41	52	0.4	3	W0369200360	
20.0	HPC-SR.AL.0369.2000.L.Z3.F0040A.HB	20	19	104	41	52	0.4	3		W0369200361

W0216-S, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	250	1xø	0,03xø	0,04	0,06	0,08	0,15	0,2
7.1.2		250	1xø	0,03xø	0,04	0,06	0,08	0,15	0,2
7.1.3		250	1xø	0,03xø	0,04	0,06	0,08	0,15	0,2
7.1.4		200	1xø	0,03xø	0,04	0,06	0,08	0,15	0,2
7.1.5		180	1xø	0,03xø	0,03	0,05	0,07	0,12	0,17
7.1.6		150	1xø	0,03xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	180	1xø	0,03xø	0,03	0,05	0,07	0,12	0,17
7.2.2		160	1xø	0,03xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	140	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**	50	1xø	0,03xø	0,01	0,02	0,03	0,04	0,05
7.8.2		35	1xø	0,03xø	0,01	0,02	0,03	0,04	0,05
7.8.3		20	1xø	0,03xø	0,01	0,02	0,03	0,04	0,05
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

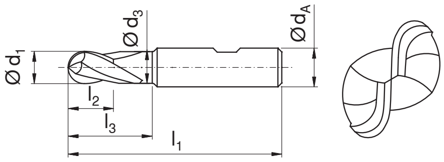
W0216-S, uncoated

Ball nose milling cutters

AL **VR**

$\lambda_S = 30°$ $\gamma_S = 13°$ $d_1 = e8$ $d_A = h6$ R E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HB Material
3.0	VR.AL.0216.0300.S.Z2.R0150.HB	6	2.9	50	5	9	1.5	2	W0216030101
4.0	VR.AL.0216.0400.S.Z2.R0200.HB	6	3.9	54	8	12	2	2	W0216040101
5.0	VR.AL.0216.0500.S.Z2.R0250.HB	6	4.9	54	9	15	2.5	2	W0216050101
6.0	VR.AL.0216.0600.S.Z2.R0300.HB	6	5.9	54	10	17	3	2	W0216060101
7.0	VR.AL.0216.0700.S.Z2.R0350.HB	8	6.8	58	11	19	3.5	2	W0216070101
8.0	VR.AL.0216.0800.S.Z2.R0400.HB	8	7.8	58	12	20	4	2	W0216080101
9.0	VR.AL.0216.0900.S.Z2.R0450.HB	10	8.8	66	13	23	4.5	2	W0216090101
10.0	VR.AL.0216.1000.S.Z2.R0500.HB	10	9.8	66	14	26	5	2	W0216100101
12.0	VR.AL.0216.1200.S.Z2.R0600.HB	12	11.8	73	16	28	6	2	W0216120101
14.0	VR.AL.0216.1400.S.Z2.R0700.HB	14	13.8	75	18	30	7	2	W0216140101
16.0	VR.AL.0216.1600.S.Z2.R0800.HB	16	15.7	82	22	32	8	2	W0216160101
18.0	VR.AL.0216.1800.S.Z2.R0900.HB	18	17.7	84	24	35	9	2	W0216180101
20.0	VR.AL.0216.2000.S.Z2.R1000.HB	20	19.7	92	26	40	10	2	W0216200101

W0238-S and W0238-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	750	1xø	0,03xø	0,04	0,06	0,08	0,15	0,2
7.1.2		750	1xø	0,03xø	0,04	0,06	0,08	0,15	0,2
7.1.3		750	1xø	0,03xø	0,04	0,06	0,08	0,15	0,2
7.1.4		670	1xø	0,03xø	0,04	0,06	0,08	0,15	0,2
7.1.5		600	1xø	0,03xø	0,03	0,05	0,07	0,12	0,17
7.1.6		400	1xø	0,03xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	350	1xø	0,03xø	0,03	0,05	0,07	0,12	0,17
7.2.2		315	1xø	0,03xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	230	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.2		190	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.3		155	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.4		190	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.5		155	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.3.6		190	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	135	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.4.2		180	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.5.2		145	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	80	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.6.2		95	1xø	0,03xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**	240	1xø	0,03xø	0,075	0,15	0,25	0,35	0,45
8.1.2		240	1xø	0,03xø	0,075	0,15	0,25	0,35	0,45
8.1.3		240	1xø	0,03xø	0,075	0,15	0,25	0,35	0,45
8.1.4		110	1xø	0,03xø	0,075	0,15	0,25	0,35	0,45
8.1.5		140	1xø	0,03xø	0,075	0,15	0,25	0,35	0,45
8.1.6		140	1xø	0,03xø	0,075	0,15	0,25	0,35	0,45
8.1.7		240	1xø	0,03xø	0,075	0,15	0,25	0,35	0,45
8.1.8		210	1xø	0,03xø	0,125	0,25	0,35	0,45	0,55
8.1.9		65	1xø	0,03xø	0,05	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	65	1xø	0,03xø	0,05	0,1	0,2	0,3	0,4
8.2.2		65	1xø	0,03xø	0,05	0,1	0,2	0,3	0,4
8.2.3		65	1xø	0,03xø	0,05	0,1	0,2	0,3	0,4
8.2.4		110	1xø	0,03xø	0,05	0,1	0,2	0,3	0,4
8.2.5		65	1xø	0,03xø	0,05	0,1	0,2	0,3	0,4
8.2.6		60	1xø	0,03xø	0,05	0,1	0,2	0,3	0,4
8.2.7		65	1xø	0,03xø	0,05	0,1	0,2	0,3	0,4
8.2.8		65	1xø	0,03xø	0,05	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

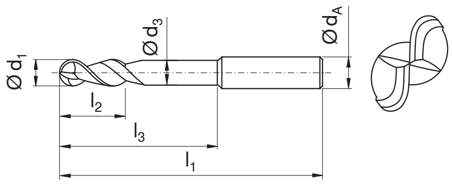
W0238-S and W0238-L, coated

Ball nose milling cutters

AL **VR**

$\lambda_S = 45°$ $\gamma_S = 13°$ $d_1 = f8$ $d_A = h6$ R E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HA Material
3.0	VR.AL.0238.0300.L.Z2.R0150.HA	3	2.7	75	10	32	1.5	2		W0238030340
3.0	VR.AL.0238.0300.S.Z2.R0150.HA	3	2.7	50	6	16	1.5	2	W0238030240	
4.0	VR.AL.0238.0400.L.Z2.R0200.HA	4	3.7	75	13	36	2	2		W0238040340
4.0	VR.AL.0238.0400.S.Z2.R0200.HA	4	3.7	54	7	17	2	2	W0238040240	
5.0	VR.AL.0238.0500.L.Z2.R0250.HA	5	4.6	75	15	40	2.5	2		W0238050340
5.0	VR.AL.0238.0500.S.Z2.R0250.HA	5	4.6	54	8	18	2.5	2	W0238050240	
6.0	VR.AL.0238.0600.L.Z2.R0300.HA	6	5.5	100	16	44	3	2		W0238060340
6.0	VR.AL.0238.0600.S.Z2.R0300.HA	6	5.5	54	10	21	3	2	W0238060240	
8.0	VR.AL.0238.0800.L.Z2.R0400.HA	8	7.5	100	22	54	4	2		W0238080340
8.0	VR.AL.0238.0800.S.Z2.R0400.HA	8	7.5	59	12	27	4	2	W0238080240	
10.0	VR.AL.0238.1000.L.Z2.R0500.HA	10	9.4	100	25	60	5	2		W0238100340
10.0	VR.AL.0238.1000.S.Z2.R0500.HA	10	9.4	67	13	32	5	2	W0238100240	
12.0	VR.AL.0238.1200.L.Z2.R0600.HA	12	11.4	100	26	60	6	2		W0238120340
12.0	VR.AL.0238.1200.S.Z2.R0600.HA	12	11.4	73	16	38	6	2	W0238120240	
14.0	VR.AL.0238.1400.L.Z2.R0700.HA	14	13.2	100	26	60	7	2		W0238140340
14.0	VR.AL.0238.1400.S.Z2.R0700.HA	14	13.2	75	16	38	7	2	W0238140240	
16.0	VR.AL.0238.1600.L.Z2.R0800.HA	16	15	150	30	92	8	2		W0238160340
16.0	VR.AL.0238.1600.S.Z2.R0800.HA	16	15	83	20	44	8	2	W0238160240	
20.0	VR.AL.0238.2000.L.Z2.R1000.HA	20	19	150	40	92	10	2		W0238200340
20.0	VR.AL.0238.2000.S.Z2.R1000.HA	20	19	93	25	50	10	2	W0238200240	

W0238-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
7.1.1	**Aluminium**	450	1xø	0,03xø	0,04	0,06	0,08	0,15
7.1.2		450	1xø	0,03xø	0,04	0,06	0,08	0,15
7.1.3		450	1xø	0,03xø	0,04	0,06	0,08	0,15
7.1.4		400	1xø	0,03xø	0,04	0,06	0,08	0,15
7.1.5		360	1xø	0,03xø	0,03	0,05	0,07	0,12
7.1.6		240	1xø	0,03xø	0,03	0,05	0,07	0,12
7.2.1	**Magnesium**	210	1xø	0,03xø	0,03	0,05	0,07	0,12
7.2.2		190	1xø	0,03xø	0,03	0,05	0,07	0,12
7.3.1	**Copper**	170	1xø	0,03xø	0,02	0,04	0,06	0,08
7.3.2		145	1xø	0,03xø	0,02	0,04	0,06	0,08
7.3.3		120	1xø	0,03xø	0,02	0,04	0,06	0,08
7.3.4		145	1xø	0,03xø	0,02	0,04	0,06	0,08
7.3.5		120	1xø	0,03xø	0,02	0,04	0,06	0,08
7.3.6		145	1xø	0,03xø	0,02	0,04	0,06	0,08
7.4.1	**CuZn (brass)**	105	1xø	0,03xø	0,02	0,04	0,06	0,08
7.4.2		140	1xø	0,03xø	0,02	0,04	0,06	0,08
7.5.1	**CuSn (bronze)**	70	1xø	0,03xø	0,02	0,04	0,06	0,08
7.5.2		85	1xø	0,03xø	0,02	0,04	0,06	0,08
7.6.1	**CuAlFe (Ampco)**	55	1xø	0,03xø	0,02	0,04	0,06	0,08
7.6.2		65	1xø	0,03xø	0,02	0,04	0,06	0,08
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**	145	1xø	0,03xø	0,075	0,15	0,25	0,35
8.1.2		145	1xø	0,03xø	0,075	0,15	0,25	0,35
8.1.3		145	1xø	0,03xø	0,075	0,15	0,25	0,35
8.1.4		65	1xø	0,03xø	0,075	0,15	0,25	0,35
8.1.5		50	1xø	0,03xø	0,075	0,15	0,25	0,35
8.1.6		85	1xø	0,03xø	0,075	0,15	0,25	0,35
8.1.7		145	1xø	0,03xø	0,075	0,15	0,25	0,35
8.1.8		125	1xø	0,03xø	0,125	0,25	0,35	0,45
8.1.9		35	1xø	0,03xø	0,05	0,1	0,2	0,3
8.2.1	**Thermosetting plastics**	40	1xø	0,03xø	0,05	0,1	0,2	0,3
8.2.2		40	1xø	0,03xø	0,05	0,1	0,2	0,3
8.2.3		40	1xø	0,03xø	0,05	0,1	0,2	0,3
8.2.4		65	1xø	0,03xø	0,05	0,1	0,2	0,3
8.2.5		40	1xø	0,03xø	0,05	0,1	0,2	0,3
8.2.6		35	1xø	0,03xø	0,05	0,1	0,2	0,3
8.2.7		40	1xø	0,03xø	0,05	0,1	0,2	0,3
8.2.8		40	1xø	0,03xø	0,05	0,1	0,2	0,3
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

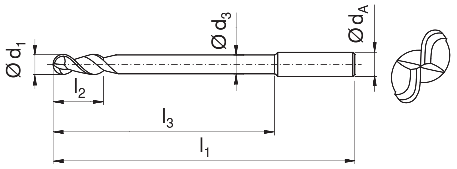
W0238-OL, coated

Ball nose milling cutters

AL **VR**

$\lambda_S = 45°$ $\gamma_S = 13°$ $d_1 = f8$ $d_A = h6$ R E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material
3.0	VR.AL.0238.0300.OL.Z2.R0150.HA	3	2.7	125	10	82	1.5	2	W0238030440
4.0	VR.AL.0238.0400.OL.Z2.R0200.HA	4	3.7	125	13	86	2	2	W0238040440
6.0	VR.AL.0238.0600.OL.Z2.R0300.HA	6	5.5	150	16	94	3	2	W0238060440
8.0	VR.AL.0238.0800.OL.Z2.R0400.HA	8	7.5	150	22	104	4	2	W0238080440
10.0	VR.AL.0238.1000.OL.Z2.R0500.HA	10	9.4	150	25	110	5	2	W0238100440
12.0	VR.AL.0238.1200.OL.Z2.R0600.HA	12	11.4	150	26	105	6	2	W0238120440
16.0	VR.AL.0238.1600.OL.Z2.R0800.HA	16	15	250	30	192	8	2	W0238160440

WP488-XL, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 2,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	700	0,1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.2		600	0,1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.3		450	0,1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.4		500	0,1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.5		450	0,1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.6		250	0,1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	400	0,1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**	350	0,1xø	0,2xø	0,04	0,06	0,08	0,15	0,2
8.1.2		350	0,1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.3		350	0,1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.4		150	0,1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.5		120	0,1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.6		200	0,1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.7		350	0,1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.8		300	0,1xø	0,2xø	0,125	0,25	0,35	0,45	0,55
8.1.9		80	0,1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	100	0,1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.2		100	0,1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.3		100	0,1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.4		150	0,1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.5		100	0,1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.6		80	0,1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.7		100	0,1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.8		100	0,1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**	105	0,1xø	0,2xø	0,04	0,06	0,08	0,15	0,2
8.3.2		100	0,1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.3.3		150	0,1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.3.4		100	0,1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.3.5									
8.3.6		120	0,1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**	800	0,1xø	0,2xø	0,04	0,06	0,08	0,15	0,2
9.1.2		550	0,1xø	0,2xø	0,04	0,06	0,08	0,15	0,2

WP488-XL, with PCD

Ball nose milling cutters

AL

PKD VR

$\lambda_S = 0°$

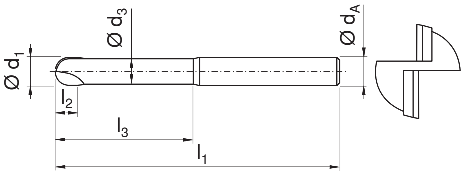
$\gamma_S = 0°$

$d_1 = h7$
$d_A = h6$

R

E/D

PKD



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material
2.0	VR.AL.P488.0200.XL.Z2.R0100.HA	6	1.7	75	2	35	1	1	WP488020300
2.0	VR.AL.P488.0200.XL.Z2.R0100.HA	6	1.7	75	2	6	1	1	WP488020400
2.0	VR.AL.P488.0200.XL.Z2.R0100.HA	6	1.7	75	2	10	1	1	WP488020500
2.0	VR.AL.P488.0200.XL.Z2.R0100.HA	6	1.7	75	2	14	1	1	WP488020600
3.0	VR.AL.P488.0300.XL.Z2.R0150.HA	6	2.5	75	2.5	35	1.5	2	WP488030300
3.0	VR.AL.P488.0300.XL.Z2.R0150.HA	6	2.5	75	2.5	9	1.5	2	WP488030400
3.0	VR.AL.P488.0300.XL.Z2.R0150.HA	6	2.5	75	2.5	15	1.5	2	WP488030500
3.0	VR.AL.P488.0300.XL.Z2.R0150.HA	6	2.5	75	2.5	21	1.5	2	WP488030600
4.0	VR.AL.P488.0400.XL.Z2.R0200.HA	6	3.5	75	2.5	35	2	2	WP488040300
4.0	VR.AL.P488.0400.XL.Z2.R0200.HA	6	3.5	75	2.5	12	2	2	WP488040400
4.0	VR.AL.P488.0400.XL.Z2.R0200.HA	6	3.5	75	2.5	20	2	2	WP488040500
4.0	VR.AL.P488.0400.XL.Z2.R0200.HA	6	3.5	75	2.5	28	2	2	WP488040600
5.0	VR.AL.P488.0500.XL.Z2.R0250.HA	6	4.4	75	3	35	2.5	2	WP488050300
5.0	VR.AL.P488.0500.XL.Z2.R0250.HA	6	4.4	75	3	15	2.5	2	WP488050400
5.0	VR.AL.P488.0500.XL.Z2.R0250.HA	6	4.4	75	3	25	2.5	2	WP488050500
6.0	VR.AL.P488.0600.XL.Z2.R0300.HA	8	5.4	100	6	40	3	2	WP488060300
6.0	VR.AL.P488.0600.XL.Z2.R0300.HA	6	5.4	100	6	18	3	2	WP488060400
6.0	VR.AL.P488.0600.XL.Z2.R0300.HA	6	5.4	100	6	30	3	2	WP488060500
6.0	VR.AL.P488.0600.XL.Z2.R0300.HA	6	5.4	100	6	42	3	2	WP488060600
8.0	VR.AL.P488.0800.XL.Z2.R0400.HA	10	7.2	100	7	40	4	2	WP488080300
8.0	VR.AL.P488.0800.XL.Z2.R0400.HA	8	7.2	100	7	24	4	2	WP488080400
8.0	VR.AL.P488.0800.XL.Z2.R0400.HA	8	7.2	100	7	40	4	2	WP488080500
10.0	VR.AL.P488.1000.XL.Z2.R0500.HA	12	9	100	8	40	5	2	WP488100300
10.0	VR.AL.P488.1000.XL.Z2.R0500.HA	10	9	100	8	30	5	2	WP488100400
10.0	VR.AL.P488.1000.XL.Z2.R0500.HA	10	9	100	8	50	5	2	WP488100500
12.0	VR.AL.P488.1200.XL.Z2.R0600.HA	16	11	105	9	40	6	2	WP488120300
12.0	VR.AL.P488.1200.XL.Z2.R0600.HA	12	11	105	9	36	6	2	WP488120400
12.0	VR.AL.P488.1200.XL.Z2.R0600.HA	12	11	105	9	60	6	2	WP488120500
16.0	VR.AL.P488.1600.XL.Z2.R0800.HA	16	15	130	11	45	8	2	WP488160200
16.0	VR.AL.P488.1600.XL.Z2.R0800.HA	16	15	130	11	50	8	2	WP488160300
20.0	VR.AL.P488.2000.XL.Z2.R1000.HA	20	19	160	13	60	10	2	WP488200300

W0362-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,035	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

W0362-L, coated

HPC torus milling cutters

AL

HPC TF

λ_S = 42,5° / 45° / 47,5°

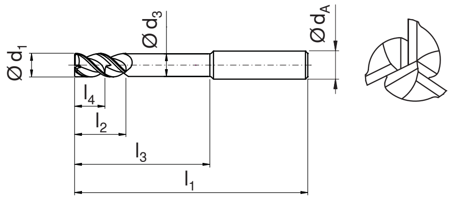
γ_S = 12°

d_1 = f8
d_A = h6

R

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	R [mm]	z	HA Material
3.0	HPC-TF.AL.0362.0300.L.Z3.R0040.HA	6	2.7	57	8	12	3.9	0.4	3	W0362030260
3.0	HPC-TF.AL.0362.0300.L.Z3.R0050.HA	6	2.7	57	8	12	3.9	0.5	3	W0362030360
3.0	HPC-TF.AL.0362.0300.L.Z3.R0100.HA	6	2.7	57	8	12	3.9	1	3	W0362030460
4.0	HPC-TF.AL.0362.0400.L.Z3.R0040.HA	6	3.7	57	11	18	5.2	0.4	3	W0362040260
4.0	HPC-TF.AL.0362.0400.L.Z3.R0050.HA	6	3.7	57	11	18	5.2	0.5	3	W0362040360
4.0	HPC-TF.AL.0362.0400.L.Z3.R0100.HA	6	3.7	57	11	18	5.2	1	3	W0362040460
5.0	HPC-TF.AL.0362.0500.L.Z3.R0050.HA	6	4.7	57	13	18	6.5	0.5	3	W0362050360
5.0	HPC-TF.AL.0362.0500.L.Z3.R0100.HA	6	4.7	57	13	18	6.5	1	3	W0362050460
6.0	HPC-TF.AL.0362.0600.L.Z3.R0050.HA	6	5.7	57	13	18	7.8	0.5	3	W0362060360
6.0	HPC-TF.AL.0362.0600.L.Z3.R0100.HA	6	5.7	57	13	18	7.8	1	3	W0362060460
6.0	HPC-TF.AL.0362.0600.L.Z3.R0150.HA	6	5.7	57	13	18	7.8	1.5	3	W0362060560
8.0	HPC-TF.AL.0362.0800.L.Z3.R0050.HA	8	7.4	63	21	25	10.4	0.5	3	W0362080360
8.0	HPC-TF.AL.0362.0800.L.Z3.R0100.HA	8	7.4	63	21	25	10.4	1	3	W0362080460
8.0	HPC-TF.AL.0362.0800.L.Z3.R0150.HA	8	7.4	63	21	25	10.4	1.5	3	W0362080560
8.0	HPC-TF.AL.0362.0800.L.Z3.R0200.HA	8	7.4	63	21	25	10.4	2	3	W0362080660
10.0	HPC-TF.AL.0362.1000.L.Z3.R0050.HA	10	9.2	72	22	30	13.0	0.5	3	W0362100360
10.0	HPC-TF.AL.0362.1000.L.Z3.R0100.HA	10	9.2	72	22	30	13.0	1	3	W0362100460
10.0	HPC-TF.AL.0362.1000.L.Z3.R0150.HA	10	9.2	72	22	30	13.0	1.5	3	W0362100560
10.0	HPC-TF.AL.0362.1000.L.Z3.R0200.HA	10	9.2	72	22	30	13.0	2	3	W0362100660
12.0	HPC-TF.AL.0362.1200.L.Z3.R0050.HA	12	11	83	26	36	15.6	0.5	3	W0362120360
12.0	HPC-TF.AL.0362.1200.L.Z3.R0100.HA	12	11	83	26	36	15.6	1	3	W0362120460
12.0	HPC-TF.AL.0362.1200.L.Z3.R0150.HA	12	11	83	26	36	15.6	1.5	3	W0362120560
12.0	HPC-TF.AL.0362.1200.L.Z3.R0200.HA	12	11	83	26	36	15.6	2	3	W0362120660
12.0	HPC-TF.AL.0362.1200.L.Z3.R0400.HA	12	11	83	26	36	15.6	4	3	W0362120760
16.0	HPC-TF.AL.0362.1600.L.Z3.R0100.HA	16	15	92	36	42	20.8	1	3	W0362160460
16.0	HPC-TF.AL.0362.1600.L.Z3.R0200.HA	16	15	92	36	42	20.8	2	3	W0362160660
16.0	HPC-TF.AL.0362.1600.L.Z3.R0400.HA	16	15	92	36	42	20.8	4	3	W0362160760
20.0	HPC-TF.AL.0362.2000.L.Z3.R0100.HA	20	19	104	41	52	26.0	1	3	W0362200460
20.0	HPC-TF.AL.0362.2000.L.Z3.R0200.HA	20	19	104	41	52	26.0	2	3	W0362200660
20.0	HPC-TF.AL.0362.2000.L.Z3.R0400.HA	20	19	104	41	52	26.0	4	3	W0362200760

W0362-OL and W0362-OLS, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		260	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		200	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		140	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	130	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		120	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	110	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		90	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		90	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	100	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		140	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	90	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	35	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		45	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0362-OL and W0362-OLS, coated

HPC torus milling cutters

AL **HPC TF**

λ_S=45° 42,5° 47,5°

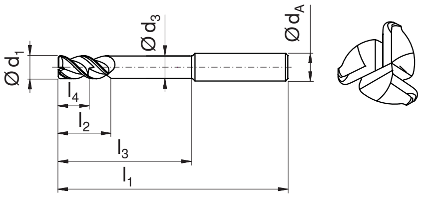
γ_S = 12°

d_1 = f8
d_A=h6

R

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	R [mm]	z	HA Material	HA Material
6.0	HPC-TF.AL.0362.0600.OLS.Z3.R0050.HA	6	5.7	80	10	42		0.5	3		W0362060R60
6.0	HPC-TF.AL.0362.0600.OLS.Z3.R0100.HA	6	5.7	80	10	42		1	3		W0362060S60
6.0	HPC-TF.AL.0362.0600.OLS.Z3.R0150.HA	6	5.7	80	10	42		1.5	3		W0362060T60
6.0	HPC-TF.AL.0362.0600.OL.Z3.R0050.HA	6	5.7	80	13	42	7.8	0.5	3	W0362060B60	
6.0	HPC-TF.AL.0362.0600.OL.Z3.R0100.HA	6	5.7	80	13	42	7.8	1	3	W0362060C60	
6.0	HPC-TF.AL.0362.0600.OL.Z3.R0150.HA	6	5.7	80	13	42	7.8	1.5	3	W0362060D60	
8.0	HPC-TF.AL.0362.0800.OLS.Z3.R0050.HA	8	7.4	100	13	62		0.5	3		W0362080R60
8.0	HPC-TF.AL.0362.0800.OLS.Z3.R0100.HA	8	7.4	100	13	62		1	3		W0362080S60
8.0	HPC-TF.AL.0362.0800.OLS.Z3.R0150.HA	8	7.4	100	13	62		1.5	3		W0362080T60
8.0	HPC-TF.AL.0362.0800.OLS.Z3.R0200.HA	8	7.4	100	13	62		2	3		W0362080U60
8.0	HPC-TF.AL.0362.0800.OL.Z3.R0050.HA	8	7.4	100	21	62	10.4	0.5	3	W0362080B60	
8.0	HPC-TF.AL.0362.0800.OL.Z3.R0100.HA	8	7.4	100	21	62	10.4	1	3	W0362080C60	
8.0	HPC-TF.AL.0362.0800.OL.Z3.R0150.HA	8	7.4	100	21	62	10.4	1.5	3	W0362080D60	
8.0	HPC-TF.AL.0362.0800.OL.Z3.R0200.HA	8	7.4	100	21	62	10.4	2	3	W0362080E60	
10.0	HPC-TF.AL.0362.1000.OLS.Z3.R0050.HA	10	9.2	100	16	58		0.5	3		W0362100R60
10.0	HPC-TF.AL.0362.1000.OLS.Z3.R0100.HA	10	9.2	100	16	58		1	3		W0362100S60
10.0	HPC-TF.AL.0362.1000.OLS.Z3.R0150.HA	10	9.2	100	16	58		1.5	3		W0362100T60
10.0	HPC-TF.AL.0362.1000.OLS.Z3.R0200.HA	10	9.2	100	16	58		2	3		W0362100U60
10.0	HPC-TF.AL.0362.1000.OL.Z3.R0050.HA	10	9.2	100	22	58	13.0	0.5	3	W0362100B60	
10.0	HPC-TF.AL.0362.1000.OL.Z3.R0100.HA	10	9.2	100	22	58	13.0	1	3	W0362100C60	
10.0	HPC-TF.AL.0362.1000.OL.Z3.R0150.HA	10	9.2	100	22	58	13.0	1.5	3	W0362100D60	
10.0	HPC-TF.AL.0362.1000.OL.Z3.R0200.HA	10	9.2	100	22	58	13.0	2	3	W0362100E60	
12.0	HPC-TF.AL.0362.1200.OLS.Z3.R0050.HA	12	11	120	19	73		0.5	3		W0362120R60
12.0	HPC-TF.AL.0362.1200.OLS.Z3.R0100.HA	12	11	120	19	73		1	3		W0362120S60
12.0	HPC-TF.AL.0362.1200.OLS.Z3.R0150.HA	12	11	120	19	73		1.5	3		W0362120T60
12.0	HPC-TF.AL.0362.1200.OLS.Z3.R0200.HA	12	11	120	19	73		2	3		W0362120U60
12.0	HPC-TF.AL.0362.1200.OLS.Z3.R0400.HA	12	11	120	19	73		4	3		W0362120V60
12.0	HPC-TF.AL.0362.1200.OL.Z3.R0050.HA	12	11	120	26	73	15.6	0.5	3	W0362120B60	
12.0	HPC-TF.AL.0362.1200.OL.Z3.R0100.HA	12	11	120	26	73	15.6	1	3	W0362120C60	
12.0	HPC-TF.AL.0362.1200.OL.Z3.R0150.HA	12	11	120	26	73	15.6	1.5	3	W0362120D60	
12.0	HPC-TF.AL.0362.1200.OL.Z3.R0200.HA	12	11	120	26	73	15.6	2	3	W0362120E60	
12.0	HPC-TF.AL.0362.1200.OL.Z3.R0400.HA	12	11	120	26	73	15.6	4	3	W0362120F60	
16.0	HPC-TF.AL.0362.1600.OLS.Z3.R0100.HA	16	15	150	25	100		1	3		W0362160S60
16.0	HPC-TF.AL.0362.1600.OLS.Z3.R0200.HA	16	15	150	25	100		2	3		W0362160U60
16.0	HPC-TF.AL.0362.1600.OLS.Z3.R0400.HA	16	15	150	25	100		4	3		W0362160V60
16.0	HPC-TF.AL.0362.1600.OL.Z3.R0100.HA	16	15	150	36	100	20.8	1	3	W0362160C60	
16.0	HPC-TF.AL.0362.1600.OL.Z3.R0200.HA	16	15	150	36	100	20.8	2	3	W0362160E60	
16.0	HPC-TF.AL.0362.1600.OL.Z3.R0400.HA	16	15	150	36	100	20.8	4	3	W0362160F60	
20.0	HPC-TF.AL.0362.2000.OLS.Z3.R0100.HA	20	19	150	32	98		1	3		W0362200S60
20.0	HPC-TF.AL.0362.2000.OLS.Z3.R0200.HA	20	19	150	32	98		2	3		W0362200U60
20.0	HPC-TF.AL.0362.2000.OLS.Z3.R0400.HA	20	19	150	32	98		4	3		W0362200V60
20.0	HPC-TF.AL.0362.2000.OL.Z3.R0100.HA	20	19	150	41	98	26.0	1	3	W0362200C60	
20.0	HPC-TF.AL.0362.2000.OL.Z3.R0200.HA	20	19	150	41	98	26.0	2	3	W0362200E60	
20.0	HPC-TF.AL.0362.2000.OL.Z3.R0400.HA	20	19	150	41	98	26.0	4	3	W0362200F60	

W0321-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		600	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		480	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		360	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		240	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	220	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		200	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	170	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		155	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		150	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		120	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		150	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	180	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		240	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	150	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		170	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	55	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		70	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0321-L, uncoated

Torus milling cutters

AL **TF**

$\lambda_S = 45°$

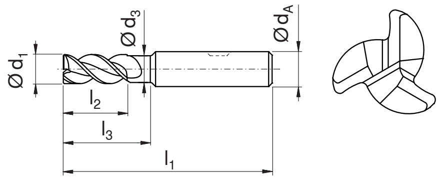
$\gamma_S = 8°$

$d_1 = h6$
$d_A = h6$

R

E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HB Material
5.0	TF.AL.0321.0500.L.Z3.R0050.HA	6	4.7	57	13	19	0.5	3	W0321050300	
5.0	TF.AL.0321.0500.L.Z3.R0100.HA	6	4.7	57	13	19	1	3	W0321050400	
6.0	TF.AL.0321.0600.L.Z3.R0050.HA	6	5.7	57	13	19	0.5	3	W0321060300	
6.0	TF.AL.0321.0600.L.Z3.R0100.HA	6	5.7	57	13	19	1	3	W0321060400	
8.0	TF.AL.0321.0800.L.Z3.R0050.HA	8	7.4	63	21	25	0.5	3	W0321080300	
8.0	TF.AL.0321.0800.L.Z3.R0100.HA	8	7.4	63	21	25	1	3	W0321080400	
10.0	TF.AL.0321.1000.L.Z3.R0050.HA	10	9.2	72	22	30	0.5	3	W0321100300	
10.0	TF.AL.0321.1000.L.Z3.R0100.HA	10	9.2	72	22	30	1	3	W0321100400	
12.0	TF.AL.0321.1200.L.Z3.R0050.HA	12	11	83	26	36	0.5	3	W0321120300	
12.0	TF.AL.0321.1200.L.Z3.R0100.HA	12	11	83	26	36	1	3	W0321120400	
16.0	TF.AL.0321.1600.L.Z3.R0200.HA	16	15	92	36	42	2	3	W0321160600	
16.0	TF.AL.0321.1600.L.Z3.R0200.HB	16	15	92	36	42	2	3		W0321160601
16.0	TF.AL.0321.1600.L.Z3.R0400.HA	16	15	92	36	42	4	3	W0321160700	
16.0	TF.AL.0321.1600.L.Z3.R0400.HB	16	15	92	36	42	4	3		W0321160701
20.0	TF.AL.0321.2000.L.Z3.R0400.HA	20	19	104	41	52	4	3	W0321200700	
20.0	TF.AL.0321.2000.L.Z3.R0400.HB	20	19	104	41	52	4	3		W0321200701

W0321-OLS, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.2		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.3		300	1xø	1xø	0,06	0,07	0,09	0,12
7.1.4		260	1xø	1xø	0,06	0,07	0,09	0,12
7.1.5		200	1xø	1xø	0,05	0,07	0,12	0,17
7.1.6		140	1xø	1xø	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	130	1xø	1xø	0,05	0,07	0,12	0,17
7.2.2		120	1xø	1xø	0,05	0,07	0,12	0,17
7.3.1	**Copper**	110	1xø	1xø	0,04	0,06	0,08	0,12
7.3.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.3.3		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.4		90	1xø	1xø	0,04	0,06	0,08	0,12
7.3.5		80	1xø	1xø	0,04	0,06	0,08	0,12
7.3.6		90	1xø	1xø	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	100	1xø	1xø	0,04	0,06	0,08	0,12
7.4.2		140	1xø	1xø	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	90	1xø	1xø	0,04	0,06	0,08	0,12
7.5.2		100	1xø	1xø	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	35	1xø	1xø	0,04	0,06	0,08	0,12
7.6.2		45	1xø	1xø	0,04	0,06	0,08	0,12
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0321-OLS, uncoated

Torus milling cutters

AL **TF**

$\lambda_S = 45°$

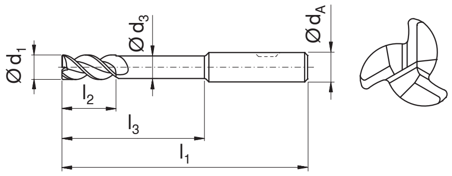
$\gamma_S = 8°$

$d_1 = h6$
$d_A = h6$

R

E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HB Material
6.0	TF.AL.0321.0600.OLS.Z3.R0050.HA	6	5.7	80	10	42	0.5	3	W0321060R00	
6.0	TF.AL.0321.0600.OLS.Z3.R0100.HA	6	5.7	80	10	42	1	3	W0321060S00	
8.0	TF.AL.0321.0800.OLS.Z3.R0050.HA	8	7.4	100	13	62	0.5	3	W0321080R00	
8.0	TF.AL.0321.0800.OLS.Z3.R0100.HA	8	7.4	100	13	62	1	3	W0321080S00	
10.0	TF.AL.0321.1000.OLS.Z3.R0050.HA	10	9.2	100	16	58	0.5	3	W0321100R00	
10.0	TF.AL.0321.1000.OLS.Z3.R0100.HA	10	9.2	100	16	58	1	3	W0321100S00	
12.0	TF.AL.0321.1200.OLS.Z3.R0050.HA	12	11	120	19	73	0.5	3	W0321120R00	
12.0	TF.AL.0321.1200.OLS.Z3.R0100.HA	12	11	120	19	73	1	3	W0321120S00	
16.0	TF.AL.0321.1600.OLS.Z3.R0200.HA	16	15	150	25	100	2	3	W0321160U00	
16.0	TF.AL.0321.1600.OLS.Z3.R0200.HB	16	15	150	25	100	2	3		W0321160U01
16.0	TF.AL.0321.1600.OLS.Z3.R0400.HA	16	15	150	25	100	4	3	W0321160V00	
16.0	TF.AL.0321.1600.OLS.Z3.R0400.HB	16	15	150	25	100	4	3		W0321160V01
20.0	TF.AL.0321.2000.OLS.Z3.R0400.HA	20	19	150	32	98	4	3	W0321200V00	
20.0	TF.AL.0321.2000.OLS.Z3.R0400.HB	20	19	150	32	98	4	3		W0321200V01

WP288-XL, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 2,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	700	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.2		600	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.3		450	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.4		500	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.5		450	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.6		250	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	400	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**	350	1xø	0,2xø	0,04	0,06	0,08	0,15	0,2
8.1.2		350	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.3		350	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.4		150	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.5		120	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.6		200	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.7		350	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.8		300	1xø	0,2xø	0,125	0,25	0,35	0,45	0,55
8.1.9		80	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.2		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.3		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.4		150	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.5		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.6		80	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.7		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.8		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**	105	1xø	0,2xø	0,04	0,06	0,08	0,15	0,2
8.3.2		100	1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.3.3		150	1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.3.4		100	1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.3.5									
8.3.6		120	1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**	800	1xø	0,2xø	0,04	0,06	0,08	0,15	0,2
9.1.2		550	1xø	0,2xø	0,04	0,06	0,08	0,15	0,2

WP288-XL, with PCD

Torus milling cutters

AL

PKD TF

$\lambda_S = 0°$

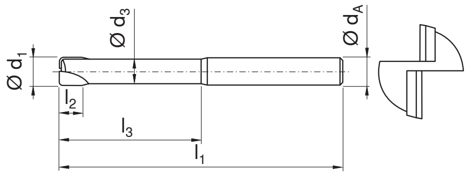
$\gamma_S = 0°$

$d_1 = h7$
$d_A = h6$

R

E/D

PKD



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material
2.0	TF.AL.P288.0200.XL.Z1.R0030.HA	6	1.7	75	2	6	0.3	1	WP288020100
2.0	TF.AL.P288.0200.XL.Z1.R0030.HA	6	1.7	75	2	10	0.3	1	WP288020200
2.0	TF.AL.P288.0200.XL.Z1.R0030.HA	6	1.7	75	2	35	0.3	1	WP288020300
2.0	TF.AL.P288.0200.XL.Z1.R0030.HA	6	1.7	75	2	14	0.3	1	WP288020400
3.0	TF.AL.P288.0300.XL.Z2.R0030.HA	6	2.5	75	2.5	9	0.3	2	WP288030100
3.0	TF.AL.P288.0300.XL.Z2.R0030.HA	6	2.5	75	2.5	15	0.3	2	WP288030200
3.0	TF.AL.P288.0300.XL.Z2.R0030.HA	6	2.5	75	2.5	35	0.3	2	WP288030300
3.0	TF.AL.P288.0300.XL.Z2.R0030.HA	6	2.5	75	2.5	21	0.3	2	WP288030400
4.0	TF.AL.P288.0400.XL.Z2.R0030.HA	6	3.5	75	2.5	12	0.3	2	WP288040100
4.0	TF.AL.P288.0400.XL.Z2.R0030.HA	6	3.5	75	2.5	20	0.3	2	WP288040200
4.0	TF.AL.P288.0400.XL.Z2.R0030.HA	6	3.5	75	2.5	35	0.3	2	WP288040300
4.0	TF.AL.P288.0400.XL.Z2.R0030.HA	6	3.5	75	2.5	28	0.3	2	WP288040400
5.0	TF.AL.P288.0500.XL.Z2.R0030.HA	6	4.4	75	3	15	0.3	2	WP288050100
5.0	TF.AL.P288.0500.XL.Z2.R0030.HA	6	4.4	75	3	25	0.3	2	WP288050200
5.0	TF.AL.P288.0500.XL.Z2.R0030.HA	6	4.4	75	3	35	0.3	2	WP288050300
6.0	TF.AL.P288.0600.XL.Z2.R0030.HA	6	5.4	100	6	18	0.3	2	WP288060000
6.0	TF.AL.P288.0600.XL.Z2.R0030.HA	6	5.4	100	6	30	0.3	2	WP288060100
6.0	TF.AL.P288.0600.XL.Z2.R0030.HA	6	5.4	100	6	42	0.3	2	WP288060200
6.0	TF.AL.P288.0600.XL.Z2.R0050.HA	6	5.4	100	6	18	0.5	2	WP288060400
6.0	TF.AL.P288.0600.XL.Z2.R0050.HA	6	5.4	100	6	30	0.5	2	WP288060500
6.0	TF.AL.P288.0600.XL.Z2.R0050.HA	6	5.4	100	6	42	0.5	2	WP288060600
6.0	TF.AL.P288.0600.XL.Z2.R0100.HA	8	5.4	100	6	40	1	2	WP288060300
6.0	TF.AL.P288.0600.XL.Z2.R0100.HA	6	5.4	100	6	18	1	2	WP288060700
6.0	TF.AL.P288.0600.XL.Z2.R0100.HA	6	5.4	100	6	42	1	2	WP288060900
8.0	TF.AL.P288.0800.XL.Z2.R0030.HA	8	7.2	100	7	24	0.3	2	WP288080000
8.0	TF.AL.P288.0800.XL.Z2.R0030.HA	8	7.2	100	7	40	0.3	2	WP288080500
8.0	TF.AL.P288.0800.XL.Z2.R0050.HA	8	7.2	100	7	24	0.5	2	WP288080100
8.0	TF.AL.P288.0800.XL.Z2.R0050.HA	8	7.2	100	7	40	0.5	2	WP288080600
8.0	TF.AL.P288.0800.XL.Z2.R0100.HA	8	7.2	100	7	24	1	2	WP288080200
8.0	TF.AL.P288.0800.XL.Z2.R0100.HA	8	7.2	100	7	40	1	2	WP288080700
8.0	TF.AL.P288.0800.XL.Z2.R0200.HA	10	7.2	100	7	40	2	2	WP288080300
8.0	TF.AL.P288.0800.XL.Z2.R0200.HA	8	7.2	100	7	24	2	2	WP288080400
8.0	TF.AL.P288.0800.XL.Z2.R0200.HA	8	7.2	100	7	40	2	2	WP288080800
10.0	TF.AL.P288.1000.XL.Z2.R0050.HA	10	9	100	8	30	0.5	2	WP288100000
10.0	TF.AL.P288.1000.XL.Z2.R0050.HA	10	9	100	8	50	0.5	2	WP288100500
10.0	TF.AL.P288.1000.XL.Z2.R0100.HA	10	9	100	8	30	1	2	WP288100100
10.0	TF.AL.P288.1000.XL.Z2.R0100.HA	10	9	100	8	50	1	2	WP288100600
10.0	TF.AL.P288.1000.XL.Z2.R0150.HA	10	9	100	8	30	1.5	2	WP288100200
10.0	TF.AL.P288.1000.XL.Z2.R0150.HA	10	9	100	8	50	1.5	2	WP288100700
10.0	TF.AL.P288.1000.XL.Z2.R0200.HA	10	9	100	8	30	2	2	WP288100A00
10.0	TF.AL.P288.1000.XL.Z2.R0200.HA	10	9	100	8	50	2	2	WP288100800
10.0	TF.AL.P288.1000.XL.Z2.R0300.HA	12	9	100	8	40	3	2	WP288100300
10.0	TF.AL.P288.1000.XL.Z2.R0300.HA	10	9	100	8	30	3	2	WP288100400
10.0	TF.AL.P288.1000.XL.Z2.R0300.HA	10	9	100	8	50	3	2	WP288100900
12.0	TF.AL.P288.1200.XL.Z2.R0050.HA	12	11	105	9	36	0.5	2	WP288120000
12.0	TF.AL.P288.1200.XL.Z2.R0050.HA	12	11	105	9	60	0.5	2	WP288120600
12.0	TF.AL.P288.1200.XL.Z2.R0100.HA	12	11	105	9	36	1	2	WP288120100
12.0	TF.AL.P288.1200.XL.Z2.R0100.HA	12	11	105	9	60	1	2	WP288120700

WP288-XL, with PCD

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 2,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	700	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.2		600	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.3		450	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.4		500	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.5		450	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.1.6		250	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	400	1xø	0,15xø	0,035	0,06	0,07	0,09	0,12
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**	350	1xø	0,2xø	0,04	0,06	0,08	0,15	0,2
8.1.2		350	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.3		350	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.4		150	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.5		120	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.6		200	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.7		350	1xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.8		300	1xø	0,2xø	0,125	0,25	0,35	0,45	0,55
8.1.9		80	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.2		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.3		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.4		150	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.5		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.6		80	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.7		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.8		100	1xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**	105	1xø	0,2xø	0,04	0,06	0,08	0,15	0,2
8.3.2		100	1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.3.3		150	1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.3.4		100	1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.3.5									
8.3.6		120	1xø	0,2xø	0,03	0,05	0,06	0,08	0,1
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**	800	1xø	0,2xø	0,04	0,06	0,08	0,15	0,2
9.1.2		550	1xø	0,2xø	0,04	0,06	0,08	0,15	0,2

WP288-XL, with PCD

Torus milling cutters

AL

PKD TF

$\lambda_s = 0°$

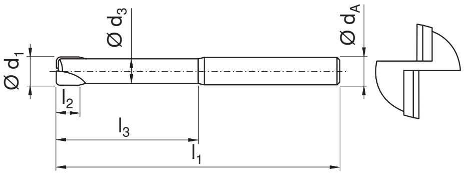
$\gamma_s = 0°$

$d_1 = h7$
$d_A = h6$

R

E/D

PKD



d₁ [mm]	Type, description	dA [mm]	d₃ [mm]	l₁ [mm]	l₂ [mm]	l₃ [mm]	R [mm]	z	HA Material
12.0	TF.AL.P288.1200.XL.Z2.R0150.HA	12	11	105	9	36	1.5	2	WP288120200
12.0	TF.AL.P288.1200.XL.Z2.R0150.HA	12	11	105	9	60	1.5	2	WP288120800
12.0	TF.AL.P288.1200.XL.Z2.R0400.HA	16	11	100	9	40	4	2	WP288120300
16.0	TF.AL.P288.1600.XL.Z2.R0300.HA	16	15	130	11	45	3	2	WP288160200
16.0	TF.AL.P288.1600.XL.Z2.R0500.HA	16	15	130	11	50	5	2	WP288160300
20.0	TF.AL.P288.2000.XL.Z2.R0600.HA	20	19	160	13	60	6	2	WP288200300

W0242-L and W0242-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]					
					= Ø 0,5 = Ø 0,6	> Ø 0,6 = Ø 0,8	> Ø 0,8 = Ø 1,0	> Ø 1,0 = Ø 1,2	> Ø 1,2 = Ø 1,5	> Ø 1,5 = Ø 2,0
7.1.1	**Aluminium**	400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.2		400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.3		400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.4		400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.5		300	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.6		200	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**	140	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.2		120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.3		100	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.4		120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.5		100	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.6		120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.4.1	**CuZn (brass)**	150	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.4.2		200	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.5.1	**CuSn (bronze)**	120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.5.2		140	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.6.1	**CuAlFe (Ampco)**	120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.6.2		140	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.8.1	**Titanium**									
7.8.2										
7.8.3										
8.1.1	**Thermoplastics**									
8.1.2										
8.1.3										
8.1.4										
8.1.5										
8.1.6										
8.1.7										
8.1.8										
8.1.9										
8.2.1	**Thermosetting plastics**									
8.2.2										
8.2.3										
8.2.4										
8.2.5										
8.2.6										
8.2.7										
8.2.8										
8.3.1	**Fibre-reinforced plastics**									
8.3.2										
8.3.3										
8.3.4										
8.3.5										
8.3.6										
8.4.1	**Sandwich**									
8.4.2										
8.4.3										
9.1.1	**Standard graphite**									
9.1.2										

W0242-L and W0242-OL, coated

Micro end mills

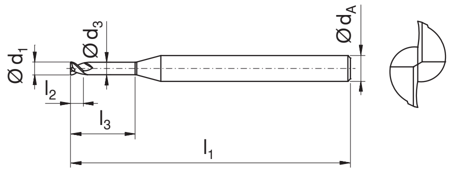
AL **MSF**

$\lambda_S = 45°$ $\gamma_S = 13°$ d_1 = 0/-0,01 d_A=h6

F 45°

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material	HA Material
0.5	MSF.AL.0242.0050.L03D.Z2.F0005A.HA	3	0.45	55	0.5	1.5	0.05	2	W0242005140	
0.5	MSF.AL.0242.0050.L05D.Z2.F0005A.HA	3	0.45	55	1.2	2.5	0.05	2	W0242005340	
0.5	MSF.AL.0242.0050.L08D.Z2.F0005A.HA	3	0.45	55	1.2	4	0.05	2	W0242005540	
0.5	MSF.AL.0242.0050.L10D.Z2.F0005A.HA	3	0.45	55	1.2	5	0.05	2	W0242005740	
1.0	MSF.AL.0242.0100.L03D.Z2.F0010A.HA	3	0.95	55	1.5	3	0.1	2	W0242010140	
1.0	MSF.AL.0242.0100.L05D.Z2.F0010A.HA	3	0.95	55	1.5	5	0.1	2	W0242010640	
1.0	MSF.AL.0242.0100.OL08D.Z2.F0010A.HA	3	0.95	65	1.5	8	0.1	2		W0242010D40
1.0	MSF.AL.0242.0100.OL10D.Z2.F0010A.HA	3	0.95	65	1.5	10	0.1	2		W0242010740
1.0	MSF.AL.0242.0100.OL12D.Z2.F0010A.HA	3	0.95	65	1.5	12	0.1	2		W0242010840
1.5	MSF.AL.0242.0150.L03D.Z2.F0010A.HA	3	1.44	55	1.8	5	0.1	2	W0242015140	
1.5	MSF.AL.0242.0150.L05D.Z2.F0010A.HA	3	1.44	55	1.8	7.5	0.1	2	W0242015640	
1.5	MSF.AL.0242.0150.OL08D.Z2.F0010A.HA	3	1.44	65	1.8	12	0.1	2		W0242015D40
1.5	MSF.AL.0242.0150.OL10D.Z2.F0010A.HA	3	1.44	65	1.8	15	0.1	2		W0242015740
2.0	MSF.AL.0242.0200.L03D.Z2.F0010A.HA	3	1.92	55	2	6	0.1	2	W0242020140	
2.0	MSF.AL.0242.0200.L05D.Z2.F0010A.HA	3	1.92	55	2	10	0.1	2	W0242020640	
2.0	MSF.AL.0242.0200.OL07D.Z2.F0010A.HA	3	1.92	55	2	14	0.1	2		W0242020D40
2.0	MSF.AL.0242.0200.OL08D.Z2.F0010A.HA	3	1.92	65	2	16	0.1	2		W0242020G40
2.0	MSF.AL.0242.0200.OL10D.Z2.F0010A.HA	3	1.92	65	2	20	0.1	2		W0242020740

W0239-L and W0239-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]					
					= Ø 0,5 = Ø 0,6	> Ø 0,6 = Ø 0,8	> Ø 0,8 = Ø 1,0	> Ø 1,0 = Ø 1,2	> Ø 1,2 = Ø 1,5	> Ø 1,5 = Ø 2,0
7.1.1	**Aluminium**	400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.2		400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.3		400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.4		400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.5		300	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.6		200	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**	140	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.2		120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.3		100	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.4		120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.5		100	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.6		120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.4.1	**CuZn (brass)**	150	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.4.2		200	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.5.1	**CuSn (bronze)**	120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.5.2		140	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.6.1	**CuAlFe (Ampco)**	120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.6.2		140	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.8.1	**Titanium**									
7.8.2										
7.8.3										
8.1.1	**Thermoplastics**									
8.1.2										
8.1.3										
8.1.4										
8.1.5										
8.1.6										
8.1.7										
8.1.8										
8.1.9										
8.2.1	**Thermosetting plastics**									
8.2.2										
8.2.3										
8.2.4										
8.2.5										
8.2.6										
8.2.7										
8.2.8										
8.3.1	**Fibre-reinforced plastics**									
8.3.2										
8.3.3										
8.3.4										
8.3.5										
8.3.6										
8.4.1	**Sandwich**									
8.4.2										
8.4.3										
9.1.1	**Standard graphite**									
9.1.2										

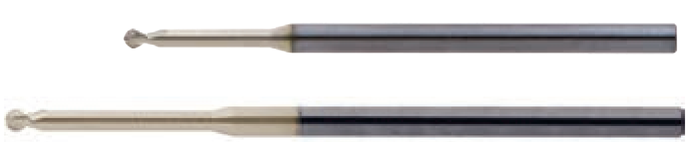
W0239-L and W0239-OL, coated

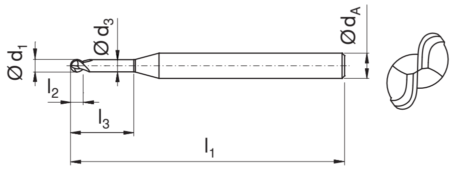
Micro ball nose milling cutters

AL **MVR**

$\lambda_S = 45°$ $\gamma_S = 13°$ $d_1 =$ 0/-0,01 d_A=h6 R E

SCPN235





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HA Material
0.5	MVR.AL.0239.0050.L03D.Z2.R0025.HA	3	0.45	55	0.5	1.5	0.25	2	W0239005140	
0.5	MVR.AL.0239.0050.L05D.Z2.R0025.HA	3	0.45	55	1.2	2.5	0.25	2	W0239005340	
0.5	MVR.AL.0239.0050.L08D.Z2.R0025.HA	3	0.45	55	1.2	4	0.25	2	W0239005540	
0.5	MVR.AL.0239.0050.L10D.Z2.R0025.HA	3	0.45	55	1.2	5	0.25	2	W0239005740	
1.0	MVR.AL.0239.0100.L03D.Z2.R0050.HA	3	0.95	55	1.5	3	0.5	2	W0239010140	
1.0	MVR.AL.0239.0100.L05D.Z2.R0050.HA	3	0.95	55	1.5	5	0.5	2	W0239010640	
1.0	MVR.AL.0239.0100.OL08D.Z2.R0050.HA	3	0.95	65	1.5	8	0.5	2		W0239010D40
1.0	MVR.AL.0239.0100.OL10D.Z2.R0050.HA	3	0.95	65	1.5	10	0.5	2		W0239010740
1.0	MVR.AL.0239.0100.OL12D.Z2.R0050.HA	3	0.95	65	1.5	12	0.5	2		W0239010840
1.5	MVR.AL.0239.0150.L03D.Z2.R0075.HA	3	1.44	55	1.8	5	0.75	2	W0239015140	
1.5	MVR.AL.0239.0150.L05D.Z2.R0075.HA	3	1.44	55	1.8	7.5	0.75	2	W0239015640	
1.5	MVR.AL.0239.0150.OL08D.Z2.R0075.HA	3	1.44	65	1.8	12	0.75	2		W0239015D40
1.5	MVR.AL.0239.0150.OL10D.Z2.R0075.HA	3	1.44	65	1.8	15	0.75	2		W0239015740
2.0	MVR.AL.0239.0200.L03D.Z2.R0100.HA	3	1.92	55	2	6	1	2	W0239020140	
2.0	MVR.AL.0239.0200.L05D.Z2.R0100.HA	3	1.92	55	2	10	1	2	W0239020640	
2.0	MVR.AL.0239.0200.L07D.Z2.R0100.HA	3	1.92	55	2	14	1	2	W0239020D40	
2.0	MVR.AL.0239.0200.OL08D.Z2.R0100.HA	3	1.92	65	2	16	1	2		W0239020G40
2.0	MVR.AL.0239.0200.OL10D.Z2.R0100.HA	3	1.92	65	2	20	1	2		W0239020740

W0249-L and W0249-OL, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]					
					= Ø 0,5 = Ø 0,6	> Ø 0,6 = Ø 0,8	> Ø 0,8 = Ø 1,0	> Ø 1,0 = Ø 1,2	> Ø 1,2 = Ø 1,5	> Ø 1,5 = Ø 2,0
7.1.1	**Aluminium**	400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.2		400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.3		400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.4		400	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.5		300	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.1.6		200	1xø	0,15xø	0,012	0,016	0,02	0,024	0,03	0,04
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**	140	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.2		120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.3		100	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.4		120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.5		100	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.3.6		120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.4.1	**CuZn (brass)**	150	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.4.2		200	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.5.1	**CuSn (bronze)**	120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.5.2		140	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.6.1	**CuAlFe (Ampco)**	120	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.6.2		140	1xø	0,08xø	0,006	0,008	0,011	0,013	0,016	0,021
7.8.1	**Titanium**									
7.8.2										
7.8.3										
8.1.1	**Thermoplastics**									
8.1.2										
8.1.3										
8.1.4										
8.1.5										
8.1.6										
8.1.7										
8.1.8										
8.1.9										
8.2.1	**Thermosetting plastics**									
8.2.2										
8.2.3										
8.2.4										
8.2.5										
8.2.6										
8.2.7										
8.2.8										
8.3.1	**Fibre-reinforced plastics**									
8.3.2										
8.3.3										
8.3.4										
8.3.5										
8.3.6										
8.4.1	**Sandwich**									
8.4.2										
8.4.3										
9.1.1	**Standard graphite**									
9.1.2										

W0249-L and W0249-OL, coated

Micro torus milling cutters

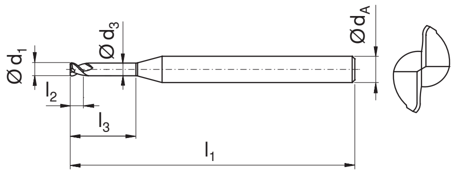
AL **MTF**

$\lambda_S = 45°$ $\gamma_S = 13°$ $d_1 =$ 0/-0,01 d_A=h6

R

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	R [mm]	z	HA Material	HA Material
0.5	MTF.AL.0249.0050.L03D.Z2.R0005.HA	3	0.45	55	0.5	1.5	0.05	2	W0249005140	
0.5	MTF.AL.0249.0050.L05D.Z2.R0005.HA	3	0.45	55	1.2	2.5	0.05	2	W0249005340	
0.5	MTF.AL.0249.0050.L08D.Z2.R0005.HA	3	0.45	55	1.2	4	0.05	2	W0249005540	
0.5	MTF.AL.0249.0050.L10D.Z2.R0005.HA	3	0.45	55	1.2	5	0.05	2	W0249005740	
1.0	MTF.AL.0249.0100.L03D.Z2.R0010.HA	3	0.95	55	1.5	3	0.1	2	W0249010140	
1.0	MTF.AL.0249.0100.L05D.Z2.R0010.HA	3	0.95	55	1.5	5	0.1	2	W0249010640	
1.0	MTF.AL.0249.0100.OL08D.Z2.R0010.HA	3	0.95	65	1.5	8	0.1	2		W0249010D40
1.0	MTF.AL.0249.0100.OL10D.Z2.R0010.HA	3	0.95	65	1.5	10	0.1	2		W0249010740
1.0	MTF.AL.0249.0100.OL12D.Z2.R0010.HA	3	0.95	65	1.5	12	0.1	2		W0249010840
1.5	MTF.AL.0249.0150.L03D.Z2.R0015.HA	3	1.44	55	1.8	5	0.15	2	W0249015140	
1.5	MTF.AL.0249.0150.L05D.Z2.R0015.HA	3	1.44	55	1.8	7.5	0.15	2	W0249015640	
1.5	MTF.AL.0249.0150.OL08D.Z2.R0015.HA	3	1.44	65	1.8	12	0.15	2		W0249015D40
1.5	MTF.AL.0249.0150.OL10D.Z2.R0015.HA	3	1.44	65	1.8	15	0.15	2		W0249015740
2.0	MTF.AL.0249.0200.L03D.Z2.R0020.HA	3	1.92	55	2	6	0.2	2	W0249020140	
2.0	MTF.AL.0249.0200.L05D.Z2.R0020.HA	3	1.92	55	2	10	0.2	2	W0249020240	
2.0	MTF.AL.0249.0200.L07D.Z2.R0020.HA	3	1.92	55	2	14	0.2	2	W0249020640	
2.0	MTF.AL.0249.0200.OL08D.Z2.R0020.HA	3	1.92	65	2	16	0.2	2		W0249020D40
2.0	MTF.AL.0249.0200.OL10D.Z2.R0020.HA	3	1.92	65	2	20	0.2	2		W0249020740

W0376-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	500	0,05xø	2xø	0,04	0,05	0,06	0,07
7.1.2		500	0,05xø	2xø	0,04	0,05	0,06	0,07
7.1.3		500	0,05xø	2xø	0,04	0,05	0,06	0,07
7.1.4		400	0,05xø	2xø	0,04	0,05	0,06	0,07
7.1.5		300	0,05xø	2xø	0,02	0,03	0,05	0,06
7.1.6		210	0,05xø	2xø	0,02	0,03	0,05	0,06
7.2.1	**Magnesium**	200	0,05xø	2xø	0,02	0,03	0,05	0,06
7.2.2		170	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.1	**Copper**	150	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.2		140	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.3		110	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.4		130	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.5		110	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.6		130	0,05xø	2xø	0,02	0,03	0,05	0,06
7.4.1	**CuZn (brass)**	150	0,05xø	2xø	0,02	0,03	0,05	0,06
7.4.2		210	0,05xø	2xø	0,02	0,03	0,05	0,06
7.5.1	**CuSn (bronze)**	130	0,05xø	2xø	0,02	0,03	0,05	0,06
7.5.2		140	0,05xø	2xø	0,02	0,03	0,05	0,06
7.6.1	**CuAlFe (Ampco)**	60	0,05xø	2xø	0,02	0,03	0,05	0,06
7.6.2		70	0,05xø	2xø	0,02	0,03	0,05	0,06
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0376-L, coated

High-precision finish milling cutters

AL

HG SC

λ_S=43,5° 46,5°

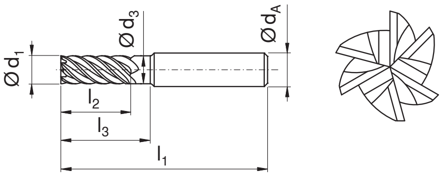
γ_S=20°

d_1 = f8
d_A=h6

S

E

SCPN235



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
6.0	HG-SC.AL.0376.0600.L.Z6.S.HA	6	5.7	58	16	20	6	W0376060360
8.0	HG-SC.AL.0376.0800.L.Z6.S.HA	8	7.4	64	19	26	6	W0376080360
10.0	HG-SC.AL.0376.1000.L.Z6.S.HA	10	9.2	74	25	32	6	W0376100360
12.0	HG-SC.AL.0376.1200.L.Z6.S.HA	12	11	84	30	37	6	W0376120360
16.0	HG-SC.AL.0376.1600.L.Z6.S.HA	16	15	93	40	44	6	W0376160360
20.0	HG-SC.AL.0376.2000.L.Z6.S.HA	20	19	104	50	53	6	W0376200360

W0376-OL and W0376-OLS, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	360	0,05xø	2xø	0,04	0,05	0,06	0,07
7.1.2		360	0,05xø	2xø	0,04	0,05	0,06	0,07
7.1.3		360	0,05xø	2xø	0,04	0,05	0,06	0,07
7.1.4		290	0,05xø	2xø	0,04	0,05	0,06	0,07
7.1.5		220	0,05xø	2xø	0,02	0,03	0,05	0,06
7.1.6		150	0,05xø	2xø	0,02	0,03	0,05	0,06
7.2.1	**Magnesium**	140	0,05xø	2xø	0,02	0,03	0,05	0,06
7.2.2		120	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.1	**Copper**	110	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.2		100	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.3		80	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.4		90	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.5		80	0,05xø	2xø	0,02	0,03	0,05	0,06
7.3.6		90	0,05xø	2xø	0,02	0,03	0,05	0,06
7.4.1	**CuZn (brass)**	110	0,05xø	2xø	0,02	0,03	0,05	0,06
7.4.2		150	0,05xø	2xø	0,02	0,03	0,05	0,06
7.5.1	**CuSn (bronze)**	90	0,05xø	2xø	0,02	0,03	0,05	0,06
7.5.2		100	0,05xø	2xø	0,02	0,03	0,05	0,06
7.6.1	**CuAlFe (Ampco)**	40	0,05xø	2xø	0,02	0,03	0,05	0,06
7.6.2		50	0,05xø	2xø	0,02	0,03	0,05	0,06
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0376-OL and W0376-OLS, coated

High-precision finish milling cutters

AL

HG SC

λ_S = 43,5° 46,5°

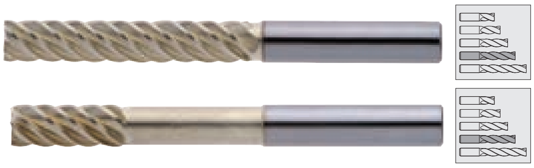
γ_S = 20°

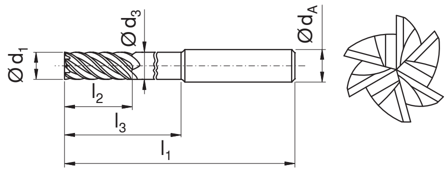
d_1 = f8 d_A = h6

S

E

SCPN235





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material	HA Material
6.0	HG-SC.AL.0376.0600.OLS.Z6.S.HA	6	5.7	80	16	42	6		W0376060460
8.0	HG-SC.AL.0376.0800.OLS.Z6.S.HA	8	7.4	100	19	62	6		W0376080460
10.0	HG-SC.AL.0376.1000.OLS.Z6.S.HA	10	9.2	100	25	58	6		W0376100460
12.0	HG-SC.AL.0376.1200.OLS.Z6.S.HA	12	11	120	30	73	6		W0376120460
12.0	HG-SC.AL.0376.1200.OL.Z6.S.HA	12		120	45		6	W0376120560	
16.0	HG-SC.AL.0376.1600.OLS.Z6.S.HA	16	15	150	40	100	6		W0376160460
16.0	HG-SC.AL.0376.1600.OL.Z6.S.HA	16		150	65		6	W0376160560	
20.0	HG-SC.AL.0376.2000.OLS.Z6.S.HA	20	19	150	50	98	6		W0376200460
20.0	HG-SC.AL.0376.2000.OL.Z6.S.HA	20		150	75		6	W0376200560	

W0228-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	300	1xø	1xø	0,04	0,06	0,08
7.1.2		300	1xø	1xø	0,04	0,06	0,08
7.1.3		300	1xø	1xø	0,04	0,06	0,08
7.1.4		250	1xø	1xø	0,04	0,06	0,08
7.1.5		200	1xø	1xø	0,03	0,05	0,07
7.1.6		150	1xø	1xø	0,03	0,05	0,07
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**	210	1xø	1xø	0,075	0,15	0,25
8.1.2		210	1xø	1xø	0,075	0,15	0,25
8.1.3		210	1xø	1xø	0,075	0,15	0,25
8.1.4		90	1xø	1xø	0,075	0,15	0,25
8.1.5		70	1xø	1xø	0,075	0,15	0,25
8.1.6		120	1xø	1xø	0,075	0,15	0,25
8.1.7		210	1xø	1xø	0,075	0,15	0,25
8.1.8		180	1xø	1xø	0,125	0,25	0,35
8.1.9		50	1xø	1xø	0,05	0,1	0,2
8.2.1	**Thermosetting plastics**	60	1xø	1xø	0,05	0,1	0,2
8.2.2		60	1xø	1xø	0,05	0,1	0,2
8.2.3		60	1xø	1xø	0,05	0,1	0,2
8.2.4		90	1xø	1xø	0,05	0,1	0,2
8.2.5		60	1xø	1xø	0,05	0,1	0,2
8.2.6		50	1xø	1xø	0,05	0,1	0,2
8.2.7		60	1xø	1xø	0,05	0,1	0,2
8.2.8		60	1xø	1xø	0,05	0,1	0,2
8.3.1	**Fibre-reinforced plastics**						
8.3.2							
8.3.3							
8.3.4							
8.3.5							
8.3.6							
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**						
9.1.2							

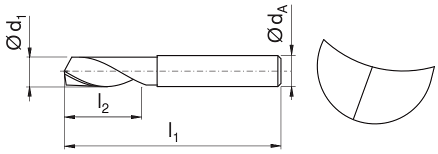
W0228-L, uncoated

Single flute milling cutters

AL **EZ**

$\lambda_S = 30°$ $\gamma_S = 13°$ $d_1 = e8$ $d_A = h6$ S E

SCWN225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	z	HA Material
3.0	EZ.AL.0228.0300.L.Z1.S.HA	3	50	8	1	W0228030300
4.0	EZ.AL.0228.0400.L.Z1.S.HA	4	60	10	1	W0228040300
5.0	EZ.AL.0228.0500.L.Z1.S.HA	5	60	15	1	W0228050300
6.0	EZ.AL.0228.0600.L.Z1.S.HA	6	60	20	1	W0228060300
8.0	EZ.AL.0228.0800.L.Z1.S.HA	8	70	25	1	W0228080300
10.0	EZ.AL.0228.1000.L.Z1.S.HA	10	70	25	1	W0228100300
12.0	EZ.AL.0228.1200.L.Z1.S.HA	12	70	25	1	W0228120300

W0740-S, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]	
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	300	0,2xø	0,2xø	0,06	0,08
7.1.2		300	0,2xø	0,2xø	0,06	0,08
7.1.3		300	0,2xø	0,2xø	0,06	0,08
7.1.4		250	0,2xø	0,2xø	0,06	0,08
7.1.5		200	0,2xø	0,2xø	0,05	0,07
7.1.6		160	0,2xø	0,2xø	0,05	0,07
7.2.1	**Magnesium**	180	0,2xø	0,2xø	0,05	0,07
7.2.2		160	0,2xø	0,2xø	0,05	0,07
7.3.1	**Copper**	140	0,2xø	0,2xø	0,04	0,06
7.3.2		120	0,2xø	0,2xø	0,04	0,06
7.3.3		100	0,2xø	0,2xø	0,04	0,06
7.3.4		120	0,2xø	0,2xø	0,04	0,06
7.3.5		100	0,2xø	0,2xø	0,04	0,06
7.3.6		120	0,2xø	0,2xø	0,04	0,06
7.4.1	**CuZn (brass)**	150	0,2xø	0,2xø	0,04	0,06
7.4.2		200	0,2xø	0,2xø	0,04	0,06
7.5.1	**CuSn (bronze)**	120	0,2xø	0,2xø	0,04	0,06
7.5.2		140	0,2xø	0,2xø	0,04	0,06
7.6.1	**CuAlFe (Ampco)**	120	0,2xø	0,2xø	0,04	0,06
7.6.2		140	0,2xø	0,2xø	0,04	0,06
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**	210	0,2xø	0,2xø	0,15	0,25
8.1.2		210	0,2xø	0,2xø	0,15	0,25
8.1.3		210	0,2xø	0,2xø	0,15	0,25
8.1.4		90	0,2xø	0,2xø	0,15	0,25
8.1.5		70	0,2xø	0,2xø	0,15	0,25
8.1.6		120	0,2xø	0,2xø	0,15	0,25
8.1.7		210	0,2xø	0,2xø	0,15	0,25
8.1.8		180	0,2xø	0,2xø	0,25	0,35
8.1.9		50	0,2xø	0,2xø	0,1	0,2
8.2.1	**Thermosetting plastics**	60	0,2xø	0,2xø	0,1	0,2
8.2.2		60	0,2xø	0,2xø	0,1	0,2
8.2.3		60	0,2xø	0,2xø	0,1	0,2
8.2.4		90	0,2xø	0,2xø	0,1	0,2
8.2.5		60	0,2xø	0,2xø	0,1	0,2
8.2.6		50	0,2xø	0,2xø	0,1	0,2
8.2.7		60	0,2xø	0,2xø	0,1	0,2
8.2.8		60	0,2xø	0,2xø	0,1	0,2
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

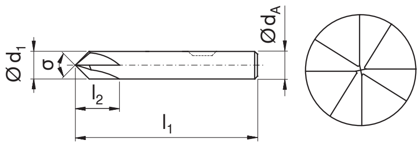
W0740-S, uncoated

Deburring cutters

AL **E**

$\lambda_S = 0°$ $\gamma_S = 0°$ $d_1 = h6$ $d_A = h6$ σ 90° E/D

SCWN225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	z	HA Material	HB Material
4.0	E.AL.0740.0400.S.Z4.HA	4	54	9	90	4	W0740040300	
6.0	E.AL.0740.0600.S.Z4.HA	6	54	12	90	4	W0740060300	
6.0	E.AL.0740.0600.S.Z4.HB	6	54	12	90	4		W0740060301
8.0	E.AL.0740.0800.S.Z4.HA	8	58	15	90	4	W0740080300	
8.0	E.AL.0740.0800.S.Z4.HB	8	58	15	90	4		W0740080301
10.0	E.AL.0740.1000.S.Z4.HA	10	66	16	90	4	W0740100300	
10.0	E.AL.0740.1000.S.Z4.HB	10	66	16	90	4		W0740100301
12.0	E.AL.0740.1200.S.Z4.HA	12	73	18	90	4	W0740120300	
12.0	E.AL.0740.1200.S.Z4.HB	12	73	18	90	4		W0740120301

W0741-S, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]	
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	300	0,2xø	0,2xø	0,06	0,08
7.1.2		300	0,2xø	0,2xø	0,06	0,08
7.1.3		300	0,2xø	0,2xø	0,06	0,08
7.1.4		250	0,2xø	0,2xø	0,06	0,08
7.1.5		200	0,2xø	0,2xø	0,05	0,07
7.1.6		160	0,2xø	0,2xø	0,05	0,07
7.2.1	**Magnesium**	180	0,2xø	0,2xø	0,05	0,07
7.2.2		160	0,2xø	0,2xø	0,05	0,07
7.3.1	**Copper**	140	0,2xø	0,2xø	0,04	0,06
7.3.2		120	0,2xø	0,2xø	0,04	0,06
7.3.3		100	0,2xø	0,2xø	0,04	0,06
7.3.4		120	0,2xø	0,2xø	0,04	0,06
7.3.5		100	0,2xø	0,2xø	0,04	0,06
7.3.6		120	0,2xø	0,2xø	0,04	0,06
7.4.1	**CuZn (brass)**	150	0,2xø	0,2xø	0,04	0,06
7.4.2		200	0,2xø	0,2xø	0,04	0,06
7.5.1	**CuSn (bronze)**	120	0,2xø	0,2xø	0,04	0,06
7.5.2		140	0,2xø	0,2xø	0,04	0,06
7.6.1	**CuAlFe (Ampco)**	120	0,2xø	0,2xø	0,04	0,06
7.6.2		140	0,2xø	0,2xø	0,04	0,06
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**	210	0,2xø	0,2xø	0,15	0,25
8.1.2		210	0,2xø	0,2xø	0,15	0,25
8.1.3		210	0,2xø	0,2xø	0,15	0,25
8.1.4		90	0,2xø	0,2xø	0,15	0,25
8.1.5		70	0,2xø	0,2xø	0,15	0,25
8.1.6		120	0,2xø	0,2xø	0,15	0,25
8.1.7		210	0,2xø	0,2xø	0,15	0,25
8.1.8		180	0,2xø	0,2xø	0,25	0,35
8.1.9		50	0,2xø	0,2xø	0,1	0,2
8.2.1	**Thermosetting plastics**	60	0,2xø	0,2xø	0,1	0,2
8.2.2		60	0,2xø	0,2xø	0,1	0,2
8.2.3		60	0,2xø	0,2xø	0,1	0,2
8.2.4		90	0,2xø	0,2xø	0,1	0,2
8.2.5		60	0,2xø	0,2xø	0,1	0,2
8.2.6		50	0,2xø	0,2xø	0,1	0,2
8.2.7		60	0,2xø	0,2xø	0,1	0,2
8.2.8		60	0,2xø	0,2xø	0,1	0,2
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

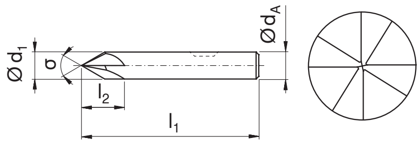
W0741-S, uncoated

Deburring cutters

AL **E**

$\lambda_s = 0°$ $\gamma_s = 0°$ $d_1 = h6$ $d_A = h6$ σ 60° E/D

SCWN225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	z	HA Material	HB Material
4.0	E.AL.0741.0400.S.Z4.HA	4	54	9	60	4	W0741040300	
6.0	E.AL.0741.0600.S.Z4.HB	6	54	12	60	4		W0741060301
8.0	E.AL.0741.0800.S.Z4.HB	8	58	15	60	4		W0741080301
10.0	E.AL.0741.1000.S.Z4.HB	10	66	16	60	4		W0741100301
12.0	E.AL.0741.1200.S.Z4.HB	12	73	18	60	4		W0741120301

W0742-S, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]	
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	300	0,2xø	0,2xø	0,06	0,08
7.1.2		300	0,2xø	0,2xø	0,06	0,08
7.1.3		300	0,2xø	0,2xø	0,06	0,08
7.1.4		250	0,2xø	0,2xø	0,06	0,08
7.1.5		200	0,2xø	0,2xø	0,05	0,07
7.1.6		160	0,2xø	0,2xø	0,05	0,07
7.2.1	**Magnesium**	180	0,2xø	0,2xø	0,05	0,07
7.2.2		160	0,2xø	0,2xø	0,05	0,07
7.3.1	**Copper**	140	0,2xø	0,2xø	0,04	0,06
7.3.2		120	0,2xø	0,2xø	0,04	0,06
7.3.3		100	0,2xø	0,2xø	0,04	0,06
7.3.4		120	0,2xø	0,2xø	0,04	0,06
7.3.5		100	0,2xø	0,2xø	0,04	0,06
7.3.6		120	0,2xø	0,2xø	0,04	0,06
7.4.1	**CuZn (brass)**	150	0,2xø	0,2xø	0,04	0,06
7.4.2		200	0,2xø	0,2xø	0,04	0,06
7.5.1	**CuSn (bronze)**	120	0,2xø	0,2xø	0,04	0,06
7.5.2		140	0,2xø	0,2xø	0,04	0,06
7.6.1	**CuAlFe (Ampco)**	120	0,2xø	0,2xø	0,04	0,06
7.6.2		140	0,2xø	0,2xø	0,04	0,06
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**	210	0,2xø	0,2xø	0,15	0,25
8.1.2		210	0,2xø	0,2xø	0,15	0,25
8.1.3		210	0,2xø	0,2xø	0,15	0,25
8.1.4		90	0,2xø	0,2xø	0,15	0,25
8.1.5		70	0,2xø	0,2xø	0,15	0,25
8.1.6		120	0,2xø	0,2xø	0,15	0,25
8.1.7		210	0,2xø	0,2xø	0,15	0,25
8.1.8		180	0,2xø	0,2xø	0,25	0,35
8.1.9		50	0,2xø	0,2xø	0,1	0,2
8.2.1	**Thermosetting plastics**	60	0,2xø	0,2xø	0,1	0,2
8.2.2		60	0,2xø	0,2xø	0,1	0,2
8.2.3		60	0,2xø	0,2xø	0,1	0,2
8.2.4		90	0,2xø	0,2xø	0,1	0,2
8.2.5		60	0,2xø	0,2xø	0,1	0,2
8.2.6		50	0,2xø	0,2xø	0,1	0,2
8.2.7		60	0,2xø	0,2xø	0,1	0,2
8.2.8		60	0,2xø	0,2xø	0,1	0,2
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

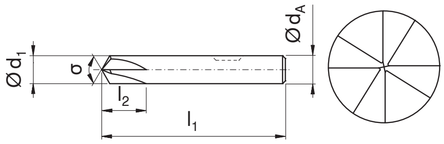
W0742-S, uncoated

Deburring cutters

AL | E

$\lambda_S = 0°$ | $\gamma_S = 0°$ | $d_1 = h6$, $d_A = h6$ | σ 120° | E/D

SCWN225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	z	HA Material	HB Material
4.0	E.AL.0742.0400.S.Z4.HA	4	54	9	120	4	W0742040300	
6.0	E.AL.0742.0600.S.Z4.HB	6	54	12	120	4		W0742060301
8.0	E.AL.0742.0800.S.Z4.HB	8	58	15	120	4		W0742080301
10.0	E.AL.0742.1000.S.Z4.HB	10	66	16	120	4		W0742100301
12.0	E.AL.0742.1200.S.Z4.HB	12	73	18	120	4		W0742120301

W0750-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	300	0,2xø	0,2xø	0,04	0,06	0,08	0,15	0,2
7.1.2		300	0,2xø	0,2xø	0,04	0,06	0,08	0,15	0,2
7.1.3		300	0,2xø	0,2xø	0,04	0,06	0,08	0,15	0,2
7.1.4		250	0,2xø	0,2xø	0,04	0,06	0,08	0,15	0,2
7.1.5		200	0,2xø	0,2xø	0,03	0,05	0,07	0,12	0,17
7.1.6		160	0,2xø	0,2xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	180	0,2xø	0,2xø	0,03	0,05	0,07	0,12	0,17
7.2.2		160	0,2xø	0,2xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	140	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**	210	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.2		210	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.3		210	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.4		90	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.5		70	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.6		120	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.7		210	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.8		180	0,2xø	0,2xø	0,125	0,25	0,35	0,45	0,55
8.1.9		50	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.2		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.3		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.4		90	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.5		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.6		50	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.7		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.8		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

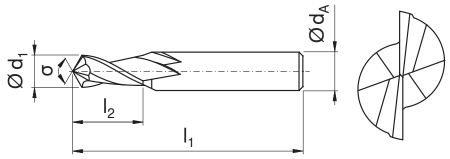
W0750-L, uncoated

Chamfer milling cutters

AL **FF**

$\lambda_S = 30°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ σ 120° E/D

SCWP225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	z	HA Material
3.0	FF.AL.0750.0300.L.Z2.HA	6	57	8	120	2	W0750030300
4.0	FF.AL.0750.0400.L.Z2.HA	6	57	11	120	2	W0750040300
5.0	FF.AL.0750.0500.L.Z2.HA	6	57	13	120	2	W0750050300
6.0	FF.AL.0750.0600.L.Z2.HA	6	57	13	120	2	W0750060300
8.0	FF.AL.0750.0800.L.Z2.HA	8	63	19	120	2	W0750080300
10.0	FF.AL.0750.1000.L.Z2.HA	10	72	22	120	2	W0750100300
12.0	FF.AL.0750.1200.L.Z2.HA	12	83	26	120	2	W0750120300
16.0	FF.AL.0750.1600.L.Z2.HA	16	92	32	120	2	W0750160300
20.0	FF.AL.0750.2000.L.Z2.HA	20	104	38	120	2	W0750200300

W0751-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	300	0,2xø	0,2xø	0,04	0,06	0,08	0,15	0,2
7.1.2		300	0,2xø	0,2xø	0,04	0,06	0,08	0,15	0,2
7.1.3		300	0,2xø	0,2xø	0,04	0,06	0,08	0,15	0,2
7.1.4		250	0,2xø	0,2xø	0,04	0,06	0,08	0,15	0,2
7.1.5		200	0,2xø	0,2xø	0,03	0,05	0,07	0,12	0,17
7.1.6		160	0,2xø	0,2xø	0,03	0,05	0,07	0,12	0,17
7.2.1	**Magnesium**	180	0,2xø	0,2xø	0,03	0,05	0,07	0,12	0,17
7.2.2		160	0,2xø	0,2xø	0,03	0,05	0,07	0,12	0,17
7.3.1	**Copper**	140	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.2		120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.3		100	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.4		120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.5		100	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.3.6		120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.4.1	**CuZn (brass)**	150	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.4.2		200	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.5.1	**CuSn (bronze)**	120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.5.2		140	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.6.1	**CuAlFe (Ampco)**	120	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.6.2		140	0,2xø	0,2xø	0,02	0,04	0,06	0,08	0,12
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**	210	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.2		210	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.3		210	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.4		90	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.5		70	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.6		120	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.7		210	0,2xø	0,2xø	0,075	0,15	0,25	0,35	0,45
8.1.8		180	0,2xø	0,2xø	0,125	0,25	0,35	0,45	0,55
8.1.9		50	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.1	**Thermosetting plastics**	60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.2		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.3		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.4		90	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.5		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.6		50	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.7		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.2.8		60	0,2xø	0,2xø	0,05	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3									
8.3.4									
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

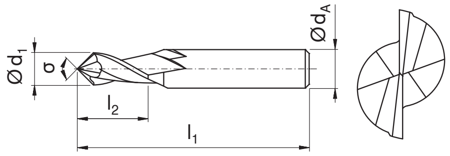
W0751-L, uncoated

Chamfer milling cutters

AL **FF**

$\lambda_S = 30°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ σ 90° E/D

SCWP225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	z	HA Material
3.0	FF.AL.0751.0300.L.Z2.HA	3	57	8	90	2	W0751030300
4.0	FF.AL.0751.0400.L.Z2.HA	4	57	11	90	2	W0751040300
5.0	FF.AL.0751.0500.L.Z2.HA	5	57	13	90	2	W0751050300
6.0	FF.AL.0751.0600.L.Z2.HA	6	57	13	90	2	W0751060300
8.0	FF.AL.0751.0800.L.Z2.HA	8	63	19	90	2	W0751080300
10.0	FF.AL.0751.1000.L.Z2.HA	10	72	22	90	2	W0751100300
12.0	FF.AL.0751.1200.L.Z2.HA	12	83	26	90	2	W0751120300
16.0	FF.AL.0751.1600.L.Z2.HA	16	92	32	90	2	W0751160300
20.0	FF.AL.0751.2000.L.Z2.HA	20	104	38	90	2	W0751200300

W0451-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**	280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.2		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.3		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.4		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.5		200	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.3.6		240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.1	**CuZn (brass)**	300	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.4.2		350	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.1	**CuSn (bronze)**	240	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.5.2		280	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.1	**CuAlFe (Ampco)**	140	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.6.2		160	1xø	1xø	0,025	0,045	0,07	0,1	0,12
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**								
8.3.2									
8.3.3		180	1xø	1xø	0,03	0,05	0,06	0,08	0,1
8.3.4		180	1xø	1xø	0,03	0,05	0,06	0,08	0,1
8.3.5									
8.3.6									
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**								
9.1.2									

W0451-L, coated

HPC end mills

V

HPC SF

$\lambda_S = 35° / 38°$

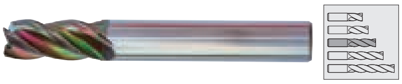
$\gamma_S = 8°$

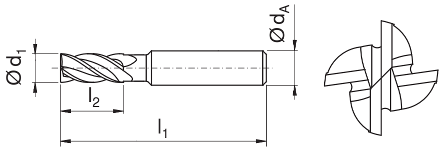
$d_1 = f8$
$d_A = h6$

F 45°

E

SCPX230





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
3.0	HPC-SF.V.0451.0300.L.Z4.F0010A.HA	6	57	8	0.1	4	W0451030330
4.0	HPC-SF.V.0451.0400.L.Z4.F0010A.HA	6	57	11	0.1	4	W0451040330
5.0	HPC-SF.V.0451.0500.L.Z4.F0010A.HA	6	57	13	0.1	4	W0451050330
6.0	HPC-SF.V.0451.0600.L.Z4.F0010A.HA	6	57	13	0.1	4	W0451060330
8.0	HPC-SF.V.0451.0800.L.Z4.F0020A.HA	8	63	21	0.2	4	W0451080330
10.0	HPC-SF.V.0451.1000.L.Z4.F0020A.HA	10	72	22	0.2	4	W0451100330
12.0	HPC-SF.V.0451.1200.L.Z4.F0030A.HA	12	83	26	0.3	4	W0451120330
16.0	HPC-SF.V.0451.1600.L.Z4.F0030A.HA	16	92	36	0.3	4	W0451160330
20.0	HPC-SF.V.0451.2000.L.Z4.F0030A.HA	20	104	41	0.3	4	W0451200330

WD451-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]				
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									
8.1.1	**Thermoplastics**								
8.1.2									
8.1.3									
8.1.4									
8.1.5									
8.1.6									
8.1.7									
8.1.8									
8.1.9									
8.2.1	**Thermosetting plastics**								
8.2.2									
8.2.3									
8.2.4									
8.2.5									
8.2.6									
8.2.7									
8.2.8									
8.3.1	**Fibre-reinforced plastics**	105	1xø	1xø	0,03	0,05	0,06	0,08	0,1
8.3.2		100	1xø	1xø	0,03	0,05	0,06	0,08	0,1
8.3.3		150	1xø	1xø	0,03	0,05	0,06	0,08	0,1
8.3.4		100	1xø	1xø	0,03	0,05	0,06	0,08	0,1
8.3.5		100	1xø	1xø	0,03	0,05	0,06	0,08	0,1
8.3.6		120	1xø	1xø	0,03	0,05	0,06	0,08	0,1
8.4.1	**Sandwich**								
8.4.2									
8.4.3									
9.1.1	**Standard graphite**	300	1xø	1xø	0,04	0,08	0,12	0,2	0,25
9.1.2		220	1xø	1xø	0,04	0,08	0,12	0,2	0,25

WD451-L, coated

HPC end mills

V

HPC SF

λ_S = 35° 38°

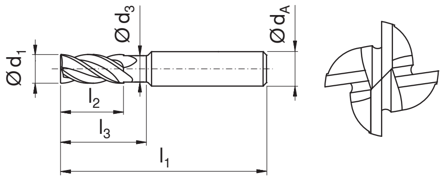
γ_S = 8°

d_1 = f8
d_A = h6

F 45°

E/D

SCPX210



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	F [mm]	z	HA Material
3.0	HPC-SF.V.D451.0300.L.Z4.F0010A.HA	6	3.9	57	8	15	0.1	4	WD451030360
4.0	HPC-SF.V.D451.0400.L.Z4.F0010A.HA	6	3.9	57	11	16	0.1	4	WD451040360
5.0	HPC-SF.V.D451.0500.L.Z4.F0010A.HA	6	4.9	57	13	19	0.1	4	WD451050360
6.0	HPC-SF.V.D451.0600.L.Z4.F0010A.HA	6	5.9	57	13	19	0.1	4	WD451060360
8.0	HPC-SF.V.D451.0800.L.Z4.F0020A.HA	8	7.8	63	19	25	0.2	4	WD451080360
10.0	HPC-SF.V.D451.1000.L.Z4.F0020A.HA	10	9.7	72	22	30	0.2	4	WD451100360
12.0	HPC-SF.V.D451.1200.L.Z4.F0030A.HA	12	11.7	83	26	36	0.3	4	WD451120360
16.0	HPC-SF.V.D451.1600.L.Z4.F0030A.HA	16	15.5	92	32	42	0.3	4	WD451160360
20.0	HPC-SF.V.D451.2000.L.Z4.F0030A.HA	20	19.5	104	38	52	0.3	4	WD451200360

W0860-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**	105	1xø	1xø	0,05	0,06	0,08	0,1
8.3.2		100	1xø	1xø	0,05	0,06	0,08	0,1
8.3.3		150	1xø	1xø	0,05	0,06	0,08	0,1
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2		250	1xø	1xø	0,05	0,06	0,08	0,1
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

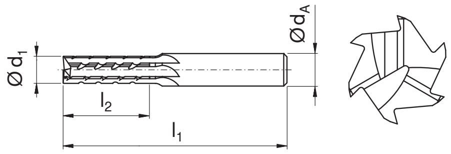
W0860-L, uncoated

Rough and finish milling cutters

V SRS

$\lambda_S = 0°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ F 45° E/D

SCWX225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
4.0	SRS.V.0860.0400.L.Z6.F0010A.HA	6	60	16	0.1	6	W0860040300
5.0	SRS.V.0860.0500.L.Z6.F0010A.HA	6	60	18	0.1	6	W0860050300
6.0	SRS.V.0860.0600.L.Z6.F0010A.HA	6	75	28	0.1	6	W0860060300
8.0	SRS.V.0860.0800.L.Z6.F0010A.HA	8	75	32	0.1	6	W0860080300
10.0	SRS.V.0860.1000.L.Z6.F0010A.HA	10	83	32	0.1	6	W0860100300
12.0	SRS.V.0860.1200.L.Z6.F0010A.HA	12	83	32	0.1	6	W0860120300
16.0	SRS.V.0860.1600.L.Z6.F0010A.HA	16	92	36	0.1	6	W0860160300
20.0	SRS.V.0860.2000.L.Z6.F0010A.HA	20	104	45	0.1	6	W0860200300

WD860-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7								
8.2.8								
8.3.1	**Fibre-reinforced plastics**	105	1xø	1xø	0,05	0,06	0,08	0,1
8.3.2		100	1xø	1xø	0,05	0,06	0,08	0,1
8.3.3		150	1xø	1xø	0,05	0,06	0,08	0,1
8.3.4								
8.3.5								
8.3.6								
8.4.1	**Sandwich**							
8.4.2		250	1xø	1xø	0,05	0,06	0,08	0,1
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

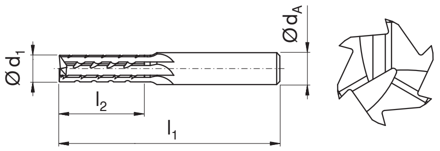
WD860-L, coated

Rough and finish milling cutters

V **SRS**

$\lambda_S = 0°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ F 45° E/D

SCPX210



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
4.0	SRS.V.D860.0400.L.Z6.F0010A.HA	6	60	16	0.1	6	WD860040360
5.0	SRS.V.D860.0500.L.Z6.F0010A.HA	6	60	18	0.1	6	WD860050360
6.0	SRS.V.D860.0600.L.Z6.F0010A.HA	6	75	28	0.1	6	WD860060360
8.0	SRS.V.D860.0800.L.Z6.F0010A.HA	8	75	32	0.1	6	WD860080360
10.0	SRS.V.D860.1000.L.Z6.F0010A.HA	10	83	32	0.1	6	WD860100360
12.0	SRS.V.D860.1200.L.Z6.F0010A.HA	12	83	32	0.1	6	WD860120360
16.0	SRS.V.D860.1600.L.Z6.F0010A.HA	16	92	36	0.1	6	WD860160360
20.0	SRS.V.D860.2000.L.Z6.F0010A.HA	20	104	45	0.1	6	WD860200360

W0810-S, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 10,0
7.1.1	**Aluminium**	500	1xø	1xø	0,04	0,06	0,08
7.1.2		500	1xø	1xø	0,04	0,06	0,08
7.1.3		500	1xø	1xø	0,04	0,06	0,08
7.1.4		500	1xø	1xø	0,04	0,06	0,08
7.1.5		400	1xø	1xø	0,03	0,05	0,07
7.1.6		300	1xø	1xø	0,03	0,05	0,07
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**	350	1xø	1xø	0,075	0,15	0,25
8.1.2		350	1xø	1xø	0,075	0,15	0,25
8.1.3		350	1xø	1xø	0,075	0,15	0,25
8.1.4		150	1xø	1xø	0,075	0,15	0,25
8.1.5		120	1xø	1xø	0,075	0,15	0,25
8.1.6		200	1xø	1xø	0,075	0,15	0,25
8.1.7		350	1xø	1xø	0,075	0,15	0,25
8.1.8		300	1xø	1xø	0,125	0,25	0,35
8.1.9		80	1xø	1xø	0,05	0,1	0,2
8.2.1	**Thermosetting plastics**	100	1xø	1xø	0,05	0,1	0,2
8.2.2		100	1xø	1xø	0,05	0,1	0,2
8.2.3		100	1xø	1xø	0,05	0,1	0,2
8.2.4		150	1xø	1xø	0,05	0,1	0,2
8.2.5		100	1xø	1xø	0,05	0,1	0,2
8.2.6		80	1xø	1xø	0,05	0,1	0,2
8.2.7		100	1xø	1xø	0,05	0,1	0,2
8.2.8		100	1xø	1xø	0,05	0,1	0,2
8.3.1	**Fibre-reinforced plastics**						
8.3.2							
8.3.3							
8.3.4							
8.3.5							
8.3.6							
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**						
9.1.2							

W0810-S, uncoated

Single flute milling cutters

V

EZ

$\lambda_S = 30°$

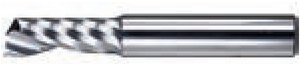
$\gamma_S = 22°$

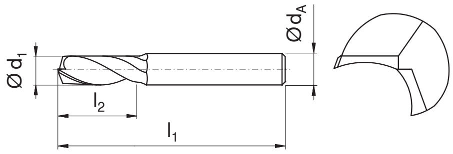
$d_1 = e8$
$d_A = h6$

F 45°

E/D

SCWX225





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
3.0	EZ.V.0810.0300.S.Z1.F0020A.HA	3	50	4	0.2	1	W0810030200
4.0	EZ.V.0810.0400.S.Z1.F0020A.HA	4	50	5	0.2	1	W0810040200
5.0	EZ.V.0810.0500.S.Z1.F0020A.HA	5	50	16	0.2	1	W0810050200
6.0	EZ.V.0810.0600.S.Z1.F0020A.HA	6	50	16	0.2	1	W0810060200
8.0	EZ.V.0810.0800.S.Z1.F0020A.HA	8	50	18	0.2	1	W0810080200
10.0	EZ.V.0810.1000.S.Z1.F0020A.HA	10	72	25	0.2	1	W0810100200

W0815-S, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 10,0
7.1.1	**Aluminium**	500	1xø	1xø	0,04	0,06	0,08
7.1.2		500	1xø	1xø	0,04	0,06	0,08
7.1.3		500	1xø	1xø	0,04	0,06	0,08
7.1.4		500	1xø	1xø	0,04	0,06	0,08
7.1.5		400	1xø	1xø	0,03	0,05	0,07
7.1.6		300	1xø	1xø	0,03	0,05	0,07
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**	350	1xø	1xø	0,075	0,15	0,25
8.1.2		350	1xø	1xø	0,075	0,15	0,25
8.1.3		350	1xø	1xø	0,075	0,15	0,25
8.1.4		150	1xø	1xø	0,075	0,15	0,25
8.1.5		120	1xø	1xø	0,075	0,15	0,25
8.1.6		200	1xø	1xø	0,075	0,15	0,25
8.1.7		350	1xø	1xø	0,075	0,15	0,25
8.1.8		300	1xø	1xø	0,125	0,25	0,35
8.1.9		80	1xø	1xø	0,05	0,1	0,2
8.2.1	**Thermosetting plastics**	100	1xø	1xø	0,05	0,1	0,2
8.2.2		100	1xø	1xø	0,05	0,1	0,2
8.2.3		100	1xø	1xø	0,05	0,1	0,2
8.2.4		150	1xø	1xø	0,05	0,1	0,2
8.2.5		100	1xø	1xø	0,05	0,1	0,2
8.2.6		80	1xø	1xø	0,05	0,1	0,2
8.2.7		100	1xø	1xø	0,05	0,1	0,2
8.2.8		100	1xø	1xø	0,05	0,1	0,2
8.3.1	**Fibre-reinforced plastics**						
8.3.2							
8.3.3							
8.3.4							
8.3.5							
8.3.6							
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**						
9.1.2							

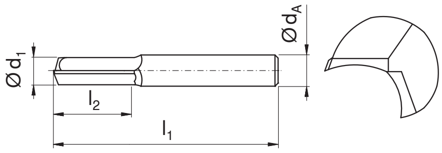
W0815-S, uncoated

Single flute milling cutters

V **EZ**

$\lambda_S = 0°$ $\gamma_S = 22°$ $d_1 = e8$ $d_A = h6$ F 45° E/D

SCWX225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
3.0	EZ.V.0815.0300.S.Z1.F0020A.HA	3	50	4	0.2	1	W0815030200
4.0	EZ.V.0815.0400.S.Z1.F0020A.HA	4	50	5	0.2	1	W0815040200
5.0	EZ.V.0815.0500.S.Z1.F0020A.HA	5	50	16	0.2	1	W0815050200
6.0	EZ.V.0815.0600.S.Z1.F0020A.HA	6	50	16	0.2	1	W0815060200
8.0	EZ.V.0815.0800.S.Z1.F0020A.HA	8	50	18	0.2	1	W0815080200
10.0	EZ.V.0815.1000.S.Z1.F0020A.HA	10	72	25	0.2	1	W0815100200

W0828-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f [mm/rev]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7		100	1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.5		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.6		120	1xø	1xø	0,1	0,2	0,3	0,4
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

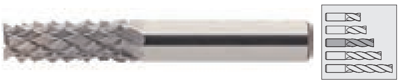
W0828-L, uncoated

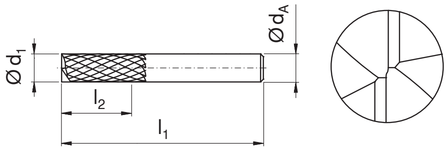
Solid carbide milling cutters for plastics

V **R**

$\lambda_S = 25°$ $\gamma_S = 8°$ $d_1 =$ -0,02/-0,04 d_A=h6 S E/D

SCWX225





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
4.0	R.V.0828.0400.L.S.HA	4	50	16	W0828040200
5.0	R.V.0828.0500.L.S.HA	5	50	16	W0828050200
6.0	R.V.0828.0600.L.S.HA	6	60	19	W0828060200
8.0	R.V.0828.0800.L.S.HA	8	63	25	W0828080200
10.0	R.V.0828.1000.L.S.HA	10	72	25	W0828100200
12.0	R.V.0828.1200.L.S.HA	12	83	32	W0828120200
16.0	R.V.0828.1600.L.S.HA	16	92	36	W0828160200
20.0	R.V.0828.2000.L.S.HA	20	104	45	W0828200200

⚠ Feed rate in mm / revolution.

W0830-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f [mm/rev]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7		100	1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.5		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.6		120	1xø	1xø	0,1	0,2	0,3	0,4
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0830-L, uncoated

Solid carbide milling cutters for plastics

V **R**

$\lambda_S = 25°$

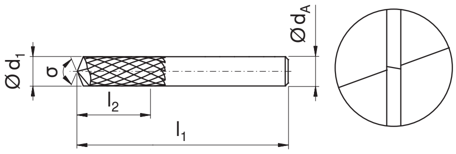
$\gamma_S = 8°$

$d_1 = -0{,}02/-0{,}04$
$d_A = h6$

σ 135°

E/D

SCWX225



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
4.0	R.V.0830.0400.L.HA	4	50	16	W0830040200
5.0	R.V.0830.0500.L.HA	5	50	16	W0830050200
6.0	R.V.0830.0600.L.HA	6	60	19	W0830060200
8.0	R.V.0830.0800.L.HA	8	63	25	W0830080200
10.0	R.V.0830.1000.L.HA	10	72	25	W0830100200
12.0	R.V.0830.1200.L.HA	12	83	32	W0830120200
16.0	R.V.0830.1600.L.HA	16	92	36	W0830160200
20.0	R.V.0830.2000.L.HA	20	104	45	W0830200200

⚠ Feed rate in mm / revolution.

W0828-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f [mm/rev]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7		100	1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.5		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.6		120	1xø	1xø	0,1	0,2	0,3	0,4
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0828-L, coated

Solid carbide milling cutters for plastics

V **R**

$\lambda_S = 25°$

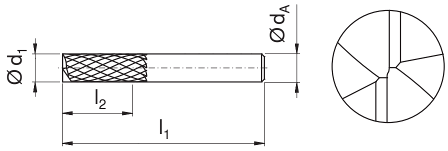
$\gamma_S = 8°$

$d_1 = -0{,}02/-0{,}04$
$d_A = h6$

S

E/D

SCPX230



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
4.0	R.V.0828.0400.L.S.HA	4	50	16	W0828040270
5.0	R.V.0828.0500.L.S.HA	5	50	16	W0828050270
6.0	R.V.0828.0600.L.S.HA	6	60	19	W0828060270
8.0	R.V.0828.0800.L.S.HA	8	63	25	W0828080270
10.0	R.V.0828.1000.L.S.HA	10	72	25	W0828100270
12.0	R.V.0828.1200.L.S.HA	12	83	32	W0828120270
16.0	R.V.0828.1600.L.S.HA	16	92	36	W0828160270
20.0	R.V.0828.2000.L.S.HA	20	104	45	W0828200270

⚠ Feed rate in mm / revolution.

WD828-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f [mm/rev]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7		100	1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.5		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.6		120	1xø	1xø	0,1	0,2	0,3	0,4
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

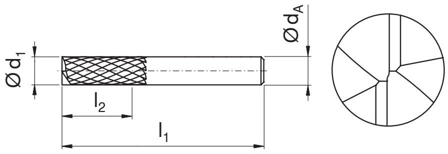
WD828-L, coated

Solid carbide milling cutters for plastics

V **R**

$\lambda_S = 25°$ | $\gamma_S = 8°$ | d_1 = -0,02/-0,04 d_A=h6 | S | E/D

SCPX210



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
4.0	R.V.D828.0400.L.S.HA	4	50	16	WD828040260
5.0	R.V.D828.0500.L.S.HA	5	50	16	WD828050260
6.0	R.V.D828.0600.L.S.HA	6	60	19	WD828060260
8.0	R.V.D828.0800.L.S.HA	8	63	25	WD828080260
10.0	R.V.D828.1000.L.S.HA	10	72	25	WD828100260
12.0	R.V.D828.1200.L.S.HA	12	83	32	WD828120260
16.0	R.V.D828.1600.L.S.HA	16	92	36	WD828160260
20.0	R.V.D828.2000.L.S.HA	20	104	45	WD828200260

⚠ Feed rate in mm / revolution.

W0830-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f [mm/rev]			
					= Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7		100	1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.5		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.6		120	1xø	1xø	0,1	0,2	0,3	0,4
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

W0830-L, coated

Solid carbide milling cutters for plastics

V **R**

$\lambda_S = 25°$

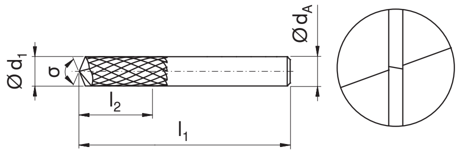
$\gamma_S = 8°$

$d_1 =$ -0,02/-0,04 $d_A = h6$

σ 135°

E/D

SCPX230



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
4.0	R.V.0830.0400.L.HA	4	50	16	W0830040270
5.0	R.V.0830.0500.L.HA	5	50	16	W0830050270
6.0	R.V.0830.0600.L.HA	6	60	19	W0830060270
8.0	R.V.0830.0800.L.HA	8	63	25	W0830080270
10.0	R.V.0830.1000.L.HA	10	72	25	W0830100270
12.0	R.V.0830.1200.L.HA	12	83	32	W0830120270
16.0	R.V.0830.1600.L.HA	16	92	36	W0830160270
20.0	R.V.0830.2000.L.HA	20	104	45	W0830200270

⚠ Feed rate in mm / revolution.

WD830-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f [mm/rev] = Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								
8.1.1	**Thermoplastics**							
8.1.2								
8.1.3								
8.1.4								
8.1.5								
8.1.6								
8.1.7								
8.1.8								
8.1.9								
8.2.1	**Thermosetting plastics**							
8.2.2								
8.2.3								
8.2.4								
8.2.5								
8.2.6								
8.2.7		100	1xø	1xø	0,1	0,2	0,3	0,4
8.2.8		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.1	**Fibre-reinforced plastics**							
8.3.2								
8.3.3								
8.3.4		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.5		100	1xø	1xø	0,1	0,2	0,3	0,4
8.3.6		120	1xø	1xø	0,1	0,2	0,3	0,4
8.4.1	**Sandwich**							
8.4.2								
8.4.3								
9.1.1	**Standard graphite**							
9.1.2								

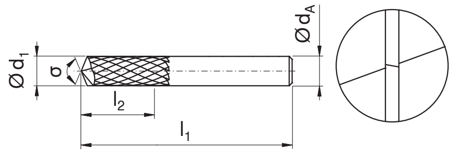
WD830-L, coated

Solid carbide milling cutters for plastics

V R

$\lambda_S = 25°$ | $\gamma_S = 8°$ | $d_1 = -0{,}02/-0{,}04$ $d_A = h6$ | σ 135° | E/D

SCPX210



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
4.0	R.V.D830.0400.L.HA	4	50	16	WD830040260
5.0	R.V.D830.0500.L.HA	5	50	16	WD830050260
6.0	R.V.D830.0600.L.HA	6	60	19	WD830060260
8.0	R.V.D830.0800.L.HA	8	63	25	WD830080260
10.0	R.V.D830.1000.L.HA	10	72	25	WD830100260
12.0	R.V.D830.1200.L.HA	12	83	32	WD830120260
16.0	R.V.D830.1600.L.HA	16	92	36	WD830160260
20.0	R.V.D830.2000.L.HA	20	104	45	WD830200260

Feed rate in mm / revolution.

W0835-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**						
8.1.2							
8.1.3							
8.1.4							
8.1.5							
8.1.6							
8.1.7							
8.1.8							
8.1.9							
8.2.1	**Thermosetting plastics**						
8.2.2							
8.2.3							
8.2.4							
8.2.5							
8.2.6							
8.2.7							
8.2.8							
8.3.1	**Fibre-reinforced plastics**						
8.3.2							
8.3.3		150	1xø	1xø	0,03	0,05	0,06
8.3.4		150	1xø	1xø	0,03	0,05	0,06
8.3.5							
8.3.6							
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**						
9.1.2							

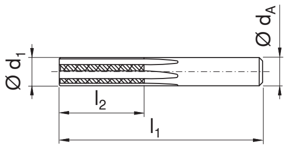
W0835-L, uncoated

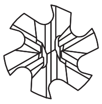
Multiple milling cutters for plastics

V **MRO**

$\lambda_s = 0°$ $\gamma_s = 15°$ $d_1 = e8$ $d_A = h6$ F 45° E/D

SCWX210





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
3.0	MRO.V.0835.0300.L.Z4.F0010A.HA	6	57	14	0.1	4	W0835030300
4.0	MRO.V.0835.0400.L.Z4.F0010A.HA	6	57	16	0.1	4	W0835040300
5.0	MRO.V.0835.0500.L.Z4.F0010A.HA	6	57	18	0.1	4	W0835050300
6.0	MRO.V.0835.0600.L.Z6.F0010A.HA	6	57	22	0.1	6	W0835060300
8.0	MRO.V.0835.0800.L.Z6.F0020A.HA	8	63	27	0.2	6	W0835080300
10.0	MRO.V.0835.1000.L.Z6.F0020A.HA	10	72	30	0.2	6	W0835100300
12.0	MRO.V.0835.1200.L.Z6.F0030A.HA	12	83	32	0.3	6	W0835120300

⚠ The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

W0837-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**						
8.1.2							
8.1.3							
8.1.4							
8.1.5							
8.1.6							
8.1.7							
8.1.8							
8.1.9							
8.2.1	**Thermosetting plastics**						
8.2.2							
8.2.3							
8.2.4							
8.2.5							
8.2.6							
8.2.7							
8.2.8							
8.3.1	**Fibre-reinforced plastics**						
8.3.2							
8.3.3		150	1xø	1xø	0,03	0,05	0,06
8.3.4		150	1xø	1xø	0,03	0,05	0,06
8.3.5							
8.3.6							
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**						
9.1.2							

W0837-L, uncoated

Multiple milling cutters for plastics

V **MRO**

$\lambda_s = 0°$

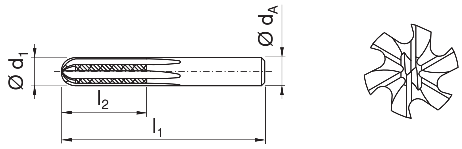
$\gamma_s = 15°$

$d_1 = e8$
$d_A = h6$

R

E/D

SCWX210



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	R [mm]	z	HA Material
3.0	MRO.V.0837.0300.L.Z4.R0150.HA	6	57	14	1.5	4	W0837030300
4.0	MRO.V.0837.0400.L.Z4.R0200.HA	6	57	16	2	4	W0837040300
5.0	MRO.V.0837.0500.L.Z4.R0250.HA	6	57	18	2.5	4	W0837050300
6.0	MRO.V.0837.0600.L.Z6.R0300.HA	6	57	22	3	6	W0837060300
8.0	MRO.V.0837.0800.L.Z6.R0400.HA	8	63	27	4	6	W0837080300
10.0	MRO.V.0837.1000.L.Z6.R0500.HA	10	72	30	5	6	W0837100300
12.0	MRO.V.0837.1200.L.Z6.R0600.HA	12	83	32	6	6	W0837120300

⚠ The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

W0839-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]	
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3		150	1xø	1xø	0,05	0,06
8.3.4		150	1xø	1xø	0,05	0,06
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

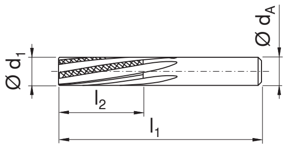
W0839-L, uncoated

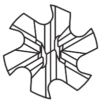
Multiple milling cutters for plastics

V **MRO**

$\lambda_S = 10°$ $\gamma_S = 15°$ d_1 = e8 d_A = h6 F 45° E/D

SCWX210





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
6.0	MRO.V.0839.0600.L.Z6.F0010A.HA	6	57	22	0.1	6	W0839060300
8.0	MRO.V.0839.0800.L.Z6.F0020A.HA	8	63	27	0.2	6	W0839080300
10.0	MRO.V.0839.1000.L.Z6.F0020A.HA	10	72	30	0.2	6	W0839100300
12.0	MRO.V.0839.1200.L.Z6.F0030A.HA	12	83	32	0.3	6	W0839120300

⚠ The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

W0841-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3		150	1xø	1xø	0,05	0,06
8.3.4		150	1xø	1xø	0,05	0,06
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

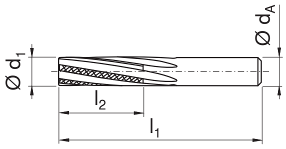
W0841-L, uncoated

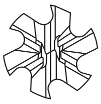
Multiple milling cutters for plastics

V **MRO**

$\lambda_S = 10°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ F 45° E/D

SCWX210





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
6.0	MRO.V.0841.0600.L.Z6.F0010A.HA	6	57	22	0.1	6	W0841060300
8.0	MRO.V.0841.0800.L.Z6.F0020A.HA	8	63	27	0.2	6	W0841080300
10.0	MRO.V.0841.1000.L.Z6.F0020A.HA	10	72	30	0.2	6	W0841100300
12.0	MRO.V.0841.1200.L.Z6.F0030A.HA	12	83	32	0.3	6	W0841120300

The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

W0843-L, uncoated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3		150	1xø	1xø	0,05	0,06
8.3.4		150	1xø	1xø	0,05	0,06
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

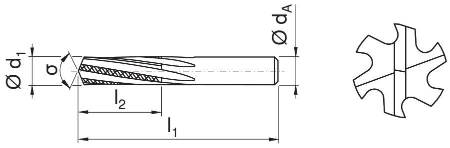
W0843-L, uncoated

Multiple milling cutters for plastics

V **MRO**

$\lambda_S = 10°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ σ 135° E/D

SCWX210



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	z	HA Material
6.0	MRO.V.0843.0600.L.Z6.HA	6	57	22	6	W0843060300
8.0	MRO.V.0843.0800.L.Z6.HA	8	63	27	6	W0843080300
10.0	MRO.V.0843.1000.L.Z6.HA	10	72	30	6	W0843100300
12.0	MRO.V.0843.1200.L.Z6.HA	12	83	32	6	W0843120300

⚠ The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

W0835-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**						
8.1.2							
8.1.3							
8.1.4							
8.1.5							
8.1.6							
8.1.7							
8.1.8							
8.1.9							
8.2.1	**Thermosetting plastics**						
8.2.2							
8.2.3							
8.2.4							
8.2.5							
8.2.6							
8.2.7							
8.2.8							
8.3.1	**Fibre-reinforced plastics**						
8.3.2							
8.3.3		250	1xø	1xø	0,03	0,05	0,06
8.3.4		250	1xø	1xø	0,03	0,05	0,06
8.3.5							
8.3.6							
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**						
9.1.2							

W0835-L, coated

Multiple milling cutters for plastics

V **MRO**

$\lambda_S = 0°$

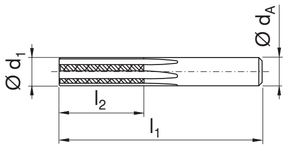
$\gamma_S = 15°$

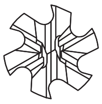
$d_1 = e8$
$d_A = h6$

F 45°

E/D

SCPX215





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
3.0	MRO.V.0835.0300.L.Z4.F0010A.HA	6	57	14	0.1	4	W0835030370
4.0	MRO.V.0835.0400.L.Z4.F0010A.HA	6	57	16	0.1	4	W0835040370
5.0	MRO.V.0835.0500.L.Z4.F0010A.HA	6	57	18	0.1	4	W0835050370
6.0	MRO.V.0835.0600.L.Z6.F0010A.HA	6	57	22	0.1	6	W0835060370
8.0	MRO.V.0835.0800.L.Z6.F0020A.HA	8	63	27	0.2	6	W0835080370
10.0	MRO.V.0835.1000.L.Z6.F0020A.HA	10	72	30	0.2	6	W0835100370
12.0	MRO.V.0835.1200.L.Z6.F0030A.HA	12	83	32	0.3	6	W0835120370

⚠ The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

W0837-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]		
					= Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							
8.1.1	**Thermoplastics**						
8.1.2							
8.1.3							
8.1.4							
8.1.5							
8.1.6							
8.1.7							
8.1.8							
8.1.9							
8.2.1	**Thermosetting plastics**						
8.2.2							
8.2.3							
8.2.4							
8.2.5							
8.2.6							
8.2.7							
8.2.8							
8.3.1	**Fibre-reinforced plastics**						
8.3.2							
8.3.3		250	1xø	1xø	0,03	0,05	0,06
8.3.4		250	1xø	1xø	0,03	0,05	0,06
8.3.5							
8.3.6							
8.4.1	**Sandwich**						
8.4.2							
8.4.3							
9.1.1	**Standard graphite**						
9.1.2							

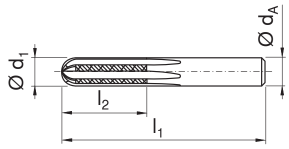
W0837-L, coated

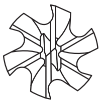
Multiple milling cutters for plastics

V MRO

$\lambda_S = 0°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ R E/D

SCPX215





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	R [mm]	z	HA Material
3.0	MRO.V.0837.0300.L.Z4.R0150.HA	6	57	14	1.5	4	W0837030370
4.0	MRO.V.0837.0400.L.Z4.R0200.HA	6	57	16	2	4	W0837040370
5.0	MRO.V.0837.0500.L.Z4.R0250.HA	6	57	18	2.5	4	W0837050370
6.0	MRO.V.0837.0600.L.Z6.R0300.HA	6	57	22	3	6	W0837060370
8.0	MRO.V.0837.0800.L.Z6.R0400.HA	8	63	27	4	6	W0837080370
10.0	MRO.V.0837.1000.L.Z6.R0500.HA	10	72	30	5	6	W0837100370
12.0	MRO.V.0837.1200.L.Z6.R0600.HA	12	83	32	6	6	W0837120370

⚠ The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

W0839-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3		250	1xø	1xø	0,05	0,06
8.3.4		250	1xø	1xø	0,05	0,06
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

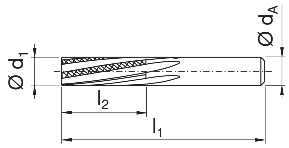
W0839-L, coated

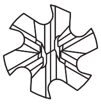
Multiple milling cutters for plastics

V **MRO**

$\lambda_S = 10°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ F 45° E/D

SCPX215





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
6.0	MRO.V.0839.0600.L.Z6.F0010A.HA	6	57	22	0.1	6	W0839060370
8.0	MRO.V.0839.0800.L.Z6.F0020A.HA	8	63	27	0.2	6	W0839080370
10.0	MRO.V.0839.1000.L.Z6.F0020A.HA	10	72	30	0.2	6	W0839100370
12.0	MRO.V.0839.1200.L.Z6.F0030A.HA	12	83	32	0.3	6	W0839120370

The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

W0841-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm]	
					= Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3		250	1xø	1xø	0,05	0,06
8.3.4		250	1xø	1xø	0,05	0,06
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

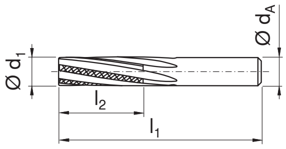
W0841-L, coated

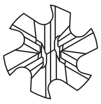
Multiple milling cutters for plastics

V **MRO**

$\lambda_S = 10°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ F 45° E/D

SCPX215





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	F [mm]	z	HA Material
6.0	MRO.V.0841.0600.L.Z6.F0010A.HA	6	57	22	0.1	6	W0841060370
8.0	MRO.V.0841.0800.L.Z6.F0020A.HA	8	63	27	0.2	6	W0841080370
10.0	MRO.V.0841.1000.L.Z6.F0020A.HA	10	72	30	0.2	6	W0841100370
12.0	MRO.V.0841.1200.L.Z6.F0030A.HA	12	83	32	0.3	6	W0841120370

⚠ The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

W0843-L, coated

Cutting data

Index	Material designation	V_c [m/min]	a_e max. [mm]	a_p max. [mm]	f_z [mm] = Ø 6,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3		250	1xø	1xø	0,05	0,06
8.3.4		250	1xø	1xø	0,05	0,06
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

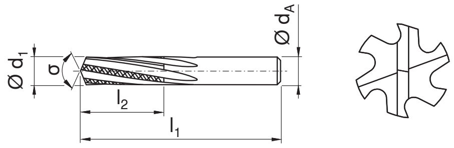
W0843-L, coated

Multiple milling cutters for plastics

V **MRO**

$\lambda_S = 10°$ $\gamma_S = 15°$ $d_1 = e8$ $d_A = h6$ σ 135° E/D

SCPX215



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	z	HA Material
6.0	MRO.V.0843.0600.L.Z6.HA	6	57	22	6	W0843060370
8.0	MRO.V.0843.0800.L.Z6.HA	8	63	27	6	W0843080370
10.0	MRO.V.0843.1000.L.Z6.HA	10	72	30	6	W0843100370
12.0	MRO.V.0843.1200.L.Z6.HA	12	83	32	6	W0843120370

⚠ The cutting data have to be increased or reduced depending on the machine, material and work piece clamping.

Designation system - tools

Solid carbide tools for drilling

TS . UN . 1125 . 0300 . h7

1 2 3 4 5

1

Tool group	
HL	– high-performance twist drills
HPC	– HPC twist drills
TS	– deep hole twist drills
A	– spot drills
PA	– precision spot drills
KS	– twist drills for Kevlar

2

Material main application	
UN	– universal
ST	– steel
VA	– stainless steel
TI	– titanium
H	– hardened steel
AL	– aluminium
V	– composite materials

3

Type

4

Ø d_1
0399 ➢ Ød_1 = 3,99 mm
1000 ➢ Ød_1 = 10,00 mm

5

Tolerance d_1

. 25XD . 135 . IK . HA | SCPP420

6 — 25XD
7 — 135
8 — IK
9 — HA
10 — SCPP420

6

Drilling depth
5XD > 5 x Ø d_1
20XD > 20 x Ø d_1

7

Point angle

8

Int. coolant supply

9

Shank
HA
HB
HE

10

Grade

Explanation of the table

Solid carbide tools for drilling

UN	Material group, e.g. UN = universal
W0108	Drill for pilot hole
h7	Tolerance nominal diameter d_1
≤ **12xD**	Drilling depth, for example up to 12xD
	without through coolant
	with through coolant
E	Emulsion recommended

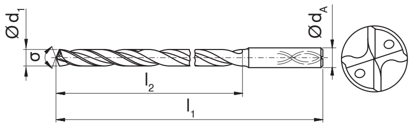
HA	Shanks to DIN6535-HA
HB	Shanks to DIN6535-HB
HE	Shanks to DIN6535-HE
HL	Tool group, for example HL = high-performance twist drills
σ 90°	Point angle
d_1=h7 d_A=h6	Tolerance cutting edge diameter Tolerance shank diameter

UN	**TS**					
$\lambda_S=30°$	d_1=h7 d_A=h6		**E**	≤ **16xD**	σ 135°	W0108

SCPP415

Grade

Application/ geometry



Shank type

d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.8	TS.UN.1116.0380h7.16XD.135.IK.HA	6	115	75	W1116038340

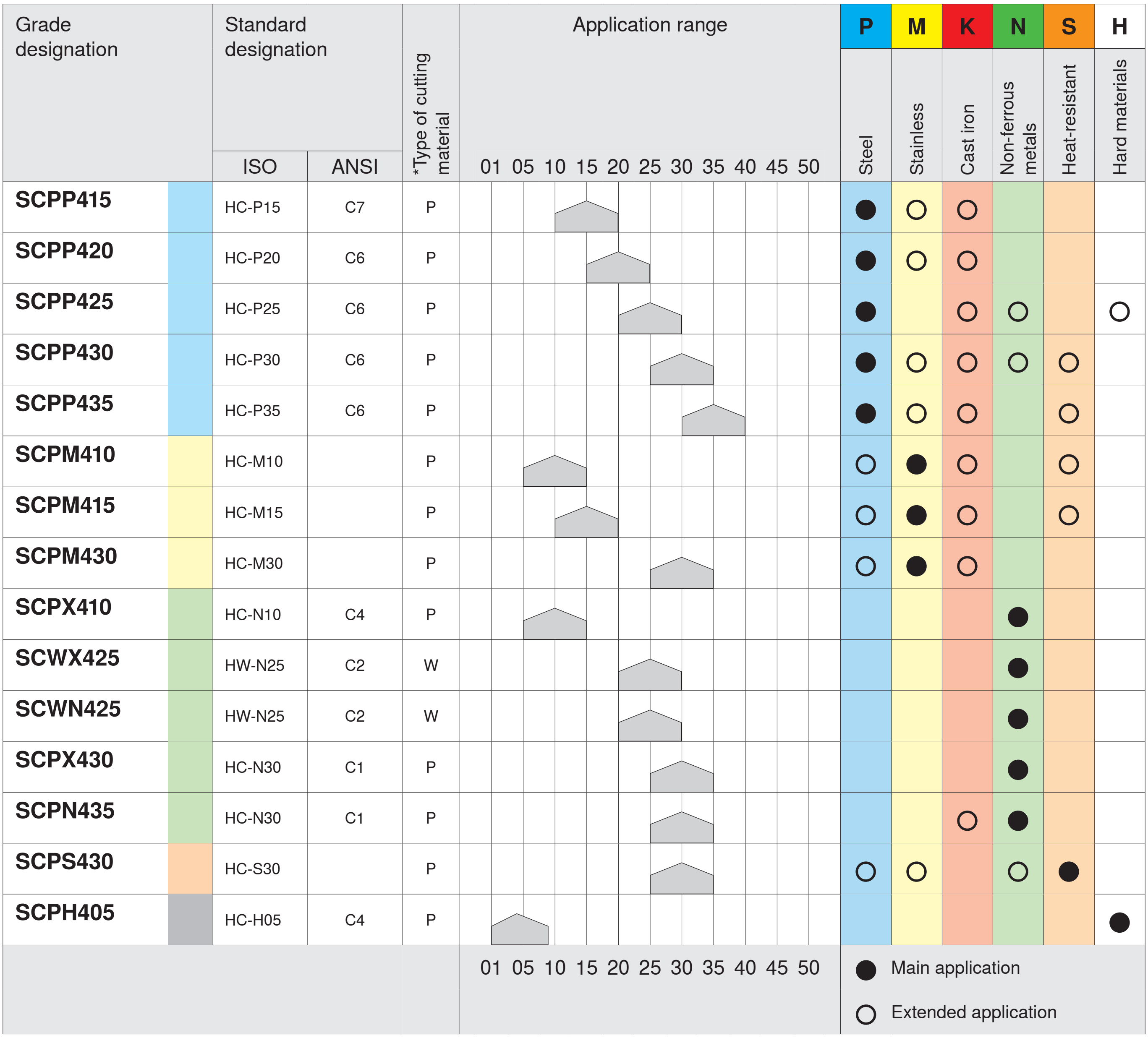
Material short text

Dimensions

Material number

Grade overview

Solid carbide tools for drilling



Grade designation		Standard designation ISO	Standard designation ANSI	*Type of cutting material	Application range 01 05 10 15 20 25 30 35 40 45 50	P Steel	M Stainless	K Cast iron	N Non-ferrous metals	S Heat-resistant	H Hard materials
SCPP415	🟦	HC-P15	C7	P		●	○	○			
SCPP420	🟦	HC-P20	C6	P		●	○	○			
SCPP425	🟦	HC-P25	C6	P		●		○	○		○
SCPP430	🟦	HC-P30	C6	P		●	○	○	○	○	
SCPP435	🟦	HC-P35	C6	P		●	○	○		○	
SCPM410	🟨	HC-M10		P		○	●	○		○	
SCPM415	🟨	HC-M15		P		○	●	○		○	
SCPM430	🟨	HC-M30		P		○	●	○			
SCPX410	🟩	HC-N10	C4	P					●		
SCWX425	🟩	HW-N25	C2	W					●		
SCWN425	🟩	HW-N25	C2	W					●		
SCPX430	🟩	HC-N30	C1	P					●		
SCPN435	🟩	HC-N30	C1	P				○	●		
SCPS430	🟧	HC-S30		P		○	○		○	●	
SCPH405	▨	HC-H05	C4	P							●
					01 05 10 15 20 25 30 35 40 45 50	● Main application ○ Extended application					

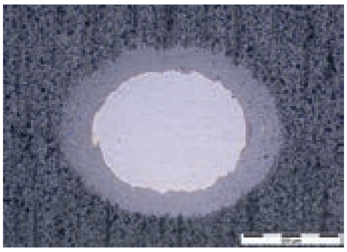
● Main application

○ Extended application

Grade description

Solid carbide tools for drilling

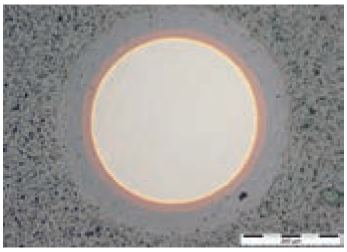
SCPP415	HC-P15	● ○ ○



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1600 | Type of coating: Ti Al C N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating for universal application.

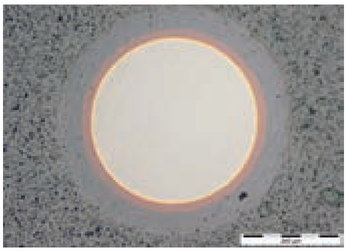
SCPP420	HC-P20	● ○ ○



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1600 | Type of coating: Ti Al C N | Coating specification: multi-layer

Recommended application:
First choice for carbide and coating for deep hole drills. Additionally optimised chip control.

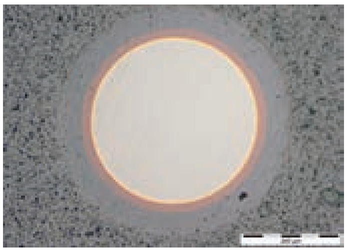
SCPP425	HC-P25	● ○ ○ ○



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1600 | Type of coating: Ti Al C N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating, for the machining of steels.

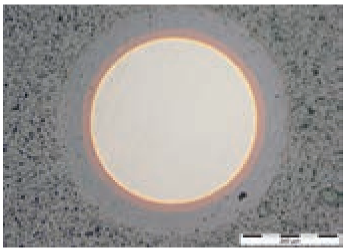
SCPP430	HC-P30	● ○ ○ ○ ○



Specification:
Grain size: fine / < 1 µm | Hardness: HV_{30} 1570 | Type of coating: Ti Al C N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating for universal application.

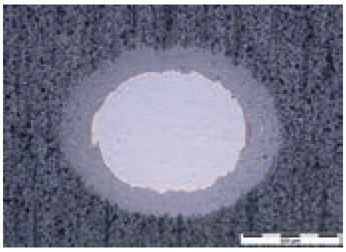
SCPP435	HC-P35	● ○ ○ ○



Specification:
Grain size: fine / < 1 μm | Hardness: HV_{30} 1570 | Type of coating: Ti Al C N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating for universal application, optimised chip evacuation.

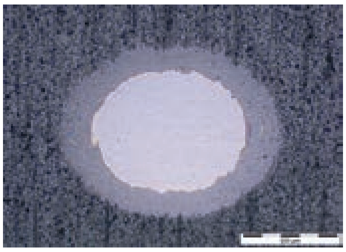
SCPM410	HC-M10	○ ● ○ ○



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Type of coating: Ti Al C N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating for the machining of stainless steels.

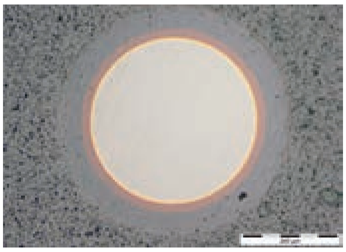
SCPM415	HC-M15	○ ● ○ ○



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Type of coating: Ti Al C N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating for the machining of stainless steels, optimised chip evacuation.

SCPM430	HC-M30	○ ● ○



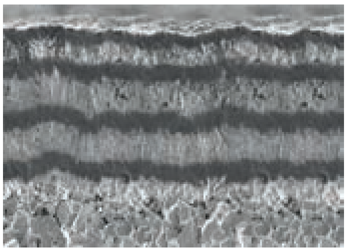
Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Type of coating: Ti Al C N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating for the machining of stainless steels, optimised chip evacuation.

Grade description

Solid carbide tools for drilling

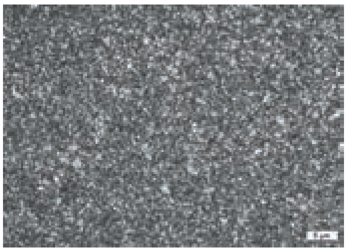
SCPX410	HC-N10	●



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1660 | Coating specification: diamond | Coating structure: multi-layer, crystalline

Recommended application:
Good combination of carbide and diamond coating, for the machining of fibre composites.

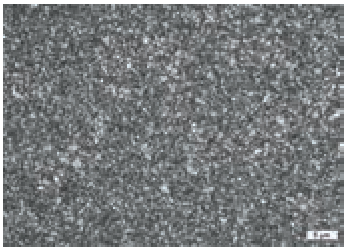
SCWX425	HW-N25	●



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600

Recommended application:
Submicron carbide for the machining of non-ferrous metals, plastics and composite materials (CFRP, GFRP).

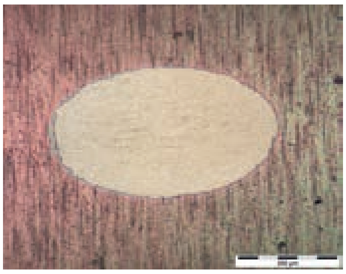
SCWN425	HW-N25	●



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600

Recommended application:
Submicron carbide for the machining of non-ferrous metals, plastics and composite materials (CFRP, GFRP).

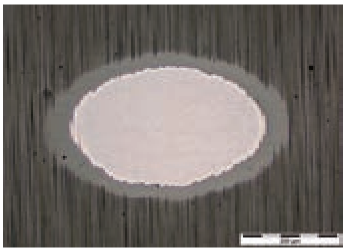
SCPX430	HC-N30	●



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Type of coating: DLC plus | Coating specification: amorph, hydrogen-free carbon layer

Recommended application:
Good combination of carbide and DLC coating for the machining of fibre composites.

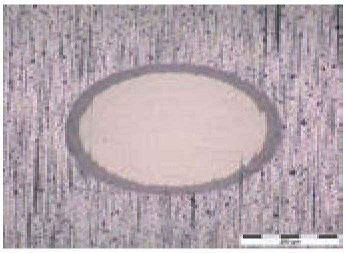
SCPN435	HC-N30	○ ●



Specification:
Grain size: submicron / 0.5 μm | Hardness: HV_{30} 1620 | Type of coating: a-C:Me | Coating specification: monolayer, DLC coating

Recommended application:
First choice for carbide and coating for the machining of non-ferrous metals.

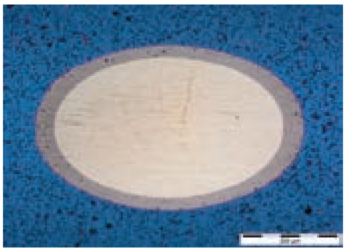
SCPS430	HC-S30	○ ○ ○ ●



Specification:
Grain size: multi-layer / 0.7 μm | Härte: HV_{30} 1600 | Type of coating: Ti Al Cr N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating for nickel-base alloys.

SCPH405	HC-H05	●



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Type of coating: Ti Al Si N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating for hard machining.

Overview

Solid carbide tools for drilling

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
UN	**HL**	High-performance twist drills, coated						
W0175	 1.0 - 20.0	**h7**	≤ **3xD**	σ 140°	$\lambda_s=30°$	HA	✗	F298
W0177	 3.0 - 20.0	**h7**	≤ **3xD**	σ 140°	$\lambda_s=30°$	HA	✓	F304
W0174	 3.0 - 20.0	**h7**	≤ **5xD**	σ 140°	$\lambda_s=30°$	HA	✗	F310
W0173	 2.0 - 20.0	**h7**	≤ **5xD**	σ 140°	$\lambda_s=30°$	HA	✓	F316
W0172	 3.0 - 20.0	**h7**	≤ **8xD**	σ 135°	$\lambda_s=30°$	HA	✓	F322
W0171	 3.0 - 16.0	**h7**	≤ **12xD**	σ 135°	$\lambda_s=30°$	HA	✓	F326

UN	**TS**	Deep hole twist drills, coated						
W1116	 3.0 - 12.0	**h7**	≤ **16xD**	σ 135°	$\lambda_s=30°$	HA	✓	F330
W1120	 2.0 - 12.0	**h7**	≤ **20xD**	σ 135°	$\lambda_s=30°$	HA	✓	F332
W1125	 3.0 - 12.0	**h7**	≤ **25xD**	σ 135°	$\lambda_s=30°$	HA	✓	F334

Overview

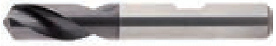
Solid carbide tools for drilling

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
UN	**TS**	Deep hole twist drills, coated						
W1130	 2.0 - 12.0	**h7**	≤ **30xD**	σ 135°	$\lambda_s = 30°$	HA	✓	F336
W1140	 3.0 - 9.0	**fg6**	≤ **40xD**	σ 135°	$\lambda_s = 30°$	HA	✓	F338
W1150	 3.0 - 7.0	**fg6**	≤ **50xD**	σ 135°	$\lambda_s = 30°$	HA	✓	F340

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
ST	**HPC**	HPC twist drills, coated						
W0105	 1.0 - 20.0	**h7**	≤ **3xD**	σ 140°	$\lambda_s = 30°$	HA	✗	F342
W0107	 3.0 - 20.0	**h7**	≤ **3xD**	σ 140°	$\lambda_s = 30°$	HA	✓	F348
W0103	 3.0 - 16.0	**h7**	≤ **5xD**	σ 140°	$\lambda_s = 30°$	HA	✓	F354
W0104	 3.0 - 12.0	**H7**	≤ **5xD**	σ 140°	$\lambda_s = 30°$	HA	✓	F358
W1103	 3.0 - 16.0	**m6**	≤ **5xD**	σ 140°	$\lambda_s = 30°$	HA	✓	F360
W1102	 3.0 - 16.0	**h7**	≤ **8xD**	σ 135°	$\lambda_s = 30°$	HA	✓	F364

Overview

Solid carbide tools for drilling

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
ST	**HPC**	HPC twist drills, coated						
W1104	 3.0 - 20.0	**m6**	**≤ 8xD**	σ 140°	$\lambda_s = 30°$	HA	✓	F368
W1101	 3.0 - 16.0	**h7**	**≤ 12xD**	σ 135°	$\lambda_s = 30°$	HA	✓	F372
W1105	 3.0 - 16.0	**m6**	**≤ 12xD**	σ 140°	$\lambda_s = 30°$	HA	✓	F376
ST	**A**	Spot drills, coated						
W0141	 2.0 - 20.0	**h6**		σ 90°	$\lambda_s = 30°$	HA HB	✗	F378
W0142	 2.0 - 20.0	**h6**		σ 142°	$\lambda_s = 30°$	HA HB	✗	F378
ST	**PA**	Precision spot drills, coated						
W0144	 2.0 - 20.0	**h6**		σ 142°	$\lambda_s = 0°$	HA HB	✗	F380

Overview

Solid carbide tools for drilling

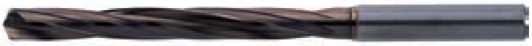
Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
VA	**HL**	High-performance twist drills, coated						
W0109	 3.0 - 16.0	**h7**	**≤ 3xD**	σ 135°	$\lambda_s = 30°$	HA	✓	F382
W0108	 1.0 - 25.0	**h7**	**≤ 5xD**	σ 135°	$\lambda_s = 30°$	HA	✓	F386
W1110	 1.0 - 16.0	**h7**	**≤ 10xD**	σ 135°	$\lambda_s = 30°$	HA	✓	F394

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
TI	**HL**	High-performance twist drills, coated						
W0115	 3.0 - 16.0	**h7**	**≤ 5xD**	σ 140°	$\lambda_s = 38°$	HA	✓	F398

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
H	**HPC**	HPC twist drills, coated						
W105H	 2.5 - 16.0	**h7**	**≤ 3xD**	σ 140°	$\lambda_s = 30°$	HA	✗	F402
W106H	 2.6 - 16.0	**h7**	**≤ 5xD**	σ 140°	$\lambda_s = 30°$	HA	✗	F404

Overview

Solid carbide tools for drilling

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
AL	**HPC** HPC twist drills, coated							
W1205	 1.0 - 20.0	**h7**	**≤ 5xD**	σ 135°	$\lambda_s = 15°$	HA	✓	F406
W1208	 3.0 - 16.0	**h7**	**≤ 8xD**	σ 135°	$\lambda_s = 15°$	HA	✓	F414
W1212	 3.0 - 16.0	**h7**	**≤ 12xD**	σ 135°	$\lambda_s = 15°$	HA	✓	F418

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
AL	**TS** Deep hole twist drills, coated							
W1216	 3.0 - 12.0	**h7**	**≤ 16xD**	σ 135°	$\lambda_s = 15°$	HA	✓	F422
W1220	 2.0 - 12.0	**h7**	**≤ 20xD**	σ 135°	$\lambda_s = 15°$	HA	✓	F424
W1225	 3.0 - 12.0	**h7**	**≤ 25xD**	σ 135°	$\lambda_s = 15°$	HA	✓	F426
W1230	 2.0 - 12.0	**h7**	**≤ 30xD**	σ 135°	$\lambda_s = 15°$	HA	✓	F428

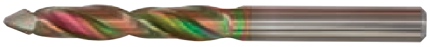
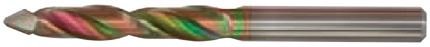
Overview

Solid carbide tools for drilling

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
AL	**A**	Spot drills, uncoated						
W0142	 2.0 - 20.0	**h6**		σ 142°	$\lambda_s = 30°$	HA	✗	F430
W0141	 2.0 - 20.0	**h6**		σ 90°	$\lambda_s = 30°$	HA	✗	F430
AL	**PA**	Precision spot drills, uncoated						
W0143	 2.0 - 20.0	**h6**		σ 90°	$\lambda_s = 0°$	HA HB	✗	F432
W0144	 2.0 - 20.0	**h6**		σ 142°	$\lambda_s = 0°$	HA HB	✗	F432
V	**HL**	High-performance twist drills, uncoated						
W0119	 3.0 - 12.0	**m7**	**≤ 5xD**	σ 118/62°	$\lambda_s = 30°$	HA	✗	F434

Overview

Solid carbide tools for drilling

Tool type	Ø-range [mm]	Tolerance	Length	Point angle	Helix angle	Shank	Int. coolant supply	Page(s)
V	**HL**	High-performance twist drills, coated						
W0119 INCH	 3.175 - 11.113	**m7**	**≤ 5xD**	σ 118/62°	$\lambda_s=30°$	HA	☒	F436
W0119	 3.0 - 12.0	**m7**	**≤ 5xD**	σ 118/62°	$\lambda_s=30°$	HA	☒	F438
WD119 INCH	 3.175 - 11.113	**m7**	**≤ 5xD**	σ 118/62°	$\lambda_s=30°$	HA	☒	F440
WD119	 3.0 - 12.0	**m7**	**≤ 5xD**	σ 118/62°	$\lambda_s=30°$	HA	☒	F442

V	**KS**	Twist drills for Kevlar, coated						
W0121	 3.0 - 16.0	**m7**	**≤ 5xD**		$\lambda_s=30°$	HA	☒	F444

Notes

W0175, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]							
				= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels		80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2			70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	Constructional steel		80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2			70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3			65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	Spring steel		50	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.2			40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
1.3.3			20	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.1.1	Cementation steel		75	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2			70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3			65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	Nitriding steel		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2			65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	Tempered steel		65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2			65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3			65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.4			65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5			50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.6			30	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.1.1	Non alloyed tool steel		50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.1	Tool steel for cold working		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.2			50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.3			30	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.4											
3.2.5											
3.3.1	Tool steel for hot working		50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.3.2			30	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.3.3											
3.3.4											
3.3.5											
3.5.1	Hardened tool steel	< 55 HRC									
3.5.2		55–58 HRC									
3.5.3		58–60 HRC									
3.5.4		60–62 HRC									
3.5.5		62–64 HRC									
4.1.1	Stainless steel										
4.1.2											
4.1.3											
4.1.4											
4.1.5											
4.2.1	Heat-resistant alloys										
4.2.2											
4.2.3											
4.2.4											
5.1.1	Conventional cast steel		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2			65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3			50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	Stainless cast steel										
5.2.2											
6.1.1	Cast iron with lamellar graphite		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2			70	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3			65	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4											
6.2.1	Spheroidal cast iron		75	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2			70	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3			50	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)		75	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2			70	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	GTS (black malleable cast iron)		75	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2			70	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	Aluminium										
7.1.2											
7.1.3											
7.1.4											
7.1.5											
7.1.6											
7.2.1	Magnesium										
7.2.2											
7.3.1	Copper										
7.3.2											
7.3.3											
7.3.4											
7.3.5											
7.3.6											
7.4.1	CuZn (brass)										
7.4.2											
7.5.1	CuSn (bronze)										
7.5.2											
7.6.1	CuAlFe (Ampco)										
7.6.2											
7.8.1	Titanium										
7.8.2											
7.8.3											

W0175, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$

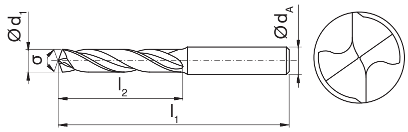
$d_1 = h7$
$d_A = h6$

E

≤ 3xD

σ 140°

SCPP425



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
1.0	HL.UN.0175.0100h7.3XD.140.HA	4	45	7	W0175010240
1.1	HL.UN.0175.0110h7.3XD.140.HA	4	45	7	W0175011240
1.2	HL.UN.0175.0120h7.3XD.140.HA	4	45	7	W0175012240
1.3	HL.UN.0175.0130h7.3XD.140.HA	4	45	7	W0175013240
1.4	HL.UN.0175.0140h7.3XD.140.HA	4	45	7	W0175014240
1.5	HL.UN.0175.0150h7.3XD.140.HA	4	55	14	W0175015240
1.6	HL.UN.0175.0160h7.3XD.140.HA	4	55	14	W0175016240
1.7	HL.UN.0175.0170h7.3XD.140.HA	4	55	14	W0175017240
1.8	HL.UN.0175.0180h7.3XD.140.HA	4	55	14	W0175018240
1.9	HL.UN.0175.0190h7.3XD.140.HA	4	55	14	W0175019240
2.0	HL.UN.0175.0200h7.3XD.140.HA	4	55	20	W0175020240
2.1	HL.UN.0175.0210h7.3XD.140.HA	4	55	20	W0175021240
2.2	HL.UN.0175.0220h7.3XD.140.HA	4	55	20	W0175022240
2.3	HL.UN.0175.0230h7.3XD.140.HA	4	55	20	W0175023240
2.4	HL.UN.0175.0240h7.3XD.140.HA	4	55	20	W0175024240
2.5	HL.UN.0175.0250h7.3XD.140.HA	4	55	20	W0175025240
2.6	HL.UN.0175.0260h7.3XD.140.HA	4	55	20	W0175026240
2.7	HL.UN.0175.0270h7.3XD.140.HA	4	55	20	W0175027240
2.8	HL.UN.0175.0280h7.3XD.140.HA	4	55	20	W0175028240
2.9	HL.UN.0175.0290h7.3XD.140.HA	4	55	20	W0175029240
3.0	HL.UN.0175.0300h7.3XD.140.HA	6	62	20	W0175030240
3.1	HL.UN.0175.0310h7.3XD.140.HA	6	62	20	W0175031240
3.2	HL.UN.0175.0320h7.3XD.140.HA	6	62	20	W0175032240
3.3	HL.UN.0175.0330h7.3XD.140.HA	6	62	20	W0175033240
3.4	HL.UN.0175.0340h7.3XD.140.HA	6	62	20	W0175034240
3.5	HL.UN.0175.0350h7.3XD.140.HA	6	62	20	W0175035240
3.6	HL.UN.0175.0360h7.3XD.140.HA	6	62	20	W0175036240
3.7	HL.UN.0175.0370h7.3XD.140.HA	6	62	20	W0175037240
3.8	HL.UN.0175.0380h7.3XD.140.HA	6	66	24	W0175038240
3.9	HL.UN.0175.0390h7.3XD.140.HA	6	66	24	W0175039240
4.0	HL.UN.0175.0400h7.3XD.140.HA	6	66	24	W0175040240
4.1	HL.UN.0175.0410h7.3XD.140.HA	6	66	24	W0175041240
4.2	HL.UN.0175.0420h7.3XD.140.HA	6	66	24	W0175042240
4.3	HL.UN.0175.0430h7.3XD.140.HA	6	66	24	W0175043240
4.4	HL.UN.0175.0440h7.3XD.140.HA	6	66	24	W0175044240
4.5	HL.UN.0175.0450h7.3XD.140.HA	6	66	24	W0175045240
4.6	HL.UN.0175.0460h7.3XD.140.HA	6	66	24	W0175046240
4.7	HL.UN.0175.0470h7.3XD.140.HA	6	66	24	W0175047240
4.8	HL.UN.0175.0480h7.3XD.140.HA	6	66	28	W0175048240
4.9	HL.UN.0175.0490h7.3XD.140.HA	6	66	28	W0175049240
5.0	HL.UN.0175.0500h7.3XD.140.HA	6	66	28	W0175050240
5.1	HL.UN.0175.0510h7.3XD.140.HA	6	66	28	W0175051240
5.2	HL.UN.0175.0520h7.3XD.140.HA	6	66	28	W0175052240
5.3	HL.UN.0175.0530h7.3XD.140.HA	6	66	28	W0175053240
5.4	HL.UN.0175.0540h7.3XD.140.HA	6	66	28	W0175054240
5.5	HL.UN.0175.0550h7.3XD.140.HA	6	66	28	W0175055240
5.6	HL.UN.0175.0560h7.3XD.140.HA	6	66	28	W0175056240
5.7	HL.UN.0175.0570h7.3XD.140.HA	6	66	28	W0175057240

W0175, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	**Constructional steel**	80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3		65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	**Spring steel**	50	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.2		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
1.3.3		20	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**	75	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3		65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	**Nitriding steel**	65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	**Tempered steel**	65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.4		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5		50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.6		30	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**	50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.1	**Tool steel for cold working**	65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.2		50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.3		30	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.4										
3.2.5										
3.3.1	**Tool steel for hot working**	50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.3.2		30	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.3.3										
3.3.4										
3.3.5										
3.5.1	**Hardened tool steel** **< 55 HRC**									
3.5.2	**55–58 HRC**									
3.5.3	**58–60 HRC**									
3.5.4	**60–62 HRC**									
3.5.5	**62–64 HRC**									
4.1.1	**Stainless steel**									
4.1.2										
4.1.3										
4.1.4										
4.1.5										
4.2.1	**Heat-resistant alloys**									
4.2.2										
4.2.3										
4.2.4										
5.1.1	**Conventional cast steel**	70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2		65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3		50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	**Stainless cast steel**									
5.2.2										
6.1.1	**Cast iron with lamellar graphite**	75	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2		70	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3		65	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4										
6.2.1	**Spheroidal cast iron**	75	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2		70	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3		50	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**	75	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2		70	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	**GTS (black malleable cast iron)**	75	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2		70	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	**Aluminium**									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	**CuZn (brass)**									
7.4.2										
7.5.1	**CuSn (bronze)**									
7.5.2										
7.6.1	**CuAlFe (Ampco)**									
7.6.2										
7.8.1	**Titanium**									
7.8.2										
7.8.3										

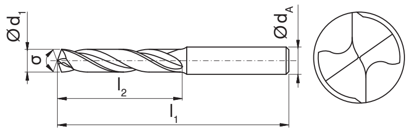
W0175, coated

High-performance twist drills

UN HL

λ_S = 30° | d_1 = h7 d_A = h6 | E | ≤ 3xD | σ 140°

SCPP425



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
5.8	HL.UN.0175.0580h7.3XD.140.HA	6	66	28	W0175058240
5.9	HL.UN.0175.0590h7.3XD.140.HA	6	66	28	W0175059240
6.0	HL.UN.0175.0600h7.3XD.140.HA	6	66	28	W0175060240
6.1	HL.UN.0175.0610h7.3XD.140.HA	8	79	34	W0175061240
6.2	HL.UN.0175.0620h7.3XD.140.HA	8	79	34	W0175062240
6.3	HL.UN.0175.0630h7.3XD.140.HA	8	79	34	W0175063240
6.4	HL.UN.0175.0640h7.3XD.140.HA	8	79	34	W0175064240
6.5	HL.UN.0175.0650h7.3XD.140.HA	8	79	34	W0175065240
6.6	HL.UN.0175.0660h7.3XD.140.HA	8	79	34	W0175066240
6.7	HL.UN.0175.0670h7.3XD.140.HA	8	79	34	W0175067240
6.8	HL.UN.0175.0680h7.3XD.140.HA	8	79	34	W0175068240
6.9	HL.UN.0175.0690h7.3XD.140.HA	8	79	34	W0175069240
7.0	HL.UN.0175.0700h7.3XD.140.HA	8	79	34	W0175070240
7.1	HL.UN.0175.0710h7.3XD.140.HA	8	79	41	W0175071240
7.2	HL.UN.0175.0720h7.3XD.140.HA	8	79	41	W0175072240
7.3	HL.UN.0175.0730h7.3XD.140.HA	8	79	41	W0175073240
7.4	HL.UN.0175.0740h7.3XD.140.HA	8	79	41	W0175074240
7.5	HL.UN.0175.0750h7.3XD.140.HA	8	79	41	W0175075240
7.6	HL.UN.0175.0760h7.3XD.140.HA	8	79	41	W0175076240
7.7	HL.UN.0175.0770h7.3XD.140.HA	8	79	41	W0175077240
7.8	HL.UN.0175.0780h7.3XD.140.HA	8	79	41	W0175078240
7.9	HL.UN.0175.0790h7.3XD.140.HA	8	79	41	W0175079240
8.0	HL.UN.0175.0800h7.3XD.140.HA	8	79	41	W0175080240
8.1	HL.UN.0175.0810h7.3XD.140.HA	10	89	47	W0175081240
8.2	HL.UN.0175.0820h7.3XD.140.HA	10	89	47	W0175082240
8.3	HL.UN.0175.0830h7.3XD.140.HA	10	89	47	W0175083240
8.4	HL.UN.0175.0840h7.3XD.140.HA	10	89	47	W0175084240
8.5	HL.UN.0175.0850h7.3XD.140.HA	10	89	47	W0175085240
8.6	HL.UN.0175.0860h7.3XD.140.HA	10	89	47	W0175086240
8.7	HL.UN.0175.0870h7.3XD.140.HA	10	89	47	W0175087240
8.8	HL.UN.0175.0880h7.3XD.140.HA	10	89	47	W0175088240
8.9	HL.UN.0175.0890h7.3XD.140.HA	10	89	47	W0175089240
9.0	HL.UN.0175.0900h7.3XD.140.HA	10	89	47	W0175090240
9.1	HL.UN.0175.0910h7.3XD.140.HA	10	89	47	W0175091240
9.2	HL.UN.0175.0920h7.3XD.140.HA	10	89	47	W0175092240
9.3	HL.UN.0175.0930h7.3XD.140.HA	10	89	47	W0175093240
9.4	HL.UN.0175.0940h7.3XD.140.HA	10	89	47	W0175094240
9.5	HL.UN.0175.0950h7.3XD.140.HA	10	89	47	W0175095240
9.6	HL.UN.0175.0960h7.3XD.140.HA	10	89	47	W0175096240
9.7	HL.UN.0175.0970h7.3XD.140.HA	10	89	47	W0175097240
9.8	HL.UN.0175.0980h7.3XD.140.HA	10	89	47	W0175098240
9.9	HL.UN.0175.0990h7.3XD.140.HA	10	89	47	W0175099240
10.0	HL.UN.0175.1000h7.3XD.140.HA	10	89	47	W0175100240
10.2	HL.UN.0175.1020h7.3XD.140.HA	12	102	55	W0175102240
10.5	HL.UN.0175.1050h7.3XD.140.HA	12	102	55	W0175105240
10.8	HL.UN.0175.1080h7.3XD.140.HA	12	102	55	W0175108240
11.0	HL.UN.0175.1100h7.3XD.140.HA	12	102	55	W0175110240
11.2	HL.UN.0175.1120h7.3XD.140.HA	12	102	55	W0175112240

W0175, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	Constructional steel	80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3		65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	Spring steel	50	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.2		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
1.3.3		20	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.1.1	Cementation steel	75	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3		65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	Nitriding steel	65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	Tempered steel	65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.4		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5		50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.6		30	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.1.1	Non alloyed tool steel	50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.1	Tool steel for cold working	65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.2		50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.3		30	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.4										
3.2.5										
3.3.1	Tool steel for hot working	50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.3.2		30	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.3.3										
3.3.4										
3.3.5										
3.5.1	Hardened tool steel < 55 HRC									
3.5.2	55–58 HRC									
3.5.3	58–60 HRC									
3.5.4	60–62 HRC									
3.5.5	62–64 HRC									
4.1.1	Stainless steel									
4.1.2										
4.1.3										
4.1.4										
4.1.5										
4.2.1	Heat-resistant alloys									
4.2.2										
4.2.3										
4.2.4										
5.1.1	Conventional cast steel	70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2		65	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3		50	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	Stainless cast steel									
5.2.2										
6.1.1	Cast iron with lamellar graphite	75	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2		70	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3		65	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4										
6.2.1	Spheroidal cast iron	75	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2		70	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3		50	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	75	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2		70	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	GTS (black malleable cast iron)	75	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2		70	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	Aluminium									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	Magnesium									
7.2.2										
7.3.1	Copper									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	CuZn (brass)									
7.4.2										
7.5.1	CuSn (bronze)									
7.5.2										
7.6.1	CuAlFe (Ampco)									
7.6.2										
7.8.1	Titanium									
7.8.2										
7.8.3										

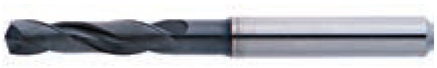
W0175, coated

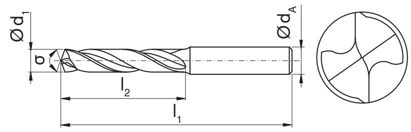
High-performance twist drills

UN **HL**

$\lambda_S = 30°$ $d_1 = h7$ $d_A = h6$ **E** ≤ **3xD** σ 140°

SCPP425





d1 [mm]	Type, description	dA [mm]	l1 [mm]	l2 [mm]	HA Material
11.5	HL.UN.0175.1150h7.3XD.140.HA	12	102	55	W0175115240
11.8	HL.UN.0175.1180h7.3XD.140.HA	12	102	55	W0175118240
12.0	HL.UN.0175.1200h7.3XD.140.HA	12	102	55	W0175120240
12.2	HL.UN.0175.1220h7.3XD.140.HA	14	107	60	W0175122240
12.5	HL.UN.0175.1250h7.3XD.140.HA	14	107	60	W0175125240
12.8	HL.UN.0175.1280h7.3XD.140.HA	14	107	60	W0175128240
13.0	HL.UN.0175.1300h7.3XD.140.HA	14	107	60	W0175130240
13.5	HL.UN.0175.1350h7.3XD.140.HA	14	107	60	W0175135240
13.8	HL.UN.0175.1380h7.3XD.140.HA	14	107	60	W0175138240
14.0	HL.UN.0175.1400h7.3XD.140.HA	14	107	60	W0175140240
14.2	HL.UN.0175.1420h7.3XD.140.HA	16	115	65	W0175142240
14.5	HL.UN.0175.1450h7.3XD.140.HA	16	115	65	W0175145240
14.8	HL.UN.0175.1480h7.3XD.140.HA	16	115	65	W0175148240
15.0	HL.UN.0175.1500h7.3XD.140.HA	16	115	65	W0175150240
15.2	HL.UN.0175.1520h7.3XD.140.HA	16	115	65	W0175152240
15.5	HL.UN.0175.1550h7.3XD.140.HA	16	115	65	W0175155240
15.8	HL.UN.0175.1580h7.3XD.140.HA	16	115	65	W0175158240
16.0	HL.UN.0175.1600h7.3XD.140.HA	16	115	65	W0175160240
16.5	HL.UN.0175.1650h7.3XD.140.HA	18	123	73	W0175165240
16.8	HL.UN.0175.1680h7.3XD.140.HA	18	123	73	W0175168240
17.0	HL.UN.0175.1700h7.3XD.140.HA	18	123	73	W0175170240
17.5	HL.UN.0175.1750h7.3XD.140.HA	18	123	73	W0175175240
18.0	HL.UN.0175.1800h7.3XD.140.HA	18	123	73	W0175180240
18.5	HL.UN.0175.1850h7.3XD.140.HA	20	131	79	W0175185240
18.8	HL.UN.0175.1880h7.3XD.140.HA	20	131	79	W0175188240
19.0	HL.UN.0175.1900h7.3XD.140.HA	20	131	79	W0175190240
19.5	HL.UN.0175.1950h7.3XD.140.HA	20	131	79	W0175195240
20.0	HL.UN.0175.2000h7.3XD.140.HA	20	131	79	W0175200240

W0177, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	100	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,16	0,22	0,28	0,34	0,38
1.2.1	**Constructional steel**	100	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,15	0,21	0,27	0,32	0,37
1.3.1	**Spring steel**	60	0,15	0,21	0,27	0,32	0,37
1.3.2		50	0,08	0,12	0,15	0,2	0,25
1.3.3		30	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**	95	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,15	0,21	0,27	0,32	0,37
2.2.1	**Nitriding steel**	75	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,08	0,12	0,15	0,2	0,25
2.3.1	**Tempered steel**	85	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,08	0,12	0,15	0,2	0,25
2.3.5		60	0,08	0,12	0,15	0,2	0,25
2.3.6		35	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**	60	0,08	0,12	0,15	0,2	0,25
3.2.1	**Tool steel for cold working**	75	0,08	0,12	0,15	0,2	0,25
3.2.2		60	0,08	0,12	0,15	0,2	0,25
3.2.3		35	0,08	0,12	0,15	0,2	0,25
3.2.4		40	0,08	0,12	0,15	0,2	0,25
3.2.5		35	0,08	0,12	0,15	0,2	0,25
3.3.1	**Tool steel for hot working**	60	0,08	0,12	0,15	0,2	0,25
3.3.2		35	0,08	0,12	0,15	0,2	0,25
3.3.3		50	0,08	0,12	0,15	0,2	0,25
3.3.4		40	0,08	0,12	0,15	0,2	0,25
3.3.5		30	0,08	0,12	0,15	0,2	0,25
3.5.1	**Hardened tool steel** **< 55 HRC**						
3.5.2	**55–58 HRC**						
3.5.3	**58–60 HRC**						
3.5.4	**60–62 HRC**						
3.5.5	**62–64 HRC**						
4.1.1	**Stainless steel**	50	0,08	0,12	0,15	0,2	0,25
4.1.2		30	0,08	0,12	0,15	0,2	0,25
4.1.3		35	0,08	0,12	0,15	0,2	0,25
4.1.4		35	0,08	0,12	0,15	0,2	0,25
4.1.5		50	0,08	0,12	0,15	0,2	0,25
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**	80	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,15	0,21	0,27	0,32	0,37
5.1.3		60	0,08	0,12	0,15	0,2	0,25
5.2.1	**Stainless cast steel**	40	0,08	0,12	0,15	0,2	0,25
5.2.2		30	0,08	0,12	0,15	0,2	0,25
6.1.1	**Cast iron with lamellar graphite**	105	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,2	0,25	0,35	0,4	0,46
6.1.4		40	0,08	0,12	0,15	0,2	0,25
6.2.1	**Spheroidal cast iron**	85	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**	85	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,125	0,175	0,225	0,3	0,375
6.4.1	**GTS (black malleable cast iron)**	85	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,125	0,175	0,225	0,3	0,375
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**	30	0,04	0,08	0,12	0,16	0,2
7.8.2		25	0,04	0,08	0,12	0,16	0,2
7.8.3		25	0,04	0,08	0,12	0,16	0,2

W0177, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$

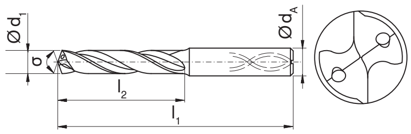
$d_1 = h7$
$d_A = h6$

E

≤ 3xD

σ 140°

SCPP430



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HL.UN.0177.0300h7.3XD.140.IK.HA	6	62	20	W0177030240
3.1	HL.UN.0177.0310h7.3XD.140.IK.HA	6	62	20	W0177031240
3.2	HL.UN.0177.0320h7.3XD.140.IK.HA	6	62	20	W0177032240
3.3	HL.UN.0177.0330h7.3XD.140.IK.HA	6	62	20	W0177033240
3.4	HL.UN.0177.0340h7.3XD.140.IK.HA	6	62	20	W0177034240
3.5	HL.UN.0177.0350h7.3XD.140.IK.HA	6	62	20	W0177035240
3.6	HL.UN.0177.0360h7.3XD.140.IK.HA	6	62	20	W0177036240
3.7	HL.UN.0177.0370h7.3XD.140.IK.HA	6	62	20	W0177037240
3.8	HL.UN.0177.0380h7.3XD.140.IK.HA	6	66	24	W0177038240
3.9	HL.UN.0177.0390h7.3XD.140.IK.HA	6	66	24	W0177039240
4.0	HL.UN.0177.0400h7.3XD.140.IK.HA	6	66	24	W0177040240
4.1	HL.UN.0177.0410h7.3XD.140.IK.HA	6	66	24	W0177041240
4.2	HL.UN.0177.0420h7.3XD.140.IK.HA	6	66	24	W0177042240
4.3	HL.UN.0177.0430h7.3XD.140.IK.HA	6	66	24	W0177043240
4.4	HL.UN.0177.0440h7.3XD.140.IK.HA	6	66	24	W0177044240
4.5	HL.UN.0177.0450h7.3XD.140.IK.HA	6	66	24	W0177045240
4.6	HL.UN.0177.0460h7.3XD.140.IK.HA	6	66	24	W0177046240
4.7	HL.UN.0177.0470h7.3XD.140.IK.HA	6	66	24	W0177047240
4.8	HL.UN.0177.0480h7.3XD.140.IK.HA	6	66	28	W0177048240
4.9	HL.UN.0177.0490h7.3XD.140.IK.HA	6	66	28	W0177049240
5.0	HL.UN.0177.0500h7.3XD.140.IK.HA	6	66	28	W0177050240
5.1	HL.UN.0177.0510h7.3XD.140.IK.HA	6	66	28	W0177051240
5.2	HL.UN.0177.0520h7.3XD.140.IK.HA	6	66	28	W0177052240
5.3	HL.UN.0177.0530h7.3XD.140.IK.HA	6	66	28	W0177053240
5.4	HL.UN.0177.0540h7.3XD.140.IK.HA	6	66	28	W0177054240
5.5	HL.UN.0177.0550h7.3XD.140.IK.HA	6	66	28	W0177055240
5.6	HL.UN.0177.0560h7.3XD.140.IK.HA	6	66	28	W0177056240
5.7	HL.UN.0177.0570h7.3XD.140.IK.HA	6	66	28	W0177057240
5.8	HL.UN.0177.0580h7.3XD.140.IK.HA	6	66	28	W0177058240
5.9	HL.UN.0177.0590h7.3XD.140.IK.HA	6	66	28	W0177059240
6.0	HL.UN.0177.0600h7.3XD.140.IK.HA	6	66	28	W0177060240
6.1	HL.UN.0177.0610h7.3XD.140.IK.HA	8	79	34	W0177061240
6.2	HL.UN.0177.0620h7.3XD.140.IK.HA	8	79	34	W0177062240
6.3	HL.UN.0177.0630h7.3XD.140.IK.HA	8	79	34	W0177063240
6.4	HL.UN.0177.0640h7.3XD.140.IK.HA	8	79	34	W0177064240
6.5	HL.UN.0177.0650h7.3XD.140.IK.HA	8	79	34	W0177065240
6.6	HL.UN.0177.0660h7.3XD.140.IK.HA	8	79	34	W0177066240
6.7	HL.UN.0177.0670h7.3XD.140.IK.HA	8	79	34	W0177067240
6.8	HL.UN.0177.0680h7.3XD.140.IK.HA	8	79	34	W0177068240
6.9	HL.UN.0177.0690h7.3XD.140.IK.HA	8	79	34	W0177069240
7.0	HL.UN.0177.0700h7.3XD.140.IK.HA	8	79	34	W0177070240
7.1	HL.UN.0177.0710h7.3XD.140.IK.HA	8	79	41	W0177071240
7.2	HL.UN.0177.0720h7.3XD.140.IK.HA	8	79	41	W0177072240
7.3	HL.UN.0177.0730h7.3XD.140.IK.HA	8	79	41	W0177073240
7.4	HL.UN.0177.0740h7.3XD.140.IK.HA	8	79	41	W0177074240
7.5	HL.UN.0177.0750h7.3XD.140.IK.HA	8	79	41	W0177075240
7.6	HL.UN.0177.0760h7.3XD.140.IK.HA	8	79	41	W0177076240
7.7	HL.UN.0177.0770h7.3XD.140.IK.HA	8	79	41	W0177077240

W0177, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]				
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		100	0,16	0,22	0,28	0,34	0,38
1.1.2			90	0,16	0,22	0,28	0,34	0,38
1.2.1	**Constructional steel**		100	0,16	0,22	0,28	0,34	0,38
1.2.2			90	0,16	0,22	0,28	0,34	0,38
1.2.3			75	0,15	0,21	0,27	0,32	0,37
1.3.1	**Spring steel**		60	0,15	0,21	0,27	0,32	0,37
1.3.2			50	0,08	0,12	0,15	0,2	0,25
1.3.3			30	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**		95	0,16	0,22	0,28	0,34	0,38
2.1.2			85	0,16	0,22	0,28	0,34	0,38
2.1.3			75	0,15	0,21	0,27	0,32	0,37
2.2.1	**Nitriding steel**		75	0,08	0,12	0,15	0,2	0,25
2.2.2			75	0,08	0,12	0,15	0,2	0,25
2.3.1	**Tempered steel**		85	0,15	0,21	0,27	0,32	0,37
2.3.2			75	0,08	0,12	0,15	0,2	0,25
2.3.3			75	0,15	0,21	0,27	0,32	0,37
2.3.4			75	0,08	0,12	0,15	0,2	0,25
2.3.5			60	0,08	0,12	0,15	0,2	0,25
2.3.6			35	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**		60	0,08	0,12	0,15	0,2	0,25
3.2.1	**Tool steel for cold working**		75	0,08	0,12	0,15	0,2	0,25
3.2.2			60	0,08	0,12	0,15	0,2	0,25
3.2.3			35	0,08	0,12	0,15	0,2	0,25
3.2.4			40	0,08	0,12	0,15	0,2	0,25
3.2.5			35	0,08	0,12	0,15	0,2	0,25
3.3.1	**Tool steel for hot working**		60	0,08	0,12	0,15	0,2	0,25
3.3.2			35	0,08	0,12	0,15	0,2	0,25
3.3.3			50	0,08	0,12	0,15	0,2	0,25
3.3.4			40	0,08	0,12	0,15	0,2	0,25
3.3.5			30	0,08	0,12	0,15	0,2	0,25
3.5.1	**Hardened tool steel**	**< 55 HRC**						
3.5.2		**55–58 HRC**						
3.5.3		**58–60 HRC**						
3.5.4		**60–62 HRC**						
3.5.5		**62–64 HRC**						
4.1.1	**Stainless steel**		50	0,08	0,12	0,15	0,2	0,25
4.1.2			30	0,08	0,12	0,15	0,2	0,25
4.1.3			35	0,08	0,12	0,15	0,2	0,25
4.1.4			35	0,08	0,12	0,15	0,2	0,25
4.1.5			50	0,08	0,12	0,15	0,2	0,25
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**		80	0,16	0,22	0,28	0,34	0,38
5.1.2			75	0,15	0,21	0,27	0,32	0,37
5.1.3			60	0,08	0,12	0,15	0,2	0,25
5.2.1	**Stainless cast steel**		40	0,08	0,12	0,15	0,2	0,25
5.2.2			30	0,08	0,12	0,15	0,2	0,25
6.1.1	**Cast iron with lamellar graphite**		105	0,2	0,25	0,35	0,4	0,46
6.1.2			85	0,2	0,25	0,35	0,4	0,46
6.1.3			75	0,2	0,25	0,35	0,4	0,46
6.1.4			40	0,08	0,12	0,15	0,2	0,25
6.2.1	**Spheroidal cast iron**		85	0,125	0,175	0,225	0,3	0,375
6.2.2			80	0,125	0,175	0,225	0,3	0,375
6.2.3			60	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**		85	0,125	0,175	0,225	0,3	0,375
6.3.2			80	0,125	0,175	0,225	0,3	0,375
6.4.1	**GTS (black malleable cast iron)**		85	0,125	0,175	0,225	0,3	0,375
6.4.2			80	0,125	0,175	0,225	0,3	0,375
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**		30	0,04	0,08	0,12	0,16	0,2
7.8.2			25	0,04	0,08	0,12	0,16	0,2
7.8.3			25	0,04	0,08	0,12	0,16	0,2

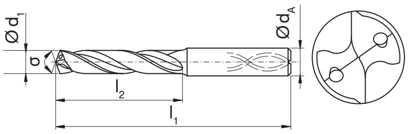
W0177, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 3xD | σ 140°

SCPP430



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HL.UN.0177.0780h7.3XD.140.IK.HA	8	79	41	W0177078240
7.9	HL.UN.0177.0790h7.3XD.140.IK.HA	8	79	41	W0177079240
8.0	HL.UN.0177.0800h7.3XD.140.IK.HA	8	79	41	W0177080240
8.1	HL.UN.0177.0810h7.3XD.140.IK.HA	10	89	47	W0177081240
8.2	HL.UN.0177.0820h7.3XD.140.IK.HA	10	89	47	W0177082240
8.3	HL.UN.0177.0830h7.3XD.140.IK.HA	10	89	47	W0177083240
8.4	HL.UN.0177.0840h7.3XD.140.IK.HA	10	89	47	W0177084240
8.5	HL.UN.0177.0850h7.3XD.140.IK.HA	10	89	47	W0177085240
8.6	HL.UN.0177.0860h7.3XD.140.IK.HA	10	89	47	W0177086240
8.7	HL.UN.0177.0870h7.3XD.140.IK.HA	10	89	47	W0177087240
8.8	HL.UN.0177.0880h7.3XD.140.IK.HA	10	89	47	W0177088240
8.9	HL.UN.0177.0890h7.3XD.140.IK.HA	10	89	47	W0177089240
9.0	HL.UN.0177.0900h7.3XD.140.IK.HA	10	89	47	W0177090240
9.1	HL.UN.0177.0910h7.3XD.140.IK.HA	10	89	47	W0177091240
9.2	HL.UN.0177.0920h7.3XD.140.IK.HA	10	89	47	W0177092240
9.3	HL.UN.0177.0930h7.3XD.140.IK.HA	10	89	47	W0177093240
9.4	HL.UN.0177.0940h7.3XD.140.IK.HA	10	89	47	W0177094240
9.5	HL.UN.0177.0950h7.3XD.140.IK.HA	10	89	47	W0177095240
9.6	HL.UN.0177.0960h7.3XD.140.IK.HA	10	89	47	W0177096240
9.7	HL.UN.0177.0970h7.3XD.140.IK.HA	10	89	47	W0177097240
9.8	HL.UN.0177.0980h7.3XD.140.IK.HA	10	89	47	W0177098240
9.9	HL.UN.0177.0990h7.3XD.140.IK.HA	10	89	47	W0177099240
10.0	HL.UN.0177.1000h7.3XD.140.IK.HA	10	89	47	W0177100240
10.2	HL.UN.0177.1020h7.3XD.140.IK.HA	12	102	55	W0177102240
10.5	HL.UN.0177.1050h7.3XD.140.IK.HA	12	102	55	W0177105240
10.8	HL.UN.0177.1080h7.3XD.140.IK.HA	12	102	55	W0177108240
11.0	HL.UN.0177.1100h7.3XD.140.IK.HA	12	102	55	W0177110240
11.2	HL.UN.0177.1120h7.3XD.140.IK.HA	12	102	55	W0177112240
11.5	HL.UN.0177.1150h7.3XD.140.IK.HA	12	102	55	W0177115240
11.8	HL.UN.0177.1180h7.3XD.140.IK.HA	12	102	55	W0177118240
12.0	HL.UN.0177.1200h7.3XD.140.IK.HA	12	102	55	W0177120240
12.2	HL.UN.0177.1220h7.3XD.140.IK.HA	14	107	60	W0177122240
12.5	HL.UN.0177.1250h7.3XD.140.IK.HA	14	107	60	W0177125240
12.8	HL.UN.0177.1280h7.3XD.140.IK.HA	14	107	60	W0177128240
13.0	HL.UN.0177.1300h7.3XD.140.IK.HA	14	107	60	W0177130240
13.5	HL.UN.0177.1350h7.3XD.140.IK.HA	14	107	60	W0177135240
13.8	HL.UN.0177.1380h7.3XD.140.IK.HA	14	107	60	W0177138240
14.0	HL.UN.0177.1400h7.3XD.140.IK.HA	14	107	60	W0177140240
14.2	HL.UN.0177.1420h7.3XD.140.IK.HA	16	115	65	W0177142240
14.5	HL.UN.0177.1450h7.3XD.140.IK.HA	16	115	65	W0177145240
14.8	HL.UN.0177.1480h7.3XD.140.IK.HA	16	115	65	W0177148240
15.0	HL.UN.0177.1500h7.3XD.140.IK.HA	16	115	65	W0177150240
15.2	HL.UN.0177.1520h7.3XD.140.IK.HA	16	115	65	W0177152240
15.5	HL.UN.0177.1550h7.3XD.140.IK.HA	16	115	65	W0177155240
15.8	HL.UN.0177.1580h7.3XD.140.IK.HA	16	115	65	W0177158240
16.0	HL.UN.0177.1600h7.3XD.140.IK.HA	16	115	65	W0177160240
16.5	HL.UN.0177.1650h7.3XD.140.IK.HA	18	123	73	W0177165240
17.0	HL.UN.0177.1700h7.3XD.140.IK.HA	18	123	73	W0177170240

W0177, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	 > Ø 5,0 = Ø 8,0	 > Ø 8,0 = Ø 12,0	 > Ø 12,0 = Ø 16,0	 > Ø 16,0 = Ø 20,0
1.1.1	Machining steels		100	0,16	0,22	0,28	0,34	0,38
1.1.2			90	0,16	0,22	0,28	0,34	0,38
1.2.1	Constructional steel		100	0,16	0,22	0,28	0,34	0,38
1.2.2			90	0,16	0,22	0,28	0,34	0,38
1.2.3			75	0,15	0,21	0,27	0,32	0,37
1.3.1	Spring steel		60	0,15	0,21	0,27	0,32	0,37
1.3.2			50	0,08	0,12	0,15	0,2	0,25
1.3.3			30	0,08	0,12	0,15	0,2	0,25
2.1.1	Cementation steel		95	0,16	0,22	0,28	0,34	0,38
2.1.2			85	0,16	0,22	0,28	0,34	0,38
2.1.3			75	0,15	0,21	0,27	0,32	0,37
2.2.1	Nitriding steel		75	0,08	0,12	0,15	0,2	0,25
2.2.2			75	0,08	0,12	0,15	0,2	0,25
2.3.1	Tempered steel		85	0,15	0,21	0,27	0,32	0,37
2.3.2			75	0,08	0,12	0,15	0,2	0,25
2.3.3			75	0,15	0,21	0,27	0,32	0,37
2.3.4			75	0,08	0,12	0,15	0,2	0,25
2.3.5			60	0,08	0,12	0,15	0,2	0,25
2.3.6			35	0,08	0,12	0,15	0,2	0,25
3.1.1	Non alloyed tool steel		60	0,08	0,12	0,15	0,2	0,25
3.2.1	Tool steel for cold working		75	0,08	0,12	0,15	0,2	0,25
3.2.2			60	0,08	0,12	0,15	0,2	0,25
3.2.3			35	0,08	0,12	0,15	0,2	0,25
3.2.4			40	0,08	0,12	0,15	0,2	0,25
3.2.5			35	0,08	0,12	0,15	0,2	0,25
3.3.1	Tool steel for hot working		60	0,08	0,12	0,15	0,2	0,25
3.3.2			35	0,08	0,12	0,15	0,2	0,25
3.3.3			50	0,08	0,12	0,15	0,2	0,25
3.3.4			40	0,08	0,12	0,15	0,2	0,25
3.3.5			30	0,08	0,12	0,15	0,2	0,25
3.5.1	Hardened tool steel	< 55 HRC						
3.5.2		55–58 HRC						
3.5.3		58–60 HRC						
3.5.4		60–62 HRC						
3.5.5		62–64 HRC						
4.1.1	Stainless steel		50	0,08	0,12	0,15	0,2	0,25
4.1.2			30	0,08	0,12	0,15	0,2	0,25
4.1.3			35	0,08	0,12	0,15	0,2	0,25
4.1.4			35	0,08	0,12	0,15	0,2	0,25
4.1.5			50	0,08	0,12	0,15	0,2	0,25
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel		80	0,16	0,22	0,28	0,34	0,38
5.1.2			75	0,15	0,21	0,27	0,32	0,37
5.1.3			60	0,08	0,12	0,15	0,2	0,25
5.2.1	Stainless cast steel		40	0,08	0,12	0,15	0,2	0,25
5.2.2			30	0,08	0,12	0,15	0,2	0,25
6.1.1	Cast iron with lamellar graphite		105	0,2	0,25	0,35	0,4	0,46
6.1.2			85	0,2	0,25	0,35	0,4	0,46
6.1.3			75	0,2	0,25	0,35	0,4	0,46
6.1.4			40	0,08	0,12	0,15	0,2	0,25
6.2.1	Spheroidal cast iron		85	0,125	0,175	0,225	0,3	0,375
6.2.2			80	0,125	0,175	0,225	0,3	0,375
6.2.3			60	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)		85	0,125	0,175	0,225	0,3	0,375
6.3.2			80	0,125	0,175	0,225	0,3	0,375
6.4.1	GTS (black malleable cast iron)		85	0,125	0,175	0,225	0,3	0,375
6.4.2			80	0,125	0,175	0,225	0,3	0,375
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium		30	0,04	0,08	0,12	0,16	0,2
7.8.2			25	0,04	0,08	0,12	0,16	0,2
7.8.3			25	0,04	0,08	0,12	0,16	0,2

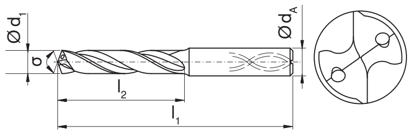
W0177, coated

High-performance twist drills

UN **HL**

λ_S = 30° | d_1 = h7 d_A = h6 | E | ≤ 3xD | σ 140°

SCPP430



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
17.5	HL.UN.0177.1750h7.3XD.140.IK.HA	18	123	73	W0177175240
18.0	HL.UN.0177.1800h7.3XD.140.IK.HA	18	123	73	W0177180240
18.5	HL.UN.0177.1850h7.3XD.140.IK.HA	20	131	79	W0177185240
19.0	HL.UN.0177.1900h7.3XD.140.IK.HA	20	131	79	W0177190240
19.5	HL.UN.0177.1950h7.3XD.140.IK.HA	20	131	79	W0177195240
20.0	HL.UN.0177.2000h7.3XD.140.IK.HA	20	131	79	W0177200240

W0174, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	100	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,16	0,22	0,28	0,34	0,38
1.2.1	**Constructional steel**	100	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,15	0,21	0,27	0,32	0,37
1.3.1	**Spring steel**	60	0,15	0,21	0,27	0,32	0,37
1.3.2		50	0,08	0,12	0,15	0,2	0,25
1.3.3		30	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**	95	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,15	0,21	0,27	0,32	0,37
2.2.1	**Nitriding steel**	75	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,08	0,12	0,15	0,2	0,25
2.3.1	**Tempered steel**	85	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,08	0,12	0,15	0,2	0,25
2.3.5		60	0,08	0,12	0,15	0,2	0,25
2.3.6		35	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**	60	0,08	0,12	0,15	0,2	0,25
3.2.1	**Tool steel for cold working**	75	0,08	0,12	0,15	0,2	0,25
3.2.2		60	0,08	0,12	0,15	0,2	0,25
3.2.3		35	0,08	0,12	0,15	0,2	0,25
3.2.4							
3.2.5							
3.3.1	**Tool steel for hot working**	60	0,08	0,12	0,15	0,2	0,25
3.3.2		35	0,08	0,12	0,15	0,2	0,25
3.3.3							
3.3.4							
3.3.5							
3.5.1	**Hardened tool steel** **< 55 HRC**						
3.5.2	**55–58 HRC**						
3.5.3	**58–60 HRC**						
3.5.4	**60–62 HRC**						
3.5.5	**62–64 HRC**						
4.1.1	**Stainless steel**						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**	80	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,15	0,21	0,27	0,32	0,37
5.1.3							
5.2.1	**Stainless cast steel**						
5.2.2							
6.1.1	**Cast iron with lamellar graphite**	105	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,2	0,25	0,35	0,4	0,46
6.1.4							
6.2.1	**Spheroidal cast iron**	85	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**	85	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,125	0,175	0,225	0,3	0,375
6.4.1	**GTS (black malleable cast iron)**	85	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,125	0,175	0,225	0,3	0,375
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							

W0174, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$

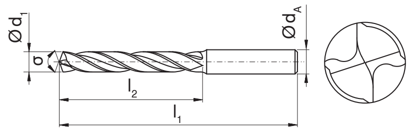
$d_1 = h7$
$d_A = h6$

E

≤ 5xD

σ 140°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HL.UN.0174.0300h7.5XD.140.HA	6	66	28	W0174030340
3.1	HL.UN.0174.0310h7.5XD.140.HA	6	66	28	W0174031340
3.2	HL.UN.0174.0320h7.5XD.140.HA	6	66	28	W0174032340
3.3	HL.UN.0174.0330h7.5XD.140.HA	6	66	28	W0174033340
3.4	HL.UN.0174.0340h7.5XD.140.HA	6	66	28	W0174034340
3.5	HL.UN.0174.0350h7.5XD.140.HA	6	66	28	W0174035340
3.6	HL.UN.0174.0360h7.5XD.140.HA	6	66	28	W0174036340
3.7	HL.UN.0174.0370h7.5XD.140.HA	6	66	28	W0174037340
3.8	HL.UN.0174.0380h7.5XD.140.HA	6	74	36	W0174038340
3.9	HL.UN.0174.0390h7.5XD.140.HA	6	74	36	W0174039340
4.0	HL.UN.0174.0400h7.5XD.140.HA	6	74	36	W0174040340
4.1	HL.UN.0174.0410h7.5XD.140.HA	6	74	36	W0174041340
4.2	HL.UN.0174.0420h7.5XD.140.HA	6	74	36	W0174042340
4.3	HL.UN.0174.0430h7.5XD.140.HA	6	74	36	W0174043340
4.4	HL.UN.0174.0440h7.5XD.140.HA	6	74	36	W0174044340
4.5	HL.UN.0174.0450h7.5XD.140.HA	6	74	36	W0174045340
4.6	HL.UN.0174.0460h7.5XD.140.HA	6	74	36	W0174046340
4.7	HL.UN.0174.0470h7.5XD.140.HA	6	74	36	W0174047340
4.8	HL.UN.0174.0480h7.5XD.140.HA	6	82	44	W0174048340
4.9	HL.UN.0174.0490h7.5XD.140.HA	6	82	44	W0174049340
5.0	HL.UN.0174.0500h7.5XD.140.HA	6	82	44	W0174050340
5.1	HL.UN.0174.0510h7.5XD.140.HA	6	82	44	W0174051340
5.2	HL.UN.0174.0520h7.5XD.140.HA	6	82	44	W0174052340
5.3	HL.UN.0174.0530h7.5XD.140.HA	6	82	44	W0174053340
5.4	HL.UN.0174.0540h7.5XD.140.HA	6	82	44	W0174054340
5.5	HL.UN.0174.0550h7.5XD.140.HA	6	82	44	W0174055340
5.6	HL.UN.0174.0560h7.5XD.140.HA	6	82	44	W0174056340
5.7	HL.UN.0174.0570h7.5XD.140.HA	6	82	44	W0174057340
5.8	HL.UN.0174.0580h7.5XD.140.HA	6	82	44	W0174058340
5.9	HL.UN.0174.0590h7.5XD.140.HA	6	82	44	W0174059340
6.0	HL.UN.0174.0600h7.5XD.140.HA	6	82	44	W0174060340
6.1	HL.UN.0174.0610h7.5XD.140.HA	8	91	53	W0174061340
6.2	HL.UN.0174.0620h7.5XD.140.HA	8	91	53	W0174062340
6.3	HL.UN.0174.0630h7.5XD.140.HA	8	91	53	W0174063340
6.4	HL.UN.0174.0640h7.5XD.140.HA	8	91	53	W0174064340
6.5	HL.UN.0174.0650h7.5XD.140.HA	8	91	53	W0174065340
6.6	HL.UN.0174.0660h7.5XD.140.HA	8	91	53	W0174066340
6.7	HL.UN.0174.0670h7.5XD.140.HA	8	91	53	W0174067340
6.8	HL.UN.0174.0680h7.5XD.140.HA	8	91	53	W0174068340
6.9	HL.UN.0174.0690h7.5XD.140.HA	8	91	53	W0174069340
7.0	HL.UN.0174.0700h7.5XD.140.HA	8	91	53	W0174070340
7.1	HL.UN.0174.0710h7.5XD.140.HA	8	91	53	W0174071340
7.2	HL.UN.0174.0720h7.5XD.140.HA	8	91	53	W0174072340
7.3	HL.UN.0174.0730h7.5XD.140.HA	8	91	53	W0174073340
7.4	HL.UN.0174.0740h7.5XD.140.HA	8	91	53	W0174074340
7.5	HL.UN.0174.0750h7.5XD.140.HA	8	91	53	W0174075340
7.6	HL.UN.0174.0760h7.5XD.140.HA	8	91	53	W0174076340
7.7	HL.UN.0174.0770h7.5XD.140.HA	8	91	53	W0174077340

W0174, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	100	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,16	0,22	0,28	0,34	0,38
1.2.1	**Constructional steel**	100	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,15	0,21	0,27	0,32	0,37
1.3.1	**Spring steel**	60	0,15	0,21	0,27	0,32	0,37
1.3.2		50	0,08	0,12	0,15	0,2	0,25
1.3.3		30	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**	95	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,15	0,21	0,27	0,32	0,37
2.2.1	**Nitriding steel**	75	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,08	0,12	0,15	0,2	0,25
2.3.1	**Tempered steel**	85	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,08	0,12	0,15	0,2	0,25
2.3.5		60	0,08	0,12	0,15	0,2	0,25
2.3.6		35	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**	60	0,08	0,12	0,15	0,2	0,25
3.2.1	**Tool steel for cold working**	75	0,08	0,12	0,15	0,2	0,25
3.2.2		60	0,08	0,12	0,15	0,2	0,25
3.2.3		35	0,08	0,12	0,15	0,2	0,25
3.2.4							
3.2.5							
3.3.1	**Tool steel for hot working**	60	0,08	0,12	0,15	0,2	0,25
3.3.2		35	0,08	0,12	0,15	0,2	0,25
3.3.3							
3.3.4							
3.3.5							
3.5.1	**Hardened tool steel** **< 55 HRC**						
3.5.2	**55–58 HRC**						
3.5.3	**58–60 HRC**						
3.5.4	**60–62 HRC**						
3.5.5	**62–64 HRC**						
4.1.1	**Stainless steel**						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**	80	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,15	0,21	0,27	0,32	0,37
5.1.3							
5.2.1	**Stainless cast steel**						
5.2.2							
6.1.1	**Cast iron with lamellar graphite**	105	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,2	0,25	0,35	0,4	0,46
6.1.4							
6.2.1	**Spheroidal cast iron**	85	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**	85	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,125	0,175	0,225	0,3	0,375
6.4.1	**GTS (black malleable cast iron)**	85	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,125	0,175	0,225	0,3	0,375
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							

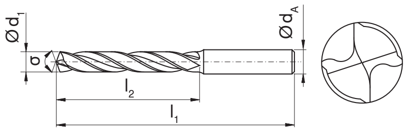
W0174, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 5xD | σ 140°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HL.UN.0174.0780h7.5XD.140.HA	8	91	53	W0174078340
7.9	HL.UN.0174.0790h7.5XD.140.HA	8	91	53	W0174079340
8.0	HL.UN.0174.0800h7.5XD.140.HA	8	91	53	W0174080340
8.1	HL.UN.0174.0810h7.5XD.140.HA	10	103	61	W0174081340
8.2	HL.UN.0174.0820h7.5XD.140.HA	10	103	61	W0174082340
8.3	HL.UN.0174.0830h7.5XD.140.HA	10	103	61	W0174083340
8.4	HL.UN.0174.0840h7.5XD.140.HA	10	103	61	W0174084340
8.5	HL.UN.0174.0850h7.5XD.140.HA	10	103	61	W0174085340
8.6	HL.UN.0174.0860h7.5XD.140.HA	10	103	61	W0174086340
8.7	HL.UN.0174.0870h7.5XD.140.HA	10	103	61	W0174087340
8.8	HL.UN.0174.0880h7.5XD.140.HA	10	103	61	W0174088340
8.9	HL.UN.0174.0890h7.5XD.140.HA	10	103	61	W0174089340
9.0	HL.UN.0174.0900h7.5XD.140.HA	10	103	61	W0174090340
9.1	HL.UN.0174.0910h7.5XD.140.HA	10	103	61	W0174091340
9.2	HL.UN.0174.0920h7.5XD.140.HA	10	103	61	W0174092340
9.3	HL.UN.0174.0930h7.5XD.140.HA	10	103	61	W0174093340
9.4	HL.UN.0174.0940h7.5XD.140.HA	10	103	61	W0174094340
9.5	HL.UN.0174.0950h7.5XD.140.HA	10	103	61	W0174095340
9.6	HL.UN.0174.0960h7.5XD.140.HA	10	103	61	W0174096340
9.7	HL.UN.0174.0970h7.5XD.140.HA	10	103	61	W0174097340
9.8	HL.UN.0174.0980h7.5XD.140.HA	10	103	61	W0174098340
9.9	HL.UN.0174.0990h7.5XD.140.HA	10	103	61	W0174099340
10.0	HL.UN.0174.1000h7.5XD.140.HA	10	103	61	W0174100340
10.2	HL.UN.0174.1020h7.5XD.140.HA	12	118	71	W0174102340
10.5	HL.UN.0174.1050h7.5XD.140.HA	12	118	71	W0174105340
10.8	HL.UN.0174.1080h7.5XD.140.HA	12	118	71	W0174108340
11.0	HL.UN.0174.1100h7.5XD.140.HA	12	118	71	W0174110340
11.2	HL.UN.0174.1120h7.5XD.140.HA	12	118	71	W0174112340
11.5	HL.UN.0174.1150h7.5XD.140.HA	12	118	71	W0174115340
11.8	HL.UN.0174.1180h7.5XD.140.HA	12	118	71	W0174118340
12.0	HL.UN.0174.1200h7.5XD.140.HA	12	118	71	W0174120340
12.2	HL.UN.0174.1220h7.5XD.140.HA	14	124	77	W0174122340
12.5	HL.UN.0174.1250h7.5XD.140.HA	14	124	77	W0174125340
12.8	HL.UN.0174.1280h7.5XD.140.HA	14	124	77	W0174128340
13.0	HL.UN.0174.1300h7.5XD.140.HA	14	124	77	W0174130340
13.2	HL.UN.0174.1320h7.5XD.140.HA	14	124	77	W0174132340
13.5	HL.UN.0174.1350h7.5XD.140.HA	14	124	77	W0174135340
13.8	HL.UN.0174.1380h7.5XD.140.HA	14	124	77	W0174138340
14.0	HL.UN.0174.1400h7.5XD.140.HA	14	124	77	W0174140340
14.2	HL.UN.0174.1420h7.5XD.140.HA	16	133	83	W0174142340
14.5	HL.UN.0174.1450h7.5XD.140.HA	16	133	83	W0174145340
14.8	HL.UN.0174.1480h7.5XD.140.HA	16	133	83	W0174148340
15.0	HL.UN.0174.1500h7.5XD.140.HA	16	133	83	W0174150340
15.2	HL.UN.0174.1520h7.5XD.140.HA	16	133	83	W0174152340
15.5	HL.UN.0174.1550h7.5XD.140.HA	16	133	83	W0174155340
15.8	HL.UN.0174.1580h7.5XD.140.HA	16	133	83	W0174158340
16.0	HL.UN.0174.1600h7.5XD.140.HA	16	133	83	W0174160340
16.5	HL.UN.0174.1650h7.5XD.140.HA	18	143	93	W0174165340

W0174, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	100	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,16	0,22	0,28	0,34	0,38
1.2.1	**Constructional steel**	100	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,15	0,21	0,27	0,32	0,37
1.3.1	**Spring steel**	60	0,15	0,21	0,27	0,32	0,37
1.3.2		50	0,08	0,12	0,15	0,2	0,25
1.3.3		30	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**	95	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,15	0,21	0,27	0,32	0,37
2.2.1	**Nitriding steel**	75	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,08	0,12	0,15	0,2	0,25
2.3.1	**Tempered steel**	85	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,08	0,12	0,15	0,2	0,25
2.3.5		60	0,08	0,12	0,15	0,2	0,25
2.3.6		35	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**	60	0,08	0,12	0,15	0,2	0,25
3.2.1	**Tool steel for cold working**	75	0,08	0,12	0,15	0,2	0,25
3.2.2		60	0,08	0,12	0,15	0,2	0,25
3.2.3		35	0,08	0,12	0,15	0,2	0,25
3.2.4							
3.2.5							
3.3.1	**Tool steel for hot working**	60	0,08	0,12	0,15	0,2	0,25
3.3.2		35	0,08	0,12	0,15	0,2	0,25
3.3.3							
3.3.4							
3.3.5							
3.5.1	**Hardened tool steel** **< 55 HRC**						
3.5.2	**55–58 HRC**						
3.5.3	**58–60 HRC**						
3.5.4	**60–62 HRC**						
3.5.5	**62–64 HRC**						
4.1.1	**Stainless steel**						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**	80	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,15	0,21	0,27	0,32	0,37
5.1.3							
5.2.1	**Stainless cast steel**						
5.2.2							
6.1.1	**Cast iron with lamellar graphite**	105	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,2	0,25	0,35	0,4	0,46
6.1.4							
6.2.1	**Spheroidal cast iron**	85	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**	85	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,125	0,175	0,225	0,3	0,375
6.4.1	**GTS (black malleable cast iron)**	85	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,125	0,175	0,225	0,3	0,375
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							

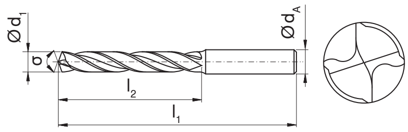
W0174, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 5xD | σ 140°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
17.0	HL.UN.0174.1700h7.5XD.140.HA	18	143	93	W0174170340
17.5	HL.UN.0174.1750h7.5XD.140.HA	18	143	93	W0174175340
18.0	HL.UN.0174.1800h7.5XD.140.HA	18	143	93	W0174180340
18.5	HL.UN.0174.1850h7.5XD.140.HA	20	153	101	W0174185340
19.0	HL.UN.0174.1900h7.5XD.140.HA	20	153	101	W0174190340
19.5	HL.UN.0174.1950h7.5XD.140.HA	20	153	101	W0174195340
20.0	HL.UN.0174.2000h7.5XD.140.HA	20	153	101	W0174200340

W0173, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]					
			= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	100	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	Constructional steel	100	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	Spring steel	60	0,08	0,15	0,21	0,27	0,32	0,37
1.3.2		50	0,05	0,08	0,12	0,15	0,2	0,25
1.3.3		30	0,05	0,08	0,12	0,15	0,2	0,25
2.1.1	Cementation steel	95	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	Nitriding steel	75	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	Tempered steel	85	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5		60	0,05	0,08	0,12	0,15	0,2	0,25
2.3.6		35	0,05	0,08	0,12	0,15	0,2	0,25
3.1.1	Non alloyed tool steel	60	0,05	0,08	0,12	0,15	0,2	0,25
3.2.1	Tool steel for cold working	75	0,05	0,08	0,12	0,15	0,2	0,25
3.2.2		60	0,05	0,08	0,12	0,15	0,2	0,25
3.2.3		35	0,05	0,08	0,12	0,15	0,2	0,25
3.2.4		40	0,05	0,08	0,12	0,15	0,2	0,25
3.2.5		35	0,05	0,08	0,12	0,15	0,2	0,25
3.3.1	Tool steel for hot working	60	0,05	0,08	0,12	0,15	0,2	0,25
3.3.2		35	0,05	0,08	0,12	0,15	0,2	0,25
3.3.3		50	0,05	0,08	0,12	0,15	0,2	0,25
3.3.4		40	0,05	0,08	0,12	0,15	0,2	0,25
3.3.5		30	0,05	0,08	0,12	0,15	0,2	0,25
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel	50	0,05	0,08	0,12	0,15	0,2	0,25
4.1.2		30	0,05	0,08	0,12	0,15	0,2	0,25
4.1.3		35	0,05	0,08	0,12	0,15	0,2	0,25
4.1.4		35	0,05	0,08	0,12	0,15	0,2	0,25
4.1.5		50	0,05	0,08	0,12	0,15	0,2	0,25
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel	80	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3		60	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	Stainless cast steel	40	0,05	0,08	0,12	0,15	0,2	0,25
5.2.2		30	0,05	0,08	0,12	0,15	0,2	0,25
6.1.1	Cast iron with lamellar graphite	105	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4		40	0,05	0,08	0,12	0,15	0,2	0,25
6.2.1	Spheroidal cast iron	85	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	85	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	GTS (black malleable cast iron)	85	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium	30	0,02	0,04	0,08	0,12	0,16	0,2
7.8.2		25	0,02	0,04	0,08	0,12	0,16	0,2
7.8.3		25	0,02	0,04	0,08	0,12	0,16	0,2

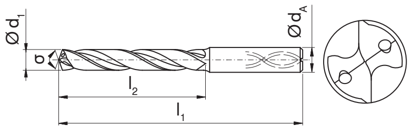
W0173, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ **5xD** | σ 140°

SCPP435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.0	HL.UN.0173.0200h7.5XD.140.IK.HA	4	57	21	W0173020370
2.1	HL.UN.0173.0210h7.5XD.140.IK.HA	4	57	21	W0173021370
2.2	HL.UN.0173.0220h7.5XD.140.IK.HA	4	57	21	W0173022370
2.3	HL.UN.0173.0230h7.5XD.140.IK.HA	4	57	21	W0173023370
2.4	HL.UN.0173.0240h7.5XD.140.IK.HA	4	57	21	W0173024370
2.5	HL.UN.0173.0250h7.5XD.140.IK.HA	4	57	21	W0173025370
2.6	HL.UN.0173.0260h7.5XD.140.IK.HA	4	57	21	W0173026370
2.7	HL.UN.0173.0270h7.5XD.140.IK.HA	4	57	21	W0173027370
2.8	HL.UN.0173.0280h7.5XD.140.IK.HA	4	57	21	W0173028370
2.9	HL.UN.0173.0290h7.5XD.140.IK.HA	4	57	21	W0173029370
3.0	HL.UN.0173.0300h7.5XD.140.IK.HA	6	66	28	W0173030370
3.1	HL.UN.0173.0310h7.5XD.140.IK.HA	6	66	28	W0173031370
3.2	HL.UN.0173.0320h7.5XD.140.IK.HA	6	66	28	W0173032370
3.3	HL.UN.0173.0330h7.5XD.140.IK.HA	6	66	28	W0173033370
3.4	HL.UN.0173.0340h7.5XD.140.IK.HA	6	66	28	W0173034370
3.5	HL.UN.0173.0350h7.5XD.140.IK.HA	6	66	28	W0173035370
3.6	HL.UN.0173.0360h7.5XD.140.IK.HA	6	66	28	W0173036370
3.7	HL.UN.0173.0370h7.5XD.140.IK.HA	6	66	28	W0173037370
3.8	HL.UN.0173.0380h7.5XD.140.IK.HA	6	74	36	W0173038370
3.9	HL.UN.0173.0390h7.5XD.140.IK.HA	6	74	36	W0173039370
4.0	HL.UN.0173.0400h7.5XD.140.IK.HA	6	74	36	W0173040370
4.1	HL.UN.0173.0410h7.5XD.140.IK.HA	6	74	36	W0173041370
4.2	HL.UN.0173.0420h7.5XD.140.IK.HA	6	74	36	W0173042370
4.3	HL.UN.0173.0430h7.5XD.140.IK.HA	6	74	36	W0173043370
4.4	HL.UN.0173.0440h7.5XD.140.IK.HA	6	74	36	W0173044370
4.5	HL.UN.0173.0450h7.5XD.140.IK.HA	6	74	36	W0173045370
4.6	HL.UN.0173.0460h7.5XD.140.IK.HA	6	74	36	W0173046370
4.7	HL.UN.0173.0470h7.5XD.140.IK.HA	6	74	36	W0173047370
4.8	HL.UN.0173.0480h7.5XD.140.IK.HA	6	82	44	W0173048370
4.9	HL.UN.0173.0490h7.5XD.140.IK.HA	6	82	44	W0173049370
5.0	HL.UN.0173.0500h7.5XD.140.IK.HA	6	82	44	W0173050370
5.1	HL.UN.0173.0510h7.5XD.140.IK.HA	6	82	44	W0173051370
5.2	HL.UN.0173.0520h7.5XD.140.IK.HA	6	82	44	W0173052370
5.3	HL.UN.0173.0530h7.5XD.140.IK.HA	6	82	44	W0173053370
5.4	HL.UN.0173.0540h7.5XD.140.IK.HA	6	82	44	W0173054370
5.5	HL.UN.0173.0550h7.5XD.140.IK.HA	6	82	44	W0173055370
5.6	HL.UN.0173.0560h7.5XD.140.IK.HA	6	82	44	W0173056370
5.7	HL.UN.0173.0570h7.5XD.140.IK.HA	6	82	44	W0173057370
5.8	HL.UN.0173.0580h7.5XD.140.IK.HA	6	82	44	W0173058370
5.9	HL.UN.0173.0590h7.5XD.140.IK.HA	6	82	44	W0173059370
6.0	HL.UN.0173.0600h7.5XD.140.IK.HA	6	82	44	W0173060370
6.1	HL.UN.0173.0610h7.5XD.140.IK.HA	8	91	53	W0173061370
6.2	HL.UN.0173.0620h7.5XD.140.IK.HA	8	91	53	W0173062370
6.3	HL.UN.0173.0630h7.5XD.140.IK.HA	8	91	53	W0173063370
6.4	HL.UN.0173.0640h7.5XD.140.IK.HA	8	91	53	W0173064370
6.5	HL.UN.0173.0650h7.5XD.140.IK.HA	8	91	53	W0173065370
6.6	HL.UN.0173.0660h7.5XD.140.IK.HA	8	91	53	W0173066370
6.7	HL.UN.0173.0670h7.5XD.140.IK.HA	8	91	53	W0173067370

W0173, coated

Cutting data

Index	Material designation	V$_c$ [m/min]	f [mm/rev]					
			= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	100	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	**Constructional steel**	100	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	**Spring steel**	60	0,08	0,15	0,21	0,27	0,32	0,37
1.3.2		50	0,05	0,08	0,12	0,15	0,2	0,25
1.3.3		30	0,05	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**	95	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	**Nitriding steel**	75	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	**Tempered steel**	85	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5		60	0,05	0,08	0,12	0,15	0,2	0,25
2.3.6		35	0,05	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**	60	0,05	0,08	0,12	0,15	0,2	0,25
3.2.1	**Tool steel for cold working**	75	0,05	0,08	0,12	0,15	0,2	0,25
3.2.2		60	0,05	0,08	0,12	0,15	0,2	0,25
3.2.3		35	0,05	0,08	0,12	0,15	0,2	0,25
3.2.4		40	0,05	0,08	0,12	0,15	0,2	0,25
3.2.5		35	0,05	0,08	0,12	0,15	0,2	0,25
3.3.1	**Tool steel for hot working**	60	0,05	0,08	0,12	0,15	0,2	0,25
3.3.2		35	0,05	0,08	0,12	0,15	0,2	0,25
3.3.3		50	0,05	0,08	0,12	0,15	0,2	0,25
3.3.4		40	0,05	0,08	0,12	0,15	0,2	0,25
3.3.5		30	0,05	0,08	0,12	0,15	0,2	0,25
3.5.1	**Hardened tool steel** **< 55 HRC**							
3.5.2	**55–58 HRC**							
3.5.3	**58–60 HRC**							
3.5.4	**60–62 HRC**							
3.5.5	**62–64 HRC**							
4.1.1	**Stainless steel**	50	0,05	0,08	0,12	0,15	0,2	0,25
4.1.2		30	0,05	0,08	0,12	0,15	0,2	0,25
4.1.3		35	0,05	0,08	0,12	0,15	0,2	0,25
4.1.4		35	0,05	0,08	0,12	0,15	0,2	0,25
4.1.5		50	0,05	0,08	0,12	0,15	0,2	0,25
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**	80	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3		60	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	**Stainless cast steel**	40	0,05	0,08	0,12	0,15	0,2	0,25
5.2.2		30	0,05	0,08	0,12	0,15	0,2	0,25
6.1.1	**Cast iron with lamellar graphite**	105	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4		40	0,05	0,08	0,12	0,15	0,2	0,25
6.2.1	**Spheroidal cast iron**	85	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**	85	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	**GTS (black malleable cast iron)**	85	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**	30	0,02	0,04	0,08	0,12	0,16	0,2
7.8.2		25	0,02	0,04	0,08	0,12	0,16	0,2
7.8.3		25	0,02	0,04	0,08	0,12	0,16	0,2

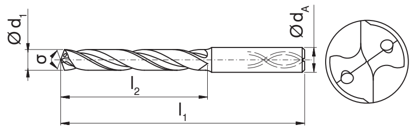
W0173, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$ | $d_1 = h7$, $d_A = h6$ | E | ≤ 5xD | σ 140°

SCPP435



d$_1$ [mm]	Type, description	d$_A$ [mm]	l$_1$ [mm]	l$_2$ [mm]	HA Material
6.8	HL.UN.0173.0680h7.5XD.140.IK.HA	8	91	53	W0173068370
6.9	HL.UN.0173.0690h7.5XD.140.IK.HA	8	91	53	W0173069370
7.0	HL.UN.0173.0700h7.5XD.140.IK.HA	8	91	53	W0173070370
7.1	HL.UN.0173.0710h7.5XD.140.IK.HA	8	91	53	W0173071370
7.2	HL.UN.0173.0720h7.5XD.140.IK.HA	8	91	53	W0173072370
7.3	HL.UN.0173.0730h7.5XD.140.IK.HA	8	91	53	W0173073370
7.4	HL.UN.0173.0740h7.5XD.140.IK.HA	8	91	53	W0173074370
7.5	HL.UN.0173.0750h7.5XD.140.IK.HA	8	91	53	W0173075370
7.6	HL.UN.0173.0760h7.5XD.140.IK.HA	8	91	53	W0173076370
7.7	HL.UN.0173.0770h7.5XD.140.IK.HA	8	91	53	W0173077370
7.8	HL.UN.0173.0780h7.5XD.140.IK.HA	8	91	53	W0173078370
7.9	HL.UN.0173.0790h7.5XD.140.IK.HA	8	91	53	W0173079370
8.0	HL.UN.0173.0800h7.5XD.140.IK.HA	8	91	53	W0173080370
8.1	HL.UN.0173.0810h7.5XD.140.IK.HA	10	103	61	W0173081370
8.2	HL.UN.0173.0820h7.5XD.140.IK.HA	10	103	61	W0173082370
8.3	HL.UN.0173.0830h7.5XD.140.IK.HA	10	103	61	W0173083370
8.4	HL.UN.0173.0840h7.5XD.140.IK.HA	10	103	61	W0173084370
8.5	HL.UN.0173.0850h7.5XD.140.IK.HA	10	103	61	W0173085370
8.6	HL.UN.0173.0860h7.5XD.140.IK.HA	10	103	61	W0173086370
8.7	HL.UN.0173.0870h7.5XD.140.IK.HA	10	103	61	W0173087370
8.8	HL.UN.0173.0880h7.5XD.140.IK.HA	10	103	61	W0173088370
8.9	HL.UN.0173.0890h7.5XD.140.IK.HA	10	103	61	W0173089370
9.0	HL.UN.0173.0900h7.5XD.140.IK.HA	10	103	61	W0173090370
9.1	HL.UN.0173.0910h7.5XD.140.IK.HA	10	103	61	W0173091370
9.2	HL.UN.0173.0920h7.5XD.140.IK.HA	10	103	61	W0173092370
9.3	HL.UN.0173.0930h7.5XD.140.IK.HA	10	103	61	W0173093370
9.4	HL.UN.0173.0940h7.5XD.140.IK.HA	10	103	61	W0173094370
9.5	HL.UN.0173.0950h7.5XD.140.IK.HA	10	103	61	W0173095370
9.6	HL.UN.0173.0960h7.5XD.140.IK.HA	10	103	61	W0173096370
9.7	HL.UN.0173.0970h7.5XD.140.IK.HA	10	103	61	W0173097370
9.8	HL.UN.0173.0980h7.5XD.140.IK.HA	10	103	61	W0173098370
9.9	HL.UN.0173.0990h7.5XD.140.IK.HA	10	103	61	W0173099370
10.0	HL.UN.0173.1000h7.5XD.140.IK.HA	10	103	61	W0173100370
10.2	HL.UN.0173.1020h7.5XD.140.IK.HA	12	118	71	W0173102370
10.3	HL.UN.0173.1030h7.5XD.140.IK.HA	12	118	71	W0173103370
10.5	HL.UN.0173.1050h7.5XD.140.IK.HA	12	118	71	W0173105370
10.8	HL.UN.0173.1080h7.5XD.140.IK.HA	12	118	71	W0173108370
11.0	HL.UN.0173.1100h7.5XD.140.IK.HA	12	118	71	W0173110370
11.2	HL.UN.0173.1120h7.5XD.140.IK.HA	12	118	71	W0173112370
11.5	HL.UN.0173.1150h7.5XD.140.IK.HA	12	118	71	W0173115370
11.8	HL.UN.0173.1180h7.5XD.140.IK.HA	12	118	71	W0173118370
12.0	HL.UN.0173.1200h7.5XD.140.IK.HA	12	118	71	W0173120370
12.2	HL.UN.0173.1220h7.5XD.140.IK.HA	14	124	77	W0173122370
12.5	HL.UN.0173.1250h7.5XD.140.IK.HA	14	124	77	W0173125370
12.8	HL.UN.0173.1280h7.5XD.140.IK.HA	14	124	77	W0173128370
13.0	HL.UN.0173.1300h7.5XD.140.IK.HA	14	124	77	W0173130370
13.2	HL.UN.0173.1320h7.5XD.140.IK.HA	14	124	77	W0173132370
13.5	HL.UN.0173.1350h7.5XD.140.IK.HA	14	124	77	W0173135370

W0173, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	100	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	Constructional steel	100	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	Spring steel	60	0,08	0,15	0,21	0,27	0,32	0,37
1.3.2		50	0,05	0,08	0,12	0,15	0,2	0,25
1.3.3		30	0,05	0,08	0,12	0,15	0,2	0,25
2.1.1	Cementation steel	95	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	Nitriding steel	75	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	Tempered steel	85	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5		60	0,05	0,08	0,12	0,15	0,2	0,25
2.3.6		35	0,05	0,08	0,12	0,15	0,2	0,25
3.1.1	Non alloyed tool steel	60	0,05	0,08	0,12	0,15	0,2	0,25
3.2.1	Tool steel for cold working	75	0,05	0,08	0,12	0,15	0,2	0,25
3.2.2		60	0,05	0,08	0,12	0,15	0,2	0,25
3.2.3		35	0,05	0,08	0,12	0,15	0,2	0,25
3.2.4		40	0,05	0,08	0,12	0,15	0,2	0,25
3.2.5		35	0,05	0,08	0,12	0,15	0,2	0,25
3.3.1	Tool steel for hot working	60	0,05	0,08	0,12	0,15	0,2	0,25
3.3.2		35	0,05	0,08	0,12	0,15	0,2	0,25
3.3.3		50	0,05	0,08	0,12	0,15	0,2	0,25
3.3.4		40	0,05	0,08	0,12	0,15	0,2	0,25
3.3.5		30	0,05	0,08	0,12	0,15	0,2	0,25
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel	50	0,05	0,08	0,12	0,15	0,2	0,25
4.1.2		30	0,05	0,08	0,12	0,15	0,2	0,25
4.1.3		35	0,05	0,08	0,12	0,15	0,2	0,25
4.1.4		35	0,05	0,08	0,12	0,15	0,2	0,25
4.1.5		50	0,05	0,08	0,12	0,15	0,2	0,25
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel	80	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3		60	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	Stainless cast steel	40	0,05	0,08	0,12	0,15	0,2	0,25
5.2.2		30	0,05	0,08	0,12	0,15	0,2	0,25
6.1.1	Cast iron with lamellar graphite	105	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4		40	0,05	0,08	0,12	0,15	0,2	0,25
6.2.1	Spheroidal cast iron	85	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	85	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	GTS (black malleable cast iron)	85	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium	30	0,02	0,04	0,08	0,12	0,16	0,2
7.8.2		25	0,02	0,04	0,08	0,12	0,16	0,2
7.8.3		25	0,02	0,04	0,08	0,12	0,16	0,2

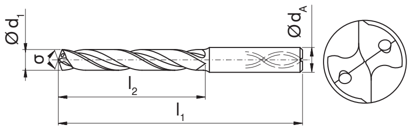
W0173, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 5xD | σ 140°

SCPP435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
13.8	HL.UN.0173.1380h7.5XD.140.IK.HA	14	124	77	W0173138370
14.0	HL.UN.0173.1400h7.5XD.140.IK.HA	14	124	77	W0173140370
14.2	HL.UN.0173.1420h7.5XD.140.IK.HA	16	133	83	W0173142370
14.5	HL.UN.0173.1450h7.5XD.140.IK.HA	16	133	83	W0173145370
14.8	HL.UN.0173.1480h7.5XD.140.IK.HA	16	133	83	W0173148370
15.0	HL.UN.0173.1500h7.5XD.140.IK.HA	16	133	83	W0173150370
15.2	HL.UN.0173.1520h7.5XD.140.IK.HA	16	133	83	W0173152370
15.5	HL.UN.0173.1550h7.5XD.140.IK.HA	16	133	83	W0173155370
15.8	HL.UN.0173.1580h7.5XD.140.IK.HA	16	133	83	W0173158370
16.0	HL.UN.0173.1600h7.5XD.140.IK.HA	16	133	83	W0173160370
16.5	HL.UN.0173.1650h7.5XD.140.IK.HA	18	143	93	W0173165370
17.0	HL.UN.0173.1700h7.5XD.140.IK.HA	18	143	93	W0173170370
17.5	HL.UN.0173.1750h7.5XD.140.IK.HA	18	143	93	W0173175370
18.0	HL.UN.0173.1800h7.5XD.140.IK.HA	18	143	93	W0173180370
18.5	HL.UN.0173.1850h7.5XD.140.IK.HA	20	153	101	W0173185370
19.0	HL.UN.0173.1900h7.5XD.140.IK.HA	20	153	101	W0173190370
19.5	HL.UN.0173.1950h7.5XD.140.IK.HA	20	153	101	W0173195370
20.0	HL.UN.0173.2000h7.5XD.140.IK.HA	20	153	101	W0173200370

W0172, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	85	0,16	0,22	0,28	0,34	0,38
1.1.2		75	0,16	0,22	0,28	0,34	0,38
1.2.1	Constructional steel	85	0,16	0,22	0,28	0,34	0,38
1.2.2		75	0,16	0,22	0,28	0,34	0,38
1.2.3		70	0,15	0,21	0,27	0,32	0,37
1.3.1	Spring steel						
1.3.2							
1.3.3							
2.1.1	Cementation steel	80	0,16	0,22	0,28	0,34	0,38
2.1.2		75	0,16	0,22	0,28	0,34	0,38
2.1.3		70	0,15	0,21	0,27	0,32	0,37
2.2.1	Nitriding steel	70	0,08	0,12	0,15	0,2	0,25
2.2.2		70	0,08	0,12	0,15	0,2	0,25
2.3.1	Tempered steel	70	0,15	0,21	0,27	0,32	0,37
2.3.2		70	0,08	0,12	0,15	0,2	0,25
2.3.3		70	0,15	0,21	0,27	0,32	0,37
2.3.4		70	0,08	0,12	0,15	0,2	0,25
2.3.5		55	0,08	0,12	0,15	0,2	0,25
2.3.6							
3.1.1	Non alloyed tool steel	55	0,08	0,12	0,15	0,2	0,25
3.2.1	Tool steel for cold working	70	0,08	0,12	0,15	0,2	0,25
3.2.2		55	0,08	0,12	0,15	0,2	0,25
3.2.3		35	0,08	0,12	0,15	0,2	0,25
3.2.4							
3.2.5							
3.3.1	Tool steel for hot working	55	0,08	0,12	0,15	0,2	0,25
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	Hardened tool steel < 55 HRC						
3.5.2	55–58 HRC						
3.5.3	58–60 HRC						
3.5.4	60–62 HRC						
3.5.5	62–64 HRC						
4.1.1	Stainless steel	75	0,08	0,12	0,15	0,2	0,25
4.1.2		65	0,08	0,12	0,15	0,2	0,25
4.1.3		70	0,08	0,12	0,15	0,2	0,25
4.1.4		70	0,08	0,12	0,15	0,2	0,25
4.1.5		75	0,08	0,12	0,15	0,2	0,25
4.2.1	Heat-resistant alloys						
4.2.2							
4.2.3							
4.2.4							
5.1.1	Conventional cast steel	75	0,16	0,22	0,28	0,34	0,38
5.1.2		70	0,15	0,21	0,27	0,32	0,37
5.1.3		55	0,08	0,12	0,15	0,2	0,25
5.2.1	Stainless cast steel	70	0,08	0,12	0,15	0,2	0,25
5.2.2		65	0,08	0,12	0,15	0,2	0,25
6.1.1	Cast iron with lamellar graphite	80	0,2	0,25	0,35	0,4	0,46
6.1.2		75	0,2	0,25	0,35	0,4	0,46
6.1.3		70	0,2	0,25	0,35	0,4	0,46
6.1.4		70	0,08	0,12	0,15	0,2	0,25
6.2.1	Spheroidal cast iron	80	0,125	0,175	0,225	0,3	0,375
6.2.2		75	0,125	0,175	0,225	0,3	0,375
6.2.3		55	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	80	0,125	0,175	0,225	0,3	0,375
6.3.2		75	0,125	0,175	0,225	0,3	0,375
6.4.1	GTS (black malleable cast iron)	80	0,125	0,175	0,225	0,3	0,375
6.4.2		75	0,125	0,175	0,225	0,3	0,375
7.1.1	Aluminium						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	Magnesium						
7.2.2							
7.3.1	Copper						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	CuZn (brass)						
7.4.2							
7.5.1	CuSn (bronze)						
7.5.2							
7.6.1	CuAlFe (Ampco)						
7.6.2							
7.8.1	Titanium	30	0,04	0,08	0,12	0,16	0,2
7.8.2		25	0,04	0,08	0,12	0,16	0,2
7.8.3		25	0,04	0,08	0,12	0,16	0,2

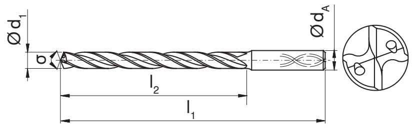
W0172, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 8xD | σ 135°

SCPP435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HL.UN.0172.0300h7.8XD.135.IK.HA	6	72	34	W0172030340
3.1	HL.UN.0172.0310h7.8XD.135.IK.HA	6	72	34	W0172031340
3.2	HL.UN.0172.0320h7.8XD.135.IK.HA	6	72	34	W0172032340
3.3	HL.UN.0172.0330h7.8XD.135.IK.HA	6	72	34	W0172033340
3.4	HL.UN.0172.0340h7.8XD.135.IK.HA	6	72	34	W0172034340
3.5	HL.UN.0172.0350h7.8XD.135.IK.HA	6	72	34	W0172035340
3.6	HL.UN.0172.0360h7.8XD.135.IK.HA	6	72	34	W0172036340
3.7	HL.UN.0172.0370h7.8XD.135.IK.HA	6	72	34	W0172037340
3.8	HL.UN.0172.0380h7.8XD.135.IK.HA	6	81	43	W0172038340
3.9	HL.UN.0172.0390h7.8XD.135.IK.HA	6	81	43	W0172039340
4.0	HL.UN.0172.0400h7.8XD.135.IK.HA	6	81	43	W0172040340
4.1	HL.UN.0172.0410h7.8XD.135.IK.HA	6	81	43	W0172041340
4.2	HL.UN.0172.0420h7.8XD.135.IK.HA	6	81	43	W0172042340
4.3	HL.UN.0172.0430h7.8XD.135.IK.HA	6	81	43	W0172043340
4.4	HL.UN.0172.0440h7.8XD.135.IK.HA	6	81	43	W0172044340
4.5	HL.UN.0172.0450h7.8XD.135.IK.HA	6	81	43	W0172045340
4.6	HL.UN.0172.0460h7.8XD.135.IK.HA	6	81	43	W0172046340
4.7	HL.UN.0172.0470h7.8XD.135.IK.HA	6	81	43	W0172047340
4.8	HL.UN.0172.0480h7.8XD.135.IK.HA	6	95	57	W0172048340
4.9	HL.UN.0172.0490h7.8XD.135.IK.HA	6	95	57	W0172049340
5.0	HL.UN.0172.0500h7.8XD.135.IK.HA	6	95	57	W0172050340
5.1	HL.UN.0172.0510h7.8XD.135.IK.HA	6	95	57	W0172051340
5.2	HL.UN.0172.0520h7.8XD.135.IK.HA	6	95	57	W0172052340
5.3	HL.UN.0172.0530h7.8XD.135.IK.HA	6	95	57	W0172053340
5.4	HL.UN.0172.0540h7.8XD.135.IK.HA	6	95	57	W0172054340
5.5	HL.UN.0172.0550h7.8XD.135.IK.HA	6	95	57	W0172055340
5.6	HL.UN.0172.0560h7.8XD.135.IK.HA	6	95	57	W0172056340
5.7	HL.UN.0172.0570h7.8XD.135.IK.HA	6	95	57	W0172057340
5.8	HL.UN.0172.0580h7.8XD.135.IK.HA	6	95	57	W0172058340
5.9	HL.UN.0172.0590h7.8XD.135.IK.HA	6	95	57	W0172059340
6.0	HL.UN.0172.0600h7.8XD.135.IK.HA	6	95	57	W0172060340
6.1	HL.UN.0172.0610h7.8XD.135.IK.HA	8	114	76	W0172061340
6.2	HL.UN.0172.0620h7.8XD.135.IK.HA	8	114	76	W0172062340
6.3	HL.UN.0172.0630h7.8XD.135.IK.HA	8	114	76	W0172063340
6.4	HL.UN.0172.0640h7.8XD.135.IK.HA	8	114	76	W0172064340
6.5	HL.UN.0172.0650h7.8XD.135.IK.HA	8	114	76	W0172065340
6.6	HL.UN.0172.0660h7.8XD.135.IK.HA	8	114	76	W0172066340
6.7	HL.UN.0172.0670h7.8XD.135.IK.HA	8	114	76	W0172067340
6.8	HL.UN.0172.0680h7.8XD.135.IK.HA	8	114	76	W0172068340
6.9	HL.UN.0172.0690h7.8XD.135.IK.HA	8	114	76	W0172069340
7.0	HL.UN.0172.0700h7.8XD.135.IK.HA	8	114	76	W0172070340
7.1	HL.UN.0172.0710h7.8XD.135.IK.HA	8	114	76	W0172071340
7.2	HL.UN.0172.0720h7.8XD.135.IK.HA	8	114	76	W0172072340
7.3	HL.UN.0172.0730h7.8XD.135.IK.HA	8	114	76	W0172073340
7.4	HL.UN.0172.0740h7.8XD.135.IK.HA	8	114	76	W0172074340
7.5	HL.UN.0172.0750h7.8XD.135.IK.HA	8	114	76	W0172075340
7.6	HL.UN.0172.0760h7.8XD.135.IK.HA	8	114	76	W0172076340
7.7	HL.UN.0172.0770h7.8XD.135.IK.HA	8	114	76	W0172077340

W0172, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]				
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		85	0,16	0,22	0,28	0,34	0,38
1.1.2			75	0,16	0,22	0,28	0,34	0,38
1.2.1	**Constructional steel**		85	0,16	0,22	0,28	0,34	0,38
1.2.2			75	0,16	0,22	0,28	0,34	0,38
1.2.3			70	0,15	0,21	0,27	0,32	0,37
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**		80	0,16	0,22	0,28	0,34	0,38
2.1.2			75	0,16	0,22	0,28	0,34	0,38
2.1.3			70	0,15	0,21	0,27	0,32	0,37
2.2.1	**Nitriding steel**		70	0,08	0,12	0,15	0,2	0,25
2.2.2			70	0,08	0,12	0,15	0,2	0,25
2.3.1	**Tempered steel**		70	0,15	0,21	0,27	0,32	0,37
2.3.2			70	0,08	0,12	0,15	0,2	0,25
2.3.3			70	0,15	0,21	0,27	0,32	0,37
2.3.4			70	0,08	0,12	0,15	0,2	0,25
2.3.5			55	0,08	0,12	0,15	0,2	0,25
2.3.6								
3.1.1	**Non alloyed tool steel**		55	0,08	0,12	0,15	0,2	0,25
3.2.1	**Tool steel for cold working**		70	0,08	0,12	0,15	0,2	0,25
3.2.2			55	0,08	0,12	0,15	0,2	0,25
3.2.3			35	0,08	0,12	0,15	0,2	0,25
3.2.4								
3.2.5								
3.3.1	**Tool steel for hot working**		55	0,08	0,12	0,15	0,2	0,25
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel**	**< 55 HRC**						
3.5.2		**55–58 HRC**						
3.5.3		**58–60 HRC**						
3.5.4		**60–62 HRC**						
3.5.5		**62–64 HRC**						
4.1.1	**Stainless steel**		75	0,08	0,12	0,15	0,2	0,25
4.1.2			65	0,08	0,12	0,15	0,2	0,25
4.1.3			70	0,08	0,12	0,15	0,2	0,25
4.1.4			70	0,08	0,12	0,15	0,2	0,25
4.1.5			75	0,08	0,12	0,15	0,2	0,25
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**		75	0,16	0,22	0,28	0,34	0,38
5.1.2			70	0,15	0,21	0,27	0,32	0,37
5.1.3			55	0,08	0,12	0,15	0,2	0,25
5.2.1	**Stainless cast steel**		70	0,08	0,12	0,15	0,2	0,25
5.2.2			65	0,08	0,12	0,15	0,2	0,25
6.1.1	**Cast iron with lamellar graphite**		80	0,2	0,25	0,35	0,4	0,46
6.1.2			75	0,2	0,25	0,35	0,4	0,46
6.1.3			70	0,2	0,25	0,35	0,4	0,46
6.1.4			70	0,08	0,12	0,15	0,2	0,25
6.2.1	**Spheroidal cast iron**		80	0,125	0,175	0,225	0,3	0,375
6.2.2			75	0,125	0,175	0,225	0,3	0,375
6.2.3			55	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**		80	0,125	0,175	0,225	0,3	0,375
6.3.2			75	0,125	0,175	0,225	0,3	0,375
6.4.1	**GTS (black malleable cast iron)**		80	0,125	0,175	0,225	0,3	0,375
6.4.2			75	0,125	0,175	0,225	0,3	0,375
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**		30	0,04	0,08	0,12	0,16	0,2
7.8.2			25	0,04	0,08	0,12	0,16	0,2
7.8.3			25	0,04	0,08	0,12	0,16	0,2

W0172, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$

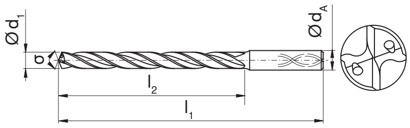
$d_1 = h7$
$d_A = h6$

E

≤ 8xD

σ 135°

SCPP435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HL.UN.0172.0780h7.8XD.135.IK.HA	8	114	76	W0172078340
7.9	HL.UN.0172.0790h7.8XD.135.IK.HA	8	114	76	W0172079340
8.0	HL.UN.0172.0800h7.8XD.135.IK.HA	8	114	76	W0172080340
8.1	HL.UN.0172.0810h7.8XD.135.IK.HA	10	142	95	W0172081340
8.2	HL.UN.0172.0820h7.8XD.135.IK.HA	10	142	95	W0172082340
8.3	HL.UN.0172.0830h7.8XD.135.IK.HA	10	142	95	W0172083340
8.4	HL.UN.0172.0840h7.8XD.135.IK.HA	10	142	95	W0172084340
8.5	HL.UN.0172.0850h7.8XD.135.IK.HA	10	142	95	W0172085340
8.6	HL.UN.0172.0860h7.8XD.135.IK.HA	10	142	95	W0172086340
8.7	HL.UN.0172.0870h7.8XD.135.IK.HA	10	142	95	W0172087340
8.8	HL.UN.0172.0880h7.8XD.135.IK.HA	10	142	95	W0172088340
8.9	HL.UN.0172.0890h7.8XD.135.IK.HA	10	142	95	W0172089340
9.0	HL.UN.0172.0900h7.8XD.135.IK.HA	10	142	95	W0172090340
9.1	HL.UN.0172.0910h7.8XD.135.IK.HA	10	142	95	W0172091340
9.2	HL.UN.0172.0920h7.8XD.135.IK.HA	10	142	95	W0172092340
9.3	HL.UN.0172.0930h7.8XD.135.IK.HA	10	142	95	W0172093340
9.4	HL.UN.0172.0940h7.8XD.135.IK.HA	10	142	95	W0172094340
9.5	HL.UN.0172.0950h7.8XD.135.IK.HA	10	142	95	W0172095340
9.6	HL.UN.0172.0960h7.8XD.135.IK.HA	10	142	95	W0172096340
9.7	HL.UN.0172.0970h7.8XD.135.IK.HA	10	142	95	W0172097340
9.8	HL.UN.0172.0980h7.8XD.135.IK.HA	10	142	95	W0172098340
9.9	HL.UN.0172.0990h7.8XD.135.IK.HA	10	142	95	W0172099340
10.0	HL.UN.0172.1000h7.8XD.135.IK.HA	10	142	95	W0172100340
10.2	HL.UN.0172.1020h7.8XD.135.IK.HA	12	162	114	W0172102340
10.5	HL.UN.0172.1050h7.8XD.135.IK.HA	12	162	114	W0172105340
11.0	HL.UN.0172.1100h7.8XD.135.IK.HA	12	162	114	W0172110340
11.5	HL.UN.0172.1150h7.8XD.135.IK.HA	12	162	114	W0172115340
12.0	HL.UN.0172.1200h7.8XD.135.IK.HA	12	162	114	W0172120340
12.5	HL.UN.0172.1250h7.8XD.135.IK.HA	14	178	131	W0172125340
13.0	HL.UN.0172.1300h7.8XD.135.IK.HA	14	178	131	W0172130340
13.5	HL.UN.0172.1350h7.8XD.135.IK.HA	14	178	131	W0172135340
14.0	HL.UN.0172.1400h7.8XD.135.IK.HA	14	178	131	W0172140340
14.5	HL.UN.0172.1450h7.8XD.135.IK.HA	16	203	152	W0172145340
15.0	HL.UN.0172.1500h7.8XD.135.IK.HA	16	203	152	W0172150340
15.5	HL.UN.0172.1550h7.8XD.135.IK.HA	16	203	152	W0172155340
16.0	HL.UN.0172.1600h7.8XD.135.IK.HA	16	203	152	W0172160340
16.5	HL.UN.0172.1650h7.8XD.135.IK.HA	18	222	171	W0172165340
17.0	HL.UN.0172.1700h7.8XD.135.IK.HA	18	222	171	W0172170340
17.5	HL.UN.0172.1750h7.8XD.135.IK.HA	18	222	171	W0172175340
18.0	HL.UN.0172.1800h7.8XD.135.IK.HA	18	222	171	W0172180340
18.5	HL.UN.0172.1850h7.8XD.135.IK.HA	20	243	190	W0172185340
19.0	HL.UN.0172.1900h7.8XD.135.IK.HA	20	243	190	W0172190340
19.5	HL.UN.0172.1950h7.8XD.135.IK.HA	20	243	190	W0172195340
20.0	HL.UN.0172.2000h7.8XD.135.IK.HA	20	243	190	W0172200340

W0171, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]			
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**		80	0,16	0,22	0,28	0,34
1.1.2			70	0,16	0,22	0,28	0,34
1.2.1	**Constructional steel**		80	0,16	0,22	0,28	0,34
1.2.2			70	0,16	0,22	0,28	0,34
1.2.3			65	0,15	0,21	0,27	0,32
1.3.1	**Spring steel**						
1.3.2							
1.3.3							
2.1.1	**Cementation steel**		75	0,16	0,22	0,28	0,34
2.1.2			70	0,16	0,22	0,28	0,34
2.1.3			65	0,15	0,21	0,27	0,32
2.2.1	**Nitriding steel**		65	0,08	0,12	0,15	0,2
2.2.2			65	0,08	0,12	0,15	0,2
2.3.1	**Tempered steel**		65	0,15	0,21	0,27	0,32
2.3.2			65	0,08	0,12	0,15	0,2
2.3.3			65	0,15	0,21	0,27	0,32
2.3.4			65	0,08	0,12	0,15	0,2
2.3.5			50	0,08	0,12	0,15	0,2
2.3.6							
3.1.1	**Non alloyed tool steel**		50	0,08	0,12	0,15	0,2
3.2.1	**Tool steel for cold working**		65	0,08	0,12	0,15	0,2
3.2.2			50	0,08	0,12	0,15	0,2
3.2.3			30	0,08	0,12	0,15	0,2
3.2.4							
3.2.5							
3.3.1	**Tool steel for hot working**		50	0,08	0,12	0,15	0,2
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	**Hardened tool steel**	**< 55 HRC**					
3.5.2		**55–58 HRC**					
3.5.3		**58–60 HRC**					
3.5.4		**60–62 HRC**					
3.5.5		**62–64 HRC**					
4.1.1	**Stainless steel**		70	0,08	0,12	0,15	0,2
4.1.2			60	0,08	0,12	0,15	0,2
4.1.3			65	0,08	0,12	0,15	0,2
4.1.4			65	0,08	0,12	0,15	0,2
4.1.5			70	0,08	0,12	0,15	0,2
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**		70	0,16	0,22	0,28	0,34
5.1.2			65	0,15	0,21	0,27	0,32
5.1.3			50	0,08	0,12	0,15	0,2
5.2.1	**Stainless cast steel**		65	0,08	0,12	0,15	0,2
5.2.2			60	0,08	0,12	0,15	0,2
6.1.1	**Cast iron with lamellar graphite**		75	0,2	0,25	0,35	0,4
6.1.2			70	0,2	0,25	0,35	0,4
6.1.3			65	0,2	0,25	0,35	0,4
6.1.4			65	0,08	0,12	0,15	0,2
6.2.1	**Spheroidal cast iron**		75	0,125	0,175	0,225	0,3
6.2.2			70	0,125	0,175	0,225	0,3
6.2.3			50	0,11	0,125	0,15	0,175
6.3.1	**GTW (white malleable cast iron)**		75	0,125	0,175	0,225	0,3
6.3.2			70	0,125	0,175	0,225	0,3
6.4.1	**GTS (black malleable cast iron)**		75	0,125	0,175	0,225	0,3
6.4.2			70	0,125	0,175	0,225	0,3
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**		30	0,04	0,08	0,12	0,16
7.8.2			25	0,04	0,08	0,12	0,16
7.8.3			25	0,04	0,08	0,12	0,16

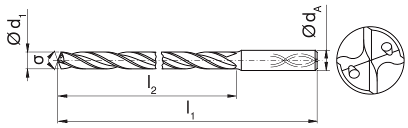
W0171, coated

High-performance twist drills

UN **HL**

λs=30° | d_1=h7 d_A=h6 | E | ≤ 12xD | σ 135°

SCPP435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HL.UN.0171.0300h7.12XD.135.IK.HA	6	92	54	W0171030340
3.1	HL.UN.0171.0310h7.12XD.135.IK.HA	6	92	54	W0171031340
3.2	HL.UN.0171.0320h7.12XD.135.IK.HA	6	92	54	W0171032340
3.3	HL.UN.0171.0330h7.12XD.135.IK.HA	6	92	54	W0171033340
3.4	HL.UN.0171.0340h7.12XD.135.IK.HA	6	92	54	W0171034340
3.5	HL.UN.0171.0350h7.12XD.135.IK.HA	6	92	54	W0171035340
3.6	HL.UN.0171.0360h7.12XD.135.IK.HA	6	92	54	W0171036340
3.7	HL.UN.0171.0370h7.12XD.135.IK.HA	6	92	54	W0171037340
3.8	HL.UN.0171.0380h7.12XD.135.IK.HA	6	102	64	W0171038340
3.9	HL.UN.0171.0390h7.12XD.135.IK.HA	6	102	64	W0171039340
4.0	HL.UN.0171.0400h7.12XD.135.IK.HA	6	102	64	W0171040340
4.1	HL.UN.0171.0410h7.12XD.135.IK.HA	6	102	64	W0171041340
4.2	HL.UN.0171.0420h7.12XD.135.IK.HA	6	102	64	W0171042340
4.3	HL.UN.0171.0430h7.12XD.135.IK.HA	6	102	64	W0171043340
4.4	HL.UN.0171.0440h7.12XD.135.IK.HA	6	102	64	W0171044340
4.5	HL.UN.0171.0450h7.12XD.135.IK.HA	6	102	64	W0171045340
4.6	HL.UN.0171.0460h7.12XD.135.IK.HA	6	102	64	W0171046340
4.7	HL.UN.0171.0470h7.12XD.135.IK.HA	6	102	64	W0171047340
4.8	HL.UN.0171.0480h7.12XD.135.IK.HA	6	116	78	W0171048340
4.9	HL.UN.0171.0490h7.12XD.135.IK.HA	6	116	78	W0171049340
5.0	HL.UN.0171.0500h7.12XD.135.IK.HA	6	116	78	W0171050340
5.1	HL.UN.0171.0510h7.12XD.135.IK.HA	6	116	78	W0171051340
5.2	HL.UN.0171.0520h7.12XD.135.IK.HA	6	116	78	W0171052340
5.3	HL.UN.0171.0530h7.12XD.135.IK.HA	6	116	78	W0171053340
5.4	HL.UN.0171.0540h7.12XD.135.IK.HA	6	116	78	W0171054340
5.5	HL.UN.0171.0550h7.12XD.135.IK.HA	6	116	78	W0171055340
5.6	HL.UN.0171.0560h7.12XD.135.IK.HA	6	116	78	W0171056340
5.7	HL.UN.0171.0570h7.12XD.135.IK.HA	6	116	78	W0171057340
5.8	HL.UN.0171.0580h7.12XD.135.IK.HA	6	116	78	W0171058340
5.9	HL.UN.0171.0590h7.12XD.135.IK.HA	6	116	78	W0171059340
6.0	HL.UN.0171.0600h7.12XD.135.IK.HA	6	116	78	W0171060340
6.1	HL.UN.0171.0610h7.12XD.135.IK.HA	8	146	108	W0171061340
6.2	HL.UN.0171.0620h7.12XD.135.IK.HA	8	146	108	W0171062340
6.3	HL.UN.0171.0630h7.12XD.135.IK.HA	8	146	108	W0171063340
6.4	HL.UN.0171.0640h7.12XD.135.IK.HA	8	146	108	W0171064340
6.5	HL.UN.0171.0650h7.12XD.135.IK.HA	8	146	108	W0171065340
6.6	HL.UN.0171.0660h7.12XD.135.IK.HA	8	146	108	W0171066340
6.7	HL.UN.0171.0670h7.12XD.135.IK.HA	8	146	108	W0171067340
6.8	HL.UN.0171.0680h7.12XD.135.IK.HA	8	146	108	W0171068340
6.9	HL.UN.0171.0690h7.12XD.135.IK.HA	8	146	108	W0171069340
7.0	HL.UN.0171.0700h7.12XD.135.IK.HA	8	146	108	W0171070340
7.1	HL.UN.0171.0710h7.12XD.135.IK.HA	8	146	108	W0171071340
7.2	HL.UN.0171.0720h7.12XD.135.IK.HA	8	146	108	W0171072340
7.3	HL.UN.0171.0730h7.12XD.135.IK.HA	8	146	108	W0171073340
7.4	HL.UN.0171.0740h7.12XD.135.IK.HA	8	146	108	W0171074340
7.5	HL.UN.0171.0750h7.12XD.135.IK.HA	8	146	108	W0171075340
7.6	HL.UN.0171.0760h7.12XD.135.IK.HA	8	146	108	W0171076340
7.7	HL.UN.0171.0770h7.12XD.135.IK.HA	8	146	108	W0171077340

W0171, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**	80	0,16	0,22	0,28	0,34
1.1.2		70	0,16	0,22	0,28	0,34
1.2.1	**Constructional steel**	80	0,16	0,22	0,28	0,34
1.2.2		70	0,16	0,22	0,28	0,34
1.2.3		65	0,15	0,21	0,27	0,32
1.3.1	**Spring steel**					
1.3.2						
1.3.3						
2.1.1	**Cementation steel**	75	0,16	0,22	0,28	0,34
2.1.2		70	0,16	0,22	0,28	0,34
2.1.3		65	0,15	0,21	0,27	0,32
2.2.1	**Nitriding steel**	65	0,08	0,12	0,15	0,2
2.2.2		65	0,08	0,12	0,15	0,2
2.3.1	**Tempered steel**	65	0,15	0,21	0,27	0,32
2.3.2		65	0,08	0,12	0,15	0,2
2.3.3		65	0,15	0,21	0,27	0,32
2.3.4		65	0,08	0,12	0,15	0,2
2.3.5		50	0,08	0,12	0,15	0,2
2.3.6						
3.1.1	**Non alloyed tool steel**	50	0,08	0,12	0,15	0,2
3.2.1	**Tool steel for cold working**	65	0,08	0,12	0,15	0,2
3.2.2		50	0,08	0,12	0,15	0,2
3.2.3		30	0,08	0,12	0,15	0,2
3.2.4						
3.2.5						
3.3.1	**Tool steel for hot working**	50	0,08	0,12	0,15	0,2
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**	70	0,08	0,12	0,15	0,2
4.1.2		60	0,08	0,12	0,15	0,2
4.1.3		65	0,08	0,12	0,15	0,2
4.1.4		65	0,08	0,12	0,15	0,2
4.1.5		70	0,08	0,12	0,15	0,2
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**	70	0,16	0,22	0,28	0,34
5.1.2		65	0,15	0,21	0,27	0,32
5.1.3		50	0,08	0,12	0,15	0,2
5.2.1	**Stainless cast steel**	65	0,08	0,12	0,15	0,2
5.2.2		60	0,08	0,12	0,15	0,2
6.1.1	**Cast iron with lamellar graphite**	75	0,2	0,25	0,35	0,4
6.1.2		70	0,2	0,25	0,35	0,4
6.1.3		65	0,2	0,25	0,35	0,4
6.1.4		65	0,08	0,12	0,15	0,2
6.2.1	**Spheroidal cast iron**	75	0,125	0,175	0,225	0,3
6.2.2		70	0,125	0,175	0,225	0,3
6.2.3		50	0,11	0,125	0,15	0,175
6.3.1	**GTW (white malleable cast iron)**	75	0,125	0,175	0,225	0,3
6.3.2		70	0,125	0,175	0,225	0,3
6.4.1	**GTS (black malleable cast iron)**	75	0,125	0,175	0,225	0,3
6.4.2		70	0,125	0,175	0,225	0,3
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**	30	0,04	0,08	0,12	0,16
7.8.2		25	0,04	0,08	0,12	0,16
7.8.3		25	0,04	0,08	0,12	0,16

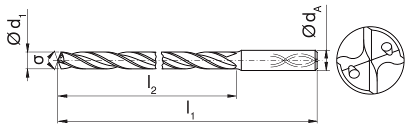
W0171, coated

High-performance twist drills

UN **HL**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 12xD | σ 135°

SCPP435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HL.UN.0171.0780h7.12XD.135.IK.HA	8	146	108	W0171078340
7.9	HL.UN.0171.0790h7.12XD.135.IK.HA	8	146	108	W0171079340
8.0	HL.UN.0171.0800h7.12XD.135.IK.HA	8	146	108	W0171080340
8.1	HL.UN.0171.0810h7.12XD.135.IK.HA	10	162	120	W0171081340
8.2	HL.UN.0171.0820h7.12XD.135.IK.HA	10	162	120	W0171082340
8.3	HL.UN.0171.0830h7.12XD.135.IK.HA	10	162	120	W0171083340
8.4	HL.UN.0171.0840h7.12XD.135.IK.HA	10	162	120	W0171084340
8.5	HL.UN.0171.0850h7.12XD.135.IK.HA	10	162	120	W0171085340
8.6	HL.UN.0171.0860h7.12XD.135.IK.HA	10	162	120	W0171086340
8.7	HL.UN.0171.0870h7.12XD.135.IK.HA	10	162	120	W0171087340
8.8	HL.UN.0171.0880h7.12XD.135.IK.HA	10	162	120	W0171088340
8.9	HL.UN.0171.0890h7.12XD.135.IK.HA	10	162	120	W0171089340
9.0	HL.UN.0171.0900h7.12XD.135.IK.HA	10	162	120	W0171090340
9.1	HL.UN.0171.0910h7.12XD.135.IK.HA	10	162	120	W0171091340
9.2	HL.UN.0171.0920h7.12XD.135.IK.HA	10	162	120	W0171092340
9.3	HL.UN.0171.0930h7.12XD.135.IK.HA	10	162	120	W0171093340
9.4	HL.UN.0171.0940h7.12XD.135.IK.HA	10	162	120	W0171094340
9.5	HL.UN.0171.0950h7.12XD.135.IK.HA	10	162	120	W0171095340
9.6	HL.UN.0171.0960h7.12XD.135.IK.HA	10	162	120	W0171096340
9.7	HL.UN.0171.0970h7.12XD.135.IK.HA	10	162	120	W0171097340
9.8	HL.UN.0171.0980h7.12XD.135.IK.HA	10	162	120	W0171098340
9.9	HL.UN.0171.0990h7.12XD.135.IK.HA	10	162	120	W0171099340
10.0	HL.UN.0171.1000h7.12XD.135.IK.HA	10	162	120	W0171100340
10.2	HL.UN.0171.1020h7.12XD.135.IK.HA	12	204	156	W0171102340
10.5	HL.UN.0171.1050h7.12XD.135.IK.HA	12	204	156	W0171105340
11.0	HL.UN.0171.1100h7.12XD.135.IK.HA	12	204	156	W0171110340
11.5	HL.UN.0171.1150h7.12XD.135.IK.HA	12	204	156	W0171115340
12.0	HL.UN.0171.1200h7.12XD.135.IK.HA	12	204	156	W0171120340
12.5	HL.UN.0171.1250h7.12XD.135.IK.HA	14	230	182	W0171125340
13.0	HL.UN.0171.1300h7.12XD.135.IK.HA	14	230	182	W0171130340
13.5	HL.UN.0171.1350h7.12XD.135.IK.HA	14	230	182	W0171135340
14.0	HL.UN.0171.1400h7.12XD.135.IK.HA	14	230	182	W0171140340
14.5	HL.UN.0171.1450h7.12XD.135.IK.HA	16	260	208	W0171145340
15.0	HL.UN.0171.1500h7.12XD.135.IK.HA	16	260	208	W0171150340
15.5	HL.UN.0171.1550h7.12XD.135.IK.HA	16	260	208	W0171155340
16.0	HL.UN.0171.1600h7.12XD.135.IK.HA	16	260	208	W0171160340

W1116, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
1.1.1	Machining steels		110	0,14	0,2	0,275
1.1.2			100	0,1	0,15	0,2
1.2.1	Constructional steel		110	0,14	0,2	0,275
1.2.2			100	0,1	0,15	0,2
1.2.3			95	0,1	0,15	0,2
1.3.1	Spring steel					
1.3.2						
1.3.3						
2.1.1	Cementation steel		105	0,14	0,2	0,275
2.1.2			100	0,14	0,2	0,275
2.1.3			95	0,1	0,15	0,2
2.2.1	Nitriding steel		95	0,1	0,15	0,2
2.2.2			95	0,1	0,15	0,2
2.3.1	Tempered steel		95	0,14	0,2	0,275
2.3.2			95	0,1	0,15	0,2
2.3.3			95	0,14	0,2	0,275
2.3.4			95	0,1	0,15	0,2
2.3.5			75	0,1	0,15	0,2
2.3.6						
3.1.1	Non alloyed tool steel		75	0,1	0,15	0,2
3.2.1	Tool steel for cold working		95	0,1	0,15	0,2
3.2.2			75	0,1	0,15	0,2
3.2.3						
3.2.4						
3.2.5						
3.3.1	Tool steel for hot working		75	0,1	0,15	0,2
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	Hardened tool steel	< 55 HRC				
3.5.2		55–58 HRC				
3.5.3		58–60 HRC				
3.5.4		60–62 HRC				
3.5.5		62–64 HRC				
4.1.1	Stainless steel		75	0,08	0,12	0,15
4.1.2			50	0,08	0,12	0,15
4.1.3			55	0,08	0,12	0,15
4.1.4			55	0,08	0,12	0,15
4.1.5			75	0,08	0,12	0,15
4.2.1	Heat-resistant alloys					
4.2.2						
4.2.3						
4.2.4						
5.1.1	Conventional cast steel		100	0,14	0,2	0,275
5.1.2			95	0,1	0,15	0,2
5.1.3			75	0,1	0,15	0,2
5.2.1	Stainless cast steel		50	0,08	0,12	0,15
5.2.2			55	0,08	0,12	0,15
6.1.1	Cast iron with lamellar graphite		105	0,23	0,335	0,425
6.1.2			100	0,23	0,335	0,425
6.1.3			95	0,23	0,335	0,425
6.1.4			75	0,08	0,12	0,15
6.2.1	Spheroidal cast iron		105	0,2	0,25	0,35
6.2.2			100	0,2	0,25	0,35
6.2.3			75	0,08	0,12	0,15
6.3.1	GTW (white malleable cast iron)		105	0,2	0,25	0,35
6.3.2			100	0,2	0,25	0,35
6.4.1	GTS (black malleable cast iron)		105	0,2	0,25	0,35
6.4.2			100	0,2	0,25	0,35
7.1.1	Aluminium					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	CuZn (brass)					
7.4.2						
7.5.1	CuSn (bronze)					
7.5.2						
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium		35	0,03	0,065	0,085
7.8.2			30	0,03	0,065	0,085
7.8.3			25	0,03	0,065	0,085

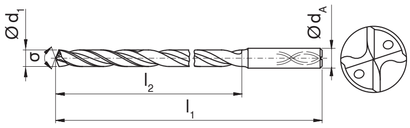
W1116, coated

Deep hole twist drills

UN **TS**

$\lambda_S = 30°$ | $d_1 = h7$, $d_A = h6$ | E | ≤ 16xD | σ 135° | W0108

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	TS.UN.1116.0300h7.16XD.135.IK.HA	6	100	60	W1116030340
3.2	TS.UN.1116.0320h7.16XD.135.IK.HA	6	100	60	W1116032340
3.3	TS.UN.1116.0330h7.16XD.135.IK.HA	6	100	60	W1116033340
3.5	TS.UN.1116.0350h7.16XD.135.IK.HA	6	100	60	W1116035340
3.8	TS.UN.1116.0380h7.16XD.135.IK.HA	6	115	75	W1116038340
4.0	TS.UN.1116.0400h7.16XD.135.IK.HA	6	115	75	W1116040340
4.2	TS.UN.1116.0420h7.16XD.135.IK.HA	6	115	75	W1116042340
4.5	TS.UN.1116.0450h7.16XD.135.IK.HA	6	130	90	W1116045340
4.8	TS.UN.1116.0480h7.16XD.135.IK.HA	6	130	90	W1116048340
5.0	TS.UN.1116.0500h7.16XD.135.IK.HA	6	130	90	W1116050340
5.5	TS.UN.1116.0550h7.16XD.135.IK.HA	6	150	108	W1116055340
5.8	TS.UN.1116.0580h7.16XD.135.IK.HA	6	150	108	W1116058340
6.0	TS.UN.1116.0600h7.16XD.135.IK.HA	6	150	108	W1116060340
6.5	TS.UN.1116.0650h7.16XD.135.IK.HA	8	165	125	W1116065340
6.8	TS.UN.1116.0680h7.16XD.135.IK.HA	8	165	125	W1116068340
7.0	TS.UN.1116.0700h7.16XD.135.IK.HA	8	165	125	W1116070340
7.5	TS.UN.1116.0750h7.16XD.135.IK.HA	8	180	140	W1116075340
7.8	TS.UN.1116.0780h7.16XD.135.IK.HA	8	180	140	W1116078340
8.0	TS.UN.1116.0800h7.16XD.135.IK.HA	8	180	140	W1116080340
8.5	TS.UN.1116.0850h7.16XD.135.IK.HA	10	205	160	W1116085340
8.8	TS.UN.1116.0880h7.16XD.135.IK.HA	10	205	160	W1116088340
9.0	TS.UN.1116.0900h7.16XD.135.IK.HA	10	205	160	W1116090340
9.8	TS.UN.1116.0980h7.16XD.135.IK.HA	10	225	180	W1116098340
10.0	TS.UN.1116.1000h7.16XD.135.IK.HA	10	225	180	W1116100340
10.2	TS.UN.1116.1020h7.16XD.135.IK.HA	12	240	190	W1116102340
10.8	TS.UN.1116.1080h7.16XD.135.IK.HA	12	240	190	W1116108340
11.8	TS.UN.1116.1180h7.16XD.135.IK.HA	12	265	215	W1116118340
12.0	TS.UN.1116.1200h7.16XD.135.IK.HA	12	265	215	W1116120340

⚠ For application see page(s) F489-F491.
For pilot hole, please use solid carbide drill type W0108 (see page(s) F385-F392).

W1120, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]			
				= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
1.1.1	Machining steels		105	0,1	0,14	0,2	0,275
1.1.2			95	0,075	0,1	0,15	0,2
1.2.1	Constructional steel		105	0,1	0,14	0,2	0,275
1.2.2			95	0,075	0,1	0,15	0,2
1.2.3			90	0,075	0,1	0,15	0,2
1.3.1	Spring steel						
1.3.2							
1.3.3							
2.1.1	Cementation steel		100	0,1	0,14	0,2	0,275
2.1.2			95	0,1	0,14	0,2	0,275
2.1.3			90	0,075	0,1	0,15	0,2
2.2.1	Nitriding steel		90	0,075	0,1	0,15	0,2
2.2.2			90	0,075	0,1	0,15	0,2
2.3.1	Tempered steel		90	0,1	0,14	0,2	0,275
2.3.2			90	0,075	0,1	0,15	0,2
2.3.3			90	0,1	0,14	0,2	0,275
2.3.4			90	0,075	0,1	0,15	0,2
2.3.5			70	0,075	0,1	0,15	0,2
2.3.6							
3.1.1	Non alloyed tool steel		70	0,075	0,1	0,15	0,2
3.2.1	Tool steel for cold working		90	0,075	0,1	0,15	0,2
3.2.2			70	0,075	0,1	0,15	0,2
3.2.3							
3.2.4							
3.2.5							
3.3.1	Tool steel for hot working		70	0,075	0,1	0,15	0,2
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	Hardened tool steel	< 55 HRC					
3.5.2		55–58 HRC					
3.5.3		58–60 HRC					
3.5.4		60–62 HRC					
3.5.5		62–64 HRC					
4.1.1	Stainless steel		70	0,05	0,08	0,12	0,15
4.1.2			45	0,05	0,08	0,12	0,15
4.1.3			50	0,05	0,08	0,12	0,15
4.1.4			50	0,05	0,08	0,12	0,15
4.1.5			70	0,05	0,08	0,12	0,15
4.2.1	Heat-resistant alloys						
4.2.2							
4.2.3							
4.2.4							
5.1.1	Conventional cast steel		95	0,1	0,14	0,2	0,275
5.1.2			90	0,075	0,1	0,15	0,2
5.1.3			70	0,075	0,1	0,15	0,2
5.2.1	Stainless cast steel		45	0,05	0,08	0,12	0,15
5.2.2			50	0,05	0,08	0,12	0,15
6.1.1	Cast iron with lamellar graphite		100	0,15	0,23	0,335	0,425
6.1.2			95	0,15	0,23	0,335	0,425
6.1.3			90	0,15	0,23	0,335	0,425
6.1.4			70	0,05	0,08	0,12	0,15
6.2.1	Spheroidal cast iron		100	0,125	0,2	0,25	0,35
6.2.2			95	0,125	0,2	0,25	0,35
6.2.3			70	0,05	0,08	0,12	0,15
6.3.1	GTW (white malleable cast iron)		100	0,125	0,2	0,25	0,35
6.3.2			95	0,125	0,2	0,25	0,35
6.4.1	GTS (black malleable cast iron)		100	0,125	0,2	0,25	0,35
6.4.2			95	0,125	0,2	0,25	0,35
7.1.1	Aluminium						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	Magnesium						
7.2.2							
7.3.1	Copper						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	CuZn (brass)						
7.4.2							
7.5.1	CuSn (bronze)						
7.5.2							
7.6.1	CuAlFe (Ampco)						
7.6.2							
7.8.1	Titanium						
7.8.2							
7.8.3							

W1120, coated

Deep hole twist drills

UN **TS**

$\lambda_S = 30°$

$d_1 = h7$
$d_A = h6$

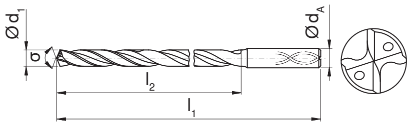
E

≤ **20xD**

σ 135°

W0108

SCPP420



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.0	TS.UN.1120.0200h7.20XD.135.IK.HA	4	92	50	W1120020340
2.2	TS.UN.1120.0220h7.20XD.135.IK.HA	4	92	50	W1120022340
2.3	TS.UN.1120.0230h7.20XD.135.IK.HA	4	92	50	W1120023340
2.4	TS.UN.1120.0240h7.20XD.135.IK.HA	4	112	70	W1120024340
2.5	TS.UN.1120.0250h7.20XD.135.IK.HA	4	112	70	W1120025340
2.7	TS.UN.1120.0270h7.20XD.135.IK.HA	4	112	70	W1120027340
2.8	TS.UN.1120.0280h7.20XD.135.IK.HA	4	112	70	W1120028340
3.0	TS.UN.1120.0300h7.20XD.135.IK.HA	6	120	80	W1120030340
3.2	TS.UN.1120.0320h7.20XD.135.IK.HA	6	120	80	W1120032340
3.3	TS.UN.1120.0330h7.20XD.135.IK.HA	6	120	80	W1120033340
3.5	TS.UN.1120.0350h7.20XD.135.IK.HA	6	120	80	W1120035340
3.8	TS.UN.1120.0380h7.20XD.135.IK.HA	6	130	90	W1120038340
4.0	TS.UN.1120.0400h7.20XD.135.IK.HA	6	130	90	W1120040340
4.2	TS.UN.1120.0420h7.20XD.135.IK.HA	6	160	110	W1120042340
4.5	TS.UN.1120.0450h7.20XD.135.IK.HA	6	160	110	W1120045340
4.8	TS.UN.1120.0480h7.20XD.135.IK.HA	6	160	120	W1120048340
5.0	TS.UN.1120.0500h7.20XD.135.IK.HA	6	160	120	W1120050340
5.5	TS.UN.1120.0550h7.20XD.135.IK.HA	6	185	140	W1120055340
5.8	TS.UN.1120.0580h7.20XD.135.IK.HA	6	185	140	W1120058340
6.0	TS.UN.1120.0600h7.20XD.135.IK.HA	6	185	140	W1120060340
6.5	TS.UN.1120.0650h7.20XD.135.IK.HA	8	210	160	W1120065340
6.8	TS.UN.1120.0680h7.20XD.135.IK.HA	8	210	160	W1120068340
7.0	TS.UN.1120.0700h7.20XD.135.IK.HA	8	210	160	W1120070340
7.5	TS.UN.1120.0750h7.20XD.135.IK.HA	8	230	180	W1120075340
7.8	TS.UN.1120.0780h7.20XD.135.IK.HA	8	230	180	W1120078340
8.0	TS.UN.1120.0800h7.20XD.135.IK.HA	8	230	180	W1120080340
8.5	TS.UN.1120.0850h7.20XD.135.IK.HA	10	260	195	W1120085340
8.8	TS.UN.1120.0880h7.20XD.135.IK.HA	10	290	230	W1120088340
9.0	TS.UN.1120.0900h7.20XD.135.IK.HA	10	290	230	W1120090340
9.8	TS.UN.1120.0980h7.20XD.135.IK.HA	10	290	230	W1120098340
10.0	TS.UN.1120.1000h7.20XD.135.IK.HA	10	290	230	W1120100340
10.2	TS.UN.1120.1020h7.20XD.135.IK.HA	12	315	268	W1120102340
10.8	TS.UN.1120.1080h7.20XD.135.IK.HA	12	315	268	W1120108340
11.8	TS.UN.1120.1180h7.20XD.135.IK.HA	12	315	268	W1120118340
12.0	TS.UN.1120.1200h7.20XD.135.IK.HA	12	315	268	W1120120340

For application see page(s) F489-F491.
For pilot hole, please use solid carbide drill type W0108 (see page(s) F385-F392).

W1125, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	 > Ø 5,0 = Ø 8,0	 > Ø 8,0 = Ø 12,0
1.1.1	Machining steels	95	0,14	0,2	0,275
1.1.2		85	0,1	0,15	0,2
1.2.1	Constructional steel	95	0,14	0,2	0,275
1.2.2		85	0,1	0,15	0,2
1.2.3		80	0,1	0,15	0,2
1.3.1	Spring steel				
1.3.2					
1.3.3					
2.1.1	Cementation steel	90	0,14	0,2	0,275
2.1.2		85	0,14	0,2	0,275
2.1.3		80	0,1	0,15	0,2
2.2.1	Nitriding steel	80	0,1	0,15	0,2
2.2.2		80	0,1	0,15	0,2
2.3.1	Tempered steel	80	0,14	0,2	0,275
2.3.2		80	0,1	0,15	0,2
2.3.3		80	0,14	0,2	0,275
2.3.4		80	0,1	0,15	0,2
2.3.5		65	0,1	0,15	0,2
2.3.6					
3.1.1	Non alloyed tool steel	65	0,1	0,15	0,2
3.2.1	Tool steel for cold working	80	0,1	0,15	0,2
3.2.2		65	0,1	0,15	0,2
3.2.3					
3.2.4					
3.2.5					
3.3.1	Tool steel for hot working	65	0,1	0,15	0,2
3.3.2					
3.3.3					
3.3.4					
3.3.5					
3.5.1	Hardened tool steel < 55 HRC				
3.5.2	55–58 HRC				
3.5.3	58–60 HRC				
3.5.4	60–62 HRC				
3.5.5	62–64 HRC				
4.1.1	Stainless steel	65	0,08	0,12	0,15
4.1.2		45	0,08	0,12	0,15
4.1.3		50	0,08	0,12	0,15
4.1.4		50	0,08	0,12	0,15
4.1.5		65	0,08	0,12	0,15
4.2.1	Heat-resistant alloys				
4.2.2					
4.2.3					
4.2.4					
5.1.1	Conventional cast steel	85	0,14	0,2	0,275
5.1.2		80	0,1	0,15	0,2
5.1.3		65	0,1	0,15	0,2
5.2.1	Stainless cast steel	45	0,08	0,12	0,15
5.2.2		50	0,08	0,12	0,15
6.1.1	Cast iron with lamellar graphite	90	0,23	0,335	0,425
6.1.2		85	0,23	0,335	0,425
6.1.3		80	0,23	0,335	0,425
6.1.4		65	0,08	0,12	0,15
6.2.1	Spheroidal cast iron	90	0,2	0,25	0,35
6.2.2		85	0,2	0,25	0,35
6.2.3		65	0,08	0,12	0,15
6.3.1	GTW (white malleable cast iron)	90	0,2	0,25	0,35
6.3.2		85	0,2	0,25	0,35
6.4.1	GTS (black malleable cast iron)	90	0,2	0,25	0,35
6.4.2		85	0,2	0,25	0,35
7.1.1	Aluminium				
7.1.2					
7.1.3					
7.1.4					
7.1.5					
7.1.6					
7.2.1	Magnesium				
7.2.2					
7.3.1	Copper				
7.3.2					
7.3.3					
7.3.4					
7.3.5					
7.3.6					
7.4.1	CuZn (brass)				
7.4.2					
7.5.1	CuSn (bronze)				
7.5.2					
7.6.1	CuAlFe (Ampco)				
7.6.2					
7.8.1	Titanium				
7.8.2					
7.8.3					

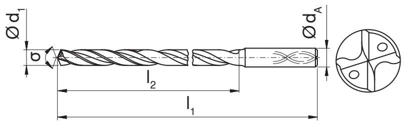
W1125, coated

Deep hole twist drills

UN **TS**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ **25xD** | σ 135° | W0108

SCPP420



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	TS.UN.1125.0300h7.25XD.135.IK.HA	6	135	98	W1125030340
3.2	TS.UN.1125.0320h7.25XD.135.IK.HA	6	135	98	W1125032340
3.3	TS.UN.1125.0330h7.25XD.135.IK.HA	6	150	110	W1125033340
3.5	TS.UN.1125.0350h7.25XD.135.IK.HA	6	150	110	W1125035340
3.8	TS.UN.1125.0380h7.25XD.135.IK.HA	6	160	120	W1125038340
4.0	TS.UN.1125.0400h7.25XD.135.IK.HA	6	160	120	W1125040340
4.2	TS.UN.1125.0420h7.25XD.135.IK.HA	6	160	120	W1125042340
4.5	TS.UN.1125.0450h7.25XD.135.IK.HA	6	180	135	W1125045340
4.8	TS.UN.1125.0480h7.25XD.135.IK.HA	6	180	135	W1125048340
5.0	TS.UN.1125.0500h7.25XD.135.IK.HA	6	180	135	W1125050340
5.5	TS.UN.1125.0550h7.25XD.135.IK.HA	6	205	168	W1125055340
5.8	TS.UN.1125.0580h7.25XD.135.IK.HA	6	205	168	W1125058340
6.0	TS.UN.1125.0600h7.25XD.135.IK.HA	6	205	168	W1125060340
6.5	TS.UN.1125.0650h7.25XD.135.IK.HA	8	240	200	W1125065340
6.8	TS.UN.1125.0680h7.25XD.135.IK.HA	8	240	200	W1125068340
7.0	TS.UN.1125.0700h7.25XD.135.IK.HA	8	240	200	W1125070340
7.5	TS.UN.1125.0750h7.25XD.135.IK.HA	8	260	220	W1125075340
7.8	TS.UN.1125.0780h7.25XD.135.IK.HA	8	260	220	W1125078340
8.0	TS.UN.1125.0800h7.25XD.135.IK.HA	8	260	220	W1125080340
8.5	TS.UN.1125.0850h7.25XD.135.IK.HA	10	285	240	W1125085340
8.8	TS.UN.1125.0880h7.25XD.135.IK.HA	10	310	268	W1125088340
9.0	TS.UN.1125.0900h7.25XD.135.IK.HA	10	310	268	W1125090340
9.8	TS.UN.1125.0980h7.25XD.135.IK.HA	10	310	268	W1125098340
10.0	TS.UN.1125.1000h7.25XD.135.IK.HA	10	310	268	W1125100340
10.2	TS.UN.1125.1020h7.25XD.135.IK.HA	12	375	325	W1125102340
10.8	TS.UN.1125.1080h7.25XD.135.IK.HA	12	375	325	W1125108340
11.8	TS.UN.1125.1180h7.25XD.135.IK.HA	12	375	325	W1125118340
12.0	TS.UN.1125.1200h7.25XD.135.IK.HA	12	375	325	W1125120340

⚠ For application see page(s) F489-F491.
For pilot hole, please use solid carbide drill type W0108 (see page(s) F385-F392).

W1130, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]			
				= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
1.1.1	Machining steels		90	0,1	0,14	0,2	0,275
1.1.2			80	0,075	0,1	0,15	0,2
1.2.1	Constructional steel		90	0,1	0,14	0,2	0,275
1.2.2			80	0,075	0,1	0,15	0,2
1.2.3			75	0,075	0,1	0,15	0,2
1.3.1	Spring steel						
1.3.2							
1.3.3							
2.1.1	Cementation steel		85	0,1	0,14	0,2	0,275
2.1.2			80	0,1	0,14	0,2	0,275
2.1.3			75	0,075	0,1	0,15	0,2
2.2.1	Nitriding steel		75	0,075	0,1	0,15	0,2
2.2.2			75	0,075	0,1	0,15	0,2
2.3.1	Tempered steel		75	0,1	0,14	0,2	0,275
2.3.2			75	0,075	0,1	0,15	0,2
2.3.3			75	0,1	0,14	0,2	0,275
2.3.4			75	0,075	0,1	0,15	0,2
2.3.5			60	0,075	0,1	0,15	0,2
2.3.6							
3.1.1	Non alloyed tool steel		60	0,075	0,1	0,15	0,2
3.2.1	Tool steel for cold working		75	0,075	0,1	0,15	0,2
3.2.2			60	0,075	0,1	0,15	0,2
3.2.3							
3.2.4							
3.2.5							
3.3.1	Tool steel for hot working		60	0,075	0,1	0,15	0,2
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	Hardened tool steel	< 55 HRC					
3.5.2		55–58 HRC					
3.5.3		58–60 HRC					
3.5.4		60–62 HRC					
3.5.5		62–64 HRC					
4.1.1	Stainless steel		60	0,05	0,08	0,12	0,15
4.1.2			40	0,05	0,08	0,12	0,15
4.1.3			45	0,05	0,08	0,12	0,15
4.1.4			45	0,05	0,08	0,12	0,15
4.1.5			60	0,05	0,08	0,12	0,15
4.2.1	Heat-resistant alloys						
4.2.2							
4.2.3							
4.2.4							
5.1.1	Conventional cast steel		80	0,1	0,14	0,2	0,275
5.1.2			75	0,075	0,1	0,15	0,2
5.1.3			60	0,075	0,1	0,15	0,2
5.2.1	Stainless cast steel		40	0,05	0,08	0,12	0,15
5.2.2			45	0,05	0,08	0,12	0,15
6.1.1	Cast iron with lamellar graphite		85	0,15	0,23	0,335	0,425
6.1.2			80	0,15	0,23	0,335	0,425
6.1.3			75	0,15	0,23	0,335	0,425
6.1.4			60	0,05	0,08	0,12	0,15
6.2.1	Spheroidal cast iron		85	0,125	0,2	0,25	0,35
6.2.2			80	0,125	0,2	0,25	0,35
6.2.3			60	0,05	0,08	0,12	0,15
6.3.1	GTW (white malleable cast iron)		85	0,125	0,2	0,25	0,35
6.3.2			80	0,125	0,2	0,25	0,35
6.4.1	GTS (black malleable cast iron)		85	0,125	0,2	0,25	0,35
6.4.2			80	0,125	0,2	0,25	0,35
7.1.1	Aluminium						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	Magnesium						
7.2.2							
7.3.1	Copper						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	CuZn (brass)						
7.4.2							
7.5.1	CuSn (bronze)						
7.5.2							
7.6.1	CuAlFe (Ampco)						
7.6.2							
7.8.1	Titanium						
7.8.2							
7.8.3							

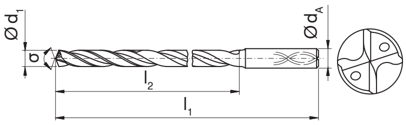
W1130, coated

Deep hole twist drills

UN | TS

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 30xD | σ 135° | W0108

SCPP420



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.0	TS.UN.1130.0200h7.30XD.135.IK.HA	4	115	70	W1130020440
2.2	TS.UN.1130.0220h7.30XD.135.IK.HA	4	115	70	W1130022440
2.3	TS.UN.1130.0230h7.30XD.135.IK.HA	4	115	70	W1130023440
2.4	TS.UN.1130.0240h7.30XD.135.IK.HA	4	138	90	W1130024440
2.5	TS.UN.1130.0250h7.30XD.135.IK.HA	4	138	90	W1130025440
2.7	TS.UN.1130.0270h7.30XD.135.IK.HA	4	138	90	W1130027440
2.8	TS.UN.1130.0280h7.30XD.135.IK.HA	4	138	90	W1130028440
3.0	TS.UN.1130.0300h7.30XD.135.IK.HA	6	150	105	W1130030440
3.2	TS.UN.1130.0320h7.30XD.135.IK.HA	6	150	105	W1130032440
3.3	TS.UN.1130.0330h7.30XD.135.IK.HA	6	185	135	W1130033440
3.5	TS.UN.1130.0350h7.30XD.135.IK.HA	6	185	135	W1130035440
3.8	TS.UN.1130.0380h7.30XD.135.IK.HA	6	185	135	W1130038440
4.0	TS.UN.1130.0400h7.30XD.135.IK.HA	6	185	135	W1130040440
4.2	TS.UN.1130.0420h7.30XD.135.IK.HA	6	185	135	W1130042440
4.5	TS.UN.1130.0450h7.30XD.135.IK.HA	6	215	165	W1130045440
4.8	TS.UN.1130.0480h7.30XD.135.IK.HA	6	215	165	W1130048440
5.0	TS.UN.1130.0500h7.30XD.135.IK.HA	6	215	165	W1130050440
5.5	TS.UN.1130.0550h7.30XD.135.IK.HA	6	230	180	W1130055440
5.8	TS.UN.1130.0580h7.30XD.135.IK.HA	6	230	180	W1130058440
6.0	TS.UN.1130.0600h7.30XD.135.IK.HA	6	230	180	W1130060440
6.5	TS.UN.1130.0650h7.30XD.135.IK.HA	8	280	215	W1130065440
6.8	TS.UN.1130.0680h7.30XD.135.IK.HA	8	280	230	W1130068440
7.0	TS.UN.1130.0700h7.30XD.135.IK.HA	8	280	230	W1130070440
7.5	TS.UN.1130.0750h7.30XD.135.IK.HA	8	280	230	W1130075440
7.8	TS.UN.1130.0780h7.30XD.135.IK.HA	8	315	265	W1130078440
8.0	TS.UN.1130.0800h7.30XD.135.IK.HA	8	315	265	W1130080440
8.5	TS.UN.1130.0850h7.30XD.135.IK.HA	10	350	295	W1130085440
8.8	TS.UN.1130.0880h7.30XD.135.IK.HA	10	380	330	W1130088440
9.0	TS.UN.1130.0900h7.30XD.135.IK.HA	10	380	330	W1130090440
9.8	TS.UN.1130.0980h7.30XD.135.IK.HA	10	380	330	W1130098440
10.0	TS.UN.1130.1000h7.30XD.135.IK.HA	10	380	330	W1130100440
10.2	TS.UN.1130.1020h7.30XD.135.IK.HA	12	430	380	W1130102440
10.8	TS.UN.1130.1080h7.30XD.135.IK.HA	12	430	380	W1130108440
11.8	TS.UN.1130.1180h7.30XD.135.IK.HA	12	430	380	W1130118440
12.0	TS.UN.1130.1200h7.30XD.135.IK.HA	12	430	380	W1130120440

⚠ For application see page(s) F489-F491.
For pilot hole, please use solid carbide drill type W0108 (see page(s) F385-F392).

W1140, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]		
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 9,0
1.1.1	Machining steels	75	0,1	0,15	0,2
1.1.2		65	0,08	0,12	0,15
1.2.1	Constructional steel	75	0,1	0,15	0,2
1.2.2		65	0,08	0,12	0,15
1.2.3		60	0,08	0,12	0,15
1.3.1	Spring steel				
1.3.2					
1.3.3					
2.1.1	Cementation steel	70	0,1	0,15	0,2
2.1.2		65	0,1	0,15	0,2
2.1.3		60	0,08	0,12	0,15
2.2.1	Nitriding steel	60	0,08	0,12	0,15
2.2.2		60	0,08	0,12	0,15
2.3.1	Tempered steel	60	0,1	0,15	0,2
2.3.2		60	0,08	0,12	0,15
2.3.3		60	0,1	0,15	0,2
2.3.4		60	0,08	0,12	0,15
2.3.5		50	0,08	0,12	0,15
2.3.6					
3.1.1	Non alloyed tool steel	50	0,08	0,12	0,15
3.2.1	Tool steel for cold working	60	0,08	0,12	0,15
3.2.2		50	0,08	0,12	0,15
3.2.3					
3.2.4					
3.2.5					
3.3.1	Tool steel for hot working	50	0,08	0,12	0,15
3.3.2					
3.3.3					
3.3.4					
3.3.5					
3.5.1	Hardened tool steel < 55 HRC				
3.5.2	55–58 HRC				
3.5.3	58–60 HRC				
3.5.4	60–62 HRC				
3.5.5	62–64 HRC				
4.1.1	Stainless steel	50	0,06	0,09	0,11
4.1.2		35	0,06	0,09	0,11
4.1.3		40	0,06	0,09	0,11
4.1.4		40	0,06	0,09	0,11
4.1.5		50	0,06	0,09	0,11
4.2.1	Heat-resistant alloys				
4.2.2					
4.2.3					
4.2.4					
5.1.1	Conventional cast steel	65	0,1	0,15	0,2
5.1.2		60	0,08	0,12	0,15
5.1.3		50	0,08	0,12	0,15
5.2.1	Stainless cast steel	35	0,06	0,09	0,11
5.2.2		40	0,06	0,09	0,11
6.1.1	Cast iron with lamellar graphite	70	0,2	0,25	0,35
6.1.2		65	0,2	0,25	0,35
6.1.3		60	0,2	0,25	0,35
6.1.4		50	0,06	0,09	0,11
6.2.1	Spheroidal cast iron	70	0,14	0,2	0,275
6.2.2		65	0,14	0,2	0,275
6.2.3		50	0,08	0,12	0,15
6.3.1	GTW (white malleable cast iron)	70	0,14	0,2	0,275
6.3.2		65	0,14	0,2	0,275
6.4.1	GTS (black malleable cast iron)	70	0,14	0,2	0,275
6.4.2		65	0,14	0,2	0,275
7.1.1	Aluminium				
7.1.2					
7.1.3					
7.1.4					
7.1.5					
7.1.6					
7.2.1	Magnesium				
7.2.2					
7.3.1	Copper				
7.3.2					
7.3.3					
7.3.4					
7.3.5					
7.3.6					
7.4.1	CuZn (brass)				
7.4.2					
7.5.1	CuSn (bronze)				
7.5.2					
7.6.1	CuAlFe (Ampco)				
7.6.2					
7.8.1	Titanium				
7.8.2					
7.8.3					

W1140, coated

Deep hole twist drills

UN **TS**

λ_S = 30°

d_1 = fg6
d_A = h6

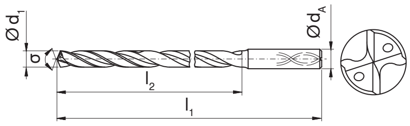
E

≤ **40xD**

σ 135°

W0108

SCPP420



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	TS.UN.1140.0300fg6.40XD.135.IK.HA	6	195	150	W1140030440
4.0	TS.UN.1140.0400fg6.40XD.135.IK.HA	6	220	175	W1140040440
4.2	TS.UN.1140.0420fg6.40XD.135.IK.HA	6	245	200	W1140042440
4.5	TS.UN.1140.0450fg6.40XD.135.IK.HA	6	245	200	W1140045440
4.8	TS.UN.1140.0480fg6.40XD.135.IK.HA	6	275	230	W1140048440
5.0	TS.UN.1140.0500fg6.40XD.135.IK.HA	6	275	230	W1140050440
5.5	TS.UN.1140.0550fg6.40XD.135.IK.HA	6	305	260	W1140055440
5.8	TS.UN.1140.0580fg6.40XD.135.IK.HA	6	305	260	W1140058440
6.0	TS.UN.1140.0600fg6.40XD.135.IK.HA	6	305	260	W1140060440
6.5	TS.UN.1140.0650fg6.40XD.135.IK.HA	8	345	300	W1140065440
6.8	TS.UN.1140.0680fg6.40XD.135.IK.HA	8	345	300	W1140068440
7.0	TS.UN.1140.0700fg6.40XD.135.IK.HA	8	345	300	W1140070440
7.5	TS.UN.1140.0750fg6.40XD.135.IK.HA	8	385	340	W1140075440
7.8	TS.UN.1140.0780fg6.40XD.135.IK.HA	8	385	340	W1140078440
8.0	TS.UN.1140.0800fg6.40XD.135.IK.HA	8	385	340	W1140080440
8.5	TS.UN.1140.0850fg6.40XD.135.IK.HA	10	430	380	W1140085440
8.8	TS.UN.1140.0880fg6.40XD.135.IK.HA	10	430	380	W1140088440
9.0	TS.UN.1140.0900fg6.40XD.135.IK.HA	10	430	380	W1140090440

⚠ For application see page(s) F489-F491.
For pilot hole, please use solid carbide drill type W0108 (see page(s) F385-F392).

W1150, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]	
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 7,0
1.1.1	Machining steels		65	0,1	0,15
1.1.2			55	0,08	0,12
1.2.1	Constructional steel		65	0,1	0,15
1.2.2			55	0,08	0,12
1.2.3			50	0,08	0,12
1.3.1	Spring steel				
1.3.2					
1.3.3					
2.1.1	Cementation steel		60	0,1	0,15
2.1.2			55	0,1	0,15
2.1.3			50	0,08	0,12
2.2.1	Nitriding steel		50	0,08	0,12
2.2.2			50	0,08	0,12
2.3.1	Tempered steel		50	0,1	0,15
2.3.2			50	0,08	0,12
2.3.3			50	0,1	0,15
2.3.4			50	0,08	0,12
2.3.5			45	0,08	0,12
2.3.6					
3.1.1	Non alloyed tool steel		45	0,08	0,12
3.2.1	Tool steel for cold working		50	0,08	0,12
3.2.2			45	0,08	0,12
3.2.3					
3.2.4					
3.2.5					
3.3.1	Tool steel for hot working		45	0,08	0,12
3.3.2					
3.3.3					
3.3.4					
3.3.5					
3.5.1	Hardened tool steel	< 55 HRC			
3.5.2		55–58 HRC			
3.5.3		58–60 HRC			
3.5.4		60–62 HRC			
3.5.5		62–64 HRC			
4.1.1	Stainless steel		45	0,06	0,09
4.1.2			30	0,06	0,09
4.1.3			35	0,06	0,09
4.1.4			35	0,06	0,09
4.1.5			45	0,06	0,09
4.2.1	Heat-resistant alloys				
4.2.2					
4.2.3					
4.2.4					
5.1.1	Conventional cast steel		55	0,1	0,15
5.1.2			50	0,08	0,12
5.1.3			55	0,08	0,12
5.2.1	Stainless cast steel		30	0,06	0,09
5.2.2			35	0,06	0,09
6.1.1	Cast iron with lamellar graphite		60	0,2	0,25
6.1.2			55	0,2	0,25
6.1.3			50	0,2	0,25
6.1.4			45	0,06	0,09
6.2.1	Spheroidal cast iron		60	0,14	0,2
6.2.2			55	0,14	0,2
6.2.3			45	0,08	0,12
6.3.1	GTW (white malleable cast iron)		60	0,14	0,2
6.3.2			55	0,14	0,2
6.4.1	GTS (black malleable cast iron)		60	0,14	0,2
6.4.2			55	0,14	0,2
7.1.1	Aluminium				
7.1.2					
7.1.3					
7.1.4					
7.1.5					
7.1.6					
7.2.1	Magnesium				
7.2.2					
7.3.1	Copper				
7.3.2					
7.3.3					
7.3.4					
7.3.5					
7.3.6					
7.4.1	CuZn (brass)				
7.4.2					
7.5.1	CuSn (bronze)				
7.5.2					
7.6.1	CuAlFe (Ampco)				
7.6.2					
7.8.1	Titanium				
7.8.2					
7.8.3					

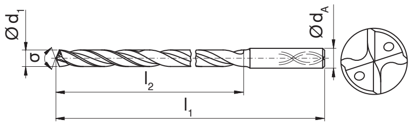
W1150, coated

Deep hole twist drills

UN **TS**

$\lambda_S = 30°$ | d_1 = fg6 d_A=h6 | E | ≤ **50xD** | σ 135° | W0108

SCPP420



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	TS.UN.1150.0300fg6.50XD.135.IK.HA	6	220	175	W1150030440
4.0	TS.UN.1150.0400fg6.50XD.135.IK.HA	6	265	220	W1150040440
4.2	TS.UN.1150.0420fg6.50XD.135.IK.HA	6	290	245	W1150042440
4.5	TS.UN.1150.0450fg6.50XD.135.IK.HA	6	290	245	W1150045440
4.8	TS.UN.1150.0480fg6.50XD.135.IK.HA	6	320	275	W1150048440
5.0	TS.UN.1150.0500fg6.50XD.135.IK.HA	6	320	275	W1150050440
5.5	TS.UN.1150.0550fg6.50XD.135.IK.HA	6	355	310	W1150055440
5.8	TS.UN.1150.0580fg6.50XD.135.IK.HA	6	355	315	W1150058440
6.0	TS.UN.1150.0600fg6.50XD.135.IK.HA	6	355	315	W1150060440
6.5	TS.UN.1150.0650fg6.50XD.135.IK.HA	8	395	350	W1150065440
7.0	TS.UN.1150.0700fg6.50XD.135.IK.HA	8	425	380	W1150070440

⚠ For application see page(s) F489-F491.
For pilot hole, please use solid carbide drill type W0108 (see page(s) F385-F392).

W0105, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]								
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	90	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.1.2		80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.2.1	Constructional steel	90	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.2.2		80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.2.3		75	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.3.1	Spring steel	50	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.3.2		40	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.3		20	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.1.1	Cementation steel	80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
2.1.2		75	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
2.1.3		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.2.1	Nitriding steel	70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.2		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.1	Tempered steel	70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.3		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.5		60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.6		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.1.1	Non alloyed tool steel	60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.2.1	Tool steel for cold working	75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.2.2		60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.2.3		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.4										
3.2.5										
3.3.1	Tool steel for hot working	60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.3.2		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.3.3										
3.3.4										
3.3.5										
3.5.1	Hardened tool steel < 55 HRC									
3.5.2	55–58 HRC									
3.5.3	58–60 HRC									
3.5.4	60–62 HRC									
3.5.5	62–64 HRC									
4.1.1	Stainless steel									
4.1.2										
4.1.3										
4.1.4										
4.1.5										
4.2.1	Heat-resistant alloys									
4.2.2										
4.2.3										
4.2.4										
5.1.1	Conventional cast steel	80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
5.1.2		75	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.3										
5.2.1	Stainless cast steel									
5.2.2										
6.1.1	Cast iron with lamellar graphite	85	0,075	0,1	0,15	0,23	0,335	0,425	0,52	0,58
6.1.2		80	0,075	0,1	0,15	0,23	0,335	0,425	0,52	0,58
6.1.3		75	0,075	0,1	0,15	0,23	0,335	0,425	0,52	0,58
6.1.4										
6.2.1	Spheroidal cast iron	85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.2.2		80	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.2.3		60	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.3.2		80	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.4.1	GTS (black malleable cast iron)	85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.4.2		80	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
7.1.1	Aluminium									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	Magnesium									
7.2.2										
7.3.1	Copper									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	CuZn (brass)									
7.4.2										
7.5.1	CuSn (bronze)									
7.5.2										
7.6.1	CuAlFe (Ampco)									
7.6.2										
7.8.1	Titanium									
7.8.2										
7.8.3										

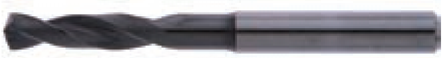
W0105, coated

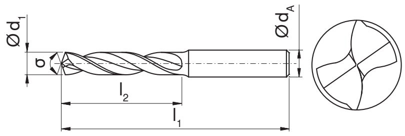
HPC twist drills

ST **HPC**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 3xD | σ 140°

SCPP425





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
1.0	HPC.ST.0105.0100h7.3XD.140.HA	4	45	7	W0105010240
1.1	HPC.ST.0105.0110h7.3XD.140.HA	4	45	7	W0105011240
1.2	HPC.ST.0105.0120h7.3XD.140.HA	4	45	7	W0105012240
1.3	HPC.ST.0105.0130h7.3XD.140.HA	4	45	7	W0105013240
1.4	HPC.ST.0105.0140h7.3XD.140.HA	4	45	7	W0105014240
1.5	HPC.ST.0105.0150h7.3XD.140.HA	4	55	14	W0105015240
1.6	HPC.ST.0105.0160h7.3XD.140.HA	4	55	14	W0105016240
1.7	HPC.ST.0105.0170h7.3XD.140.HA	4	55	14	W0105017240
1.8	HPC.ST.0105.0180h7.3XD.140.HA	4	55	14	W0105018240
1.9	HPC.ST.0105.0190h7.3XD.140.HA	4	55	14	W0105019240
2.0	HPC.ST.0105.0200h7.3XD.140.HA	4	55	20	W0105020240
2.1	HPC.ST.0105.0210h7.3XD.140.HA	4	55	20	W0105021240
2.2	HPC.ST.0105.0220h7.3XD.140.HA	4	55	20	W0105022240
2.3	HPC.ST.0105.0230h7.3XD.140.HA	4	55	20	W0105023240
2.4	HPC.ST.0105.0240h7.3XD.140.HA	4	55	20	W0105024240
2.5	HPC.ST.0105.0250h7.3XD.140.HA	4	55	20	W0105025240
2.6	HPC.ST.0105.0260h7.3XD.140.HA	4	55	20	W0105026240
2.7	HPC.ST.0105.0270h7.3XD.140.HA	4	55	20	W0105027240
2.8	HPC.ST.0105.0280h7.3XD.140.HA	4	55	20	W0105028240
2.9	HPC.ST.0105.0290h7.3XD.140.HA	4	55	20	W0105029240
3.0	HPC.ST.0105.0300h7.3XD.140.HA	6	62	20	W0105030240
3.1	HPC.ST.0105.0310h7.3XD.140.HA	6	62	20	W0105031240
3.2	HPC.ST.0105.0320h7.3XD.140.HA	6	62	20	W0105032240
3.3	HPC.ST.0105.0330h7.3XD.140.HA	6	62	20	W0105033240
3.4	HPC.ST.0105.0340h7.3XD.140.HA	6	62	20	W0105034240
3.5	HPC.ST.0105.0350h7.3XD.140.HA	6	62	20	W0105035240
3.6	HPC.ST.0105.0360h7.3XD.140.HA	6	62	20	W0105036240
3.7	HPC.ST.0105.0370h7.3XD.140.HA	6	62	20	W0105037240
3.8	HPC.ST.0105.0380h7.3XD.140.HA	6	66	24	W0105038240
3.9	HPC.ST.0105.0390h7.3XD.140.HA	6	66	24	W0105039240
4.0	HPC.ST.0105.0400h7.3XD.140.HA	6	66	24	W0105040240
4.1	HPC.ST.0105.0410h7.3XD.140.HA	6	66	24	W0105041240
4.2	HPC.ST.0105.0420h7.3XD.140.HA	6	66	24	W0105042240
4.3	HPC.ST.0105.0430h7.3XD.140.HA	6	66	24	W0105043240
4.4	HPC.ST.0105.0440h7.3XD.140.HA	6	66	24	W0105044240
4.5	HPC.ST.0105.0450h7.3XD.140.HA	6	66	24	W0105045240
4.6	HPC.ST.0105.0460h7.3XD.140.HA	6	66	24	W0105046240
4.7	HPC.ST.0105.0470h7.3XD.140.HA	6	66	24	W0105047240
4.8	HPC.ST.0105.0480h7.3XD.140.HA	6	66	28	W0105048240
4.9	HPC.ST.0105.0490h7.3XD.140.HA	6	66	28	W0105049240
5.0	HPC.ST.0105.0500h7.3XD.140.HA	6	66	28	W0105050240
5.1	HPC.ST.0105.0510h7.3XD.140.HA	6	66	28	W0105051240
5.2	HPC.ST.0105.0520h7.3XD.140.HA	6	66	28	W0105052240
5.3	HPC.ST.0105.0530h7.3XD.140.HA	6	66	28	W0105053240
5.4	HPC.ST.0105.0540h7.3XD.140.HA	6	66	28	W0105054240
5.5	HPC.ST.0105.0550h7.3XD.140.HA	6	66	28	W0105055240
5.6	HPC.ST.0105.0560h7.3XD.140.HA	6	66	28	W0105056240
5.7	HPC.ST.0105.0570h7.3XD.140.HA	6	66	28	W0105057240

W0105, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	90	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.1.2		80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.2.1	**Constructional steel**	90	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.2.2		80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.2.3		75	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.3.1	**Spring steel**	50	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.3.2		40	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.3		20	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**	80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
2.1.2		75	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
2.1.3		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.2.1	**Nitriding steel**	70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.2		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.1	**Tempered steel**	70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.3		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.5		60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.6		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**	60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.2.1	**Tool steel for cold working**	75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.2.2		60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.2.3		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.4										
3.2.5										
3.3.1	**Tool steel for hot working**	60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.3.2		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.3.3										
3.3.4										
3.3.5										
3.5.1	**Hardened tool steel** **< 55 HRC**									
3.5.2	**55–58 HRC**									
3.5.3	**58–60 HRC**									
3.5.4	**60–62 HRC**									
3.5.5	**62–64 HRC**									
4.1.1	**Stainless steel**									
4.1.2										
4.1.3										
4.1.4										
4.1.5										
4.2.1	**Heat-resistant alloys**									
4.2.2										
4.2.3										
4.2.4										
5.1.1	**Conventional cast steel**	80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
5.1.2		75	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.3										
5.2.1	**Stainless cast steel**									
5.2.2										
6.1.1	**Cast iron with lamellar graphite**	85	0,075	0,1	0,15	0,23	0,335	0,425	0,52	0,58
6.1.2		80	0,075	0,1	0,15	0,23	0,335	0,425	0,52	0,58
6.1.3		75	0,075	0,1	0,15	0,23	0,335	0,425	0,52	0,58
6.1.4										
6.2.1	**Spheroidal cast iron**	85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.2.2		80	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.2.3		60	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**	85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.3.2		80	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.4.1	**GTS (black malleable cast iron)**	85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.4.2		80	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
7.1.1	**Aluminium**									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	**CuZn (brass)**									
7.4.2										
7.5.1	**CuSn (bronze)**									
7.5.2										
7.6.1	**CuAlFe (Ampco)**									
7.6.2										
7.8.1	**Titanium**									
7.8.2										
7.8.3										

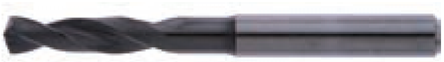
W0105, coated

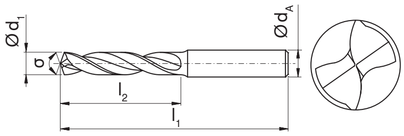
HPC twist drills

ST **HPC**

$\lambda_S = 30°$ $d_1 = h7$ $d_A = h6$ E ≤ 3xD σ 140°

SCPP425





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
5.8	HPC.ST.0105.0580h7.3XD.140.HA	6	66	28	W0105058240
5.9	HPC.ST.0105.0590h7.3XD.140.HA	6	66	28	W0105059240
6.0	HPC.ST.0105.0600h7.3XD.140.HA	6	66	28	W0105060240
6.1	HPC.ST.0105.0610h7.3XD.140.HA	8	79	34	W0105061240
6.2	HPC.ST.0105.0620h7.3XD.140.HA	8	79	34	W0105062240
6.3	HPC.ST.0105.0630h7.3XD.140.HA	8	79	34	W0105063240
6.4	HPC.ST.0105.0640h7.3XD.140.HA	8	79	34	W0105064240
6.5	HPC.ST.0105.0650h7.3XD.140.HA	8	79	34	W0105065240
6.6	HPC.ST.0105.0660h7.3XD.140.HA	8	79	34	W0105066240
6.7	HPC.ST.0105.0670h7.3XD.140.HA	8	79	34	W0105067240
6.8	HPC.ST.0105.0680h7.3XD.140.HA	8	79	34	W0105068240
6.9	HPC.ST.0105.0690h7.3XD.140.HA	8	79	34	W0105069240
7.0	HPC.ST.0105.0700h7.3XD.140.HA	8	79	34	W0105070240
7.1	HPC.ST.0105.0710h7.3XD.140.HA	8	79	41	W0105071240
7.2	HPC.ST.0105.0720h7.3XD.140.HA	8	79	41	W0105072240
7.3	HPC.ST.0105.0730h7.3XD.140.HA	8	79	41	W0105073240
7.4	HPC.ST.0105.0740h7.3XD.140.HA	8	79	41	W0105074240
7.5	HPC.ST.0105.0750h7.3XD.140.HA	8	79	41	W0105075240
7.6	HPC.ST.0105.0760h7.3XD.140.HA	8	79	41	W0105076240
7.7	HPC.ST.0105.0770h7.3XD.140.HA	8	79	41	W0105077240
7.8	HPC.ST.0105.0780h7.3XD.140.HA	8	79	41	W0105078240
7.9	HPC.ST.0105.0790h7.3XD.140.HA	8	79	41	W0105079240
8.0	HPC.ST.0105.0800h7.3XD.140.HA	8	79	41	W0105080240
8.1	HPC.ST.0105.0810h7.3XD.140.HA	10	89	47	W0105081240
8.2	HPC.ST.0105.0820h7.3XD.140.HA	10	89	47	W0105082240
8.3	HPC.ST.0105.0830h7.3XD.140.HA	10	89	47	W0105083240
8.4	HPC.ST.0105.0840h7.3XD.140.HA	10	89	47	W0105084240
8.5	HPC.ST.0105.0850h7.3XD.140.HA	10	89	47	W0105085240
8.6	HPC.ST.0105.0860h7.3XD.140.HA	10	89	47	W0105086240
8.7	HPC.ST.0105.0870h7.3XD.140.HA	10	89	47	W0105087240
8.8	HPC.ST.0105.0880h7.3XD.140.HA	10	89	47	W0105088240
8.9	HPC.ST.0105.0890h7.3XD.140.HA	10	89	47	W0105089240
9.0	HPC.ST.0105.0900h7.3XD.140.HA	10	89	47	W0105090240
9.1	HPC.ST.0105.0910h7.3XD.140.HA	10	89	47	W0105091240
9.2	HPC.ST.0105.0920h7.3XD.140.HA	10	89	47	W0105092240
9.3	HPC.ST.0105.0930h7.3XD.140.HA	10	89	47	W0105093240
9.4	HPC.ST.0105.0940h7.3XD.140.HA	10	89	47	W0105094240
9.5	HPC.ST.0105.0950h7.3XD.140.HA	10	89	47	W0105095240
9.6	HPC.ST.0105.0960h7.3XD.140.HA	10	89	47	W0105096240
9.7	HPC.ST.0105.0970h7.3XD.140.HA	10	89	47	W0105097240
9.8	HPC.ST.0105.0980h7.3XD.140.HA	10	89	47	W0105098240
9.9	HPC.ST.0105.0990h7.3XD.140.HA	10	89	47	W0105099240
10.0	HPC.ST.0105.1000h7.3XD.140.HA	10	89	47	W0105100240
10.2	HPC.ST.0105.1020h7.3XD.140.HA	12	102	55	W0105102240
10.5	HPC.ST.0105.1050h7.3XD.140.HA	12	102	55	W0105105240
10.8	HPC.ST.0105.1080h7.3XD.140.HA	12	102	55	W0105108240
11.0	HPC.ST.0105.1100h7.3XD.140.HA	12	102	55	W0105110240
11.2	HPC.ST.0105.1120h7.3XD.140.HA	12	102	55	W0105112240

W0105, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	90	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.1.2		80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.2.1	Constructional steel	90	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.2.2		80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
1.2.3		75	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.3.1	Spring steel	50	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.3.2		40	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.3		20	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.1.1	Cementation steel	80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
2.1.2		75	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
2.1.3		70	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.2.1	Nitriding steel	70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.2		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.1	Tempered steel	70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.3		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		70	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.5		60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.6		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.1.1	Non alloyed tool steel	60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.2.1	Tool steel for cold working	75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.2.2		60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.2.3		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.2.4										
3.2.5										
3.3.1	Tool steel for hot working	60	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
3.3.2		40	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
3.3.3										
3.3.4										
3.3.5										
3.5.1	Hardened tool steel < 55 HRC									
3.5.2	55–58 HRC									
3.5.3	58–60 HRC									
3.5.4	60–62 HRC									
3.5.5	62–64 HRC									
4.1.1	Stainless steel									
4.1.2										
4.1.3										
4.1.4										
4.1.5										
4.2.1	Heat-resistant alloys									
4.2.2										
4.2.3										
4.2.4										
5.1.1	Conventional cast steel	80	0,05	0,067	0,1	0,18	0,24	0,3	0,35	0,4
5.1.2		75	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.3										
5.2.1	Stainless cast steel									
5.2.2										
6.1.1	Cast iron with lamellar graphite	85	0,075	0,1	0,15	0,23	0,335	0,425	0,52	0,58
6.1.2		80	0,075	0,1	0,15	0,23	0,335	0,425	0,52	0,58
6.1.3		75	0,075	0,1	0,15	0,23	0,335	0,425	0,52	0,58
6.1.4										
6.2.1	Spheroidal cast iron	85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.2.2		80	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.2.3		60	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.3.2		80	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.4.1	GTS (black malleable cast iron)	85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.4.2		80	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
7.1.1	Aluminium									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	Magnesium									
7.2.2										
7.3.1	Copper									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	CuZn (brass)									
7.4.2										
7.5.1	CuSn (bronze)									
7.5.2										
7.6.1	CuAlFe (Ampco)									
7.6.2										
7.8.1	Titanium									
7.8.2										
7.8.3										

W0105, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$

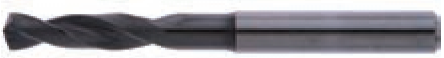
$d_1 = h7$
$d_A = h6$

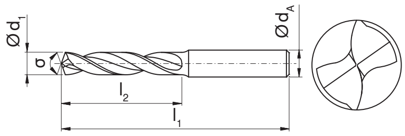
E

≤ **3xD**

σ 140°

SCPP425





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
11.5	HPC.ST.0105.1150h7.3XD.140.HA	12	102	55	W0105115240
11.8	HPC.ST.0105.1180h7.3XD.140.HA	12	102	55	W0105118240
12.0	HPC.ST.0105.1200h7.3XD.140.HA	12	102	55	W0105120240
12.2	HPC.ST.0105.1220h7.3XD.140.HA	14	107	60	W0105122240
12.5	HPC.ST.0105.1250h7.3XD.140.HA	14	107	60	W0105125240
12.8	HPC.ST.0105.1280h7.3XD.140.HA	14	107	60	W0105128240
13.0	HPC.ST.0105.1300h7.3XD.140.HA	14	107	60	W0105130240
13.5	HPC.ST.0105.1350h7.3XD.140.HA	14	107	60	W0105135240
13.8	HPC.ST.0105.1380h7.3XD.140.HA	14	107	60	W0105138240
14.0	HPC.ST.0105.1400h7.3XD.140.HA	14	107	60	W0105140240
14.2	HPC.ST.0105.1420h7.3XD.140.HA	16	115	65	W0105142240
14.5	HPC.ST.0105.1450h7.3XD.140.HA	16	115	65	W0105145240
14.8	HPC.ST.0105.1480h7.3XD.140.HA	16	115	65	W0105148240
15.0	HPC.ST.0105.1500h7.3XD.140.HA	16	115	65	W0105150240
15.2	HPC.ST.0105.1520h7.3XD.140.HA	16	115	65	W0105152240
15.5	HPC.ST.0105.1550h7.3XD.140.HA	16	115	65	W0105155240
15.8	HPC.ST.0105.1580h7.3XD.140.HA	16	115	65	W0105158240
16.0	HPC.ST.0105.1600h7.3XD.140.HA	16	115	65	W0105160240
16.5	HPC.ST.0105.1650h7.3XD.140.HA	18	123	73	W0105165240
16.8	HPC.ST.0105.1680h7.3XD.140.HA	18	123	73	W0105168240
17.0	HPC.ST.0105.1700h7.3XD.140.HA	18	123	73	W0105170240
17.5	HPC.ST.0105.1750h7.3XD.140.HA	18	123	73	W0105175240
18.0	HPC.ST.0105.1800h7.3XD.140.HA	18	123	73	W0105180240
18.5	HPC.ST.0105.1850h7.3XD.140.HA	20	131	79	W0105185240
18.8	HPC.ST.0105.1880h7.3XD.140.HA	20	131	79	W0105188240
19.0	HPC.ST.0105.1900h7.3XD.140.HA	20	131	79	W0105190240
19.5	HPC.ST.0105.1950h7.3XD.140.HA	20	131	79	W0105195240
20.0	HPC.ST.0105.2000h7.3XD.140.HA	20	131	79	W0105200240

W0107, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]				
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	130	0,18	0,24	0,3	0,35	0,4
1.1.2		120	0,18	0,24	0,3	0,35	0,4
1.2.1	**Constructional steel**	130	0,18	0,24	0,3	0,35	0,4
1.2.2		120	0,18	0,24	0,3	0,35	0,4
1.2.3		75	0,16	0,22	0,28	0,34	0,38
1.3.1	**Spring steel**	60	0,16	0,22	0,28	0,34	0,38
1.3.2		50	0,15	0,21	0,27	0,32	0,37
1.3.3		30	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**	120	0,18	0,24	0,3	0,35	0,4
2.1.2		110	0,18	0,24	0,3	0,35	0,4
2.1.3		100	0,16	0,22	0,28	0,34	0,38
2.2.1	**Nitriding steel**	100	0,15	0,21	0,27	0,32	0,37
2.2.2		100	0,15	0,21	0,27	0,32	0,37
2.3.1	**Tempered steel**	110	0,16	0,22	0,28	0,34	0,38
2.3.2		100	0,15	0,21	0,27	0,32	0,37
2.3.3		100	0,16	0,22	0,28	0,34	0,38
2.3.4		100	0,15	0,21	0,27	0,32	0,37
2.3.5		85	0,15	0,21	0,27	0,32	0,37
2.3.6		60	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**	80	0,15	0,21	0,27	0,32	0,37
3.2.1	**Tool steel for cold working**	95	0,15	0,21	0,27	0,32	0,37
3.2.2		80	0,15	0,21	0,27	0,32	0,37
3.2.3		55	0,08	0,12	0,15	0,2	0,25
3.2.4		60	0,08	0,12	0,15	0,2	0,25
3.2.5		55	0,08	0,12	0,15	0,2	0,25
3.3.1	**Tool steel for hot working**	80	0,15	0,21	0,27	0,32	0,37
3.3.2		45	0,08	0,12	0,15	0,2	0,25
3.3.3		70	0,08	0,12	0,15	0,2	0,25
3.3.4		60	0,08	0,12	0,15	0,2	0,25
3.3.5		50	0,08	0,12	0,15	0,2	0,25
3.5.1	**Hardened tool steel** **< 55 HRC**						
3.5.2	**55–58 HRC**						
3.5.3	**58–60 HRC**						
3.5.4	**60–62 HRC**						
3.5.5	**62–64 HRC**						
4.1.1	**Stainless steel**						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**	100	0,18	0,24	0,3	0,35	0,4
5.1.2		95	0,16	0,22	0,28	0,34	0,38
5.1.3		80	0,15	0,21	0,27	0,32	0,37
5.2.1	**Stainless cast steel**						
5.2.2							
6.1.1	**Cast iron with lamellar graphite**	115	0,23	0,335	0,425	0,52	0,58
6.1.2		95	0,23	0,335	0,425	0,52	0,58
6.1.3		85	0,23	0,335	0,425	0,52	0,58
6.1.4							
6.2.1	**Spheroidal cast iron**	95	0,2	0,25	0,35	0,4	0,46
6.2.2		90	0,2	0,25	0,35	0,4	0,46
6.2.3		70	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**	95	0,2	0,25	0,35	0,4	0,46
6.3.2		90	0,2	0,25	0,35	0,4	0,46
6.4.1	**GTS (black malleable cast iron)**	95	0,2	0,25	0,35	0,4	0,46
6.4.2		90	0,2	0,25	0,35	0,4	0,46
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							

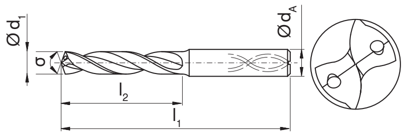
W0107, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ **3xD** | σ 140°

SCPP425



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.ST.0107.0300h7.3XD.140.IK.HA	6	62	20	W0107030240
3.1	HPC.ST.0107.0310h7.3XD.140.IK.HA	6	62	20	W0107031240
3.2	HPC.ST.0107.0320h7.3XD.140.IK.HA	6	62	20	W0107032240
3.3	HPC.ST.0107.0330h7.3XD.140.IK.HA	6	62	20	W0107033240
3.4	HPC.ST.0107.0340h7.3XD.140.IK.HA	6	62	20	W0107034240
3.5	HPC.ST.0107.0350h7.3XD.140.IK.HA	6	62	20	W0107035240
3.6	HPC.ST.0107.0360h7.3XD.140.IK.HA	6	62	20	W0107036240
3.7	HPC.ST.0107.0370h7.3XD.140.IK.HA	6	62	20	W0107037240
3.8	HPC.ST.0107.0380h7.3XD.140.IK.HA	6	66	24	W0107038240
3.9	HPC.ST.0107.0390h7.3XD.140.IK.HA	6	66	24	W0107039240
4.0	HPC.ST.0107.0400h7.3XD.140.IK.HA	6	66	24	W0107040240
4.1	HPC.ST.0107.0410h7.3XD.140.IK.HA	6	66	24	W0107041240
4.2	HPC.ST.0107.0420h7.3XD.140.IK.HA	6	66	24	W0107042240
4.3	HPC.ST.0107.0430h7.3XD.140.IK.HA	6	66	24	W0107043240
4.4	HPC.ST.0107.0440h7.3XD.140.IK.HA	6	66	24	W0107044240
4.5	HPC.ST.0107.0450h7.3XD.140.IK.HA	6	66	24	W0107045240
4.6	HPC.ST.0107.0460h7.3XD.140.IK.HA	6	66	24	W0107046240
4.7	HPC.ST.0107.0470h7.3XD.140.IK.HA	6	66	24	W0107047240
4.8	HPC.ST.0107.0480h7.3XD.140.IK.HA	6	66	28	W0107048240
4.9	HPC.ST.0107.0490h7.3XD.140.IK.HA	6	66	28	W0107049240
5.0	HPC.ST.0107.0500h7.3XD.140.IK.HA	6	66	28	W0107050240
5.1	HPC.ST.0107.0510h7.3XD.140.IK.HA	6	66	28	W0107051240
5.2	HPC.ST.0107.0520h7.3XD.140.IK.HA	6	66	28	W0107052240
5.3	HPC.ST.0107.0530h7.3XD.140.IK.HA	6	66	28	W0107053240
5.4	HPC.ST.0107.0540h7.3XD.140.IK.HA	6	66	28	W0107054240
5.5	HPC.ST.0107.0550h7.3XD.140.IK.HA	6	66	28	W0107055240
5.6	HPC.ST.0107.0560h7.3XD.140.IK.HA	6	66	28	W0107056240
5.7	HPC.ST.0107.0570h7.3XD.140.IK.HA	6	66	28	W0107057240
5.8	HPC.ST.0107.0580h7.3XD.140.IK.HA	6	66	28	W0107058240
5.9	HPC.ST.0107.0590h7.3XD.140.IK.HA	6	66	28	W0107059240
6.0	HPC.ST.0107.0600h7.3XD.140.IK.HA	6	66	28	W0107060240
6.1	HPC.ST.0107.0610h7.3XD.140.IK.HA	8	79	34	W0107061240
6.2	HPC.ST.0107.0620h7.3XD.140.IK.HA	8	79	34	W0107062240
6.3	HPC.ST.0107.0630h7.3XD.140.IK.HA	8	79	34	W0107063240
6.4	HPC.ST.0107.0640h7.3XD.140.IK.HA	8	79	34	W0107064240
6.5	HPC.ST.0107.0650h7.3XD.140.IK.HA	8	79	34	W0107065240
6.6	HPC.ST.0107.0660h7.3XD.140.IK.HA	8	79	34	W0107066240
6.7	HPC.ST.0107.0670h7.3XD.140.IK.HA	8	79	34	W0107067240
6.8	HPC.ST.0107.0680h7.3XD.140.IK.HA	8	79	34	W0107068240
6.9	HPC.ST.0107.0690h7.3XD.140.IK.HA	8	79	34	W0107069240
7.0	HPC.ST.0107.0700h7.3XD.140.IK.HA	8	79	34	W0107070240
7.1	HPC.ST.0107.0710h7.3XD.140.IK.HA	8	79	41	W0107071240
7.2	HPC.ST.0107.0720h7.3XD.140.IK.HA	8	79	41	W0107072240
7.3	HPC.ST.0107.0730h7.3XD.140.IK.HA	8	79	41	W0107073240
7.4	HPC.ST.0107.0740h7.3XD.140.IK.HA	8	79	41	W0107074240
7.5	HPC.ST.0107.0750h7.3XD.140.IK.HA	8	79	41	W0107075240
7.6	HPC.ST.0107.0760h7.3XD.140.IK.HA	8	79	41	W0107076240
7.7	HPC.ST.0107.0770h7.3XD.140.IK.HA	8	79	41	W0107077240

W0107, coated

Cutting data

Index	Material designation		Vc [m/min]	f [mm/rev]				
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		130	0,18	0,24	0,3	0,35	0,4
1.1.2			120	0,18	0,24	0,3	0,35	0,4
1.2.1	**Constructional steel**		130	0,18	0,24	0,3	0,35	0,4
1.2.2			120	0,18	0,24	0,3	0,35	0,4
1.2.3			75	0,16	0,22	0,28	0,34	0,38
1.3.1	**Spring steel**		60	0,16	0,22	0,28	0,34	0,38
1.3.2			50	0,15	0,21	0,27	0,32	0,37
1.3.3			30	0,08	0,12	0,15	0,2	0,25
2.1.1	**Cementation steel**		120	0,18	0,24	0,3	0,35	0,4
2.1.2			110	0,18	0,24	0,3	0,35	0,4
2.1.3			100	0,16	0,22	0,28	0,34	0,38
2.2.1	**Nitriding steel**		100	0,15	0,21	0,27	0,32	0,37
2.2.2			100	0,15	0,21	0,27	0,32	0,37
2.3.1	**Tempered steel**		110	0,16	0,22	0,28	0,34	0,38
2.3.2			100	0,15	0,21	0,27	0,32	0,37
2.3.3			100	0,16	0,22	0,28	0,34	0,38
2.3.4			100	0,15	0,21	0,27	0,32	0,37
2.3.5			85	0,15	0,21	0,27	0,32	0,37
2.3.6			60	0,08	0,12	0,15	0,2	0,25
3.1.1	**Non alloyed tool steel**		80	0,15	0,21	0,27	0,32	0,37
3.2.1	**Tool steel for cold working**		95	0,15	0,21	0,27	0,32	0,37
3.2.2			80	0,15	0,21	0,27	0,32	0,37
3.2.3			55	0,08	0,12	0,15	0,2	0,25
3.2.4			60	0,08	0,12	0,15	0,2	0,25
3.2.5			55	0,08	0,12	0,15	0,2	0,25
3.3.1	**Tool steel for hot working**		80	0,15	0,21	0,27	0,32	0,37
3.3.2			45	0,08	0,12	0,15	0,2	0,25
3.3.3			70	0,08	0,12	0,15	0,2	0,25
3.3.4			60	0,08	0,12	0,15	0,2	0,25
3.3.5			50	0,08	0,12	0,15	0,2	0,25
3.5.1	**Hardened tool steel**	**< 55 HRC**						
3.5.2		**55–58 HRC**						
3.5.3		**58–60 HRC**						
3.5.4		**60–62 HRC**						
3.5.5		**62–64 HRC**						
4.1.1	**Stainless steel**							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**		100	0,18	0,24	0,3	0,35	0,4
5.1.2			95	0,16	0,22	0,28	0,34	0,38
5.1.3			80	0,15	0,21	0,27	0,32	0,37
5.2.1	**Stainless cast steel**							
5.2.2								
6.1.1	**Cast iron with lamellar graphite**		115	0,23	0,335	0,425	0,52	0,58
6.1.2			95	0,23	0,335	0,425	0,52	0,58
6.1.3			85	0,23	0,335	0,425	0,52	0,58
6.1.4								
6.2.1	**Spheroidal cast iron**		95	0,2	0,25	0,35	0,4	0,46
6.2.2			90	0,2	0,25	0,35	0,4	0,46
6.2.3			70	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**		95	0,2	0,25	0,35	0,4	0,46
6.3.2			90	0,2	0,25	0,35	0,4	0,46
6.4.1	**GTS (black malleable cast iron)**		95	0,2	0,25	0,35	0,4	0,46
6.4.2			90	0,2	0,25	0,35	0,4	0,46
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								

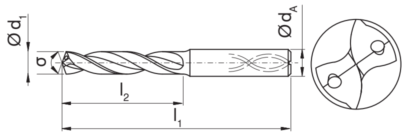
W0107, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$ | $d_1 = h7$, $d_A = h6$ | E | ≤ 3xD | σ 140°

SCPP425



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HPC.ST.0107.0780h7.3XD.140.IK.HA	8	79	41	W0107078240
7.9	HPC.ST.0107.0790h7.3XD.140.IK.HA	8	79	41	W0107079240
8.0	HPC.ST.0107.0800h7.3XD.140.IK.HA	8	79	41	W0107080240
8.1	HPC.ST.0107.0810h7.3XD.140.IK.HA	10	89	47	W0107081240
8.2	HPC.ST.0107.0820h7.3XD.140.IK.HA	10	89	47	W0107082240
8.3	HPC.ST.0107.0830h7.3XD.140.IK.HA	10	89	47	W0107083240
8.4	HPC.ST.0107.0840h7.3XD.140.IK.HA	10	89	47	W0107084240
8.5	HPC.ST.0107.0850h7.3XD.140.IK.HA	10	89	47	W0107085240
8.6	HPC.ST.0107.0860h7.3XD.140.IK.HA	10	89	47	W0107086240
8.7	HPC.ST.0107.0870h7.3XD.140.IK.HA	10	89	47	W0107087240
8.8	HPC.ST.0107.0880h7.3XD.140.IK.HA	10	89	47	W0107088240
8.9	HPC.ST.0107.0890h7.3XD.140.IK.HA	10	89	47	W0107089240
9.0	HPC.ST.0107.0900h7.3XD.140.IK.HA	10	89	47	W0107090240
9.1	HPC.ST.0107.0910h7.3XD.140.IK.HA	10	89	47	W0107091240
9.2	HPC.ST.0107.0920h7.3XD.140.IK.HA	10	89	47	W0107092240
9.3	HPC.ST.0107.0930h7.3XD.140.IK.HA	10	89	47	W0107093240
9.4	HPC.ST.0107.0940h7.3XD.140.IK.HA	10	89	47	W0107094240
9.5	HPC.ST.0107.0950h7.3XD.140.IK.HA	10	89	47	W0107095240
9.6	HPC.ST.0107.0960h7.3XD.140.IK.HA	10	89	47	W0107096240
9.7	HPC.ST.0107.0970h7.3XD.140.IK.HA	10	89	47	W0107097240
9.8	HPC.ST.0107.0980h7.3XD.140.IK.HA	10	89	47	W0107098240
9.9	HPC.ST.0107.0990h7.3XD.140.IK.HA	10	89	47	W0107099240
10.0	HPC.ST.0107.1000h7.3XD.140.IK.HA	10	89	47	W0107100240
10.2	HPC.ST.0107.1020h7.3XD.140.IK.HA	12	102	55	W0107102240
10.5	HPC.ST.0107.1050h7.3XD.140.IK.HA	12	102	55	W0107105240
10.8	HPC.ST.0107.1080h7.3XD.140.IK.HA	12	102	55	W0107108240
11.0	HPC.ST.0107.1100h7.3XD.140.IK.HA	12	102	55	W0107110240
11.2	HPC.ST.0107.1120h7.3XD.140.IK.HA	12	102	55	W0107112240
11.5	HPC.ST.0107.1150h7.3XD.140.IK.HA	12	102	55	W0107115240
11.8	HPC.ST.0107.1180h7.3XD.140.IK.HA	12	102	55	W0107118240
12.0	HPC.ST.0107.1200h7.3XD.140.IK.HA	12	102	55	W0107120240
12.2	HPC.ST.0107.1220h7.3XD.140.IK.HA	14	107	60	W0107122240
12.5	HPC.ST.0107.1250h7.3XD.140.IK.HA	14	107	60	W0107125240
12.8	HPC.ST.0107.1280h7.3XD.140.IK.HA	14	107	60	W0107128240
13.0	HPC.ST.0107.1300h7.3XD.140.IK.HA	14	107	60	W0107130240
13.5	HPC.ST.0107.1350h7.3XD.140.IK.HA	14	107	60	W0107135240
13.8	HPC.ST.0107.1380h7.3XD.140.IK.HA	14	107	60	W0107138240
14.0	HPC.ST.0107.1400h7.3XD.140.IK.HA	14	107	60	W0107140240
14.2	HPC.ST.0107.1420h7.3XD.140.IK.HA	16	115	65	W0107142240
14.5	HPC.ST.0107.1450h7.3XD.140.IK.HA	16	115	65	W0107145240
14.8	HPC.ST.0107.1480h7.3XD.140.IK.HA	16	115	65	W0107148240
15.0	HPC.ST.0107.1500h7.3XD.140.IK.HA	16	115	65	W0107150240
15.2	HPC.ST.0107.1520h7.3XD.140.IK.HA	16	115	65	W0107152240
15.5	HPC.ST.0107.1550h7.3XD.140.IK.HA	16	115	65	W0107155240
15.8	HPC.ST.0107.1580h7.3XD.140.IK.HA	16	115	65	W0107158240
16.0	HPC.ST.0107.1600h7.3XD.140.IK.HA	16	115	65	W0107160240
16.5	HPC.ST.0107.1650h7.3XD.140.IK.HA	18	123	73	W0107165240
16.8	HPC.ST.0107.1680h7.3XD.140.IK.HA	18	123	73	W0107168240

W0107, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	130	0,18	0,24	0,3	0,35	0,4
1.1.2		120	0,18	0,24	0,3	0,35	0,4
1.2.1	Constructional steel	130	0,18	0,24	0,3	0,35	0,4
1.2.2		120	0,18	0,24	0,3	0,35	0,4
1.2.3		75	0,16	0,22	0,28	0,34	0,38
1.3.1	Spring steel	60	0,16	0,22	0,28	0,34	0,38
1.3.2		50	0,15	0,21	0,27	0,32	0,37
1.3.3		30	0,08	0,12	0,15	0,2	0,25
2.1.1	Cementation steel	120	0,18	0,24	0,3	0,35	0,4
2.1.2		110	0,18	0,24	0,3	0,35	0,4
2.1.3		100	0,16	0,22	0,28	0,34	0,38
2.2.1	Nitriding steel	100	0,15	0,21	0,27	0,32	0,37
2.2.2		100	0,15	0,21	0,27	0,32	0,37
2.3.1	Tempered steel	110	0,16	0,22	0,28	0,34	0,38
2.3.2		100	0,15	0,21	0,27	0,32	0,37
2.3.3		100	0,16	0,22	0,28	0,34	0,38
2.3.4		100	0,15	0,21	0,27	0,32	0,37
2.3.5		85	0,15	0,21	0,27	0,32	0,37
2.3.6		60	0,08	0,12	0,15	0,2	0,25
3.1.1	Non alloyed tool steel	80	0,15	0,21	0,27	0,32	0,37
3.2.1	Tool steel for cold working	95	0,15	0,21	0,27	0,32	0,37
3.2.2		80	0,15	0,21	0,27	0,32	0,37
3.2.3		55	0,08	0,12	0,15	0,2	0,25
3.2.4		60	0,08	0,12	0,15	0,2	0,25
3.2.5		55	0,08	0,12	0,15	0,2	0,25
3.3.1	Tool steel for hot working	80	0,15	0,21	0,27	0,32	0,37
3.3.2		45	0,08	0,12	0,15	0,2	0,25
3.3.3		70	0,08	0,12	0,15	0,2	0,25
3.3.4		60	0,08	0,12	0,15	0,2	0,25
3.3.5		50	0,08	0,12	0,15	0,2	0,25
3.5.1	Hardened tool steel < 55 HRC						
3.5.2	55–58 HRC						
3.5.3	58–60 HRC						
3.5.4	60–62 HRC						
3.5.5	62–64 HRC						
4.1.1	Stainless steel						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	Heat-resistant alloys						
4.2.2							
4.2.3							
4.2.4							
5.1.1	Conventional cast steel	100	0,18	0,24	0,3	0,35	0,4
5.1.2		95	0,16	0,22	0,28	0,34	0,38
5.1.3		80	0,15	0,21	0,27	0,32	0,37
5.2.1	Stainless cast steel						
5.2.2							
6.1.1	Cast iron with lamellar graphite	115	0,23	0,335	0,425	0,52	0,58
6.1.2		95	0,23	0,335	0,425	0,52	0,58
6.1.3		85	0,23	0,335	0,425	0,52	0,58
6.1.4							
6.2.1	Spheroidal cast iron	95	0,2	0,25	0,35	0,4	0,46
6.2.2		90	0,2	0,25	0,35	0,4	0,46
6.2.3		70	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	95	0,2	0,25	0,35	0,4	0,46
6.3.2		90	0,2	0,25	0,35	0,4	0,46
6.4.1	GTS (black malleable cast iron)	95	0,2	0,25	0,35	0,4	0,46
6.4.2		90	0,2	0,25	0,35	0,4	0,46
7.1.1	Aluminium						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	Magnesium						
7.2.2							
7.3.1	Copper						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	CuZn (brass)						
7.4.2							
7.5.1	CuSn (bronze)						
7.5.2							
7.6.1	CuAlFe (Ampco)						
7.6.2							
7.8.1	Titanium						
7.8.2							
7.8.3							

W0107, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$

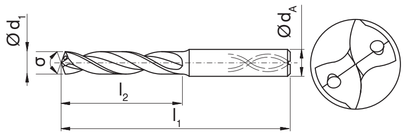
$d_1 = h7$
$d_A = h6$

E

≤ **3xD**

σ 140°

SCPP425



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
17.0	HPC.ST.0107.1700h7.3XD.140.IK.HA	18	123	73	W0107170240
17.5	HPC.ST.0107.1750h7.3XD.140.IK.HA	18	123	73	W0107175240
18.0	HPC.ST.0107.1800h7.3XD.140.IK.HA	18	123	73	W0107180240
18.5	HPC.ST.0107.1850h7.3XD.140.IK.HA	20	131	79	W0107185240
18.8	HPC.ST.0107.1880h7.3XD.140.IK.HA	20	131	79	W0107188240
19.0	HPC.ST.0107.1900h7.3XD.140.IK.HA	20	131	79	W0107190240
19.5	HPC.ST.0107.1950h7.3XD.140.IK.HA	20	131	79	W0107195240
20.0	HPC.ST.0107.2000h7.3XD.140.IK.HA	20	131	79	W0107200240

W0103, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**	130	0,18	0,24	0,3	0,35
1.1.2		120	0,18	0,24	0,3	0,35
1.2.1	**Constructional steel**	130	0,18	0,24	0,3	0,35
1.2.2		120	0,18	0,24	0,3	0,35
1.2.3		75	0,16	0,22	0,28	0,34
1.3.1	**Spring steel**	60	0,16	0,22	0,28	0,34
1.3.2		50	0,15	0,21	0,27	0,32
1.3.3		30	0,08	0,12	0,15	0,2
2.1.1	**Cementation steel**	120	0,18	0,24	0,3	0,35
2.1.2		110	0,18	0,24	0,3	0,35
2.1.3		100	0,16	0,22	0,28	0,34
2.2.1	**Nitriding steel**	100	0,15	0,21	0,27	0,32
2.2.2		100	0,15	0,21	0,27	0,32
2.3.1	**Tempered steel**	110	0,16	0,22	0,28	0,34
2.3.2		100	0,15	0,21	0,27	0,32
2.3.3		100	0,16	0,22	0,28	0,34
2.3.4		100	0,15	0,21	0,27	0,32
2.3.5		85	0,15	0,21	0,27	0,32
2.3.6		60	0,08	0,12	0,15	0,2
3.1.1	**Non alloyed tool steel**	80	0,15	0,21	0,27	0,32
3.2.1	**Tool steel for cold working**	95	0,15	0,21	0,27	0,32
3.2.2		80	0,15	0,21	0,27	0,32
3.2.3		55	0,08	0,12	0,15	0,2
3.2.4		60	0,08	0,12	0,15	0,2
3.2.5		55	0,08	0,12	0,15	0,2
3.3.1	**Tool steel for hot working**	80	0,15	0,21	0,27	0,32
3.3.2		45	0,08	0,12	0,15	0,2
3.3.3		70	0,08	0,12	0,15	0,2
3.3.4		60	0,08	0,12	0,15	0,2
3.3.5		50	0,08	0,12	0,15	0,2
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**					
4.1.2						
4.1.3						
4.1.4						
4.1.5						
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**	100	0,18	0,24	0,3	0,35
5.1.2		95	0,16	0,22	0,28	0,34
5.1.3		80	0,15	0,21	0,27	0,32
5.2.1	**Stainless cast steel**					
5.2.2						
6.1.1	**Cast iron with lamellar graphite**	115	0,23	0,335	0,425	0,52
6.1.2		95	0,23	0,335	0,425	0,52
6.1.3		85	0,23	0,335	0,425	0,52
6.1.4						
6.2.1	**Spheroidal cast iron**	95	0,2	0,25	0,35	0,4
6.2.2		90	0,2	0,25	0,35	0,4
6.2.3		70	0,11	0,125	0,15	0,175
6.3.1	**GTW (white malleable cast iron)**	95	0,2	0,25	0,35	0,4
6.3.2		90	0,2	0,25	0,35	0,4
6.4.1	**GTS (black malleable cast iron)**	95	0,2	0,25	0,35	0,4
6.4.2		90	0,2	0,25	0,35	0,4
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						

W0103, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$

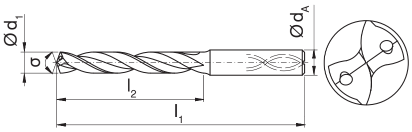
$d_1 = h7$
$d_A = h6$

E

≤ **5xD**

σ 140°

SCPP425



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.ST.0103.0300h7.5XD.140.IK.HA	6	66	28	W0103030340
3.1	HPC.ST.0103.0310h7.5XD.140.IK.HA	6	66	28	W0103031340
3.2	HPC.ST.0103.0320h7.5XD.140.IK.HA	6	66	28	W0103032340
3.3	HPC.ST.0103.0330h7.5XD.140.IK.HA	6	66	28	W0103033340
3.4	HPC.ST.0103.0340h7.5XD.140.IK.HA	6	66	28	W0103034340
3.5	HPC.ST.0103.0350h7.5XD.140.IK.HA	6	66	28	W0103035340
3.6	HPC.ST.0103.0360h7.5XD.140.IK.HA	6	66	28	W0103036340
3.7	HPC.ST.0103.0370h7.5XD.140.IK.HA	6	66	28	W0103037340
3.8	HPC.ST.0103.0380h7.5XD.140.IK.HA	6	74	36	W0103038340
3.9	HPC.ST.0103.0390h7.5XD.140.IK.HA	6	74	36	W0103039340
4.0	HPC.ST.0103.0400h7.5XD.140.IK.HA	6	74	36	W0103040340
4.1	HPC.ST.0103.0410h7.5XD.140.IK.HA	6	74	36	W0103041340
4.2	HPC.ST.0103.0420h7.5XD.140.IK.HA	6	74	36	W0103042340
4.3	HPC.ST.0103.0430h7.5XD.140.IK.HA	6	74	36	W0103043340
4.4	HPC.ST.0103.0440h7.5XD.140.IK.HA	6	74	36	W0103044340
4.5	HPC.ST.0103.0450h7.5XD.140.IK.HA	6	74	36	W0103045340
4.6	HPC.ST.0103.0460h7.5XD.140.IK.HA	6	74	36	W0103046340
4.7	HPC.ST.0103.0470h7.5XD.140.IK.HA	6	74	36	W0103047340
4.8	HPC.ST.0103.0480h7.5XD.140.IK.HA	6	82	44	W0103048340
4.9	HPC.ST.0103.0490h7.5XD.140.IK.HA	6	82	44	W0103049340
5.0	HPC.ST.0103.0500h7.5XD.140.IK.HA	6	82	44	W0103050340
5.1	HPC.ST.0103.0510h7.5XD.140.IK.HA	6	82	44	W0103051340
5.2	HPC.ST.0103.0520h7.5XD.140.IK.HA	6	82	44	W0103052340
5.3	HPC.ST.0103.0530h7.5XD.140.IK.HA	6	82	44	W0103053340
5.4	HPC.ST.0103.0540h7.5XD.140.IK.HA	6	82	44	W0103054340
5.5	HPC.ST.0103.0550h7.5XD.140.IK.HA	6	82	44	W0103055340
5.6	HPC.ST.0103.0560h7.5XD.140.IK.HA	6	82	44	W0103056340
5.7	HPC.ST.0103.0570h7.5XD.140.IK.HA	6	82	44	W0103057340
5.8	HPC.ST.0103.0580h7.5XD.140.IK.HA	6	82	44	W0103058340
5.9	HPC.ST.0103.0590h7.5XD.140.IK.HA	6	82	44	W0103059340
6.0	HPC.ST.0103.0600h7.5XD.140.IK.HA	6	82	44	W0103060340
6.1	HPC.ST.0103.0610h7.5XD.140.IK.HA	8	91	53	W0103061340
6.2	HPC.ST.0103.0620h7.5XD.140.IK.HA	8	91	53	W0103062340
6.3	HPC.ST.0103.0630h7.5XD.140.IK.HA	8	91	53	W0103063340
6.4	HPC.ST.0103.0640h7.5XD.140.IK.HA	8	91	53	W0103064340
6.5	HPC.ST.0103.0650h7.5XD.140.IK.HA	8	91	53	W0103065340
6.6	HPC.ST.0103.0660h7.5XD.140.IK.HA	8	91	53	W0103066340
6.7	HPC.ST.0103.0670h7.5XD.140.IK.HA	8	91	53	W0103067340
6.8	HPC.ST.0103.0680h7.5XD.140.IK.HA	8	91	53	W0103068340
6.9	HPC.ST.0103.0690h7.5XD.140.IK.HA	8	91	53	W0103069340
7.0	HPC.ST.0103.0700h7.5XD.140.IK.HA	8	91	53	W0103070340
7.1	HPC.ST.0103.0710h7.5XD.140.IK.HA	8	91	53	W0103071340
7.2	HPC.ST.0103.0720h7.5XD.140.IK.HA	8	91	53	W0103072340
7.3	HPC.ST.0103.0730h7.5XD.140.IK.HA	8	91	53	W0103073340
7.4	HPC.ST.0103.0740h7.5XD.140.IK.HA	8	91	53	W0103074340
7.5	HPC.ST.0103.0750h7.5XD.140.IK.HA	8	91	53	W0103075340
7.6	HPC.ST.0103.0760h7.5XD.140.IK.HA	8	91	53	W0103076340
7.7	HPC.ST.0103.0770h7.5XD.140.IK.HA	8	91	53	W0103077340

W0103, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]			
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**		130	0,18	0,24	0,3	0,35
1.1.2			120	0,18	0,24	0,3	0,35
1.2.1	**Constructional steel**		130	0,18	0,24	0,3	0,35
1.2.2			120	0,18	0,24	0,3	0,35
1.2.3			75	0,16	0,22	0,28	0,34
1.3.1	**Spring steel**		60	0,16	0,22	0,28	0,34
1.3.2			50	0,15	0,21	0,27	0,32
1.3.3			30	0,08	0,12	0,15	0,2
2.1.1	**Cementation steel**		120	0,18	0,24	0,3	0,35
2.1.2			110	0,18	0,24	0,3	0,35
2.1.3			100	0,16	0,22	0,28	0,34
2.2.1	**Nitriding steel**		100	0,15	0,21	0,27	0,32
2.2.2			100	0,15	0,21	0,27	0,32
2.3.1	**Tempered steel**		110	0,16	0,22	0,28	0,34
2.3.2			100	0,15	0,21	0,27	0,32
2.3.3			100	0,16	0,22	0,28	0,34
2.3.4			100	0,15	0,21	0,27	0,32
2.3.5			85	0,15	0,21	0,27	0,32
2.3.6			60	0,08	0,12	0,15	0,2
3.1.1	**Non alloyed tool steel**		80	0,15	0,21	0,27	0,32
3.2.1	**Tool steel for cold working**		95	0,15	0,21	0,27	0,32
3.2.2			80	0,15	0,21	0,27	0,32
3.2.3			55	0,08	0,12	0,15	0,2
3.2.4			60	0,08	0,12	0,15	0,2
3.2.5			55	0,08	0,12	0,15	0,2
3.3.1	**Tool steel for hot working**		80	0,15	0,21	0,27	0,32
3.3.2			45	0,08	0,12	0,15	0,2
3.3.3			70	0,08	0,12	0,15	0,2
3.3.4			60	0,08	0,12	0,15	0,2
3.3.5			50	0,08	0,12	0,15	0,2
3.5.1	**Hardened tool steel**	**< 55 HRC**					
3.5.2		**55–58 HRC**					
3.5.3		**58–60 HRC**					
3.5.4		**60–62 HRC**					
3.5.5		**62–64 HRC**					
4.1.1	**Stainless steel**						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**		100	0,18	0,24	0,3	0,35
5.1.2			95	0,16	0,22	0,28	0,34
5.1.3			80	0,15	0,21	0,27	0,32
5.2.1	**Stainless cast steel**						
5.2.2							
6.1.1	**Cast iron with lamellar graphite**		115	0,23	0,335	0,425	0,52
6.1.2			95	0,23	0,335	0,425	0,52
6.1.3			85	0,23	0,335	0,425	0,52
6.1.4							
6.2.1	**Spheroidal cast iron**		95	0,2	0,25	0,35	0,4
6.2.2			90	0,2	0,25	0,35	0,4
6.2.3			70	0,11	0,125	0,15	0,175
6.3.1	**GTW (white malleable cast iron)**		95	0,2	0,25	0,35	0,4
6.3.2			90	0,2	0,25	0,35	0,4
6.4.1	**GTS (black malleable cast iron)**		95	0,2	0,25	0,35	0,4
6.4.2			90	0,2	0,25	0,35	0,4
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							

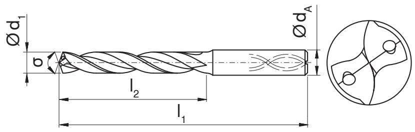
W0103, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 5xD | σ 140°

SCPP425



d₁ [mm]	Type, description	d_A [mm]	l₁ [mm]	l₂ [mm]	HA Material
7.8	HPC.ST.0103.0780h7.5XD.140.IK.HA	8	91	53	W0103078340
7.9	HPC.ST.0103.0790h7.5XD.140.IK.HA	8	91	53	W0103079340
8.0	HPC.ST.0103.0800h7.5XD.140.IK.HA	8	91	53	W0103080340
8.1	HPC.ST.0103.0810h7.5XD.140.IK.HA	10	103	61	W0103081340
8.2	HPC.ST.0103.0820h7.5XD.140.IK.HA	10	103	61	W0103082340
8.3	HPC.ST.0103.0830h7.5XD.140.IK.HA	10	103	61	W0103083340
8.4	HPC.ST.0103.0840h7.5XD.140.IK.HA	10	103	61	W0103084340
8.5	HPC.ST.0103.0850h7.5XD.140.IK.HA	10	103	61	W0103085340
8.6	HPC.ST.0103.0860h7.5XD.140.IK.HA	10	103	61	W0103086340
8.7	HPC.ST.0103.0870h7.5XD.140.IK.HA	10	103	61	W0103087340
8.8	HPC.ST.0103.0880h7.5XD.140.IK.HA	10	103	61	W0103088340
8.9	HPC.ST.0103.0890h7.5XD.140.IK.HA	10	103	61	W0103089340
9.0	HPC.ST.0103.0900h7.5XD.140.IK.HA	10	103	61	W0103090340
9.1	HPC.ST.0103.0910h7.5XD.140.IK.HA	10	103	61	W0103091340
9.2	HPC.ST.0103.0920h7.5XD.140.IK.HA	10	103	61	W0103092340
9.3	HPC.ST.0103.0930h7.5XD.140.IK.HA	10	103	61	W0103093340
9.4	HPC.ST.0103.0940h7.5XD.140.IK.HA	10	103	61	W0103094340
9.5	HPC.ST.0103.0950h7.5XD.140.IK.HA	10	103	61	W0103095340
9.6	HPC.ST.0103.0960h7.5XD.140.IK.HA	10	103	61	W0103096340
9.7	HPC.ST.0103.0970h7.5XD.140.IK.HA	10	103	61	W0103097340
9.8	HPC.ST.0103.0980h7.5XD.140.IK.HA	10	103	61	W0103098340
9.9	HPC.ST.0103.0990h7.5XD.140.IK.HA	10	103	61	W0103099340
10.0	HPC.ST.0103.1000h7.5XD.140.IK.HA	10	103	61	W0103100340
10.2	HPC.ST.0103.1020h7.5XD.140.IK.HA	12	118	71	W0103102340
10.5	HPC.ST.0103.1050h7.5XD.140.IK.HA	12	118	71	W0103105340
10.8	HPC.ST.0103.1080h7.5XD.140.IK.HA	12	118	71	W0103108340
11.0	HPC.ST.0103.1100h7.5XD.140.IK.HA	12	118	71	W0103110340
11.2	HPC.ST.0103.1120h7.5XD.140.IK.HA	12	118	71	W0103112340
11.5	HPC.ST.0103.1150h7.5XD.140.IK.HA	12	118	71	W0103115340
11.8	HPC.ST.0103.1180h7.5XD.140.IK.HA	12	118	71	W0103118340
12.0	HPC.ST.0103.1200h7.5XD.140.IK.HA	12	118	71	W0103120340
12.2	HPC.ST.0103.1220h7.5XD.140.IK.HA	14	124	77	W0103122340
12.5	HPC.ST.0103.1250h7.5XD.140.IK.HA	14	124	77	W0103125340
12.8	HPC.ST.0103.1280h7.5XD.140.IK.HA	14	124	77	W0103128340
13.0	HPC.ST.0103.1300h7.5XD.140.IK.HA	14	124	77	W0103130340
13.2	HPC.ST.0103.1320h7.5XD.140.IK.HA	14	124	77	W0103132340
13.5	HPC.ST.0103.1350h7.5XD.140.IK.HA	14	124	77	W0103135340
13.8	HPC.ST.0103.1380h7.5XD.140.IK.HA	14	124	77	W0103138340
14.0	HPC.ST.0103.1400h7.5XD.140.IK.HA	14	124	77	W0103140340
14.2	HPC.ST.0103.1420h7.5XD.140.IK.HA	16	133	83	W0103142340
14.5	HPC.ST.0103.1450h7.5XD.140.IK.HA	16	133	83	W0103145340
14.8	HPC.ST.0103.1480h7.5XD.140.IK.HA	16	133	83	W0103148340
15.0	HPC.ST.0103.1500h7.5XD.140.IK.HA	16	133	83	W0103150340
15.2	HPC.ST.0103.1520h7.5XD.140.IK.HA	16	133	83	W0103152340
15.5	HPC.ST.0103.1550h7.5XD.140.IK.HA	16	133	83	W0103155340
15.8	HPC.ST.0103.1580h7.5XD.140.IK.HA	16	133	83	W0103158340
16.0	HPC.ST.0103.1600h7.5XD.140.IK.HA	16	133	83	W0103160340

W0104, coated

Cutting data

Index	Material designation		Vc [m/min]	f [mm/rev] = Ø 3,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 12,0
1.1.1	**Machining steels**		130	0,1	0,18	0,24	0,3	0,35
1.1.2			120	0,1	0,18	0,24	0,3	0,35
1.2.1	**Constructional steel**		130	0,1	0,18	0,24	0,3	0,35
1.2.2			120	0,1	0,18	0,24	0,3	0,35
1.2.3			75	0,09	0,16	0,22	0,28	0,34
1.3.1	**Spring steel**		60	0,09	0,16	0,22	0,28	0,34
1.3.2			50	0,08	0,15	0,21	0,27	0,32
1.3.3			30	0,05	0,08	0,12	0,15	0,2
2.1.1	**Cementation steel**		120	0,1	0,18	0,24	0,3	0,35
2.1.2			110	0,1	0,18	0,24	0,3	0,35
2.1.3			100	0,09	0,16	0,22	0,28	0,34
2.2.1	**Nitriding steel**		100	0,08	0,15	0,21	0,27	0,32
2.2.2			100	0,08	0,15	0,21	0,27	0,32
2.3.1	**Tempered steel**		110	0,09	0,16	0,22	0,28	0,34
2.3.2			100	0,08	0,15	0,21	0,27	0,32
2.3.3			100	0,09	0,16	0,22	0,28	0,34
2.3.4			100	0,08	0,15	0,21	0,27	0,32
2.3.5			85	0,08	0,15	0,21	0,27	0,32
2.3.6			60	0,05	0,08	0,12	0,15	0,2
3.1.1	**Non alloyed tool steel**		80	0,08	0,15	0,21	0,27	0,32
3.2.1	**Tool steel for cold working**		95	0,08	0,15	0,21	0,27	0,32
3.2.2			80	0,08	0,15	0,21	0,27	0,32
3.2.3			55	0,05	0,08	0,12	0,15	0,2
3.2.4			60	0,05	0,08	0,12	0,15	0,2
3.2.5			55	0,05	0,08	0,12	0,15	0,2
3.3.1	**Tool steel for hot working**		80	0,08	0,15	0,21	0,27	0,32
3.3.2			45	0,05	0,08	0,12	0,15	0,2
3.3.3			70	0,05	0,08	0,12	0,15	0,2
3.3.4			60	0,05	0,08	0,12	0,15	0,2
3.3.5			50	0,05	0,08	0,12	0,15	0,2
3.5.1	**Hardened tool steel**	**< 55 HRC**						
3.5.2		**55–58 HRC**						
3.5.3		**58–60 HRC**						
3.5.4		**60–62 HRC**						
3.5.5		**62–64 HRC**						
4.1.1	**Stainless steel**							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**		100	0,1	0,18	0,24	0,3	0,35
5.1.2			95	0,09	0,16	0,22	0,28	0,34
5.1.3			80	0,08	0,15	0,21	0,27	0,32
5.2.1	**Stainless cast steel**							
5.2.2								
6.1.1	**Cast iron with lamellar graphite**		115	0,15	0,23	0,335	0,425	0,52
6.1.2			95	0,15	0,23	0,335	0,425	0,52
6.1.3			85	0,15	0,23	0,335	0,425	0,52
6.1.4								
6.2.1	**Spheroidal cast iron**		95	0,125	0,2	0,25	0,35	0,4
6.2.2			90	0,125	0,2	0,25	0,35	0,4
6.2.3			70	0,075	0,11	0,125	0,15	0,175
6.3.1	**GTW (white malleable cast iron)**		95	0,125	0,2	0,25	0,35	0,4
6.3.2			90	0,125	0,2	0,25	0,35	0,4
6.4.1	**GTS (black malleable cast iron)**		95	0,125	0,2	0,25	0,35	0,4
6.4.2			90	0,125	0,2	0,25	0,35	0,4
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								

W0104, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$

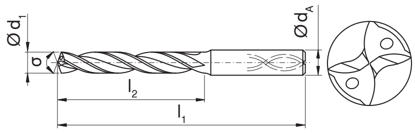
$d_1 = H7$
$d_A = h6$

E

≤ 5xD

σ 140°

SCPP425



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.99	HPC.ST.0104.0299H7.5XD.140.IK.HA	4	57	21	W0104029990
3.0	HPC.ST.0104.0300H7.5XD.140.IK.HA	6	66	28	W0104030340
3.01	HPC.ST.0104.0301H7.5XD.140.IK.HA	6	66	28	W0104030190
3.5	HPC.ST.0104.0350H7.5XD.140.IK.HA	6	66	28	W0104035340
3.99	HPC.ST.0104.0399H7.5XD.140.IK.HA	6	74	36	W0104039990
4.0	HPC.ST.0104.0400H7.5XD.140.IK.HA	6	74	36	W0104040340
4.01	HPC.ST.0104.0401H7.5XD.140.IK.HA	6	74	36	W0104040190
4.5	HPC.ST.0104.0450H7.5XD.140.IK.HA	6	74	36	W0104045340
4.99	HPC.ST.0104.0499H7.5XD.140.IK.HA	6	82	44	W0104049990
5.0	HPC.ST.0104.0500H7.5XD.140.IK.HA	6	82	44	W0104050340
5.01	HPC.ST.0104.0501H7.5XD.140.IK.HA	6	82	44	W0104050190
5.5	HPC.ST.0104.0550H7.5XD.140.IK.HA	6	82	44	W0104055340
5.99	HPC.ST.0104.0599H7.5XD.140.IK.HA	6	82	44	W0104059990
6.0	HPC.ST.0104.0600H7.5XD.140.IK.HA	6	82	44	W0104060340
6.01	HPC.ST.0104.0601H7.5XD.140.IK.HA	6	82	44	W0104060190
6.5	HPC.ST.0104.0650H7.5XD.140.IK.HA	8	91	53	W0104065340
6.99	HPC.ST.0104.0699H7.5XD.140.IK.HA	8	91	53	W0104069990
7.0	HPC.ST.0104.0700H7.5XD.140.IK.HA	8	91	53	W0104070340
7.01	HPC.ST.0104.0701H7.5XD.140.IK.HA	8	91	53	W0104070190
7.5	HPC.ST.0104.0750H7.5XD.140.IK.HA	8	91	53	W0104075340
7.99	HPC.ST.0104.0799H7.5XD.140.IK.HA	8	91	53	W0104079990
8.0	HPC.ST.0104.0800H7.5XD.140.IK.HA	8	91	53	W0104080340
8.01	HPC.ST.0104.0801H7.5XD.140.IK.HA	8	91	53	W0104080190
8.5	HPC.ST.0104.0850H7.5XD.140.IK.HA	10	103	61	W0104085340
8.99	HPC.ST.0104.0899H7.5XD.140.IK.HA	10	103	61	W0104089990
9.0	HPC.ST.0104.0900H7.5XD.140.IK.HA	10	103	61	W0104090340
9.01	HPC.ST.0104.0901H7.5XD.140.IK.HA	10	103	61	W0104090190
9.5	HPC.ST.0104.0950H7.5XD.140.IK.HA	10	103	61	W0104095340
9.99	HPC.ST.0104.0999H7.5XD.140.IK.HA	10	103	61	W0104099990
10.0	HPC.ST.0104.1000H7.5XD.140.IK.HA	10	103	61	W0104100340
10.01	HPC.ST.0104.1001H7.5XD.140.IK.HA	10	103	61	W0104100190
10.5	HPC.ST.0104.1050H7.5XD.140.IK.HA	12	118	71	W0104105340
10.99	HPC.ST.0104.1099H7.5XD.140.IK.HA	12	118	71	W0104109990
11.0	HPC.ST.0104.1100H7.5XD.140.IK.HA	12	118	71	W0104110340
11.01	HPC.ST.0104.1101H7.5XD.140.IK.HA	12	118	71	W0104110190
11.5	HPC.ST.0104.1150H7.5XD.140.IK.HA	12	118	71	W0104115340
11.99	HPC.ST.0104.1199H7.5XD.140.IK.HA	12	118	71	W0104119990
12.0	HPC.ST.0104.1200H7.5XD.140.IK.HA	12	118	71	W0104120340
12.01	HPC.ST.0104.1201H7.5XD.140.IK.HA	12	118	71	W0104120190

W1103, coated

Cutting data

Index	Material designation		V$_c$ [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**		170	0,18	0,24	0,3	0,35
1.1.2			150	0,18	0,24	0,3	0,35
1.2.1	**Constructional steel**		170	0,18	0,24	0,3	0,35
1.2.2			150	0,18	0,24	0,3	0,35
1.2.3			130	0,16	0,22	0,28	0,34
1.3.1	**Spring steel**		105	0,16	0,22	0,28	0,34
1.3.2			90	0,15	0,21	0,27	0,32
1.3.3			55	0,08	0,12	0,15	0,2
2.1.1	**Cementation steel**		160	0,18	0,24	0,3	0,35
2.1.2			145	0,18	0,24	0,3	0,35
2.1.3			130	0,16	0,22	0,28	0,34
2.2.1	**Nitriding steel**		130	0,15	0,21	0,27	0,32
2.2.2			130	0,15	0,21	0,27	0,32
2.3.1	**Tempered steel**		145	0,16	0,22	0,28	0,34
2.3.2			130	0,15	0,21	0,27	0,32
2.3.3			130	0,16	0,22	0,28	0,34
2.3.4			130	0,15	0,21	0,27	0,32
2.3.5			105	0,15	0,21	0,27	0,32
2.3.6			65	0,08	0,12	0,15	0,2
3.1.1	**Non alloyed tool steel**		105	0,15	0,21	0,27	0,32
3.2.1	**Tool steel for cold working**		130	0,15	0,21	0,27	0,32
3.2.2			105	0,15	0,21	0,27	0,32
3.2.3			65	0,08	0,12	0,15	0,2
3.2.4			70	0,08	0,12	0,15	0,2
3.2.5			65	0,08	0,12	0,15	0,2
3.3.1	**Tool steel for hot working**		105	0,15	0,21	0,27	0,32
3.3.2			65	0,08	0,12	0,15	0,2
3.3.3			90	0,08	0,12	0,15	0,2
3.3.4			70	0,08	0,12	0,15	0,2
3.3.5			55	0,08	0,12	0,15	0,2
3.5.1	**Hardened tool steel**	**< 55 HRC**					
3.5.2		**55–58 HRC**					
3.5.3		**58–60 HRC**					
3.5.4		**60–62 HRC**					
3.5.5		**62–64 HRC**					
4.1.1	**Stainless steel**						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**		135	0,18	0,24	0,3	0,35
5.1.2			130	0,16	0,22	0,28	0,34
5.1.3			105	0,15	0,21	0,27	0,32
5.2.1	**Stainless cast steel**						
5.2.2							
6.1.1	**Cast iron with lamellar graphite**		150	0,23	0,335	0,425	0,52
6.1.2			135	0,23	0,335	0,425	0,52
6.1.3			105	0,23	0,335	0,425	0,52
6.1.4			70	0,08	0,12	0,15	0,2
6.2.1	**Spheroidal cast iron**		120	0,2	0,25	0,35	0,4
6.2.2			105	0,2	0,25	0,35	0,4
6.2.3			80	0,08	0,12	0,15	0,2
6.3.1	**GTW (white malleable cast iron)**		120	0,2	0,25	0,35	0,4
6.3.2			110	0,2	0,25	0,35	0,4
6.4.1	**GTS (black malleable cast iron)**		120	0,2	0,25	0,35	0,4
6.4.2			110	0,2	0,25	0,35	0,4
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							

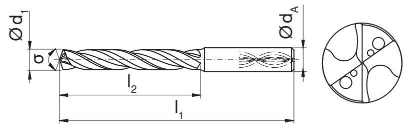
W1103, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$ | $d_1 = m6$ $d_A = h6$ | E | ≤ 5xD | σ 140°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.ST.1103.0300m6.5XD.140.IK.HA	6	66	28	W1103030340
3.1	HPC.ST.1103.0310m6.5XD.140.IK.HA	6	66	28	W1103031340
3.2	HPC.ST.1103.0320m6.5XD.140.IK.HA	6	66	28	W1103032340
3.3	HPC.ST.1103.0330m6.5XD.140.IK.HA	6	66	28	W1103033340
3.4	HPC.ST.1103.0340m6.5XD.140.IK.HA	6	66	28	W1103034340
3.5	HPC.ST.1103.0350m6.5XD.140.IK.HA	6	66	28	W1103035340
3.6	HPC.ST.1103.0360m6.5XD.140.IK.HA	6	66	28	W1103036340
3.7	HPC.ST.1103.0370m6.5XD.140.IK.HA	6	66	28	W1103037340
3.8	HPC.ST.1103.0380m6.5XD.140.IK.HA	6	74	36	W1103038340
3.9	HPC.ST.1103.0390m6.5XD.140.IK.HA	6	74	36	W1103039340
4.0	HPC.ST.1103.0400m6.5XD.140.IK.HA	6	74	36	W1103040340
4.1	HPC.ST.1103.0410m6.5XD.140.IK.HA	6	74	36	W1103041340
4.2	HPC.ST.1103.0420m6.5XD.140.IK.HA	6	74	36	W1103042340
4.3	HPC.ST.1103.0430m6.5XD.140.IK.HA	6	74	36	W1103043340
4.4	HPC.ST.1103.0440m6.5XD.140.IK.HA	6	74	36	W1103044340
4.5	HPC.ST.1103.0450m6.5XD.140.IK.HA	6	74	36	W1103045340
4.6	HPC.ST.1103.0460m6.5XD.140.IK.HA	6	74	36	W1103046340
4.7	HPC.ST.1103.0470m6.5XD.140.IK.HA	6	74	36	W1103047340
4.8	HPC.ST.1103.0480m6.5XD.140.IK.HA	6	82	44	W1103048340
4.9	HPC.ST.1103.0490m6.5XD.140.IK.HA	6	82	44	W1103049340
5.0	HPC.ST.1103.0500m6.5XD.140.IK.HA	6	82	44	W1103050340
5.1	HPC.ST.1103.0510m6.5XD.140.IK.HA	6	82	44	W1103051340
5.2	HPC.ST.1103.0520m6.5XD.140.IK.HA	6	82	44	W1103052340
5.3	HPC.ST.1103.0530m6.5XD.140.IK.HA	6	82	44	W1103053340
5.4	HPC.ST.1103.0540m6.5XD.140.IK.HA	6	82	44	W1103054340
5.5	HPC.ST.1103.0550m6.5XD.140.IK.HA	6	82	44	W1103055340
5.6	HPC.ST.1103.0560m6.5XD.140.IK.HA	6	82	44	W1103056340
5.7	HPC.ST.1103.0570m6.5XD.140.IK.HA	6	82	44	W1103057340
5.8	HPC.ST.1103.0580m6.5XD.140.IK.HA	6	82	44	W1103058340
5.9	HPC.ST.1103.0590m6.5XD.140.IK.HA	6	82	44	W1103059340
6.0	HPC.ST.1103.0600m6.5XD.140.IK.HA	6	82	44	W1103060340
6.1	HPC.ST.1103.0610m6.5XD.140.IK.HA	8	91	53	W1103061340
6.2	HPC.ST.1103.0620m6.5XD.140.IK.HA	8	91	53	W1103062340
6.3	HPC.ST.1103.0630m6.5XD.140.IK.HA	8	91	53	W1103063340
6.4	HPC.ST.1103.0640m6.5XD.140.IK.HA	8	91	53	W1103064340
6.5	HPC.ST.1103.0650m6.5XD.140.IK.HA	8	91	53	W1103065340
6.6	HPC.ST.1103.0660m6.5XD.140.IK.HA	8	91	53	W1103066340
6.7	HPC.ST.1103.0670m6.5XD.140.IK.HA	8	91	53	W1103067340
6.8	HPC.ST.1103.0680m6.5XD.140.IK.HA	8	91	53	W1103068340
6.9	HPC.ST.1103.0690m6.5XD.140.IK.HA	8	91	53	W1103069340
7.0	HPC.ST.1103.0700m6.5XD.140.IK.HA	8	91	53	W1103070340
7.1	HPC.ST.1103.0710m6.5XD.140.IK.HA	8	91	53	W1103071340
7.2	HPC.ST.1103.0720m6.5XD.140.IK.HA	8	91	53	W1103072340
7.3	HPC.ST.1103.0730m6.5XD.140.IK.HA	8	91	53	W1103073340
7.4	HPC.ST.1103.0740m6.5XD.140.IK.HA	8	91	53	W1103074340
7.5	HPC.ST.1103.0750m6.5XD.140.IK.HA	8	91	53	W1103075340
7.6	HPC.ST.1103.0760m6.5XD.140.IK.HA	8	91	53	W1103076340
7.7	HPC.ST.1103.0770m6.5XD.140.IK.HA	8	91	53	W1103077340

W1103, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]			
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**		170	0,18	0,24	0,3	0,35
1.1.2			150	0,18	0,24	0,3	0,35
1.2.1	**Constructional steel**		170	0,18	0,24	0,3	0,35
1.2.2			150	0,18	0,24	0,3	0,35
1.2.3			130	0,16	0,22	0,28	0,34
1.3.1	**Spring steel**		105	0,16	0,22	0,28	0,34
1.3.2			90	0,15	0,21	0,27	0,32
1.3.3			55	0,08	0,12	0,15	0,2
2.1.1	**Cementation steel**		160	0,18	0,24	0,3	0,35
2.1.2			145	0,18	0,24	0,3	0,35
2.1.3			130	0,16	0,22	0,28	0,34
2.2.1	**Nitriding steel**		130	0,15	0,21	0,27	0,32
2.2.2			130	0,15	0,21	0,27	0,32
2.3.1	**Tempered steel**		145	0,16	0,22	0,28	0,34
2.3.2			130	0,15	0,21	0,27	0,32
2.3.3			130	0,16	0,22	0,28	0,34
2.3.4			130	0,15	0,21	0,27	0,32
2.3.5			105	0,15	0,21	0,27	0,32
2.3.6			65	0,08	0,12	0,15	0,2
3.1.1	**Non alloyed tool steel**		105	0,15	0,21	0,27	0,32
3.2.1	**Tool steel for cold working**		130	0,15	0,21	0,27	0,32
3.2.2			105	0,15	0,21	0,27	0,32
3.2.3			65	0,08	0,12	0,15	0,2
3.2.4			70	0,08	0,12	0,15	0,2
3.2.5			65	0,08	0,12	0,15	0,2
3.3.1	**Tool steel for hot working**		105	0,15	0,21	0,27	0,32
3.3.2			65	0,08	0,12	0,15	0,2
3.3.3			90	0,08	0,12	0,15	0,2
3.3.4			70	0,08	0,12	0,15	0,2
3.3.5			55	0,08	0,12	0,15	0,2
3.5.1	**Hardened tool steel**	**< 55 HRC**					
3.5.2		**55–58 HRC**					
3.5.3		**58–60 HRC**					
3.5.4		**60–62 HRC**					
3.5.5		**62–64 HRC**					
4.1.1	**Stainless steel**						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**		135	0,18	0,24	0,3	0,35
5.1.2			130	0,16	0,22	0,28	0,34
5.1.3			105	0,15	0,21	0,27	0,32
5.2.1	**Stainless cast steel**						
5.2.2							
6.1.1	**Cast iron with lamellar graphite**		150	0,23	0,335	0,425	0,52
6.1.2			135	0,23	0,335	0,425	0,52
6.1.3			105	0,23	0,335	0,425	0,52
6.1.4			70	0,08	0,12	0,15	0,2
6.2.1	**Spheroidal cast iron**		120	0,2	0,25	0,35	0,4
6.2.2			105	0,2	0,25	0,35	0,4
6.2.3			80	0,08	0,12	0,15	0,2
6.3.1	**GTW (white malleable cast iron)**		120	0,2	0,25	0,35	0,4
6.3.2			110	0,2	0,25	0,35	0,4
6.4.1	**GTS (black malleable cast iron)**		120	0,2	0,25	0,35	0,4
6.4.2			110	0,2	0,25	0,35	0,4
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							

W1103, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$

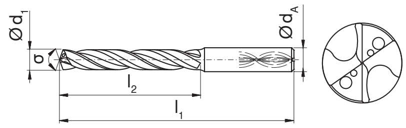
$d_1 = m6$
$d_A = h6$

E

≤ **5xD**

σ 140°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HPC.ST.1103.0780m6.5XD.140.IK.HA	8	91	53	W1103078340
7.9	HPC.ST.1103.0790m6.5XD.140.IK.HA	8	91	53	W1103079340
8.0	HPC.ST.1103.0800m6.5XD.140.IK.HA	8	91	53	W1103080340
8.1	HPC.ST.1103.0810m6.5XD.140.IK.HA	10	103	61	W1103081340
8.2	HPC.ST.1103.0820m6.5XD.140.IK.HA	10	103	61	W1103082340
8.3	HPC.ST.1103.0830m6.5XD.140.IK.HA	10	103	61	W1103083340
8.4	HPC.ST.1103.0840m6.5XD.140.IK.HA	10	103	61	W1103084340
8.5	HPC.ST.1103.0850m6.5XD.140.IK.HA	10	103	61	W1103085340
8.6	HPC.ST.1103.0860m6.5XD.140.IK.HA	10	103	61	W1103086340
8.7	HPC.ST.1103.0870m6.5XD.140.IK.HA	10	103	61	W1103087340
8.8	HPC.ST.1103.0880m6.5XD.140.IK.HA	10	103	61	W1103088340
8.9	HPC.ST.1103.0890m6.5XD.140.IK.HA	10	103	61	W1103089340
9.0	HPC.ST.1103.0900m6.5XD.140.IK.HA	10	103	61	W1103090340
9.1	HPC.ST.1103.0910m6.5XD.140.IK.HA	10	103	61	W1103091340
9.2	HPC.ST.1103.0920m6.5XD.140.IK.HA	10	103	61	W1103092340
9.3	HPC.ST.1103.0930m6.5XD.140.IK.HA	10	103	61	W1103093340
9.4	HPC.ST.1103.0940m6.5XD.140.IK.HA	10	103	61	W1103094340
9.5	HPC.ST.1103.0950m6.5XD.140.IK.HA	10	103	61	W1103095340
9.6	HPC.ST.1103.0960m6.5XD.140.IK.HA	10	103	61	W1103096340
9.7	HPC.ST.1103.0970m6.5XD.140.IK.HA	10	103	61	W1103097340
9.8	HPC.ST.1103.0980m6.5XD.140.IK.HA	10	103	61	W1103098340
9.9	HPC.ST.1103.0990m6.5XD.140.IK.HA	10	103	61	W1103099340
10.0	HPC.ST.1103.1000m6.5XD.140.IK.HA	10	103	61	W1103100340
10.2	HPC.ST.1103.1020m6.5XD.140.IK.HA	12	118	71	W1103102340
10.5	HPC.ST.1103.1050m6.5XD.140.IK.HA	12	118	71	W1103105340
10.8	HPC.ST.1103.1080m6.5XD.140.IK.HA	12	118	71	W1103108340
11.0	HPC.ST.1103.1100m6.5XD.140.IK.HA	12	118	71	W1103110340
11.2	HPC.ST.1103.1120m6.5XD.140.IK.HA	12	118	71	W1103112340
11.5	HPC.ST.1103.1150m6.5XD.140.IK.HA	12	118	71	W1103115340
11.8	HPC.ST.1103.1180m6.5XD.140.IK.HA	12	118	71	W1103118340
12.0	HPC.ST.1103.1200m6.5XD.140.IK.HA	12	118	71	W1103120340
12.2	HPC.ST.1103.1220m6.5XD.140.IK.HA	14	124	77	W1103122340
12.5	HPC.ST.1103.1250m6.5XD.140.IK.HA	14	124	77	W1103125340
12.8	HPC.ST.1103.1280m6.5XD.140.IK.HA	14	124	77	W1103128340
13.0	HPC.ST.1103.1300m6.5XD.140.IK.HA	14	124	77	W1103130340
13.2	HPC.ST.1103.1320m6.5XD.140.IK.HA	14	124	77	W1103132340
13.5	HPC.ST.1103.1350m6.5XD.140.IK.HA	14	124	77	W1103135340
13.8	HPC.ST.1103.1380m6.5XD.140.IK.HA	14	124	77	W1103138340
14.0	HPC.ST.1103.1400m6.5XD.140.IK.HA	14	124	77	W1103140340
14.2	HPC.ST.1103.1420m6.5XD.140.IK.HA	16	133	83	W1103142340
14.5	HPC.ST.1103.1450m6.5XD.140.IK.HA	16	133	83	W1103145340
14.8	HPC.ST.1103.1480m6.5XD.140.IK.HA	16	133	83	W1103148340
15.0	HPC.ST.1103.1500m6.5XD.140.IK.HA	16	133	83	W1103150340
15.2	HPC.ST.1103.1520m6.5XD.140.IK.HA	16	133	83	W1103152340
15.5	HPC.ST.1103.1550m6.5XD.140.IK.HA	16	133	83	W1103155340
15.8	HPC.ST.1103.1580m6.5XD.140.IK.HA	16	133	83	W1103158340
16.0	HPC.ST.1103.1600m6.5XD.140.IK.HA	16	133	83	W1103160340

W1102, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**	100	0,14	0,2	0,275	0,35
1.1.2		85	0,1	0,15	0,2	0,26
1.2.1	**Constructional steel**	100	0,14	0,2	0,275	0,35
1.2.2		85	0,1	0,15	0,2	0,26
1.2.3		80	0,1	0,15	0,2	0,26
1.3.1	**Spring steel**					
1.3.2						
1.3.3						
2.1.1	**Cementation steel**	95	0,14	0,2	0,275	0,35
2.1.2		85	0,14	0,2	0,275	0,35
2.1.3		80	0,1	0,15	0,2	0,26
2.2.1	**Nitriding steel**	80	0,1	0,15	0,2	0,26
2.2.2		80	0,1	0,15	0,2	0,26
2.3.1	**Tempered steel**	80	0,14	0,2	0,275	0,35
2.3.2		80	0,1	0,15	0,2	0,26
2.3.3		80	0,14	0,2	0,275	0,35
2.3.4		80	0,1	0,15	0,2	0,26
2.3.5		65	0,1	0,15	0,2	0,26
2.3.6						
3.1.1	**Non alloyed tool steel**	65	0,1	0,15	0,2	0,26
3.2.1	**Tool steel for cold working**	80	0,1	0,15	0,2	0,26
3.2.2		65	0,1	0,15	0,2	0,26
3.2.3		45	0,08	0,12	0,15	0,2
3.2.4						
3.2.5						
3.3.1	**Tool steel for hot working**	65	0,1	0,15	0,2	0,26
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**					
4.1.2						
4.1.3						
4.1.4						
4.1.5						
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**	85	0,14	0,2	0,275	0,35
5.1.2		80	0,1	0,15	0,2	0,26
5.1.3		65	0,1	0,15	0,2	0,26
5.2.1	**Stainless cast steel**					
5.2.2						
6.1.1	**Cast iron with lamellar graphite**	95	0,14	0,2	0,275	0,35
6.1.2		85	0,14	0,2	0,275	0,35
6.1.3		80	0,125	0,175	0,225	0,3
6.1.4						
6.2.1	**Spheroidal cast iron**	95	0,14	0,2	0,275	0,35
6.2.2		85	0,14	0,2	0,275	0,35
6.2.3		65	0,125	0,175	0,225	0,3
6.3.1	**GTW (white malleable cast iron)**	95	0,14	0,2	0,275	0,35
6.3.2		85	0,125	0,175	0,225	0,3
6.4.1	**GTS (black malleable cast iron)**	90	0,14	0,2	0,275	0,35
6.4.2		85	0,125	0,175	0,225	0,3
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						

W1102, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$

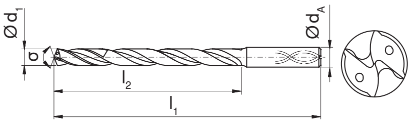
$d_1 = h7$
$d_A = h6$

E

≤ 8xD

σ 135°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.ST.1102.0300h7.8XD.135.IK.HA	6	72	34	W1102030440
3.1	HPC.ST.1102.0310h7.8XD.135.IK.HA	6	72	34	W1102031440
3.2	HPC.ST.1102.0320h7.8XD.135.IK.HA	6	72	34	W1102032440
3.3	HPC.ST.1102.0330h7.8XD.135.IK.HA	6	72	34	W1102033440
3.4	HPC.ST.1102.0340h7.8XD.135.IK.HA	6	72	34	W1102034440
3.5	HPC.ST.1102.0350h7.8XD.135.IK.HA	6	72	34	W1102035440
3.6	HPC.ST.1102.0360h7.8XD.135.IK.HA	6	72	34	W1102036440
3.7	HPC.ST.1102.0370h7.8XD.135.IK.HA	6	72	34	W1102037440
3.8	HPC.ST.1102.0380h7.8XD.135.IK.HA	6	81	43	W1102038440
3.9	HPC.ST.1102.0390h7.8XD.135.IK.HA	6	81	43	W1102039440
4.0	HPC.ST.1102.0400h7.8XD.135.IK.HA	6	81	43	W1102040440
4.1	HPC.ST.1102.0410h7.8XD.135.IK.HA	6	81	43	W1102041440
4.2	HPC.ST.1102.0420h7.8XD.135.IK.HA	6	81	43	W1102042440
4.3	HPC.ST.1102.0430h7.8XD.135.IK.HA	6	81	43	W1102043440
4.4	HPC.ST.1102.0440h7.8XD.135.IK.HA	6	81	43	W1102044440
4.5	HPC.ST.1102.0450h7.8XD.135.IK.HA	6	81	43	W1102045440
4.6	HPC.ST.1102.0460h7.8XD.135.IK.HA	6	81	43	W1102046440
4.7	HPC.ST.1102.0470h7.8XD.135.IK.HA	6	81	43	W1102047440
4.8	HPC.ST.1102.0480h7.8XD.135.IK.HA	6	95	57	W1102048440
4.9	HPC.ST.1102.0490h7.8XD.135.IK.HA	6	95	57	W1102049440
5.0	HPC.ST.1102.0500h7.8XD.135.IK.HA	6	95	57	W1102050440
5.1	HPC.ST.1102.0510h7.8XD.135.IK.HA	6	95	57	W1102051440
5.2	HPC.ST.1102.0520h7.8XD.135.IK.HA	6	95	57	W1102052440
5.3	HPC.ST.1102.0530h7.8XD.135.IK.HA	6	95	57	W1102053440
5.4	HPC.ST.1102.0540h7.8XD.135.IK.HA	6	95	57	W1102054440
5.5	HPC.ST.1102.0550h7.8XD.135.IK.HA	6	95	57	W1102055440
5.6	HPC.ST.1102.0560h7.8XD.135.IK.HA	6	95	57	W1102056440
5.7	HPC.ST.1102.0570h7.8XD.135.IK.HA	6	95	57	W1102057440
5.8	HPC.ST.1102.0580h7.8XD.135.IK.HA	6	95	57	W1102058440
5.9	HPC.ST.1102.0590h7.8XD.135.IK.HA	6	95	57	W1102059440
6.0	HPC.ST.1102.0600h7.8XD.135.IK.HA	6	95	57	W1102060440
6.1	HPC.ST.1102.0610h7.8XD.135.IK.HA	8	114	76	W1102061440
6.2	HPC.ST.1102.0620h7.8XD.135.IK.HA	8	114	76	W1102062440
6.3	HPC.ST.1102.0630h7.8XD.135.IK.HA	8	114	76	W1102063440
6.4	HPC.ST.1102.0640h7.8XD.135.IK.HA	8	114	76	W1102064440
6.5	HPC.ST.1102.0650h7.8XD.135.IK.HA	8	114	76	W1102065440
6.6	HPC.ST.1102.0660h7.8XD.135.IK.HA	8	114	76	W1102066440
6.7	HPC.ST.1102.0670h7.8XD.135.IK.HA	8	114	76	W1102067440
6.8	HPC.ST.1102.0680h7.8XD.135.IK.HA	8	114	76	W1102068440
6.9	HPC.ST.1102.0690h7.8XD.135.IK.HA	8	114	76	W1102069440
7.0	HPC.ST.1102.0700h7.8XD.135.IK.HA	8	114	76	W1102070440
7.1	HPC.ST.1102.0710h7.8XD.135.IK.HA	8	114	76	W1102071440
7.2	HPC.ST.1102.0720h7.8XD.135.IK.HA	8	114	76	W1102072440
7.3	HPC.ST.1102.0730h7.8XD.135.IK.HA	8	114	76	W1102073440
7.4	HPC.ST.1102.0740h7.8XD.135.IK.HA	8	114	76	W1102074440
7.5	HPC.ST.1102.0750h7.8XD.135.IK.HA	8	114	76	W1102075440
7.6	HPC.ST.1102.0760h7.8XD.135.IK.HA	8	114	76	W1102076440
7.7	HPC.ST.1102.0770h7.8XD.135.IK.HA	8	114	76	W1102077440

W1102, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**	100	0,14	0,2	0,275	0,35
1.1.2		85	0,1	0,15	0,2	0,26
1.2.1	**Constructional steel**	100	0,14	0,2	0,275	0,35
1.2.2		85	0,1	0,15	0,2	0,26
1.2.3		80	0,1	0,15	0,2	0,26
1.3.1	**Spring steel**					
1.3.2						
1.3.3						
2.1.1	**Cementation steel**	95	0,14	0,2	0,275	0,35
2.1.2		85	0,14	0,2	0,275	0,35
2.1.3		80	0,1	0,15	0,2	0,26
2.2.1	**Nitriding steel**	80	0,1	0,15	0,2	0,26
2.2.2		80	0,1	0,15	0,2	0,26
2.3.1	**Tempered steel**	80	0,14	0,2	0,275	0,35
2.3.2		80	0,1	0,15	0,2	0,26
2.3.3		80	0,14	0,2	0,275	0,35
2.3.4		80	0,1	0,15	0,2	0,26
2.3.5		65	0,1	0,15	0,2	0,26
2.3.6						
3.1.1	**Non alloyed tool steel**	65	0,1	0,15	0,2	0,26
3.2.1	**Tool steel for cold working**	80	0,1	0,15	0,2	0,26
3.2.2		65	0,1	0,15	0,2	0,26
3.2.3		45	0,08	0,12	0,15	0,2
3.2.4						
3.2.5						
3.3.1	**Tool steel for hot working**	65	0,1	0,15	0,2	0,26
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**					
4.1.2						
4.1.3						
4.1.4						
4.1.5						
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**	85	0,14	0,2	0,275	0,35
5.1.2		80	0,1	0,15	0,2	0,26
5.1.3		65	0,1	0,15	0,2	0,26
5.2.1	**Stainless cast steel**					
5.2.2						
6.1.1	**Cast iron with lamellar graphite**	95	0,14	0,2	0,275	0,35
6.1.2		85	0,14	0,2	0,275	0,35
6.1.3		80	0,125	0,175	0,225	0,3
6.1.4						
6.2.1	**Spheroidal cast iron**	95	0,14	0,2	0,275	0,35
6.2.2		85	0,14	0,2	0,275	0,35
6.2.3		65	0,125	0,175	0,225	0,3
6.3.1	**GTW (white malleable cast iron)**	95	0,14	0,2	0,275	0,35
6.3.2		85	0,125	0,175	0,225	0,3
6.4.1	**GTS (black malleable cast iron)**	90	0,14	0,2	0,275	0,35
6.4.2		85	0,125	0,175	0,225	0,3
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						

W1102, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$

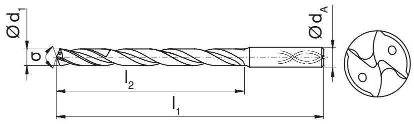
$d_1 = h7$
$d_A = h6$

E

≤ 8xD

σ 135°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HPC.ST.1102.0780h7.8XD.135.IK.HA	8	114	76	W1102078440
7.9	HPC.ST.1102.0790h7.8XD.135.IK.HA	8	114	76	W1102079440
8.0	HPC.ST.1102.0800h7.8XD.135.IK.HA	8	114	76	W1102080440
8.1	HPC.ST.1102.0810h7.8XD.135.IK.HA	10	142	95	W1102081440
8.2	HPC.ST.1102.0820h7.8XD.135.IK.HA	10	142	95	W1102082440
8.3	HPC.ST.1102.0830h7.8XD.135.IK.HA	10	142	95	W1102083440
8.4	HPC.ST.1102.0840h7.8XD.135.IK.HA	10	142	95	W1102084440
8.5	HPC.ST.1102.0850h7.8XD.135.IK.HA	10	142	95	W1102085440
8.6	HPC.ST.1102.0860h7.8XD.135.IK.HA	10	142	95	W1102086440
8.7	HPC.ST.1102.0870h7.8XD.135.IK.HA	10	142	95	W1102087440
8.8	HPC.ST.1102.0880h7.8XD.135.IK.HA	10	142	95	W1102088440
8.9	HPC.ST.1102.0890h7.8XD.135.IK.HA	10	142	95	W1102089440
9.0	HPC.ST.1102.0900h7.8XD.135.IK.HA	10	142	95	W1102090440
9.1	HPC.ST.1102.0910h7.8XD.135.IK.HA	10	142	95	W1102091440
9.2	HPC.ST.1102.0920h7.8XD.135.IK.HA	10	142	95	W1102092440
9.3	HPC.ST.1102.0930h7.8XD.135.IK.HA	10	142	95	W1102093440
9.4	HPC.ST.1102.0940h7.8XD.135.IK.HA	10	142	95	W1102094440
9.5	HPC.ST.1102.0950h7.8XD.135.IK.HA	10	142	95	W1102095440
9.6	HPC.ST.1102.0960h7.8XD.135.IK.HA	10	142	95	W1102096440
9.7	HPC.ST.1102.0970h7.8XD.135.IK.HA	10	142	95	W1102097440
9.8	HPC.ST.1102.0980h7.8XD.135.IK.HA	10	142	95	W1102098440
9.9	HPC.ST.1102.0990h7.8XD.135.IK.HA	10	142	95	W1102099440
10.0	HPC.ST.1102.1000h7.8XD.135.IK.HA	10	142	95	W1102100440
10.2	HPC.ST.1102.1020h7.8XD.135.IK.HA	12	162	114	W1102102440
10.5	HPC.ST.1102.1050h7.8XD.135.IK.HA	12	162	114	W1102105440
10.8	HPC.ST.1102.1080h7.8XD.135.IK.HA	12	162	114	W1102108440
11.0	HPC.ST.1102.1100h7.8XD.135.IK.HA	12	162	114	W1102110440
11.2	HPC.ST.1102.1120h7.8XD.135.IK.HA	12	162	114	W1102112440
11.5	HPC.ST.1102.1150h7.8XD.135.IK.HA	12	162	114	W1102115440
11.8	HPC.ST.1102.1180h7.8XD.135.IK.HA	12	162	114	W1102118440
12.0	HPC.ST.1102.1200h7.8XD.135.IK.HA	12	162	114	W1102120440
12.5	HPC.ST.1102.1250h7.8XD.135.IK.HA	14	178	131	W1102125440
12.8	HPC.ST.1102.1280h7.8XD.135.IK.HA	14	178	131	W1102128440
13.0	HPC.ST.1102.1300h7.8XD.135.IK.HA	14	178	131	W1102130440
13.5	HPC.ST.1102.1350h7.8XD.135.IK.HA	14	178	131	W1102135440
13.8	HPC.ST.1102.1380h7.8XD.135.IK.HA	14	178	131	W1102138440
14.0	HPC.ST.1102.1400h7.8XD.135.IK.HA	14	178	131	W1102140440
14.5	HPC.ST.1102.1450h7.8XD.135.IK.HA	16	203	152	W1102145440
14.8	HPC.ST.1102.1480h7.8XD.135.IK.HA	16	203	152	W1102148440
15.0	HPC.ST.1102.1500h7.8XD.135.IK.HA	16	203	152	W1102150440
15.5	HPC.ST.1102.1550h7.8XD.135.IK.HA	16	203	152	W1102155440
15.8	HPC.ST.1102.1580h7.8XD.135.IK.HA	16	203	152	W1102158440
16.0	HPC.ST.1102.1600h7.8XD.135.IK.HA	16	203	152	W1102160440

W1104, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]				
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		90	0,14	0,2	0,275	0,35	0,45
1.1.2			75	0,1	0,15	0,2	0,26	0,325
1.2.1	**Constructional steel**		90	0,14	0,2	0,275	0,35	0,45
1.2.2			75	0,1	0,15	0,2	0,26	0,325
1.2.3			70	0,1	0,15	0,2	0,26	0,325
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**		80	0,14	0,2	0,275	0,35	0,45
2.1.2			75	0,14	0,2	0,275	0,35	0,45
2.1.3			70	0,1	0,15	0,2	0,26	0,325
2.2.1	**Nitriding steel**		70	0,1	0,15	0,2	0,26	0,325
2.2.2			70	0,1	0,15	0,2	0,26	0,325
2.3.1	**Tempered steel**		75	0,14	0,2	0,275	0,35	0,45
2.3.2			70	0,1	0,15	0,2	0,26	0,325
2.3.3			70	0,14	0,2	0,275	0,35	0,45
2.3.4			70	0,1	0,15	0,2	0,26	0,325
2.3.5			55	0,1	0,15	0,2	0,26	0,325
2.3.6								
3.1.1	**Non alloyed tool steel**		55	0,1	0,15	0,2	0,26	0,325
3.2.1	**Tool steel for cold working**		70	0,1	0,15	0,2	0,26	0,325
3.2.2			55	0,1	0,15	0,2	0,26	0,325
3.2.3			32	0,1	0,15	0,2	0,26	0,325
3.2.4								
3.2.5								
3.3.1	**Tool steel for hot working**		55	0,1	0,15	0,2	0,26	0,325
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel**	**< 55 HRC**						
3.5.2		**55–58 HRC**						
3.5.3		**58–60 HRC**						
3.5.4		**60–62 HRC**						
3.5.5		**62–64 HRC**						
4.1.1	**Stainless steel**							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**		75	0,14	0,2	0,275	0,35	0,45
5.1.2			70	0,1	0,15	0,2	0,26	0,325
5.1.3			55	0,1	0,15	0,2	0,26	0,325
5.2.1	**Stainless cast steel**							
5.2.2								
6.1.1	**Cast iron with lamellar graphite**		85	0,23	0,335	0,425	0,52	0,58
6.1.2			75	0,23	0,335	0,425	0,52	0,58
6.1.3			70	0,23	0,335	0,425	0,52	0,58
6.1.4			65	0,08	0,12	0,15	0,2	0,25
6.2.1	**Spheroidal cast iron**		80	0,2	0,25	0,35	0,4	0,46
6.2.2			75	0,2	0,25	0,35	0,4	0,46
6.2.3			55	0,08	0,12	0,15	0,2	0,25
6.3.1	**GTW (white malleable cast iron)**		80	0,2	0,25	0,35	0,4	0,46
6.3.2			75	0,2	0,25	0,35	0,4	0,46
6.4.1	**GTS (black malleable cast iron)**		80	0,2	0,25	0,35	0,4	0,46
6.4.2			75	0,2	0,25	0,35	0,4	0,46
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								

W1104, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$

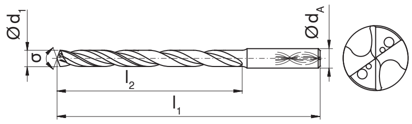
$d_1 = m6$
$d_A = h6$

E

≤ 8xD

σ 140°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.ST.1104.0300m6.8XD.140.IK.HA	6	72	34	W1104030440
3.3	HPC.ST.1104.0330m6.8XD.140.IK.HA	6	72	34	W1104033440
3.4	HPC.ST.1104.0340m6.8XD.140.IK.HA	6	72	34	W1104034440
3.5	HPC.ST.1104.0350m6.8XD.140.IK.HA	6	72	34	W1104035440
3.7	HPC.ST.1104.0370m6.8XD.140.IK.HA	6	72	34	W1104037440
3.8	HPC.ST.1104.0380m6.8XD.140.IK.HA	6	81	43	W1104038440
4.0	HPC.ST.1104.0400m6.8XD.140.IK.HA	6	81	43	W1104040440
4.1	HPC.ST.1104.0410m6.8XD.140.IK.HA	6	81	43	W1104041440
4.2	HPC.ST.1104.0420m6.8XD.140.IK.HA	6	81	43	W1104042440
4.3	HPC.ST.1104.0430m6.8XD.140.IK.HA	6	81	43	W1104043440
4.5	HPC.ST.1104.0450m6.8XD.140.IK.HA	6	81	43	W1104045440
4.6	HPC.ST.1104.0460m6.8XD.140.IK.HA	6	81	43	W1104046440
4.7	HPC.ST.1104.0470m6.8XD.140.IK.HA	6	81	43	W1104047440
4.8	HPC.ST.1104.0480m6.8XD.140.IK.HA	6	95	57	W1104048440
5.0	HPC.ST.1104.0500m6.8XD.140.IK.HA	6	95	57	W1104050440
5.1	HPC.ST.1104.0510m6.8XD.140.IK.HA	6	95	57	W1104051440
5.2	HPC.ST.1104.0520m6.8XD.140.IK.HA	6	95	57	W1104052440
5.3	HPC.ST.1104.0530m6.8XD.140.IK.HA	6	95	57	W1104053440
5.5	HPC.ST.1104.0550m6.8XD.140.IK.HA	6	95	57	W1104055440
5.8	HPC.ST.1104.0580m6.8XD.140.IK.HA	6	95	57	W1104058440
5.9	HPC.ST.1104.0590m6.8XD.140.IK.HA	6	95	57	W1104059440
6.0	HPC.ST.1104.0600m6.8XD.140.IK.HA	6	95	57	W1104060440
6.1	HPC.ST.1104.0610m6.8XD.140.IK.HA	8	114	76	W1104061440
6.2	HPC.ST.1104.0620m6.8XD.140.IK.HA	8	114	76	W1104062440
6.3	HPC.ST.1104.0630m6.8XD.140.IK.HA	8	114	76	W1104063440
6.5	HPC.ST.1104.0650m6.8XD.140.IK.HA	8	114	76	W1104065440
6.6	HPC.ST.1104.0660m6.8XD.140.IK.HA	8	114	76	W1104066440
6.8	HPC.ST.1104.0680m6.8XD.140.IK.HA	8	114	76	W1104068440
7.0	HPC.ST.1104.0700m6.8XD.140.IK.HA	8	114	76	W1104070440
7.4	HPC.ST.1104.0740m6.8XD.140.IK.HA	8	114	76	W1104074440
7.5	HPC.ST.1104.0750m6.8XD.140.IK.HA	8	114	76	W1104075440
7.7	HPC.ST.1104.0770m6.8XD.140.IK.HA	8	114	76	W1104077440
7.8	HPC.ST.1104.0780m6.8XD.140.IK.HA	8	114	76	W1104078440
7.9	HPC.ST.1104.0790m6.8XD.140.IK.HA	8	114	76	W1104079440
8.0	HPC.ST.1104.0800m6.8XD.140.IK.HA	8	114	76	W1104080440
8.1	HPC.ST.1104.0810m6.8XD.140.IK.HA	10	142	95	W1104081440
8.2	HPC.ST.1104.0820m6.8XD.140.IK.HA	10	142	95	W1104082440
8.3	HPC.ST.1104.0830m6.8XD.140.IK.HA	10	142	95	W1104083440
8.5	HPC.ST.1104.0850m6.8XD.140.IK.HA	10	142	95	W1104085440
8.6	HPC.ST.1104.0860m6.8XD.140.IK.HA	10	142	95	W1104086440
8.7	HPC.ST.1104.0870m6.8XD.140.IK.HA	10	142	95	W1104087440
8.8	HPC.ST.1104.0880m6.8XD.140.IK.HA	10	142	95	W1104088440
9.0	HPC.ST.1104.0900m6.8XD.140.IK.HA	10	142	95	W1104090440
9.1	HPC.ST.1104.0910m6.8XD.140.IK.HA	10	142	95	W1104091440
9.2	HPC.ST.1104.0920m6.8XD.140.IK.HA	10	142	95	W1104092440
9.3	HPC.ST.1104.0930m6.8XD.140.IK.HA	10	142	95	W1104093440
9.4	HPC.ST.1104.0940m6.8XD.140.IK.HA	10	142	95	W1104094440
9.5	HPC.ST.1104.0950m6.8XD.140.IK.HA	10	142	95	W1104095440

W1104, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]				
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**		90	0,14	0,2	0,275	0,35	0,45
1.1.2			75	0,1	0,15	0,2	0,26	0,325
1.2.1	**Constructional steel**		90	0,14	0,2	0,275	0,35	0,45
1.2.2			75	0,1	0,15	0,2	0,26	0,325
1.2.3			70	0,1	0,15	0,2	0,26	0,325
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**		80	0,14	0,2	0,275	0,35	0,45
2.1.2			75	0,14	0,2	0,275	0,35	0,45
2.1.3			70	0,1	0,15	0,2	0,26	0,325
2.2.1	**Nitriding steel**		70	0,1	0,15	0,2	0,26	0,325
2.2.2			70	0,1	0,15	0,2	0,26	0,325
2.3.1	**Tempered steel**		75	0,14	0,2	0,275	0,35	0,45
2.3.2			70	0,1	0,15	0,2	0,26	0,325
2.3.3			70	0,14	0,2	0,275	0,35	0,45
2.3.4			70	0,1	0,15	0,2	0,26	0,325
2.3.5			55	0,1	0,15	0,2	0,26	0,325
2.3.6								
3.1.1	**Non alloyed tool steel**		55	0,1	0,15	0,2	0,26	0,325
3.2.1	**Tool steel for cold working**		70	0,1	0,15	0,2	0,26	0,325
3.2.2			55	0,1	0,15	0,2	0,26	0,325
3.2.3			32	0,1	0,15	0,2	0,26	0,325
3.2.4								
3.2.5								
3.3.1	**Tool steel for hot working**		55	0,1	0,15	0,2	0,26	0,325
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel**	**< 55 HRC**						
3.5.2		**55–58 HRC**						
3.5.3		**58–60 HRC**						
3.5.4		**60–62 HRC**						
3.5.5		**62–64 HRC**						
4.1.1	**Stainless steel**							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**		75	0,14	0,2	0,275	0,35	0,45
5.1.2			70	0,1	0,15	0,2	0,26	0,325
5.1.3			55	0,1	0,15	0,2	0,26	0,325
5.2.1	**Stainless cast steel**							
5.2.2								
6.1.1	**Cast iron with lamellar graphite**		85	0,23	0,335	0,425	0,52	0,58
6.1.2			75	0,23	0,335	0,425	0,52	0,58
6.1.3			70	0,23	0,335	0,425	0,52	0,58
6.1.4			65	0,08	0,12	0,15	0,2	0,25
6.2.1	**Spheroidal cast iron**		80	0,2	0,25	0,35	0,4	0,46
6.2.2			75	0,2	0,25	0,35	0,4	0,46
6.2.3			55	0,08	0,12	0,15	0,2	0,25
6.3.1	**GTW (white malleable cast iron)**		80	0,2	0,25	0,35	0,4	0,46
6.3.2			75	0,2	0,25	0,35	0,4	0,46
6.4.1	**GTS (black malleable cast iron)**		80	0,2	0,25	0,35	0,4	0,46
6.4.2			75	0,2	0,25	0,35	0,4	0,46
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								

W1104, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$

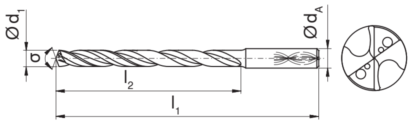
$d_1 = m6$
$d_A = h6$

E

≤ **8xD**

σ 140°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
9.7	HPC.ST.1104.0970m6.8XD.140.IK.HA	10	142	95	W1104097440
9.8	HPC.ST.1104.0980m6.8XD.140.IK.HA	10	142	95	W1104098440
9.9	HPC.ST.1104.0990m6.8XD.140.IK.HA	10	142	95	W1104099440
10.0	HPC.ST.1104.1000m6.8XD.140.IK.HA	10	142	95	W1104100440
10.2	HPC.ST.1104.1020m6.8XD.140.IK.HA	12	162	114	W1104102440
10.5	HPC.ST.1104.1050m6.8XD.140.IK.HA	12	162	114	W1104105440
10.8	HPC.ST.1104.1080m6.8XD.140.IK.HA	12	162	114	W1104108440
11.0	HPC.ST.1104.1100m6.8XD.140.IK.HA	12	162	114	W1104110440
11.2	HPC.ST.1104.1120m6.8XD.140.IK.HA	12	162	114	W1104112440
11.5	HPC.ST.1104.1150m6.8XD.140.IK.HA	12	162	114	W1104115440
11.8	HPC.ST.1104.1180m6.8XD.140.IK.HA	12	162	114	W1104118440
12.0	HPC.ST.1104.1200m6.8XD.140.IK.HA	12	162	114	W1104120440
12.2	HPC.ST.1104.1220m6.8XD.140.IK.HA	14	178	131	W1104122440
12.5	HPC.ST.1104.1250m6.8XD.140.IK.HA	14	178	131	W1104125440
12.8	HPC.ST.1104.1280m6.8XD.140.IK.HA	14	178	131	W1104128440
13.0	HPC.ST.1104.1300m6.8XD.140.IK.HA	14	178	131	W1104130440
13.2	HPC.ST.1104.1320m6.8XD.140.IK.HA	14	178	131	W1104132440
13.5	HPC.ST.1104.1350m6.8XD.140.IK.HA	14	178	131	W1104135440
13.8	HPC.ST.1104.1380m6.8XD.140.IK.HA	14	178	131	W1104138440
14.0	HPC.ST.1104.1400m6.8XD.140.IK.HA	14	178	131	W1104140440
14.2	HPC.ST.1104.1420m6.8XD.140.IK.HA	16	203	152	W1104142440
14.5	HPC.ST.1104.1450m6.8XD.140.IK.HA	16	203	152	W1104145440
14.8	HPC.ST.1104.1480m6.8XD.140.IK.HA	16	203	152	W1104148440
15.0	HPC.ST.1104.1500m6.8XD.140.IK.HA	16	203	152	W1104150440
15.5	HPC.ST.1104.1550m6.8XD.140.IK.HA	16	203	152	W1104155440
15.8	HPC.ST.1104.1580m6.8XD.140.IK.HA	16	203	152	W1104158440
16.0	HPC.ST.1104.1600m6.8XD.140.IK.HA	16	203	152	W1104160440
16.5	HPC.ST.1104.1650m6.8XD.140.IK.HA	18	222	171	W1104165440
17.0	HPC.ST.1104.1700m6.8XD.140.IK.HA	18	222	171	W1104170440
17.5	HPC.ST.1104.1750m6.8XD.140.IK.HA	18	222	171	W1104175440
18.0	HPC.ST.1104.1800m6.8XD.140.IK.HA	18	222	171	W1104180440
18.5	HPC.ST.1104.1850m6.8XD.140.IK.HA	20	243	190	W1104185440
19.0	HPC.ST.1104.1900m6.8XD.140.IK.HA	20	243	190	W1104190440
19.5	HPC.ST.1104.1950m6.8XD.140.IK.HA	20	243	190	W1104195440
20.0	HPC.ST.1104.2000m6.8XD.140.IK.HA	20	243	190	W1104200440

W1101, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**	100	0,14	0,2	0,275	0,35
1.1.2		85	0,1	0,15	0,2	0,26
1.2.1	**Constructional steel**	100	0,14	0,2	0,275	0,35
1.2.2		85	0,1	0,15	0,2	0,26
1.2.3		80	0,1	0,15	0,2	0,26
1.3.1	**Spring steel**					
1.3.2						
1.3.3						
2.1.1	**Cementation steel**	95	0,14	0,2	0,275	0,35
2.1.2		85	0,14	0,2	0,275	0,35
2.1.3		80	0,1	0,15	0,2	0,26
2.2.1	**Nitriding steel**	80	0,1	0,15	0,2	0,26
2.2.2		80	0,1	0,15	0,2	0,26
2.3.1	**Tempered steel**	80	0,14	0,2	0,275	0,35
2.3.2		80	0,1	0,15	0,2	0,26
2.3.3		80	0,14	0,2	0,275	0,35
2.3.4		80	0,1	0,15	0,2	0,26
2.3.5		65	0,1	0,15	0,2	0,26
2.3.6						
3.1.1	**Non alloyed tool steel**	65	0,1	0,15	0,2	0,26
3.2.1	**Tool steel for cold working**	80	0,1	0,15	0,2	0,26
3.2.2		65	0,1	0,15	0,2	0,26
3.2.3		45	0,08	0,12	0,15	0,2
3.2.4						
3.2.5						
3.3.1	**Tool steel for hot working**	65	0,1	0,15	0,2	0,26
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**					
4.1.2						
4.1.3						
4.1.4						
4.1.5						
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**	85	0,14	0,2	0,275	0,35
5.1.2		80	0,1	0,15	0,2	0,26
5.1.3		65	0,1	0,15	0,2	0,26
5.2.1	**Stainless cast steel**					
5.2.2						
6.1.1	**Cast iron with lamellar graphite**	95	0,14	0,2	0,275	0,35
6.1.2		85	0,14	0,2	0,275	0,35
6.1.3		80	0,125	0,175	0,225	0,3
6.1.4						
6.2.1	**Spheroidal cast iron**	95	0,14	0,2	0,275	0,35
6.2.2		85	0,14	0,2	0,275	0,35
6.2.3		65	0,125	0,175	0,225	0,3
6.3.1	**GTW (white malleable cast iron)**	95	0,14	0,2	0,275	0,35
6.3.2		85	0,125	0,175	0,225	0,3
6.4.1	**GTS (black malleable cast iron)**	90	0,14	0,2	0,275	0,35
6.4.2		85	0,125	0,175	0,225	0,3
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						

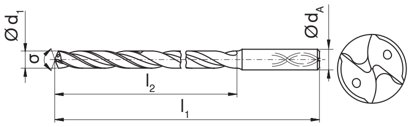
W1101, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 12xD | σ 135°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.ST.1101.0300h7.12XD.135.IK.HA	6	92	54	W1101030540
3.1	HPC.ST.1101.0310h7.12XD.135.IK.HA	6	92	54	W1101031540
3.2	HPC.ST.1101.0320h7.12XD.135.IK.HA	6	92	54	W1101032540
3.3	HPC.ST.1101.0330h7.12XD.135.IK.HA	6	92	54	W1101033540
3.4	HPC.ST.1101.0340h7.12XD.135.IK.HA	6	92	54	W1101034540
3.5	HPC.ST.1101.0350h7.12XD.135.IK.HA	6	92	54	W1101035540
3.6	HPC.ST.1101.0360h7.12XD.135.IK.HA	6	92	54	W1101036540
3.7	HPC.ST.1101.0370h7.12XD.135.IK.HA	6	92	54	W1101037540
3.8	HPC.ST.1101.0380h7.12XD.135.IK.HA	6	102	64	W1101038540
3.9	HPC.ST.1101.0390h7.12XD.135.IK.HA	6	102	64	W1101039540
4.0	HPC.ST.1101.0400h7.12XD.135.IK.HA	6	102	64	W1101040540
4.1	HPC.ST.1101.0410h7.12XD.135.IK.HA	6	102	64	W1101041540
4.2	HPC.ST.1101.0420h7.12XD.135.IK.HA	6	102	64	W1101042540
4.3	HPC.ST.1101.0430h7.12XD.135.IK.HA	6	102	64	W1101043540
4.4	HPC.ST.1101.0440h7.12XD.135.IK.HA	6	102	64	W1101044540
4.5	HPC.ST.1101.0450h7.12XD.135.IK.HA	6	102	64	W1101045540
4.6	HPC.ST.1101.0460h7.12XD.135.IK.HA	6	102	64	W1101046540
4.7	HPC.ST.1101.0470h7.12XD.135.IK.HA	6	102	64	W1101047540
4.8	HPC.ST.1101.0480h7.12XD.135.IK.HA	6	116	78	W1101048540
4.9	HPC.ST.1101.0490h7.12XD.135.IK.HA	6	116	78	W1101049540
5.0	HPC.ST.1101.0500h7.12XD.135.IK.HA	6	116	78	W1101050540
5.1	HPC.ST.1101.0510h7.12XD.135.IK.HA	6	116	78	W1101051540
5.2	HPC.ST.1101.0520h7.12XD.135.IK.HA	6	116	78	W1101052540
5.3	HPC.ST.1101.0530h7.12XD.135.IK.HA	6	116	78	W1101053540
5.4	HPC.ST.1101.0540h7.12XD.135.IK.HA	6	116	78	W1101054540
5.5	HPC.ST.1101.0550h7.12XD.135.IK.HA	6	116	78	W1101055540
5.6	HPC.ST.1101.0560h7.12XD.135.IK.HA	6	116	78	W1101056540
5.7	HPC.ST.1101.0570h7.12XD.135.IK.HA	6	116	78	W1101057540
5.8	HPC.ST.1101.0580h7.12XD.135.IK.HA	6	116	78	W1101058540
5.9	HPC.ST.1101.0590h7.12XD.135.IK.HA	6	116	78	W1101059540
6.0	HPC.ST.1101.0600h7.12XD.135.IK.HA	6	116	78	W1101060540
6.1	HPC.ST.1101.0610h7.12XD.135.IK.HA	8	146	108	W1101061540
6.2	HPC.ST.1101.0620h7.12XD.135.IK.HA	8	146	108	W1101062540
6.3	HPC.ST.1101.0630h7.12XD.135.IK.HA	8	146	108	W1101063540
6.4	HPC.ST.1101.0640h7.12XD.135.IK.HA	8	146	108	W1101064540
6.5	HPC.ST.1101.0650h7.12XD.135.IK.HA	8	146	108	W1101065540
6.6	HPC.ST.1101.0660h7.12XD.135.IK.HA	8	146	108	W1101066540
6.7	HPC.ST.1101.0670h7.12XD.135.IK.HA	8	146	108	W1101067540
6.8	HPC.ST.1101.0680h7.12XD.135.IK.HA	8	146	108	W1101068540
6.9	HPC.ST.1101.0690h7.12XD.135.IK.HA	8	146	108	W1101069540
7.0	HPC.ST.1101.0700h7.12XD.135.IK.HA	8	146	108	W1101070540
7.1	HPC.ST.1101.0710h7.12XD.135.IK.HA	8	146	108	W1101071540
7.2	HPC.ST.1101.0720h7.12XD.135.IK.HA	8	146	108	W1101072540
7.3	HPC.ST.1101.0730h7.12XD.135.IK.HA	8	146	108	W1101073540
7.4	HPC.ST.1101.0740h7.12XD.135.IK.HA	8	146	108	W1101074540
7.5	HPC.ST.1101.0750h7.12XD.135.IK.HA	8	146	108	W1101075540
7.6	HPC.ST.1101.0760h7.12XD.135.IK.HA	8	146	108	W1101076540
7.7	HPC.ST.1101.0770h7.12XD.135.IK.HA	8	146	108	W1101077540

W1101, coated

Cutting data

Index	Material designation		V$_c$ [m/min]	f [mm/rev]			
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**		100	0,14	0,2	0,275	0,35
1.1.2			85	0,1	0,15	0,2	0,26
1.2.1	**Constructional steel**		100	0,14	0,2	0,275	0,35
1.2.2			85	0,1	0,15	0,2	0,26
1.2.3			80	0,1	0,15	0,2	0,26
1.3.1	**Spring steel**						
1.3.2							
1.3.3							
2.1.1	**Cementation steel**		95	0,14	0,2	0,275	0,35
2.1.2			85	0,14	0,2	0,275	0,35
2.1.3			80	0,1	0,15	0,2	0,26
2.2.1	**Nitriding steel**		80	0,1	0,15	0,2	0,26
2.2.2			80	0,1	0,15	0,2	0,26
2.3.1	**Tempered steel**		80	0,14	0,2	0,275	0,35
2.3.2			80	0,1	0,15	0,2	0,26
2.3.3			80	0,14	0,2	0,275	0,35
2.3.4			80	0,1	0,15	0,2	0,26
2.3.5			65	0,1	0,15	0,2	0,26
2.3.6							
3.1.1	**Non alloyed tool steel**		65	0,1	0,15	0,2	0,26
3.2.1	**Tool steel for cold working**		80	0,1	0,15	0,2	0,26
3.2.2			65	0,1	0,15	0,2	0,26
3.2.3			45	0,08	0,12	0,15	0,2
3.2.4							
3.2.5							
3.3.1	**Tool steel for hot working**		65	0,1	0,15	0,2	0,26
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	**Hardened tool steel**	**< 55 HRC**					
3.5.2		**55–58 HRC**					
3.5.3		**58–60 HRC**					
3.5.4		**60–62 HRC**					
3.5.5		**62–64 HRC**					
4.1.1	**Stainless steel**						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**		85	0,14	0,2	0,275	0,35
5.1.2			80	0,1	0,15	0,2	0,26
5.1.3			65	0,1	0,15	0,2	0,26
5.2.1	**Stainless cast steel**						
5.2.2							
6.1.1	**Cast iron with lamellar graphite**		95	0,14	0,2	0,275	0,35
6.1.2			85	0,14	0,2	0,275	0,35
6.1.3			80	0,125	0,175	0,225	0,3
6.1.4							
6.2.1	**Spheroidal cast iron**		95	0,14	0,2	0,275	0,35
6.2.2			85	0,14	0,2	0,275	0,35
6.2.3			65	0,125	0,175	0,225	0,3
6.3.1	**GTW (white malleable cast iron)**		95	0,14	0,2	0,275	0,35
6.3.2			85	0,125	0,175	0,225	0,3
6.4.1	**GTS (black malleable cast iron)**		90	0,14	0,2	0,275	0,35
6.4.2			85	0,125	0,175	0,225	0,3
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**						
7.8.2							
7.8.3							

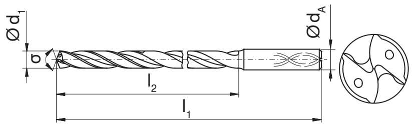
W1101, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$ | $d_1 = h7$, $d_A = h6$ | E | ≤ 12xD | σ 135°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HPC.ST.1101.0780h7.12XD.135.IK.HA	8	146	108	W1101078540
7.9	HPC.ST.1101.0790h7.12XD.135.IK.HA	8	146	108	W1101079540
8.0	HPC.ST.1101.0800h7.12XD.135.IK.HA	8	146	108	W1101080540
8.1	HPC.ST.1101.0810h7.12XD.135.IK.HA	10	162	120	W1101081540
8.2	HPC.ST.1101.0820h7.12XD.135.IK.HA	10	162	120	W1101082540
8.3	HPC.ST.1101.0830h7.12XD.135.IK.HA	10	162	120	W1101083540
8.4	HPC.ST.1101.0840h7.12XD.135.IK.HA	10	162	120	W1101084540
8.5	HPC.ST.1101.0850h7.12XD.135.IK.HA	10	162	120	W1101085540
8.6	HPC.ST.1101.0860h7.12XD.135.IK.HA	10	162	120	W1101086540
8.7	HPC.ST.1101.0870h7.12XD.135.IK.HA	10	162	120	W1101087540
8.8	HPC.ST.1101.0880h7.12XD.135.IK.HA	10	162	120	W1101088540
8.9	HPC.ST.1101.0890h7.12XD.135.IK.HA	10	162	120	W1101089540
9.0	HPC.ST.1101.0900h7.12XD.135.IK.HA	10	162	120	W1101090540
9.1	HPC.ST.1101.0910h7.12XD.135.IK.HA	10	162	120	W1101091540
9.2	HPC.ST.1101.0920h7.12XD.135.IK.HA	10	162	120	W1101092540
9.3	HPC.ST.1101.0930h7.12XD.135.IK.HA	10	162	120	W1101093540
9.4	HPC.ST.1101.0940h7.12XD.135.IK.HA	10	162	120	W1101094540
9.5	HPC.ST.1101.0950h7.12XD.135.IK.HA	10	162	120	W1101095540
9.6	HPC.ST.1101.0960h7.12XD.135.IK.HA	10	162	120	W1101096540
9.7	HPC.ST.1101.0970h7.12XD.135.IK.HA	10	162	120	W1101097540
9.8	HPC.ST.1101.0980h7.12XD.135.IK.HA	10	162	120	W1101098540
9.9	HPC.ST.1101.0990h7.12XD.135.IK.HA	10	162	120	W1101099540
10.0	HPC.ST.1101.1000h7.12XD.135.IK.HA	10	162	120	W1101100540
10.2	HPC.ST.1101.1020h7.12XD.135.IK.HA	12	204	156	W1101102540
10.5	HPC.ST.1101.1050h7.12XD.135.IK.HA	12	204	156	W1101105540
10.8	HPC.ST.1101.1080h7.12XD.135.IK.HA	12	204	156	W1101108540
11.0	HPC.ST.1101.1100h7.12XD.135.IK.HA	12	204	156	W1101110540
11.2	HPC.ST.1101.1120h7.12XD.135.IK.HA	12	204	156	W1101112540
11.5	HPC.ST.1101.1150h7.12XD.135.IK.HA	12	204	156	W1101115540
11.8	HPC.ST.1101.1180h7.12XD.135.IK.HA	12	204	156	W1101118540
12.0	HPC.ST.1101.1200h7.12XD.135.IK.HA	12	204	156	W1101120540
12.5	HPC.ST.1101.1250h7.12XD.135.IK.HA	14	230	182	W1101125540
12.8	HPC.ST.1101.1280h7.12XD.135.IK.HA	14	230	182	W1101128540
13.0	HPC.ST.1101.1300h7.12XD.135.IK.HA	14	230	182	W1101130540
13.5	HPC.ST.1101.1350h7.12XD.135.IK.HA	14	230	182	W1101135540
13.8	HPC.ST.1101.1380h7.12XD.135.IK.HA	14	230	182	W1101138540
14.0	HPC.ST.1101.1400h7.12XD.135.IK.HA	14	230	182	W1101140540
14.5	HPC.ST.1101.1450h7.12XD.135.IK.HA	16	260	208	W1101145540
14.8	HPC.ST.1101.1480h7.12XD.135.IK.HA	16	260	208	W1101148540
15.0	HPC.ST.1101.1500h7.12XD.135.IK.HA	16	260	208	W1101150540
15.5	HPC.ST.1101.1550h7.12XD.135.IK.HA	16	260	208	W1101155540
15.8	HPC.ST.1101.1580h7.12XD.135.IK.HA	16	260	208	W1101158540
16.0	HPC.ST.1101.1600h7.12XD.135.IK.HA	16	260	208	W1101160540

W1105, coated

Cutting data

Index	Material designation		V$_c$ [m/min]	f [mm/rev]			
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	Machining steels		90	0,14	0,2	0,275	0,35
1.1.2			75	0,1	0,15	0,2	0,26
1.2.1	Constructional steel		90	0,14	0,2	0,275	0,35
1.2.2			75	0,1	0,15	0,2	0,26
1.2.3			70	0,1	0,15	0,2	0,26
1.3.1	Spring steel						
1.3.2							
1.3.3							
2.1.1	Cementation steel		80	0,14	0,2	0,275	0,35
2.1.2			75	0,14	0,2	0,275	0,35
2.1.3			70	0,1	0,15	0,2	0,26
2.2.1	Nitriding steel		70	0,1	0,15	0,2	0,26
2.2.2			70	0,1	0,15	0,2	0,26
2.3.1	Tempered steel		75	0,14	0,2	0,275	0,35
2.3.2			70	0,1	0,15	0,2	0,26
2.3.3			70	0,14	0,2	0,275	0,35
2.3.4			70	0,1	0,15	0,2	0,26
2.3.5			55	0,1	0,15	0,2	0,26
2.3.6							
3.1.1	Non alloyed tool steel		55	0,1	0,15	0,2	0,26
3.2.1	Tool steel for cold working		70	0,1	0,15	0,2	0,26
3.2.2			55	0,1	0,15	0,2	0,26
3.2.3			32	0,1	0,15	0,2	0,26
3.2.4							
3.2.5							
3.3.1	Tool steel for hot working		55	0,1	0,15	0,2	0,26
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	Hardened tool steel	< 55 HRC					
3.5.2		55–58 HRC					
3.5.3		58–60 HRC					
3.5.4		60–62 HRC					
3.5.5		62–64 HRC					
4.1.1	Stainless steel						
4.1.2							
4.1.3							
4.1.4							
4.1.5							
4.2.1	Heat-resistant alloys						
4.2.2							
4.2.3							
4.2.4							
5.1.1	Conventional cast steel		75	0,14	0,2	0,275	0,35
5.1.2			70	0,1	0,15	0,2	0,26
5.1.3			55	0,1	0,15	0,2	0,26
5.2.1	Stainless cast steel						
5.2.2							
6.1.1	Cast iron with lamellar graphite		85	0,23	0,335	0,425	0,52
6.1.2			75	0,23	0,335	0,425	0,52
6.1.3			70	0,23	0,335	0,425	0,52
6.1.4			65	0,08	0,12	0,15	0,2
6.2.1	Spheroidal cast iron		80	0,2	0,25	0,35	0,4
6.2.2			75	0,2	0,25	0,35	0,4
6.2.3			55	0,08	0,12	0,15	0,2
6.3.1	GTW (white malleable cast iron)		80	0,2	0,25	0,35	0,4
6.3.2			75	0,2	0,25	0,35	0,4
6.4.1	GTS (black malleable cast iron)		80	0,2	0,25	0,35	0,4
6.4.2			75	0,2	0,25	0,35	0,4
7.1.1	Aluminium						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	Magnesium						
7.2.2							
7.3.1	Copper						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	CuZn (brass)						
7.4.2							
7.5.1	CuSn (bronze)						
7.5.2							
7.6.1	CuAlFe (Ampco)						
7.6.2							
7.8.1	Titanium						
7.8.2							
7.8.3							

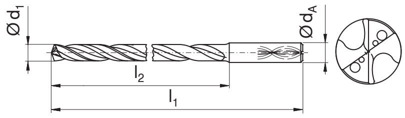
W1105, coated

HPC twist drills

ST **HPC**

$\lambda_S = 30°$ | $d_1 = m6$ $d_A = h6$ | E | ≤ 12xD | σ 140°

SCPP415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.ST.1105.0300m6.12XD.140.IK.HA	6	92	54	W1105030540
3.3	HPC.ST.1105.0330m6.12XD.140.IK.HA	6	92	54	W1105033540
3.4	HPC.ST.1105.0340m6.12XD.140.IK.HA	6	92	54	W1105034540
3.5	HPC.ST.1105.0350m6.12XD.140.IK.HA	6	92	54	W1105035540
3.7	HPC.ST.1105.0370m6.12XD.140.IK.HA	6	92	54	W1105037540
3.8	HPC.ST.1105.0380m6.12XD.140.IK.HA	6	102	64	W1105038540
4.0	HPC.ST.1105.0400m6.12XD.140.IK.HA	6	102	64	W1105040540
4.2	HPC.ST.1105.0420m6.12XD.140.IK.HA	6	102	64	W1105042540
4.5	HPC.ST.1105.0450m6.12XD.140.IK.HA	6	102	64	W1105045540
4.8	HPC.ST.1105.0480m6.12XD.140.IK.HA	6	116	78	W1105048540
5.0	HPC.ST.1105.0500m6.12XD.140.IK.HA	6	116	78	W1105050540
5.5	HPC.ST.1105.0550m6.12XD.140.IK.HA	6	116	78	W1105055540
5.8	HPC.ST.1105.0580m6.12XD.140.IK.HA	6	116	78	W1105058540
6.0	HPC.ST.1105.0600m6.12XD.140.IK.HA	6	116	78	W1105060540
6.3	HPC.ST.1105.0630m6.12XD.140.IK.HA	8	146	108	W1105063540
6.5	HPC.ST.1105.0650m6.12XD.140.IK.HA	8	146	108	W1105065540
6.8	HPC.ST.1105.0680m6.12XD.140.IK.HA	8	146	108	W1105068540
7.0	HPC.ST.1105.0700m6.12XD.140.IK.HA	8	146	108	W1105070540
7.5	HPC.ST.1105.0750m6.12XD.140.IK.HA	8	146	108	W1105075540
7.8	HPC.ST.1105.0780m6.12XD.140.IK.HA	8	146	108	W1105078540
8.0	HPC.ST.1105.0800m6.12XD.140.IK.HA	8	146	108	W1105080540
8.2	HPC.ST.1105.0820m6.12XD.140.IK.HA	10	162	120	W1105082540
8.5	HPC.ST.1105.0850m6.12XD.140.IK.HA	10	162	120	W1105085540
9.0	HPC.ST.1105.0900m6.12XD.140.IK.HA	10	162	120	W1105090540
9.5	HPC.ST.1105.0950m6.12XD.140.IK.HA	10	162	120	W1105095540
9.8	HPC.ST.1105.0980m6.12XD.140.IK.HA	10	162	120	W1105098540
10.0	HPC.ST.1105.1000m6.12XD.140.IK.HA	10	162	120	W1105100540
10.2	HPC.ST.1105.1020m6.12XD.140.IK.HA	12	204	156	W1105102540
10.5	HPC.ST.1105.1050m6.12XD.140.IK.HA	12	204	156	W1105105540
11.0	HPC.ST.1105.1100m6.12XD.140.IK.HA	12	204	156	W1105110540
11.5	HPC.ST.1105.1150m6.12XD.140.IK.HA	12	204	156	W1105115540
11.8	HPC.ST.1105.1180m6.12XD.140.IK.HA	12	204	156	W1105118540
12.0	HPC.ST.1105.1200m6.12XD.140.IK.HA	12	204	156	W1105120540
12.5	HPC.ST.1105.1250m6.12XD.140.IK.HA	14	230	182	W1105125540
13.0	HPC.ST.1105.1300m6.12XD.140.IK.HA	14	230	182	W1105130540
13.5	HPC.ST.1105.1350m6.12XD.140.IK.HA	14	230	182	W1105135540
14.0	HPC.ST.1105.1400m6.12XD.140.IK.HA	14	230	182	W1105140540
14.5	HPC.ST.1105.1450m6.12XD.140.IK.HA	16	260	208	W1105145540
14.8	HPC.ST.1105.1480m6.12XD.140.IK.HA	16	260	208	W1105148540
15.0	HPC.ST.1105.1500m6.12XD.140.IK.HA	16	260	208	W1105150540
15.5	HPC.ST.1105.1550m6.12XD.140.IK.HA	16	260	208	W1105155540
15.8	HPC.ST.1105.1580m6.12XD.140.IK.HA	16	260	208	W1105158540
16.0	HPC.ST.1105.1600m6.12XD.140.IK.HA	16	260	208	W1105160540

W0141 and W0142, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]					
			= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	80	0,1	0,14	0,2	0,275	0,35	0,45
1.1.2		70	0,075	0,1	0,15	0,2	0,26	0,325
1.2.1	Constructional steel	80	0,1	0,14	0,2	0,275	0,35	0,45
1.2.2		70	0,075	0,1	0,15	0,2	0,26	0,325
1.2.3		65	0,075	0,1	0,15	0,2	0,26	0,325
1.3.1	Spring steel							
1.3.2								
1.3.3								
2.1.1	Cementation steel	75	0,1	0,14	0,2	0,275	0,35	0,45
2.1.2		70	0,1	0,14	0,2	0,275	0,35	0,45
2.1.3		65	0,075	0,1	0,15	0,2	0,26	0,325
2.2.1	Nitriding steel	65	0,075	0,1	0,15	0,2	0,26	0,325
2.2.2		65	0,075	0,1	0,15	0,2	0,26	0,325
2.3.1	Tempered steel	65	0,1	0,14	0,2	0,275	0,35	0,45
2.3.2		65	0,075	0,1	0,15	0,2	0,26	0,325
2.3.3		65	0,1	0,14	0,2	0,275	0,35	0,45
2.3.4		65	0,075	0,1	0,15	0,2	0,26	0,325
2.3.5		50	0,075	0,1	0,15	0,2	0,26	0,325
2.3.6								
3.1.1	Non alloyed tool steel	50	0,075	0,1	0,15	0,2	0,26	0,325
3.2.1	Tool steel for cold working	65	0,075	0,1	0,15	0,2	0,26	0,325
3.2.2		50	0,075	0,1	0,15	0,2	0,26	0,325
3.2.3								
3.2.4								
3.2.5								
3.3.1	Tool steel for hot working	50	0,075	0,1	0,15	0,2	0,26	0,325
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	Hardened tool steel < 55 HRC	28	0,04	0,055	0,065	0,075	0,09	0,11
3.5.2	55–58 HRC	20	0,04	0,055	0,065	0,075	0,09	0,11
3.5.3	58–60 HRC	16	0,04	0,055	0,065	0,075	0,09	0,11
3.5.4	60–62 HRC	14	0,04	0,055	0,065	0,075	0,09	0,11
3.5.5	62–64 HRC							
4.1.1	Stainless steel							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel	75	0,1	0,14	0,2	0,275	0,35	0,45
5.1.2		70	0,1	0,14	0,2	0,275	0,35	0,45
5.1.3								
5.2.1	Stainless cast steel							
5.2.2								
6.1.1	Cast iron with lamellar graphite	70	0,075	0,125	0,175	0,225	0,3	0,375
6.1.2		70	0,075	0,1	0,15	0,2	0,26	0,325
6.1.3								
6.1.4								
6.2.1	Spheroidal cast iron	70	0,075	0,1	0,15	0,2	0,26	0,325
6.2.2		70	0,075	0,1	0,15	0,2	0,26	0,325
6.2.3								
6.3.1	GTW (white malleable cast iron)	70	0,075	0,1	0,15	0,2	0,26	0,325
6.3.2		70	0,075	0,1	0,15	0,2	0,26	0,325
6.4.1	GTS (black malleable cast iron)	70	0,075	0,1	0,15	0,2	0,26	0,325
6.4.2		70	0,075	0,1	0,15	0,2	0,26	0,325
7.1.1	Aluminium	200	0,02	0,03	0,07	0,11	0,15	0,2
7.1.2		200	0,02	0,03	0,07	0,11	0,15	0,2
7.1.3		200	0,02	0,03	0,07	0,11	0,15	0,2
7.1.4		180	0,02	0,03	0,07	0,11	0,15	0,2
7.1.5		160	0,02	0,03	0,07	0,11	0,15	0,2
7.1.6		130	0,02	0,03	0,07	0,11	0,15	0,2
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper	100	0,01	0,02	0,06	0,11	0,16	0,2
7.3.2		100	0,01	0,02	0,06	0,11	0,16	0,2
7.3.3		100	0,01	0,02	0,06	0,11	0,16	0,2
7.3.4		60	0,01	0,02	0,06	0,11	0,16	0,2
7.3.5		60	0,01	0,02	0,06	0,11	0,16	0,2
7.3.6		60	0,01	0,02	0,06	0,11	0,16	0,2
7.4.1	CuZn (brass)	120	0,01	0,02	0,06	0,11	0,16	0,2
7.4.2		160	0,01	0,02	0,06	0,11	0,16	0,2
7.5.1	CuSn (bronze)	60	0,01	0,02	0,06	0,11	0,16	0,2
7.5.2		70	0,01	0,02	0,06	0,11	0,16	0,2
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

W0141 and W0142, coated

Spot drills

ST **A**

λ_S = 30°

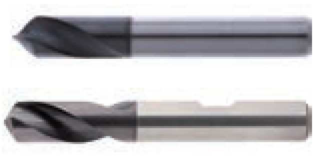
d_1 = h6
d_A = h6

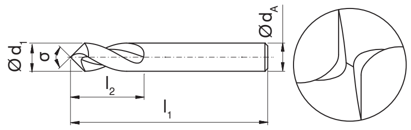
E

σ 142°

σ 90°

SCPP425





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	HA Material	HB Material
2.0	A.ST.0141.0200.90.HA	2	32	6	90	W0141020140	
3.0	A.ST.0141.0300.90.HA	3	32	8	90	W0141030140	
3.0	A.ST.0142.0300.142.HA	3	32	8	142	W0142030140	
4.0	A.ST.0141.0400.90.HA	4	40	10	90	W0141040140	
4.0	A.ST.0142.0400.142.HA	4	40	10	142	W0142040140	
5.0	A.ST.0141.0500.90.HA	5	50	13	90	W0141050140	
5.0	A.ST.0142.0500.142.HA	5	50	13	142	W0142050140	
6.0	A.ST.0141.0600.90.HA	6	50	13	90	W0141060140	
6.0	A.ST.0142.0600.142.HB	6	50	13	142		W0142060141
8.0	A.ST.0141.0800.90.HA	8	60	23	90	W0141080140	
8.0	A.ST.0142.0800.142.HB	8	60	23	142		W0142080141
10.0	A.ST.0141.1000.90.HA	10	70	24	90	W0141100140	
10.0	A.ST.0142.1000.142.HB	10	70	24	142		W0142100141
12.0	A.ST.0141.1200.90.HA	12	70	24	90	W0141120140	
12.0	A.ST.0142.1200.142.HB	12	70	24	142		W0142120141
16.0	A.ST.0141.1600.90.HA	16	75	29	90	W0141160140	
16.0	A.ST.0142.1600.142.HB	16	75	29	142		W0142160141
20.0	A.ST.0142.2000.142.HB	20	100	35	142		W0142200141

W0144, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	100	0,01	0,016	0,025	0,038	0,045	0,05
1.1.2		85	0,006	0,01	0,015	0,023	0,027	0,03
1.2.1	**Constructional steel**	100	0,01	0,016	0,025	0,038	0,045	0,05
1.2.2		85	0,006	0,01	0,015	0,023	0,027	0,03
1.2.3		80	0,006	0,01	0,015	0,023	0,027	0,03
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**	95	0,01	0,016	0,025	0,038	0,045	0,05
2.1.2		85	0,01	0,016	0,025	0,038	0,045	0,05
2.1.3		80	0,006	0,01	0,015	0,023	0,027	0,03
2.2.1	**Nitriding steel**	80	0,006	0,01	0,015	0,023	0,027	0,03
2.2.2		80	0,006	0,01	0,015	0,023	0,027	0,03
2.3.1	**Tempered steel**	80	0,01	0,016	0,025	0,038	0,045	0,05
2.3.2		80	0,006	0,01	0,015	0,023	0,027	0,03
2.3.3		80	0,01	0,016	0,025	0,038	0,045	0,05
2.3.4		80	0,006	0,01	0,015	0,023	0,027	0,03
2.3.5		60	0,006	0,01	0,015	0,023	0,027	0,03
2.3.6								
3.1.1	**Non alloyed tool steel**	60	0,006	0,01	0,015	0,023	0,027	0,03
3.2.1	**Tool steel for cold working**	80	0,006	0,01	0,015	0,023	0,027	0,03
3.2.2		60	0,006	0,01	0,015	0,023	0,027	0,03
3.2.3								
3.2.4								
3.2.5								
3.3.1	**Tool steel for hot working**	60	0,006	0,01	0,015	0,023	0,027	0,03
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel** **< 55 HRC**							
3.5.2	**55–58 HRC**							
3.5.3	**58–60 HRC**							
3.5.4	**60–62 HRC**							
3.5.5	**62–64 HRC**							
4.1.1	**Stainless steel**							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**	95	0,01	0,016	0,025	0,038	0,045	0,05
5.1.2		85	0,01	0,016	0,025	0,038	0,045	0,05
5.1.3								
5.2.1	**Stainless cast steel**							
5.2.2								
6.1.1	**Cast iron with lamellar graphite**	85	0,014	0,022	0,035	0,053	0,063	0,07
6.1.2		85	0,01	0,016	0,025	0,038	0,045	0,05
6.1.3								
6.1.4								
6.2.1	**Spheroidal cast iron**	85	0,01	0,016	0,025	0,038	0,045	0,05
6.2.2		85	0,01	0,016	0,025	0,038	0,045	0,05
6.2.3								
6.3.1	**GTW (white malleable cast iron)**	85	0,01	0,016	0,025	0,038	0,045	0,05
6.3.2		85	0,01	0,016	0,025	0,038	0,045	0,05
6.4.1	**GTS (black malleable cast iron)**	85	0,01	0,016	0,025	0,038	0,045	0,05
6.4.2		85	0,01	0,016	0,025	0,038	0,045	0,05
7.1.1	**Aluminium**	250	0,006	0,01	0,015	0,023	0,027	0,03
7.1.2		250	0,006	0,01	0,015	0,023	0,027	0,03
7.1.3		250	0,006	0,01	0,015	0,023	0,027	0,03
7.1.4		225	0,01	0,016	0,025	0,038	0,045	0,05
7.1.5		200	0,01	0,016	0,025	0,038	0,045	0,05
7.1.6		160	0,006	0,01	0,015	0,023	0,027	0,03
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**	125	0,006	0,01	0,015	0,023	0,027	0,03
7.3.2		125	0,006	0,01	0,015	0,023	0,027	0,03
7.3.3		125	0,006	0,01	0,015	0,023	0,027	0,03
7.3.4		75	0,006	0,01	0,015	0,023	0,027	0,03
7.3.5		75	0,006	0,01	0,015	0,023	0,027	0,03
7.3.6		75	0,006	0,01	0,015	0,023	0,027	0,03
7.4.1	**CuZn (brass)**	150	0,01	0,016	0,025	0,038	0,045	0,05
7.4.2		200	0,014	0,022	0,035	0,053	0,063	0,07
7.5.1	**CuSn (bronze)**	75	0,01	0,016	0,025	0,038	0,045	0,05
7.5.2		85	0,014	0,022	0,035	0,053	0,063	0,07
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								

W0144, coated

Precision spot drills

ST **PA**

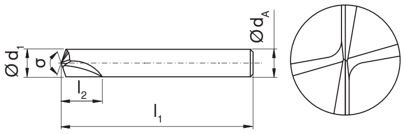
$\lambda_S = 0°$

$d_1 = h6$
$d_A = h6$

E

σ
142°

SCPP430



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	HA  Material	HB  Material
2.0	PA.ST.0144.0200.142.HA	2	32	3	142	W0144020340	
3.0	PA.ST.0144.0300.142.HA	3	32	4.5	142	W0144030340	
4.0	PA.ST.0144.0400.142.HA	4	40	6	142	W0144040340	
5.0	PA.ST.0144.0500.142.HA	5	50	7.5	142	W0144050340	
6.0	PA.ST.0144.0600.142.HB	6	50	9	142		W0144060341
8.0	PA.ST.0144.0800.142.HB	8	60	12	142		W0144080341
10.0	PA.ST.0144.1000.142.HB	10	70	15	142		W0144100341
12.0	PA.ST.0144.1200.142.HB	12	70	18	142		W0144120341
16.0	PA.ST.0144.1600.142.HB	16	75	24	142		W0144160341
20.0	PA.ST.0144.2000.142.HB	20	100	30	142		W0144200341

W0109, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**	100	0,16	0,22	0,28	0,34
1.1.2		90	0,16	0,22	0,28	0,34
1.2.1	**Constructional steel**	100	0,16	0,22	0,28	0,34
1.2.2		90	0,16	0,22	0,28	0,34
1.2.3		75	0,15	0,21	0,27	0,32
1.3.1	**Spring steel**					
1.3.2						
1.3.3						
2.1.1	**Cementation steel**	95	0,16	0,22	0,28	0,34
2.1.2		85	0,16	0,22	0,28	0,34
2.1.3		75	0,15	0,21	0,27	0,32
2.2.1	**Nitriding steel**	75	0,08	0,12	0,15	0,2
2.2.2		75	0,08	0,12	0,15	0,2
2.3.1	**Tempered steel**	85	0,15	0,21	0,27	0,32
2.3.2		75	0,08	0,12	0,15	0,2
2.3.3		75	0,15	0,21	0,27	0,32
2.3.4		75	0,08	0,12	0,15	0,2
2.3.5						
2.3.6						
3.1.1	**Non alloyed tool steel**					
3.2.1	**Tool steel for cold working**					
3.2.2						
3.2.3						
3.2.4						
3.2.5						
3.3.1	**Tool steel for hot working**					
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**	75	0,08	0,12	0,15	0,2
4.1.2		65	0,08	0,12	0,15	0,2
4.1.3		70	0,08	0,12	0,15	0,2
4.1.4		70	0,08	0,12	0,15	0,2
4.1.5		75	0,08	0,12	0,15	0,2
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**	80	0,16	0,22	0,28	0,34
5.1.2		75	0,15	0,21	0,27	0,32
5.1.3		60	0,08	0,12	0,15	0,2
5.2.1	**Stainless cast steel**	70	0,08	0,12	0,15	0,2
5.2.2		65	0,08	0,12	0,15	0,2
6.1.1	**Cast iron with lamellar graphite**	105	0,2	0,25	0,35	0,4
6.1.2		85	0,2	0,25	0,35	0,4
6.1.3		75	0,2	0,25	0,35	0,4
6.1.4		70	0,08	0,12	0,15	0,2
6.2.1	**Spheroidal cast iron**	85	0,125	0,175	0,225	0,3
6.2.2		80	0,125	0,175	0,225	0,3
6.2.3		60	0,11	0,125	0,15	0,175
6.3.1	**GTW (white malleable cast iron)**	85	0,125	0,175	0,225	0,3
6.3.2		80	0,125	0,175	0,225	0,3
6.4.1	**GTS (black malleable cast iron)**	85	0,125	0,175	0,225	0,3
6.4.2		80	0,125	0,175	0,225	0,3
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**	30	0,04	0,08	0,12	0,16
7.8.2		25	0,04	0,08	0,12	0,16
7.8.3		25	0,04	0,08	0,12	0,16

W0109, coated

High-performance twist drills

VA **HL**

$\lambda_S = 30°$

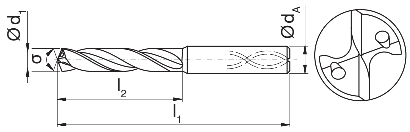
$d_1 = h7$
$d_A = h6$

E

≤ 3xD

σ 135°

SCPM410



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HL.VA.0109.0300h7.3XD.135.IK.HA	6	62	20	W0109030240
3.1	HL.VA.0109.0310h7.3XD.135.IK.HA	6	62	20	W0109031240
3.2	HL.VA.0109.0320h7.3XD.135.IK.HA	6	62	20	W0109032240
3.3	HL.VA.0109.0330h7.3XD.135.IK.HA	6	62	20	W0109033240
3.4	HL.VA.0109.0340h7.3XD.135.IK.HA	6	62	20	W0109034240
3.5	HL.VA.0109.0350h7.3XD.135.IK.HA	6	62	20	W0109035240
3.6	HL.VA.0109.0360h7.3XD.135.IK.HA	6	62	20	W0109036240
3.7	HL.VA.0109.0370h7.3XD.135.IK.HA	6	62	20	W0109037240
3.8	HL.VA.0109.0380h7.3XD.135.IK.HA	6	66	24	W0109038240
3.9	HL.VA.0109.0390h7.3XD.135.IK.HA	6	66	24	W0109039240
4.0	HL.VA.0109.0400h7.3XD.135.IK.HA	6	66	24	W0109040240
4.1	HL.VA.0109.0410h7.3XD.135.IK.HA	6	66	24	W0109041240
4.2	HL.VA.0109.0420h7.3XD.135.IK.HA	6	66	24	W0109042240
4.3	HL.VA.0109.0430h7.3XD.135.IK.HA	6	66	24	W0109043240
4.4	HL.VA.0109.0440h7.3XD.135.IK.HA	6	66	24	W0109044240
4.5	HL.VA.0109.0450h7.3XD.135.IK.HA	6	66	24	W0109045240
4.6	HL.VA.0109.0460h7.3XD.135.IK.HA	6	66	24	W0109046240
4.7	HL.VA.0109.0470h7.3XD.135.IK.HA	6	66	24	W0109047240
4.8	HL.VA.0109.0480h7.3XD.135.IK.HA	6	66	28	W0109048240
4.9	HL.VA.0109.0490h7.3XD.135.IK.HA	6	66	28	W0109049240
5.0	HL.VA.0109.0500h7.3XD.135.IK.HA	6	66	28	W0109050240
5.1	HL.VA.0109.0510h7.3XD.135.IK.HA	6	66	28	W0109051240
5.2	HL.VA.0109.0520h7.3XD.135.IK.HA	6	66	28	W0109052240
5.3	HL.VA.0109.0530h7.3XD.135.IK.HA	6	66	28	W0109053240
5.4	HL.VA.0109.0540h7.3XD.135.IK.HA	6	66	28	W0109054240
5.5	HL.VA.0109.0550h7.3XD.135.IK.HA	6	66	28	W0109055240
5.6	HL.VA.0109.0560h7.3XD.135.IK.HA	6	66	28	W0109056240
5.7	HL.VA.0109.0570h7.3XD.135.IK.HA	6	66	28	W0109057240
5.8	HL.VA.0109.0580h7.3XD.135.IK.HA	6	66	28	W0109058240
5.9	HL.VA.0109.0590h7.3XD.135.IK.HA	6	66	28	W0109059240
6.0	HL.VA.0109.0600h7.3XD.135.IK.HA	6	66	28	W0109060240
6.1	HL.VA.0109.0610h7.3XD.135.IK.HA	8	79	34	W0109061240
6.2	HL.VA.0109.0620h7.3XD.135.IK.HA	8	79	34	W0109062240
6.3	HL.VA.0109.0630h7.3XD.135.IK.HA	8	79	34	W0109063240
6.4	HL.VA.0109.0640h7.3XD.135.IK.HA	8	79	34	W0109064240
6.5	HL.VA.0109.0650h7.3XD.135.IK.HA	8	79	34	W0109065240
6.6	HL.VA.0109.0660h7.3XD.135.IK.HA	8	79	34	W0109066240
6.7	HL.VA.0109.0670h7.3XD.135.IK.HA	8	79	34	W0109067240
6.8	HL.VA.0109.0680h7.3XD.135.IK.HA	8	79	34	W0109068240
6.9	HL.VA.0109.0690h7.3XD.135.IK.HA	8	79	34	W0109069240
7.0	HL.VA.0109.0700h7.3XD.135.IK.HA	8	79	34	W0109070240
7.1	HL.VA.0109.0710h7.3XD.135.IK.HA	8	79	41	W0109071240
7.2	HL.VA.0109.0720h7.3XD.135.IK.HA	8	79	41	W0109072240
7.3	HL.VA.0109.0730h7.3XD.135.IK.HA	8	79	41	W0109073240
7.4	HL.VA.0109.0740h7.3XD.135.IK.HA	8	79	41	W0109074240
7.5	HL.VA.0109.0750h7.3XD.135.IK.HA	8	79	41	W0109075240
7.6	HL.VA.0109.0760h7.3XD.135.IK.HA	8	79	41	W0109076240
7.7	HL.VA.0109.0770h7.3XD.135.IK.HA	8	79	41	W0109077240

W0109, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]			
				= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**		100	0,16	0,22	0,28	0,34
1.1.2			90	0,16	0,22	0,28	0,34
1.2.1	**Constructional steel**		100	0,16	0,22	0,28	0,34
1.2.2			90	0,16	0,22	0,28	0,34
1.2.3			75	0,15	0,21	0,27	0,32
1.3.1	**Spring steel**						
1.3.2							
1.3.3							
2.1.1	**Cementation steel**		95	0,16	0,22	0,28	0,34
2.1.2			85	0,16	0,22	0,28	0,34
2.1.3			75	0,15	0,21	0,27	0,32
2.2.1	**Nitriding steel**		75	0,08	0,12	0,15	0,2
2.2.2			75	0,08	0,12	0,15	0,2
2.3.1	**Tempered steel**		85	0,15	0,21	0,27	0,32
2.3.2			75	0,08	0,12	0,15	0,2
2.3.3			75	0,15	0,21	0,27	0,32
2.3.4			75	0,08	0,12	0,15	0,2
2.3.5							
2.3.6							
3.1.1	**Non alloyed tool steel**						
3.2.1	**Tool steel for cold working**						
3.2.2							
3.2.3							
3.2.4							
3.2.5							
3.3.1	**Tool steel for hot working**						
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	**Hardened tool steel**	**< 55 HRC**					
3.5.2		**55–58 HRC**					
3.5.3		**58–60 HRC**					
3.5.4		**60–62 HRC**					
3.5.5		**62–64 HRC**					
4.1.1	**Stainless steel**		75	0,08	0,12	0,15	0,2
4.1.2			65	0,08	0,12	0,15	0,2
4.1.3			70	0,08	0,12	0,15	0,2
4.1.4			70	0,08	0,12	0,15	0,2
4.1.5			75	0,08	0,12	0,15	0,2
4.2.1	**Heat-resistant alloys**						
4.2.2							
4.2.3							
4.2.4							
5.1.1	**Conventional cast steel**		80	0,16	0,22	0,28	0,34
5.1.2			75	0,15	0,21	0,27	0,32
5.1.3			60	0,08	0,12	0,15	0,2
5.2.1	**Stainless cast steel**		70	0,08	0,12	0,15	0,2
5.2.2			65	0,08	0,12	0,15	0,2
6.1.1	**Cast iron with lamellar graphite**		105	0,2	0,25	0,35	0,4
6.1.2			85	0,2	0,25	0,35	0,4
6.1.3			75	0,2	0,25	0,35	0,4
6.1.4			70	0,08	0,12	0,15	0,2
6.2.1	**Spheroidal cast iron**		85	0,125	0,175	0,225	0,3
6.2.2			80	0,125	0,175	0,225	0,3
6.2.3			60	0,11	0,125	0,15	0,175
6.3.1	**GTW (white malleable cast iron)**		85	0,125	0,175	0,225	0,3
6.3.2			80	0,125	0,175	0,225	0,3
6.4.1	**GTS (black malleable cast iron)**		85	0,125	0,175	0,225	0,3
6.4.2			80	0,125	0,175	0,225	0,3
7.1.1	**Aluminium**						
7.1.2							
7.1.3							
7.1.4							
7.1.5							
7.1.6							
7.2.1	**Magnesium**						
7.2.2							
7.3.1	**Copper**						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	**CuZn (brass)**						
7.4.2							
7.5.1	**CuSn (bronze)**						
7.5.2							
7.6.1	**CuAlFe (Ampco)**						
7.6.2							
7.8.1	**Titanium**		30	0,04	0,08	0,12	0,16
7.8.2			25	0,04	0,08	0,12	0,16
7.8.3			25	0,04	0,08	0,12	0,16

W0109, coated

High-performance twist drills

VA **HL**

$\lambda_S = 30°$

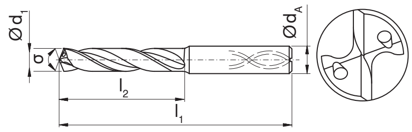
$d_1 = h7$
$d_A = h6$

E

≤ 3xD

σ 135°

SCPM410



d₁ [mm]	Type, description	d_A [mm]	l₁ [mm]	l₂ [mm]	HA Material
7.8	HL.VA.0109.0780h7.3XD.135.IK.HA	8	79	41	W0109078240
7.9	HL.VA.0109.0790h7.3XD.135.IK.HA	8	79	41	W0109079240
8.0	HL.VA.0109.0800h7.3XD.135.IK.HA	8	79	41	W0109080240
8.1	HL.VA.0109.0810h7.3XD.135.IK.HA	10	89	47	W0109081240
8.2	HL.VA.0109.0820h7.3XD.135.IK.HA	10	89	47	W0109082240
8.3	HL.VA.0109.0830h7.3XD.135.IK.HA	10	89	47	W0109083240
8.4	HL.VA.0109.0840h7.3XD.135.IK.HA	10	89	47	W0109084240
8.5	HL.VA.0109.0850h7.3XD.135.IK.HA	10	89	47	W0109085240
8.6	HL.VA.0109.0860h7.3XD.135.IK.HA	10	89	47	W0109086240
8.7	HL.VA.0109.0870h7.3XD.135.IK.HA	10	89	47	W0109087240
8.8	HL.VA.0109.0880h7.3XD.135.IK.HA	10	89	47	W0109088240
8.9	HL.VA.0109.0890h7.3XD.135.IK.HA	10	89	47	W0109089240
9.0	HL.VA.0109.0900h7.3XD.135.IK.HA	10	89	47	W0109090240
9.1	HL.VA.0109.0910h7.3XD.135.IK.HA	10	89	47	W0109091240
9.2	HL.VA.0109.0920h7.3XD.135.IK.HA	10	89	47	W0109092240
9.3	HL.VA.0109.0930h7.3XD.135.IK.HA	10	89	47	W0109093240
9.4	HL.VA.0109.0940h7.3XD.135.IK.HA	10	89	47	W0109094240
9.5	HL.VA.0109.0950h7.3XD.135.IK.HA	10	89	47	W0109095240
9.6	HL.VA.0109.0960h7.3XD.135.IK.HA	10	89	47	W0109096240
9.7	HL.VA.0109.0970h7.3XD.135.IK.HA	10	89	47	W0109097240
9.8	HL.VA.0109.0980h7.3XD.135.IK.HA	10	89	47	W0109098240
9.9	HL.VA.0109.0990h7.3XD.135.IK.HA	10	89	47	W0109099240
10.0	HL.VA.0109.1000h7.3XD.135.IK.HA	10	89	47	W0109100240
10.2	HL.VA.0109.1020h7.3XD.135.IK.HA	12	102	55	W0109102240
10.5	HL.VA.0109.1050h7.3XD.135.IK.HA	12	102	55	W0109105240
10.8	HL.VA.0109.1080h7.3XD.135.IK.HA	12	102	55	W0109108240
11.0	HL.VA.0109.1100h7.3XD.135.IK.HA	12	102	55	W0109110240
11.2	HL.VA.0109.1120h7.3XD.135.IK.HA	12	102	55	W0109112240
11.5	HL.VA.0109.1150h7.3XD.135.IK.HA	12	102	55	W0109115240
11.8	HL.VA.0109.1180h7.3XD.135.IK.HA	12	102	55	W0109118240
12.0	HL.VA.0109.1200h7.3XD.135.IK.HA	12	102	55	W0109120240
12.2	HL.VA.0109.1220h7.3XD.135.IK.HA	14	107	60	W0109122240
12.5	HL.VA.0109.1250h7.3XD.135.IK.HA	14	107	60	W0109125240
12.8	HL.VA.0109.1280h7.3XD.135.IK.HA	14	107	60	W0109128240
13.0	HL.VA.0109.1300h7.3XD.135.IK.HA	14	107	60	W0109130240
13.5	HL.VA.0109.1350h7.3XD.135.IK.HA	14	107	60	W0109135240
13.8	HL.VA.0109.1380h7.3XD.135.IK.HA	14	107	60	W0109138240
14.0	HL.VA.0109.1400h7.3XD.135.IK.HA	14	107	60	W0109140240
14.2	HL.VA.0109.1420h7.3XD.135.IK.HA	16	115	65	W0109142240
14.5	HL.VA.0109.1450h7.3XD.135.IK.HA	16	115	65	W0109145240
14.8	HL.VA.0109.1480h7.3XD.135.IK.HA	16	115	65	W0109148240
15.0	HL.VA.0109.1500h7.3XD.135.IK.HA	16	115	65	W0109150240
15.2	HL.VA.0109.1520h7.3XD.135.IK.HA	16	115	65	W0109152240
15.5	HL.VA.0109.1550h7.3XD.135.IK.HA	16	115	65	W0109155240
15.8	HL.VA.0109.1580h7.3XD.135.IK.HA	16	115	65	W0109158240
16.0	HL.VA.0109.1600h7.3XD.135.IK.HA	16	115	65	W0109160240

W0108, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	100	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	Constructional steel	100	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	Spring steel									
1.3.2										
1.3.3										
2.1.1	Cementation steel	95	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	Nitriding steel	75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	Tempered steel	85	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5										
2.3.6										
3.1.1	Non alloyed tool steel									
3.2.1	Tool steel for cold working									
3.2.2										
3.2.3										
3.2.4										
3.2.5										
3.3.1	Tool steel for hot working									
3.3.2										
3.3.3										
3.3.4										
3.3.5										
3.5.1	Hardened tool steel < 55 HRC									
3.5.2	55–58 HRC									
3.5.3	58–60 HRC									
3.5.4	60–62 HRC									
3.5.5	62–64 HRC									
4.1.1	Stainless steel	75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.3		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.4		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.5		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.2.1	Heat-resistant alloys									
4.2.2										
4.2.3										
4.2.4										
5.1.1	Conventional cast steel	80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3		60	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	Stainless cast steel	70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
6.1.1	Cast iron with lamellar graphite	105	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
6.2.1	Spheroidal cast iron	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	GTS (black malleable cast iron)	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	Aluminium									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	Magnesium									
7.2.2										
7.3.1	Copper									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	CuZn (brass)									
7.4.2										
7.5.1	CuSn (bronze)									
7.5.2										
7.6.1	CuAlFe (Ampco)									
7.6.2										
7.8.1	Titanium	30	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2
7.8.2		25	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2
7.8.3		25	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2

W0108, coated

High-performance twist drills

VA **HL**

$\lambda_S = 30°$

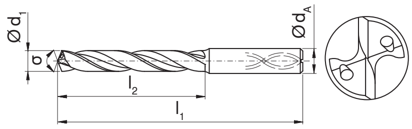
$d_1 = h7$
$d_A = h6$

E

≤ 5xD

σ 135°

SCPM415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
1.0	HL.VA.0108.0100h7.5XD.135.IK.HA	4	55	8	W0108010340
1.1	HL.VA.0108.0110h7.5XD.135.IK.HA	4	55	12	W0108011340
1.2	HL.VA.0108.0120h7.5XD.135.IK.HA	4	55	12	W0108012340
1.3	HL.VA.0108.0130h7.5XD.135.IK.HA	4	55	12	W0108013340
1.4	HL.VA.0108.0140h7.5XD.135.IK.HA	4	55	12	W0108014340
1.5	HL.VA.0108.0150h7.5XD.135.IK.HA	4	55	12	W0108015340
1.6	HL.VA.0108.0160h7.5XD.135.IK.HA	4	55	16	W0108016340
1.7	HL.VA.0108.0170h7.5XD.135.IK.HA	4	55	16	W0108017340
1.8	HL.VA.0108.0180h7.5XD.135.IK.HA	4	55	16	W0108018340
1.9	HL.VA.0108.0190h7.5XD.135.IK.HA	4	55	16	W0108019340
2.0	HL.VA.0108.0200h7.5XD.135.IK.HA	4	57	21	W0108020340
2.02	HL.VA.0108.0202h7.5XD.135.IK.HA	4	57	21	W0108020290
2.1	HL.VA.0108.0210h7.5XD.135.IK.HA	4	57	21	W0108021340
2.2	HL.VA.0108.0220h7.5XD.135.IK.HA	4	57	21	W0108022340
2.22	HL.VA.0108.0222h7.5XD.135.IK.HA	4	57	21	W0108022290
2.3	HL.VA.0108.0230h7.5XD.135.IK.HA	4	57	21	W0108023340
2.32	HL.VA.0108.0232h7.5XD.135.IK.HA	4	57	21	W0108023290
2.4	HL.VA.0108.0240h7.5XD.135.IK.HA	4	57	21	W0108024340
2.42	HL.VA.0108.0242h7.5XD.135.IK.HA	4	57	21	W0108024290
2.5	HL.VA.0108.0250h7.5XD.135.IK.HA	4	57	21	W0108025340
2.52	HL.VA.0108.0252h7.5XD.135.IK.HA	4	57	21	W0108025290
2.6	HL.VA.0108.0260h7.5XD.135.IK.HA	4	57	21	W0108026340
2.7	HL.VA.0108.0270h7.5XD.135.IK.HA	4	57	21	W0108027340
2.72	HL.VA.0108.0272h7.5XD.135.IK.HA	4	57	21	W0108027290
2.8	HL.VA.0108.0280h7.5XD.135.IK.HA	4	57	21	W0108028340
2.82	HL.VA.0108.0282h7.5XD.135.IK.HA	4	57	21	W0108028290
2.9	HL.VA.0108.0290h7.5XD.135.IK.HA	4	57	21	W0108029340
3.0	HL.VA.0108.0300h7.5XD.135.IK.HA	6	66	28	W0108030340
3.02	HL.VA.0108.0302h7.5XD.135.IK.HA	6	66	28	W0108030290
3.1	HL.VA.0108.0310h7.5XD.135.IK.HA	6	66	28	W0108031340
3.2	HL.VA.0108.0320h7.5XD.135.IK.HA	6	66	28	W0108032340
3.22	HL.VA.0108.0322h7.5XD.135.IK.HA	6	66	28	W0108032290
3.3	HL.VA.0108.0330h7.5XD.135.IK.HA	6	66	28	W0108033340
3.32	HL.VA.0108.0332h7.5XD.135.IK.HA	6	66	28	W0108033290
3.4	HL.VA.0108.0340h7.5XD.135.IK.HA	6	66	28	W0108034340
3.5	HL.VA.0108.0350h7.5XD.135.IK.HA	6	66	28	W0108035340
3.52	HL.VA.0108.0352h7.5XD.135.IK.HA	6	66	28	W0108035290
3.6	HL.VA.0108.0360h7.5XD.135.IK.HA	6	66	28	W0108036340
3.7	HL.VA.0108.0370h7.5XD.135.IK.HA	6	66	28	W0108037340
3.8	HL.VA.0108.0380h7.5XD.135.IK.HA	6	74	36	W0108038340
3.82	HL.VA.0108.0382h7.5XD.135.IK.HA	6	74	36	W0108038290
3.9	HL.VA.0108.0390h7.5XD.135.IK.HA	6	74	36	W0108039340
4.0	HL.VA.0108.0400h7.5XD.135.IK.HA	6	74	36	W0108040340
4.02	HL.VA.0108.0402h7.5XD.135.IK.HA	6	74	36	W0108040290
4.1	HL.VA.0108.0410h7.5XD.135.IK.HA	6	74	36	W0108041340
4.2	HL.VA.0108.0420h7.5XD.135.IK.HA	6	74	36	W0108042340
4.22	HL.VA.0108.0422h7.5XD.135.IK.HA	6	74	36	W0108042290
4.3	HL.VA.0108.0430h7.5XD.135.IK.HA	6	74	36	W0108043340

W0108, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	100	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	Constructional steel	100	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	Spring steel									
1.3.2										
1.3.3										
2.1.1	Cementation steel	95	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	Nitriding steel	75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	Tempered steel	85	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5										
2.3.6										
3.1.1	Non alloyed tool steel									
3.2.1	Tool steel for cold working									
3.2.2										
3.2.3										
3.2.4										
3.2.5										
3.3.1	Tool steel for hot working									
3.3.2										
3.3.3										
3.3.4										
3.3.5										
3.5.1	Hardened tool steel < 55 HRC									
3.5.2	55–58 HRC									
3.5.3	58–60 HRC									
3.5.4	60–62 HRC									
3.5.5	62–64 HRC									
4.1.1	Stainless steel	75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.3		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.4		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.5		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.2.1	Heat-resistant alloys									
4.2.2										
4.2.3										
4.2.4										
5.1.1	Conventional cast steel	80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3		60	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	Stainless cast steel	70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
6.1.1	Cast iron with lamellar graphite	105	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
6.2.1	Spheroidal cast iron	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	GTS (black malleable cast iron)	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	Aluminium									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	Magnesium									
7.2.2										
7.3.1	Copper									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	CuZn (brass)									
7.4.2										
7.5.1	CuSn (bronze)									
7.5.2										
7.6.1	CuAlFe (Ampco)									
7.6.2										
7.8.1	Titanium	30	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2
7.8.2		25	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2
7.8.3		25	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2

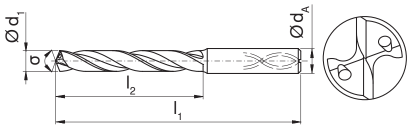
W0108, coated

High-performance twist drills

VA **HL**

λ_S=30° | d_1=h7 d_A=h6 | E | ≤ 5xD | σ 135°

SCPM415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
4.4	HL.VA.0108.0440h7.5XD.135.IK.HA	6	74	36	W0108044340
4.5	HL.VA.0108.0450h7.5XD.135.IK.HA	6	74	36	W0108045340
4.52	HL.VA.0108.0452h7.5XD.135.IK.HA	6	74	36	W0108045290
4.6	HL.VA.0108.0460h7.5XD.135.IK.HA	6	74	36	W0108046340
4.7	HL.VA.0108.0470h7.5XD.135.IK.HA	6	74	36	W0108047340
4.8	HL.VA.0108.0480h7.5XD.135.IK.HA	6	82	44	W0108048340
4.82	HL.VA.0108.0482h7.5XD.135.IK.HA	6	82	44	W0108048290
4.9	HL.VA.0108.0490h7.5XD.135.IK.HA	6	82	44	W0108049340
5.0	HL.VA.0108.0500h7.5XD.135.IK.HA	6	82	44	W0108050340
5.02	HL.VA.0108.0502h7.5XD.135.IK.HA	6	82	44	W0108050290
5.1	HL.VA.0108.0510h7.5XD.135.IK.HA	6	82	44	W0108051340
5.2	HL.VA.0108.0520h7.5XD.135.IK.HA	6	82	44	W0108052340
5.3	HL.VA.0108.0530h7.5XD.135.IK.HA	6	82	44	W0108053340
5.4	HL.VA.0108.0540h7.5XD.135.IK.HA	6	82	44	W0108054340
5.5	HL.VA.0108.0550h7.5XD.135.IK.HA	6	82	44	W0108055340
5.52	HL.VA.0108.0552h7.5XD.135.IK.HA	6	82	44	W0108055290
5.6	HL.VA.0108.0560h7.5XD.135.IK.HA	6	82	44	W0108056340
5.7	HL.VA.0108.0570h7.5XD.135.IK.HA	6	82	44	W0108057340
5.8	HL.VA.0108.0580h7.5XD.135.IK.HA	6	82	44	W0108058340
5.82	HL.VA.0108.0582h7.5XD.135.IK.HA	6	82	44	W0108058290
5.9	HL.VA.0108.0590h7.5XD.135.IK.HA	6	82	44	W0108059340
6.0	HL.VA.0108.0600h7.5XD.135.IK.HA	6	82	44	W0108060340
6.02	HL.VA.0108.0602h7.5XD.135.IK.HA	6	82	44	W0108060290
6.1	HL.VA.0108.0610h7.5XD.135.IK.HA	8	91	53	W0108061340
6.2	HL.VA.0108.0620h7.5XD.135.IK.HA	8	91	53	W0108062340
6.3	HL.VA.0108.0630h7.5XD.135.IK.HA	8	91	53	W0108063340
6.4	HL.VA.0108.0640h7.5XD.135.IK.HA	8	91	53	W0108064340
6.5	HL.VA.0108.0650h7.5XD.135.IK.HA	8	91	53	W0108065340
6.52	HL.VA.0108.0652h7.5XD.135.IK.HA	8	91	53	W0108065290
6.6	HL.VA.0108.0660h7.5XD.135.IK.HA	8	91	53	W0108066340
6.7	HL.VA.0108.0670h7.5XD.135.IK.HA	8	91	53	W0108067340
6.8	HL.VA.0108.0680h7.5XD.135.IK.HA	8	91	53	W0108068340
6.82	HL.VA.0108.0682h7.5XD.135.IK.HA	8	91	53	W0108068290
6.9	HL.VA.0108.0690h7.5XD.135.IK.HA	8	91	53	W0108069340
7.0	HL.VA.0108.0700h7.5XD.135.IK.HA	8	91	53	W0108070340
7.02	HL.VA.0108.0702h7.5XD.135.IK.HA	8	91	53	W0108070290
7.1	HL.VA.0108.0710h7.5XD.135.IK.HA	8	91	53	W0108071340
7.2	HL.VA.0108.0720h7.5XD.135.IK.HA	8	91	53	W0108072340
7.3	HL.VA.0108.0730h7.5XD.135.IK.HA	8	91	53	W0108073340
7.4	HL.VA.0108.0740h7.5XD.135.IK.HA	8	91	53	W0108074340
7.5	HL.VA.0108.0750h7.5XD.135.IK.HA	8	91	53	W0108075340
7.52	HL.VA.0108.0752h7.5XD.135.IK.HA	8	91	53	W0108075290
7.55	HL.VA.0108.0755h7.5XD.135.IK.HA	8	91	53	W0108075590
7.6	HL.VA.0108.0760h7.5XD.135.IK.HA	8	91	53	W0108076340
7.7	HL.VA.0108.0770h7.5XD.135.IK.HA	8	91	53	W0108077340
7.8	HL.VA.0108.0780h7.5XD.135.IK.HA	8	91	53	W0108078340
7.82	HL.VA.0108.0782h7.5XD.135.IK.HA	8	91	53	W0108078290
7.9	HL.VA.0108.0790h7.5XD.135.IK.HA	8	91	53	W0108079340

W0108, coated

Cutting data

Index	Material designation	V$_c$ [m/min]	f [mm/rev] = Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels	100	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	Constructional steel	100	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	Spring steel									
1.3.2										
1.3.3										
2.1.1	Cementation steel	95	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	Nitriding steel	75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	Tempered steel	85	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5										
2.3.6										
3.1.1	Non alloyed tool steel									
3.2.1	Tool steel for cold working									
3.2.2										
3.2.3										
3.2.4										
3.2.5										
3.3.1	Tool steel for hot working									
3.3.2										
3.3.3										
3.3.4										
3.3.5										
3.5.1	Hardened tool steel < 55 HRC									
3.5.2	55–58 HRC									
3.5.3	58–60 HRC									
3.5.4	60–62 HRC									
3.5.5	62–64 HRC									
4.1.1	Stainless steel	75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.3		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.4		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.5		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.2.1	Heat-resistant alloys									
4.2.2										
4.2.3										
4.2.4										
5.1.1	Conventional cast steel	80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3		60	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	Stainless cast steel	70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
6.1.1	Cast iron with lamellar graphite	105	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
6.2.1	Spheroidal cast iron	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	GTW (white malleable cast iron)	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	GTS (black malleable cast iron)	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	Aluminium									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	Magnesium									
7.2.2										
7.3.1	Copper									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	CuZn (brass)									
7.4.2										
7.5.1	CuSn (bronze)									
7.5.2										
7.6.1	CuAlFe (Ampco)									
7.6.2										
7.8.1	Titanium	30	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2
7.8.2		25	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2
7.8.3		25	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2

W0108, coated

High-performance twist drills

VA **HL**

$\lambda_S=30°$

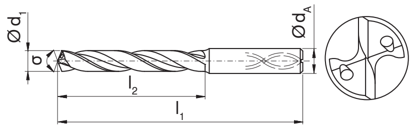
$d_1=h7$
$d_A=h6$

E

≤ 5xD

σ 135°

SCPM415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
8.0	HL.VA.0108.0800h7.5XD.135.IK.HA	8	91	53	W0108080340
8.02	HL.VA.0108.0802h7.5XD.135.IK.HA	8	91	53	W0108080290
8.1	HL.VA.0108.0810h7.5XD.135.IK.HA	10	103	61	W0108081340
8.2	HL.VA.0108.0820h7.5XD.135.IK.HA	10	103	61	W0108082340
8.3	HL.VA.0108.0830h7.5XD.135.IK.HA	10	103	61	W0108083340
8.4	HL.VA.0108.0840h7.5XD.135.IK.HA	10	103	61	W0108084340
8.5	HL.VA.0108.0850h7.5XD.135.IK.HA	10	103	61	W0108085340
8.52	HL.VA.0108.0852h7.5XD.135.IK.HA	10	103	61	W0108085290
8.6	HL.VA.0108.0860h7.5XD.135.IK.HA	10	103	61	W0108086340
8.7	HL.VA.0108.0870h7.5XD.135.IK.HA	10	103	61	W0108087340
8.8	HL.VA.0108.0880h7.5XD.135.IK.HA	10	103	61	W0108088340
8.82	HL.VA.0108.0882h7.5XD.135.IK.HA	10	103	61	W0108088290
8.9	HL.VA.0108.0890h7.5XD.135.IK.HA	10	103	61	W0108089340
9.0	HL.VA.0108.0900h7.5XD.135.IK.HA	10	103	61	W0108090340
9.02	HL.VA.0108.0902h7.5XD.135.IK.HA	10	103	61	W0108090290
9.1	HL.VA.0108.0910h7.5XD.135.IK.HA	10	103	61	W0108091340
9.2	HL.VA.0108.0920h7.5XD.135.IK.HA	10	103	61	W0108092340
9.3	HL.VA.0108.0930h7.5XD.135.IK.HA	10	103	61	W0108093340
9.4	HL.VA.0108.0940h7.5XD.135.IK.HA	10	103	61	W0108094340
9.5	HL.VA.0108.0950h7.5XD.135.IK.HA	10	103	61	W0108095340
9.55	HL.VA.0108.0955h7.5XD.135.IK.HA	10	103	61	W0108095590
9.6	HL.VA.0108.0960h7.5XD.135.IK.HA	10	103	61	W0108096340
9.7	HL.VA.0108.0970h7.5XD.135.IK.HA	10	103	61	W0108097340
9.8	HL.VA.0108.0980h7.5XD.135.IK.HA	10	103	61	W0108098340
9.82	HL.VA.0108.0982h7.5XD.135.IK.HA	10	103	61	W0108098290
9.9	HL.VA.0108.0990h7.5XD.135.IK.HA	10	103	61	W0108099340
10.0	HL.VA.0108.1000h7.5XD.135.IK.HA	10	103	61	W0108100340
10.02	HL.VA.0108.1002h7.5XD.135.IK.HA	10	103	61	W0108100290
10.2	HL.VA.0108.1020h7.5XD.135.IK.HA	12	118	71	W0108102340
10.22	HL.VA.0108.1022h7.5XD.135.IK.HA	12	118	71	W0108102290
10.5	HL.VA.0108.1050h7.5XD.135.IK.HA	12	118	71	W0108105340
10.8	HL.VA.0108.1080h7.5XD.135.IK.HA	12	118	71	W0108108340
10.82	HL.VA.0108.1082h7.5XD.135.IK.HA	12	118	71	W0108108290
11.0	HL.VA.0108.1100h7.5XD.135.IK.HA	12	118	71	W0108110340
11.2	HL.VA.0108.1120h7.5XD.135.IK.HA	12	118	71	W0108112340
11.5	HL.VA.0108.1150h7.5XD.135.IK.HA	12	118	71	W0108115340
11.55	HL.VA.0108.1155h7.5XD.135.IK.HA	12	118	71	W0108115590
11.8	HL.VA.0108.1180h7.5XD.135.IK.HA	12	118	71	W0108118340
11.82	HL.VA.0108.1182h7.5XD.135.IK.HA	12	118	71	W0108118290
12.0	HL.VA.0108.1200h7.5XD.135.IK.HA	12	118	71	W0108120340
12.02	HL.VA.0108.1202h7.5XD.135.IK.HA	12	118	71	W0108120290
12.2	HL.VA.0108.1220h7.5XD.135.IK.HA	14	124	77	W0108122340
12.5	HL.VA.0108.1250h7.5XD.135.IK.HA	14	124	77	W0108125340
12.55	HL.VA.0108.1255h7.5XD.135.IK.HA	14	124	77	W0108125590
12.8	HL.VA.0108.1280h7.5XD.135.IK.HA	14	124	77	W0108128340
13.0	HL.VA.0108.1300h7.5XD.135.IK.HA	14	124	77	W0108130340
13.5	HL.VA.0108.1350h7.5XD.135.IK.HA	14	124	77	W0108135340
13.8	HL.VA.0108.1380h7.5XD.135.IK.HA	14	124	77	W0108138340

W0108, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	100	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.1.2		90	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.1	**Constructional steel**	100	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.2		90	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
1.2.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
1.3.1	**Spring steel**									
1.3.2										
1.3.3										
2.1.1	**Cementation steel**	95	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.2		85	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
2.1.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.2.1	**Nitriding steel**	75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.2.2		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.1	**Tempered steel**	85	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.2		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.3		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
2.3.4		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
2.3.5										
2.3.6										
3.1.1	**Non alloyed tool steel**									
3.2.1	**Tool steel for cold working**									
3.2.2										
3.2.3										
3.2.4										
3.2.5										
3.3.1	**Tool steel for hot working**									
3.3.2										
3.3.3										
3.3.4										
3.3.5										
3.5.1	**Hardened tool steel** **< 55 HRC**									
3.5.2	**55–58 HRC**									
3.5.3	**58–60 HRC**									
3.5.4	**60–62 HRC**									
3.5.5	**62–64 HRC**									
4.1.1	**Stainless steel**	75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.3		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.4		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.1.5		75	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
4.2.1	**Heat-resistant alloys**									
4.2.2										
4.2.3										
4.2.4										
5.1.1	**Conventional cast steel**	80	0,045	0,06	0,09	0,16	0,22	0,28	0,34	0,38
5.1.2		75	0,04	0,053	0,08	0,15	0,21	0,27	0,32	0,37
5.1.3		60	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.1	**Stainless cast steel**	70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
5.2.2		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
6.1.1	**Cast iron with lamellar graphite**	105	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.2		85	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.3		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4	0,46
6.1.4		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2	0,25
6.2.1	**Spheroidal cast iron**	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.2.3		60	0,038	0,05	0,075	0,11	0,125	0,15	0,175	0,2
6.3.1	**GTW (white malleable cast iron)**	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.3.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.1	**GTS (black malleable cast iron)**	85	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
6.4.2		80	0,038	0,05	0,075	0,125	0,175	0,225	0,3	0,375
7.1.1	**Aluminium**									
7.1.2										
7.1.3										
7.1.4										
7.1.5										
7.1.6										
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**									
7.3.2										
7.3.3										
7.3.4										
7.3.5										
7.3.6										
7.4.1	**CuZn (brass)**									
7.4.2										
7.5.1	**CuSn (bronze)**									
7.5.2										
7.6.1	**CuAlFe (Ampco)**									
7.6.2										
7.8.1	**Titanium**	30	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2
7.8.2		25	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2
7.8.3		25	0,01	0,013	0,02	0,04	0,08	0,12	0,16	0,2

W0108, coated

High-performance twist drills

VA **HL**

λ_S=30°

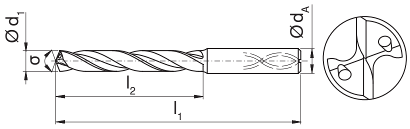
d_1=h7 d_A=h6

E

≤ 5xD

σ 135°

SCPM415



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
14.0	HL.VA.0108.1400h7.5XD.135.IK.HA	14	124	77	W0108140340
14.2	HL.VA.0108.1420h7.5XD.135.IK.HA	16	133	83	W0108142340
14.5	HL.VA.0108.1450h7.5XD.135.IK.HA	16	133	83	W0108145340
14.8	HL.VA.0108.1480h7.5XD.135.IK.HA	16	133	83	W0108148340
15.0	HL.VA.0108.1500h7.5XD.135.IK.HA	16	133	83	W0108150340
15.2	HL.VA.0108.1520h7.5XD.135.IK.HA	16	133	83	W0108152340
15.5	HL.VA.0108.1550h7.5XD.135.IK.HA	16	133	83	W0108155340
15.8	HL.VA.0108.1580h7.5XD.135.IK.HA	16	133	83	W0108158340
16.0	HL.VA.0108.1600h7.5XD.135.IK.HA	16	133	83	W0108160340
16.05	HL.VA.0108.1605h7.5XD.135.IK.HA	16	133	83	W0108160590
16.5	HL.VA.0108.1650h7.5XD.135.IK.HA	18	143	93	W0108165340
16.8	HL.VA.0108.1680h7.5XD.135.IK.HA	18	143	93	W0108168340
17.0	HL.VA.0108.1700h7.5XD.135.IK.HA	18	143	93	W0108170340
17.5	HL.VA.0108.1750h7.5XD.135.IK.HA	18	143	93	W0108175340
17.8	HL.VA.0108.1780h7.5XD.135.IK.HA	18	143	93	W0108178340
18.0	HL.VA.0108.1800h7.5XD.135.IK.HA	18	143	93	W0108180340
18.5	HL.VA.0108.1850h7.5XD.135.IK.HA	20	153	101	W0108185340
18.8	HL.VA.0108.1880h7.5XD.135.IK.HA	20	153	101	W0108188340
19.0	HL.VA.0108.1900h7.5XD.135.IK.HA	20	153	101	W0108190340
19.5	HL.VA.0108.1950h7.5XD.135.IK.HA	20	153	101	W0108195340
19.8	HL.VA.0108.1980h7.5XD.135.IK.HA	20	153	101	W0108198340
20.0	HL.VA.0108.2000h7.5XD.135.IK.HA	20	153	101	W0108200340
20.15	HL.VA.0108.2015h7.5XD.135.IK.HA	25	205	140	W0108201590
20.5	HL.VA.0108.2050h7.5XD.135.IK.HA	25	205	140	W0108205340
20.75	HL.VA.0108.2075h7.5XD.135.IK.HA	25	205	140	W0108207590
21.0	HL.VA.0108.2100h7.5XD.135.IK.HA	25	205	140	W0108210340
21.5	HL.VA.0108.2150h7.5XD.135.IK.HA	25	205	140	W0108215340
21.75	HL.VA.0108.2175h7.5XD.135.IK.HA	25	205	140	W0108217590
22.0	HL.VA.0108.2200h7.5XD.135.IK.HA	25	205	140	W0108220340
22.5	HL.VA.0108.2250h7.5XD.135.IK.HA	25	205	140	W0108225340
22.75	HL.VA.0108.2275h7.5XD.135.IK.HA	25	205	140	W0108227590
23.0	HL.VA.0108.2300h7.5XD.135.IK.HA	25	205	140	W0108230340
23.5	HL.VA.0108.2350h7.5XD.135.IK.HA	25	205	140	W0108235340
23.75	HL.VA.0108.2375h7.5XD.135.IK.HA	25	205	140	W0108237590
24.0	HL.VA.0108.2400h7.5XD.135.IK.HA	25	205	140	W0108240340
24.5	HL.VA.0108.2450h7.5XD.135.IK.HA	25	205	140	W0108245340
24.75	HL.VA.0108.2475h7.5XD.135.IK.HA	25	205	140	W0108247590
25.0	HL.VA.0108.2500h7.5XD.135.IK.HA	25	205	140	W0108250340

W1110, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]						
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	Machining steels	90	0,05	0,067	0,1	0,14	0,2	0,275	0,35
1.1.2		75	0,038	0,05	0,075	0,1	0,15	0,2	0,26
1.2.1	Constructional steel	90	0,05	0,067	0,1	0,14	0,2	0,275	0,35
1.2.2		75	0,038	0,05	0,075	0,1	0,15	0,2	0,26
1.2.3		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
1.3.1	Spring steel								
1.3.2									
1.3.3									
2.1.1	Cementation steel	80	0,05	0,067	0,1	0,14	0,2	0,275	0,35
2.1.2		75	0,05	0,067	0,1	0,14	0,2	0,275	0,35
2.1.3		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.2.1	Nitriding steel	70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.2.2		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.3.1	Tempered steel	75	0,05	0,067	0,1	0,14	0,2	0,275	0,35
2.3.2		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.3.3		70	0,05	0,067	0,1	0,14	0,2	0,275	0,35
2.3.4		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.3.5		55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.3.6									
3.1.1	Non alloyed tool steel	55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.2.1	Tool steel for cold working	70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.2.2		55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.2.3		32	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.2.4									
3.2.5									
3.3.1	Tool steel for hot working	55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	Hardened tool steel < 55 HRC								
3.5.2	55–58 HRC								
3.5.3	58–60 HRC								
3.5.4	60–62 HRC								
3.5.5	62–64 HRC								
4.1.1	Stainless steel	70	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.1.2		60	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.1.3		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.1.4		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.1.5		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.2.1	Heat-resistant alloys								
4.2.2									
4.2.3									
4.2.4									
5.1.1	Conventional cast steel	75	0,05	0,067	0,1	0,14	0,2	0,275	0,35
5.1.2		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
5.1.3		55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
5.2.1	Stainless cast steel	65	0,025	0,033	0,05	0,08	0,12	0,15	0,2
5.2.2		60	0,025	0,033	0,05	0,08	0,12	0,15	0,2
6.1.1	Cast iron with lamellar graphite	85	0,075	0,1	0,15	0,23	0,335	0,425	0,52
6.1.2		75	0,075	0,1	0,15	0,23	0,335	0,425	0,52
6.1.3		70	0,075	0,1	0,15	0,23	0,335	0,425	0,52
6.1.4		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2
6.2.1	Spheroidal cast iron	80	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.2.2		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.2.3		55	0,025	0,033	0,05	0,08	0,12	0,15	0,2
6.3.1	GTW (white malleable cast iron)	80	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.3.2		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.4.1	GTS (black malleable cast iron)	80	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.4.2		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4
7.1.1	Aluminium								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	Magnesium								
7.2.2									
7.3.1	Copper								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	CuZn (brass)								
7.4.2									
7.5.1	CuSn (bronze)								
7.5.2									
7.6.1	CuAlFe (Ampco)								
7.6.2									
7.8.1	Titanium								
7.8.2									
7.8.3									

W1110, coated

High-performance twist drills

VA **HL**

$\lambda_S = 30°$

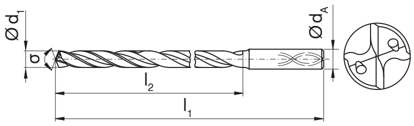
$d_1 = h7$
$d_A = h6$

E

≤ **10xD**

σ 135°

SCPM430



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
1.0	HL.VA.1110.0100h7.10XD.135.IK.HA	4	45	15	W1110010340
1.1	HL.VA.1110.0110h7.10XD.135.IK.HA	4	45	15	W1110011340
1.2	HL.VA.1110.0120h7.10XD.135.IK.HA	4	45	15	W1110012340
1.3	HL.VA.1110.0130h7.10XD.135.IK.HA	4	45	15	W1110013340
1.4	HL.VA.1110.0140h7.10XD.135.IK.HA	4	45	15	W1110014340
1.5	HL.VA.1110.0150h7.10XD.135.IK.HA	4	50	20	W1110015340
1.6	HL.VA.1110.0160h7.10XD.135.IK.HA	4	50	20	W1110016340
1.7	HL.VA.1110.0170h7.10XD.135.IK.HA	4	50	20	W1110017340
1.8	HL.VA.1110.0180h7.10XD.135.IK.HA	4	50	20	W1110018340
1.9	HL.VA.1110.0190h7.10XD.135.IK.HA	4	55	24	W1110019340
2.0	HL.VA.1110.0200h7.10XD.135.IK.HA	4	55	24	W1110020340
2.1	HL.VA.1110.0210h7.10XD.135.IK.HA	4	55	24	W1110021340
2.2	HL.VA.1110.0220h7.10XD.135.IK.HA	4	55	24	W1110022340
2.3	HL.VA.1110.0230h7.10XD.135.IK.HA	4	60	29	W1110023340
2.4	HL.VA.1110.0240h7.10XD.135.IK.HA	4	60	29	W1110024340
2.5	HL.VA.1110.0250h7.10XD.135.IK.HA	4	60	29	W1110025340
2.6	HL.VA.1110.0260h7.10XD.135.IK.HA	4	60	29	W1110026340
2.7	HL.VA.1110.0270h7.10XD.135.IK.HA	4	65	34	W1110027340
2.8	HL.VA.1110.0280h7.10XD.135.IK.HA	4	65	34	W1110028340
2.9	HL.VA.1110.0290h7.10XD.135.IK.HA	4	65	34	W1110029340
3.0	HL.VA.1110.0300h7.10XD.135.IK.HA	6	80	40	W1110030340
3.3	HL.VA.1110.0330h7.10XD.135.IK.HA	6	80	40	W1110033340
3.5	HL.VA.1110.0350h7.10XD.135.IK.HA	6	80	40	W1110035340
3.8	HL.VA.1110.0380h7.10XD.135.IK.HA	6	86	48	W1110038340
4.0	HL.VA.1110.0400h7.10XD.135.IK.HA	6	86	48	W1110040340
4.2	HL.VA.1110.0420h7.10XD.135.IK.HA	6	86	48	W1110042340
4.5	HL.VA.1110.0450h7.10XD.135.IK.HA	6	86	48	W1110045340
4.8	HL.VA.1110.0480h7.10XD.135.IK.HA	6	100	62	W1110048340
5.0	HL.VA.1110.0500h7.10XD.135.IK.HA	6	100	62	W1110050340
5.1	HL.VA.1110.0510h7.10XD.135.IK.HA	6	100	62	W1110051340
5.2	HL.VA.1110.0520h7.10XD.135.IK.HA	6	100	62	W1110052340
5.5	HL.VA.1110.0550h7.10XD.135.IK.HA	6	100	62	W1110055340
5.7	HL.VA.1110.0570h7.10XD.135.IK.HA	6	110	70	W1110057340
5.8	HL.VA.1110.0580h7.10XD.135.IK.HA	6	110	70	W1110058340
5.9	HL.VA.1110.0590h7.10XD.135.IK.HA	6	110	70	W1110059340
6.0	HL.VA.1110.0600h7.10XD.135.IK.HA	6	110	70	W1110060340
6.2	HL.VA.1110.0620h7.10XD.135.IK.HA	8	114	75	W1110062340
6.3	HL.VA.1110.0630h7.10XD.135.IK.HA	8	114	75	W1110063340
6.5	HL.VA.1110.0650h7.10XD.135.IK.HA	8	114	75	W1110065340
6.6	HL.VA.1110.0660h7.10XD.135.IK.HA	8	114	75	W1110066340
6.7	HL.VA.1110.0670h7.10XD.135.IK.HA	8	114	75	W1110067340
6.8	HL.VA.1110.0680h7.10XD.135.IK.HA	8	114	75	W1110068340
6.9	HL.VA.1110.0690h7.10XD.135.IK.HA	8	114	75	W1110069340
7.0	HL.VA.1110.0700h7.10XD.135.IK.HA	8	114	75	W1110070340
7.1	HL.VA.1110.0710h7.10XD.135.IK.HA	8	130	91	W1110071340
7.5	HL.VA.1110.0750h7.10XD.135.IK.HA	8	130	91	W1110075340
7.6	HL.VA.1110.0760h7.10XD.135.IK.HA	8	130	91	W1110076340
7.7	HL.VA.1110.0770h7.10XD.135.IK.HA	8	130	91	W1110077340

W1110, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]						
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**	90	0,05	0,067	0,1	0,14	0,2	0,275	0,35
1.1.2		75	0,038	0,05	0,075	0,1	0,15	0,2	0,26
1.2.1	**Constructional steel**	90	0,05	0,067	0,1	0,14	0,2	0,275	0,35
1.2.2		75	0,038	0,05	0,075	0,1	0,15	0,2	0,26
1.2.3		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**	80	0,05	0,067	0,1	0,14	0,2	0,275	0,35
2.1.2		75	0,05	0,067	0,1	0,14	0,2	0,275	0,35
2.1.3		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.2.1	**Nitriding steel**	70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.2.2		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.3.1	**Tempered steel**	75	0,05	0,067	0,1	0,14	0,2	0,275	0,35
2.3.2		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.3.3		70	0,05	0,067	0,1	0,14	0,2	0,275	0,35
2.3.4		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.3.5		55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
2.3.6									
3.1.1	**Non alloyed tool steel**	55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.2.1	**Tool steel for cold working**	70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.2.2		55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.2.3		32	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.2.4									
3.2.5									
3.3.1	**Tool steel for hot working**	55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	**Hardened tool steel** **< 55 HRC**								
3.5.2	**55–58 HRC**								
3.5.3	**58–60 HRC**								
3.5.4	**60–62 HRC**								
3.5.5	**62–64 HRC**								
4.1.1	**Stainless steel**	70	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.1.2		60	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.1.3		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.1.4		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.1.5		70	0,025	0,033	0,05	0,08	0,12	0,15	0,2
4.2.1	**Heat-resistant alloys**								
4.2.2									
4.2.3									
4.2.4									
5.1.1	**Conventional cast steel**	75	0,05	0,067	0,1	0,14	0,2	0,275	0,35
5.1.2		70	0,038	0,05	0,075	0,1	0,15	0,2	0,26
5.1.3		55	0,038	0,05	0,075	0,1	0,15	0,2	0,26
5.2.1	**Stainless cast steel**	65	0,025	0,033	0,05	0,08	0,12	0,15	0,2
5.2.2		60	0,025	0,033	0,05	0,08	0,12	0,15	0,2
6.1.1	**Cast iron with lamellar graphite**	85	0,075	0,1	0,15	0,23	0,335	0,425	0,52
6.1.2		75	0,075	0,1	0,15	0,23	0,335	0,425	0,52
6.1.3		70	0,075	0,1	0,15	0,23	0,335	0,425	0,52
6.1.4		65	0,025	0,033	0,05	0,08	0,12	0,15	0,2
6.2.1	**Spheroidal cast iron**	80	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.2.2		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.2.3		55	0,025	0,033	0,05	0,08	0,12	0,15	0,2
6.3.1	**GTW (white malleable cast iron)**	80	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.3.2		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.4.1	**GTS (black malleable cast iron)**	80	0,063	0,083	0,125	0,2	0,25	0,35	0,4
6.4.2		75	0,063	0,083	0,125	0,2	0,25	0,35	0,4
7.1.1	**Aluminium**								
7.1.2									
7.1.3									
7.1.4									
7.1.5									
7.1.6									
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**								
7.3.2									
7.3.3									
7.3.4									
7.3.5									
7.3.6									
7.4.1	**CuZn (brass)**								
7.4.2									
7.5.1	**CuSn (bronze)**								
7.5.2									
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									

W1110, coated

High-performance twist drills

VA **HL**

$\lambda_S = 30°$

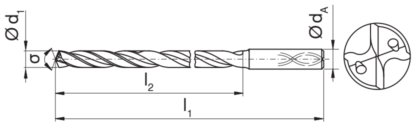
$d_1 = h7$
$d_A = h6$

E

≤ **10xD**

σ 135°

SCPM430



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HL.VA.1110.0780h7.10XD.135.IK.HA	8	130	91	W1110078340
8.0	HL.VA.1110.0800h7.10XD.135.IK.HA	8	130	91	W1110080340
8.1	HL.VA.1110.0810h7.10XD.135.IK.HA	10	150	107	W1110081340
8.2	HL.VA.1110.0820h7.10XD.135.IK.HA	10	150	107	W1110082340
8.4	HL.VA.1110.0840h7.10XD.135.IK.HA	10	150	107	W1110084340
8.5	HL.VA.1110.0850h7.10XD.135.IK.HA	10	150	107	W1110085340
8.6	HL.VA.1110.0860h7.10XD.135.IK.HA	10	150	107	W1110086340
8.7	HL.VA.1110.0870h7.10XD.135.IK.HA	10	150	107	W1110087340
9.0	HL.VA.1110.0900h7.10XD.135.IK.HA	10	150	107	W1110090340
9.3	HL.VA.1110.0930h7.10XD.135.IK.HA	10	150	107	W1110093340
9.5	HL.VA.1110.0950h7.10XD.135.IK.HA	10	150	107	W1110095340
9.8	HL.VA.1110.0980h7.10XD.135.IK.HA	10	150	107	W1110098340
10.0	HL.VA.1110.1000h7.10XD.135.IK.HA	10	150	107	W1110100340
10.2	HL.VA.1110.1020h7.10XD.135.IK.HA	12	180	130	W1110102340
10.5	HL.VA.1110.1050h7.10XD.135.IK.HA	12	180	130	W1110105340
10.8	HL.VA.1110.1080h7.10XD.135.IK.HA	12	180	130	W1110108340
11.0	HL.VA.1110.1100h7.10XD.135.IK.HA	12	180	130	W1110110340
11.2	HL.VA.1110.1120h7.10XD.135.IK.HA	12	180	130	W1110112340
11.5	HL.VA.1110.1150h7.10XD.135.IK.HA	12	180	130	W1110115340
11.8	HL.VA.1110.1180h7.10XD.135.IK.HA	12	180	130	W1110118340
12.0	HL.VA.1110.1200h7.10XD.135.IK.HA	12	180	130	W1110120340
12.5	HL.VA.1110.1250h7.10XD.135.IK.HA	14	208	160	W1110125340
13.0	HL.VA.1110.1300h7.10XD.135.IK.HA	14	208	160	W1110130340
13.5	HL.VA.1110.1350h7.10XD.135.IK.HA	14	208	160	W1110135340
13.8	HL.VA.1110.1380h7.10XD.135.IK.HA	14	208	160	W1110138340
14.0	HL.VA.1110.1400h7.10XD.135.IK.HA	14	208	160	W1110140340
14.5	HL.VA.1110.1450h7.10XD.135.IK.HA	16	236	186	W1110145340
14.8	HL.VA.1110.1480h7.10XD.135.IK.HA	16	236	186	W1110148340
15.0	HL.VA.1110.1500h7.10XD.135.IK.HA	16	236	186	W1110150340
15.5	HL.VA.1110.1550h7.10XD.135.IK.HA	16	236	186	W1110155340
15.8	HL.VA.1110.1580h7.10XD.135.IK.HA	16	236	186	W1110158340
16.0	HL.VA.1110.1600h7.10XD.135.IK.HA	16	236	186	W1110160340

W0115, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	Machining steels		80	0,14	0,2	0,275	0,35
1.1.2			70	0,1	0,15	0,2	0,26
1.2.1	Constructional steel		80	0,14	0,2	0,275	0,35
1.2.2			70	0,1	0,15	0,2	0,26
1.2.3			65	0,1	0,15	0,2	0,26
1.3.1	Spring steel						
1.3.2							
1.3.3							
2.1.1	Cementation steel		75	0,14	0,2	0,275	0,35
2.1.2			70	0,14	0,2	0,275	0,35
2.1.3			65	0,1	0,15	0,2	0,26
2.2.1	Nitriding steel		65	0,1	0,15	0,2	0,26
2.2.2			65	0,1	0,15	0,2	0,26
2.3.1	Tempered steel		65	0,14	0,2	0,275	0,35
2.3.2			65	0,1	0,15	0,2	0,26
2.3.3			65	0,14	0,2	0,275	0,35
2.3.4			65	0,1	0,15	0,2	0,26
2.3.5			50	0,1	0,15	0,2	0,26
2.3.6							
3.1.1	Non alloyed tool steel		50	0,1	0,15	0,2	0,26
3.2.1	Tool steel for cold working		65	0,1	0,15	0,2	0,26
3.2.2			50	0,1	0,15	0,2	0,26
3.2.3							
3.2.4							
3.2.5							
3.3.1	Tool steel for hot working		50	0,1	0,15	0,2	0,26
3.3.2							
3.3.3							
3.3.4							
3.3.5							
3.5.1	Hardened tool steel	< 55 HRC					
3.5.2		55–58 HRC					
3.5.3		58–60 HRC					
3.5.4		60–62 HRC					
3.5.5		62–64 HRC					
4.1.1	Stainless steel		75	0,08	0,12	0,15	0,2
4.1.2			65	0,08	0,12	0,15	0,2
4.1.3			70	0,08	0,12	0,15	0,2
4.1.4			70	0,08	0,12	0,15	0,2
4.1.5			75	0,08	0,12	0,15	0,2
4.2.1	Heat-resistant alloys		40	0,04	0,08	0,12	0,16
4.2.2			35	0,04	0,08	0,12	0,16
4.2.3			35	0,04	0,08	0,12	0,16
4.2.4			35	0,04	0,08	0,12	0,16
5.1.1	Conventional cast steel						
5.1.2							
5.1.3							
5.2.1	Stainless cast steel						
5.2.2							
6.1.1	Cast iron with lamellar graphite						
6.1.2							
6.1.3							
6.1.4							
6.2.1	Spheroidal cast iron						
6.2.2							
6.2.3							
6.3.1	GTW (white malleable cast iron)						
6.3.2							
6.4.1	GTS (black malleable cast iron)						
6.4.2							
7.1.1	Aluminium		180	0,14	0,2	0,275	0,35
7.1.2			180	0,14	0,2	0,275	0,35
7.1.3			180	0,14	0,2	0,275	0,35
7.1.4			160	0,14	0,2	0,275	0,35
7.1.5			140	0,14	0,2	0,275	0,35
7.1.6			110	0,14	0,2	0,275	0,35
7.2.1	Magnesium						
7.2.2							
7.3.1	Copper						
7.3.2							
7.3.3							
7.3.4							
7.3.5							
7.3.6							
7.4.1	CuZn (brass)						
7.4.2							
7.5.1	CuSn (bronze)						
7.5.2							
7.6.1	CuAlFe (Ampco)						
7.6.2							
7.8.1	Titanium		45	0,04	0,08	0,12	0,16
7.8.2			40	0,04	0,08	0,12	0,16
7.8.3			35	0,04	0,08	0,12	0,16

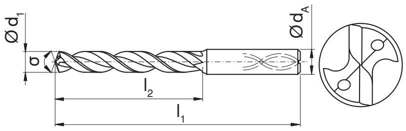
W0115, coated

High-performance twist drills

TI **HL**

$\lambda_S = 38°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ **5xD** | σ 140°

SCPS430



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HL.TI.0115.0300h7.5XD.140.IK.HA	6	66	28	W0115030340
3.1	HL.TI.0115.0310h7.5XD.140.IK.HA	6	66	28	W0115031340
3.2	HL.TI.0115.0320h7.5XD.140.IK.HA	6	66	28	W0115032340
3.3	HL.TI.0115.0330h7.5XD.140.IK.HA	6	66	28	W0115033340
3.4	HL.TI.0115.0340h7.5XD.140.IK.HA	6	66	28	W0115034340
3.5	HL.TI.0115.0350h7.5XD.140.IK.HA	6	66	28	W0115035340
3.6	HL.TI.0115.0360h7.5XD.140.IK.HA	6	66	28	W0115036340
3.7	HL.TI.0115.0370h7.5XD.140.IK.HA	6	66	28	W0115037340
3.8	HL.TI.0115.0380h7.5XD.140.IK.HA	6	66	28	W0115038340
3.9	HL.TI.0115.0390h7.5XD.140.IK.HA	6	66	28	W0115039340
4.0	HL.TI.0115.0400h7.5XD.140.IK.HA	6	66	28	W0115040340
4.1	HL.TI.0115.0410h7.5XD.140.IK.HA	6	82	44	W0115041340
4.2	HL.TI.0115.0420h7.5XD.140.IK.HA	6	82	44	W0115042340
4.3	HL.TI.0115.0430h7.5XD.140.IK.HA	6	82	44	W0115043340
4.4	HL.TI.0115.0440h7.5XD.140.IK.HA	6	82	44	W0115044340
4.5	HL.TI.0115.0450h7.5XD.140.IK.HA	6	82	44	W0115045340
4.6	HL.TI.0115.0460h7.5XD.140.IK.HA	6	82	44	W0115046340
4.7	HL.TI.0115.0470h7.5XD.140.IK.HA	6	82	44	W0115047340
4.8	HL.TI.0115.0480h7.5XD.140.IK.HA	6	82	44	W0115048340
4.9	HL.TI.0115.0490h7.5XD.140.IK.HA	6	82	44	W0115049340
5.0	HL.TI.0115.0500h7.5XD.140.IK.HA	6	82	44	W0115050340
5.1	HL.TI.0115.0510h7.5XD.140.IK.HA	6	82	44	W0115051340
5.2	HL.TI.0115.0520h7.5XD.140.IK.HA	6	82	44	W0115052340
5.3	HL.TI.0115.0530h7.5XD.140.IK.HA	6	82	44	W0115053340
5.4	HL.TI.0115.0540h7.5XD.140.IK.HA	6	82	44	W0115054340
5.5	HL.TI.0115.0550h7.5XD.140.IK.HA	6	82	44	W0115055340
5.6	HL.TI.0115.0560h7.5XD.140.IK.HA	6	82	44	W0115056340
5.7	HL.TI.0115.0570h7.5XD.140.IK.HA	6	82	44	W0115057340
5.8	HL.TI.0115.0580h7.5XD.140.IK.HA	6	82	44	W0115058340
5.9	HL.TI.0115.0590h7.5XD.140.IK.HA	6	82	44	W0115059340
6.0	HL.TI.0115.0600h7.5XD.140.IK.HA	6	82	44	W0115060340
6.1	HL.TI.0115.0610h7.5XD.140.IK.HA	8	91	53	W0115061340
6.2	HL.TI.0115.0620h7.5XD.140.IK.HA	8	91	53	W0115062340
6.3	HL.TI.0115.0630h7.5XD.140.IK.HA	8	91	53	W0115063340
6.4	HL.TI.0115.0640h7.5XD.140.IK.HA	8	91	53	W0115064340
6.5	HL.TI.0115.0650h7.5XD.140.IK.HA	8	91	53	W0115065340
6.6	HL.TI.0115.0660h7.5XD.140.IK.HA	8	91	53	W0115066340
6.7	HL.TI.0115.0670h7.5XD.140.IK.HA	8	91	53	W0115067340
6.8	HL.TI.0115.0680h7.5XD.140.IK.HA	8	91	53	W0115068340
6.9	HL.TI.0115.0690h7.5XD.140.IK.HA	8	91	53	W0115069340
7.0	HL.TI.0115.0700h7.5XD.140.IK.HA	8	91	53	W0115070340
7.1	HL.TI.0115.0710h7.5XD.140.IK.HA	8	91	53	W0115071340
7.2	HL.TI.0115.0720h7.5XD.140.IK.HA	8	91	53	W0115072340
7.3	HL.TI.0115.0730h7.5XD.140.IK.HA	8	91	53	W0115073340
7.4	HL.TI.0115.0740h7.5XD.140.IK.HA	8	91	53	W0115074340
7.5	HL.TI.0115.0750h7.5XD.140.IK.HA	8	91	53	W0115075340
7.6	HL.TI.0115.0760h7.5XD.140.IK.HA	8	91	53	W0115076340
7.7	HL.TI.0115.0770h7.5XD.140.IK.HA	8	91	53	W0115077340

W0115, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**	80	0,14	0,2	0,275	0,35
1.1.2		70	0,1	0,15	0,2	0,26
1.2.1	**Constructional steel**	80	0,14	0,2	0,275	0,35
1.2.2		70	0,1	0,15	0,2	0,26
1.2.3		65	0,1	0,15	0,2	0,26
1.3.1	**Spring steel**					
1.3.2						
1.3.3						
2.1.1	**Cementation steel**	75	0,14	0,2	0,275	0,35
2.1.2		70	0,14	0,2	0,275	0,35
2.1.3		65	0,1	0,15	0,2	0,26
2.2.1	**Nitriding steel**	65	0,1	0,15	0,2	0,26
2.2.2		65	0,1	0,15	0,2	0,26
2.3.1	**Tempered steel**	65	0,14	0,2	0,275	0,35
2.3.2		65	0,1	0,15	0,2	0,26
2.3.3		65	0,14	0,2	0,275	0,35
2.3.4		65	0,1	0,15	0,2	0,26
2.3.5		50	0,1	0,15	0,2	0,26
2.3.6						
3.1.1	**Non alloyed tool steel**	50	0,1	0,15	0,2	0,26
3.2.1	**Tool steel for cold working**	65	0,1	0,15	0,2	0,26
3.2.2		50	0,1	0,15	0,2	0,26
3.2.3						
3.2.4						
3.2.5						
3.3.1	**Tool steel for hot working**	50	0,1	0,15	0,2	0,26
3.3.2						
3.3.3						
3.3.4						
3.3.5						
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**	75	0,08	0,12	0,15	0,2
4.1.2		65	0,08	0,12	0,15	0,2
4.1.3		70	0,08	0,12	0,15	0,2
4.1.4		70	0,08	0,12	0,15	0,2
4.1.5		75	0,08	0,12	0,15	0,2
4.2.1	**Heat-resistant alloys**	40	0,04	0,08	0,12	0,16
4.2.2		35	0,04	0,08	0,12	0,16
4.2.3		35	0,04	0,08	0,12	0,16
4.2.4		35	0,04	0,08	0,12	0,16
5.1.1	**Conventional cast steel**					
5.1.2						
5.1.3						
5.2.1	**Stainless cast steel**					
5.2.2						
6.1.1	**Cast iron with lamellar graphite**					
6.1.2						
6.1.3						
6.1.4						
6.2.1	**Spheroidal cast iron**					
6.2.2						
6.2.3						
6.3.1	**GTW (white malleable cast iron)**					
6.3.2						
6.4.1	**GTS (black malleable cast iron)**					
6.4.2						
7.1.1	**Aluminium**	180	0,14	0,2	0,275	0,35
7.1.2		180	0,14	0,2	0,275	0,35
7.1.3		180	0,14	0,2	0,275	0,35
7.1.4		160	0,14	0,2	0,275	0,35
7.1.5		140	0,14	0,2	0,275	0,35
7.1.6		110	0,14	0,2	0,275	0,35
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**	45	0,04	0,08	0,12	0,16
7.8.2		40	0,04	0,08	0,12	0,16
7.8.3		35	0,04	0,08	0,12	0,16

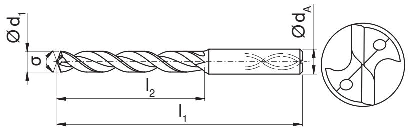
W0115, coated

High-performance twist drills

TI **HL**

$\lambda_S = 38°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 5xD | σ 140°

SCPS430



dd_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HL.TI.0115.0780h7.5XD.140.IK.HA	8	91	53	W0115078340
7.9	HL.TI.0115.0790h7.5XD.140.IK.HA	8	91	53	W0115079340
8.0	HL.TI.0115.0800h7.5XD.140.IK.HA	8	91	53	W0115080340
8.1	HL.TI.0115.0810h7.5XD.140.IK.HA	10	103	61	W0115081340
8.2	HL.TI.0115.0820h7.5XD.140.IK.HA	10	103	61	W0115082340
8.3	HL.TI.0115.0830h7.5XD.140.IK.HA	10	103	61	W0115083340
8.4	HL.TI.0115.0840h7.5XD.140.IK.HA	10	103	61	W0115084340
8.5	HL.TI.0115.0850h7.5XD.140.IK.HA	10	103	61	W0115085340
8.6	HL.TI.0115.0860h7.5XD.140.IK.HA	10	103	61	W0115086340
8.7	HL.TI.0115.0870h7.5XD.140.IK.HA	10	103	61	W0115087340
8.8	HL.TI.0115.0880h7.5XD.140.IK.HA	10	103	61	W0115088340
8.9	HL.TI.0115.0890h7.5XD.140.IK.HA	10	103	61	W0115089340
9.0	HL.TI.0115.0900h7.5XD.140.IK.HA	10	103	61	W0115090340
9.1	HL.TI.0115.0910h7.5XD.140.IK.HA	10	103	61	W0115091340
9.2	HL.TI.0115.0920h7.5XD.140.IK.HA	10	103	61	W0115092340
9.3	HL.TI.0115.0930h7.5XD.140.IK.HA	10	103	61	W0115093340
9.4	HL.TI.0115.0940h7.5XD.140.IK.HA	10	103	61	W0115094340
9.5	HL.TI.0115.0950h7.5XD.140.IK.HA	10	103	61	W0115095340
9.6	HL.TI.0115.0960h7.5XD.140.IK.HA	10	103	61	W0115096340
9.7	HL.TI.0115.0970h7.5XD.140.IK.HA	10	103	61	W0115097340
9.8	HL.TI.0115.0980h7.5XD.140.IK.HA	10	103	61	W0115098340
9.9	HL.TI.0115.0990h7.5XD.140.IK.HA	10	103	61	W0115099340
10.0	HL.TI.0115.1000h7.5XD.140.IK.HA	10	103	61	W0115100340
10.2	HL.TI.0115.1020h7.5XD.140.IK.HA	12	118	71	W0115102340
10.5	HL.TI.0115.1050h7.5XD.140.IK.HA	12	118	71	W0115105340
10.8	HL.TI.0115.1080h7.5XD.140.IK.HA	12	118	71	W0115108340
11.0	HL.TI.0115.1100h7.5XD.140.IK.HA	12	118	71	W0115110340
11.2	HL.TI.0115.1120h7.5XD.140.IK.HA	12	118	71	W0115112340
11.5	HL.TI.0115.1150h7.5XD.140.IK.HA	12	118	71	W0115115340
11.8	HL.TI.0115.1180h7.5XD.140.IK.HA	12	118	71	W0115118340
12.0	HL.TI.0115.1200h7.5XD.140.IK.HA	12	118	71	W0115120340
12.2	HL.TI.0115.1220h7.5XD.140.IK.HA	14	124	77	W0115122340
12.5	HL.TI.0115.1250h7.5XD.140.IK.HA	14	124	77	W0115125340
12.8	HL.TI.0115.1280h7.5XD.140.IK.HA	14	124	77	W0115128340
13.0	HL.TI.0115.1300h7.5XD.140.IK.HA	14	124	77	W0115130340
13.2	HL.TI.0115.1320h7.5XD.140.IK.HA	14	124	77	W0115132340
13.5	HL.TI.0115.1350h7.5XD.140.IK.HA	14	124	77	W0115135340
13.8	HL.TI.0115.1380h7.5XD.140.IK.HA	14	124	77	W0115138340
14.0	HL.TI.0115.1400h7.5XD.140.IK.HA	14	124	77	W0115140340
14.2	HL.TI.0115.1420h7.5XD.140.IK.HA	16	133	83	W0115142340
14.5	HL.TI.0115.1450h7.5XD.140.IK.HA	16	133	83	W0115145340
14.8	HL.TI.0115.1480h7.5XD.140.IK.HA	16	133	83	W0115148340
15.0	HL.TI.0115.1500h7.5XD.140.IK.HA	16	133	83	W0115150340
15.2	HL.TI.0115.1520h7.5XD.140.IK.HA	16	133	83	W0115152340
15.5	HL.TI.0115.1550h7.5XD.140.IK.HA	16	133	83	W0115155340
15.8	HL.TI.0115.1580h7.5XD.140.IK.HA	16	133	83	W0115158340
16.0	HL.TI.0115.1600h7.5XD.140.IK.HA	16	133	83	W0115160340

W105H, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]				
				= Ø 2,5 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	Machining steels							
1.1.2								
1.2.1	Constructional steel							
1.2.2								
1.2.3								
1.3.1	Spring steel							
1.3.2								
1.3.3								
2.1.1	Cementation steel							
2.1.2								
2.1.3								
2.2.1	Nitriding steel							
2.2.2								
2.3.1	Tempered steel							
2.3.2								
2.3.3								
2.3.4								
2.3.5								
2.3.6								
3.1.1	Non alloyed tool steel							
3.2.1	Tool steel for cold working							
3.2.2								
3.2.3								
3.2.4								
3.2.5								
3.3.1	Tool steel for hot working							
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	Hardened tool steel	< 55 HRC	28	0,06	0,08	0,09	0,11	0,13
3.5.2		55–58 HRC	20	0,06	0,08	0,09	0,11	0,13
3.5.3		58–60 HRC	16	0,06	0,08	0,09	0,11	0,13
3.5.4		60–62 HRC	14	0,04	0,055	0,065	0,075	0,09
3.5.5		62–64 HRC	10	0,04	0,055	0,065	0,075	0,09
4.1.1	Stainless steel							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel							
5.1.2								
5.1.3								
5.2.1	Stainless cast steel							
5.2.2								
6.1.1	Cast iron with lamellar graphite							
6.1.2								
6.1.3								
6.1.4								
6.2.1	Spheroidal cast iron							
6.2.2								
6.2.3								
6.3.1	GTW (white malleable cast iron)							
6.3.2								
6.4.1	GTS (black malleable cast iron)							
6.4.2								
7.1.1	Aluminium							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	CuZn (brass)							
7.4.2								
7.5.1	CuSn (bronze)							
7.5.2								
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

W105H, coated

HPC twist drills

H **HPC**

$\lambda_S = 30°$

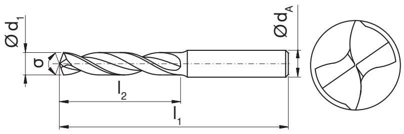
$d_1 = h7$
$d_A = h6$

E

≤ **3xD**

σ 140°

SCPH405



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.5	HPC.H.105H.0250h7.3XD.140.HA	4	55	20	W0105025270
2.6	HPC.H.105H.0260h7.3XD.140.HA	4	55	20	W0105026270
2.9	HPC.H.105H.0290h7.3XD.140.HA	4	55	20	W0105029270
3.0	HPC.H.105H.0300h7.3XD.140.HA	6	62	20	W0105030270
3.4	HPC.H.105H.0340h7.3XD.140.HA	6	62	20	W0105034270
3.5	HPC.H.105H.0350h7.3XD.140.HA	6	62	20	W0105035270
3.9	HPC.H.105H.0390h7.3XD.140.HA	6	66	24	W0105039270
4.0	HPC.H.105H.0400h7.3XD.140.HA	6	66	24	W0105040270
4.3	HPC.H.105H.0430h7.3XD.140.HA	6	66	24	W0105043270
4.5	HPC.H.105H.0450h7.3XD.140.HA	6	66	24	W0105045270
4.8	HPC.H.105H.0480h7.3XD.140.HA	6	66	28	W0105048270
5.0	HPC.H.105H.0500h7.3XD.140.HA	6	66	28	W0105050270
5.1	HPC.H.105H.0510h7.3XD.140.HA	6	66	28	W0105051270
5.5	HPC.H.105H.0550h7.3XD.140.HA	6	66	28	W0105055270
5.8	HPC.H.105H.0580h7.3XD.140.HA	6	66	28	W0105058270
6.0	HPC.H.105H.0600h7.3XD.140.HA	6	66	28	W0105060270
6.5	HPC.H.105H.0650h7.3XD.140.HA	8	79	34	W0105065270
6.8	HPC.H.105H.0680h7.3XD.140.HA	8	79	34	W0105068270
6.9	HPC.H.105H.0690h7.3XD.140.HA	8	79	34	W0105069270
7.0	HPC.H.105H.0700h7.3XD.140.HA	8	79	34	W0105070270
7.5	HPC.H.105H.0750h7.3XD.140.HA	8	79	41	W0105075270
7.8	HPC.H.105H.0780h7.3XD.140.HA	8	79	41	W0105078270
8.0	HPC.H.105H.0800h7.3XD.140.HA	8	79	41	W0105080270
8.5	HPC.H.105H.0850h7.3XD.140.HA	10	89	47	W0105085270
8.6	HPC.H.105H.0860h7.3XD.140.HA	10	89	47	W0105086270
8.8	HPC.H.105H.0880h7.3XD.140.HA	10	89	47	W0105088270
9.0	HPC.H.105H.0900h7.3XD.140.HA	10	89	47	W0105090270
9.5	HPC.H.105H.0950h7.3XD.140.HA	10	89	47	W0105095270
9.8	HPC.H.105H.0980h7.3XD.140.HA	10	89	47	W0105098270
10.0	HPC.H.105H.1000h7.3XD.140.HA	10	89	47	W0105100270
10.2	HPC.H.105H.1020h7.3XD.140.HA	12	102	55	W0105102270
10.5	HPC.H.105H.1050h7.3XD.140.HA	12	102	55	W0105105270
10.8	HPC.H.105H.1080h7.3XD.140.HA	12	102	55	W0105108270
11.0	HPC.H.105H.1100h7.3XD.140.HA	12	102	55	W0105110270
11.5	HPC.H.105H.1150h7.3XD.140.HA	12	102	55	W0105115270
11.8	HPC.H.105H.1180h7.3XD.140.HA	12	102	55	W0105118270
12.0	HPC.H.105H.1200h7.3XD.140.HA	12	102	55	W0105120270
12.2	HPC.H.105H.1220h7.3XD.140.HA	14	107	60	W0105122270
12.5	HPC.H.105H.1250h7.3XD.140.HA	14	107	60	W0105125270
13.0	HPC.H.105H.1300h7.3XD.140.HA	14	107	60	W0105130270
13.5	HPC.H.105H.1350h7.3XD.140.HA	14	107	60	W0105135270
14.0	HPC.H.105H.1400h7.3XD.140.HA	14	107	60	W0105140270
14.2	HPC.H.105H.1420h7.3XD.140.HA	16	115	65	W0105142270
14.5	HPC.H.105H.1450h7.3XD.140.HA	16	115	65	W0105145270
15.0	HPC.H.105H.1500h7.3XD.140.HA	16	115	65	W0105150270
15.5	HPC.H.105H.1550h7.3XD.140.HA	16	115	65	W0105155270
15.8	HPC.H.105H.1580h7.3XD.140.HA	16	115	65	W0105158270
16.0	HPC.H.105H.1600h7.3XD.140.HA	16	115	65	W0105160270

W106H, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev]				
				= Ø 2,6 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
1.1.1	**Machining steels**							
1.1.2								
1.2.1	**Constructional steel**							
1.2.2								
1.2.3								
1.3.1	**Spring steel**							
1.3.2								
1.3.3								
2.1.1	**Cementation steel**							
2.1.2								
2.1.3								
2.2.1	**Nitriding steel**							
2.2.2								
2.3.1	**Tempered steel**							
2.3.2								
2.3.3								
2.3.4								
2.3.5								
2.3.6								
3.1.1	**Non alloyed tool steel**							
3.2.1	**Tool steel for cold working**							
3.2.2								
3.2.3								
3.2.4								
3.2.5								
3.3.1	**Tool steel for hot working**							
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	**Hardened tool steel**	**< 55 HRC**	28	0,06	0,08	0,09	0,11	0,13
3.5.2		**55–58 HRC**	20	0,06	0,08	0,09	0,11	0,13
3.5.3		**58–60 HRC**	16	0,06	0,08	0,09	0,11	0,13
3.5.4		**60–62 HRC**	14	0,04	0,055	0,065	0,075	0,09
3.5.5		**62–64 HRC**	10	0,04	0,055	0,065	0,075	0,09
4.1.1	**Stainless steel**							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	**Heat-resistant alloys**							
4.2.2								
4.2.3								
4.2.4								
5.1.1	**Conventional cast steel**							
5.1.2								
5.1.3								
5.2.1	**Stainless cast steel**							
5.2.2								
6.1.1	**Cast iron with lamellar graphite**							
6.1.2								
6.1.3								
6.1.4								
6.2.1	**Spheroidal cast iron**							
6.2.2								
6.2.3								
6.3.1	**GTW (white malleable cast iron)**							
6.3.2								
6.4.1	**GTS (black malleable cast iron)**							
6.4.2								
7.1.1	**Aluminium**							
7.1.2								
7.1.3								
7.1.4								
7.1.5								
7.1.6								
7.2.1	**Magnesium**							
7.2.2								
7.3.1	**Copper**							
7.3.2								
7.3.3								
7.3.4								
7.3.5								
7.3.6								
7.4.1	**CuZn (brass)**							
7.4.2								
7.5.1	**CuSn (bronze)**							
7.5.2								
7.6.1	**CuAlFe (Ampco)**							
7.6.2								
7.8.1	**Titanium**							
7.8.2								
7.8.3								

W106H, coated

HPC twist drills

H **HPC**

$\lambda_S = 30°$

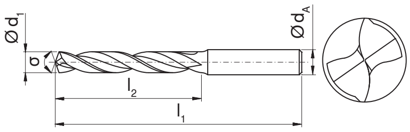
$d_1 = h7$
$d_A = h6$

E

≤ 5xD

σ 140°

SCPH405



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.6	HPC.H.106H.0260h7.5XD.140.HA	4	57	21	W0106026370
2.8	HPC.H.106H.0280h7.5XD.140.HA	4	57	21	W0106028370
3.0	HPC.H.106H.0300h7.5XD.140.HA	6	66	28	W0106030370
3.3	HPC.H.106H.0330h7.5XD.140.HA	6	66	28	W0106033370
3.4	HPC.H.106H.0340h7.5XD.140.HA	6	66	28	W0106034370
3.5	HPC.H.106H.0350h7.5XD.140.HA	6	66	28	W0106035370
3.8	HPC.H.106H.0380h7.5XD.140.HA	6	74	36	W0106038370
4.0	HPC.H.106H.0400h7.5XD.140.HA	6	74	36	W0106040370
4.2	HPC.H.106H.0420h7.5XD.140.HA	6	74	36	W0106042370
4.3	HPC.H.106H.0430h7.5XD.140.HA	6	74	36	W0106043370
4.5	HPC.H.106H.0450h7.5XD.140.HA	6	74	36	W0106045370
4.8	HPC.H.106H.0480h7.5XD.140.HA	6	82	44	W0106048370
5.0	HPC.H.106H.0500h7.5XD.140.HA	6	82	44	W0106050370
5.2	HPC.H.106H.0520h7.5XD.140.HA	6	82	44	W0106052370
5.5	HPC.H.106H.0550h7.5XD.140.HA	6	82	44	W0106055370
5.8	HPC.H.106H.0580h7.5XD.140.HA	6	82	44	W0106058370
6.0	HPC.H.106H.0600h7.5XD.140.HA	6	82	44	W0106060370
6.5	HPC.H.106H.0650h7.5XD.140.HA	8	91	53	W0106065370
6.8	HPC.H.106H.0680h7.5XD.140.HA	8	91	53	W0106068370
7.0	HPC.H.106H.0700h7.5XD.140.HA	8	91	53	W0106070370
7.2	HPC.H.106H.0720h7.5XD.140.HA	8	91	53	W0106072370
7.8	HPC.H.106H.0780h7.5XD.140.HA	8	91	53	W0106078370
8.0	HPC.H.106H.0800h7.5XD.140.HA	8	91	53	W0106080370
8.5	HPC.H.106H.0850h7.5XD.140.HA	10	103	61	W0106085370
8.7	HPC.H.106H.0870h7.5XD.140.HA	10	103	61	W0106087370
8.8	HPC.H.106H.0880h7.5XD.140.HA	10	103	61	W0106088370
9.0	HPC.H.106H.0900h7.5XD.140.HA	10	103	61	W0106090370
9.8	HPC.H.106H.0980h7.5XD.140.HA	10	103	61	W0106098370
10.0	HPC.H.106H.1000h7.5XD.140.HA	10	103	61	W0106100370
10.2	HPC.H.106H.1020h7.5XD.140.HA	12	118	71	W0106102370
10.3	HPC.H.106H.1030h7.5XD.140.HA	12	118	71	W0106103370
10.5	HPC.H.106H.1050h7.5XD.140.HA	12	118	71	W0106105370
10.8	HPC.H.106H.1080h7.5XD.140.HA	12	118	71	W0106108370
11.0	HPC.H.106H.1100h7.5XD.140.HA	12	118	71	W0106110370
11.8	HPC.H.106H.1180h7.5XD.140.HA	12	118	71	W0106118370
12.0	HPC.H.106H.1200h7.5XD.140.HA	12	118	71	W0106120370
12.5	HPC.H.106H.1250h7.5XD.140.HA	14	124	77	W0106125370
12.8	HPC.H.106H.1280h7.5XD.140.HA	14	124	77	W0106128370
13.0	HPC.H.106H.1300h7.5XD.140.HA	14	124	77	W0106130370
13.8	HPC.H.106H.1380h7.5XD.140.HA	14	124	77	W0106138370
14.0	HPC.H.106H.1400h7.5XD.140.HA	14	124	77	W0106140370
14.8	HPC.H.106H.1480h7.5XD.140.HA	16	133	83	W0106148370
15.0	HPC.H.106H.1500h7.5XD.140.HA	16	133	83	W0106150370
15.8	HPC.H.106H.1580h7.5XD.140.HA	16	133	83	W0106158370
16.0	HPC.H.106H.1600h7.5XD.140.HA	16	133	83	W0106160370

W1205, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	360	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.2		360	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.3		400	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.4		400	0,2	0,225	0,3	0,35	0,45	0,55	0,65	0,7
7.1.5		360	0,2	0,225	0,3	0,35	0,45	0,55	0,65	0,7
7.1.6		350	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**	160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.2		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.3		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.4		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.5		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.6		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.4.1	**CuZn (brass)**	200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.4.2		200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.5.1	**CuSn (bronze)**	200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.5.2		200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.6.1	**CuAlFe (Ampco)**									
7.6.2										
7.8.1	**Titanium**									
7.8.2										
7.8.3										
8.1.1	**Thermoplastics**									
8.1.2										
8.1.3										
8.1.4										
8.1.5										
8.1.6										
8.1.7										
8.1.8										
8.1.9										
8.2.1	**Thermosetting plastics**									
8.2.2										
8.2.3										
8.2.4										
8.2.5										
8.2.6										
8.2.7										
8.2.8										
8.3.1	**Fibre-reinforced plastics**									
8.3.2										
8.3.3										
8.3.4										
8.3.5										
8.3.6										
8.4.1	**Sandwich**									
8.4.2										
8.4.3										
9.1.1	**Standard graphite**									
9.1.2										

W1205, coated

HPC twist drills

AL **HPC**

$\lambda_S = 15°$

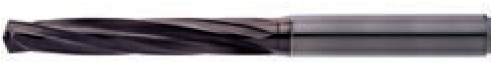
$d_1 = h7$
$d_A = h6$

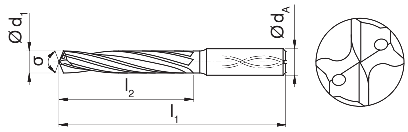
E

≤ **5xD**

σ 135°

SCPN435





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
1.0	HPC.AL.1205.0100h7.5XD.135.IK.HA	4	55	8	W1205010360
1.1	HPC.AL.1205.0110h7.5XD.135.IK.HA	4	55	12	W1205011360
1.2	HPC.AL.1205.0120h7.5XD.135.IK.HA	4	55	12	W1205012360
1.3	HPC.AL.1205.0130h7.5XD.135.IK.HA	4	55	12	W1205013360
1.4	HPC.AL.1205.0140h7.5XD.135.IK.HA	4	55	12	W1205014360
1.5	HPC.AL.1205.0150h7.5XD.135.IK.HA	4	55	12	W1205015360
1.6	HPC.AL.1205.0160h7.5XD.135.IK.HA	4	55	16	W1205016360
1.7	HPC.AL.1205.0170h7.5XD.135.IK.HA	4	55	16	W1205017360
1.8	HPC.AL.1205.0180h7.5XD.135.IK.HA	4	55	16	W1205018360
1.9	HPC.AL.1205.0190h7.5XD.135.IK.HA	4	55	16	W1205019360
2.0	HPC.AL.1205.0200h7.5XD.135.IK.HA	4	57	21	W1205020360
2.02	HPC.AL.1205.0202h7.5XD.135.IK.HA	4	57	21	W1205020290
2.1	HPC.AL.1205.0210h7.5XD.135.IK.HA	4	57	21	W1205021360
2.2	HPC.AL.1205.0220h7.5XD.135.IK.HA	4	57	21	W1205022360
2.22	HPC.AL.1205.0222h7.5XD.135.IK.HA	4	57	21	W1205022290
2.3	HPC.AL.1205.0230h7.5XD.135.IK.HA	4	57	21	W1205023360
2.4	HPC.AL.1205.0240h7.5XD.135.IK.HA	4	57	21	W1205024360
2.42	HPC.AL.1205.0242h7.5XD.135.IK.HA	4	57	21	W1205024290
2.5	HPC.AL.1205.0250h7.5XD.135.IK.HA	4	57	21	W1205025360
2.52	HPC.AL.1205.0252h7.5XD.135.IK.HA	4	57	21	W1205025290
2.6	HPC.AL.1205.0260h7.5XD.135.IK.HA	4	57	21	W1205026360
2.7	HPC.AL.1205.0270h7.5XD.135.IK.HA	4	57	21	W1205027360
2.72	HPC.AL.1205.0272h7.5XD.135.IK.HA	4	57	21	W1205027290
2.8	HPC.AL.1205.0280h7.5XD.135.IK.HA	4	57	21	W1205028360
2.82	HPC.AL.1205.0282h7.5XD.135.IK.HA	4	57	21	W1205028290
2.9	HPC.AL.1205.0290h7.5XD.135.IK.HA	4	57	21	W1205029360
3.0	HPC.AL.1205.0300h7.5XD.135.IK.HA	6	66	28	W1205030360
3.02	HPC.AL.1205.0302h7.5XD.135.IK.HA	6	66	28	W1205030290
3.1	HPC.AL.1205.0310h7.5XD.135.IK.HA	6	66	28	W1205031360
3.2	HPC.AL.1205.0320h7.5XD.135.IK.HA	6	66	28	W1205032360
3.22	HPC.AL.1205.0322h7.5XD.135.IK.HA	6	66	28	W1205032290
3.3	HPC.AL.1205.0330h7.5XD.135.IK.HA	6	66	28	W1205033360
3.32	HPC.AL.1205.0332h7.5XD.135.IK.HA	6	66	28	W1205033290
3.4	HPC.AL.1205.0340h7.5XD.135.IK.HA	6	66	28	W1205034360
3.5	HPC.AL.1205.0350h7.5XD.135.IK.HA	6	66	28	W1205035360
3.52	HPC.AL.1205.0352h7.5XD.135.IK.HA	6	66	28	W1205035290
3.6	HPC.AL.1205.0360h7.5XD.135.IK.HA	6	66	28	W1205036360
3.7	HPC.AL.1205.0370h7.5XD.135.IK.HA	6	66	28	W1205037360
3.8	HPC.AL.1205.0380h7.5XD.135.IK.HA	6	74	36	W1205038360
3.82	HPC.AL.1205.0382h7.5XD.135.IK.HA	6	74	36	W1205038290
3.9	HPC.AL.1205.0390h7.5XD.135.IK.HA	6	74	36	W1205039360
4.0	HPC.AL.1205.0400h7.5XD.135.IK.HA	6	74	36	W1205040360
4.02	HPC.AL.1205.0402h7.5XD.135.IK.HA	6	74	36	W1205040290
4.1	HPC.AL.1205.0410h7.5XD.135.IK.HA	6	74	36	W1205041360
4.2	HPC.AL.1205.0420h7.5XD.135.IK.HA	6	74	36	W1205042360
4.22	HPC.AL.1205.0422h7.5XD.135.IK.HA	6	74	36	W1205042290
4.3	HPC.AL.1205.0430h7.5XD.135.IK.HA	6	74	36	W1205043360
4.4	HPC.AL.1205.0440h7.5XD.135.IK.HA	6	74	36	W1205044360

W1205, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	360	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.2		360	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.3		400	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.4		400	0,2	0,225	0,3	0,35	0,45	0,55	0,65	0,7
7.1.5		360	0,2	0,225	0,3	0,35	0,45	0,55	0,65	0,7
7.1.6		350	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**	160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.2		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.3		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.4		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.5		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.6		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.4.1	**CuZn (brass)**	200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.4.2		200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.5.1	**CuSn (bronze)**	200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.5.2		200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.6.1	**CuAlFe (Ampco)**									
7.6.2										
7.8.1	**Titanium**									
7.8.2										
7.8.3										
8.1.1	**Thermoplastics**									
8.1.2										
8.1.3										
8.1.4										
8.1.5										
8.1.6										
8.1.7										
8.1.8										
8.1.9										
8.2.1	**Thermosetting plastics**									
8.2.2										
8.2.3										
8.2.4										
8.2.5										
8.2.6										
8.2.7										
8.2.8										
8.3.1	**Fibre-reinforced plastics**									
8.3.2										
8.3.3										
8.3.4										
8.3.5										
8.3.6										
8.4.1	**Sandwich**									
8.4.2										
8.4.3										
9.1.1	**Standard graphite**									
9.1.2										

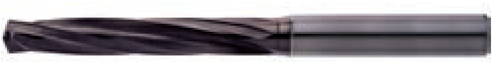
W1205, coated

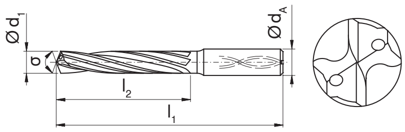
HPC twist drills

AL **HPC**

λ_S = 15° | d_1 = h7 d_A = h6 | E | ≤ 5xD | σ 135°

SCPN435





dd_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
4.5	HPC.AL.1205.0450h7.5XD.135.IK.HA	6	74	36	W1205045360
4.52	HPC.AL.1205.0452h7.5XD.135.IK.HA	6	74	36	W1205045290
4.6	HPC.AL.1205.0460h7.5XD.135.IK.HA	6	74	36	W1205046360
4.7	HPC.AL.1205.0470h7.5XD.135.IK.HA	6	74	36	W1205047360
4.8	HPC.AL.1205.0480h7.5XD.135.IK.HA	6	82	44	W1205048360
4.82	HPC.AL.1205.0482h7.5XD.135.IK.HA	6	82	44	W1205048290
4.9	HPC.AL.1205.0490h7.5XD.135.IK.HA	6	82	44	W1205049360
5.0	HPC.AL.1205.0500h7.5XD.135.IK.HA	6	82	44	W1205050360
5.02	HPC.AL.1205.0502h7.5XD.135.IK.HA	6	82	44	W1205050290
5.1	HPC.AL.1205.0510h7.5XD.135.IK.HA	6	82	44	W1205051360
5.2	HPC.AL.1205.0520h7.5XD.135.IK.HA	6	82	44	W1205052360
5.3	HPC.AL.1205.0530h7.5XD.135.IK.HA	6	82	44	W1205053360
5.4	HPC.AL.1205.0540h7.5XD.135.IK.HA	6	82	44	W1205054360
5.5	HPC.AL.1205.0550h7.5XD.135.IK.HA	6	82	44	W1205055360
5.52	HPC.AL.1205.0552h7.5XD.135.IK.HA	6	82	44	W1205055290
5.6	HPC.AL.1205.0560h7.5XD.135.IK.HA	6	82	44	W1205056360
5.7	HPC.AL.1205.0570h7.5XD.135.IK.HA	6	82	44	W1205057360
5.8	HPC.AL.1205.0580h7.5XD.135.IK.HA	6	82	44	W1205058360
5.82	HPC.AL.1205.0582h7.5XD.135.IK.HA	6	82	44	W1205058290
5.9	HPC.AL.1205.0590h7.5XD.135.IK.HA	6	82	44	W1205059360
6.0	HPC.AL.1205.0600h7.5XD.135.IK.HA	6	82	44	W1205060360
6.02	HPC.AL.1205.0602h7.5XD.135.IK.HA	6	82	44	W1205060290
6.1	HPC.AL.1205.0610h7.5XD.135.IK.HA	8	91	53	W1205061360
6.2	HPC.AL.1205.0620h7.5XD.135.IK.HA	8	91	53	W1205062360
6.3	HPC.AL.1205.0630h7.5XD.135.IK.HA	8	91	53	W1205063360
6.4	HPC.AL.1205.0640h7.5XD.135.IK.HA	8	91	53	W1205064360
6.5	HPC.AL.1205.0650h7.5XD.135.IK.HA	8	91	53	W1205065360
6.52	HPC.AL.1205.0652h7.5XD.135.IK.HA	8	91	53	W1205065290
6.6	HPC.AL.1205.0660h7.5XD.135.IK.HA	8	91	53	W1205066360
6.7	HPC.AL.1205.0670h7.5XD.135.IK.HA	8	91	53	W1205067360
6.8	HPC.AL.1205.0680h7.5XD.135.IK.HA	8	91	53	W1205068360
6.82	HPC.AL.1205.0682h7.5XD.135.IK.HA	8	91	53	W1205068290
6.9	HPC.AL.1205.0690h7.5XD.135.IK.HA	8	91	53	W1205069360
7.0	HPC.AL.1205.0700h7.5XD.135.IK.HA	8	91	53	W1205070360
7.02	HPC.AL.1205.0702h7.5XD.135.IK.HA	8	91	53	W1205070290
7.1	HPC.AL.1205.0710h7.5XD.135.IK.HA	8	91	53	W1205071360
7.2	HPC.AL.1205.0720h7.5XD.135.IK.HA	8	91	53	W1205072360
7.3	HPC.AL.1205.0730h7.5XD.135.IK.HA	8	91	53	W1205073360
7.4	HPC.AL.1205.0740h7.5XD.135.IK.HA	8	91	53	W1205074360
7.5	HPC.AL.1205.0750h7.5XD.135.IK.HA	8	91	53	W1205075360
7.52	HPC.AL.1205.0752h7.5XD.135.IK.HA	8	91	53	W1205075290
7.6	HPC.AL.1205.0760h7.5XD.135.IK.HA	8	91	53	W1205076360
7.7	HPC.AL.1205.0770h7.5XD.135.IK.HA	8	91	53	W1205077360
7.8	HPC.AL.1205.0780h7.5XD.135.IK.HA	8	91	53	W1205078360
7.82	HPC.AL.1205.0782h7.5XD.135.IK.HA	8	91	53	W1205078290
7.9	HPC.AL.1205.0790h7.5XD.135.IK.HA	8	91	53	W1205079360
8.0	HPC.AL.1205.0800h7.5XD.135.IK.HA	8	91	53	W1205080360
8.02	HPC.AL.1205.0802h7.5XD.135.IK.HA	8	91	53	W1205080290

W1205, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	360	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.2		360	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.3		400	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.4		400	0,2	0,225	0,3	0,35	0,45	0,55	0,65	0,7
7.1.5		360	0,2	0,225	0,3	0,35	0,45	0,55	0,65	0,7
7.1.6		350	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**	160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.2		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.3		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.4		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.5		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.6		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.4.1	**CuZn (brass)**	200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.4.2		200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.5.1	**CuSn (bronze)**	200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.5.2		200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.6.1	**CuAlFe (Ampco)**									
7.6.2										
7.8.1	**Titanium**									
7.8.2										
7.8.3										
8.1.1	**Thermoplastics**									
8.1.2										
8.1.3										
8.1.4										
8.1.5										
8.1.6										
8.1.7										
8.1.8										
8.1.9										
8.2.1	**Thermosetting plastics**									
8.2.2										
8.2.3										
8.2.4										
8.2.5										
8.2.6										
8.2.7										
8.2.8										
8.3.1	**Fibre-reinforced plastics**									
8.3.2										
8.3.3										
8.3.4										
8.3.5										
8.3.6										
8.4.1	**Sandwich**									
8.4.2										
8.4.3										
9.1.1	**Standard graphite**									
9.1.2										

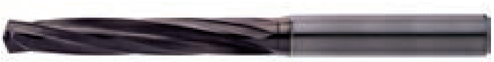
W1205, coated

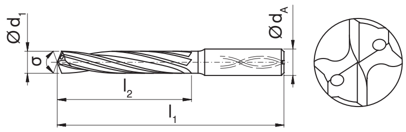
HPC twist drills

AL **HPC**

$\lambda_S = 15°$ | $d_1 = h7$, $d_A = h6$ | E | ≤ 5xD | σ 135°

SCPN435





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
8.1	HPC.AL.1205.0810h7.5XD.135.IK.HA	10	103	61	W1205081360
8.2	HPC.AL.1205.0820h7.5XD.135.IK.HA	10	103	61	W1205082360
8.3	HPC.AL.1205.0830h7.5XD.135.IK.HA	10	103	61	W1205083360
8.4	HPC.AL.1205.0840h7.5XD.135.IK.HA	10	103	61	W1205084360
8.5	HPC.AL.1205.0850h7.5XD.135.IK.HA	10	103	61	W1205085360
8.52	HPC.AL.1205.0852h7.5XD.135.IK.HA	10	103	61	W1205085290
8.6	HPC.AL.1205.0860h7.5XD.135.IK.HA	10	103	61	W1205086360
8.7	HPC.AL.1205.0870h7.5XD.135.IK.HA	10	103	61	W1205087360
8.8	HPC.AL.1205.0880h7.5XD.135.IK.HA	10	103	61	W1205088360
8.82	HPC.AL.1205.0882h7.5XD.135.IK.HA	10	103	61	W1205088290
8.9	HPC.AL.1205.0890h7.5XD.135.IK.HA	10	103	61	W1205089360
9.0	HPC.AL.1205.0900h7.5XD.135.IK.HA	10	103	61	W1205090360
9.02	HPC.AL.1205.0902h7.5XD.135.IK.HA	10	103	61	W1205090290
9.1	HPC.AL.1205.0910h7.5XD.135.IK.HA	10	103	61	W1205091360
9.2	HPC.AL.1205.0920h7.5XD.135.IK.HA	10	103	61	W1205092360
9.3	HPC.AL.1205.0930h7.5XD.135.IK.HA	10	103	61	W1205093360
9.4	HPC.AL.1205.0940h7.5XD.135.IK.HA	10	103	61	W1205094360
9.5	HPC.AL.1205.0950h7.5XD.135.IK.HA	10	103	61	W1205095360
9.6	HPC.AL.1205.0960h7.5XD.135.IK.HA	10	103	61	W1205096360
9.7	HPC.AL.1205.0970h7.5XD.135.IK.HA	10	103	61	W1205097360
9.8	HPC.AL.1205.0980h7.5XD.135.IK.HA	10	103	61	W1205098360
9.82	HPC.AL.1205.0982h7.5XD.135.IK.HA	10	103	61	W1205098290
9.9	HPC.AL.1205.0990h7.5XD.135.IK.HA	10	103	61	W1205099360
10.0	HPC.AL.1205.1000h7.5XD.135.IK.HA	10	103	61	W1205100360
10.02	HPC.AL.1205.1002h7.5XD.135.IK.HA	10	103	61	W1205100290
10.1	HPC.AL.1205.1010h7.5XD.135.IK.HA	12	118	71	W1205101360
10.2	HPC.AL.1205.1020h7.5XD.135.IK.HA	12	118	71	W1205102360
10.22	HPC.AL.1205.1022h7.5XD.135.IK.HA	12	118	71	W1205102290
10.3	HPC.AL.1205.1030h7.5XD.135.IK.HA	12	118	71	W1205103360
10.4	HPC.AL.1205.1040h7.5XD.135.IK.HA	12	118	71	W1205104360
10.5	HPC.AL.1205.1050h7.5XD.135.IK.HA	12	118	71	W1205105360
10.6	HPC.AL.1205.1060h7.5XD.135.IK.HA	12	118	71	W1205106360
10.7	HPC.AL.1205.1070h7.5XD.135.IK.HA	12	118	71	W1205107360
10.8	HPC.AL.1205.1080h7.5XD.135.IK.HA	12	118	71	W1205108360
10.82	HPC.AL.1205.1082h7.5XD.135.IK.HA	12	118	71	W1205108290
11.0	HPC.AL.1205.1100h7.5XD.135.IK.HA	12	118	71	W1205110360
11.1	HPC.AL.1205.1110h7.5XD.135.IK.HA	12	118	71	W1205111360
11.2	HPC.AL.1205.1120h7.5XD.135.IK.HA	12	118	71	W1205112360
11.3	HPC.AL.1205.1130h7.5XD.135.IK.HA	12	118	71	W1205113360
11.5	HPC.AL.1205.1150h7.5XD.135.IK.HA	12	118	71	W1205115360
11.8	HPC.AL.1205.1180h7.5XD.135.IK.HA	12	118	71	W1205118360
11.82	HPC.AL.1205.1182h7.5XD.135.IK.HA	12	118	71	W1205118290
12.0	HPC.AL.1205.1200h7.5XD.135.IK.HA	12	118	71	W1205120360
12.02	HPC.AL.1205.1202h7.5XD.135.IK.HA	12	118	71	W1205120290
12.2	HPC.AL.1205.1220h7.5XD.135.IK.HA	14	124	77	W1205122360
12.5	HPC.AL.1205.1250h7.5XD.135.IK.HA	14	124	77	W1205125360
12.8	HPC.AL.1205.1280h7.5XD.135.IK.HA	14	124	77	W1205128360
13.0	HPC.AL.1205.1300h7.5XD.135.IK.HA	14	124	77	W1205130360

W1205, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]							
			= Ø 1,0 = Ø 1,5	> Ø 1,5 = Ø 2,0	> Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
7.1.1	**Aluminium**	360	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.2		360	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.3		400	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.1.4		400	0,2	0,225	0,3	0,35	0,45	0,55	0,65	0,7
7.1.5		360	0,2	0,225	0,3	0,35	0,45	0,55	0,65	0,7
7.1.6		350	0,15	0,2	0,25	0,3	0,4	0,5	0,6	0,65
7.2.1	**Magnesium**									
7.2.2										
7.3.1	**Copper**	160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.2		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.3		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.4		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.5		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.3.6		160	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.4.1	**CuZn (brass)**	200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.4.2		200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.5.1	**CuSn (bronze)**	200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.5.2		200	0,08	0,11	0,15	0,23	0,3	0,38	0,45	0,52
7.6.1	**CuAlFe (Ampco)**									
7.6.2										
7.8.1	**Titanium**									
7.8.2										
7.8.3										
8.1.1	**Thermoplastics**									
8.1.2										
8.1.3										
8.1.4										
8.1.5										
8.1.6										
8.1.7										
8.1.8										
8.1.9										
8.2.1	**Thermosetting plastics**									
8.2.2										
8.2.3										
8.2.4										
8.2.5										
8.2.6										
8.2.7										
8.2.8										
8.3.1	**Fibre-reinforced plastics**									
8.3.2										
8.3.3										
8.3.4										
8.3.5										
8.3.6										
8.4.1	**Sandwich**									
8.4.2										
8.4.3										
9.1.1	**Standard graphite**									
9.1.2										

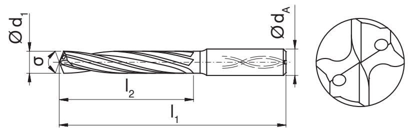
W1205, coated

HPC twist drills

AL **HPC**

$\lambda_S = 15°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 5xD | σ 135°

SCPN435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
13.5	HPC.AL.1205.1350h7.5XD.135.IK.HA	14	124	77	W1205135360
13.8	HPC.AL.1205.1380h7.5XD.135.IK.HA	14	124	77	W1205138360
14.0	HPC.AL.1205.1400h7.5XD.135.IK.HA	14	124	77	W1205140360
14.2	HPC.AL.1205.1420h7.5XD.135.IK.HA	16	133	83	W1205142360
14.5	HPC.AL.1205.1450h7.5XD.135.IK.HA	16	133	83	W1205145360
14.8	HPC.AL.1205.1480h7.5XD.135.IK.HA	16	133	83	W1205148360
15.0	HPC.AL.1205.1500h7.5XD.135.IK.HA	16	133	83	W1205150360
15.2	HPC.AL.1205.1520h7.5XD.135.IK.HA	16	133	83	W1205152360
15.5	HPC.AL.1205.1550h7.5XD.135.IK.HA	16	133	83	W1205155360
15.8	HPC.AL.1205.1580h7.5XD.135.IK.HA	16	133	83	W1205158360
16.0	HPC.AL.1205.1600h7.5XD.135.IK.HA	16	133	83	W1205160360
16.5	HPC.AL.1205.1650h7.5XD.135.IK.HA	18	143	93	W1205165360
17.0	HPC.AL.1205.1700h7.5XD.135.IK.HA	18	143	93	W1205170360
17.5	HPC.AL.1205.1750h7.5XD.135.IK.HA	18	143	93	W1205175360
18.0	HPC.AL.1205.1800h7.5XD.135.IK.HA	18	143	93	W1205180360
18.5	HPC.AL.1205.1850h7.5XD.135.IK.HA	20	153	101	W1205185360
19.0	HPC.AL.1205.1900h7.5XD.135.IK.HA	20	153	101	W1205190360
19.5	HPC.AL.1205.1950h7.5XD.135.IK.HA	20	153	101	W1205195360
20.0	HPC.AL.1205.2000h7.5XD.135.IK.HA	20	153	101	W1205200360

W1208, coated

Cutting data

Index	Material designation	Vc [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
7.1.1	**Aluminium**	320	0,3	0,4	0,5	0,6
7.1.2		320	0,3	0,4	0,5	0,6
7.1.3		360	0,3	0,4	0,5	0,6
7.1.4		360	0,35	0,45	0,55	0,65
7.1.5		320	0,35	0,45	0,55	0,65
7.1.6		310	0,3	0,4	0,5	0,6
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**	140	0,23	0,3	0,38	0,45
7.3.2		140	0,23	0,3	0,38	0,45
7.3.3		140	0,23	0,3	0,38	0,45
7.3.4		130	0,23	0,3	0,38	0,45
7.3.5		130	0,23	0,3	0,38	0,45
7.3.6		130	0,23	0,3	0,38	0,45
7.4.1	**CuZn (brass)**	160	0,23	0,3	0,38	0,45
7.4.2		160	0,23	0,3	0,38	0,45
7.5.1	**CuSn (bronze)**	160	0,23	0,3	0,38	0,45
7.5.2		160	0,23	0,3	0,38	0,45
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

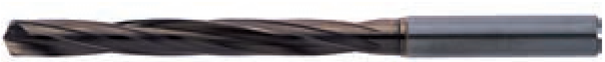
W1208, coated

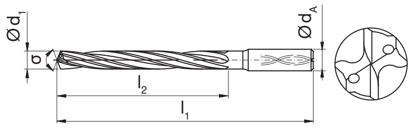
HPC twist drills

AL **HPC**

$\lambda_S = 15°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 8xD | σ 135°

SCPN435





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.AL.1208.0300h7.8XD.135.IK.HA	6	72	34	W1208030360
3.1	HPC.AL.1208.0310h7.8XD.135.IK.HA	6	72	34	W1208031360
3.2	HPC.AL.1208.0320h7.8XD.135.IK.HA	6	72	34	W1208032360
3.3	HPC.AL.1208.0330h7.8XD.135.IK.HA	6	72	34	W1208033360
3.4	HPC.AL.1208.0340h7.8XD.135.IK.HA	6	72	34	W1208034360
3.5	HPC.AL.1208.0350h7.8XD.135.IK.HA	6	72	34	W1208035360
3.6	HPC.AL.1208.0360h7.8XD.135.IK.HA	6	72	34	W1208036360
3.7	HPC.AL.1208.0370h7.8XD.135.IK.HA	6	72	34	W1208037360
3.8	HPC.AL.1208.0380h7.8XD.135.IK.HA	6	81	43	W1208038360
3.9	HPC.AL.1208.0390h7.8XD.135.IK.HA	6	81	43	W1208039360
4.0	HPC.AL.1208.0400h7.8XD.135.IK.HA	6	81	43	W1208040360
4.1	HPC.AL.1208.0410h7.8XD.135.IK.HA	6	81	43	W1208041360
4.2	HPC.AL.1208.0420h7.8XD.135.IK.HA	6	81	43	W1208042360
4.3	HPC.AL.1208.0430h7.8XD.135.IK.HA	6	81	43	W1208043360
4.4	HPC.AL.1208.0440h7.8XD.135.IK.HA	6	81	43	W1208044360
4.5	HPC.AL.1208.0450h7.8XD.135.IK.HA	6	81	43	W1208045360
4.6	HPC.AL.1208.0460h7.8XD.135.IK.HA	6	81	43	W1208046360
4.7	HPC.AL.1208.0470h7.8XD.135.IK.HA	6	81	43	W1208047360
4.8	HPC.AL.1208.0480h7.8XD.135.IK.HA	6	95	57	W1208048360
4.9	HPC.AL.1208.0490h7.8XD.135.IK.HA	6	95	57	W1208049360
5.0	HPC.AL.1208.0500h7.8XD.135.IK.HA	6	95	57	W1208050360
5.1	HPC.AL.1208.0510h7.8XD.135.IK.HA	6	95	57	W1208051360
5.2	HPC.AL.1208.0520h7.8XD.135.IK.HA	6	95	57	W1208052360
5.3	HPC.AL.1208.0530h7.8XD.135.IK.HA	6	95	57	W1208053360
5.4	HPC.AL.1208.0540h7.8XD.135.IK.HA	6	95	57	W1208054360
5.5	HPC.AL.1208.0550h7.8XD.135.IK.HA	6	95	57	W1208055360
5.6	HPC.AL.1208.0560h7.8XD.135.IK.HA	6	95	57	W1208056360
5.7	HPC.AL.1208.0570h7.8XD.135.IK.HA	6	95	57	W1208057360
5.8	HPC.AL.1208.0580h7.8XD.135.IK.HA	6	95	57	W1208058360
5.9	HPC.AL.1208.0590h7.8XD.135.IK.HA	6	95	57	W1208059360
6.0	HPC.AL.1208.0600h7.8XD.135.IK.HA	6	95	57	W1208060360
6.1	HPC.AL.1208.0610h7.8XD.135.IK.HA	8	114	76	W1208061360
6.2	HPC.AL.1208.0620h7.8XD.135.IK.HA	8	114	76	W1208062360
6.3	HPC.AL.1208.0630h7.8XD.135.IK.HA	8	114	76	W1208063360
6.4	HPC.AL.1208.0640h7.8XD.135.IK.HA	8	114	76	W1208064360
6.5	HPC.AL.1208.0650h7.8XD.135.IK.HA	8	114	76	W1208065360
6.6	HPC.AL.1208.0660h7.8XD.135.IK.HA	8	114	76	W1208066360
6.7	HPC.AL.1208.0670h7.8XD.135.IK.HA	8	114	76	W1208067360
6.8	HPC.AL.1208.0680h7.8XD.135.IK.HA	8	114	76	W1208068360
6.9	HPC.AL.1208.0690h7.8XD.135.IK.HA	8	114	76	W1208069360
7.0	HPC.AL.1208.0700h7.8XD.135.IK.HA	8	114	76	W1208070360
7.1	HPC.AL.1208.0710h7.8XD.135.IK.HA	8	114	76	W1208071360
7.2	HPC.AL.1208.0720h7.8XD.135.IK.HA	8	114	76	W1208072360
7.3	HPC.AL.1208.0730h7.8XD.135.IK.HA	8	114	76	W1208073360
7.4	HPC.AL.1208.0740h7.8XD.135.IK.HA	8	114	76	W1208074360
7.5	HPC.AL.1208.0750h7.8XD.135.IK.HA	8	114	76	W1208075360
7.6	HPC.AL.1208.0760h7.8XD.135.IK.HA	8	114	76	W1208076360
7.7	HPC.AL.1208.0770h7.8XD.135.IK.HA	8	114	76	W1208077360

W1208, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
7.1.1	**Aluminium**	320	0,3	0,4	0,5	0,6
7.1.2		320	0,3	0,4	0,5	0,6
7.1.3		360	0,3	0,4	0,5	0,6
7.1.4		360	0,35	0,45	0,55	0,65
7.1.5		320	0,35	0,45	0,55	0,65
7.1.6		310	0,3	0,4	0,5	0,6
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**	140	0,23	0,3	0,38	0,45
7.3.2		140	0,23	0,3	0,38	0,45
7.3.3		140	0,23	0,3	0,38	0,45
7.3.4		130	0,23	0,3	0,38	0,45
7.3.5		130	0,23	0,3	0,38	0,45
7.3.6		130	0,23	0,3	0,38	0,45
7.4.1	**CuZn (brass)**	160	0,23	0,3	0,38	0,45
7.4.2		160	0,23	0,3	0,38	0,45
7.5.1	**CuSn (bronze)**	160	0,23	0,3	0,38	0,45
7.5.2		160	0,23	0,3	0,38	0,45
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

W1208, coated

HPC twist drills

AL **HPC**

λ_S = 15°

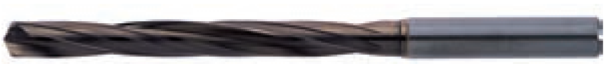
d_1 = h7
d_A = h6

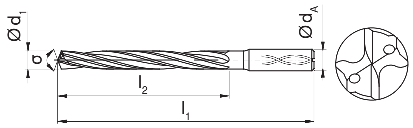
E

≤ 8xD

σ 135°

SCPN435





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HPC.AL.1208.0780h7.8XD.135.IK.HA	8	114	76	W1208078360
7.9	HPC.AL.1208.0790h7.8XD.135.IK.HA	8	114	76	W1208079360
8.0	HPC.AL.1208.0800h7.8XD.135.IK.HA	8	114	76	W1208080360
8.1	HPC.AL.1208.0810h7.8XD.135.IK.HA	10	142	95	W1208081360
8.2	HPC.AL.1208.0820h7.8XD.135.IK.HA	10	142	95	W1208082360
8.3	HPC.AL.1208.0830h7.8XD.135.IK.HA	10	142	95	W1208083360
8.4	HPC.AL.1208.0840h7.8XD.135.IK.HA	10	142	95	W1208084360
8.5	HPC.AL.1208.0850h7.8XD.135.IK.HA	10	142	95	W1208085360
8.6	HPC.AL.1208.0860h7.8XD.135.IK.HA	10	142	95	W1208086360
8.7	HPC.AL.1208.0870h7.8XD.135.IK.HA	10	142	95	W1208087360
8.8	HPC.AL.1208.0880h7.8XD.135.IK.HA	10	142	95	W1208088360
8.9	HPC.AL.1208.0890h7.8XD.135.IK.HA	10	142	95	W1208089360
9.0	HPC.AL.1208.0900h7.8XD.135.IK.HA	10	142	95	W1208090360
9.1	HPC.AL.1208.0910h7.8XD.135.IK.HA	10	142	95	W1208091360
9.2	HPC.AL.1208.0920h7.8XD.135.IK.HA	10	142	95	W1208092360
9.3	HPC.AL.1208.0930h7.8XD.135.IK.HA	10	142	95	W1208093360
9.4	HPC.AL.1208.0940h7.8XD.135.IK.HA	10	142	95	W1208094360
9.5	HPC.AL.1208.0950h7.8XD.135.IK.HA	10	142	95	W1208095360
9.6	HPC.AL.1208.0960h7.8XD.135.IK.HA	10	142	95	W1208096360
9.7	HPC.AL.1208.0970h7.8XD.135.IK.HA	10	142	95	W1208097360
9.8	HPC.AL.1208.0980h7.8XD.135.IK.HA	10	142	95	W1208098360
9.9	HPC.AL.1208.0990h7.8XD.135.IK.HA	10	142	95	W1208099360
10.0	HPC.AL.1208.1000h7.8XD.135.IK.HA	10	142	95	W1208100360
10.2	HPC.AL.1208.1020h7.8XD.135.IK.HA	12	162	114	W1208102360
10.5	HPC.AL.1208.1050h7.8XD.135.IK.HA	12	162	114	W1208105360
10.8	HPC.AL.1208.1080h7.8XD.135.IK.HA	12	162	114	W1208108360
11.0	HPC.AL.1208.1100h7.8XD.135.IK.HA	12	162	114	W1208110360
11.2	HPC.AL.1208.1120h7.8XD.135.IK.HA	12	162	114	W1208112360
11.5	HPC.AL.1208.1150h7.8XD.135.IK.HA	12	162	114	W1208115360
11.8	HPC.AL.1208.1180h7.8XD.135.IK.HA	12	162	114	W1208118360
12.0	HPC.AL.1208.1200h7.8XD.135.IK.HA	12	162	114	W1208120360
12.5	HPC.AL.1208.1250h7.8XD.135.IK.HA	14	178	131	W1208125360
12.8	HPC.AL.1208.1280h7.8XD.135.IK.HA	14	178	131	W1208128360
13.0	HPC.AL.1208.1300h7.8XD.135.IK.HA	14	178	131	W1208130360
13.5	HPC.AL.1208.1350h7.8XD.135.IK.HA	14	178	131	W1208135360
13.8	HPC.AL.1208.1380h7.8XD.135.IK.HA	14	178	131	W1208138360
14.0	HPC.AL.1208.1400h7.8XD.135.IK.HA	14	178	131	W1208140360
14.5	HPC.AL.1208.1450h7.8XD.135.IK.HA	16	203	152	W1208145360
14.8	HPC.AL.1208.1480h7.8XD.135.IK.HA	16	203	152	W1208148360
15.0	HPC.AL.1208.1500h7.8XD.135.IK.HA	16	203	152	W1208150360
15.5	HPC.AL.1208.1550h7.8XD.135.IK.HA	16	203	152	W1208155360
15.8	HPC.AL.1208.1580h7.8XD.135.IK.HA	16	203	152	W1208158360
16.0	HPC.AL.1208.1600h7.8XD.135.IK.HA	16	203	152	W1208160360

W1212, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
7.1.1	**Aluminium**	250	0,3	0,4	0,5	0,6
7.1.2		250	0,3	0,4	0,5	0,6
7.1.3		280	0,3	0,4	0,5	0,6
7.1.4		280	0,35	0,45	0,55	0,65
7.1.5		250	0,35	0,45	0,55	0,65
7.1.6		245	0,3	0,4	0,5	0,6
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**	120	0,23	0,3	0,38	0,45
7.3.2		120	0,23	0,3	0,38	0,45
7.3.3		120	0,23	0,3	0,38	0,45
7.3.4		120	0,23	0,3	0,38	0,45
7.3.5		120	0,23	0,3	0,38	0,45
7.3.6		120	0,23	0,3	0,38	0,45
7.4.1	**CuZn (brass)**	150	0,23	0,3	0,38	0,45
7.4.2		150	0,23	0,3	0,38	0,45
7.5.1	**CuSn (bronze)**	150	0,23	0,3	0,38	0,45
7.5.2		150	0,23	0,3	0,38	0,45
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

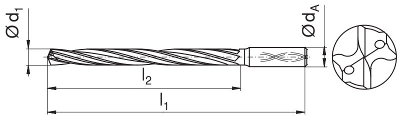
W1212, coated

HPC twist drills

AL **HPC**

$\lambda_S = 15°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 12xD | σ 135°

SCPN435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HPC.AL.1212.0300h7.12XD.135.IK.HA	6	92	54	W1212030360
3.1	HPC.AL.1212.0310h7.12XD.135.IK.HA	6	92	54	W1212031360
3.2	HPC.AL.1212.0320h7.12XD.135.IK.HA	6	92	54	W1212032360
3.3	HPC.AL.1212.0330h7.12XD.135.IK.HA	6	92	54	W1212033360
3.4	HPC.AL.1212.0340h7.12XD.135.IK.HA	6	92	54	W1212034360
3.5	HPC.AL.1212.0350h7.12XD.135.IK.HA	6	92	54	W1212035360
3.6	HPC.AL.1212.0360h7.12XD.135.IK.HA	6	92	54	W1212036360
3.7	HPC.AL.1212.0370h7.12XD.135.IK.HA	6	92	54	W1212037360
3.8	HPC.AL.1212.0380h7.12XD.135.IK.HA	6	102	64	W1212038360
3.9	HPC.AL.1212.0390h7.12XD.135.IK.HA	6	102	64	W1212039360
4.0	HPC.AL.1212.0400h7.12XD.135.IK.HA	6	102	64	W1212040360
4.1	HPC.AL.1212.0410h7.12XD.135.IK.HA	6	102	64	W1212041360
4.2	HPC.AL.1212.0420h7.12XD.135.IK.HA	6	102	64	W1212042360
4.3	HPC.AL.1212.0430h7.12XD.135.IK.HA	6	102	64	W1212043360
4.4	HPC.AL.1212.0440h7.12XD.135.IK.HA	6	102	64	W1212044360
4.5	HPC.AL.1212.0450h7.12XD.135.IK.HA	6	102	64	W1212045360
4.6	HPC.AL.1212.0460h7.12XD.135.IK.HA	6	102	64	W1212046360
4.7	HPC.AL.1212.0470h7.12XD.135.IK.HA	6	102	64	W1212047360
4.8	HPC.AL.1212.0480h7.12XD.135.IK.HA	6	116	78	W1212048360
4.9	HPC.AL.1212.0490h7.12XD.135.IK.HA	6	116	78	W1212049360
5.0	HPC.AL.1212.0500h7.12XD.135.IK.HA	6	116	78	W1212050360
5.1	HPC.AL.1212.0510h7.12XD.135.IK.HA	6	116	78	W1212051360
5.2	HPC.AL.1212.0520h7.12XD.135.IK.HA	6	116	78	W1212052360
5.3	HPC.AL.1212.0530h7.12XD.135.IK.HA	6	116	78	W1212053360
5.4	HPC.AL.1212.0540h7.12XD.135.IK.HA	6	116	78	W1212054360
5.5	HPC.AL.1212.0550h7.12XD.135.IK.HA	6	116	78	W1212055360
5.6	HPC.AL.1212.0560h7.12XD.135.IK.HA	6	116	78	W1212056360
5.7	HPC.AL.1212.0570h7.12XD.135.IK.HA	6	116	78	W1212057360
5.8	HPC.AL.1212.0580h7.12XD.135.IK.HA	6	116	78	W1212058360
5.9	HPC.AL.1212.0590h7.12XD.135.IK.HA	6	116	78	W1212059360
6.0	HPC.AL.1212.0600h7.12XD.135.IK.HA	6	116	78	W1212060360
6.1	HPC.AL.1212.0610h7.12XD.135.IK.HA	8	146	108	W1212061360
6.2	HPC.AL.1212.0620h7.12XD.135.IK.HA	8	146	108	W1212062360
6.3	HPC.AL.1212.0630h7.12XD.135.IK.HA	8	146	108	W1212063360
6.4	HPC.AL.1212.0640h7.12XD.135.IK.HA	8	146	108	W1212064360
6.5	HPC.AL.1212.0650h7.12XD.135.IK.HA	8	146	108	W1212065360
6.6	HPC.AL.1212.0660h7.12XD.135.IK.HA	8	146	108	W1212066360
6.7	HPC.AL.1212.0670h7.12XD.135.IK.HA	8	146	108	W1212067360
6.8	HPC.AL.1212.0680h7.12XD.135.IK.HA	8	146	108	W1212068360
6.9	HPC.AL.1212.0690h7.12XD.135.IK.HA	8	146	108	W1212069360
7.0	HPC.AL.1212.0700h7.12XD.135.IK.HA	8	146	108	W1212070360
7.1	HPC.AL.1212.0710h7.12XD.135.IK.HA	8	146	108	W1212071360
7.2	HPC.AL.1212.0720h7.12XD.135.IK.HA	8	146	108	W1212072360
7.3	HPC.AL.1212.0730h7.12XD.135.IK.HA	8	146	108	W1212073360
7.4	HPC.AL.1212.0740h7.12XD.135.IK.HA	8	146	108	W1212074360
7.5	HPC.AL.1212.0750h7.12XD.135.IK.HA	8	146	108	W1212075360
7.6	HPC.AL.1212.0760h7.12XD.135.IK.HA	8	146	108	W1212076360
7.7	HPC.AL.1212.0770h7.12XD.135.IK.HA	8	146	108	W1212077360

W1212, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
7.1.1	Aluminium	250	0,3	0,4	0,5	0,6
7.1.2		250	0,3	0,4	0,5	0,6
7.1.3		280	0,3	0,4	0,5	0,6
7.1.4		280	0,35	0,45	0,55	0,65
7.1.5		250	0,35	0,45	0,55	0,65
7.1.6		245	0,3	0,4	0,5	0,6
7.2.1	Magnesium					
7.2.2						
7.3.1	Copper	120	0,23	0,3	0,38	0,45
7.3.2		120	0,23	0,3	0,38	0,45
7.3.3		120	0,23	0,3	0,38	0,45
7.3.4		120	0,23	0,3	0,38	0,45
7.3.5		120	0,23	0,3	0,38	0,45
7.3.6		120	0,23	0,3	0,38	0,45
7.4.1	CuZn (brass)	150	0,23	0,3	0,38	0,45
7.4.2		150	0,23	0,3	0,38	0,45
7.5.1	CuSn (bronze)	150	0,23	0,3	0,38	0,45
7.5.2		150	0,23	0,3	0,38	0,45
7.6.1	CuAlFe (Ampco)					
7.6.2						
7.8.1	Titanium					
7.8.2						
7.8.3						
8.1.1	Thermoplastics					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	Thermosetting plastics					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	Fibre-reinforced plastics					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	Sandwich					
8.4.2						
8.4.3						
9.1.1	Standard graphite					
9.1.2						

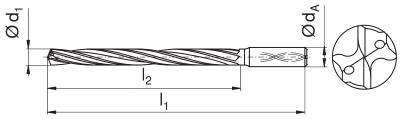
W1212, coated

HPC twist drills

AL **HPC**

$\lambda_S = 15°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ **12xD** | σ 135°

SCPN435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
7.8	HPC.AL.1212.0780h7.12XD.135.IK.HA	8	146	108	W1212078360
7.9	HPC.AL.1212.0790h7.12XD.135.IK.HA	8	146	108	W1212079360
8.0	HPC.AL.1212.0800h7.12XD.135.IK.HA	8	146	108	W1212080360
8.1	HPC.AL.1212.0810h7.12XD.135.IK.HA	10	162	120	W1212081360
8.2	HPC.AL.1212.0820h7.12XD.135.IK.HA	10	162	120	W1212082360
8.3	HPC.AL.1212.0830h7.12XD.135.IK.HA	10	162	120	W1212083360
8.4	HPC.AL.1212.0840h7.12XD.135.IK.HA	10	162	120	W1212084360
8.5	HPC.AL.1212.0850h7.12XD.135.IK.HA	10	162	120	W1212085360
8.6	HPC.AL.1212.0860h7.12XD.135.IK.HA	10	162	120	W1212086360
8.7	HPC.AL.1212.0870h7.12XD.135.IK.HA	10	162	120	W1212087360
8.8	HPC.AL.1212.0880h7.12XD.135.IK.HA	10	162	120	W1212088360
8.9	HPC.AL.1212.0890h7.12XD.135.IK.HA	10	162	120	W1212089360
9.0	HPC.AL.1212.0900h7.12XD.135.IK.HA	10	162	120	W1212090360
9.1	HPC.AL.1212.0910h7.12XD.135.IK.HA	10	162	120	W1212091360
9.2	HPC.AL.1212.0920h7.12XD.135.IK.HA	10	162	120	W1212092360
9.3	HPC.AL.1212.0930h7.12XD.135.IK.HA	10	162	120	W1212093360
9.4	HPC.AL.1212.0940h7.12XD.135.IK.HA	10	162	120	W1212094360
9.5	HPC.AL.1212.0950h7.12XD.135.IK.HA	10	162	120	W1212095360
9.6	HPC.AL.1212.0960h7.12XD.135.IK.HA	10	162	120	W1212096360
9.7	HPC.AL.1212.0970h7.12XD.135.IK.HA	10	162	120	W1212097360
9.8	HPC.AL.1212.0980h7.12XD.135.IK.HA	10	162	120	W1212098360
9.9	HPC.AL.1212.0990h7.12XD.135.IK.HA	10	162	120	W1212099360
10.0	HPC.AL.1212.1000h7.12XD.135.IK.HA	10	162	120	W1212100360
10.2	HPC.AL.1212.1020h7.12XD.135.IK.HA	12	204	156	W1212102360
10.5	HPC.AL.1212.1050h7.12XD.135.IK.HA	12	204	156	W1212105360
10.8	HPC.AL.1212.1080h7.12XD.135.IK.HA	12	204	156	W1212108360
11.0	HPC.AL.1212.1100h7.12XD.135.IK.HA	12	204	156	W1212110360
11.2	HPC.AL.1212.1120h7.12XD.135.IK.HA	12	204	156	W1212112360
11.5	HPC.AL.1212.1150h7.12XD.135.IK.HA	12	204	156	W1212115360
11.8	HPC.AL.1212.1180h7.12XD.135.IK.HA	12	204	156	W1212118360
12.0	HPC.AL.1212.1200h7.12XD.135.IK.HA	12	204	156	W1212120360
12.5	HPC.AL.1212.1250h7.12XD.135.IK.HA	14	230	182	W1212125360
12.8	HPC.AL.1212.1280h7.12XD.135.IK.HA	14	230	182	W1212128360
13.0	HPC.AL.1212.1300h7.12XD.135.IK.HA	14	230	182	W1212130360
13.5	HPC.AL.1212.1350h7.12XD.135.IK.HA	14	230	182	W1212135360
13.8	HPC.AL.1212.1380h7.12XD.135.IK.HA	14	230	182	W1212138360
14.0	HPC.AL.1212.1400h7.12XD.135.IK.HA	14	230	182	W1212140360
14.5	HPC.AL.1212.1450h7.12XD.135.IK.HA	16	260	208	W1212145360
14.8	HPC.AL.1212.1480h7.12XD.135.IK.HA	16	260	208	W1212148360
15.0	HPC.AL.1212.1500h7.12XD.135.IK.HA	16	260	208	W1212150360
15.5	HPC.AL.1212.1550h7.12XD.135.IK.HA	16	260	208	W1212155360
15.8	HPC.AL.1212.1580h7.12XD.135.IK.HA	16	260	208	W1212158360
16.0	HPC.AL.1212.1600h7.12XD.135.IK.HA	16	260	208	W1212160360

W1216, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]		
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	160	0,2	0,25	0,35
7.1.2		160	0,2	0,25	0,35
7.1.3		180	0,2	0,25	0,35
7.1.4		190	0,23	0,3	0,38
7.1.5		160	0,23	0,3	0,38
7.1.6		140	0,2	0,25	0,35
7.2.1	**Magnesium**				
7.2.2					
7.3.1	**Copper**	90	0,04	0,06	0,09
7.3.2		90	0,2	0,25	0,35
7.3.3		90	0,2	0,25	0,35
7.3.4		90	0,2	0,25	0,35
7.3.5		90	0,2	0,25	0,35
7.3.6		90	0,2	0,25	0,35
7.4.1	**CuZn (brass)**	115	0,2	0,25	0,35
7.4.2		115	0,2	0,25	0,35
7.5.1	**CuSn (bronze)**	115	0,2	0,25	0,35
7.5.2		115	0,2	0,25	0,35
7.6.1	**CuAlFe (Ampco)**				
7.6.2					
7.8.1	**Titanium**				
7.8.2					
7.8.3					
8.1.1	**Thermoplastics**				
8.1.2					
8.1.3					
8.1.4					
8.1.5					
8.1.6					
8.1.7					
8.1.8					
8.1.9					
8.2.1	**Thermosetting plastics**				
8.2.2					
8.2.3					
8.2.4					
8.2.5					
8.2.6					
8.2.7					
8.2.8					
8.3.1	**Fibre-reinforced plastics**				
8.3.2					
8.3.3					
8.3.4					
8.3.5					
8.3.6					
8.4.1	**Sandwich**				
8.4.2					
8.4.3					
9.1.1	**Standard graphite**				
9.1.2					

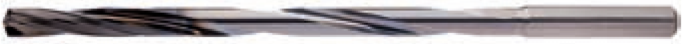
W1216, coated

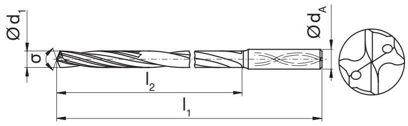
Deep hole twist drills

AL **TS**

λ_S = 15° | d_1 = h7 d_A = h6 | E | ≤ 16xD | σ 135° | W1205

SCPN435





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	TS.AL.1216.0300h7.16XD.135.IK.HA	6	100	60	W1216030360
3.2	TS.AL.1216.0320h7.16XD.135.IK.HA	6	100	60	W1216032360
3.3	TS.AL.1216.0330h7.16XD.135.IK.HA	6	100	60	W1216033360
3.5	TS.AL.1216.0350h7.16XD.135.IK.HA	6	100	60	W1216035360
3.8	TS.AL.1216.0380h7.16XD.135.IK.HA	6	115	75	W1216038360
4.0	TS.AL.1216.0400h7.16XD.135.IK.HA	6	115	75	W1216040360
4.2	TS.AL.1216.0420h7.16XD.135.IK.HA	6	115	75	W1216042360
4.5	TS.AL.1216.0450h7.16XD.135.IK.HA	6	130	90	W1216045360
4.8	TS.AL.1216.0480h7.16XD.135.IK.HA	6	130	90	W1216048360
5.0	TS.AL.1216.0500h7.16XD.135.IK.HA	6	130	90	W1216050360
5.5	TS.AL.1216.0550h7.16XD.135.IK.HA	6	150	108	W1216055360
5.8	TS.AL.1216.0580h7.16XD.135.IK.HA	6	150	108	W1216058360
6.0	TS.AL.1216.0600h7.16XD.135.IK.HA	6	150	108	W1216060360
6.5	TS.AL.1216.0650h7.16XD.135.IK.HA	8	165	125	W1216065360
6.8	TS.AL.1216.0680h7.16XD.135.IK.HA	8	165	125	W1216068360
7.0	TS.AL.1216.0700h7.16XD.135.IK.HA	8	165	125	W1216070360
7.5	TS.AL.1216.0750h7.16XD.135.IK.HA	8	180	140	W1216075360
7.8	TS.AL.1216.0780h7.16XD.135.IK.HA	8	180	140	W1216078360
8.0	TS.AL.1216.0800h7.16XD.135.IK.HA	8	180	140	W1216080360
8.5	TS.AL.1216.0850h7.16XD.135.IK.HA	10	205	160	W1216085360
8.8	TS.AL.1216.0880h7.16XD.135.IK.HA	10	205	160	W1216088360
9.0	TS.AL.1216.0900h7.16XD.135.IK.HA	10	205	160	W1216090360
9.8	TS.AL.1216.0980h7.16XD.135.IK.HA	10	225	180	W1216098360
10.0	TS.AL.1216.1000h7.16XD.135.IK.HA	10	225	180	W1216100360
10.2	TS.AL.1216.1020h7.16XD.135.IK.HA	12	240	190	W1216102360
10.8	TS.AL.1216.1080h7.16XD.135.IK.HA	12	240	190	W1216108360
11.8	TS.AL.1216.1180h7.16XD.135.IK.HA	12	265	215	W1216118360
12.0	TS.AL.1216.1200h7.16XD.135.IK.HA	12	265	215	W1216120360

⚠ For application see pages F489-F491.
For pilot hole, please use solid carbide drill type W1205 (see pages F405-F412).

W1220, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	150	0,125	0,2	0,25	0,35
7.1.2		150	0,125	0,2	0,25	0,35
7.1.3		170	0,125	0,2	0,25	0,35
7.1.4		180	0,15	0,23	0,3	0,38
7.1.5		150	0,15	0,23	0,3	0,38
7.1.6		130	0,125	0,2	0,25	0,35
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**	80	0,125	0,2	0,25	0,35
7.3.2		80	0,125	0,2	0,25	0,35
7.3.3		80	0,125	0,2	0,25	0,35
7.3.4		80	0,125	0,2	0,25	0,35
7.3.5		80	0,125	0,2	0,25	0,35
7.3.6		80	0,125	0,2	0,25	0,35
7.4.1	**CuZn (brass)**	100	0,125	0,2	0,25	0,35
7.4.2		100	0,125	0,2	0,25	0,35
7.5.1	**CuSn (bronze)**	100	0,125	0,2	0,25	0,35
7.5.2		100	0,125	0,2	0,25	0,35
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

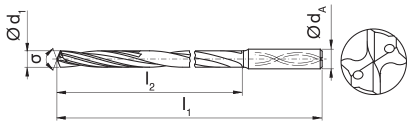
W1220, coated

Deep hole twist drills

AL **TS**

$\lambda_S = 15°$ | $d_1 = h7$ $d_A = h6$ | E | ≤ 20xD | σ 135° | W1205

SCPN435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.0	TS.AL.1220.0200h7.20XD.135.IK.HA	4	92	50	W1220020360
2.2	TS.AL.1220.0220h7.20XD.135.IK.HA	4	92	50	W1220022360
2.3	TS.AL.1220.0230h7.20XD.135.IK.HA	4	92	50	W1220023360
2.4	TS.AL.1220.0240h7.20XD.135.IK.HA	4	112	70	W1220024360
2.5	TS.AL.1220.0250h7.20XD.135.IK.HA	4	112	70	W1220025360
2.7	TS.AL.1220.0270h7.20XD.135.IK.HA	4	112	70	W1220027360
2.8	TS.AL.1220.0280h7.20XD.135.IK.HA	4	112	70	W1220028360
3.0	TS.AL.1220.0300h7.20XD.135.IK.HA	6	120	80	W1220030360
3.2	TS.AL.1220.0320h7.20XD.135.IK.HA	6	120	80	W1220032360
3.3	TS.AL.1220.0330h7.20XD.135.IK.HA	6	120	80	W1220033360
3.5	TS.AL.1220.0350h7.20XD.135.IK.HA	6	120	80	W1220035360
3.8	TS.AL.1220.0380h7.20XD.135.IK.HA	6	130	90	W1220038360
4.0	TS.AL.1220.0400h7.20XD.135.IK.HA	6	130	90	W1220040360
4.2	TS.AL.1220.0420h7.20XD.135.IK.HA	6	160	110	W1220042360
4.5	TS.AL.1220.0450h7.20XD.135.IK.HA	6	160	110	W1220045360
4.8	TS.AL.1220.0480h7.20XD.135.IK.HA	6	160	120	W1220048360
5.0	TS.AL.1220.0500h7.20XD.135.IK.HA	6	160	120	W1220050360
5.5	TS.AL.1220.0550h7.20XD.135.IK.HA	6	185	140	W1220055360
5.8	TS.AL.1220.0580h7.20XD.135.IK.HA	6	185	140	W1220058360
6.0	TS.AL.1220.0600h7.20XD.135.IK.HA	6	185	140	W1220060360
6.5	TS.AL.1220.0650h7.20XD.135.IK.HA	8	210	160	W1220065360
6.8	TS.AL.1220.0680h7.20XD.135.IK.HA	8	210	160	W1220068360
7.0	TS.AL.1220.0700h7.20XD.135.IK.HA	8	210	160	W1220070360
7.5	TS.AL.1220.0750h7.20XD.135.IK.HA	8	230	180	W1220075360
7.8	TS.AL.1220.0780h7.20XD.135.IK.HA	8	230	180	W1220078360
8.0	TS.AL.1220.0800h7.20XD.135.IK.HA	8	230	180	W1220080360
8.5	TS.AL.1220.0850h7.20XD.135.IK.HA	10	260	195	W1220085360
8.8	TS.AL.1220.0880h7.20XD.135.IK.HA	10	290	230	W1220088360
9.0	TS.AL.1220.0900h7.20XD.135.IK.HA	10	290	230	W1220090360
9.8	TS.AL.1220.0980h7.20XD.135.IK.HA	10	290	230	W1220098360
10.0	TS.AL.1220.1000h7.20XD.135.IK.HA	10	290	230	W1220100360
10.2	TS.AL.1220.1020h7.20XD.135.IK.HA	12	315	268	W1220102360
10.8	TS.AL.1220.1080h7.20XD.135.IK.HA	12	315	268	W1220108360
11.8	TS.AL.1220.1180h7.20XD.135.IK.HA	12	315	268	W1220118360
12.0	TS.AL.1220.1200h7.20XD.135.IK.HA	12	315	268	W1220120360

⚠ For application see pages F489-F491.
For pilot hole, please use solid carbide drill type W1205 (see pages F405-F412).

W1225, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]		
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	130	0,2	0,25	0,35
7.1.2		130	0,2	0,25	0,35
7.1.3		150	0,2	0,25	0,35
7.1.4		160	0,23	0,3	0,38
7.1.5		130	0,23	0,3	0,38
7.1.6		120	0,2	0,25	0,35
7.2.1	**Magnesium**				
7.2.2					
7.3.1	**Copper**	75	0,2	0,25	0,35
7.3.2		75	0,2	0,25	0,35
7.3.3		75	0,2	0,25	0,35
7.3.4		75	0,2	0,25	0,35
7.3.5		75	0,2	0,25	0,35
7.3.6		75	0,2	0,25	0,35
7.4.1	**CuZn (brass)**	90	0,2	0,25	0,35
7.4.2		90	0,2	0,25	0,35
7.5.1	**CuSn (bronze)**	90	0,2	0,25	0,35
7.5.2		90	0,2	0,25	0,35
7.6.1	**CuAlFe (Ampco)**				
7.6.2					
7.8.1	**Titanium**				
7.8.2					
7.8.3					
8.1.1	**Thermoplastics**				
8.1.2					
8.1.3					
8.1.4					
8.1.5					
8.1.6					
8.1.7					
8.1.8					
8.1.9					
8.2.1	**Thermosetting plastics**				
8.2.2					
8.2.3					
8.2.4					
8.2.5					
8.2.6					
8.2.7					
8.2.8					
8.3.1	**Fibre-reinforced plastics**				
8.3.2					
8.3.3					
8.3.4					
8.3.5					
8.3.6					
8.4.1	**Sandwich**				
8.4.2					
8.4.3					
9.1.1	**Standard graphite**				
9.1.2					

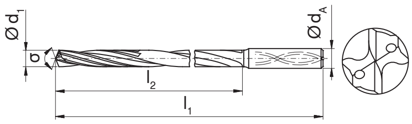
W1225, coated

Deep hole twist drills

AL **TS**

λ_S = 15° | d_1 = h7 d_A = h6 | E | ≤ 25xD | σ 135° | W1205

SCPN435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	TS.AL.1225.0300h7.25XD.135.IK.HA	6	135	98	W1225030360
3.2	TS.AL.1225.0320h7.25XD.135.IK.HA	6	135	98	W1225032360
3.3	TS.AL.1225.0330h7.25XD.135.IK.HA	6	150	110	W1225033360
3.5	TS.AL.1225.0350h7.25XD.135.IK.HA	6	150	110	W1225035360
3.8	TS.AL.1225.0380h7.25XD.135.IK.HA	6	160	120	W1225038360
4.0	TS.AL.1225.0400h7.25XD.135.IK.HA	6	160	120	W1225040360
4.2	TS.AL.1225.0420h7.25XD.135.IK.HA	6	160	120	W1225042360
4.5	TS.AL.1225.0450h7.25XD.135.IK.HA	6	180	135	W1225045360
4.8	TS.AL.1225.0480h7.25XD.135.IK.HA	6	180	135	W1225048360
5.0	TS.AL.1225.0500h7.25XD.135.IK.HA	6	180	135	W1225050360
5.5	TS.AL.1225.0550h7.25XD.135.IK.HA	6	205	168	W1225055360
5.8	TS.AL.1225.0580h7.25XD.135.IK.HA	6	205	168	W1225058360
6.0	TS.AL.1225.0600h7.25XD.135.IK.HA	6	205	168	W1225060360
6.5	TS.AL.1225.0650h7.25XD.135.IK.HA	8	240	200	W1225065360
6.8	TS.AL.1225.0680h7.25XD.135.IK.HA	8	240	200	W1225068360
7.0	TS.AL.1225.0700h7.25XD.135.IK.HA	8	240	200	W1225070360
7.5	TS.AL.1225.0750h7.25XD.135.IK.HA	8	260	220	W1225075360
7.8	TS.AL.1225.0780h7.25XD.135.IK.HA	8	260	220	W1225078360
8.0	TS.AL.1225.0800h7.25XD.135.IK.HA	8	260	220	W1225080360
8.5	TS.AL.1225.0850h7.25XD.135.IK.HA	10	285	240	W1225085360
8.8	TS.AL.1225.0880h7.25XD.135.IK.HA	10	310	268	W1225088360
9.0	TS.AL.1225.0900h7.25XD.135.IK.HA	10	310	268	W1225090360
9.8	TS.AL.1225.0980h7.25XD.135.IK.HA	10	310	268	W1225098360
10.0	TS.AL.1225.1000h7.25XD.135.IK.HA	10	310	268	W1225100360
10.2	TS.AL.1225.1020h7.25XD.135.IK.HA	12	375	325	W1225102360
10.8	TS.AL.1225.1080h7.25XD.135.IK.HA	12	375	325	W1225108360
11.8	TS.AL.1225.1180h7.25XD.135.IK.HA	12	375	325	W1225118360
12.0	TS.AL.1225.1200h7.25XD.135.IK.HA	12	375	325	W1225120360

⚠ For application see pages F489-F491.
For pilot hole, please use solid carbide drill type W1205 (see pages F405-F412).

W1230, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**	120	0,08	0,15	0,21	0,27
7.1.2		120	0,08	0,15	0,21	0,27
7.1.3		140	0,08	0,15	0,21	0,27
7.1.4		150	0,15	0,23	0,3	0,38
7.1.5		120	0,15	0,23	0,3	0,38
7.1.6		110	0,08	0,15	0,21	0,27
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**	70	0,08	0,15	0,21	0,27
7.3.2		70	0,08	0,15	0,21	0,27
7.3.3		70	0,08	0,15	0,21	0,27
7.3.4		70	0,08	0,15	0,21	0,27
7.3.5		70	0,08	0,15	0,21	0,27
7.3.6		70	0,08	0,15	0,21	0,27
7.4.1	**CuZn (brass)**	80	0,08	0,15	0,21	0,27
7.4.2		80	0,08	0,15	0,21	0,27
7.5.1	**CuSn (bronze)**	80	0,08	0,15	0,21	0,27
7.5.2		80	0,08	0,15	0,21	0,27
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**					
8.1.2						
8.1.3						
8.1.4						
8.1.5						
8.1.6						
8.1.7						
8.1.8						
8.1.9						
8.2.1	**Thermosetting plastics**					
8.2.2						
8.2.3						
8.2.4						
8.2.5						
8.2.6						
8.2.7						
8.2.8						
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3						
8.3.4						
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2						
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

W1230, coated

Deep hole twist drills

AL **TS**

λ_S = 15°

d_1 = h7
d_A = h6

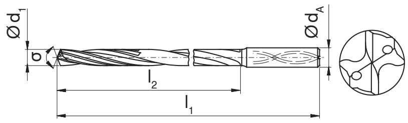
E

≤ **30xD**

σ 135°

W1205

SCPN435



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
2.0	TS.AL.1230.0200h7.30XD.135.IK.HA	4	115	70	W1230020460
2.2	TS.AL.1230.0220h7.30XD.135.IK.HA	4	115	70	W1230022460
2.3	TS.AL.1230.0230h7.30XD.135.IK.HA	4	115	70	W1230023460
2.4	TS.AL.1230.0240h7.30XD.135.IK.HA	4	138	90	W1230024460
2.5	TS.AL.1230.0250h7.30XD.135.IK.HA	4	138	90	W1230025460
2.7	TS.AL.1230.0270h7.30XD.135.IK.HA	4	138	90	W1230027460
2.8	TS.AL.1230.0280h7.30XD.135.IK.HA	4	138	90	W1230028460
3.0	TS.AL.1230.0300h7.30XD.135.IK.HA	6	150	105	W1230030460
3.2	TS.AL.1230.0320h7.30XD.135.IK.HA	6	150	105	W1230032460
3.3	TS.AL.1230.0330h7.30XD.135.IK.HA	6	185	135	W1230033460
3.5	TS.AL.1230.0350h7.30XD.135.IK.HA	6	185	135	W1230035460
3.8	TS.AL.1230.0380h7.30XD.135.IK.HA	6	185	135	W1230038460
4.0	TS.AL.1230.0400h7.30XD.135.IK.HA	6	185	135	W1230040460
4.2	TS.AL.1230.0420h7.30XD.135.IK.HA	6	185	135	W1230042460
4.5	TS.AL.1230.0450h7.30XD.135.IK.HA	6	215	165	W1230045460
4.8	TS.AL.1230.0480h7.30XD.135.IK.HA	6	215	165	W1230048460
5.0	TS.AL.1230.0500h7.30XD.135.IK.HA	6	215	165	W1230050460
5.5	TS.AL.1230.0550h7.30XD.135.IK.HA	6	230	180	W1230055460
5.8	TS.AL.1230.0580h7.30XD.135.IK.HA	6	230	180	W1230058460
6.0	TS.AL.1230.0600h7.30XD.135.IK.HA	6	230	180	W1230060460
6.5	TS.AL.1230.0650h7.30XD.135.IK.HA	8	280	215	W1230065460
6.8	TS.AL.1230.0680h7.30XD.135.IK.HA	8	280	230	W1230068460
7.0	TS.AL.1230.0700h7.30XD.135.IK.HA	8	280	230	W1230070460
7.5	TS.AL.1230.0750h7.30XD.135.IK.HA	8	280	230	W1230075460
7.8	TS.AL.1230.0780h7.30XD.135.IK.HA	8	315	265	W1230078460
8.0	TS.AL.1230.0800h7.30XD.135.IK.HA	8	315	265	W1230080460
8.5	TS.AL.1230.0850h7.30XD.135.IK.HA	10	350	295	W1230085460
8.8	TS.AL.1230.0880h7.30XD.135.IK.HA	10	380	330	W1230088460
9.0	TS.AL.1230.0900h7.30XD.135.IK.HA	10	380	330	W1230090460
9.8	TS.AL.1230.0980h7.30XD.135.IK.HA	10	380	330	W1230098460
10.0	TS.AL.1230.1000h7.30XD.135.IK.HA	10	380	330	W1230100460
10.2	TS.AL.1230.1020h7.30XD.135.IK.HA	12	430	380	W1230102460
10.8	TS.AL.1230.1080h7.30XD.135.IK.HA	12	430	380	W1230108460
11.8	TS.AL.1230.1180h7.30XD.135.IK.HA	12	430	380	W1230118460
12.0	TS.AL.1230.1200h7.30XD.135.IK.HA	12	430	380	W1230120460

⚠ For application see pages F489-F491.
For pilot hole, please use solid carbide drill type W1205 (see pages F405-F412).

W0141 and W0142, uncoated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]					
			= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	Machining steels							
1.1.2								
1.2.1	Constructional steel							
1.2.2								
1.2.3								
1.3.1	Spring steel							
1.3.2								
1.3.3								
2.1.1	Cementation steel							
2.1.2								
2.1.3								
2.2.1	Nitriding steel							
2.2.2								
2.3.1	Tempered steel							
2.3.2								
2.3.3								
2.3.4								
2.3.5								
2.3.6								
3.1.1	Non alloyed tool steel							
3.2.1	Tool steel for cold working							
3.2.2								
3.2.3								
3.2.4								
3.2.5								
3.3.1	Tool steel for hot working							
3.3.2								
3.3.3								
3.3.4								
3.3.5								
3.5.1	Hardened tool steel < 55 HRC							
3.5.2	55–58 HRC							
3.5.3	58–60 HRC							
3.5.4	60–62 HRC							
3.5.5	62–64 HRC							
4.1.1	Stainless steel							
4.1.2								
4.1.3								
4.1.4								
4.1.5								
4.2.1	Heat-resistant alloys							
4.2.2								
4.2.3								
4.2.4								
5.1.1	Conventional cast steel							
5.1.2								
5.1.3								
5.2.1	Stainless cast steel							
5.2.2								
6.1.1	Cast iron with lamellar graphite							
6.1.2								
6.1.3								
6.1.4								
6.2.1	Spheroidal cast iron							
6.2.2								
6.2.3								
6.3.1	GTW (white malleable cast iron)							
6.3.2								
6.4.1	GTS (black malleable cast iron)							
6.4.2								
7.1.1	Aluminium	200	0,02	0,03	0,07	0,11	0,15	0,2
7.1.2		200	0,02	0,03	0,07	0,11	0,15	0,2
7.1.3		200	0,02	0,03	0,07	0,11	0,15	0,2
7.1.4		180	0,02	0,03	0,07	0,11	0,15	0,2
7.1.5		160	0,02	0,03	0,07	0,11	0,15	0,2
7.1.6		130	0,02	0,03	0,07	0,11	0,15	0,2
7.2.1	Magnesium							
7.2.2								
7.3.1	Copper	100	0,01	0,02	0,06	0,11	0,16	0,2
7.3.2		100	0,01	0,02	0,06	0,11	0,16	0,2
7.3.3		100	0,01	0,02	0,06	0,11	0,16	0,2
7.3.4		60	0,01	0,02	0,06	0,11	0,16	0,2
7.3.5		60	0,01	0,02	0,06	0,11	0,16	0,2
7.3.6		60	0,01	0,02	0,06	0,11	0,16	0,2
7.4.1	CuZn (brass)	120	0,01	0,02	0,06	0,11	0,16	0,2
7.4.2		160	0,01	0,02	0,06	0,11	0,16	0,2
7.5.1	CuSn (bronze)	60	0,01	0,02	0,06	0,11	0,16	0,2
7.5.2		70	0,01	0,02	0,06	0,11	0,16	0,2
7.6.1	CuAlFe (Ampco)							
7.6.2								
7.8.1	Titanium							
7.8.2								
7.8.3								

W0141 and W0142, uncoated

Spot drills

AL **A**

$\lambda_S = 30°$

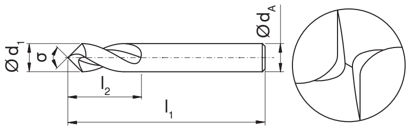
$d_1 = h6$
$d_A = h6$

E

σ 142°

σ 90°

SCWN425



d1 [mm]	Type, description	dA [mm]	l1 [mm]	l2 [mm]	σ [°]	HA Material
2.0	A.AL.0141.0200.90.HA	2	32	6	90	W0141020100
2.0	A.AL.0142.0200.142.HA	2	32	6	142	W0142020100
3.0	A.AL.0141.0300.90.HA	3	32	8	90	W0141030100
3.0	A.AL.0142.0300.142.HA	3	32	8	142	W0142030100
4.0	A.AL.0141.0400.90.HA	4	40	10	90	W0141040100
4.0	A.AL.0142.0400.142.HA	4	40	10	142	W0142040100
5.0	A.AL.0141.0500.90.HA	5	50	13	90	W0141050100
5.0	A.AL.0142.0500.142.HA	5	50	13	142	W0142050100
6.0	A.AL.0141.0600.90.HA	6	50	13	90	W0141060100
6.0	A.AL.0142.0600.142.HA	6	50	13	142	W0142060100
8.0	A.AL.0141.0800.90.HA	8	60	23	90	W0141080100
8.0	A.AL.0142.0800.142.HA	8	60	23	142	W0142080100
10.0	A.AL.0141.1000.90.HA	10	70	24	90	W0141100100
10.0	A.AL.0142.1000.142.HA	10	70	24	142	W0142100100
12.0	A.AL.0141.1200.90.HA	12	70	24	90	W0141120100
12.0	A.AL.0142.1200.142.HA	12	70	24	142	W0142120100
14.0	A.AL.0141.1400.90.HA	14	75	26	90	W0141140100
16.0	A.AL.0141.1600.90.HA	16	75	29	90	W0141160100
16.0	A.AL.0142.1600.142.HA	16	75	29	142	W0142160100
20.0	A.AL.0141.2000.90.HA	20	100	35	90	W0141200100
20.0	A.AL.0142.2000.142.HA	20	100	35	142	W0142200100

W0143 and W0144, uncoated

Cutting data

				f [mm/rev]					
Index	**Material designation**		V_c [m/min]	= Ø 2,0 = Ø 3,0	> Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**								
1.1.2									
1.2.1	**Constructional steel**								
1.2.2									
1.2.3									
1.3.1	**Spring steel**								
1.3.2									
1.3.3									
2.1.1	**Cementation steel**								
2.1.2									
2.1.3									
2.2.1	**Nitriding steel**								
2.2.2									
2.3.1	**Tempered steel**								
2.3.2									
2.3.3									
2.3.4									
2.3.5									
2.3.6									
3.1.1	**Non alloyed tool steel**								
3.2.1	**Tool steel for cold working**								
3.2.2									
3.2.3									
3.2.4									
3.2.5									
3.3.1	**Tool steel for hot working**								
3.3.2									
3.3.3									
3.3.4									
3.3.5									
3.5.1	**Hardened tool steel**	**< 55 HRC**							
3.5.2		**55–58 HRC**							
3.5.3		**58–60 HRC**							
3.5.4		**60–62 HRC**							
3.5.5		**62–64 HRC**							
4.1.1	**Stainless steel**								
4.1.2									
4.1.3									
4.1.4									
4.1.5									
4.2.1	**Heat-resistant alloys**								
4.2.2									
4.2.3									
4.2.4									
5.1.1	**Conventional cast steel**								
5.1.2									
5.1.3									
5.2.1	**Stainless cast steel**								
5.2.2									
6.1.1	**Cast iron with lamellar graphite**								
6.1.2									
6.1.3									
6.1.4									
6.2.1	**Spheroidal cast iron**								
6.2.2									
6.2.3									
6.3.1	**GTW (white malleable cast iron)**								
6.3.2									
6.4.1	**GTS (black malleable cast iron)**								
6.4.2									
7.1.1	**Aluminium**		250	0,006	0,01	0,015	0,023	0,027	0,03
7.1.2			250	0,006	0,01	0,015	0,023	0,027	0,03
7.1.3			250	0,006	0,01	0,015	0,023	0,027	0,03
7.1.4			225	0,01	0,016	0,025	0,038	0,045	0,05
7.1.5			200	0,01	0,016	0,025	0,038	0,045	0,05
7.1.6			160	0,006	0,01	0,015	0,023	0,027	0,03
7.2.1	**Magnesium**								
7.2.2									
7.3.1	**Copper**		125	0,006	0,01	0,015	0,023	0,027	0,03
7.3.2			125	0,006	0,01	0,015	0,023	0,027	0,03
7.3.3			125	0,006	0,01	0,015	0,023	0,027	0,03
7.3.4			75	0,006	0,01	0,015	0,023	0,027	0,03
7.3.5			75	0,006	0,01	0,015	0,023	0,027	0,03
7.3.6			75	0,006	0,01	0,015	0,023	0,027	0,03
7.4.1	**CuZn (brass)**		150	0,01	0,016	0,025	0,038	0,045	0,05
7.4.2			200	0,014	0,022	0,035	0,053	0,063	0,07
7.5.1	**CuSn (bronze)**		75	0,01	0,016	0,025	0,038	0,045	0,05
7.5.2			85	0,014	0,022	0,035	0,053	0,063	0,07
7.6.1	**CuAlFe (Ampco)**								
7.6.2									
7.8.1	**Titanium**								
7.8.2									
7.8.3									

W0143 and W0144, uncoated

Precision spot drills

AL **PA**

$\lambda_S = 0°$

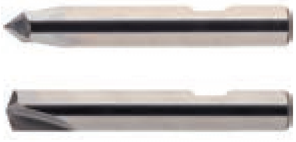
$d_1 = h6$ $d_A = h6$

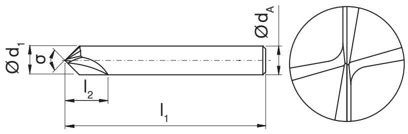
E

σ 142°

σ 90°

SCWN425





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	σ [°]	HA Material	HB Material
2.0	PA.AL.0143.0200.90.HA	2	32	3	90	W0143020300	
2.0	PA.AL.0144.0200.142.HA	2	32	3	142	W0144020300	
3.0	PA.AL.0143.0300.90.HA	3	32	4.5	90	W0143030300	
3.0	PA.AL.0144.0300.142.HA	3	32	4.5	142	W0144030300	
4.0	PA.AL.0143.0400.90.HA	4	40	6	90	W0143040300	
4.0	PA.AL.0144.0400.142.HA	4	40	6	142	W0144040300	
5.0	PA.AL.0143.0500.90.HA	5	50	7.5	90	W0143050300	
5.0	PA.AL.0144.0500.142.HA	5	50	7.5	142	W0144050300	
6.0	PA.AL.0143.0600.90.HB	6	50	9	90		W0143060301
6.0	PA.AL.0144.0600.142.HB	6	50	9	142		W0144060301
8.0	PA.AL.0143.0800.90.HB	8	60	12	90		W0143080301
8.0	PA.AL.0144.0800.142.HB	8	60	12	142		W0144080301
10.0	PA.AL.0143.1000.90.HB	10	70	15	90		W0143100301
10.0	PA.AL.0144.1000.142.HB	10	70	15	142		W0144100301
12.0	PA.AL.0143.1200.90.HB	12	70	18	90		W0143120301
12.0	PA.AL.0144.1200.142.HB	12	70	18	142		W0144120301
16.0	PA.AL.0143.1600.90.HB	16	75	24	90		W0143160301
16.0	PA.AL.0144.1600.142.HB	16	75	24	142		W0144160301
20.0	PA.AL.0143.2000.90.HB	20	100	30	90		W0143200301
20.0	PA.AL.0144.2000.142.HB	20	100	30	142		W0144200301

W0119, uncoated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]		
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**				
7.1.2					
7.1.3					
7.1.4					
7.1.5					
7.1.6					
7.2.1	**Magnesium**				
7.2.2					
7.3.1	**Copper**				
7.3.2					
7.3.3					
7.3.4					
7.3.5					
7.3.6					
7.4.1	**CuZn (brass)**				
7.4.2					
7.5.1	**CuSn (bronze)**				
7.5.2					
7.6.1	**CuAlFe (Ampco)**				
7.6.2					
7.8.1	**Titanium**				
7.8.2					
7.8.3					
8.1.1	**Thermoplastics**	100	0,085	0,11	0,13
8.1.2		100	0,085	0,11	0,13
8.1.3		100	0,085	0,11	0,13
8.1.4		80	0,085	0,11	0,13
8.1.5		70	0,085	0,11	0,13
8.1.6		90	0,085	0,11	0,13
8.1.7		100	0,085	0,11	0,13
8.1.8		95	0,085	0,11	0,13
8.1.9		60	0,06	0,09	0,11
8.2.1	**Thermosetting plastics**	100	0,06	0,09	0,11
8.2.2		100	0,06	0,09	0,11
8.2.3		100	0,06	0,09	0,11
8.2.4		150	0,06	0,09	0,11
8.2.5		100	0,06	0,09	0,11
8.2.6		80	0,06	0,09	0,11
8.2.7		100	0,06	0,09	0,11
8.2.8		100	0,06	0,09	0,11
8.3.1	**Fibre-reinforced plastics**				
8.3.2					
8.3.3		130	0,04	0,06	0,09
8.3.4		90	0,04	0,06	0,09
8.3.5					
8.3.6					
8.4.1	**Sandwich**				
8.4.2		150	0,085	0,11	0,13
8.4.3					
9.1.1	**Standard graphite**				
9.1.2					

W0119, uncoated

High-performance twist drills

V **HL**

λ_S = 30°

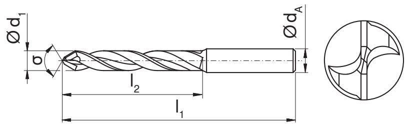
d_1 = m7
d_A = h6

E

≤ **5xD**

σ 118/62°

SCWX425



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HL.V.0119.0300m7.5XD.118_62.HA	6	66	28	W0119030200
4.0	HL.V.0119.0400m7.5XD.118_62.HA	6	74	36	W0119040200
5.0	HL.V.0119.0500m7.5XD.118_62.HA	6	82	44	W0119050200
6.0	HL.V.0119.0600m7.5XD.118_62.HA	6	82	44	W0119060200
8.0	HL.V.0119.0800m7.5XD.118_62.HA	8	91	53	W0119080200
9.0	HL.V.0119.0900m7.5XD.118_62.HA	10	103	61	W0119090200
10.0	HL.V.0119.1000m7.5XD.118_62.HA	10	103	61	W0119100200
11.0	HL.V.0119.1100m7.5XD.118_62.HA	12	118	71	W0119110200
12.0	HL.V.0119.1200m7.5XD.118_62.HA	12	118	71	W0119120200

W0119-INCH, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]		
			= Ø 3,2 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 11,1
7.1.1	**Aluminium**				
7.1.2					
7.1.3					
7.1.4					
7.1.5					
7.1.6					
7.2.1	**Magnesium**				
7.2.2					
7.3.1	**Copper**				
7.3.2					
7.3.3					
7.3.4					
7.3.5					
7.3.6					
7.4.1	**CuZn (brass)**				
7.4.2					
7.5.1	**CuSn (bronze)**				
7.5.2					
7.6.1	**CuAlFe (Ampco)**				
7.6.2					
7.8.1	**Titanium**				
7.8.2					
7.8.3					
8.1.1	**Thermoplastics**	100	0,085	0,11	0,13
8.1.2		100	0,085	0,11	0,13
8.1.3		100	0,085	0,11	0,13
8.1.4		80	0,085	0,11	0,13
8.1.5		70	0,085	0,11	0,13
8.1.6		90	0,085	0,11	0,13
8.1.7		100	0,085	0,11	0,13
8.1.8		95	0,085	0,11	0,13
8.1.9		60	0,06	0,09	0,11
8.2.1	**Thermosetting plastics**	100	0,06	0,09	0,11
8.2.2		100	0,06	0,09	0,11
8.2.3		100	0,06	0,09	0,11
8.2.4		150	0,06	0,09	0,11
8.2.5		100	0,06	0,09	0,11
8.2.6		80	0,06	0,09	0,11
8.2.7		100	0,06	0,09	0,11
8.2.8		100	0,06	0,09	0,11
8.3.1	**Fibre-reinforced plastics**				
8.3.2					
8.3.3		130	0,04	0,06	0,09
8.3.4		90	0,04	0,06	0,09
8.3.5					
8.3.6					
8.4.1	**Sandwich**				
8.4.2		150	0,085	0,11	0,13
8.4.3					
9.1.1	**Standard graphite**				
9.1.2					

W0119-INCH, coated

High-performance twist drills

V **HL**

$\lambda_S = 30°$

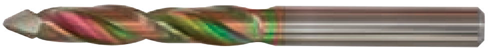
$d_1 = m7$
$d_A = h6$

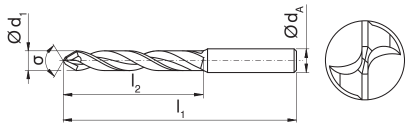
E

≤ 5xD

σ 118/62°

SCPX430





d_1 [mm]	Type, description	d_1 [inch]	d_1 [inch]	d_A [mm]	l_1 [mm]	HA Material
3.175	HL.V.0119.IN031750m7.5XD.118_62.HA	0.125	1/8	6	66	W0119IN031750270
4.763	HL.V.0119.IN047630m7.5XD.118_62.HA	0.188	3/16	6	82	W0119IN047630270
6.350	HL.V.0119.IN063500m7.5XD.118_62.HA	0.250	1/4	8	91	W0119IN063500270
7.938	HL.V.0119.IN079380m7.5XD.118_62.HA	0.313	5/16	8	91	W0119IN079380270
9.525	HL.V.0119.IN095250m7.5XD.118_62.HA	0.375	3/8	10	103	W0119IN095250270
11.113	HL.V.0119.IN111130m7.5XD.118_62.HA	0.438	7/16	12	118	W0119IN111110270

W0119, coated

Cutting data

Index	Material designation	Vc [m/min]	f [mm/rev] = Ø 3,0 = Ø 5,0	f [mm/rev] > Ø 5,0 = Ø 8,0	f [mm/rev] > Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**				
7.1.2					
7.1.3					
7.1.4					
7.1.5					
7.1.6					
7.2.1	**Magnesium**				
7.2.2					
7.3.1	**Copper**				
7.3.2					
7.3.3					
7.3.4					
7.3.5					
7.3.6					
7.4.1	**CuZn (brass)**				
7.4.2					
7.5.1	**CuSn (bronze)**				
7.5.2					
7.6.1	**CuAlFe (Ampco)**				
7.6.2					
7.8.1	**Titanium**				
7.8.2					
7.8.3					
8.1.1	**Thermoplastics**	100	0,085	0,11	0,13
8.1.2		100	0,085	0,11	0,13
8.1.3		100	0,085	0,11	0,13
8.1.4		80	0,085	0,11	0,13
8.1.5		70	0,085	0,11	0,13
8.1.6		90	0,085	0,11	0,13
8.1.7		100	0,085	0,11	0,13
8.1.8		95	0,085	0,11	0,13
8.1.9		60	0,06	0,09	0,11
8.2.1	**Thermosetting plastics**	100	0,06	0,09	0,11
8.2.2		100	0,06	0,09	0,11
8.2.3		100	0,06	0,09	0,11
8.2.4		150	0,06	0,09	0,11
8.2.5		100	0,06	0,09	0,11
8.2.6		80	0,06	0,09	0,11
8.2.7		100	0,06	0,09	0,11
8.2.8		100	0,06	0,09	0,11
8.3.1	**Fibre-reinforced plastics**				
8.3.2					
8.3.3		130	0,04	0,06	0,09
8.3.4		90	0,04	0,06	0,09
8.3.5					
8.3.6					
8.4.1	**Sandwich**				
8.4.2		150	0,085	0,11	0,13
8.4.3					
9.1.1	**Standard graphite**				
9.1.2					

W0119, coated

High-performance twist drills

V **HL**

$\lambda_S = 30°$

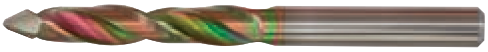
$d_1 = m7$
$d_A = h6$

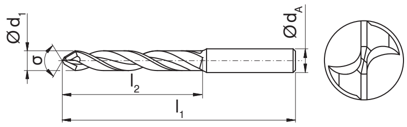
E

≤ 5xD

σ 118/62°

SCPX430





d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HL.V.0119.0300m7.5XD.118_62.HA	6	66	28	W0119030270
3.1	HL.V.0119.0310m7.5XD.118_62.HA	6	66	28	W0119031270
3.2	HL.V.0119.0320m7.5XD.118_62.HA	6	66	28	W0119032270
3.3	HL.V.0119.0330m7.5XD.118_62.HA	6	66	28	W0119033270
3.5	HL.V.0119.0350m7.5XD.118_62.HA	6	66	28	W0119035270
3.8	HL.V.0119.0380m7.5XD.118_62.HA	6	74	36	W0119038270
4.0	HL.V.0119.0400m7.5XD.118_62.HA	6	74	36	W0119040270
4.1	HL.V.0119.0410m7.5XD.118_62.HA	6	74	36	W0119041270
4.8	HL.V.0119.0480m7.5XD.118_62.HA	6	82	44	W0119048270
5.0	HL.V.0119.0500m7.5XD.118_62.HA	6	82	44	W0119050270
5.1	HL.V.0119.0510m7.5XD.118_62.HA	6	82	44	W0119051270
5.5	HL.V.0119.0550m7.5XD.118_62.HA	6	82	44	W0119055270
5.8	HL.V.0119.0580m7.5XD.118_62.HA	6	82	44	W0119058270
6.0	HL.V.0119.0600m7.5XD.118_62.HA	6	82	44	W0119060270
6.1	HL.V.0119.0610m7.5XD.118_62.HA	8	91	53	W0119061270
6.8	HL.V.0119.0680m7.5XD.118_62.HA	8	91	53	W0119068270
7.0	HL.V.0119.0700m7.5XD.118_62.HA	8	91	53	W0119070270
7.2	HL.V.0119.0720m7.5XD.118_62.HA	8	91	53	W0119072270
7.5	HL.V.0119.0750m7.5XD.118_62.HA	8	91	53	W0119075270
7.8	HL.V.0119.0780m7.5XD.118_62.HA	8	91	53	W0119078270
8.0	HL.V.0119.0800m7.5XD.118_62.HA	8	91	53	W0119080270
8.1	HL.V.0119.0810m7.5XD.118_62.HA	10	103	61	W0119081270
8.5	HL.V.0119.0850m7.5XD.118_62.HA	10	103	61	W0119085270
8.8	HL.V.0119.0880m7.5XD.118_62.HA	10	103	61	W0119088270
9.0	HL.V.0119.0900m7.5XD.118_62.HA	10	103	61	W0119090270
9.2	HL.V.0119.0920m7.5XD.118_62.HA	10	103	61	W0119092270
9.5	HL.V.0119.0950m7.5XD.118_62.HA	10	103	61	W0119095270
9.8	HL.V.0119.0980m7.5XD.118_62.HA	10	103	61	W0119098270
10.0	HL.V.0119.1000m7.5XD.118_62.HA	10	103	61	W0119100270
10.2	HL.V.0119.1020m7.5XD.118_62.HA	12	118	71	W0119102270
10.5	HL.V.0119.1050m7.5XD.118_62.HA	12	118	71	W0119105270
10.8	HL.V.0119.1080m7.5XD.118_62.HA	12	118	71	W0119108270
11.0	HL.V.0119.1100m7.5XD.118_62.HA	12	118	71	W0119110270
11.2	HL.V.0119.1120m7.5XD.118_62.HA	12	118	71	W0119112270
11.5	HL.V.0119.1150m7.5XD.118_62.HA	12	118	71	W0119115270
11.8	HL.V.0119.1180m7.5XD.118_62.HA	12	118	71	W0119118270
12.0	HL.V.0119.1200m7.5XD.118_62.HA	12	118	71	W0119120270

WD119-INCH, coated

Cutting data

Index	Material designation	V$_c$ [m/min]	f [mm/rev]		
			= Ø 3,2 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 11,1
7.1.1	**Aluminium**				
7.1.2					
7.1.3					
7.1.4					
7.1.5					
7.1.6					
7.2.1	**Magnesium**				
7.2.2					
7.3.1	**Copper**				
7.3.2					
7.3.3					
7.3.4					
7.3.5					
7.3.6					
7.4.1	**CuZn (brass)**				
7.4.2					
7.5.1	**CuSn (bronze)**				
7.5.2					
7.6.1	**CuAlFe (Ampco)**				
7.6.2					
7.8.1	**Titanium**				
7.8.2					
7.8.3					
8.1.1	**Thermoplastics**	100	0,085	0,11	0,13
8.1.2		100	0,085	0,11	0,13
8.1.3		100	0,085	0,11	0,13
8.1.4		80	0,085	0,11	0,13
8.1.5		70	0,085	0,11	0,13
8.1.6		90	0,085	0,11	0,13
8.1.7		100	0,085	0,11	0,13
8.1.8		95	0,085	0,11	0,13
8.1.9		60	0,06	0,09	0,11
8.2.1	**Thermosetting plastics**	100	0,06	0,09	0,11
8.2.2		100	0,06	0,09	0,11
8.2.3		100	0,06	0,09	0,11
8.2.4		150	0,06	0,09	0,11
8.2.5		100	0,06	0,09	0,11
8.2.6		80	0,06	0,09	0,11
8.2.7		100	0,06	0,09	0,11
8.2.8		100	0,06	0,09	0,11
8.3.1	**Fibre-reinforced plastics**				
8.3.2					
8.3.3		130	0,04	0,06	0,09
8.3.4		90	0,04	0,06	0,09
8.3.5		90	0,04	0,06	0,09
8.3.6		110	0,04	0,06	0,09
8.4.1	**Sandwich**				
8.4.2		150	0,085	0,11	0,13
8.4.3					
9.1.1	**Standard graphite**				
9.1.2					

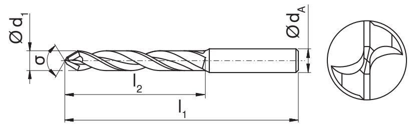
WD119-INCH, coated

High-performance twist drills

V **HL**

$\lambda_S = 30°$ | $d_1 = m7$ $d_A = h6$ | D | ≤ 5xD | σ 118/62°

SCPX410



d_1 [mm]	Type, description	d_1 [inch]	d_1 [inch]	d_A [mm]	l_1 [mm]	HA Material
3.175	HL.V.D119.IN031750m7.5XD.118_62.HA	0.125	1/8	6	66	W0119IN031750260
4.763	HL.V.D119.IN047630m7.5XD.118_62.HA	0.188	3/16	6	82	W0119IN047630260
6.350	HL.V.D119.IN063500m7.5XD.118_62.HA	0.250	1/4	8	91	W0119IN063500260
7.938	HL.V.D119.IN079380m7.5XD.118_62.HA	0.313	5/16	8	91	W0119IN079380260
9.525	HL.V.D119.IN095250m7.5XD.118_62.HA	0.375	3/8	10	103	W0119IN095250260
11.113	HL.V.D119.IN111130m7.5XD.118_62.HA	0.438	7/16	12	118	W0119IN111110260

WD119, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]		
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
7.1.1	**Aluminium**				
7.1.2					
7.1.3					
7.1.4					
7.1.5					
7.1.6					
7.2.1	**Magnesium**				
7.2.2					
7.3.1	**Copper**				
7.3.2					
7.3.3					
7.3.4					
7.3.5					
7.3.6					
7.4.1	**CuZn (brass)**				
7.4.2					
7.5.1	**CuSn (bronze)**				
7.5.2					
7.6.1	**CuAlFe (Ampco)**				
7.6.2					
7.8.1	**Titanium**				
7.8.2					
7.8.3					
8.1.1	**Thermoplastics**	100	0,085	0,11	0,13
8.1.2		100	0,085	0,11	0,13
8.1.3		100	0,085	0,11	0,13
8.1.4		80	0,085	0,11	0,13
8.1.5		70	0,085	0,11	0,13
8.1.6		90	0,085	0,11	0,13
8.1.7		100	0,085	0,11	0,13
8.1.8		95	0,085	0,11	0,13
8.1.9		60	0,06	0,09	0,11
8.2.1	**Thermosetting plastics**	100	0,06	0,09	0,11
8.2.2		100	0,06	0,09	0,11
8.2.3		100	0,06	0,09	0,11
8.2.4		150	0,06	0,09	0,11
8.2.5		100	0,06	0,09	0,11
8.2.6		80	0,06	0,09	0,11
8.2.7		100	0,06	0,09	0,11
8.2.8		100	0,06	0,09	0,11
8.3.1	**Fibre-reinforced plastics**				
8.3.2					
8.3.3		130	0,04	0,06	0,09
8.3.4		90	0,04	0,06	0,09
8.3.5		90	0,04	0,06	0,09
8.3.6		110	0,04	0,06	0,09
8.4.1	**Sandwich**				
8.4.2		150	0,085	0,11	0,13
8.4.3					
9.1.1	**Standard graphite**				
9.1.2					

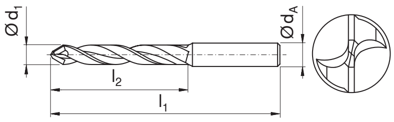
WD119, coated

High-performance twist drills

V **HL**

$\lambda_S = 30°$ | $d_1 = m7$ $d_A = h6$ | D | ≤ 5xD | σ 118/62°

SCPX410



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	HL.V.D119.0300m7.5XD.118_62.HA	6	66	28	W0119030260
3.1	HL.V.D119.0310m7.5XD.118_62.HA	6	66	28	W0119031260
3.2	HL.V.D119.0320m7.5XD.118_62.HA	6	66	28	W0119032260
3.3	HL.V.D119.0330m7.5XD.118_62.HA	6	66	28	W0119033260
3.5	HL.V.D119.0350m7.5XD.118_62.HA	6	66	28	W0119035260
3.8	HL.V.D119.0380m7.5XD.118_62.HA	6	74	36	W0119038260
4.0	HL.V.D119.0400m7.5XD.118_62.HA	6	74	36	W0119040260
4.1	HL.V.D119.0410m7.5XD.118_62.HA	6	74	36	W0119041260
4.8	HL.V.D119.0480m7.5XD.118_62.HA	6	82	44	W0119048260
5.0	HL.V.D119.0500m7.5XD.118_62.HA	6	82	44	W0119050260
5.1	HL.V.D119.0510m7.5XD.118_62.HA	6	82	44	W0119051260
5.5	HL.V.D119.0550m7.5XD.118_62.HA	6	82	44	W0119055260
5.8	HL.V.D119.0580m7.5XD.118_62.HA	6	82	44	W0119058260
6.0	HL.V.D119.0600m7.5XD.118_62.HA	6	82	44	W0119060260
6.1	HL.V.D119.0610m7.5XD.118_62.HA	8	91	53	W0119061260
6.8	HL.V.D119.0680m7.5XD.118_62.HA	8	91	53	W0119068260
7.0	HL.V.D119.0700m7.5XD.118_62.HA	8	91	53	W0119070260
7.2	HL.V.D119.0720m7.5XD.118_62.HA	8	91	53	W0119072260
7.5	HL.V.D119.0750m7.5XD.118_62.HA	8	91	53	W0119075260
7.8	HL.V.D119.0780m7.5XD.118_62.HA	8	91	53	W0119078260
8.0	HL.V.D119.0800m7.5XD.118_62.HA	8	91	53	W0119080260
8.1	HL.V.D119.0810m7.5XD.118_62.HA	10	103	61	W0119081260
8.5	HL.V.D119.0850m7.5XD.118_62.HA	10	103	61	W0119085260
8.8	HL.V.D119.0880m7.5XD.118_62.HA	10	103	61	W0119088260
9.0	HL.V.D119.0900m7.5XD.118_62.HA	10	103	61	W0119090260
9.2	HL.V.D119.0920m7.5XD.118_62.HA	10	103	61	W0119092260
9.5	HL.V.D119.0950m7.5XD.118_62.HA	10	103	61	W0119095260
9.8	HL.V.D119.0980m7.5XD.118_62.HA	10	103	61	W0119098260
10.0	HL.V.D119.1000m7.5XD.118_62.HA	10	103	61	W0119100260
10.2	HL.V.D119.1020m7.5XD.118_62.HA	12	118	71	W0119102260
10.5	HL.V.D119.1050m7.5XD.118_62.HA	12	118	71	W0119105260
10.8	HL.V.D119.1080m7.5XD.118_62.HA	12	118	71	W0119108260
11.0	HL.V.D119.1100m7.5XD.118_62.HA	12	118	71	W0119110260
11.2	HL.V.D119.1120m7.5XD.118_62.HA	12	118	71	W0119112260
11.5	HL.V.D119.1150m7.5XD.118_62.HA	12	118	71	W0119115260
11.8	HL.V.D119.1180m7.5XD.118_62.HA	12	118	71	W0119118260
12.0	HL.V.D119.1200m7.5XD.118_62.HA	12	118	71	W0119120260

W0121, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 3,0 = Ø 5,0	> Ø 5,0 = Ø 8,0	> Ø 8,0 = Ø 12,0	> Ø 12,0 = Ø 16,0
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						
8.1.1	**Thermoplastics**	100	0,085	0,11	0,13	0,175
8.1.2		100	0,085	0,11	0,13	0,175
8.1.3		100	0,085	0,11	0,13	0,175
8.1.4		80	0,085	0,11	0,13	0,175
8.1.5		70	0,085	0,11	0,13	0,175
8.1.6		90	0,085	0,11	0,13	0,175
8.1.7		100	0,085	0,11	0,13	0,175
8.1.8		95	0,085	0,11	0,13	0,175
8.1.9		60	0,06	0,09	0,11	0,15
8.2.1	**Thermosetting plastics**	100	0,06	0,09	0,11	0,15
8.2.2		100	0,06	0,09	0,11	0,15
8.2.3		100	0,06	0,09	0,11	0,15
8.2.4		150	0,06	0,09	0,11	0,15
8.2.5		100	0,06	0,09	0,11	0,15
8.2.6		80	0,06	0,09	0,11	0,15
8.2.7		100	0,06	0,09	0,11	0,15
8.2.8		100	0,06	0,09	0,11	0,15
8.3.1	**Fibre-reinforced plastics**					
8.3.2						
8.3.3		130	0,04	0,06	0,09	0,12
8.3.4		90	0,04	0,06	0,09	0,12
8.3.5						
8.3.6						
8.4.1	**Sandwich**					
8.4.2		150	0,085	0,11	0,13	0,175
8.4.3						
9.1.1	**Standard graphite**					
9.1.2						

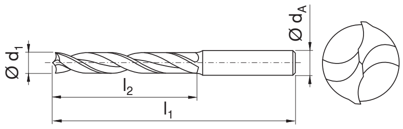
W0121, coated

Twist drills for Kevlar

V | KS

λ_S = 30° | d_1 = m7 d_A = h6 | D | ≤ 5xD

SCPX430



d_1 [mm]	Type, description	d_A [mm]	l_1 [mm]	l_2 [mm]	HA Material
3.0	KS.V.0121.0300m7.5XD.CO.HA	6	66	28	W0121030270
3.2	KS.V.0121.0320m7.5XD.CO.HA	6	66	28	W0121032270
3.3	KS.V.0121.0330m7.5XD.CO.HA	6	66	28	W0121033270
3.5	KS.V.0121.0350m7.5XD.CO.HA	6	66	28	W0121035270
3.7	KS.V.0121.0370m7.5XD.CO.HA	6	66	28	W0121037270
4.0	KS.V.0121.0400m7.5XD.CO.HA	6	74	36	W0121040270
4.2	KS.V.0121.0420m7.5XD.CO.HA	6	74	36	W0121042270
4.5	KS.V.0121.0450m7.5XD.CO.HA	6	74	36	W0121045270
4.7	KS.V.0121.0470m7.5XD.CO.HA	6	74	36	W0121047270
5.0	KS.V.0121.0500m7.5XD.CO.HA	6	82	44	W0121050270
5.3	KS.V.0121.0530m7.5XD.CO.HA	6	82	44	W0121053270
5.5	KS.V.0121.0550m7.5XD.CO.HA	6	82	44	W0121055270
5.8	KS.V.0121.0580m7.5XD.CO.HA	6	82	44	W0121058270
6.0	KS.V.0121.0600m7.5XD.CO.HA	6	82	44	W0121060270
6.5	KS.V.0121.0650m7.5XD.CO.HA	8	91	53	W0121065270
7.0	KS.V.0121.0700m7.5XD.CO.HA	8	91	53	W0121070270
7.5	KS.V.0121.0750m7.5XD.CO.HA	8	91	53	W0121075270
8.0	KS.V.0121.0800m7.5XD.CO.HA	8	91	53	W0121080270
8.5	KS.V.0121.0850m7.5XD.CO.HA	10	103	61	W0121085270
9.0	KS.V.0121.0900m7.5XD.CO.HA	10	103	61	W0121090270
9.5	KS.V.0121.0950m7.5XD.CO.HA	10	103	61	W0121095270
10.0	KS.V.0121.1000m7.5XD.CO.HA	10	103	61	W0121100270
10.5	KS.V.0121.1050m7.5XD.CO.HA	12	118	71	W0121105270
11.0	KS.V.0121.1100m7.5XD.CO.HA	12	118	71	W0121110270
11.5	KS.V.0121.1150m7.5XD.CO.HA	12	118	71	W0121115270
12.0	KS.V.0121.1200m7.5XD.CO.HA	12	118	71	W0121120270
13.0	KS.V.0121.1300m7.5XD.CO.HA	14	124	77	W0121130270
14.0	KS.V.0121.1400m7.5XD.CO.HA	14	124	77	W0121140270
15.0	KS.V.0121.1500m7.5XD.CO.HA	16	133	83	W0121150270
16.0	KS.V.0121.1600m7.5XD.CO.HA	16	133	83	W0121160270

Notes

Designation system - tools

Solid carbide tools for reaming

HSC-SLR .	UN .	0607 .	0397	H7
1	2	3	4	5

1

Tool group	
DR	– reamers for through holes
HSC-DR	– HSC reamers for through holes
SLR	– reamers for blind holes
HSC-SLR	– HSC reamers for blind holes

2

Material main application	
UN	– universal
ST	– steel
VA	– stainless steel
TI	– titanium
H	– hardened steel
AL	– aluminium
V	– composite materials

3

Type

4

Ø d_1
0397 ➢ Ød_1 = 3,97 mm

5

Tolerance d_1

Designation system - tools

Solid carbide tools for reaming

. 29 . IK . HA | SCPP625

6 7 8 9

6

Working length l3

7

Int. coolant supply

8

Shank
HA
HB

9

Grade

Explanation of symbols

Solid carbide tools for reaming

UN	Material group, e.g. UN = universal
σ 120°	Point angle on the support point
HSC DR	Tool group, e.g. HSC-RA = HSC reamers for through-holes
B	Tool shape, e.g. B = helical flutes
H7	Drilling tolerance
	without through coolant
	with central through coolant

	with radial through coolant
E	Emulsion recommended
	Through hole
	Blind hole
HA	Shanks to DIN6535-HA
$\lambda_S = -7°$	Helix angle

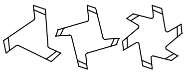
UN DR

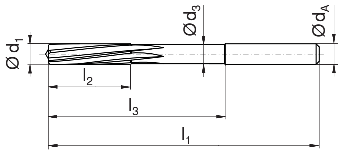
$\lambda_S = -7°$ | $d_1 = H7$, $d_A = h6$ | B | E | σ 120°

Application/geometry

SCWP625

Grade





Shank type

d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
1.0	DR.UN.0602.0100H7.14.HA	4	0.9	50	6	16	3	W0602010000

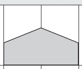
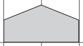
Material short text

Dimensions

Material number

Grade overview

Solid carbide tools for reaming

Grade designation		Standard designation		*Type of cutting material	Application range	P	M	K	N	S	H
		ISO	ANSI		01 05 10 15 20 25 30 35 40 45 50	Steel	Stainless	Cast iron	Non-ferrous metals	Heat-resistant	Hard materials
SCPP625	🟦	HC-P25	C6	P		●	○	○	○	○	
SCWP625	🟦	HW-P25	C6	W		●		○	○	○	
SCPH605	▨	HC-H05	C4	P		○	○	○			●
					01 05 10 15 20 25 30 35 40 45 50	● Main application ○ Extended application					

Grade description

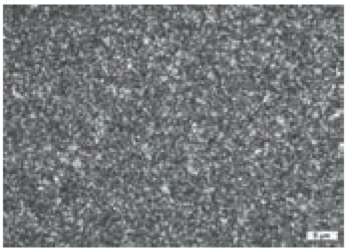
Solid carbide tools for reaming

SCPP625	HC-P25	● ○ ○ ○ ○

Specification:
Grain size: submicron / 0.5 µm | Hardness: HV_{30} 1620 | Type of coating: Ti Al C N | Coating specification: multi-layer

Recommended application:
Good combination of carbide and coating for universal application.

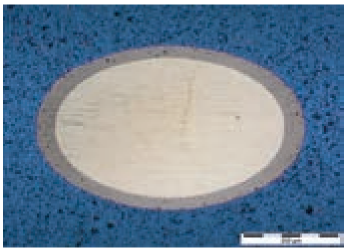
SCWP625	HW-P25	● ○ ○ ○



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1600 | Coating specification: Ti Al C N | Coating structure: multi-layer

Recommended application:
Submicron carbide for the universal machining of alloyed and non alloyed steels, titanium alloys and nickel-base alloys.

SCPH605	HC-H05	○ ○ ○ ●



Specification:
Grain size: submicron / 0.7 µm | Hardness: HV_{30} 1600 | Coating specification: Ti Al Si N | Coating structure: multi-layer

Recommended application:
Good combination of carbide and diamond coating, for the machining of hard materials.

Overview

Solid carbide tools for reaming

Tool type	Type	Ø-range [mm]	Tolerance	Helix angle	Direction of helix	Number of teeth	Int. coolant supply	Shank	Hole standard	Page(s)
UN	**DR**	Reamers for through holes, uncoated								
W0602	 Similar to DIN 212	1.0 - 12.0	**H7**	$\lambda_s = -7^\circ$	left-hand helix	3 - 6	✗	HA		F454
UN	**HSC** **DR**	HSC reamers for through holes, coated								
W0606	 Factory standard	4.0 - 20.0	**H7**	$\lambda_s = -7^\circ$	left-hand helix	6 - 6	✓	HA		F458
UN	**HSC** **SLR**	HSC reamers for blind holes, coated								
W0607	 Factory standard	4.0 - 20.0	**H7**	$\lambda_s = 0^\circ$	straight flutes	6 - 6	✓	HA		F460
H	**SLR**	Reamers for blind holes, coated								
W0603	 Similar to DIN 212	3.0 - 12.0	**H7**	$\lambda_s = 0^\circ$	straight flutes	4 - 6	✗	HA		F462

W0602, uncoated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev] = Ø 1,0 = Ø 4,0	f [mm/rev] > Ø 4,0 = Ø 8,0	f [mm/rev] > Ø 8,0 = Ø 12,0
1.1.1	**Machining steels**	18	0,1	0,2	0,238
1.1.2		17	0,08	0,16	0,195
1.2.1	**Constructional steel**	14	0,1	0,2	0,238
1.2.2		12	0,08	0,16	0,195
1.2.3		10	0,075	0,15	0,175
1.3.1	**Spring steel**	12	0,075	0,15	0,175
1.3.2		10	0,075	0,15	0,175
1.3.3					
2.1.1	**Cementation steel**	14	0,1	0,2	0,238
2.1.2		13	0,08	0,16	0,195
2.1.3		12	0,08	0,16	0,195
2.2.1	**Nitriding steel**	14	0,1	0,2	0,238
2.2.2		10	0,075	0,15	0,175
2.3.1	**Tempered steel**	11	0,08	0,16	0,195
2.3.2		10	0,075	0,15	0,175
2.3.3		11	0,08	0,16	0,195
2.3.4		10	0,075	0,15	0,175
2.3.5		9	0,063	0,125	0,15
2.3.6		8	0,063	0,125	0,15
3.1.1	**Non alloyed tool steel**	9	0,075	0,15	0,175
3.2.1	**Tool steel for cold working**	11	0,08	0,16	0,195
3.2.2		10	0,08	0,16	0,195
3.2.3		9	0,075	0,15	0,175
3.2.4					
3.2.5					
3.3.1	**Tool steel for hot working**	10	0,08	0,16	0,195
3.3.2		9	0,075	0,15	0,175
3.3.3					
3.3.4					
3.3.5					
3.5.1	**Hardened tool steel** **< 55 HRC**				
3.5.2	**55–58 HRC**				
3.5.3	**58–60 HRC**				
3.5.4	**60–62 HRC**				
3.5.5	**62–64 HRC**				
4.1.1	**Stainless steel**				
4.1.2					
4.1.3					
4.1.4					
4.1.5					
4.2.1	**Heat-resistant alloys**				
4.2.2					
4.2.3					
4.2.4					
5.1.1	**Conventional cast steel**	14	0,063	0,125	0,15
5.1.2		13	0,08	0,16	0,195
5.1.3		9	0,063	0,125	0,15
5.2.1	**Stainless cast steel**				
5.2.2					
6.1.1	**Cast iron with lamellar graphite**	15	0,125	0,25	0,325
6.1.2		12	0,113	0,225	0,275
6.1.3		10	0,1	0,2	0,238
6.1.4					
6.2.1	**Spheroidal cast iron**	15	0,113	0,225	0,275
6.2.2		12	0,1	0,2	0,238
6.2.3		11	0,1	0,2	0,238
6.3.1	**GTW (white malleable cast iron)**	15	0,113	0,225	0,275
6.3.2		12	0,1	0,2	0,238
6.4.1	**GTS (black malleable cast iron)**	15	0,113	0,225	0,275
6.4.2		12	0,1	0,2	0,238
7.1.1	**Aluminium**	30	0,1	0,2	0,238
7.1.2		30	0,1	0,2	0,238
7.1.3		30	0,1	0,2	0,238
7.1.4		30	0,1	0,2	0,238
7.1.5		25	0,1	0,2	0,238
7.1.6		20	0,1	0,2	0,238
7.2.1	**Magnesium**	30	0,1	0,2	0,238
7.2.2		25	0,1	0,2	0,238
7.3.1	**Copper**	35	0,1	0,2	0,238
7.3.2		30	0,1	0,2	0,238
7.3.3		25	0,1	0,2	0,238
7.3.4					
7.3.5					
7.3.6					
7.4.1	**CuZn (brass)**	25	0,1	0,2	0,238
7.4.2		30	0,1	0,2	0,238
7.5.1	**CuSn (bronze)**	25	0,1	0,2	0,238
7.5.2		30	0,1	0,2	0,238
7.6.1	**CuAlFe (Ampco)**				
7.6.2					
7.8.1	**Titanium**	15	0,05	0,1	0,113
7.8.2		15	0,05	0,1	0,113
7.8.3		10	0,05	0,1	0,113

W0602, uncoated

Reamers for through holes

UN **DR**

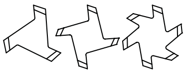
λ_S = −7°

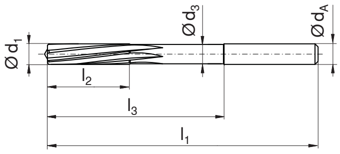
d_1 =H7
d_A=h6

B

E

SCWP625





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
0.98	DR.UN.0602.0098H7.14.HA	4	0.9	50	6	16	3	W0602009800
0.99	DR.UN.0602.0099H7.14.HA	4	0.9	50	6	16	3	W0602009900
1.0	DR.UN.0602.0100H7.14.HA	4	0.9	50	6	16	3	W0602010000
1.01	DR.UN.0602.0101H7.14.HA	4	0.9	50	6	16	3	W0602010100
1.02	DR.UN.0602.0102H7.14.HA	4	0.9	50	6	16	3	W0602010200
1.03	DR.UN.0602.0103H7.14.HA	4	0.9	50	6	16	3	W0602010300
1.48	DR.UN.0602.0148H7.13.HA	4	1.4	50	9	16	3	W0602014800
1.49	DR.UN.0602.0149H7.13.HA	4	1.4	50	9	16	3	W0602014900
1.5	DR.UN.0602.0150H7.13.HA	4	1.4	50	9	16	3	W0602015000
1.51	DR.UN.0602.0151H7.13.HA	4	1.4	50	9	16	3	W0602015100
1.52	DR.UN.0602.0152H7.13.HA	4	1.4	50	9	16	3	W0602015200
1.97	DR.UN.0602.0197H7.13.HA	4	1.86	50	12	16	4	W0602019700
1.98	DR.UN.0602.0198H7.13.HA	4	1.86	50	12	16	4	W0602019800
1.99	DR.UN.0602.0199H7.13.HA	4	1.86	50	12	16	4	W0602019900
2.0	DR.UN.0602.0200H7.13.HA	4	1.86	50	12	16	4	W0602020000
2.01	DR.UN.0602.0201H7.13.HA	4	1.86	50	12	16	4	W0602020100
2.02	DR.UN.0602.0202H7.13.HA	4	1.86	50	12	16	4	W0602020200
2.03	DR.UN.0602.0203H7.13.HA	4	1.86	50	12	16	4	W0602020300
2.97	DR.UN.0602.0297H7.25.HA	4	2.81	64	17	30	4	W0602029700
2.98	DR.UN.0602.0298H7.25.HA	4	2.81	64	17	30	4	W0602029800
2.99	DR.UN.0602.0299H7.25.HA	4	2.81	64	17	30	4	W0602029900
3.0	DR.UN.0602.0300H7.25.HA	4	2.81	64	17	30	4	W0602030000
3.01	DR.UN.0602.0301H7.25.HA	4	2.96	64	17	30	4	W0602030100
3.02	DR.UN.0602.0302H7.25.HA	4	2.96	64	17	30	4	W0602030200
3.03	DR.UN.0602.0303H7.25.HA	4	2.96	64	17	30	4	W0602030300
3.97	DR.UN.0602.0397H7.37.HA	4	3.71	77	21	43	4	W0602039700
3.98	DR.UN.0602.0398H7.37.HA	4	3.71	77	21	43	4	W0602039800
3.99	DR.UN.0602.0399H7.37.HA	4	3.71	77	21	43	4	W0602039900
4.0	DR.UN.0602.0400H7.37.HA	4	3.71	77	21	43	4	W0602040000
4.01	DR.UN.0602.0401H7.37.HA	4	3.96	77	21	43	4	W0602040100
4.02	DR.UN.0602.0402H7.37.HA	4	3.96	77	21	43	4	W0602040200
4.03	DR.UN.0602.0403H7.37.HA	4	3.96	77	21	43	4	W0602040300
4.97	DR.UN.0602.0497H7.43.HA	6	4.46	93	26	51	6	W0602049700
4.98	DR.UN.0602.0498H7.43.HA	6	4.46	93	26	51	6	W0602049800
4.99	DR.UN.0602.0499H7.43.HA	6	4.46	93	26	51	6	W0602049900
5.0	DR.UN.0602.0500H7.43.HA	6	4.46	93	26	51	6	W0602050000
5.01	DR.UN.0602.0501H7.43.HA	6	4.96	93	26	51	6	W0602050100
5.02	DR.UN.0602.0502H7.43.HA	6	4.96	93	26	51	6	W0602050200
5.03	DR.UN.0602.0503H7.43.HA	6	4.96	93	26	51	6	W0602050300
5.97	DR.UN.0602.0597H7.42.HA	6	5.26	93	26	51	6	W0602059700
5.98	DR.UN.0602.0598H7.42.HA	6	5.26	93	26	51	6	W0602059800
5.99	DR.UN.0602.0599H7.42.HA	6	5.26	93	26	51	6	W0602059900
6.0	DR.UN.0602.0600H7.42.HA	6	5.26	93	26	51	6	W0602060000
6.01	DR.UN.0602.0601H7.42.HA	6	5.96	93	26	51	6	W0602060100
6.02	DR.UN.0602.0602H7.42.HA	6	5.96	93	26	51	6	W0602060200
6.03	DR.UN.0602.0603H7.42.HA	6	5.96	93	26	51	6	W0602060300
7.0	DR.UN.0602.0700H7.56.HA	8	6.66	109	31	67	6	W0602070000
7.97	DR.UN.0602.0797H7.63.HA	8	7.46	117	33	75	6	W0602079700

W0602, uncoated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev] = Ø 1,0 = Ø 4,0	f [mm/rev] > Ø 4,0 = Ø 8,0	f [mm/rev] > Ø 8,0 = Ø 12,0
1.1.1	**Machining steels**		18	0,1	0,2	0,238
1.1.2			17	0,08	0,16	0,195
1.2.1	**Constructional steel**		14	0,1	0,2	0,238
1.2.2			12	0,08	0,16	0,195
1.2.3			10	0,075	0,15	0,175
1.3.1	**Spring steel**		12	0,075	0,15	0,175
1.3.2			10	0,075	0,15	0,175
1.3.3						
2.1.1	**Cementation steel**		14	0,1	0,2	0,238
2.1.2			13	0,08	0,16	0,195
2.1.3			12	0,08	0,16	0,195
2.2.1	**Nitriding steel**		14	0,1	0,2	0,238
2.2.2			10	0,075	0,15	0,175
2.3.1	**Tempered steel**		11	0,08	0,16	0,195
2.3.2			10	0,075	0,15	0,175
2.3.3			11	0,08	0,16	0,195
2.3.4			10	0,075	0,15	0,175
2.3.5			9	0,063	0,125	0,15
2.3.6			8	0,063	0,125	0,15
3.1.1	**Non alloyed tool steel**		9	0,075	0,15	0,175
3.2.1	**Tool steel for cold working**		11	0,08	0,16	0,195
3.2.2			10	0,08	0,16	0,195
3.2.3			9	0,075	0,15	0,175
3.2.4						
3.2.5						
3.3.1	**Tool steel for hot working**		10	0,08	0,16	0,195
3.3.2			9	0,075	0,15	0,175
3.3.3						
3.3.4						
3.3.5						
3.5.1	**Hardened tool steel**	**< 55 HRC**				
3.5.2		**55–58 HRC**				
3.5.3		**58–60 HRC**				
3.5.4		**60–62 HRC**				
3.5.5		**62–64 HRC**				
4.1.1	**Stainless steel**					
4.1.2						
4.1.3						
4.1.4						
4.1.5						
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**		14	0,063	0,125	0,15
5.1.2			13	0,08	0,16	0,195
5.1.3			9	0,063	0,125	0,15
5.2.1	**Stainless cast steel**					
5.2.2						
6.1.1	**Cast iron with lamellar graphite**		15	0,125	0,25	0,325
6.1.2			12	0,113	0,225	0,275
6.1.3			10	0,1	0,2	0,238
6.1.4						
6.2.1	**Spheroidal cast iron**		15	0,113	0,225	0,275
6.2.2			12	0,1	0,2	0,238
6.2.3			11	0,1	0,2	0,238
6.3.1	**GTW (white malleable cast iron)**		15	0,113	0,225	0,275
6.3.2			12	0,1	0,2	0,238
6.4.1	**GTS (black malleable cast iron)**		15	0,113	0,225	0,275
6.4.2			12	0,1	0,2	0,238
7.1.1	**Aluminium**		30	0,1	0,2	0,238
7.1.2			30	0,1	0,2	0,238
7.1.3			30	0,1	0,2	0,238
7.1.4			30	0,1	0,2	0,238
7.1.5			25	0,1	0,2	0,238
7.1.6			20	0,1	0,2	0,238
7.2.1	**Magnesium**		30	0,1	0,2	0,238
7.2.2			25	0,1	0,2	0,238
7.3.1	**Copper**		35	0,1	0,2	0,238
7.3.2			30	0,1	0,2	0,238
7.3.3			25	0,1	0,2	0,238
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**		25	0,1	0,2	0,238
7.4.2			30	0,1	0,2	0,238
7.5.1	**CuSn (bronze)**		25	0,1	0,2	0,238
7.5.2			30	0,1	0,2	0,238
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**		15	0,05	0,1	0,113
7.8.2			15	0,05	0,1	0,113
7.8.3			10	0,05	0,1	0,113

W0602, uncoated

Reamers for through holes

UN **DR**

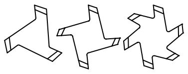
$\lambda_S = -7°$

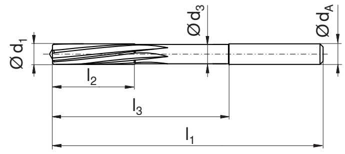
d_1 =H7
d_A=h6

B

E

SCWP625





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
7.98	DR.UN.0602.0798H7.63.HA	8	7.46	117	33	75	6	W0602079800
7.99	DR.UN.0602.0799H7.63.HA	8	7.46	117	33	75	6	W0602079900
8.0	DR.UN.0602.0800H7.63.HA	8	7.46	117	33	75	6	W0602080000
8.01	DR.UN.0602.0801H7.63.HA	8	7.9	117	33	75	6	W0602080100
8.02	DR.UN.0602.0802H7.63.HA	8	7.9	117	33	75	6	W0602080200
8.03	DR.UN.0602.0803H7.63.HA	8	7.9	117	33	75	6	W0602080300
9.0	DR.UN.0602.0900H7.65.HA	10	8.4	125	36	79	6	W0602090000
9.97	DR.UN.0602.0997H7.72.HA	10	9.4	133	41	87	6	W0602099700
9.98	DR.UN.0602.0998H7.72.HA	10	9.4	133	41	87	6	W0602099800
9.99	DR.UN.0602.0999H7.72.HA	10	9.4	133	41	87	6	W0602099900
10.0	DR.UN.0602.1000H7.72.HA	10	9.4	133	41	87	6	W0602100000
10.01	DR.UN.0602.1001H7.72.HA	10	9.9	133	41	87	6	W0602100100
10.02	DR.UN.0602.1002H7.72.HA	10	9.9	133	41	87	6	W0602100200
10.03	DR.UN.0602.1003H7.72.HA	10	9.9	133	41	87	6	W0602100300
11.97	DR.UN.0602.1197H7.81.HA	12	11.6	150	44	99	6	W0602119700
11.98	DR.UN.0602.1198H7.81.HA	12	11.6	150	44	99	6	W0602119800
11.99	DR.UN.0602.1199H7.81.HA	12	11.6	150	44	99	6	W0602119900
12.0	DR.UN.0602.1200H7.81.HA	12	11.6	150	44	99	6	W0602120000
12.01	DR.UN.0602.1201H7.81.HA	12	11.6	150	44	99	6	W0602120100
12.02	DR.UN.0602.1202H7.81.HA	12	11.6	150	44	99	6	W0602120200
12.03	DR.UN.0602.1203H7.81.HA	12	11.6	150	44	99	6	W0602120300

W0606, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 4,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	150	0,3	0,6	1	1,2
1.1.2		100	0,3	0,6	1	1,2
1.2.1	**Constructional steel**	150	0,3	0,6	1	1,2
1.2.2		100	0,3	0,6	1	1,2
1.2.3		90	0,3	0,6	1	1,2
1.3.1	**Spring steel**	90	0,2	0,4	0,7	0,9
1.3.2		80	0,2	0,4	0,7	0,9
1.3.3						
2.1.1	**Cementation steel**	120	0,3	0,6	1	1,2
2.1.2		100	0,3	0,6	1	1,2
2.1.3		100	0,3	0,6	1	1,2
2.2.1	**Nitriding steel**	100	0,3	0,6	1	1,2
2.2.2		130	0,2	0,4	0,7	0,9
2.3.1	**Tempered steel**	100	0,3	0,6	1	1,2
2.3.2		130	0,2	0,4	0,7	0,9
2.3.3		120	0,2	0,4	0,7	0,9
2.3.4		100	0,2	0,4	0,7	0,9
2.3.5		100	0,2	0,4	0,7	0,9
2.3.6						
3.1.1	**Non alloyed tool steel**	80	0,3	0,6	1	1,2
3.2.1	**Tool steel for cold working**	130	0,2	0,4	0,7	0,9
3.2.2		100	0,2	0,4	0,7	0,9
3.2.3		80	0,2	0,4	0,7	0,9
3.2.4		60	0,2	0,4	0,7	0,9
3.2.5		60	0,2	0,4	0,7	0,9
3.3.1	**Tool steel for hot working**	100	0,2	0,4	0,7	0,9
3.3.2		80	0,2	0,4	0,7	0,9
3.3.3		60	0,2	0,4	0,7	0,9
3.3.4		60	0,2	0,4	0,7	0,9
3.3.5						
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**	30	0,08	0,16	0,195	0,23
4.1.2		25	0,08	0,16	0,195	0,23
4.1.3		20	0,08	0,16	0,195	0,23
4.1.4		20	0,08	0,16	0,195	0,23
4.1.5		30	0,08	0,16	0,195	0,23
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**	100	0,2	0,4	0,7	0,9
5.1.2		95	0,2	0,4	0,7	0,9
5.1.3		90	0,2	0,4	0,7	0,9
5.2.1	**Stainless cast steel**	25	0,08	0,16	0,195	0,23
5.2.2		20	0,08	0,16	0,195	0,23
6.1.1	**Cast iron with lamellar graphite**	80	0,3	0,6	1	1,2
6.1.2		80	0,3	0,6	1	1,2
6.1.3		70	0,3	0,6	1	1,2
6.1.4						
6.2.1	**Spheroidal cast iron**	70	0,3	0,6	1	1,2
6.2.2		65	0,3	0,6	1	1,2
6.2.3		55	0,3	0,6	1	1,2
6.3.1	**GTW (white malleable cast iron)**	70	0,3	0,6	1	1,2
6.3.2		65	0,3	0,6	1	1,2
6.4.1	**GTS (black malleable cast iron)**	70	0,3	0,6	1	1,2
6.4.2		65	0,3	0,6	1	1,2
7.1.1	**Aluminium**	200	0,3	0,6	1	1,2
7.1.2		200	0,3	0,6	1	1,2
7.1.3		200	0,3	0,6	1	1,2
7.1.4		200	0,3	0,6	1	1,2
7.1.5		180	0,3	0,6	1	1,2
7.1.6		170	0,3	0,6	1	1,2
7.2.1	**Magnesium**	200	0,3	0,6	1	1,2
7.2.2		180	0,3	0,6	1	1,2
7.3.1	**Copper**	220	0,3	0,6	1	1,2
7.3.2		200	0,3	0,6	1	1,2
7.3.3		180	0,3	0,6	1	1,2
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**	140	0,3	0,6	1	1,2
7.4.2		200	0,3	0,6	1	1,2
7.5.1	**CuSn (bronze)**	120	0,3	0,6	1	1,2
7.5.2		200	0,3	0,6	1	1,2
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**	60	0,2	0,4	0,7	0,9
7.8.2		60	0,2	0,4	0,7	0,9
7.8.3		30	0,15	0,25	0,45	0,6

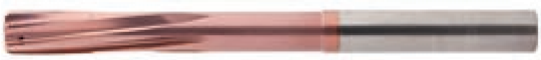
W0606, coated

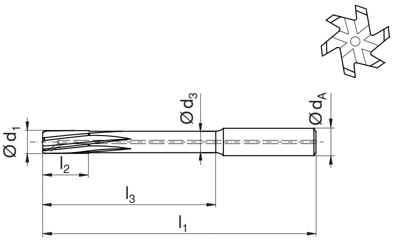
HSC reamers for through holes

UN | **HSC DR**

$\lambda_S = -7°$ | $d_1 = H7$ $d_A = h6$ | **B** | **E**

SCPP625





d1 [mm]	Type, description	dA [mm]	d3 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	z	HA Material
3.97	HSC-DR.UN.0606.0397H7.29.IK.HA	6	3.73	75	12	35	6	W0606039750
3.98	HSC-DR.UN.0606.0398H7.29.IK.HA	6	3.74	75	12	35	6	W0606039850
3.99	HSC-DR.UN.0606.0399H7.29.IK.HA	6	3.75	75	12	35	6	W0606039950
4.0	HSC-DR.UN.0606.0400H7.29.IK.HA	6	3.76	75	12	35	6	W0606040050
4.01	HSC-DR.UN.0606.0401H7.29.IK.HA	6	3.77	75	12	35	6	W0606040150
4.02	HSC-DR.UN.0606.0402H7.29.IK.HA	6	3.78	75	12	35	6	W0606040250
4.03	HSC-DR.UN.0606.0403H7.29.IK.HA	6	3.79	75	12	35	6	W0606040350
4.97	HSC-DR.UN.0606.0497H7.27.IK.HA	6	4.67	75	12	35	6	W0606049750
4.98	HSC-DR.UN.0606.0498H7.27.IK.HA	6	4.68	75	12	35	6	W0606049850
4.99	HSC-DR.UN.0606.0499H7.27.IK.HA	6	4.69	75	12	35	6	W0606049950
5.0	HSC-DR.UN.0606.0500H7.27.IK.HA	6	4.7	75	12	35	6	W0606050050
5.01	HSC-DR.UN.0606.0501H7.27.IK.HA	6	4.71	75	12	35	6	W0606050150
5.02	HSC-DR.UN.0606.0502H7.27.IK.HA	6	4.72	75	12	35	6	W0606050250
5.03	HSC-DR.UN.0606.0503H7.27.IK.HA	6	4.73	75	12	35	6	W0606050350
5.97	HSC-DR.UN.0606.0597H7.26.IK.HA	6	5.61	75	12	35	6	W0606059750
5.98	HSC-DR.UN.0606.0598H7.26.IK.HA	6	5.62	75	12	35	6	W0606059850
5.99	HSC-DR.UN.0606.0599H7.26.IK.HA	6	5.63	75	12	35	6	W0606059950
6.0	HSC-DR.UN.0606.0600H7.26.IK.HA	6	5.64	75	12	35	6	W0606060050
6.01	HSC-DR.UN.0606.0601H7.26.IK.HA	6	5.65	75	12	35	6	W0606060150
6.02	HSC-DR.UN.0606.0602H7.26.IK.HA	6	5.66	75	12	35	6	W0606060250
6.03	HSC-DR.UN.0606.0603H7.26.IK.HA	6	5.67	75	12	35	6	W0606060350
7.0	HSC-DR.UN.0606.0700H7.49.IK.HA	8	6.58	100	16	60	6	W0606070050
7.97	HSC-DR.UN.0606.0797H7.48.IK.HA	8	7.49	100	16	60	6	W0606079750
7.98	HSC-DR.UN.0606.0798H7.48.IK.HA	8	7.5	100	16	60	6	W0606079850
7.99	HSC-DR.UN.0606.0799H7.48.IK.HA	8	7.51	100	16	60	6	W0606079950
8.0	HSC-DR.UN.0606.0800H7.48.IK.HA	8	7.52	100	16	60	6	W0606080050
8.01	HSC-DR.UN.0606.0801H7.48.IK.HA	8	7.53	100	16	60	6	W0606080150
8.02	HSC-DR.UN.0606.0802H7.48.IK.HA	8	7.54	100	16	60	6	W0606080250
8.03	HSC-DR.UN.0606.0803H7.48.IK.HA	8	7.55	100	16	60	6	W0606080350
9.97	HSC-DR.UN.0606.0997H7.61.IK.HA	10	9.37	120	20	76	6	W0606099750
9.98	HSC-DR.UN.0606.0998H7.61.IK.HA	10	9.38	120	20	76	6	W0606099850
9.99	HSC-DR.UN.0606.0999H7.61.IK.HA	10	9.39	120	20	76	6	W0606099950
10.0	HSC-DR.UN.0606.1000H7.61.IK.HA	10	9.4	120	20	76	6	W0606100050
10.01	HSC-DR.UN.0606.1001H7.61.IK.HA	10	9.41	120	20	76	6	W0606100150
10.02	HSC-DR.UN.0606.1002H7.61.IK.HA	10	9.42	120	20	76	6	W0606100250
10.03	HSC-DR.UN.0606.1003H7.61.IK.HA	10	9.43	120	20	76	6	W0606100350
11.97	HSC-DR.UN.0606.1197H7.53.IK.HA	12	11.25	120	20	71	6	W0606119750
11.98	HSC-DR.UN.0606.1198H7.53.IK.HA	12	11.26	120	20	71	6	W0606119850
11.99	HSC-DR.UN.0606.1199H7.53.IK.HA	12	11.27	120	20	71	6	W0606119950
12.0	HSC-DR.UN.0606.1200H7.53.IK.HA	12	11.28	120	20	71	6	W0606120050
12.01	HSC-DR.UN.0606.1201H7.53.IK.HA	12	11.29	120	20	71	6	W0606120150
12.02	HSC-DR.UN.0606.1202H7.53.IK.HA	12	11.3	120	20	71	6	W0606120250
12.03	HSC-DR.UN.0606.1203H7.53.IK.HA	12	11.31	120	20	71	6	W0606120350
14.0	HSC-DR.UN.0606.1400H7.60.IK.HA	14	13.16	130	22	81	6	W0606140050
16.0	HSC-DR.UN.0606.1600H7.74.IK.HA	16	15.04	150	25	98	6	W0606160050
18.0	HSC-DR.UN.0606.1800H7.71.IK.HA	18	16.92	150	25	98	6	W0606180050
20.0	HSC-DR.UN.0606.2000H7.66.IK.HA	20	18.8	150	25	96	6	W0606200050

W0607, coated

Cutting data

Index	Material designation	V_c [m/min]	f [mm/rev]			
			= Ø 4,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 16,0	> Ø 16,0 = Ø 20,0
1.1.1	**Machining steels**	150	0,3	0,6	1	1,2
1.1.2		100	0,3	0,6	1	1,2
1.2.1	**Constructional steel**	150	0,3	0,6	1	1,2
1.2.2		100	0,3	0,6	1	1,2
1.2.3		90	0,3	0,6	1	1,2
1.3.1	**Spring steel**	90	0,2	0,4	0,7	0,9
1.3.2		80	0,2	0,4	0,7	0,9
1.3.3						
2.1.1	**Cementation steel**	120	0,3	0,6	1	1,2
2.1.2		100	0,3	0,6	1	1,2
2.1.3		100	0,3	0,6	1	1,2
2.2.1	**Nitriding steel**	100	0,3	0,6	1	1,2
2.2.2		130	0,2	0,4	0,7	0,9
2.3.1	**Tempered steel**	100	0,3	0,6	1	1,2
2.3.2		130	0,2	0,4	0,7	0,9
2.3.3		120	0,2	0,4	0,7	0,9
2.3.4		100	0,2	0,4	0,7	0,9
2.3.5		100	0,2	0,4	0,7	0,9
2.3.6						
3.1.1	**Non alloyed tool steel**	80	0,3	0,6	1	1,2
3.2.1	**Tool steel for cold working**	130	0,2	0,4	0,7	0,9
3.2.2		100	0,2	0,4	0,7	0,9
3.2.3		80	0,2	0,4	0,7	0,9
3.2.4		60	0,2	0,4	0,7	0,9
3.2.5		60	0,2	0,4	0,7	0,9
3.3.1	**Tool steel for hot working**	100	0,2	0,4	0,7	0,9
3.3.2		80	0,2	0,4	0,7	0,9
3.3.3		60	0,2	0,4	0,7	0,9
3.3.4		60	0,2	0,4	0,7	0,9
3.3.5						
3.5.1	**Hardened tool steel** **< 55 HRC**					
3.5.2	**55–58 HRC**					
3.5.3	**58–60 HRC**					
3.5.4	**60–62 HRC**					
3.5.5	**62–64 HRC**					
4.1.1	**Stainless steel**	30	0,08	0,16	0,195	0,23
4.1.2		25	0,08	0,16	0,195	0,23
4.1.3		20	0,08	0,16	0,195	0,23
4.1.4		20	0,08	0,16	0,195	0,23
4.1.5		30	0,08	0,16	0,195	0,23
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**	100	0,2	0,4	0,7	0,9
5.1.2		95	0,2	0,4	0,7	0,9
5.1.3		90	0,2	0,4	0,7	0,9
5.2.1	**Stainless cast steel**	25	0,08	0,16	0,195	0,23
5.2.2		20	0,08	0,16	0,195	0,23
6.1.1	**Cast iron with lamellar graphite**	80	0,3	0,6	1	1,2
6.1.2		80	0,3	0,6	1	1,2
6.1.3		70	0,3	0,6	1	1,2
6.1.4						
6.2.1	**Spheroidal cast iron**	70	0,3	0,6	1	1,2
6.2.2		65	0,3	0,6	1	1,2
6.2.3		55	0,3	0,6	1	1,2
6.3.1	**GTW (white malleable cast iron)**	70	0,3	0,6	1	1,2
6.3.2		65	0,3	0,6	1	1,2
6.4.1	**GTS (black malleable cast iron)**	70	0,3	0,6	1	1,2
6.4.2		65	0,3	0,6	1	1,2
7.1.1	**Aluminium**	200	0,3	0,6	1	1,2
7.1.2		200	0,3	0,6	1	1,2
7.1.3		200	0,3	0,6	1	1,2
7.1.4		200	0,3	0,6	1	1,2
7.1.5		180	0,3	0,6	1	1,2
7.1.6		170	0,3	0,6	1	1,2
7.2.1	**Magnesium**	200	0,3	0,6	1	1,2
7.2.2		180	0,3	0,6	1	1,2
7.3.1	**Copper**	220	0,3	0,6	1	1,2
7.3.2		200	0,3	0,6	1	1,2
7.3.3		180	0,3	0,6	1	1,2
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**	140	0,3	0,6	1	1,2
7.4.2		200	0,3	0,6	1	1,2
7.5.1	**CuSn (bronze)**	120	0,3	0,6	1	1,2
7.5.2		200	0,3	0,6	1	1,2
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**	60	0,2	0,4	0,7	0,9
7.8.2		60	0,2	0,4	0,7	0,9
7.8.3		30	0,15	0,25	0,45	0,6

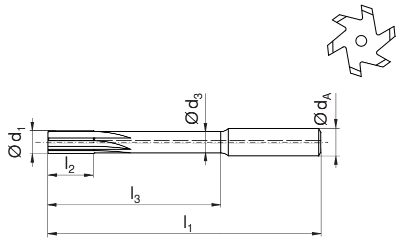
W0607, coated

HSC reamers for blind holes

UN | **HSC SLR**

$\lambda_s = 0°$ | $d_1 = H7$ $d_A = h6$ | **A** | **E**

SCPP625



d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
3.97	HSC-SLR.UN.0607.0397H7.29.IK.HA	6	3.73	75	12	35	6	W0607039750
3.98	HSC-SLR.UN.0607.0398H7.29.IK.HA	6	3.74	75	12	35	6	W0607039850
3.99	HSC-SLR.UN.0607.0399H7.29.IK.HA	6	3.75	75	12	35	6	W0607039950
4.0	HSC-SLR.UN.0607.0400H7.29.IK.HA	6	3.76	75	12	35	6	W0607040050
4.01	HSC-SLR.UN.0607.0401H7.29.IK.HA	6	3.77	75	12	35	6	W0607040150
4.02	HSC-SLR.UN.0607.0402H7.29.IK.HA	6	3.78	75	12	35	6	W0607040250
4.03	HSC-SLR.UN.0607.0403H7.29.IK.HA	6	3.79	75	12	35	6	W0607040350
4.97	HSC-SLR.UN.0607.0497H7.27.IK.HA	6	4.67	75	12	35	6	W0607049750
4.98	HSC-SLR.UN.0607.0498H7.27.IK.HA	6	4.68	75	12	35	6	W0607049850
4.99	HSC-SLR.UN.0607.0499H7.27.IK.HA	6	4.69	75	12	35	6	W0607049950
5.0	HSC-SLR.UN.0607.0500H7.27.IK.HA	6	4.7	75	12	35	6	W0607050050
5.01	HSC-SLR.UN.0607.0501H7.27.IK.HA	6	4.71	75	12	35	6	W0607050150
5.02	HSC-SLR.UN.0607.0502H7.27.IK.HA	6	4.72	75	12	35	6	W0607050250
5.03	HSC-SLR.UN.0607.0503H7.27.IK.HA	6	4.73	75	12	35	6	W0607050350
5.97	HSC-SLR.UN.0607.0597H7.26.IK.HA	6	5.61	75	12	35	6	W0607059750
5.98	HSC-SLR.UN.0607.0598H7.26.IK.HA	6	5.62	75	12	35	6	W0607059850
5.99	HSC-SLR.UN.0607.0599H7.26.IK.HA	6	5.63	75	12	35	6	W0607059950
6.0	HSC-SLR.UN.0607.0600H7.26.IK.HA	6	5.64	75	12	35	6	W0607060050
6.01	HSC-SLR.UN.0607.0601H7.26.IK.HA	6	5.65	75	12	35	6	W0607060150
6.02	HSC-SLR.UN.0607.0602H7.26.IK.HA	6	5.66	75	12	35	6	W0607060250
6.03	HSC-SLR.UN.0607.0603H7.26.IK.HA	6	5.67	75	12	35	6	W0607060350
7.97	HSC-SLR.UN.0607.0797H7.48.IK.HA	8	7.49	100	16	60	6	W0607079750
7.98	HSC-SLR.UN.0607.0798H7.48.IK.HA	8	7.5	100	16	60	6	W0607079850
7.99	HSC-SLR.UN.0607.0799H7.48.IK.HA	8	7.51	100	16	60	6	W0607079950
8.0	HSC-SLR.UN.0607.0800H7.48.IK.HA	8	7.52	100	16	60	6	W0607080050
8.01	HSC-SLR.UN.0607.0801H7.48.IK.HA	8	7.53	100	16	60	6	W0607080150
8.02	HSC-SLR.UN.0607.0802H7.48.IK.HA	8	7.54	100	16	60	6	W0607080250
8.03	HSC-SLR.UN.0607.0803H7.48.IK.HA	8	7.55	100	16	60	6	W0607080350
9.97	HSC-SLR.UN.0607.0997H7.61.IK.HA	10	9.37	120	20	76	6	W0607099750
9.98	HSC-SLR.UN.0607.0998H7.61.IK.HA	10	9.38	120	20	76	6	W0607099850
9.99	HSC-SLR.UN.0607.0999H7.61.IK.HA	10	9.39	120	20	76	6	W0607099950
10.0	HSC-SLR.UN.0607.1000H7.61.IK.HA	10	9.4	120	20	76	6	W0607100050
10.01	HSC-SLR.UN.0607.1001H7.61.IK.HA	10	9.41	120	20	76	6	W0607100150
10.02	HSC-SLR.UN.0607.1002H7.61.IK.HA	10	9.42	120	20	76	6	W0607100250
10.03	HSC-SLR.UN.0607.1003H7.61.IK.HA	10	9.43	120	20	76	6	W0607100350
11.97	HSC-SLR.UN.0607.1197H7.53.IK.HA	12	11.25	120	20	71	6	W0607119750
11.98	HSC-SLR.UN.0607.1198H7.53.IK.HA	12	11.26	120	20	71	6	W0607119850
11.99	HSC-SLR.UN.0607.1199H7.53.IK.HA	12	11.27	120	20	71	6	W0607119950
12.0	HSC-SLR.UN.0607.1200H7.53.IK.HA	12	11.28	120	20	71	6	W0607120050
12.01	HSC-SLR.UN.0607.1201H7.53.IK.HA	12	11.29	120	20	71	6	W0607120150
12.02	HSC-SLR.UN.0607.1202H7.53.IK.HA	12	11.3	120	20	71	6	W0607120250
12.03	HSC-SLR.UN.0607.1203H7.53.IK.HA	12	11.31	120	20	71	6	W0607120350
16.0	HSC-SLR.UN.0607.1600H7.74.IK.HA	16	15.04	150	25	98	6	W0607160050
18.0	HSC-SLR.UN.0607.1800H7.71.IK.HA	18	16.92	150	25	98	6	W0607180050
20.0	HSC-SLR.UN.0607.2000H7.66.IK.HA	20	18.8	150	25	96	6	W0607200050

W0603, coated

Cutting data

Index	Material designation		V_c [m/min]	f [mm/rev] = Ø 3,0 = Ø 4,0	 > Ø 4,0 = Ø 8,0	 > Ø 8,0 = Ø 12,0
1.1.1	**Machining steels**		20	0,1	0,2	0,238
1.1.2			19	0,08	0,16	0,195
1.2.1	**Constructional steel**		16	0,1	0,2	0,238
1.2.2			14	0,08	0,16	0,195
1.2.3			12	0,075	0,15	0,175
1.3.1	**Spring steel**		14	0,075	0,15	0,175
1.3.2			12	0,075	0,15	0,175
1.3.3						
2.1.1	**Cementation steel**		16	0,1	0,2	0,238
2.1.2			15	0,08	0,16	0,195
2.1.3			14	0,08	0,16	0,195
2.2.1	**Nitriding steel**		16	0,1	0,2	0,238
2.2.2			12	0,075	0,15	0,175
2.3.1	**Tempered steel**		13	0,08	0,16	0,195
2.3.2			12	0,075	0,15	0,175
2.3.3			13	0,08	0,16	0,195
2.3.4			12	0,075	0,15	0,175
2.3.5			11	0,063	0,125	0,15
2.3.6			10	0,063	0,125	0,15
3.1.1	**Non alloyed tool steel**		11	0,075	0,15	0,175
3.2.1	**Tool steel for cold working**		13	0,08	0,16	0,195
3.2.2			12	0,08	0,16	0,195
3.2.3			11	0,075	0,15	0,175
3.2.4			10	0,063	0,125	0,15
3.2.5			9	0,063	0,125	0,15
3.3.1	**Tool steel for hot working**		12	0,08	0,16	0,195
3.3.2			11	0,075	0,15	0,175
3.3.3			10	0,063	0,125	0,15
3.3.4			9	0,063	0,125	0,15
3.3.5			9	0,063	0,125	0,15
3.5.1	**Hardened tool steel**	**< 55 HRC**	8	0,075	0,15	0,175
3.5.2		**55–58 HRC**	8	0,063	0,125	0,15
3.5.3		**58–60 HRC**	7	0,063	0,125	0,15
3.5.4		**60–62 HRC**	6	0,05	0,1	0,113
3.5.5		**62–64 HRC**	5	0,05	0,1	0,113
4.1.1	**Stainless steel**		11	0,063	0,125	0,15
4.1.2			8	0,05	0,1	0,113
4.1.3			9	0,063	0,125	0,15
4.1.4						
4.1.5			11	0,063	0,125	0,15
4.2.1	**Heat-resistant alloys**					
4.2.2						
4.2.3						
4.2.4						
5.1.1	**Conventional cast steel**		16	0,063	0,125	0,15
5.1.2			15	0,08	0,16	0,195
5.1.3			11	0,063	0,125	0,15
5.2.1	**Stainless cast steel**					
5.2.2			11	0,063	0,125	0,15
6.1.1	**Cast iron with lamellar graphite**		17	0,125	0,25	0,325
6.1.2			14	0,113	0,225	0,275
6.1.3			12	0,1	0,2	0,238
6.1.4						
6.2.1	**Spheroidal cast iron**		17	0,113	0,225	0,275
6.2.2			14	0,1	0,2	0,238
6.2.3			13	0,1	0,2	0,238
6.3.1	**GTW (white malleable cast iron)**		17	0,113	0,225	0,275
6.3.2			14	0,1	0,2	0,238
6.4.1	**GTS (black malleable cast iron)**		17	0,113	0,225	0,275
6.4.2			14	0,1	0,2	0,238
7.1.1	**Aluminium**					
7.1.2						
7.1.3						
7.1.4						
7.1.5						
7.1.6						
7.2.1	**Magnesium**					
7.2.2						
7.3.1	**Copper**					
7.3.2						
7.3.3						
7.3.4						
7.3.5						
7.3.6						
7.4.1	**CuZn (brass)**					
7.4.2						
7.5.1	**CuSn (bronze)**					
7.5.2						
7.6.1	**CuAlFe (Ampco)**					
7.6.2						
7.8.1	**Titanium**					
7.8.2						
7.8.3						

W0603, coated

Reamers for blind holes

H **SLR**

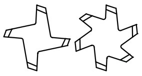
$\lambda_s = 0°$

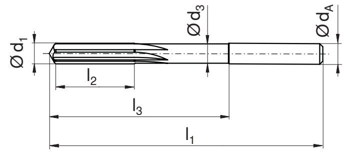
d_1 = H7
d_A = h6

A

E

SCPH605





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
2.97	SLR.H.0603.0297H7.25.HA	4	2.81	64	17	30	4	W0603029770
2.98	SLR.H.0603.0298H7.25.HA	4	2.81	64	17	30	4	W0603029870
2.99	SLR.H.0603.0299H7.25.HA	4	2.81	64	17	30	4	W0603029970
3.0	SLR.H.0603.0300H7.25.HA	4	2.81	64	17	30	4	W0603030070
3.01	SLR.H.0603.0301H7.25.HA	4	2.96	64	17	30	4	W0603030170
3.02	SLR.H.0603.0302H7.25.HA	4	2.96	64	17	30	4	W0603030270
3.03	SLR.H.0603.0303H7.25.HA	4	2.96	64	17	30	4	W0603030370
3.97	SLR.H.0603.0397H7.37.HA	4	3.71	77	21	43	4	W0603039770
3.98	SLR.H.0603.0398H7.37.HA	4	3.71	77	21	43	4	W0603039870
3.99	SLR.H.0603.0399H7.37.HA	4	3.71	77	21	43	4	W0603039970
4.0	SLR.H.0603.0400H7.37.HA	4	3.71	77	21	43	4	W0603040070
4.01	SLR.H.0603.0401H7.37.HA	4	3.96	77	21	43	4	W0603040170
4.02	SLR.H.0603.0402H7.37.HA	4	3.96	77	21	43	4	W0603040270
4.03	SLR.H.0603.0403H7.37.HA	4	3.96	77	21	43	4	W0603040370
4.97	SLR.H.0603.0497H7.43.HA	6	4.46	93	26	51	6	W0603049770
4.98	SLR.H.0603.0498H7.43.HA	6	4.46	93	26	51	6	W0603049870
4.99	SLR.H.0603.0499H7.43.HA	6	4.46	93	26	51	6	W0603049970
5.0	SLR.H.0603.0500H7.43.HA	6	4.46	93	26	51	6	W0603050070
5.01	SLR.H.0603.0501H7.43.HA	6	4.96	93	26	51	6	W0603050170
5.02	SLR.H.0603.0502H7.43.HA	6	4.96	93	26	51	6	W0603050270
5.03	SLR.H.0603.0503H7.43.HA	6	4.96	93	26	51	6	W0603050370
5.97	SLR.H.0603.0597H7.42.HA	6	5.26	93	26	51	6	W0603059770
5.98	SLR.H.0603.0598H7.42.HA	6	5.26	93	26	51	6	W0603059870
5.99	SLR.H.0603.0599H7.42.HA	6	5.26	93	26	51	6	W0603059970
6.0	SLR.H.0603.0600H7.42.HA	6	5.26	93	26	51	6	W0603060070
6.01	SLR.H.0603.0601H7.42.HA	6	5.96	93	26	51	6	W0603060170
6.02	SLR.H.0603.0602H7.42.HA	6	5.96	93	26	51	6	W0603060270
6.03	SLR.H.0603.0603H7.42.HA	6	5.96	93	26	51	6	W0603060370
7.0	SLR.H.0603.0700H7.56.HA	8	6.66	109	31	67	6	W0603070070
7.97	SLR.H.0603.0797H7.63.HA	8	7.46	117	33	75	6	W0603079770
7.98	SLR.H.0603.0798H7.63.HA	8	7.46	117	33	75	6	W0603079870
7.99	SLR.H.0603.0799H7.63.HA	8	7.46	117	33	75	6	W0603079970
8.0	SLR.H.0603.0800H7.63.HA	8	7.46	117	33	75	6	W0603080070
8.01	SLR.H.0603.0801H7.63.HA	8	7.9	117	33	75	6	W0603080170
8.02	SLR.H.0603.0802H7.63.HA	8	7.9	117	33	75	6	W0603080270
8.03	SLR.H.0603.0803H7.63.HA	8	7.9	117	33	75	6	W0603080370
9.0	SLR.H.0603.0900H7.65.HA	10	8.4	125	36	79	6	W0603090070
9.97	SLR.H.0603.0997H7.72.HA	10	9.4	133	41	87	6	W0603099770
9.98	SLR.H.0603.0998H7.72.HA	10	9.4	133	41	87	6	W0603099870
9.99	SLR.H.0603.0999H7.72.HA	10	9.4	133	41	87	6	W0603099970
10.0	SLR.H.0603.1000H7.72.HA	10	9.4	133	41	87	6	W0603100070
10.01	SLR.H.0603.1001H7.72.HA	10	9.9	133	41	87	6	W0603100170
10.02	SLR.H.0603.1002H7.72.HA	10	9.9	133	41	87	6	W0603100270
10.03	SLR.H.0603.1003H7.72.HA	10	9.9	133	41	87	6	W0603100370
11.97	SLR.H.0603.1197H7.81.HA	12	11.6	150	44	99	6	W0603119770
11.98	SLR.H.0603.1198H7.81.HA	12	11.6	150	44	99	6	W0603119870
11.99	SLR.H.0603.1199H7.81.HA	12	11.6	150	44	99	6	W0603119970
12.0	SLR.H.0603.1200H7.81.HA	12	11.6	150	44	99	6	W0603120070

W0603, coated

Cutting data

Index	Material designation	Vc [m/min]	f [mm/rev] = Ø 3,0 = Ø 4,0	> Ø 4,0 = Ø 8,0	> Ø 8,0 = Ø 12,0
1.1.1	Machining steels	20	0,1	0,2	0,238
1.1.2		19	0,08	0,16	0,195
1.2.1	Constructional steel	16	0,1	0,2	0,238
1.2.2		14	0,08	0,16	0,195
1.2.3		12	0,075	0,15	0,175
1.3.1	Spring steel	14	0,075	0,15	0,175
1.3.2		12	0,075	0,15	0,175
1.3.3					
2.1.1	Cementation steel	16	0,1	0,2	0,238
2.1.2		15	0,08	0,16	0,195
2.1.3		14	0,08	0,16	0,195
2.2.1	Nitriding steel	16	0,1	0,2	0,238
2.2.2		12	0,075	0,15	0,175
2.3.1	Tempered steel	13	0,08	0,16	0,195
2.3.2		12	0,075	0,15	0,175
2.3.3		13	0,08	0,16	0,195
2.3.4		12	0,075	0,15	0,175
2.3.5		11	0,063	0,125	0,15
2.3.6		10	0,063	0,125	0,15
3.1.1	Non alloyed tool steel	11	0,075	0,15	0,175
3.2.1	Tool steel for cold working	13	0,08	0,16	0,195
3.2.2		12	0,08	0,16	0,195
3.2.3		11	0,075	0,15	0,175
3.2.4		10	0,063	0,125	0,15
3.2.5		9	0,063	0,125	0,15
3.3.1	Tool steel for hot working	12	0,08	0,16	0,195
3.3.2		11	0,075	0,15	0,175
3.3.3		10	0,063	0,125	0,15
3.3.4		9	0,063	0,125	0,15
3.3.5		9	0,063	0,125	0,15
3.5.1	Hardened tool steel < 55 HRC	8	0,075	0,15	0,175
3.5.2	55–58 HRC	8	0,063	0,125	0,15
3.5.3	58–60 HRC	7	0,063	0,125	0,15
3.5.4	60–62 HRC	6	0,05	0,1	0,113
3.5.5	62–64 HRC	5	0,05	0,1	0,113
4.1.1	Stainless steel	11	0,063	0,125	0,15
4.1.2		8	0,05	0,1	0,113
4.1.3		9	0,063	0,125	0,15
4.1.4					
4.1.5		11	0,063	0,125	0,15
4.2.1	Heat-resistant alloys				
4.2.2					
4.2.3					
4.2.4					
5.1.1	Conventional cast steel	16	0,063	0,125	0,15
5.1.2		15	0,08	0,16	0,195
5.1.3		11	0,063	0,125	0,15
5.2.1	Stainless cast steel				
5.2.2		11	0,063	0,125	0,15
6.1.1	Cast iron with lamellar graphite	17	0,125	0,25	0,325
6.1.2		14	0,113	0,225	0,275
6.1.3		12	0,1	0,2	0,238
6.1.4					
6.2.1	Spheroidal cast iron	17	0,113	0,225	0,275
6.2.2		14	0,1	0,2	0,238
6.2.3		13	0,1	0,2	0,238
6.3.1	GTW (white malleable cast iron)	17	0,113	0,225	0,275
6.3.2		14	0,1	0,2	0,238
6.4.1	GTS (black malleable cast iron)	17	0,113	0,225	0,275
6.4.2		14	0,1	0,2	0,238
7.1.1	Aluminium				
7.1.2					
7.1.3					
7.1.4					
7.1.5					
7.1.6					
7.2.1	Magnesium				
7.2.2					
7.3.1	Copper				
7.3.2					
7.3.3					
7.3.4					
7.3.5					
7.3.6					
7.4.1	CuZn (brass)				
7.4.2					
7.5.1	CuSn (bronze)				
7.5.2					
7.6.1	CuAlFe (Ampco)				
7.6.2					
7.8.1	Titanium				
7.8.2					
7.8.3					

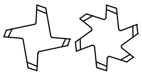
W0603, coated

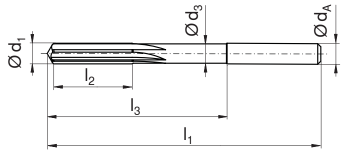
Reamers for blind holes

H **SLR**

$\lambda_S = 0°$ $d_1 = H7$ $d_A = h6$ **A** **E**

SCPH605





d_1 [mm]	Type, description	d_A [mm]	d_3 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	z	HA Material
12.01	SLR.H.0603.1201H7.81.HA	12	11.6	150	44	99	6	W0603120170
12.02	SLR.H.0603.1202H7.81.HA	12	11.6	150	44	99	6	W0603120270
12.03	SLR.H.0603.1203H7.81.HA	12	11.6	150	44	99	6	W0603120370

Notes

Technical information

Materials

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
1 Machining, constructional and spring steel	1.1 Machining steels	1.1.1 up to 500 N/mm^2	1.0711	9 S 20		CF 9 S 22	220 M 07	SUM 21			G 12120	1212
			1.0715	9 SMn 28	S 250	CF 9 SMn 28	230 M 07	SUM 22	1912		G 12130	1213
			1.0718	9 SMnPb 28	S 250 Pb	CF 9 SMnPb 28		SUM 22 L	1914		G 12134	12 L 13
			1.0721	10 S 20	10 F 1	CF 10 S 20	210 M 15					1108
			1.0722	10 SPb 20	10 PbF 2	CF 10 SPb 20						11 L 08
			1.0723	15 S 20			210 A 15	SUM 32	1922			
			1.0736	9 SMn 36	S 300	CF 9 SMn 36	240 M 07				G 12150	1215
			1.0737	9 SMnPb 36	S 300 Pb	CF 9 SMnPb 36			1926		G 12144	12 L 14
		1.1.2 above 500 N/mm^2	1.0726	35 S 20	35 MF 4		212 M 36		1957		G 11400	1140
			1.0727	45 S 20	45 MF 4		212 M 44		1973		G 11460	1146
			1.0728	60 S 20	60 MF 4							
	1.2 Constructional steel	1.2.1 non alloyed up to 500 N/mm^2	1.0037	St 37-2				STKM 12 C				
			1.0044	St 44-2	E 28-2	Fe 430 B FN	4360-43 B	SM 41 B	1412			A 570 Gr. 40
			1.0116	St 37-3	E 24-3; E 24-4	Fe 360 D FF	4360-40 C		1312; 1313	St 3 kp; ps; sp		A 573 Gr. 58
			1.0144	St 44-3	E 28-3; E 28-4	Fe 430 D FF	4360-43 C	SM 41 C	1412; 1414	St 4 kp; ps; sp		A 573 Gr. 70
		1.2.2 non alloyed above 500 N/mm^2	1.0050	St 50-2	A 50-2	Fe 490	4360-50 B	SS 50	2172	BSt 5 ps; sp		A 570 Gr. 50
			1.0060	St 60-2	A 60-2	Fe 590; Fe 60-2	4360-SSE; SSC	SM 58		St 6 ps; sp		
			1.0570	St 52-3	E 36-3; E 36-4	Fe 510 B; C; D	4360-50 B	SM 50 YA	2132	17 GS		
		1.2.3 alloyed	1.5415	15 Mo 3	15 D 3	16 Mo 3	1501-240		2912			A 204 Gr. A
			1.5423	16 Mo 5		16 Mo 5	1503-245-420				G 45200	4520
			1.5622	14 Ni 6	16 N 6	14 Ni 6						A 350-LF 5
			1.5680	12 Ni 19	Z 18 N 5							2515
			1.7335	13 CrMo 4 4	15 CD 3.5	14 CrMo 4 5	1501-620 Gr. 27		2216	12ChM; 15ChM		A 182-F11; F12
			1.7337	16 CrMo 4 4	15 CD 4.5	14 CrMo 4 5	1501-620 Gr. 27		2216	15ChM		A 387 Gr. 12 Cl. 2
			1.7380	10 CrMo 9 10	10 CD 9.10	12 CrMo 9 10	1501-622 Gr. 31; 45		2218		J 21890	A 182-F22
			1.7709	21 CrMoV 5 7								
			1.7715	14 MoV 6 3			1503-660-440					
			1.7735	14 CrMoV 6 9	15 CDV 6							
	1.3 Spring steel	1.3.1 annealed (up to 250 HB)	1.0904	55 Si 7	55 S 7	55 Si 8	250 A 53		2085; 2090	55S2		9255
			1.0961	60 SiCr 7	60 SC 7	60 SiCr 8		SUP 7				9262
			1.1231	Ck 67	XC 68	C 70	060 A 67		1770	70	G 10700	1070
			1.1248	Ck 75	XC 75	C 75	060 A 78		1774; 1778	75	G 10780	1078; 1080
			1.1274	Ck 101	XC 100		060 A 96	SUP 4	1870		G 10950	1095
			1.2101	62 SiMnCr 4								
			1.2103	58 SiCr 8								
			1.7103	67 SiCr 5								
			1.7176	55 Cr 3	55 C 3	55 Cr 3	527 A 60	SUP 9 (A)	2253	50ChGA	G 51550	5155
			1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150
		1.3.2 naturally hard materials	1.0904	55 Si 7	55 S 7	55 Si 8	250 A 53		2085; 2090	55S2		9255
			1.0961	60 SiCr 7	60 SC 7	60 SiCr 8		SUP 7				9262
			1.1231	Ck 67	XC 68	C 70	060 A 67		1770	70	G 10700	1070
			1.1248	Ck 75	XC 75	C 75	060 A 78		1774; 1778	75	G 10780	1078; 1080
			1.1274	Ck 101	XC 100		060 A 96	SUP 4	1870		G 10950	1095
			1.2101	62 SiMnCr 4								
			1.2103	58 SiCr 8								
			1.7103	67 SiCr 5								
			1.7176	55 Cr 3	55 C 3	55 Cr 3	527 A 60	SUP 9 (A)	2253	50ChGA	G 51550	5155
			1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150
		1.3.3 hard materials for spring steel	1.0904	55 Si 7	55 S 7	55 Si 8	250 A 53		2085; 2090	55S2		9255
			1.0961	60 SiCr 7	60 SC 7	60 SiCr 8		SUP 7				9262
			1.1231	Ck 67	XC 68	C 70	060 A 67		1770	70	G 10700	1070
			1.1248	Ck 75	XC 75	C 75	060 A 78		1774; 1778	75	G 10780	1078; 1080
			1.1274	Ck 101	XC 100		060 A 96	SUP 4	1870		G 10950	1095

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
1 Machining, constructional and spring steel	1.3 Spring steel	hard materials for spring steel	1.2101	62 SiMnCr 4								
			1.2103	58 SiCr 8								
			1.7103	67 SiCr 5								
			1.7176	55 Cr 3	55 C 3	55 Cr 3	527 A 60	SUP 9 (A)	2253	50ChGA	G 51550	5155
			1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150
2 Cementation, nitriding and tempered steel	2.1 Cementation steel	2.1.1 up to 150 HB	1.0301	C 10	AF 34 C 10; XC 10	C 10	045 M 10	S 10 C		10	G 10100	1010
			1.0401	C 15	AF3 7 C 12; XC 18	C 15; C 16	080 M 15		1350		G 10170	1015
			1.1121	Ck 10	XC 10	C 10	045 M 10	S 10 C; S 9 CK	1265	08; 10	G 10100	1010
			1.1141	Ck 15	XC 15; XC 18	C 15; C 16	080 M 15	S 15 C; S 15 CK	1370	15	G 10170	1015
		2.1.2 150 - 200 HB	1.7012	13 Cr 2								
			1.7015	15 Cr 3	12 C 3		523 M 15	SCr 415 (H)		15Ch	G 50150	5015
		2.1.3 above 200 HB	1.5732	14 NiCr 10	14 NC 11	16 NiCr 11		SNC 415 (H)				3415
			1.5752	14 NiCr 14	12 NC 15		655 M 13	SNC 815 (H)			G 33106	3310; 9314
			1.5860	14 NiCr 18								
			1.5919	15 CrNi 6	16 NC 6	16 CrNi 4	S 107					
			1.5920	18 CrNi 8	20 NC 6							
			1.6523	21 NiCrMo 2	20 NCD 2	20 NiCrMo 2	805 M 20	SNCM 220 (H)	2506		G 86170	8620
			1.6587	17 CrNiMo 6	18 NCD 6	18 NiCrMo 7	820 A 16					
			1.7131	16 MnCr 5	16 MC 4	16 MnCr 5	527 M 17	SCR 415	2511	18ChG	G 51170	5115
			1.7139	16 MnCrS 5								
			1.7147	20 MnCr 5	20 MC 5	20 MnCr 5		SMnC 420 (H)		18ChG	G 51200	5120
			1.7149	20 MnCrS 5								
			1.7262	15 CrMo 5	12 CD 4	12 CrMo 4		SCM 415 (H)				
			1.7264	20 CrMo 5	18 CD 4			SCM 421				
			1.7271	23 CrMoB 3 3								
			1.7311	20 CrMo 2								
			1.7321	20 MoCr 4								
			1.7323	20 MoCrS 4								
			1.7325	25 MoCr 4								
			1.7326	25 MoCrS 4								
	2.2 Nitriding steel	2.2.1 up to 1000 N/mm^2	1.8504	34 CrAl 6								
			1.8506	34 CrAlS 5							K 23745	
			1.8507	34 CrAlMo 5	30 CAD 6.12	34 CrAlMo 7	905 M 31				K 23545	A 355 Cl. D
			1.8509	41 CrAlMo 7	40 CAD 6.12	41 CrAlMo 7	905 M 39	SACM 645	2940	38ChMJuA	K 24065	A 355 Cl. A
		2.2.2 above 1000 N/mm^2	1.8515	31 CrMo 12	30 CD 12	31 CrMo 12	722 M 24		2240			
			1.8519	31 CrMoV 9								
			1.8521	15 CrMoV 5 9								
			1.8523	39 CrMoV 13 9		36 CrMoV 13 9	897 M 39					
			1.8550	34 CrAlNi 7							K 52440	
	2.3 Tempered steel	2.3.1 non alloyed up to 800 N/mm^2	1.0402	C 22	AF 42 C 20	C 20; C 21	050 A 20		1450	20	G 10200	1020
			1.0406	C 25	AF 50 C 30	C 25	070 M 26					1025
			1.0501	C 35	AF 55 C 35	C 35	060 A 35		1550	35	G 10350	1035
			1.0503	C 45	AF 65 C 45	C 45	080 M 46		1650	45	G 10430	1045
			1.0511	C 40	AF 60 C 40	C 40						1040
			1.0528	C 30								
			1.1151	Ck 22	XC 25; XC 18	C 20	050 A 20	S 20 C; S 20 CK		20		1023
			1.1158	Ck 25	XC 25	C 25	070 M 26	S 25 C		25	G 10250	1025
			1.1178	Ck 30								
			1.1181	Ck 35	XC 38 H1:XC 32	C 35	080 M 36	S 35 C	1572	35	G 10340	1035
			1.1186	Ck 40	XC 42 H1	C 40	080 M 40	S 40 C		40		1040
			1.1191	Ck 45	XC 42	C 45	080 M 46	S 45 C	1672	45	G 10420	1045

Technical information

Materials

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
2 Cementation, nitriding and tempered steel	2.3 Tempered steel	2.3.2 non alloyed 800 - 1000 N/mm^2	1.0535	C 55	AF 70 C55	C 55	070 M 55		1655	55		1055
			1.0540	C 50								
			1.0601	C 60	CC 55	C 60	080 A 62			60	G 10600	1060
			1.1203	Ck 55	XC 55	C50	070 M 55	S 55 C		55		1055
			1.1206	Ck 50	XC 48 H1		080 M 50			50		1050
			1.1221	Ck 60	XC 60	C60	080 A 62	S 58 C	1665; 1678	60; 60G	G 10640	1060
		2.3.3 alloyed up to 800 N/mm^2	1.1133	20 Mn 5	20 M 5	G 22 Mn 3	120 M 19	SMnC 420			G 10220	1022; 1518
			1.3505	100 Cr 6	100 C 6	100 Cr 6	534 A 99	SUJ 2	2258	SchCh 15	G 52986	52100
			1.5120	38 MnSi 4								
			1.5121	46 MnSi 4								
			1.5141	53 MnSi 4								
			1.5710	36 NiCr 6	35 NC 6		640 A 35	SNC 236				3135
			1.6546	40 NiCrMo 2 2	40 NCD 2	40 NiCrMo 2 (KB)	311-Type 7	SNCM 240		38ChGNM	G 87400	8740
			1.6565	40 NiCrMo 6			311-Type 6	SNCM 439		40Ch2N2MA		4340
			1.7003	38 Cr 2	38 C 2	38 Cr 2						
			1.7006	46 Cr 2	42 C 2	45 Cr 2						5045
			1.7020	32 Cr 2								
			1.7030	28 Cr 4			530 A 30			30Ch		5130
			1.7033	34 Cr 4	32 C 4	34 Cr 4 (KB)	530 A 32	SCr 430 (H)		35Ch	G 51320	5132
			1.7218	25 CrMo 4	25 CD 4	25 CrMo 4 (KB)	1717 CDS 110	SCM 420; SCM 430	2225	30ChM	G 41300	4130
			1.7220	34 CrMo 4	35 CD 4	35 CrMo 4	708 A 37	SCM 432; SCCrM 3	2234	AS38ChGM	G 41350	4135; 4137
			1.7223	41 CrMo 4	42 CD 4 TS	41 CrMo 4	708 M 40	SCM 440	2244	40 ChFA	G 41420	4142; 4140
			1.7225	42 CrMo 4	42 CD 4	42 CrMo 4	708 M 40	SCM 440 (H)	2244		G 41400	4142; 4140
			1.7228	50 CrMo 4	50 CR MO4		708 A 47	SCM 445 (H)		50ChFA	G 41470	4150
			1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150
		2.3.4 alloyed 800 - 1000 N/mm^2	1.1157	40 Mn 4	35 M 5		150 M 36			40G	G 10390	1039
			1.1165	30 Mn 5	35 M 5		120 M 36	SMn 433 H; SCMn 2		30GSL		1330
			1.1167	36 Mn 5	40 M 5		150 M 36	SMn 438 (H); SCMn 3	2120	35G2; 35GL	G 13350	1335
			1.1170	28 Mn 6	20 M 5	C 28 Mn	150 M 28	SCMn 1		30G		1330
			1.3561	44 Cr 2								
			1.3563	43 CrMo 4								
			1.3565	48 CrMo 4			817 M 40	SNC 836				
			1.5120	38 MnSi 4								
			1.5121	46 MnSi 4								
			1.5122	37 MnSi 4								
			1.5131	50 MnSi 4								
			1.5141	53 MnSi 4								
			1.5223	42 MnV 7								
			1.5710	36 NiCr 6	35 NC 6		640 A 35	SNC 236				3135
			1.5736	36 NiCr 10	30 NC 11	35 NiCr 9		SNC 631 (H)				3435
			1.5755	31 NiCr 14	18 NC 13		653 M 31	SNC 836				
			1.6511	36 CrNiMo 4	40 NCD 3	38 NiCrMo 4 (KB)	816 M 40			40 ChN2MA	G 98400	9840
			1.6513	28 NiCrMo 4								
			1.7003	38 Cr 2	38 C 2	38 Cr 2						
			1.7006	46 Cr 2	42 C 2	45 Cr 2						5045
			1.7030	28 Cr 4			530 A 30			30Ch		5130
			1.7033	34 Cr 4	32 C 4	34 Cr 4 (KB)	530 A 32	SCr 430 (H)		35Ch	G 51320	5132
			1.7034	37 Cr 4	38 C 4	38 Cr 4	530 A 36	SCr 435 H		40Ch		5135
			1.7035	41 Cr 4	42 C 4	41 Cr 4	530 M 40	SCr 440 (H)		40Ch	G 51400	5140
			1.7218	25 CrMo 4	25 CD 4 S	25 CrMo 4 (KB)	1717 CDS 110	SCM 420; SCM 430	2225	30ChM	G 41300	4130
			1.7220	34 CrMo 4	35 CD 4	35 CrMo 4	708 A 37	SCM 432; SCCrM 3	2234	AS38ChGM	G 41350	4135; 4137
			1.7223	41 CrMo 4	42 CD 4 TS	41 CrMo 4	708 M 40	SCM 440	2244	40 ChFA	G 41420	4142; 4140
			1.7225	42 CrMo 4	42 CD 4	42 CrMo 4	708 M 40	SCM 440 (H)	2244		G 41400	4142; 4140

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
2 Cementation, nitriding and tempered steel	2.3 Tempered steel	2.3.4 alloyed 800 - 1000 N/mm^2	1.7228	50 CrMo 4	50 CR MO4		708 A 47	SCM 445 (H)		50ChFA	G 41470	4150
			1.7561	42 CrV 6								
			1.7735	14 CrMoV 6 9								
			1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150
		2.3.5 alloyed 1000 - 1300 N/mm^2	1.3563	43 CrMo 4								
			1.3565	48 CrMo 4			817 M 40	SNC 836				
			1.5120	38 MnSi 4								
			1.5121	46 MnSi 4								
			1.5122	37 MnSi 4								
			1.5223	42 MnV 7								
			1.5710	36 NiCr 6	35 NC 6		640 A 35	SNC 236				3135
			1.5736	36 NiCr 10	30 NC 11	35 NiCr 9		SNC 631 (H)				3435
			1.5864	35 NiCr 18								
			1.6511	36 CrNiMo 4	40 NCD 3	38 NiCrMo 4 (KB)	816 M 40			40 ChN2MA	G 98400	9840
			1.6580	30 CrNiMo 8	30 CND 8	30 NiCrMo 8	823 M 30	SNCM 431				
			1.6582	34 CrNiMo 6	35 NCD 6	35 NiCrMo 6 (KW)	817 M 40	SNCM 447	2541	38Ch2N2MA		4340
			1.7033	34 Cr 4	32 C 4	34 Cr 4 (KB)	530 A 32	SCr 430 (H)		35Ch	G 51320	5132
			1.7034	37 Cr 4	38 C 4	38 Cr 4	530 A 36	SCr 435 H		40Ch		5135
			1.7035	41 Cr 4	42 C 4	41 Cr 4	530 M 40	SCr 440 (H)		40Ch	G 51400	5140
			1.7045	42 Cr 4	42 C 4 TS	41 Cr 4	530 A 40	SCr 440	2245	40Ch		5140
			1.7218	25 CrMo 4	25 CD 4 S	25 CrMo 4 (KB)	1717 CDS 110	SCM 420; SCM 430	2225	30ChM	G 41300	4130
			1.7220	34 CrMo 4	35 CD 4	35 CrMo 4	708 A 37	SCM 432; SCCrM 3	2234	AS38ChGM	G 41350	4135; 4137
			1.7223	41 CrMo 4	42 CD 4 TS	41 CrMo 4	708 M 40	SCM 440	2244	40 ChFA	G 41420	4142; 4140
			1.7225	42 CrMo 4	42 CD 4	42 CrMo 4	708 M 40	SCM 440 (H)	2244		G 41400	4142; 4140
			1.7228	50 CrMo 4	50 CR MO4		708 A 47	SCM 445 (H)		50ChFA	G 41470	4150
			1.7361	32 CrMo 12	30 CD 12	32 CrMo 12	722 M 24		2240			
			1.7561	42 CrV 6								
			1.7707	30 CrMoV 9								
			1.7735	14 CrMoV 6 9								
			1.8159	50 CrV 4	50 CV 4	51 CrV 4	735 A 50	SUP 10	2230	50ChGFA	G 61500	6150
			1.8161	58 CrV 4								
		2.3.6 alloyed 1000 - 1600 N/mm^2	1.1273	90 Mn 4								
			1.5864	35 NiCr 18								
			1.6580	30 CrNiMo 8	30 CND 8	30 NiCrMo 8	823 M 30	SNCM 431				
			1.6582	34 CrNiMo 6	35 NCD 6	35 NiCrMo 6 (KW)	817 M 40	SNCM 447	2541	38Ch2N2MA		4340
			1.6746	32 NiCrMo 14 5	35 NCD 14		830 M 31					
			1.7361	32 CrMo 12	30 CD 12	32 CrMo 12	722 M 24		2240			
			1.7707	30 CrMoV 9								
			1.7735	14 CrMoV 6 9								
			1.8161	58 CrV 4								
3 Tool steel	3.1 Non alloyed tool steel	3.1.1 general	1.1520	C 70 W1								
			1.1525	C 80 W1	Y1 90; Y1 80	C 80 KU				U8A	T 72301	W 108
			1.1620	C 70 W2								
			1.1625	C 80 W2		C 80 KU	BW 1 B	SKC 3; SK 5; SK 6		U8; 80	T 72301	W 1
			1.1645	C 105 W2	Y2 105	C 100 KU		SK 3		U10	T 72301	
			1.1654	C 110 W								
			1.1663	C 125 W	Y2 120	C 120 KU		SK 2		U13	T 72301	W 112
			1.1673	C 135 W	Y2 140	C 140 KU		SK 1				
			1.1730	C 45 W	Y3 42							
			1.1740	C 60 W	Y3 55			SK 7				
			1.1744	C 67 W								
			1.1750	C 75 W			BW 1A			75		W 1
			1.1820	C 55 W								

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3 Tool steel	3.1 Non alloyed tool steel	3.1.1 general	1.1830	C 85 W	Y3 90			SK 5				
			1.1545	C 105 W1	Y1 105	C 100 KU			1880	U10A	T 72301	W 110
	3.2 Tool steel for cold working	3.2.1 low alloyed up to 1000 N/mm^2	1.2067	100 Cr 6	Y 100 C 6		BL 3				T 61203	L 3
			1.2101	62 SiMnCr 4								
			1.2103	58 SiCr 8								
			1.2108	90 CrSi 5								
			1.2162	21 MnCr 5	20 NC 5			SCR 420 H				
			1.2210	115 CrV 3	100 C 3	107 CrV 3 KU					T 61202	L 2
			1.2330	35 CrMo 4	34 CD 4	35 CrMo 4	708 A 37		2234	35 HM	T 51620	4135
			1.2332	47 CrMo 4	42 CD 4	40 CrMo 4	708 M 40		2244			4142
			1.2369	81 CrMov 42 16								
			1.2419	105 WCr 6	105 WC 13	107 WCr 5 KU		SKS 31		ChWG		
			1.2510	100 MnCrW 4	90 MWCV 5	95 MnWCr 5 KU	BO 1	SKS 3	2140		T 31501	O 1
			1.2516	120 WV 4	110 WC 20	110 W 4 KU	BF 1					
			1.2542	45 WCrV 7		45 WCrV 8 KU	BS 1		2710		T 41901	S 1
			1.2550	60 WCrV 7	55 WC 20	55 WCrV 8 KU						
			1.2721	50 NiCr 13								
			1.2735	15 NiCr 14	10 NC 12			SNC 22			T 51606	
			1.2762	75 CrMoNiW 6 7								
			1.2826	60 MnSiCr 4								
			1.2833	100 V 1	Y1 105 V	102 V 2 KU	BW 2	SKS 43			T 72302	W 210
			1.2842	90 MnCrV 8	90 MV 8	90 MnVCr 8 KU	BO 2				T 31502	O 2
		3.2.2 low alloyed up to 1200 N/mm^2	1.2312	40 CrMnMoS 8 6								
			1.2711	54 NiCrMoV 6	55 NCDV 6							
		3.2.3 low alloyed up to 1500 N/mm^2	1.2713	55 NiCrMoV 6	55 NCDV 7			SKT 4		5ChNM	T 61206	L 6
		3.2.4 high alloyed annealed	1.2080	X 210 Cr 12	Z 200 C 12	X 210 Cr 13 KU	BD 3	SKD 1		Ch12	T 30403	D 3
			1.2083	X 42 Cr 13	Z 40 C 14	X 41 Cr 13 KU		SUS 420 J 2				
			1.2341	X 6 CrMo 4								
			1.2363	X 100 CrMoV 5 1	Z 100 CDV 5	X 100 CrMoV 5 1 KU	BA 2	SKD 12	2260		T 30102	A 2
			1.2379	X 155 CrVMo 12 1	Z 160 CDV 12	X 155 CrVMo 12 1 KU	BD 2	SKD 11			T 30402	D 2
			1.2436	X 210 CrW 12	Z 200 CW 12	X 215 CrW 12 1 KU		SKD 2	2312			
			1.2601	X 165 CrMoV 12		X 165 CrMoW 12 KU			2310			
			1.2764	X 19 NiCrMo 4								
			1.2767	X 45 NiCrMo 4	Y 35 NCD 16	42 NiCrMo 15 7						
			1.2885	X 32 CrMoCoV 3 3 3	30 DCKV 28							
		3.2.5 high alloyed tempered	1.2316	X 36 CrMo 17		X 38 CrMo 16 1 KU						
			1.6356	X 2 NiCoMoTi 18 12 4								
			1.6358	X 2 NiCoMoTi 18 9 5								
	3.3 Tool steel for hot working	3.3.1 low alloyed up to 1200 N/mm^2	1.2311	40 CrMnMo 7								
			1.2738	40 CrMnNiMo 8								
			1.2744	57 NiCrMoV 7 7								
		3.3.2 low alloyed up to 1500 N/mm^2	1.2713	55 NiCrMoV 6	55 NCDV 7			SKT 4		5ChNM	T 61206	L 6
		3.3.3 high alloyed annealed	1.2343	X 38 CrMoV 5 1	Z 38 CDV 5	X 37 CrMoV 5 1 KU	BH 11	SKD 6		4Ch5MFS	T 28811	H 11
			1.2344	X 40 CrMoV 5 1	Z 40 CDV 5	X 40 CrMo 5 1 1 KU	BH 13	SKD 61	2242	4Ch5MF1S	T 20813	H 13
			1.2365	X 32 CrMoV 3 3	32 DCV 28	30 CrMoV 12 27 KU	BH 10	SKD 7		3Ch3M3F	T 20810	H 10
			1.2367	X 38 CrMoV 5 3								
			1.2567	X 30 WCrV 5 3	Z 32 WCV 5	X 30 WCrV 5 3 KU		SKD 4				
			1.2581	X 30 WCrV 9 3	Z 30 WCV 9	X 30 WCrV 9 3 KU	BH 21	SKD 5		3Ch2W8F	T 20821	H 21
			1.2706	X 3 NiCrMo 18 8 5	E-Z 2 NKD 18						K 93120	
		3.3.4 high alloyed tempered	1.2709	X 2 NiCoMoTi 18 9 5								
				tempered								

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3 Tool steel	3.4 High speed steel	3.4.1 general	1.3202	S 12-1-4-5							T 12015	T15
			1.3207	S 10-4-3-10	Z 130 WKCDV 10-10-04	HS 10-4-3-10	BT 42	SKH 57				
			1.3243	S 6-5-2-5	Z 85 WDKCV 06-05-05-	HS 6-5-2-5		SKH 55	2723	R6M5K5		
			1.3246	S 7-4-2-5	Z 110 WKCDV 07-05-04	HS 7-4-2-5					T 11341	M 41
			1.3247	S 2-10-1-8	Z 110 DKCWV 09-08-04	HS 2-9-1-8	BM 42	SKH 51			T 11342	M 42
			1.3249	S 2-9-2-8			BM 34				T 11333	M 33; M 34
			1.3255	S 18-1-2-5	Z 80 WKCV 18-05-04-0	HS 18-1-1-5	BT 4	SKH 3			T 12004	T 4
			1.3257	S 18-1-2-15								
			1.3265	S 18-1-2-10		HS 18-0-1-10	BT 5	SKH 4 A			T 12005	T 5
			1.3302	S 12-1-4								
			1.3318	S 12-1-2								
			1.3333	S 3-3-2		HS 3-3-2						
			1.3343	S 6-5-2	Z 85 WDCV 06-05-04-0	HS 6-5-2	BM 2	SKH 9; SKH 51	2722	R6AM5	T 11302	M 2
			1.3344	S 6-5-3	Z 120 WDCV 06-05-04-	HS 6-5-3	BM 4	SKH 52; SKH 53			T 11323	M 3 Cl. 2
			1.3346	S 2-9-1	Z 85 DCWV 08-04-02-0	HS 1-8-1	BM 1			H41	T 11301	H 41; M 1
			1.3348	S 2-9-2	Z 100 DCWV 09-04-02-	HS 2-9-2			2782		T 11307	M 7
			1.3355	S 18-0-1	Z 80 WCV 18-04-01	HS 18-0-1	BT 1	SKH 2		R18	T 12001	T 1
	3.5 Hardened tool steel	3.5.1 < 55 HRC		hardened								
		3.5.2 55 – 58 HRC		hardened								
		3.5.3 58 – 60 HRC		hardened								
		3.5.4 60 – 62 HRC		hardened								
		3.5.5 62 – 64 HRC		hardened								
4 Stainless steel, heat resistant alloys	4.1 Stainless steel	4.1.1 ferritic	1.4000	X 6 Cr 13	Z 6 C 13	X 6 Cr 13	403 S 17	SUS 403	2301	08Ch13	S 40300	403
			1.4002	X 6 CrAl 13	Z 6 CA 13	X 6 CrAl 13	405 S 17	SUS 405	2302		S 40500	405
			1.4016	X 6 Cr 17	Z 8 C 17	X 8 Cr 17	430 S 15	SUS 430	2320	12Ch17	S 43000	430
			1.4113	X 6 CrMo 17	Z 8 CD 17.01	X 8 CrMo 17	434 S 17	SUS 434	2325		S 43400	434
			1.4313	X 5 CrNi 13 4	Z 5 CN 13.4	X 6 CrNi 13 04	425 C 11	SCS 5	2385			CA 6-NM
			1.4510	X 6 CrTi 17	Z 8 CT 17	X 6 CrTi 17		SUS 430 LX		08Ch17T	S 43036	XM 8; 430 Ti
			1.4511	X 8 CrNb 17	Z 8 CNb 17	X 6 CrNb 17		SUS 430 LX				
			1.4512	X 5 CrTi 12	Z 6 CT 12	X 6 CrTi 12	409 S 19	SUH 409			S 40900	409
		4.1.2 martensitic	1.4006	X 10 Cr 13	Z 12 C 13	X 12 Cr 13	410 S 21	SUS 410	2302	12Ch13	S 41000	410; CA-15
			1.4021	X 20 Cr 13	Z 20 C 13	X 20 Cr 13	420 S 37	SUS 420 J 1	2303	20Ch13	S 42000	420
			1.4024	X 15 Cr 13	Z 13 C 13		420 S 29	SUS 410 J 1				
			1.4028	X 30 Cr 13	Z 30 C 13	X 30 Cr 13	420 S 45	SUS 420 J 2	2304	30Ch13		
			1.4031	X 38 Cr 13	Z 40 C 14	X 40 Cr 14		SUS 420 J 2	2304	40Ch13		
			1.4034	X 46 Cr 13	Z 40 C 14	X 40 Cr 14	420 S 45			40Ch13		
			1.4057	X 20 CrNi 17 2	Z 15 CN 16.02	X 16 CrNi 16	431 S 29	SUS 431	2321	20Ch17N2	S 43100	431
			1.4108	X 100 CrMo 13								
			1.4109	X 65 CrMo 14								
			1.4112	X 90 CrMoV 18							S 44003	
			1.4113	X 6 CrMo 17	Z 8 CD 17.01	X 8 CrMo 17	434 S 17	SUS 434	2325		S 43400	434
			1.4116	X 45 CrMoV 15								
			1.4125	X 105 CrMo 17	Z 100 CD 17	X 105 CrMo 17		SUS 440 C			S 44004	440 C
		4.1.3 austenitic A5 < 40%	1.4311	X 2 CrNiN 18 10	Z 2 CN 18 .10	X 2 CrNiN 18 11	304 S 62	SUS 304 LN	2371		S 30453	304 LN
			1.4401	X 5 CrNiMo 18 10	Z 6 CND 17.11	X 5 CrNiMo 17 12	316 S 16	SUS 316	2347		S 31600	316
			1.4404	X 2 CrNiMo 17 13 2	Z 2 CND 17.12	X 2 CrNiMo 17 12	316 S 11	SUS 316 L	2348		S 31603	316 L
			1.4406	X 2 CrNiMoN 17 12 2	Z 2 CND 17.12 Az	X 2 CrNiMoN 17 12	316 S 61	SUS 316 LN			S 31653	316 LN
			1.4429	X 2 CrNiMoN 17 13 3	Z 2 CND 17.13 Az	X 2 CrNiMoN 17 13	316 S 62	SUS 316 LN	2375		S 31653	316 LN
			1.4435	X 2 CrNiMo 18 14 3	Z 2 CND 17.13	X 2 CrNiMo 17 13	316 S 12	SCS 16; SUS 316 L	2353	03Ch17N14M2	S 31603	316 L
			1.4436	X 5 CrNiMo 17 13 3	Z 6 CND 17.12	X 5 CrNiMo 17 13	316 S 16	SUS 316	2343		S 31600	316

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4 Stainless steel, heat resistant alloys	4.1 Stainless steel	4.1.3 austenitic A5 < 40%	1.4438	X 2 CrNiMo 18 16 4	Z 2 CND 19.15	X 2 CrNiMo 18 15	317 S 12	SUS 317 L	2367		S 31703	317 L
			1.4460	X 8 CrNiMo 27 5	Z 5 CND 27.05 Az			SUS 329 J 1	2324		S 32900	329
			1.4462	X 2 CrNiMoN 22 5	Z 2 CND 22 5 Az						S 31803	
			1.4539	X 2 NiCrMoCu 25 20 5	Z 1 CNDU 25 20						N 08904	
			1.4541	X 6 CrNiTi 18 10	Z 6 CNT 18.10	X 6 CrNiTi 18 11	321 S 12	SUS 321	2337	12Ch18N10T	S 32100	321
			1.4542	X 5 CrNiCuNb 17 14	Z 5 CNU 17.4			SCS 24; SUS 630			S 17400	630
			1.4546	X 5 CrNiNb 18 10		X 6 CrNiNb 18 11	347 S 18				S 34800	348
			1.4550	X 6 CrNiNb 18 10	Z 6 CNNb 18.10	X 6 CrNiNb 18 11	347 S 17	SUS 347	2338	08Ch18N12B	S 34700	347
			1.4571	X 6 CrNiMoTi 17 12 2	Z 6 CNT 17.12	X 6 CrNiMoTi 17 12	320 S 31		2350	10Ch17N13M2T	S 31635	316 Ti
			1.4580	X 6 CrNiMoNb 17 12 2	Z 6 CNDNb 17.12	X 6 CrNiMoNb 17 12	318 S 17			08Ch16N13M2B	S 31640	316 Cb
		4.1.4 austenitic A5 > 40%	1.4301	X 5 CrNi 18 9	Z 6 CN 18.09	X 5 CrNi 18 10	304 S 15	SUS 304	2332; 2333	08Ch18N10	S 30400	304; 304 H
			1.4303	X 5 CrNi 18 12	Z 8 CN 18.12	X 8 CrNi 19 10	305 S 19	SUS 305		06Ch18N11	S 30500	308; 305
			1.4306	X 2 CrNi 19 11	Z 2 CN 18.10	X 2 CrNi 18 11	304 S 12	SCS 19	2352; 2333	03Ch18N11	S 30403	304 L
			1.4310	X 12 CrNi 17 7	Z 12 CN 17.07	X 12 CrNi 17 07	301 S 21	SUS 301			S 30100	301
			1.4573	X 10 CrNiMoTi 18 12		X 6 CrNiMoTi 17 13	320 S 33			10Ch17N13M3T	S 31635	316 Ti
			1.4583	X 10 CrNiMoNb 18 12		X 6 CrNiMoNb 17 13						318
		4.1.5 martensitic	1.4005	X 12 CrS 13	Z 12 CF 13	X 12 CrS 13	416 S 21	SUS 416	2380		S 41600	416
			1.4104	X 12 CrMoS 17	Z 10 CF 17	X 10 CrS 17		SUS 430 F	2383		S 43020	430 F
		4.1.6 austenitic A5 > 40%	1.4305	X 10 CrNiS 18 9	Z 10 CNF 18.09	X 10 CrNi 18 09	303 S 21	SUS 303	2346		S 30300	303
		4.1.7 sulphured		sulphured								
	4.2 Heat-resistant alloys	4.2.1 Fe alloys	1.4718	X 45 CrSi 9 3	Z 45 CS 9	X 45 CrSi 8	401 S 45	SUH 1		40Ch9S2	S 65007	HNV 3
			1.4724	X 10 CrAl 13	Z 10 C 13	X 10 CrAl 12	403 S 17			10Ch13SJu		
			1.4742	X 10 CrAl 18	Z 10 CAS 18	X 8 Cr 17	430 S 15	SUS 430; SUH21				430
			1.4747	X 80 CrNiSi 20	Z 80 CSN 20.02	X 80 CrSiNi 20	443 S 65	SUH 4			S 65006	HNV 6
			1.4762	X 10 CrAl 24	Z 10 CAS 24	X 16 Cr 26					S 44600	446
			1.4828	X 15 CrNiSi 20 12	Z 15 CNS 20.12		309 S 24	SUH 309		20Ch20N14S2	S 30900	309
			1.4841	X 15 CrNiSi 25 20	Z 15 CNS 25.20	X 16 CrNiSi 25 20		SUH 310		20Ch25N20S2	S 31000	314; 310
			1.4845	X 12 CrNi 25 21	Z 12 CN 25.20	X 6 CrNi 26 20	310 S24	SUH 310; SUS 310 S	2361		S 31008	310 S
			1.4864	X 12 NiCrSi 36 16	Z 12 NCS 37.18		NA 17	SUH 330			N 08330	330
			1.4871	X 53 CrMnNiN 21 9	Z 52 CMN 21.09	X 53 CrMnNiN 21 9	349 S 54	SUH 35; SUH 36		55Ch20G9AN4	S 63008	EV 8
			1.4873	X 45 CrNiW 18 9	Z 35 CNWS 20.09	X 45 CrNiW 18 9	331 S 40	SUH 31				
			1.4876	X 10 NiCrAlTi 33 20	Z 8 NC 32.21		NA 15 (H)	NCF 800				B 163
			1.4878	X 12 CrNiTi 18 9	Z 6 CNT 18.12 (B)	X 6 CrNiTi 18 11	321 S 20	SUS 321	2337	12Ch18N10T		321
			1.4923	X 22 CrMoV 12 1			762					
			1.4935	X 20 CrMoWV 12 1							S 42200	
			1.4943	X 4 NiCrTi 25 15	Z 6 NCTDV 25.15 B		HR 251; HR 52; HR 51	SUH 660				
			1.4945	X 6 CrNiWNb 16 16								
			1.4962	X 12 CrNiWTi 16 3								
			1.4980	X 5 NiCrTi 26 15							S66286	
		4.2.2 Ni alloys, non hardened	1.4876	X 10 NiCrAlTi 32 20	Incoloy 800							
			2.4360	NiCu30Fe	Monel 400							
			2.4375	NiCu30Al	Monel K 500							
			2.4603	NiCr30FeMo	Hastelloy X							
			2.4617		Hastelloy B-2							
			2.4640	NiCr15Fe	Inconel 600							
			2.4668	NiCr19Fe18Nb5Mg	Inconel 718							
			2.4812		Hastelloy C							
			2.4816	NiCr15Fe	Inconel 600		NA 14	NCF 600			N 06600	
			2.4856	NiCr22Mo9Nb	Inconel 625							
			2.4858	NiCr21Mo			NA 16	NCF 825			N 08825	
			2.4983		Udimet 500							

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4 Stainless steel, heat resistant alloys	4.2 Heat-resistant alloys	4.2.3 Ni alloys, hardened	2.4630	NiCr20Ti	Nimonic 75		HR 5					
			2.4631	NiCr20TiAl	Nimonic 80 A		HR 401; 601	NCF 80 A			N 07080	
			2.4632	NiCr20Co18Ti	Nimonic 90							
			2.4634	NiCo20Cr15MoAlTi	Nimonic 105							
			2.4662	NiCr13Mo6Ti3	Nimonic 901							
			2.4670		Nimocast 713							
			2.4674		Nimocast PK 24							
			2.4951	NiCr20Ti	Nimonic 75		HR 5					
			2.4952	NiCr20TiAl	Nimonic 80 A							
			2.4969	NiCr20Co18Ti	Nimonic 90							
			2.4973	NiCr19Co11MoTi								
			2.6554		Waspaloy							
		4.2.4 Co alloys	2.4711	CoCr20Ni15Mo								
			2.4964	CoCr20W15Ni								
			2.4979	CoCr28MoNi								
			2.4989	CoCr20NiW								
5 Cast steel	5.1 Conventional cast steel	5.1.1 non alloyed	1.0420	GS-38								
			1.0446	GS-45								
			1.0552	GS-52								
			1.0558	GS-60								
			1.0619	GS-C 25								
			1.1142	GS-Ck 16								
			1.1155	GS-Ck 25								
			1.1191	GS-Ck 45								
		5.1.2 low alloyed	1.1118	GS-24 Mn 6								
			1.1120	GS-20 Mn 5								
			1.1131	GS-16 Mn 5								
			1.1136	GS-24 Mn 4								
			1.1138	GS-21 Mn 5								
			1.1159	GS-46 Mn4								
			1.1165	GS-30 Mn 5								
			1.1167	GS-36 Mn 5								
			1.1168	GS-40 Mn 5								
			1.2311	GS-40 CrMnMo 7								
			1.2323	GS-48 CrMoV 6 7								
			1.2713	GS-55 NiCrMoV 6								
			1.2728	GS-20 MoNi 33 13								
			1.2887	GS-34 CoCrMoV 19 12								
			1.5015	GS-8 Mn 7								
			1.5120	GS-38 MnSi 4								
			1.5121	GS-46 MnSi 4								
			1.5122	GS-37 MnSi 5								
			1.5418	GS-20 MnMo 5 3								
			1.5419	GS-22 Mo 4								
			1.5430	GS-8 MnMo 7 4								
			1.5431	GS-12 MnMo 7 4								
			1.5475	GS-20 MnNb 5								
			1.5485	GS-20 MnNiTi 5 3								
			1.5621	GS-10 Ni 6								
			1.5633	GS-24 Ni 8								
			1.5638	GS-10 Ni 14								
			1.5681	GS-10 Ni 19								
			1.5919	GS-15 CrNi 6								

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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
5 Cast steel	5.1 Conventional cast steel	5.1.2 low alloyed	1.6219	GS-22 MnNi 5								
			1.6221	GS-13 MnNi 6 4								
			1.6309	GS-20 MnMoNi 5 5								
			1.6511	GS-36 CrNiMo 4								
			1.6515	GS-25 CrNiMo 4								
			1.6552	GS-24 CrNiMo 3 2 5								
			1.6570	GS-30 NiCrMo 8 5								
			1.6582	GS-34 CrNiMo 6								
			1.6740	GS-33 NiCrMo 7 4 4								
			1.6741	GS-38 NiCrMo 8 4 4								
			1.6748	GS-40 NiCrMo 6 5 6								
			1.6750	GS-20 NiCrMo 3 7								
			1.6759	GS-18 NiMoCr 3 6								
			1.6760	GS-22 NiMoCr 5 6								
			1.6779	GS-14 NiCrMo 10 6								
			1.6781	GS-18 NiCrMo 12 6								
			1.6783	GS-19 NiCrMo 12 6								
			1.6916	GS-12 MnNiCrMo 5 3								
			1.7131	GS-16 MnCr 5								
			1.7147	GS-20 MnCr 5								
			1.7218	GS-25 CrMo 4								
			1.7219	GS-26 CrMo 4								
			1.7220	GS-34 CrMo 4								
			1.7225	GS-42 CrMo 4								
			1.7228	GS-50 CrMo 4								
			1.7341	GS-34 CrMo 4 4								
			1.7354	GS-22 CrMo 5 4								
			1.7354	GS-17 CrMnMo 5 5								
			1.7357	GS-17 CrMo 5 5								
			1.7363	GS-12 CrMo 19 5								
			1.7377	GS-17 CrMo 9 10								
			1.7379	GS-18 CrMo 9 10								
			1.7380	GS-12 CrMo 9 10								
			1.7382	GS-19 CrMo 9 10								
			1.7706	GS-17 CrMoV 5 11								
			1.7725	GS-30 CrMoV 6 4								
			1.7755	GS-35 CrMoV 10 4								
			1.7756	GS-36 CrMoV 10 4								
			1.7903	GS-18 MnCrMo 6 3								
			1.7906	GS-19 MnCrMo 6 3								
			1.7909	GS-20 MnCrMo 6 3								
			1.8159	GS-50 CrV 4								
		5.1.3 high alloyed	1.2201	G-X 165 CrV 12								
			1.2343	G-X 38 CrMoV 5 1	Z 38 CDV 5							
			1.2363	G-X 100 CrMoV 5 1	Z 100 CDV 5							
			1.2365	G-X 32 CrMoV 3 3	32 DCV 28							
			1.2367	G-X 40 CrMoV 5 3	Z 40 CDV 5							
			1.2392	G-X 28 CrMoV 5 1								
			1.2601	G-X 165 CrMoV 12								
			1.2606	G-X 37 CrMoW 5 1								
			1.2880	G-X 165 CrCoMo 12								
			1.3401	G-X 120 Mn 12	Z 120 M 12	XG 120 Mn 12	Z 120 M 12	SCMnH 1		110G13L		A 128 (A)
			1.3966	G-X 25 MnCrNi 8 8 6								

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
5 Cast steel	5.1 Conventional cast steel	5.1.3 high alloyed	1.4710	G-X 30 CrSi 6								
			1.4718	G-X 45 CrSi 9 3								
			1.5662	G-X 8 Ni 9								
			1.6351	G-X 2 NiCoMoTi 17 10								
			1.7389	G-X 12 CrMo 10 1								
	5.2 Stainless cast steel	5.2.1 ferritic / martensitic	1.4001	G-X 7 Cr 13	Z 8 C 13 FF							
			1.4006	G-X 10 Cr 13	Z 10 C 13							
			1.4008	G-X 8 CrNi 13	Z 12 CN 13 M							
			1.4027	G-X 20 Cr 14	Z 20 C 13 M		420 C 29	SCS 2		20Ch13L		
			1.4034	G-X 46 Cr 13	Z 40 C 14							
			1.4059	G-X 22 CrNi 17								
			1.4085	G-X 70 Cr 29								
			1.4086	G-X 120 Cr 29								
			1.4107	G-X 8 CrNi 12								
			1.4120	G-X 20 CrMo 13								
			1.4122	G-X 35 CrMo 17								
			1.4136	G-X 70 CrMo 29 2								
			1.4138	G-X 120 CrMo 29 2								
			1.4313	G-X 5 CrNi 13 4								
			1.4339	G-X 32 CrNi 28 10								
			1.4340	G-X 40 CrNi 27 4								
			1.4405	G-X 5 CrNiMo 16 5								
			1.4407	G-X 5 CrNiMo 13 4								
			1.4414	G-X 4 CrNiMo 13 4								
			1.4464	G-X 40 CrNiMo 27 5								
			1.4540	G-X 4 CrNiCuNb 16 4								
			1.4729	G-X 40 CrSi 13								
			1.4740	G-X 40 CrSi 17								
			1.4743	G-X 160 CrSi 18								
			1.4745	G-X 40 CrSi 23								
			1.4761	G-X 120 CrSi 23								
			1.4776	G-X 40 CrSi 29								
			1.4777	G-X 130 CrSi 29								
			1.4809	G-X 40 CrNi 23 14								
			1.4820	G-X 12 CrNi 26 5								
			1.4822	G-X 40 CrNi 24 5								
			1.4823	G-X 40 CrNiSi 27 4								
			1.4825	G-X 25 CrNiSi 18 9								
			1.4826	G-X 40 CrNiSi 22 9								
			1.4832	G-X 25 CrNiSi 20 14								
			1.4837	G-X 40 CrNiSi 25 12								
			1.4840	G-X 15 CrNi 25 20								
			1.4848	G-X 40 CrNiSi 25 20								
			1.4849	G-X 40 NiCrSiNb 38 1								
			1.4852	G-X 40 NiCrNb 35 25								
			1.4855	G-X 30 CrNiSiNb 24 2								
			1.4857	G-X 40 NiCrSi 35 25								
			1.4859	G-X 10 NiCrNb 32 20								
			1.4865	G-X 40 NiCrSi 38 18		GX 50 NiCr 39 19	330 C 40	SCH 15; SCH 16				
			1.4868	G-X 50 CrNi 30 30								
			1.4873	G-X 45 CrNiW 18 9								
			1.4928	G-X 12 CrNiMoCoVN 12								
			1.4930	G-X 14 CrCoMo 13 10								

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5 Cast steel	5.2 Stainless cast steel	5.2.1 ferritic / martensitic	1.4931	G-X 22 CrMoV 12 1								
			1.4957	G-X 15 CrNiCo 21 20								
			1.4968	G-X 7 CrNiNb 16 13								
			1.4988	G-X 8 CrNiMoVNb 16 1								
			1.6982	G-X 3 CrNi 13 4								
		5.2.2 austenitic	1.3941	G-X 4 CrNi 18 13								
			1.3944	G-X 5 CrNi 18 11								
			1.3951	G-X 4 CrNiMoN 22 15								
			1.3952	G-X 4 CrNiMoN 18 14								
			1.3953	G-X 2 CrNiMo 18 15								
			1.3955	G-X 12 CrNi 18 11								
			1.3959	G-X 10 CrNiNb 16 13								
			1.3964	G-X 4 CrNiMnMoN 19 1								
			1.4306	G-X 2 CrNi 18 9								
			1.4308	G-X 6 CrNi 18 9	Z 6 CN 18.10 M		304 C 15	SCS 13	2333	07Ch18N9L		CF-8
			1.4312	G-X 10 CrNi 18 8								
			1.4347	G-X 8 CrNi 26 7								
			1.4404	G-X 2 CrNiMo 18 10								
			1.4408	G-X 6 CrNiMo 18 10								
			1.4410	G-X 10 CrNiMo 18 9								
			1.4437	G-X 6 CrNiMo 18 12								
			1.4439	G-X 3 CrNiMo 17 13 5								
			1.4446	G-X 2 CrNiMo 17 13 4								
			1.4448	G-X 6 CrNiMo 17 13								
			1.4463	G-X 6 CrNiMo 24 8 2								
			1.4465	G-X 2 CrNiMoN 25 25								
			1.4500	G-X 7 NiCrMoCuNb 25								
			1.4531	G-X 2 NiCrMoCuN 20 1								
			1.4536	G-X 2 NiCrMoCuN 25 2								
			1.4552	G-X 5 CrNiNb 18 9								
			1.4580	G-X 10 CrNiMoNb 18 1								
			1.4581	G-X 5 CrNiMoNb 18 10	Z 4 CNDNb 18.12 M	GX 6 CrMoNb 20 11	318 C 17	SCS 22				
			1.4585	G-X 7 CrNiMoCuNb 18								
			1.4815	G-X 8 CrNi 19 10								
			1.4927	G-X 5 CrNi 22 10								
			1.6901	G-X 8 CrNi 18 10								
			1.6902	G-X 6 CrNi 18 10								
			1.6905	G-X 5 CrNiNb 18 10								
6 Cast iron	6.1 Cast iron with lamellar graphite	6.1.1 non alloyed up to 180 HB	0.6010	GG-10	Ft 10 D	G 10		FC 10	01 10-00	Sc 10		A48-20 B
			0.6015	GG-15	Ft 15 D	G 15	Grade 150	FC 15	01 15-00	Sc 15		A48-25 B
			0.6020	GG-20	Ft 20 D	G 20	Grade 220	FC 20	01 20-00	Sc 20		A48-30 B
		6.1.2 non alloyed above 180 HB	0.6025	GG-25	Ft 25 D	G 25	Grade 260	FC 25	01 25-00	Sc 25		A48-40 B
			0.6030	GG-30	Ft 30 D	G 30	Grade 300	FC 30	01 30-00	Sc 30		A48-45 B
			0.6035	GG-35	Ft 35 D	G 35	Grade 350	FC 35	01 35-00	Sc 35		A48-50 B
			0.6040	GG-40	Ft 40 D		Grade 400		01 40-00	Sc 40		A48-60 B
		6.1.3 alloyed	0.6652	GGL-NiMn 13 7	L- NM 13 7		L-NiMn 13 7					
			0.6655	GGL-NiCuCr 15 6 2	L-NUC 15 6 2		L-NiCuCr 15 6 2					A 436 Type 1
			0.6656	GGL-NiCuCr 15 6 3	L-NUC 15 6 3		L-NiCuCr 15 6 3					A 436 Type 1b
			0.6660	GGL-NiCr 20 2	L-NC 20 2		L-NiCr 20 2		05 23-00			A 436 Type 2
			0.6661	GGL-NiCr 20 3	L-NC 20 3		L-NiCr 20 3					A 436 Type 2b
			0.6667	GGL-NiSiCr 20 5 3	L-NSC 20 5 3		L-NiSiCr 20 5 3					
			0.6676	GGL-NiCr 30 3	L-NC 30 3		L-NiCr 30 3					A 436 Type 3
			0.6680	GGL-NiSiCr 30 5 5	L-NSC 30 5 5		L-NiSiCr 30 5 5					A 436 Type 4

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
6 Cast iron	6.1 Cast iron with lamellar graphite	6.1.4 high alloyed	0.9620	G-X 260 NiCr 4 2			Grade 2 A		0512-00			A 532 I B NiCr-LC
			0.9625	G-X 330 NiCr 4 2			Grade 2 B		0513-00			A 532 I A NiCr-HC
			0.9630	G-X 300 CrNiSi 9 5 2			Grade 2 C; D; E		0457-00			A 532 I D Ni-HiCr
			0.9635	G-X 330 CrMo 15 3			Grade 3 A; B					A 532 II C 15% CrMo-
			0.9640	G-X 300 CrMoNi 15 2			Grade 3 A; B					
			0.9645	G-X 260 CrMoNi 20 2			Grade 3 C					A 532 II D 20% CrMo-
			0.9650	G-X 260 Cr 27			Grade 3 D		0466-00			A 532 III A 25% Cr
			0.9655	G-X 300 CrMo 27 1			Grade 3 E					A 532 III A 25% Cr
	6.2 Spheroidal cast iron	6.2.1 non alloyed up to 180 HB	0.7033	GGG-35.3								
			0.7040	GGG-40	FGS 400-12	GS 400-12	SNG 420/12	FCD 40	0717-02	VC 42-12		60-40-18
			0.7043	GGG-40.3	FGS 370-17	GSO 42/17	SNG 370/17		0717-15	VC 42-12		
		6.2.2 non alloyed above 180 HB	0.7050	GGG-50	FGS 500-7	GS 500/7	SNG 500/7	FCD 50	0727-02	VC 50-2		65-45-12
			0.7060	GGG-60	FGS 600-3	GS 600/3	SNG 600/3	FCD 60	0732-03	VC 60-2		80-55-06
			0.7070	GGG-70	FGS 700-2	GS 700-2	SNG 700/2	FCD 70	0737-01	VC 70-2		100-70-03
			0.7080	GGG-80	FGS 800-2	GS 800-2	SNG 800/2			VC 80-2		120-90-02
		6.2.3 alloyed	0.7652	GGG-NiMn 13 7	S-NM 13 7		S-NiMn 13 7					
			0.7660	GGG-NiCr 20 2	S-NC 20 2		S-NiCr 20 2					A 439 Type D-2
			0.7661	GGG-NiCr 20 3	S-NC 20 3		S-NiCr 20 3					A 439 Type D-2B
			0.7665	GGG-NiSiCr 20 5 2	S-NSC 20 5 2		S-NiSiCr 20 5 2					
			0.7670	GGG-Ni 22	S-N 22		S-Ni 22					A 439 Type D-2C
			0.7673	GGG-NiMn 23 4	S-NM 23 4		S-NiMn 23 4					A 439 Type D-2M
			0.7676	GGG-NiCr 30 3	S-NC 30 3		S-NiCr 30 3					A 439 Type D-3
			0.7677	GGG-NiCr 30 1	S-NC 30 1		S-NiCr 30 1					A 439 Type D-3A
			0.7680	GGG-NiSiCr 30 5 5	S-NSC 30 5 5		S-NiSiCr 30 5 5					A 439 Type D-4
			0.7683	GGG-Ni 35	S-N 35		S-Ni 35					A 439 Type D-5
			0.7685	GGG-NiCr 35 3	S-NC 35 3		S-NiCr 35 3					A 439 Type D-5B
	6.3 GTW (white malleable cast iron)	6.3.1 up to 180 HB	0.8035	GTW-35-04								
			0.8040	GTW-40-05								
			0.8045	GTW-45-07								
		6.3.2 above 180 HB	0.8055	GTW-55								
			0.8065	GTW-65								
	6.4 GTS (black malleable cast iron)	6.4.1 up to 180 HB	0.8135	GTS-35-10	MN 35-10		B 340/12					
		6.4.2 above 180 HB	0.8145	GTS-45-06			P 440/7					
			0.8155	GTS-55-04	MP 50-5		P 510/4					
			0.8165	GTS-65-02	MP 60-3		P 570/3					
			0.8170	GTS-70-02	IP 70-2		P 690/2					
7 Non-ferrous metal	7.1 Aluminium	7.1.1 non alloyed	3.0205	Al99								
			3.0255	Al99.5	1050 A							
			3.0275	Al99.7								
			3.0285	Al99.8								
			3.0305	Al99.9								
		7.1.2 aluminium wrought alloys, non hardened	3.0505	AlMn0.5Mg0.5								
			3.0515	AlMn1								
			3.0517	AlMnCu								
			3.0525	AlMn1Mg0.5	3005							
			3.0526	AlMn1Mg1								
			3.0915	AlFeSi								
			3.3307	Al99.85Mg0.5								
			3.3308	Al99.5Mg0.5								
			3.3315	AlMg1	5005							
			3.3316	AlMg1.5								
			3.3317	Al99.85Mg1								

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7 Non-ferrous metal	7.1 Aluminium	7.1.2 aluminium wrought alloys, non hardened	3.3318	Al99.9Mg1								
			3.3326	AlMg1.8								
			3.3345	AlMg4.5								
			3.3523	AlMg2.5								
			3.3525	AlMg2Mn0.3								
			3.3527	AlMg2Mn0.8								
			3.3535	AlMg3	5754							
			3.3537	AlMg2.7Mn								
			3.3545	AlMg4Mn	5086							
			3.3547	AlMg4.5Mn	5087							
			3.3549	AlMg5Mn								
			3.3555	AlMg5	5056 A							
			3.0506	AlMn0.6								
		7.1.3 aluminium wrought alloys, hardened	3.0615	AlMgSiPb								
			3.1255	AlCuSiMn	2014							
			3.1305	AlCu2.5Mg0.5								
			3.1325	AlCuMg1	2017 A							
			3.1355	AlCuMg2	2024							
			3.1645	AlCuMgPb	2030							
			3.1655	AlCuBiPb	2011							
			3.2307	Al99.85MgSi								
			3.2315	AlMgSi1	6082							
			3.3206	AlMgSi0.5	6060							
			3.3208	Al99.9MgSi								
			3.3210	AlMgSi0.7	6005 A							
			3.3211	AlMg1SiCu	6061							
			3.4335	AlZn4.5Mg1	7020							
			3.4337	Al99.8ZnMg								
			3.4345	AlZnMgCu0.5								
			3.4365	AlZnMgCu1.5	7075							
		7.1.4 aluminium cast alloys up to 6% Si	3.1371	G-AlCu4TiMg								
			3.1841	G-AlCu4Ti								
			3.2134	G-AlSi5Cu1Mg								
			3.3241	G-AlMg3Si								
			3.3261	G-AlMg5Si								
			3.3292	GD-AlMg9								
			3.3541	G-AlMg3								
			3.3543	G-AlMg3(Cu)								
			3.3561	G-AlMg5								
			3.3591	G-AlMg10								
		7.1.5 aluminium cast alloys 6-12% Si	3.2151	G-AlSi6Cu4								
			3.2161	G-AlSi8Cu3								
			3.2341	G-AlSi5Mg								
			3.2371	G-AlSi7Mg								
			3.2373	G-AlSi9Mg								
			3.2381	G-AlSi10Mg								
			3.2383	G-AlSi10Mg(Cu)								
			3.2581	G-AlSi12								
			3.2583	G-AlSi12(Cu)								
		7.1.6 aluminium cast alloys above 12% Si		G-AlSi18								
	7.2 Magnesium	7.2.1 wrought alloys	3.5200	MgMn2								
			3.5312	MgAl3Zn								

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7 Non-ferrous metal	7.2 Magnesium	7.2.1 wrought alloys	3.5612	MgAl6Zn								
			3.5812	MgAl8Zn								
		7.2.2 cast alloys	3.5101	G-MgZn4SE1Zr1								
			3.5102	G-MgZn5Th2Zr1								
			3.5103	G-MgSE3Zn2Zr1								
			3.5105	G-MgTh3Zn2Zr1								
			3.5106	G-MgAg3Se2Zr1								
			3.5470	GD-MgAl4Si1								
			3.5612	GD-MgAl6Zn1								
			3.5662	G-MgAl6								
			3.5812	G-MgAl8Zn1								
			3.5912	G-MgAl9Zn1								
	7.3 Copper	7.3.1 non alloyed	2.0040	OF-Cu								
			2.0060	E-Cu57								
			2.0065	E-Cu58								
			2.0070	SE-Cu								
			2.0076	SW-Cu								
			2.0090	SF-Cu								
		7.3.2 wrought alloys, non hardened	2.0205	CuZn0.5								
			2.1160	CuPb1P								
			2.1191	CuAg0.1P								
			2.1203	CuAg0.1								
			2.1265	CuCd0.5								
			2.1266	CuCd1								
			2.1310	CuFe2P								
			2.1322	CuMg0.4								
			2.1323	CuMg0.7								
			2.1356	CuMn3								
			2.1363	CuMn2								
			2.1366	CuMn5								
			2.1491	CuAsP								
			2.1498	CuSP								
			2.1522	CuSuMnF34								
			2.1522	CuSi2Mn								
			2.1525	CuSi3Mn								
			2.1546	CuTeP								
		7.3.3 wrought alloys, hardened	2.0850	CuNi2Be								
			2.0853	CuNi1.5Si								
			2.0855	CuNi2Si								
			2.0857	CuNi3Si								
			2.1245	CuBe1.7								
			2.1247	CuBe2								
			2.1248	CuBe2Pb								
			2.1285	CuCo2Be								
			2.1293	CuCrZr								
			2.1580	CuZr								
		7.3.4 CuNi alloys	2.0830	CuNi25								
			2.0842	CuNi44Mn1								
			2.0872	CuNi10Fe1Mn								
			2.0875	CuNi9Sn2								
			2.0882	CuNi30Mn1Fe								
			2.0883	CuNi30Fe2Mn2								

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7 Non-ferrous metal	7.3 Copper	7.3.5 CuNiZn alloys, long-chipping	2.0730	CuNi12Zn24								
			2.0740	CuNi18Zn20								
			2.0742	CuNi18Zn27								
		7.3.6 CuNiZn alloys, short-chipping	2.0771	CuNi7Zn39Mn5Pb3								
			2.0780	CuNi12Zn30Pb1								
			2.0790	CuNi18Zn19Pb1								
	7.4 CuZn (brass)	7.4.1 long-chipping	2.0220	CuZn5								
			2.0230	CuZn10								
			2.0240	CuZn15								
			2.0250	CuZn20								
			2.0261	CuZn28								
			2.0265	CuZn30								
			2.0280	CuZn33								
			2.0321	CuZn37								
			2.0332	CuZn37Pb0.5								
			2.0335	CuZn36								
			2.0360	CuZn40								
			2.0372	CuZn39Pb0.5								
		7.4.2 short-chipping	2.0331	CuZn36Pb1.5								
			2.0371	CuZn38Pb1.5								
			2.0375	CuZn36Pb3								
			2.0380	CuZn39Pb2								
			2.0401	CuZn39Pb3								
			2.0402	CuZn40Pb2								
			2.0410	CuZn44Pb2								
			2.0460	CuZn20Al2								
			2.0470	CuZn28Sn1								
			2.0490	CuZn31Si1								
			2.0500	CuZn23Al6Mn4Fe3								
			2.0510	CuZn37Al1								
			2.0525	CuZn38SnAl								
			2.0530	CuZn38Sn1								
			2.0540	CuZn35Ni2								
			2.0550	CuZn40Al2								
			2.0561	CuZn40Al1								
			2.0572	CuZn40Mn1								
			2.0580	CuZn40Mn1Pb								
	7.5 CuSn (bronze)	7.5.1 long-chipping	2.1016	CuSn4								
			2.1020	CuSn6								
			2.1030	CuSn8								
			2.1080	CuSn6Zn6								
		7.5.2 short-chipping	2.1086	G-CuSn10Zn								
			2.1093	G-CuSn6ZnNi								
			2.1096	G-CuSn5ZnPb								
	7.6 CuAlFe (Ampco)	7.6.1 long-chipping	2.0918	CuAl5As								
			2.0920	CuAl8								
			2.0932	CuAl8Fe3								
			2.0936	CuAl10Fe3Mn2								
			2.0960	CuAl9Mn2								
			2.0966	CuAl10Ni5Fe4								
			2.0971	CuAl9Ni3Fe2								
			2.0978	CuAl11Ni6Fe5								
			Ampco 12	CuAl9Fe3								

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7 Non-ferrous metal	7.6 CuAlFe (Ampco)	7.6.1 long-chipping	Ampco 16	CuAl10Fe3								
			Ampco 18	CuAl10.5Fe3.5								
			Ampco 20	CuAl11Fe4								
			Ampco 21	CuAl13Fe4.5								
			Ampco 22	CuAl14Fe5								
			Ampco 25	Zn								
			Ampco 26	Zn								
			Ampco 45	CuAl10Fe2.5Ni5Mn1.5								
			Ampco 483	CuAl9Fe4Ni4.5Mn1								
			Ampco 8	CuAl6.5Fe2.5Sn								
			Ampco M-4	CuAl10.5Fe4Ni5Mn3.5								
		7.6.2 short-chipping		Amco 8								
	7.7 Nickel	7.7.1 non alloyed	2.1504	NiAlBz								
			2.4042	Ni99CSi								
			2.4060	Ni99.6								
			2.4062	Ni99.4Fe								
		7.7.2 alloyed		Nickel								
	7.8 Titanium	7.8.1 non alloyed	3.7024	Ti99.5								
			3.7034	Ti99.7								
			3.7055	Ti99.4								
			3.7064	Ti99.2								
		7.8.2 alloyed, soft annealed	3.7114	TiAl5Sn2								
			3.7124	TiCu2								
		7.8.3 alloyed, hardened	3.7144	TiAl6Sn2Zr4Mo2								
			3.7154	TiAl6Zr5								
			3.7165	TiAl6V4	T-A 6 V		TA 10 bis TA 13				R 56400	
			3.7174	TiAl6V6Sn2								
			3.7184	TiAl4Mo4Sn2			TA 45 bis TA 51					
8 Plastics	8.1 Thermoplastics	8.1.1 polyethylene	PE	Baylon	Lacqtène	Alkathene	Eraclene	Mirason				Alathon
			PE	Dekalen	Natène	Carlona	Fertene	Novatec				Bakelite
			PE	Ertalen		Escorene	Rumiten	Rexlon				Chemplex
			PE	Hostalen				Sholex				Dylan
			PE	Lupolen				Sumikathene				Fortiflex
			PE	Supralen				Suntec				Marlex
			PE	Symalen				Staflene				Microthene
			PE	Vestolen				Yukalon				Paxon
			PE									Petrothene
			PE									Poly-Eth
			PE									Rigidex
			PE									Rotothene
		8.1.2 polypropylene	PP	Daplen	Eltex P	Carlona P	Kastilen	Noblene				Pro-fax
			PP	Hostalen PP	Lacqtène P	Propathene	Moplen	Poly-Pro				Rexene
			PP	Luparen	Napryl	Procom		Sho-Allomer				Tenite
			PP	Novolen		Propyply						
			PP	Symalen PP		Propafoil						
			PP	Vestolen PP								
		8.1.3 polyvinyl chloride	PVC	Coroplast	Ekavyl	Breon	Raivinil	Nipeon	Pevikon			Dalvin
			PVC	Hostalit,		Carina	Sicron	Nipolit				Geon
			PVC	Mipolam		Corvic	Vipla	Vinika				Kohinor
			PVC	Opalon		Scon	Viplast	Vinichlon				Marvinol
			PVC	Rhodopas		Shell PVC						Pliovic
			PVC	Soflex		Welvic						Vygen

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
8 Plastics	8.1 Thermoplastics	8.1.3 polyvinyl chloride	PVC	Solvec								
			PVC	Supradur								
			PVC	Trosiplast								
			PVC	Trovidur								
			PVC	Vestolit								
			PVC	Vinidur								
			PVC	Vinnol								
			PVC	Vinoflex								
			PVC	Vinylite								
		8.1.4 polystyrene	PS	Hostyron	Afcolène	Lustrex	Edistir	Diarex				Carinex
			PS	Lorkalen	Lacqrène		Lastirol	Esbrite				Dylene
			PS	Polystyrol	Gédex		Restirolo					Styron
			PS	Styropor								Toporex
			PS	Trolitul								
			PS	Vestyron								
		8.1.5 polymethyl methacrylate	PMMA	Acrylglas	Altulite	Diakon	Lacrilex	Delpet				Lucite
			PMMA	Daglas		Perspex	Vedril	Shinkolite				Oroglas
			PMMA	Degalan				Sumipex				Swedcast
			PMMA	Dewoglas								
			PMMA	Plexidur								
			PMMA	Plexiglas								
			PMMA	Resartglas								
		8.1.6 Polytetrafluo-rethylene	PTFE	Hostaflon	Soreflon	Fluon		Neoflon				Halon
			PTFE									Teflon
		8.1.7 polyamide	PA	Akulon	Orgamide	Maranyl	Latamid	Amilan				Amidel
			PA	Durethan	Rilsan	Verton	Nivionplast	Leona				Capron
			PA	Fabenyl	Technyl		Renyl	Toray				Fosta Nylon
			PA	Grilamid			Sniamid	Torayca				Minlon
			PA	Grilon			Vydyne					Plaskon
			PA	Nylon								
			PA	Trogamid								
			PA	Ultramid								
			PA	Vestamid								
		8.1.8 polycarbonate	PC	Makralon	Orgalan		Sinvet	Jupilon				Merlon
			PC	Nuclon				Novarex				Lexan
			PC	Plastocarbon				Panlite				
		8.1.9 polyamide, thermoplastic	PI		Kerimel							Torlon
			PI		Kinel							Ultem
			PI		Nolimid							PI 2080
	8.2 Thermosetting plastics	8.2.1 phenol formal-dehyde	PF	Alberit			Fenochem					Biralit
			PF	Bakelit			Formolo					Biratex
			PF	Bulitol			Moldesile					Birax
			PF	Durax			Vegetalite					
			PF	Durophen								
			PF	Faturan								
			PF	Geax								
			PF	Harex								
			PF	Luphen								
			PF	Pertinax								
			PF	Resinol								
			PF	Supraplast								
			PF	Trolitan								
			PF	Trolitax								

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
8 Plastics	8.2 Thermosetting plastics	8.2.2 melamine formaldehyde	MF	Albanit		Melmex	Melbrite		Isomin			Biramin
			MF	Duropal		Formica	Melochem		Perstorp panel			Resimene
			MF	Getalit			Minitrack					
			MF	Homapal			Puriplast					
			MF	Hornit								
			MF	Madurit								
			MF	Maprenal								
			MF	Melan								
			MF	Melolam								
			MF	Melopas								
			MF	Nyhamin								
			MF	Pressal								
			MF	Resart								
			MF	Resopal								
			MF	Ricolor								
			MF	Supraplast								
			MF	Trespa-Duro								
			MF	Ultrapas								
		8.2.3 urea formaldehyde	UF	Bakelite			Gabrite					
			UF	Carbalit			Urochem					
			UF	Cibamin								
			UF	Kaurit								
			UF	Melocol								
			UF	Pollopas								
			UF	Resamin								
			UF	Urecoll								
		8.2.4 polyurethane resin	PUR	Baydur								
			PUR	Bayfill								
			PUR	Bayfit								
			PUR	Bayflex								
			PUR	Baynat								
			PUR	Baypreg								
			PUR	Contilan								
			PUR	Desmodur								
			PUR	Elastolan								
			PUR	Elastolit								
			PUR	Elastopal								
			PUR	Elastopan								
			PUR	Elastopor								
			PUR	Moltopren								
			PUR	Vulkollan								
		8.2.5 silicone resin	SI	Baysilon								Silicone
			SI	Silastic								Textolite
			SI	Silopren								
		8.2.6 thermosetting polyimide	PI	Sintimid								Kapton
			PI									Vespel SP
		8.2.7 unsaturated polyester resin	UP	Alpolit	Norsomix	Crystic Impel	Shimoco	Rigolac	Sonoglas			Freeflow
			UP	Ampal	Stratyl	Uralam		Vyloglass				Haysite
			UP	Artrite								Hetron
			UP	Dobeckan								Rosite
			UP	Durapreg								Selectron
			UP	Durax								
			UP	Durodet								

Technical information

Materials

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
8 Plastics	8.2 Thermosetting plastics	8.2.7 unsaturated polyester resin	UP	Hostaset								
			UP	Keripol								
			UP	Laminac								
			UP	Leguval								
			UP	Menzolit								
			UP	Oldapal								
			UP	Palatal								
			UP	Polydur								
			UP	Polyleit								
			UP	Resipol								
			UP	Setarol								
			UP	Synolite								
			UP	Vestopal								
			UP	Vetrophen								
			UP	Viapal								
		8.2.8 epoxy resin	EP	Araldit		Epikote	Eponac	Epodite				Conapoxy
			EP	Beckopox		Epon						Epiphan
			EP	Duroxyn								Epocast
			EP	Epoxin								Epolene
			EP	Eurepox								Epolite
			EP	Grilonit								Stycast
			EP	Lekutherm								
			EP	Rütapox								
			EP	Trolon								
	8.3 Fibre-reinforced plastics	8.3.1 aramid-fibre reinforced	AFK	Kevlar								
		8.3.2 boron-fibre reinforced	BFK									
		8.3.3 carbon-fibre reinforced	CFK									
		8.3.4 glass-fibre reinforced	GFK									
		8.3.5 metal-fibre reinforced	MFK									
		8.3.6 synthetic-fibre reinforced	SFK									
	8.4 Sandwich	8.4.1 plastic - metal - wood	P - M - H									
		8.4.2 honeycomb	honeycomb									
		8.4.3 metal	metal									
9 Graphite	9.1 Standard graphite	9.1.1 standard graphite	R8340	graphite								
			R8500X	graphite								
			Techno-graph 15	graphite								
			Techno-graph 30	graphite								
		9.1.2 wear-resistant graphite	R8510	graphite								
			R8650	graphite								
			Union Poco EDM C-3	graphite								
			Union Poco EDM1	graphite								
			Union Poco EDM3	graphite								

Technical information

Comparison table

Tensile strength N/mm²	Vickers HV	Brinell HB	Rockwell HRC	Shore C
575	180	171		
595	185	176		
610	190	181		
625	195	185		
640	200	190	12	
660	205	195	13	
675	210	199	14	
690	215	204	15	
705	220	209	15	28
720	225	214	16	
740	230	219	17	29
755	235	223	18	
770	240	228	20.3	30
785	245	233	21.3	
800	250	238	22.2	31
820	255	242	23.1	32
835	260	247	24	33
850	265	252	24.8	
865	270	257	25.6	
880	275	261	26.4	34
900	280	268	27.1	
915	285	271	27.8	35
930	290	276	28.5	
950	295	280	29.2	36
965	300	285	29.8	37
995	310	295	31	38
1030	320	304	32.2	39
1060	330	314	33.3	40
1095	340	323	34.3	41
1125	350	333	35.5	42
1155	360	342	36.6	43
1190	370	352	37.7	44
1220	380	361	38.8	45
1255	390	371	39.8	46
1290	400	380	40.8	47
1320	410	390	41.8	48
1350	420	399	42.7	
1385	430	409	43.6	49
1420	440	418	44.5	
1455	450	428	45.3	51
1485	460	437	46.1	52
1520	470	447	46.9	53
1555	480	465	47.7	54
1595	490	466	48.4	
1630	500	475	49.1	57
1665	510	485	49.8	58
1700	520	494	50.5	59
1740	530	504	51.1	60
1775	540	513	51.7	61
1810	550	523	52.3	62
1845	560	532	53	63
1880	570	542	53.6	64
1920	580	551	54.1	65
1955	590	561	54.7	66
1995	600	570	55.2	67
2030	610	580	55.7	68
2070	620	589	56.3	69
2105	630	599	56.8	70
2145	640	608	57.3	71
2180	650	618	57.8	72
2210	660	628	58.3	73
2240	665	633	58.8	74
2280	670	638	59.3	
2310	675	643	59.8	75
2350	680	648	60.3	76
2380	685	653	61.1	77
2410	690	658	61.3	78
2450	695	663	61.7	79
2480	710	668	62.2	80
2520	720	678	62.6	81
2550	730	683	63.1	82
2590	740	693	63.5	
2630	750	703	63.9	83
2660	760	708	64.3	84
2700	770	718	64.7	85
2730	780	723	65.1	
2770	790	733	65.5	86
2800	800	738	65.9	
2840	810	748	66.3	87
2870	820	753	66.7	88
2910	830	763	67	
2940	840	768	67.4	89
2980	850		67.7	
3010	860		68.1	90
3050	870		68.4	
3080	880		68.7	91
3120	890		69	
3150	900		69.3	92
3190	910		69.6	
3220	920		69.9	
3260	930		70.1	

The figures given are approximate according to DIN EN ISO18265 (02-2004)

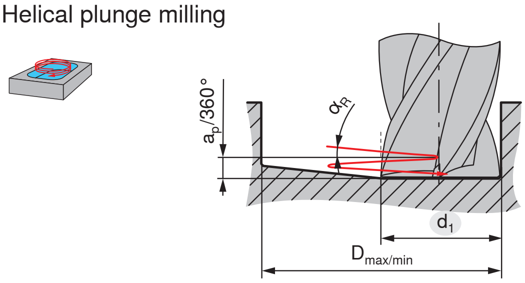
Technical information

Application data - plunge milling

Plunge milling and ramping

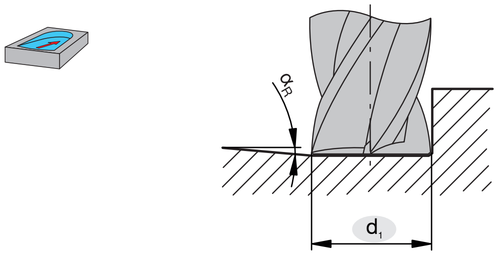
It is recommended to plunge into the material by ramping (angled ramping) or helically (interpolation milling). Direct 'drill-milling' (axial plunging) is generally not recommended as it requires a reduction of the cutting parameters by up to 80%.
As a general rule, the secondary cutting edges of the tools used for plunging must cut to or beyond the centre.

Helical plunge milling



D_{max} [mm] = max. hole diameter
D_{min} [mm] = min. hole diameter

Angled ramping



Ramping angle / axial approach when helical plunge milling with hole diameter D_{min}

		Ramping angle α_R [°]									
Tool Ø d_1 [mm]	Pocket Ø d_{min} [mm]	2	3	4	5	6	7	8	9	10	Axial approach a_p/360° [mm]
3	3,90	0,1	0,1	0,2	0,2	0,3	0,3	0,4	0,4	0,5	
4	5,20	0,1	0,2	0,3	0,3	0,4	0,5	0,5	0,6	0,7	
5	6,50	0,2	0,2	0,3	0,4	0,5	0,6	0,7	0,7	0,8	
6	7,80	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0	
8	10,40	0,3	0,4	0,5	0,7	0,8	0,9	1,1	1,2	1,3	
10	13,00	0,3	0,5	0,7	0,8	1,0	1,2	1,3	1,5	1,7	
12	15,60	0,4	0,6	0,8	1,0	1,2	1,4	1,6	1,8	2,0	
14	18,20	0,5	0,7	0,9	1,2	1,4	1,6	1,9	2,1	2,3	
16	20,80	0,5	0,8	1,1	1,3	1,6	1,9	2,1	21,4	2,7	
18	23,40	0,6	0,9	1,2	1,5	1,8	2,1	2,4	2,7	3,0	
20	26,00	0,7	1,0	1,3	1,6	2,0	2,3	2,6	3,0	3,3	

Min. pocket Ø	$D_{min} = d_1 * 1{,}3$
Axial approach a_p/360°	$a_p = \tan \alpha_R * \pi * (D_{min} - d_1)$

Ramping angle / axial approach when helical plunge milling with hole diameter D_{max}

		Ramping angle α_R [°]									
Tool Ø d_1 [mm]	Pocket Ø d_{max} [mm]	2	3	4	5	6	7	8	9	10	Axial approach a_p/360° [mm]
3	6,00	0,3	0,5	0,7	0,8	1,0	1,2	1,3	1,5	1,7	
4	8,00	0,4	0,7	0,9	1,1	1,3	1,5	1,8	2,0	2,2	
5	10,00	0,5	0,8	1,1	1,4	1,7	1,9	2,2	2,5	2,8	
6	12,00	0,7	1,0	1,3	1,6	2,0	2,3	2,6	3,0	3,3	
8	16,00	0,9	1,3	1,8	2,2	2,6	3,1	3,5	4,0	4,4	
10	20,00	1,1	1,6	2,2	2,7	3,3	3,9	4,4	5,0	5,5	
12	24,00	1,3	2,0	2,6	3,3	4,0	4,6	5,3	6,0	6,6	
14	28,00	1,5	2,3	2,1	3,8	4,6	5,4	6,2	7,0	7,8	
16	32,00	1,8	2,6	3,5	4,4	5,3	6,2	7,1	8,0	8,9	
18	36,00	2,0	3,0	1,4	4,9	5,9	6,9	7,9	9,0	10,0	
20	40,00	2,2	3,3	4,4	5,5	6,6	7,7	8,8	10,0	11,1	

Max. pocket Ø $D_{max} = d_1 * 2$

Recommended ramping angles

	Ramping angle α_R [°]
for milling cutters with z ≤ 3	6° - 10°
for milling cutters with z = 4	3° - 6°
for milling cutters with z ≥ 5	2° - 3°

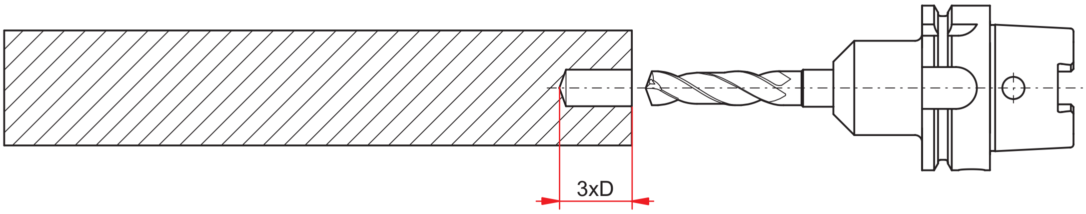
Problem								
Bad surface				Tool wear				
Roughness	Waviness	Angularity	Chattering, vibration	Wear of cutting edge or flank wear	Edge chipping	Tool breakage	Chip jamming, vibration	**Causes and corrective measures**
⇧	⇧	⇧					⇩	Number of teeth
⇧	⇧	⇧						Helix angle
⇧	⇧	⇧	⇩	⇩		⇧		Cutting speed
⇩	⇩	⇩		⇧	⇩	⇩	⇩	Feed rate
⇩	⇩	⇩				⇩	⇩	Depth of cut
			Climb milling		Climb milling			Milling strategy
			≈		≈			Work piece clamping
			≈					Tool clamping
			⇩		⇩	⇩		Overhang length
			≈		≈			Backlash/play of the spindle

⇧	raise, increase
⇩	lower, decrease
≈	check, optimise

Technical information

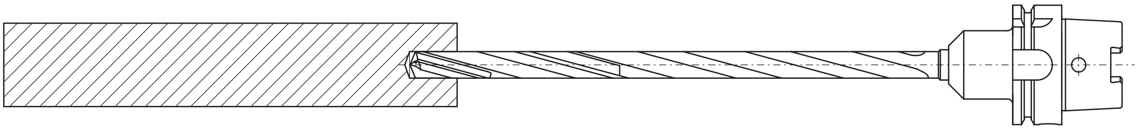
Application of deep hole twist drills 16xØ and greater

Drill the pilot hole



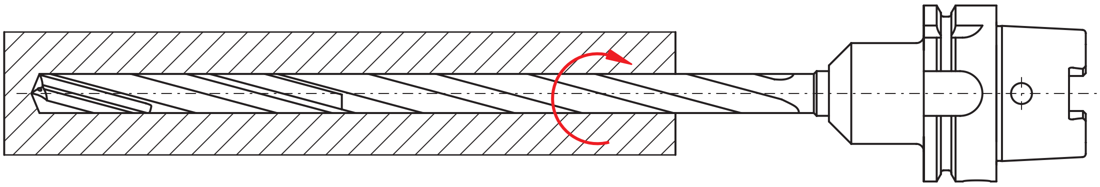
- ○ For the pilot hole we recommend our W0108 (for UN) or our W1205 drill (for AL).
- ○ The pilot drill should have 0.02 mm more diameter than the deep hole drill.
- ○ Please ensure that the pilot hole is precise and has a minimum depth of 3xD.

Enter the pilot hole with the deep hole drill



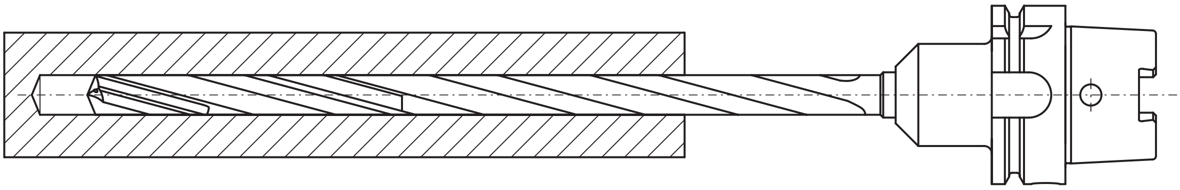
- ○ Deep hole drilling up to 40xD
  Use a low rpm (n=300 rev/min) as well as a low feed rate (v_f=1000 mm/min) when entering the pilot hole. 1-2 mm before reaching the bottom of the pilot hole, stop the feed and increase the spindle speed to the recommended value.
- ○ Deep hole drilling, 40xD and greater
  To enter the pilot hole rotate the drill in a left-hand direction at very low rpm (n=100 rev/min) and a low feed rate (v_f=1000 mm/min). 1-2 mm before reaching the bottom of the pilot hole, stop the feed and rotation. With **right-hand rotation** (i.e. the normal cutting direction) increase the spindle speed to the recommended value.

Deep hole drilling



- ○ Increase feed rate to cycle speed.
- ○ Drill to the desired depth without the need to peck.

Retract the drill



- ○ Retract the drill to approximately 1xØ.
- ○ Reduce the rpm to a low speed (n=300 rev/min). Use rapid feed (v_f=3000 mm/min) when exiting the hole.

Technical information

Application of deep hole twist drills 16xØ and greater

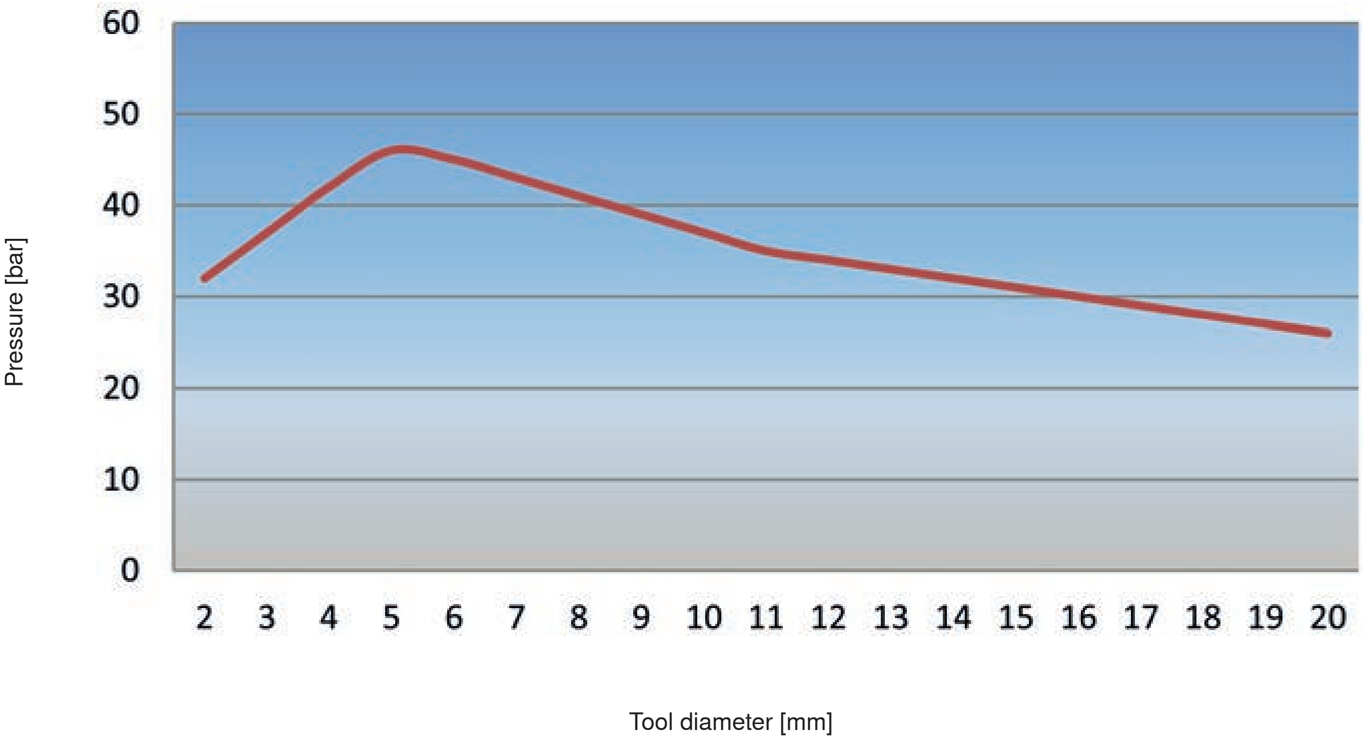
Please note:

- Under unfavourable application conditions, starting from drilling depth 30xØ the swarf must be removed every 3xØ. The movement to evacuate the swarf (retraction) should take place at the depth of the pilot hole.
- When the drill exits, and also when through holes are produced in transverse holes the feed rate has to be reduced by 50% due to the risk of edge chipping.
- The recommended coolant pressure can be seen in the diagram of the coolant pressure recommendations (see below).

⚠ **CAUTION: please ensure that deep hole drills are not moved freely at maximum revolution numbers in the machine.**

Coolant pressure

The coolant pressure always depends on the machine as every machine has a different cooling system and therefore also shows different leakage. The recommended values are particularly adapted to our tools and their application fields. For our deep hole twist drills, for example, the coolant volume for steel was determined as the tools were particularly designed for this material. Should you drill other materials, the indicated coolant volume is still more than sufficient, as steel and in particular deep hole drills require the largest volume and thus the recommendation can be used in general for all drills.



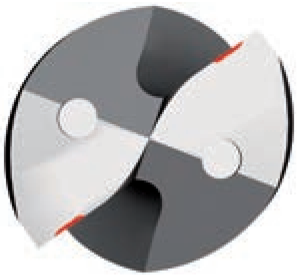
Built-up edge

Failure criterion	Solution
Insufficient cutting speed	Increase cutting speed
Insufficient coolant supply	Increase coolant pressure and ensure optimal coolant supply

Outer cutting edge wear

Failure criterion	Solution
Unstable work piece clamping	Check work piece clamping
Radial run-out error	Correct radial run-out
Insufficient cooling	Increase coolant pressure and ensure optimal coolant supply

Edge chipping on main cutting edge

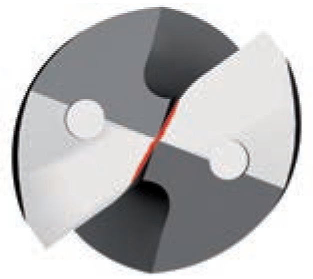


Failure criterion	Solution
Unstable work piece clamping	Check work piece clamping
Coating	Choose tool with suitable coating (tougher)
Excessive tool wear	Adapt interval of tool change

Technical information

Application data - drilling

Untypical chisel edge wear



Failure criterion		Solution
Feed rate too high	-	Reduce feed rate
Insufficient cutting speed	-	Increase cutting speed

Tool breakage

Failure criterion		Solution
Feed rate too high	-	Reduce feed rate
Bad chip evacuation (chip jamming)	-	Adapt coolant and cutting parameters
Excessive tool wear	-	Adapt interval of tool change
Incorrect cutting parameters	-	See recommended cutting parameters
Unstable work piece clamping	-	Check work piece clamping
Insufficient coolant supply	-	Increase coolant pressure and ensure optimal coolant supply

Problem							
Quality of the hole					Chip formation		
Bad surface quality	Hole too large	Hole too small	Varying precision	Non-circular hole	Long chips	Bad chip evacuation	**Causes and corrective measures**
≈	≈			≈			Radial run-out error adapter/tool holder
≈	≈			≈			Radial run-out error spindle
		⇩	⇩			⇩	Cutting speed
		⇧	⇩	⇩	⇧		Feed rate
≈		⇧	⇧			⇧	Coolant
	≈	≈					Nominal tool diameter
≈	≈	≈	≈	≈	≈	≈	Drill type

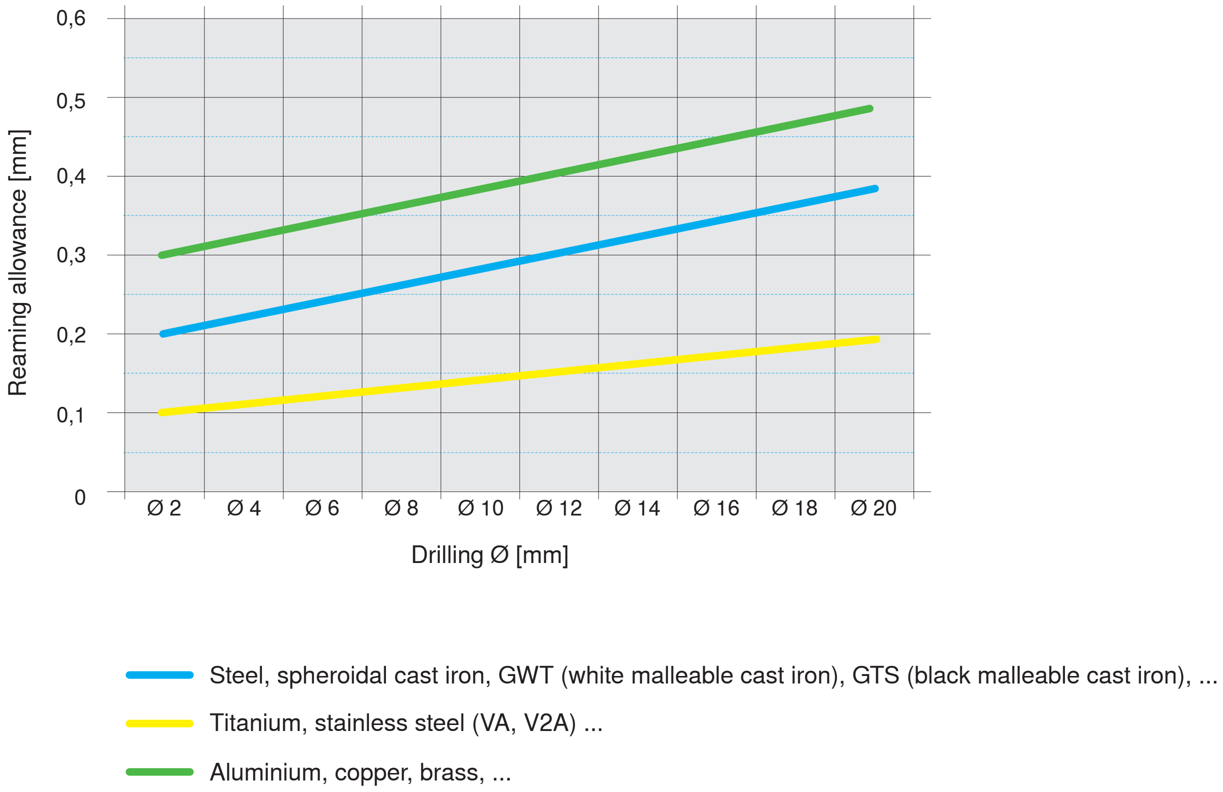
⇧	raise, increase
⇩	lower, decrease
≈	check, optimise

Technical information

Application data - reaming

In order to achieve an optimal machining result, it is necessary to maintain a minimum chip thickness. The reaming allowance for the calculation of the rough machining diameter must be chosen in relation to the nominal diameter of the hole and the material that has to be machined.

The recommended values of the reaming allowance are listed in the diagram below.



Problem							
Bad hole quality					Tool wear		
Bad surface quality	Hole too large	Hole too small	Tapered hole	Non-circular hole	Reamer jams	Reamer breaks	**Causes and corrective measures**
≈	≈		≈	≈			Radial run-out error of reamer
≈	≈		≈	≈			Radial run-out error adapter/tool holder
≈	≈		≈	≈			Radial run-out error spindle
⇩	⇩	⇧					Cutting speed
⇧	⇩	⇧				⇩	Feed rate
≈		≈					Use high viscosity coolant or cutting oil
	≈						Coolant too viscous
	≈	≈			≈	≈	Check tool dimensions
≈	≈		≈	≈			Incorrect initial cut
≈					≈	≈	Radial land too wide
≈		≈					Reamer is dull
		≈					Ductile material
≈		≈			≈	≈	Insufficient machining allowance
			≈	≈			Pilot hole and reamer axis are not aligned
			≈	≈			Use a floating tool holder
					≈	≈	Material tends to jam; use spiral reamer
≈		≈					Provide with coating

⇧	raise, increase
⇩	lower, decrease
≈	check, optimise

Tools and inserts for turning

Tools and inserts for milling

Tools and inserts for drilling

Notes

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