CUTTING SOLUTIONS BY CERATIZIT

PROGRAMME EXTENSIONS
CUTTING TOOLS
2016.2

EN

CUTTING SOLUTIONS BY
CERATIZIT


ECC 16R-1.5D 08
XC.T 0804...

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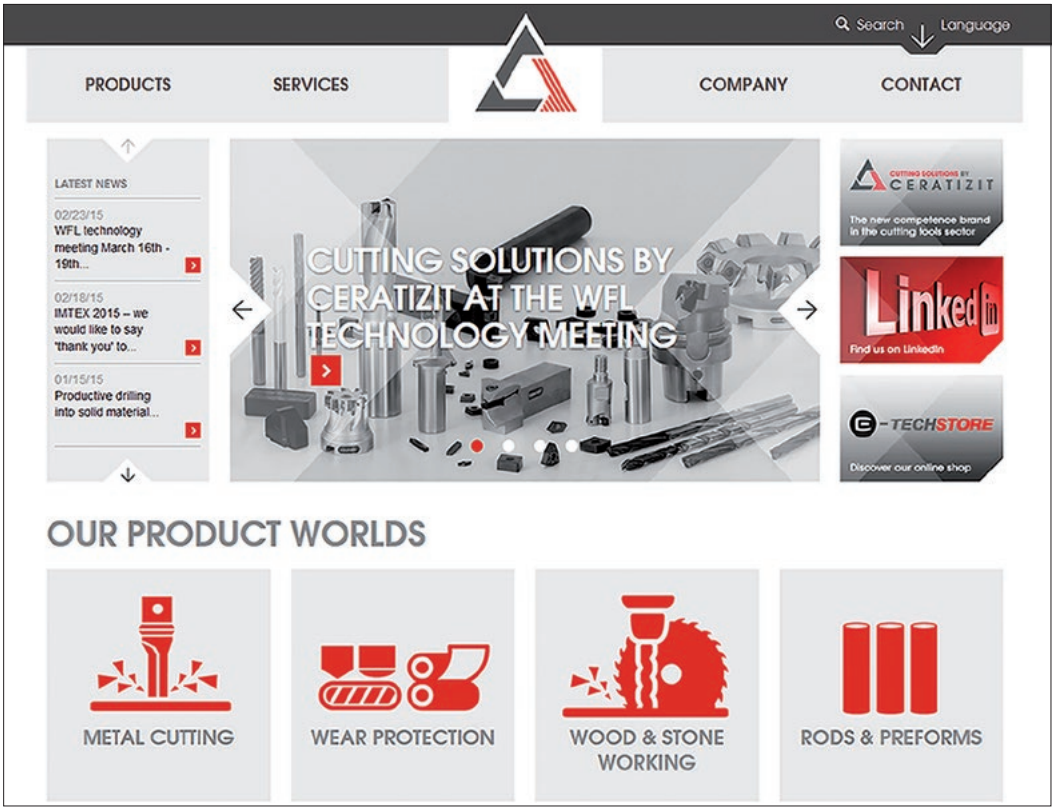
Online service

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.



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.

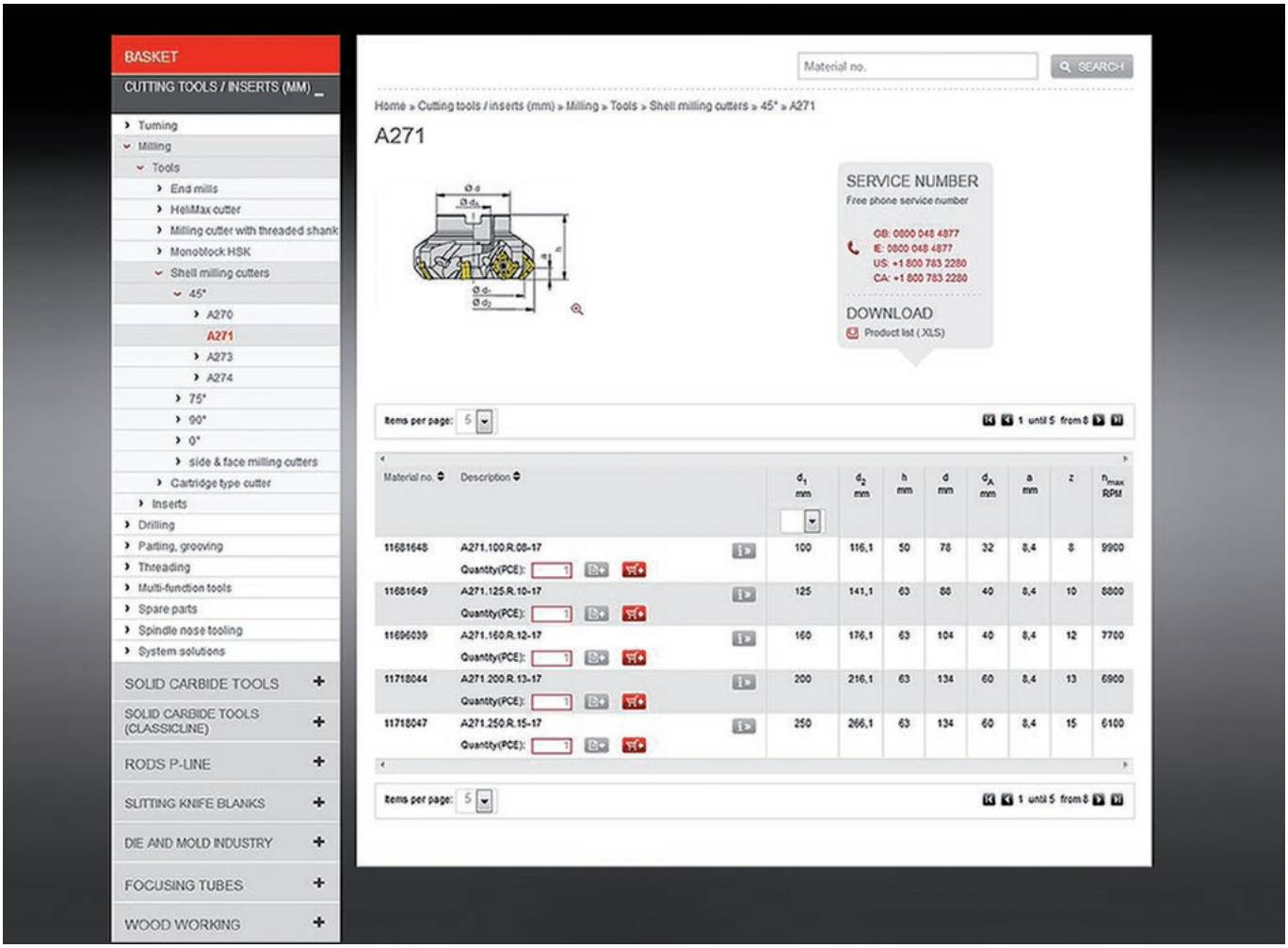
E-TECHSTORE

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.



CONFIGURATE

Your customised tool

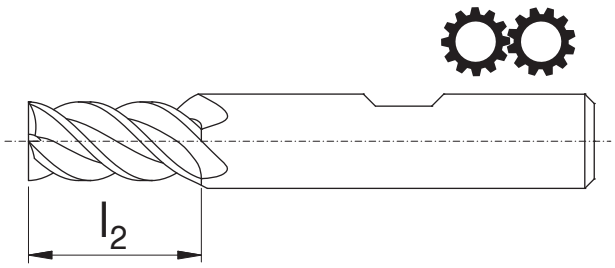
Using the online solution CONFIGURATE, it is possible to configure a customised semi-standard tool with only a few mouse clicks.

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

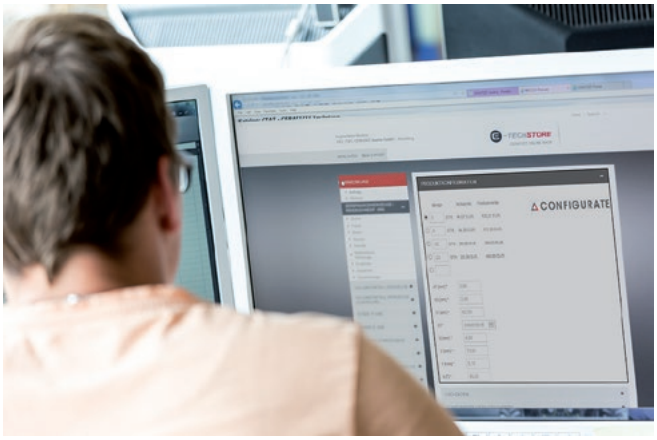
- Offers and orders of individual tools - as fast and easy as for any standard tool.
- Availability 24 hours a day. Order regardless of business hours, thanks to fully automated processing.
- Easy to use thanks to menu-guided navigation: obtain your individual tool in just a few steps.
- Optimised for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

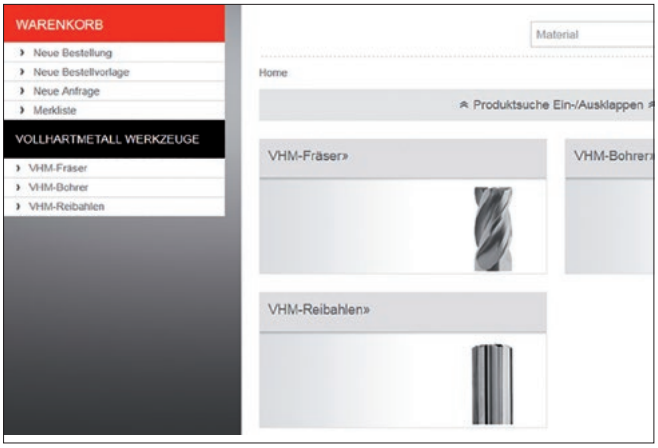
d_1 [mm]*	10,00
d_3 [mm]*	9,50
l_1 [mm]*	72,00
ST*	DIN6535HB
l_2 [mm]*	15,00
l_3 [mm]*	30,00
F [mm]*	0,20
a [mm]*	45,00

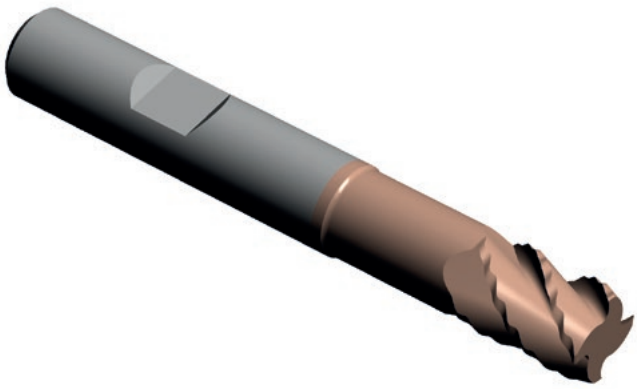


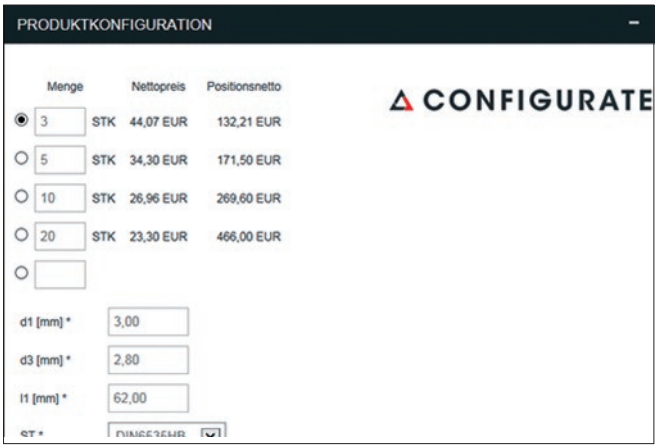
What to do:

- 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.









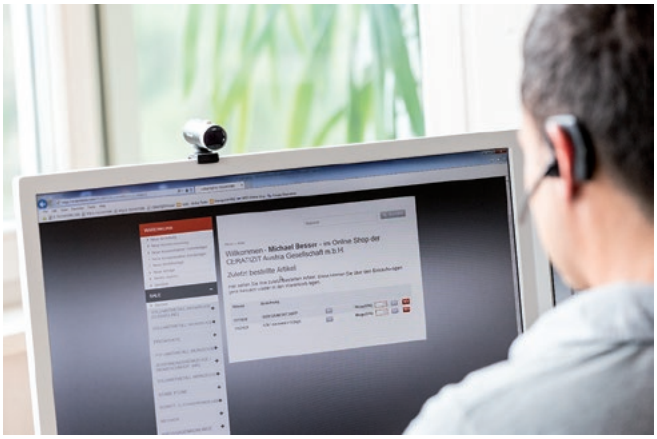
Any questions? Feel free to contact us!
E-mail: **configurate@ceratizit.com**

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**

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.

The new CERATIZIT grade universe

As one of the most competent partners when it comes to cutting tools technology, CERATIZIT continuously optimises and revises the grade range for milling, drilling, turning, parting and grooving.

The universe

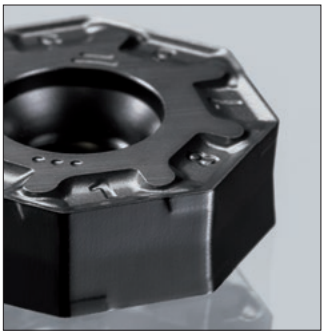
Within the universe, several galaxies represent the applications (milling, turning, drilling, parting and grooving). Every galaxy then consists of single solar systems. Each of these systems contains their own solutions for special requirements. Immersing ourselves deeper into the planetary systems, and taking a closer look at the planets they reveal themselves as our unique grade coatings - the 'Stars'.

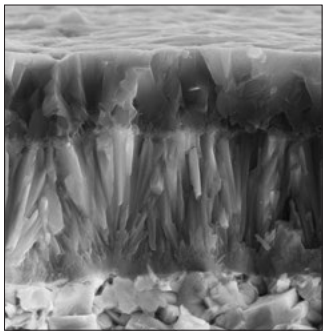
The 'STARS'

Each of the STARS is easily recognisable by the colour of its coating and shows its strengths in the machining of specific materials and in determined applications.

BLACKSTAR™

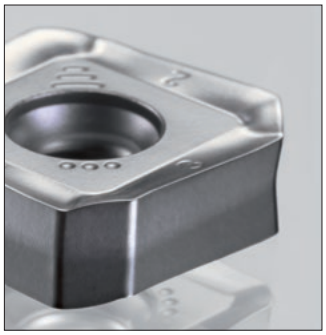
The BLACKSTAR™ grades are highly wear-resistant thanks to their TiN/TICN/Al_2O_3 coatings. Due to their excellent adhesion, these coatings are particularly suitable for the machining of steel and cast iron.

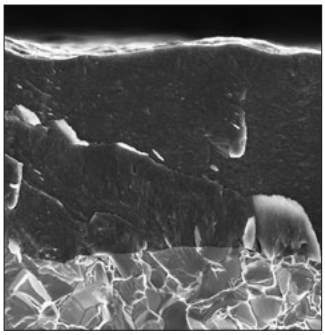




SILVERSTAR™

For high cutting performance in interrupted cutting actions or with difficult to machine materials, SILVERSTAR™ grades are the first choice.



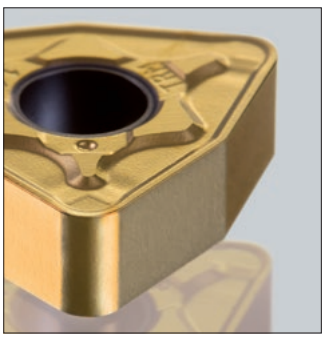


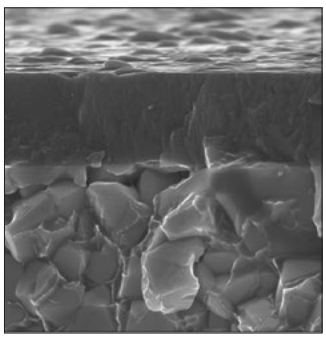
GOLDSTAR™

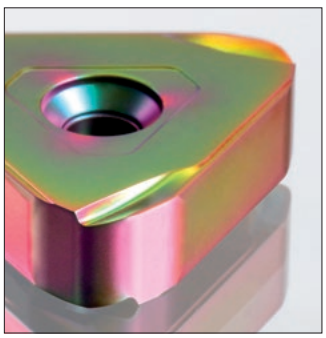
This all-rounder among coatings is suitable for a variety of machining operations and numerous materials. GOLDSTAR™ is characterised by the diverse application possibilities and good wear recognition through the golden-yellow colour.

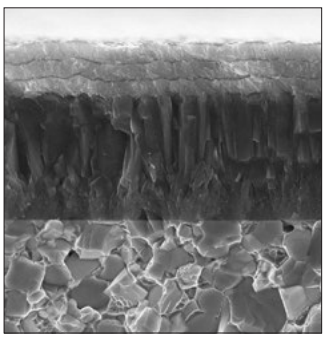
COLORSTAR™

When a combination of wear resistance and toughness is required, the multi-oxide layers of COLORSTAR™ can demonstrate their strengths. They increase reliability and edge stability with medium to high cutting speeds.

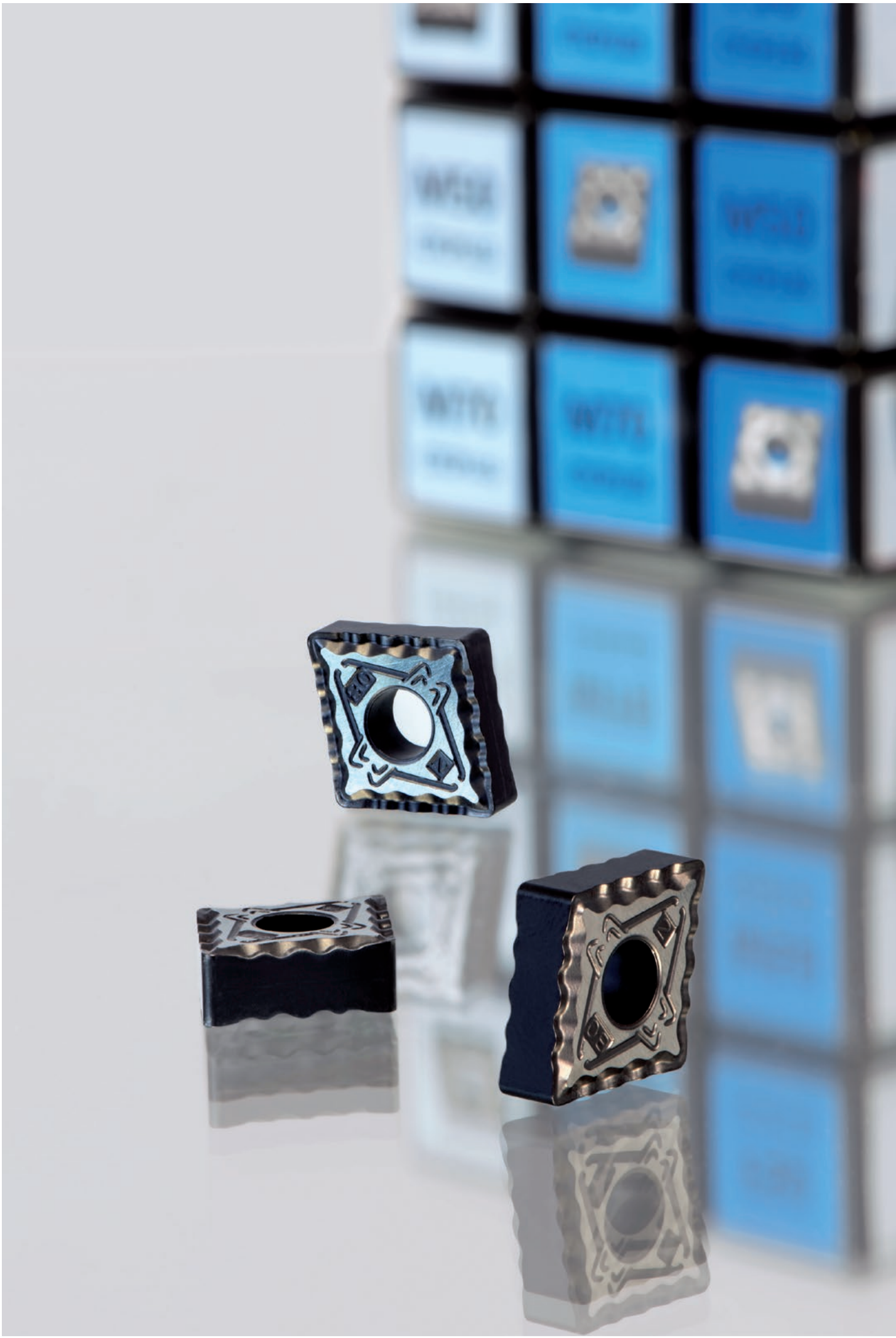




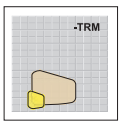




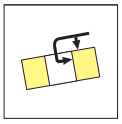
CUTTING SOLUTIONS BY CERATIZIT



Introduction

	Product extensions	#R01#
	Grade overview and description	#R02#
	Chip grooves	#R03#

Inserts

	MaxiLock D/N	#R01#

Technical information

	Cutting data	#R01#

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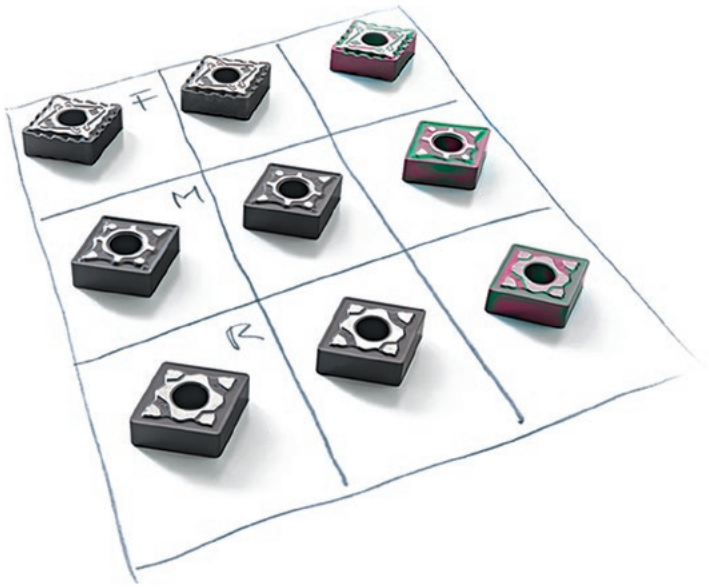
CERATIZIT 3x3 - the complete package for the turning of steel

Turning of steel is one of the most frequent machining operations. To meet the many requirements in this field, a wide range of grades, geometries and tools is necessary. Finding an optimal solution can be a challenge here.



An intelligent combination - this is how you achieve maximum productivity

Discover our new CERATIZIT 3x3. From now on we offer you an innovative total package for the turning of steel. Choose the most economical solution from an extremely well-structured product portfolio.

For every requirements profile our 3x3 will reliably and quickly tell you the intelligent combination of grade, chip groove and machining parameters. In this way you always receive the best suited tool for achieving maximum productivity. From roughing to finishing you will come a very big step closer to the optimum. Try for yourself! All important information can be found on the following pages...

CERATIZIT 3x3: 3 grades - 3 chip grooves

With the introduction of the new finishing geometry -F50 the entire steel machining range has been revised. With 3 grades and 3 chip grooves all machining situations for steel are covered.

This user-friendly concept enables quick selection of a suitable combination of grades and geometries for any kind of machining situation.

	P15	P25	P35
F	-F50 CTCP115	-F50 CTCP125	-F50 CTCP135
M	-M50 CTCP115	-M50 CTCP125	-M50 CTCP135
R	-M70 CTCP115	-M70 CTCP125	-M70 CTCP135

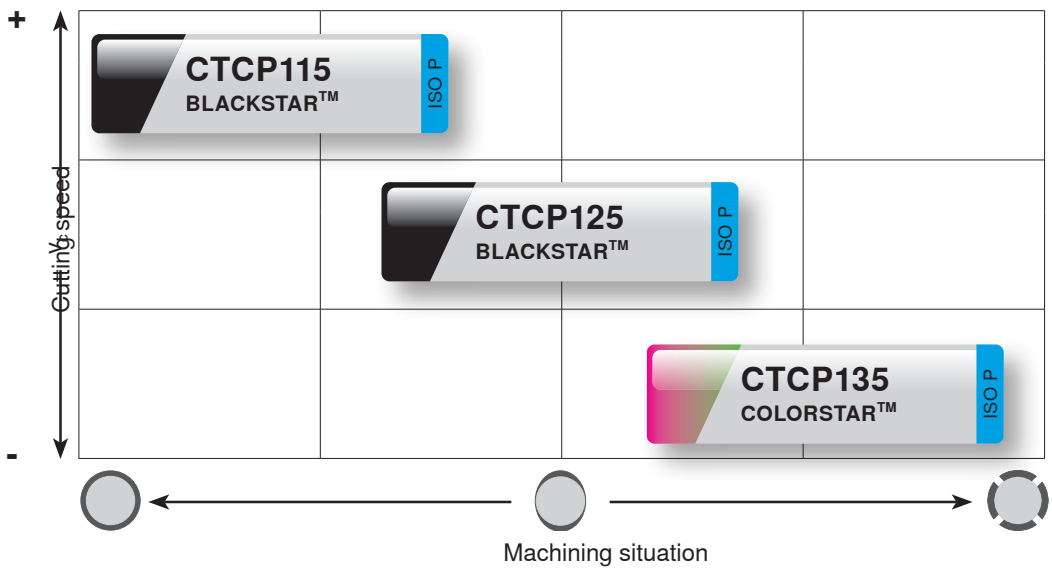
Your advantages

- ▲ Three grades cover all steel machining applications
- ▲ Complete, well-structured programme
- ▲ BLACKSTAR™ CTCP115 – highly wear-resistant grade for high cutting parameters
- ▲ BLACKSTAR™ CTCP125 - universal grade for all applications including slightly interrupted cut
- ▲ COLORSTAR™ CTCP135 – tough grade for interrupted cut and difficult conditions
- ▲ Ground contact face

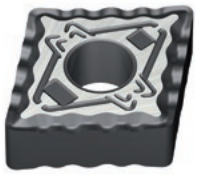
Your benefits

- ▲ Reduced stock inventory, resulting in lower costs
- ▲ Easy selection of the correct insert
- ▲ For a wide application field in steel machining
- ▲ For maximum process security and consistent quality
- ▲ Higher mechanical stability of the tool holder ensures process security even under extremely difficult machining conditions

The 3 grades



The 3 chip grooves

-F50 the fine-cutting chip groove	**F**		
-M50 the universal chip groove	**M**		
-M70 the stable chip groove	**R**		

Negative inserts

With only 3 chip grooves, the new 3x3 concept focuses on a targeted selection of the right insert: -F50 for finishing, -M50 for medium machining and -M70 for roughing. The user-friendly concept thus offers you perfectly adapted chip grooves for all applications and machining situations in the field of steel turning.

-F50

- ▲ Chip groove for finish-machining of steels and stainless steels
- ▲ Very good chip control
- ▲ High surface quality

-M50

- ▲ Medium machining
- ▲ First choice for steel machining
- ▲ Universal application
- ▲ Wide application range

-M70

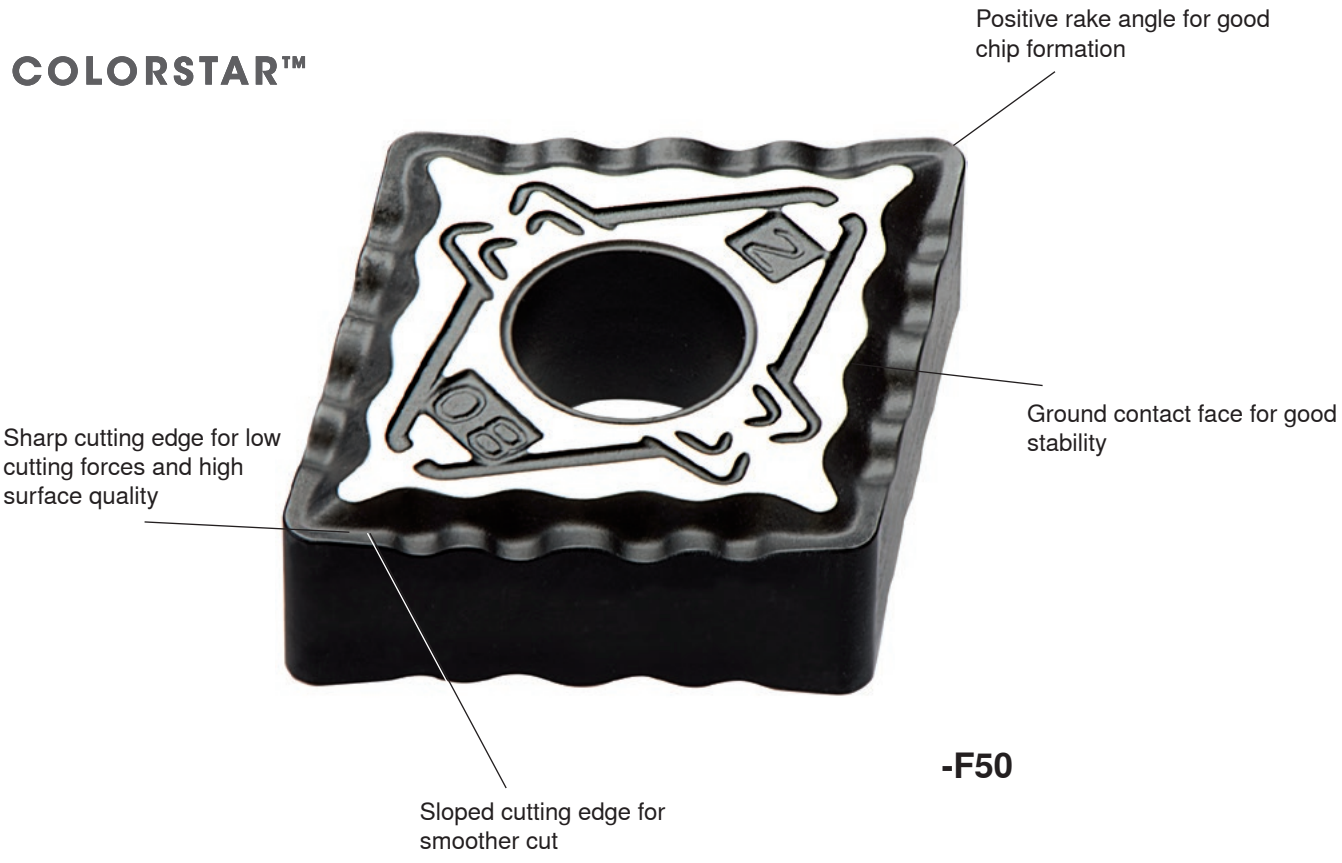
- ▲ Light to medium-rough machining
- ▲ Interrupted cut
- ▲ Cast skin and forging skin
- ▲ Blanks and forged parts

The new -F50

The finishing geometry -F50 for steel and stainless steel is new in the range and completes CERATIZIT 3x3. It offers excellent chip control together with a high surface quality. The ground contact face increases stability. The sharp cutting edge guarantees a smooth cut and low cutting forces.

BLACKSTAR™

COLORSTAR™

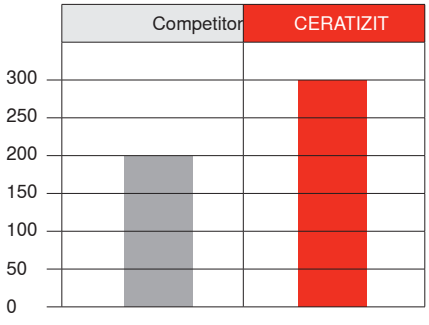


A practical example

Work piece: bearing / 100Cr6

Cutting data	Competitor	CERATIZIT
Geometry	–	-F50
Grade	–	CTCP125
v_c (m/min)	250	300
f (mm/rev)	0,2 – 0,3	0,3 – 0,35
a_p (mm)	1	1
Quantity	200	**300**

Quantity



+50%

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
CTCP115	HC-P15	C7	C		●					
	HC-K25	C2	C				●			
	HC-M10	-	C			○				
CTCP125	HC-P25	C6	C		●					
	HC-K30	C1	C				●			
	HC-M20	-	C			○				
CTCP135	HC-P35	C5	C		●					
	HC-M25	-	C			○				
	HC-S25	-	C						○	

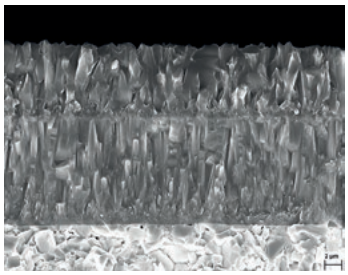
● Main application

○ Extended application

CTCP115

HC-P15 | HC-K25 | HC-M10

● ● ○



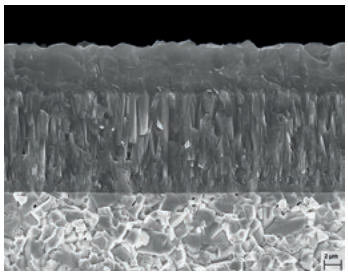
Specification:
Composition: Co 5.8%; mixed carbides 6.4%; WC balance | Grain size: 1 - 2 µm | Hardness: HV_{30} 1550 | Coating specification: CVD TiCN-Al_2O_3

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

CTCP125

HC-P25 | HC-K30 | HC-M20

● ● ○



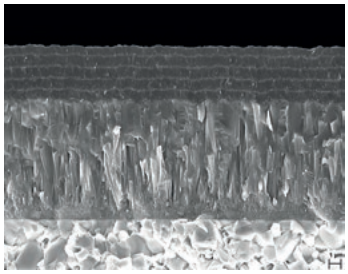
Specification:
Composition: Co 7.0%; mixed carbides 8.0%; WC balance | Grain size: 1 - 2 µm | Hardness: HV_{30} 1450 | Coating specification: CVD TiCN-Al_2O_3

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

CTCP135

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

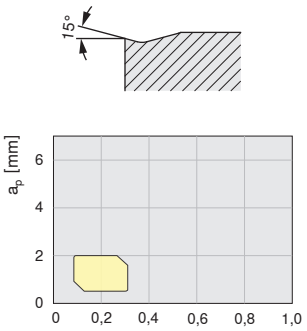
Recommended application:
The tough alternative for heavily interrupted cutting action.

Chip grooves for negative/positive inserts

-F50

- Chip groove for finish machining
- Steel and stainless steel
- Very good chip control
- High surface quality

CNMG 120408..



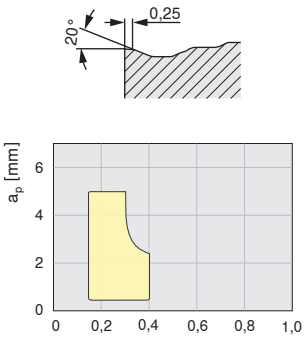
Machining conditions

CTCP115	**CTCP125**	**CTCP135**
CTCP115	**CTCP125**	**CTCP135**

-M50

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

CNMG 120408..



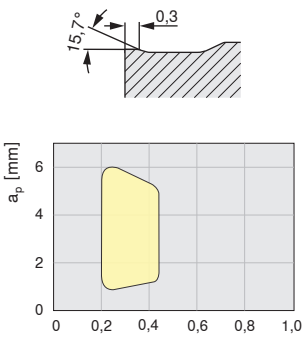
Machining conditions

CTCP115	**CTCP125**	**CTCP135**
CTCP115	CTCP135	CTCP135
CTCK110	**CTCK120**	**CTCK120**

-M70

- Light to medium roughing
- Cast skin and forging skin
- Stable cutting edge
- Interrupted cut
- For blanks and forged parts

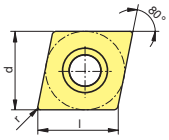
CNMG 120408..

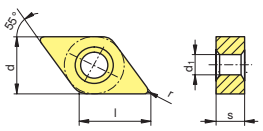


Machining conditions

CTCP115	**CTCP125**	**CTCP135**
CTCP125	**CTC2135**	**CTC2135**
CTCK110 CTCP115	**CTCK120**	**CTCK120**

			CTCP115	CTCP125	CTCP135	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-F50		CNMG 090304EN-F50	●	●	●	9.52	9.70	3.18	0.40	3.81
		CNMG 090308EN-F50	●	●	●	9.52	9.70	3.18	0.80	3.81
		CNMG 120404EN-F50	●	●	●	12.70	12.90	4.76	0.40	5.16
		CNMG 120408EN-F50	●	●	●	12.70	12.90	4.76	0.80	5.16
		CNMG 120412EN-F50	●	●	●	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
-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
-F50		DNMG 110404EN-F50	●	●	●	9.52	11.60	4.76	0.40	3.81
		DNMG 110408EN-F50	●	●	●	9.52	11.60	4.76	0.80	3.81
		DNMG 110412EN-F50	●	●	●	9.52	11.60	4.76	1.20	3.81
		DNMG 150404EN-F50	●	●	●	12.70	15.50	4.76	0.40	5.16
		DNMG 150408EN-F50	●	●	●	12.70	15.50	4.76	0.80	5.16
		DNMG 150412EN-F50	●	●	●	12.70	15.50	4.76	1.20	5.16
		DNMG 150604EN-F50	●	●	●	12.70	15.50	6.35	0.40	5.16
		DNMG 150608EN-F50	●	●	●	12.70	15.50	6.35	0.80	5.16
		DNMG 150612EN-F50	●	●	●	12.70	15.50	6.35	1.20	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
			CTCP115	CTCP125	CTCP135	d	l	s	r	d_1



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MaxiLock D/N

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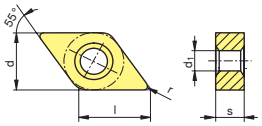
			CTCP115	CTCP125	CTCP135	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-M70		DNMG 110408EN-M70	●	●	●	9.52	11.60	4.76	0.80	3.81
		DNMG 110412EN-M70	●	●	●	9.52	11.60	4.76	1.20	3.81
		DNMG 150408EN-M70	●	●	●	12.70	15.50	4.76	0.80	5.16
		DNMG 150412EN-M70	●	●	●	12.70	15.50	4.76	1.20	5.16
		DNMG 150416EN-M70	●	●	●	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
			CTCP115	CTCP125	CTCP135	d	l	s	r	d_1



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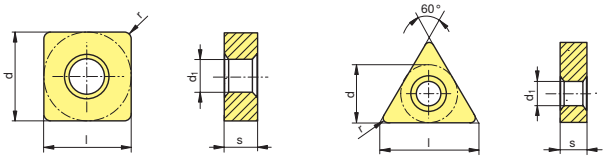
			CTCP115	CTCP125	CTCP135	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-F50		SNMG 090308EN-F50	●	●	●	9.52	9.52	3.18	0.80	3.81
		SNMG 120404EN-F50	●	●	●	12.70	12.70	4.76	0.40	5.16
		SNMG 120408EN-F50	●	●	●	12.70	12.70	4.76	0.80	5.16
		SNMG 120412EN-F50	●	●	●	12.70	12.70	4.76	1.20	5.16
-M50		SNMG 120408EN-M50	●	●	●	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 150608EN-M50	●	●	●	15.88	15.88	6.35	0.80	6.35
		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
-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
-F50		TNMG 110304EN-F50	●	●	●	6.35	11.00	3.18	0.40	2.26
		TNMG 160404EN-F50	●	●	●	9.52	16.50	4.76	0.40	3.81
		TNMG 160408EN-F50	●	●	●	9.52	16.50	4.76	0.80	3.81
		TNMG 160412EN-F50	●	●	●	9.52	16.50	4.76	1.20	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
-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
			CTCP115	CTCP125	CTCP135	d	l	s	r	d_1



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MaxiLock D/N

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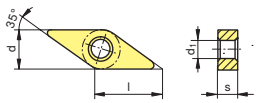
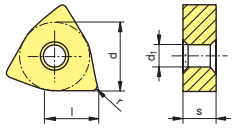
			P	M	K	N	S	H	CTCP115	CTCP125	CTCP135	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
-F50		VNMG 160404EN-F50	●	○	●				●	●	●	9.52	16.60	4.76	0.40	3.81
		VNMG 160408EN-F50	●	○	●				●	●	●	9.52	16.60	4.76	0.80	3.81
-M50		VNMG 160404EN-M50	●	●					●	●		9.52	16.60	4.76	0.40	3.81
		VNMG 160408EN-M50	●	●					●	●		9.52	16.60	4.76	0.80	3.81
		VNMG 160412EN-M50	●	●					●	●		9.52	16.60	4.76	1.20	3.81
-F50		WNMG 060404EN-F50	●	○	●				●	●	●	9.52	6.50	4.76	0.40	3.81
		WNMG 060408EN-F50	●	○	●				●	●	●	9.52	6.50	4.76	0.80	3.81
		WNMG 080404EN-F50	●	○	●				●	●	●	12.70	8.69	4.76	0.40	5.16
		WNMG 080408EN-F50	●	○	●				●	●	●	12.70	8.69	4.76	0.80	5.16
		WNMG 080412EN-F50	●	○	●				●	●	●	12.70	8.69	4.76	1.20	5.16
-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
-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
									CTCP115	CTCP125	CTCP135	d	l	s	r	d_1





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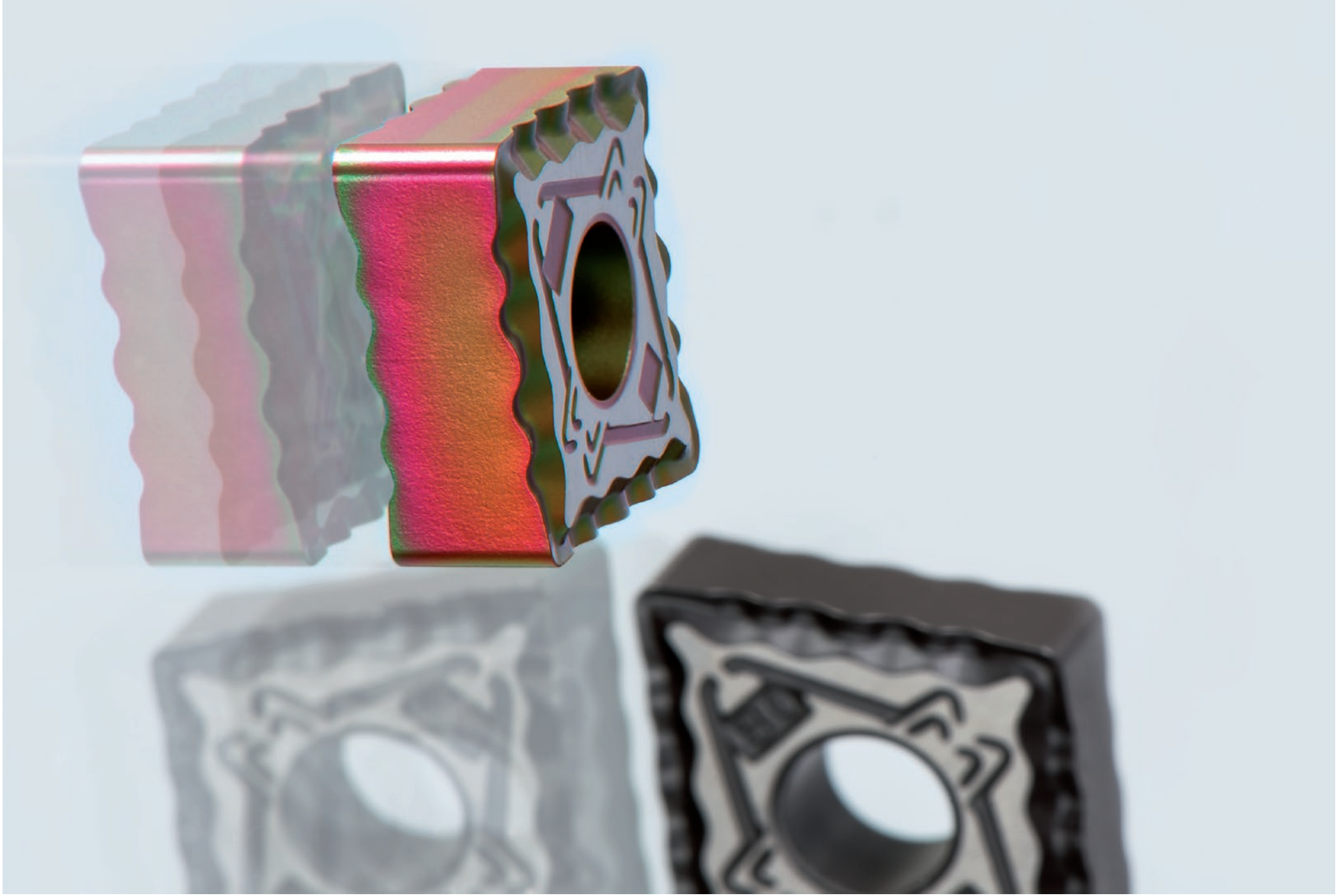


Cutting data

	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

CTCP115 v_c [m/min]	CTCP125 v_c [m/min]	CTCP135 v_c [m/min]
250 - 500	190 - 290	160 - 210
220 - 400	170 - 240	150 - 170
180 - 300	130 - 200	110 - 130
250 - 400	170 - 250	150 - 170
200 - 320	100 - 190	80 - 130
150 - 280	80 - 170	60 - 110
180 - 320	130 - 210	100 - 180
120 - 280	80 - 160	40 - 80
200 - 320	130 - 220	120 - 160
150 - 280	110 - 190	90 - 140
220 - 300	140 - 210	120 - 180
	100 - 210	90 - 170
		70 - 130
	70 - 100	40 - 60
140 - 370	130 - 210	
140 - 330	120 - 200	
190 - 350	120 - 240	
140 - 270	120 - 200	
180 - 320	150 - 250	
150 - 270	120 - 200	

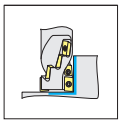
The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

Introduction

Product extensions #R01#

Grade overview and description #R02#

Types of milling



MaxiMill 491 shoulder milling #R01#

Technical information

Cutting data #R01#

Spare parts #R02#

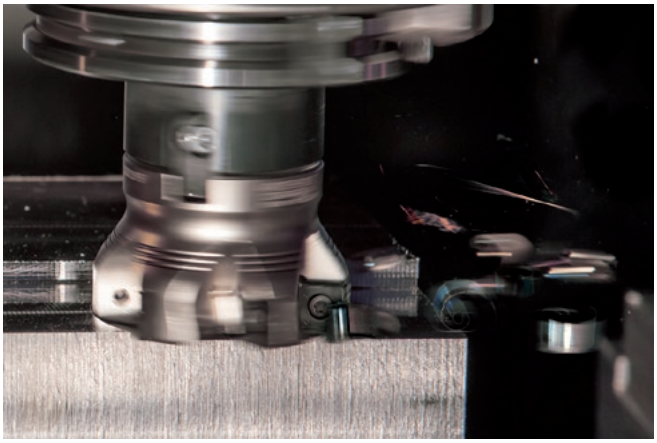
Index

Index #R01#

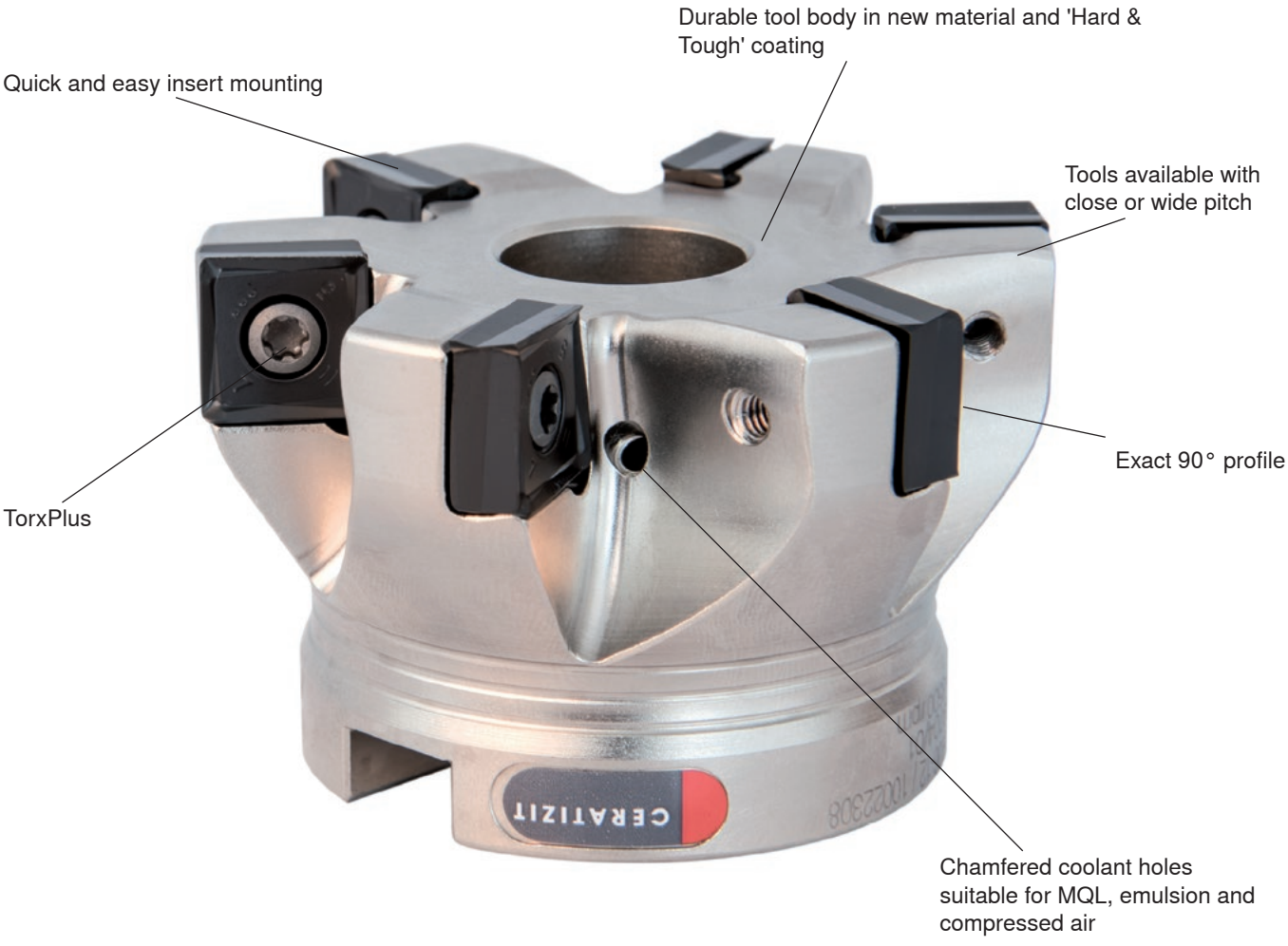
MaxiMill 491
The new 90° shoulder milling system

The new MaxiMill 491 shoulder milling system from Cutting Solutions by CERATIZIT features 8 usable cutting edges per insert and shows excellent performance, quality and price-performance ratio.

Thanks to the latest grinding technology, the precision inserts can be produced with tolerance H. This enhances the service life of the cutting edge, allowing top-quality surfaces to be achieved on your component.



Reduced vibration is a particular advantage when it comes to low-power machines and thin-walled, unstable components.

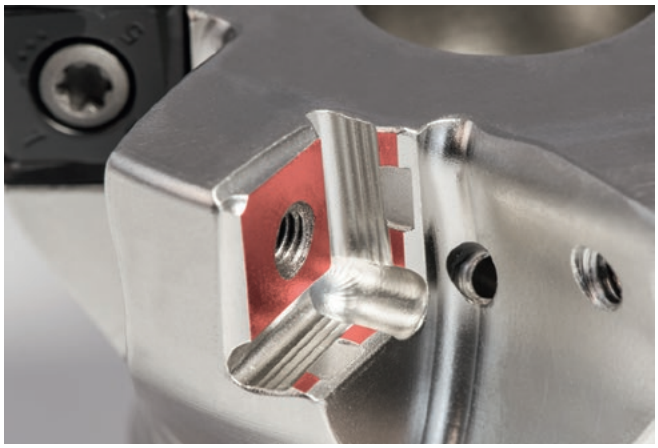


Your advantages

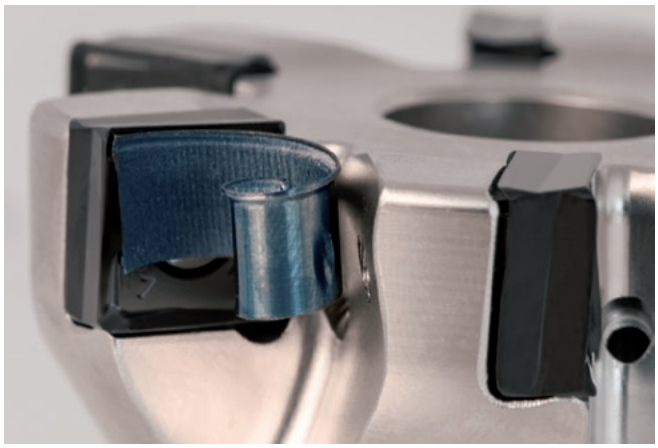
- ▲ Exact 90° profile with 8 usable cutting edges per insert
- ▲ Ground precision insert with tolerance H
- ▲ Smooth cut with low power consumption
- ▲ Outstanding surface quality
- ▲ Universal application (e.g. face milling, shoulder milling, peripheral milling, slot milling, trochoidal slot milling)
- ▲ Tools with irregular pitch for minimum vibration during the milling operation
- ▲ Optimum chip evacuation
- ▲ Coolant arrives directly on the cutting edge; emulsion, MQL or compressed air can be used

Your benefits

- ▲ Excellent economic efficiency regarding the price per cutting edge for 90° shoulder milling
- ▲ Exact 90° profile
- ▲ Perfect axial run-out precision and concentricity
- ▲ Very good suitability for low-power machines
- ▲ Quick and easy loading of the milling cutter possible



Maximum repeatability thanks to innovative insert design with generous contact faces



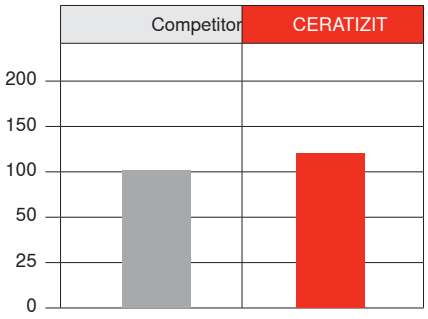
Perfectly adapted chip pockets

A practical example

Spheroidal cast iron

	Competitor	CERATIZIT
Milling cutter	–	A491.80.R.08-12
Insert	–	SNHU 12048SR-R50
Grade	–	CTPK220
Cutting edge/insert	4	**8**
V_c [m/min]	301	301
V_f [mm/rev]	1200	1200
a_p [mm]	0,5	0,5
Quantity	100	**120**

Quantity



+20%

Insert start programme

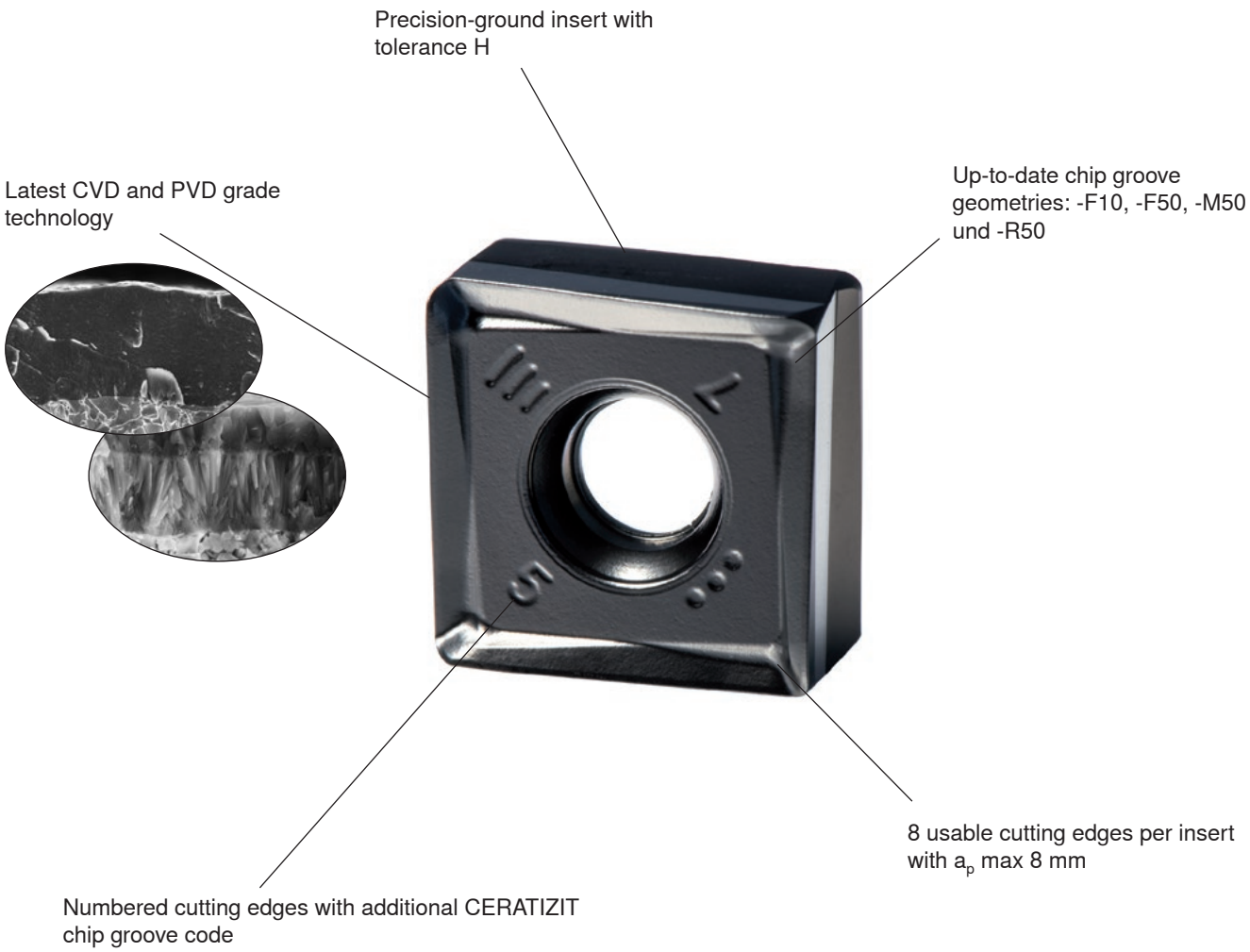
The insert start programme for ISO P steel, ISO K cast iron and ISO M stainless steel machining features the latest BLACKSTAR™ and SILVERSTAR™ manufacturing technology. For the machining of aluminium, the proven CTWN215 grade is used.

▲ Extended range of corner radii 1.2 mm - 1.6 mm - 2.0 mm

In addition to corner radius 0.8 mm the product range has been extended with the corner radii 1.2 mm, 1.6 mm and 2.0 mm.

BLACKSTAR™

SILVERSTAR™



MaxiMill 491 - product launch

The product launch of MaxiMill 491 will start with a 12 mm assembly size and includes Ø ranging from 32-160 mm. Cutting Solutions by CERATIZIT offers you shell milling cutters, end mills and milling cutters with threaded shank. The end milling cutters are available with a wide or narrow pitch. The F-M-R chip grooves combined with the latest grade technology cover applications for a variety of materials ranging from steel to cast iron, stainless steels (ISO P K M) and aluminium.

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
CTCP230 BLACKSTAR™	HC-P30	C6	C		●					
	HC-K25	C2	C				●			
	HC-M25	-	C			○				
CTPP235 SILVERSTAR™	HC-P35	C5	P		●					
	HC-M30	-	P			○				
CTPM240 SILVERSTAR™	HC-M40	-	P			●				
	HC-P40	C5	P		○					
CTCK215 BLACKSTAR™	HC-K15	C3	C				●			
CTPK220 SILVERSTAR™	HC-K20	C2	P				●			
CTWN215	HW-N15	C3	W					●		
	HW-K15	C3	W				●			

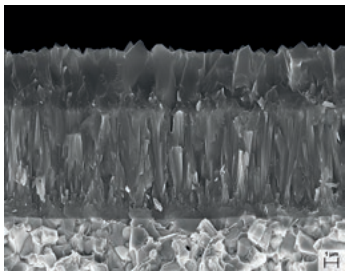
● Main application

○ Extended application

CTCP230
BLACKSTAR™

HC-P30 | HC-K25 | HC-M25

● ● ○



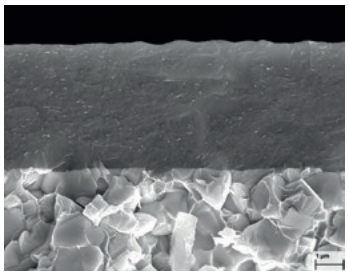
Specification:
Composition: Co 10.5%; mixed carbides 2.0%; WC balance | Grain size: 1-2 µm | Hardness: HV_{30} 1400 | Coating specification: CVD TiCN-Al_2O_3

Recommended application:
First choice for dry machining of steels at high cutting speeds.

CTPP235
SILVERSTAR™

HC-P35 | HC-M30

● ○



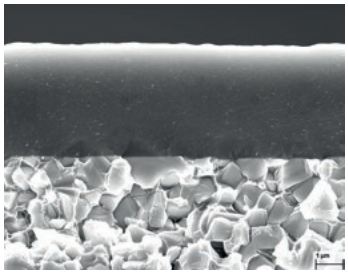
Specification:
Composition: Co 10.5%; mixed carbide 2.0%; WC balance | Grain size: 1-2 µm | Hardness: HV_{30} 1400 | Coating specification: PVD TiAlTaN

Recommended application:
Particularly suitable for the wet machining of steels.

CTPM240
SILVERSTAR™

HC-M40 | HC-P40

● ○



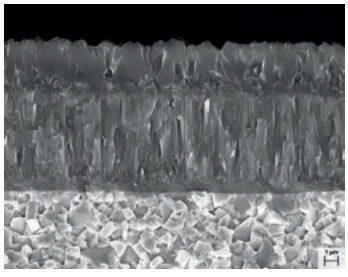
Specification:
Composition: Co 12.5%; mixed carbides 2.0%; WC balance | Grain size: 1 µm | Hardness: HV_{30} 1380 | Coating specification: PVD TiAlTaN

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

CTCK215
BLACKSTAR™

HC-K15

●

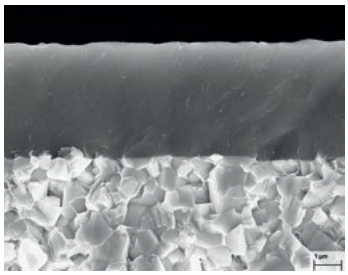


Specification:
Composition: Co 6.0%; mixed carbides 2.0%; WC balance | Grain size: 1 µm | Hardness: HV_{30} 1630 | Coating specification: CVD TiN; MT-TiCN; Al_2O_3

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

Grade description

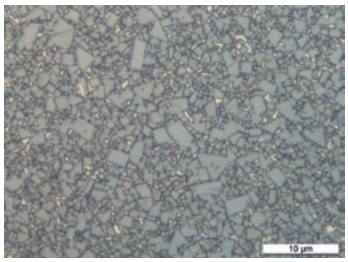
CTPK220 SILVERSTAR™	HC-K20	●



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.

CTWN215	HW-N15 | HW-K15	● ●



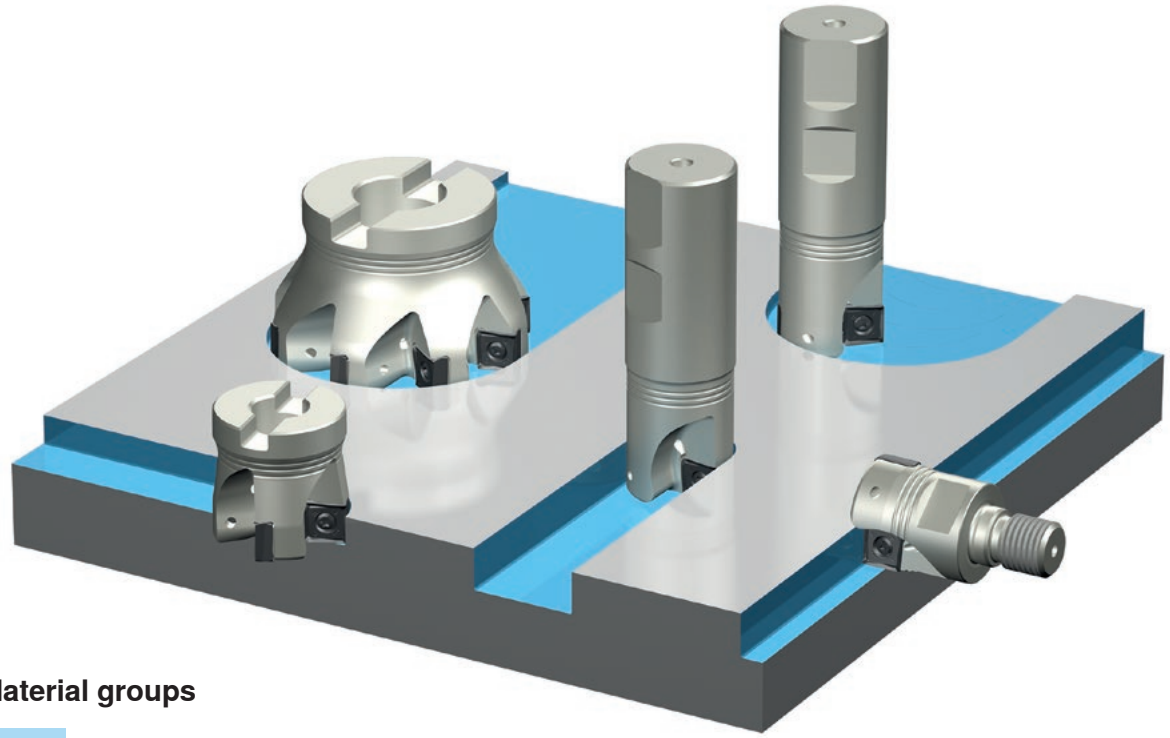
Specification:
Composition: Co 6.0%; others 0.2%; WC balance | Grain size: submicron | Hardness: HV_{30} 1650

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

Notes

90° shoulder milling system with 8 cutting edges per insert

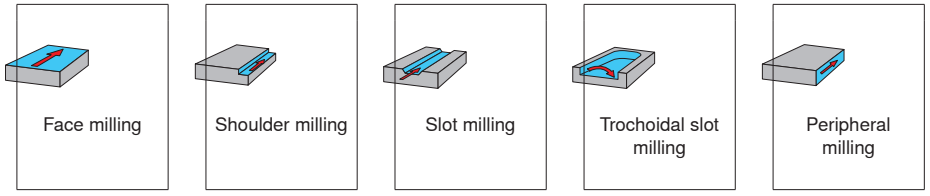
- ○ Exact 90° profile
- ○ Easy handling
- ○ Ground precision insert with tolerance H



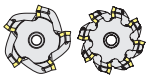
Material groups

P	●
M	○
K	●
N	●
S	
H	

Possible applications



Detailed information

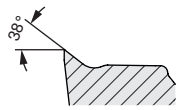
Pitch	Ø range	Inserts
	Ø 32 - 160 mm	SNHU 12..

MaxiMill 491 system

Geometry overview

-F10

- Highly positive geometry
- Sharp cutting edge
- Low tendency to adhesion
- First choice for non-ferrous metals



f_z [mm]

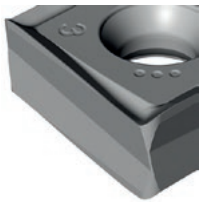
0,05 - 0,25

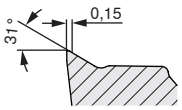
Machining conditions

CTWN215		
CTWN215	**CTWN215**	**CTWN215**

-F50

- Positive geometry
- Finishing and roughing
- First choice for stainless steel materials





f_z [mm]

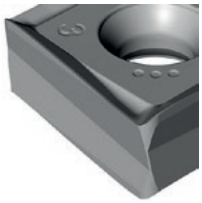
0,10 - 0,20

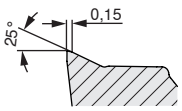
Machining conditions

CTPM240	**CTPM240**	

-M50

- Universal geometry
- Light to medium roughing operations
- First choice for general steel materials





f_z [mm]

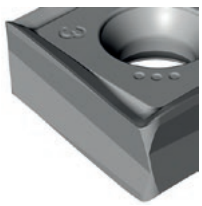
0,10 - 0,25

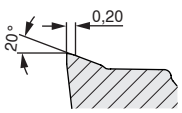
Machining conditions

	CTCP230 CTPP235	CTCP230 **CTPP235**
	CTPM240	**CTPM240**

-R50

- Stable geometry
- Roughing
- For heavily interrupted cut
- First choice for cast iron materials



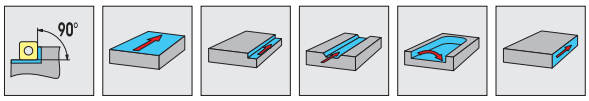


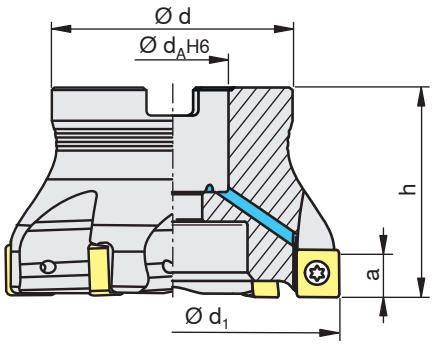
f_z [mm]

0,10 - 0,30

Machining conditions

	CTCK215 CTPK220	CTCK215 **CTPK220**



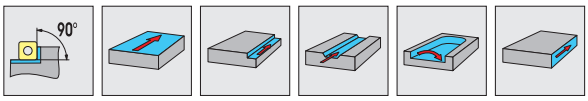


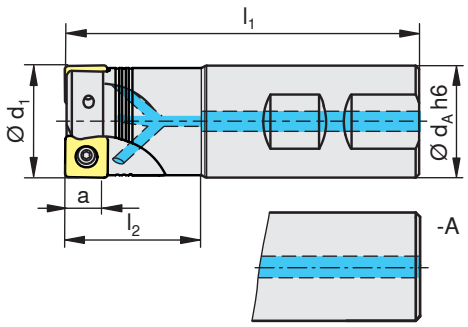
d_1 [mm]	Type, description	h [mm]	d [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
40	A491.40.R.03-12	40	38	16	8	3	11500	3.2	SNHU 1204..	E01
40	A491.40.R.04-12	40	38	16	8	4	11500	3.2	SNHU 1204..	E01
50	A491.50.R.04-12	40	43	22	8	4	9800	3.2	SNHU 1204..	E02
50	A491.50.R.05-12	40	43	22	8	5	9800	3.2	SNHU 1204..	E02
63	A491.63.R.05-12	40	48	22	8	5	8500	3.2	SNHU 1204..	E02
63	A491.63.R.06-12	40	48	22	8	6	8500	3.2	SNHU 1204..	E02
80	A491.80.R.06-12	50	58	27	8	6	7400	3.2	SNHU 1204..	E02
80	A491.80.R.08-12	50	58	27	8	8	7400	3.2	SNHU 1204..	E02
100	A491.100.R.07-12	50	78	32	8	7	6500	3.2	SNHU 1204..	E02
100	A491.100.R.10-12	50	78	32	8	10	6500	3.2	SNHU 1204..	E02
125	A491.125.R.08-12	63	88	40	8	8	5700	3.2	SNHU 1204..	E02
125	A491.125.R.12-12	63	88	40	8	12	5700	3.2	SNHU 1204..	E02
160	A491.160.R.09-12	63	98	40	8	9	5000	3.2	SNHU 1204..	E02
160	A491.160.R.14-12	63	98	40	8	14	5000	3.2	SNHU 1204..	E02

E01	11036880	11610311	11450867	8095012000	4425
E02		11610311	11450867	8095012000	

MaxiMill 491 system

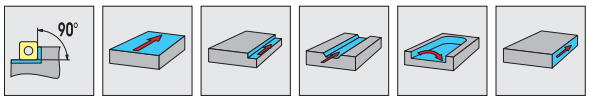
C491-12

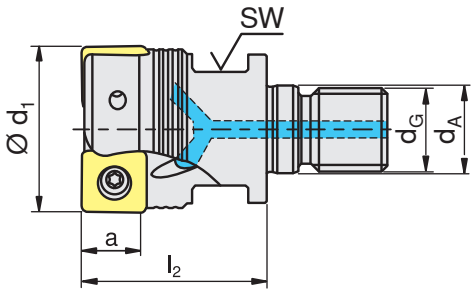




d_1 [mm]	Type, description	l_1 [mm]	l_2 [mm]	d_A [mm]	a [mm]	z	n_{max} [min^{-1}]	[Nm]		
32	C491.32.R.02-12-A-63-250	250	63	32	8	2	10200	3.2	SNHU 1204..	E01
32	C491.32.R.02-12-B-40	102	40	32	8	2	13600	3.2	SNHU 1204..	E01

E01	11610311	11450867	8095012000





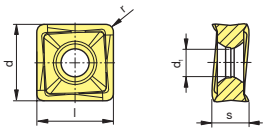
d1 [mm]	Type, description	l2 [mm]	dG [mm]	dA [mm]	a [mm]	z	nmax [min-1]	[Nm]		
32	G491.32.R.02-12	35	16	17.0	8	2	13600	3.2	SNHU 1204..	E01

E01	11610311	11450867	8095012000

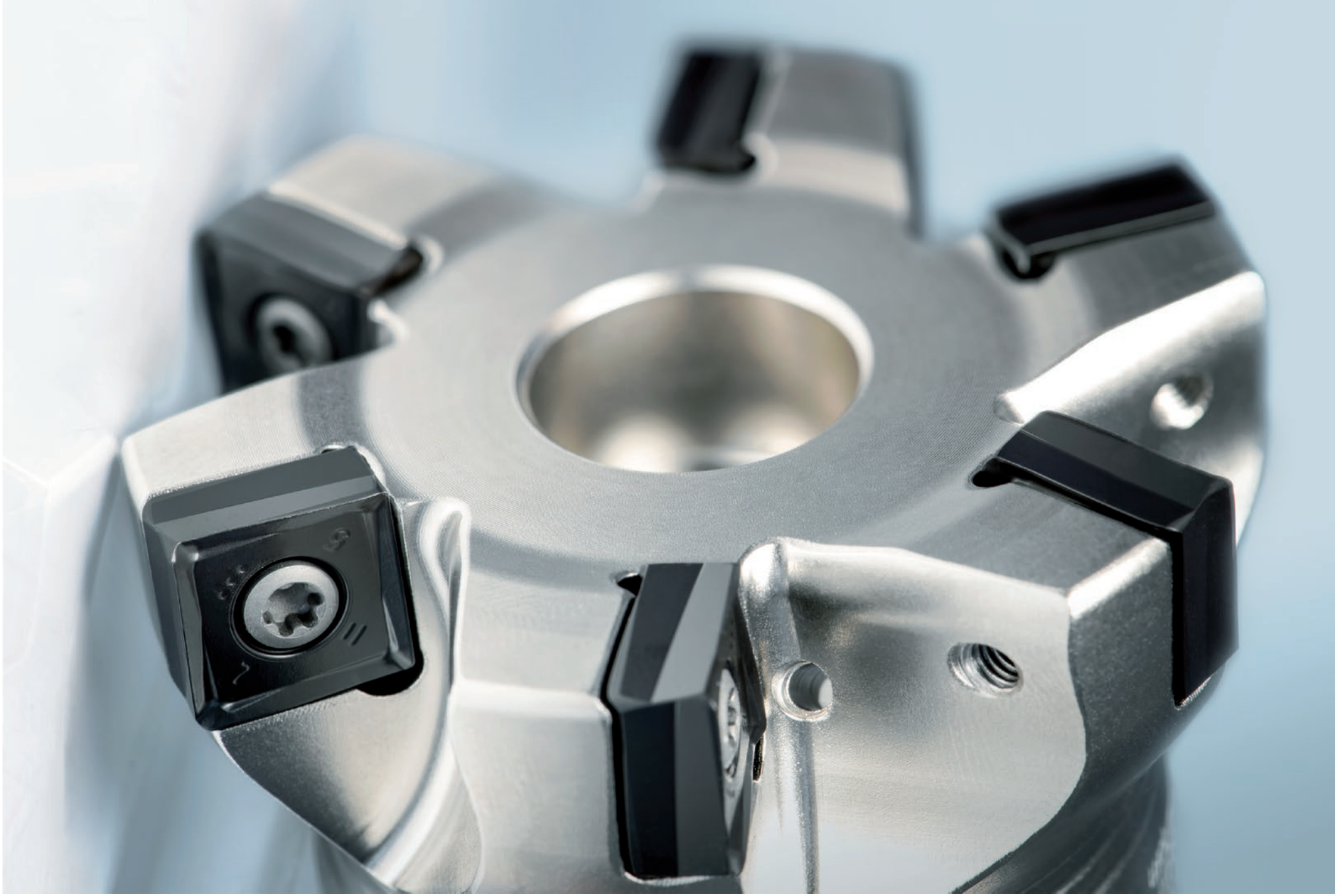
MaxiMill 491 system

SNHU..

			CTCP230	CTPP235	CTPM240	CTCK215	CTPK220	CTWN215	d [mm]	l [mm]	s [mm]	r [mm]	d_1 [mm]
P			●	●	○								
M			○	○	●								
K			●			●	●	●					
N								●					
S													
H													
-F10		SNHU 120408FR-F10						●	12.20	12.20	5.00	0.80	4.40
		SNHU 120412FR-F10						●	12.20	12.20	5.00	1.20	4.40
		SNHU 120416FR-F10						●	12.20	12.20	5.00	1.60	4.40
		SNHU 120420FR-F10						●	12.20	12.20	5.00	2.00	4.40
-F50		SNHU 120408SR-F50			●				12.20	12.20	5.00	0.80	4.40
		SNHU 120412SR-F50			●				12.20	12.20	5.00	1.20	4.40
		SNHU 120416SR-F50			●				12.20	12.20	5.00	1.60	4.40
		SNHU 120420SR-F50			●				12.20	12.20	5.00	2.00	4.40
-M50		SNHU 120408SR-M50	●	●	●				12.20	12.20	5.00	0.80	4.40
		SNHU 120412SR-M50		●					12.20	12.20	5.00	1.20	4.40
		SNHU 120416SR-M50		●					12.20	12.20	5.00	1.60	4.40
		SNHU 120420SR-M50		●					12.20	12.20	5.00	2.00	4.40
-R50		SNHU 120408SR-R50				●	●		12.20	12.20	5.00	0.80	4.40
		SNHU 120412SR-R50				●			12.20	12.20	5.00	1.20	4.40
		SNHU 120416SR-R50				●			12.20	12.20	5.00	1.60	4.40
		SNHU 120420SR-R50				●			12.20	12.20	5.00	2.00	4.40
			CTCP230	CTPP235	CTPM240	CTCK215	CTPK220	CTWN215	d	l	s	r	d_1



#R01# #R02# #R03#



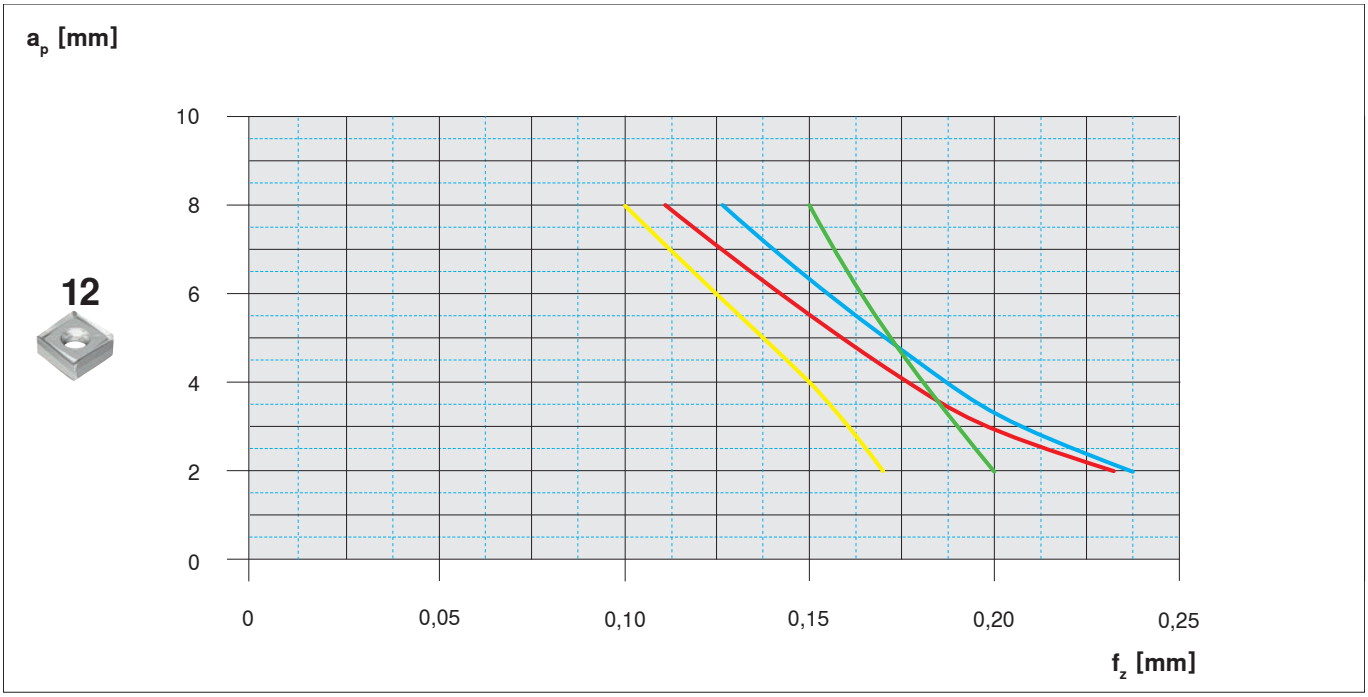
MaxiMill 491 system

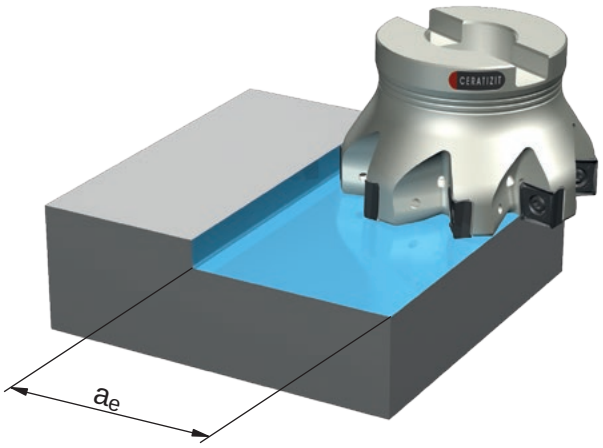
Starting parameters for example materials

Materials				Insert		v_c [m/min]	Coolant
▼	1.2312	40CrMnMoS8-6	1.000 N/mm²	SNHU 120408SR-M50	CTPP235	200	dry
▼	1.4571	X6CrNiMoTi17-12-2	600 N/mm²	SNHU 120408SR-F50	CTPM240	140	dry
▼	5.1301	EN-GJL-250	HB 180	SNHU 120408SR-R50	CTCK215	250	dry
▼	3.4365	Alu	450 N/mm²	SNHU 120408SR-F10	CTCK215	1500	Minimum quantity lubrication

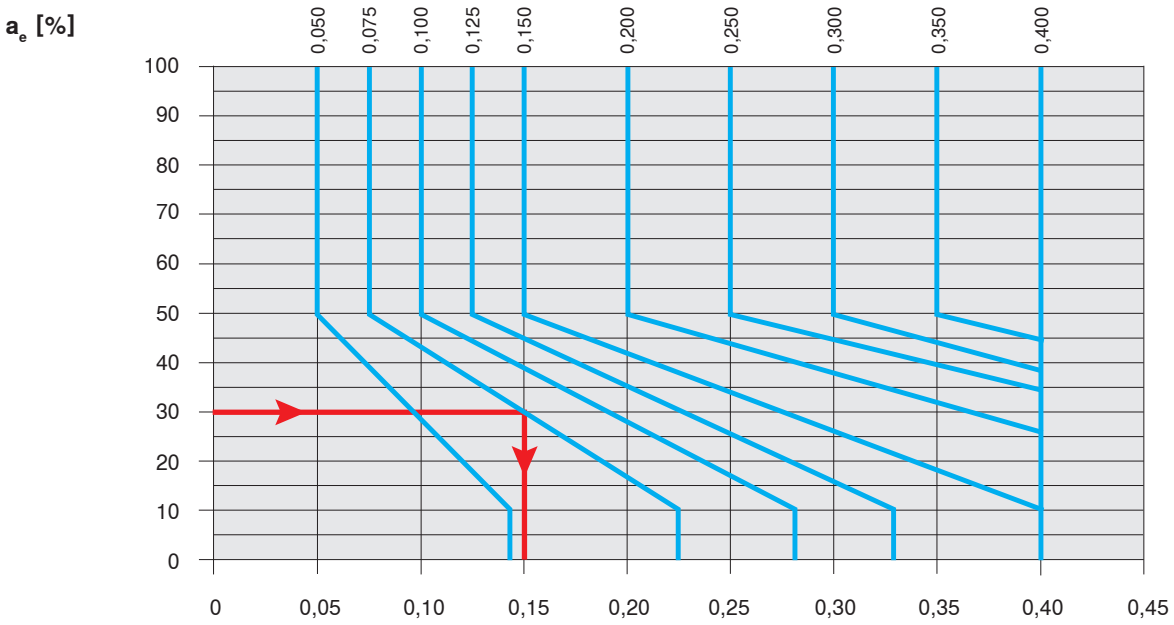
If a_e < 50% use correction list

#R01#





Starting values f_z [mm] from starting parameter diagram



Corrected values f_z [mm]

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

	Material	Type, description
	11036880	7818267/M8,0x30,0

	Material	Type, description	Key size	Torque moment [Nm]	Torque moment [in.lbs] [lb]
	11450867	DMSD 3,2Nm/SORT 15IP	IP15	3.2	28,3

	Material	Type, description	Key size
	8095012000	SD-T15IP-80mm	15IP
	4425	S4/SW4	SW4

	Material	Type, description	l [mm]	Thread size	Key size
	11610311	M3,5X8,6-15IP/10008749	8.6	M3,5	15IP

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

CTCP230		CTPP235		CTPM240		CTCK215		CTPK220	
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]	v_c [m/min]	v_c [m/min]
280	150	240	140	220	120				
250	135	210	120	190	110				
190	110	160	100	140	90				
250	135	220	120	200	110				
190	110	160	100	140	90				
140	100	120	90	100	70				
130	90	110	80	110	80				
80	60	80	60	80	60				
130	90	110	80	110	80				
90	60	80	60	80	60				
130	90	110	80	110	80				
		150	110	170	110				
		150	110	160	110				
		130	90	130	90				
310	190					360	210	320	190
160	100					220	130	170	100
200	120					230	140	210	130
130	80					160	100	140	90
190	115					250	150	200	120
160	100					210	130	170	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

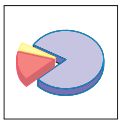
	Work piece material	Type of treatment / alloy		VDI 3323 group	Hard-ness HB
P	Non alloyed steel	annealed	≤ 0.15 % C	1	125
		annealed	0.15 % - 0.45 % C	2	150 - 250
		tempered	≥ 0.45 % C	3	300
	Low alloyed steel	annealed		6	180
		tempered		7 / 8	250 - 300
		tempered		9	350
	High alloyed steel	annealed		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

CTWN215	
v_c [m/min]	v_c [m/min]
130	130
110	110
130	130
120	120
130	130
110	120
	1500
	1000
	1100
	1000
	280
	350
	350
	320
	320
160	160
240	240

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

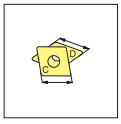
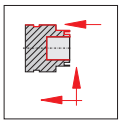
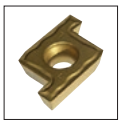
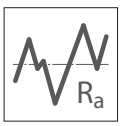
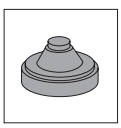
Introduction

	Revised product range	#R01#

Index

	Index	#R01#

ProfileMaster

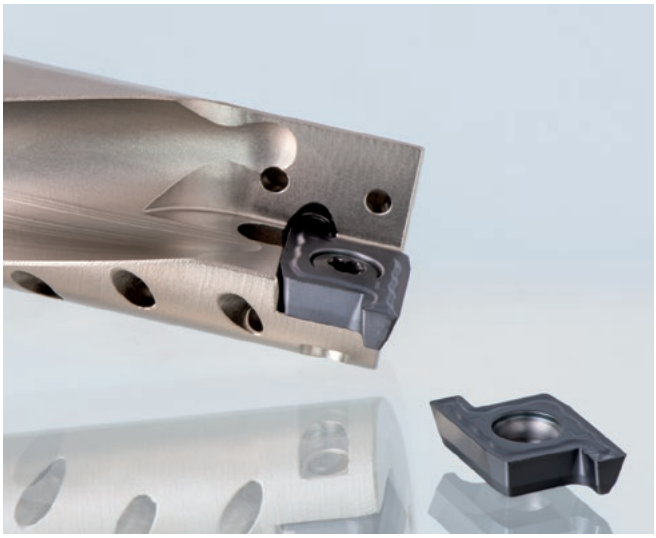
	System overview	#R01#
	Designation system	#R02#
	Chip grooves, grades	#R03#
	Machining methods	#R04#
	Inserts	#R05#
	Tools	#R06#
	Cutting data, feed rate	#R07#
	Surface quality	#R08#
	Application	#R09#
	Spare parts	#R10#
	Machining examples	#R11#

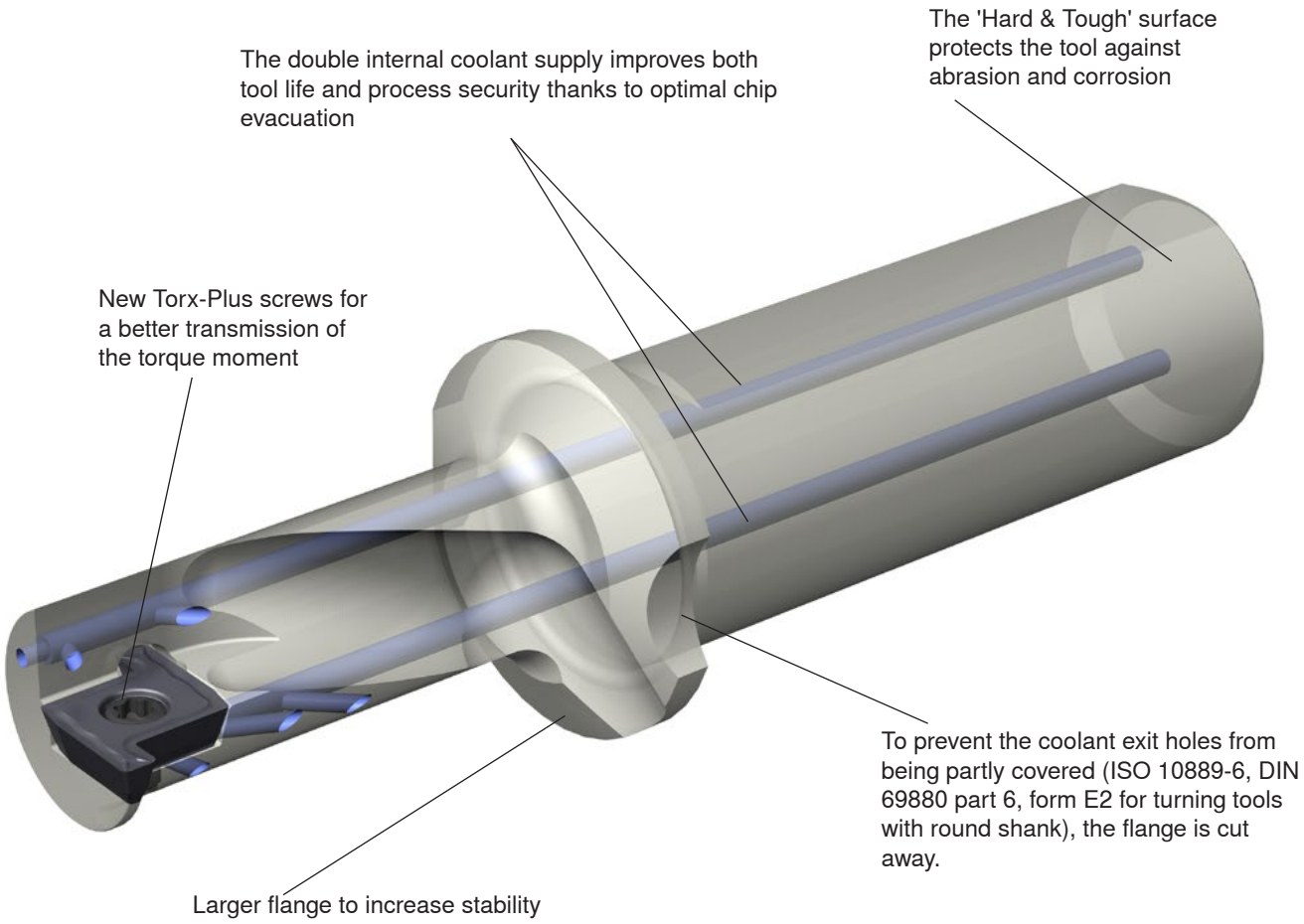
Multi-function tools

Revised product range

ProfileMaster with a new guise

We have been consistently developing our ProfileMaster further - benefit from more than 20 years' experience with multi-function tools: the new 'Hard & Tough' coating protects the tool against abrasion and corrosion. Also new: the optimised double coolant supply ensures optimal chip evacuation and thus longer tool life. For improved stability, ProfileMaster also features a larger flange.



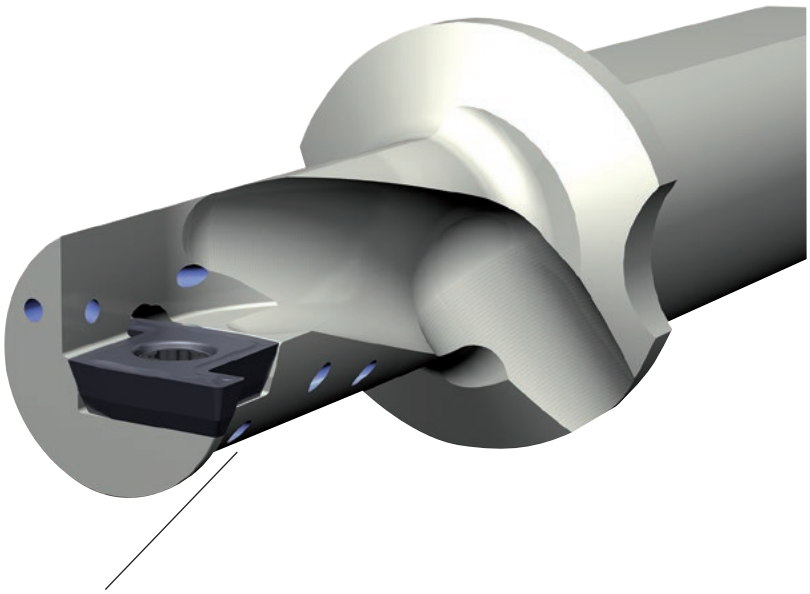


Your advantages

- ▲ Drilling, boring, face and longitudinal turning, counter-boring, off-centre drilling, axial or radial grooving
- ▲ Flat bottom holes
- ▲ Through coolant
- ▲ Easy to use

Your benefits

- ▲ One tool for several machining operations
- ▲ Fewer tool positions necessary
- ▲ Fewer tool changes
- ▲ Reduced machining time
- ▲ No additional tool required
- ▲ Good chip evacuation
- ▲ High process security
- ▲ Reduced pre-setting time
- ▲ Short set-up time
- ▲ Reduced programming effort

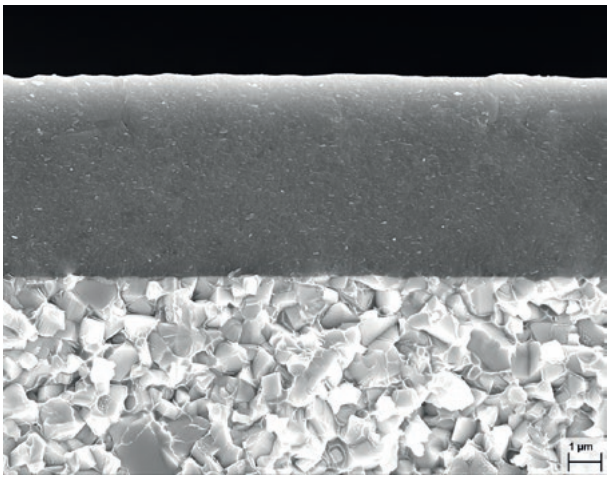


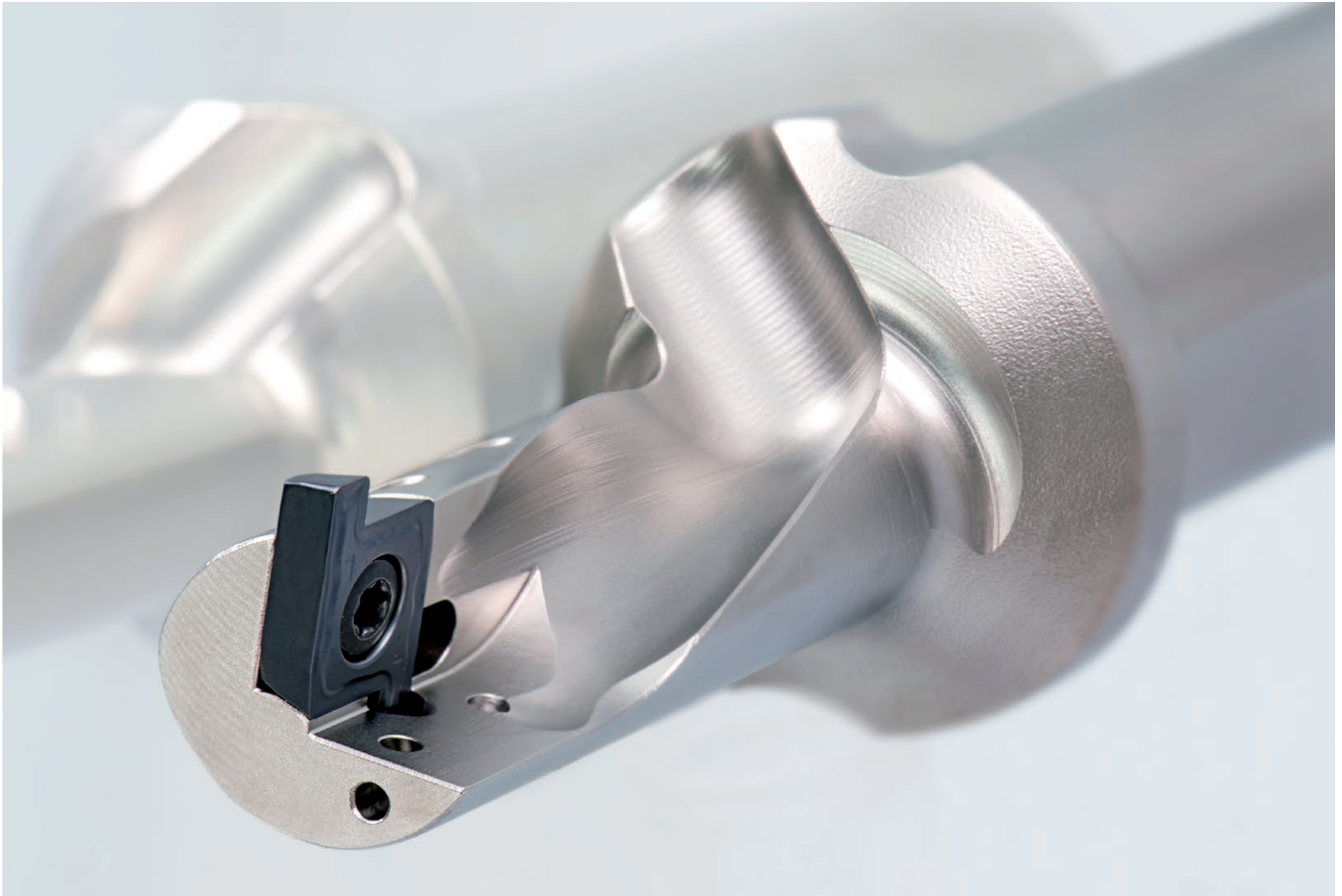
Due to the insert size the diameters 10 mm and 12 mm can be applied only as 90° version. For this reason the new tools are provided with a support in the area of the parting and grooving blade in the insert seat to increase stability.

SILVERSTAR™ CTPP430

The high-performance grade for steel materials, austenitic steel, cast iron materials and heat-resistant materials can be applied universally. Thanks to its high transverse rupture strength and cutting edge stability SILVERSTAR™ CTP430 is ideal for applications with ProfileMaster.

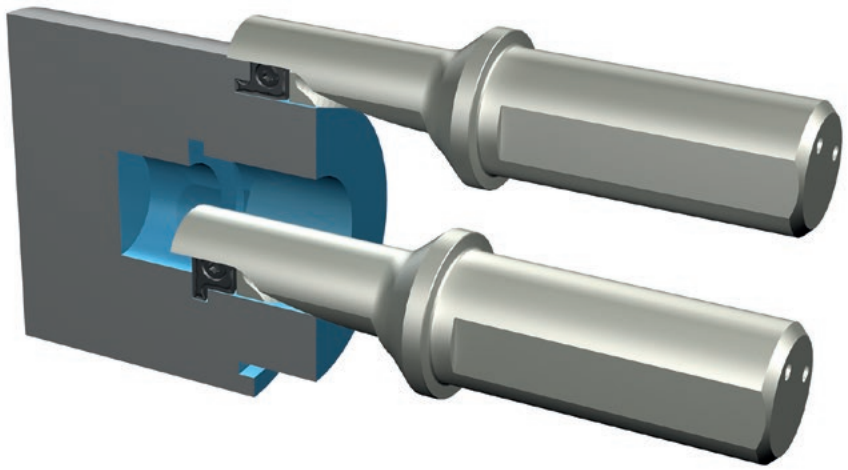
SILVERSTAR™





Drilling, turning, parting and grooving with only one tool

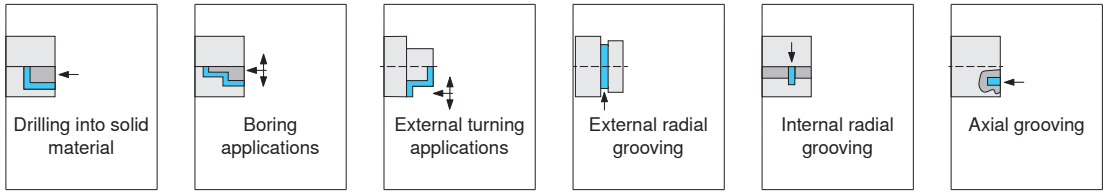
- The ProfileMaster is excellently suited for profiles that are so complex that they can normally only be produced with the use of several tools
- In addition, it helps free up valuable positions on the machine and minimise the need to change tools
- Thanks to the Masterfinish effect, the ProfileMaster produces an excellent surface finish in the shortest possible time



Material groups

P	●
M	●
K	
N	○
S	●
H	

Possible applications



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

Inserts

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

Tools

PMC 25 R - 2.25D

1 2 3 4

1
ProfileMaster

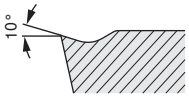
2
Nominal diameter [mm]

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]	Machining conditions		
	CTPP430	**CTPP430**	**CTPP430**
	CTPP430	**CTPP430**	**CTPP430**
	CTPP430	CTPP430	CTPP430
0,05 - 0,25			
	CTPP430	CTPP430	

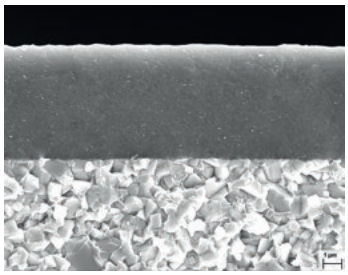
Grade overview

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
CTPP430 SILVERSTAR™	HC-P30	C6	P		●					
	HC-M25	-	P			●				
	HC-S25	-	P						●	
	HC-K30	C1	P				○			
	HC-N25	C2	P					○		
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						○	

● Main application

○ Extended application

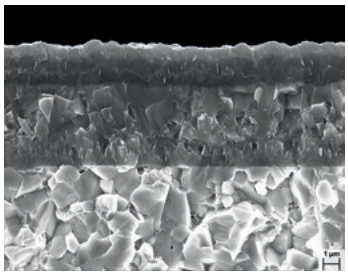
CTPP430	HC-P30 | HC-M25 | HC-S25 | HC-K30 | HC-N25	● ● ● ○ ○



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.

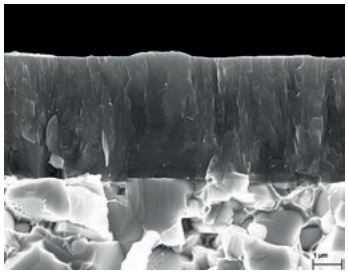
CTC1435	HC-P35 | HC-M30 | HC-K20	● ○ ○



Specification:
Composition: Co 9.6%; mixed carbide 7.4%; WC balance | Grain size: 1 - 2 μm | Hardness: HV_{30} 1400 | Coating specification: CVD TiCN-Al_2O_3 multi-layer

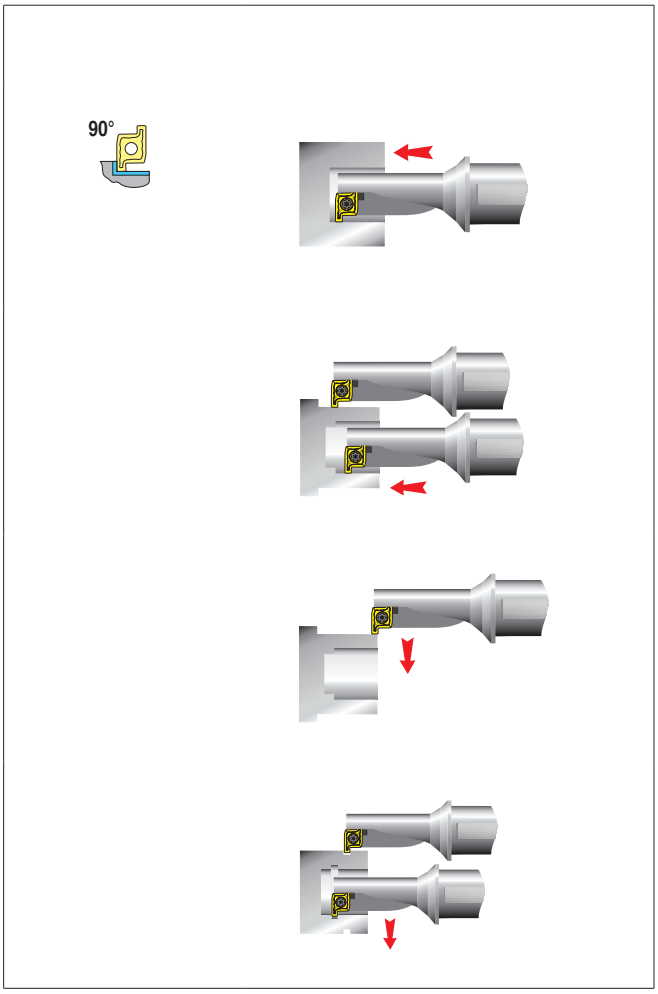
Recommended application:
First choice for steel and cast iron materials.

CTP2440	HC-M35 | HC-P40 | HC-N25 | HC-S30	● ● ○ ○



Specification:
Composition: Co 9.6%; mixed carbides 7.4%; WC balance | Grain size: 1 - 2 μm | 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

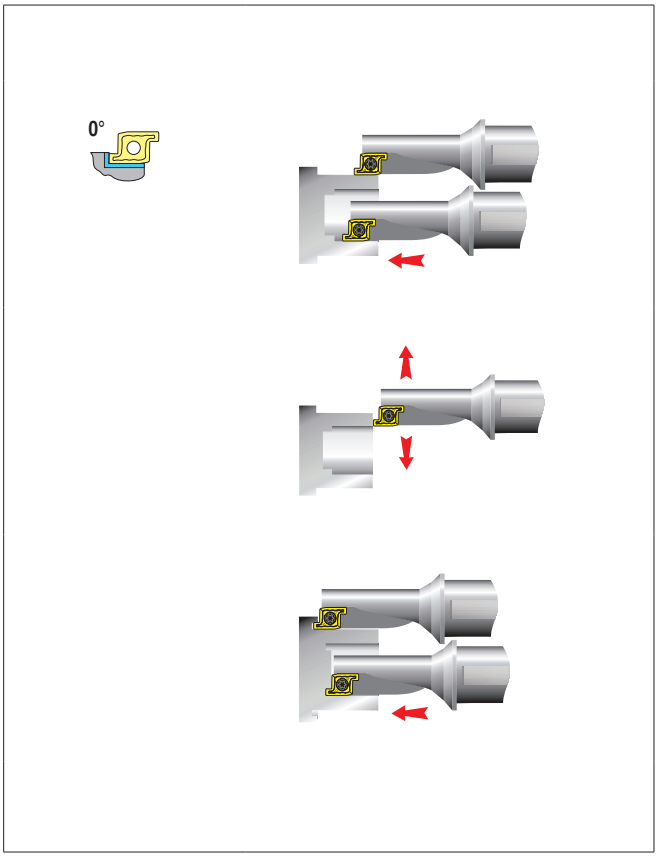
External turning applications

Internal turning applications

Turning of face profiles

External radial grooving

Internal radial grooving



Machining methods - radial application 0°

External turning applications

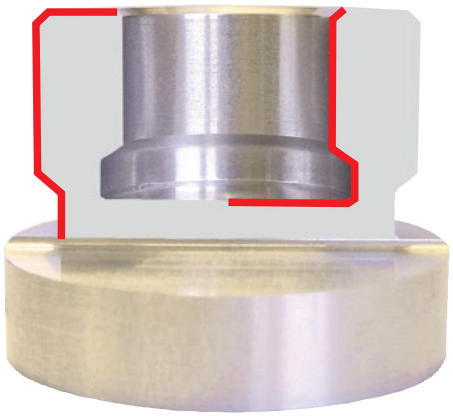
Boring applications

Turning of face profiles

External radial grooving

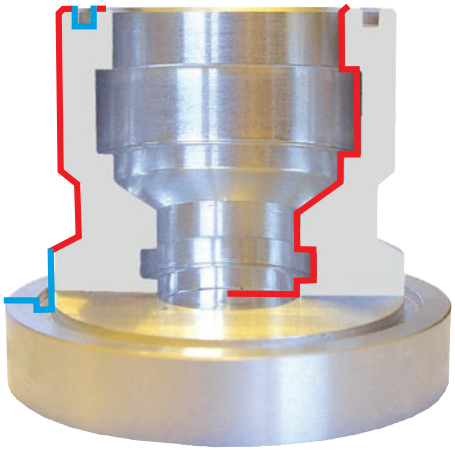
Internal radial grooving

⚠ When changing from internal to external machining, reverse direction of rotation



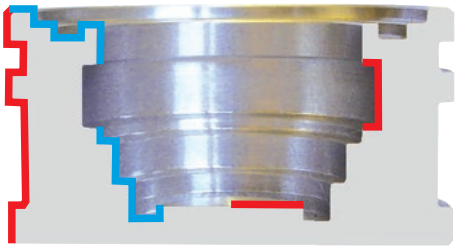
right-hand tool

● right-hand insert



right-hand tool

● left-hand insert ● right-hand insert



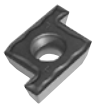
left-hand tool

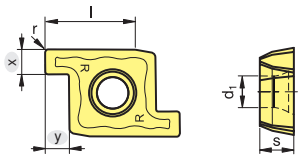
right-hand tool

● right-hand insert ● right-hand insert

ProfileMaster

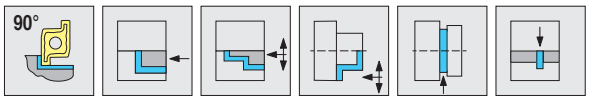
PM..

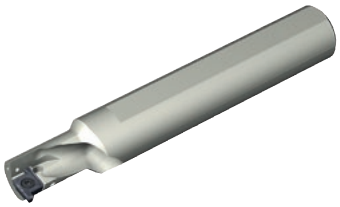
		CTPP430	CTC1435	CTP2440	x [mm]	y [mm]	l [mm]	s [mm]	d_1 [mm]	r [mm]
P		●	●	●						
M		●	○	●						
K		○	○							
N										
S		●		○						
H										
-M20		CTPP430	CTC1435	CTP2440	x [mm]	y [mm]	l [mm]	s [mm]	d_1 [mm]	r [mm]
	PM 10LG 201504-M20	●	●	●	2.00	1.50	5.00	2.10	2.10	0.40
	PM 10RG 201504-M20	●	●	●	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
		CTPP430	CTC1435	CTP2440	x	y	l	s	d_1	r

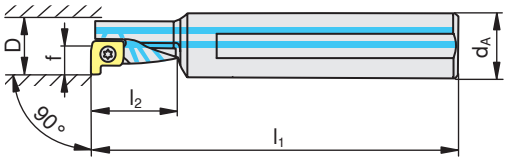


#R01#

#R02#

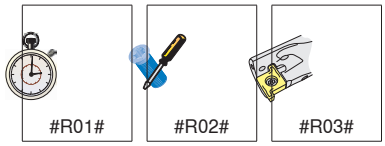






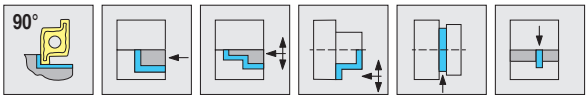
D_{min} [mm]	Type, description	L N R	d_A [mm]	l_1 [mm]	l_2 [mm]	f [mm]	[Nm]		
10	PMC 10R-1.5D	R	12	80	15	5	0.4	PM 10..	E01
10	PMC 10L-1.5D	L	12	80	15	5	0.4	PM 10..	E01
12	PMC 12R-1.5D	R	16	90	18	6	1.0	PM 12..	E02
12	PMC 12L-1.5D	L	16	90	18	6	1.0	PM 12..	E02
16	PMC 16R-1.5D	R	20	125	24	8	2.2	PM 16..	E03
16	PMC 16L-1.5D	L	20	125	24	8	2.2	PM 16..	E03
20	PMC 20R-1.5D	R	25	150	30	10	3.2	PM 20..	E04
20	PMC 20L-1.5D	L	25	150	30	10	3.2	PM 20..	E04
25	PMC 25R-1.5D	R	32	180	38	12.5	3.2	PM 25..	E05
25	PMC 25L-1.5D	L	32	180	38	12.5	3.2	PM 25..	E05
32	PMC 32R-1.5D	R	40	180	48	16	5.0	PM 32..	E06
32	PMC 32L-1.5D	L	40	180	48	16	5.0	PM 32..	E06

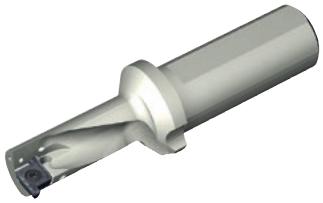
E01	11807484		11843205
E02	11450028		11488748
E03	12052220		11843208
E04	12052231	8095012000	
E05	11610311	8095012000	
E06	12052233	8095012100	

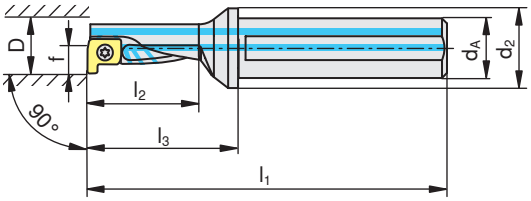


ProfileMaster

90° / 2.25D







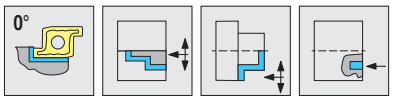
D_{min} [mm]	Type, description	LNR	d_A [mm]	d_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	[Nm]		
10	PMC 10R-2.25D	R	12	18	72.4	22.5	30.4	5	0.4	PM 10..	E01
10	PMC 10L-2.25D	L	12	18	72.4	22.5	30.4	5	0.4	PM 10..	E01
12	PMC 12R-2.25D	R	16	22	78	27	33.0	6	1.0	PM 12..	E02
12	PMC 12L-2.25D	L	16	22	78	27	33.0	6	1.0	PM 12..	E02
16	PMC 16R-2.25D	R	20	28	96.5	36	46.5	8	2.2	PM 16..	E03
16	PMC 16L-2.25D	L	20	28	96.5	36	46.5	8	2.2	PM 16..	E03
20	PMC 20R-2.25D	R	25	35	111	45	55.0	10	3.2	PM 20..	E04
20	PMC 20L-2.25D	L	25	35	111	45	55.0	10	3.2	PM 20..	E04
25	PMC 25R-2.25D	R	32	44	132.6	56.3	72.6	12.5	3.2	PM 25..	E05
25	PMC 25L-2.25D	L	32	44	132.6	56.3	72.6	12.5	3.2	PM 25..	E05
32	PMC 32R-2.25D	R	40	54	158	72	88.0	16	5.0	PM 32..	E06
32	PMC 32L-2.25D	L	40	54	158	72	88.0	16	5.0	PM 32..	E06

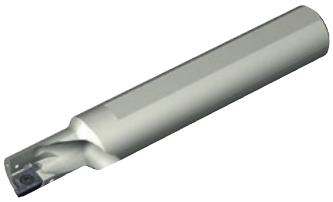
E01	11807484		11843205
E02	11450028		11488748
E03	12052220		11843208
E04	12052231	8095012000	
E05	11610311	8095012000	
E06	12052233	8095012100	

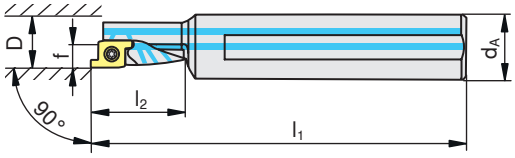

#R01#


#R02#


#R03#

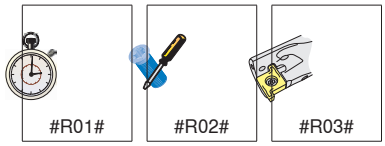






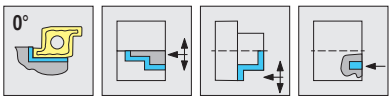
D_{min} [mm]	Type, description	L N R	d_A [mm]	l_1 [mm]	l_2 [mm]	f [mm]	[Nm]		
16	PMC 16R-1.5D	R	20	127.2	26.2	5.75	2.2	PM 16..	E01
16	PMC 16L-1.5D	L	20	127.2	26.2	5.75	2.2	PM 16..	E01
20	PMC 20R-1.5D	R	25	152.7	32.7	7.30	3.2	PM 20..	E02
20	PMC 20L-1.5D	L	25	152.7	32.7	7.30	3.2	PM 20..	E02
25	PMC 25R-1.5D	R	32	183.2	41.2	9.30	3.2	PM 25..	E03
25	PMC 25L-1.5D	L	32	183.2	41.2	9.30	3.2	PM 25..	E03
32	PMC 32R-1.5D	R	40	184.2	52.2	11.85	5.0	PM 32..	E04
32	PMC 32L-1.5D	L	40	184.2	52.2	11.85	5.0	PM 32..	E04

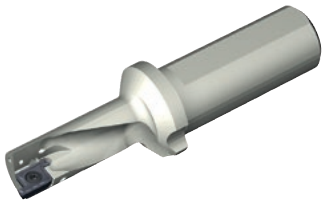
E01	12052220		11843208
E02	12052231	8095012000	
E03	11610311	8095012000	
E04	12052233	8095012100	

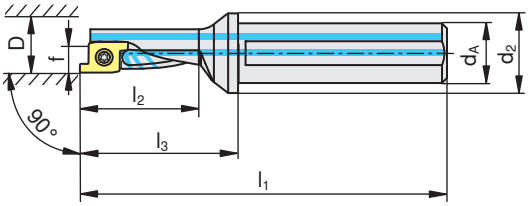


ProfileMaster

0° / 2.25D





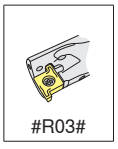


D_{min} [mm]	Type, description	LNR	d_A [mm]	d_2 [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	f [mm]	[Nm]		
16	PMC 16R-2.25D	R	20	28	98.7	38.2	48.7	5.75	2.2	PM 16..	E01
16	PMC 16L-2.25D	L	20	28	98.7	38.2	48.7	5.75	2.2	PM 16..	E01
20	PMC 20R-2.25D	R	25	35	113.7	47.7	57.7	7.30	3.2	PM 20..	E02
20	PMC 20L-2.25D	L	25	35	113.7	47.7	57.7	7.30	3.2	PM 20..	E02
25	PMC 25R-2.25D	R	32	44	135.8	59.5	75.8	9.30	3.2	PM 25..	E03
25	PMC 25L-2.25D	L	32	44	135.8	59.5	75.8	9.30	3.2	PM 25..	E03
32	PMC 32R-2.25D	R	40	54	162.2	76.2	92.2	11.85	5.0	PM 32..	E04
32	PMC 32L-2.25D	L	40	54	162.2	76.2	92.2	11.85	5.0	PM 32..	E04

E01	12052220		11843208
E02	12052231	8095012000	
E03	11610311	8095012000	
E04	12052233	8095012100	


#R01#


#R02#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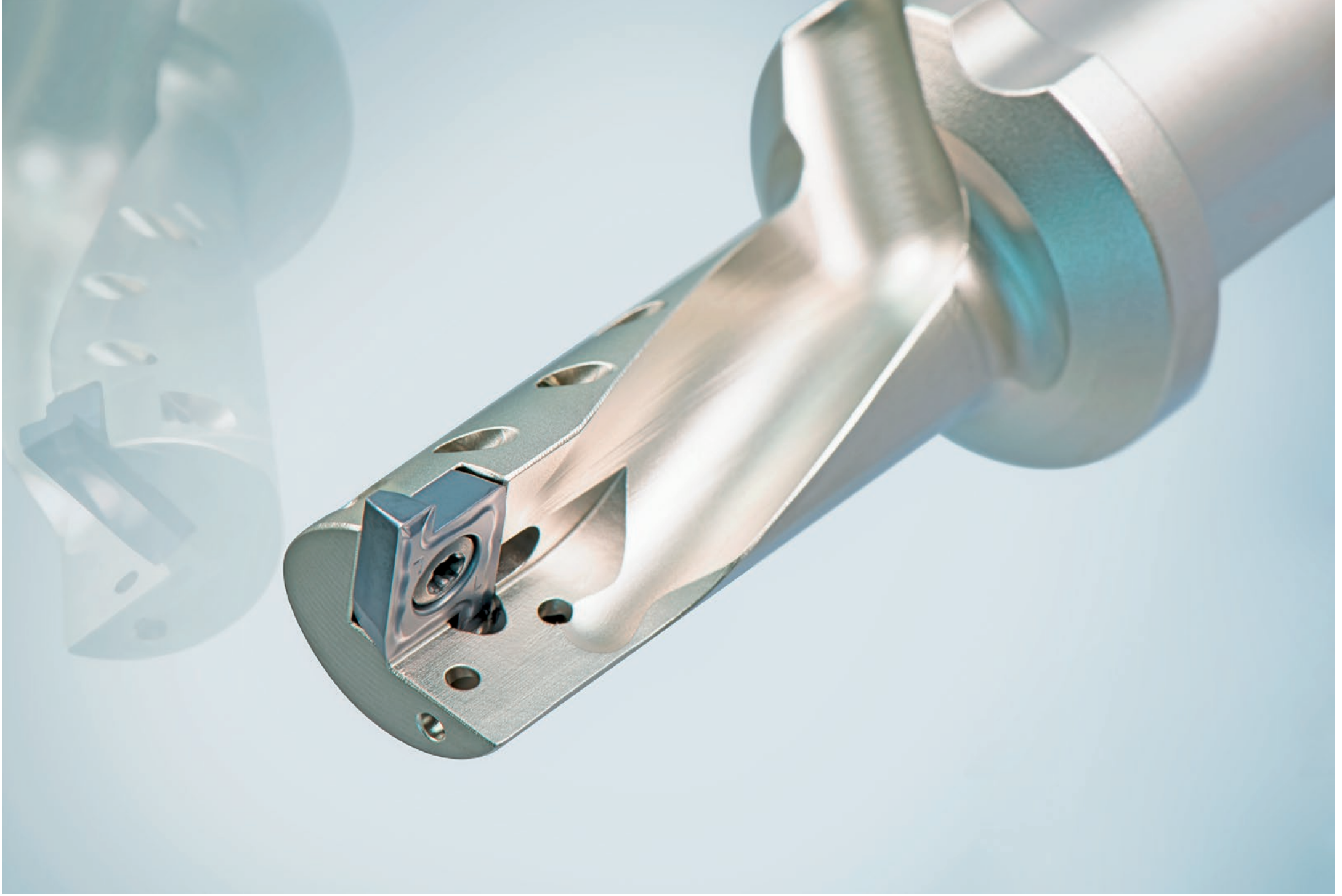


Cutting data

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

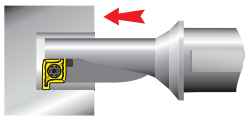
CTPP430	CTC1435	CTP2440
v_c [m/min]	v_c [m/min]	v_c [m/min]
120 - 250	140 - 280	120 - 250
80 - 180	100 - 200	80 - 180
60 - 160	80 - 180	60 - 150
80 - 180	100 - 200	80 - 180
60 - 150	80 - 160	60 - 150
60 - 130	70 - 140	60 - 120
80 - 170	100 - 180	80 - 160
50 - 130	60 - 140	50 - 120
50 - 200	100 - 200	50 - 200
50 - 150	80 - 150	50 - 150
50 - 160	100 - 200	50 - 200
50 - 180	100 - 180	50 - 180
50 - 130		50 - 100
50 - 120		50 - 80
120 - 200	120 - 250	
100 - 180	120 - 250	
120 - 200	110 - 250	
100 - 180	110 - 250	
90 - 160	100 - 250	
70 - 150	100 - 250	
80 - 2000		100 - 500
80 - 1500		100 - 300
80 - 1500		100 - 500
80 - 1300		100 - 300
80 - 600		100 - 200
80 - 400		100 - 500
80 - 400		100 - 500
80 - 300		100 - 300
80 - 200		100 - 300
60 - 160		80 - 180
50 - 140		60 - 150
80 - 200		100 - 250
20 - 90		20 - 50
20 - 90		20 - 40
20 - 90		15 - 25
20 - 90		10 - 20
20 - 90		10 - 20
40 - 100		50 - 120
30 - 90		30 - 50

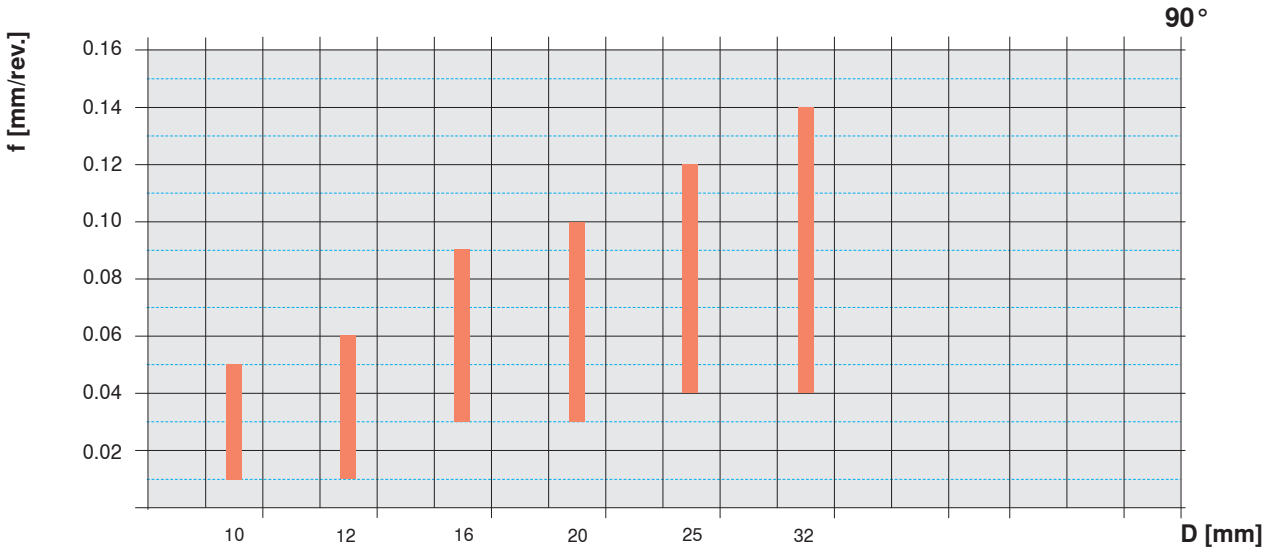
The cutting data are non-binding indications for the operator. It is recommended to adapt them to the current conditions.

ProfileMaster

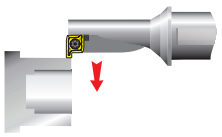
90° depth of cut/feed rate

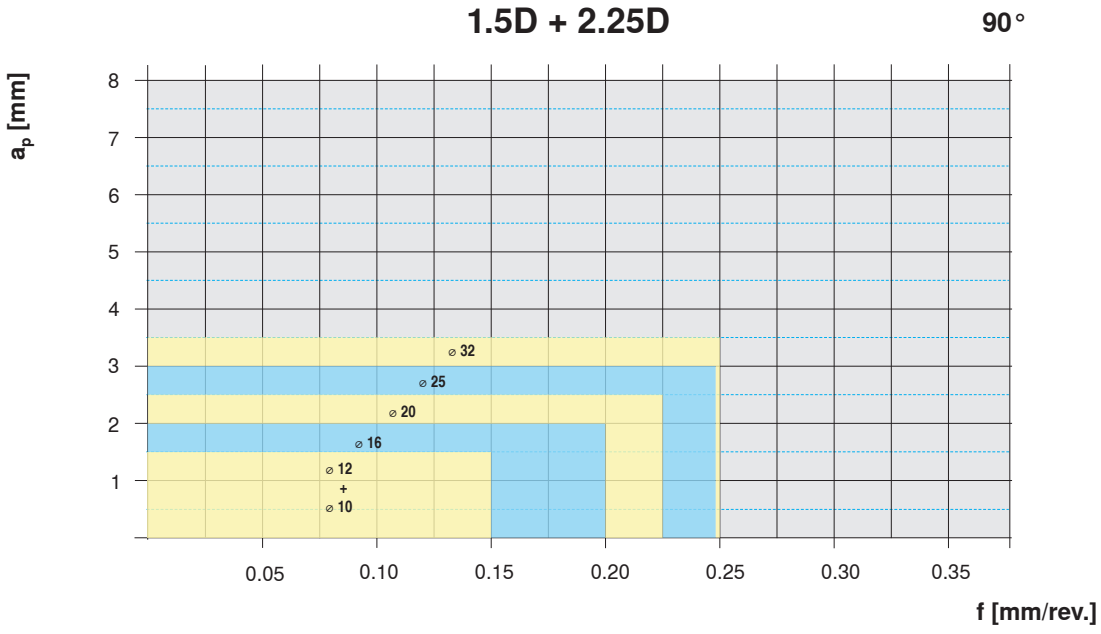
Drilling



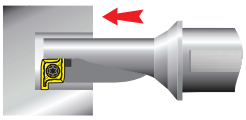


Face turning

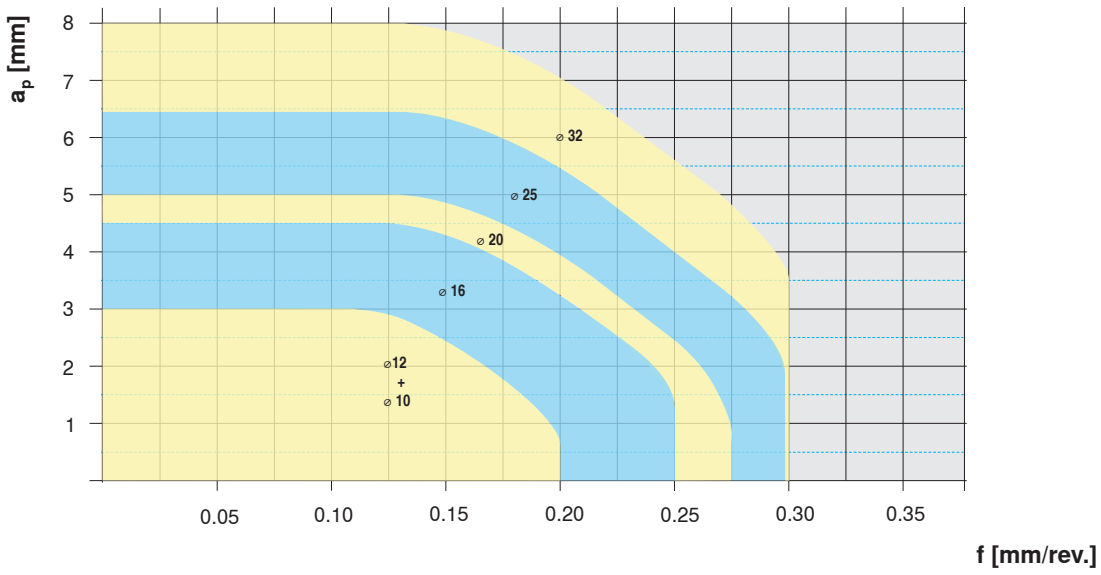




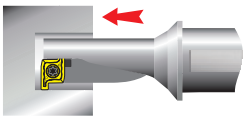
Longitudinal turning



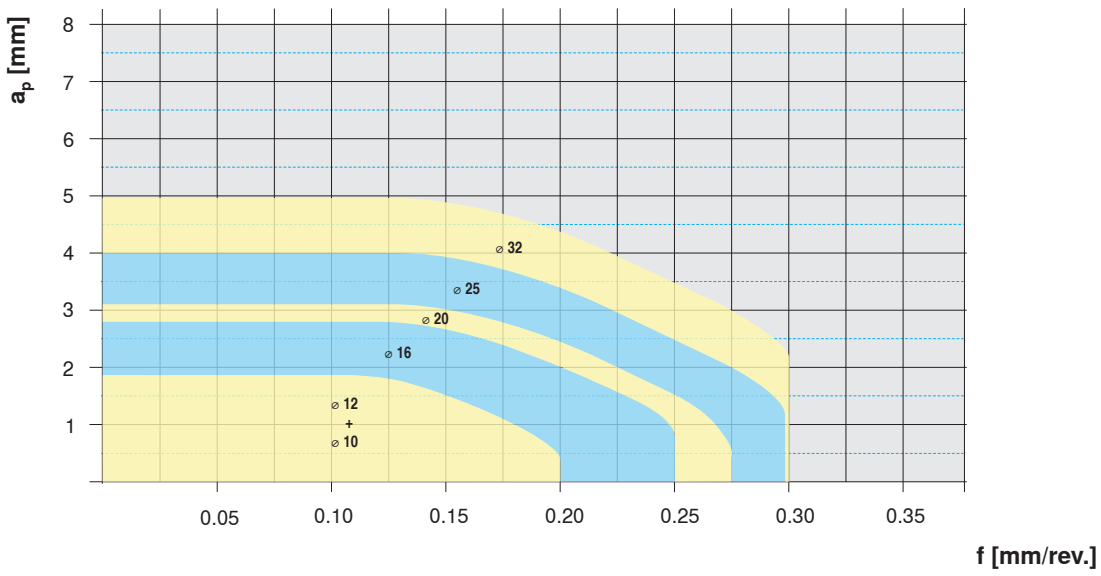
1.5D 90°



Longitudinal turning



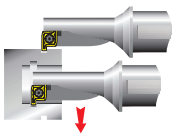
2.25D 90°

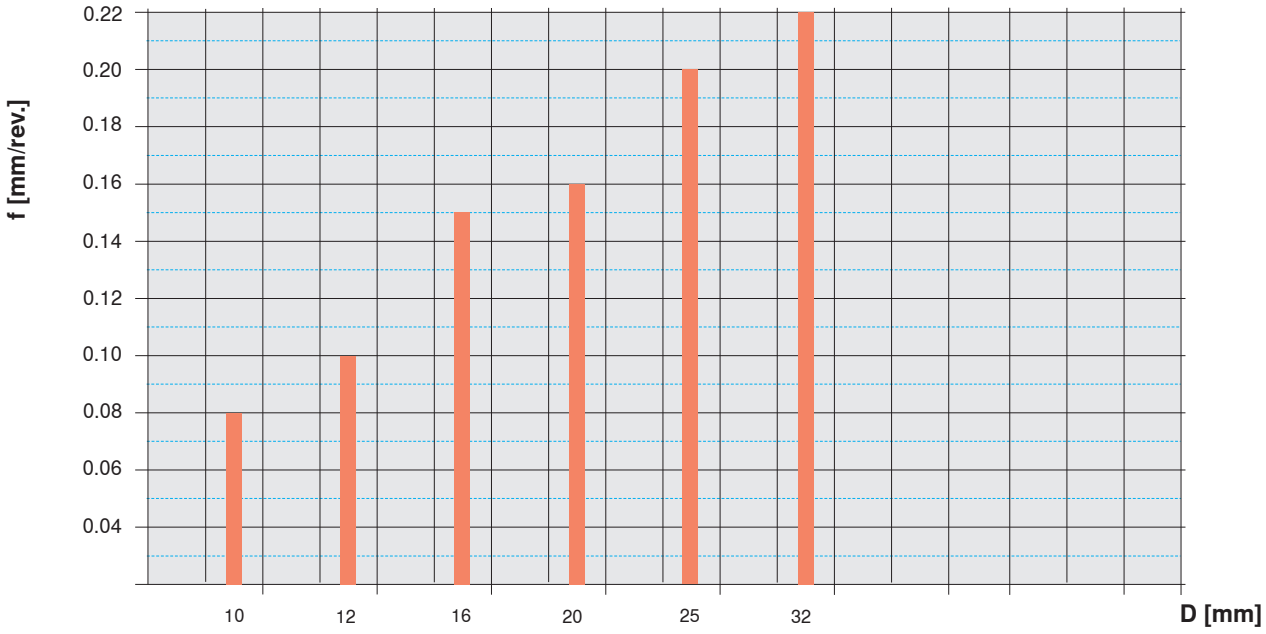


ProfileMaster

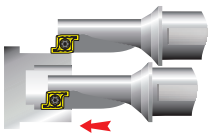
90° depth of cut/feed rate

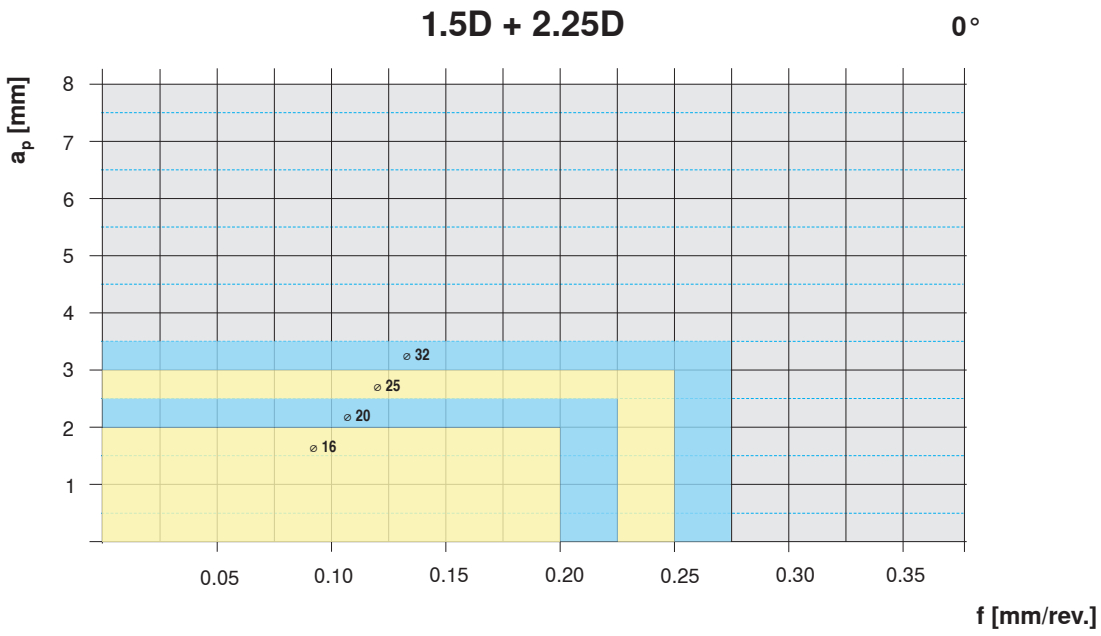
Radial grooving - internal + external



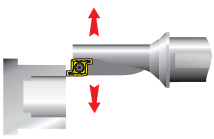


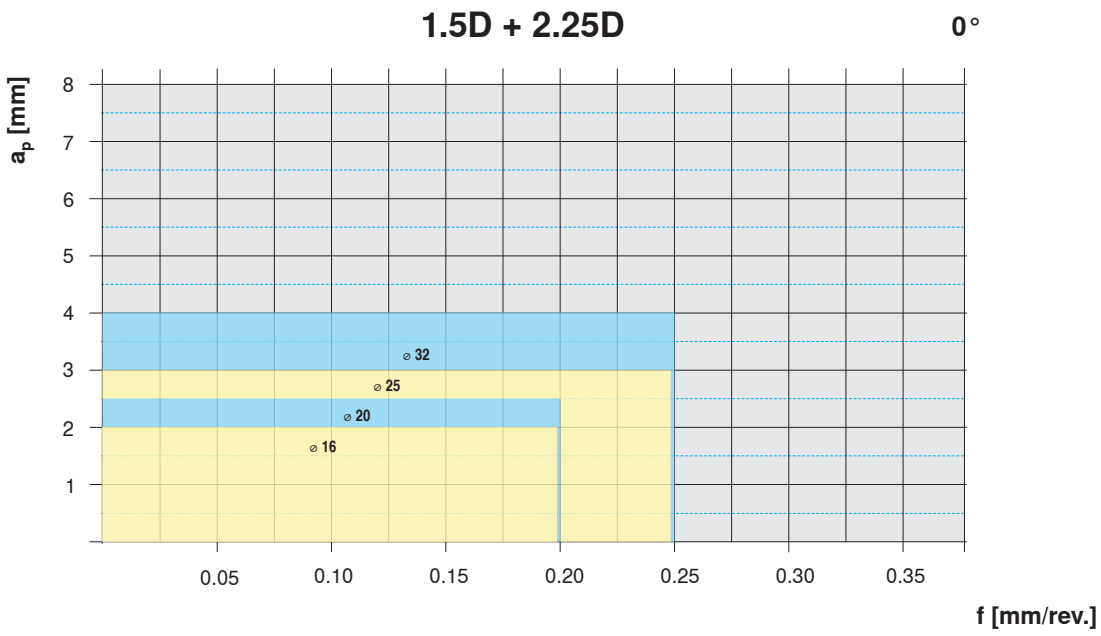
Longitudinal turning





Face turning

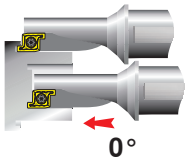


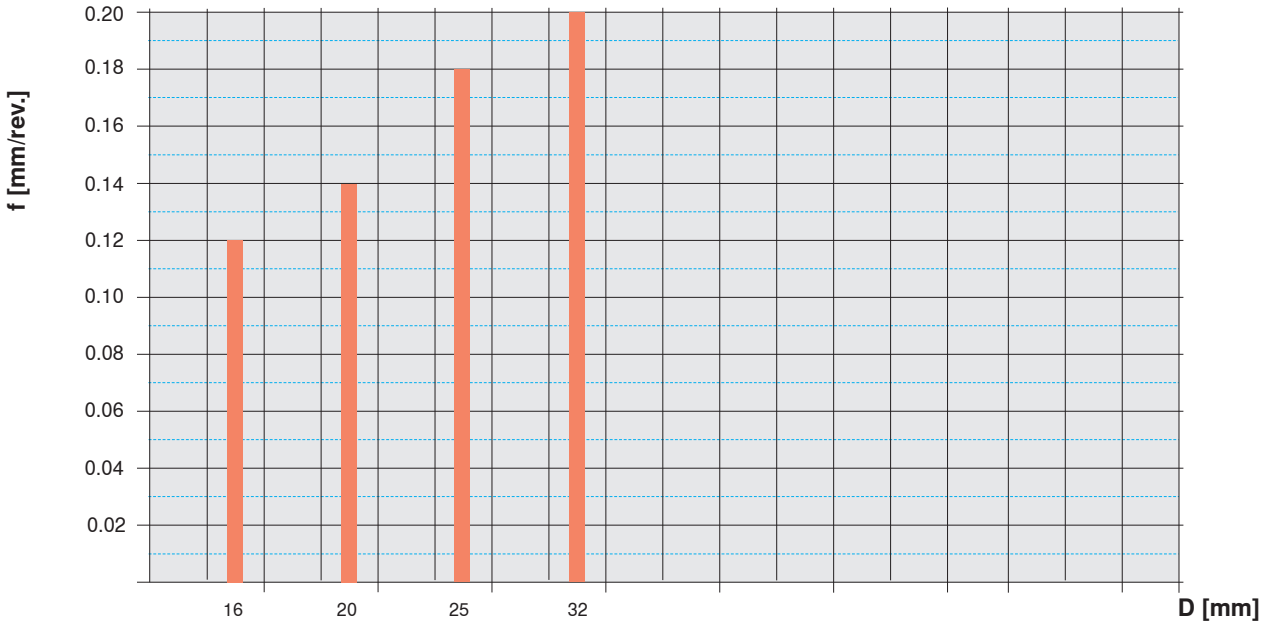


ProfileMaster

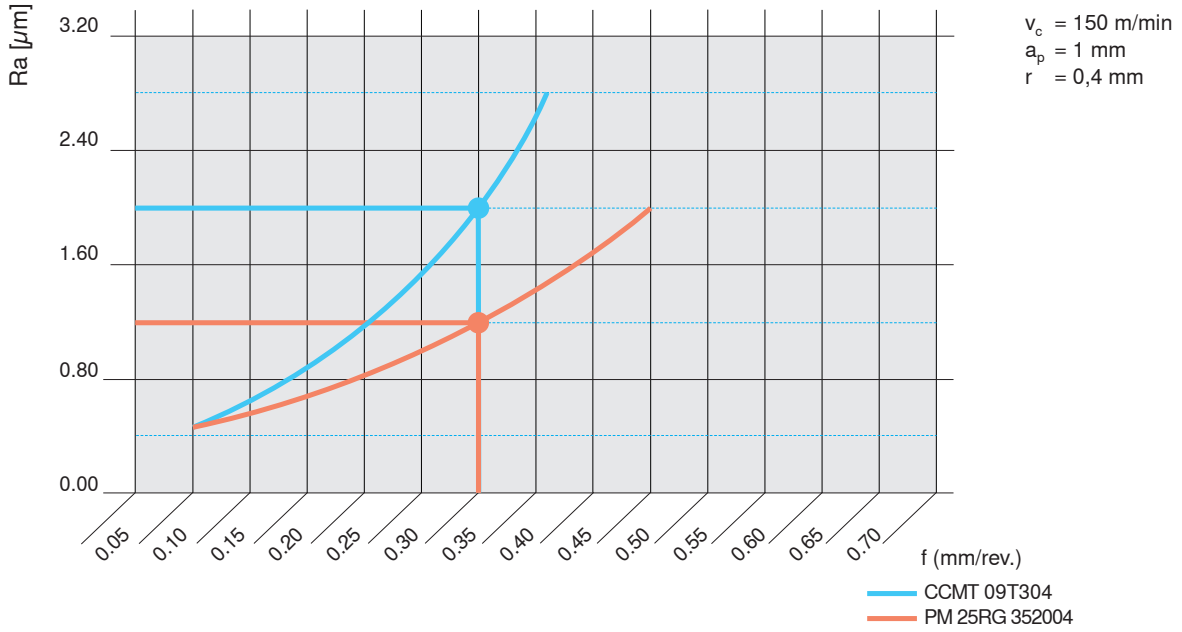
0° depth of cut/feed rate

Axial grooving - internal + external





Material: Ck60 (1.1221)
with a standard boring bar and ProfileMaster



ProfileMaster

Problems, corrective measures

Type of problem								Corrective measures	
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)		
	⇧	⇩	⇩	⇩ ⇧	⇩ ⇧	⇩		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

⇧ raise, increase low influence

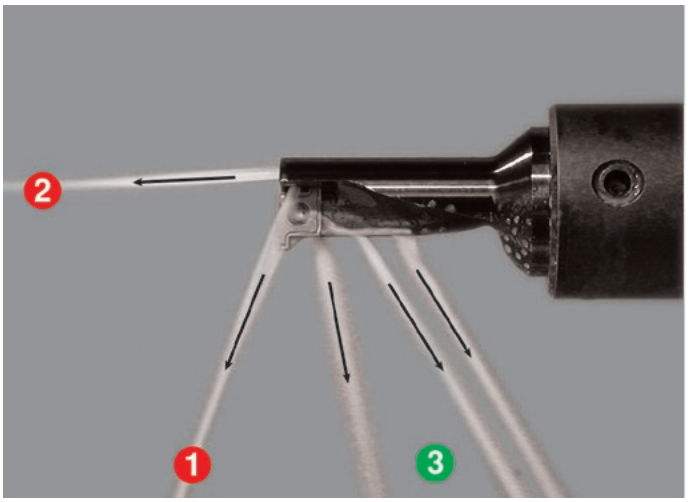
⇩ avoid, reduce large influence

⇩ avoid, reduce low influence

≈ check, optimise

▢ use

ProfileMaster is equipped with a unique coolant and chip removal system.



1 Cooling of the inserts

2 General coolant stream

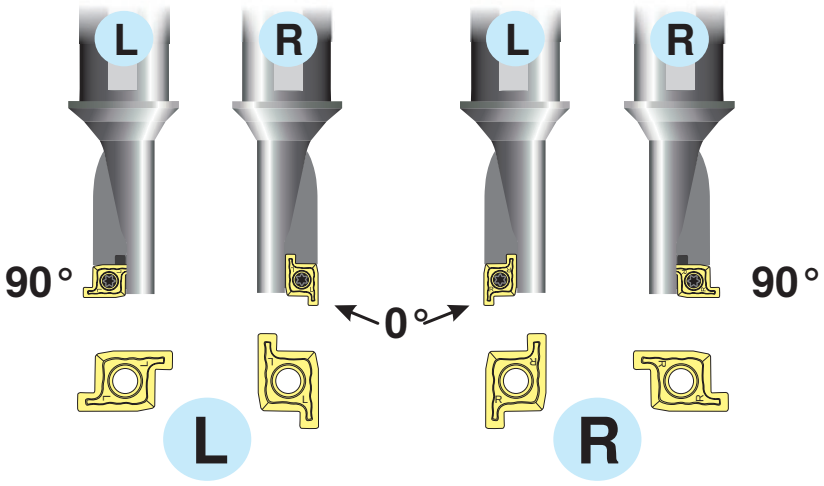
3 Chipbooster prevents chips from getting stuck between tool and work piece

⚠ 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

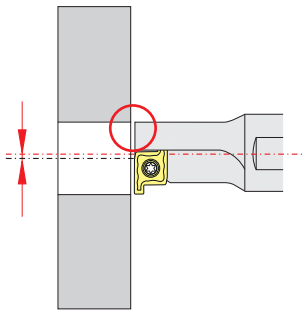
Application

Mounting of the insert

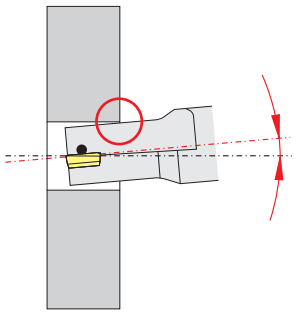


Axial displacement of the machine

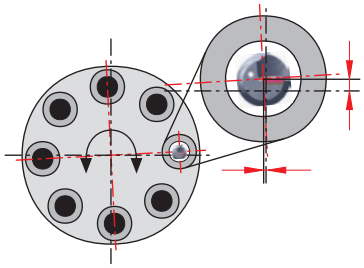
Displacement in x-direction



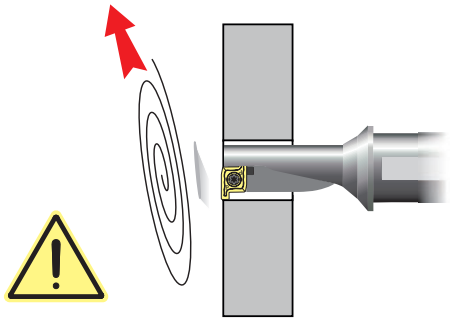
Angular error



Turret position error

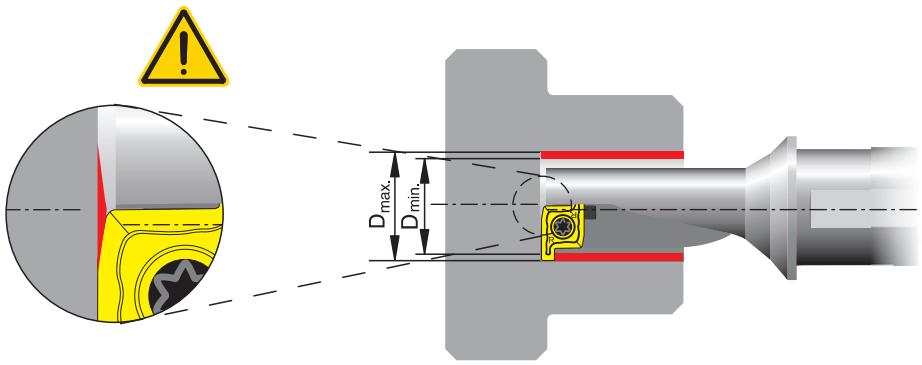


Through hole



With through holes a **sharp-edged disk** as tool break-out occurs. Safety measures are necessary.

Off-centre drilling



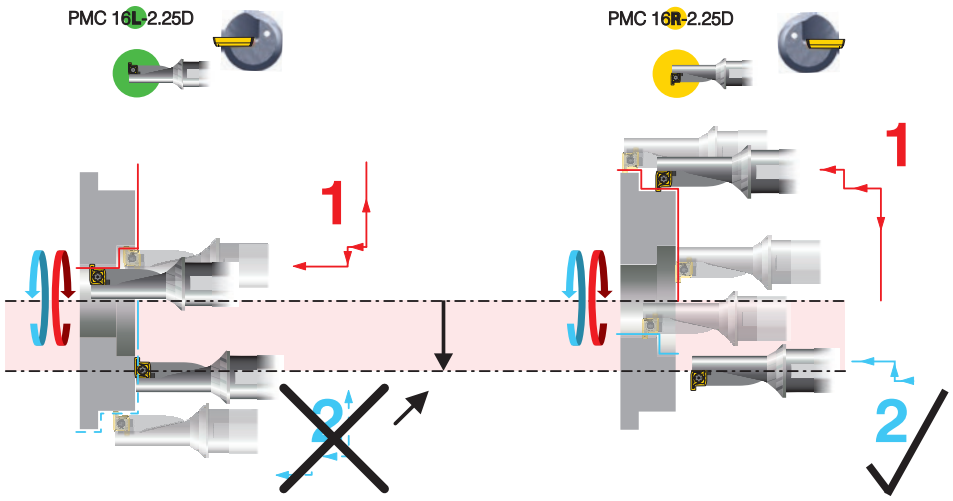
Due to the special construction of ProfileMaster tools and inserts off-centre drilling is possible. Thus desired devations from the tool's nominal diameter can be obtained (see table below).

Type of tool	Nominal tool diameter D [mm]	Drilling diameter (work piece) D_{min} [mm]	Drilling diameter (work piece) D_{max} [mm]
PMC 10R/L ...	10	9,85	12
PMC 12R/L ...	12	11,85	15
PMC 16R/L ...	16	15,85	19
PMC 20R/L ...	20	19,80	24
PMC 25R/L ...	25	24,80	29
PMC 32R/L ...	32	31,80	38

Machining across centre line

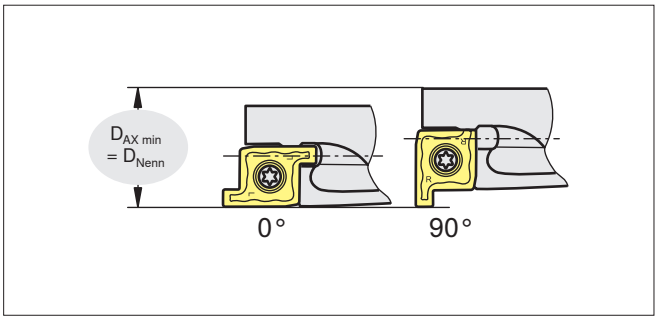
Situation:
In case of insufficient movement of the machine across the centre line the external diameter can not be machined with the same tool.

Solution:
Use a right-hand ProfileMaster tool.



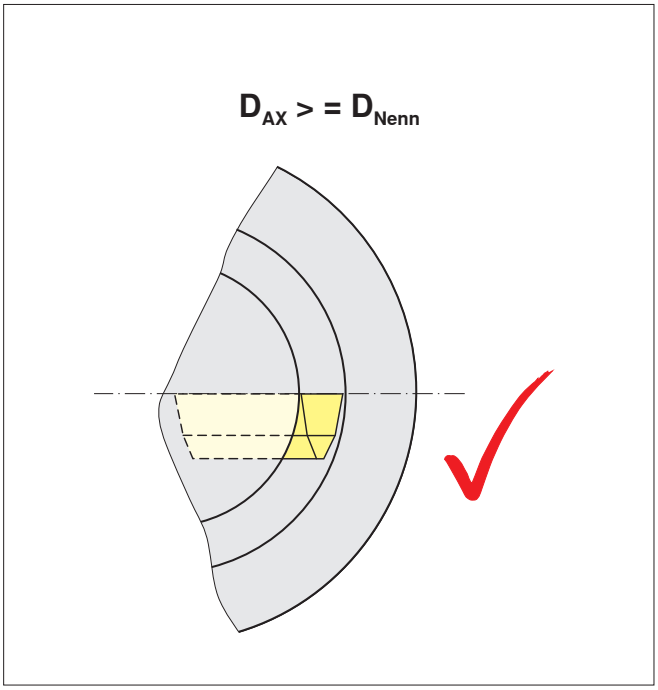
ProfileMaster

Axial grooving - application 0°

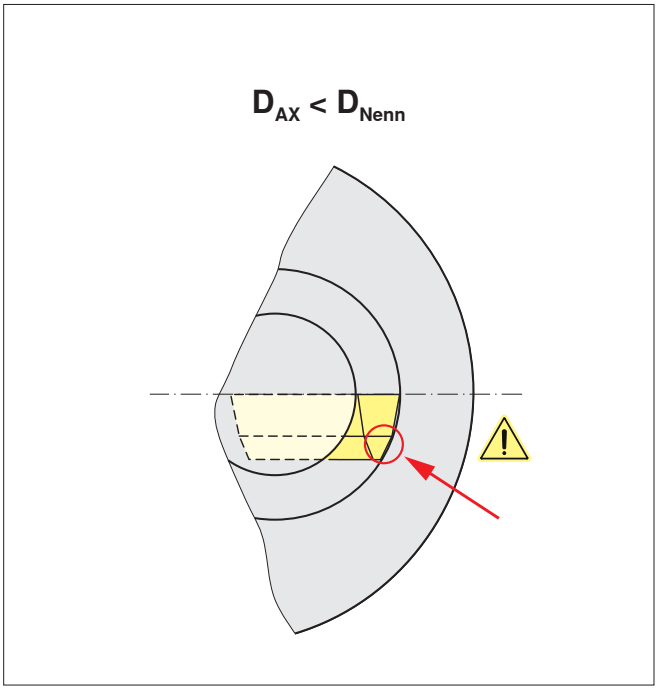


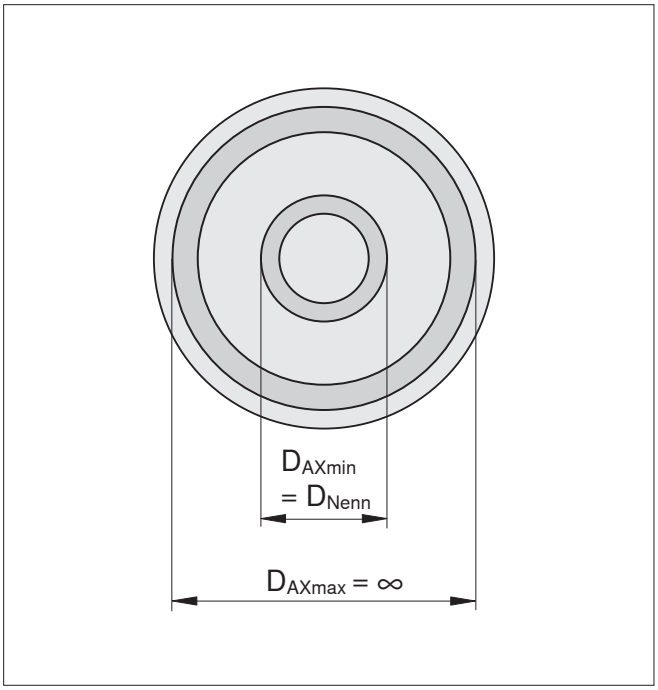
D_{Nenn}	D_{AXmin}	D_{AXmax}
16	16	∞
20	20	∞
25	25	∞
32	32	∞

$D_{AX} >= D_{Nenn}$



$D_{AX} < D_{Nenn}$



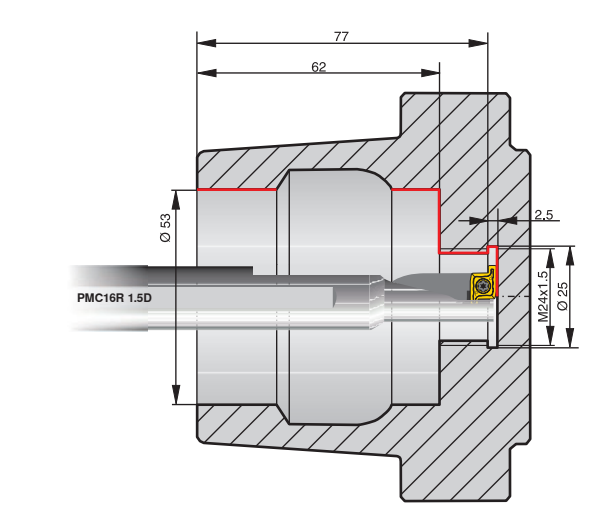


If the first cut is carried out with a diameter which is smaller than the nominal tool diameter D_{Nenn} (90° application), collision will result.

	Material	Type, description	Key size
	11488748	10007404/TORX 07IP F	07IP
	11843205	10014921/TORX 06IP F	06IP
	11843208	10014922/TORX 09IP F	09IP
	8095012000	SD-T15IP-80mm	15IP
	8095012100	SD-T20IP-100mm	20IP

	Material	Type, description	l [mm]	Thread size	Key size
	11450028	M2,2X4,2-07IP/10006888	4.2	M2,2	07IP
	11610311	M3,5X8,6-15IP/10008749	8.6	M3,5	15IP
	11807484	M1,8x3,6-06IP/10013338	3.6	M1,8	06IP
	12052220	M3,0X5,7-09IP/10022515	5.7	M3,0	09IP
	12052231	M3,5X7,2-15IP/10022527	7.2	M3,5	15IP
	12052233	M5,0X10,8-20IP/10022539	10.8	M5,0	20IP

Machining example



Technical data

Work piece	HSK100 adapter
Material	1.2342 X38 CrMoV 5 1
Tensile strength	approx. 1100 N/mm^2
Tool	PMC 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	

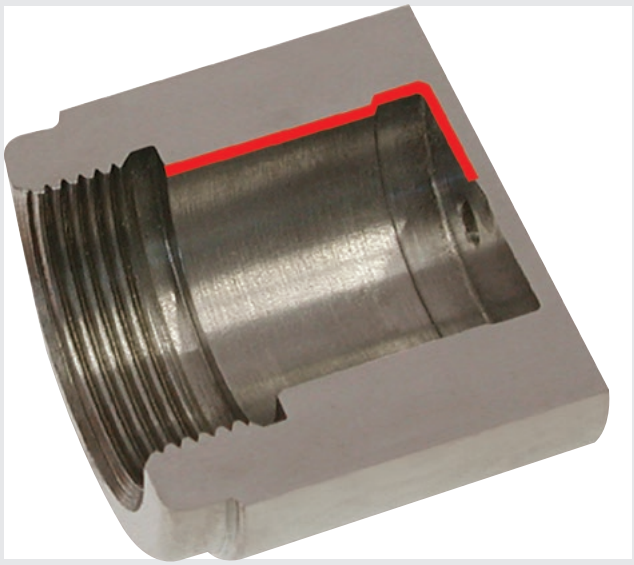
Criteria

- 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	PMC 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

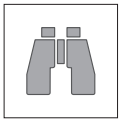
- Machining time reduced by 50%
- Enhanced groove quality

Introduction

Product extensions	#R01#

Solid carbide tools for milling

Introduction	#R01#



Overview	#R02#

Material group UN	#R03#

Technical information

Comparison of materials	#R01#

Index

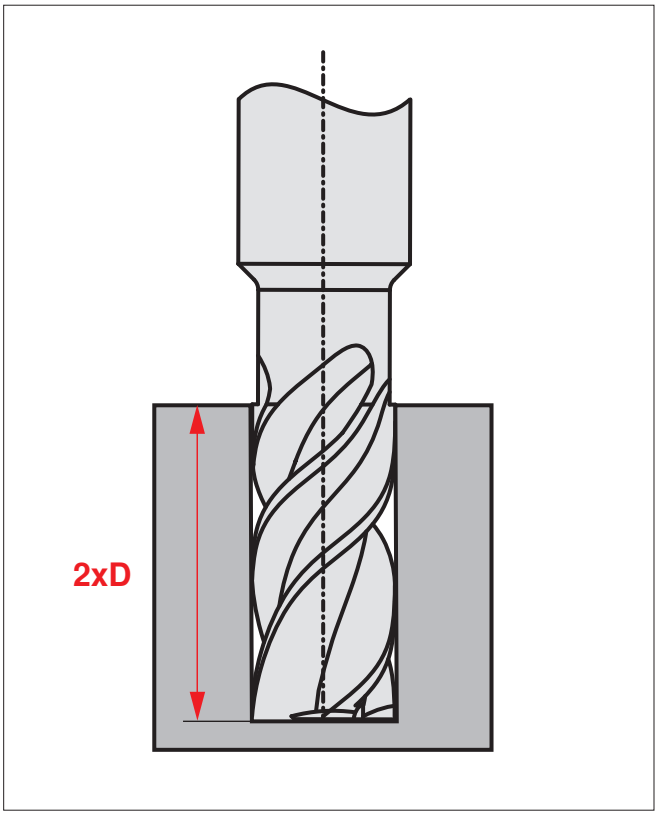
Index	#R01#

High performance x 2

A new generation of end mills

HPC2 W4420 - for universal application:

HPC milling cutters reach higher metal removal rates than conventional end mills. The development of our new HPC2 W4420 end mill has set new standards in the field of HPC machining. Maximum metal removal rates are achieved thanks to high feed rates and at large depths of cut. The geometry of the tool was specially designed for the requirements of this type of machining. Excellent cutting action together with reduced vibration during the milling operation ensures good surface quality.



Your advantages

- ▲ Excellent chip evacuation also when full-slot milling
- ▲ Excellent cutting action due to very positive rake angle
- ▲ Milling operation with reduced vibration and large depths of cut for improved process security
- ▲ Low stress on the spindle – protection of the machine
- ▲ Long tool life and cutting parameters thanks to grade SCPP225 and special micro-geometries
- ▲ Ground neck for large depths of cut

Your benefits

- ▲ Maximum productivity due to high metal removal rates
- ▲ Longer tool life with the same metal removal rates for reduced tooling costs
- ▲ Secure production processes through increased process security

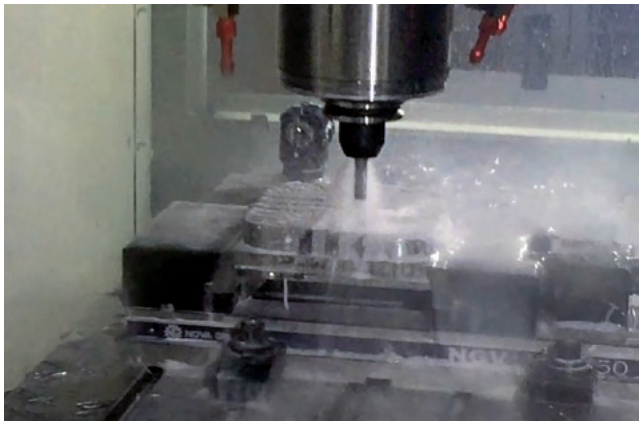
HPC2 W4420 end mills

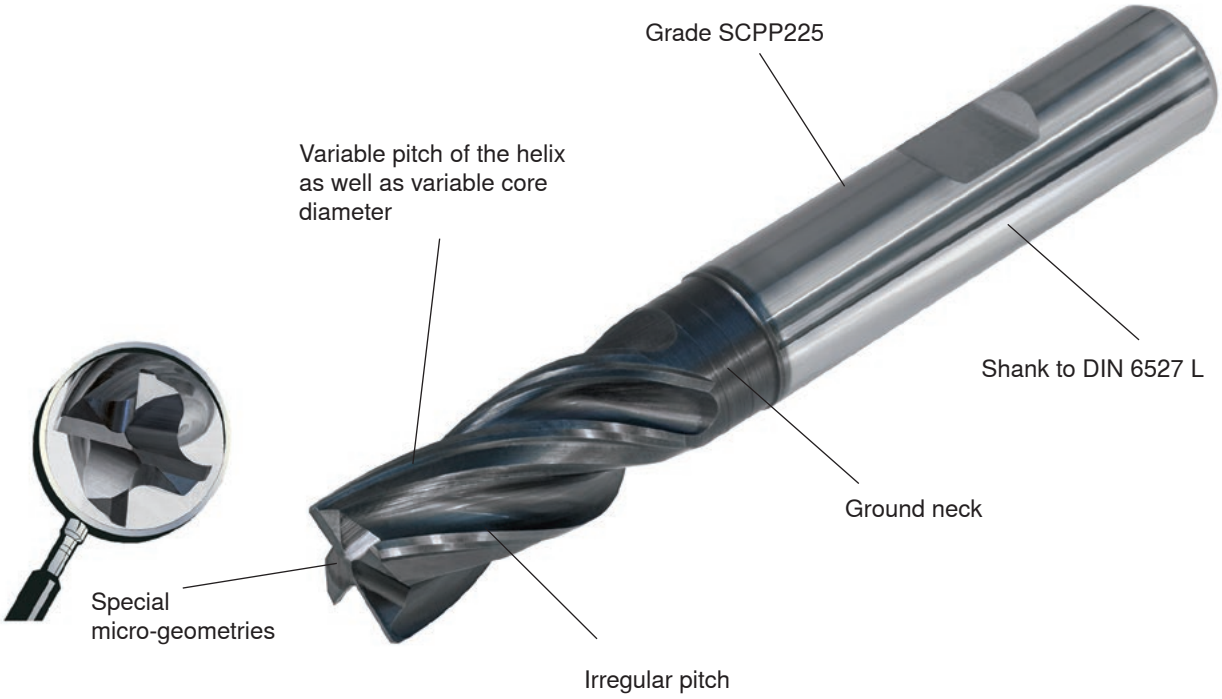
We offer the new solid carbide cutting tool with 4 cutting edges in diameters from 3 mm to 20 mm for common steel materials, stainless steels, cast iron and non-ferrous metals. The geometries specially created for this milling cutter combine the advantages of small and large rake angles as well as variable core diameters for deep chip pockets in one tool.

HPC2-SF		Ø ranges	z	Through-coolant	Tolerances	Helix angle	Rake angle	Grade
UN	W4420	3 – 20	4		d_1 = f8 / d_A = h6	λ_s = 22–42° 17–40°	γ_s = 14°	SCPP225

The universal tool for very high metal removal rates

The HPC2 W4420 end mill combines various characteristics for maximum metal removal rates: the SCPP225 grade, together with the special micro-geometry on the front and peripheral cutting edges, provides long tool life and high cutting parameters. Also possible are great depths of cut > 1.5xD with very high feed rates. Thanks to the ground neck, deep pockets can be machined. Furthermore, the irregular pitch of the tool reduces vibration and guarantees low cutting noise. The variable core diameter and the variable helix increase stability providing quick and secure chip evacuation.



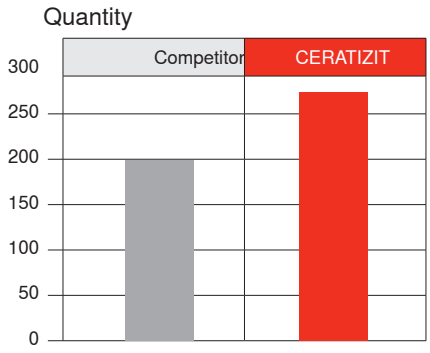


A practical example

Material: non-alloyed steel, annealed
0.15 % - 0.45 % C (VDI 3323 group 2)

	Competitor	CERATIZIT
Cutter Ø [mm]	16	16
a_e [mm]	16	16
a_p [mm]	32 (2xD)	32 (2xD)
V_c [m/min]	90	90
n [min^{-1}]	1800	1800
f_z [mm]	0,05	0,05
V_f [mm/min]	360	360
Quantity	200	280

+40%



HPC2 W4420 - with different variable rake angles

Increasing helix angle

The continuously increasing helix angle of 17° or 22° to 40° or 42°, unites the advantages of a small and a large helix angle.

Low cutting forces and quicker chip evacuation and formation make for low cutting noise and reduced vibration ensuring good surface quality with high cutting parameters.

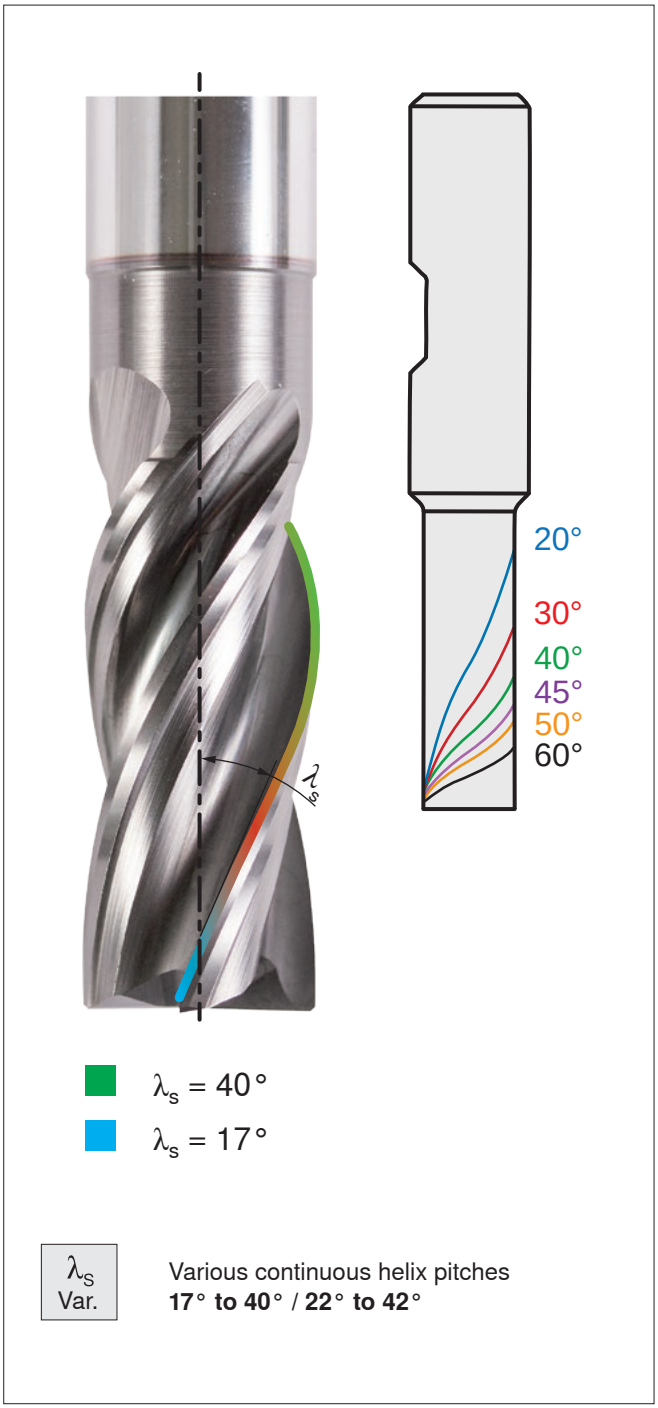
Variable core diameter

Due to the gradually increasing helix angle, the core diameter has been adapted to optimise chip evacuation. The HPC2 W4420 end mill thus ensures consistent metal removal rates thanks to the deeper helical flutes.
To guarantee sufficient stability of the HPC2 W4420, however, the core diameter was reduced variably and implemented with only two flutes.

Irregular pitch

The irregular pitch ensures smooth cutting action even with substantial depths of cut, making for low cutting noise and low vibration.

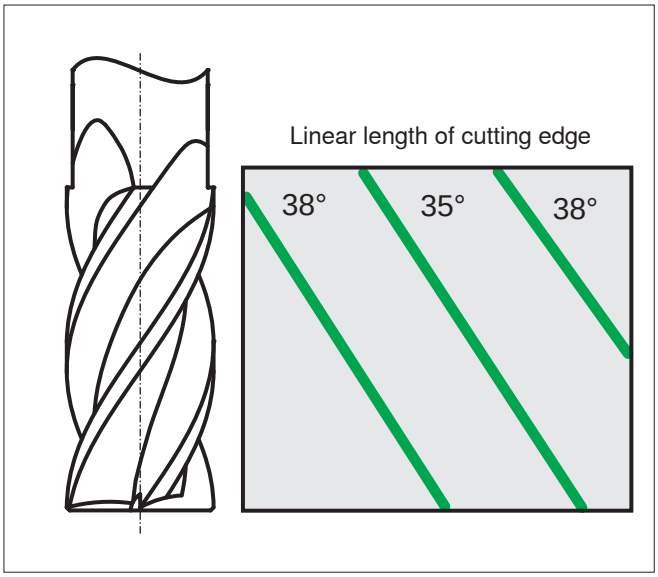
"Excellent stability combined with optimal chip evacuation."



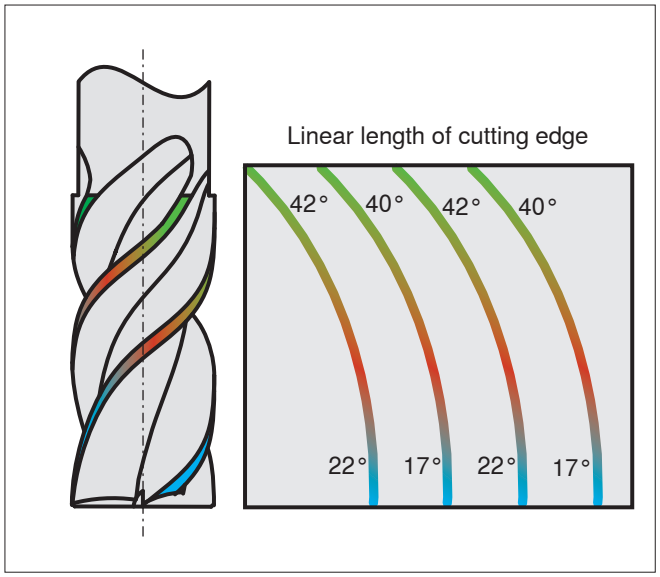
λ_S Var. Various continuous helix pitches **17° to 40° / 22° to 42°**

The following illustration compares a HPC cutter with irregular pitch to a HPC2 end mill additionally characterised by a variable helix angle and core diameter. It shows the 'linear' length of the cutting edge or length of the helical flutes of the tools. This points out the difference of the variable helix angle of a HPC2 W4420 end mill when compared with a solid carbide milling cutter commonly used on the market, one that has a constant helix angle over the entire length of the groove.

Tool with irregular pitch



HPC2 tool with irregular pitch and variable helix angle

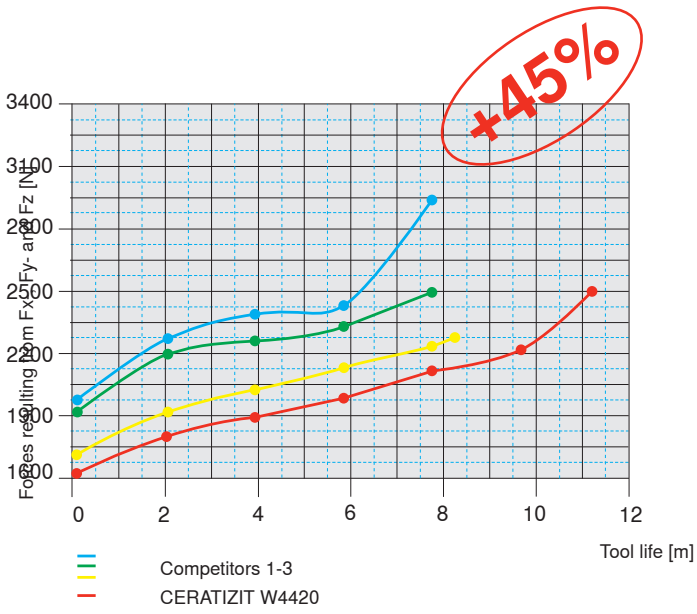


Resulting forces

Compared to competitor tools, the HPC2 tool exhibits notably lower forces generated by the tool (see chart). Improvements in tool life of up to 45% are achieved when the cutting forces are equal.

Material: non alloyed steel, annealed
1.2379 X155 Cr V Mo 121

	Competitor	CERATIZIT
Cutter Ø [mm]	10	10
a_e [mm]	10	10
a_p [mm]	10 (1xD)	10 (1xD)
V_c [m/min]	160	160
n [min^{-1}]	5093	5093
f_z [mm]	0,05	0,05
V_f [mm/min]	1019	1019
Tool life [m]	7,8	11,3



Designation system - tools

Solid carbide tools for milling

CUTTING SOLUTIONS BY CERATIZIT

MRO . V . 0839 . 0800 . L

1 2 3 4 5

1

Tool group	
HPC2-SF	HPC2 end mills
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

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

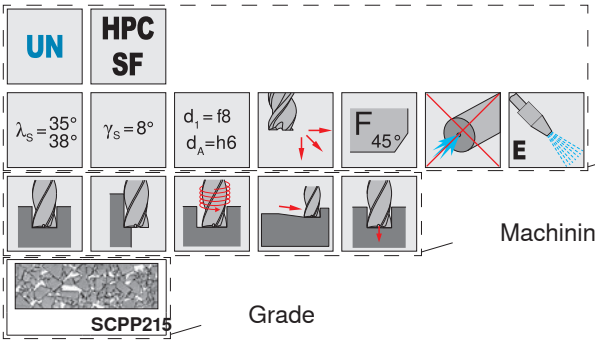
Grade

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
λ_S = 44,5° 46,5°	Helix angle

λ_S Var.	Variable helix angle
 z	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

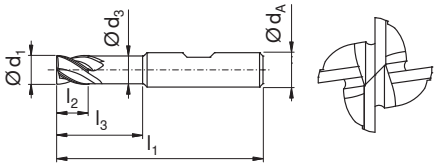


Application/
geometry

Machining possibilities

Grade

Shank length



Length/shank type

d1 [mm]	Type, description	dA [mm]	d3 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	F [mm]	z	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, grade description

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
SCPP225	HC-P25	C6	P		●	○	○	○	○	

01 05 10 15 20 25 30 35 40 45 50

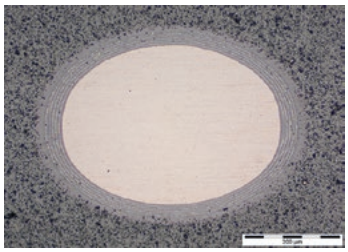
● Main application

○ Extended application

SCPP225

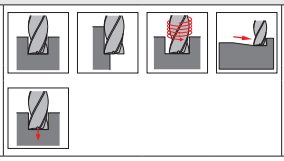
HC-P25

● ○ ○ ○ ○



Specification:
Grain size: submicron / 0.7 μm | Hardness: HV_{30} 1600 | Coating specification: Ti Al C N | Coating structure: multi-layer (stacked structure)

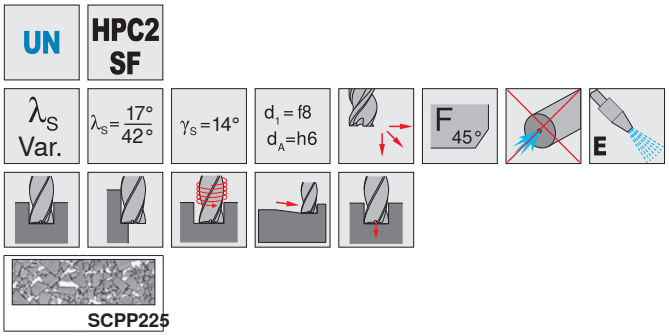
Recommended application:
Good combination of carbide and coating for universal application.

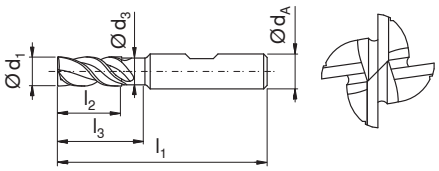
Tool type	Length	Ø-range [mm]	Number of teeth	Helix angle	Rake angle	Int. coolant supply	Cutting edge form	Shank	Machining direction	Machining method	Page(s)
UN	HPC2 SF	HPC2 end mills, coated									
W4420	 	3.0 - 20.0	Z4	$\lambda_S = \frac{17°}{42°}$	$\gamma_S = 14°$		F 45°	HB 			#R01#

W4420-L, coated

HPC2 end mills

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	2xø	0,028	0,05	0,08	0,12	0,14
1.1.2			240	1xø	2xø	0,025	0,045	0,07	0,1	0,12
1.2.1	Constructional steel		250	1xø	2xø	0,028	0,05	0,08	0,12	0,14
1.2.2			230	1xø	2xø	0,025	0,045	0,07	0,1	0,12
1.2.3			220	1xø	2xø	0,025	0,045	0,07	0,1	0,12
1.3.1	Spring steel									
1.3.2										
1.3.3										
2.1.1	Cementation steel		210	1xø	2xø	0,025	0,045	0,07	0,1	0,12
2.1.2			200	1xø	2xø	0,025	0,045	0,07	0,1	0,12
2.1.3			190	1xø	2xø	0,02	0,04	0,06	0,08	0,1
2.2.1	Nitriding steel		190	1xø	2xø	0,025	0,045	0,07	0,1	0,12
2.2.2			170	1xø	2xø	0,02	0,04	0,06	0,08	0,1
2.3.1	Tempered steel		200	1xø	2xø	0,025	0,045	0,07	0,1	0,12
2.3.2			190	1xø	2xø	0,025	0,045	0,07	0,1	0,12
2.3.3			190	1xø	2xø	0,025	0,045	0,07	0,1	0,12
2.3.4			180	1xø	2xø	0,025	0,045	0,07	0,1	0,12
2.3.5			170	1xø	2xø	0,02	0,04	0,06	0,08	0,1
2.3.6			150	1xø	2xø	0,02	0,04	0,06	0,08	0,1
3.1.1	Non alloyed tool steel		180	1xø	2xø	0,025	0,045	0,07	0,1	0,12
3.2.1	Tool steel for cold working		180	1xø	2xø	0,025	0,045	0,07	0,1	0,12
3.2.2			170	1xø	2xø	0,025	0,045	0,07	0,1	0,12
3.2.3			150	1xø	2xø	0,02	0,04	0,06	0,08	0,1
3.2.4			160	1xø	2xø	0,025	0,045	0,07	0,1	0,12
3.2.5			140	1xø	2xø	0,025	0,045	0,07	0,1	0,12
3.3.1	Tool steel for hot working		200	1xø	2xø	0,025	0,045	0,07	0,1	0,12
3.3.2			180	1xø	2xø	0,02	0,04	0,06	0,08	0,1
3.3.3			150	1xø	2xø	0,025	0,045	0,07	0,1	0,12
3.3.4			140	1xø	2xø	0,025	0,045	0,07	0,1	0,12
3.3.5			130	1xø	2xø	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		120	1xø	1,5xø	0,012	0,025	0,04	0,05	0,07
4.1.2			100	1xø	1,5xø	0,012	0,025	0,04	0,05	0,07
4.1.3			120	1xø	1,5xø	0,012	0,025	0,04	0,05	0,07
4.1.4			120	1xø	1,5xø	0,012	0,025	0,04	0,05	0,07
4.1.5			130	1xø	1,5xø	0,012	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	2xø	0,025	0,045	0,07	0,1	0,12
5.1.2			160	1xø	2xø	0,025	0,045	0,07	0,1	0,12
5.1.3			140	1xø	2xø	0,025	0,045	0,07	0,1	0,12
5.2.1	Stainless cast steel		120	1xø	2xø	0,015	0,03	0,05	0,06	0,08
5.2.2			120	1xø	2xø	0,015	0,03	0,05	0,06	0,08
6.1.1	Cast iron with lamellar graphite		200	1xø	2xø	0,028	0,05	0,08	0,12	0,14
6.1.2			180	1xø	2xø	0,028	0,05	0,08	0,12	0,14
6.1.3			160	1xø	2xø	0,025	0,045	0,07	0,1	0,12
6.1.4			120	1xø	2xø	0,025	0,045	0,07	0,1	0,12
6.2.1	Spheroidal cast iron		190	1xø	2xø	0,025	0,045	0,07	0,1	0,12
6.2.2			170	1xø	2xø	0,025	0,045	0,07	0,1	0,12
6.2.3			150	1xø	2xø	0,025	0,045	0,07	0,1	0,12
6.3.1	GTW (white malleable cast iron)		180	1xø	2xø	0,025	0,045	0,07	0,1	0,12
6.3.2			160	1xø	2xø	0,025	0,045	0,07	0,1	0,12
6.4.1	GTS (black malleable cast iron)		180	1xø	2xø	0,025	0,045	0,07	0,1	0,12
6.4.2			160	1xø	2xø	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		280	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.3.2			240	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.3.3			200	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.3.4			240	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.3.5			200	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.3.6			240	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.4.1	CuZn (brass)		300	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.4.2			350	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.5.1	CuSn (bronze)		240	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.5.2			280	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.6.1	CuAlFe (Ampco)		140	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.6.2			160	1xø	2xø	0,028	0,05	0,08	0,12	0,14
7.8.1	Titanium									
7.8.2										
7.8.3										





d1 [mm]	Type, description	dA [mm]	d3 [mm]	l1 [mm]	l2 [mm]	l3 [mm]	F [mm]	z	HB Material
3.0	HPC2-SF.UN.4420.0300.L.Z4.F0010A.HB	6	2.8	57	8	13	0.1	4	W4420030341
4.0	HPC2-SF.UN.4420.0400.L.Z4.F0010A.HB	6	3.8	57	11	17	0.1	4	W4420040341
5.0	HPC2-SF.UN.4420.0500.L.Z4.F0010A.HB	6	4.8	57	13	19	0.1	4	W4420050341
6.0	HPC2-SF.UN.4420.0600.L.Z4.F0010A.HB	6	5.8	57	13	19	0.1	4	W4420060341
8.0	HPC2-SF.UN.4420.0800.L.Z4.F0020A.HB	8	7.7	63	21	25	0.2	4	W4420080341
10.0	HPC2-SF.UN.4420.1000.L.Z4.F0020A.HB	10	9.7	72	22	30	0.2	4	W4420100341
12.0	HPC2-SF.UN.4420.1200.L.Z4.F0030A.HB	12	11.6	83	26	36	0.3	4	W4420120341
16.0	HPC2-SF.UN.4420.1600.L.Z4.F0030A.HB	16	15.5	92	36	42	0.3	4	W4420160341
20.0	HPC2-SF.UN.4420.2000.L.Z4.F0030A.HB	20	19.5	104	41	52	0.3	4	W4420200341

Notes

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Material table

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/mm²	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/mm²	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/mm²	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/mm²	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/mm²	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/mm²	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/mm²	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

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Material table

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/mm²	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/mm²	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/mm²	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/mm²	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/mm²	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/mm²	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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Material table

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
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/mm²	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/mm²	1.2312	40 CrMnMoS 8 6								
			1.2711	54 NiCrMoV 6	55 NCDV 6							
		3.2.3 low alloyed up to 1500 N/mm²	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/mm²	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/mm²	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								

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
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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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
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							

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
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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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
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 metals	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 metals	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								

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
7 Non-ferrous metals	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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Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
7 Non-ferrous metals	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								

Material main group	Material sub-group	Quality	StNr	DIN	AFNOR	UNI	BS	JIS	SS	GOST	UNS	USA
7 Non-ferrous metals	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

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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 formalde-hyde	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

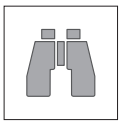
Material table

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								

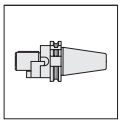
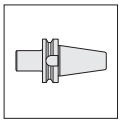
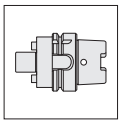
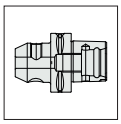
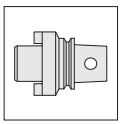
Notes

CUTTING SOLUTIONS BY CERATIZIT

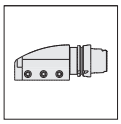
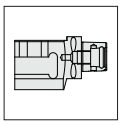
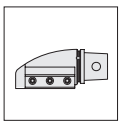
Introduction

	Product extensions	#R01#
	Overview	#R02#

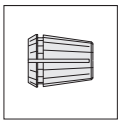
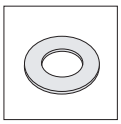
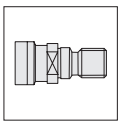
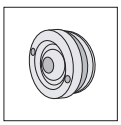
Rotating adapters

	DIN 69871	#R01#
	MAS-BT	#R02#
	HSK-A	#R03#
	PSC	#R04#
	UTS	#R05#

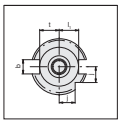
Stationary adapters

	HSK-T	#R01#
	PSC	#R02#
	UTS	#R03#

Accessories

	Collets, clamping nuts	#R01#
	Sealing rings	#R02#
	Pull studs	#R03#
	Other	#R04#

Technical information

	Dimensions of HSK adapters	#R01#
	Spare parts	#R02#

Spindle nose tooling from CERATIZIT

After launching the initial programme covering the most common standard adapters, Cutting Solutions by CERATIZIT now offers you an even broader range of spindle nose tools. Our range has been extended with over 500 additional items for collet chucks, hydraulic chucks and the versatile and stable Polygon adapter interface. Please see below an overview of the entire programme.

Rotating spindle nose tools

Rotating spindle nose tools	DIN 69871	MAS-BT	HSK-A	UTS	PSC
Weldon adapters	●	●	●	●	●
Whistle Notch adapters	●	●	●	●	●
Shrink fit adapters	●	●	●	–	●
Hydraulic expansion chucks	●	●	●	–	●
Collet chucks type ER	●	●	●	●	●
Collet chucks type OZ	●	●	–	–	–
Adapters for threaded shank milling cutters	–	–	●	–	●
Combination shell mill adapters	●	●	–	–	●
Shell mill adapters, centre bolt	●	●	●	●	–
Shell mill adapters, 4 bolts	●	●	–	–	–
Morse taper adapters with thread	●	●	●	–	●
Test bars	●	●	●	–	●
Blanks	●	●	●	–	●

Stationary spindle nose tool

Stationary spindle nose tools	HSK-T	UTS	PSC
Shank holders	●	●	●
Boring bar holders	●	●	●
Extensions	●	●	●
Reducers	●	–	●
UTS adapters	●	–	●
Blanks	●	●	●
Test bars	●	●	●

● New!

Shrink fit adapters

An initial highlight of this extended range are the shrink fit adapters with a 4.5° profile. These are suitable for clamping solid carbide and HSS shanks. In addition to their highly precise concentricity, they are characterised by high rigidity, clamping forces (up to 640 Nm) as well as economic efficiency.

Programme

- ▲ Diameter range from 3-32 mm
- ▲ Available from short to extra-long versions
- ▲ Available connections for example SK, HSK-A and PSC
- ▲ Balancing class G2.5/n_{max} 25000 min^{-1}
- ▲ Concentricity starting from 0.003 mm

Hydraulic expansion chucks

Hydraulic expansion chucks are suitable for mounting tool shanks to DIN1835A+B / DIN6535HA+HB. The technical features of these expansion chucks are the vibration-damping effect during machining, a high radial rigidity as well as easy handling. No additional devices are required and the clamping area can be flexibly adapted by using reduction sleeves.

Programme

- ▲ Diameter range 6-32 mm
- ▲ Connections available for example SK, HSK-A and PSC
- ▲ Balancing class G2.5/n_{max} 25000 min^{-1}
- ▲ Concentricity better than 0.003 mm

Polygon adapters

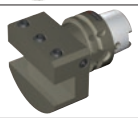
Another highlight of the programme extension in the spindle nose tooling sector are the Polygon adapters (PSC). The advantages of the Polygon adapter in connection with the location face are:

- ▲ High rigidity and transverse rupture strength
- ▲ Maximum precision
- ▲ Accurate repeatability
- ▲ High torque moments

Spindle nose tooling
Overview

Rotating spindle nose tools		DIN69871	MAS-BT	HSK-A	PSC	UTS	
	Weldon adapters	#R01#	#R02#	#R03#	#R04#	#R05#	
	Whistle Notch adapters	#R07#	#R08#	#R09#	#R10#	#R11#	
	Shrink fit adapters	#R13#	#R14#	#R15#	#R16#		
	Hydraulic expansion chucks	#R19#	#R20#	#R21#	#R22#		
	Collet chucks type ER	#R25#	#R26#	#R27#	#R28#	#R29#	
	Collet chucks type ER-D	#R31#	#R32#				
	Collet chucks type OZ	#R37#	#R38#				
	Combination shell mill adapters	#R43#	#R44#		#R46#		
	Shell mill adapters, centre bolt	#R49#	#R50#	#R51#		#R53#	
	Adapters for threaded shank milling cutters			#R57#	#R58#		
	Shell mill adapters, 4 bolts	#R61#	#R62#				
	Morse taper adapters with tang	#R67#	#R68#	#R69#			
	Morse taper adapters with thread	#R73#	#R74#		#R76#		
	PSC adapters			#R81#			
	Test bars	#R85#	#R86#	#R87#	#R88#		

Rotating spindle nose tools		DIN69871	MAS-BT	HSK-A	PSC	UTS	
	Blanks	#R91#	#R92#	#R93#	#R94#		

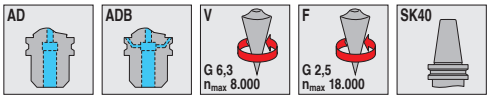
Stationary spindle nose tools		DIN69871	MAS-BT	HSK-A	PSC	UTS	
	Tool holders 0°			#R03#	#R04#	#R05#	
	Tool holders 45°			#R09#	#R10#		
	Tool holders 90° / neutral			#R15#	#R16#		
	Multiple shank holders			#R21#	#R22#	#R23#	
	Boring bar holders			#R27#	#R28#	#R29#	
	Extensions			#R33#	#R34#	#R35#	
	Reducers			#R39#	#R40#		
	UTS adapters			#R45#			
	Assembly sets					#R53#	
	Test bars			#R57#	#R58#	#R59#	
	Blanks			#R63#	#R64#	#R65#	

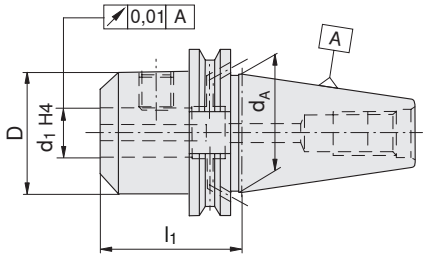
Spindle nose tooling
Overview

Accessories		DIN69871	MAS-BT	HSK-A	PSC	UTS	
	Collets ER						#R06#
	Collets DIN6388-B						#R12#
	Lock nuts ER						#R18#
	Lock nuts ER-D						#R24#
	Lock nuts OZ						#R30#
	Sealing rings						#R36#
	Pull studs DIN 69872						#R42#
	Pull studs MAS-BT						#R48#
	Pull studs DIN 7388						#R54#
	Reducers MK						#R60#
	Reduction sleeves for hydraulic expansion chucks						#R66#
	Drive rings						#R72#

DIN 69871

Weldon adapters



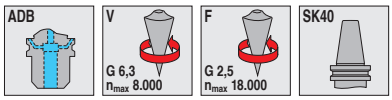


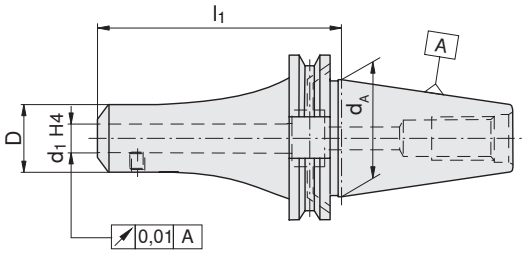
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
69871-ADB40-WE06-50-F	6	50	40	25	E01
69871-ADB40-WE06-50-V	6	50	40	25	E01
69871-ADB40-WE08-50-F	8	50	40	28	E02
69871-ADB40-WE08-50-V	8	50	40	28	E02
69871-ADB40-WE10-50-F	10	50	40	35	E03
69871-ADB40-WE10-50-V	10	50	40	35	E03
69871-ADB40-WE12-50-F	12	50	40	42	E04
69871-ADB40-WE12-50-V	12	50	40	42	E04
69871-ADB40-WE14-50-F	14	50	40	44	E04
69871-ADB40-WE14-50-V	14	50	40	44	E04
69871-AD40-WE16-35-F	16	35	40	48	E05
69871-AD40-WE16-35-V	16	35	40	48	E05
69871-ADB40-WE16-63-F	16	63	40	48	E05
69871-ADB40-WE16-63-V	16	63	40	48	E05
69871-ADB40-WE18-63-F	18	63	40	50	E05
69871-ADB40-WE18-63-V	18	63	40	50	E05
69871-AD40-WE20-35-F	20	35	40	50	E06
69871-AD40-WE20-35-V	20	35	40	50	E06
69871-ADB40-WE20-63-F	20	63	40	52	E06
69871-ADB40-WE20-63-V	20	63	40	52	E06
69871-AD40-WE25-40-F	25	40	40	50	E07
69871-AD40-WE25-40-V	25	40	40	50	E07
69871-ADB40-WE25-100-F	25	100	40	65	E07
69871-ADB40-WE25-100-V	25	100	40	65	E07
69871-ADB40-WE32-100-F	32	100	40	72	E08
69871-ADB40-WE32-100-V	32	100	40	72	E08
69871-ADB40-WE40-120-V	40	120	40	90	E09

E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200
E09		6295003200


#R01#


#R02#





Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
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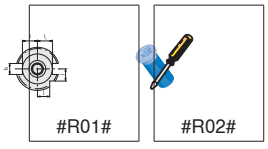
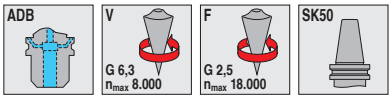
69871-ADB40-WE06-100-V	6	100	40	25	E01
69871-ADB40-WE06-160-F	6	160	40	25	E01
69871-ADB40-WE06-160-V	6	160	40	25	E01
69871-ADB40-WE08-100-F	8	100	40	28	E02
69871-ADB40-WE08-100-V	8	100	40	28	E02
69871-ADB40-WE08-160-F	8	160	40	28	E02
69871-ADB40-WE08-160-V	8	160	40	28	E02
69871-ADB40-WE10-100-F	10	100	40	35	E03
69871-ADB40-WE10-100-V	10	100	40	35	E03
69871-ADB40-WE10-160-F	10	160	40	35	E03
69871-ADB40-WE10-160-V	10	160	40	35	E03
69871-ADB40-WE12-100-F	12	100	40	42	E04
69871-ADB40-WE12-100-V	12	100	40	42	E04
69871-ADB40-WE12-160-F	12	160	40	42	E04
69871-ADB40-WE12-160-V	12	160	40	42	E04
69871-ADB40-WE14-160-F	14	160	40	44	E04
69871-ADB40-WE14-160-V	14	160	40	44	E04
69871-ADB40-WE16-100-F	16	100	40	48	E05
69871-ADB40-WE16-100-V	16	100	40	48	E05
69871-ADB40-WE16-160-F	16	160	40	48	E05
69871-ADB40-WE16-160-V	16	160	40	48	E05
69871-ADB40-WE18-160-F	18	160	40	50	E05
69871-ADB40-WE18-160-V	18	160	40	50	E05
69871-ADB40-WE20-100-F	20	100	40	52	E06
69871-ADB40-WE20-100-V	20	100	40	52	E06
69871-ADB40-WE20-160-F	20	160	40	52	E06
69871-ADB40-WE20-160-V	20	160	40	52	E06
69871-ADB40-WE25-160-F	25	160	40	65	E07
69871-ADB40-WE25-160-V	25	160	40	65	E07

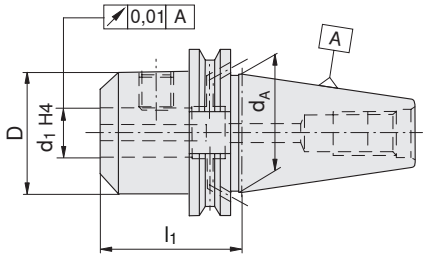
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500



DIN 69871

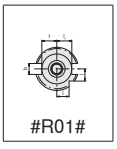
Weldon adapters



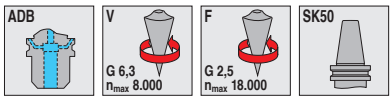


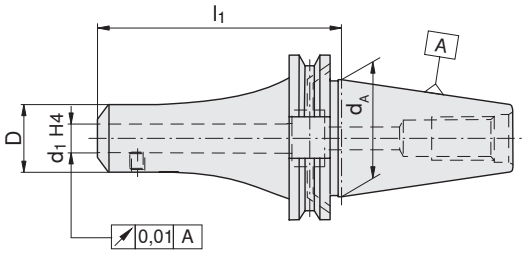
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
69871-ADB50-WE06-63-F	6	63	50	25	E01
69871-ADB50-WE06-63-V	6	63	50	25	E01
69871-ADB50-WE08-63-F	8	63	50	28	E02
69871-ADB50-WE08-63-V	8	63	50	28	E02
69871-ADB50-WE10-63-F	10	63	50	35	E03
69871-ADB50-WE10-63-V	10	63	50	35	E03
69871-ADB50-WE12-63-F	12	63	50	42	E04
69871-ADB50-WE12-63-V	12	63	50	42	E04
69871-ADB50-WE14-63-F	14	63	50	44	E04
69871-ADB50-WE14-63-V	14	63	50	44	E04
69871-ADB50-WE16-63-F	16	63	50	48	E05
69871-ADB50-WE16-63-V	16	63	50	48	E05
69871-ADB50-WE18-63-F	18	63	50	50	E05
69871-ADB50-WE18-63-V	18	63	50	50	E05
69871-ADB50-WE20-63-F	20	63	50	52	E06
69871-ADB50-WE20-63-V	20	63	50	52	E06
69871-ADB50-WE25-80-F	25	80	50	65	E07
69871-ADB50-WE25-80-V	25	80	50	65	E07
69871-ADB50-WE32-100-F	32	100	50	72	E08
69871-ADB50-WE32-100-V	32	100	50	72	E08
69871-ADB50-WE40-120-V	40	120	50	90	E09

E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200
E09		6295003200


#R01#

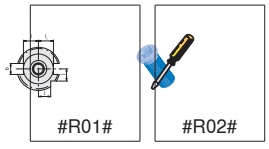

#R02#





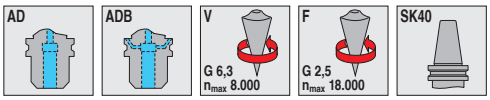
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
69871-ADB50-WE06-100-V	6	100	50	25	E01
69871-ADB50-WE06-160-V	6	160	50	25	E01
69871-ADB50-WE08-100-V	8	100	50	28	E02
69871-ADB50-WE08-160-V	8	160	50	28	E02
69871-ADB50-WE10-100-V	10	100	50	35	E03
69871-ADB50-WE10-160-V	10	160	50	35	E03
69871-ADB50-WE12-100-V	12	100	50	42	E04
69871-ADB50-WE12-160-V	12	160	50	42	E04
69871-ADB50-WE14-100-V	14	100	50	44	E04
69871-ADB50-WE14-160-V	14	160	50	44	E04
69871-ADB50-WE16-100-V	16	100	50	48	E05
69871-ADB50-WE16-160-V	16	160	50	48	E05
69871-ADB50-WE18-100-V	18	100	50	50	E05
69871-ADB50-WE18-160-V	18	160	50	50	E05
69871-ADB50-WE20-100-V	20	100	50	52	E06
69871-ADB50-WE20-160-V	20	160	50	52	E06
69871-ADB50-WE25-100-V	25	100	50	65	E07
69871-ADB50-WE25-160-V	25	160	50	65	E07
69871-ADB50-WE32-160-V	32	160	50	72	E08

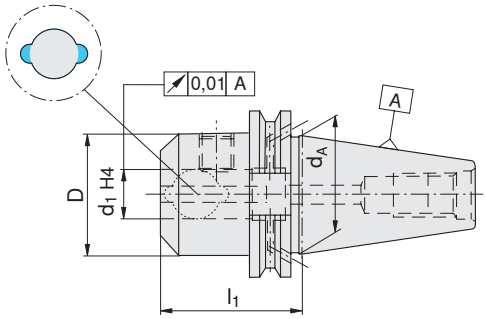
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200



DIN 69871

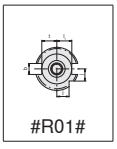
Weldon adapters with through-coolant (IK)





Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
69871-ADB40-WE06IK-50-F	6	50	40	25	E01
69871-ADB40-WE06IK-50-V	6	50	40	25	E01
69871-ADB40-WE08IK-50-F	8	50	40	28	E02
69871-ADB40-WE08IK-50-V	8	50	40	28	E02
69871-ADB40-WE10IK-50-F	10	50	40	35	E03
69871-ADB40-WE10IK-50-V	10	50	40	35	E03
69871-ADB40-WE12IK-50-F	12	50	40	42	E04
69871-ADB40-WE12IK-50-V	12	50	40	42	E04
69871-ADB40-WE14IK-50-F	14	50	40	44	E04
69871-ADB40-WE14IK-50-V	14	50	40	44	E04
69871-AD40-WE16IK-35-V	16	35	40	48	E05
69871-ADB40-WE16IK-63-F	16	63	40	48	E05
69871-ADB40-WE16IK-63-V	16	63	40	48	E05
69871-ADB40-WE18IK-63-F	18	63	40	50	E05
69871-ADB40-WE18IK-63-V	18	63	40	50	E05
69871-AD40-WE20IK-35-V	20	35	40	50	E06
69871-ADB40-WE20IK-63-F	20	63	40	52	E06
69871-ADB40-WE20IK-63-V	20	63	40	52	E06
69871-AD40-WE25IK-40-V	25	40	40	50	E07
69871-ADB40-WE25IK-100-F	25	100	40	65	E07
69871-ADB40-WE25IK-100-V	25	100	40	65	E07
69871-ADB40-WE32IK-100-V	32	100	40	72	E08

E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200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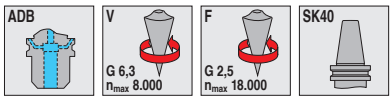
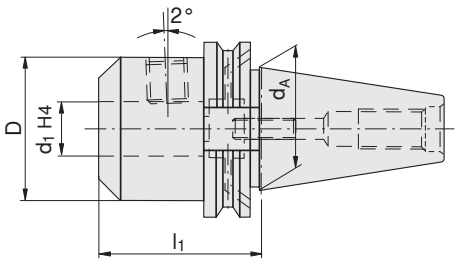
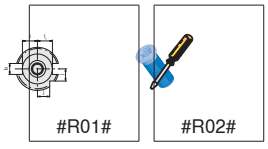
#R02#





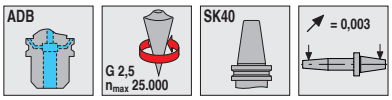
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
69871-ADB40-WN06-50-F	6	50	40	25	E01
69871-ADB40-WN06-50-V	6	50	40	25	E01
69871-ADB40-WN08-50-F	8	50	40	28	E02
69871-ADB40-WN08-50-V	8	50	40	28	E02
69871-ADB40-WN10-50-F	10	50	40	35	E03
69871-ADB40-WN10-50-V	10	50	40	35	E03
69871-ADB40-WN12-50-F	12	50	40	42	E04
69871-ADB40-WN12-50-V	12	50	40	42	E04
69871-ADB40-WN14-50-F	14	50	40	44	E04
69871-ADB40-WN14-50-V	14	50	40	44	E04
69871-ADB40-WN16-63-F	16	63	40	48	E05
69871-ADB40-WN16-63-V	16	63	40	48	E05
69871-ADB40-WN18-63-F	18	63	40	50	E05
69871-ADB40-WN18-63-V	18	63	40	50	E05
69871-ADB40-WN20-63-F	20	63	40	52	E06
69871-ADB40-WN20-63-V	20	63	40	52	E06

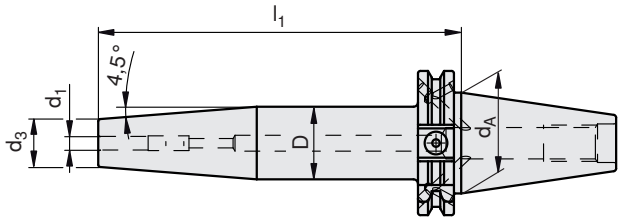
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000



DIN 69871

Shrink fit adapters





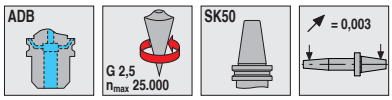
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	d_3 [mm]	
69871-ADB40-SF4.5°-3-70	3	70	40	17	12	
69871-ADB40-SF4.5°-3-120	3	120	40	17	12	
69871-ADB40-SF4.5°-4-70	4	70	40	17	12	
69871-ADB40-SF4.5°-4-120	4	120	40	17	12	
69871-ADB40-SF4.5°-5-70	5	70	40	17	12	
69871-ADB40-SF4.5°-5-120	5	120	40	17	12	
69871-ADB40-SF4.5°-6-80	6	80	40	30.6	21	E01
69871-ADB40-SF4.5°-6-120	6	120	40	32	21	E01
69871-ADB40-SF4.5°-6-160	6	160	40	32	21	E01
69871-ADB40-SF4.5°-8-80	8	80	40	30.5	21	E02
69871-ADB40-SF4.5°-8-120	8	120	40	32	21	E02
69871-ADB40-SF4.5°-8-160	8	160	40	32	21	E02
69871-ADB40-SF4.5°-10-80	10	80	40	33.6	24	E03
69871-ADB40-SF4.5°-10-120	10	120	40	34	24	E03
69871-ADB40-SF4.5°-10-160	10	160	40	34	24	E03
69871-ADB40-SF4.5°-12-80	12	80	40	33.6	24	E04
69871-ADB40-SF4.5°-12-120	12	120	40	34	24	E04
69871-ADB40-SF4.5°-12-160	12	160	40	34	24	E04
69871-ADB40-SF4.5°-14-80	14	80	40	36.6	27	E04
69871-ADB40-SF4.5°-14-160	14	160	40	36	27	E04
69871-ADB40-SF4.5°-16-80	16	80	40	36.6	27	E05
69871-ADB40-SF4.5°-16-120	16	120	40	36	27	E05
69871-ADB40-SF4.5°-16-160	16	160	40	36	27	E05
69871-ADB40-SF4.5°-18-80	18	80	40	42.6	33	E05
69871-ADB40-SF4.5°-18-160	18	160	40	44	33	E05
69871-ADB40-SF4.5°-20-80	20	80	40	42.6	33	E06
69871-ADB40-SF4.5°-20-120	20	120	40	44	33	E06
69871-ADB40-SF4.5°-20-160	20	160	40	44	33	E06
69871-ADB40-SF4.5°-25-100	25	100	40	50	44	E06
69871-ADB40-SF4.5°-25-160	25	160	40	50	44	E06
69871-ADB40-SF4.5°-32-100	32	100	40	50	44	E06

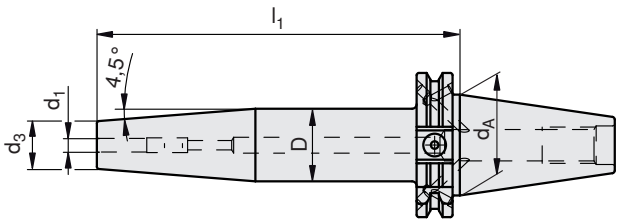
⚠ For shanks with tolerance h6 or better

E01	12087062
E02	12087063
E03	12087064
E04	12087065
E05	12087066
E06	12087067


#R01#


#R02#

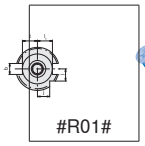




Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	d_3 [mm]	
69871-ADB50-SF4.5°-6-80	6	80	50	30.6	21	E01
69871-ADB50-SF4.5°-6-160	6	160	50	32	21	E01
69871-ADB50-SF4.5°-6-200	6	200	50	27	21	E01
69871-ADB50-SF4.5°-8-80	8	80	50	30.6	21	E02
69871-ADB50-SF4.5°-8-160	8	160	50	32	21	E02
69871-ADB50-SF4.5°-8-200	8	200	50	27	21	E02
69871-ADB50-SF4.5°-10-80	10	80	50	33.6	24	E03
69871-ADB50-SF4.5°-10-160	10	160	50	34	24	E03
69871-ADB50-SF4.5°-10-200	10	200	50	34	24	E03
69871-ADB50-SF4.5°-12-80	12	80	50	33.6	24	E04
69871-ADB50-SF4.5°-12-160	12	160	50	34	24	E04
69871-ADB50-SF4.5°-12-200	12	200	50	34	24	E04
69871-ADB50-SF4.5°-14-80	14	80	50	36.6	27	E04
69871-ADB50-SF4.5°-14-160	14	160	50	36	27	E04
69871-ADB50-SF4.5°-14-200	14	200	50	36	27	E04
69871-ADB50-SF4.5°-16-80	16	80	50	36.6	27	E05
69871-ADB50-SF4.5°-16-160	16	160	50	36	27	E05
69871-ADB50-SF4.5°-16-200	16	200	50	36	27	E05
69871-ADB50-SF4.5°-18-80	18	80	50	42.6	33	E05
69871-ADB50-SF4.5°-18-160	18	160	50	44	33	E05
69871-ADB50-SF4.5°-18-200	18	200	50	44	33	E05
69871-ADB50-SF4.5°-20-80	20	80	50	42.6	33	E06
69871-ADB50-SF4.5°-20-160	20	160	50	44	33	E06
69871-ADB50-SF4.5°-20-200	20	200	50	44	33	E06
69871-ADB50-SF4.5°-25-100	25	100	50	53	44	E06
69871-ADB50-SF4.5°-25-160	25	160	50	53	44	E06
69871-ADB50-SF4.5°-25-200	25	200	50	53	44	E06
69871-ADB50-SF4.5°-32-100	32	100	50	56.8	44	E06
69871-ADB50-SF4.5°-32-160	32	160	50	56	44	E06
69871-ADB50-SF4.5°-32-200	32	200	50	53	44	E06

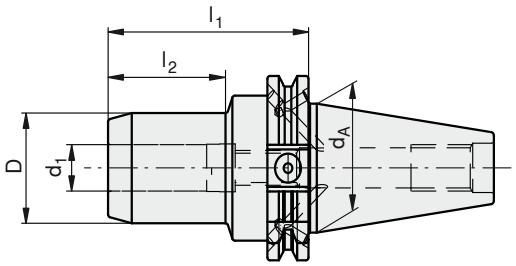
⚠ For shanks with tolerance h6 or better

	
E01	12087062
E02	12087063
E03	12087064
E04	12087065
E05	12087066
E06	12087067



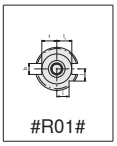
DIN 69871

Hydraulic expansion chucks



Type, description	d_1 [mm]	l_1 [mm]	l_2 [mm]	d_A [mm]	D [mm]
69871-ADB40-HD06-80	6	80	40	40	26
69871-ADB40-HD08-80	8	80	40	40	28
69871-ADB40-HD10-80	10	80	40	40	30
69871-ADB40-HD12-80	12	80	40	40	32
69871-ADB40-HD14-80	14	80	40	40	34
69871-ADB40-HD16-80	16	80	46	40	38
69871-ADB40-HD18-80	18	80	46	40	40
69871-ADB40-HD20-80	20	80	46	40	42
69871-ADB40-HD25-95	25	95	60	40	55
69871-ADB40-HD32-95	32	95	60	40	63
69871-ADB50-HD06-80	6	80	40	50	26
69871-ADB50-HD08-80	8	80	40	50	28
69871-ADB50-HD10-80	10	80	40	50	30
69871-ADB50-HD12-80	12	80	40	50	32
69871-ADB50-HD14-80	14	80	40	50	34
69871-ADB50-HD16-80	16	80	46	50	38
69871-ADB50-HD18-80	18	80	46	50	40
69871-ADB50-HD20-80	20	80	46	50	42
69871-ADB50-HD25-100	25	100	55	50	55
69871-ADB50-HD32-100	32	100	55	50	63

⚠ For tools with shank to DIN 1835 A+B and DIN 6535 HA+HB
Shank to DIN 6535 HE in connection with reduction sleeves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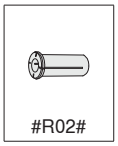
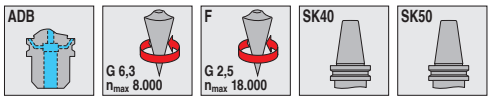
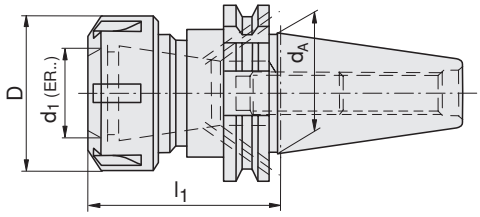
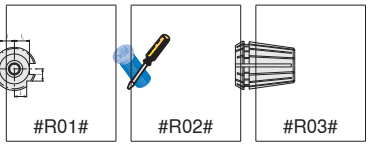

#R02#





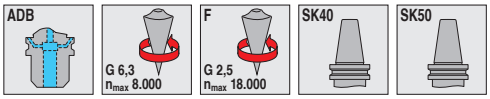
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
69871-ADB40-ER16-60	16	60	40	32	E01
69871-ADB40-ER16-60-F	16	60	40	32	E01
69871-ADB40-ER16-120	16	120	40	32	E01
69871-ADB40-ER16-120-F	16	120	40	32	E01
69871-ADB40-ER25-70	25	70	40	42	E02
69871-ADB40-ER25-70-F	25	70	40	42	E02
69871-ADB40-ER25-120	25	120	40	42	E02
69871-ADB40-ER25-120-F	25	120	40	42	E02
69871-ADB40-ER32-70	32	70	40	50	E03
69871-ADB40-ER32-70-F	32	70	40	50	E03
69871-ADB40-ER32-120	32	120	40	50	E03
69871-ADB40-ER32-120-F	32	120	40	50	E03
69871-ADB40-ER40-70	40	70	40	63	E04
69871-ADB40-ER40-70-F	40	70	40	63	E04
69871-ADB50-ER25-70	25	70	50	42	E02
69871-ADB50-ER25-100	25	100	50	42	E02
69871-ADB50-ER25-160	25	160	50	42	E02
69871-ADB50-ER32-70	32	70	50	50	E03
69871-ADB50-ER32-100	32	100	50	50	E03
69871-ADB50-ER32-160	32	160	50	50	E03
69871-ADB50-ER40-70	40	70	50	63	E04
69871-ADB50-ER40-100	40	100	50	63	E04

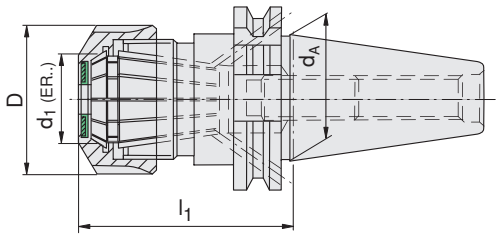
E01	6295005400		8335711600
E02	6295005500	8395001000	8335712500
E03	6295005600	8395001000	8335713200
E04	6295005700	8395001100	8335714000



DIN 69871

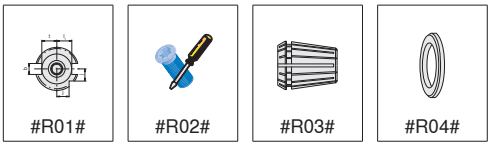
Collet chucks type ER-D

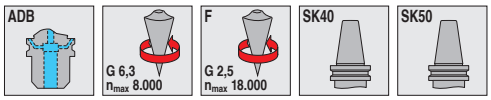


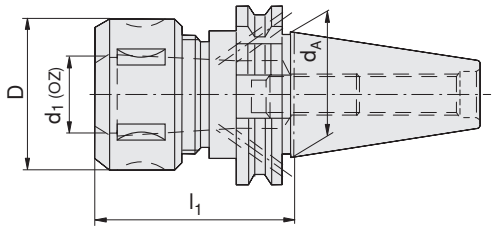


Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
69871-ADB40-ER25D-73	25	73	40	42	E01
69871-ADB40-ER25D-73-F	25	73	40	42	E01
69871-ADB40-ER25D-123	25	123	40	42	E01
69871-ADB40-ER25D-123-F	25	123	40	42	E01
69871-ADB40-ER32D-73	32	73	40	50	E02
69871-ADB40-ER32D-73-F	32	73	40	50	E02
69871-ADB40-ER32D-123	32	123	40	50	E02
69871-ADB40-ER32D-123-F	32	123	40	50	E02
69871-ADB40-ER40D-73	40	73	40	63	E03
69871-ADB40-ER40D-73-F	40	73	40	63	E03
69871-ADB40-ER40D-123	40	123	40	63	E03
69871-ADB40-ER40D-123-F	40	123	40	63	E03
69871-ADB50-ER25D-73	25	73	50	42	E01
69871-ADB50-ER25D-103	25	103	50	42	E01
69871-ADB50-ER32D-73	32	73	50	50	E02
69871-ADB50-ER32D-103	32	103	50	50	E02

E01	8395005500	8395001000	8335712500
E02	8395005600	8395001000	8335713200
E03	8395005700	8395001100	8335714000

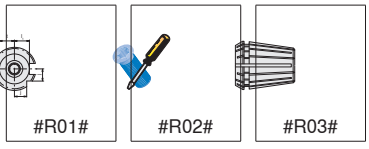






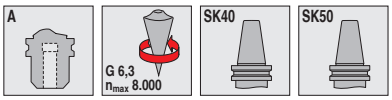
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
69871-ADB40-BC2-16-70	16	70	40	43	E01
69871-ADB40-BC2-16-70-F	16	70	40	43	E01
69871-ADB40-BC2-16-120	16	120	40	43	E01
69871-ADB40-BC2-16-120-F	16	120	40	43	E01
69871-ADB40-BC2-25-70	25	70	40	60	E02
69871-ADB40-BC2-25-70-F	25	70	40	60	E02
69871-ADB40-BC2-25-120	25	120	40	60	E02
69871-ADB40-BC2-25-120-F	25	120	40	60	E02
69871-ADB50-BC2-16-70	16	70	50	43	E01
69871-ADB50-BC2-16-100	16	100	50	43	E01
69871-ADB50-BC2-25-70	25	70	50	60	E02
69871-ADB50-BC2-25-100	25	100	50	60	E02
69871-ADB50-BC4-32-73	32	70	50	72	E03

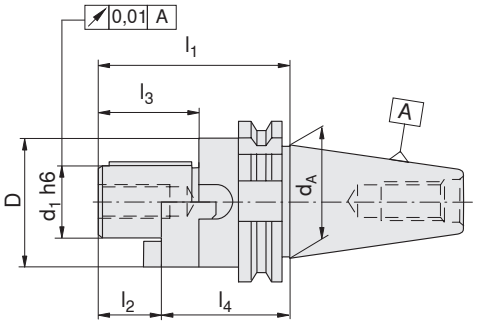
E01	6295005000	8395001000	8335411600
E02	6295005100	8395001000	8335412500
E03		8395001100	8335413200



DIN 69871

Combination shell mill adapters



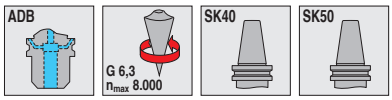


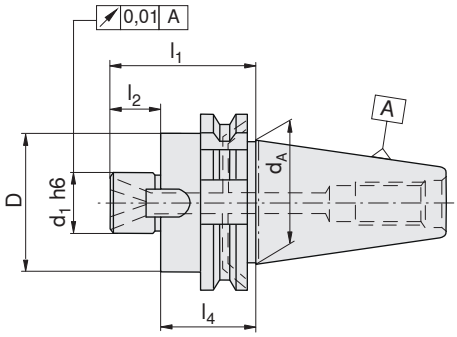
Type, description	d_1 [mm]	d_A [mm]	D [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	
69871-A40-KA16-55	16	40	32	72	17	27	55	E01
69871-A40-KA22-55	22	40	40	74	19	31	55	E02
69871-A40-KA27-55	27	40	48	76	21	33	55	E03
69871-A40-KA32-60	32	40	58	84	24	38	60	E04
69871-A40-KA40-60	40	40	70	87	27	41	60	E05
69871-A50-KA16-55	16	50	32	72	17	27	55	E01
69871-A50-KA22-55	22	50	40	74	19	31	55	E02
69871-A50-KA27-55	27	50	48	76	21	33	55	E03
69871-A50-KA32-55	32	50	58	79	24	38	55	E04
69871-A50-KA40-55	40	50	70	82	27	41	55	E05
69871-A50-KA50-70	50	50	80	100	30	46	70	E06

E01	8337011600	8395028400	8395011300	8336701600	8336811600
E02	8337012200	8395028500	8395012400	8336702200	8336812200
E03	8337012700	8395028600	8395012500	8336702700	8336812700
E04	8337013200	8395028700	8395012600	8336703200	8336813200
E05	8337014000	8395028800	8395011200	8336704000	8336814000
E06	8337015000	8395028900		8336705000	


#R01#

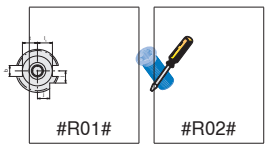

#R02#





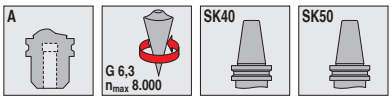
Type, description	d_1 [mm]	d_A [mm]	D [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	
69871-ADB40-QA16-44	16	40	38	61	17	44	E01
69871-ADB40-QA16-100	16	40	38	117	17	100	E01
69871-ADB40-QA16-160	16	40	38	177	17	160	E01
69871-ADB40-QA22-44	22	40	48	63	19	44	E02
69871-ADB40-QA22-100	22	40	48	119	19	100	E02
69871-ADB40-QA22-160	22	40	48	179	19	160	E02
69871-ADB40-QA27-55	27	40	58	76	21	55	E03
69871-ADB40-QA27-100	27	40	58	121	21	100	E03
69871-ADB40-QA27-160	27	40	58	181	21	160	E03
69871-ADB40-QA32-50	32	40	78	74	24	50	E04
69871-ADB40-QA32-100	32	40	78	124	24	100	E04
69871-ADB40-QA32-160	32	40	78	184	24	160	E04
69871-ADB40-QA40-50	40	40	88	77	27	50	E05
69871-ADB40-QA40-100	40	40	88	127	27	100	E05
69871-ADB40-QA40-160	40	40	88	187	27	160	E05
69871-ADB50-QA16-44	16	50	38	61	17	44	E01
69871-ADB50-QA16-100	16	50	38	117	17	100	E01
69871-ADB50-QA16-160	16	50	38	177	17	160	E01
69871-ADB50-QA22-44	22	50	48	61	19	44	E02
69871-ADB50-QA22-100	22	50	48	119	19	100	E02
69871-ADB50-QA22-160	22	50	48	179	19	160	E02
69871-ADB50-QA27-44	27	50	58	65	21	44	E03
69871-ADB50-QA27-100	27	50	58	121	21	100	E03
69871-ADB50-QA27-160	27	50	58	181	21	160	E03
69871-ADB50-QA32-40	32	50	78	64	24	40	E04
69871-ADB50-QA32-100	32	50	78	124	24	100	E04
69871-ADB50-QA32-160	32	50	78	184	24	160	E04
69871-ADB50-QA40-50	40	50	88	77	27	50	E05
69871-ADB50-QA40-100	40	50	88	127	27	100	E05
69871-ADB50-QA40-160	40	50	88	187	27	160	E05

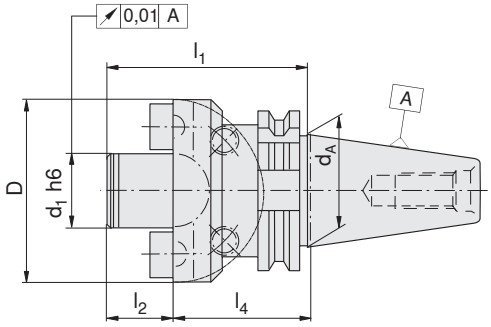
E01	8395012000	8395029600	8395011300	8336701600	8336811600
E02	8395012100	8395029700	8395012400	8336702200	8336812200
E03	8395012200	8395013600	8395012500	8336702700	8336812700
E04	8395012300	8395013700	8395012600	8336703200	8336813200
E05	8395029500	8395013800	8395011200	8336704000	8336814000



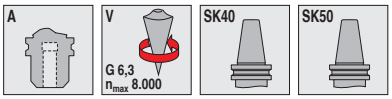
DIN 69871

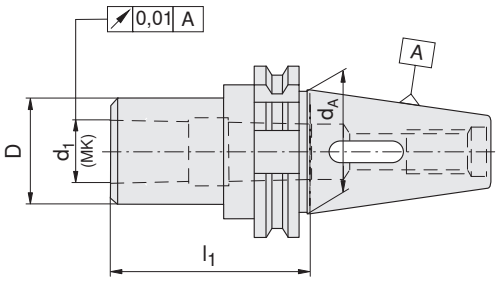
Shell mill adapters for MT shanks / Morse taper adapters with tang





Type, description	d_1 [mm]	d_A [mm]	D [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	
69871-A40-MA40-60	40	40	89	90	30	60	E01
69871-A50-MA40-70	40	50	89	100	30	70	E01
69871-A50-MA60-70	60	50	129	110	40	70	E02





Type, description	d_1 Morse taper [MK]	l_1 [mm]	d_A [mm]	D [mm]
69871-A40-MK1D-50-V	1	50	40	25
69871-A40-MK2D-50-V	2	50	40	32
69871-A40-MK3D-70-V	3	70	40	40
69871-A40-MK4D-95-V	4	95	40	48
69871-A50-MK1D-50-V	1	50	50	25
69871-A50-MK2D-60-V	2	60	50	32
69871-A50-MK3D-65-V	3	65	50	40
69871-A50-MK4D-95-V	4	95	50	48
69871-A50-MK5D-105-V	5	105	50	63

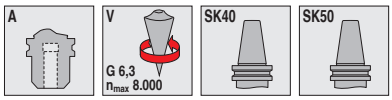
			
E01	8395029500	8395013800	8395014000
E02	8395029800		333940 / 8395016000

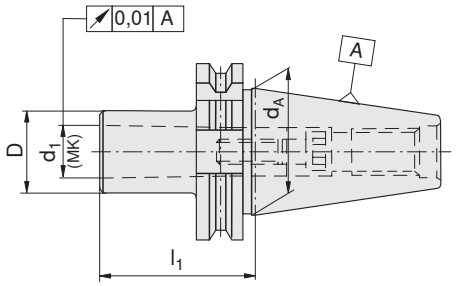

#R01#


#R02#

DIN 69871

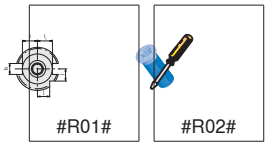
Morse taper adapters with thread





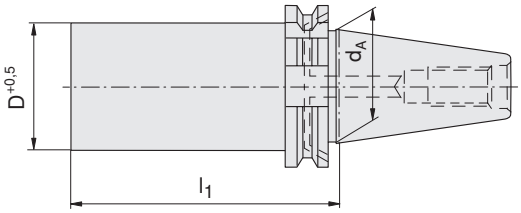
Type, description	d_1 Morse taper [MK]	l_1 [mm]	d_A [mm]	D [mm]	
69871-A40-MK1C-50-V	1	50	40	25	E01
69871-A40-MK2C-50-V	2	50	40	32	E02
69871-A40-MK3C-70-V	3	70	40	40	E03
69871-A40-MK4C-95-V	4	95	40	48	E04
69871-A50-MK1C-45-V	1	45	50	25	E05
69871-A50-MK2C-60-V	2	60	50	32	E06
69871-A50-MK3C-65-V	3	65	50	40	E07
69871-A50-MK4C-95-V	4	95	50	48	E04
69871-A50-MK5C-120-V	5	120	50	63	E08

E01	8335901300	8395003000	8395026000	8395026500
E02	8335901300	8395003100	8395026100	8395026700
E03	8335901700	8395003000	8395001800	8395026900
E04	8335902300	8395003100	8395001900	8395027000
E05	8335902000	8395003100	8395026000	8395026600
E06	8335902000	8395003100	8395001700	8395026800
E07	8335901700	8395003100	8395001700	8395026900
E08	8335903300	8395003100	8395026200	8395027100

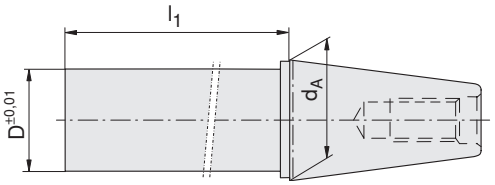


DIN 69871

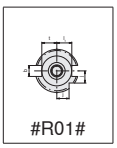
Blanks / Test bars

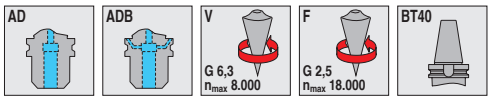


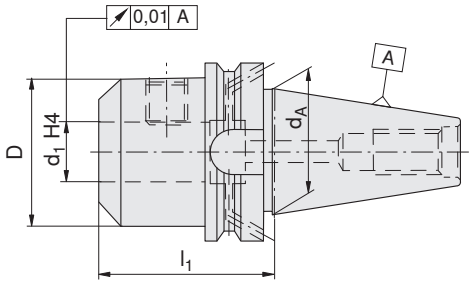
Type, description	d_A [mm]	D [mm]	l [mm]
69871-ADB40-HF63-250	40	63	250
69871-ADB50-HF63,5-300	50	63.5	300



Type, description	d_A [mm]	D [mm]	l [mm]
DIN69871/MAS-BT-A40.KD.40.330	40	40	330
DIN69871/MAS-BT-A50.KD.50.330	50	50	330

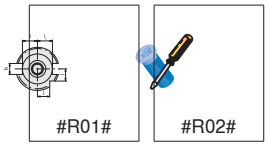






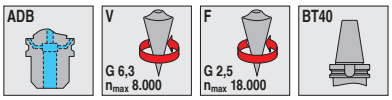
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-ADB40-WE06-50-F	6	50	40	25	E01
MAS-BT-ADB40-WE06-50-V	6	50	40	25	E01
MAS-BT-ADB40-WE08-50-F	8	50	40	28	E02
MAS-BT-ADB40-WE08-50-V	8	50	40	28	E02
MAS-BT-ADB40-WE10-63-F	10	50	40	35	E03
MAS-BT-ADB40-WE10-63-V	10	50	40	35	E03
MAS-BT-ADB40-WE12-63-F	12	50	40	42	E04
MAS-BT-ADB40-WE12-63-V	12	50	40	42	E04
MAS-BT-ADB40-WE14-63-F	14	50	40	44	E04
MAS-BT-ADB40-WE14-63-V	14	50	40	44	E04
MAS-BT-AD40-WE16-35-F	16	35	40	48	E05
MAS-BT-AD40-WE16-35-V	16	35	40	48	E05
MAS-BT-ADB40-WE16-63-F	16	63	40	48	E06
MAS-BT-ADB40-WE16-63-V	16	63	40	48	E06
MAS-BT-ADB40-WE18-63-F	18	63	40	50	E06
MAS-BT-ADB40-WE18-63-V	18	63	40	50	E06
MAS-BT-AD40-WE20-35-F	20	35	40	50	E07
MAS-BT-AD40-WE20-35-V	20	35	40	50	E07
MAS-BT-ADB40-WE20-63-F	20	63	40	52	E08
MAS-BT-ADB40-WE20-63-V	20	63	40	52	E08
MAS-BT-AD40-WE25-40-F	25	40	40	50	E09
MAS-BT-AD40-WE25-40-V	25	40	40	50	E09
MAS-BT-ADB40-WE25-100-F	25	100	40	65	E10
MAS-BT-ADB40-WE25-100-V	25	100	40	65	E10
MAS-BT-ADB40-WE32-100-F	32	100	40	72	E11
MAS-BT-ADB40-WE32-100-V	32	100	40	72	E11
MAS-BT-ADB40-WE40-120-V	40	120	40	90	E12

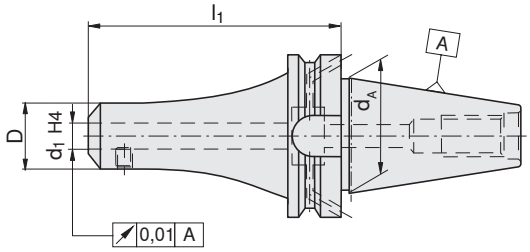
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05		6295001600
E06	8395003700	6295001600
E07		6295002000
E08	8395027200	6295002000
E09		6295002500
E10	8395029000	6295002500
E11	8395029000	6295003200
E12		6295003200



MAS-BT

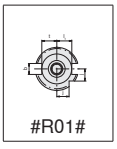
Weldon adapters, long



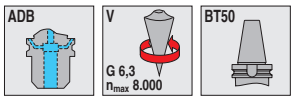


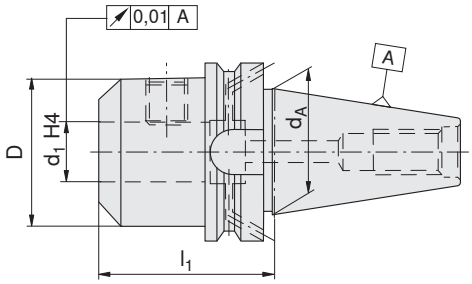
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-ADB40-WE06-100-F	6	100	40	25	E01
MAS-BT-ADB40-WE06-100-V	6	100	40	25	E01
MAS-BT-ADB40-WE06-160-F	6	160	40	25	E01
MAS-BT-ADB40-WE06-160-V	6	160	40	25	E01
MAS-BT-ADB40-WE08-100-F	8	100	40	28	E02
MAS-BT-ADB40-WE08-100-V	8	100	40	28	E02
MAS-BT-ADB40-WE08-160-F	8	160	40	28	E02
MAS-BT-ADB40-WE08-160-V	8	160	40	28	E02
MAS-BT-ADB40-WE10-100-F	10	100	40	35	E03
MAS-BT-ADB40-WE10-100-V	10	100	40	35	E03
MAS-BT-ADB40-WE10-160-F	10	160	40	35	E03
MAS-BT-ADB40-WE10-160-V	10	160	40	35	E03
MAS-BT-ADB40-WE12-100-F	12	100	40	42	E04
MAS-BT-ADB40-WE12-100-V	12	100	40	42	E04
MAS-BT-ADB40-WE12-160-F	12	160	40	42	E04
MAS-BT-ADB40-WE12-160-V	12	160	40	42	E04
MAS-BT-ADB40-WE14-160-F	14	160	40	44	E04
MAS-BT-ADB40-WE14-160-V	14	160	40	44	E04
MAS-BT-ADB40-WE16-100-F	16	100	40	48	E05
MAS-BT-ADB40-WE16-100-V	16	100	40	48	E05
MAS-BT-ADB40-WE16-160-F	16	160	40	48	E05
MAS-BT-ADB40-WE16-160-V	16	160	40	48	E05
MAS-BT-ADB40-WE18-160-F	18	160	40	50	E05
MAS-BT-ADB40-WE18-160-V	18	160	40	50	E05
MAS-BT-ADB40-WE20-100-F	20	100	40	52	E06
MAS-BT-ADB40-WE20-100-V	20	100	40	52	E06
MAS-BT-ADB40-WE20-160-F	20	160	40	52	E06
MAS-BT-ADB40-WE20-160-V	20	160	40	52	E06
MAS-BT-ADB40-WE25-160-F	25	160	40	65	E07
MAS-BT-ADB40-WE25-160-V	25	160	40	65	E07

E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500


#R01#

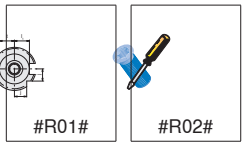

#R02#





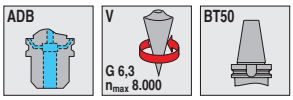
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-ADB50-WE06-63-V	6	63	50	25	E01
MAS-BT-ADB50-WE08-63-V	8	63	50	28	E02
MAS-BT-ADB50-WE10-80-V	10	80	50	35	E03
MAS-BT-ADB50-WE12-80-V	12	80	50	42	E04
MAS-BT-ADB50-WE14-80-V	14	80	50	44	E04
MAS-BT-ADB50-WE16-80-V	16	80	50	48	E05
MAS-BT-ADB50-WE18-80-V	18	80	50	50	E05
MAS-BT-ADB50-WE20-80-V	20	80	50	52	E06
MAS-BT-ADB50-WE25-100-V	25	100	50	65	E07
MAS-BT-ADB50-WE32-105-V	32	105	50	72	E08
MAS-BT-ADB50-WE40-120-V	40	120	50	90	E09

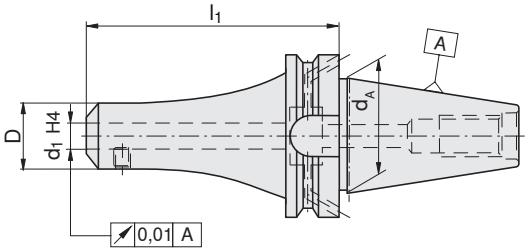
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200
E09		6295003200



MAS-BT

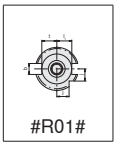
Weldon adapters, long

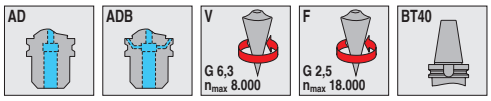


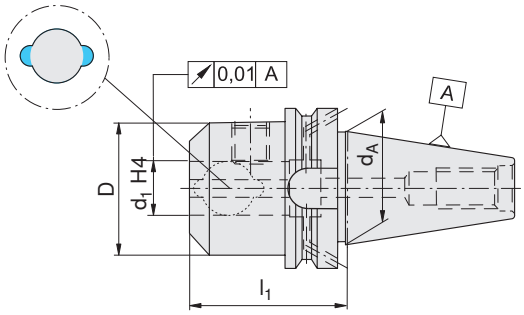


Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-ADB50-WE06-100-V	6	100	50	25	E01
MAS-BT-ADB50-WE06-160-V	6	160	50	25	E01
MAS-BT-ADB50-WE08-100-V	8	100	50	28	E02
MAS-BT-ADB50-WE08-160-V	8	160	50	28	E02
MAS-BT-ADB50-WE10-100-V	10	100	50	35	E03
MAS-BT-ADB50-WE10-160-V	10	160	50	35	E03
MAS-BT-ADB50-WE12-100-V	12	100	50	42	E04
MAS-BT-ADB50-WE12-160-V	12	160	50	42	E04
MAS-BT-ADB50-WE14-100-V	14	100	50	44	E04
MAS-BT-ADB50-WE14-160-V	14	160	50	44	E04
MAS-BT-ADB50-WE16-100-V	16	100	50	48	E05
MAS-BT-ADB50-WE16-160-V	16	160	50	48	E05
MAS-BT-ADB50-WE18-100-V	18	100	50	50	E05
MAS-BT-ADB50-WE18-160-V	18	160	50	50	E05
MAS-BT-ADB50-WE20-100-V	20	100	50	52	E06
MAS-BT-ADB50-WE20-160-V	20	160	50	52	E06
MAS-BT-ADB50-WE25-120-V	25	120	50	65	E07
MAS-BT-ADB50-WE25-160-V	25	160	50	65	E07
MAS-BT-ADB50-WE32-160-V	32	160	50	72	E08

E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200

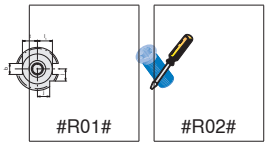






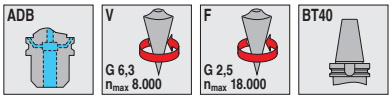
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-ADB40-WE06IK-50-F	6	50	40	25	E01
MAS-BT-ADB40-WE06IK-50-V	6	50	40	25	E01
MAS-BT-ADB40-WE08IK-50-F	8	50	40	28	E02
MAS-BT-ADB40-WE08IK-50-V	8	50	40	28	E02
MAS-BT-ADB40-WE10IK-63-F	10	63	40	35	E03
MAS-BT-ADB40-WE10IK-63-V	10	63	40	35	E03
MAS-BT-ADB40-WE12IK-63-F	12	63	40	42	E04
MAS-BT-ADB40-WE12IK-63-V	12	63	40	42	E04
MAS-BT-ADB40-WE14IK-63-F	14	63	40	44	E04
MAS-BT-ADB40-WE14IK-63-V	14	63	40	44	E04
MAS-BT-AD40-WE16IK-35-V	16	35	40	48	E05
MAS-BT-ADB40-WE16IK-63-F	16	63	40	48	E05
MAS-BT-ADB40-WE16IK-63-V	16	63	40	48	E05
MAS-BT-ADB40-WE18IK-63-F	18	63	40	50	E05
MAS-BT-ADB40-WE18IK-63-V	18	63	40	50	E05
MAS-BT-AD40-WE20IK-35-V	20	35	40	50	E06
MAS-BT-ADB40-WE20IK-63-F	20	63	40	52	E06
MAS-BT-ADB40-WE20IK-63-V	20	63	40	52	E06
MAS-BT-AD40-WE25IK-40-V	25	40	40	50	E07
MAS-BT-ADB40-WE25IK-100-F	25	100	40	65	E07
MAS-BT-ADB40-WE25IK-100-V	25	100	40	65	E07
MAS-BT-ADB40-WE32IK-100-V	32	100	40	72	E08

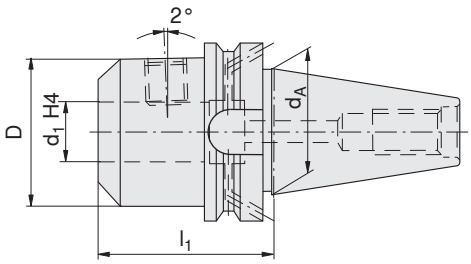
E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000
E07	8395029000	6295002500
E08	8395029000	6295003200



MAS-BT

Whistle Notch adapters



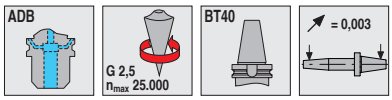


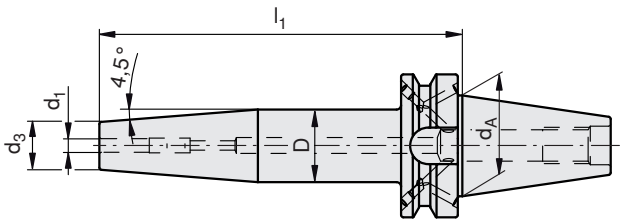
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-ADB40-WN06-50-F	6	50	40	25	E01
MAS-BT-ADB40-WN06-50-V	6	50	40	25	E01
MAS-BT-ADB40-WN08-50-F	8	50	40	28	E02
MAS-BT-ADB40-WN08-50-V	8	50	40	28	E02
MAS-BT-ADB40-WN10-63-F	10	63	40	35	E03
MAS-BT-ADB40-WN10-63-V	10	63	40	35	E03
MAS-BT-ADB40-WN12-63-F	12	63	40	42	E04
MAS-BT-ADB40-WN12-63-V	12	63	40	42	E04
MAS-BT-ADB40-WN14-63-F	14	63	40	44	E04
MAS-BT-ADB40-WN14-63-V	14	63	40	44	E04
MAS-BT-ADB40-WN16-63-F	16	63	40	48	E05
MAS-BT-ADB40-WN16-63-V	16	63	40	48	E05
MAS-BT-ADB40-WN18-63-F	18	63	40	50	E05
MAS-BT-ADB40-WN18-63-V	18	63	40	50	E05
MAS-BT-ADB40-WN20-63-V	20	63	40	52	E06

E01	8395003300	6295000600
E02	8395003400	6295000800
E03	8395003500	6295001000
E04	8395003600	6295001200
E05	8395003700	6295001600
E06	8395027200	6295002000


#R01#


#R02#

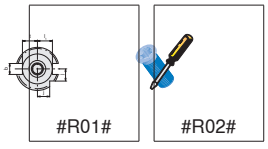




Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	d_3 [mm]	
MAS-BT-ADB40-SF4.5°-3-80	3	80	40	17	12	
MAS-BT-ADB40-SF4.5°-4-80	4	80	40	17	12	
MAS-BT-ADB40-SF4.5°-5-80	5	80	40	17	12	
MAS-BT-ADB40-SF4.5°-6-90	6	90	40	31	21	E01
MAS-BT-ADB40-SF4.5°-6-160	6	160	40	32	21	E01
MAS-BT-ADB40-SF4.5°-8-90	8	90	40	31	21	E02
MAS-BT-ADB40-SF4.5°-8-160	8	160	40	32	21	E02
MAS-BT-ADB40-SF4.5°-10-90	10	90	40	34	24	E03
MAS-BT-ADB40-SF4.5°-10-160	10	160	40	34	24	E03
MAS-BT-ADB40-SF4.5°-12-90	12	90	40	34	24	E04
MAS-BT-ADB40-SF4.5°-12-160	12	160	40	34	24	E04
MAS-BT-ADB40-SF4.5°-14-90	14	90	40	37	27	E04
MAS-BT-ADB40-SF4.5°-14-160	14	160	40	36	27	E04
MAS-BT-ADB40-SF4.5°-16-90	16	90	40	37	27	E05
MAS-BT-ADB40-SF4.5°-16-160	16	160	40	36	27	E05
MAS-BT-ADB40-SF4.5°-18-90	18	90	40	43	33	E05
MAS-BT-ADB40-SF4.5°-18-160	18	160	40	44	33	E05
MAS-BT-ADB40-SF4.5°-20-90	20	90	40	43	33	E06
MAS-BT-ADB40-SF4.5°-20-160	20	160	40	44	33	E06
MAS-BT-ADB40-SF4.5°-25-100	25	100	40	53	44	E06
MAS-BT-ADB40-SF4.5°-25-160	25	160	40	53	44	E06

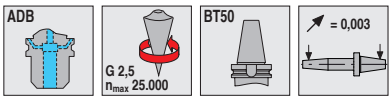
⚠ For shanks with tolerance h6 or better

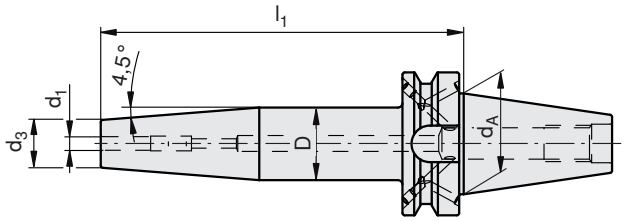
E01	12087062
E02	12087063
E03	12087064
E04	12087065
E05	12087066
E06	12087067



MAS-BT

Shrink fit adapters

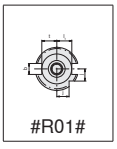




Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	d_3 [mm]	
MAS-BT-ADB50-SF4.5°-6-100	6	100	50	31	21	E01
MAS-BT-ADB50-SF4.5°-6-160	6	160	50	32	21	E01
MAS-BT-ADB50-SF4.5°-8-100	8	100	50	31	21	E02
MAS-BT-ADB50-SF4.5°-8-160	8	160	50	32	21	E02
MAS-BT-ADB50-SF4.5°-10-100	10	100	50	34	24	E03
MAS-BT-ADB50-SF4.5°-10-160	10	160	50	34	24	E03
MAS-BT-ADB50-SF4.5°-12-100	12	100	50	34	24	E04
MAS-BT-ADB50-SF4.5°-12-160	12	160	50	34	24	E04
MAS-BT-ADB50-SF4.5°-14-100	14	100	50	37	27	E04
MAS-BT-ADB50-SF4.5°-14-160	14	160	50	36	27	E04
MAS-BT-ADB50-SF4.5°-16-100	16	100	50	37	27	E05
MAS-BT-ADB50-SF4.5°-16-160	16	160	50	36	27	E05
MAS-BT-ADB50-SF4.5°-18-100	18	100	50	43	33	E05
MAS-BT-ADB50-SF4.5°-18-160	18	160	50	44	33	E05
MAS-BT-ADB50-SF4.5°-20-100	20	100	50	43	33	E06
MAS-BT-ADB50-SF4.5°-20-160	20	160	50	44	33	E06
MAS-BT-ADB50-SF4.5°-25-120	25	120	50	57	44	E06
MAS-BT-ADB50-SF4.5°-25-160	25	160	50	53	44	E06
MAS-BT-ADB50-SF4.5°-32-120	32	120	50	57	44	E06
MAS-BT-ADB50-SF4.5°-32-160	32	160	50	53	44	E06

⚠ For shanks with tolerance h6 or better

E01	12087062
E02	12087063
E03	12087064
E04	12087065
E05	12087066
E06	12087067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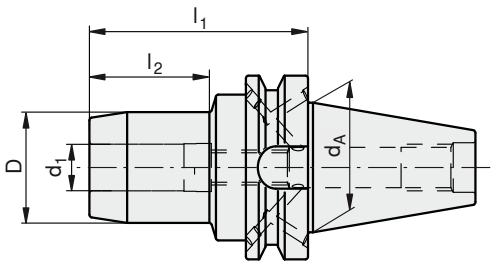
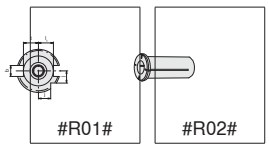
#R02#



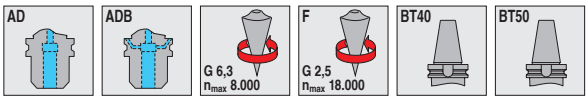
Type, description	d_1 [mm]	l_1 [mm]	l_2 [mm]	d_A [mm]	D [mm]
MAS-BT-ADB40-HD06-90	6	90	40	40	26
MAS-BT-ADB40-HD08-90	8	90	40	40	28
MAS-BT-ADB40-HD10-90	10	90	40	40	30
MAS-BT-ADB40-HD12-90	12	90	40	40	32
MAS-BT-ADB40-HD14-90	14	90	40	40	34
MAS-BT-ADB40-HD16-90	16	90	40	40	38
MAS-BT-ADB40-HD18-90	18	90	40	40	40
MAS-BT-ADB40-HD20-90	20	90	40	40	42
MAS-BT-ADB40-HD25-90	25	90	40	40	55
MAS-BT-ADB40-HD32-90	32	90	40	40	63
MAS-BT-ADB50-HD06-110	6	110	40	50	26
MAS-BT-ADB50-HD08-110	8	110	40	50	28
MAS-BT-ADB50-HD10-110	10	110	40	50	30
MAS-BT-ADB50-HD12-110	12	110	40	50	32
MAS-BT-ADB50-HD14-110	14	110	40	50	34
MAS-BT-ADB50-HD16-110	16	110	40	50	38
MAS-BT-ADB50-HD18-110	18	110	40	50	40
MAS-BT-ADB50-HD20-110	20	110	40	50	42
MAS-BT-ADB50-HD25-110	25	110	40	50	55
MAS-BT-ADB50-HD32-115	32	115	40	50	63

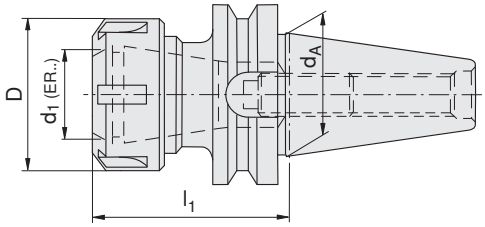
⚠ For tools with shank to DIN 1835 A+B and DIN 6535 HA+HB
Shank to DIN 6535 HE in connection with reduction sleeves



MAS-BT

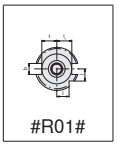
Collet chucks type ER





Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-ADB40-ER16-60	16	60	40	32	E01
MAS-BT-ADB40-ER16-60-F	16	60	40	32	E01
MAS-BT-ADB40-ER16-120	16	120	40	32	E01
MAS-BT-ADB40-ER16-120-F	16	120	40	32	E01
MAS-BT-ADB40-ER25-70	25	70	40	42	E02
MAS-BT-ADB40-ER25-70-F	25	70	40	42	E02
MAS-BT-ADB40-ER25-120	25	120	40	42	E02
MAS-BT-ADB40-ER25-120-F	25	120	40	42	E02
MAS-BT-ADB40-ER32-70	32	70	40	50	E03
MAS-BT-ADB40-ER32-70-F	32	70	40	50	E03
MAS-BT-ADB40-ER32-120	32	120	40	50	E03
MAS-BT-ADB40-ER32-120-F	32	120	40	50	E03
MAS-BT-ADB40-ER40-70	40	70	40	63	E04
MAS-BT-ADB40-ER40-70-F	40	70	40	63	E04
MAS-BT-AD50-ER25-100	25	100	50	42	E02
MAS-BT-AD50-ER25-160	25	160	50	42	E02
MAS-BT-AD50-ER.2-20.75	32	75	50	50	E03
MAS-BT-AD50-ER32-100	32	100	50	50	E03
MAS-BT-AD50-ER32-160	32	160	50	50	E03
MAS-BT-AD50-ER.4-26.75	40	75	50	63	E04
MAS-BT-AD50-ER40-100	40	100	50	63	E04

E01	6295005400		8335711600
E02	6295005500	8395001000	8335712500
E03	6295005600	8395001000	8335713200
E04	6295005700	8395001100	8335714000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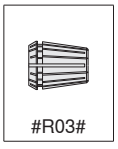
#R02#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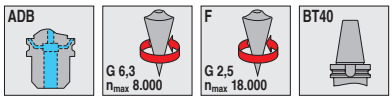
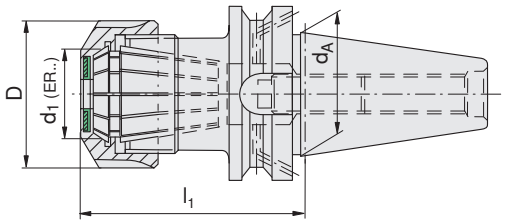
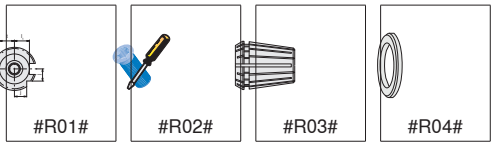




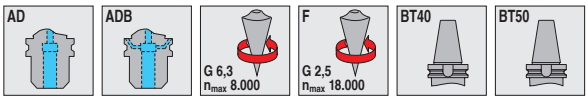
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-ADB40-ER25D-73	25	73	40	42	E01
MAS-BT-ADB40-ER25D-123	25	123	40	42	E01
MAS-BT-ADB40-ER25D-123-F	25	123	40	42	E01
MAS-BT-ADB40-ER32D-73	32	73	40	50	E02
MAS-BT-ADB40-ER32D-73-F	32	73	40	50	E02
MAS-BT-ADB40-ER32D-123	32	123	40	50	E02
MAS-BT-ADB40-ER32D-123-F	32	123	40	50	E02
MAS-BT-ADB40-ER40D-73	40	73	40	63	E03

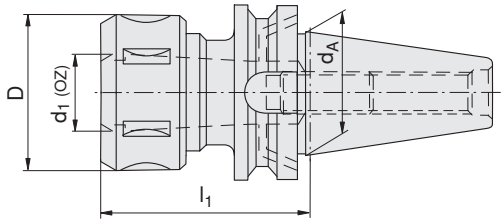
E01	8395005500	8395001000	8335712500
E02	8395005600	8395001000	8335713200
E03	8395005700	8395001100	8335714000



MAS-BT

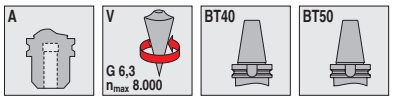
Collet chucks type OZ

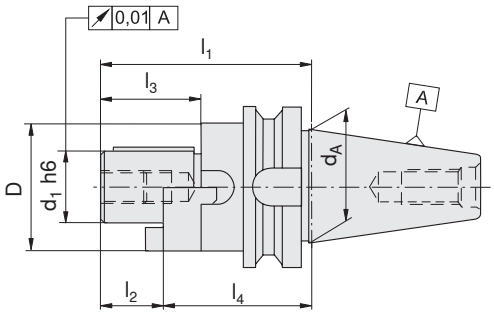




Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-ADB40-BC2-16-70	16	70	40	43	E01
MAS-BT-ADB40-BC2-16-120	16	120	40	43	E01
MAS-BT-ADB40-BC2-16-120-F	16	120	40	43	E01
MAS-BT-ADB40-BC2-25-70	25	70	40	60	E02
MAS-BT-ADB40-BC2-25-120	25	120	40	60	E02
MAS-BT-ADB40-BC2-25-120-F	25	120	40	60	E02
MAS-BT-AD50-BC2-25-90	25	90	50	60	E02
MAS-BT-AD50-BC2-25-120	25	120	50	60	E02
MAS-BT-AD50-BC4-32-100	32	100	50	72	E03
MAS-BT-AD50-BC4-32-120	32	120	50	72	E03

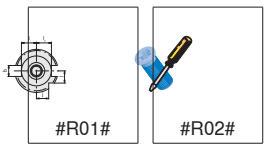
E01	6295005000	8395001000	8335411600
E02	6295005100	8395001000	8335412500
E03		8395001100	8335413200





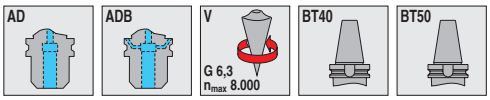
Type, description	d_1 [mm]	d_A [mm]	D [mm]	l_1 [mm]	l_2 [mm]	l_3 [mm]	l_4 [mm]	
MAS-BT-A40.KA16.55.V	16	40	32	72	17	27	55	E01
MAS-BT-A40.KA22.55.V	22	40	40	74	19	31	55	E02
MAS-BT-A40.KA27.55.V	27	40	48	76	21	33	55	E03
MAS-BT-A40.KA32.60.V	32	40	58	84	24	38	60	E04
MAS-BT-A40.KA40.60.V	40	40	70	87	27	41	60	E05
MAS-BT-A50.KA16.70.V	16	50	32	72	17	27	70	E01
MAS-BT-A50.KA22.70.V	22	50	40	74	19	31	70	E02
MAS-BT-A50.KA27.70.V	27	50	48	76	21	33	70	E03
MAS-BT-A50.KA32.70.V	32	50	58	84	24	38	70	E04
MAS-BT-A50.KA40.70.V	40	50	70	87	27	41	70	E05

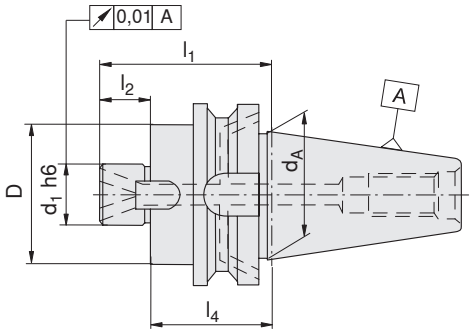
E01	8337011600	8395028400	8395011300	8336701600	8336811600
E02	8337012200	8395028500	8395012400	8336702200	8336812200
E03	8337012700	8395028600	8395012500	8336702700	8336812700
E04	8337013200	8395028700	8395012600	8336703200	8336813200
E05	8337014000	8395028800	8395011200	8336704000	8336814000



MAS-BT

Shell mill adapters, centre bolt





Type, description	d_1 [mm]	d_A [mm]	D [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	
MAS-BT-ADB40.QA16.52.V	16	40	38	69	17	52	E01
MAS-BT-ADB40.QA16.100.V	16	40	38	117	17	100	E01
MAS-BT-ADB40.QA16.160.V	16	40	38	177	17	160	E01
MAS-BT-ADB40.QA22.52.V	22	40	48	71	19	52	E02
MAS-BT-ADB40.QA22.100.V	22	40	48	119	19	100	E02
MAS-BT-ADB40.QA22.160.V	22	40	48	179	19	160	E02
MAS-BT-ADB40.QA27.52.V	27	40	58	73	21	52	E03
MAS-BT-ADB40.QA27.100.V	27	40	58	121	21	100	E03
MAS-BT-ADB40.QA27.160.V	27	40	58	181	21	160	E03
MAS-BT-ADB40.QA32.50.V	32	40	78	74	24	50	E04
MAS-BT-ADB40.QA32.100.V	32	40	78	124	24	100	E04
MAS-BT-ADB40.QA32.160.V	32	40	78	184	24	160	E04
MAS-BT-ADB40.QA40.50.V	40	40	88	77	27	50	E05
MAS-BT-ADB40.QA40.100.V	40	40	88	127	27	100	E05
MAS-BT-ADB40.QA40.160.V	40	40	88	187	27	160	E05
MAS-BT-AD50.QA16.63.V	16	50	48	80	17	63	E01
MAS-BT-AD50.QA16.100.V	16	50	38	117	17	100	E01
MAS-BT-AD50.QA16.160.V	16	50	38	177	17	160	E01
MAS-BT-AD50.QA22.63.V	22	50	48	82	19	63	E02
MAS-BT-AD50.QA22.100.V	22	50	48	119	19	100	E02
MAS-BT-AD50.QA22.160.V	22	50	48	179	19	160	E02
MAS-BT-AD50-QA27-63	27	50	58	84	21	63	E03
MAS-BT-AD50.QA27.100.V	27	50	58	121	21	100	E03
MAS-BT-AD50.QA27.160.V	27	50	58	181	21	160	E03
MAS-BT-AD50.QA32.60.V	32	50	78	84	24	60	E04
MAS-BT-AD50.QA32.100.V	32	50	78	124	24	100	E04
MAS-BT-AD50.QA32.160.V	32	50	78	184	24	160	E04
MAS-BT-AD50.QA40.60.V	40	50	88	87	27	60	E05
MAS-BT-AD50.QA40.100.V	40	50	88	127	27	100	E05
MAS-BT-AD50.QA40.160.V	40	50	88	187	27	160	E05

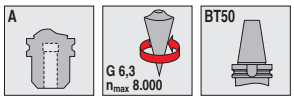
E01	8395012000	8395029600	8395011300	8336701600	8336811600
E02	8395012100	8395029700	8395012400	8336702200	8336812200
E03	8395012200	8395013600	8395012500	8336702700	8336812700
E04	8395012300	8395013700	8395012600	8336703200	8336813200
E05	8395029500	8395013800	8395011200	8336704000	8336814000

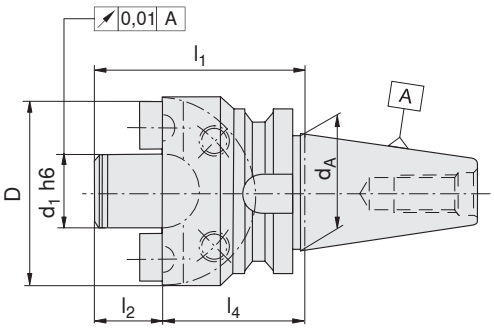

#R01#


#R02#

MAS-BT

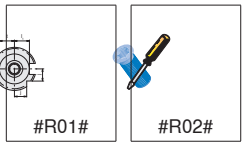
Shell mill adapters, 4 bolts





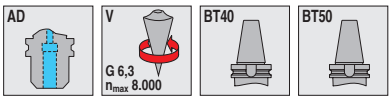
Type, description	d_1 [mm]	d_A [mm]	D [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	
MAS-BT-A50-MA40-70	40	50	89	100	30	70	E01
MAS-BT-A50-MA60-80	60	50	129	120	40	80	E02

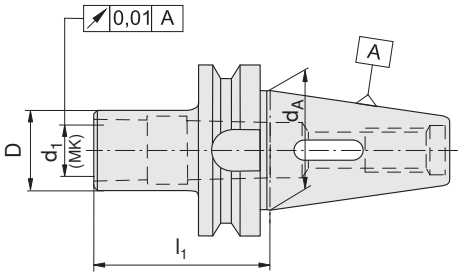
E01	8395029500	8395013800	8395014000
E02	8395029800		333940 / 8395016000



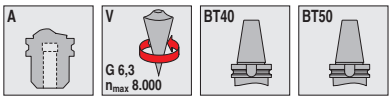
MAS-BT

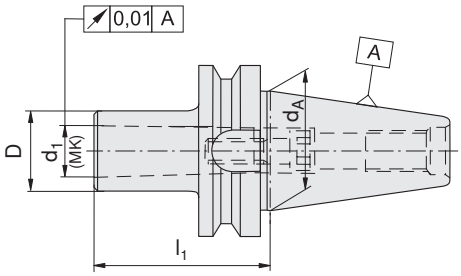
Morse taper adapters with tang / Morse taper adapters with thread





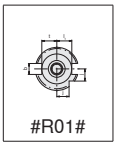
Type, description	d_1 Morse taper [MK]	l_1 [mm]	d_A [mm]	D [mm]
MAS-BT-AD40.KH.MK1.50.V	1	50	40	25
MAS-BT-AD40.KH.MK2.50.V	2	50	40	32
MAS-BT-AD40.KH.MK3.70.V	3	70	40	40
MAS-BT-AD40.KH.MK4.95.V	4	95	40	48
MAS-BT-AD50.KH.MK1.45.V	1	45	50	25
MAS-BT-AD50.KH.MK2.60.V	2	60	50	32
MAS-BT-AD50.KH.MK4.95.V	4	95	50	48
MAS-BT-AD50.KH.MK5.105.V	5	105	50	63



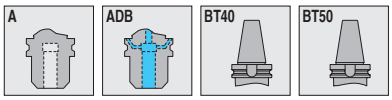


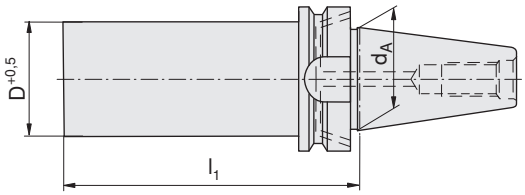
Type, description	d_1 Morse taper [MK]	l_1 [mm]	d_A [mm]	D [mm]	
MAS-BT-A40-MK3C-70-V	3	70	40	40	E01
MAS-BT-A40-MK4C-95-V	4	95	40	48	E02
MAS-BT-A50-MK1C-45-V	1	45	50	25	E03
MAS-BT-A50-MK2C-60-V	2	60	50	32	E04
MAS-BT-A50-MK3C-65-V	3	65	50	40	E01
MAS-BT-A50-MK4C-95-V	4	95	50	48	E02
MAS-BT-A50-MK5C-118-V	5	118	50	63	E05

E01	8335901700	8395003000	8395001800	8395026900
E02	8335902300	8395003100	8395001900	8395027000
E03	8335902000	8395003100	8395026000	8395026600
E04	8335902000	8395003100	8395001700	8395026800
E05	8335903300	8395003100	8395026200	8395027100

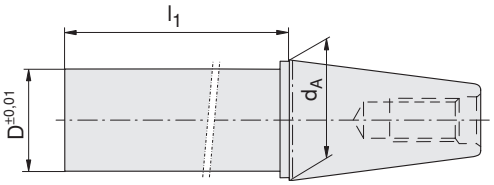

#R01#


#R02#

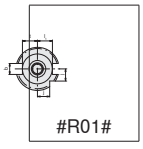




Type, description	d_A [mm]	D [mm]	l [mm]
MAS-BT-ADB40-HF63-250	40	63	250
MAS-BT-A50-HF63,5-300	50	63.5	300

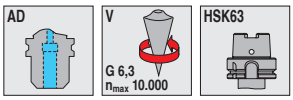


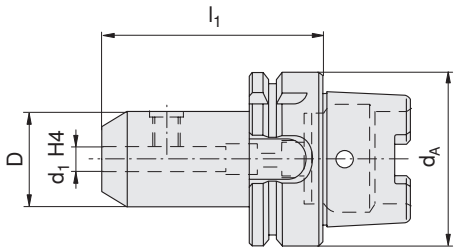
Type, description	d_A [mm]	D [mm]	l [mm]
DIN69871/MAS-BT-A40.KD.40.330	40	40	330
DIN69871/MAS-BT-A50.KD.50.330	50	50	330



HSK-A

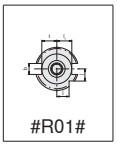
Weldon adapters





Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
HSK63A-WE06-65-V	6	65	63	25	E01
HSK63A-WE06-160-V	6	160	63	22	E01
HSK63A-WE08-65-V	8	65	63	28	E02
HSK63A-WE08-160-V	8	160	63	24	E02
HSK63A-WE10-65-V	10	65	63	35	E03
HSK63A-WE10-160-V	10	160	63	25	E03
HSK63A-WE12-80-V	12	80	63	42	E04
HSK63A-WE12-160-V	12	160	63	26	E04
HSK63A-WE14-80-V	14	80	63	44	E04
HSK63A-WE14-160-V	14	160	63	28	E04
HSK63A-WE16-80-V	16	80	63	48	E05
HSK63A-WE16-160-V	16	160	63	30	E05
HSK63A-WE18-80-V	18	80	63	50	E05
HSK63A-WE18-160-V	18	160	63	32	E05
HSK63A-WE20-80-V	20	80	63	52	E06
HSK63A-WE20-160-V	20	160	63	34	E06
HSK63A-WE25-110-V	25	110	63	65	E07
HSK63A-WE25-160-V	25	160	63	65	E07
HSK63A-WE32-110-V	32	110	63	72	E08
HSK63A-WE32-160-V	32	160	63	72	E08

E01	8376006300	6295000600
E02	8376006300	6295000800
E03	8376006300	6295001000
E04	8376006300	6295001200
E05	8376006300	6295001600
E06	8376006300	6295002000
E07	8376006300	6295002500
E08	8376006300	6295003200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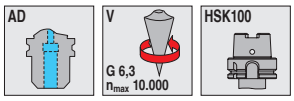
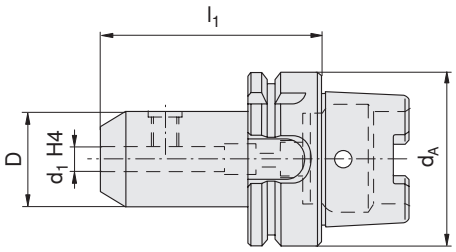
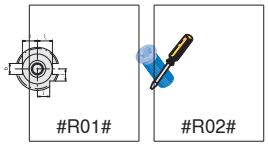
#R02#





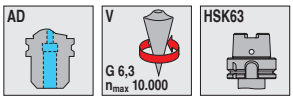
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
HSK100A-WE06-80-V	6	80	100	25	E01
HSK100A-WE06-160-V	6	160	100	22	E01
HSK100A-WE08-80-V	8	80	100	28	E02
HSK100A-WE08-160-V	8	160	100	24	E02
HSK100A-WE10-80-V	10	80	100	35	E03
HSK100A-WE10-160-V	10	160	100	25	E03
HSK100A-WE12-80-V	12	80	100	42	E04
HSK100A-WE12-160-V	12	160	100	25	E04
HSK100A-WE14-80-V	14	80	100	44	E04
HSK100A-WE14-160-V	14	160	100	28	E04
HSK100A-WE16-100-V	16	100	100	48	E05
HSK100A-WE16-160-V	16	160	100	30	E05
HSK100A-WE18-100-V	18	100	100	50	E05
HSK100A-WE18-160-V	18	160	100	32	E05
HSK100A-WE20-100-V	20	100	100	52	E06
HSK100A-WE20-160-V	20	160	100	34	E06
HSK100A-WE25-100-V	25	100	100	65	E07
HSK100A-WE25-160-V	25	160	100	65	E07
HSK100A-WE32-100-V	32	100	100	75	E08
HSK100A-WE32-160-V	32	160	100	75	E08

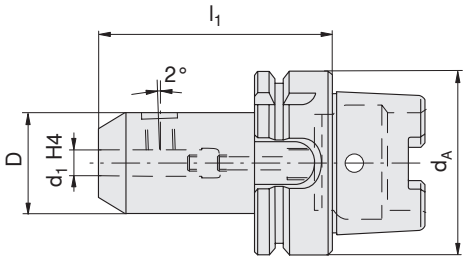
E01	8376010000	6295000600
E02	8376010000	6295000800
E03	8376010000	6295001000
E04	8376010000	6295001200
E05	8376010000	6295001600
E06	8376010000	6295002000
E07	8376010000	6295002500
E08	8376010000	6295003200



HSK-A

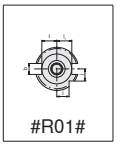
Whistle Notch adapters





Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
HSK63A-WN06-80-V	6	80	63	25	E01
HSK63A-WN06-160-V	6	160	63	22	E01
HSK63A-WN08-80-V	8	80	63	28	E02
HSK63A-WN08-160-V	8	160	63	24	E02
HSK63A-WN10-80-V	10	80	63	35	E03
HSK63A-WN10-160-V	10	160	63	25	E03
HSK63A-WN12-90-V	12	90	63	42	E04
HSK63A-WN12-160-V	12	160	63	26	E04
HSK63A-WN14-90-V	14	90	63	44	E04
HSK63A-WN14-160-V	14	160	63	28	E04
HSK63A-WN16-100-V	16	100	63	48	E05
HSK63A-WN16-160-V	16	160	63	30	E05
HSK63A-WN18-100-V	18	100	63	50	E05
HSK63A-WN18-160-V	18	160	63	32	E05
HSK63A-WN20-100-V	20	100	63	52	E06
HSK63A-WN20-160-V	20	160	63	34	E06
HSK63A-WN25-110-V	25	110	63	65	E07
HSK63A-WN25-160-V	25	160	63	65	E07
HSK63A-WN32-110-V	32	110	63	72	E08
HSK63A-WN32-160-V	32	160	63	72	E08

E01	8376006300	6295000600
E02	8376006300	6295000800
E03	8376006300	6295001000
E04	8376006300	6295001200
E05	8376006300	6295001600
E06	8376006300	6295002000
E07	8376006300	6295002500
E08	8376006300	6295003200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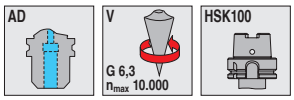
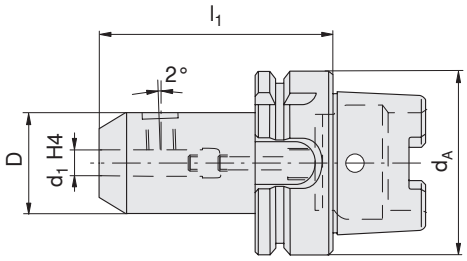
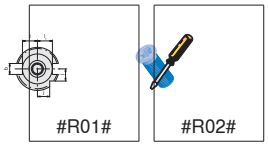
#R02#





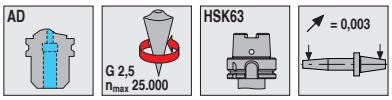
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
HSK100A-WN06-90-V	6	90	100	25	E01
HSK100A-WN06-160-V	6	160	100	22	E01
HSK100A-WN08-90-V	8	90	100	28	E02
HSK100A-WN08-160-V	8	160	100	24	E02
HSK100A-WN10-90-V	10	90	100	35	E03
HSK100A-WN10-160-V	10	160	100	25	E03
HSK100A-WN12-100-V	12	100	100	42	E04
HSK100A-WN12-160-V	12	160	100	26	E04
HSK100A-WN14-100-V	14	100	100	44	E04
HSK100A-WN14-160-V	14	160	100	28	E04
HSK100A-WN16-100-V	16	100	100	48	E05
HSK100A-WN16-160-V	16	160	100	30	E05
HSK100A-WN18-100-V	18	100	100	50	E05
HSK100A-WN18-160-V	18	160	100	32	E05
HSK100A-WN20-110-V	20	110	100	52	E06
HSK100A-WN20-160-V	20	160	100	34	E06
HSK100A-WN25-120-V	25	120	100	65	E07
HSK100A-WN25-160-V	25	160	100	65	E07
HSK100A-WN32-120-V	32	120	100	72	E08
HSK100A-WN32-160-V	32	160	100	72	E08

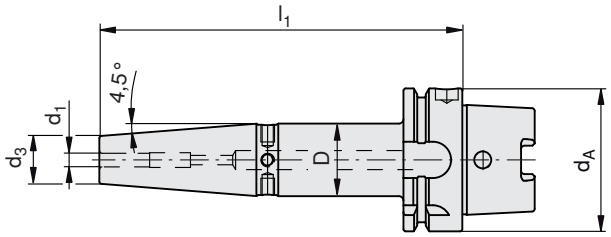
E01	8376010000	6295000600
E02	8376010000	6295000800
E03	8376010000	6295001000
E04	8376010000	6295001200
E05	8376010000	6295001600
E06	8376010000	6295002000
E07	8376010000	6295002500
E08	8376010000	6295003200



HSK-A

Shrink fit adapters





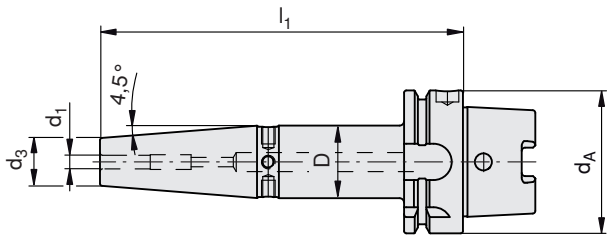
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	d_3 [mm]	
HSK63A-SF4.5°-3-80	3	80	63	17	12	
HSK63A-SF4.5°-3-120	3	120	63	17	12	
HSK63A-SF4.5°-3-160	3	160	63	17	12	
HSK63A-SF4.5°-4-80	4	80	63	17	12	
HSK63A-SF4.5°-4-120	4	120	63	17	12	
HSK63A-SF4.5°-4-160	4	160	63	17	12	
HSK63A-SF4.5°-5-80	5	80	63	17	12	
HSK63A-SF4.5°-5-120	5	120	63	17	12	
HSK63A-SF4.5°-5-160	5	160	63	17	12	
HSK63A-SF4.5°-6-80	6	80	63	30	21	E01
HSK63A-SF4.5°-6-120	6	120	63	32	21	E01
HSK63A-SF4.5°-6-160	6	160	63	32	21	E01
HSK63A-SF4.5°-6-200	6	200	63	32	21	E01
HSK63A-SF4.5°-8-80	8	80	63	30	21	E02
HSK63A-SF4.5°-8-120	8	120	63	32	21	E02
HSK63A-SF4.5°-8-160	8	160	63	32	21	E02
HSK63A-SF4.5°-8-200	8	200	63	32	21	E02
HSK63A-SF4.5°-10-85	10	85	63	33	24	E03
HSK63A-SF4.5°-10-120	10	120	63	34	24	E03
HSK63A-SF4.5°-10-160	10	160	63	34	24	E03
HSK63A-SF4.5°-10-200	10	200	63	34	24	E03
HSK63A-SF4.5°-12-90	12	90	63	34	24	E04
HSK63A-SF4.5°-12-120	12	120	63	34	24	E04
HSK63A-SF4.5°-12-160	12	160	63	34	24	E04
HSK63A-SF4.5°-12-200	12	200	63	34	24	E04
HSK63A-SF4.5°-14-90	14	90	63	37	27	E04
HSK63A-SF4.5°-14-120	14	120	63	36	27	E04
HSK63A-SF4.5°-14-160	14	160	63	36	27	E04
HSK63A-SF4.5°-14-200	14	200	63	36	27	E04
HSK63A-SF4.5°-16-95	16	95	63	38	27	E05
HSK63A-SF4.5°-16-120	16	120	63	36	27	E05
HSK63A-SF4.5°-16-160	16	160	63	36	27	E05
HSK63A-SF4.5°-16-200	16	200	63	36	27	E05
HSK63A-SF4.5°-18-95	18	95	63	44	33	E05
HSK63A-SF4.5°-18-160	18	160	63	44	33	E05
HSK63A-SF4.5°-18-200	18	200	63	44	33	E05

⚠ For shanks with tolerance h6 or better

E01	12087062
E02	12087063
E03	12087064
E04	12087065
E05	12087066


#R01#

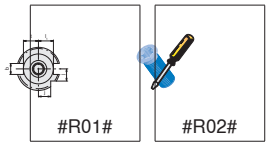

#R02#



Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	d_3 [mm]	
HSK63A-SF4.5°-20-100	20	100	63	45	33	E01
HSK63A-SF4.5°-20-160	20	160	63	44	33	E01
HSK63A-SF4.5°-20-200	20	200	63	44	33	E01
HSK63A-SF4.5°-25-115	25	115	63	53	44	E01
HSK63A-SF4.5°-25-160	25	160	63	53	44	E01
HSK63A-SF4.5°-25-200	25	200	63	53	44	E01
HSK63A-SF4.5°-32-120	32	120	63	53	44	E01
HSK63A-SF4.5°-32-160	32	160	63	53	44	E01
HSK63A-SF4.5°-32-200	32	200	63	53	44	E01
HSK100A-SF4.5°-6-85	6	85	100	30	21	E02
HSK100A-SF4.5°-6-120	6	120	100	32	21	E02
HSK100A-SF4.5°-6-160	6	160	100	32	21	E02
HSK100A-SF4.5°-6-200	6	200	100	32	21	E02
HSK100A-SF4.5°-8-85	8	85	100	30	21	E03
HSK100A-SF4.5°-8-120	8	120	100	32	21	E03
HSK100A-SF4.5°-8-160	8	160	100	32	21	E03
HSK100A-SF4.5°-8-200	8	200	100	32	21	E03
HSK100A-SF4.5°-10-90	10	90	100	34	24	E04
HSK100A-SF4.5°-10-120	10	120	100	34	24	E04
HSK100A-SF4.5°-10-160	10	160	100	34	24	E04
HSK100A-SF4.5°-10-200	10	200	100	34	24	E04
HSK100A-SF4.5°-12-95	12	95	100	35	24	E05
HSK100A-SF4.5°-12-120	12	120	100	34	24	E05
HSK100A-SF4.5°-12-160	12	160	100	34	24	E05
HSK100A-SF4.5°-12-200	12	200	100	34	24	E05
HSK100A-SF4.5°-14-95	14	95	100	38	27	E05
HSK100A-SF4.5°-14-120	14	120	100	36	27	E05
HSK100A-SF4.5°-14-160	14	160	100	36	27	E05
HSK100A-SF4.5°-14-200	14	200	100	36	27	E05
HSK100A-SF4.5°-16-100	16	100	100	39	27	E06
HSK100A-SF4.5°-16-160	16	160	100	36	27	E06
HSK100A-SF4.5°-16-200	16	200	100	36	27	E06
HSK100A-SF4.5°-18-100	18	100	100	45	33	E06
HSK100A-SF4.5°-18-160	18	160	100	44	33	E06
HSK100A-SF4.5°-18-200	18	200	100	44	33	E06

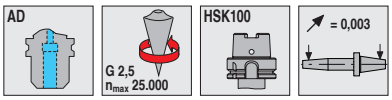
⚠ For shanks with tolerance h6 or better

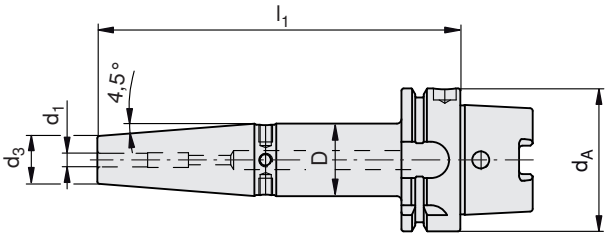
E01	12087067
E02	12087062
E03	12087063
E04	12087064
E05	12087065
E06	12087066



HSK-A

Shrink fit adapters

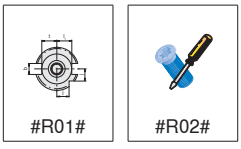


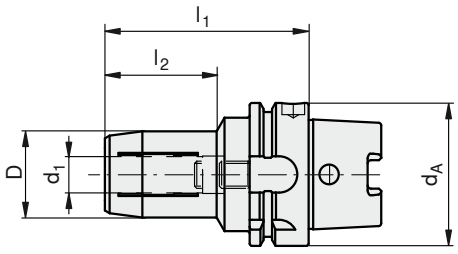


Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	d_3 [mm]	
HSK100A-SF4.5°-20-105	20	105	100	45	33	E01
HSK100A-SF4.5°-20-160	20	160	100	44	33	E01
HSK100A-SF4.5°-20-200	20	200	100	44	33	E01
HSK100A-SF4.5°-25-115	25	115	100	53	44	E01
HSK100A-SF4.5°-25-160	25	160	100	53	44	E01
HSK100A-SF4.5°-25-200	25	200	100	53	44	E01
HSK100A-SF4.5°-32-120	32	120	100	59	44	E01
HSK100A-SF4.5°-32-160	32	160	100	53	44	E01
HSK100A-SF4.5°-32-200	32	200	100	53	44	E01

⚠ For shanks with tolerance h6 or better

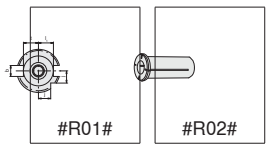
E01	12087067





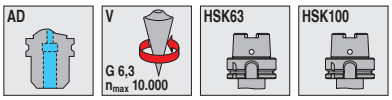
Type, description	d_1 [mm]	l_1 [mm]	l_2 [mm]	d_A [mm]	D [mm]
HSK63A-HD06-70	6	70	26	63	26
HSK63A-HD06-150	6	150	105	63	26
HSK63A-HD06-200	6	200	155	63	26
HSK63A-HD08-70	8	70	26	63	28
HSK63A-HD08-150	8	150	105	63	28
HSK63A-HD08-200	8	200	155	63	28
HSK63A-HD10-80	10	80	35	63	30
HSK63A-HD10-150	10	150	105	63	30
HSK63A-HD10-200	10	200	155	63	30
HSK63A-HD12-85	12	85	40	63	32
HSK63A-HD12-150	12	150	105	63	32
HSK63A-HD12-200	12	200	155	63	32
HSK63A-HD14-85	14	85	40	63	34
HSK63A-HD14-150	14	150	105	63	34
HSK63A-HD14-200	14	200	155	63	34
HSK63A-HD16-90	16	90	46	63	38
HSK63A-HD16-150	16	150	105	63	38
HSK63A-HD16-200	16	200	155	63	38
HSK63A-HD18-90	18	90	46	63	40
HSK63A-HD18-150	18	150	105	63	40
HSK63A-HD18-200	18	200	155	63	40
HSK63A-HD20-90	20	90	46	63	42
HSK63A-HD20-150	20	150	105	63	42
HSK63A-HD20-200	20	200	155	63	42
HSK63A-HD25-120	25	120	52	63	53
HSK63A-HD32-125	32	125	99	63	60
HSK100A-HD06-75	6	75	26	100	26
HSK100A-HD08-75	8	75	26	100	28
HSK100A-HD10-90	10	90	40	100	30
HSK100A-HD12-95	12	95	40	100	32
HSK100A-HD14-95	14	95	40	100	34
HSK100A-HD16-100	16	100	46	100	38
HSK100A-HD18-100	18	100	46	100	40
HSK100A-HD20-105	20	105	46	100	42
HSK100A-HD25-115	25	115	86	100	57
HSK100A-HD32-120	32	120	91	100	64

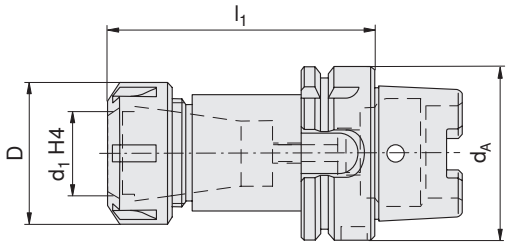
⚠ For tools with shank to DIN 1835 A+B and DIN 6535 HA+HB
Shank to DIN 6535 HE in connection with reduction sleeves



HSK-A

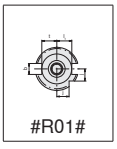
Collet chucks type ER



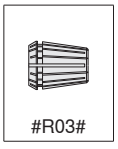


Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
HSK63A-ER16-100-V	16	100	63	28	E01
HSK63A-ER16-160-V	16	160	63	28	E01
HSK63A-ER20-103-V	20	103	63	35	E02
HSK63A-ER25-103-V	25	103	63	42	E03
HSK63A-ER25-160-V	25	160	63	42	E03
HSK63A-ER32-103-V	32	103	63	50	E04
HSK63A-ER40-120-V	40	120	63	63	E05
HSK100A-ER16-100-V	16	100	100	32	E06
HSK100A-ER16-160-V	16	160	100	32	E06
HSK100A-ER20-103-V	20	103	100	35	E07
HSK100A-ER25-103-V	25	103	100	42	E08
HSK100A-ER25-160-V	25	160	100	42	E08
HSK100A-ER32-103-V	32	103	100	50	E09
HSK100A-ER40-120-V	40	120	100	63	E10

E01	6295005400	8376006300	11154410	8335711600
E02	6295004500	8376006300	11154413	
E03	6295005500	8376006300	11154414	8335712500
E04	6295005600	8376006300	11154418	8335713200
E05	6295005700	8376006300	11154419	8335714000
E06	6295005400	8376010000	11154410	8335711600
E07	6295004500	8376010000	11154413	
E08	6295005500	8376010000	11154414	8335712500
E09	6295005600	8376010000	11154418	8335713200
E10	6295005700	8376010000	11154419	8335714000


#R01#


#R02#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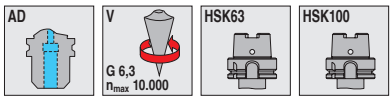
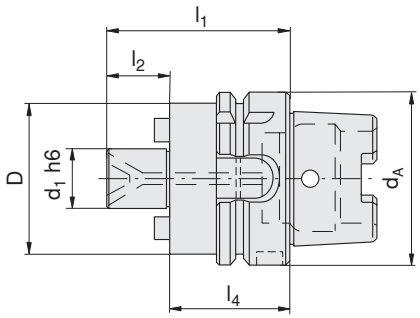
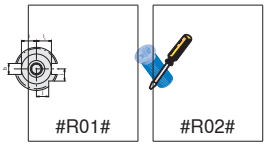




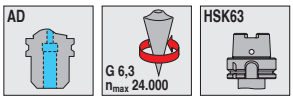
Type, description	d_1 [mm]	d_A [mm]	D [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	
HSK63A-QA16-50-V	16	63	40	67	17	50	E01
HSK63A-QA22-50-V	22	63	50	69	19	50	E02
HSK63A-QA27-60-V	27	63	60	81	21	60	E03
HSK63A-QA32-60-V	32	63	78	84	24	60	E04
HSK63A-QA40-60-V	40	63	89	87	27	60	E05
HSK100A-QA16-50-V	16	100	40	67	17	50	E06
HSK100A-QA22-50-V	22	100	50	69	19	50	E07
HSK100A-QA27-50-V	27	100	60	71	21	50	E08
HSK100A-QA32-50-V	32	100	78	74	24	50	E09
HSK100A-QA40-60-V	40	100	89	87	27	60	E10
HSK100A-QA60-70-V	60	100	129	110	40	70	E11

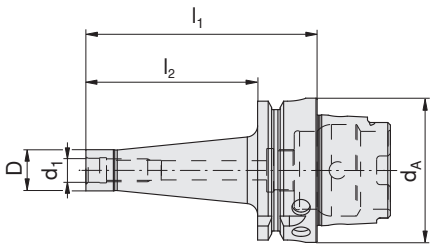
E01	8395012000	8376006300	8395029600		8336701600
E02	8395012100	8376006300	8395029700		8336702200
E03	8395012200	8376006300	8395013600		8336702700
E04	8395012300	8376006300	8395013700		8336703200
E05	8395029500	8376006300	8395013800	8395014000	8336704000
E06	8395012000	8376010000	8395029600		8336701600
E07	8395012100	8376010000	8395029700		8336702200
E08	8395012200	8376010000	8395013600		8336702700
E09	8395012300	8376010000	8395013700		8336703200
E10	8395029500	8376010000	8395013800	8395014000	8336704000
E11	8395029800	8376010000		8395016000 / 8395012500	



HSK-A

Adapters for threaded shank milling cutters

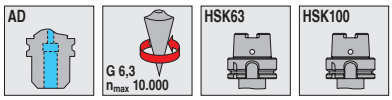


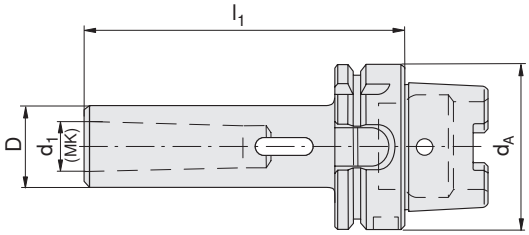


Type, description	d_1 [mm]	l_1 [mm]	l_2 [mm]	d_A [mm]	D [mm]	
HSK-A63-M8-50	8	76	50	63	23	E01
HSK-A63-M8-75	8	101	75	63	25	E01
HSK-A63-M8-100	8	126	100	63	30	E01
HSK-A63-M10-50	10	76	50	63	25	E01
HSK-A63-M10-75	10	101	75	63	30	E01
HSK-A63-M10-100	10	126	100	63	35	E01
HSK-A63-M12-50	12	76	50	63	30	E01
HSK-A63-M12-75	12	101	75	63	35	E01
HSK-A63-M12-100	12	126	100	63	38	E01
HSK-A63-M16-50	16	76	50	63	34	E01
HSK-A63-M16-75	16	101	75	63	35	E01
HSK-A63-M16-100	16	126	100	63	40	E01

E01	8376006300

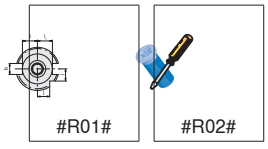
#R01# #R02#





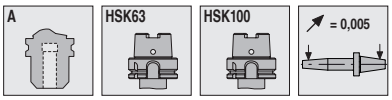
Type, description	d_1 Morse taper [MK]	l_1 [mm]	d_A [mm]	D [mm]	
HSK63A-MK1D-100	1	100	63	25	E01
HSK63A-MK2D-120	2	120	63	32	E01
HSK63A-MK3D-140	3	140	63	40	E01
HSK63A-MK4D-160	4	160	63	48	E01
HSK100A-MK1D-110	1	110	100	25	E02
HSK100A-MK2D-120	2	120	100	32	E02
HSK100A-MK3D-150	3	150	100	40	E02
HSK100A-MK4D-170	4	170	100	48	E02
HSK100A-MK5D-200	5	200	100	63	E02

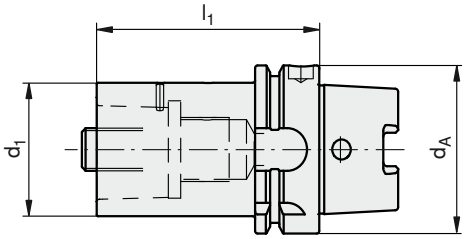
E01	8376006300
E02	8376010000



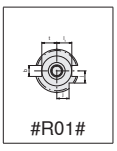
HSK-A

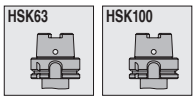
PSC adapters

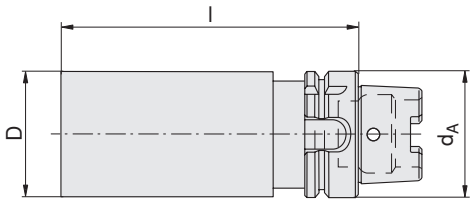




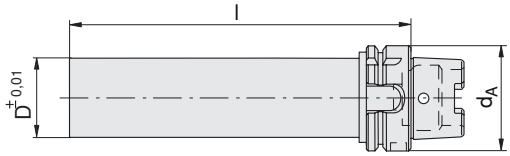
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	Torque moment [Nm]
HSK63A-PSC50	50	90	63	50	--
HSK100A-PSC50	50	100	100	50	--
HSK100A-PSC63	63	110	100	63	--



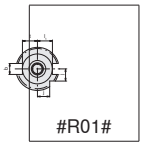




Type, description	d_A [mm]	D [mm]	l [mm]
HSK63A-HF63-200	63	63	200
HSK100A-HF100-250	100	100	250

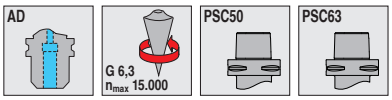


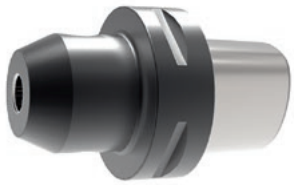
Type, description	d_A [mm]	D [mm]	l [mm]
HSK63A-KD40-346	63	63	346
HSK100A-KD40-349	100	40	349

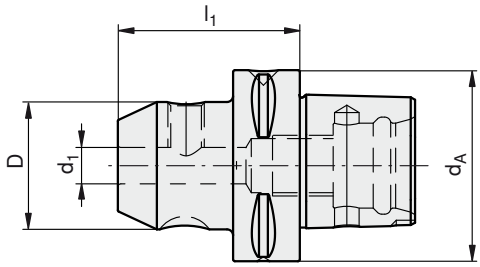


PSC

Weldon adapters

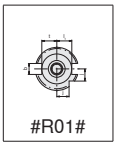






Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
PSC50-WE06-50	6	50	50	25	E01
PSC50-WE08-50	8	50	50	28	E02
PSC50-WE10-55	10	55	50	35	E02
PSC50-WE12-60	12	60	50	42	E03
PSC50-WE14-60	14	60	50	44	E03
PSC50-WE16-60	16	60	50	48	E04
PSC50-WE18-60	18	60	50	50	E05
PSC50-WE20-60	20	60	50	52	E06
PSC50-WE25-80	25	80	50	65	E05
PSC63-WE06-55	6	55	63	25	E01
PSC63-WE08-55	8	55	63	28	E02
PSC63-WE10-60	10	60	63	35	E02
PSC63-WE12-60	12	60	63	42	E03
PSC63-WE14-60	14	60	63	44	E03
PSC63-WE16-65	16	65	63	48	E04
PSC63-WE18-65	18	65	63	50	E05
PSC63-WE20-65	20	65	63	52	E06
PSC63-WE25-80	25	80	63	65	E05
PSC63-WE32-90	32	90	63	72	E06
PSC63-WE40-100	40	100	63	80	E06

E01	6295001000
E02	6295001200
E03	6295001600
E04	6295002000
E05	6295002500
E06	6295003200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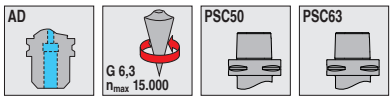
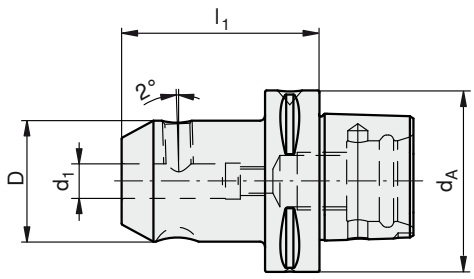
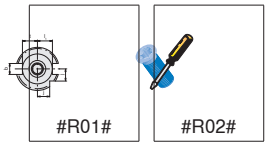
#R02#





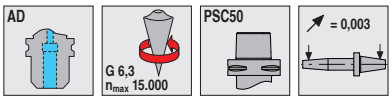
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
PSC50-WN06-70	6	70	50	25	E01
PSC50-WN08-70	8	70	50	28	E02
PSC50-WN10-70	10	70	50	35	E02
PSC50-WN12-75	12	75	50	42	E03
PSC50-WN14-75	14	75	50	44	E03
PSC50-WN16-80	16	80	50	48	E04
PSC50-WN18-80	18	80	50	50	E05
PSC50-WN20-85	20	85	50	52	E06
PSC63-WN06-75	6	75	63	25	E01
PSC63-WN08-75	8	75	63	28	E02
PSC63-WN10-75	10	75	63	35	E02
PSC63-WN12-80	12	80	63	42	E03
PSC63-WN14-80	14	80	63	44	E03
PSC63-WN16-80	16	80	63	48	E04
PSC63-WN18-80	18	80	63	50	E05
PSC63-WN20-85	20	85	63	52	E06
PSC63-WN25-90	25	90	63	58	E05
PSC63-WN32-95	32	95	63	61	E06

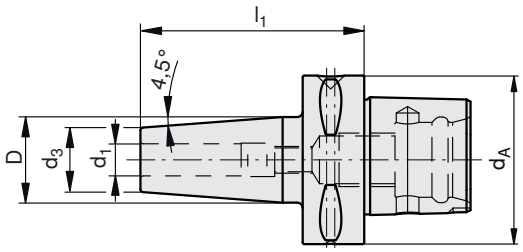
E01	6295001000
E02	6295001200
E03	6295001600
E04	6295002000
E05	6295002500
E06	6295003200



PSC

Shrink fit adapters

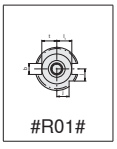




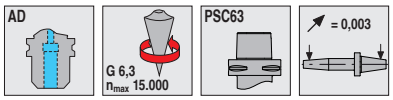
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	d_3 [mm]	
PSC50-SF4.5°-3-65	3	65	50	17	12	
PSC50-SF4.5°-4-65	4	65	50	17	12	
PSC50-SF4.5°-5-65	5	65	50	17	12	
PSC50-SF4.5°-6-75	6	75	50	29.7	21	E01
PSC50-SF4.5°-6-120	6	120	50	32	21	E01
PSC50-SF4.5°-8-75	8	75	50	29.7	21	E02
PSC50-SF4.5°-8-120	8	120	50	32	21	E02
PSC50-SF4.5°-10-75	10	75	50	32.7	24	E03
PSC50-SF4.5°-10-120	10	120	50	34	24	E03
PSC50-SF4.5°-12-75	12	75	50	32.7	24	E04
PSC50-SF4.5°-12-120	12	120	50	34	24	E04
PSC50-SF4.5°-14-80	14	80	50	34	27	E04
PSC50-SF4.5°-14-120	14	120	50	36	27	E04
PSC50-SF4.5°-16-80	16	80	50	34	27	E05
PSC50-SF4.5°-16-120	16	120	50	36	27	E05
PSC50-SF4.5°-18-80	18	80	50	42	33	E05
PSC50-SF4.5°-18-120	18	120	50	42	33	E05
PSC50-SF4.5°-20-85	20	85	50	42	33	E06
PSC50-SF4.5°-20-120	20	120	50	42	33	E06
PSC50-SF4.5°-25-90	25	90	50	53	44	E06
PSC50-SF4.5°-25-120	25	120	50	53	44	E06

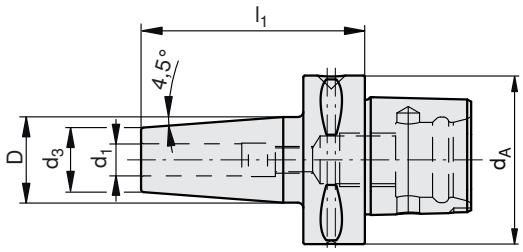
⚠ For shanks with tolerance h6 or better

E01	12087062
E02	12087063
E03	12087064
E04	12087065
E05	12087066
E06	12087067


#R01#


#R02#

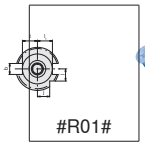


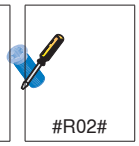


Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	d_3 [mm]	
PSC63-SF4.5°-3-80	3	80	63	17	12	
PSC63-SF4.5°-4-80	4	80	63	17	12	
PSC63-SF4.5°-5-80	5	80	63	17	12	
PSC63-SF4.5°-6-80	6	80	63	27	21	E01
PSC63-SF4.5°-6-120	6	120	63	32	21	E01
PSC63-SF4.5°-6-160	6	160	63	32	21	E01
PSC63-SF4.5°-8-80	8	80	63	27	21	E02
PSC63-SF4.5°-8-120	8	120	63	32	21	E02
PSC63-SF4.5°-8-160	8	160	63	32	21	E02
PSC63-SF4.5°-10-80	10	80	63	32	24	E03
PSC63-SF4.5°-10-120	10	120	63	32	24	E03
PSC63-SF4.5°-10-160	10	160	63	34	24	E03
PSC63-SF4.5°-12-80	12	80	63	32	24	E04
PSC63-SF4.5°-12-120	12	120	63	32	24	E04
PSC63-SF4.5°-12-160	12	160	63	34	24	E04
PSC63-SF4.5°-14-85	14	85	63	34	27	E04
PSC63-SF4.5°-14-120	14	120	63	36	27	E04
PSC63-SF4.5°-14-160	14	160	63	36	27	E04
PSC63-SF4.5°-16-85	16	85	63	34	27	E05
PSC63-SF4.5°-16-120	16	120	63	36	27	E05
PSC63-SF4.5°-16-160	16	160	63	36	27	E05
PSC63-SF4.5°-18-85	18	85	63	42	33	E05
PSC63-SF4.5°-18-120	18	120	63	44	33	E05
PSC63-SF4.5°-18-160	18	160	63	44	33	E05
PSC63-SF4.5°-20-85	20	85	63	42	33	E06
PSC63-SF4.5°-20-120	20	120	63	44	33	E06
PSC63-SF4.5°-20-160	20	160	63	44	33	E06
PSC63-SF4.5°-25-90	25	90	63	52.5	44	E06
PSC63-SF4.5°-25-120	25	120	63	52.5	44	E06
PSC63-SF4.5°-25-160	25	160	63	52.5	44	E06
PSC63-SF4.5°-32-95	32	95	63	52.5	44	
PSC63-SF4.5°-32-120	32	120	63	52.5	44	E06
PSC63-SF4.5°-32-160	32	160	63	52.5	44	E06

⚠ For shanks with tolerance h6 or better

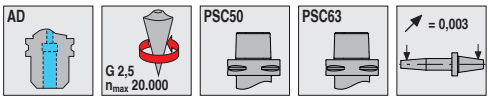
	
E01	12087062
E02	12087063
E03	12087064
E04	12087065
E05	12087066
E06	12087067

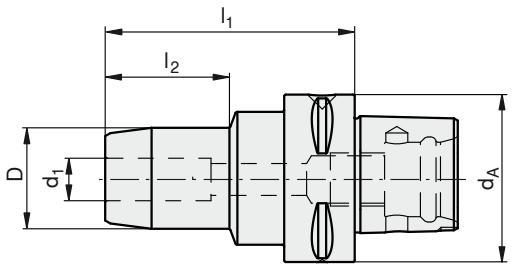




PSC

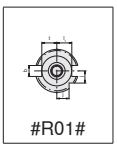
Hydraulic expansion chucks





Type, description	d_1 [mm]	l_1 [mm]	l_2 [mm]	d_A [mm]	D [mm]
PSC50-HD06-65	6	65	30	50	26
PSC50-HD08-65	8	65	30	50	28
PSC50-HD10-75	10	75	40	50	30
PSC50-HD12-80	12	80	40	50	32
PSC50-HD14-80	14	80	40	50	34
PSC50-HD16-85	16	85	46	50	38
PSC50-HD18-85	18	85	46	50	40
PSC50-HD20-85	20	85	46	50	42
PSC63-HD06-65	6	65	25	63	26
PSC63-HD08-65	8	65	25	63	28
PSC63-HD10-75	10	75	35	63	30
PSC63-HD12-80	12	80	40	63	32
PSC63-HD14-80	14	80	40	63	34
PSC63-HD16-85	16	85	46	63	38
PSC63-HD18-85	18	85	46	63	40
PSC63-HD20-85	20	85	46	63	42
PSC63-HD25-95	25	95	73	63	55
PSC63-HD32-100	32	100	78	63	63

⚠ For tools with shank to DIN 1835 A+B and DIN 6535 HA+HB
Shank to DIN 6535 HE in connection with reduction sleeves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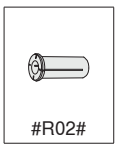
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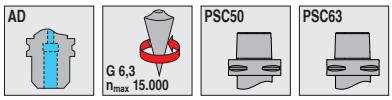
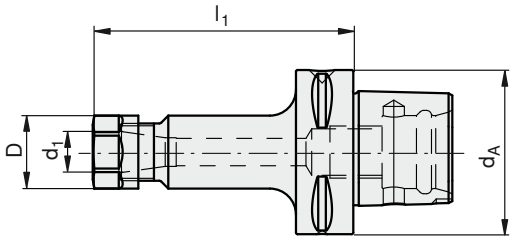
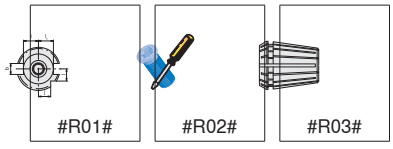




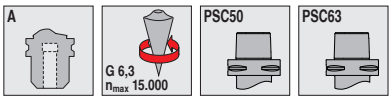
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
PSC50-ER16-60	16	60	50	28	E01
PSC50-ER16-100	16	100	50	28	E01
PSC50-ER20-60	20	60	50	34	E02
PSC50-ER20-100	20	100	50	34	E02
PSC50-ER25-60	25	60	50	42	E03
PSC50-ER25-100	25	100	50	42	E03
PSC50-ER32-60	32	60	50	50	E04
PSC50-ER32-100	32	100	50	50	E04
PSC50-ER40-65	40	65	50	63	E05
PSC50-ER40-100	40	100	50	63	E05
PSC63-ER20-60	20	60	63	34	E02
PSC63-ER20-100	20	100	63	34	E02
PSC63-ER25-60	25	60	63	42	E03
PSC63-ER25-100	25	100	63	42	E03
PSC63-ER32-60	32	60	63	50	E04
PSC63-ER32-100	32	100	63	50	E04
PSC63-ER40-65	40	65	63	63	E05
PSC63-ER40-100	40	100	63	63	E05

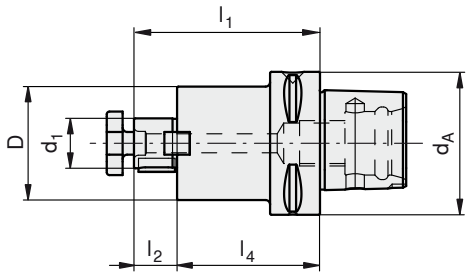
E01	6295005400	8335711600
E02	6295004500	
E03	6295005500	8335712500
E04	6295005600	8335713200
E05	6295005700	8335714000



PSC

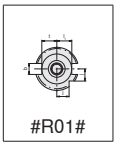
Combination shell mill adapters





Type, description	d_1 [mm]	d_A [mm]	D [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	
PSC50-KA16-28	16	50	40	45	17	28	E01
PSC50-KA16-63	16	50	40	80	17	63	E01
PSC50-KA22-28	22	50	50	47	19	28	E02
PSC50-KA22-63	22	50	50	82	19	63	E02
PSC50-KA27-32	27	50	58	53	21	32	E03
PSC50-KA27-63	27	50	58	84	21	63	E03
PSC50-KA32-40	32	50	63	64	24	40	E04
PSC50-KA32-63	32	50	63	87	24	63	E04
PSC63-KA16-63	16	63	40	80	17	63	E01
PSC63-KA22-28	22	63	63	47	19	28	E02
PSC63-KA22-63	22	63	50	82	19	63	E02
PSC63-KA27-28	27	63	58	49	21	28	E03
PSC63-KA27-63	27	63	58	84	21	63	E03
PSC63-KA32-22	32	63	63	46	24	22	E04
PSC63-KA32-86	32	63	63	110	24	86	E04
PSC63-KA40-40	40	63	70	67	27	40	E05

E01	12087073	12087068	8395011300	8336701600	8336811600
E02	12087074	12087069	8395012400	8336702200	8336812200
E03	12087075	12087070	8395012500	8336702700	8336812700
E04	12087076	12087071	8395012600	8336703200	8336813200
E05	12087077	12087072	8395011200	8336704000	8336814000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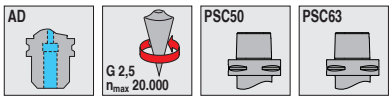
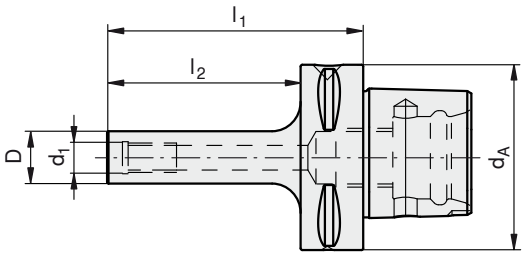
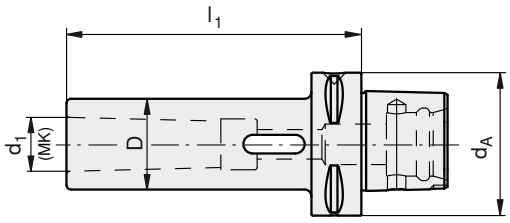
#R02#

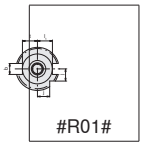




Type, description	d_1 [mm]	l_1 [mm]	l_2 [mm]	d_A [mm]	D [mm]
PSC50-M8-70	8	70	50	50	13
PSC50-M10-80	10	80	60	50	18
PSC50-M12-80	12	80	60	50	21
PSC50-M16-80	16	80	60	50	29
PSC63-M8-70	8	70	48	63	13
PSC63-M10-90	10	90	68	63	18
PSC63-M12-100	12	100	78	63	21
PSC63-M16-100	16	100	78	63	29

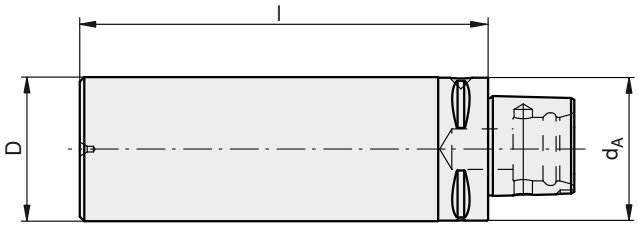


Type, description	d_1 Morse taper [MK]	l_1 [mm]	d_A [mm]	D [mm]
PSC50-MK2-110	2	110	50	32
PSC50-MK3-130	3	130	50	40
PSC50-MK4-150	4	150	50	48
PSC63-MK2-110	2	110	63	32
PSC63-MK3-130	3	130	63	40
PSC63-MK4-150	4	150	63	48

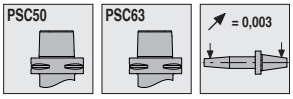


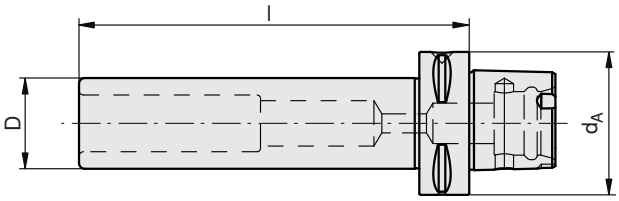
PSC

Blanks / Test bars

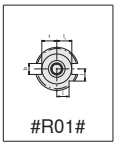


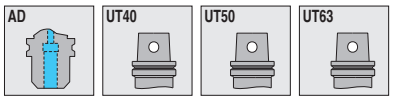
Type, description	d_A [mm]	D [mm]	l [mm]
PSC50-HF50-125	50	50	125
PSC50-HF50-150	50	50	150
PSC50-HF75-175	50	75	175
PSC50-HF90-80	50	90	80
PSC50-HF95-150	50	95	150
PSC50-HF110-90	50	110	90
PSC63-HF63-180	63	63	180
PSC63-HF75-195	63	75	195
PSC63-HF110-85	63	110	85
PSC63-HF120-180	63	120	180
PSC63-HF130-95	63	130	95

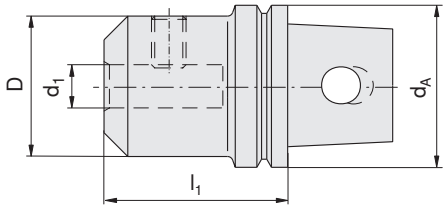




Type, description	d_A [mm]	D [mm]	l [mm]
PSC50-KD32-235	50	32	235
PSC63-KD40-322	63	40	322







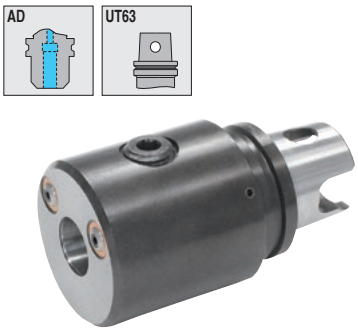
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
UT40-AD-ZYL 08	8	45	40	28	E01
UT40-AD-ZYL 12	12	55	40	42	E02
UT40-AD-ZYL 16	16	60	40	48	E03
UT40-AD-ZYL 20	20	65	40	52	E04
UT40-AD-ZYL 25	25	75	40	65	E05
UT50-AD-ZYL 20	20	60	50	52	E06
UT63-WE06-80-MIY	6	80	63	25	E07
UT63-WE08-80-MIY	8	80	63	28	E08
UT63-WE10-80-MIY	10	80	63	35	E09
UT63-WE12-80-MIY	12	80	63	42	E10
UT63-WE14-80-MIY	14	80	63	44	E10
UT63-WE16-80-MIY	16	80	63	48	E11
UT63-WE18-80-MIY	18	80	63	50	E11
UT63-WE20-80-MIY	20	80	63	52	E12
UT63-WE25-80-MIY	25	80	63	65	E13
UT63-WE32-85-MIY	32	80	63	72	E14
UT63-AD-ZYL 32	32	85	63	70	E14
UT63-WE40-95-MIY	40	95	63	63	E15
UT63-AD-ZYL 40	40	100	63	90	E15

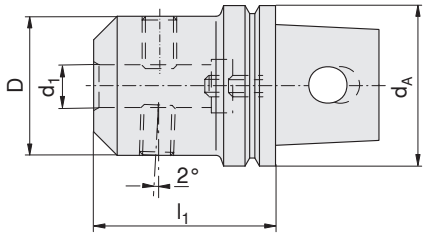
E01	8395003400	6295000800	194263
E02	8395003600	6295001200	194263
E03	8395003700	6295001600	194263
E04	8395027200	6295002000	194263
E05	8395029000	6295002500	194263
E06	8395027200	6295002000	225429
E07	8395003300	6295000600	225430
E08	8395003400	6295000800	225430
E09	8395003500	6295001000	225430
E10	8395003600	6295001200	225430
E11	8395003700	6295001600	225430
E12	8395027200	6295002000	225430
E13	8395029000	6295002500	225430
E14	8395029000	6295003200	225430
E15		6295003200	225430

#R01#

UTS

Whistle Notch adapters

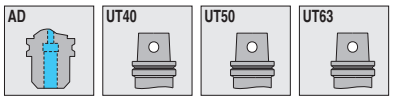


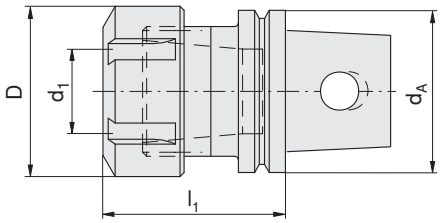


Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
UT63-WEWN06-80-MIY	6	80	63	25	E01
UT63-WEWN08-80-MIY	8	80	63	28	E02
UT63-WEWN10-80-MIY	10	80	63	35	E03
UT63-WEWN12-80-MIY	12	80	63	42	E04
UT63-WEWN14-80-MIY	14	80	63	44	E04
UT63-WEWN16-80-MIY	16	80	63	48	E05
UT63-WEWN18-80-MIY	18	80	63	50	E05
UT63-WEWN20-80-MIY	20	80	63	52	E06
UT63-WEWN25-80-MIY	25	80	63	65	E07
UT63-WEWN32-80-MIY	32	80	63	72	E08
UT63-WEWN40-95-MIY	40	95	63	80	E09

E01	8395003300	6295000600	225430
E02	8395003400	6295000800	225430
E03	8395003500	6295001000	225430
E04	8395003600	6295001200	225430
E05	8395003700	6295001600	225430
E06	8395027200	6295002000	225430
E07	8395029000	6295002500	225430
E08	8395029000	6295003200	225430
E09		6295003200	225430


#R01#





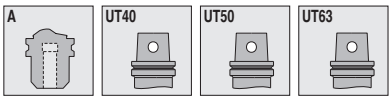
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
UT40-ER16-38	16	38	40	32	E01
UT40-ER25-45	25	45	40	42	E02
UT40-ER32-51	32	51	40	50	E03
UT50-ER32-51	32	51	50	50	E04
UT63-ER16-90-MIY	16	90	63	32	E05
UT63-ER16-120-MIY	16	120	63	32	E05
UT63-ER25-90-MIY	25	90	63	42	E06
UT63-ER25-120-MIY	25	120	63	42	E06
UT63-ER32-90-MIY	32	90	63	50	E07
UT63-ER40-80-MIY	40	80	63	63	E08

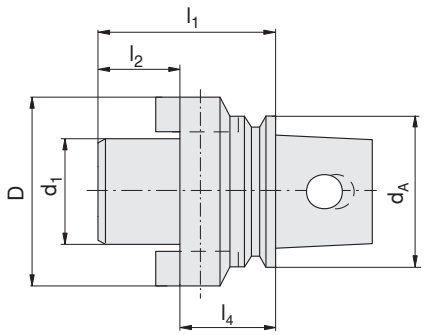
E01	6295005400			194263	8335711600
E02	6295005500	8395001000		194263	8335712500
E03	6295005600	8395001000		194263	8335713200
E04	6295005600	8395001000		225429	8335713200
E05	6295005400			225430	8335711600
E06	6295005500	8395001000		225430	8335712500
E07		8395029000	6295003200	225430	
E08			6295003200	225430	


#R01#

UTS

Shell mill adapters, centre bolt





Type, description	d_1 [mm]	d_A [mm]	D [mm]	l_1 [mm]	l_2 [mm]	l_4 [mm]	
UT40-QA16-25IK	16	40	38	42	17	25	E01
UT40-QA22-25IK	22	40	46	44	19	25	E02
UT50-QA22-27IK	22	50	48	46	19	27	E03
UT50-QA32-35IK	32	50	78	59	24	35	E04
UT63-QA16-28-MIY	16	63	38	44	17	28	E05
UT63-QA16-110-MIY	16	63	38	127	17	110	E05
UT63-QA22-36-MIY	22	63	50	46	19	36	E06
UT63-QA22-110-MIY	22	63	50	129	19	110	E06
UT63-QA27-36-MIY	27	63	58	57	21	36	E07
UT63-QA27-36IK	27	63	58	57	21	36	E07
UT63-QA27-110-MIY	27	63	58	131	21	110	E07
UT63-QA32-33-MIY	32	63	78	57	24	33	E08
UT63-QA40-56IK	40	63	88	83	27	56	E09

E01	8395012000	8395029600	333935		194263
E02	8395012100	11210254	333937		194263
E03	8395012100	11210254	333937		225429
E04	8395012300	8395013700	333945		225429
E05	8395012000	8395029600	333935		225430
E06	8395012100	11210254	333937		225430
E07	8395012200	8395013600	333940		225430
E08	8395012300	8395013700	333945		225430
E09	8395029500	8395013800		8336704000	225430

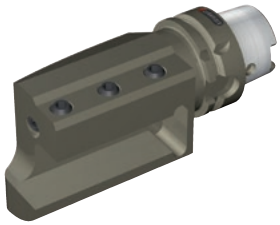
#R01#

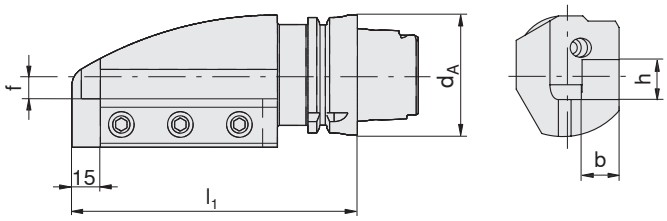

CERATIZIT

HSK-T

Tool holders 0° / Tool holders 45°

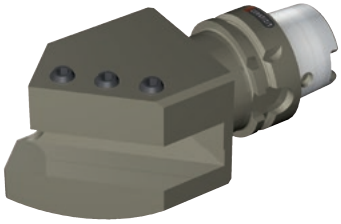
HSK63 HSK100

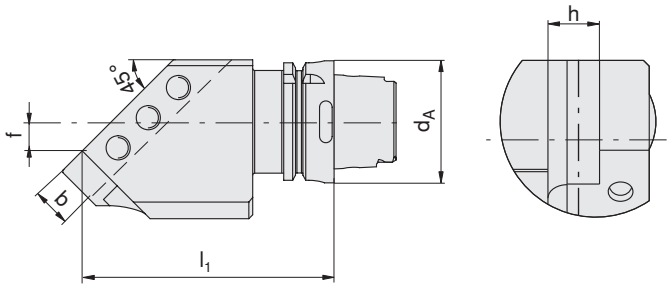




Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]	
HSK-T63-SHL00-2525	63	150	13	25	25	E01
HSK-T63-SHR00-2525	63	150	13	25	25	E01
HSK-T100-SHR00-3232	100	160	15	32	32	E01
HSK-T100-SHL00-3232	100	160	15	32	32	E01

HSK63 HSK100



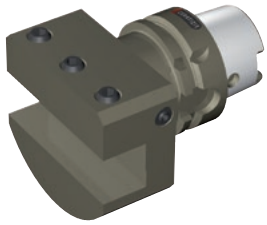


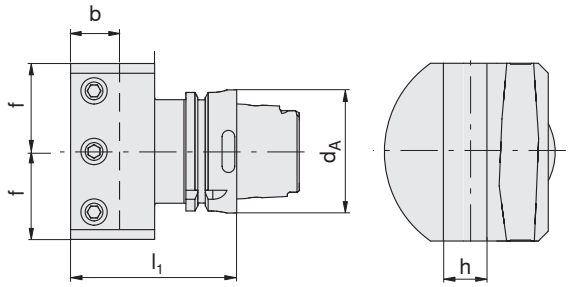
Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]	
HSK-T63-SHL45-2525	63	130	15	25	25	E01
HSK-T63-SHR45-2525	63	130	15	25	25	E01
HSK-T100-SHL45-3232	100	160	20	32	32	E01
HSK-T100-SHR45-3232	100	160	20	32	32	E01

E01	12001280	11960178	11848510	11106932

#R01#

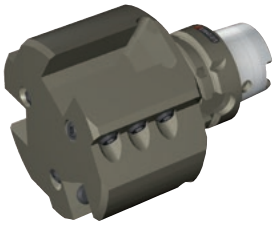
HSK63 HSK100

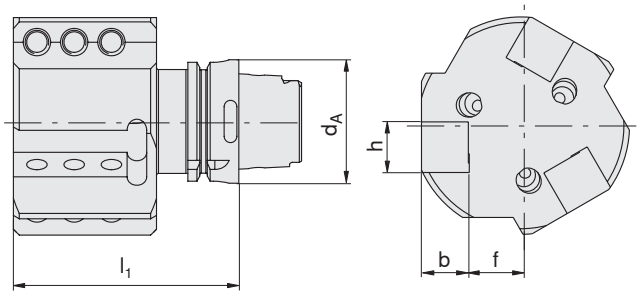




Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]	
HSK-T63-SHN90-2525	63	85	45	25	25	E01
HSK-T100-SHN90-3232	100	90	50	32	32	E01

HSK63 HSK100





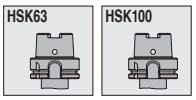
Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]	
HSK-T63-SH3L00-2525	63	115	28	25	25	E01
HSK-T100-SH3L00-2525	100	120	33	25	25	E01

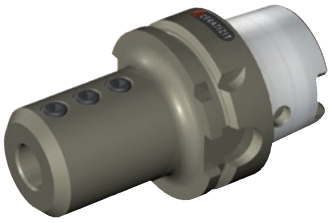
E01	12001280	11960178	11848510	11106932

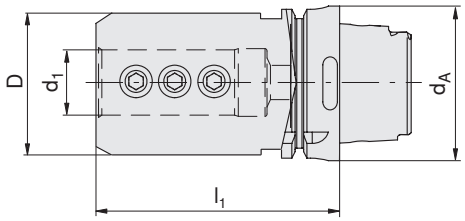
#R01#

HSK-T

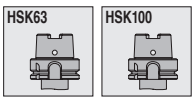
Boring bar holders / Extensions

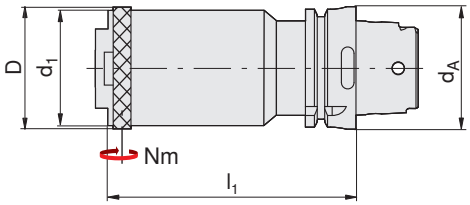






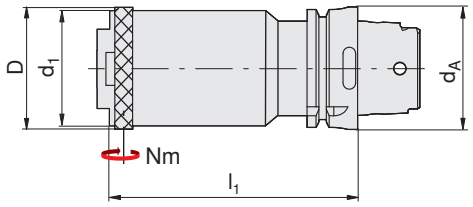
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]
HSK-T63-BH08-80	8	80	63	32
HSK-T63-BH10-80	10	80	63	40
HSK-T63-BH12-80	12	80	63	40
HSK-T63-BH16-80	16	80	63	40
HSK-T63-BH20-80	20	80	63	50
HSK-T63-BH25-90	25	90	63	52.6
HSK-T63-BH32-95	32	95	63	68
HSK-T100-BH20-90	20	90	100	55
HSK-T100-BH25-95	25	95	100	55
HSK-T100-BH32-110	32	110	100	68
HSK-T100-BH40-120	40	120	100	83
HSK-T100-BH50-125	50	125	100	98





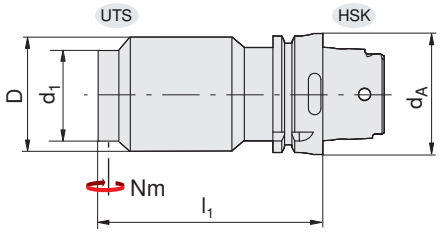
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	Torque moment [Nm]
HSK-T63-V80	63	80	63	68	20
HSK-T63-V120	63	120	63	68	20
HSK-T100-V120	100	120	100	105	50

HSK100



Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	Torque moment [Nm]
HSK-T100-R63-100	63	100	100	68	50

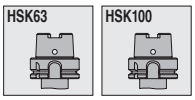
HSK63 HSK100

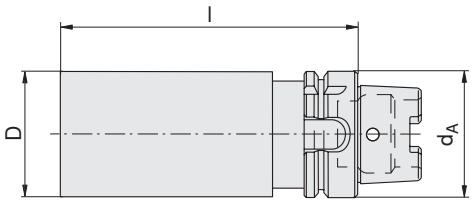


Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	Torque moment [Nm]
HSK-T63-UT40-80	40	80	63	48	16
HSK-T63-UT50-95	50	95	63	58	32
HSK-T63-UT63-105	63	105	63	72	50
HSK-T100-UT40-80	40	80	100	48	16
HSK-T100-UT50-100	50	100	100	58	32
HSK-T100-UT63-115	63	115	100	72	50

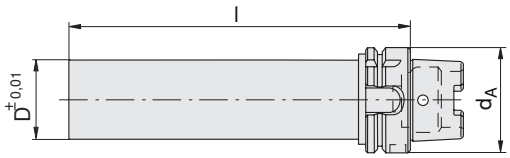
HSK-T

Blanks / Test bars

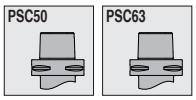


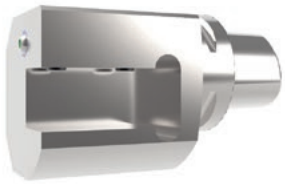


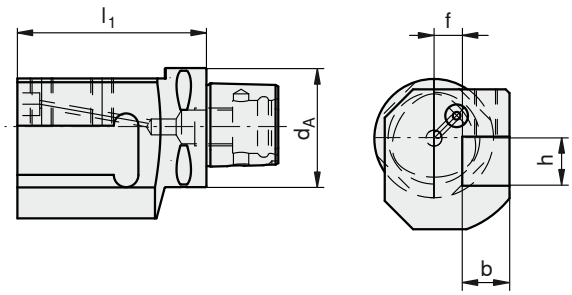
Type, description	d_A [mm]	D [mm]	l [mm]
HSK-T63-HF72-210	63	72	210
HSK-T63-HF90-90	63	90	90
HSK-T63-HF100-150	63	100	150
HSK-T100-HF100-250	100	100	250
HSK-T100-HF110-100	100	110	100
HSK-T100-HF120-160	100	120	160



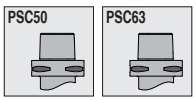
Type, description	d_A [mm]	D [mm]	l [mm]
HSK63A-KD40-346	63	63	346
HSK100A-KD40-349	100	40	349

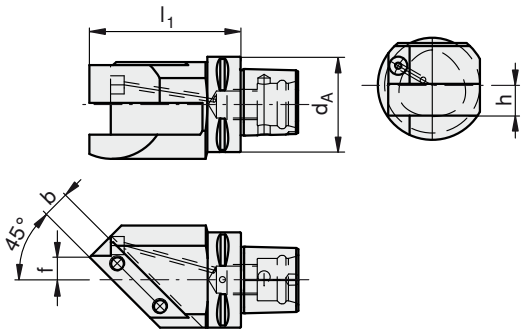




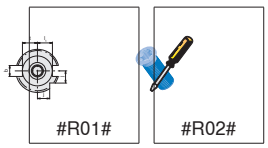


Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]
PSC50-SHL00-2020	50	80	15	20	20
PSC50-SHR00-2020	50	80	15	20	20
PSC50-SHL00-2525	50	90	15	25	25
PSC50-SHR00-2525	50	90	15	25	25
PSC50-SHL00-3232	50	115	15	32	32
PSC50-SHR00-3232	50	115	15	32	32
PSC63-SHL00-2020	63	90	15	20	20
PSC63-SHR00-2020	63	90	15	20	20
PSC63-SHL00-2525	63	100	15	25	25
PSC63-SHR00-2525	63	100	15	25	25
PSC63-SHL00-3232	63	125	15	32	32
PSC63-SHR00-3232	63	125	15	32	32



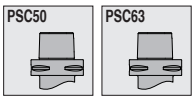


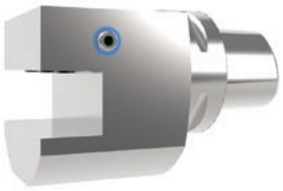
Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]
PSC50-SHR45-2020	50	100	15	20	20
PSC50-SHL45-2020	50	100	15	20	20
PSC63-SHR45-2020	63	100	15	20	20
PSC63-SHL45-2020	63	100	15	20	20

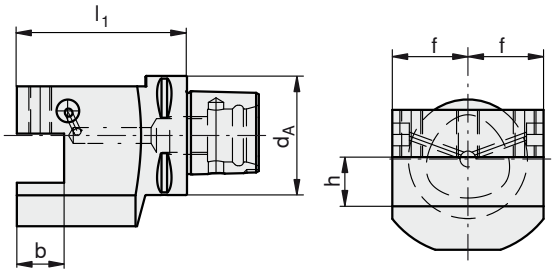


PSC

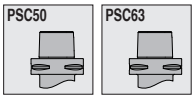
Tool holders 90° / Double tool holders

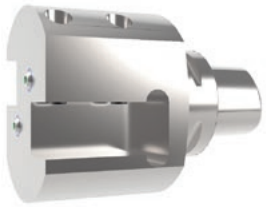


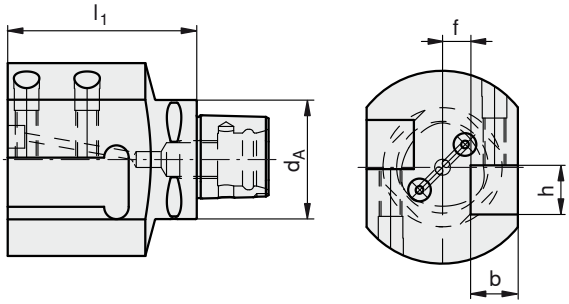




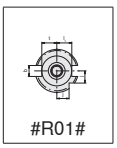
Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]
PSC50-SHN90-2020	50	70	35	20	20
PSC50-SHN90-2525	50	80	40	25	25
PSC50-SHN90-3232	50	90	45	32	32
PSC63-SHN90-2020	63	80	35	20	20
PSC63-SHN90-2525	63	90	40	25	25
PSC63-SHN90-3232	63	100	45	32	32

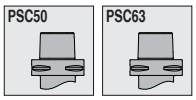


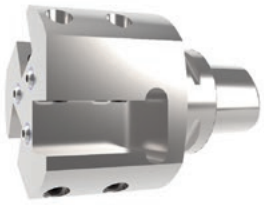


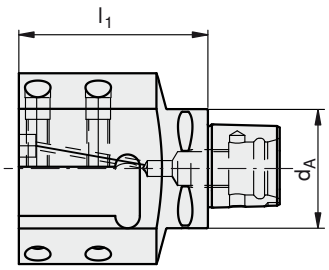


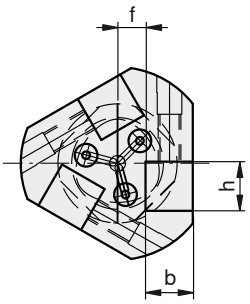
Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]
PSC50-SH2L00-2020	50	80	15	20	20
PSC50-SH2R00-2020	50	80	15	20	20
PSC50-SH2L00-2525	50	90	15	25	25
PSC50-SH2R00-2525	50	90	15	25	25
PSC50-SH2L00-3232	50	115	15	32	32
PSC50-SH2R00-3232	50	115	15	32	32
PSC63-SH2L00-2020	63	90	15	20	20
PSC63-SH2R00-2020	63	90	15	20	20
PSC63-SH2L00-2525	63	100	15	25	25
PSC63-SH2R00-2525	63	100	15	25	25
PSC63-SH2L00-3232	63	125	15	32	32
PSC63-SH2R00-3232	63	125	15	32	32



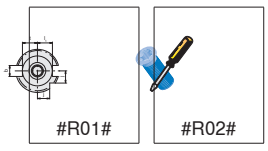






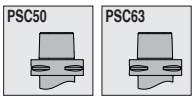


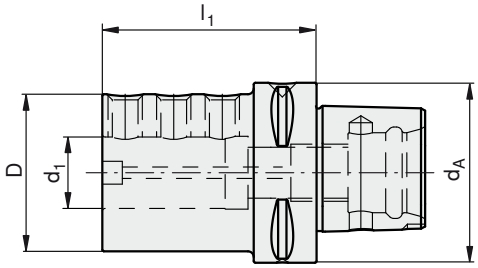
Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]
PSC50-SH3R00-2020	50	80	15	20	20
PSC50-SH3L00-2020	50	80	15	20	20
PSC50-SH3R00-2525	50	90	15	25	25
PSC50-SH3L00-2525	50	90	15	25	25
PSC50-SH3R00-3232	50	115	15	32	32
PSC50-SH3L00-3232	50	115	15	32	32
PSC63-SH3R00-2020	63	90	15	20	20
PSC63-SH3L00-2020	63	90	15	20	20
PSC63-SH3R00-2525	63	100	15	25	25
PSC63-SH3L00-2525	63	100	15	25	25
PSC63-SH3R00-3232	63	125	15	32	32
PSC63-SH3L00-3232	63	125	15	32	32



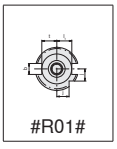
PSC

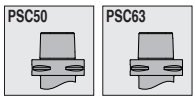
Boring bar holders

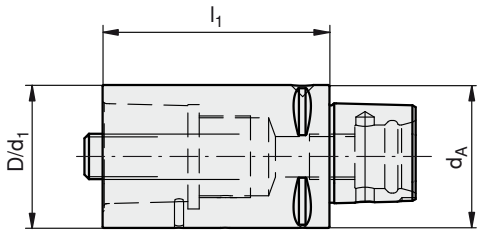




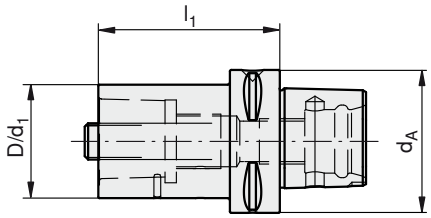
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]
PSC50-BH6-70	6	70	50	40
PSC50-BH8-70	8	70	50	44
PSC50-BH10-70	10	70	50	44
PSC50-BH12-70	12	70	50	44
PSC50-BH16-75	16	75	50	44
PSC50-BH20-75	20	75	50	50
PSC50-BH25-80	25	80	50	55
PSC50-BH32-90	32	90	50	72
PSC63-BH6-75	6	75	63	40
PSC63-BH6-80	6	80	63	40
PSC63-BH8-75	8	75	63	44
PSC63-BH8-85	8	85	63	45
PSC63-BH10-75	10	75	63	44
PSC63-BH10-85	10	85	63	50
PSC63-BH12-75	12	75	63	44
PSC63-BH12-100	12	100	63	63
PSC63-BH16-75	16	75	63	44
PSC63-BH16-100	16	100	63	63
PSC63-BH20-75	20	75	63	50
PSC63-BH20-100	20	100	63	68
PSC63-BH25-75	25	75	63	55
PSC63-BH25-100	25	100	63	68
PSC63-BH32-75	32	75	63	72
PSC63-BH32-100	32	100	63	72
PSC63-BH40-105	40	105	63	70





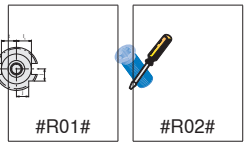


Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	Torque moment [Nm]	
PSC50-V80	50	80	50	50	--	E01
PSC50-V100	50	100	50	50	--	E01
PSC63-V100	63	100	63	63	--	E02
PSC63-V140	63	140	63	63	--	E02



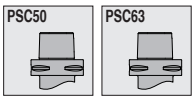
Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	Torque moment [Nm]	
PSC63-R50-80	50	80	63	50	--	E02

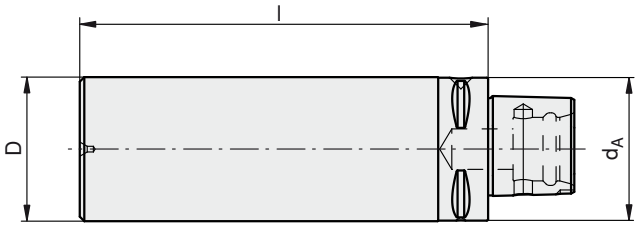
E01	12087020	12087022
E02	12087021	12087023



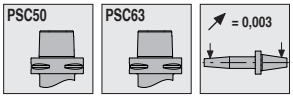
PSC

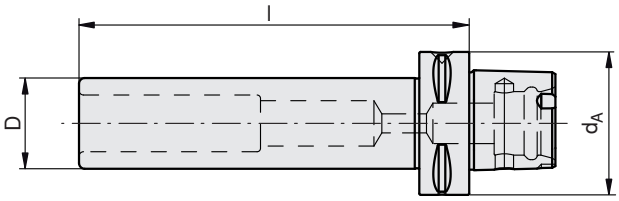
Blanks / Test bars



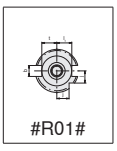


Type, description	d_A [mm]	D [mm]	l [mm]
PSC50-HF50-125	50	50	125
PSC50-HF50-150	50	50	150
PSC63-HF63-180	63	63	180
PSC50-HF75-175	50	75	175
PSC63-HF75-195	63	75	195
PSC50-HF90-80	50	90	80
PSC50-HF95-150	50	95	150
PSC50-HF110-90	50	110	90
PSC63-HF110-85	63	110	85
PSC63-HF120-180	63	120	180
PSC63-HF130-95	63	130	95

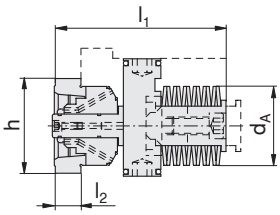




Type, description	d_A [mm]	D [mm]	l [mm]
PSC50-KD32-235	50	32	235
PSC63-KD40-322	63	40	322

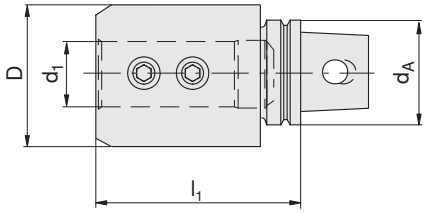


UT40



Type, description	d_1 [mm]	d_A [mm]	l_2 [mm]	l_1 [mm]	h [mm]	b [mm]
UT40-ES1473-OSN	40	40	14	87.5	46	74
UT40-ES1473-SSN	40	40	14	87.5	46	74

UT63

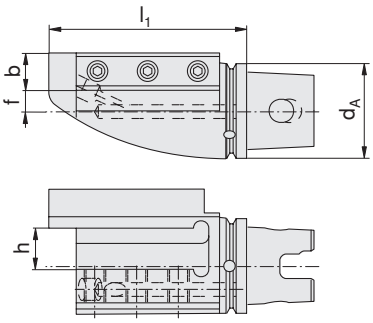


Type, description	d_1 [mm]	l_1 [mm]	d_A [mm]	D [mm]	
UT63-BH40-75-MIY	40	75	63	75	E01

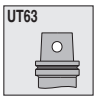
E01	225430

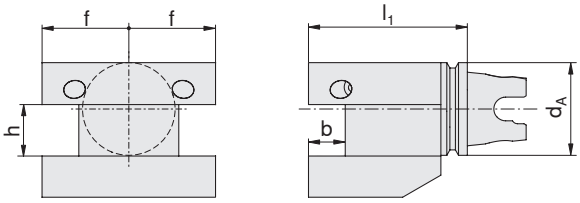
UTS

Single shank holders / Multiple tool holders



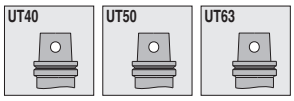
Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]	
UT63-SHR2525-MIY	63	130	13	25	25	E01
UT63-SHL2525-MIY	63	130	13	25	25	E01

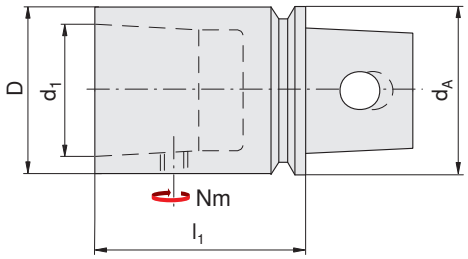




Type, description	d_A [mm]	l_1 [mm]	f [mm]	b [mm]	h [mm]	
UT63-SH4-2020-MIY	63	110	27.8	20	20	E02
UT63-3225-KN	63	108	34	25	32	E03

E01	231176	11106932	225430
E02			225430
E03	231176		225430



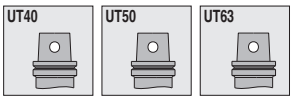


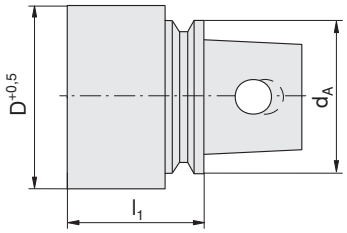
Type, description	d_A [mm]	d_1 [mm]	D [mm]	l_1 [mm]	Torque moment [Nm]	
UT40-AD-VLG 60	40	40	40	60	16	E01
UT40-AD-VLG 80	40	40	40	80	16	E01
UT50-AD-VLG 140	50	50	50	140	32	E02
UT63-V63-80-MIY	63	63	63	80	50	E03
UT63-AD-VLG 100	63	63	63	100	50	E03
UT63-V63-120-MIY	63	63	63	120	50	E03
UT63-AD-VLG 140	63	63	63	140	50	E03

E01	194263
E02	225429
E03	225430

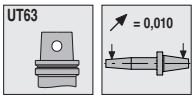
UTS

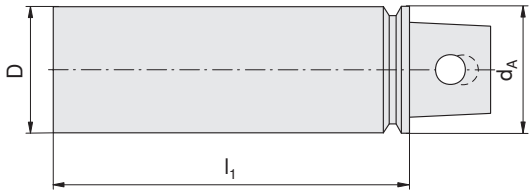
Blanks / Test bars



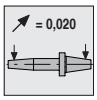


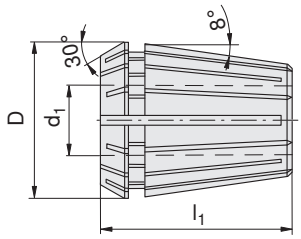
Type, description	d_A [mm]	D [mm]	l [mm]
UT40-HF49-60	40	49	60
UT40-HF49-112	40	49	112
UT40-HF49-120	40	49	120
UT40-HF72-49	40	72	49
UT40-HF72-130	40	72	130
UT40-HF88-80	40	88	80
UT40-HF88-150	40	88	150
UT50-HF55-200	50	55	200
UT50-HF105-100	50	105	100
UT63-HF63-112	63	63	112
UT63-HF74-250	63	74	250
UT63-HF88-75	63	88	75
UT63-HF88-141-MIY	63	88	141
UT63-HF115-150	63	115	150
UT63-HF125-120	63	125	120





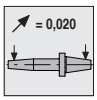
Type, description	d_A [mm]	D [mm]	l [mm]
UT63-AD-AD	63	63	120

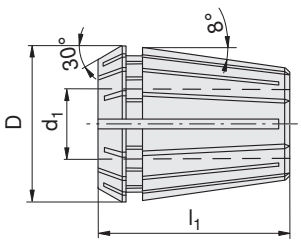




Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
DIN6499-B-426E/ER16.SZ.Ø1,0	1.0	0.50	1.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø2,0	2.0	1.50	2.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø3,0	3.0	2.50	3.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø4,0	4.0	3.00	4.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø5,0	5.0	4.00	5.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø6,0	6.0	5.00	6.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø7,0	7.0	6.00	7.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø8,0	8.0	7.00	8.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø9,0	9.0	8.00	9.00	17.25	27.5
DIN6499-B-426E/ER16.SZ.Ø10,0	10.0	9.00	10.00	17.25	27.5
DIN6499-B-426E/ER16.SZ				17.25	27.5

⚠ Set in wooden box: DIN6499-B-426E/ER16.SZ

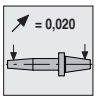


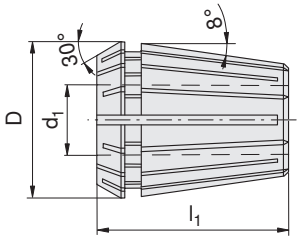


Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
428E-010	1.0	0.50	1.00	21.3	31.5
428E-020	2.0	1.50	2.00	21.3	31.5
428E-030	3.0	2.50	3.00	21.3	31.5
428E-040	4.0	3.00	4.00	21.3	31.5
428E-050	5.0	4.00	5.00	21.3	31.5
428E-060	6.0	5.00	6.00	21.3	31.5
428E-070	7.0	6.00	7.00	21.3	31.5
428E-080	8.0	7.00	8.00	21.3	31.5
428E-090	9.0	8.00	9.00	21.3	31.5
428E-100	10.0	9.00	10.00	21.3	31.5
428E-110	11.0	10.00	11.00	21.3	31.5
428E-120	12.0	11.00	12.00	21.3	31.5
428E-130	13.0	12.00	13.00	21.3	31.5
428E-SET				21.3	31.5

⚠ Set in wooden box: 428E-SET

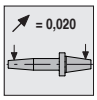
Collets ER25/430E / collets ER32/470E

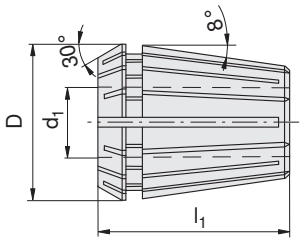




Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
430E-020	2.0	1.50	2.00	26.3	34
430E-030	3.0	2.50	3.00	26.3	34
430E-040	4.0	3.00	4.00	26.3	34
430E-050	5.0	4.00	5.00	26.3	34
430E-060	6.0	5.00	6.00	26.3	34
430E-070	7.0	6.00	7.00	26.3	34
430E-080	8.0	7.00	8.00	26.3	34
430E-090	9.0	8.00	9.00	26.3	34
430E-100	10.0	9.00	10.00	26.3	34
430E-110	11.0	10.00	11.00	26.3	34
430E-120	12.0	11.00	12.00	26.3	34
430E-130	13.0	12.00	13.00	26.3	34
430E-140	14.0	13.00	14.00	26.3	34
430E-150	15.0	14.00	15.00	26.3	34
430E-160	16.0	15.00	16.00	26.3	34
430E-SET				26.3	34

⚠ Set in wooden box: 430E-SET

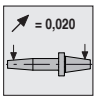


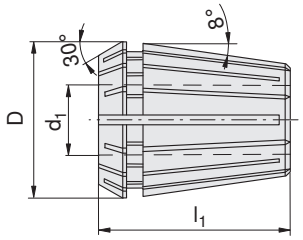


Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
470E-030	3.0	2.50	3.00	33.35	40
470E-040	4.0	3.00	4.00	33.35	40
470E-050	5.0	4.00	5.00	33.35	40
470E-060	6.0	5.00	6.00	33.35	40
470E-070	7.0	6.00	7.00	33.35	40
470E-080	8.0	7.00	8.00	33.35	40
470E-090	9.0	8.00	9.00	33.35	40
470E-100	10.0	9.00	10.00	33.35	40
470E-110	11.0	10.00	11.00	33.35	40
470E-120	12.0	11.00	12.00	33.35	40
470E-130	13.0	12.00	13.00	33.35	40
470E-140	14.0	13.00	14.00	33.35	40
470E-150	15.0	14.00	15.00	33.35	40
470E-160	16.0	15.00	16.00	33.35	40
470E-170	17.0	16.00	17.00	33.35	40
470E-180	18.0	17.00	18.00	33.35	40
470E-190	19.0	18.00	19.00	33.35	40
470E-200	20.0	19.00	20.00	33.35	40
470E-SET				33.35	40

⚠ Set in wooden box: 470E-SET

Collets ER40/472E

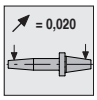


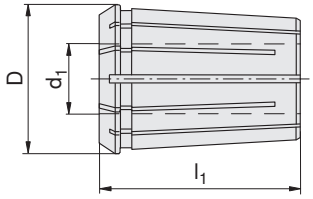


Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
472E-030	3.0	2.50	3.00	41.4	46
472E-040	4.0	3.00	4.00	41.4	46
472E-050	5.0	4.00	5.00	41.4	46
472E-060	6.0	5.00	6.00	41.4	46
472E-070	7.0	6.00	7.00	41.4	46
472E-080	8.0	7.00	8.00	41.4	46
472E-090	9.0	8.00	9.00	41.4	46
472E-100	10.0	9.00	10.00	41.4	46
472E-110	11.0	10.00	11.00	41.4	46
472E-120	12.0	11.00	12.00	41.4	46
472E-130	13.0	12.00	13.00	41.4	46
472E-140	14.0	13.00	14.00	41.4	46
472E-150	15.0	14.00	15.00	41.4	46
472E-160	16.0	15.00	16.00	41.4	46
472E-170	17.0	16.00	17.00	41.4	46
472E-180	18.0	17.00	18.00	41.4	46
472E-190	19.0	18.00	19.00	41.4	46
472E-200	20.0	19.00	20.00	41.4	46
472E-210	21.0	20.00	21.00	41.4	46
472E-220	22.0	21.00	22.00	41.4	46
472E-230	23.0	22.00	23.00	41.4	46
472E-240	24.0	23.00	24.00	41.4	46
472E-250	25.0	24.00	25.00	41.4	46
472E-260	26.0	25.00	26.00	41.4	46
472E-SET				41.4	46

⚠ Set in wooden box: 472E-SET

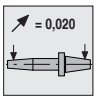
Collets 415E

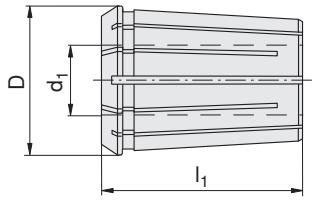




Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
415E-020	2.0	1.6	2.1	25.5	40
415E-025	2.5	2.1	2.6	25.5	40
415E-030	3.0	2.6	3.1	25.5	40
415E-035	3.5	3.1	3.6	25.5	40
415E-040	4.0	3.6	4.1	25.5	40
415E-045	4.5	4.1	4.6	25.5	40
415E-050	5.0	4.6	5.1	25.5	40
415E-055	5.5	5.1	5.6	25.5	40
415E-060	6.0	5.6	6.1	25.5	40
415E-065	6.5	6.1	6.6	25.5	40
415E-070	7.0	6.6	7.1	25.5	40
415E-075	7.5	7.1	7.6	25.5	40
415E-080	8.0	7.6	8.1	25.5	40
415E-085	8.5	8.1	8.6	25.5	40
415E-090	9.0	8.6	9.1	25.5	40
415E-095	9.5	9.1	9.6	25.5	40
415E-100	10.0	9.6	10.1	25.5	40
415E-105	10.5	10.1	10.6	25.5	40
415E-110	11.0	10.6	11.1	25.5	40
415E-115	11.5	11.1	11.6	25.5	40
415E-120	12.0	11.6	12.1	25.5	40
415E-125	12.5	12.1	12.6	25.5	40
415E-130	13.0	12.6	13.1	25.5	40
415E-135	13.5	13.1	13.6	25.5	40
415E-140	14.0	13.6	14.1	25.5	40
415E-145	14.5	14.1	14.6	25.5	40
415E-150	15.0	14.6	15.1	25.5	40
415E-155	15.5	15.1	15.6	25.5	40
415E-160	16.0	15.6	16.1	25.5	40

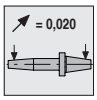
Collets 462E

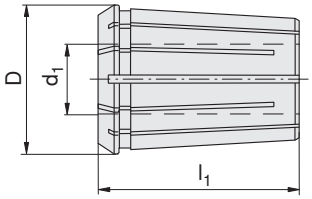




Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
462E-020	2.0	1.6	2.1	35.05	52
462E-025	2.5	2.1	2.6	35.05	52
462E-030	3.0	2.6	3.1	35.05	52
462E-035	3.5	3.1	3.6	35.05	52
462E-040	4.0	3.6	4.1	35.05	52
462E-045	4.5	4.1	4.6	35.05	52
462E-050	5.0	4.6	5.1	35.05	52
462E-055	5.5	5.1	5.6	35.05	52
462E-060	6.0	5.6	6.1	35.05	52
462E-065	6.5	6.1	6.6	35.05	52
462E-070	7.0	6.6	7.1	35.05	52
462E-075	7.5	7.1	7.6	35.05	52
462E-080	8.0	7.6	8.1	35.05	52
462E-085	8.5	8.1	8.6	35.05	52
462E-090	9.0	8.6	9.1	35.05	52
462E-095	9.5	9.1	9.6	35.05	52
462E-100	10.0	9.6	10.1	35.05	52
462E-105	10.5	10.1	10.6	35.05	52
462E-110	11.0	10.6	11.1	35.05	52
462E-115	11.5	11.1	11.6	35.05	52
462E-120	12.0	11.6	12.1	35.05	52
462E-125	12.5	12.1	12.6	35.05	52
462E-130	13.0	12.6	13.1	35.05	52
462E-135	13.5	13.1	13.6	35.05	52
462E-140	14.0	13.6	14.1	35.05	52
462E-145	14.5	14.1	14.6	35.05	52
462E-150	15.0	14.6	15.1	35.05	52
462E-155	15.5	15.1	15.6	35.05	52
462E-160	16.0	15.6	16.1	35.05	52
462E-165	16.5	16.1	16.6	35.05	52
462E-170	17.0	16.6	17.1	35.05	52
462E-175	17.5	17.1	17.6	35.05	52
462E-180	18.0	17.6	18.1	35.05	52
462E-185	18.5	18.1	18.6	35.05	52
462E-190	19.0	18.6	19.1	35.05	52
462E-195	19.5	19.1	19.6	35.05	52
462E-200	20.0	19.6	20.1	35.05	52
462E-205	20.5	20.1	20.6	35.05	52
462E-210	21.0	20.6	21.1	35.05	52
462E-215	21.5	21.1	21.6	35.05	52
462E-220	22.0	21.6	22.1	35.05	52
462E-225	22.5	22.1	22.6	35.05	52
462E-230	23.0	22.6	23.1	35.05	52
462E-235	23.5	23.1	23.6	35.05	52
462E-240	24.0	23.6	24.1	35.05	52
462E-245	24.5	24.1	24.6	35.05	52
462E-250	25.0	24.6	25.1	35.05	52

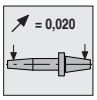
Collets 467E

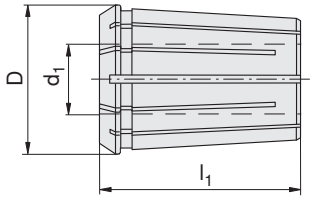




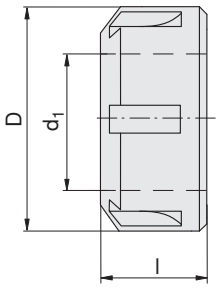
Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
467E-040	4.0	3.6	4.1	43.7	60
467E-045	4.5	4.1	4.6	43.7	60
467E-050	5.0	4.6	5.1	43.7	60
467E-055	5.5	5.1	5.6	43.7	60
467E-060	6.0	5.6	6.1	43.7	60
467E-065	6.5	6.1	6.6	43.7	60
467E-070	7.0	6.6	7.1	43.7	60
467E-075	7.5	7.1	7.6	43.7	60
467E-080	8.0	7.6	8.1	43.7	60
467E-085	8.5	8.1	8.6	43.7	60
467E-090	9.0	8.6	9.1	43.7	60
467E-095	9.5	9.1	9.6	43.7	60
467E-100	10.0	9.6	10.1	43.7	60
467E-105	10.5	10.1	10.6	43.7	60
467E-110	11.0	10.6	11.1	43.7	60
467E-115	11.5	11.1	11.6	43.7	60
467E-120	12.0	11.6	12.1	43.7	60
467E-125	12.5	12.1	12.6	43.7	60
467E-130	13.0	12.6	13.1	43.7	60
467E-135	13.5	13.1	13.6	43.7	60
467E-140	14.0	13.6	14.1	43.7	60
467E-145	14.5	14.1	14.6	43.7	60
467E-150	15.0	14.6	15.1	43.7	60
467E-155	15.5	15.1	15.6	43.7	60
467E-160	16.0	15.6	16.1	43.7	60
467E-165	16.5	16.1	16.6	43.7	60
467E-170	17.0	16.6	17.1	43.7	60
467E-175	17.5	17.1	17.6	43.7	60
467E-180	18.0	17.6	18.1	43.7	60
467E-185	18.5	18.1	18.6	43.7	60
467E-190	19.0	18.6	19.1	43.7	60
467E-195	19.5	19.1	19.6	43.7	60

Collets 467E

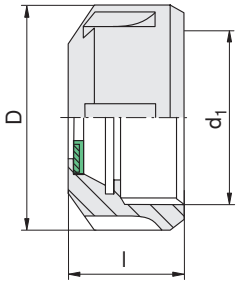




Type, description	d_1 [mm]	$d_{1\ min}$ [mm]	$d_{1\ max}$ [mm]	D [mm]	l_1 [mm]
467E-200	20.0	19.6	20.1	43.7	60
467E-205	20.5	20.1	20.6	43.7	60
467E-210	21.0	20.6	21.1	43.7	60
467E-215	21.5	21.1	21.6	43.7	60
467E-220	22.0	21.6	22.1	43.7	60
467E-225	22.5	22.1	22.6	43.7	60
467E-230	23.0	22.6	23.1	43.7	60
467E-235	23.5	23.1	23.6	43.7	60
467E-240	24.0	23.6	24.1	43.7	60
467E-245	24.5	24.1	24.6	43.7	60
467E-250	25.0	24.6	25.1	43.7	60
467E-255	25.5	25.1	25.6	43.7	60
467E-260	26.0	25.6	26.1	43.7	60
467E-265	26.5	26.1	26.6	43.7	60
467E-270	27.0	26.6	27.1	43.7	60
467E-275	27.5	27.1	27.6	43.7	60
467E-280	28.0	27.6	28.1	43.7	60
467E-285	28.5	28.1	28.6	43.7	60
467E-290	29.0	28.6	29.1	43.7	60
467E-295	29.5	29.1	29.6	43.7	60
467E-300	30.0	29.6	30.1	43.7	60
467E-305	30.5	30.1	30.6	43.7	60
467E-310	31.0	30.6	31.1	43.7	60
467E-315	31.5	31.1	31.6	43.7	60
467E-320	32.0	31.6	32.1	43.7	60

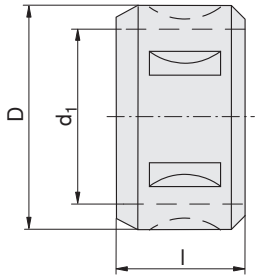


Type, description	l [mm]	D [mm]	d_1 [mm]
SM-ER16/M22x1,5	17.0	32	M22x1,5
SM-ER20/M25x1,5	19.5	34	M25x1,5
SM-ER25/M32X1,5	20.0	42	M32x1,5
SM-ER32/M40x1,5	22.3	50	M40x1,5
SM-ER40/M50x1,5	25.3	63	M50x1,5

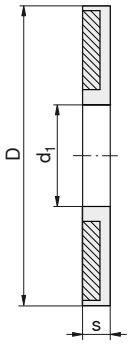


Type, description	l [mm]	D [mm]	d_1 [mm]
SM-ER16D	22.0	32	M22x1,5
SM-ER25D	24.7	42	M32x1,5
SM-ER32D	27.0	50	M40x1,5
SM-ER40D	30.7	63	M50x1,5

Lock nuts OZ

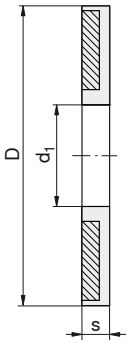


Type, description	l [mm]	D [mm]	d_1 [mm]
SM-BC2-16	24.0	43	M33x1,5
SM-BC2-25	30.0	60	M48x2,0

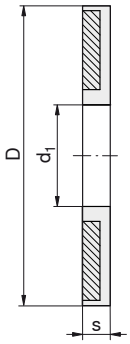


Type, description	d_1 [mm]	D [mm]	s [mm]
DS-426E-020	2.0	12.6	2.0
DS-426E-025	2.5	12.6	2.0
DS-426E-030	3.0	12.6	2.0
DS-426E-035	3.5	12.6	2.0
DS-426E-040	4.0	12.6	2.0
DS-426E-045	4.5	12.6	2.0
DS-426E-050	5.0	12.6	2.0
DS-426E-055	5.5	12.6	2.0
DS-426E-060	6.0	12.6	2.0
DS-426E-065	6.5	12.6	2.0
DS-426E-070	7.0	12.6	2.0
DS-426E-075	7.5	12.6	2.0
DS-426E-080	8.0	12.6	2.0
DS-426E-085	8.5	12.6	2.0
DS-426E-090	9.0	12.6	2.0
DS-426E-095	9.5	12.6	2.0
DS-426E-100	10.0	12.6	2.0
DS-430E-020	2.0	20.2	2.0
DS-430E-025	2.5	20.2	2.0
DS-430E-030	3.0	20.2	2.0
DS-430E-035	3.5	20.2	2.0
DS-430E-040	4.0	20.2	2.0
DS-430E-045	4.5	20.2	2.0
DS-430E-050	5.0	20.2	2.0
DS-430E-055	5.5	20.2	2.0
DS-430E-060	6.0	20.2	2.0
DS-430E-065	6.5	20.2	2.0
DS-430E-070	7.0	20.2	2.0
DS-430E-075	7.5	20.2	2.0
DS-430E-080	8.0	20.2	2.0
DS-430E-085	8.5	20.2	2.0
DS-430E-090	9.0	20.2	2.0
DS-430E-095	9.5	20.2	2.0
DS-430E-100	10.0	20.2	2.0
DS-430E-105	10.5	20.2	2.0
DS-430E-110	11.0	20.2	2.0
DS-430E-115	11.5	20.2	2.0
DS-430E-120	12.0	20.2	2.0
DS-430E-125	12.5	20.2	2.0
DS-430E-130	13.0	20.2	2.0
DS-430E-135	13.5	20.2	2.0
DS-430E-140	14.0	20.2	2.0
DS-430E-145	14.5	20.2	2.0
DS-430E-150	15.0	20.2	2.0
DS-430E-155	15.5	20.2	2.0
DS-430E-160	16.0	20.2	2.0

Sealing rings

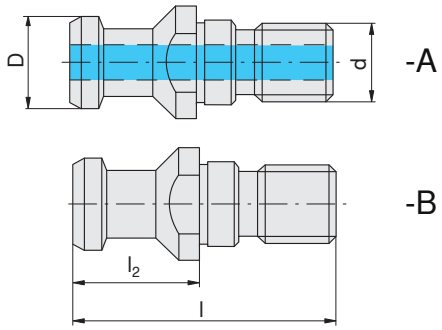


Type, description	d_1 [mm]	D [mm]	s [mm]
DS-470E-020	2.0	26.2	2.0
DS-470E-025	2.5	26.2	2.0
DS-470E-030	3.0	26.2	2.0
DS-470E-035	3.5	26.2	2.0
DS-470E-040	4.0	26.2	2.0
DS-470E-045	4.5	26.2	2.0
DS-470E-050	5.0	26.2	2.0
DS-470E-055	5.5	26.2	2.0
DS-470E-060	6.0	26.2	2.0
DS-470E-065	6.5	26.2	2.0
DS-470E-070	7.0	26.2	2.0
DS-470E-075	7.5	26.2	2.0
DS-470E-080	8.0	26.2	2.0
DS-470E-085	8.5	26.2	2.0
DS-470E-090	9.0	26.2	2.0
DS-470E-095	9.5	26.2	2.0
DS-470E-100	10.0	26.2	2.0
DS-470E-105	10.5	26.2	2.0
DS-470E-110	11.0	26.2	2.0
DS-470E-115	11.5	26.2	2.0
DS-470E-120	12.0	26.2	2.0
DS-470E-125	12.5	26.2	2.0
DS-470E-130	13.0	26.2	2.0
DS-470E-135	13.5	26.2	2.0
DS-470E-140	14.0	26.2	2.0
DS-470E-145	14.5	26.2	2.0
DS-470E-150	15.0	26.2	2.0
DS-470E-155	15.5	26.2	2.0
DS-470E-160	16.0	26.2	2.0
DS-470E-165	16.5	26.2	2.0
DS-470E-170	17.0	26.2	2.0
DS-470E-175	17.5	26.2	2.0
DS-470E-180	18.0	26.2	2.0
DS-470E-185	18.5	26.2	2.0
DS-470E-190	19.0	26.2	2.0
DS-470E-195	19.5	26.2	2.0
DS-470E-200	20.0	26.2	2.0

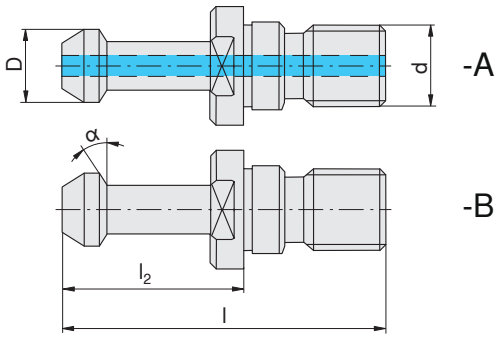


Type, description	d_1 [mm]	D [mm]	s [mm]
DS-472E-030	3.0	34.2	2.0
DS-472E-035	3.5	34.2	2.0
DS-472E-040	4.0	34.2	2.0
DS-472E-045	4.5	34.2	2.0
DS-472E-050	5.0	34.2	2.0
DS-472E-055	5.5	34.2	2.0
DS-472E-060	6.0	34.2	2.0
DS-472E-065	6.5	34.2	2.0
DS-472E-070	7.0	34.2	2.0
DS-472E-075	7.5	34.2	2.0
DS-472E-080	8.0	34.2	2.0
DS-472E-085	8.5	34.2	2.0
DS-472E-090	9.0	34.2	2.0
DS-472E-095	9.5	34.2	2.0
DS-472E-100	10.0	34.2	2.0
DS-472E-105	10.5	34.2	2.0
DS-472E-110	11.0	34.2	2.0
DS-472E-115	11.5	34.2	2.0
DS-472E-120	12.0	34.2	2.0
DS-472E-125	12.5	34.2	2.0
DS-472E-130	13.0	34.2	2.0
DS-472E-135	13.5	34.2	2.0
DS-472E-140	14.0	34.2	2.0
DS-472E-145	14.5	34.2	2.0
DS-472E-150	15.0	34.2	2.0
DS-472E-155	15.5	34.2	2.0
DS-472E-160	16.0	34.2	2.0
DS-472E-165	16.5	34.2	2.0
DS-472E-170	17.0	34.2	2.0
DS-472E-175	17.5	34.2	2.0
DS-472E-180	18.0	34.2	2.0
DS-472E-185	18.5	34.2	2.0
DS-472E-190	19.0	34.2	2.0
DS-472E-195	19.5	34.2	2.0
DS-472E-200	20.0	34.2	2.0
DS-472E-205	20.5	34.2	2.0
DS-472E-210	21.0	34.2	2.0
DS-472E-215	21.5	34.2	2.0
DS-472E-220	22.0	34.2	2.0
DS-472E-225	22.5	34.2	2.0
DS-472E-230	23.0	34.2	2.0
DS-472E-235	23.5	34.2	2.0
DS-472E-240	24.0	34.2	2.0
DS-472E-245	24.5	34.2	2.0
DS-472E-250	25.0	34.2	2.0
DS-472E-255	25.5	34.2	2.0
DS-472E-260	26.0	34.2	2.0

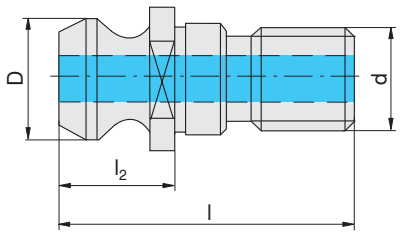
Pull studs SK / pull studs MAS-BT



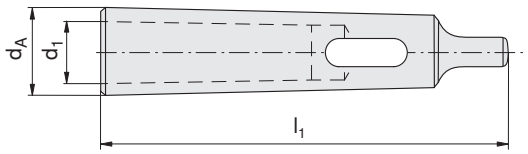
Type, description	SK	D [mm]	l_2 [mm]	l [mm]	Thread size
69872-A19	40	23	26	54	M16
69872-A28	50	36	34	74	M24
69872-B19	40	23	26	54	M16
69872-B28	50	36	34	74	M24



Type, description	MAS-BT	α [°]	D [mm]	l_2 [mm]	l [mm]	Thread size
MAS-BT-30-A15	40	30	23	35	60	M16
MAS-BT-30-A23	50	30	38	45	85	M24
MAS-BT-30-B15	40	30	23	35	60	M16
MAS-BT-30-B23	50	30	38	45	85	M24
MAS-BT-45-A15	40	45	23	35	60	M16
MAS-BT-45-A23	50	45	38	45	85	M24
MAS-BT-45-B15	40	45	23	35	60	M16
MAS-BT-45-B23	50	45	38	45	85	M24
MAS-BT-90-A15	40	90	23	35	60	M16
MAS-BT-90-A23	50	90	38	45	85	M24
MAS-BT-90-B15	40	90	23	35	60	M16
MAS-BT-90-B23	50	90	38	45	85	M24

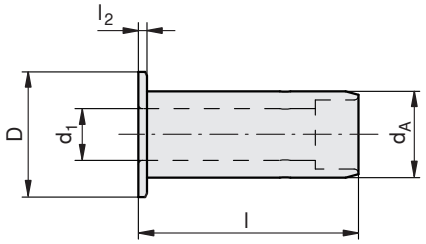


Type, description	SK	D [mm]	l_2 [mm]	l [mm]	Thread size
ISO/DIS7388-40.M16	40	22.5	16.40	41.26	M16
ISO/DIS7388-50.M24	50	37.0	25.55	65.50	M24

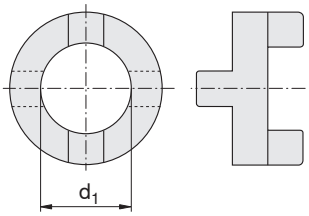


Type, description	d_A Morse taper [MK]	d_1 Morse taper [MK]	l_1 [mm]
DIN2185.MK1-MK0-80	MK1	MK0	80
DIN2185.MK2-MK1-92	MK2	MK1	92
DIN2185.MK3-MK1-99	MK3	MK1	99
DIN2185.MK3-MK2-112	MK3	MK2	112
DIN2185.MK4-MK1-124	MK4	MK1	124
DIN2185.MK4-MK2-124	MK4	MK2	124
DIN2185.MK4-MK3-140	MK4	MK3	140
DIN2185.MK5-MK3-156	MK5	MK3	156
DIN2185.MK5-MK2-156	MK5	MK2	156
DIN2185.MK5-MK4-171	MK5	MK4	171

Reducers for hydraulic expansion chucks



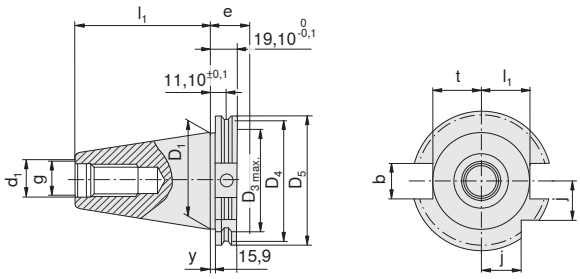
Type, description	d_1 [mm]	d_A [mm]	l [mm]	D [mm]	l_2 [mm]
HD12-R03	3	12	44.5	19	2
HD12-R04	4	12	44.5	19	2
HD12-R05	5	12	44.5	19	2
HD12-R06	6	12	44.5	19	2
HD12-R08	8	12	44.5	19	2
HD20-R03	3	20	51	29	2
HD20-R04	4	20	51	29	2
HD20-R05	5	20	51	29	2
HD20-R06	6	20	51	29	2
HD20-R07	7	20	51	29	2
HD20-R08	8	20	51	29	2
HD20-R09	9	20	51	29	2
HD20-R10	10	20	51	29	2
HD20-R11	11	20	51	29	2
HD20-R12	12	20	51	29	2
HD20-R13	13	20	51	29	2
HD20-R14	14	20	51	29	2
HD20-R15	15	20	51	29	2
HD20-R16	16	20	51	29	2
HD32-R06	6	32	64	40	3
HD32-R08	8	32	64	40	3
HD32-R10	10	32	64	40	3
HD32-R12	12	32	64	40	3
HD32-R14	14	32	64	40	3
HD32-R16	16	32	64	40	3
HD32-R18	18	32	64	40	3
HD32-R20	20	32	64	40	3
HD32-R25	25	32	64	40	3



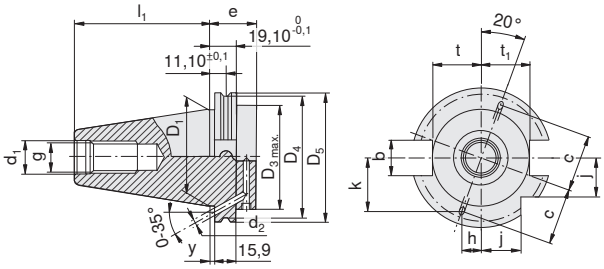
Type, description	d_1 [mm]
83370116/ Ø16/DIN 6366	16
83370122/ Ø22/DIN 6366	22
83370127/ Ø27/DIN 6366	27
83370132/ Ø32/DIN 6366	32
83370140/ Ø40/DIN 6366	40
83370150/ Ø50/DIN 6366	50

Technical data of ISO adapters (SK, HSK)

DIN 69871 form A

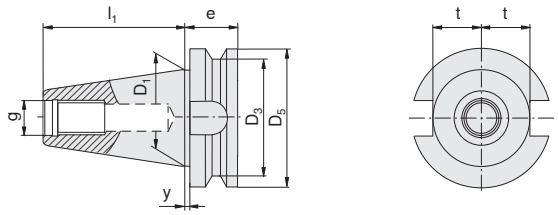


DIN 69871 form B



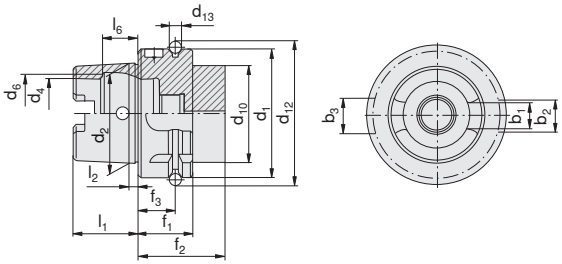
	D_1 [mm]	$D_{3\,max}$ [mm]	D_4 [mm]	D_5 [mm]	l_1 [mm]	g	d_1 [mm]	e [mm]	y [mm]	t [mm]	t_1 [mm]	j [mm]	d_2 [mm]	h [mm]	k [mm]	c [mm]	b [mm]
SK 40	44,45	50	56,25	63,55	68,4	M 16	17	35	3,2	22,8	25	18,5	4	9,2	25,4	27	16,1
SK 50	69,85	80	91,25	97,5	101,75	M 24	25	35	3,2	35,5	37,7	30	6	14,4	39,5	42	25,7

MAS-BT



	D_1 [mm]	D_3 [mm]	D_5 [mm]	l_1 [mm]	g	e [mm]	t [mm]	y [mm]	b [mm]
BT 40	44,45	53	63	65,4	M 16	27	22,5	2	16,1
BT 50	69,85	85	100	101,8	M 24	38	35,3	3,2	25,7

HSK DIN 69893 A+C

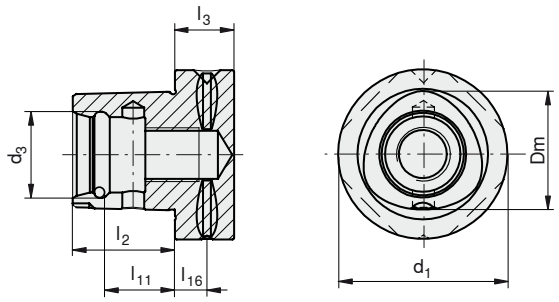


Recommended parameters for HSK-A adapters

HSK-A 63 up to 25,000 min^{-1}
HSK-A 100 up to 16,000 min^{-1}

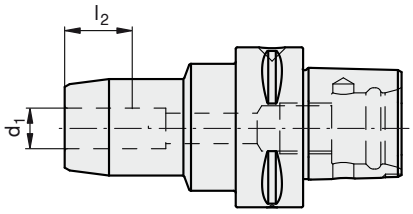
	b_1 [mm]	b_2 [mm]	b_3 [mm]	d_1 [mm]	d_2 [mm]	d_4 [mm]	d_6 [mm]	d_{10} [mm]	d_{12} [mm]	f_1 [mm]	f_2 [mm]	b_1 [mm]	f_3 [mm]	l_1 [mm]	l_2 [mm]	l_6 [mm]
HSK 63	12,54	16	18	63	48	34	37	53	72,3	7	26	42	18	32	6,3	18,13
HSK 100	20,02	20	22	100	75	53	58	88	109,75	7	29	45	20	50	10	28,56

PSC



	d_1 [mm]	d_3 [mm]	l_2 [mm]	l_3 [mm]	l_{11} [mm]	l_{16} [mm]	D_m [mm]
PSC 50	50	24	30	20	22	12	35
PSC 63	63	32	38	22	26	12	44

Hydraulic expansion chuck



d_1 h6 [mm]	Max. rev number [min^{-1}]	Max. torque moment [Nm]	Min. clamping depth l_2 [mm]	Max. adjustment [mm]	Optimal operating temperature [°C]	Max. coolant pressure [bar]
6	40 000	20	28	10	20 - 50	80
8	40 000	30	28	10	20 - 50	80
10	40 000	50	33	10	20 - 50	80
12	40 000	85	28	10	20 - 50	80
14	40 000	110	38	10	20 - 50	80
16	40 000	180	41	10	20 - 50	80
18	40 000	240	41	10	20 - 50	80
20	40 000	310	43	10	20 - 50	80
25	40 000	420	49	10	20 - 50	80
32	40 000	650	53	10	20 - 50	80

Spare parts

	Material	Type, description
	8337011600	83370116/ Ø16/DIN 6366
	8337012200	83370122/ Ø22/DIN 6366
	8337012700	83370127/ Ø27/DIN 6366
	8337013200	83370132/ Ø32/DIN 6366
	8337014000	83370140/ Ø40/DIN 6366
	8337015000	83370150/ Ø50/DIN 6366
	12087073	MS-KA16
	12087074	MS-KA22
	12087075	MS-KA27
	12087076	MS-KA32
	12087077	MS-KA40
	8395012000	8X9X17,5
	8395012100	10X11X20,5
	8395012200	12X13X24,3
	8395012300	14X21X21,2
	8395029500	15,9X16,3X19,5
	8395029800	25,4X25X26,5
	12087068	4x4x14 DIN 6885 FORM A
	12087069	6x6x16 DIN 6885 FORM A
	12087070	7x7x18 DIN 6885 FORM A
	12087071	8x7x20 DIN 6885 FORM A
	12087072	10x8x22 DIN 6885 FORM A
	8395028400	82998015.4X4X20
	8395028500	82998016.6X6X25
	8395028600	82998017.7X7X25
	8395028700	82998018.8X7X28
	8395028800	82998019.10X8X32
	8395028900	82998020.12X8X36
	6295005000	SM-BC2-16
	6295005100	SM-BC2-25
	8395005500	SM-ER25D
	8395005600	SM-ER32D
	8395005700	SM-ER40D
	6295004500	SM-ER20/M25x1,5
	6295005400	SM-ER16/M22x1,5
	6295005500	SM-ER25/M32X1,5
	6295005600	SM-ER32/M40x1,5
	6295005700	SM-ER40/M50x1,5
	8336811600	604016.Ø16
	8336812200	604022.Ø22
	8336812700	604027.Ø27
	8336813200	604032.Ø32
	8336814000	83 368 140
	12001280	10014334/S-D12-D1.3
	8335901300	SCHL.13X62
	8335901700	SCHL.17X117
	8335902000	SCHL.20X135
	8335902300	SCHL.23X145
	8335903300	SCHL.33X175
	8335411600	SS-BC2-16
	8335412500	601060.2-25
	8335413200	SS-BC4-32
	8335711600	SS-ER16
	8335712500	SS-ER25
	8335713200	SS-ER32
	8335714000	SS-ER40
	11960178	GS-HSK 10015789-0

	Material	Type, description
	8395026500	83950265/M16x8x6,5/
	8395026600	83950266/M24x10x6,5/
	8395026700	83950267/M16x8x10,5/
	8395026800	83950268/M24x10x10,5/
	8395026900	83950269/M20x1,5x10x13/
	8395027000	83950270/M26x1,5x8x17/
	8395027100	83950271/M36x1,5x8x21/
	8376006300	KMS.HSK63
	8376010000	KMS.HSK100
	194263	7896900/O-RING 40
	225429	7896940/O-RING 50
	225430	7896941/O-RING 63
	11848510	10014329/SD 12X7 100BAR
	231176	7896944/SD 12X8
	12087020	PSC50-SW10
	12087021	PSC63-SW10
	8336701600	604008.M8
	8336702200	604010.M10
	8336702700	604012.M12
	8336703200	604016.M16
	8336704000	83 367 040/M20x30-12,9
	8336705000	83367050/M24/DIN 6367
	12087022	PSC50
	12087023	PSC63
	11210254	10002666/M4X16 DIN912 - 12.9
	8395013600	82998006.M5X12
	8395013700	82998008.M5X20
	8395013800	82998009.M6X16
	8395029600	82998004.M3X8
	8395029700	82998005.M4X12
	12087062	VS-SF-6/7
	12087063	VS-SF-8/9
	12087064	VS-SF-10/11
	12087065	VS-SF-12/14
	12087066	VS-SF-16/18
	12087067	VS-SF-20/25/32

	Material	Type, description	l [mm]	Thread size	Key size
	8395001000	VS-ER25	50	M10	SW5
	8395001100	VS-ER40	50	M12	SW6
	8395003300	83950033/M5x35/DIN 913	35	M5	SW2,5
	8395003400	83950034/M6x35/DIN 913	35	M6	SW3
	8395003500	83950035/M8x35/DIN 913	35	M8	SW4
	8395003600	83950036/M10x35/DIN 913	35	M10	SW5
	8395003700	83950037/M12x40/DIN 913	40	M12	SW7
	8395027200	83950272/M16x45/DIN 913	45	M16	SW8
	8395029000	M20x35.SW10	35	M20	SW10
	11106932	7896982/M12X1.75X25-DIN913	25	M12	SW6
	11154410	VS-ER16-K/M5X8	8	M5	SW2,5
	11154413	VS-ER20-K/M6X12	12	M6	SW3
	11154414	VS-ER25-K/M8X1X14	14	M8	SW4
	11154418	VS-ER32-K/M10X1X14	14	M10	SW5
	11154419	VS-ER40-K/M12X1X18	18	M12	SW6
	6295000600	62 950 006/M6X10	10	M6	SW3
	6295000800	62 950 008/M8x10	10	M8	SW4
	6295001000	62 950 010/M10x12	12	M10	SW5
	6295001200	62 950 012/M12x16	16	M12	SW6
	6295001600	62 950 016/M14x16	16	M14	SW6
	6295002000	62 950 020/M16X16	16	M16	SW8
	6295002500	62 950 025/M18X2X20	20	M18	SW10
	6295003200	62 950 032/M20x2x20	20	M20	SW10
	8395003000	83950030/M5x6/DIN 914	6	M5	SW2,5
	8395003100	83950031/M5x8/DIN 914	8	M5	SW2,5
	333935	7818123/M8X25/DIN912-12.9	25	M8	SW6
	333937	7818124/M10X25/DIN912-12.9	25	M10	SW8
	333940	7818125/M12X30/DIN912-12.9	30	M12	SW10
	333945	7818126/M16X35 DIN912 - 12.9	35	M16	SW14
	8395001700	83950017/M10x30/DIN 7984	30	M10	SW8
	8395001800	83950018/M12x35/DIN7984	35	M12	SW10
	8395001900	83950019/M16x40/DIN7984	40	M16	SW14
	8395011200	M20X40	40	M20	SW17
	8395011300	M8X25	25	M8	SW6
	8395012400	M10X25	25	M10	SW8
	8395012500	M12X30	30	M12	SW10
	8395012600	M16X35	35	M16	SW14
	8395014000	M12X50	50	M12	SW10
	8395016000	M16X45	45	M16	SW14
	8395026000	83950260/1403952/DIN EN ISO 4762	30	M6	SW5
	8395026100	83950261/M10x30/DIN7984	30	M10	SW8
	8395026200	83950262/M20x50/DIN 7984	50	M20	SW17

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Headquarters
Production sites
Sales companies

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Reutte	Austria
Gabrovo	Bulgaria
Empfingen	Germany
Hitzacker	Germany
Alserio	Italy
Kolkata	India
Livange	Luxembourg
Niederkorn	Luxembourg
Biel	Switzerland
Warren	United States
Kempten	Germany

Reutte	Austria
São Paulo	Brazil
Gabrovo	Bulgaria
Velké Meziříčí	Czech Republic + Slovakia
Empfingen	Germany
Sheffield	United Kingdom
Budapest	Hungary
Bangalore	India
Chennai	India
Pune	India
New Delhi	India
Alserio	Italy
Shizuoka	Japan
Mamer	Luxembourg + Belgium + France
Querétaro	Mexico
Roosendaal	Netherlands
Krakow	Poland
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