ZCC Cutting Tools Europe GmbH

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Product Innovations 09/2025

Update 2026

PANGU grades **PG8005, PG8020, PG8030, PG1110, PG1120** – **LH** chip breaker **F-QF** chip breaker **(YNT251D grade)** – **ISO tool holder with internal cooling** – **zGroove Compact HG** chip breaker – **EMP08** square shoulder milling system – **EMP10** square shoulder milling system **XMR13** high-feed milling system – **PGMS** series – **ZTE** indexable head drilling system

– EN –

The Company

Zhuzhou Cemented Carbide Cutting Tools Co., Ltd. (ZCC-CT), based in Zhuzhou, China, is the largest Chinese manufacturer of carbide tools. It is also a key company of China Tungsten High-Tech Material Co. Ltd. part of the China Minmetals Corporation.

Since its founding in 1953, ZCC Cutting Tools Co., Ltd. has grown to become one of the world's leading carbide manufacturers with more than 2,000 employees by using the latest technologies and employing highly skilled personnel. The company continuously modernises production technologies and expands its production capacities to enable the company's ongoing growth. As part of Minmetals Corporation, ZCC-CT is able to cover the entire value chain of modern carbide tool production itself, from raw material extraction through to the coated end product and all associated intermediate steps.

By drawing on the latest in European production technology, the company offers products that consistently meet the highest quality standards. Our extensive product range includes carbide/solid carbide, cermet, CBN, PCD and ceramic inserts, carbide tools, tool holders, milling bodies and the accompanying tool systems. All products are consistently produced to accepted international standards, including ISO, DIN, ANSI, JIS and BSI. In addition, ZCC-CT offers customised solutions and special carbide products built to individual specifications.

ZCC-CT invests heavily in research and development. The associated investments go beyond that of most competitors. ZCC Cutting Tools' excellently trained engineers, scientists and a competent, international team, research the necessary fundamentals. These form the basis for the ongoing development of new products and the improvement of existing ones.

The company continuously introduces improvements in quality to meet the customers' ever-increasing demands for new and innovative products and to maximise the benefit of each individual customer. Both production and administration in China are subject to the ISO 9001:2008 standard, while environmental management is subject to the requirements set out in ISO 14001:2004.

The foundation of the European headquarters of ZCC-CT, ZCC Cutting Tools Europe GmbH and the European central warehouse, both located in Düsseldorf (Germany), dates back to 2003. Today, all European countries as well as the adjacent markets are served from there.

The quality management system of ZCC Cutting Tools Europe GmbH is certified in the area of 'distribution and logistics of metal-working tools' in accordance with ISO 9001:2008.

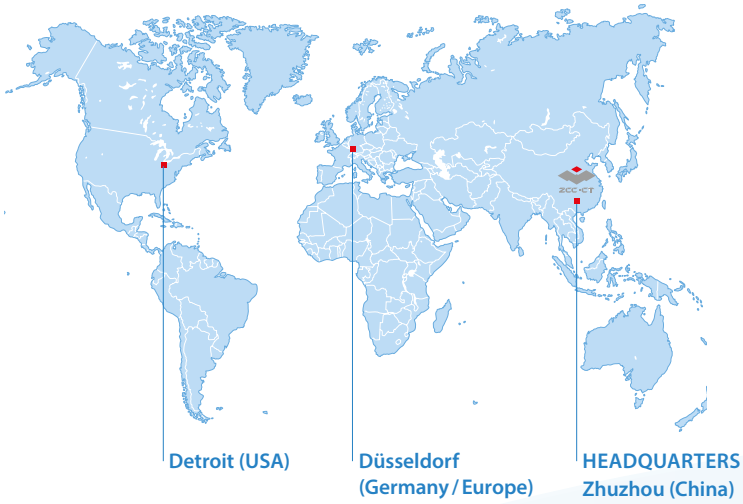
The Test and Demonstration Centre is available for optimizing customer processes according to individual requirements.

External sales staff and distribution partners in Europe work hand in hand to support customers across the region. Our friendly ZCC-CT application engineers are also available to support you with their expertise and experience by phone, e-mail or in person at your production facility.

The entire field and office sales force is available to answer enquiries from clients across Europe in their native language. Together with employees from the logistics team and with the help of a sophisticated service system, they ensure that all orders are delivered as quickly as possible to you. Branch offices in France and Great Britain add to additional regional proximity to customers.

ZCC Cutting Tools Europe GmbH and all of our employees are there for you and have your back as a competent partner for all matters concerning machining production. This is how we define 'your partner – your value'.

Member of Minmetals Group



This brochure will be presenting the following new products:

Product Innovations 09/2025

GENERAL TURNING

PARTING & GROOVING

INDEXABLE MILLING

SOLID CARBIDE MILLING

INDEXABLE HEAD DRILLING

A glimpse inside: Highlights from previous Product Innovations brochures

Product Innovations 03/2025

INDEXABLE MILLING
XMR12 high-feed milling system – Maximum chip removal rates coupled with minimum machining times

SOLID CARBIDE MILLING
XM-2C series – Flexible deburring cutter with interchangeable head

SOLID CARBIDE DRILLING
UL series – Solid carbide deep hole drills for difficult-to-machine materials

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Product Innovations 09/2024

GENERAL TURNING
QF chip breaker – Maximum chip control in finishing operations

INDEXABLE MILLING
SMP09 slot mill cutting system – Highly versatile tangential milling system

TOOL HOLDERS
zClamp Hydro hydraulic expansion chucks – Secure tool clamping for maximum process reliability

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Product Innovations 09/2023

GENERAL TURNING
XLR chip breaker – Roughing made easy
ONMX high feed turning system – New Octa insert and tool holder series for efficient turning applications
PNMX high feed turning system – New Penta insert and tool holder series for efficient turning applications

THREADING
zType threading tool holders with internal cooling – New series for high-quality results in threading operations

SOLID CARBIDE DRILLING
FD flat drills – 180° solid carbide drills for any application

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Product Innovations 03/2023

GENERAL TURNING
YBG205H grade – The perfect choice for high-temperature turning applications

PARTING & GROOVING
MU chip breaker – Universal tool that delivers optimum chip control

INDEXABLE MILLING
FME17 face milling system – Highly efficient universal tool for machining end faces and contours
EMP05 plunge milling system – Universal tool for any machining application
FMR06 round insert milling cutter – Maximum cutting performance
CSX1000 grade – High-performance grade for superalloys
APL chip breaker – Universal geometry

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Product Innovations 09/2022

GENERAL TURNING
XMH chip breaker – Semi-finishing made easy

THREADING
zType threading inserts – New series for high-quality results in threading operations

INDEXABLE MILLING
FMA12 face milling system – Now available in new ONHU09T5 insert size
EMP14 aluminium milling system – Precisely 90° for shoulder milling operations
FMR11 round insert milling cutter – Maximum cutting performance

SOLID CARBIDE MILLING
VPM series – Now also available as a torus milling cutter/with Weldon clamping surface

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Product Innovations 05/2022

GENERAL TURNING
miniTURN – New YPG202 grade for enhanced performance

INDEXABLE MILLING
YBG205H grade – Optimal for high-temperature applications
FMP06 – High-performance hard machining with 88° approach angle
FMA17 – Versatile milling system for efficient facing operations
FMP17 – Efficient universal tool for machining end faces and contours
FMR04 – Extension: Now with new inserts and chip breakers

SOLID CARBIDE MILLING
TM series – Expanded line with compact torus milling cutters from Ø1.0 mm
VPM series – High-speed full-slot milling

SOLID CARBIDE DRILLING
UD series – Extension: Now available in diameters from 1.0 mm with internal cooling

Go to PDF online

PANGU

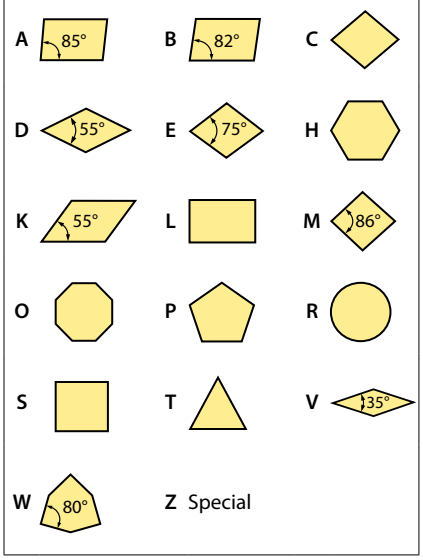
PG8030 grade

General turning

ISO standard

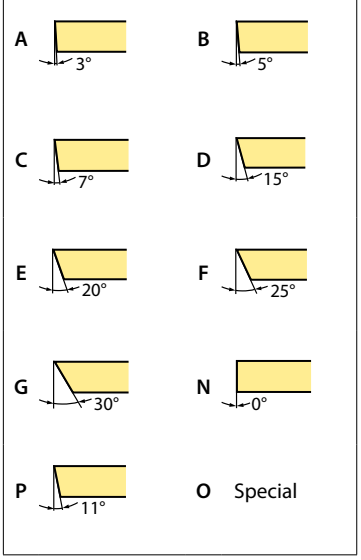
T	N	M	G	22	04	08	(N)	–	DM
1	2	3	4	5	6	7	8		9

Insert shape



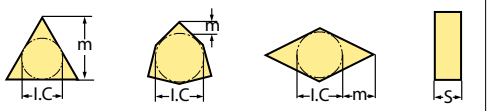
1

Clearance angle



2

Tolerance class

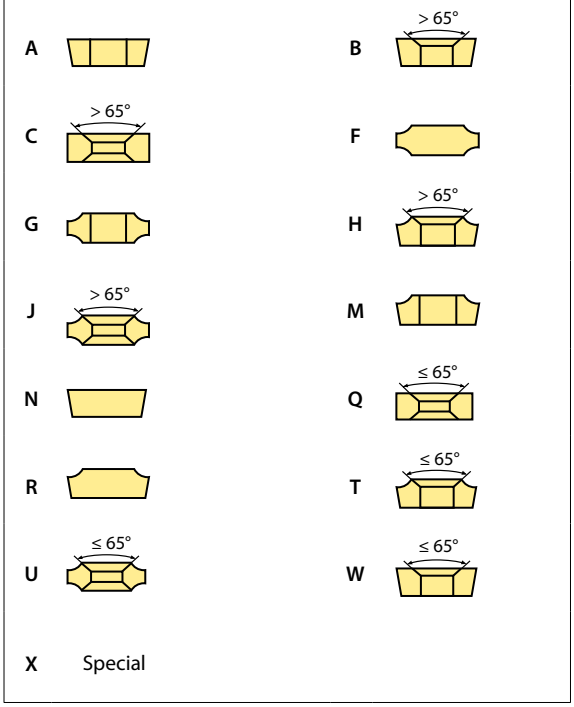


Code	I.C [mm]	m [mm]	S [mm]
A	±0,025	±0,005	±0,025
C	±0,025	±0,013	±0,025
E	±0,025	±0,025	±0,025
F	±0,013	±0,005	±0,025
G	±0,025	±0,025	±0,130
H	±0,013	±0,013	±0,025
J	±0,05–0,15	±0,005	±0,025
K	±0,05–0,15	±0,013	±0,025
L	±0,05–0,15	±0,025	±0,025
M	±0,05–0,15	±0,08–0,20	±0,130
N	±0,05–0,15	±0,08–0,20	±0,025
U	±0,08–0,25	±0,13–0,38	±0,130

3

Fastening features (metric)

Insert shape

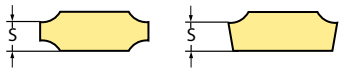


4

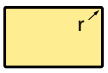
Cutting edge length l [mm]

I.C [mm]	Insert shape C	D	R	S	T	V	W	K
3,97					06			
5,0			05					
5,56					09			
6,0			06					
6,35	06	07			11	11		
8,0			08					
9,525	09	11	09	09	16	16	06	16
10,0			10					
12,0			12					
12,7	12	15	12	12	22	22	08	
15,875	16		15	15	27			
16,0		19	16					
19,05	19		19	19	33			
20,0			20					
25,0	25	25	25					
25,4			25	25				
31,75			31					
32			32					

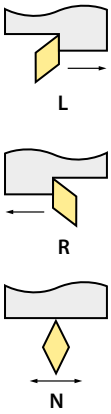
5

Insert thickness S [mm]			
			
Code	S	Code	S
00	0,79	**T5**	5,95
T0	0,99	**06**	6,35
01	1,59	**T6**	6,75
T1	1,98	**07**	7,94
02	2,38	**09**	9,52
T2	2,58	**T9**	9,72
03	3,18	**11**	11,11
T3	3,97	**12**	12,70
04	4,76		
T4	4,96		
05	5,56		

6

Nose radius r [mm]	
	
Code	r
00	–
02	0,2
04	0,4
08	0,8
12	1,2
16	1,6
20	2,0
24	2,4
32	3,2
X	Special
MO	Round inserts

7

Cutting direction

L
R
N

8

Chip breaker overview (on page A16 in the Main Catalogue)

9

ANSI standard

T	N	M	G	4	3	2	(N)	–	DM
1	2	3	4	5	6	7	8		9

Inner circle		
Code	[mm]	Pouce
2	6.35	0.250
3	9.525	0.375
4	12.7	0.500
5	15.875	0.625
6	19.05	0.750
8	25.4	1.000

5

Insert thickness		
Code	[mm]	Pouce
2	3.18	0.125
3	4.76	0.187
4	6.35	0.250
5	7.94	0.313
6	9.52	0.375

6

Nose radius		
Code	[mm]	Pouce
0	0.2	0.008
1	0.4	0.016
2	0.8	0.031
3	1.2	0.047
4	1.6	0.063
5	2.0	0.079
6	2.4	0.094

7

P	C	L	N	L	25	25	M	12
1	2	3	4	5	6	7	8	9

Clamping system

Code	Description	
P	Lever lock clamping	
M	Wedge/pin lock clamping	
S	Screw-on clamping	
C/J	Wedge clamping	
D	Duel wedge clamping	

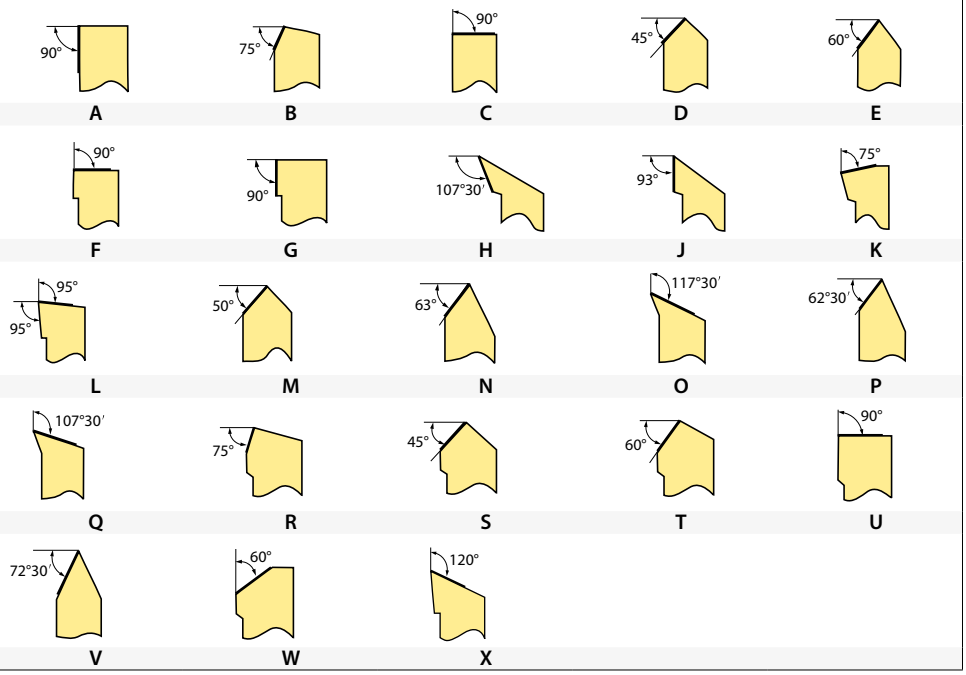
1

Insert shape

C	
D	
R	
S	
T	
V	
W	

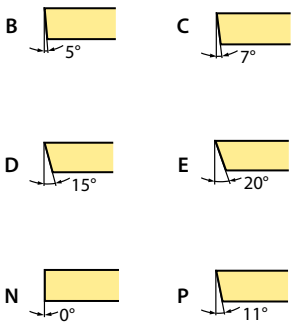
2

Tool holder type and entering angle



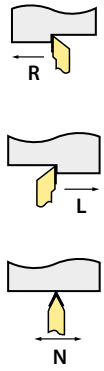
3

Clearance angle



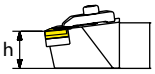
4

Cutting direction



5

Shank height h [mm]



Code	h
12	12
16	16
20	20
25	25
32	32
40	40
50	50

6

Shank width b [mm]

Code	b
12	12
16	16
20	20
25	25
32	32
40	40
50	50

7

Holder length L [mm]

Code	L
H	100
K	125
M	150
P	170
Q	180
R	200
S	250
T	300

8

Cutting edge length l [mm]

I.C [mm]	Insert shape						
	C	D	R	S	T	V	W
5,56					**09**		
6,35	**06**	**07**			**11**		
9,525	**09**	**11**	**09**	**09**	**16**	**16**	**06**
12,7	**12**	**15**	**12**	**12**	**22**	**22**	**08**
15,875	**16**	**19**	**15**	**15**	**27**		
19,05	**19**		**19**	**19**	**33**		
25,4	**25**		**25**	**25**	**44**		
32			**32**				

9

PG8005 grade

Premium grade for maximum wear resistance

YOUR BENEFITS

– High-performance coating (AlTiCNO-CVD) with ultra-smooth polished surface that **minimises friction**
– Ideal choice for difficult-to-machine materials such as superalloys and heat-resistant cast steel
– Minimum wear for a **long tool life**

Fig.: DNMG150608-SNR PG8005

Update

Articles available with the new PG8005 grade:

Article	Stock
CNEG120404-NF PG8005	●
CNEG120408-NF PG8005	●
CNEG120408-SNR PG8005 ■	○
CNMG120408-SNR PG8005	○
CNMG120408-XLR PG8005	●
CNMG120412-XLR PG8005 ■	○
DNEG150604-NF PG8005	●
DNEG150608-NF PG8005	●
DNMG150608-SNR PG8005	○
VBET160404-NF PG8005	●
VBET160404-NGF PG8005	●
VBET160408-NF PG8005	●
VBET160408-NGF PG8005	●

● Ex stock ○ On demand

Article	Stock
VBMT160408-SNR PG8005	●
VCGT160404-NGF PG8005	●
VCGT160408-SNR PG8005	●
VNEG160404-NF PG8005	●
VNEG160408-NF PG8005	●
VNEG160408-NGF PG8005	●
VNMG160408-SNR PG8005	○
WNMG080408-SNR PG8005	○

● Ex stock ○ On demand

PG8030 grade

Premium universal CVD grade with heat-resistant properties

YOUR BENEFITS

– Optimised for turning difficult-to-machine materials such as superalloys and heat-resistant cast steel
– **Reduces wear** thanks to mechanically robust substrate and thermally stable coating
– Premium coating technology (AlTiCNO-CVD) for **low wear** thanks to polished coating surface
– Ideal for continuous and interrupted cuts

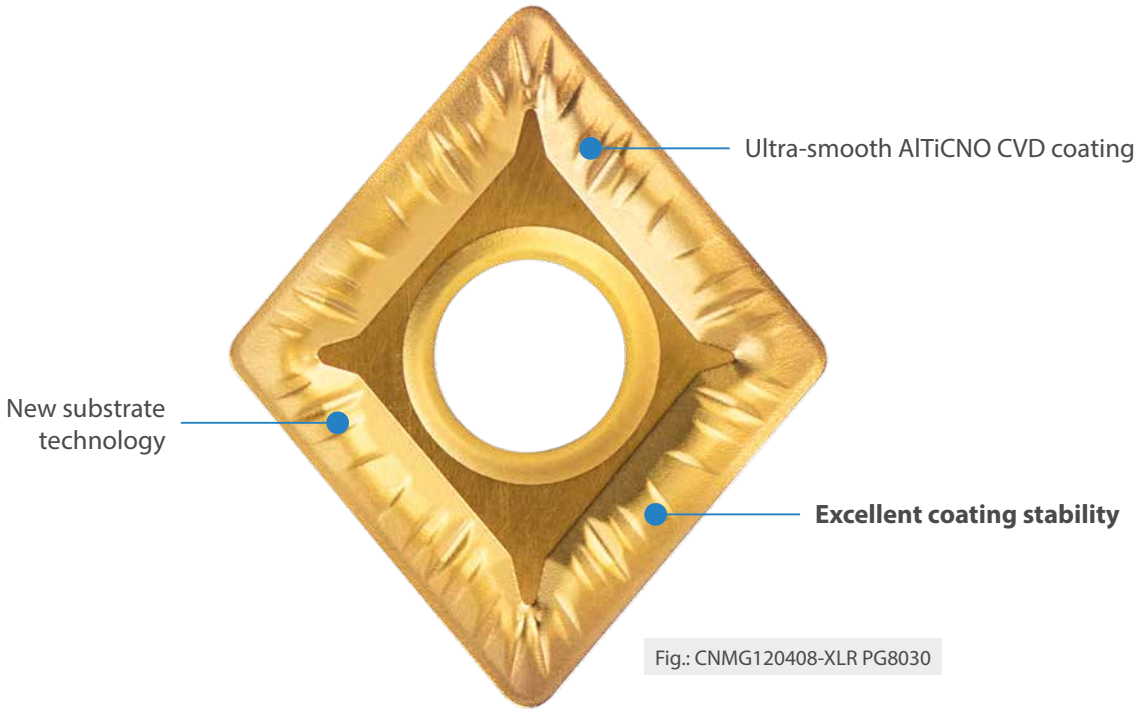


Fig.: CNMG120408-XLR PG8030

Update

Articles available with the new PG8030 grade:

Article	Stock
CNMG120408-XLR PG8030	●
CNMG120412-XLR PG8030	●
CNMG120416-XLR PG8030	●
CNMG160612-XLR PG8030	●
CNMG160616-XLR PG8030 ■	●
CNMG190612-XLR PG8030	●
CNMG190616-XLR PG8030	●
CNMG190624-XLR PG8030	●
CNMM160612-XLR PG8030	○
CNMM190616-XLR PG8030	○
CNMM190624-XLR PG8030	●
CNMM250924-XLR PG8030	○
DNMG150608-XLR PG8030	●

● Ex stock ○ On demand

Article	Stock
RCMT2507MO-GR PG8030	○
RCMT2507MO PG8030	○
RCMX3209MO-GR PG8030	○
SNMG190624-XLR PG8030	●
SNMM190616-XLR PG8030	○
SNMM190624-XLR PG8030	●
SNMM250924-XLR PG8030	○
TNMG160408-XLR PG8030	●

● Ex stock ○ On demand

PG1110 grade

Premium heat-resistant PVD grade for turning applications

YOUR BENEFITS

– Innovative coating concept (TiAlSiN-PVD) for **enhanced adhesion** and improved surface quality with a **low coefficient of friction**
– Ideal for use in combination with difficult-to-machine materials
– Maximum heat resistance for the **longest tool life possible**

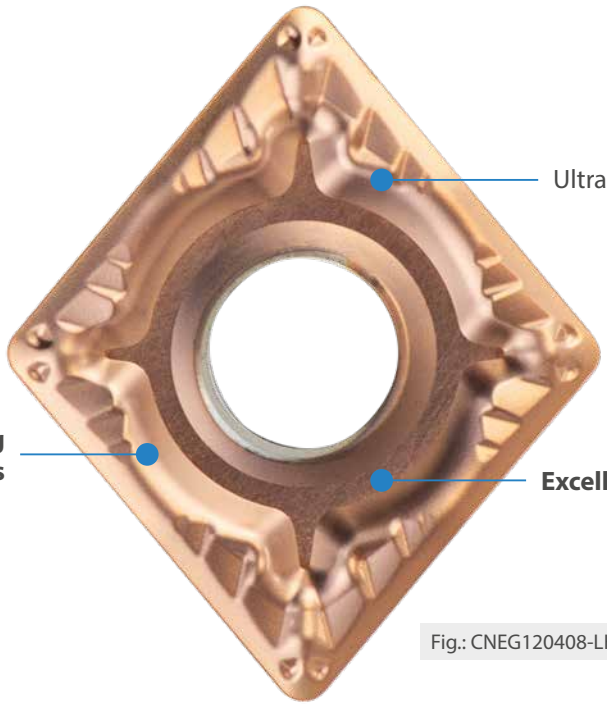


Fig.: CNEG120408-LH PG1110

Articles available with the new PG1110 grade:

Article	Stock
CNEG120404-LH PG1110	●
CNEG120408-LH PG1110	●
CNEG120412-LH PG1110	●
CNEG120416-LH PG1110	●
CNEG160608-LH PG1110	●
CNEG160612-LH PG1110	●
CNEG160616-LH PG1110	●
DNEG150604-LH PG1110	●
DNEG150608-LH PG1110	●
DNEG150612-LH PG1110	●
DNEG150616-LH PG1110	○
SNEG120408-LH PG1110	●
SNEG120412-LH PG1110	●
SNEG120416-LH PG1110	○

● Ex stock ○ On demand

Article	Stock
VNEG160408-LH PG1110	●
WNEG080404-LH PG1110	●
WNEG080408-LH PG1110	●
WNEG080412-LH PG1110	●

● Ex stock ○ On demand

LH chip breaker

Consistent results in the medium application range

YOUR BENEFITS

– Controlled machining in a **wide range of applications**
– Top performance in applications involving non-ferrous metals and superalloys
– Large rake angle: **enhanced chip removal**; reliable results across a range of feed rates
– **Significant decrease in the formation of built-up edge** thanks to a polished top face

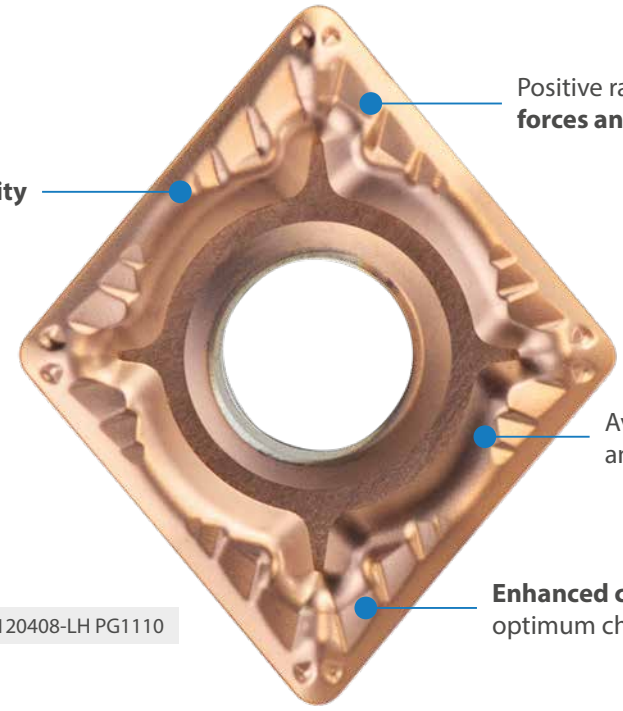


Fig.: CNEG120408-LH PG1110

Articles available with the new LH chip breaker:

Article	Stock
CNEG120404-LH PG1110	●
CNEG120408-LH PG1110	●
CNEG120412-LH PG1110	●
CNEG120416-LH PG1110	●
CNEG160608-LH PG1110	●
CNEG160612-LH PG1110	●
CNEG160616-LH PG1110	●
DNEG150604-LH PG1110	●
DNEG150608-LH PG1110	●
DNEG150612-LH PG1110	●
DNEG150616-LH PG1110	●
SNEG120408-LH PG1110	●
SNEG120412-LH PG1110	●
SNEG120416-LH PG1110	●

● Ex stock ○ On demand

Article	Stock
VNEG160408-LH PG1110	●
WNEG080404-LH PG1110	●
WNEG080408-LH PG1110	●
WNEG080412-LH PG1110	●

● Ex stock ○ On demand

F-QF chip breaker (YNT251D grade)

Premium tools for super-finishing applications

YOUR BENEFITS

– **Thinly coated** Cermet grade (TiAlN-PVD)
– Excellent Smooth surface properties for **optimum chip removal**
– For super-finishing applications with **high quality surface finish** involving low cutting depths and feed rates
– **Long tool life** in a wide range of applications

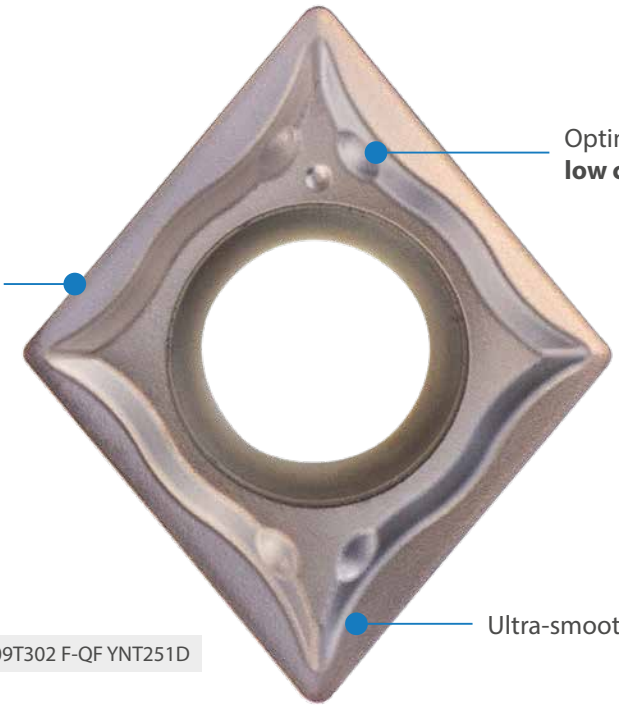


Fig.: CCGT09T302 F-QF YNT251D

Update

Articles available with the new F-QF (YNT251D grade) chip breaker:

Article	Stock
CCGT060201F-QF YNT251D	●
CCGT060202F-QF YNT251D	●
CCGT060204F-QF YNT251D	●
CCGT09T301F-QF YNT251D	●
CCGT09T302F-QF YNT251D	●
CCGT09T304F-QF YNT251D	●
DCGT070201F-QF YNT251D	●
DCGT070202F-QF YNT251D	●
DCGT070204F-QF YNT251D	●
DCGT11T301F-QF YNT251D	●
DCGT11T302F-QF YNT251D	●

● Ex stock ○ On demand

Article	Stock
DCGT11T304F-QF YNT251D	●
DPGT11T301F-QF YNT251D	○
DPGT11T302F-QF YNT251D	○
VBGT110202F-QF YNT251D ■	●
VBGT110204F-QF YNT251D ■	●
VBGT110301F-QF YNT251D	●
VBGT110302F-QF YNT251D	●
VBGT110304F-QF YNT251D	●
VCGT110301F-QF YNT251D	●
VCGT110302F-QF YNT251D	●
VCGT110304F-QF YNT251D	●

● Ex stock ○ On demand

ISO tool holders (internal cooling)

Optimum temperature control for consistent results every time

YOUR BENEFITS

– Targeted supply of coolant and flank face cooling for **optimum chip removal** and a **long tool life**
– **Higher productivity** thanks to reduced machining temperatures
– Optimised shank lengths for **greater ease of use** with VDI tool holders with coolant delivery

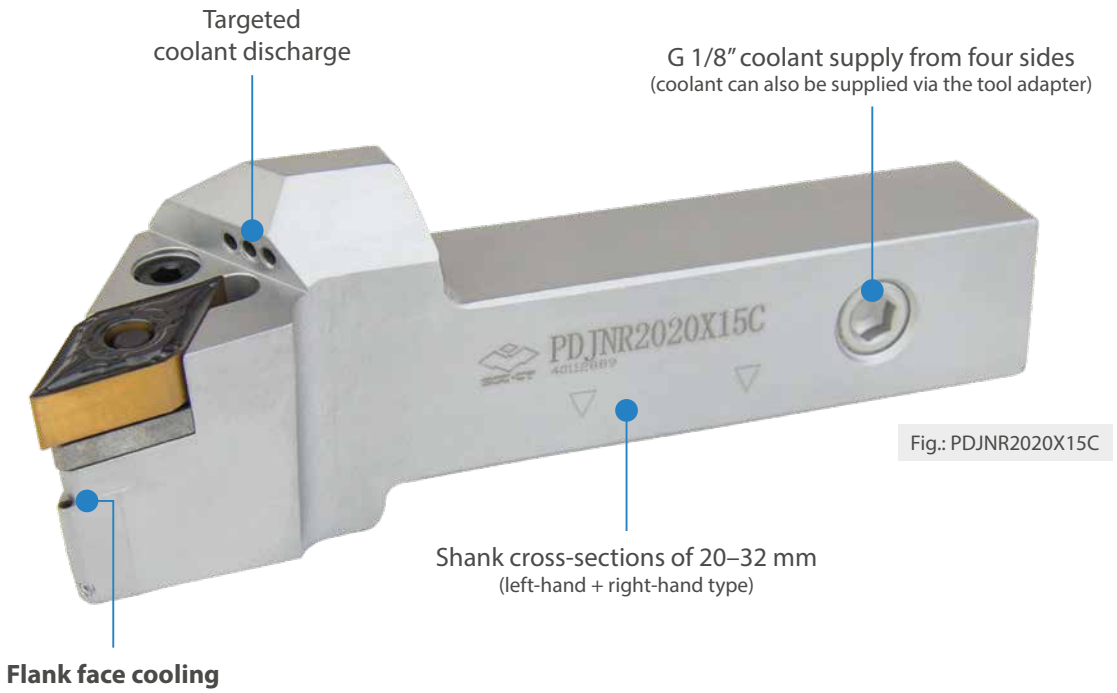
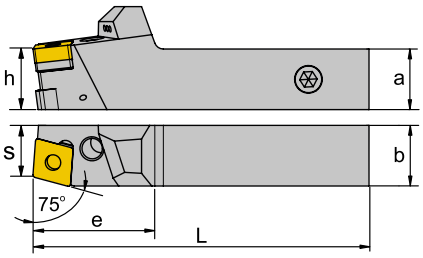


Fig.: PDJNR2020X15C

CN holder (external)** **P clamping**

PCBNR/LC Kr: 75°

Right hand style



Article	✻	Stock		Dimensions [mm]							Insert
		R	L	a	b	L	h	s	e	M	
PCBNR/L2020X12C	✻	●	●	20	20	112	20	17	42	G1/8	CN**1204**
PCBNR/L2525X12C	✻	●	●	25	25	127	25	22	42	G1/8	CN**1204**
PCBNR/L2525X16C	✻	●	●	25	25	132	25	22	47	G1/8	CN**1606**

● Ex stock ○ On demand

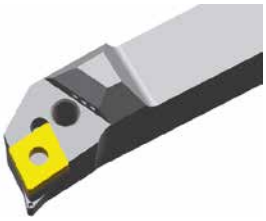
✻ With internal cooling

Spare parts

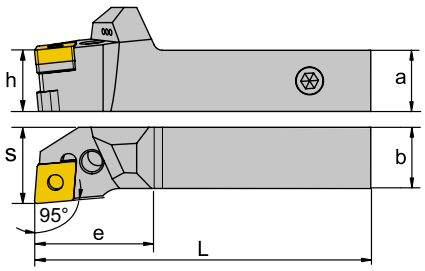
	Insert	**CN**1204****	**CN**1606****
	ØD	**16-32**	**16-40**
	Knee lever	L4	L5
	Screw	LEM8×21 (10,2 Nm)	LEM8×25 (10,2 Nm)
	Shim	C12AP	C16AP
	Shim pin	SP4	SP5
	Wrench	WH30L	WH30L

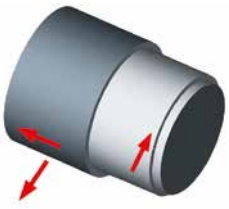
CN holder (external)** **P clamping**

PCLNR/LC Kr: 95°



Right hand style





Article	✻	Stock		Dimensions [mm]							Insert
		R	L	a	b	L	h	s	e	M	
PCLNR/L2020X12C	✻	●	●	20	20	112	20	27	42	G1/8	CN**1204**
PCLNR/L2525K12C	✻	●	●	25	25	125	25	32	40	G1/8	CN**1204**
PCLNR/L2525X16C	✻	●	●	25	25	131	25	32	46	G1/8	CN**1606**
PCLNR/L3232X19C	✻	●	●	32	32	153	32	40	53	G1/8	CN**1906**

● Ex stock ○ On demand

✻ With internal cooling

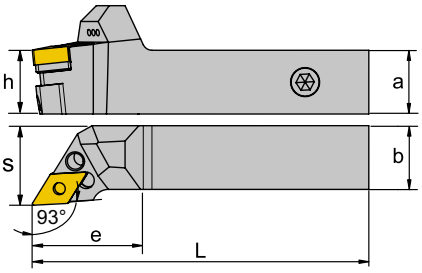
Spare parts

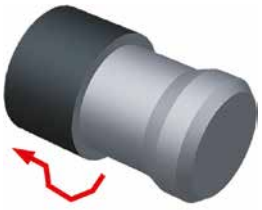
	Insert	**CN**1204****	**CN**1606****	**CN**1906****
	ØD	**16-32**	**16-40**	**25-40**
	Knee lever	L4	L5	L6
	Screw	LEM8×21 (10,2 Nm)	LEM8×25 (10,2 Nm)	LEM10×27 (16,6 Nm)
	Shim	C12AP	C16AP	C19AP
	Shim pin	SP4	SP5	SP6
	Wrench	WH30L	WH30L	WH40L

DN holder (external)** **P clamping**

PDJNR/LC Kr: 93°

Right hand style





Article	✻	Stock R	Stock L	Dimensions [mm] a	b	L	h	s	e	M	Insert
PDJNR/L2020X11C	✻	●	●	20	20	106	20	27	36	G1/8	DN**1104**
PDJNR/L2525X11C	✻	●	●	25	25	121	25	32	36	G1/8	DN**1104**
PDJNR/L2020X15C	✻	●	●	20	20	115	20	27	45	G1/8	DN**1506**
PDJNR/L2525X15C	✻	●	●	25	25	128	25	32	43	G1/8	DN**1506**

● Ex stock ○ On demand

✻ With internal cooling

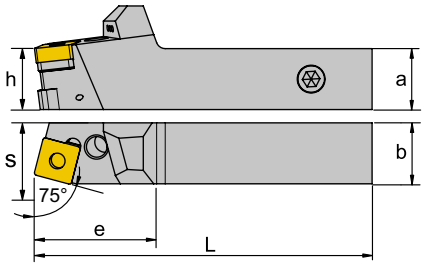
Spare parts

	Insert	DN**1104**	DN**1506**
	ØD	16-32	20-40
	Knee lever	L3	L4B
	Screw		LEM8×21 (10,2 Nm)
	Screw	LEM6×13,4A (7,0 Nm)	
	Shim	D11AP	D15AP
	Shim pin	SP3	SP4
	Wrench	WH25L	WH30L

SN holder (external)** **P clamping**

PSBNR/LC Kr: 75°

Right hand style



Article	✻	Stock		Dimensions [mm]							Insert
		R	L	a	b	L	h	s	e	M	
PSBNR/L2020X12C	✻	●	●	20	20	112	20	17	42	G1/8	SN**1204**
PSBNR/L2525X12C	✻	●	●	25	25	127	25	22	42	G1/8	SN**1204**
PSBNR/L3232X19C	✻	●	●	32	32	155	32	27	55	G1/8	SN**1906**

● Ex stock ○ On demand

✻ With internal cooling

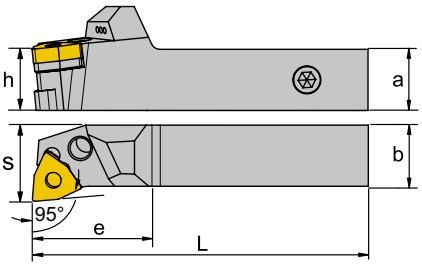
Spare parts

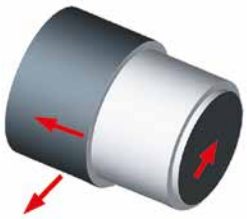
	Insert	**SN**1204****	**SN**1906****
	ØD	**20-40**	**25-40**
	Knee lever	L4	L6
	Screw	LEM8×21 (10,2 Nm)	LEM10×27 (16,6 Nm)
	Shim	S12AP	S19AP
	Shim pin	SP4	SP6
	Wrench	WH30L	WH40L

WN holder (external)** **P clamping**

PWLNR/LC Kr: 95°

Right hand style





Article	✻	Stock		Dimensions [mm]							Insert
		R	L	a	b	L	h	s	e	M	
PWLNR/L2020X08C	✻	●	●	20	20	112	20	25	42	G1/8	WN**0804**
PWLNR/L2525X08C	✻	●	●	25	25	127	25	31	42	G1/8	WN**0804**

● Ex stock ○ Oh demand

✻ With internal cooling

Spare parts

	Insert	**WN**0804****
	ØD	**20-32**
	Knee lever	L4
	Screw	LEM8×21 (10,2 Nm)
	Shim	W08AP
	Shim pin	SP4
	Wrench	WH30L

ISO tool holders with internal cooling

Turning insert, negative, positive

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
						HC (CVD)								
						PG1110			PG8005			PG8020		
						Feed rate [mm]			Feed rate [mm]			Feed rate [mm]		
						0,1	0,3	0,6	0,1	0,3	0,6	0,1	0,3	0,6
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1									
		approx. 0,45 % C	annealed	190	2									
		approx. 0,45 % C	tempered	250	3									
		approx. 0,75 % C	annealed	270	4									
		approx. 0,75 % C	tempered	300	5									
	Low-alloyed steel		annealed	180	6									
			tempered	275	7									
			tempered	300	8									
			tempered	350	9									
	High-alloyed steel and high-alloyed tool steel		annealed	200	10									
			hardened and tempered	325	11									
M	Stainless steel	ferritic/martensitic	annealed	200	12									
		martensitic	tempered	240	13									
		austenitic	quench hardened	180	14									
		austenitic-ferritic		230	15									
K	Grey cast iron	perlitic/ferritic		180	16									
		perlitic (martensitic)		260	17									
	Cast iron with spheroidal graphite	ferritic		160	18									
		perlitic		250	19									
	Malleable cast iron	ferritic		130	20									
		perlitic		230	21									
N	Aluminium wrought alloys	cannot be hardened		60	22									
		hardenable	hardened	100	23									
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24									
		≤ 12 % Si, hardenable	hardened	90	25									
		> 12 % Si, cannot be hardened		130	26									
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27									
		CuZn, CuSnZn		90	28									
		CuSn, Pb-free copper, electrolytic copper		100	29									
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30	70	55	–	80	60	–	60	40	–
			hardened	280	31	65	45	–	70	50	–	50	30	–
		Ni or Co bass	annealed	250	32	65	45	–	70	50	–	50	30	–
			hardened	350	33	60	40	–	65	45	–	45	25	–
			cast	320	34	60	40	–	65	45	–	45	25	–
	Titanium alloys	pure titanium		R_m 400	35	100	60	–	120	80	–	90	65	–
		α and β alloys	hardened	R_m 1050	36	80	40	–	100	60	–	80	45	–
H	Hardened steel		hardened and tempered	55 HRC	37									
			hardened and tempered	60 HRC	38									
	Hard cast iron		cast	400	39									
	Hardened cast iron		hardened and tempered	55 HRC	40									
X	Non-metallic materials	Thermoplastics			41									
		Thermosetting plastics			42									
		Plastic, glass-fibre reinforced GFRP			43									
		Plastic, carbon fibre reinforced CFRP			44									
		Graphite			45									
		Wood			46									

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.
For examples of material for cutting tool groups view page D11.

Starting values for cutting speed v_c [m/min]																									
HC (CVD)																									
PG8030 PANGU				YNT251D																					
Feed rate [mm]				Feed rate [mm]																					
0,1	0,3	0,6		0,05	0,1	0,15																			
				480	470	320																			
				410	400	250																			
				310	300	200																			
				300	290	180																			
				255	245	150																			
				380	370	220																			
				265	255	160																			
				210	200	140																			
				195	185	130																			
				295	285	180																			
				160	150	90																			
45	30	25		60	40	–																			
35	25	20		55	35	–																			
35	25	20		55	35	–																			
30	20	20		50	30	–																			
30	20	20		50	30	–																			
70	50	40		85	55	–																			
60	30	20		75	35	–																			

HC Coated carbide
HT Uncoated carbide, primary component (TiC) or (TiN), cermet
HW Uncoated carbide, primary component (WC)
BL Cubic boron nitride with low BN content
BH Cubic boron nitride with high BN content
CN Si3N4 ceramic
CM Mixed ceramic
HC_1 Coated cermet
BC CBN with coating
CC Coated cutting ceramic
CR Cutting ceramic, primary component aluminium oxide (Al_2O_3), reinforced
DP Polycrystalline diamond

ZGROOVE® COMPACT

Modular grooving system

Modular grooving system

A

Modular grooving system

System code – inserts

ZP	G	D	04	04	–	H	G
1	2	3	4	5		6	7

Application	
Code	Description
ZP	Parting
ZT	Grooving & turning
ZR	Form turning

1

Insert seat size [mm]	
Groove width	
Code	Description
B	2,0
E	2,5
F	3,0
G	4,0
H	5,0
K	6,0
L	8,0

2

No. of cutting edges	
Code	Description
S	Single
D	Double

3

Insert thickness S [mm]	
	
Code	S
02	2,0
025	2,5
03	3,0
04	4,0
05	5,0
06	6,0
08	8,0

4

Nose radius r [mm]	
	
Code	r
02	0,2
03	0,3
04	0,4
08	0,8

5

Tolerance class [mm]	
Code	Description
M	±0,13
E	±0,025
H	±0,025

6

Chip breaker	
Code	Description
G	General chip breaker
F	Special chip breaker
M	Straight edge

7

PG1110 grade

Maximum resistance to wear when working with difficult-to-machine materials

YOUR BENEFITS

– Thermally stable TiAlSiN coating technology with **enhanced adhesion properties** and **ultra-smooth coating surface**
– **Longer tool life** thanks to hard substrate base
– Ideally suited for **mass production applications** with stable cutting conditions

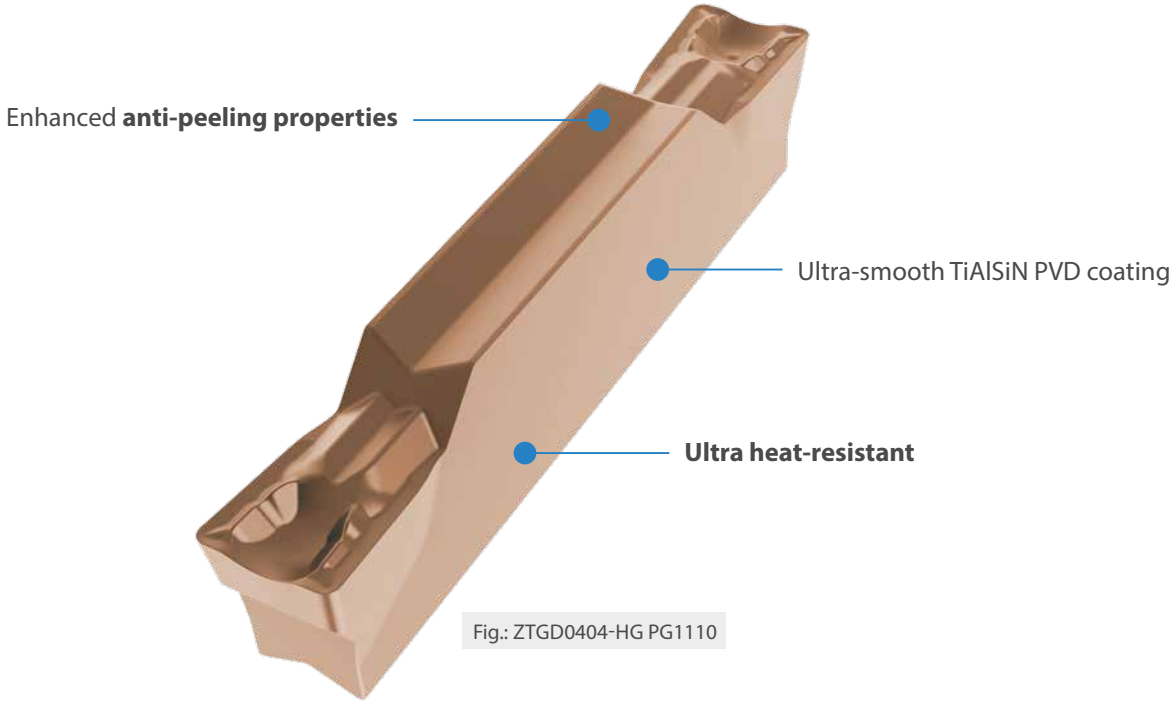


Fig.: ZTGD0404-HG PG1110

Articles available with the new PG1110 grade:

Article	Stock
ZTBD02002-HG PG1110	●
ZTBD0202-HG PG1110 ■	●
ZTED02503-HG PG1110	●
ZTFD0303-HG PG1110	●
ZTGD0402-HG PG1110	●
ZTGD0404-HG PG1110	●
ZTHD0504-HG PG1110	●
ZTKD0608-HG PG1110	●

● Ex stock ○ On demand

PG1120 grade

Maximum reliability even when cutting conditions change

YOUR BENEFITS

– Well suited for machining alloyed steel, stainless steel and difficult-to-machine materials
– Suitable for parting and grooving applications under high thermal and mechanical loads
– Temperature-resistant TiAlSiN coating with **ultra-smooth surface** and **enhanced adhesion properties**
– **Reduced chipping on cutting edge** thanks to high fracture toughness

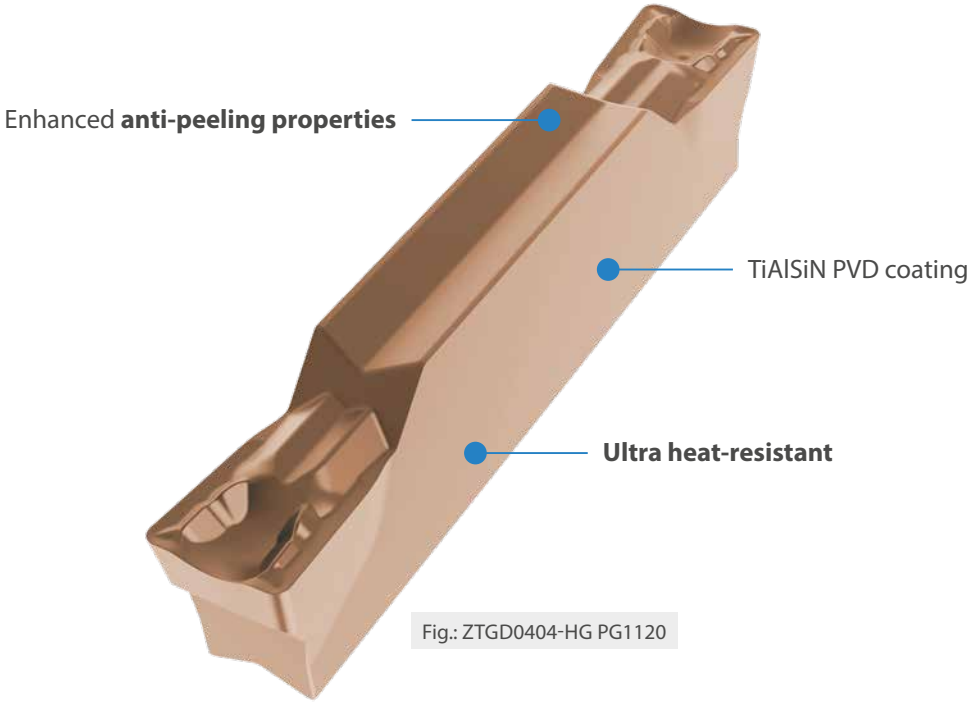


Fig.: ZTGD0404-HG PG1120

Update

Articles available with the new PG1120 grade:

Article	Stock
ZTAD01502-HG PG1120 ■	●
ZTBD02002-HG PG1120	●
ZTBS0202-HG PG1120 ■	●
ZTED02502-HG PG1120 ■	●
ZTED02503-HG PG1120	●
ZTES02503-HG PG1120 ■	●
ZTFD0302-HG PG1120 ■	●
ZTFD0303-HG PG1120	●

● Ex stock ○ On demand

Article	Stock
ZTFS0303-HG PG1120 ■	●
ZTGD0402-HG PG1120	●
ZTGD0404-HG PG1120	●
ZTGD0408-HG PG1120 ■	●
ZTHD0504-HG PG1120	●
ZTHD0508-HG PG1120 ■	●
ZTKD0604-HG PG1120 ■	●
ZTKD0608-HG PG1120	●

● Ex stock ○ On demand

zGROOVE® COMPACT

Compact design, easy to work with

YOUR BENEFITS

– Newly designed zGroove interface for **simple** and **precise change-over of any component**
– **Excellent chip removal** and **reduced machining temperatures** thanks to targeted dual cooling
– **Compatible with a wide range of machines** thanks to compact design
– Sturdy design for all parting and grooving/turning applications

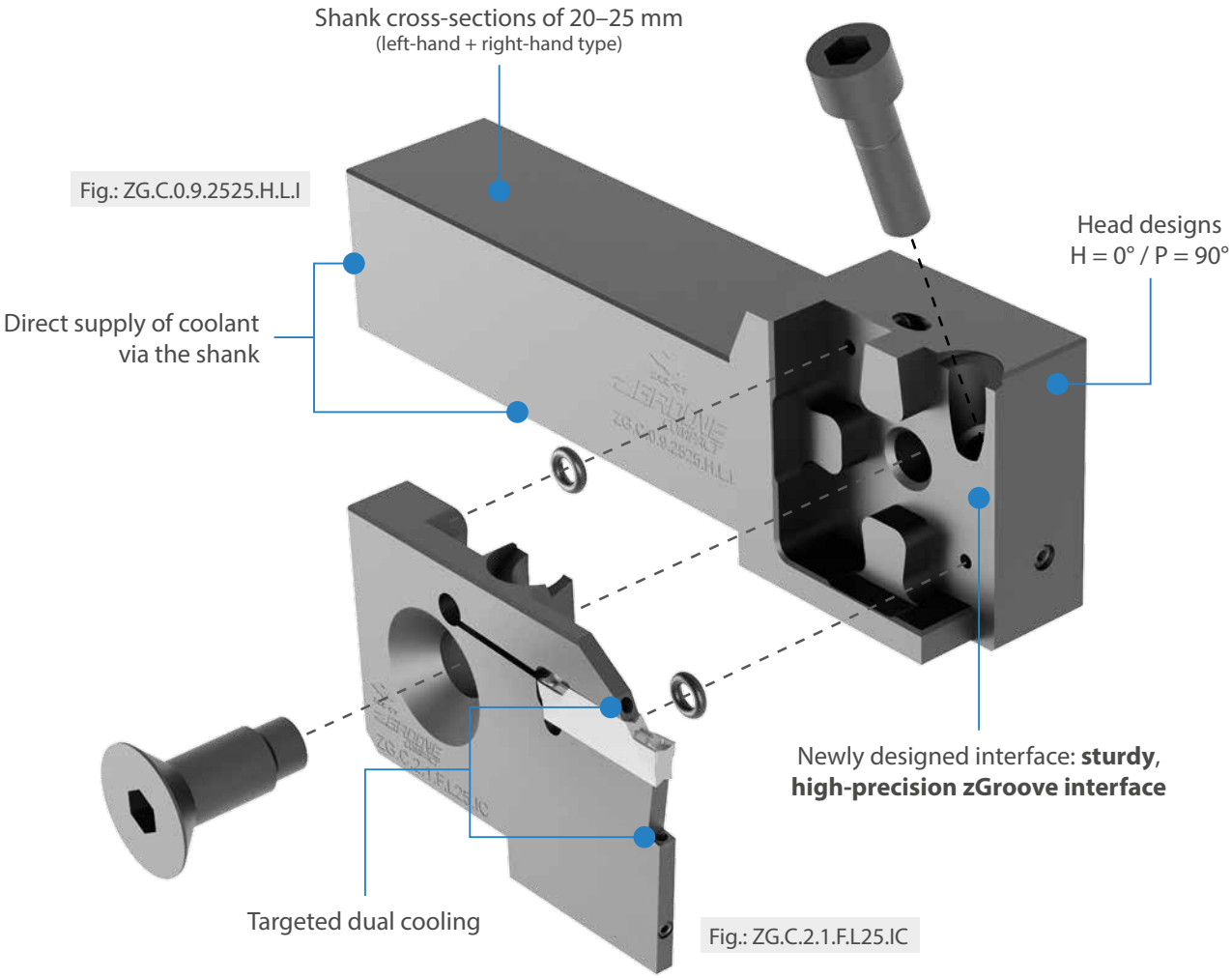
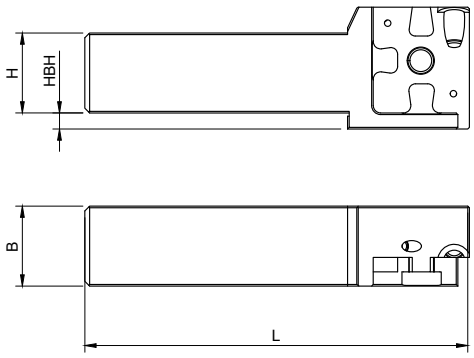


Fig.: ZG.C.0.9.2525.H.L.I

Fig.: ZG.C.2.1.F.L25.IC

zGroove Compact shank holder, H = 0°

Left hand style



Left hand style

Article	✻	Stock	Dimensions [mm]				Primary cartridge
			H	B	L	HBH	
ZG.C.0.9.2020.H.L.I	✻	●	20	20	108	10	ZG.C.2.*.*.L**.IC
ZG.C.0.9.2525.H.L.I	✻	●	25	25	120	5	ZG.C.2.*.*.L**.IC

● Ex stock ○ On demand

Right hand style

Article	✻	Stock	Dimensions [mm]				Primary cartridge
			H	B	L	HBH	
ZG.C.0.9.2020.H.R.I	✻	●	20	20	108	10	ZG.C.2.*.*.R**.IC
ZG.C.0.9.2525.H.R.I	✻	●	25	25	120	5	ZG.C.2.*.*.R**.IC

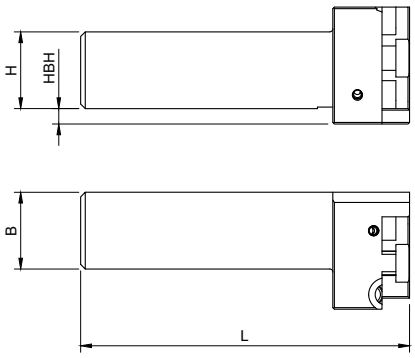
● Ex stock ○ On demand

Spare parts

		Article	Stock
	**Screw (primary cartridge)**	ZG.C.2.M8*16	●
	**Screw (insert)**	GB70-85-M6*20	●

zGroove Compact shank holder, P = 90°

Left hand style



Left hand style

Article	✻	Stock	Dimensions [mm]				Primary cartridge
			H	B	L	HBH	
ZG.C.0.9.2020.P.LR.I	✻	●	20	20	90	10	ZG.C.2.*.*.R**.IC
ZG.C.0.9.2525.P.LR.I	✻	●	25	25	107	5	ZG.C.2.*.*.R**.IC

● Ex stock ○ On demand

Right hand style

Article	✻	Stock	Dimensions [mm]				Primary cartridge
			H	B	L	HBH	
ZG.C.0.9.2020.P.RL.I	✻	●	20	20	90	10	ZG.C.2.*.*.L**.IC
ZG.C.0.9.2525.P.RL.I	✻	●	25	25	107	5	ZG.C.2.*.*.L**.IC

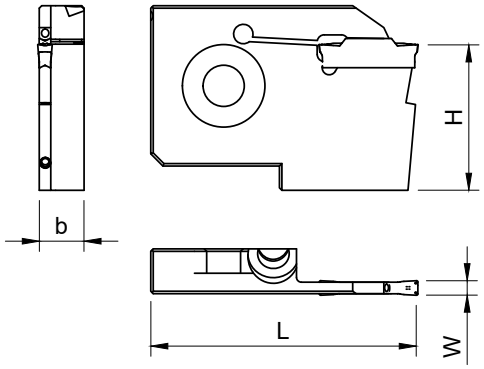
● Ex stock ○ On demand

Spare parts

		Article	Stock
	**Screw (primary cartridge)**	ZG.C.2.M8*16	●
	**Screw (insert)**	GB70-85-M6*20	●

zGroove Compact primary cartridge (parting & grooving / turning)

Left hand style



Article	*	Stock		Dimensions [mm]					Insert
		R	L	W	H	a_r max.	L	b	
ZG.C.2.1.B.L/R10.IC		●	●	2.0	30	10	45	9	Z*BD**
ZG.C.2.1.E.L/R15.IC		●	●	2.5	30	15	50	9	Z*ED**
ZG.C.2.1.F.L/R15.IC		●	●	3.0	30	15	55	9	Z*FD**
ZG.C.2.1.F.L/R25.IC		●	●	3.0	30	25	55	9	Z*FD**
ZG.C.2.1.G.L/R20.IC		●	●	4.0	30	20	55	9	Z*GD**
ZG.C.2.1.H.L/R25.IC		●	●	5.0	30	25	55	9	Z*HD**
ZG.C.2.1.K.L/R25.IC		●	●	6.0	30	25	55	9	Z*KD**
ZG.C.2.1.L.L/R30.IC		●	●	8.0	30	30	55	9	Z*LD**

● Ex stock ○ On demand

Find all compatible grooving inserts on our website.

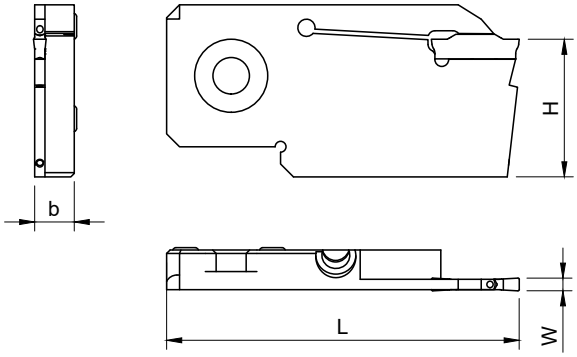
Also compatible with our new **HG chip breaker (see page A36)**

Spare parts

		Article	Stock
	**Seal (primary cartridge)**	ZG.C.S.3*1.5	●

zGroove Compact primary cartridge, reinforced (parting & grooving (ar max. 40 mm))

Left hand style



Article	*	Stock		Dimensions [mm]					Insert
		R	L	W	H	a_r max.	L	b	
ZG.C.2.2.E.L/R42.IC	*	●	●	2.5	30	21	55	9	Z*ED**
ZG.C.2.2.F.L/R65.IC	*	●	●	3.0	30	32,5	68	9	Z*FD**
ZG.C.2.2.F.L/R80.IC	*	●	●	3.0	30	40	71	9	Z*FD**

● Ex stock ○ On demand

Find all compatible grooving inserts on our website.

Also compatible with our new **HG chip breaker (see page A36)**

Spare parts

		Article	Stock
	Seal (primary cartridge)	ZG.C.S.3*1.5	●

HG chip breaker

Specially designed for soft and difficult-to-machine materials

YOUR BENEFITS

– **Low cutting forces** thanks to a positive geometry and sharp cutting edge design
– Ideally suited for soft and ductile materials
– **Flexible** in any application (grooving/parting/ Groove-turning)
– **Less wear and tear** thanks to reduced surface contact
– During machining, the geometry creates a **virtually flat groove base**

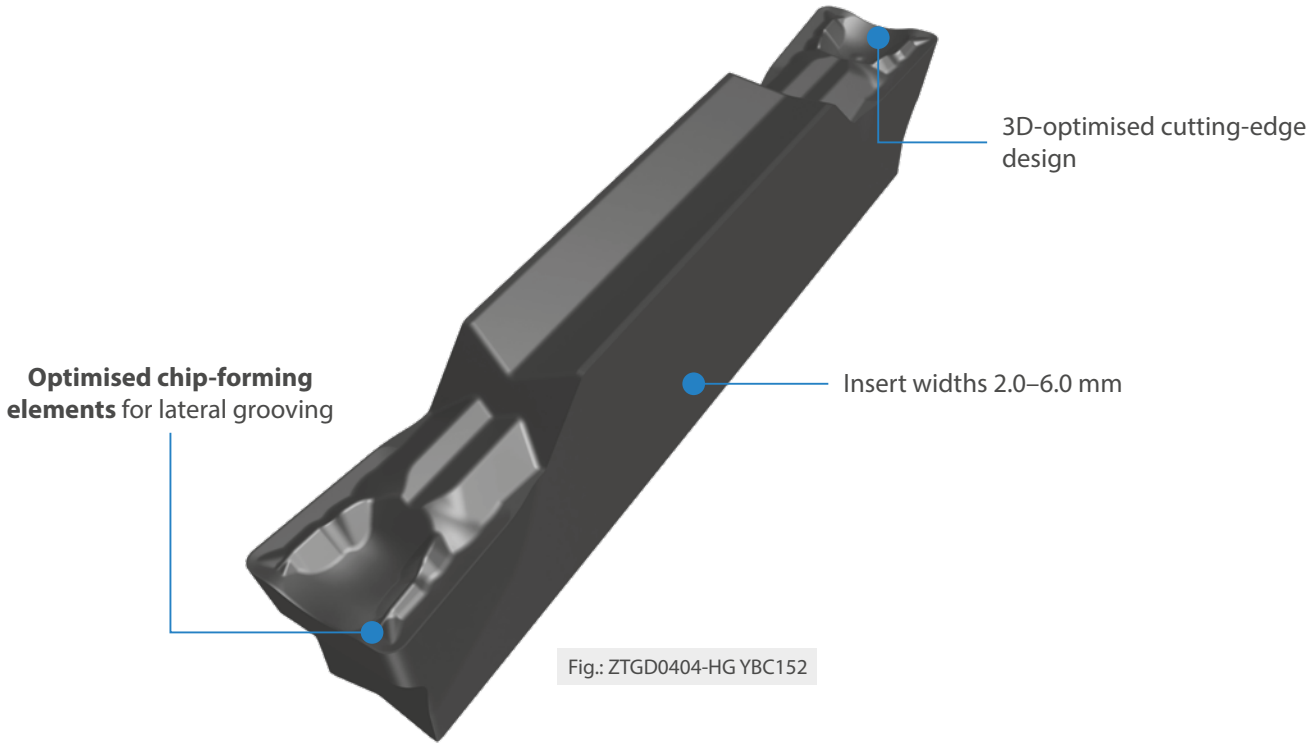
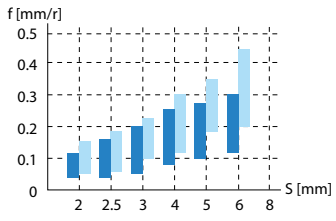
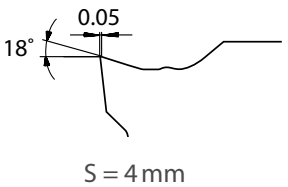


Fig.: ZTGD0404-HG YBC152

Chip breaker	Application	P	M	K	N	S	H	Feed	Cutting edge design
ZT****-HG	Parting & grooving ✔	✔	✔	✔		✔			
	Turning ✔								

S = 4 mm

✔ Very suitable ✔ Suitable

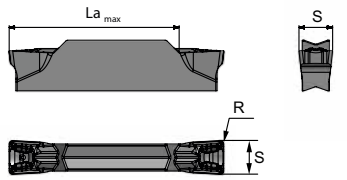
Parting & grooving
Turning

Update

Parting inserts

- Ideal machining conditions
- Normal machining conditions
- Unfavourable machining conditions

Parting & grooving insert (double sided)



Double cutting edge

	HC[1] (CVD)	HC[1] (PVD)	HW
P	○	○ ❁ ❁	
M		❁ ❁	
K	○		
N			
S		○ ❁ ❁	
H			

	ISO	S ±0.1	R±0.1	La max	L	f_1	f_2	ap	YBC152	PG1110	PG1120	YBG205H
	**ZTAD01502-HG** ■	1.5	0.2	12	16	0.04-0.11	0.04-0.12	0.25-1.00			●	
	ZTBD02002-HG	2.0	0.2	13	16	0.04-0.12	0.05-0.15	0.30-1.00		●	●	●
	ZTED02502-HG ■	2.5	0.2	17	20	0.04-0.16	0.05-0.16	0.40-1.50			●	
	ZTED02503-HG	2.5	0.3	17	20	0.04-0.16	0.06-0.18	0.40-1.50		●	●	●
	ZTFD0302-HG ■	3.0	0.2	17	20	0.05-0.20	0.10-0.20	0.40-2.00			●	
	ZTFD0303-HG	3.0	0.3	17	20	0.05-0.20	0.10-0.23	0.40-2.00	●	●	●	●
	ZTGD0402-HG	4.0	0.2	22	25	0.08-0.25	0.12-0.28	0.30-3.00		●	●	●
	ZTGD0404-HG	4.0	0.4	22	25	0.08-0.25	0.15-0.30	0.50-3.00	●	●	●	●
	ZTHD0504-HG	5.0	0.4	22	25	0.10-0.28	0.18-0.35	0.50-3.50	●	●	●	●
	ZTHD0508-HG ■	5.0	0.8	22	25	0.10-0.28	0.18-0.37	0.50-3.50			●	
	ZTKD0604-HG ■	6.0	0.4	22	25	0.12-0.30	0.20-0.42	0.90-4.00			●	
	ZTKD0608-HG	6.0	0.8	22	25	0.12-0.30	0.20-0.45	0.90-4.00	●	●	●	●

● Ex stock ○ On demand

HC[1] Coated carbide
HW Uncoated carbide

f_1 Parting & grooving
f_2 Turning
ap Side turning

Parting & grooving inserts

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed vc [m/min]				
						HC (CVD)		HC (PVD)		
						YBC152	YBC252	YBG102	YBG105	
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1		190			
		approx. 0,45 % C	annealed	190	2		175			
		approx. 0,45 % C	tempered	250	3		145			
		approx. 0,75 % C	annealed	270	4		140			
		approx. 0,75 % C	tempered	300	5		135			
	Low-alloyed steel		annealed	180	6		170			
			tempered	275	7		125			
			tempered	300	8		115			
			tempered	350	9		105			
	High-alloyed steel and high-alloyed tool steel		annealed	200	10		125			
			hardened and tempered	325	11		95			
M	Stainless steel	ferritic/martensitic	annealed	200	12		165	165	170	
		martensitic	tempered	240	13		135	135	140	
		austenitic	quench hardened	180	14		155	155	160	
		austenitic-ferritic		230	15		135	135	140	
K	Grey cast iron	perlitic/ferritic		180	16		240			
		perlitic (martensitic)		260	17		185			
	Cast iron with spheroidal graphite	ferritic		160	18		220			
		perlitic		250	19		165			
	Malleable cast iron	ferritic		130	20		175			
		perlitic		230	21		165			
N	Aluminium wrought alloys	cannot be hardened		60	22					
		hardenable	hardened	100	23					
	Cast aluminium alloys	≤ 12% Si, cannot be hardened		75	24					
		≤ 12% Si, hardenable	hardened	90	25					
		> 12% Si, cannot be hardened		130	26					
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27					
		CuZn, CuSnZn		90	28					
		CuSn, Pb-free copper, electrolytic copper		100	29					
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30			95	100	
			hardened	280	31			50	50	
		Ni or Co bass	annealed	250	32			80	80	
			hardened	350	33			70	70	
			cast	320	34			70	70	
	Titanium alloys	pure titanium		R_m 400	35			145	150	
		α and β alloys	hardened	R_m 1050	36			50	50	
H	Hardened steel		hardened and tempered	55 HRC	37					
			hardened and tempered	60 HRC	38					
	Hard cast iron		cast	400	39					
	Hardened cast iron		hardened and tempered	55 HRC	40					
X	Non-metallic materials	Thermoplasts			41					
		Thermosetting plastics			42					
		Plastic, glass-fibre reinforced GFRP			43					
		Plastic, carbon fibre reinforced CFRP			44					
		Graphite			45					
		Wood			46					

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.
For examples of material for cutting tool groups view page D11.

	Starting values for cutting speed vc [m/min]								
	HC (PVD)						HW		
	YB9320	YBG202	YBG205(H)	YBG302	PG1110 PANGU	PG1120 PANGU	YD101	YD201	
	190	190	190	185		205			
	175	175	175	170		189			
	145	145	145	140		157			
	140	140	140	135		151			
	135	135	135	130		146			
	170	170	170	165		184			
	125	125	125	125		135			
	115	115	115	115		124			
	105	105	105	105		113			
	125	125	125	125		135			
	95	95	95	95		103			
	165	165	165	160	190	178			
	135	135	135	130	155	146			
	155	155	155	150	178	167			
	135	135	135	130	155	146			
	240	240	240	235					
	185	185	185	180					
	220	220	220	215					
	165	165	165	160					
	175	175	175	170					
	165	165	165	160					
							800	760	
							600	570	
							320	305	
							240	230	
							160	155	
							160	155	
							600	570	
							200	190	
	95	95	95	95	110	100	70	65	
	50	50	50	50	60	55	35	35	
	80	80	80	75	95	85	60	60	
	70	70	70	65	80	75	50	50	
	70	70	70	65	80	75	50	50	
	145	145	145	140	170	160	105	100	
	50	50	50	50	60	55	35	35	

HC Coated carbide
HW Uncoated carbide, main component (WC)

High-feed milling system XMR13

Indexable milling

B

Indexable milling ISO code – inserts

S	P	K	N	12	04	ED	T21K	R	–	DM
1	2	3	4	5	6	7	8	9		10

Insert shape

A		C	
H		L	
M		O	
P		R	
S		T	
W		X	Special
Z	Special		

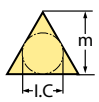
1

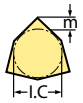
Clearance angle

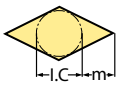
B		C	
D		E	
F		N	
P			

2

Tolerance class







Code	I.C [mm]	m [mm]	S [mm]
A	±0,025	±0,005	±0,025
C	±0,025	±0,013	±0,025
E	±0,025	±0,025	±0,025
F	±0,013	±0,005	±0,025
G	±0,025	±0,025	±0,130
H	±0,013	±0,013	±0,025
J	±0,05–0,13	±0,005	±0,025
K	±0,05–0,13	±0,013	±0,025
L	±0,05–0,13	±0,025	±0,025
M	±0,05–0,13	±0,08–0,18	±0,130
N	±0,05–0,13	±0,08–0,18	±0,025
U	±0,08–0,25	±0,13–0,38	±0,130

3

Fastening features (metric)

Insert shape

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

4

Cutting edge length l [mm]

Insert shape

	
A	C, M
	
H, O, P	L
R	S
T	W

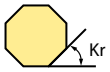
5

Insert thickness S [mm]

Code	S	Code	S
00	0,79	**05**	5,56
T0	0,99	**T5**	5,95
01	1,59	**06**	6,35
T1	1,98	**T6**	6,75
02	2,38	**07**	7,94
T2	2,58	**09**	9,52
03	3,18	**T9**	9,72
T3	3,97	**11**	11,11
04	4,76	**12**	12,70
T4	4,96		

6

Angle



Code	Kr	Code	αn
A	45°	**A**	3°
D	60°	**B**	5°
E	75°	**C**	7°
F	85°	**D**	15°
P	90°	**E**	20°
Z	Special	**F**	25°
		G	30°
		N	0°
		P	11°
		Z	Special

7

Chamfer

Code	Type	Code	Angle	Code	Width [mm]	Code	Position
F		**0**	5°	**0**	0,10	**K**	
E		**1**	10°	**1**	0,15		
T		**2**	15°	**2**	0,20	**P**	
S		**3**	20°	**3**	0,25		
		4	25°	**4**	0,30	**W**	
		5	30°	**5**	0,35		
				6	0,40		
				7	0,45	**–**	

8

Cutting direction

Code	Description
R	Right
L	Left
N	Right and left

9

Chip breakers

10

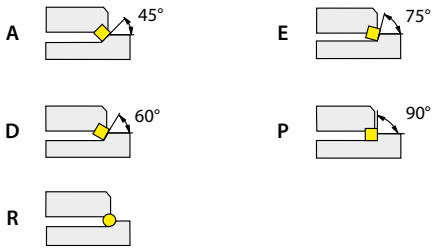
FM A 12 050 – A22 O – N 06 – 04 (L) (AC)

1	2	3	4	5	6	7	8	9	10	11

Type	
Code	Description
BM	Profile milling
CM	Chamfer milling
EM	Square shoulder milling
FM	Face milling
HM	Helical milling
SM	Slot milling
TM	T-slot milling
XM	Special

1

Entering angle



2

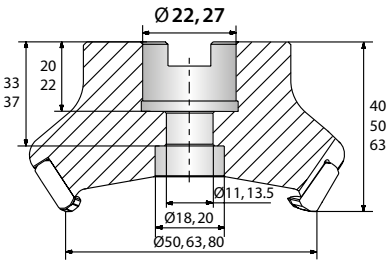
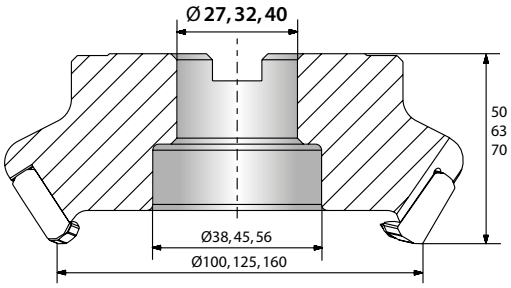
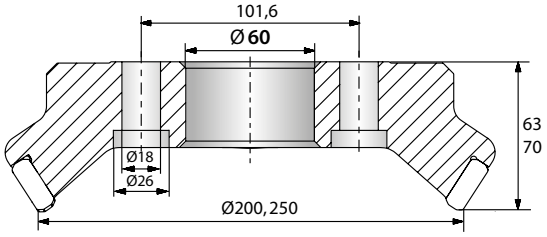
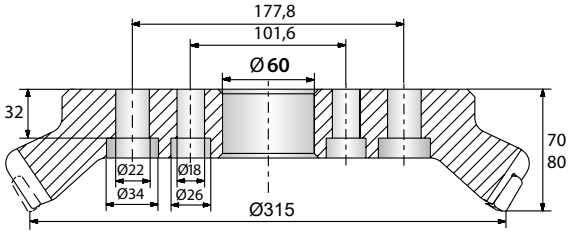
Serial number

3

Nominal diameter [mm]	
Code	Description
025	25
050	50
160	160
315	315
...	

4

Type and size of tool holders

Code	Type	Code	Type
A	Nominal diameter Ø50 – 80 mm 	**B**	Nominal diameter Ø100 – 160 mm 
C	Nominal diameter Ø200 – 250 mm 	**D**	Nominal diameter Ø315 mm 
G	Straight shank	**XP**	Weldon shank
K	Bore with keyway		

5

With respect to mounting please adhere to the information provided by the tool holder manufacturer.

Insert shape			
A		C	
H		L	
M		O	
P		R	
S		T	
W		X	Special
Z	Special		

6

Clearance angle			
B	5°	C	7°
D	15°	E	20°
F	25°	N	0°
P	11°		

7

Cutting edge length l [mm]	
Insert shape	
A	C, M
H, O, P	L
R	S
T	W

8

Number of teeth

9

Cutting direction	
Code	Description
L	Left

10

Cooling	
Code	Description
C	Inner cooling
AC	Air cooling

11

Tools with B coupling and inner coolant supply require the following spare parts:

Coolant clamp screw

Coolant shower plate

Spare parts (B coupling with inner coolant supply)

		B27	B32	B40	B40
	Ø	**80**	**100**	**125**	**160**
	**Coolant clamp screw**	LDB27C	LDB32C	LDB40C	LDB40C
	**Coolant shower plate**	B27-002-CP	B32-002-CP	B40-002-CP	B40-003-CP

When purchasing tools with inner coolant supply and B coupling these spare parts are included in delivery.

PG8020 grade

For high-performance finishing applications involving heat-resistant cast steel

YOUR BENEFITS

– **High-performance finish milling grade** for difficult-to-machine materials such as heat-resistant cast steel
– **Reduced wear and tear** and longer **tool life**
– High mechanical stability
– Ultra, thermally stable coating

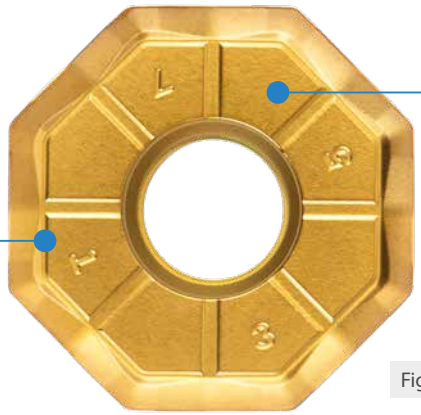


Fig.: ONHU09T508ANN-GM PG8020

Update

Articles available with the new PG8020 grade:

Article	Stock	Milling system
APKT11T304-APL PG8020 ■	●	EMP01/EMP02
APKT11T308-APL PG8020 ■	●	EMP01/EMP02
APKT11T312-ANL PG8020 ■	●	EMP01/EMP02
APKT11T320-ANL PG8020 ■	●	EMP01/EMP02
APKT11T330-ANL PG8020 ■	●	EMP01/EMP02
APKT160408-APL PG8020 ■	●	EMP01/EMP02
APKT160420-ANL PG8020 ■	●	EMP01/EMP02
APKT160430-ANL PG8020 ■	●	EMP01/EMP02
APKT160440-ANL PG8020 ■	●	EMP01/EMP02
APKT160450-ANL PG8020 ■	●	EMP01/EMP02
LNKT080404PNR-GL PG8020 ■	●	EMP09
LNKT080404PNR-GM PG8020 ■	●	EMP09
LNKT080408PNR-GM PG8020 ■	●	EMP09
LNKT080412PNR-GM PG8020 ■	●	EMP09
LNKT120608PNR-GL PG8020 ■	●	EMP09
LNKT120608PNR-GM PG8020 ■	●	EMP09
LNKT120612PNR-GM PG8020 ■	●	EMP09
LNKT120616PNR-GM PG8020 ■	●	EMP09
LNKT120620PNR-GM PG8020 ■	●	EMP09
LNKT120624PNR-GM PG8020	●	EMP09
LNKT120632PNR-GM PG8020	●	EMP09
LNKT160708PNR-GL PG8020 ■	●	EMP09
LNKT160708PNR-GM PG8020 ■	●	EMP09
LNKT160712PNR-GM PG8020 ■	●	EMP09
LNKT160716PNR-GM PG8020 ■	●	EMP09
LNKT160732PNR-GM PG8020 ■	●	EMP09

● Ex stock ○ On demand

Article	Stock	Milling system
ONHU060404ANN-GL PG8020 ■	●	FMA12
ONHU060408ANN-GH PG8020 ■	●	FMA12
ONHU060408ANN-GM PG8020 ■	●	FMA12
ONHU09T508ANN-GH PG8020 ■	●	FMA12
ONHU09T508ANN-GL PG8020 ■	●	FMA12
ONHU09T508ANN-GM PG8020 ■	●	FMA12
ONMU060408-GH PG8020	●	FMA12
ONMU060408-GM PG8020	●	FMA12
ONMU09T512-GH PG8020	●	FMA12
ONMU09T512-GM PG8020	●	FMA12
RDMT10T3MO-MM PG8020 ■	●	FMR11
RDMT1204MO-MM PG8020 ■	●	FMR11
RPMT10T3MO-MM PG8020 ■	●	FMR11
RPMT1204MO-MM PG8020 ■	●	FMR11
SDMT06T208-DM PG8020	●	XMR01
SDMT06T208-NM PG8020	●	XMR01
SDMT09T312-DM PG8020	●	XMR01
SDMT09T312-NM PG8020	●	XMR01
SDMT120412-DM PG8020	●	XMR01
SDMT120412-NM PG8020	●	XMR01
SNGX1205PNN-GH PG8020	●	FMP17
SNGX1205PNN-GL PG8020	●	FMP17
SNGX1205PNN-GM PG8020	●	FMP17
SNGY12T508PNR-GM PG8020 ■	●	EMP08
SNMX120512-GH PG8020	●	FMA17/FMP17/FME17
SNMX120512-GL PG8020	●	FMA17/FMP17/FME17
SNMX120512-GM PG8020	●	FMA17/FMP17/FME17

● Ex stock ○ On demand

PG8030 grade

Ultra-efficient milling grade for HRSA materials

YOUR BENEFITS

– **Ultra-efficient milling grade** for difficult-to-machine materials
– Ideal for materials such as heat-resistant cast steel and duplex Materials
– **Heat-resistant anti-peeling coating**, even under variable thermal loads
– **Maximum process reliability** thanks to improved impact and wear resistance

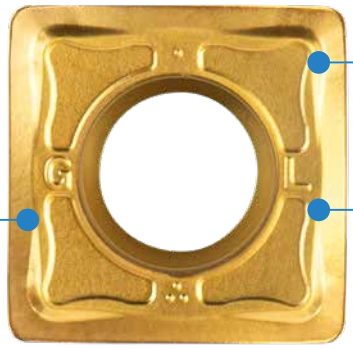


Fig.: SNGX1205PNN-GL PG8030

Update

Articles available with the new PG8030 grade:

Article	Stock	Milling system
APKT11T304-APL PG8030 ■	●	EMP01/EMP02
APKT11T308-APL PG8030 ■	●	EMP01/EMP02
APKT11T312-ANL PG8030 ■	●	EMP01/EMP02
APKT11T320-ANL PG8030 ■	●	EMP01/EMP02
APKT11T324-ANL PG8030 ■	●	EMP01/EMP02
APKT11T330-ANL PG8030 ■	●	EMP01/EMP02
APKT160408-APL PG8030 ■	●	EMP01/EMP02
APKT160420-ANL PG8030 ■	●	EMP01/EMP02
APKT160430-ANL PG8030 ■	●	EMP01/EMP02
APKT160440-ANL PG8030 ■	●	EMP01/EMP02
APKT160450-ANL PG8030 ■	●	EMP01/EMP02
LNKT080404PNR-GL PG8030 ■	●	EMP09
LNKT080404PNR-GM PG8030 ■	●	EMP09
LNKT080408PNR-GM PG8030 ■	●	EMP09
LNKT080412PNR-GM PG8030 ■	●	EMP09
LNKT120608PNR-GL PG8030 ■	●	EMP09
LNKT120608PNR-GM PG8030 ■	○	EMP09
LNKT120612PNR-GM PG8030 ■	●	EMP09
LNKT120616PNR-GM PG8030 ■	●	EMP09
LNKT120620PNR-GM PG8030 ■	●	EMP09
LNKT120624PNR-GM PG8030 ■	●	EMP09
LNKT120632PNR-GM PG8030 ■	●	EMP09
LNKT160708PNR-GL PG8030 ■	○	EMP09
LNKT160708PNR-GM PG8030 ■	○	EMP09
LNKT160712PNR-GM PG8030 ■	○	EMP09
LNKT160716PNR-GM PG8030 ■	○	EMP09
LNKT160732PNR-GM PG8030 ■	○	EMP09

● Ex stock ○ On demand

Article	Stock	Milling system
ONHU060404ANN-GL PG8030 ■	●	FMA12
ONHU060408ANN-GH PG8030 ■	●	FMA12
ONHU060408ANN-GM PG8030 ■	●	FMA12
ONHU09T508ANN-GH PG8030 ■	○	FMA12
ONHU09T508ANN-GL PG8030 ■	○	FMA12
ONHU09T508ANN-GM PG8030 ■	○	FMA12
ONMU060408-GH PG8030	●	FMA12
ONMU060408-GM PG8030	●	FMA12
ONMU09T512-GH PG8030	○	FMA12
ONMU09T512-GM PG8030	○	FMA12
RDMT10T3MO-MM PG8030 ■	●	FMR11
RDMT1204MO-MM PG8030 ■	●	FMR11
RPMT10T3MO-MM PG8030 ■	●	FMR11
RPMT1204MO-MM PG8030 ■	●	FMR11
RPMT1204MO-M PG8030 ■	●	FMR11
SDMT06T208-DM PG8030	●	XMR01
SDMT06T208-NM PG8030	●	XMR01
SDMT09T312-DM PG8030	●	XMR01
SDMT09T312-NM PG8030	●	XMR01
SDMT120412-DM PG8030	●	XMR01
SDMT120412-NM PG8030	●	XMR01
SNGX1205PNN-GH PG8030	●	FMP17
SNGX1205PNN-GL PG8030	●	FMP17
SNGX1205PNN-GM PG8030	●	FMP17
SNMX120512-GH PG8030	●	FMA17/FMP17/FME17
SNMX120512-GL PG8030	●	FMA17/FMP17/FME17
SNMX120512-GM PG8030	●	FMA17/FMP17/FME17

● Ex stock ○ On demand

EMP08 square shoulder milling system

Efficient and reliable 90° shoulder milling

YOUR BENEFITS

– **Maximum efficiency** thanks to eight-edged, double-sided inserts
– **Real 90° machining** thanks to complex contoured main cutting edge
– **Reliable results even when working** under difficult conditions thanks to optimised insert seat design
– **Universal tool** for large components with focus on **surface quality**, **reduction in cutting forces** and **process reliability**; ideal for **mass production applications**

Fig.: EMP08-063-A22-SN12-06C

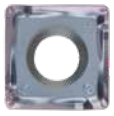
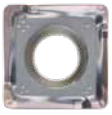
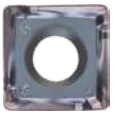
The **maximum cutting depth** in 90° shoulder machining operations with EMP08-SNGY12** is **8.3 mm**. For **lower width of cuts**, a **radial offset** of at least **0.4 mm** is required to ensure flawless shoulder formation.

Insert grades

PANGU

PG8020	YBM253	YBD152	YBG205H	YB9320	YBS303
CVD *S10 – S20* *M15 – M35*	*CVD* *P20 – P40* *M15 – M35*	*CVD* *K10 – K25*	*PVD* *P10 – P30* *M20 – M40*	*PVD* *P10 – P30* *M20 – M40*	*PVD* *S20 – S30* *M20 – M40*

Chip breaker

SN*Y-GL	SN*Y-GM	SN*Y-GH
		
Finishing	General machining	High-feed machining

Complex chip former for **controlled chip removal protects unused cutting edges**

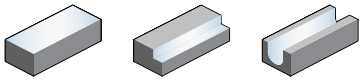
high-quality surface finish thanks to a large radius wiper

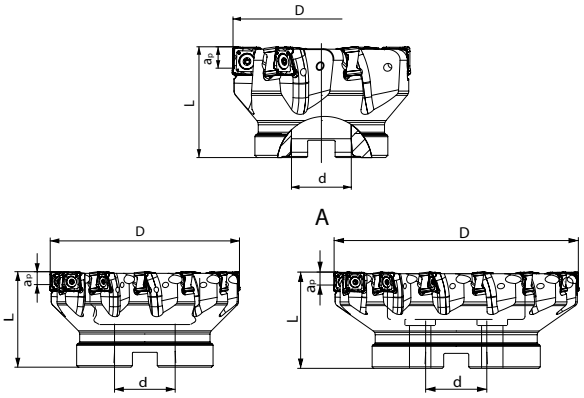
Low cutting forces thanks to positive cutting edge design

Fig.: SNGY12T508PNR-GM YBG205H

Square shoulder milling

EMP08 Kr: 90°





Article	✲	Stock	Dimensions [mm] ØD	ØD$_1$	ød	L$_1$	a$_{p\ max}$	Teeth	kg	Insert
EMP08-050-A22-SN12-04C	✲	●	50	40	22	40	8	4	0,25	SNGY12T508PNR**
EMP08-050-A22-SN12-05C	✲	●	50	40	22	40	8	5	0,24	
EMP08-063-A22-SN12-05C	✲	●	63	50	22	50	8	5	0,46	
EMP08-063-A22-SN12-06C	✲	●	63	50	22	50	8	6	0,48	
EMP08-080-A27-SN12-06C	✲	●	80	60	27	50	8	6	1,01	
EMP08-080-A27-SN12-08C	✲	●	80	60	27	50	8	8	1,01	
EMP08-100-B32-SN12-08C	✲	●	100	70	32	50	8	8	1,16	
EMP08-100-B32-SN12-10C	✲	●	100	70	32	50	8	10	1,11	
EMP08-125-B40-SN12-10C	✲	●	125	90	40	63	8	10	2,52	
EMP08-125-B40-SN12-12C	✲	●	125	90	40	63	8	12	2,45	
EMP08-160-C40-SN12-12		●	160	110	40	63	8	12	4,14	
EMP08-160-C40-SN12-14		●	160	110	40	63	8	14	4,07	
EMP08-200-C60-SN12-14		●	200	137	60	63	8	14	6,04	
EMP08-200-C60-SN12-16		●	200	137	60	63	8	16	6,03	

● Ex stock ○ On demand

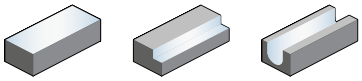
✲ With internal cooling

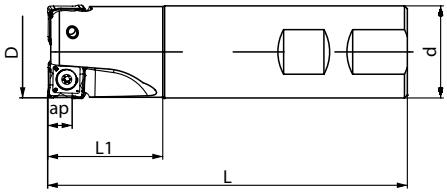
Spare parts

	Insert	**SNGY12T5**
	ØD	**32–200**
	Screw	IRM4x10 (3,4Nm)
	Wrench (Insert)	WT15IP/ WT15IS

Square shoulder milling

EMP08 Kr: 90°





Article	✻	Stock	Dimensions [mm]					Teeth	kg	Insert
			ØD	ød	L_1	L	$a_{p\ max}$			
EMP08-032-XP32-SN12-02C	✻	○	32	32	40	125	8	2	0,617	
EMP08-040-XP32-SN12-03C	✻	●	40	32	45	125	8	3	0,678	SNGY12T508PNR**
EMP08-040-XP32-SN12-04C	✻	●	40	32	45	125	8	4	0,776	

● Ex stock ○ On demand

✻ With internal cooling

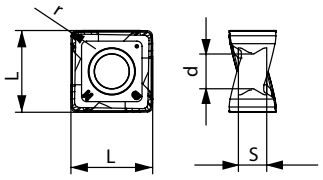
Spare parts

	Insert	**SNGY12T5**	
	ØD	**32–200**	
	Screw	IRM4x10 (3,4Nm)	
	Wrench (Insert)	WT15IP/ WT15IS	

Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

SNGY	L	I.C	S	d
12 T5	8,00	12,70	7,36	4,7

Milling Insert



SN** milling insert				HC¹ (CVD)			HC¹ (PVD)			HT	HC²	HW
				PG8020	YBM253	YBD152	YBG205H	YB9320	YBS303			
P				⊛			⊛	⊛				
M				⊛	⊛		⊛	⊛	⊛			
K					⊛							
N												
S				⊛				⊛				
H												
ISO		bs	r									
	SNGY12T508PNR-GL	1,2	0,8	●	●	●	●	●	●			
	SNGY12T508PNR-GM	1,2	0,8				●	●				
	SNGY12T508PNR-GH	1,2	0,8				●	●				

● Ex stock ○ On demand

HC¹ Coated carbide
HT Uncoated cermet
HC² Coated cermet
HW Uncoated carbide

Square shoulder milling system EMP08

EMP10 square shoulder milling system

Maximum feed rates to boost your production

YOUR BENEFITS

– Eight-edged, tangentially mounted inserts for **maximum efficiency** and **cutting force absorption**
– **Real 90° shoulder machining** thanks to complex contoured main cutting edge
– **High per-tooth feed rates** thanks to tangentially mounted insert
– Smooth, easy cuts; ideal for interrupted cuts and variable cutting conditions
– **Maximum reliability** thanks to enhanced insert seat geometry
– For any application involving steel, cast iron, stainless steel and difficult-to-machine materials; ideal choice for **low-cost mass production applications**

High cutting performance thanks to tangentially mounted inserts

Enhanced insert seat design for **superior load distribution**

Heavy-duty milling body for **maximum cutting rates** coupled with **High Performance reliability**

Fig.: EMP10-050-A22-S013-05C

Diameter range 40 – 160 mm

Insert grades

YBM253	YBG205H	YB9320
CVD	*PVD*	*PVD*
P20 – P40	*P10 – P30*	*P10 – P30*
M15 – M35	*M20 – M40*	*M20 – M40*

Chip breaker

SOKX-GM

General machining

Eight usable cutting edges for **maximum efficiency**

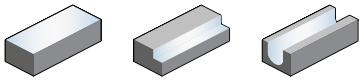
Dual rake angle design for **smooth cuts** with **high cutting edge stability**

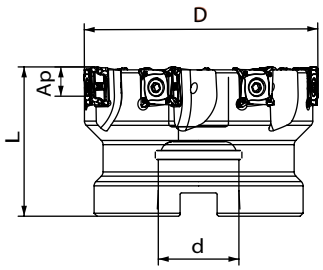
Complex contoured main cutting edge for **high-precision 90° shoulder machining operations**

Fig.: SOKX130608PNR-GM YGB205H

Square shouler milling

EMP10 Kr: 90°





Article	✻	Stock	Dimensions [mm]				Teeth	kg	Insert
			ØD	ød	L_1	$a_{p\,max}$			
EMP10-040-A16-SO13-03C	✻	○	40	16	40	8	3	0,25	
EMP10-040-A16-SO13-04C	✻	●	40	16	40	8	4	0,21	
EMP10-040-A16-SO13-05C	✻	○	40	16	40	8	5	0,20	
EMP10-050-A22-SO13-04C	✻	●	50	22	40	8	4	0,35	
EMP10-050-A22-SO13-05C	✻	●	50	22	40	8	5	0,32	
EMP10-050-A22-SO13-06C	✻	●	50	22	40	8	6	0,32	
EMP10-063-A22-SO13-06C	✻	●	63	22	40	8	6	0,56	
EMP10-063-A22-SO13-07C	✻	○	63	22	40	8	7	0,56	
EMP10-063-A22-SO13-08C	✻	○	63	22	40	8	8	0,57	
EMP10-080-A27-SO13-06C	✻	○	80	27	50	8	6	1,17	SOKX130608PNR-GM
EMP10-080-A27-SO13-07C	✻	●	80	27	50	8	7	1,19	
EMP10-080-A27-SO13-09C	✻	○	80	27	50	8	9	1,18	
EMP10-100-B32-SO13-08C	✻	○	100	32	50	8	8	1,64	
EMP10-100-B32-SO13-12C	✻	○	100	32	50	8	12	1,66	
EMP10-125-B40-SO13-10C	✻	○	125	40	63	8	10	3,21	
EMP10-125-B40-SO13-15C	✻	○	125	40	63	8	15	3,23	
EMP10-160-B40-SO13-12C	✻	○	160	40	63	8	12	6,2	
EMP10-160-B40-SO13-18C	✻	○	160	40	63	8	18	6,21	

● Ex stock ○ On demand

✻ With internal cooling

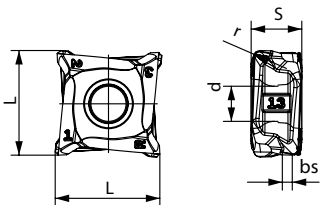
Spare parts

	Insert	**SOKX1306**
	ØD	**40–160**
	Screw	l60M4*12 (3,4Nm)
	Wrench (insert)	WT15IS

Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

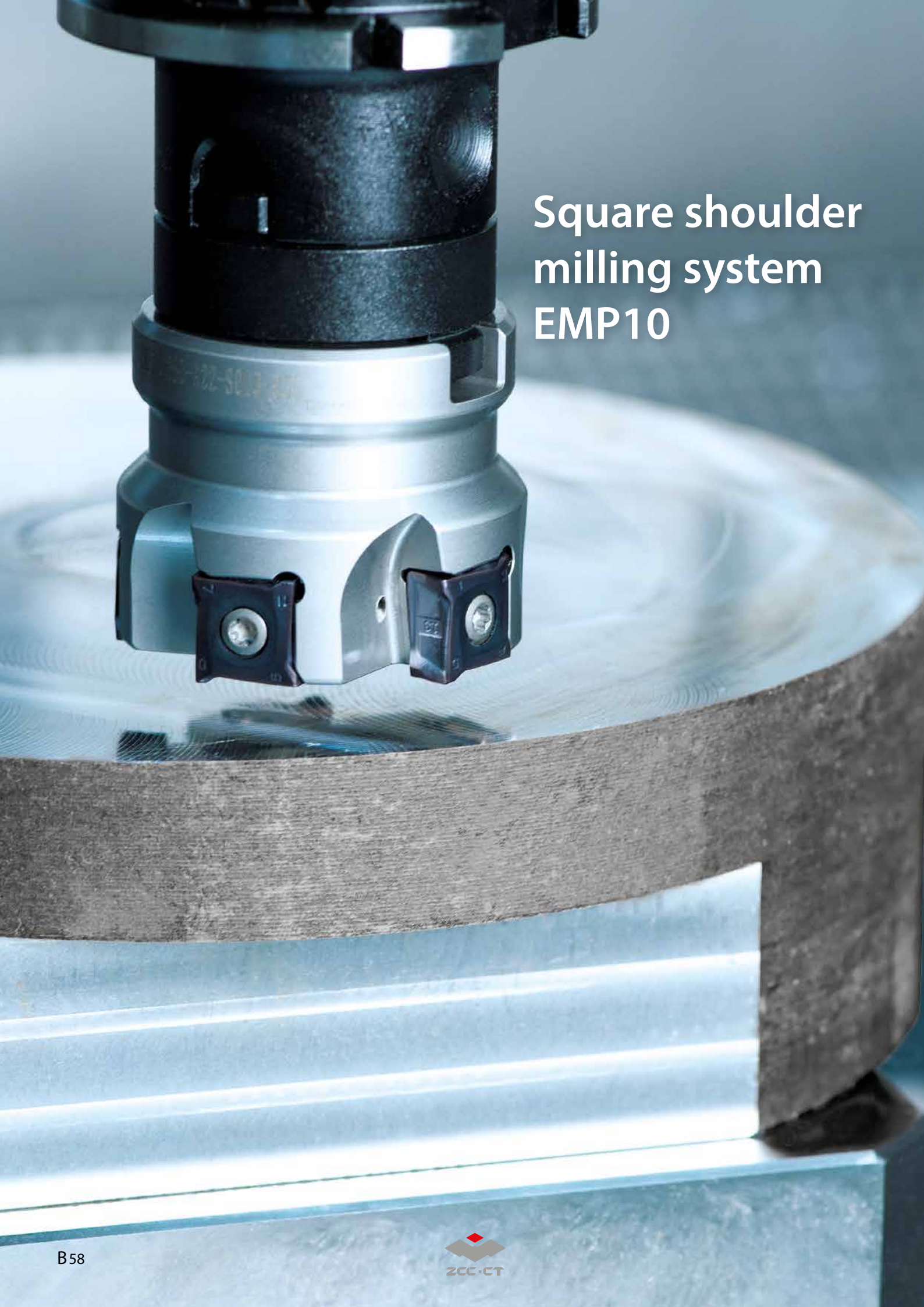
SOKX	L	I.W	S	d
13 06	8,00	12,70	7,36	4,7

Milling insert

SO** milling insert				HC[1] (CVD)	HC[1] (PVD)		HT	HC[2]	HW
			P						
			M						
			K						
			N						
			S						
			H						
ISO		bs	r	YBM253	YBG205H	YB9320			
	**SOKX130608PNR-GM**	1,35	0,8	●	●	●			

● Ex stock ○ On demand

HC[1] Coated carbide
HT Uncoated cermet
HC[2] Coated cermet
HW Uncoated carbide



Square shoulder milling system EMP10

Notes

XMR13 high-feed milling system

For maximum performance in terms of feed rate and efficiency

YOUR BENEFITS

– Eight-edged, double-sided inserts for **maximum efficiency**
– Enhanced 3D contour of the cutting edge **decreases cutting forces** and **increases process reliability**
– Steady, even increase in cutting force when entering the material serves **to protect the cutting edge**
– Constant cutting forces during operation for **smooth** and **reliable machining**
– **High quality chip control** in steel, tool steel and cast iron

Available in coarse and fine pitch for **feed rate optimisation to match varied application**

Double-sided insert for **maximum cutting stability**

Heavy-duty milling body for **maximum cutting force absorption**

Fig.: XMR13-063-A22-SN13-06C

Diameter range 50 – 160 mm

Insert grades

YBM253	YBC302	YBG205H	YB9320	YBS303
CVD *P20 – P40* *M15 – M35*	*CVD* *P20 – P40*	*PVD* *P10 – P30* *M20 – M40*	*PVD* *P10 – P30* *M20 – M40*	*PVD* *S20 – S30* *M20 – M40*

Chip breaker

SNMU-GL

Universal geometry

SNMU-GM

General machining

Eight usable cutting edges for **maximum efficiency**

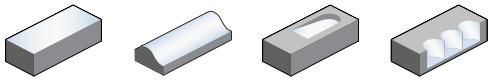
Wiper geometry designed to deliver **high quality surface quality**

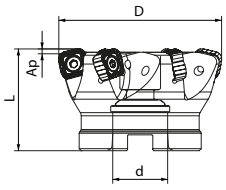
Enhanced 3D contour

Fig.: SNMU130520-GL YBG205H

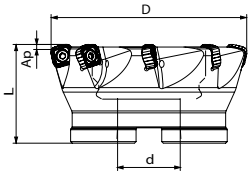
High-feed milling

XMR13 Kr: 15°

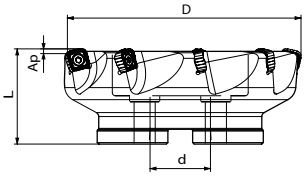




A



B



C

Article	✻	Stock	Dimensions [mm]				Teeth	Coupling	kg	Insert
			ØD	ød	L	$a_{p\ max}$				
XMR13-050-A22-SN13-04C	✻	●	50	22	40	1,9	4	A	0,5	
XMR13-063-A22-SN13-05C	✻	●	63	22	40	1,9	5	A	0,8	
XMR13-063-A22-SN13-07C	✻	●	63	22	40	1,9	7	A	1,0	
XMR13-080-A27-SN13-06C	✻	●	80	27	50	1,9	6	A	1,0	
XMR13-080-A27-SN13-08C	✻	●	80	27	50	1,9	8	A	1,5	SNMU130520**
XMR13-100-B32-SN13-07C	✻	●	100	32	50	1,9	7	B	1,5	
XMR13-100-B32-SN13-10C	✻	●	100	32	50	1,9	10	B	2,0	
XMR13-125-B32-SN13-08C	✻	●	125	32	63	1,9	8	B	3,0	
XMR13-160-C40-SN13-09	✻	●	160	40	63	1,9	9	C	5,0	

● Ex stock ○ On demand

✻ With internal cooling

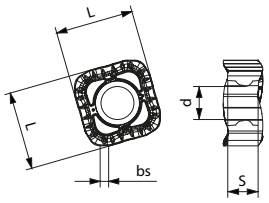
Spare parts

	Insert	**SNMU1305**
	ØD	**50–160**
	Screw	I60M5X13 (3,5Nm)
	Wrench (insert)	WT20IT

Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

SNMU	L	I.C	S	d
13 05	13,50	13,50	5,28	5,7

Milling insert



SN** milling insert				HC¹ (CVD)		HC¹ (PVD)			HT	HC²	HW
			P								
			M								
			K								
			N								
			S								
			H								
ISO		bs	r	YBM253	YBC302	YBG205H	YB9320	YBS303			
	**SNMU130520-GL**	1,5	2,0			●	●	○			
	SNMU130520-GM	1,5	2,0	●	○	●	○	●			

● Ex stock ○ On demand

HC¹ Coated carbide
HT Uncoated cermet
HC² Coated cermet
HW Uncoated carbide

Indexable milling – group 2 (FMA01/02/03/04, FME02/03/17, FMP01/02, EMP01/02/03/04/05/08/10/14)

Material group		Composition / structure / heat treatment			Machining group	Starting values for cutting speed v_c [m/min]							
						HC (CVD)							
						YBC302		YBC401		YBD152		YBD252	
						a_e / D		a_e / D		a_e / D		a_e / D	
						1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	245	285	210	245				
		approx. 0,45 % C	annealed	190	2	210	245	180	210				
		approx. 0,45 % C	tempered	250	3	200	230	170	200				
		approx. 0,75 % C	annealed	270	4	175	200	150	175				
		approx. 0,75 % C	tempered	300	5	160	190	140	160				
	Low-alloyed steel		annealed	180	6	210	245	180	210				
			tempered	275	7	175	200	150	175				
			tempered	300	8	160	190	140	160				
			tempered	350	9	135	160	120	135				
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	125	145	105	125				
			hardened and tempered	325	11	90	100	75	90				
M	Stainless steel	ferritic/martensitic	annealed	200	12								
		martensitic	tempered	240	13								
		austenitic	quench hardened	180	14								
		austenitic-ferritic		230	15								
K	Grey cast iron	perlitic/ferritic		180	16					315	365	270	315
		perlitic (martensitic)		260	17					185	215	160	190
	Cast iron with spheroidal graphite	ferritic		160	18					215	250	185	215
		perlitic		250	19					145	170	125	145
	Malleable cast iron	ferritic		130	20					260	300	225	260
		perlitic		230	21					175	205	150	175
N	Aluminium wrought alloys	cannot be hardened		60	22								
		hardenable	hardened	100	23								
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24								
		≤ 12 % Si, hardenable	hardened	90	25								
		> 12 % Si, cannot be hardened		130	26								
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27								
		CuZn, CuSnZn		90	28								
		CuSn, Pb-free copper, electrolytic copper		100	29								
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30								
			hardened	280	31								
		Ni or Co bass	annealed	250	32								
			hardened	350	33								
			cast	320	34								
	Titanium alloys	pure titanium		R_m 400	35								
		α and β alloys	hardened	R_m 1050	36								
H	Hardened steel		hardened and tempered	55 HRC	37								
			hardened and tempered	60 HRC	38								
	Hard cast iron		cast	400	39								
	Hardened cast iron		hardened and tempered	55 HRC	40								
X	Non-metallic materials	Thermoplasts			41								
		Thermosetting plastics			42								
		Plastic, glass-fibre reinforced GFRP			43								
		Plastic, carbon fibre reinforced CFRP			44								
		Graphite			45								
		Wood			46								

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.
Feed rate recommendations on page B38–B43.

	Starting values for cutting speed v_c [m/min]																					
	HC (CVD)				HC (PVD)														HW			
	YBM253		PG8020		YBG101		YBG102		YBG152		YB9320		YBG205(H)		YBG252		YBG302		YD101		YD201	
	a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D		a_e / D	
	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5	1/1 | 3/4	1/5
	245	285					255	295	240	280	230	265	220	255	215	250	210	245				
	210	245					220	255	205	240	200	230	190	220	185	215	180	210				
	200	230					205	240	195	225	185	215	180	205	175	200	170	200				
	175	200					180	210	170	200	165	190	155	180	155	175	150	175				
	160	190					170	195	160	185	150	175	145	170	140	165	140	160				
	210	245					220	255	205	240	200	230	190	220	185	215	180	210				
	175	200					180	210	170	200	165	190	155	180	155	175	150	175				
	160	190					170	195	160	185	150	175	145	170	140	165	140	160				
	135	160					145	165	135	155	130	150	125	145	120	140	120	135				
	125	145					130	150	120	140	115	135	110	130	110	125	105	125				
	90	100					90	105	85	100	85	95	80	90	80	90	75	90				
	125	145	145	165			130	150	120	140	115	135	110	130	110	125	105	125				
	105	120	120	137			110	125	105	120	100	115	95	110	95	105	90	105				
	130	155	150	171			140	160	130	150	125	145	120	140	115	135	115	130				
	105	120	120	137			110	125	105	120	100	115	95	110	95	105	90	105				
							285	330	265	305	255	295	245	285	240	280	235	275				
							170	195	160	185	150	175	145	170	140	165	140	160				
							195	225	180	210	175	200	165	195	165	190	160	185				
							130	150	120	140	115	135	110	130	110	125	105	125				
							230	270	220	255	210	240	200	230	195	225	190	225				
							155	180	145	170	140	160	135	155	130	150	130	150				
					1505	1735													1205	1390	1040	1200
					1225	1420													980	1140	850	980
					540	620													435	500	375	435
					435	505													350	405	300	350
					220	255													180	205	155	180
					170	195													140	160	120	140
					210	245													170	200	150	170
					385	445													310	360	265	310
			75	86			75	85	70	80	65	75	65	75	65	75	60	70				
			52	59			50	55	50	55	45	50	45	50	45	50	40	45				
			63	72			60	70	55	65	55	65	50	55	50	55	50	55				
			35	40			35	40	35	40	30	35	30	35	30	35	30	35				
			75	86			45	50	45	50	40	45	40	45	40	45	40	45				
			75	86			75	85	70	80	65	75	65	75	65	75	60	70				
			75	86			75	85	70	80	65	75	65	75	65	75	60	70				

HC Coated carbide
HT Uncoated carbide, primary component (TiC) or (TiN), cermet
HW Uncoated carbide, primary component (WC)
BL Cubic boron nitride with low BN content
BH Cubic boron nitride with high BN content
CN Si3N4 ceramic
CM Mixed ceramic
HC_1 Coated cermet
BC CBN with coating
CC Coated cutting ceramic
CR Cutting ceramic, primary component aluminium oxide (Al_2O_3), reinforced
DP Polycrystalline diamond

Indexable milling – group 7 (XMR01, XMR12, XMR13, XMP01, QCH)

Material group		Composition / structure / heat treatment			Machining group	Starting values for cutting speed v_c [m/min] HC (CVD) YBC302 a_e / D 1/1 | 3/4	YBC302 a_e / D 1/5	YBC302 a_e / D 1/20	YBD152 a_e / D 1/1 | 3/4	YBD152 a_e / D 1/5	YBD152 a_e / D 1/20
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	260	300	390			
		approx. 0,45 % C	annealed	190	2	225	255	335			
		approx. 0,45 % C	tempered	250	3	210	240	315			
		approx. 0,75 % C	annealed	270	4	185	210	275			
		approx. 0,75 % C	tempered	300	5	170	195	255			
	Low-alloyed steel		annealed	180	6	225	255	335			
			tempered	275	7	185	210	275			
			tempered	300	8	170	195	255			
			tempered	350	9	145	165	215			
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	130	150	195			
			hardened and tempered	325	11	95	105	140			
M	Stainless steel	ferritic/martensitic	annealed	200	12						
		martensitic	tempered	240	13						
		austenitic	quench hardened	180	14						
		austenitic-ferritic		230	15						
K	Grey cast iron	perlitic/ferritic		180	16				335	390	510
		perlitic (martensitic)		260	17				200	230	300
	Cast iron with spheroidal graphite	ferritic		160	18				225	260	340
		perlitic		250	19				150	175	230
	Malleable cast iron	ferritic		130	20				275	320	420
		perlitic		230	21				185	215	280
N	Aluminium wrought alloys	cannot be hardened		60	22						
		hardenable	hardened	100	23						
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24						
		≤ 12 % Si, hardenable	hardened	90	25						
		> 12 % Si, cannot be hardened		130	26						
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27						
		CuZn, CuSnZn		90	28						
		CuSn, Pb-free copper, electrolytic copper		100	29						
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30						
			hardened	280	31						
		Ni or Co bass	annealed	250	32						
			hardened	350	33						
			cast	320	34						
	Titanium alloys	pure titanium		R_m 400	35						
		α and β alloys	hardened	R_m 1050	36						
H	Hardened steel		hardened and tempered	55 HRC	37						
			hardened and tempered	60 HRC	38						
	Hard cast iron		cast	400	39						
	Hardened cast iron		hardened and tempered	55 HRC	40						
X	Non-metallic materials	Thermoplasts			41						
		Thermosetting plastics			42						
		Plastic, glass-fibre reinforced GFRP			43						
		Plastic, carbon fibre reinforced CFRP			44						
		Graphite			45						
		Wood			46						

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.
Feed rate recommendations on page B38–B43.

	Starting values for cutting speed v_c [m/min]																				
	HC (CVD)						HC (PVD)														
	YBD252			YBM253			YBG102			YBG152			YB9320			YBG205(H)			YBG212		
	a_e / D			a_e / D			a_e / D			a_e / D			a_e / D			a_e / D			a_e / D		
	1/1 | 3/4	1/5	1/20	1/1 | 3/4	1/5	1/20	1/1 | 3/4	1/5	1/20	1/1 | 3/4	1/5	1/20	1/1 | 3/4	1/5	1/20	1/1 | 3/4	1/5	1/20	1/1 | 3/4	1/5	1/20
				260	300	390	270	315	410	255	295	385	245	285	375	235	275	360	240	280	365
				225	255	335	230	270	355	220	255	335	210	245	320	200	235	310	205	240	315
				210	240	315	220	255	335	205	240	315	200	230	300	190	220	290	195	225	295
				185	210	275	190	225	295	180	210	275	175	200	260	165	195	255	170	200	260
				170	195	255	180	205	270	170	195	255	160	190	250	155	180	235	160	185	245
				225	255	335	230	270	355	220	255	335	210	245	320	200	235	310	205	240	315
				185	210	275	190	225	295	180	210	275	175	200	260	165	195	255	170	200	260
				170	195	255	180	205	270	170	195	255	160	190	250	155	180	235	160	185	245
				145	165	215	150	175	230	145	165	215	135	160	210	130	155	205	135	155	205
				130	150	195	135	160	210	130	150	195	125	145	190	120	140	185	120	140	185
				95	105	140	95	115	150	90	105	140	90	100	130	85	100	130	85	100	130
				130	150	195	135	160	205	130	150	195	125	145	190	120	140	180	120	140	185
				110	130	165	115	135	175	110	125	165	105	120	160	100	120	155	105	120	155
				140	160	210	145	170	220	140	160	205	130	155	200	125	150	195	130	150	195
				110	130	165	115	135	175	110	125	165	105	120	160	100	120	155	105	120	155
	290	335	440				300	345	450	285	330	430	270	315	410	260	300	390	265	305	400
	170	195	255				180	205	270	170	195	255	160	190	250	155	180	235	160	185	245
	195	225	295				205	240	315	195	225	295	185	215	280	180	210	275	180	210	275
	130	150	195				135	160	210	130	150	195	125	145	190	120	140	185	120	140	185
	235	270	355				245	285	375	230	270	355	225	260	340	215	250	325	220	255	335
	160	180	235				165	190	250	155	180	235	150	175	230	145	165	215	145	170	225

HC Coated carbide
HT Uncoated carbide, primary component (TiC) or (TiN), cermet
HW Uncoated carbide, primary component (WC)
BL Cubic boron nitride with low BN content
BH Cubic boron nitride with high BN content
CN Si3N4 ceramic
CM Mixed ceramic
HC_1 Coated cermet
BC CBN with coating
CC Coated cutting ceramic
CR Cutting ceramic, primary component aluminium oxide (Al_2O_3), reinforced
DP Polycrystalline diamond

Recommended feed rate

Indexable milling – group 2 (FMA01/02/03/04, FME02/03/17, FMP01/02, EMP01/02/03/04/05/08/10/14)

Material group		Feed rate per cutting edge [mm]																	
		FMA01 | FMA02			FMA03			FMA03			FMA04			FMA04			FMA04		
		SEET12			SEKN12			SEKN15			OFKT05			OFKR07			ODHT06		
		Application																	
		F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R
P	Unalloyed steel	0,15	0,20	0,25		0,18			0,20		0,20	0,25		0,20	0,25		0,20	0,25	
	Low-alloyed steel	0,14	0,19	0,23		0,17			0,19		0,19	0,23		0,19	0,23		0,19	0,23	
	High-alloyed steel and high-alloyed tool steel	0,13	0,18	0,22		0,16			0,18		0,18	0,22		0,18	0,22		0,18	0,22	
M	Stainless steel	0,11	0,14	0,18		0,13			0,14		0,14	0,18		0,14	0,18		0,14	0,18	
K	Grey cast iron	0,17	0,22	0,28		0,20			0,22		0,22	0,28		0,22	0,28		0,22	0,28	
	Cast iron with spheroidal graphite	0,15	0,20	0,25		0,18			0,20		0,20	0,25		0,20	0,25		0,20	0,25	
	Malleable cast iron	0,15	0,20	0,25		0,18			0,20		0,20	0,25		0,20	0,25		0,20	0,25	
N	Aluminium wrought alloys	0,13	0,17	0,21							0,17	0,21		0,17	0,21		0,17	0,21	
	Aluminum cast alloys	0,13	0,17	0,21							0,17	0,21		0,17	0,21		0,17	0,21	
	Copper and copper alloys (bronze/brass)	0,11	0,15	0,19							0,15	0,19		0,15	0,19		0,15	0,19	
S	Heat-resistant alloys	0,11	0,14	0,18							0,14	0,18		0,14	0,18		0,14	0,18	
	Titanium alloys	0,11	0,14	0,18							0,14	0,18		0,14	0,18		0,14	0,18	
H	Hardened steel																		
	Hard cast iron																		
	Hardened cast iron																		
X	Non-metallic materials																		

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Indexable milling – group 2 (FMA01/02/03/04, FME02/03/17, FMP01/02, EMP01/02/03/04/05/08/10/14)

Material group		Feed rate per cutting edge [mm]																	
		EMP03 | EMP04			EMP05			EMP08			EMP10			EMP14					
		APKT11			ADKT**			SNGY			SOKX			VPGT22					
		Application																	
		F	M	R	F	M	R	F	M	R	F	M	R	F	M	R			
P	Unalloyed steel	0,12	0,17	0,23	0,10	0,15	0,20	0,12	0,2	–	0,12	0,2	–						
	Low-alloyed steel	0,11	0,16	0,21	0,09	0,14	0,19	0,1	0,14	–	0,1	0,14	–						
	High-alloyed steel and high-alloyed tool steel	0,10	0,15	0,20	0,09	0,13	0,18	0,1	0,14	–	0,1	0,14	–						
M	Stainless steel	0,08	0,12	0,16	0,07	0,11	0,14	0,1	0,14	–	0,1	0,14	–						
K	Grey cast iron	0,13	0,19	0,25	0,11	0,17	0,22	0,1	0,2	–	0,1	0,2	–						
	Cast iron with spheroidal graphite	0,12	0,17	0,23	0,10	0,15	0,20	0,1	0,2	–	0,1	0,2	–						
	Malleable cast iron	0,12	0,17	0,23	0,10	0,15	0,20	0,1	0,2	–	0,1	0,2	–						
N	Aluminium wrought alloys	0,10	0,15	0,20	0,09	0,13	0,17							0,05	0,2	0,3			
	Aluminum cast alloys	0,10	0,15	0,20	0,09	0,13	0,17							0,05	0,2	0,3			
	Copper and copper alloys (bronze/brass)	0,09	0,13	0,18	0,08	0,11	0,15							0,05	0,2	0,3			
S	Heat-resistant alloys																		
	Titanium alloys																		
H	Hardened steel																		
	Hard cast iron																		
	Hardened cast iron																		
X	Non-metallic materials																		

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

	Feed rate per cutting edge [mm]																							
	FME02			FME03			FME03			FME17			FMP01			FMP02			EMP01 | EMP02			EMP01 | EMP02		
	SPK*12			SPK*12			SPK*15			SNGX1205ENN**			TPKN22			SEET12			APKT11			APKT16		
	Application																							
	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R
		0,20			0,19			0,20		0,20	0,25			0,20		0,15	0,20	0,25	0,10	0,15	0,20	0,12	0,17	0,23
		0,19			0,17			0,19		0,19	0,23			0,19		0,14	0,19	0,23	0,09	0,14	0,19	0,11	0,16	0,21
		0,18			0,16			0,18		0,18	0,22			0,18		0,13	0,18	0,22	0,09	0,13	0,18	0,10	0,15	0,20
		0,14			0,13			0,14		0,14	0,18			0,14		0,11	0,14	0,18	0,07	0,11	0,14	0,08	0,12	0,16
		0,22			0,20			0,22		0,22	0,28			0,22		0,17	0,22	0,28	0,11	0,17	0,22	0,13	0,19	0,25
		0,20			0,19			0,20		0,20	0,25			0,20		0,15	0,20	0,25	0,10	0,15	0,20	0,12	0,17	0,23
		0,20			0,19			0,20		0,20	0,25			0,20		0,15	0,20	0,25	0,10	0,15	0,20	0,12	0,17	0,23
										0,17	0,21					0,13	0,17	0,21	0,09	0,13	0,17	0,10	0,15	0,20
										0,17	0,21					0,13	0,17	0,21	0,09	0,13	0,17	0,10	0,15	0,20
										0,15	0,19					0,11	0,15	0,19	0,08	0,11	0,15	0,09	0,13	0,18
										0,14	0,18													
										0,14	0,18													

F Finishing
M Medium machining
R Roughing

F Finishing
M Medium machining
R Roughing

Recommended feed rate

Indexable milling – group 7 (XMR01, XMR12, XMR13, XMP01, QCH)

Material group		Feed rate per cutting edge [mm]								
		XMR01 face milling			XMR01 plunge milling			XMR01 circular milling		
		SDMT/WPGT			SDMT/WPGT			SDMT/WPGT		
		Tool diameter [mm]								
		20–25	30–50	63–160	20–25	30–50	63–160	20–25	30–50	63–160
P	Unalloyed steel	1,00	1,20	2,00	0,20	0,25	0,30	0,80	0,96	1,40
P	Low-alloyed steel	0,93	1,12	1,86	0,19	0,23	0,28	0,74	0,89	1,30
P	High-alloyed steel and high-alloyed tool steel	0,70	0,84	1,40	0,18	0,22	0,26	0,70	0,84	1,23
M	Stainless steel	0,50	0,60	1,00	0,14	0,18	0,21	0,56	0,67	0,98
K	Grey cast iron	0,90	1,08	1,80	0,22	0,28	0,33	0,88	1,06	1,54
K	Cast iron with spheroidal graphite	0,90	1,08	1,80	0,20	0,25	0,30	0,80	0,96	1,40
K	Malleable cast iron	1,00	1,20	2,00	0,20	0,25	0,30	0,80	0,96	1,40
N	Aluminium wrought alloys									
N	Aluminum cast alloys									
N	Copper and copper alloys (bronze/brass)									
S	Heat-resistant alloys									
S	Titanium alloys									
H	Hardened steel									
H	Hard cast iron									
H	Hardened cast iron									
X	Non-metallic materials									

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Indexable milling – group 7 (XMR01, XMR12, XMR13, XMP01, QCH)

Material group		Feed rate per cutting edge [mm]							
		XMP01	QCH	QCH	QCH	QCH	QCH	QCH	QCH
		CNE	ZOHX	RD*	APKT	WPGT	SDMT	XPHT	ENMX
		Tool diameter [mm]							
		80–400	16–32	15–32	16–40	20–42	20–40	16–32	16–40
P	Unalloyed steel	0,20	0,20	0,20	0,15	1,00	1,00	0,20	1,00
P	Low-alloyed steel	0,20	0,19	0,19	0,14	0,93	0,93	0,19	0,93
P	High-alloyed steel and high-alloyed tool steel	0,20	0,18	0,18	0,13	0,70	0,70	0,18	0,70
M	Stainless steel	0,20	0,14	0,14	0,11	0,50	0,50	0,14	0,50
K	Grey cast iron	0,20	0,22	0,22	0,17	0,90	0,90	0,22	0,90
K	Cast iron with spheroidal graphite	0,20	0,20	0,20	0,15	0,90	0,90	0,20	0,90
K	Malleable cast iron	0,20	0,20	0,20	0,15	1,00	1,00	0,20	1,00
N	Aluminium wrought alloys				0,13				
N	Aluminum cast alloys				0,13				
N	Copper and copper alloys (bronze/brass)				0,11				
S	Heat-resistant alloys								
S	Titanium alloys								
H	Hardened steel								
H	Hard cast iron								
H	Hardened cast iron								
X	Non-metallic materials								

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

	Feed rate per cutting edge [mm]								
	XMR01 face milling		XMR01 plunge milling		XMR01 circular milling		XMR12	XMR13	
	ENMX-R30 / ENMX-XR		ENMX-R30 / ENMX-XR		ENMX-R30 / ENMX-XR		ENMX-08-GM	SNMU13	
	Tool diameter [mm]								
	16–30	32–63	16–30	32–63	16–30	32–63	16–63	50–160	
	1,00	1,20	0,20	0,25	0,80	0,96	0,20	1,5	
	0,93	1,12	0,19	0,23	0,74	0,89	0,20	1,5	
	0,70	0,84	0,18	0,22	0,70	0,84	0,20	1,2	
	0,50	0,60	0,14	0,18	0,56	0,67	0,20	1,2	
	0,90	1,08	0,22	0,28	0,88	1,06	0,20	1,5	
	0,90	1,08	0,20	0,25	0,80	0,96	0,20	1,2	
	1,00	1,20	0,20	0,25	0,80	0,96	0,20	1,2	

PGMS series

Solid carbide milling

B

Solid carbide milling System code – DIN-ISO

5	5	0	1	R	30	2	GM	R05	0800
1	2	3	4	5	6	7	8	9	10

1 Type

Code	Description
5	Milling cutter

2 Shank type

Code	Description
1	Shank
5	DIN 6535 HA
6	Weldon shank DIN 6535 HB
7	Whistle Notch DIN 6535 HE
9	Morse taper shank

3 Cutting edge type

Code	Description
0	Square shoulder mill
6	Ball nose cutter
8	Torus mill

4 Tool length

Code	Description
1	DIN 6527 K
2	DIN 6527 L
5	Factory standard ZCC-A
6	Factory standard ZCC-B
8	DIN 6528
9	Factory standard ZCC-D

5 Rotation direction

Code	Description
R	Right
L	Left

6 Helix angle

Code	Description
20	20°
30	30°
3841	38°/41°
45	45°
55	55°
60	60°

7 Number of teeth

Code	Description
2	2
...	
M	Indicated when different diameters have a different number of teeth

8 Application

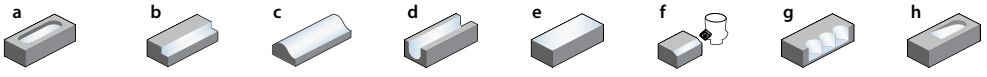
Code	Description
GM	Semi-finishing
GF	Finishing
HM	Hard machining
MHH	High-speed hard machining
NH	High-performance machining of heat-resistant alloys

9 Radius [mm]

Code	Description
R03	0,3
R15	1,5
R30	3,0
...	

10 Diameter [mm]

Code	Description
0100	1,0
0800	8,0
2000	20,0
...	



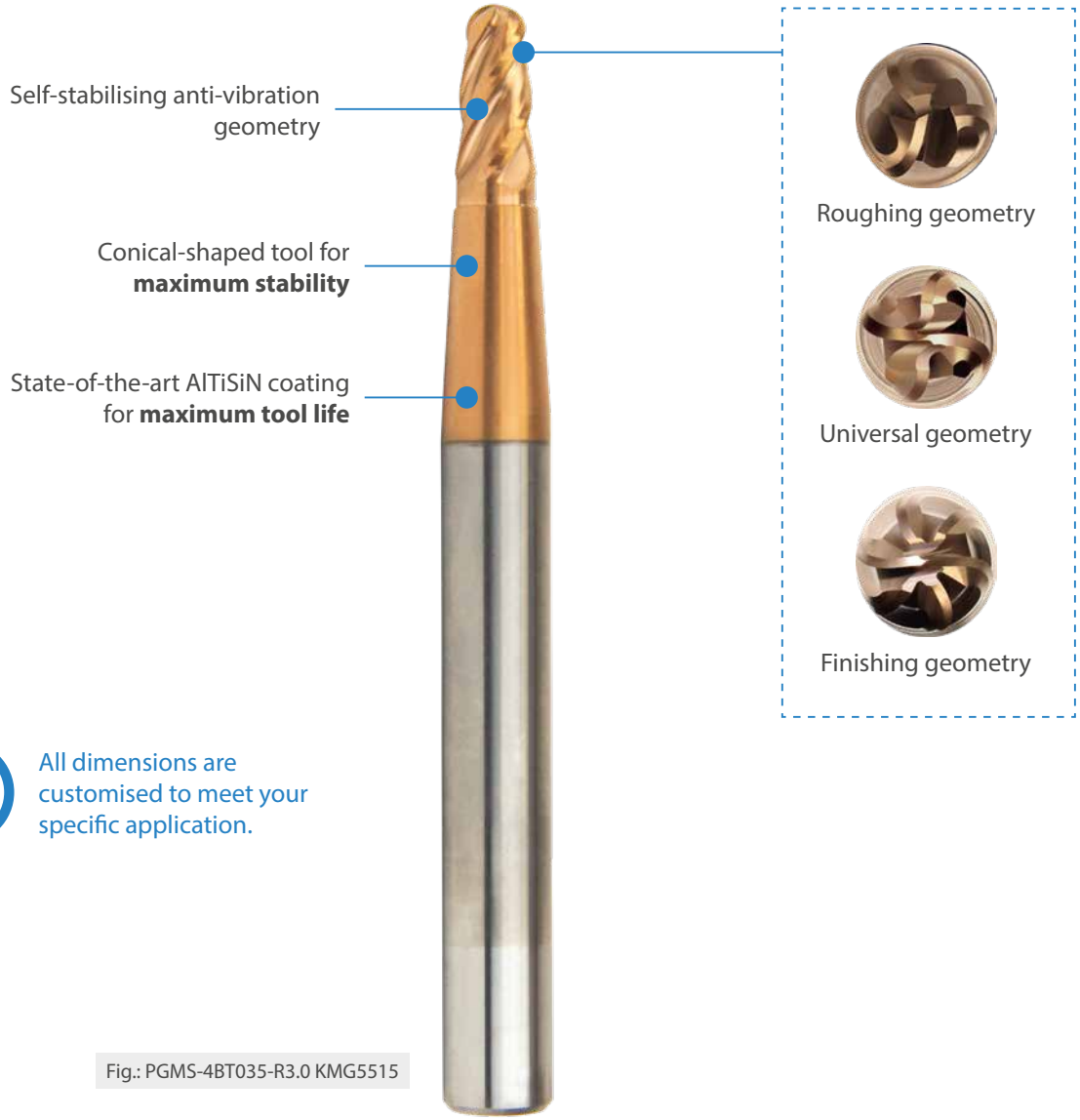
a Groove milling
b Square shoulder milling
c Profile milling
d Slot milling
e Face milling
f Chamfer milling
g Plunge milling
h Circular milling/Ramping

PGMS series

The ideal choice for complex contours

YOUR BENEFITS

– **Higher productivity** thanks to conical cutting edge
– **Flawless surface quality** made possible by low-vibration machining
– **Shorter process times** thanks to enhanced tool geometry
– **Extremely long tool life** when machining HRSA and titanium thanks to customised cutting edge geometry



All dimensions are customised to meet your specific application.

Fig.: PGMS-4BT035-R3.0 KMG5515

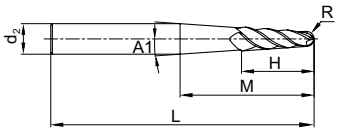
Ball nose cutters

High-performance machining

Update

PGMS-4BT

– Straight shank
– Centre cutting
– Tapered cutting edge



Article	✻	Dimensions [mm]						Grade
		A1	R	d_2	H	M	L	KMG5515
PGMS-4BT020-R1.0		2°	1.0	4	10	32.5	60	●
PGMS-4BT020-R2.0		2°	2.0	4	12	33.5	75	●
PGMS-4BT020-R4.0		2°	4.0	10	15	35.5	100	●
PGMS-4BT020-R5.0		2°	5.0	12	20	65	120	●
PGMS-4BT020-R6.0		2°	6.0	16	25	66	150	●
PGMS-4BT040-R1.0		4°	1.0	6	10	31	75	●
PGMS-4BT040-R2.0		4°	2.0	8	12	32	100	●
PGMS-4BT040-R4.0		4°	4.0	12	15	34	100	●
PGMS-4BT040-R5.0		4°	5.0	16	20	49	120	●
PGMS-4BT040-R6.0		4°	6.0	20	25	64.5	150	●
PGMS-4BT050-R2.0		5°	2.0	8	12	26	75	●
PGMS-4BT050-R3.0		5°	3.0	12	15	38	100	●
PGMS-4BT050-R4.0		5°	4.0	16	15	50	100	●
PGMS-4BT050-R5.0		5°	5.0	16	20	40	120	●
PGMS-4BT050-R6.0		5°	6.0	20	25	52.5	150	●
PGMS-4BT060-R2.0		6°	2.0	10	12	40	100	●
PGMS-4BT060-R4.0		6°	4.0	16	15	42	100	●
PGMS-4BT060-R5.0		6°	5.0	18	20	43	120	●
PGMS-4BT060-R6.0		6°	6.0	20	25	44.5	150	●

● Ex stock ○ On demand
✻ With inner cooling

Application fields

P	M	K	N	S	H
✔	✔	✔	✔	✔	

✔ Very suitable
✔ Suitable

Q 08 – XM – 2 C60 – D12 H9.4

1	2	3	4	5	6	7

Thread type

1

Thread diametre [mm]	
Code	Description
08	8,0
10	10,0
12	12,0
14	14,0
18	18,0

2

Application	
Code	Description
PM	High-performance machining
HMX	Hard machining
XM	Deburring

3

Number of teeth

4

Cutting edge type	
Code	Description
E	Square shoulder mill with protective chamfer
B	Ball nose cutter
R	Torus mill
C	

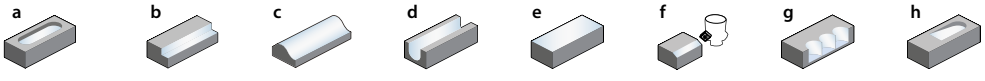
5

Diametre [mm]	
Code	Description
D3.0	3,0
D8.0	8,0
D20.0	20,0

6

Radius R / Effective cutting edge length H [mm]	
Code	Description
R0.5	0,5
R1.0	1,5
R3.0	3,0
H9.4	9,4

7



a Groove milling **b** Square shoulder milling **c** Profile milling **d** Slot milling **e** Face milling **f** Chamfer milling **g** Plunge milling **h** Circular milling/Ramping

XM-2C series

Flexible deburring cutter with interchangeable head

YOUR BENEFITS

– **Greater flexibility** in real-world applications thanks to numerous possible combinations
– **Perfect concentricity** and **maximum change-over accuracy** thanks to patented Q interface
– **Universal tool** for countersinking holes and deburring contours

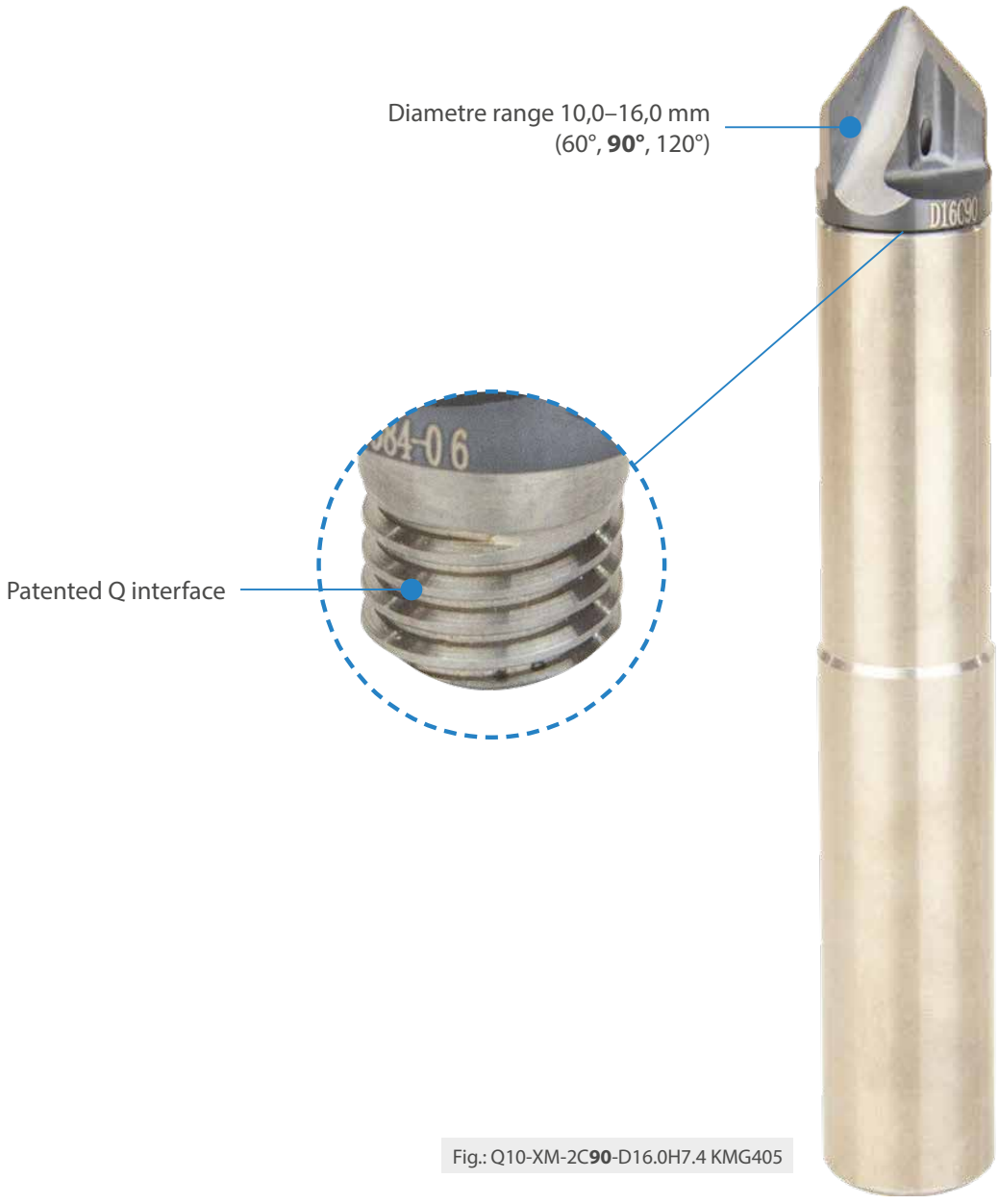
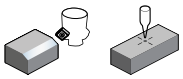


Fig.: Q10-XM-2C**90**-D16.0H7.4 KMG405

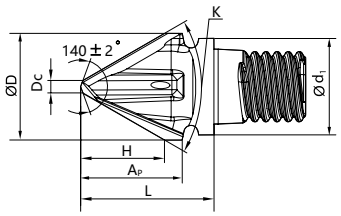
Deburring cutters

General machining

XM-2C



– Centre cutting
– Helix angle 0°



Article	✻	Dimensions [mm]								Teeth	Grade
		D	d_1	Dc	A_p	H	K	L	MD		KMG405
Q07-XM-2C60-D10.0H7.6	✻	10.0	9.5	1.5	9.3	7.6	60°	12.0	Q07	2	●
Q07-XM-2C90-D10.0H4.5	✻	10.0	9.5	1.5	9.3	4.5	90°	12.0	Q07	2	●
Q07-XM-2C120-D10.0H2.7	✻	10.0	9.5	1.5	9.3	2.7	120°	12.0	Q07	2	●
Q08-XM-2C60-D12.0H9.2	✻	12.0	11.5	1.5	11.0	9.2	60°	16.0	Q08	2	●
Q08-XM-2C90-D12.0H5.3	✻	12.0	11.5	1.5	11.0	5.3	90°	16.0	Q08	2	●
Q08-XM-2C120-D12.0H3.5	✻	12.0	11.5	1.5	11.0	3.5	120°	16.0	Q08	2	●
Q10-XM-2C60-D16.0H12.1	✻	16.0	15.2	1.5	14.0	12.1	60°	18.0	Q10	2	●
Q10-XM-2C90-D16.0H7.4	✻	16.0	15.2	1.5	14.0	7.4	90°	18.0	Q10	2	●
Q10-XM-2C120-D16.0H4.5	✻	16.0	15.2	1.5	14.0	4.5	120°	18.0	Q10	2	●

● Ex stock ○ On demand
✻ With inner cooling

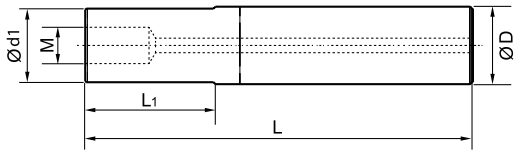
Application fields

P	M	K	N	S	H
✔	✔	✔	✔	✔	✔

✔ Very suitable
✔ Suitable

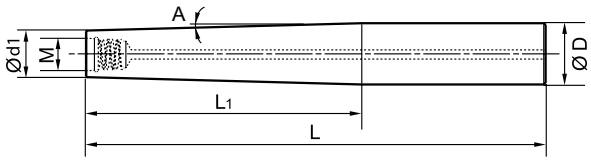
Indexable heads shanks

Solid carbide shank, stepped, Q thread



Article	Dimensions [mm]				Thread (M)	Stock
	D	d1	L	L1		
G12-QCH-Q08-80C	12	11,5	80	30	Q8	●
G12-QCH-Q08-100C	12	11,5	100	50	Q8	●
G12-QCH-Q08-120C	12	11,5	120	70	Q8	●
G16-QCH-Q10-90C	16	15,2	90	40	Q10	●
G16-QCH-Q10-120C	16	15,2	120	70	Q10	●
G16-QCH-Q10-150C	16	15,2	150	100	Q10	●
G20-QCH-Q12-100C	20	19	100	40	Q12	●
G20-QCH-Q12-140C	20	19	140	80	Q12	●
G20-QCH-Q12-180C	20	19	180	120	Q12	●
G25-QCH-Q14-120C	25	24	120	50	Q14	●
G25-QCH-Q14-170C	25	24	170	100	Q14	●
G25-QCH-Q14-220C	25	24	220	150	Q14	●
G32-QCH-Q18-140C	32	30	140	70	Q18	●
G32-QCH-Q18-200C	32	30	200	130	Q18	●
G32-QCH-Q18-260C	32	30	260	190	Q18	●
G32-QCH-Q18-320C	32	30	320	250	Q18	●

Solid carbide shank, tapered, Q thread



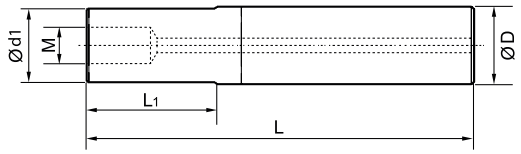
Article	Dimensions [mm]				Thread (M)	Angle (A)	Stock
	D	d1	L	L1			
G16-QCH-Q08-140C-ZJ90	16	11,5	140	90	Q8	1,0	●
G20-QCH-Q10-200C-ZJ140	20	15,2	200	140	Q8	0,8	●
G25-QCH-Q12-250C-ZJ180	25	19	250	180	Q8	0,8	●
G32-QCH-Q14-270C-ZJ200	32	30	270	200	Q10	0,8	●

Spare parts

	Thread	Q8 / Q10	Q12 / Q14	Q18
	Wrench	QCH-10×13	QCH-16×20	QCH-26

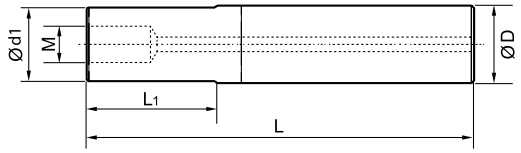
Indexable heads shanks

Steel shank, stepped, Q thread



Article	Dimensions [mm]				Thread (M)	Stock
	D	d1	L	L1		
G12-QCH-Q08-65S	12	11,5	65	19	Q08	●
G16-QCH-Q10-100S	16	15,2	100	42	Q10	●
G20-QCH-Q12-110S	20	19	110	54	Q12	●

Solid carbide shank, stepped, metric thread



Article	Dimensions [mm]				Thread (M)	Stock
	D	d1	L	L1		
G16-QCH-M8-90C-125	16	12,5	90	35	M8	○
G16-QCH-M8-110C-125	16	12,5	110	55	M8	○
G16-QCH-M8-130C-125	16	12,5	130	75	M8	○
G16-QCH-M8-90C	16	15	90	35	M8	○
G16-QCH-M8-110C	16	15	110	55	M8	○
G16-QCH-M8-130C	16	15	130	75	M8	○
G16-QCH-M8-170C	16	15	170	115	M8	○
G16-QCH-M8-200C	16	15	200	145	M8	○
G20-QCH-M10-87C	20	18,5	87	30	M10	○
G20-QCH-M10-107C	20	18,5	107	50	M10	○
G20-QCH-M10-127C	20	18,5	127	70	M10	○
G20-QCH-M10-167C	20	18,5	167	110	M10	○
G20-QCH-M10-197C	20	18,5	197	140	M10	○
G25-QCH-M12-128C	25	23	128	65	M12	○
G25-QCH-M12-148C	25	23	148	85	M12	○
G25-QCH-M12-168C	25	23	168	105	M12	○
G25-QCH-M12-198C	25	23	198	135	M12	○
G25-QCH-M12-228C	25	23	228	165	M12	○
G32-QCH-M16-161C	32	29	161	95	M16	○
G32-QCH-M16-211C	32	29	211	145	M16	○
G32-QCH-M16-281C	32	29	281	215	M16	○
G32-QCH-M16-311C	32	29	311	245	M16	○
G32-QCH-M16-361C	32	29	361	295	M16	○

Notes

XM-2C deburring cutter with interchangeable head

End mill – QCH series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]							
						Q**-PM-4E Q**-PM-4R Q**-VPM-4E Q**-VPM-4R				Q**PM-2B Q**PM-4B			
						Slot milling		Shoulder milling					
						Ø [mm]	$a_{p\,max}$	Ø [mm]	$a_{e\,max}$				
						0 < x < 3	0,3 x D	0 < x < 20	0,15xD				
						3 ≤ x < 6	0,3 x D						
						6 ≤ x ≤ 20	0,5 x D						
						KMG405				KMG405			
						a_e / D				a_e / D			
						1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	165	220	300	1		270	300	5
		approx. 0,45 % C	annealed	190	2	160	210	285	1		260	285	5
		approx. 0,45 % C	tempered	250	3	120	155	210	1		190	210	5
		approx. 0,75 % C	annealed	270	4	100	135	180	1		165	180	5
		approx. 0,75 % C	tempered	300	5	95	125	165	1		150	165	5
	Low-alloyed steel		annealed	180	6	125	165	225	1		205	225	5
			tempered	275	7	100	135	180	1		165	180	5
			tempered	300	8	95	125	165	1		150	165	5
			tempered	350	9	90	115	160	1		145	160	5
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	120	155	210	1		190	210	5
			hardened and tempered	325	11	90	120	160	1		145	160	5
M	Stainless steel	ferritic/martensitic	annealed	200	12	55	75	100	1		90	100	5
		martensitic	tempered	240	13	50	65	85	1		80	85	5
		austenitic	quench hardened	180	14	60	75	105	1		95	105	5
		austenitic-ferritic		230	15	50	65	85	1		80	85	5
K	Grey cast iron	perlitic/ferritic		180	16	125	165	220	1		200	220	5
		perlitic (martensitic)		260	17	100	135	180	1		165	180	5
	Cast iron with spheroidal graphite	ferritic		160	18	150	200	270	1		245	270	5
		perlitic		250	19	120	155	210	1		190	210	5
	Malleable cast iron	ferritic		130	20	165	220	300	1		270	300	5
		perlitic		230	21	135	180	240	1		220	240	5
N	Aluminium wrought alloys	cannot be hardened		60	22								
		hardenable	hardened	100	23								
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24								
		≤ 12 % Si, hardenable	hardened	90	25								
		> 12 % Si, cannot be hardened		130	26								
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27								
		CuZn, CuSnZn		90	28								
		CuSn, Pb-free copper, electrolytic copper		100	29								
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30								
			hardened	280	31								
		Ni or Co bass	annealed	250	32								
			hardened	350	33								
			cast	320	34								
	Titanium alloys	pure titanium		R_m 400	35								
		α and β alloys	hardened	R_m 1050	36								
H	Hardened steel		hardened and tempered	55 HRC	37	80	105	140	1				
			hardened and tempered	60 HRC	38								
	Hard cast iron		cast	400	39	105	140	185	1				
	Hardened cast iron		hardened and tempered	55 HRC	40								
X	Non-metallic materials	Thermoplasts			41								
		Thermosetting plastics			42								
		Plastic, glass-fibre reinforced GFRP			43								
		Plastic, carbon fibre reinforced CFRP			44								
		Graphite			45								
		Wood			46								

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

	Starting values for cutting speed v_c [m/min]																			
	Q**-HMX-4E Q**-HMX-4R				Q**-HMX-2B Q**-HMX-4B				Q**-XM-2C											
			Shoulder milling																	
	Ø [mm]	$a_{p\,max}$	Ø [mm]	$a_{e\,max}$	Ø [mm]	$a_{p\,max}$	Ø [mm]	$a_{e\,max}$	Ø [mm]	$a_{p\,max}$	Ø [mm]	$a_{e\,max}$								
			0 < x ≤ 20	0.15 x D																
	KMG5515				KMG5515				KMG405											
	a_e / D				a_e / D				a_e / D											
	1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group								
									–	–	230	11								
									–	–	220	11								
									–	–	165	11								
									–	–	140	11								
									–	–	130	11								
									–	–	175	11								
									–	–	140	11								
									–	–	130	11								
									–	–	120	11								
									–	–	165	11								
									–	–	125	11								
									–	–	75	11								
									–	–	65	11								
									–	–	80	11								
									–	–	65	11								
									–	–	170	11								
									–	–	140	11								
									–	–	210	11								
									–	–	165	11								
									–	–	230	11								
									–	–	185	11								
									–	–	1200	11								
									–	–	720	11								
									–	–	480	11								
									–	–	600	11								
									–	–	180	11								
									–	–	360	11								
									–	–	420	11								
									–	–	360	11								
									–	–	60	11								
									–	–	50	11								
									–	–	50	11								
									–	–	30	11								
									–	–	40	11								
									–	–	70	11								
									–	–	60	11								
	55	100	125	3		130	145	7	–	–	70	11								
	55	95	120	3		80	90	7	–	–	40	11								
	70	125	160	3		163	181	7	–	–	80	11								
	55	100	125	3		109	145	7	–	–	40	11								

Solid carbide milling group 11 – Deburring cutters FM series, QCH series

	a_e / D	Feed rate per cutting edge (f_z) [mm]																			
		Ø 3	Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 18	Ø 20									
P	1/1																				
	1/2																				
	1/10	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09									
M	1/1																				
	1/2																				
	1/10	0,02	0,02	0,02	0,02	0,03	0,05	0,06	0,06	0,06	0,06	0,07									
K	1/1																				
	1/2																				
	1/10	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09									
N	1/1																				
	1/2																				
	1/10	0,03	0,03	0,05	0,05	0,06	0,09	0,11	0,11	0,12	0,12	0,14									

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.

Indexable head drilling

C

Indexable head drilling System code – drilling bodies

ZTE	03	–	ED160	–	XP	20	C
1	2		3		4	5	6

Type	
Code	Description
ZTE	Indexable head drills

1

L/D relation	
Code	Description
015	1,5 x D
03	3 x D
05	5 x D
08	8 x D

2

Diameter [mm]	
Code	Description
ED160	16–16,9
...	

3

Shank type	
Code	Description
G	Straight shank
XP	Weldon shank

4

Coupling size [mm]

5

Cooling	
Code	Description
C	Internal cooling, normal spiral
HC	Internal cooling, low spiral

4

EDR 1600 – 065 – UD

1	2	3	4

Type	
Code	Description
EDR	Drill heads

1

Diameter [mm]	
Code	Description
1600	16

2

Coupling size [mm]	
Code	Description
065	65
...	

3

Code	Description
UD	Steel, difficult-to-machine materials
KD	Cast Iron
PD	Pilot drill

4

ZTE indexable head drilling system

Consistent drilling results coupled with high material removal rates

YOUR BENEFITS

– **Maximum productivity** at high feed rates and speeds
– **Low cutting forces** and **stable drilling processes** in steel and cast iron thanks to optimised geometries and grades
– **Less time** and **effort required to replace drill heads**; high change-over accuracy
– No pilot holes required up to 5×D with zero impact on **performance** and **tool life**
– Innovative interface with higher clamping force for **reliable clamping during drilling operations**

Fig.: ZTE03-ED-180-XP25C

Chip breaker

-UD	-KD	Coming soon -PD
		
General machining	Cast iron machining	Pilot hole

Deep-hole drilling with ZTE08 (8xD)

From a drilling depth of **8xD** we recommend drilling a **pilot hole**.

Example: Drilling a 8xD deep hole with a diameter of 18.0 mm in steel

Pilot hole drilling
- ZTE015-ED180-XP25C + EDR1800-075-PD (Ø18.03/point angle: 150°)
- Refer to table for cutting parameters (see C96–C97), drilling depth: 1.0–1.5xD
- Make sure there are no chips in the hole after removing the pilot drill.

Deep-hole drilling
- ZTE08-ED180-XP25C + EDR1800-075-UD
- Enter the drill into the pilot hole at a lower feed rate and cutting speed.
- Stop feeding approx. 2–3 mm before you reach the bottom of the entry hole and activate internal cooling.
- Increase the cutting speed (see table) and then start at the specified feed rate.
- If necessary, reduce the feed rate if drilling cross-holes.
- After reaching the drilling depth, reduce the cutting speed and feed rate. exit the drill from the hole.
- When drilling through holes, only allow half of the drill head to exit the hole. This is to avoid damaging the drill when retracting.

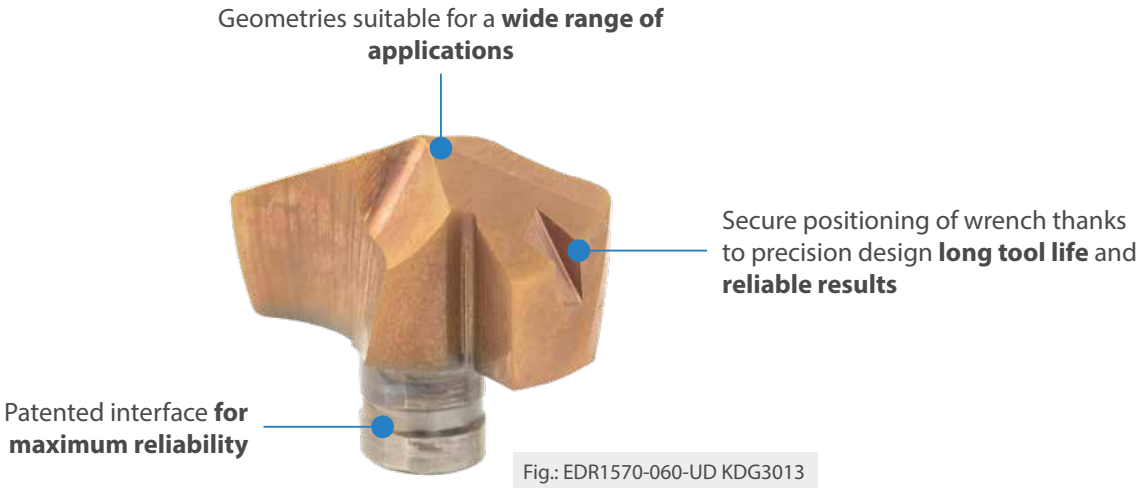
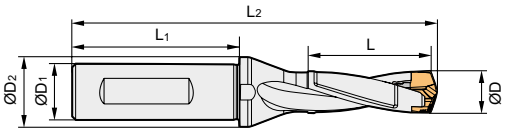


Fig.: EDR1570-060-UD KDG3013

Indexable head drills

ZTE015



Article	✻	Stock	Dimensions [mm]						Wrench	Drill head
			ØD	ØD1	ØD2	L1	L2	L		
ZTE015-ED120-XP16C	✻	•	12-12.9	16	20	48	84,50	18,0	ZTK12-15.9	EDR12**
ZTE015-ED130-XP16C	✻	•	13-13.9	16	20	48	86,00	19,5	ZTK12-15.9	EDR13**
ZTE015-ED140-XP20C	✻	•	14-14.9	16	25	48	92,50	21,0	ZTK12-15.9	EDR14**
ZTE015-ED150-XP20C	✻	•	15-15.9	20	25	50	94,00	22,5	ZTK12-15.9	EDR15**
ZTE015-ED160-XP20C	✻	•	16-16.9	20	25	50	95,50	24,0	ZTK16-20.9	EDR16**
ZTE015-ED170-XP20C	✻	•	17-17.9	20	25	50	97,00	25,5	ZTK16-20.9	EDR17**
ZTE015-ED180-XP25C	✻	•	18-18.9	25	32	56	106,50	27,0	ZTK16-20.9	EDR18**
ZTE015-ED190-XP25C	✻	•	19-19.9	25	32	56	108,00	28,5	ZTK16-20.9	EDR19**
ZTE015-ED200-XP25C	✻	•	20-20.9	25	32	56	109,50	30,0	ZTK16-20.9	EDR20**
ZTE015-ED210-XP25C	✻	•	21-21.9	25	32	56	111,00	31,5	ZTK21-25.9	EDR21**
ZTE015-ED220-XP25C	✻	•	22-22.9	25	32	56	112,50	33,0	ZTK21-25.9	EDR22**
ZTE015-ED230-XP32C	✻	•	23.23.9	32	42	60	126,00	34,5	ZTK21-25.9	EDR23**
ZTE015-ED240-XP32C	✻	•	24-24.9	32	42	60	127,50	36,0	ZTK21-25.9	EDR24**
ZTE015-ED250-XP32C	✻	•	25-25.9	32	42	60	129,00	37,5	ZTK21-25.9	EDR25**

• Ex stock ○ On demand

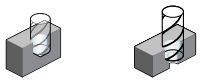
✻ Internal cooling

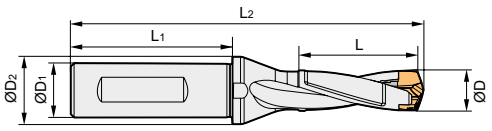
Spare parts

	Drill head	EDR1200-1590	EDR1600-2090	EDR2100-2590
	Wrench	ZTK12-15,9	ZTK16-20,9	ZTK21-25,9

Indexable head drills

ZTE03





Article	✻	Stock	Dimensions [mm]						Wrench	Drill head
			ØD	ØD1	ØD2	L1	L2	L		
ZTE03-ED120-XP16C	✻	•	12-12.9	16	20	48	104,0	36,0	ZTK12-15.9	EDR12**
ZTE03-ED125-XP16C	✻	•	12.5-12.9	16	20	48	105,5	37,0	ZTK12-15.9	EDR12**
ZTE03-ED130-XP16C	✻	•	13-13.9	16	20	48	107,0	39,0	ZTK12-15.9	EDR13**
ZTE03-ED135-XP16C	✻	•	13.5-13.9	16	20	48	108,5	41,0	ZTK12-15.9	EDR13**
ZTE03-ED140-XP20C	✻	•	14-14.9	16	20	50	115,0	42,0	ZTK12-15.9	EDR14**
ZTE03-ED145-XP20C	✻	•	14.5-14.9	16	20	50	116,5	44,0	ZTK12-15.9	EDR14**
ZTE03-ED150-XP20C	✻	•	15-15.9	20	25	50	118,0	45,0	ZTK12-15.9	EDR15**
ZTE03-ED160-XP20C	✻	•	16-16.9	20	25	50	121,0	48,0	ZTK16-20.9	EDR16**
ZTE03-ED170-XP20C	✻	•	17-17.9	20	25	50	124,0	51,0	ZTK16-20.9	EDR17**
ZTE03-ED180-XP25C	✻	•	18-18.9	25	32	56	135,0	54,0	ZTK16-20.9	EDR18**
ZTE03-ED190-XP25C	✻	•	19-19.9	25	32	56	138,0	57,0	ZTK16-20.9	EDR19**
ZTE03-ED200-XP25C	✻	•	20-20.9	25	32	56	141,0	60,0	ZTK16-20.9	EDR20**
ZTE03-ED210-XP25C	✻	•	21-21.9	25	32	56	144,0	63,0	ZTK21-25.9	EDR21**
ZTE03-ED220-XP25C	✻	•	22-22.9	25	32	56	147,0	66,0	ZTK21-25.9	EDR22**
ZTE03-ED230-XP32C	✻	•	23.23.9	32	42	60	162,0	69,0	ZTK21-25.9	EDR23**
ZTE03-ED240-XP32C	✻	•	24-24.9	32	42	60	165,0	72,0	ZTK21-25.9	EDR24**
ZTE03-ED250-XP32C	✻	•	25-25.9	32	42	60	168,0	75,0	ZTK21-25.9	EDR25**

• Ex stock ○ On demand

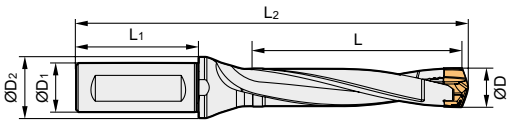
✻ Internal cooling

Spare parts

	Drill head	EDR1200-1590	EDR1600-2090	EDR2100-2590
	Wrench	ZTK12-15,9	ZTK16-20,9	ZTK21-25,9

Indexable head drills

ZTE05



Article	✻	Stock	Dimensions [mm]						Wrench	Drill head
			ØD	ØD1	ØD2	L1	L2	L		
ZTE05-ED120-XP16HC	✻	•	12-12.9	16	20	48	130,0	60,0	ZTK12-15.9	EDR12**
ZTE05-ED125-XP16HC	✻	•	12.5-12.9	16	20	48	132,5	62,0	ZTK12-15.9	EDR12**
ZTE05-ED130-XP16HC	✻	•	13-13.9	16	20	48	135,0	65,0	ZTK12-15.9	EDR13**
ZTE05-ED135-XP16HC	✻	•	13.5-13.9	16	20	48	137,5	68,0	ZTK12-15.9	EDR13**
ZTE05-ED140-XP20HC	✻	•	14-14.9	20	25	50	145,0	70,0	ZTK12-15.9	EDR14**
ZTE05-ED145-XP20HC	✻	•	14.5-14.9	20	25	50	147,5	73,0	ZTK12-15.9	EDR14**
ZTE05-ED150-XP20HC	✻	•	15-15.9	20	25	50	150,0	75,0	ZTK12-15.9	EDR15**
ZTE05-ED160-XP20HC	✻	•	16-16.9	20	25	50	155,0	80,0	ZTK16-20.9	EDR16**
ZTE05-ED170-XP20HC	✻	•	17-17.9	20	25	50	160,0	85,0	ZTK16-20.9	EDR17**
ZTE05-ED180-XP25HC	✻	•	18-18.9	25	32	56	173,0	90,0	ZTK16-20.9	EDR18**
ZTE05-ED190-XP25HC	✻	•	19-19.9	25	32	56	178,0	95,0	ZTK16-20.9	EDR19**
ZTE05-ED200-XP25HC	✻	•	20-20.9	25	32	56	183,0	100,0	ZTK16-20.9	EDR20**
ZTE05-ED210-XP25HC	✻	•	21-21.9	25	32	56	188,0	105,0	ZTK21-25.9	EDR21**
ZTE05-ED220-XP25HC	✻	•	22-22.9	25	32	56	193,0	110,0	ZTK21-25.9	EDR22**
ZTE05-ED230-XP32HC	✻	•	23.23.9	32	42	60	210,0	115,0	ZTK21-25.9	EDR23**
ZTE05-ED240-XP32HC	✻	•	24-24.9	32	42	60	215,0	120,0	ZTK21-25.9	EDR24**
ZTE05-ED250-XP32HC	✻	•	25-25.9	32	42	60	220,0	125,0	ZTK21-25.9	EDR25**

• Ex stock ○ On demand

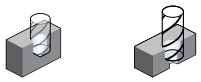
✻ Internal cooling

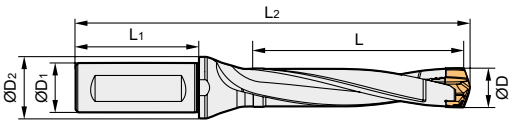
Spare parts

	Drill head	EDR1200-1590	EDR1600-2090	EDR2100-2590
	Wrench	ZTK12-15,9	ZTK16-20,9	ZTK21-25,9

Indexable head drills

ZTE08





Article	✻	Stock	Dimensions [mm]						Wrench	Drill head
			ØD	ØD1	ØD2	L1	L2	L		
ZTE08-ED120-XP16HC	✻	○	12-12.9	16	20	48	169,0	96,0	ZTK12-15.9	EDR12**
ZTE08-ED125-XP16HC	✻	○	12.5-12.9	16	20	48	173,0	99,5	ZTK12-15.9	EDR12**
ZTE08-ED130-XP16HC	✻	○	13-13.9	16	20	48	177,0	104,0	ZTK12-15.9	EDR13**
ZTE08-ED135-XP16HC	✻	○	13.5-13.9	16	20	48	181,0	108,5	ZTK12-15.9	EDR13**
ZTE08-ED140-XP20HC	✻	○	14-14.9	20	25	50	190,0	112,0	ZTK12-15.9	EDR14**
ZTE08-ED145-XP20HC	✻	○	14.5-14.9	20	25	50	194,0	116,5	ZTK12-15.9	EDR14**
ZTE08-ED150-XP20HC	✻	○	15-15.9	20	25	50	198,0	120,0	ZTK12-15.9	EDR15**
ZTE08-ED160-XP20HC	✻	○	16-16.9	20	25	50	206,0	128,0	ZTK16-20.9	EDR16**
ZTE08-ED170-XP20HC	✻	○	17-17.9	20	25	50	214,0	136,0	ZTK16-20.9	EDR17**
ZTE08-ED180-XP25HC	✻	○	18-18.9	25	32	56	230,0	144,0	ZTK16-20.9	EDR18**
ZTE08-ED190-XP25HC	✻	○	19-19.9	25	32	56	238,0	152,0	ZTK16-20.9	EDR19**
ZTE08-ED200-XP25HC	✻	○	20-20.9	25	32	56	246,0	160,0	ZTK16-20.9	EDR20**
ZTE08-ED210-XP25HC	✻	○	21-21.9	25	32	56	254,0	168,0	ZTK21-25.9	EDR21**
ZTE08-ED220-XP25HC	✻	○	22-22.9	25	32	56	262,0	176,0	ZTK21-25.9	EDR22**
ZTE08-ED230-XP32HC	✻	○	23.23.9	32	42	60	282,0	184,0	ZTK21-25.9	EDR23**
ZTE08-ED240-XP32HC	✻	○	24-24.9	32	42	60	290,0	192,0	ZTK21-25.9	EDR24**
ZTE08-ED250-XP32HC	✻	○	25-25.9	32	42	60	298,0	200,0	ZTK21-25.9	EDR25**

• Ex stock ○ On demand

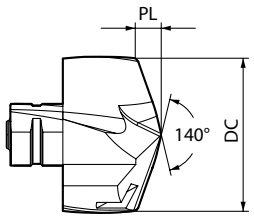
✻ Internal cooling

Spare parts

	Drill head	EDR1200-1590	EDR1600-2090	EDR2100-2590
	Wrench	ZTK12-15,9	ZTK16-20,9	ZTK21-25,9

Drill heads

EDR-UD

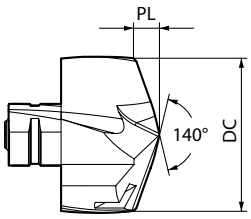


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	PL	Dc	KDG3013		
EDR1200-045-UD	2,18	12,00	●	ZTE015-ED120-** ZTE03-ED120-** ZTE05-ED120-** ZTE08-ED120-**	ZTK12-15.9
EDR1210-045-UD	2,20	12,10	○		
EDR1220-045-UD	2,22	12,20	○		
EDR1230-045-UD	2,24	12,30	○		
EDR1240-045-UD	2,26	12,40	○		
EDR1250-045-UD	2,27	12,50	●	ZTE015-ED125-** ZTE03-ED125-** ZTE05-ED125-** ZTE08-ED125-**	
EDR1260-045-UD	2,29	12,60	○		
EDR1270-045-UD	2,31	12,70	○		
EDR1280-045-UD	2,33	12,80	●		
EDR1290-045-UD	2,35	12,90	○		
EDR1300-050-UD	2,36	13,00	●	ZTE015-ED130-** ZTE03-ED130-** ZTE05-ED130-** ZTE08-ED130-**	
EDR1310-050-UD	2,38	13,10	●		
EDR1320-050-UD	2,40	13,20	○		
EDR1330-050-UD	2,42	13,30	○		
EDR1340-050-UD	2,44	13,40	●		
EDR1350-050-UD	2,46	13,50	●	ZTE015-ED130-** ZTE03-ED135-** ZTE05-ED135-** ZTE08-ED135-**	
EDR1360-050-UD	2,47	13,60	○		
EDR1370-050-UD	2,49	13,70	○		
EDR1380-050-UD	2,51	13,80	○		
EDR1390-050-UD	2,53	13,90	○		
EDR1400-055-UD	2,55	14,00	●	ZTE015-ED140-** ZTE03-ED140-** ZTE05-ED140-** ZTE08-ED140-**	
EDR1410-055-UD	2,56	14,10	○		
EDR1420-055-UD	2,58	14,20	○		
EDR1430-055-UD	2,60	14,30	○		
EDR1440-055-UD	2,62	14,40	○		
EDR1450-055-UD	2,64	14,50	●	ZTE015-ED140-** ZTE03-ED145-** ZTE05-ED145-** ZTE08-ED145-**	
EDR1460-055-UD	2,66	14,60	○		
EDR1470-055-UD	2,67	14,70	○		
EDR1480-055-UD	2,69	14,80	○		
EDR1490-055-UD	2,71	14,90	○		
EDR1500-060-UD	2,73	15,00	●	ZTE015-ED150-** ZTE03-ED150-** ZTE05-ED150-** ZTE08-ED150-**	
EDR1510-060-UD	2,75	15,10	●		
EDR1520-060-UD	2,76	15,20	○		
EDR1530-060-UD	2,78	15,30	●		
EDR1540-060-UD	2,80	15,40	○		
EDR1550-060-UD	2,82	15,50	●		
EDR1560-060-UD	2,84	15,60	○		
EDR1570-060-UD	2,86	15,70	●		
EDR1580-060-UD	2,87	15,80	○		
EDR1590-060-UD	2,89	15,90	○		

● Ex stock ○ On demand

Drill heads

EDR-UD

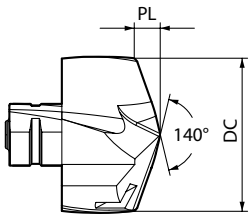


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	PL	Dc	KDG3013		
EDR1600-065-UD	2,91	16,00	●	ZTE015-ED160-** ZTE03-ED160-** ZTE05-ED160-** ZTE08-ED160-**	ZTK16-20.9
EDR1610-065-UD	2,93	16,10	○		
EDR1620-065-UD	2,95	16,20	○		
EDR1630-065-UD	2,96	16,30	●		
EDR1640-065-UD	2,98	16,40	○		
EDR1650-065-UD	3,00	16,50	●		
EDR1660-065-UD	3,02	16,60	○		
EDR1670-065-UD	3,04	16,70	○		
EDR1680-065-UD	3,06	16,80	○		
EDR1690-065-UD	3,07	16,90	●		
EDR1700-070-UD	3,09	17,00	●	ZTE015-ED170-** ZTE03-ED170-** ZTE05-ED170-** ZTE08-ED170-**	
EDR1710-070-UD	3,11	17,10	○		
EDR1720-070-UD	3,13	17,20	○		
EDR1730-070-UD	3,15	17,30	●		
EDR1740-070-UD	3,16	17,40	○		
EDR1750-070-UD	3,18	17,50	●		
EDR1760-070-UD	3,20	17,60	○		
EDR1770-070-UD	3,22	17,70	○		
EDR1780-070-UD	3,24	17,80	○		
EDR1790-070-UD	3,26	17,90	○		
EDR1800-075-UD	3,27	18,00	●	ZTE015-ED180-** ZTE03-ED180-** ZTE05-ED180-** ZTE08-ED180-**	
EDR1810-075-UD	3,29	18,10	○		
EDR1820-075-UD	3,31	18,20	○		
EDR1830-075-UD	3,33	18,30	○		
EDR1840-075-UD	3,35	18,40	○		
EDR1850-075-UD	3,36	18,50	●		
EDR1860-075-UD	3,38	18,60	○		
EDR1870-075-UD	3,40	18,70	○		
EDR1880-075-UD	3,42	18,80	○		
EDR1890-075-UD	3,44	18,90	●		
EDR1900-080-UD	3,46	19,00	●	ZTE015-ED190-** ZTE03-ED190-** ZTE05-ED190-** ZTE08-ED190-**	
EDR1910-080-UD	3,47	19,10	○		
EDR1920-080-UD	3,49	19,20	○		
EDR1930-080-UD	3,51	19,30	●		
EDR1940-080-UD	3,53	19,40	○		
EDR1950-080-UD	3,55	19,50	●		
EDR1960-080-UD	3,56	19,60	○		
EDR1970-080-UD	3,58	19,70	○		
EDR1980-080-UD	3,60	19,80	○		
EDR1990-080-UD	3,62	19,90	○		

● Ex stock ○ On demand

Drill heads

EDR-UD

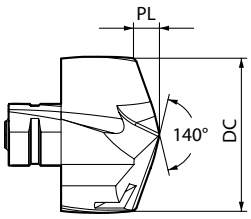


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	PL	Dc	KDG3013		
EDR2000-085-UD	3,64	20,00	●	ZTE015-ED200-** ZTE03-ED200-** ZTE05-ED200-** ZTK08-ED200-**	ZTK16-20.9
EDR2010-085-UD	3,66	20,10	○		
EDR2020-085-UD	3,67	20,20	○		
EDR2030-085-UD	3,69	20,30	○		
EDR2040-085-UD	3,71	20,40	○		
EDR2050-085-UD	3,73	20,50	●		
EDR2060-085-UD	3,75	20,60	○		
EDR2070-085-UD	3,77	20,70	○		
EDR2080-085-UD	3,78	20,80	○		
EDR2090-085-UD	3,80	20,90	○		
EDR2100-090-UD	3,82	21,00	●	ZTE015-ED210-** ZTE03-ED210-** ZTE05-ED210-** ZTE08-ED210-**	ZTK21-25.9
EDR2110-090-UD	3,84	21,10	○		
EDR2120-090-UD	3,86	21,20	○		
EDR2130-090-UD	3,88	21,30	●		
EDR2140-090-UD	3,89	21,40	○		
EDR2150-090-UD	3,91	21,50	●		
EDR2160-090-UD	3,93	21,60	○		
EDR2170-090-UD	3,95	21,70	○		
EDR2800-090-UD	3,97	21,80	○		
EDR2190-090-UD	3,98	21,90	○		
EDR2200-095-UD	4,00	22,00	●	ZTE015-ED220-** ZTE03-ED220-** ZTE05-ED220-** ZTE08-ED220-**	
EDR2210-095-UD	4,02	22,10	○		
EDR2220-095-UD	4,04	22,20	○		
EDR2230-095-UD	4,06	22,30	○		
EDR2240-095-UD	4,08	22,40	○		
EDR2250-095-UD	4,09	22,50	●		
EDR2260-095-UD	4,11	22,60	○		
EDR2270-095-UD	4,13	22,70	○		
EDR2280-095-UD	4,15	22,80	○		
EDR2290-095-UD	4,17	22,90	○		
EDR2300-100-UD	4,18	23,00	●	ZTE015-ED230-** ZTE03-ED230-** ZTE05-ED230-** ZTE08-ED230-**	
EDR2310-100-UD	4,20	23,10	○		
EDR2320-100-UD	4,22	23,20	○		
EDR2330-100-UD	4,24	23,30	●		
EDR2340-100-UD	4,26	23,40	○		
EDR2350-100-UD	4,27	23,50	●		
EDR2360-100-UD	4,29	23,60	○		
EDR2370-100-UD	4,31	23,70	○		
EDR2380-100-UD	4,33	23,80	○		
EDR2390-100-UD	4,35	23,90	○		

● Ex stock ○ On demand

Drill heads

EDR-UD

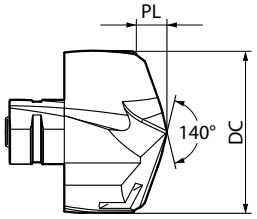


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	Pl	Dc	KDG3013		
EDR2400-110-UD	4,37	24,00	●	ZTE015-ED240-** ZTE03-ED240-** ZTE05-ED240-** ZTE08-ED240-**	ZTK21-25.9
EDR2410-110-UD	4,38	24,10	○		
EDR2420-110-UD	4,40	24,20	○		
EDR2430-110-UD	4,42	24,30	○		
EDR2440-110-UD	4,44	24,40	○		
EDR2450-110-UD	4,46	24,50	●		
EDR2460-110-UD	4,48	24,60	○		
EDR2470-110-UD	4,49	24,70	○		
EDR2480-110-UD	4,51	24,80	○		
EDR2490-110-UD	4,53	24,90	○		
EDR2500-115-UD	4,55	25,00	●	ZTE015-ED250-** ZTE03-ED250-** ZTE05-ED250-** ZTE08-ED250-**	
EDR2510-115-UD	4,57	25,10	○		
EDR2520-115-UD	4,58	25,20	○		
EDR2530-115-UD	4,60	25,30	○		
EDR2540-115-UD	4,62	25,40	○		
EDR2550-115-UD	4,64	25,50	●		
EDR2560-115-UD	4,66	25,60	○		
EDR2570-115-UD	4,68	25,70	○		
EDR2580-115-UD	4,69	25,80	○		
EDR2590-115-UD	4,70	25,90	○		

● Ex stock ○ On demand

Drill heads

EDR-KD

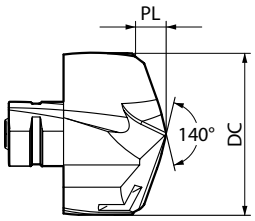


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	Pl	Dc	KDG303		
EDR1200-045-KD	2,18	12,00	●	ZTE015-ED120-** ZTE03-ED120-** ZTE05-ED120-** ZTE08-ED120-**	ZTK12-15.9
EDR1210-045-KD	2,20	12,10	○		
EDR1220-045-KD	2,22	12,20	○		
EDR1230-045-KD	2,24	12,30	○		
EDR1240-045-KD	2,26	12,40	○		
EDR1250-045-KD	2,27	12,50	●	ZTE015-ED125-** ZTE03-ED125-** ZTE05-ED125-** ZTE08-ED125-**	
EDR1260-045-KD	2,29	12,60	○		
EDR1270-045-KD	2.31	12,70	○		
EDR1280-045-KD	2,33	12,80	●		
EDR1290-045-KD	2,35	12,90	○		
EDR1300-050-KD	2,36	13,00	●	ZTE015-ED130-** ZTE03-ED130-** ZTE05-ED130-** ZTE08-ED130-**	
EDR1310-050-KD	2,38	13,10	●		
EDR1320-050-KD	2,40	13,20	○		
EDR1330-050-KD	2,42	13,30	○		
EDR1340-050-KD	2,44	13,40	●		
EDR1350-050-KD	2,46	13,50	●	ZTE015-ED130-** ZTE03-ED135-** ZTE05-ED135-** ZTE08-ED135-**	
EDR1360-050-KD	2,47	13,60	○		
EDR1370-050-KD	2,49	13,70	○		
EDR1380-050-KD	2,51	13,80	○		
EDR1390-050-KD	2,53	13,90	○		
EDR1400-055-KD	2,55	14,00	●	ZTE015-ED140-** ZTE03-ED140-** ZTE05-ED140-** ZTE08-ED140-**	
EDR1410-055-KD	2,56	14,10	○		
EDR1420-055-KD	2,58	14,20	○		
EDR1430-055-KD	2,60	14,30	○		
EDR1440-055-KD	2,62	14,40	○		
EDR1450-055-KD	2,64	14,50	●	ZTE015-ED140-** ZTE03-ED145-** ZTE05-ED145-** ZTE08-ED145-**	
EDR1460-055-KD	2,66	14,60	○		
EDR1470-055-KD	2,67	14,70	○		
EDR1480-055-KD	2,69	14,80	○		
EDR1490-055-KD	2,71	14,90	○		
EDR1500-060-KD	2,73	15,00	●	ZTE015-ED150-** ZTE03-ED150-** ZTE05-ED150-** ZTE08-ED150-**	
EDR1510-060-KD	2,75	15,10	●		
EDR1520-060-KD	2,76	15,20	○		
EDR1530-060-KD	2,78	15,30	●		
EDR1540-060-KD	2,80	15,40	○		
EDR1550-060-KD	2,82	15,50	●		
EDR1560-060-KD	2,84	15,60	○		
EDR1570-060-KD	2,86	15,70	●		
EDR1580-060-KD	2,87	15,80	○		
EDR1590-060-KD	2,89	15,90	○		

● Ex stock ○ On demand

Drill heads

EDR-KD

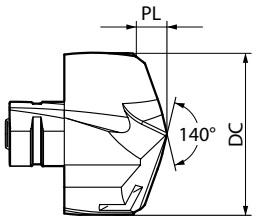


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	Pl	Dc	KDG303		
EDR1600-065-KD	2,91	16,00	●	ZTE015-ED160-** ZTE03-ED160-** ZTE05-ED160-** ZTE08-ED160-**	ZTK16-20.9
EDR1610-065-KD	2,93	16,10	○		
EDR1620-065-KD	2,95	16,20	○		
EDR1630-065-KD	2.96	16,30	●		
EDR1640-065-KD	2,98	16,40	○		
EDR1650-065-KD	3,00	16,50	●		
EDR1660-065-KD	3,02	16,60	○		
EDR1670-065-KD	3,04	16,70	○		
EDR1680-065-KD	3,06	16,80	○		
EDR1690-065-KD	3,07	16,90	●		
EDR1700-070-KD	3,09	17,00	●	ZTE015-ED170-** ZTE03-ED170-** ZTE05-ED170-** ZTE08-ED170-**	
EDR1710-070-KD	3,11	17,10	○		
EDR1720-070-KD	3,13	17,20	○		
EDR1730-070-KD	3,15	17,30	●		
EDR1740-070-KD	3,16	17,40	○		
EDR1750-070-KD	3,18	17,50	●		
EDR1760-070-KD	3,20	17,60	○		
EDR1770-070-KD	3,22	17,70	○		
EDR1780-070-KD	3,24	17,80	○		
EDR1790-070-KD	3,26	17,90	○		
EDR1800-075-KD	3,27	18,00	●	ZTE015-ED180-** ZTE03-ED180-** ZTE05-ED180-** ZTE08-ED180-**	
EDR1810-075-KD	3,29	18,10	○		
EDR1820-075-KD	3,31	18,20	○		
EDR1830-075-KD	3,33	18,30	○		
EDR1840-075-KD	3,35	18,40	○		
EDR1850-075-KD	3,36	18,50	●		
EDR1860-075-KD	3,38	18,60	○		
EDR1870-075-KD	3,40	18,70	○		
EDR1880-075-KD	3,42	18,80	○		
EDR1890-075-KD	3,44	18,90	●		
EDR1900-080-KD	3,46	19,00	●	ZTE015-ED190-** ZTE03-ED190-** ZTE05-ED190-** ZTE08-ED190-**	
EDR1910-080-KD	3,47	19,10	○		
EDR1920-080-KD	3,49	19,20	○		
EDR1930-080-KD	3,51	19,30	●		
EDR1940-080-KD	3,53	19,40	○		
EDR1950-080-KD	3,55	19,50	●		
EDR1960-080-KD	3,56	19,60	○		
EDR1970-080-KD	3,58	19,70	○		
EDR1980-080-KD	3,60	19,80	○		
EDR1990-080-KD	3,62	19,90	○		

● Ex stock ○ On demand

Drill heads

EDR-KD

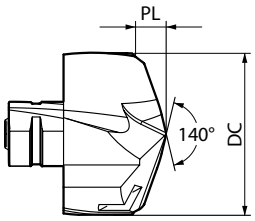


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	Pl	Dc	KDG303		
EDR2000-085-KD	3,64	20,00	●	ZTE015-ED200-** ZTE03-ED200-** ZTE05-ED200-** ZTK08-ED200-**	ZTK16-20.9
EDR2010-085-KD	3,66	20,10	○		
EDR2020-085-KD	3,67	20,20	○		
EDR2030-085-KD	3.69	20,30	○		
EDR2040-085-KD	3,71	20,40	○		
EDR2050-085-KD	3,73	20,50	●		
EDR2060-085-KD	3,75	20,60	○		
EDR2070-085-KD	3,77	20,70	○		
EDR2080-085-KD	3,78	20,80	○		
EDR2090-085-KD	3,80	20,90	○		
EDR2100-090-KD	3.82	21,00	●	ZTE015-ED210-** ZTE03-ED210-** ZTE05-ED210-** ZTE08-ED210-**	ZTK21-25.9
EDR2110-090-KD	3,84	21,10	○		
EDR2120-090-KD	3,86	21,20	○		
EDR2130-090-KD	3,88	21,30	●		
EDR2140-090-KD	3,89	21,40	○		
EDR2150-090-KD	3.91	21,50	●		
EDR2160-090-KD	3,93	21,60	○		
EDR2170-090-KD	3,95	21,70	○		
EDR2800-090-KD	3,97	21,80	○		
EDR2190-090-KD	3,98	21,90	○		
EDR2200-095-KD	4,00	22,00	●	ZTE015-ED220-** ZTE03-ED220-** ZTE05-ED220-** ZTE08-ED220-**	
EDR2210-095-KD	4,02	22,10	○		
EDR2220-095-KD	4,04	22,20	○		
EDR2230-095-KD	4,06	22,30	○		
EDR2240-095-KD	4,08	22,40	○		
EDR2250-095-KD	4,09	22,50	●		
EDR2260-095-KD	4,11	22,60	○		
EDR2270-095-KD	4,13	22,70	○		
EDR2280-095-KD	4,15	22,80	○		
EDR2290-095-KD	4,17	22,90	○		
EDR2300-100-KD	4,18	23,00	●	ZTE015-ED230-** ZTE03-ED230-** ZTE05-ED230-** ZTE08-ED230-**	
EDR2310-100-KD	4,20	23,10	○		
EDR2320-100-KD	4,22	23,20	○		
EDR2330-100-KD	4,24	23,30	●		
EDR2340-100-KD	4,26	23,40	○		
EDR2350-100-KD	4,27	23,50	●		
EDR2360-100-KD	4,29	23,60	○		
EDR2370-100-KD	4,31	23,70	○		
EDR2380-100-KD	4,33	23,80	○		
EDR2390-100-KD	4,35	23,90	○		

● Ex stock ○ On demand

Drill heads

EDR-KD

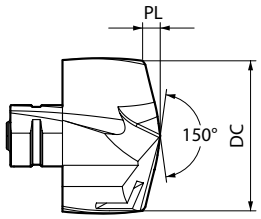


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	Pl	Dc	KDG303		
EDR2400-110-KD	4,37	24,00	●	ZTE015-ED240-** ZTE03-ED240-** ZTE05-ED240-** ZTE08-ED240-**	ZTK21-25.9
EDR2410-110-KD	4,38	24,10	○		
EDR2420-110-KD	4,40	24,20	○		
EDR2430-110-KD	4,42	24,30	○		
EDR2440-110-KD	4,44	24,40	○		
EDR2450-110-KD	4,46	24,50	●		
EDR2460-110-KD	4,48	24,60	○		
EDR2470-110-KD	4,49	24,70	○		
EDR2480-110-KD	4,51	24,80	○		
EDR2490-110-KD	4,53	24,90	○		
EDR2500-115-KD	4,55	25,00	●	ZTE015-ED250-** ZTE03-ED250-** ZTE05-ED250-** ZTE08-ED250-**	
EDR2510-115-KD	4,57	25,10	○		
EDR2520-115-KD	4,58	25,20	○		
EDR2530-115-KD	4,60	25,30	○		
EDR2540-115-KD	4,62	25,40	○		
EDR2550-115-KD	4,64	25,50	●		
EDR2560-115-KD	4,66	25,60	○		
EDR2570-115-KD	4,68	25,70	○		
EDR2580-115-KD	4,69	25,80	○		
EDR2590-115-KD	4,70	25,90	○		

● Ex stock ○ On demand

Drill heads

EDR-PD

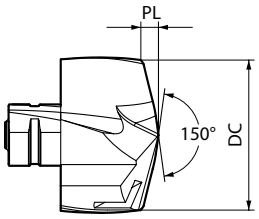


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	Pl	Dc	KDG3013		
EDR1200-045-PD	1,61	12,03	●	ZTE015-ED120-**	ZTK12-15.9
EDR1210-045-PD	1,63	12,13	○		
EDR1220-045-PD	1,64	12,23	○		
EDR1230-045-PD	1,65	12,33	○		
EDR1240-045-PD	1,67	12,43	○		
EDR1250-045-PD	1,68	12,53	●	ZTE015-ED120-**	
EDR1260-045-PD	1,69	12,63	○		
EDR1270-045-PD	1,71	12,73	○		
EDR1280-045-PD	1,72	12,83	○		
EDR1290-045-PD	1,73	12,93	○		
EDR1300-050-PD	1,75	13,03	●	ZTE015-ED130-**	
EDR1310-050-PD	1,76	13,13	○		
EDR1320-050-PD	1,77	13,23	○		
EDR1330-050-PD	1,79	13,33	○		
EDR1340-050-PD	1,80	13,43	○		
EDR1350-050-PD	1,81	13,53	●	ZTE015-ED130-**	
EDR1360-050-PD	1,83	13,63	○		
EDR1370-050-PD	1,84	13,73	○		
EDR1380-050-PD	1,85	13,83	○		
EDR1390-050-PD	1,87	13,93	○		
EDR1400-055-PD	1,88	14,03	●	ZTE015-ED140-**	
EDR1410-055-PD	1,89	14,13	○		
EDR1420-055-PD	1,91	14,23	○		
EDR1430-055-PD	1,92	14,33	○		
EDR1440-055-PD	1,93	14,43	○		
EDR1450-055-PD	1,95	14,53	●	ZTE015-ED140-**	
EDR1460-055-PD	1,96	14,63	○		
EDR1470-055-PD	1,97	14,73	○		
EDR1480-055-PD	1,99	14,83	○		
EDR1490-055-PD	2,00	14,93	○		
EDR1500-060-PD	2,01	15,03	●	ZTE015-ED150-**	
EDR1510-060-PD	2,03	15,13	○		
EDR1520-060-PD	2,04	15,23	○		
EDR1530-060-PD	2,05	15,33	○		
EDR1540-060-PD	2,07	15,43	○		
EDR1550-060-PD	2,08	15,53	●		
EDR1560-060-PD	2,09	15,63	○		
EDR1570-060-PD	2,11	15,73	○		
EDR1580-060-PD	2,12	15,83	○		
EDR1590-060-PD	2,13	15,93	○		

● Ex stock ○ On demand

Drill heads

EDR-PD

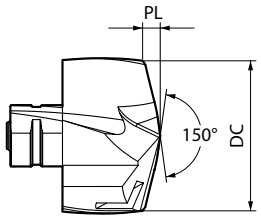


Article	Dimensions [mm]		Grade	Drilling body	Wrench
	Pl	Dc	KDG3013		
EDR1600-065-PD	2,15	16,03	●	ZTE015-ED160-**	ZTK16-20.9
EDR1610-065-PD	2,16	16,13	○		
EDR1620-065-PD	2,17	16,23	○		
EDR1630-065-PD	2,19	16,33	○		
EDR1640-065-PD	2,20	16,43	○		
EDR1650-065-PD	2,21	16,53	●		
EDR1660-065-PD	2,23	16,63	○		
EDR1670-065-PD	2,24	16,73	○		
EDR1680-065-PD	2,25	16,83	○		
EDR1690-065-PD	2,27	16,93	○		
EDR1700-070-PD	2,28	17,03	●	ZTE015-ED170-**	
EDR1710-070-PD	2,30	17,13	○		
EDR1720-070-PD	2,31	17,23	○		
EDR1730-070-PD	2,32	17,33	○		
EDR1740-070-PD	2,34	17,43	○		
EDR1750-070-PD	2,35	17,53	●		
EDR1760-070-PD	2,36	17,63	○		
EDR1770-070-PD	2,38	17,73	○		
EDR1780-070-PD	2,39	17,83	○		
EDR1790-070-PD	2,40	17,93	○		
EDR1800-075-PD	2,42	18,03	●	ZTE015-ED180-**	
EDR1810-075-PD	2,43	18,13	○		
EDR1820-075-PD	2,44	18,23	○		
EDR1830-075-PD	2,46	18,33	○		
EDR1840-075-PD	2,47	18,43	○		
EDR1850-075-PD	2,48	18,53	●		
EDR1860-075-PD	2,50	18,63	○		
EDR1870-075-PD	2,51	18,73	○		
EDR1880-075-PD	2,52	18,83	○		
EDR1890-075-PD	2,54	18,93	○		
EDR1900-080-PD	2,55	19,03	●	ZTE015-ED190-**	
EDR1910-080-PD	2,56	19,13	○		
EDR1920-080-PD	2,58	19,23	○		
DR1930-080-PD	2,59	19,33	●		
EDR1940-080-PD	2,60	19,43	○		
EDR1950-080-PD	2,62	19,53	●		
EDR1960-080-PD	2,63	19,63	○		
EDR1970-080-PD	2,64	19,73	○		
EDR1980-080-PD	2,66	19,83	○		
EDR1990-080-PD	2,67	19,93	○		

● Ex stock ○ On demand

Drill heads

EDR-PD



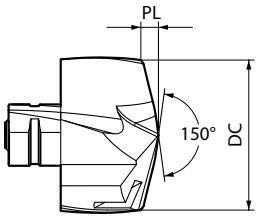
Article	Dimensions [mm]		Grade	Drilling body	Wrench
	Pl	Dc	KDG3013		
EDR2000-085-PD	2,68	20,03	●	ZTE015-ED200-**	ZTK16-20.9
EDR2010-085-PD	2,70	20,13	○		
EDR2020-085-PD	2,71	20,23	○		
EDR2030-085-PD	2,72	20,33	○		
EDR2040-085-PD	2,74	20,43	○		
EDR2050-085-PD	2,75	20,53	●		
EDR2060-085-PD	2,76	20,63	○		
EDR2070-085-PD	2,78	20,73	○		
EDR2080-085-PD	2,79	20,83	○		
EDR2090-085-PD	2,80	20,93	○		
EDR2100-090-PD	2,82	21,03	●	ZTE015-ED210-**	ZTK21-25.9
EDR2110-090-PD	2,83	21,13	○		
EDR2120-090-PD	2,84	21,23	○		
EDR2130-090-PD	2,86	21,33	○		
EDR2140-090-PD	2,87	21,43	○		
EDR2150-090-PD	2,88	21,53	●		
EDR2160-090-PD	2,90	21,63	○		
EDR2170-090-PD	2,91	21,73	○		
EDR2180-090-PD	2,92	21,83	○		
EDR2190-090-PD	2,94	21,93	○		
EDR2200-095-PD	2,95	22,03	●	ZTE015-ED220-**	
EDR2210-095-PD	2,96	22,13	○		
EDR2220-095-PD	2,98	22,23	○		
EDR2230-095-PD	2,99	22,33	○		
EDR2240-095-PD	3,01	22,43	○		
EDR2250-095-PD	3,02	22,53	●		
EDR2260-095-PD	3,03	22,63	○		
EDR2270-095-PD	3,05	22,73	○		
EDR2280-095-PD	3,06	22,83	○		
EDR2290-095-PD	3,07	22,93	○		
EDR2300-100-PD	3,09	23,03	●	ZTE015-ED230-**	
EDR2310-100-PD	3,10	23,13	●		
EDR2320-100-PD	3,11	23,23	○		
EDR2330-100-PD	3,13	23,33	●		
EDR2340-100-PD	3,14	23,43	○		
EDR2350-100-PD	3,15	23,53	●		
EDR2360-100-PD	3,17	23,63	○		
EDR2370-100-PD	3,18	23,73	●		
EDR2380-100-PD	3,19	23,83	○		
EDR2390-100-PD	3,21	23,93	○		

● Ex stock ○ On demand

For more information on using the **PD geometry** (recommended: pilot hole from 8xD), please refer to page C79.

Drill heads

EDR-PD



Article	Dimensions [mm]		Grade	Drilling body	Wrench
	Pl	Dc	KDG3013		
EDR2400-110-PD	3,22	24,03	●	ZTE015-ED240-**	ZTK21-25.9
EDR2410-110-PD	3,23	24,13	○		
EDR2420-110-PD	3,25	24,23	○		
EDR2430-110-PD	3,26	24,33	○		
EDR2440-110-PD	3,27	24,43	○		
EDR2450-110-PD	3,29	24,53	●		
EDR2460-110-PD	3,30	24,63	○		
EDR2470-110-PD	3,31	24,73	○		
EDR2480-110-PD	3,33	24,83	○		
EDR2490-110-PD	3,34	24,93	○		
EDR2500-115-PD	3,35	25,03	●	ZTE015-ED250-**	
EDR2510-115-PD	3,37	25,13	○		
EDR2520-115-PD	3,38	25,23	○		
EDR2530-115-PD	3,39	25,33	○		
EDR2540-115-PD	3,41	25,43	○		
EDR2550-115-PD	3,42	25,53	●		
EDR2560-115-PD	3,43	25,63	○		
EDR2570-115-PD	3,45	25,73	○		
EDR2580-115-PD	3,46	25,83	○		
EDR2590-115-PD	3,47	25,93	○		

● Ex stock ○ On demand

For more information on using the **PD geometry** (recommended: pilot hole from 8xD), please refer to page C79.

Indexable head drilling Recommended cutting data

Indexable head drills

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]					
						Ø 12-25,9		Ø 12-25,9		Ø 12-25,9	
						1,5-3xD (GD)		5xD (GD)		8xD (GD)	
						KDG3013		KDG3013		KDG3013	
						Vc [m/min]	f-group	Vc [m/min]	f-group	Vc [m/min]	f-group
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	130	18	100	17	80	16
		approx. 0,45 % C	annealed	190	2	110	18	90	17	70	16
		approx. 0,45 % C	tempered	250	3	100	18	80	17	60	16
		approx. 0,75 % C	annealed	270	4	85	18	70	17	50	16
		approx. 0,75 % C	tempered	300	5	75	18	60	17	45	16
	Low-alloyed steel		annealed	180	6	110	18	90	17	70	16
			tempered	275	7	85	18	70	17	50	16
			tempered	300	8	75	18	60	17	45	16
			tempered	350	9	65	18	50	17	40	16
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	100	18	80	17	60	16
			hardened and tempered	325	11	75	18	60	17	45	16
M	Stainless steel	ferritic/martensitic	annealed	200	12	60	18	50	17	40	16
		martensitic	tempered	240	13	35	18	30	17	25	16
		austenitic	quench hardened	180	14	40	18	30	17	25	16
		austenitic-ferritic		230	15	35	18	30	17	25	16
K	Grey cast iron	perlitic/ferritic		180	16	125	18	100	17	75	16
		perlitic (martensitic)		260	17	100	18	80	17	60	16
	Cast iron with spheroidal graphite	ferritic		160	18	110	18	90	17	60	16
		perlitic		250	19	70	18	60	17	40	16
	Malleable cast iron	ferritic		130	20	120	18	100	17	70	16
		perlitic		230	21	70	18	60	17	40	16
N	Aluminium wrought alloys	cannot be hardened		60	22	180	18	140	17	110	16
		hardenable	hardened	100	23	180	18	140	17	110	16
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24	180	18	145	17	110	16
		≤ 12 % Si, hardenable	hardened	90	25	180	18	145	17	110	16
		> 12 % Si, cannot be hardened		130	26	180	18	145	17	110	16
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27	–	–	–	–	–	–
		CuZn, CuSnZn		90	28	–	–	–	–	–	–
		CuSn, Pb-free copper, electrolytic copper		100	29	–	–	–	–	–	–
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30	–	–	–	–	–	–
			hardened	280	31	–	–	–	–	–	–
		Ni or Co bass	annealed	250	32	–	–	–	–	–	–
			hardened	350	33	–	–	–	–	–	–
			cast	320	34	–	–	–	–	–	–
	Titanium alloys	pure titanium		R_m 400	35	–	–	–	–	–	–
		α and β alloys	hardened	R_m 1050	36	–	–	–	–	–	–
H	Hardened steel		hardened and tempered	55 HRC	37	60	16	50	16	40	16
			hardened and tempered	60 HRC	38	–	–	–	–	–	–
	Hard cast iron		cast	400	39	–	–	–	–	–	–
	Hardened cast iron		hardened and tempered	55 HRC	40	50	16	40	16	30	16
X	Non-metallic materials	Thermoplasts			41	–	–	–	–	–	–
		Thermosetting plastics			42	–	–	–	–	–	–
		Plastic, glass-fibre reinforced GFRP			43	–	–	–	–	–	–
		Plastic, carbon fibre reinforced CFRP			44	–	–	–	–	–	–
		Graphite			45	–	–	–	–	–	–
		Wood			46	–	–	–	–	–	–

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.
With hole depths of 5xD adjust the cutting data accordingly to the application.
f-group = feed rate recommendations on page C148.
For examples of material for cutting tool groups view page D11.

	Starting values for cutting speed v_c [m/min]															
	Ø 12-25,9		Ø 12-25,9		Ø 12-25,9		Ø 12-25,9									
	1,5-3xD (KD)		5xD (KD)		8xD (KD)		1,5-3xD (PD)									
	KDG303		KDG303		KDG303		KDG3013									
	Vc [m/min]	f-group	Vc [m/min]	f-group	Vc [m/min]	f-group	Vc [m/min]	f-group								
	130	18	100	17	80	16	130	18								
	110	18	90	17	70	16	110	18								
	100	18	80	17	60	16	100	18								
	85	18	70	17	50	16	85	18								
	75	18	60	17	45	16	75	18								
	110	18	90	17	70	16	110	18								
	85	18	70	17	50	16	85	18								
	75	18	60	17	45	16	75	18								
	65	18	50	17	40	16	65	18								
	100	18	80	17	60	16	100	18								
	75	18	60	17	45	16	75	18								
	–	–	–	–	–	–	60	18								
	–	–	–	–	–	–	35	18								
	–	–	–	–	–	–	40	18								
	–	–	–	–	–	–	35	18								
	125	18	100	17	75	16	125	18								
	100	18	80	17	60	16	100	18								
	110	18	90	17	60	16	110	18								
	70	18	60	17	40	16	70	18								
	120	18	100	17	70	16	120	18								
	70	18	60	17	40	16	70	18								
	–	–	–	–	–	–	180	18								
	–	–	–	–	–	–	180	18								
	–	–	–	–	–	–	180	18								
	–	–	–	–	–	–	180	18								
	–	–	–	–	–	–	180	18								
	–	–	–	–	–	–	–	–								
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	–	–	–	–	–	–	–	–								
	–	–	–	–	–	–	–	–								
	60	16	50	16	40	16	60	16								
	–	–	–	–	–	–	–	–								
	–	–	–	–	–	–	–	–								
	50	16	40	16	30	16	50	16								
	–	–	–	–	–	–	–	–								
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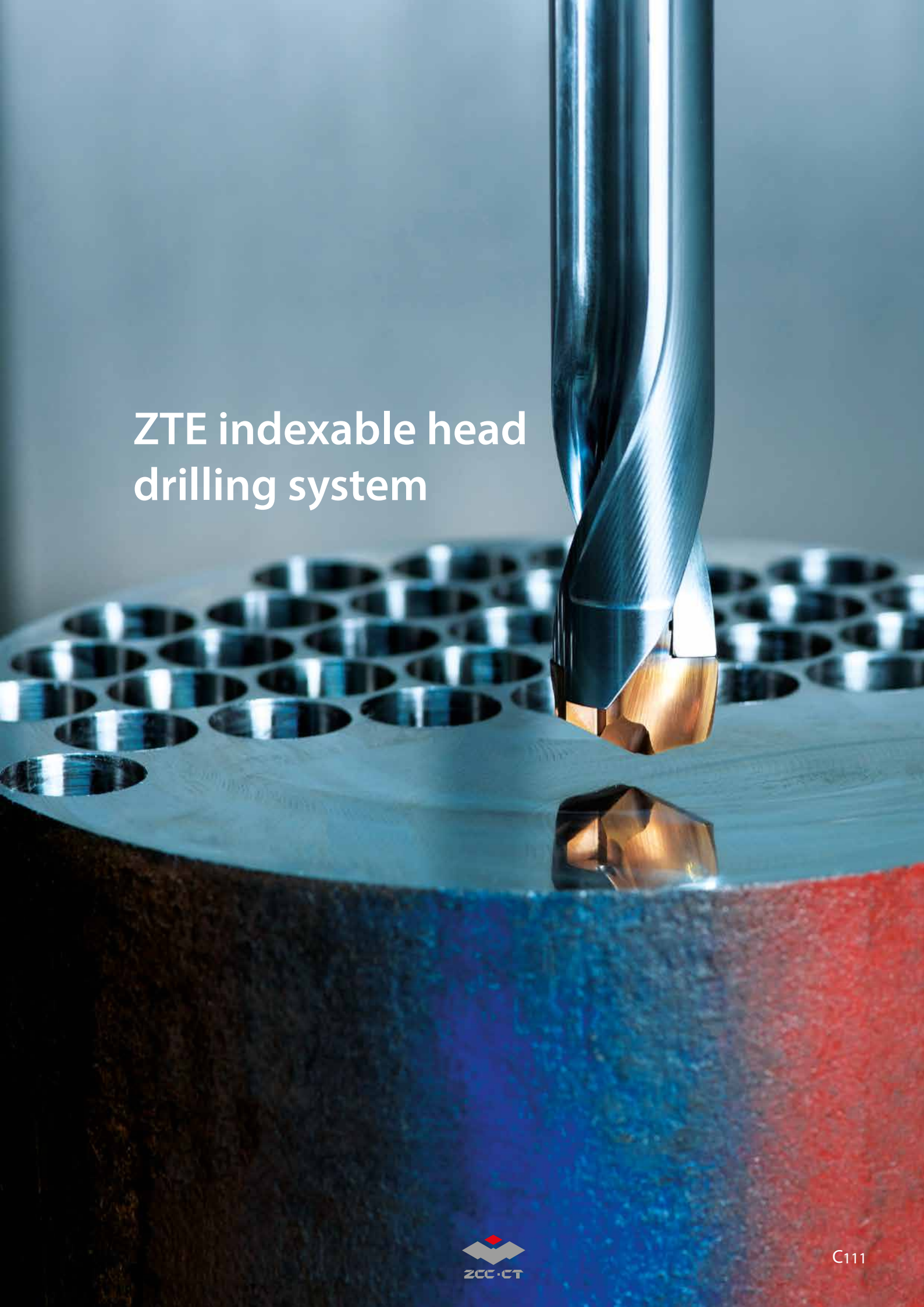
	–	–	–	–	–	–	–	–								

Recommended feed rate

Indexable head drills

f-group	Feed rate [mm]													
	Ø12	**Ø13**	**Ø14**	**Ø15**	**Ø16**	**Ø17**	**Ø18**	**Ø19**	**Ø20**	**Ø21**	**Ø22**	**Ø23**	**Ø24**	**Ø25**
16	0,15	0,155	0,16	0,17	0,175	0,18	0,19	0,195	0,2	0,21	0,22	0,225	0,23	0,24
17	0,19	0,2	0,21	0,22	0,225	0,23	0,24	0,25	0,26	0,27	0,28	0,29	0,3	0,31
18	0,21	0,22	0,23	0,24	0,25	0,26	0,27	0,28	0,29	0,3	0,31	0,32	0,33	0,34

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.



ZTE indexable head drilling system

738 | PNK | v2.0 | 0.0 | 06.26

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