20 years in Europe

ZCC Cutting Tools Europe GmbH

Product Innovations 03/2023

[YBG205H grade – MU chip breaker – FME17 face milling system
EMP05 plunge milling system – FMR06 round insert milling cutter
CSX1000 grade – APL chip breaker]

– 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.

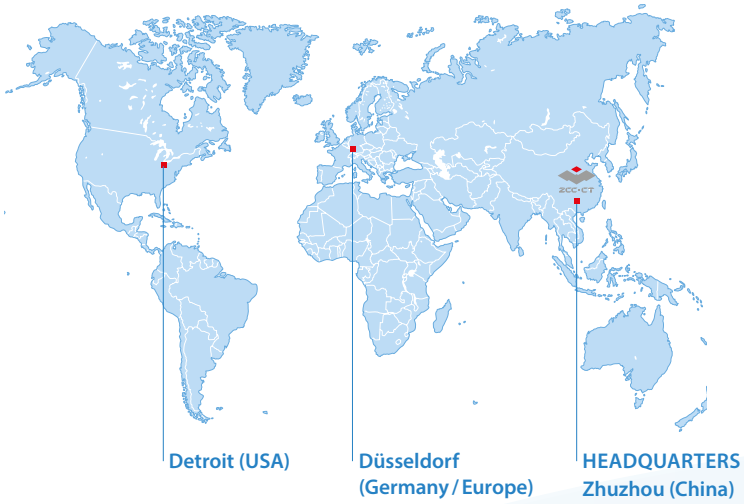
The quality management system of ZCC Cutting Tools Europe GmbH is certified in the area of 'distribution and logistics of metal-working tools' in accordance with ISO 9001:2008.

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 03 / 2023

A glimpse inside: Highlights from previous Product Innovations brochures

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

Go to PDF online

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

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Celebrating 20 years of growth built on partnership

2023 marks a special year in the success story that is ZCC Cutting Tools Europe GmbH. It all started 20 years ago in Düsseldorf when we began offering cutting tools targeted at the European market. While our business was small to begin with, we steadily expanded, with a constant focus on growth and on our customers.

A strong brand promise

From day one, ZCC Cutting Tools Europe has shown a constant commitment to offering **premium technological products** that are tailored to the requirements of the individual target groups, **represent a strong value proposition** and improve quality, productivity and efficiency in the production environments of our customers from across a range of industrial segments. We also provide an array of **associated services** that deliver the quality our customers on the European market demand.

Technological expertise and resources

ZCC Cutting Tools has the **expertise, capabilities** and **resources** required across the entire value chain in the development and production of cutting tools. This is our USP that has allowed us to offer and continue to offer these products and services. From the start, we have passed on this added value to our customers and business partners who have benefited from this ever since.

Trust built on 20 years of continuity

We now **develop** and **test** products and solutions in Europe for the markets **in Europe** in close consultation with our customers. We offer a **full range of standard products** and **customised special solutions**. Our logistics processes guarantee **on-time delivery** in all markets across Europe.

We present our latest new products to kick off our 20th year anniversary, and look forward to growing our partnership with you.

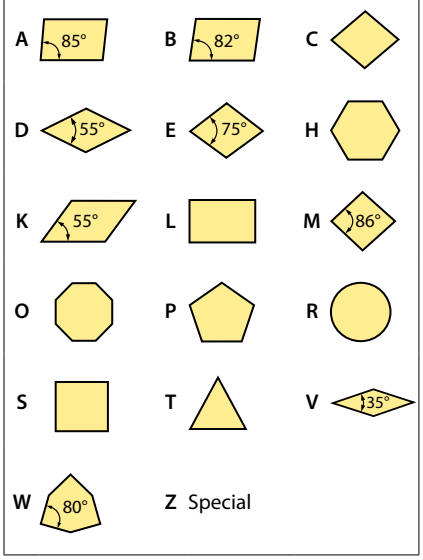
Notes

General turning

ISO standard

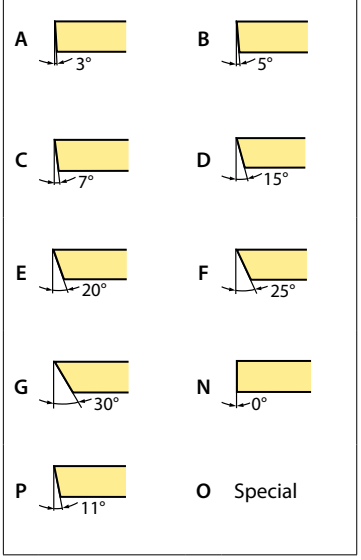
T	N	M	G	22	04	08	(N)	–	DM
1	2	3	4	5	6	7	8		9

Insert shape



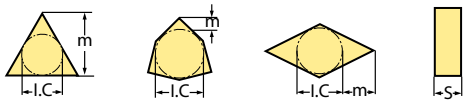
1

Clearance angle



2

Tolerance class

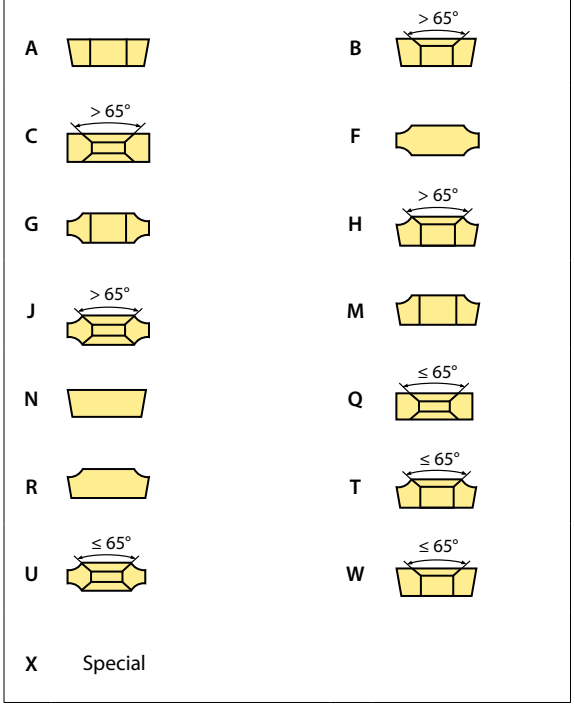


Code	I.C [mm]	m [mm]	S [mm]
A	±0,025	±0,005	±0,025
C	±0,025	±0,013	±0,025
E	±0,025	±0,025	±0,025
F	±0,013	±0,005	±0,025
G	±0,025	±0,025	±0,130
H	±0,013	±0,013	±0,025
J	±0,05–0,15	±0,005	±0,025
K	±0,05–0,15	±0,013	±0,025
L	±0,05–0,15	±0,025	±0,025
M	±0,05–0,15	±0,08–0,20	±0,130
N	±0,05–0,15	±0,08–0,20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

3

Fastening features (metric)

Insert shape



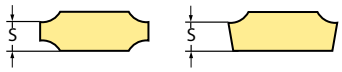
4

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

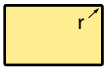
Insert thickness S [mm]



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

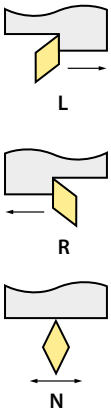
Nose radius r [mm]



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



8

Chip breaker overview

(from page A16 in the ZCC Cutting Tools Europe Main Catalogue 2023)

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

YBG205H grade

The perfect choice for high-temperature turning applications

YOUR BENEFITS

– Ultra-modern TiAlSiN PVD coating **with optimal stability for a long tool life**
– Well suited for machining steel and stainless steel
– Thin layer structure for **optimally defined and prepared cutting edges**

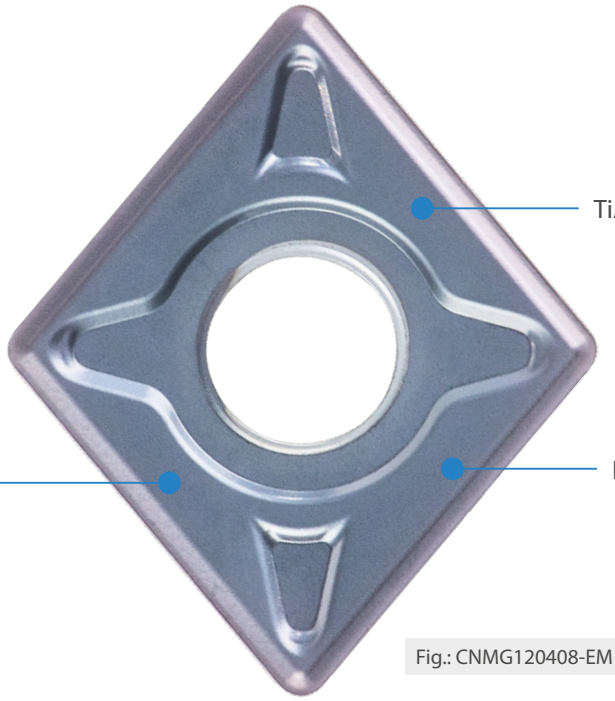


Fig.: CNMG120408-EM YBG205H

The following articles are currently available with the new YBG205H grade:

Article	Stock
CCMT060204-EF YBG205H	●
CCMT060204-EM YBG205H	●
CCMT060208-EM YBG205H	●
CCMT09T304-EF YBG205H	●
CCMT09T304-EM YBG205H	●
CCMT09T308-EM YBG205H	●
CNMG120404-EF YBG205H	●
CNMG120404-EM YBG205H	●
CNMG120408-EF YBG205H	●
CNMG120408-EM YBG205H	●
DCMT070204-EM YBG205H	●
DCMT11T304-EF YBG205H	●
DCMT11T304-EM YBG205H	●
DCMT11T308-EM YBG205H	●

● Ex stock ○ On demand

Article	Stock
TCMT090204-EM YBG205H	●
TCMT110204-EF YBG205H	●
TCMT110204-EM YBG205H	●
TCMT16T304-EM YBG205H	●
TCMT16T308-EM YBG205H	●
TNMG160404-EF YBG205H	●
TNMG160404-EM YBG205H	●
TNMG160408-EF YBG205H	●
TNMG160408-EM YBG205H	●
WNMG080404-EF YBG205H	●
WNMG080404-EM YBG205H	●
WNMG080408-EF YBG205H	●
WNMG080408-EM YBG205H	●

● Ex stock ○ On demand

YBG205H grade

The perfect choice for high-temperature turning applications

Turning insert, negative

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
						HC (CVD)			HC (PVD)					
						YBD152C			YBG101			YBG102		
						Feed rate [mm]			Feed rate [mm]					
						0,1	0,3	0,5	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							360	290	200
		martensitic	tempered	240	13							180	150	110
		austenitic	quench hardened	180	14							240	190	140
		austenitic-ferritic		230	15							190	150	110
K	Grey cast iron	perlitic/ferritic		180	16	570	395	220						
		perlitic (martensitic)		260	17	310	230	150						
	Cast iron with spheroidal graphite	ferritic		160	18	310	230	150						
		perlitic		250	19	230	170	110						
	Malleable cast iron	ferritic		130	20	340	280	220						
		perlitic		230	21	250	180	110						
N	Aluminium wrought alloys	cannot be hardened		60	22				2000	1200	–	2000	1200	–
		hardenable	hardened	100	23				610	420	–	610	420	–
	Cast aluminium alloys	≤ 12% Si, cannot be hardened		75	24				550	300	–	550	300	–
		≤ 12% Si, hardenable	hardened	90	25				360	190	–	360	190	–
		> 12% Si, cannot be hardened		130	26				320	170	–	320	170	–
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27				730	350	–	730	350	–
		CuZn, CuSnZn		90	28				370	330	–	370	330	–
		CuSn, Pb-free copper, electrolytic copper		100	29				270	200	–	270	200	–
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30							65	45	–
			hardened	280	31							60	40	–
		Ni or Co bass	annealed	250	32							60	40	–
			hardened	350	33							55	35	–
			cast	320	34							55	35	–
	Titanium alloys	pure titanium		R_m 400	35							100	60	–
		α and β alloys	hardened	R_m 1050	36							80	40	–
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 (PVD)															HC_1			HT					
	YBS103			YBG105			YB9320			YBG205(H)			YPD201			YNG151C			YNG151			YNT251		
	Feed rate [mm]			Feed rate [mm]			Feed rate [mm]			Feed rate [mm]			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	0,1	0,3	0,6	0,1	0,3	0,6	0,1	0,2	0,4	0,1	0,2	0,4	0,1	0,2	0,4
																510	350	–	510	350	–	510	350	–
																430	270	–	430	270	–	430	270	–
																330	220	–	330	220	–	330	220	–
																320	200	–	320	200	–	320	200	–
																280	170	–	280	170	–	280	170	–
																400	240	–	400	240	–	400	240	–
																290	180	–	290	180	–	290	180	–
																240	170	–	240	170	–	240	170	–
																220	150	–	220	150	–	220	150	–
																340	220	–	340	220	–	340	220	–
																180	110	–	180	110	–	180	110	–
	360	290	200	360	290	200	360	290	200	320	250	160	360	290	200									
	180	150	110	180	150	110	190	155	110	170	150	110	190	155	110									
	240	190	140	240	190	140	250	210	150	230	190	140	250	210	150									
	190	150	110	190	150	110	200	165	120	180	150	110	200	165	120									
																430	365	280	430	365	280	430	365	280
																390	340	270	390	340	270	390	340	270
																360	300	220	360	300	220	360	300	220
																340	295	230	340	295	230	340	295	230
																310	260	190	310	260	190	310	260	190
																250	210	150	250	210	150	250	210	150
	80	65	45	65	45	–	55	35	–	55	–	–	–	65	45									
	75	60	40	60	40	–	50	30	–	50	–	–	–	60	40									
	70	60	40	60	40	–	50	30	–	50	–	–	–	60	40									
	65	55	35	55	35	–	45	25	–	45	–	–	–	55	35									
	65	55	35	55	35	–	45	25	–	45	–	–	–	55	35									
	110	100	60	100	60	–	80	60	–	70	–	–	–	100	60									
	90	80	40	80	40	–	60	40	–	50	–	–	–	80	40									

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

Notes

Parting & grooving

ZP G D 04 04 – M U

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

6

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

7

MU chip breaker

Universal tool that delivers optimum chip control

YOUR BENEFITS

- **Maximum chip control** thanks to 3D-optimised chip-forming elements
- Optimally suited for steel, stainless steel and cast iron
- **Flexible in any application** (parting and grooving/grooving)
- Reduced wear thanks to limited surface contact

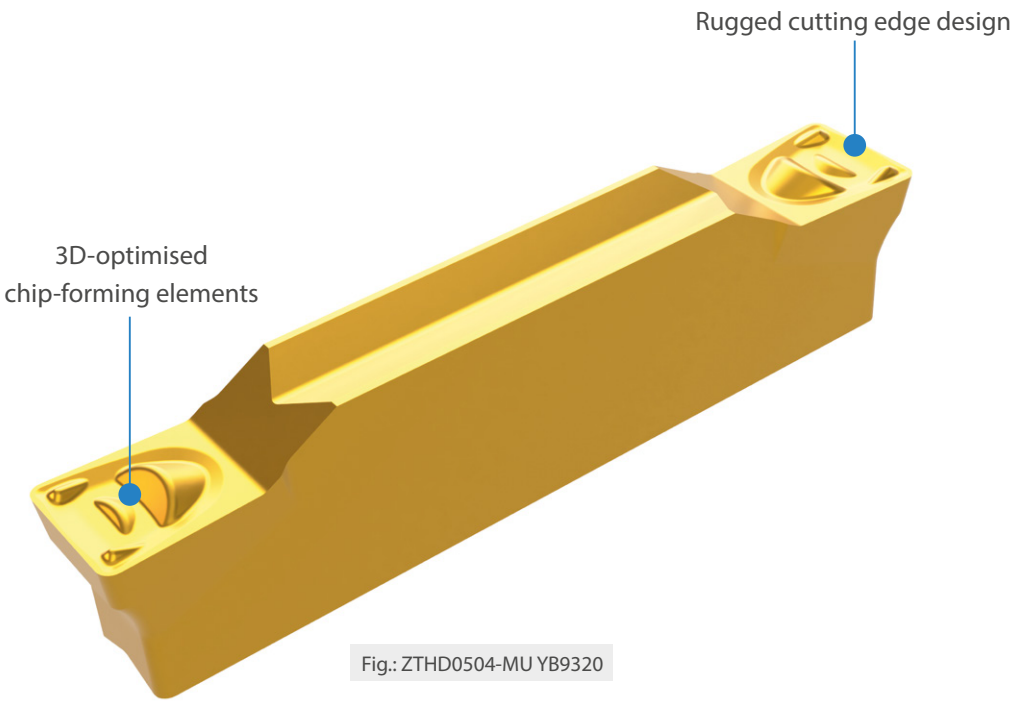
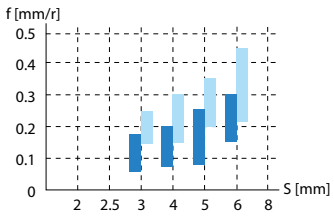
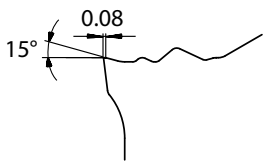


Fig.: ZTHD0504-MU YB9320

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

S = 4 mm

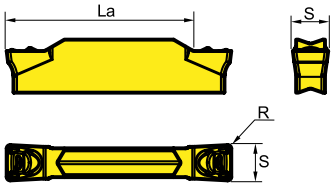
✔ Very suitable ✔ Suitable

Parting & grooving
Turning

Parting inserts

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

Parting & grooving insert (double sided)



Double cutting edge

	HC¹ (CVD)						HC¹ (PVD)						HW	
P	◉	◉						◉	◉	◉	◉			
M								◉	◉	◉	◉			
K														
N													●	◉
S							●	●	◉	◉	◉			
H														

	ISO	R±0.1	La *max*	S±0.10	f	YBC252	YBC251					YBG105	YBG102	YB9320	YBG205	YBG202	YBG302		YD101	YD201
	**ZTFD0302-MU**	0.2	17	3	0,06-0,18									●						
	ZTFD0303-MU	0.3	17	3	0,06-0,18									●						
	ZTGD0402-MU	0.2	22	4	0,08-0,20									●						
	ZTGD0404-MU	0.4	22	4	0,08-0,20									●						
	ZTHD0504-MU	0.4	22	5	0,09-0,25									●						
	ZTHD0508-MU	0.8	22	5	0,09-0,25									●						
	ZTKD0604-MU	0.4	22	6	0,15-0,30									○						
	ZTKD0608-MU	0.8	22	6	0,15-0,30									○						

● Ex stock ○ On demand

HC¹ Coated carbide
HW Uncoated carbide

MU chip breaker

Universal tool that delivers optimum chip control

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)	
						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	YBG302	YD101	YD201	
	190	190	190	185			
	175	175	175	170			
	145	145	145	140			
	140	140	140	135			
	135	135	135	130			
	170	170	170	165			
	125	125	125	125			
	115	115	115	115			
	105	105	105	105			
	125	125	125	125			
	95	95	95	95			
	165	165	165	160			
	135	135	135	130			
	155	155	155	150			
	135	135	135	130			
	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	70	65	
	50	50	50	50	35	35	
	80	80	80	75	60	60	
	70	70	70	65	50	50	
	70	70	70	65	50	50	
	145	145	145	140	105	100	
	50	50	50	50	35	35	

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

FME17 face milling system

Highly efficient universal tool for machining end faces and contours

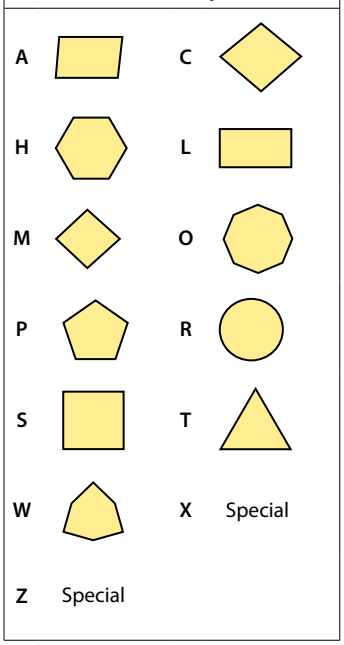
Indexable milling

B

Indexable milling ISO code – inserts

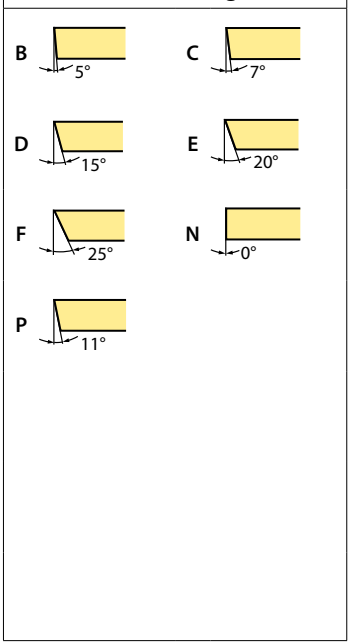
S	P	K	N	12	04	ED	T21K	R	–	DM
1	2	3	4	5	6	7	8	9		10

Insert shape



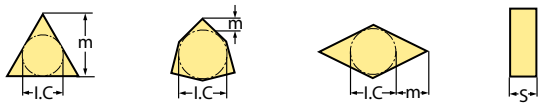
1

Clearance angle



2

Tolerance class

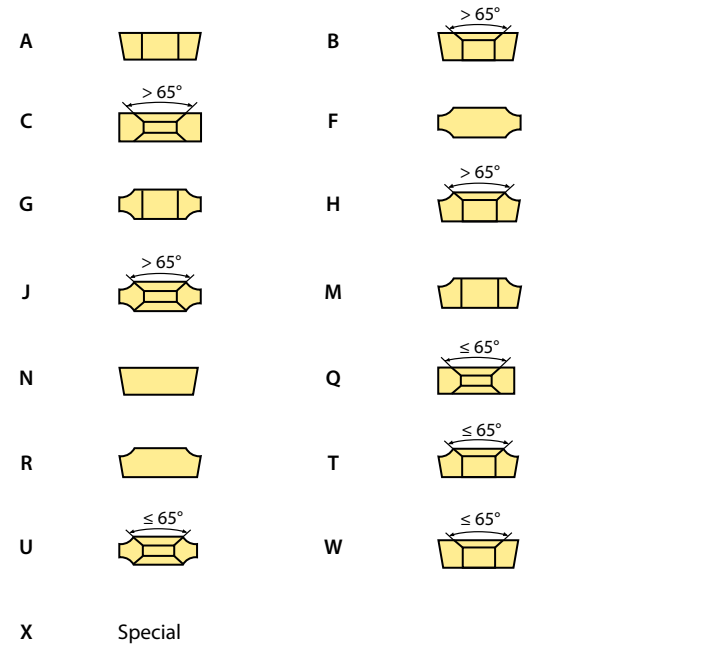


Code	I.C [mm]	m [mm]	S [mm]
A	±0,025	±0,005	±0,025
C	±0,025	±0,013	±0,025
E	±0,025	±0,025	±0,025
F	±0,013	±0,005	±0,025
G	±0,025	±0,025	±0,130
H	±0,013	±0,013	±0,025
J	±0,05–0,13	±0,005	±0,025
K	±0,05–0,13	±0,013	±0,025
L	±0,05–0,13	±0,025	±0,025
M	±0,05–0,13	±0,08–0,18	±0,130
N	±0,05–0,13	±0,08–0,18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

3

Fastening features (metric)

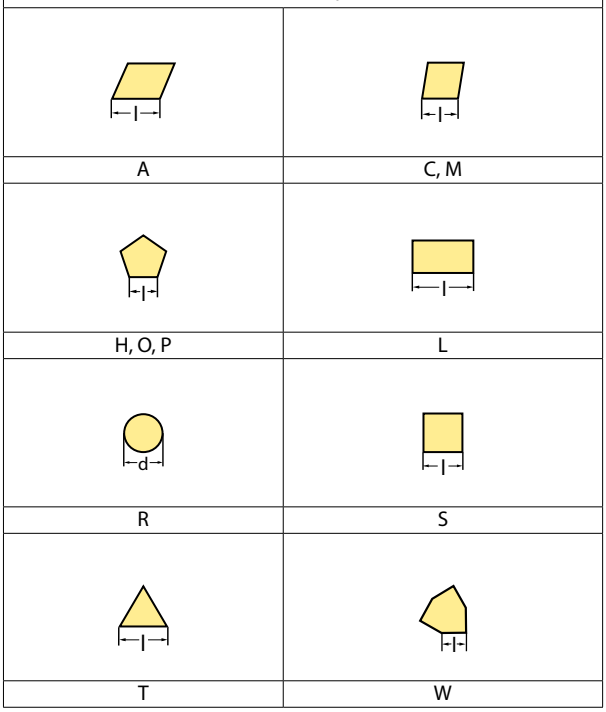
Insert shape



4

Cutting edge length l [mm]

Insert shape



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

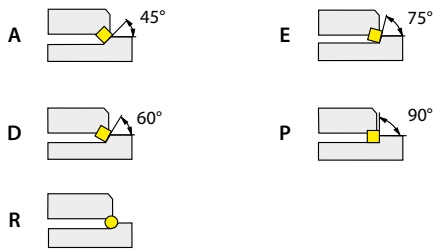
Indexable milling System code – milling bodies

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

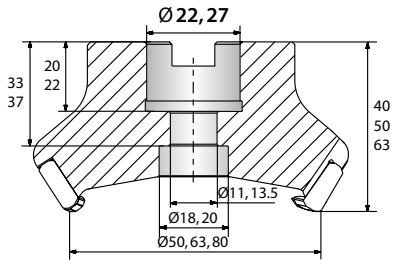
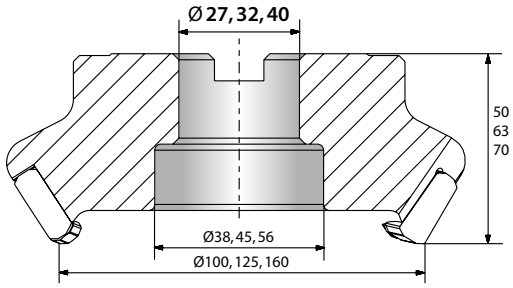
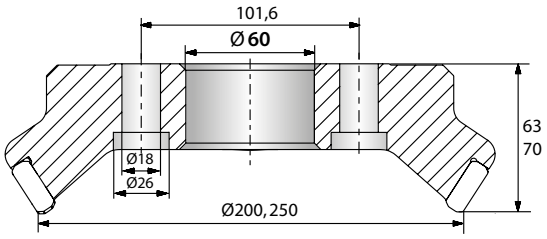
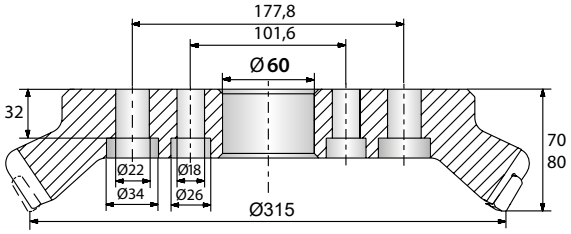
Serial number

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.

FME17 face milling system

Highly efficient universal tool for machining end faces and contours

YOUR BENEFITS

- The 75° milling system with negative inserts ensures a **stable cutting edge**
- Available for a wide range of finishing and roughing applications
- The newly developed chip breaker features a **positive cutting edge geometry and generates lower cutting forces**
- The **SNMX120512-**** insert can be used in combination with the **FME17, FMA17** and **FMP17** systems
- **Highly economical** thanks to eight-edged inserts

Precision insert seat enables **high surface qualities**

New insert design provides for **increased resistance to breaking and greater process reliability**

Fig.: FME17-063-A22-SN12-07C

Diameter range: 50 – 400 mm

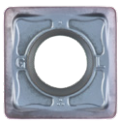
The **face milling system FME17** can be used in combination with SNGX1205**ENN** and SNMX120512 inserts.

Insert grades

YBM253	YBG205H	YBD252	YBS303
CVD	*PVD*	*CVD*	*PVD*
P20 – P40	*P10 – P30*	*K20 – K35*	*S25 – S35*
M15 – M35	*M20 – M40*		

Chip breaker

SN*X-GL

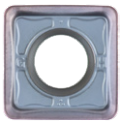


Finishing

SN*X-GM

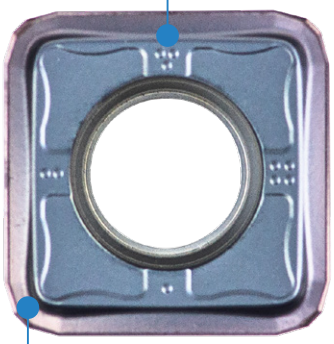
General machining

SN*X-GH



Roughing

Easy to identify cutting edges



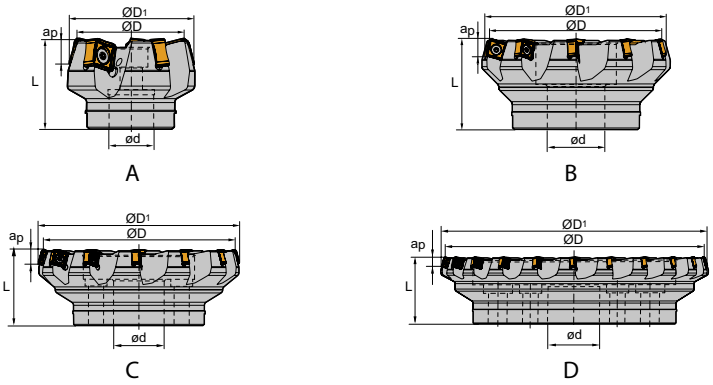
Controlled chip removal thanks to open chip former design

Low cutting forces thanks to positive cutting edge design

Fig.: SNGX1205**ENN**-GH YBG205H

Face milling

FME17 Kr: 75°



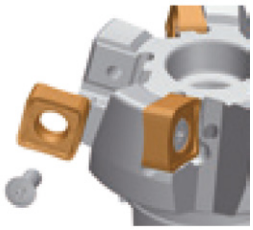
Article	✻	Stock R	Stock L	Dimensions [mm] ØD	ØD1	ød	L	ap max	Teeth	Coupling	kg	Inserts
FME17-050-A22-SN12-04C	✻	○	○	50	60	22	40	8	4	A	0.361	SNGX1205ENN SNMX120512
FME17-050-A22-SN12-05C	✻	●		50	60	22	40	8	5	A	0.337	
FME17-063-A22-SN12-05C	✻	○	○	63	73	22	50	8	5	A	0.52	
FME17-080-A27-SN12-06C	✻	●	○	80	90	27	63	8	6	A	1.101	
FME17-063-A22-SN12-07C	✻	●		63	73	22	50	8	7	A	0.53	
FME17-100-A32-SN12-08C	✻	●	○	100	110	32	63	8	8	A	1.663	
FME17-080-A27-SN12-09C	✻	●		80	90	27	63	8	9	A	1.112	
FME17-100-A32-SN12-11C	✻	●		100	110	32	63	8	11	A	1.577	
FME17-125-B40-SN12-10		●	○	125	135	40	63	8	10	B	3.099	
FME17-125-B40-SN12-14		●		125	170	40	63	8	14	B	3.145	
FME17-160-C40-SN12-12		●	○	160	170	40	63	8	12	C	4.535	
FME17-200-C60-SN12-14		○	○	200	210	60	63	8	18	C	6.45	
FME17-250-C60-SN12-18		○		250	260	60	63	8	18	C	12.98	
FME17-160-C40-SN12-18		●		160	210	40	63	8	20	C	4.647	
FME17-200-C60-SN12-22		○		200	215	60	63	8	22	C	6.552	
FME17-315-D60-SN12-22		○		315	325	60	80	8	22	D	21.98	

● Ex stock ○ On demand

✻ With internal cooling

Spare parts

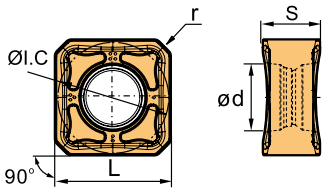
	Insert	SNGX1205ENN	SNGX1205ENN	SNGX1205ENN
	ØD	50-75	80-180	200-400
	Screw (insert)	IRM4×10 (3.4 Nm)	IRM4×10 (3.4 Nm)	IRM4×10 (3.4 Nm)
	Wrench (insert)	WT15IP		
	Wrench (insert)		WT15IS	
	Wrench (insert)			WT15IT



Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

SNGX	L	I.C	S	d
12 05	12.7	12.7	6.5	5.9

Milling inserts



SN** milling insert			HC¹ (CVD)								HC¹ (PVD)										HT		HC²		HW	
		P																								
		M																								
		K																								
		N																								
		S																								
		H																								
ISO		r	YBC302	YBC301	YBM253	YBC401	YBM251	YBM351	YBD152	YBD252	YBD203	YBG101	YBG102	YBG202	YBG212	YBS203	YBG205	YBG205H	YB9320	YBG302	YBS303	YBG252	YNG151	YNG151C	YD101	YD201
	**SNGX1205ENN-GH**	0,8								●								●								
	**SNGX1205ENN-GL**	0,8																●								
	**SNGX1205ENN-GM**	0,8							○		●							●								
	**SNMX120512-GH**	1,2								●								●								
	**SNMX120512-GM**	1,2								●								●								

● Ex stock ○ On demand

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

EMP05 plunge milling system

Universal tool for any machining application

Now with new design New

YOUR BENEFITS

- Flexible, versatile system for **slot and plunge milling**
- For use in any machine and plant engineering application
- Equipped with two inserts for **deep groove milling**
- **Ramping possible** (ideal for die and mould making)
- Can be used in centre cutting operations and **as a groove milling cutter**

Fig.: EMP05-025-G25-AD12-C

A **left-hand** and a **right-hand cutting insert** must be employed.

Insert grades

YB9320

PVD
P10 – P30
M10 – M25

Chip breaker

ADKT*-L-GM

General machining

ADKT*-R-GM

General machining

Left-hand and right-hand cutting type

High-performance YB9320 grade for steel, stainless steel and cast iron

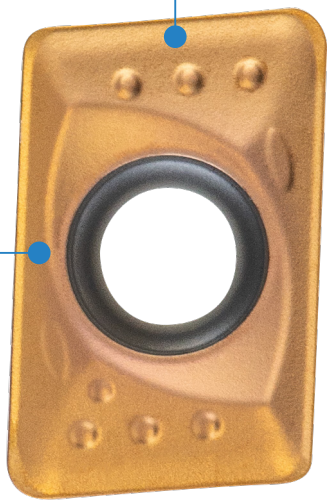


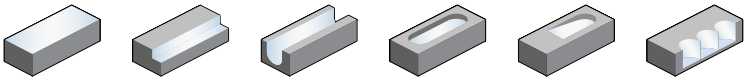
Fig.: ADKT12T308L-GM YB9320

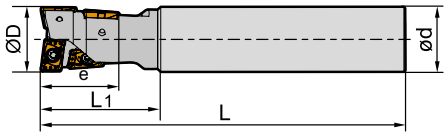
The **new EMP05 plunge milling system** can **only** be used in combination with the **new ADKT inserts**!

Example: EMP05-020-G20-**AD**10-C with **AD**KT100308**L**-GM YB9320 and **AD**KT100308**R**-GM YB9320

Square shoulder milling

EMP05 Kr: 90°





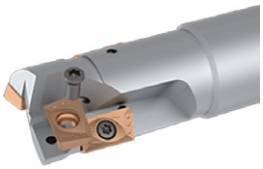
Article	✻	Stock	Dimensions [mm]					Teeth	kg	Inserts
			ØD	e	ød	L_1	L			
EMP05-016-G16-AD08-C	✻	●	16	19	16	33	120	4	0.154	ADKT0803L & ADKT0903R
EMP05-020-G20-AD10-C	✻	●	20	23	20	35	130	4	0.262	ADKT1003L & ADKT1003R
EMP05-025-G25-AD12-C	✻	●	25	29	25	45	140	4	0.425	ADKT12T3L & ADKT12T3R
EMP05-040-G32-AD12-C	✻	●	40	40	32	55	160	6	0.943	
EMP05-032-G32-AD15-C	✻	●	32	34	32	50	150	4	0.425	ADKT1605L & ADKT1505R
EMP05-050-G40-AD15-C	✻	●	50	50	40	70	170	6	1.612	

● Ex stock ○ On demand

✻ With internal cooling

Spare parts

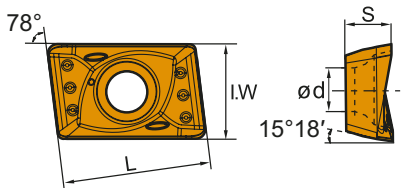
	Insert	**ADKT0803L & ADKT0903R**	**ADKT1003L & ADKT1003R**	**ADKT12T3L & ADKT12T3R**	**ADKT12T3L & ADKT12T3R**	**ADKT1605L & ADKT1505R**	**ADKT1605L & ADKT1505R**
	ØD	**16**	**20**	**25**	**40**	**32**	**50**
	Screw (insert)	I60M2.2×5.5 (0.8 Nm)		I60M4×7 (3.4 Nm)	I60M4×7 (3.4 Nm)	I43M4×8 (3.4 Nm)	I43M4×8 (3.4 Nm)
	Screw (insert)		I60M2.5×6.5T (1.0 Nm)				
	Wrench (insert)	WT07IP	WT08IP	WT09IP	WT09IP		
	Wrench (insert)					WT15S	WT15S



ADKT	L	S	d
08 03	7.96	3	2.4
10 03	10	3.2	2.8
12 T3	12.44	3.9	3.5
16 05	16	5	4.4

Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

Milling inserts



AD** milling insert			HC¹ (CVD)								HC¹ (PVD)										HT	HC²	HW	
		P	◐	◐	◐	◐	◐	◐		◐	◐			◐	◐		◐	◐	◐	◐		●	●			
		M		◐	◐	◐	◐	◐						◐	◐		◐	◐	◐	◐	◐	○	○			
		K							◐	◐	◐	●										●				◐
		N											◐												◐	◐
		S			◐			◐					●	◐		◐	◐		◐		◐					
		H																◐								
ISO		I.W	YBC302	YBC301	YBM253	YBC401	YBM251	YBM351	YBD152	YBD252	YBD203	YBG101	YBG102	YBG202	YBG212	YBS203	YBG205	YBG205H	YB9320	YBG302	YBS303	YBG252	YNG151	YNG151C	YD101	YD201
	**ADKT080308L-GM**	5.33																	●							
	ADKT100308L-GM	6.44																	●							
	ADKT12T308L-GM	8																	●							
	ADKT160508L-GM	9.62																	●							

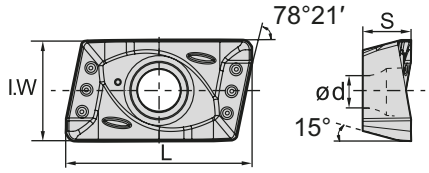
● Ex stock ○ On demand

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

ADKT	L	S	d
09 03	10	2.8	2.4
10 03	11.65	3.5	2.8
12 T3	15	3.9	3.54
15 05	17.05	4.95	4.5

Ideal machining conditions
Normal machining conditions
Unfavourable machining conditions

Milling inserts



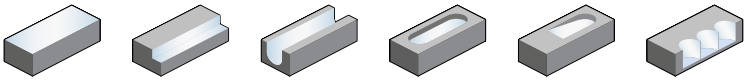
AD** milling insert			HC¹ (CVD)								HC¹ (PVD)										HT	HC²	HW	
		P	◐	◐	◐	◐	◐	◐		◐	◐			◐	◐		◐	◐	◐	◐		●	●			
		M		◐	◐	◐	◐	◐						◐	◐		◐	◐	◐	◐	◐	○	○			
		K							◐	◐	◐	●										●				◐
		N											◐												◐	◐
		S			◐			◐					●	◐		◐	◐		◐		◐					
		H																◐								
ISO		I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBD203	YBG101	YBG102	YBG202	YBG212	YBS203	YBG205	YBG205H	YB9320	YBG302	YBS303	YBG252	YNG151	YNG151C	YD101	YD201
	**ADKT090308R-GM**	5																	●							
	ADKT100308R-GM	6.04																	●							
	ADKT12T308R-GM	8.16																	●							
	ADKT150508R-GM	8.81																	●							

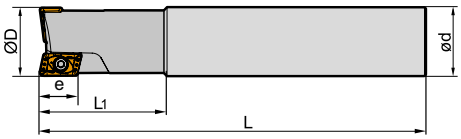
● Ex stock ○ On demand

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

Square shoulder milling

EMP05 Kr: 90°





Article	✻	Stock	Dimensions [mm] ØD	e	ød	L_1	L	Teeth	kg	Inserts
EMP05-S017-G16-AD08-C	✻	○	17	8.5	16	33	120	2	0.166	ADKT0803L & ADKT0903R
EMP05-S020-G20-AD10-C	✻	○	20	9.5	20	35	130	2	0.275	ADKT1003L & ADKT1003R
EMP05-S021-G20-AD10-C	✻	○	21	9.5	20	35	130	2	0.282	
EMP05-S025-G25-AD12-C	✻	○	25	12.5	25	45	140	2	0.453	ADKT12T3L & ADKT12T3R
EMP05-S026-G25-AD12-C	✻	○	26	12.5	25	45	140	2	0.467	
EMP05-S040-G32-AD12-C	✻	○	40	12.5	32	55	160	3	1.02	
EMP05-S032-G32-AD15-C	✻	○	32	14.5	32	50	150	2	0.81	ADKT1605L & ADKT1505R
EMP05-S033-G32-AD15-C	✻	○	33	14.5	32	50	150	2	0.829	
EMP05-S050-G40-AD15-C	✻	○	50	14.5	40	70	170	3	1.725	

● Ex stock ○ On demand

✻ With internal cooling

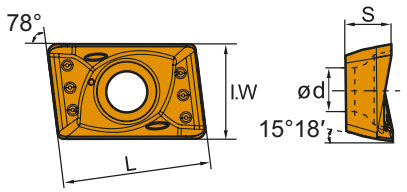
Spare parts

	Insert	ADKT0803L & ADKT0903R	ADKT1003L & ADKT1003R	ADKT1003L & ADKT1003R	ADKT12T3L & ADKT12T3R	ADKT12T3L & ADKT12T3R	ADKT12T3L & ADKT12T3R	ADKT1605L & ADKT1505R	ADKT1605L & ADKT1505R	ADKT1605L & ADKT1505R
	ØD	17	20	21	25	26	40	32	33	50
	Screw (insert)	I60M2.2×5.5 (0.8 Nm)			I60M4×7 (3.4 Nm)	I60M4×7 (3.4 Nm)	I60M4×7 (3.4 Nm)	I43M4×8 (3.4 Nm)	I43M4×8 (3.4 Nm)	I43M4×8 (3.4 Nm)
	Screw (insert)		I60M2.5×6.5T (1.0 Nm)	I60M2.5×6.5T (1.0 Nm)						
	Wrench (insert)	WT07IP	WT08IP	WT08IP	WT09IP	WT09IP	WT09IP			
	Wrench (insert)							WT15S	WT15S	WT15S

ADKT	L	S	d
08 03	7.96	3	2.4
10 03	10	3.2	2.8
12 T3	12.44	3.9	3.5
16 05	16	5	4.4

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

Milling inserts



AD** milling insert			HC¹ (CVD)								HC¹ (PVD)										HT	HC²	HW	
		P																						
		M																						
		K																						
		N																						
		S																						
		H																						
ISO		I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBD203	YBG101	YBG102	YBG202	YBG212	YBS203	YBG205	YBG205H	YB9320	YBG302	YBG252	YBS303	YNG151	YNG151C	YD101	YD201
	**ADKT080308L-GM**	5.33																	●							
	ADKT100308L-GM	6.44																	●							
	ADKT12T308L-GM	8																	●							
	ADKT160508L-GM	9.62																	●							

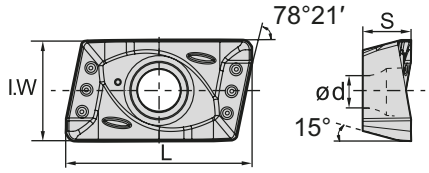
● Ex stock ○ On demand

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

ADKT	L	S	d
09 03	10	2.8	2.4
10 03	11.65	3.5	2.8
12 T3	15	3.9	3.54
15 05	17.05	4.95	4.5

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

Milling inserts



AD** milling insert			HC¹ (CVD)								HC¹ (PVD)										HT	HC²	HW	
		P																						
		M																						
		K																						
		N																						
		S																						
		H																						
ISO		I.W	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBD203	YBG101	YBG102	YBG202	YBG212	YBS203	YBG205	YBG205H	YB9320	YBG302	YBG252	YBS303	YNG151	YNG151C	YD101	YD201
	**ADKT090308R-GM**	5																	●							
	ADKT100308R-GM	6.04																	●							
	ADKT12T308R-GM	8.16																	●							
	ADKT150508R-GM	8.81																	●							

● Ex stock ○ On demand

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

FMR06 round insert milling cutter

Maximum stability in facing operations

YOUR BENEFITS

- Milling system **for solid CBN and ceramic inserts**
- Milling system for high performance values
- **Heavy-duty round insert mill** for use in a wide range of applications
- Well suited for use in die and mould making and in aerospace applications
- Safe and easy to use thanks to wedge clamping
- **Air cooling (AC) for optimum chip removal**
- Well suited for machining cast iron, hardened steel and superalloys

Fig.: FMR06-063-A27-RN1207-05AC

Insert grades

CA1000	CM1000	CN1000	CSX1000 New	YZB223
Mixed ceramic	*Mixed ceramic*	*Si_3N_4 ceramic*	*SiAlON ceramic*	*Solid CBN*
K10 – K25	*K10 – K25*	*K05 – K15*	*S05 – S20*	*K10 – K25*
H10 – H25	*H10 – H25*			

Inserts

RNGN090300

RNGN120400

RNGN120700

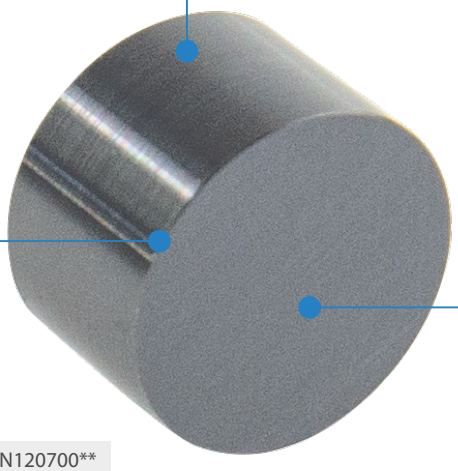


Fig.: RNGN120700**

CSX1000 grade

High-performance grade for superalloys

YOUR BENEFITS

- Latest generation of SiAlON ceramic for **longer tool life**
- Well suited for applications ranging from semi-finishing to the roughing of heat-resistant alloys
- Achieves excellent balance between toughness and wear resistance
- Suitable for **turning applications** or **milling operations**, for example, with our new FMR06 round insert milling system

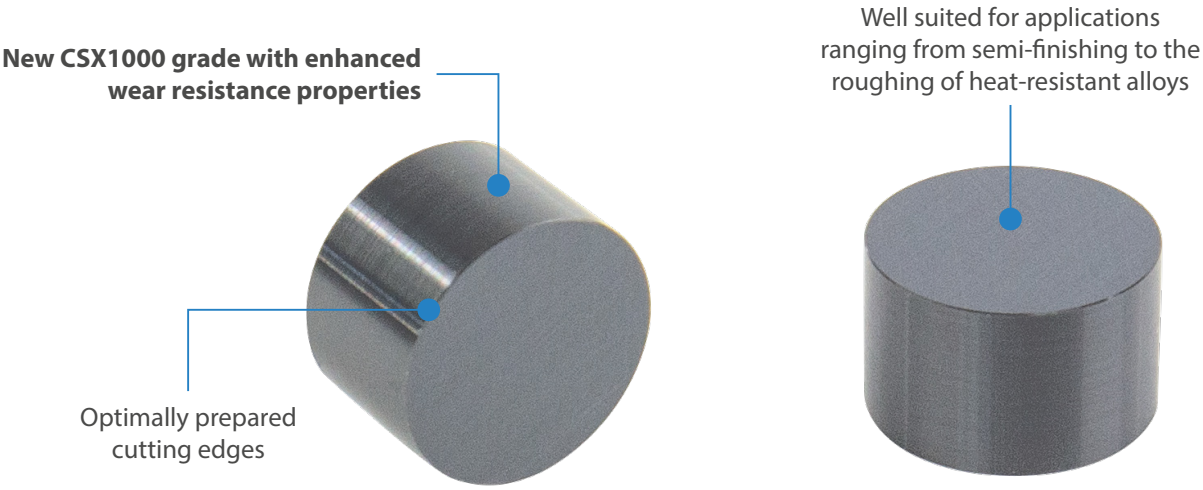
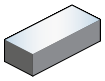
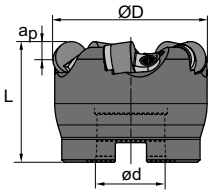


Fig.: RNGN120700T00525 CSX1000

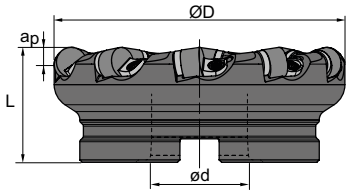
Face milling

FMR06





A



B

Article	✻	Stock	Dimensions [mm]				Teeth	Coupling	kg	Inserts
			ØD	ød	L	$a_{p\,max}$				
FMR06-050-A22-RN0903-05AC	✻	○	50	22	50	2	5	A	0.3	RNGN0903
FMR06-063-A22-RN0903-05AC	✻	○	63	22	50	2	5	A	0.5	
FMR06-050-A22-RN0904-05AC	✻	○	50	22	50	2	5	A	0.3	RNGN0904
FMR06-063-A22-RN1204-05AC	✻	○	63	22	50	4	5	A	0.5	RNGN1204
FMR06-080-A27-RN1204-07AC	✻	○	80	27	50	4	7	A	0.7	
FMR06-100-B32-RN1204-06		○	100	32	50	4	6	B	1.965	
FMR06-100-B32-RN1204-09AC	✻	○	100	32	50	4	9	B	1.2	
FMR06-125-B40-RN1204-11AC	✻	○	125	40	63	4	11	B	1.9	
FMR06-050-A22-RN1207-04		○	50	22	50	4	4	A	0.3	RNGN1207
FMR06-063-A22-RN1207-04		○	63	22	50	4	4	A	0.7	
FMR06-063-A22-RN1207-05AC	✻	○	63	22	50	4	5	A	0.5	
FMR06-080-A27-RN1207-06AC	✻	○	80	27	50	4	6	A	0.7	
FMR06-100-B32-RN1207-08AC	✻	○	100	32	50	4	8	B	1.2	
FMR06-125-B40-RN1207-10AC	✻	○	125	40	63	4	10	B	1.9	

● Ex stock ○ On demand

✻ With internal cooling

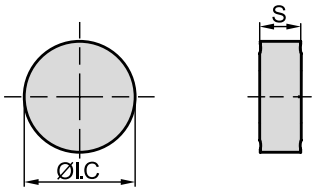
Spare parts

	Insert	RNGN0903	RNGN0904	RNGN1204	RNGN1207
	ØD	50-160	50-160	50-160	50-160
	Screw (wedge)	DM6×17.5A (11.4 Nm)	DM6×17.5A (11.4 Nm)	DM6×17.5A (11.4 Nm)	DM6×17.5A (11.4 Nm)
	Shim pin (shim)			SM5×8.65XA (4.0 Nm)	SM5×8.65XA (4.0 Nm)
	Shim pin (shim)	SP3	SP3		
	Shim	R09BS	R09BS		
	Shim			R12BS	R12BS
	Wedge	W18N	W18N	W18N	W18N
	Wrench (wedge)	WT15IT	WT15IT	WT15IT	WT15IT

Milling inserts

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

	I.C	S
09 03	9,525	3,18
12 04	12,40	4,76
12 07	12,70	7,94



RN** Milling Insert		CM				CC				CN				CR				CS			
	P																				
	M																				
	K	○				○								⊛							
	N																				
	S																	⊛			
	H	⊛				⊛															
ISO	r	CA1000				CM1000				CN1000				CW1400 CW1800				CSX1000			
RNGN090300 T01525	4,5	●				●												●			
RNGN120400 T01525	6,0	●				●												●			
RNGN120700 T01525	6,0	●				●												●			

● Ex stock ○ On demand

Other cutting edge designs and grades available on demand!

CM Mixed ceramic
CC Mixed ceramic, coated
CN Si3N4 Ceramic
CR Al2O3 cutting ceramic, reinforced
CS Cutting ceramic, SiAlON

FMR06 round insert milling cutter

Maximum stability in facing operations

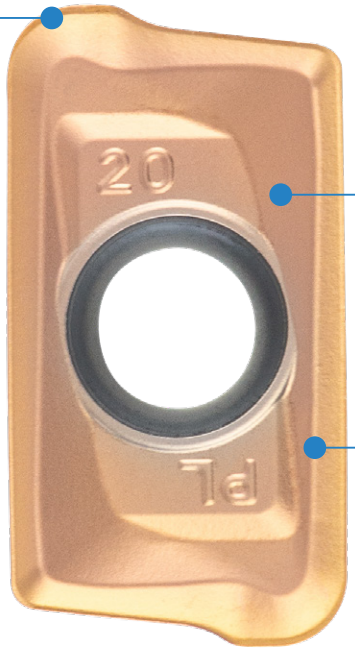
APL chip breaker

Universal geometry

YOUR BENEFITS

– **Can be used in any application** involving steel, stainless steel and cast iron
– Wide range of applications possible thanks to array of sizes and radii available

Available radii:
0.4 mm / 0.8 mm / 2 mm



Available in YB9320 and
YBS203 / YBS303 grades

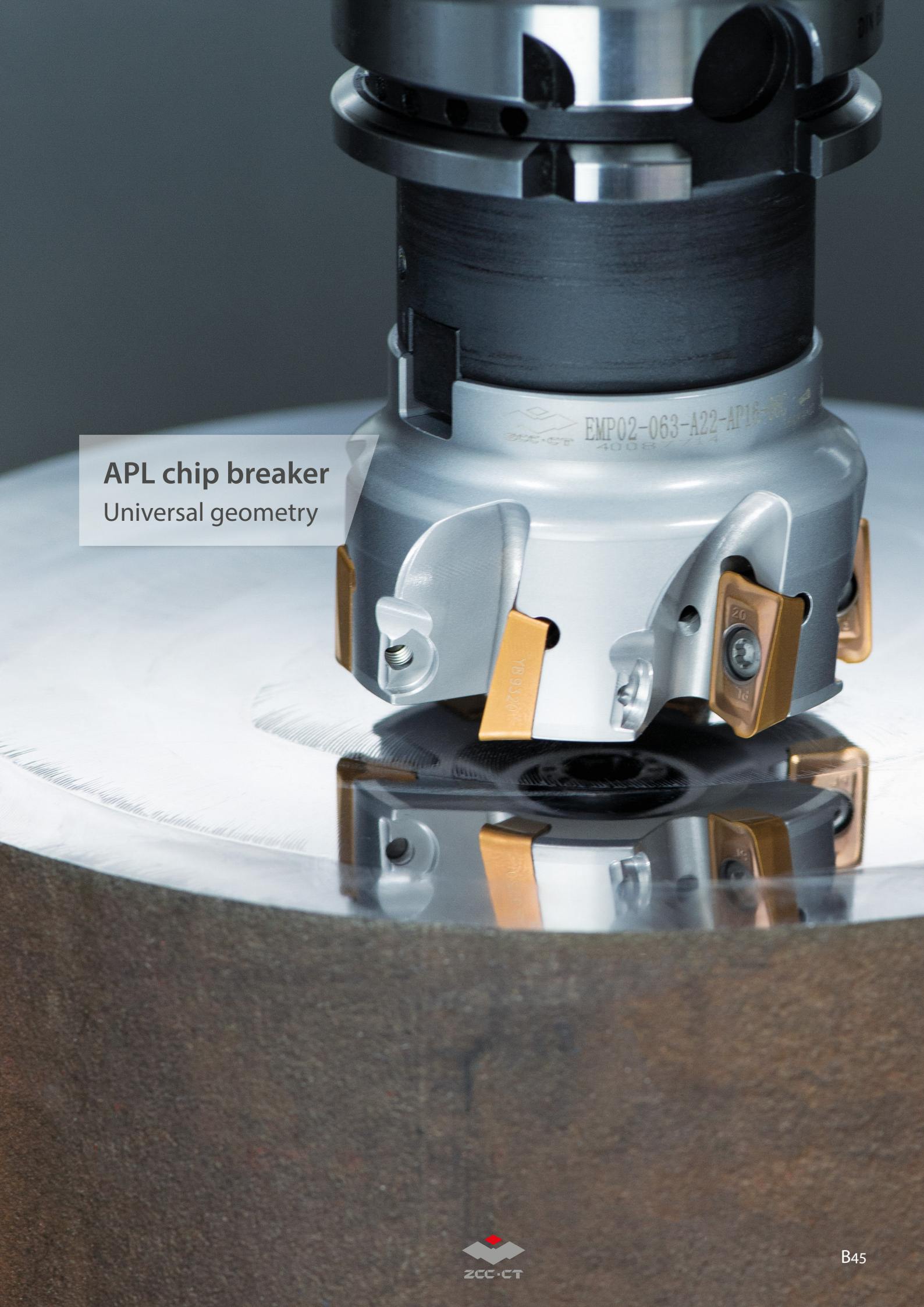
For use in EMP01/EMP02 and
QCH-APKT milling systems

Fig.: APKT160420-APL YB9320

Articles available at launch of new APL chip breaker:

Article	Stock
APKT11T304-APL YB9320	●
APKT11T308-APL YB9320	●
APKT160408-APL YB9320	●
APKT160420-APL YB9320	●

● Ex stock ○ On demand



APL chip breaker

Universal geometry

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

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 1/5	YBC401 a_e / D 1/1 | 3/4	YBC401 1/5	YBD152 a_e / D 1/1 | 3/4	YBD152 1/5	YBD252 a_e / D 1/1 | 3/4	YBD252 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				HT	
	YBM253		YBG101		YBG102		YBG152		YB9320		YBG205(H)		YBG252		YBG302		YD101		YD201		YNG151	
	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					270	315
	210	245			220	255	205	240	200	230	190	220	185	215	180	210					235	270
	200	230			205	240	195	225	185	215	180	205	175	200	170	200					220	255
	175	200			180	210	170	200	165	190	155	180	155	175	150	175					195	220
	160	190			170	195	160	185	150	175	145	170	140	165	140	160					180	210
	210	245			220	255	205	240	200	230	190	220	185	215	180	210					235	270
	175	200			180	210	170	200	165	190	155	180	155	175	150	175					195	220
	160	190			170	195	160	185	150	175	145	170	140	165	140	160					180	210
	135	160			145	165	135	155	130	150	125	145	120	140	120	135					150	180
	125	145			130	150	120	140	115	135	110	130	110	125	105	125					140	160
	90	100			90	105	85	100	85	95	80	90	80	90	75	90					100	110
	125	145			130	150	120	140	115	135	110	130	110	125	105	125					135	160
	105	120			110	125	105	120	100	115	95	110	95	105	90	105					115	135
	130	155			140	160	130	150	125	145	120	140	115	135	115	130					145	170
	105	120			110	125	105	120	100	115	95	110	95	105	90	105					115	135
					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	85	70	80	65	75	65	75	65	75	60	70						
					50	55	50	55	45	50	45	50	45	50	40	45						
					60	70	55	65	55	65	50	55	50	55	50	55						
					35	40	35	40	30	35	30	35	30	35	30	35						
					45	50	45	50	40	45	40	45	40	45	40	45						
					75	85	70	80	65	75	65	75	65	75	60	70						
					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 8 (FMP06, FMR06)

Material group		Composition / structure / heat treatment			Machining group	Starting values for cutting speed v_c [m/min]							
						HC (CVD)				HC (PVD)		BH	
						YBM253		YBD252		YB9320		YZB223	
						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	260	300	280	360	245	285		
		approx. 0,45 % C	annealed	190	2	225	255	280	320	210	245		
		approx. 0,45 % C	tempered	250	3	210	240	260	300	200	230		
		approx. 0,75 % C	annealed	270	4	185	210	220	280	175	200		
		approx. 0,75 % C	tempered	300	5	170	195	220	280	160	190		
	Low-alloyed steel		annealed	180	6	225	255	280	320	210	245		
			tempered	275	7	185	210	240	280	175	200		
			tempered	300	8	170	195	240	280	160	190		
			tempered	350	9	145	165	220	240	135	160		
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	130	150	200	260	125	145		
			hardened and tempered	325	11	95	105	200	220	90	100		
M	Stainless steel	ferritic/martensitic	annealed	200	12	130	150			125	145		
		martensitic	tempered	240	13	11	130			105	120		
		austenitic	quench hardened	180	14	140	160			130	155		
		austenitic-ferritic		230	15	110	130			105	120		
K	Grey cast iron	perlitic/ferritic		180	16			320	370	270	315	1000	1200
		perlitic (martensitic)		260	17			220	260	160	190	700	900
	Cast iron with spheroidal graphite	ferritic		160	18			240	280	185	215	–	–
		perlitic		250	19			220	260	125	145	300	400
	Malleable cast iron	ferritic		130	20			280	305	225	260	–	–
		perlitic		230	21			180	220	150	175	300	400
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]																					
CM				CR				CN													
CA1000		CM1000		CW1400		CW1800		CN1000		CSX1000											
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										
								600	800												
								450	600												
								600	800												
								450	600												
								–	–												
								–	–												
				150	360	–	–			–	–										
				150	360	–	–			–	–										
				–	–	150	400			700	900										
				–	–	150	400			600	800										
				–	–	150	400			600	800										
140	200	140	200																		
120	180	120	180																		
–	–	–	–																		
120	180	120	180																		

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, EMP01/02/03/04/05/14)

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, EMP01/02/03/04/05/14)

Material group		Feed rate per cutting edge [mm]																	
		EMP03 | EMP04			EMP05			EMP14											
		APKT11			ADKT**			VPGT22											
		Application																	
		F	M	R	F	M	R	F	M	R									
P	Unalloyed steel	0,12	0,17	0,23	0,10	0,15	0,20												
	Low-alloyed steel	0,11	0,16	0,21	0,09	0,14	0,19												
	High-alloyed steel and high-alloyed tool steel	0,10	0,15	0,20	0,09	0,13	0,18												
M	Stainless steel	0,08	0,12	0,16	0,07	0,11	0,14												
K	Grey cast iron	0,13	0,19	0,25	0,11	0,17	0,22												
	Cast iron with spheroidal graphite	0,12	0,17	0,23	0,10	0,15	0,20												
	Malleable cast iron	0,12	0,17	0,23	0,10	0,15	0,20												
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

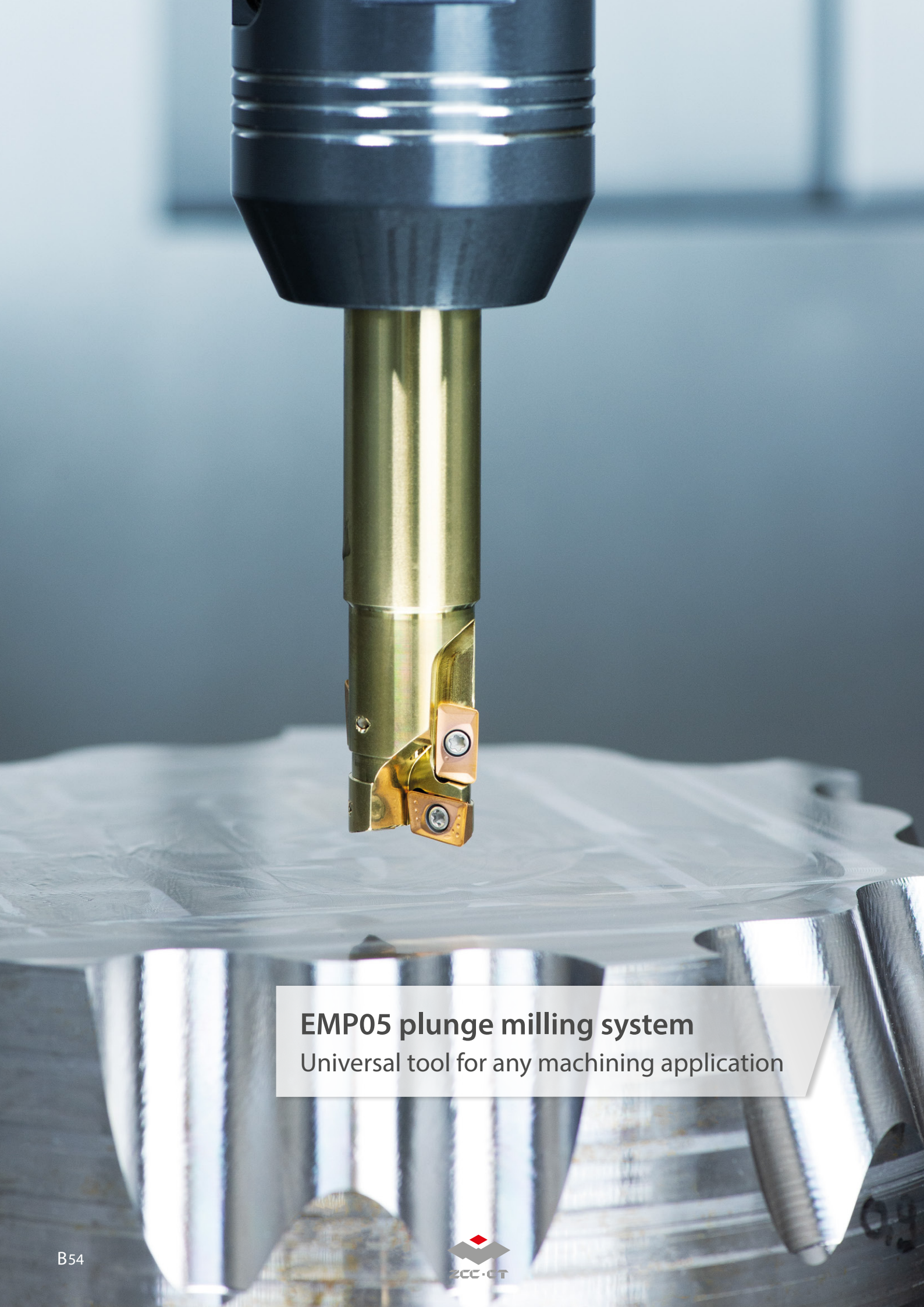
Indexable milling – group 8 (FMP06, FMR06)

Material group		Feed rate per cutting edge [mm]																	
		FMP06			FMP06			FMP06			FMR06			FMR06					
		SNCU12 (HC)			SNGN12 (CN)			SNGN12 (CM)			RNGN* (CN)			RNGN* (CM)					
		Application																	
		F	M	R	F	M	R	F	M	R	F	M	R						
P	Unalloyed steel		0,23																
	Low-alloyed steel		0,22																
	High-alloyed steel and high-alloyed tool steel		0,20																
M	Stainless steel		0,16																
K	Grey cast iron		0,26			0,10	0,25					0,10	0,25						
	Cast iron with spheroidal graphite		0,23			0,10	0,25					0,10	0,25						
	Malleable cast iron		0,23			0,10	0,25					0,10	0,25						
N	Aluminum wrought alloys																		
	Aluminum cast alloys																		
	Copper and copper alloys (bronze/brass)																		
S	Heat-resistant alloys																		
	Titanium alloys																		
H	Hardened steel								0,05	0,10					0,05	0,10			
	Hard cast iron																		
	Hardened cast iron								0,05	0,10					0,05	0,10			
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.

HC	Coated carbide
CN	Si3N4 ceramic
CM	Mixed ceramic

F	Finishing
M	Medium machining
R	Roughing



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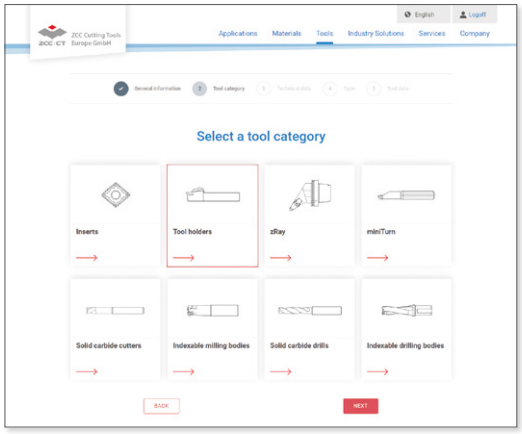

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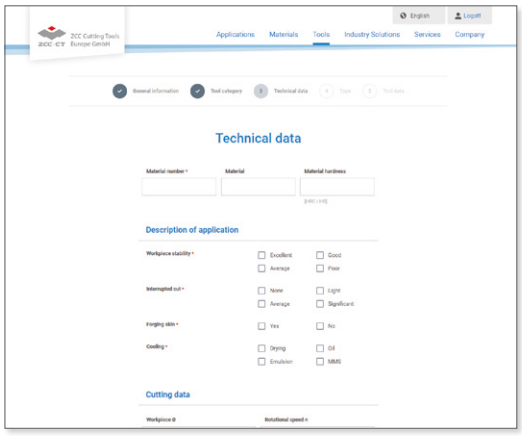

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