

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]

## The Company

**Z**huzhou 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.

**T**he 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.

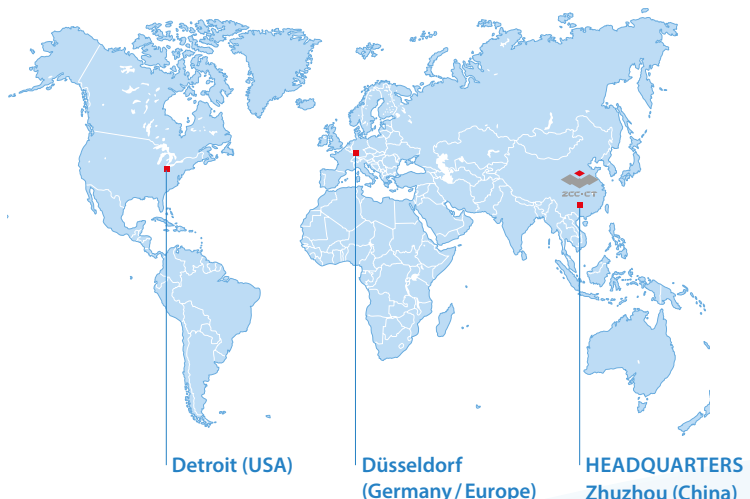
The quality management system of ZCC Cutting Tools Europe GmbH is certified in the area of 'distribution and logistics of metal-working tools' in accordance with ISO 9001:2008.

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'.**



# This brochure will be presenting the following new products:

## Product Innovations 03 / 2023

### GENERAL TURNING

Page



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

A10

### PARTING & GROOVING

Page



**MU chip breaker** – Universal tool that delivers optimum chip control

A17

### INDEXABLE MILLING

Page



**FME17 face milling system** – Highly efficient universal tool for machining end faces and contours

B28–B31



**EMP05 plunge milling system** – Universal tool for any machining application

B32–B37



**FMR06 round insert milling cutter** – Maximum cutting performance

B38–B42



**CSX1000 grade** – High-performance grade for superalloys

B40–B42



**APL chip breaker** – Universal geometry

B44



# 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



[Go to PDF online](#)



## 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.



## General turning

ISO code – general turning inserts

A8–A9

YBG205H grade

A10

Recommended cutting data

A12–A13



**A**

Turning

**B**

Milling

**C**

Drilling

**D**

Technical  
Information

















**E**

Index










## ISO standard

**T N M G 22 04 08 (N) – DM**

**1 2 3 4 5 6 7 8 9**

Insert shape		
A 	B 	C 
D 	E 	H 
K 	L 	M 
O 	P 	R 
S 	T 	V 
W 	Z Special	















**1**

Clearance angle	
A 	B 
C 	D 
E 	F 
G 	N 
P 	O Special

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

**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**

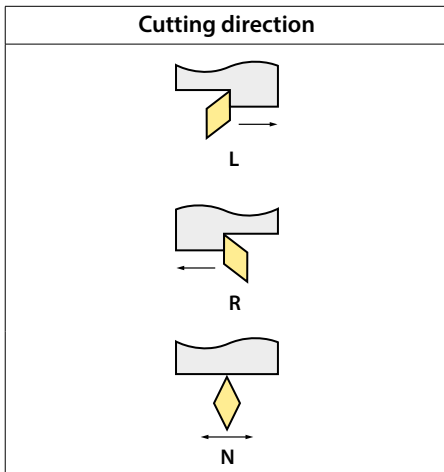


Insert thickness S [mm]			
Code	S	Code	S
00	0,79	T5	5,95
T0	0,99	06	6,35
01	1,59	T6	6,75
T1	1,98	07	7,94
02	2,38	09	9,52
T2	2,58	T9	9,72
03	3,18	11	11,11
T3	3,97	12	12,70
04	4,76		
T4	4,96		
05	5,56		

**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**



**8**

**Chip breaker overview**  
(from page A16 in the ZCC Cutting Tools Europe Main Catalogue 2023)

**9**

**ANSI standard**



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

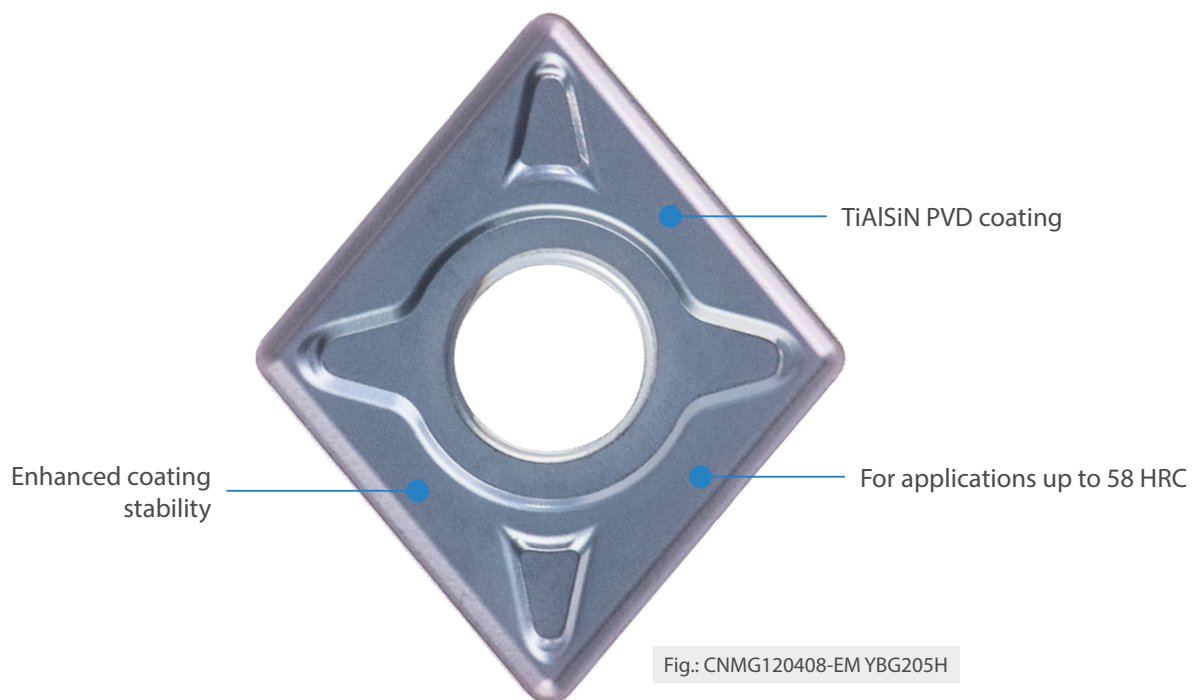
**7**

# 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**



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

Article	Stock	Article	Stock
CCMT060204-EF YBG205H	●	TCMT090204-EM YBG205H	●
CCMT060204-EM YBG205H	●	TCMT110204-EF YBG205H	●
CCMT060208-EM YBG205H	●	TCMT110204-EM YBG205H	●
CCMT09T304-EF YBG205H	●	TCMT16T304-EM YBG205H	●
CCMT09T304-EM YBG205H	●	TCMT16T308-EM YBG205H	●
CCMT09T308-EM YBG205H	●	TNMG160404-EF YBG205H	●
CNMG120404-EF YBG205H	●	TNMG160404-EM YBG205H	●
CNMG120404-EM YBG205H	●	TNMG160408-EF YBG205H	●
CNMG120408-EF YBG205H	●	TNMG160408-EM YBG205H	●
CNMG120408-EM YBG205H	●	WNMG080404-EF YBG205H	●
DCMT070204-EM YBG205H	●	WNMG080404-EM YBG205H	●
DCMT11T304-EF YBG205H	●	WNMG080408-EF YBG205H	●
DCMT11T304-EM YBG205H	●	WNMG080408-EM YBG205H	●
DCMT11T308-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]			Feed rate [mm]		
					0,1	0,3	0,5	0,1	0,3	0,6	0,1	0,3	0,6	
<b>P</b>	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									
<b>M</b>	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
<b>K</b>	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						
<b>N</b>	Aluminium wrought alloys	cannot be hardened		60	22				2000	1200	-	2000	1200	-
		hardenable	hardened	100	23				610	420	-	610	420	-
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24				550	300	-	550	300	-
		$\leq 12\%$ 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	-	
<b>S</b>	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 <sub>m</sub> 400	35							100	60	-	
	$\alpha$ and $\beta$ alloys	hardened	R <sub>m</sub> 1050	36							80	40	-	
<b>H</b>	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									
<b>X</b>	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.

**A** Turning  
**B** Milling  
**C** Drilling  
**D** Technical Information  
**E** Index

Starting values for cutting speed $v_c$ [m/min]																							
HC (PVD)															HC <sub>1</sub>			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]			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 Si<sub>3</sub>N<sub>4</sub> ceramic
- CM Mixed ceramic
- HC<sub>1</sub> Coated cermet
- BC CBN with coating
- CC Coated cutting ceramic
- CR Cutting ceramic, primary component aluminium oxide (Al<sub>2</sub>O<sub>3</sub>), reinforced
- DP Polycrystalline diamond

**A**

Turning

**B**

Milling

**C**

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## Parting & grooving

System code – inserts

A16

MU chip breaker

A17–A18

Recommended cutting data

A19–A20



**A**

Turning

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## ZP G D 04 04 – M U

1 2 3 4 5 6 7

**A**

Turning

**B**

Milling

**C**

Drilling

**D**

Technical Information

**E**

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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

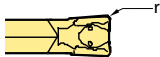
**2**

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

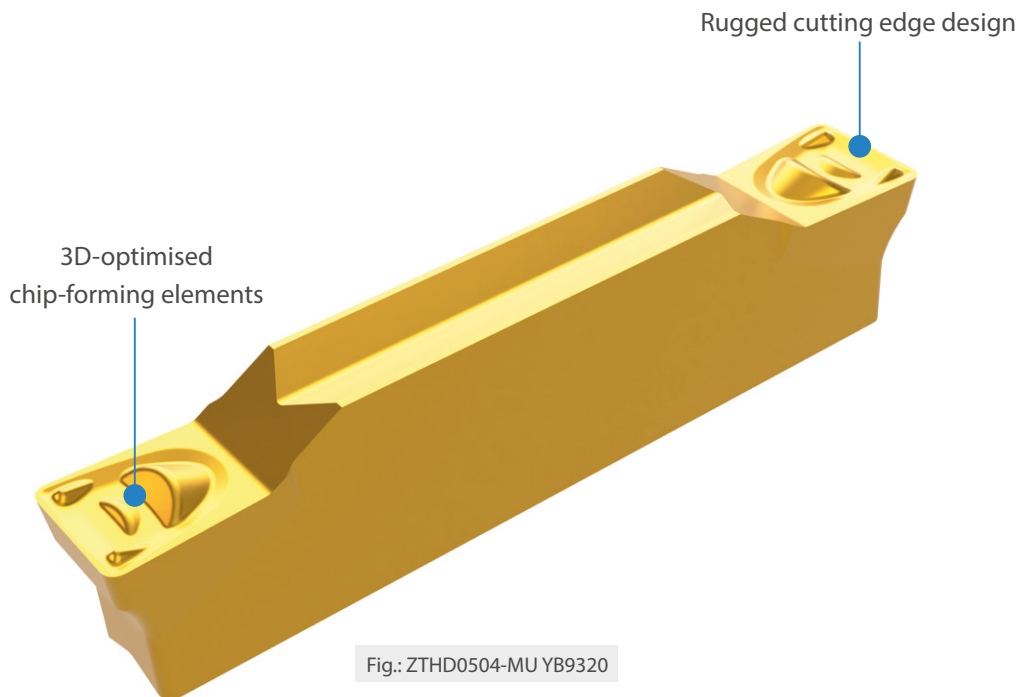





Fig.: ZTHD0504-MU YB9320

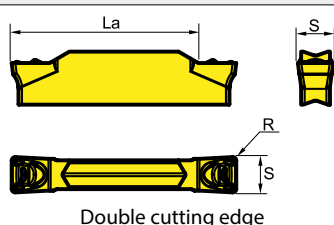

















Chip breaker	Application	P	M	K	N	S	H	Feed	Cutting edge design
ZT****-MU	Parting & grooving ✓								
	Turning ✓	✓	✓	✓		✓			
✓ Very suitable	✓ Suitable							<span style="color: blue;">■</span> Parting & grooving <span style="color: lightblue;">■</span> Turning	

A

Turning

## Parting inserts

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

Parting & grooving insert (double sided)						HC <sup>1</sup> (CVD)		HC <sup>1</sup> (PVD)				HW							
 <p>Double cutting edge</p>						<b>P</b>													
						<b>M</b>													
						<b>K</b>													
						<b>N</b>													
						<b>S</b>													
						<b>H</b>													
ISO	R±0.1	La max	S±0.10	f	YBC252 YBC251			YBG105 YBG102	YB9320 YBG205	YBG202 YBG302		YD101 YD201							
	<b>ZTFD0302-MU</b>	0.2	17	3	0,06-0,18				●										
	<b>ZTFD0303-MU</b>	0.3	17	3	0,06-0,18				●										
	<b>ZTGD0402-MU</b>	0.2	22	4	0,08-0,20				●										
	<b>ZTGD0404-MU</b>	0.4	22	4	0,08-0,20				●										
	<b>ZTHD0504-MU</b>	0.4	22	5	0,09-0,25				●										
	<b>ZTHD0508-MU</b>	0.8	22	5	0,09-0,25				●										
	<b>ZTKD0604-MU</b>	0.4	22	6	0,15-0,30				○										
	<b>ZTKD0608-MU</b>	0.8	22	6	0,15-0,30				○										

● Ex stock    ○ On demand

HC<sup>1</sup> Coated carbide  
HW Uncoated carbide

B

Milling

C

Drilling

D

Technical Information

E

Index



## **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	
<b>A</b> Turning	<b>P</b> 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			
	<b>B</b> Milling	Low-alloyed steel		annealed	180	6	170		
				tempered	275	7	125		
				tempered	300	8	115		
				tempered	350	9	105		
	<b>C</b> Drilling	High-alloyed steel and high-alloyed tool steel		annealed	200	10	125		
			hardened and tempered	325	11	95			
<b>D</b> Technical Information	<b>M</b> 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	
<b>E</b> Index	<b>K</b> Cast iron with spheroidal graphite	perlitic/ferritic		180	16	240			
		perlitic (martensitic)		260	17	185			
	Malleable cast iron	ferritic		160	18	220			
		perlitic		250	19	165			
<b>F</b> Index	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			
	<b>G</b> Index	<b>S</b> 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 <sub>m</sub> 400	35		145	150		
	α and β alloys	hardened	R <sub>m</sub> 1050	36		50	50		
<b>H</b> Index	Hardened steel		hardened and tempered	55 HRC	37				
			hardened and tempered	60 HRC	38				
	Hard cast iron		cast	400	39				
<b>X</b> Index	Non-metallic materials				41				
		Thermoplasts				42			
		Thermosetting plastics				43			
		Plastic, glass-fibre reinforced GFRP				44			
		Plastic, carbon fibre reinforced CFRP				45			
		Graphite				46			
	Wood								

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)

**A**

Turning

**B**

Milling

**C**

Drilling

**D**

Technical Information

**E**

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## FME17 face milling system

Highly efficient universal tool for machining end faces and contours

## **Indexable milling**

System code – milling bodies	<b>B24–B25</b>
ISO-Code – inserts	<b>B26–B27</b>
FME17	<b>B28–B31</b>
EMP05	<b>B32–B37</b>
FMR06	<b>B38–B42</b>
CSX1000 grade	<b>B40–B42</b>
APL chip breaker	<b>B44</b>
Recommended cutting data	<b>B46–B53</b>

# B

**A**

Turning

**B**

Milling

**C**

Drilling

**D**

Technical  
Information

**E**

Index

**S P K N 12 04 ED T21K R – DM**

**1 2 3 4 5 6 7 8 9 10**

**A**

Turning

**B**

Milling

**C**

Drilling

**D**

Technical Information

**E**

Index

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

Clearance angle	
B	C
D	E
F	N
P	

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

**1**

**2**

**3**

Fastening features (metric)	
Insert shape	
A	B
C	F
G	H
J	M
N	Q
R	T
U	W
X Special	

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

**4**

**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	an
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**

**A**

Turning

**B**

Milling

**C**

Drilling

**D**

Technical Information

**E**

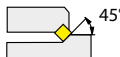
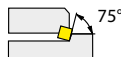

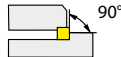

Index

## 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			
A		E	
D		P	
R			

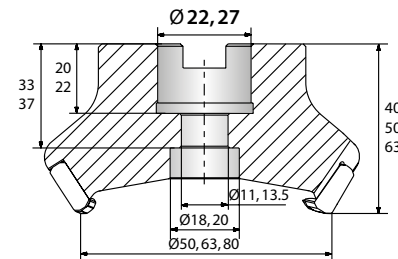
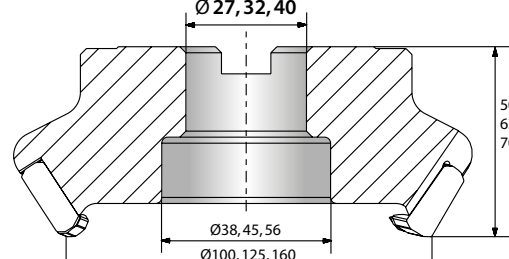
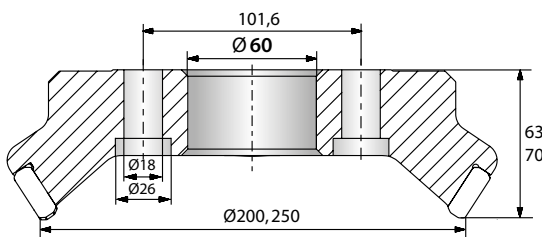
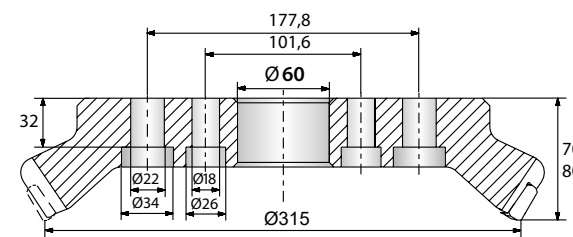
2

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	<p>Nominal diameter Ø50 – 80 mm</p> 	B	<p>Nominal diameter Ø100 – 160 mm</p> 
C	<p>Nominal diameter Ø200 – 250 mm</p> 	D	<p>Nominal diameter Ø315 mm</p> 
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 	C 
D 	E 
F 	N 
P 	

**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:



Spare parts (B coupling with inner coolant supply)					
		B27	B32	B40	B40
	∅	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

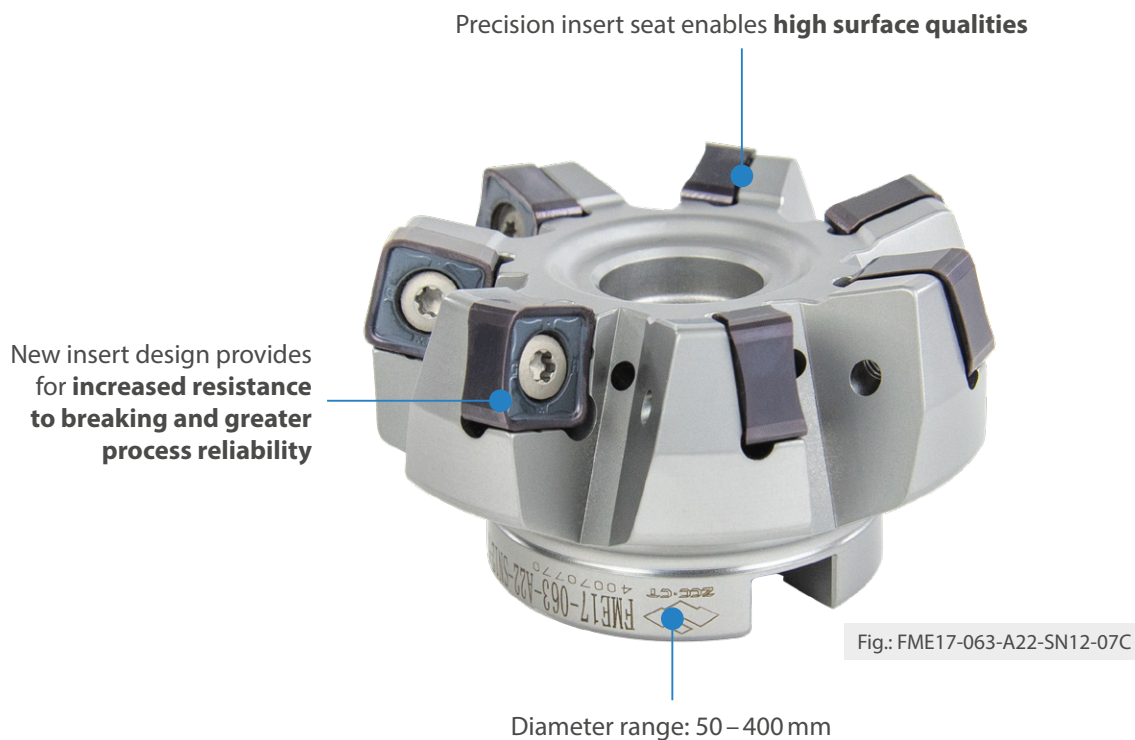
When purchasing tools with inner coolant supply and B coupling these spare parts are included in delivery.

# 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



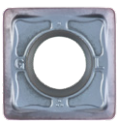
The **face milling system FME17** can be used in combination with **SNGX1205ENN** and **SNMX120512** inserts.

## Insert grades

<b>YBM253</b>	<b>YBG205H</b>	<b>YBD252</b>	<b>YBS303</b>
CVD	PVD	CVD	PVD
P20-P40	P10-P30	K20-K35	S25-S35
M15-M35	M20-M40		

## Chip breaker

SN\*X-GL



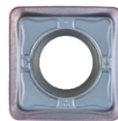
Finishing

SN\*X-GM



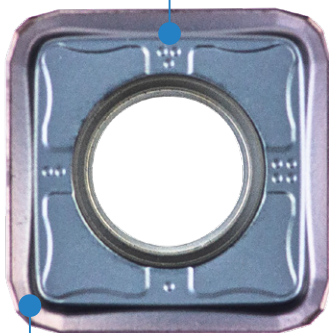
General machining

SN\*X-GH



Roughing

Easy to identify cutting edges



**Controlled chip removal** thanks to open chip former design

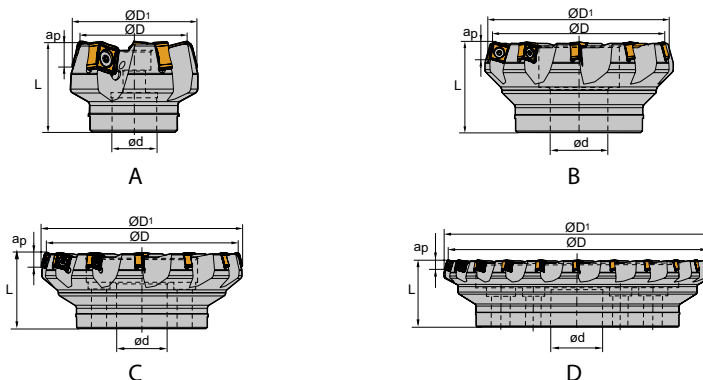
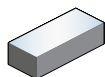
**Low cutting forces** thanks to positive cutting edge design



Fig.: SNGX1205ENN-GH YBG205H

## Face milling

FME17 Kr: 75°



Article	*	Stock		Dimensions [mm]					Teeth	Coupling	kg	Inserts
		R	L	ØD	ØD <sub>1</sub>	ød	L	a <sub>p max</sub>				
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 ØD	SNGX1205ENN	SNGX1205ENN	SNGX1205ENN
		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			HC <sup>1</sup> (CVD)					HC <sup>1</sup> (PVD)					HT	HC <sup>2</sup>	HW												
	<b>P</b>		●	●	●	●	●	●	●	●	●	●	●	●	●												
	<b>M</b>		●	●	●	●	●	●	●	●	●	●	●	●	●												
	<b>K</b>								●							●											
	<b>N</b>								●						●	●											
	<b>S</b>		●		●				●	●	●	●	●	●													
	<b>H</b>											●															
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

HC<sup>1</sup> Coated carbide  
 HT Uncoated cermet  
 HC<sup>2</sup> Coated cermet  
 HW Uncoated carbide

**A**

Turning

**B**

Milling

**C**

Drilling

**D**

Technical Information

**E**

Index

# EMP05 plunge milling system

## Universal tool for any machining application

Now with new design 

### 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**



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

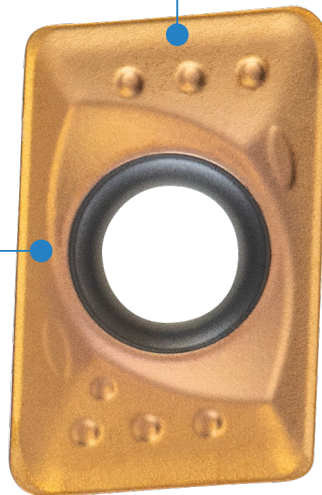


Fig.: ADKT12T308L-GM YB9320

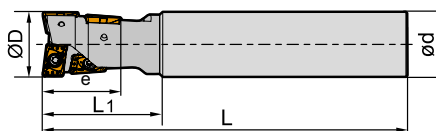
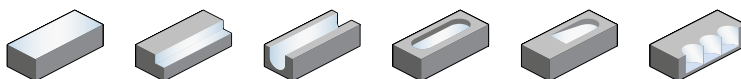


The new **EMP05 plunge milling system** can **only** be used in combination with the **new ADKT inserts!**

**Example:** EMP05-020-G20-AD10-C with **ADKT100308L-GM YB9320** and **ADKT100308R-GM YB9320**

## Square shoulder milling

EMP05 Kr: 90°



Article	*	Stock	Dimensions [mm]					Teeth	kg	Inserts
			ØD	e	ød	L <sub>1</sub>	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	ADKT12T3L & ADKT12T3R
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	ADKT1605L & ADKT1505R

● 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)		I60M2.2x5.5 (0.8 Nm)		I60M4x7 (3.4 Nm)	I60M4x7 (3.4 Nm)	I43M4x8 (3.4 Nm)	I43M4x8 (3.4 Nm)					
Screw (insert)			I60M2.5x6.5T (1.0 Nm)									
Wrench (insert)		WT07IP	WT08IP	WT09IP	WT09IP							
Wrench (insert)						WT15S	WT15S					



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

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

## Milling inserts

AD** milling insert		HC <sup>1</sup> (CVD)							HC <sup>1</sup> (PVD)					HT	HC <sup>2</sup>	HW											
	<b>P</b>	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗												
	<b>M</b>	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗												
	<b>K</b>																										
	<b>N</b>																										
	<b>S</b>																										
	<b>H</b>																										
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

HC<sup>1</sup> Coated carbide  
 HT Uncoated cermet  
 HC<sup>2</sup> Coated cermet  
 HW Uncoated carbide

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

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

## Milling inserts

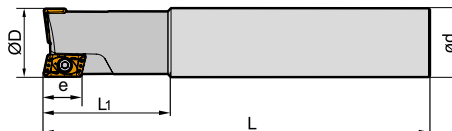
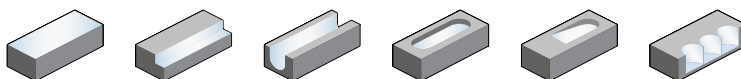
AD** milling insert		HC <sup>1</sup> (CVD)							HC <sup>1</sup> (PVD)					HT	HC <sup>2</sup>	HW											
	<b>P</b>	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗												
	<b>M</b>	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗												
	<b>K</b>																										
	<b>N</b>																										
	<b>S</b>																										
	<b>H</b>																										
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

HC<sup>1</sup> Coated carbide  
 HT Uncoated cermet  
 HC<sup>2</sup> Coated cermet  
 HW Uncoated carbide

## Square shoulder milling

EMP05 Kr: 90°



Article	*	Stock	Dimensions [mm]					Teeth	kg	Inserts
			ØD	e	ød	L <sub>1</sub>	L			
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	ADKT1605L & ADKT1505R
EMP05-S032-G32-AD15-C	*	○	32	14.5	32	50	150	2	0.81	
EMP05-S033-G32-AD15-C	*	○	33	14.5	32	50	150	2	0.829	ADKT1605L & ADKT1505R
EMP05-S050-G40-AD15-C	*	○	50	14.5	40	70	170	3	1.725	

● Ex stock    ○ On demand

\* With internal cooling

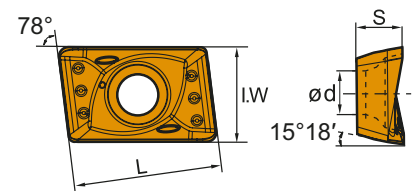
Spare parts										
Insert	ADKT0803L & ADKT0903R	ADKT1003L & ADKT1003R	ADKT1003L & ADKT1003R	ADKT12T3L & ADKT12T3R	ADKT12T3L & ADKT12T3R	ADKT12T3L & ADKT12T3R	ADKT1605L & ADKT1505R	ADKT1605L & ADKT1505R	ADKT1605L & ADKT1505R	
ØD	17	20	21	25	26	40	32	33	50	
Screw (insert)	I60M2.2×5.5 (0.8 Nm)			I60M4×7 (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
<b>08 03</b>	7.96	3	2.4
<b>10 03</b>	10	3.2	2.8
<b>12 T3</b>	12.44	3.9	3.5
<b>16 05</b>	16	5	4.4

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

## Milling inserts



AD** milling insert		HC <sup>1</sup> (CVD)						HC <sup>1</sup> (PVD)						HT	HC <sup>2</sup>	HW										
 ADKT080308L-GM ADKT100308L-GM ADKT12T308L-GM ADKT160508L-GM	I.W	<b>P</b>	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗										
		<b>M</b>	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗										
		<b>K</b>					⊗	⊗	⊗																	
		<b>N</b>								⊗							⊗	⊗								
		<b>S</b>			⊗	⊗				⊗	⊗	⊗	⊗	⊗	⊗											
		<b>H</b>											⊗													
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	
		5.33																●								
		6.44																●								
		8																●								
		9.62																●								

● Ex stock ○ On demand

HC<sup>1</sup> Coated carbide  
HT Uncoated cermet  
HC<sup>2</sup> Coated cermet  
HW Uncoated carbide

A

Turning

B

Milling

C

Drilling

D

Technical Information

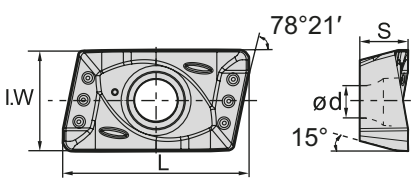
E


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## Milling inserts

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

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



AD** milling insert		HC <sup>1</sup> (CVD)						HC <sup>1</sup> (PVD)						HT	HC <sup>2</sup>	HW										
 ADKT090308R-GM ADKT100308R-GM ADKT12T308R-GM ADKT150508R-GM	I.W	<b>P</b>	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗										
		<b>M</b>	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗	⊗										
		<b>K</b>					⊗	⊗	⊗																	
		<b>N</b>								⊗							⊗	⊗								
		<b>S</b>			⊗	⊗				⊗	⊗	⊗	⊗	⊗	⊗											
		<b>H</b>											⊗													
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	
		5																●								
		6.04																●								
		8.16																●								
		8.81																●								

● Ex stock ○ On demand

HC<sup>1</sup> Coated carbide  
HT Uncoated cermet  
HC<sup>2</sup> 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



## Insert grades

<b>CA1000</b>	<b>CM1000</b>	<b>CN1000</b>	<b>CSX1000</b>	<b>New</b>	<b>YZB223</b>
Mixed ceramic K10–K25 H10–H25	Mixed ceramic K10–K25 H10–H25	$\text{Si}_3\text{N}_4$ ceramic K05–K15	SiAlON ceramic S05–S20		Solid CBN K10–K25

## Inserts

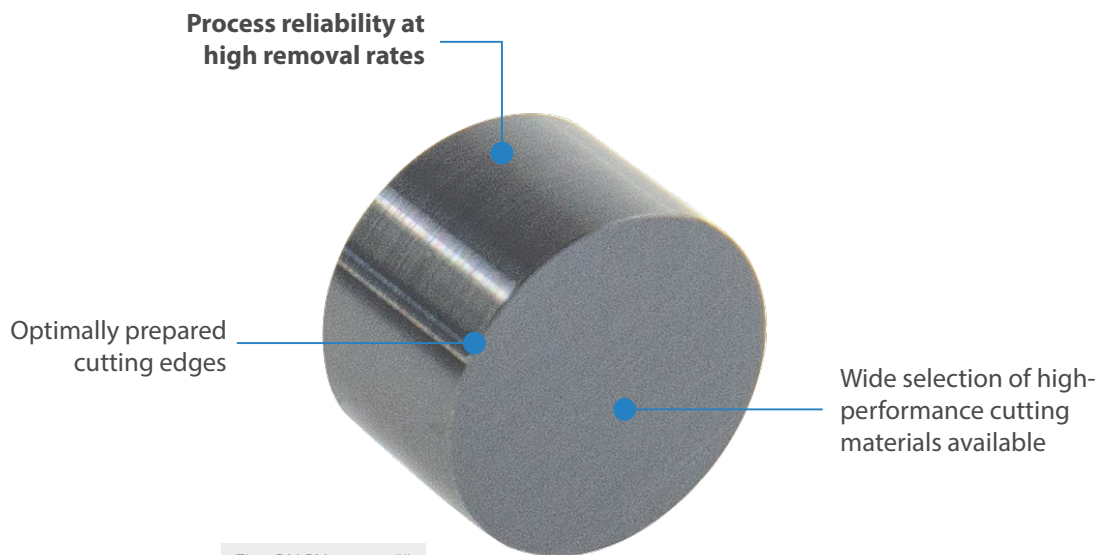
RNGN090300



RNGN120400



RNGN120700



# CSX1000 grade

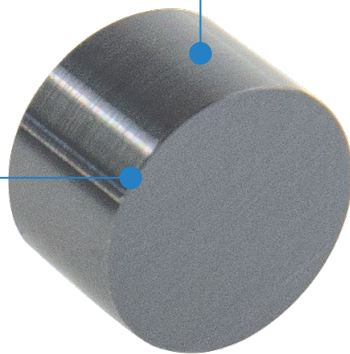
## High-performance grade for superalloys

### 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

New CSX1000 grade with enhanced wear resistance properties

Optimally prepared cutting edges



Well suited for applications ranging from semi-finishing to the roughing of heat-resistant alloys

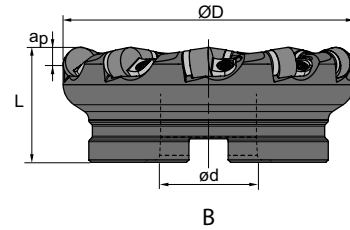
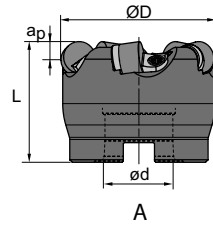
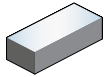


Fig.: RNGN120700T00525 CSX1000



Face milling

FMR06



Article	*	Stock	Dimensions [mm]				Teeth	Coupling	kg	Inserts
			ØD	ød	L	ap 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	
FMR06-080-A27-RN1204-07AC	*	○	80	27	50	4	7	A	0.7	RNGN1204
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	RNGN1204
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	RNGN1207
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	RNGN1207
FMR06-125-B40-RN1207-10AC	*	○	125	40	63	4	10	B	1.9	

● Ex stock    ○ On demand

\* With internal cooling

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

Index

**A**

Turning

**B**

Milling

**C**

Drilling

**D**

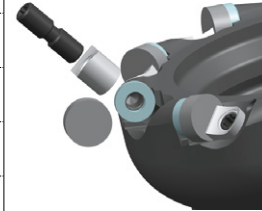
Technical Information

**E**

Index

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
<b>09 03</b>	9,525	3,18
<b>12 04</b>	12,40	4,76
<b>12 07</b>	12,70	7,94

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



Schichtfräser Ø63; Z5; A27; RM1207; IKZ  
2227703

**FMR06 round insert milling cutter**  
Maximum stability in facing operations



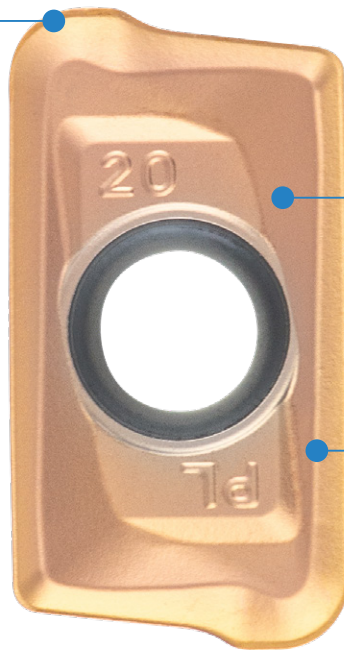
# APL chip breaker

## 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		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	
<b>P</b>	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				
<b>P</b>	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				
<b>P</b>	High-alloyed steel and high-alloyed tool steel		annealed	200	10	125	145	105	125				
			hardened and tempered	325	11	90	100	75	90				
<b>M</b>	Stainless steel	ferritic/martensitic	annealed	200	12								
			martensitic	tempered	240	13							
			austenitic	quench hardened	180	14							
			austenitic-ferritic		230	15							
<b>K</b>	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	
<b>K</b>	Malleable cast iron	ferritic		130	20				260	300	225	260	
			perlitic	230	21				175	205	150	175	
<b>N</b>	Aluminium wrought alloys	cannot be hardened		60	22								
			hardenable	hardened	100	23							
	Cast aluminium alloys	$\leq 12\% \text{ Si}$ , cannot be hardened		75	24								
			$\leq 12\% \text{ Si}$ , hardenable	hardened	90	25							
			$> 12\% \text{ Si}$ , 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									
<b>S</b>	Heat-resistant alloys	Fe-based alloys	annealed	200	30								
				hardened	280	31							
		Ni or Co base	annealed	250	32								
				hardened	350	33							
		cast	320	34									
Titanium alloys	pure titanium		$R_m$ 400	35									
		$\alpha$ and $\beta$ alloys	hardened	$R_m$ 1050	36								
<b>H</b>	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							
<b>X</b>	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<sub>1</sub> Coated cermet
- BC CBN with coating
- CC Coated cutting ceramic
- CR Cutting ceramic, primary component aluminium oxide (Al<sub>2</sub>O<sub>3</sub>), 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		
<b>P</b>	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				
<b>M</b>	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		
<b>K</b>	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		
<b>N</b>	Aluminium wrought alloys	cannot be hardened		60	22									
		hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\% \text{ Si}$ , cannot be hardened		75	24									
		$\leq 12\% \text{ Si}$ , hardenable	hardened	90	25									
		$> 12\% \text{ Si}$ , 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										
<b>S</b>	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										
	$\alpha$ and $\beta$ alloys	hardened	$R_m$ 1050	36										
<b>H</b>	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									
<b>X</b>	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.





## 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
<b>P</b>	Unalloyed steel	0,15	0,20	0,25				0,20			0,20	0,25		0,20	0,25		0,20	0,25	
	Low-alloyed steel	0,14	0,19	0,23				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				0,18			0,18	0,22		0,18	0,22		0,18	0,22	
<b>M</b>	Stainless steel	0,11	0,14	0,18				0,14			0,14	0,18		0,14	0,18		0,14	0,18	
<b>K</b>	Grey cast iron	0,17	0,22	0,28				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				0,20			0,20	0,25		0,20	0,25		0,20	0,25	
	Malleable cast iron	0,15	0,20	0,25				0,20			0,20	0,25		0,20	0,25		0,20	0,25	
<b>N</b>	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	
<b>S</b>	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	
<b>H</b>	Hardened steel																		
	Hard cast iron																		
	Hardened cast iron																		
<b>X</b>	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									
<b>P</b>	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												
<b>M</b>	Stainless steel	0,08	0,12	0,16	0,07	0,11	0,14												
<b>K</b>	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												
<b>N</b>	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									
<b>S</b>	Heat-resistant alloys																		
	Titanium alloys																		
<b>H</b>	Hardened steel																		
	Hard cast iron																		
	Hardened cast iron																		
<b>X</b>	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	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			
<b>P</b>	Unalloyed steel	0,23													
	Low-alloyed steel	0,22													
	High-alloyed steel and high-alloyed tool steel	0,20													
<b>M</b>	Stainless steel	0,16													
<b>K</b>	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			
<b>N</b>	Aluminum wrought alloys														
	Aluminum cast alloys														
	Copper and copper alloys (bronze/brass)														
<b>S</b>	Heat-resistant alloys														
	Titanium alloys														
<b>H</b>	Hardened steel							0,05	0,10				0,05	0,10	
	Hard cast iron														
	Hardened cast iron							0,05	0,10				0,05	0,10	
<b>X</b>	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.

A

Turning

B

Milling

C

Drilling

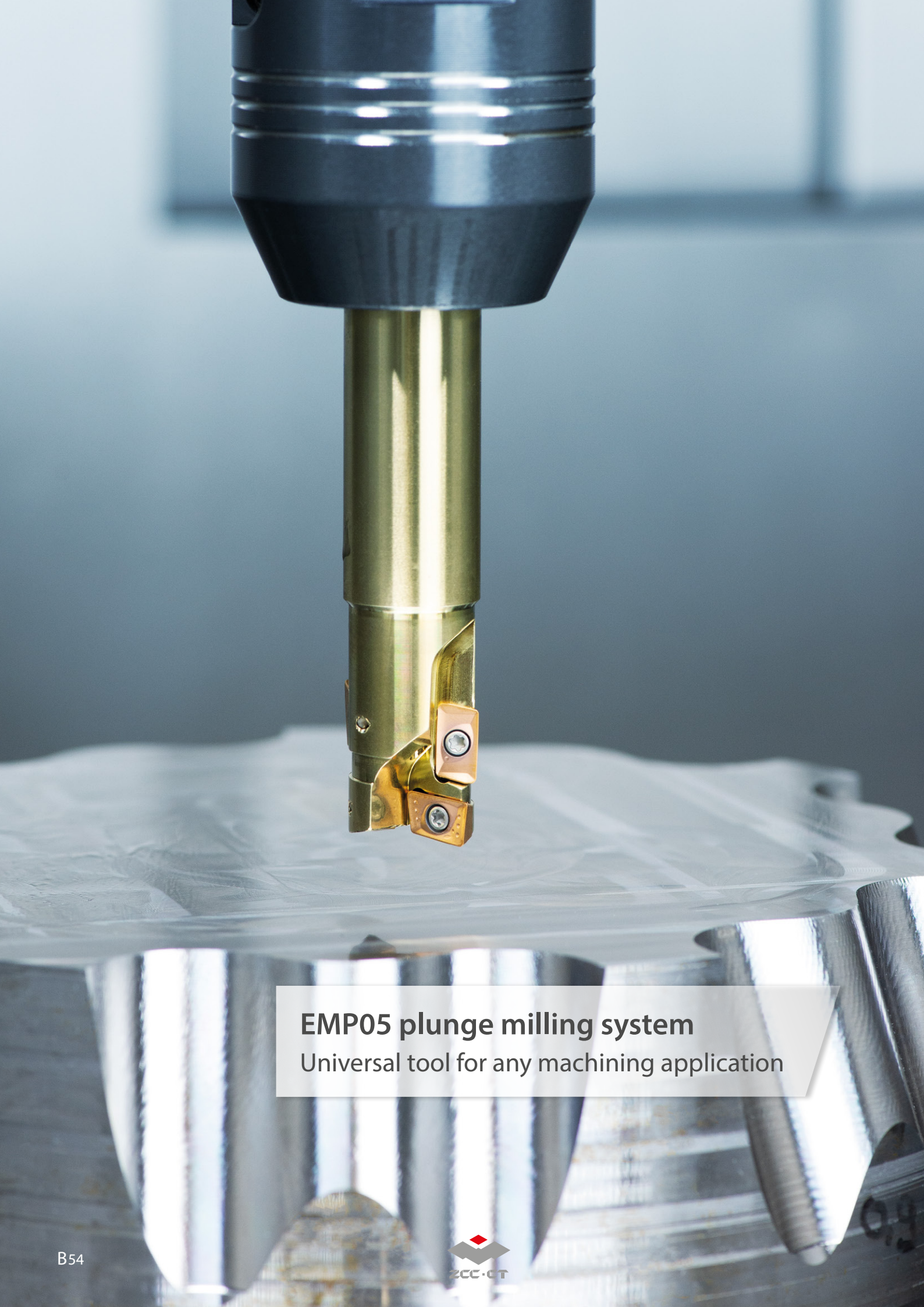
D

Technical Information

E

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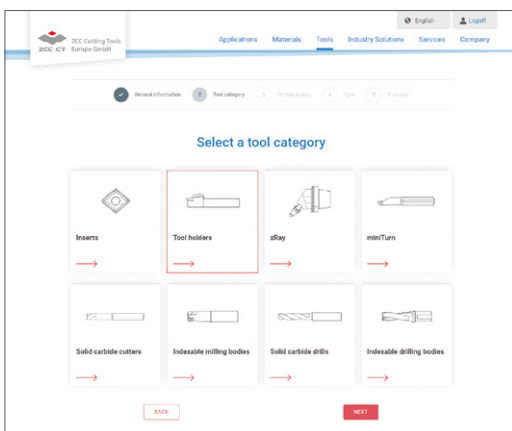




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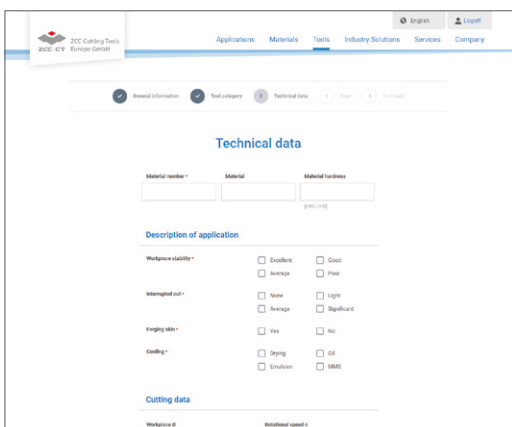
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