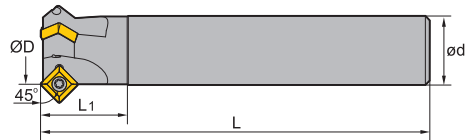


Chamfer milling

CMA01 Kr: 45°



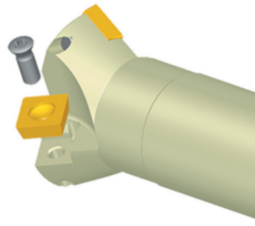
Straight shank

Article	*	Stock	Dimensions [mm]				Teeth	kg	Inserts
			ØD	ød	L ₁	L			
CMA01-012-G20-SP12-01		●	12	20	40	100	1	0.2	SPMT1204
CMA01-025-G25-SP12-02		●	25	25	40	120	2	0.8	
CMA01-032-G32-SP12-03		●	32	32	40	180	3	1.1	

● Ex stock ○ On demand

* With internal cooling

Spare parts

	Insert	SPMT1204	
	ØD	12-32	
 Screw (insert)		I43M5×11 (6.7 Nm)	
 Wrench (insert)		WT20IS	

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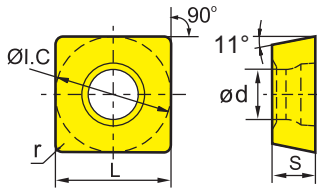
A

Turning

Milling inserts

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

SPMT	L	I.C	S	d
12 04	12.7	12.7	4.76	5.5

SP** milling insert		HC ¹ (CVD)								HC ¹ (PVD)						HT	HC ²	HW						
	P																							
	M																							
	K																							
	N																							
	S																							
	H																							
ISO		r	YBC302	YBC301	YBC401	YBM253	YBM251	YBM351	YBD152	YBD252	YBG101	YBG102	YBG202	YBG212	YBS203	YBG205	YB9320	YBG302	YBS303	YBG252	YNG151	YNG151C	YD101	YD201
	SPMT120408-HT-1	0.8												○										
	SPMT120408	0.8	○	●	○		●	○										○						

● Ex stock ○ On demand

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

B

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System code > B26

Grade selection > B24

Technical info > B527

Cutting data > B230

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

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	45°
E	75°
D	60°
P	90°
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	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 	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

With inner 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.

S P K N 12 04 ED T21K R – DM

1 2 3 4 5 6 7 8 9 10

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

1

Clearance angle	
B	C
D	E
F	N
P	

2

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

3

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

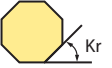
4

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

5

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

6

Angle			
			
Code	Kr	Code	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	P	
T		2	15°	2	0,20	W	
S		3	20°	3	0,25	-	
		4	25°	4	0,30		
		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 breaker overview (on page B20)
--

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Guide for recommended cutting data – indexable milling

Indexable milling – group 1 (FMA07/11/12, FMD02, EMP09/13)

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c (m/min)								
						HC (CVD)								
						YBC302		YBC401		YBD152		YBD252		
						a_p / D		a_p / D		a_p / D		a_p / D		
						1/1 3/4	1/5	1/1 3/4	1/5	1/1 3/4	1/5			
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	260	300	225	260					
		ca. 0,45 % C	annealed	190	2	225	255	195	225					
		ca. 0,45 % C	tempered	250	3	210	240	180	210					
		ca. 0,75 % C	annealed	270	4	185	210	160	185					
		ca. 0,75 % C	tempered	300	5	170	195	150	170					
	Low-alloyed steel		annealed	180	6	225	255	195	225					
			tempered	275	7	185	210	160	185					
			tempered	300	8	170	195	150	170					
			tempered	350	9	145	165	125	145					
High-alloyed steel and high-alloyed tool steel		annealed	200	10	130	150	115	130						
		hardened and tempered	325	11	95	105	80	95						
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					370	430	320	370	
		perlitic (martensitic)		260	17					220	255	190	220	
	Cast iron with spheroidal graphite	ferritic		160	18					255	295	220	255	
		perlitic		250	19					170	200	145	170	
	Malleable cast iron	ferritic		130	20					305	355	265	305	
		perlitic		230	21					205	240	175	205	
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 base	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 B248

For examples of material for cutting tool groups view page D22.

Recommend feed rate

Indexable milling – group1 (FMA07/11/12, FMD02, EMP09/13)

5		Material group	Feed rate per cutting edge [mm]																	
			EMP09			EMP13			EMP13			FMA07			FMA07			FMA11		
			LNKT12			ANGX11			ANGX15			ONHU06			ONHU08			SNEG12		
			Application																	
		F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	F	M	R	
P	Unalloyed steel		0,25	0,50		0,23			0,25			0,19	0,23		0,19	0,23			0,20	0,23
	Low-alloyed steel		0,23	0,47		0,22			0,23			0,17	0,22		0,17	0,22			0,19	0,21
	High-alloyed steel and high-alloyed tool steel		0,22	0,44		0,20			0,22			0,16	0,20		0,16	0,20			0,18	0,20
M	Stainless steel		0,18	0,35															0,14	0,16
K	Grey cast iron		0,28	0,55		0,26			0,28			0,20	0,26		0,20	0,26			0,22	0,25
	Cast iron with spheroidal graphite		0,25	0,50		0,23			0,25			0,19	0,23		0,19	0,23			0,20	0,23
	Malleable cast iron		0,25	0,50		0,23			0,25			0,19	0,23		0,19	0,23			0,20	0,23
N	Aluminium wrought alloys					0,20			0,21											
	Aluminium-Gusslegierungen					0,20			0,21											
	Copper and copper alloys(bronze/brass)					0,18			0,19											
S	Heat-resistant alloys																			
	Titanium alloys																			
H	Hardened steel																			
	Hard cast iron																			
	Hardened cast iron																			
X	Non-metallic materials																			

1. Select the appropriate product family/cutting data group.
2. Select the used grade.
3. Determine the immersion.
4. Select the used material and read the cutting speed.
5. Please have a look at the detached feed rate recommendations.
6. Select the used tool, the machining mode and the used material.

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Indexable milling – group 4 (BMR01/02/03/04, TMP01, CMZ01, CMA01, CMD01)

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v _c [m/min]						
						HC (CVD)						
						YBC302			YBC401			
						a _e / D			a _e / D			
					1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20		
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	235	275	360	200	230	300	
		approx. 0,45 % C	annealed	190	2	200	235	310	170	200	260	
		approx. 0,45 % C	tempered	250	3	190	220	290	160	185	245	
		approx. 0,75 % C	annealed	270	4	165	195	255	140	165	215	
		approx. 0,75 % C	tempered	300	5	155	180	235	130	150	195	
	Low-alloyed steel		annealed	180	6	200	235	310	170	200	260	
			tempered	275	7	165	195	255	140	165	215	
			tempered	300	8	155	180	235	130	150	195	
			tempered	350	9	130	155	205	110	130	170	
High-alloyed steel and high-alloyed tool steel		annealed	200	10	120	140	185	100	115	150		
		hardened and tempered	325	11	85	100	130	70	85	115		
M	Stainless steel	ferritic/martensitic	annealed	200	12							
		martensitic	tempered	240	13							
		austenitic	quench hardened	180	14							
		austenitic-ferritic		230	15							
K	Grey cast iron	perlitic/ferritic		180	16							
		perlitic (martensitic)		260	17							
	Cast iron with spheroidal graphite	ferritic		160	18							
		perlitic		250	19							
	Malleable cast iron	ferritic		130	20							
		perlitic		230	21							
N	Aluminium wrought alloys	cannot be hardened		60	22							
		hardenable	hardened	100	23							
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24							
		≤ 12 % Si, hardenable	hardened	90	25							
		> 12 % Si, cannot be hardened		130	26							
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27							
		CuZn, CuSnZn		90	28							
CuSn, Pb-free copper, electrolytic copper		100	29									
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30							
			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 B254.
 For examples of material for cutting tool groups view page D11.

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HC	Coated carbide
HT	Uncoated carbide, main component (TiC) o. (TiN), cermet
HC ₁	Coated cermet
HW	Uncoated carbide, main component (WC)

Indexable milling – group 4 (BMR01/02/03/04, TMP01, CMZ01, CMA01, CMD01)

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v _c [m/min]						
						HC (PVD)						
						YBG212			YBG252			
						a _e / D			a _e / D			
		1/1 3/4	1/5	1/20	1/1 3/4	1/5	1/20					
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	215	250	325	205	240	315	
		approx. 0,45 % C	annealed	190	2	185	215	280	175	205	270	
		approx. 0,45 % C	tempered	250	3	175	200	260	165	195	255	
		approx. 0,75 % C	annealed	270	4	155	175	230	145	170	225	
		approx. 0,75 % C	tempered	300	5	140	165	215	135	160	210	
	Low-alloyed steel		annealed	180	6	185	215	280	175	205	270	
			tempered	275	7	155	175	230	145	170	225	
			tempered	300	8	140	165	215	135	160	210	
			tempered	350	9	120	140	185	115	135	180	
High-alloyed steel and high-alloyed tool steel		annealed	200	10	110	125	165	105	120	160		
		hardened and tempered	325	11	80	90	120	75	85	115		
M	Stainless steel	ferritic/martensitic	annealed	200	12	110	125	165	105	120	160	
		martensitic	tempered	240	13	95	105	140	90	105	135	
		austenitic	quench hardened	180	14	115	135	175	110	130	170	
		austenitic-ferritic		230	15	95	105	140	90	105	135	
K	Grey cast iron	perlitic/ferritic		180	16	240	280	365	230	265	345	
		perlitic (martensitic)		260	17	140	165	215	135	160	210	
	Cast iron with spheroidal graphite	ferritic		160	18	165	190	250	155	180	235	
		perlitic		250	19	110	125	165	105	120	160	
	Malleable cast iron	ferritic		130	20	195	225	295	185	220	290	
		perlitic		230	21	130	150	195	125	145	190	
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 B254.
 For examples of material for cutting tool groups view page D11.

[illegible]

HC	Coated carbide
HT	Uncoated carbide, main component (TiC) o. (TiN), cermet
HC ₁	Coated cermet
HW	Uncoated carbide, main component (WC)

Recommended feed rate

Indexable milling – group 3 (FMR01/02/03/04) Circular milling

Material group		Feed rate per cutting edge [mm]								
		FMR01	FMR01	FMR02	FMR02		FMR02		FMR03	
		RCKT10	RC*12	RC*12	RCKT16		RCKT20		RDKW07	
		Tool diameter [mm]								
		25-32	40-50	50-100	63-125	160-200	80-125	160-250	15	
P	Unalloyed steel	0,12	0,16	0,18	0,24	0,32	0,26	0,35	0,07	
	Low-alloyed steel	0,11	0,14	0,16	0,21	0,28	0,23	0,31	0,06	
	High-alloyed steel and high-alloyed tool steel	0,10	0,13	0,14	0,19	0,26	0,21	0,28	0,06	
M	Stainless steel	0,07	0,09	0,10	0,14	0,18	0,15	0,20	0,04	
K	Grey cast iron	0,11	0,14	0,16	0,22	0,29	0,23	0,32	0,06	
	Cast iron with spheroidal graphite	0,10	0,13	0,14	0,19	0,26	0,21	0,28	0,06	
	Malleable cast iron	0,10	0,13	0,14	0,19	0,26	0,21	0,28	0,06	
N	Aluminium wrought alloys									
	Aluminum cast alloys									
	Copper and copper alloys (bronze/brass)									
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.

Indexable milling – group 4 (BMR01/02/03/04, TMP01, CMZ01, CMA01, CMD01)

Material group		Feed rate per cutting edge [mm]									
		BMR01	BMR01	BMR01	BMR01	BMR02	BMR02	BMR02	BMR03	BMR03	
		ZD*08 / SP*06	ZD*11 / SP*06	ZD*13 / SP*09	ZP*22 / SP*12	ROHX12	ROHX16	ROHX20	-	-	
		Tool diameter [mm]									
		20	25	32	40-63	12	16	20	16	20	
P	Unalloyed steel	0,14	0,21	0,26	0,32	0,10	0,13	0,14	0,13	0,14	
	Low-alloyed steel	0,10	0,15	0,18	0,22	0,07	0,09	0,10	0,09	0,10	
	High-alloyed steel and high-alloyed tool steel	0,09	0,14	0,17	0,21	0,07	0,08	0,09	0,08	0,09	
M	Stainless steel	0,08	0,12	0,14	0,18	0,06	0,07	0,08	0,07	0,08	
K	Grey cast iron	0,18	0,27	0,34	0,42	0,13	0,17	0,18	0,17	0,18	
	Cast iron with spheroidal graphite	0,13	0,20	0,25	0,30	0,10	0,12	0,13	0,12	0,13	
	Malleable cast iron	0,14	0,21	0,26	0,32	0,10	0,13	0,14	0,13	0,14	
N	Aluminum wrought alloys										
	Aluminum cast alloys										
	Copper and copper alloys (bronze/brass)										
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.

A

Turning

	Feed rate per cutting edge [mm]					
	FMR03	FMR03	FMR04	FMR04	FMR04	
	RDKW08	RD*10	RD*12	RDKW16	RDKW20	
	Tool diameter [mm]					
	16-25	32	50-63	80-100	125-160	
	0,07	0,12	0,17	0,24	0,30	
	0,06	0,11	0,15	0,21	0,26	
	0,06	0,10	0,14	0,19	0,24	
	0,04	0,07	0,10	0,14	0,17	
	0,06	0,11	0,15	0,22	0,27	
	0,06	0,10	0,14	0,19	0,24	
	0,06	0,10	0,14	0,19	0,24	
		0,10	0,11			
		0,10	0,11			
		0,10	0,11			

B

Milling

C

Drilling

	Feed rate per cutting edge [mm]											
	BMR03	BMR03	BMR03	BMR04	BMR04	BMR04	BMR04	BMR04	CMZ01	CMA01	CMD01	
	-	-	-	ZOHX12	ZOHX16	ZOHX20	ZOHX25	ZOHX30	SPMT12	SPMT12	SPMT12	
	Tool diameter [mm]											
	25	30-32	40-50	12	16	20	25	30	12-32	12-32	12-36	
	0,21	0,26	0,30	0,10	0,13	0,14	0,16	0,17	0,23	0,23	0,23	
	0,15	0,18	0,21	0,07	0,09	0,10	0,11	0,12	0,16	0,16	0,16	
	0,14	0,17	0,20	0,07	0,08	0,09	0,10	0,11	0,15	0,15	0,15	
	0,12	0,14	0,17	0,06	0,07	0,08	0,09	0,09	0,13	0,13	0,13	
	0,27	0,34	0,39	0,13	0,17	0,18	0,21	0,22	0,30	0,30	0,30	
	0,20	0,25	0,29	0,10	0,12	0,13	0,15	0,16	0,22	0,22	0,22	
	0,21	0,26	0,30	0,10	0,13	0,14	0,16	0,17	0,23	0,23	0,23	

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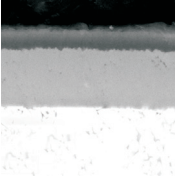
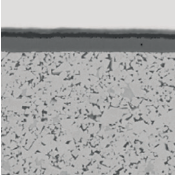
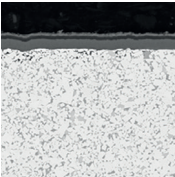
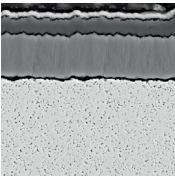
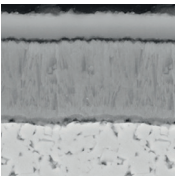
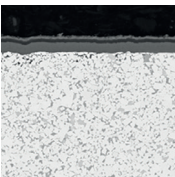
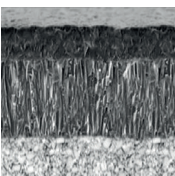
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Chamfer milling

	Series	Milling body	Inserts	Kr	Application						Features	Page
					P	M	K	N	S	H		
A Turning	CMZ01		 SPMT1204	30°	✓	✓	✓				- Diameter range Ø12 – 32 mm - For steel, stainless steel and cast iron - Chamfer milling cutter 30°	B185
	CMZ01		 SPMT1204	30°	✓	✓	✓				- Diameter range Ø12 – 32 mm - For steel, stainless steel and cast iron - Chamfer milling cutter 30°	B183
B Milling	CMA01		 SPMT1204	45°	✓	✓	✓				- Diameter range Ø12 – 32 mm - For steel, stainless steel and cast iron - Chamfer milling cutter 45° - Weldon shank	B187
	CMA01		 SPMT1204	45°	✓	✓	✓				- Diameter range Ø12 – 32 mm - For steel, stainless steel and cast iron - Chamfer milling cutter 45° - Weldon shank	B189
C Drilling	CMD01		 SPMT1204	60°	✓	✓	✓				- Diameter range Ø12 – 32 mm - For steel, stainless steel and cast iron - Chamfer milling cutter 60° - Weldon shank	B191
	CMD01		 SPMT1204	60°	✓	✓	✓				- Diameter range Ø12 – 32 mm - For steel, stainless steel and cast iron - Chamfer milling cutter 60° - Weldon shank	B193

✓ Very suitable ✓ Suitable

Coated cemented carbide CVD

Grade	ISO	Micro structure	Grade description
YBC302	P20 - P35		CVD coated P20–P35 carbide grade for medium operation to roughing of steel at higher cutting speed. Optimal performance of wear resistance and toughness for a wide application field.
YBC301	P20 - P35		CVD coated P20–P35 carbide grade for medium operation to roughing of steel at lower cutting speed.
YBC401	P30 - P50 M30 - M40		CVD coated P30–P50/M30–M40 carbide grade for roughing operation of steel at lower cutting speed and unstable condition.
YBM251	P20 - P30 M15 - M35		CVD coated P20–P30/M15–M35 carbide grade for medium to roughing operation in stainless steel and steel with wide application field. Good wear resistance and capability against plastic deformation at normal cutting speed.
YBM253	M15 - M35		CVD coated M15–M35 carbide grade for medium to roughing operation in stainless steel with wide application field. High wear resistance and capability against plastic deformation at higher cutting speed.
YBM351	P25 - P40 M20 - M40		CVD coated P25–P40/M25–M40 carbide grade for roughing operation in stainless steel and steel. Good wear resistance and edge stability at normal cutting speed.
YBD152	K10 - K25		CVD coated K10–K25 carbide substrate. Optimized for medium to roughing operation of cast iron. Good wear resistance and toughness at higher cutting speed.
YBD252	K20 - K35		CVD coated K20–K35 carbide substrate. Optimized for medium to roughing operation of cast iron and Steel. Good wear resistance and toughness at higher cutting speed.

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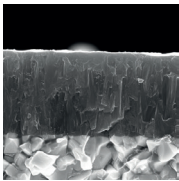
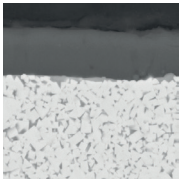
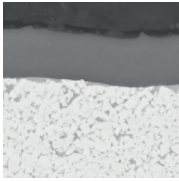
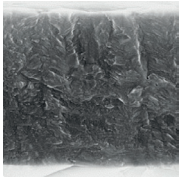
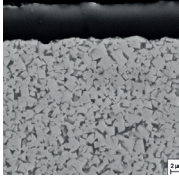
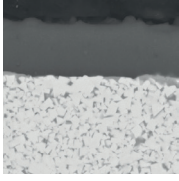
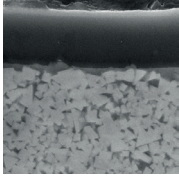
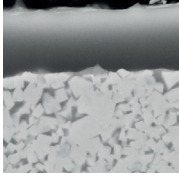
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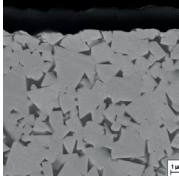
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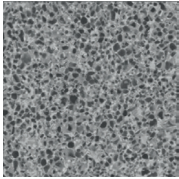
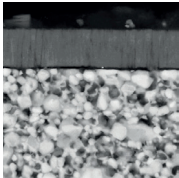
Coated cemented carbide PVD

Grade	ISO	Micro structure	Grade description
YBG101	N05–N20		PVD coated N05–N20 carbide substrate for finishing to semi-finishing in aluminium materials. Coating only on the top face, in combination with the aluminium chip breakers, prevents built-up edges and gives a smooth cut.
YBG102	S05 - S15		PVD coated S05–S15 carbide substrate for finishing to medium application of super alloy material, stainless steel and aluminum. Good wear resistance in a wide application field.
YBG202	P10 - P30 M10-M25		PVD coated P10–P30/M10–M25 carbide substrate for finishing to medium application of stainless steel and steel (milling). Good wear resistance in a wide application field.
YBG212	P25 - P35 M25-M40		PVD coated M25–M40/P25–P35 carbide substrate for steel and stainless steel. Especially for inner insert at drilling operation.
YBS203	S15 – S25		Turning and milling grades for processing heat-resistant materials. A special carbon substrate and the latest PVD coating technology enable a very good wear behaviour, high fracture toughness and high thermal stability.
YBG205	P10 - P30 M20 - M40 S15-S25		PVD multilayer coated P10–P30/M20–M40/S15–S25 carbide substrate for finishing to medium machining of stainless steel, super alloys and steel (milling). Excellent wear resistance and thermal stability in a wide range of applications.
YB9320	P10 - P30 M10-M25		PVD multilayer coated P10–P30/M10–M25 carbide substrate for finishing to medium machining of stainless steel, super alloys and steel (grooving/milling). Optimised coating stability for higher wear resistance and thermal stability in a wide range of applications.
YBG302	P15 - P30 M25 - M40		PVD coated P15–P30/M25–M40 carbide substrate for medium roughing application of stainless steel and steel (milling). Good wear resistance and toughness.

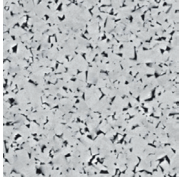
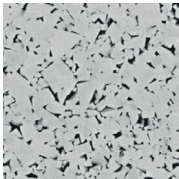
Coated cemented carbide PVD

Grade	ISO	Micro structure	Grade description
YBS303	S25 - S35		Milling grade for machining titanium alloys. A tough carbide substrate and the latest PVD coating technology with increased impact resistance and high thermal stability.

Cermet

Grade	ISO	Micro structure	Grade description
YNG151	P05 - P15		Uncoated P05-P15 cermet grade for fine finishing operation of steel and stainless steel. Good resistance against plastic deformation for good surface finishing.
YNG151C	P05 - P15		PVD coated P05-P15 cermet grade for fine finishing operation of steel and stainless steel. Good wear resistance and capability against plastic deformation for good surface roughness.

Uncoated cemented carbide

Grade	ISO	Micro structure	Grade description
YD101	N05 - N25 K05 - K20		Uncoated K05-K20/N05-N20 carbide substrate for fine to medium application in aluminum and other material.
YD201	K10 - K30 N10 - N30		Uncoated K10-K30/N10-N30 carbide substrate for medium application in aluminum and other material.

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Application fields of grades – indexable milling

	ISO	HC ¹ (CVD)	HC ¹ (PVD)	HT	HC ²	HW	PCBN/PCD
P	P01		YBG102		YNG151C		
	P10		YBG202	YNG151			
	P20	YBC301	YBG205				
	P30	YBC302	YBG302			YC305	
	P40	YBC401	YB9320				
M	M01		YBG102		YNG151C		
	M10	YBM251	YBG202	YNG151			
	M20	YBM253	YBG205				
	M30	YBM351	YBG302			YC305	
	M40	YBC401	YB9320				
K	K01		YBG102				
	K10	YBD152	YBG152				
	K20	YBD252	YBG202			YD201	
	K30						
	K40						
N	N01					YD051	
	N10		YBG101			YD101	
	N20		YBG202				YD201
	N30						
S	S01		YBG102				
	S10		YBG202				
	S20		YBG205				
	S30		YBS203				
H	H01		YBG102				
	H10						
	H20						
	H30						

P	Steel
M	Stainless steel
K	Cast iron

N	Non-ferrous metals
S	Heat-resistant alloys
H	Hardened materials

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