



Micro PM

Product Trailer

EN



ZCC Cutting Tools Europe GmbH

your Partner \ your Value

PM – 2 B L P – D12 R0.5 – M08 – W

1

2

3

4

5

6

7

8

9

Application		Number of teeth
Code	Description	
GR	General roughing	
GM	Semi-finishing	
GF	Finishing	
PM	High-performance machining	
EPM	«Ecoline» – High-performance machining	
HM	Hard machining	
HH	High-speed hard machining	
NM	General machining of non-ferrous metals	
AL	General machining of Al and Al alloys	
ALP	High-performance machining of Al and Al alloys	
ALG	General machining of Al and Al alloys	
UM	HSC/HPC machining	
VSM	General machining of heat-resistant alloys	

1

2

Cutting edge type		Cutting edge length	
Code	Description	Code	Description
E	Square shoulder mill with protective chamfer	L	Long
F	Square shoulder mill with sharp cutting edges	X	Extra long
B	Ball nose cutter	F	Short
R	Torus mill		
W	Ripper		
H	High-feed mill		

3

4

Type		Diameter [mm]	
Code	Description	Code	Description
S	Mini diameter	D3.0	3,0
P	Ground neck	D8.0	8,0
C	Conical neck	D20.0	20,0
		...	

5

6

Radius [mm]		Features		Weldon shank
Code	Description	Code	Description	
R0.5	0,5	G	Spiral angle 30°	
R1.0	1,5	M	Neck length [mm]	
R3.0	3,0	S	Thin shank	
...		AIR	For aerospace industry	

7

8

9



a Groove milling

b Square shoulder milling

c Profile milling

d Slot milling

e Face milling

f Chamfer milling

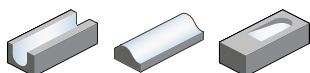
g Plunge milling

h Circular milling/Ramping

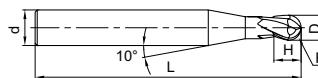
Ball nose cutters

Semi-finishing

PM-2BS



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Grade KMG405
		D	R	d (h6)	H	L		
PM-2BS-R0.15		0,3	0,15	4	0,5	50	2	●
PM-2BS-R0.20		0,4	0,2	4	0,6	50	2	●
PM-2BS-R0.25		0,5	0,25	4	0,8	50	2	●
PM-2BS-R0.30		0,6	0,3	4	0,9	50	2	●
PM-2BS-R0.35		0,7	0,35	4	1	50	2	○
PM-2BS-R0.40		0,8	0,4	4	1,2	50	2	●
PM-2BS-R0.45		0,9	0,45	4	1,3	50	2	○
PM-2BS-R0.50		1	0,5	4	1,5	50	2	●
PM-2BS-R0.60		1,2	0,6	4	1,8	50	2	●
PM-2BS-R0.70		1,4	0,7	4	2	50	2	○
PM-2BS-R0.75		1,5	0,75	4	2,3	50	2	●
PM-2BS-R0.80		1,6	0,8	4	2,5	50	2	○
PM-2BS-R0.90		1,8	0,9	4	2,7	50	2	○
PM-2BS-R1.00		2	1	4	3	50	2	●
PM-2BS-R1.25		2,5	1,25	4	3,7	50	2	○
PM-2BS-R1.50		3	1,5	4	4,5	50	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

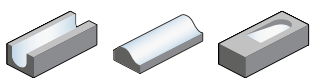
✓ Very suitable

✓ Suitable

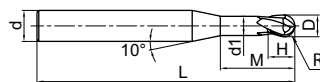
Ball nose cutters

Semi-finishing

PM-2BP



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]							Teeth	Grade
		D	R	d (h6)	d ₁	H	M	L		
PM-2BP-R0.25-M04		0,5	0,25	4	0,45	0,7	4	50	2	●
PM-2BP-R0.25-M06		0,5	0,25	4	0,45	0,7	6	50	2	●
PM-2BP-R0.3-M04		0,6	0,3	4	0,55	0,9	4	50	2	●
PM-2BP-R0.3-M06		0,6	0,3	4	0,55	0,9	6	50	2	●
PM-2BP-R0.3-M08		0,6	0,3	4	0,55	0,9	8	50	2	●
PM-2BP-R0.4-M04		0,8	0,4	4	0,75	1,2	4	50	2	●
PM-2BP-R0.4-M06		0,8	0,4	4	0,75	1,2	6	50	2	●
PM-2BP-R0.4-M08		0,8	0,4	4	0,75	1,2	8	50	2	●
PM-2BP-R0.4-M10		0,8	0,4	4	0,75	1,2	10	50	2	●
PM-2BP-R0.5-M04		1	0,5	4	0,95	1,5	4	50	2	●
PM-2BP-R0.5-M06		1	0,5	4	0,95	1,5	6	50	2	●
PM-2BP-R0.5-M08		1	0,5	4	0,95	1,5	8	50	2	●
PM-2BP-R0.5-M10		1	0,5	4	0,95	1,5	10	50	2	●
PM-2BP-R0.5-M12		1	0,5	4	0,95	1,5	12	50	2	●
PM-2BP-R0.5-M15		1	0,5	4	0,95	1,5	15	50	2	○
PM-2BP-R0.6-M06		1,2	0,6	4	1,15	1,8	6	50	2	●
PM-2BP-R0.6-M08		1,2	0,6	4	1,15	1,8	8	50	2	○
PM-2BP-R0.6-M12		1,2	0,6	4	1,15	1,8	12	50	2	○
PM-2BP-R0.6-M16		1,2	0,6	4	1,15	1,8	16	50	2	○
PM-2BP-R0.75-M06		1,5	0,75	4	1,45	2,3	6	50	2	○
PM-2BP-R0.75-M08		1,5	0,75	4	1,45	2,3	8	50	2	●
PM-2BP-R0.75-M12		1,5	0,75	4	1,45	2,3	12	50	2	●
PM-2BP-R0.75-M16		1,5	0,75	4	1,45	2,3	16	50	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

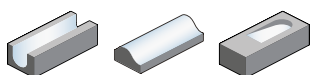
✓ Very suitable

✓ suitable

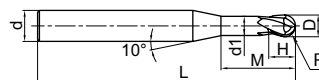
Ball nose cutters

Semi-finishing

PM-2BP



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]							Teeth	Grade
		D	R	d (h6)	d ₁	H	M	L		
PM-2BP-R1.0-M06		2	1	4	1,95	3	6	50	2	●
PM-2BP-R1.0-M08		2	1	4	1,95	3	8	50	2	●
PM-2BP-R1.0-M10		2	1	4	1,95	3	10	50	2	●
PM-2BP-R1.0-M12		2	1	4	1,95	3	12	50	2	●
PM-2BP-R1.0-M16		2	1	4	1,95	3	16	50	2	●
PM-2BP-R1.0-M20		2	1	4	1,95	3	20	50	2	●
PM-2BP-R1.25-M08		2,5	1,25	4	2,4	3,7	8	50	2	○
PM-2BP-R1.25-M10		2,5	1,25	4	2,4	3,7	10	50	2	○
PM-2BP-R1.25-M12		2,5	1,25	4	2,4	3,7	12	50	2	●
PM-2BP-R1.25-M16		2,5	1,25	4	2,4	3,7	16	60	2	○
PM-2BP-R1.25-M20		2,5	1,25	4	2,4	3,7	20	60	2	○
PM-2BP-R1.5-M08		3	1,5	6	2,85	4,5	8	50	2	●
PM-2BP-R1.5-M10		3	1,5	6	2,85	4,5	10	50	2	●
PM-2BP-R1.5-M12		3	1,5	6	2,85	4,5	12	50	2	●
PM-2BP-R1.5-M16		3	1,5	6	2,85	4,5	16	60	2	●
PM-2BP-R1.5-M20		3	1,5	6	2,85	4,5	20	60	2	●
PM-2BP-R2.0-M10		4	2	6	3,85	6	10	60	2	●
PM-2BP-R2.0-M16		4	2	6	3,85	6	16	60	2	●
PM-2BP-R2.0-M20		4	2	6	3,85	6	20	60	2	●
PM-2BP-R2.0-M25		4	2	6	3,85	6	25	60	2	○
PM-2BP-R2.5-M16		5	2,5	6	4,85	7,5	16	60	2	●
PM-2BP-R2.5-M25		5	2,5	6	4,85	7,5	25	70	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ suitable

End mill – PM series

Material group	Composition / structure / heat treatment	Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]				
				PM-2BS PM-2BP				
				KMG405				
				a_p / D				
				1/1	1/10	1/20	f-group	
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	250	280	5
		approx. 0,45 % C	annealed	190	2	240	270	5
		approx. 0,45 % C	tempered	250	3	175	200	5
		approx. 0,75 % C	annealed	270	4	150	170	5
		approx. 0,75 % C	tempered	300	5	140	155	5
	Low-alloyed steel		annealed	180	6	190	210	5
			tempered	275	7	150	170	5
			tempered	300	8	140	155	5
			tempered	350	9	130	150	5
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	175	200	5
			hardened and tempered	325	11	135	150	5
M	Stainless steel	ferritic/martensitic	annealed	200	12	80	90	5
		martensitic	tempered	240	13	70	80	5
		austenitic	quench hardened	180	14	85	100	5
		austenitic-ferritic		230	15	70	80	5
K	Grey cast iron	perlitic/ferritic		180	16	185	205	5
		perlitic (martensitic)		260	17	150	170	5
	Cast iron with spheroidal graphite	ferritic		160	18	225	255	5
		perlitic		250	19	175	200	5
	Malleable cast iron	ferritic		130	20	250	280	5
		perlitic		230	21	200	225	5
N	Aluminium wrought alloys	cannot be hardened		60	22			
		hardenable	hardened	100	23			
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24			
		≤ 12 % Si, hardenable	hardened	90	25			
		> 12 % Si, cannot be hardened		130	26			
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27			
		CuZn, CuSnZn		90	28			
		CuSn, Pb-free copper, electrolytic copper		100	29			
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30			
			hardened	280	31			
		Ni or Co bass	annealed	250	32			
			hardened	350	33			
			cast	320	34			
	Titanium alloys	pure titanium		R _m 400	35			
		α and β alloys	hardened	R _m 1050	36			
H	Hardened steel		hardened and tempered	55 HRC	37	110	130	5
			hardened and tempered	60 HRC	38			
	Hard cast iron		cast	400	39	145	160	5
	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.

Recommended feed rate**Solid carbide milling group 5 – Ball nose cutters PM series**

	a_e / D	Feed rate per cutting edge (f_z) [mm]																	
		Ø0,5	Ø0,8	Ø 1	Ø 2	Ø 3	Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 18	Ø 20			
P	1/1																		
	1/10	0,02	0,05	0,05	0,05	0,05	0,05	0,07	0,07	0,09	0,14	0,16	0,16	0,18	0,18	0,20			
	1/20	0,03	0,06	0,06	0,06	0,06	0,06	0,08	0,08	0,11	0,17	0,20	0,20	0,23	0,23	0,25			
M	1/1																		
	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,05	0,05	0,07	0,11	0,13	0,13	0,15	0,15	0,16			
	1/20	0,02	0,05	0,05	0,05	0,05	0,05	0,07	0,07	0,09	0,14	0,16	0,16	0,18	0,18	0,21			
K	1/1																		
	1/10	0,02	0,05	0,05	0,05	0,05	0,05	0,07	0,07	0,09	0,14	0,16	0,16	0,18	0,18	0,20			
	1/20	0,03	0,06	0,06	0,06	0,06	0,06	0,08	0,08	0,11	0,17	0,20	0,20	0,23	0,23	0,25			
H	1/1																		
	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,05	0,05	0,07	0,11	0,13	0,13	0,15	0,15	0,16			
	1/20	0,02	0,05	0,05	0,05	0,05	0,05	0,07	0,07	0,09	0,14	0,16	0,16	0,18	0,18	0,21			

Note: The given cutting values are guide values, which were determined under ideal conditions.

The values have to be adapted in individual cases.

Material 60CrMoV18-5 (1.2358)

Cooling: air-cooled

Tool: PM-2BS-R1.5 KMG405
Ball nose cutter $\varnothing$ 3 mm

Angle of attack: 65°

Cutting data: $v_c = 100$ m/min
 $n = 18000$ rpm
 $f_z = 0,04$ mm
 $v_f = 1440$ mm/min
 $a_p = 0,3$ mm
 $a_e = 0,3$ mm
 $T = 35$ min



Competition

PM-2BS-R1.5 KMG405

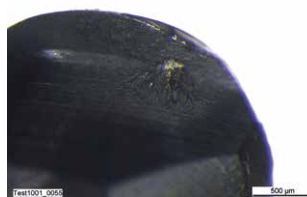
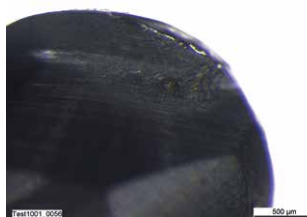
Material S355JR (1.0045)

Cooling: air-cooled

Tool: PM-2BS-R1.5 KMG405
Ball nose cutter $\varnothing$ 3 mm

Angle of attack: 45°

Cutting data: $v_c = 85$ m/min
 $n = 18000$ rpm
 $f_z = 0,04$ mm
 $v_f = 1440$ mm/min
 $a_p = 0,3$ mm
 $a_e = 0,3$ mm
 $T = 120$ min



Competition

PM-2BS-R1.5 KMG405

ИМТ ГРУП ЕООД

Гр. Габрово

Ул. Любен Каравелов 16

Тел./Факс 066 860 048

Моб. 0887598796

E-mail : imtgroup@abv.bg