



Catalogue

Version 2019

2019 EN



ZCC Cutting Tools Europe GmbH

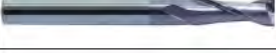
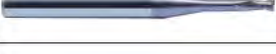
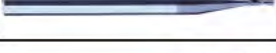
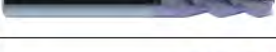
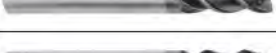
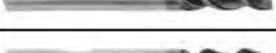
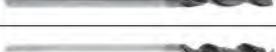
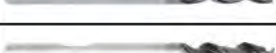
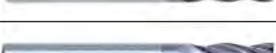
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High performance milling

Products	Solid carbide cutters	Teeth	Ø	Application						Type	Page
				P	M	K	N	S	H		
PM-2E		2	1.0-20.0	✓	✓	✓			✓	End mills	B330
PM-2EL		2	3.0-20.0	✓	✓	✓			✓	End mills	B331
PM-4E-G		4	1.0-20.0	✓	✓	✓			✓	End mills	B332
PM-4EL-G		4	3.0-20.0	✓	✓	✓			✓	End mills	B333
PM-4EX-G		4	3.0-20.0	✓	✓	✓			✓	End mills	B334
PM-4E		4	1.0-20.0	✓	✓	✓			✓	End mills	B335
PM-4EL		4	3.0-20.0	✓	✓	✓			✓	End mills	B336
PM-6E		6	6.0-20.0	✓	✓	✓			✓	End mills	B337
PM-6EL		6	6.0-20.0	✓	✓	✓			✓	End mills	B338
PM-2B		2	1.0-20.0	✓	✓	✓			✓	Ball nose cutters	B339
PM-2BL		2	2.0-20.0	✓	✓	✓			✓	Ball nose cutters	B340
PM-2BFP		2	1.0-20.0	✓	✓	✓			✓	Ball nose cutters	B341
PM-2BC		2	0.5-4.0	✓	✓	✓			✓	Ball nose cutter with conical neck	B342
PM-4B		4	3.0-20.0	✓	✓	✓			✓	Ball nose cutters	B345
PM-4BL		4	3.0-20.0	✓	✓	✓			✓	Ball nose cutters	B346
PM-2R		2	1.0-12.0	✓	✓	✓			✓	Torus mills	B347
PM-4R		4	3.0-12.0	✓	✓	✓			✓	Torus mills	B350
PM-4RL		4	6.0-16.0	✓	✓	✓			✓	Torus mills	B351
PM-4H		4	3.0-12.0	✓	✓	✓			✓	High-feed mills	B348
PM-4HL		4	4.0-12.0	✓	✓	✓			✓	High-feed mills	B349

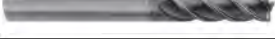
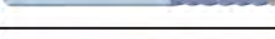
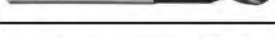
✓ Very suitable ✓ Suitable

General machining

Products	Solid carbide cutters	Teeth	Ø	Application						Type	Page
				P	M	K	N	S	H		
5501R302GM		2	3.0-20.0	✓	✓	✓				End mills	B272
5601R302GM		2	3.0-20.0	✓	✓	✓				End mills	B273
5502R302GM		2	1.0-20.0	✓	✓	✓				End mills	B274
5602R302GM		2	2.0-20.0	✓	✓	✓				End mills	B275
GM-2E		2	1.0-20.0	✓	✓	✓				End mills	B276
GM-2EL		2	3.0-20.0	✓	✓	✓				End mills	B277
GM-2EX		2	3.0-20.0	✓	✓	✓				End mills	B278
GM-2EFP		2	6.0-16.0	✓	✓	✓				End mills	B279
GM-2F		2	1.0-20.0	✓	✓	✓				End mills	B280
GM-2FL		2	3.0-20.0	✓	✓	✓				End mills	B281
GM-2EP		2	0.5-5.0	✓	✓	✓				Mini end mills	B282
GM-2ES		2	0.3-3.0	✓	✓	✓				Mini end mills	B284
GM-3E		3	1.0-20.0	✓	✓	✓				End mills	B285
GM-3EL		3	3.0-20.0	✓	✓	✓				End mills	B286
5501R303GM		3	3.0-20.0	✓	✓	✓				End mills	B287
5601R303GM		3	3.0-20.0	✓	✓	✓				End mills	B288
5502R303GM		3	3.0-20.0	✓	✓	✓				End mills	B289
5602R303GM		3	3.0-20.0	✓	✓	✓				End mills	B290
5502R453GM		3	3.0-20.0	✓	✓	✓				End mills	B291
5602R453GM		3	3.0-20.0	✓	✓	✓				End mills	B292
GM-4E-G		4	1.0-20.0	✓	✓	✓				End mills	B298

✓ Very suitable ✓ Suitable

General machining

Products	Solid carbide cutters	Teeth	Ø	Application						Type	Page
				P	M	K	N	S	H		
GM-4F-G		4	1.0-20.0	✓	✓	✓				End mills	B293
GM-4EL-G		4	3.0-20.0	✓	✓	✓				End mills	B294
GM-4FL-G		4	3.0-16.0	✓	✓	✓				End mills	B295
GM-4EX-G		4	3.0-20.0	✓	✓	✓				End mills	B296
GM-4E		4	1.0-20.0	✓	✓	✓				End mills	B297
GM-4EL		4	3.0-20.0	✓	✓	✓				End mills	B299
GM-4EFP		4	6.0-20.0	✓	✓	✓				End mills	B300
5501R304GF		4	3.0-20.0	✓	✓	✓				End mills	B301
5601R304GF		4	3.0-20.0	✓	✓	✓				End mills	B302
5502R304GF		4	3.0-20.0	✓	✓	✓				End mills	B303
5602R304GF		4	3.0-20.0	✓	✓	✓				End mills	B304
5508R454GM		4	3.0-20.0	✓	✓	✓				End mills	B305
5602R454GM		4	3.0-20.0	✓	✓	✓				End mills	B306
5589R45MGF		6-10	6.0-20.0	✓	✓	✓				End mills	B307
GM-6E		6	6.0-20.0	✓	✓	✓				End mills	B308
GM-6EL		6	6.0-20.0	✓	✓	✓				End mills	B309
5565R302GF		2	3.0-20.0	✓	✓	✓				Ball nose cutters	B310
5665R202GM		2	3.0-20.0	✓	✓	✓				Ball nose cutters	B311
5566R302GF		2	3.0-12.0	✓	✓	✓				Ball nose cutters	B312
GM-2B		2	1.0-20.0	✓	✓	✓				Ball nose cutters	B313
GM-2BL		2	2.0-20.0	✓	✓	✓				Ball nose cutters	B314

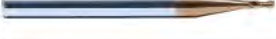
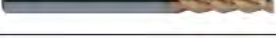
✓ Very suitable ✓ Suitable

General machining

Products	Solid carbide cutters	Teeth	Ø	Application						Type	Page
				P	M	K	N	S	H		
GM-2BFP		2	1.0-20.0	✓	✓	✓				Ball nose cutters	B315
GM-2BS		2	0.3-3.0	✓	✓	✓				Mini ball nose cutters	B316
GM-2BP		2	0.5-5.0	✓	✓	✓				Mini ball nose cutters	B317
GM-4B		4	3.0-20.0	✓	✓	✓				Ball nose cutters	B319
GM-4BL		4	3.0-20.0	✓	✓	✓				Ball nose cutters	B320
GM-2R		2	1.0-12.0	✓	✓	✓				Torus mills	B321
GM-4R		4	3.0-12.0	✓	✓	✓				Torus mills	B322
GM-4RL		4	6.0-16.0	✓	✓	✓				Torus mills	B323
5602R303GR		3	6.0-8.0	✓	✓	✓				Rippers	B324
5602R304GR		4	10.0-20.0	✓	✓	✓				Rippers	B325
5602R305GR		5	25.0	✓	✓	✓				Rippers	B326
GM-4W		4	6.0-20.0	✓	✓	✓				Rippers	B327

✓ Very suitable ✓ Suitable

Machining high hardness steel

HM-2E		2	1.0-20.0						✓	End mills	B354
HM-2EFP		2	6.0-20.0						✓	End mills	B355
HM-2EP		2	0.5-5.0						✓	Mini end mills	B356
HM-2ES		2	0.3-3.0						✓	Mini end mills	B358
HM-4E		4	1.0-20.0						✓	End mills	B359
HM-4EL		4	3.0-20.0						✓	End mills	B360
HM-4EFP		4	6.0-20.0						✓	End mills	B361
5502R55MHH		4-8	3.0-20.0						✓	End mills	B362

✓ Very suitable ✓ Suitable

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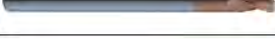
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Machining high hardness steel

Products	Solid carbide cutters	Teeth	Ø	Application						Type	Page
				P	M	K	N	S	H		
HM-6E		6	6.0-20.0						✓	End mills	B363
HM-6EL		6	6.0-20.0						✓	End mills	B364
HM-2B		2	1.0-20.0						✓	Ball nose cutters	B365
HM-2BL		2	2.0-20.0						✓	Ball nose cutters	B366
HM-2BFP		2	1.0-20.0						✓	Ball nose cutters	B367
HM-2BS		2	0.3-3.0						✓	Mini ball nose cutters	B368
HM-2BP		2	0.5-5.0						✓	Mini ball nose cutters	B369
HM-4B		4	3.0-20.0						✓	Ball nose cutters	B371
HM-4BL		4	3.0-20.0						✓	Ball nose cutters	B372
HM-4R		4	3.0-12.0						✓	Torus mills	B373
HM-4RF		4	6.0-12.0						✓	Torus mills	B374
HM-4RP		4	6.0-16.0						✓	Torus mills	B375

✓ Very suitable ✓ Suitable

Copper and copper alloys

5502R402NM		2	3.0-20.0				✓			End mills	B378
NM-2E		2	1.0-12.0				✓			End mills	B379
NM-2EP		2	0.5-5.0				✓			Mini end mills	B380
NM-4E		4	3.0-12.0				✓			End mills	B381
NM-2B		2	1.0-12.0				✓			Ball nose cutters	B382
NM-2BP		2	0.5-5.0				✓			Mini ball nose cutters	B383

✓ Very suitable ✓ Suitable

Aluminium and aluminium alloys

Products	Solid carbide cutters	Teeth	Ø	Application						Type	Page
				P	M	K	N	S	H		
AL-2E		2	1.0-20.0				✓			End mills	B386
AL-2EL		2	3.0-20.0				✓			End mills	B387
ALG-2E		2	1.0-20.0				✓			End mills	B388
ALG-2R		2	6.0-25.0				✓			Torus mills	B403
ALG-2R-W		2	6.0-25.0				✓			Torus mills	B404
AL-3E		3	1.0-20.0				✓			End mills	B389
AL-3EL		3	3.0-20.0				✓			End mills	B390
ALG-3E		3	1.0-20.0				✓			End mills	B391
ALG-3E-W		3	3.0-20.0				✓			End mills	B392
ALP-3E		3	1.0-20.0				✓			End mills	B393
ALP-3E-W		3	3.0-20.0				✓			End mills	B394
ALP-4E		4	3.0-20.0				✓			End mills	B395
ALP-4E-W		4	3.0-20.0				✓			End mills	B396
AL-3W		3	6.0-20.0				✓			Rippers	B397
5565R302NH		2	3.0-16.0				✓			Ball nose cutters	B398
5566R302NH		2	3.0-16.0				✓			Ball nose cutters	B399
AL-2B		2	2.0-12.0				✓			Ball nose cutters	B400
AL-2R-AIR		2	6.0-20.0				✓			High performance torus mills	B401
AL-2RL-AIR		2	6.0-20.0				✓			High performance torus mills	B402
AL-3R-AIR		3	12.0-20.0				✓			High performance torus mills	B405
AL-3RL-AIR		3	12.0-20.0				✓			High performance torus mills	B406

✓ Very suitable ✓ Suitable

HPC with unequal helix angle

Products	Solid carbide cutters	Teeth	Ø	Application						Type	Page
				P	M	K	N	S	H		
5501R38414GM		4	4.0-20.0	✓	✓	✓			✓	End mills	B408
5502R38414GM		4	4.0-20.0	✓	✓	✓			✓	End mills	B409
5601R38414GM		4	4.0-20.0	✓	✓	✓			✓	End mills	B410
5602R38414GM		4	3.0-20.0	✓	✓	✓			✓	End mills	B411
5502R38414GM-R		4	4.0-20.0	✓	✓	✓			✓	Torus mills	B412
5602R38414GM-R		4	4.0-20.0	✓	✓	✓			✓	Torus mills	B413
UM-4E		4	4.0-20.0	✓	✓	✓			✓	End mills	B416
UM-4E-W		4	4.0-20.0	✓	✓	✓			✓	End mills	B417
UM-4EL		4	4.0-20.0	✓	✓	✓			✓	End mills	B418
UM-4EL-W		4	4.0-20.0	✓	✓	✓			✓	End mills	B419
UM-4ELP-W		4	4.0-20.0	✓	✓	✓			✓	End mills	B420
UM-4EFP		4	6.0-20.0	✓	✓	✓			✓	End mills	B421
UM-4R		4	4.0-20.0	✓	✓	✓			✓	Torus mills	B422
UM-4RL		4	6.0-16.0	✓	✓	✓			✓	Torus mills	B423
UM-4RFP		4	6.0-16.0	✓	✓	✓			✓	Torus mills	B424
VSM-4E		4	4.0-20.0	✓	✓			✓		End mills	B426
VSM-4E-C		4	10.0-20.0	✓	✓			✓		End mills	B427
VSM-4R		4	4.0-20.0	✓	✓			✓		Torus mills	B428

✓ Very suitable ✓ Suitable

Deburring cutter

Products	Solid carbide cutters	Teeth	Ø	Application						Type	Page
				P	M	K	N	S	H		
5501/5601		3-4	0.2-0.7	✓	✓	✓	✓			Deburring cutters	B432
5501/5601		3-4	0.2-0.7	✓	✓	✓	✓			Deburring cutters	B433
5601		4	5.2-10.0	✓	✓	✓	✓			Deburring cutters	B434

✓ Very suitable ✓ Suitable

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A

Turning

Coated cemented carbide PVD

Grade	Grade description
KMD401	PVD coated carbide substrate for high performance milling application of non-ferrous metals, CFRP and GFRP and organic materials. The DLC layer has very good wear protection and high thermal stability.

B

Milling

KMG303	PVD coated carbide substrate for universal milling application of steel (up to HRC<=48), stainless steel and cast iron.
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KMG405	PVD coated carbide substrate for high performance milling application of steel (up to HRC <55), stainless steel, super alloy material and cast iron. High wear resistance and toughness for a wide application field.
---------------	---

C

Drilling

KMG555	PVD coated carbide substrate for hard milling application of steel (HRC 55–68), highest wear resistance and toughness for best cutting result.
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KMG309	PVD coated carbide substrate for non ferrous materials. High wear resistance even in abrasive materials.
---------------	--

D

Technical
Information

Uncoated cemented carbide

Grade	Grade description
YK30F	Uncoated K30 carbide substrate for steel, stainless steel, cast iron and non ferrous materials.

E

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YK40F	Uncoated K20–K30/N20–N30 carbide substrate for cast iron and non ferrous materials.
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5 5 0 1 R 30 2 GM R05 0800

1 2 3 4 5 6 7 8 9 10

Turning

Type	
Code	Description
5	Milling cutter

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

B

1

2

Milling

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

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

C

3

4

Drilling

Rotation direction	
Code	Description
R	Right
L	Left

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

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

D

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Technical Information

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

Radius [mm]	
Code	Description
R03	0,3
R15	1,5
R30	3,0
...	

Diameter [mm]	
Code	Description
0100	1,0
0800	8,0
2000	20,0
...	

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a Groove milling
g Plunge milling



b Square shoulder milling
h Circular milling/Ramping



c Profile milling



d Slot milling



e Face milling



f Chamfer milling

GM – 2 E L P – D12 R0.5 – M08 – W

1

2

3

4

5

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Application		Number of teeth
Code	Description	
GR	General roughing	
GM	Semi-finishing	
GF	Finishing	
PM	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
		...	

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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	

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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

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E

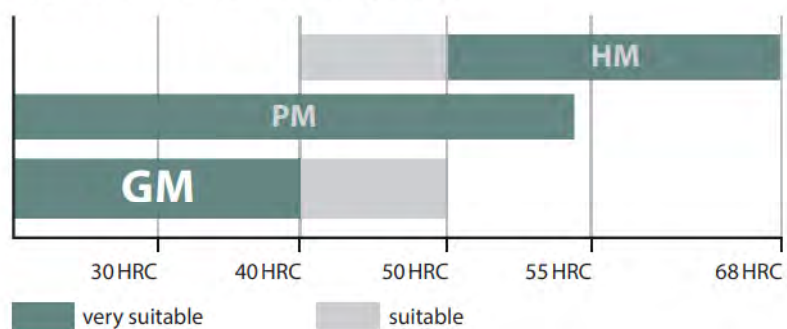
Index

GM series

For general applications

- For machining of steel to max. 50 HRC and cast iron to heat-resistant alloys.
- Sharp cutting edge with high edge stability. Roughing to finishing with long tool life.
- End mills, ball nose cutters, torus mills, rippers and mini cutters.
- Diameter range 0.3–20.0 mm

Application fields for machining of steel



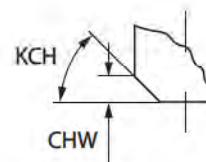
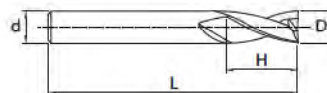
End mill

Semi-finishing

5501R302GM



- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5501R302GM-0300		3	6	4	50	0	0	2	●	○
5501R302GM-0400		4	6	5	54	0	0	2	●	○
5501R302GM-0500		5	6	6	54	0	0	2	●	○
5501R302GM-0600		6	6	7	54	45	0.1	2	●	○
5501R302GM-0800		8	8	9	58	45	0.1	2	●	○
5501R302GM-1000		10	10	11	66	45	0.1	2	●	○
5501R302GM-1200		12	12	12	73	45	0.1	2	●	○
5501R302GM-1400		14	14	14	75	45	0.15	2	●	○
5501R302GM-1600		16	16	16	82	45	0.15	2	●	○
5501R302GM-1800		18	18	18	84	45	0.15	2	●	○
5501R302GM-2000		20	20	20	92	45	0.15	2	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

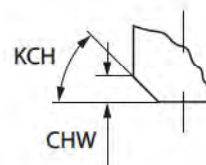
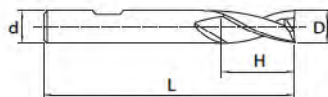
P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

End mill**Semi-finishing****5601R302GM**

- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5601R302GM-0300		3	6	4	50	0	0	2	●	○
5601R302GM-0400		4	6	5	54	0	0	2	●	○
5601R302GM-0500		5	6	6	54	0	0	2	●	○
5601R302GM-0600		6	6	7	54	45	0.1	2	●	○
5601R302GM-0800		8	8	9	58	45	0.1	2	●	○
5601R302GM-1000		10	10	11	66	45	0.1	2	●	○
5601R302GM-1200		12	12	12	73	45	0.1	2	●	○
5601R302GM-1400		14	14	14	75	45	0.15	2	●	○
5601R302GM-1600		16	16	16	82	45	0.15	2	●	○
5601R302GM-1800		18	18	18	84	45	0.15	2	●	○
5601R302GM-2000		20	20	20	92	45	0.15	2	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

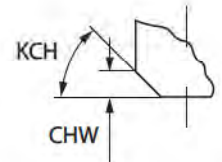
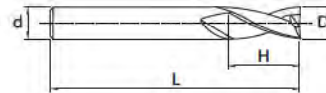
End mill long cutting edge

Semi-finishing

5502R302GM



- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5502R302GM-0100		1	3	2	38	0	0	2	●	○
5502R302GM-0150		1.5	3	3	38	0	0	2	●	○
5502R302GM-0200		2	6	6	57	0	0	2	●	○
5502R302GM-0250		2.5	6	7	57	0	0	2	●	○
5502R302GM-0280		2.8	6	7	57	0	0	2	●	○
5502R302GM-0300		3	6	7	57	0	0	2	●	○
5502R302GM-0350		3.5	6	7	57	0	0	2	●	○
5502R302GM-0380		3.8	6	8	57	0	0	2	●	○
5502R302GM-0400		4	6	8	57	0	0	2	●	○
5502R302GM-0450		4.5	6	8	57	0	0	2	●	○
5502R302GM-0480		4.8	6	8	57	0	0	2	●	○
5502R302GM-0500		5	6	10	57	0	0	2	●	○
5502R302GM-0550		5.5	6	10	57	0	0	2	●	○
5502R302GM-0575		5.75	6	10	57	0	0	2	●	○
5502R302GM-0600		6	6	10	57	45	0.1	2	●	○
5502R302GM-0675		6.75	8	13	63	45	0.1	2	○	○
5502R302GM-0700		7	8	13	63	45	0.1	2	●	○
5502R302GM-0750		7.5	8	16	63	45	0.1	2	●	○
5502R302GM-0775		7.75	8	16	63	45	0.1	2	●	○
5502R302GM-0800		8	8	16	63	45	0.1	2	●	○
5502R302GM-0870		8.7	10	16	72	45	0.1	2	●	○
5502R302GM-0900		9	10	16	72	45	0.1	2	●	○
5502R302GM-0950		9.5	10	16	72	45	0.1	2	○	○
5502R302GM-1000		10	10	19	72	45	0.1	2	●	○
5502R302GM-1100		11	12	22	83	45	0.1	2	●	○
5502R302GM-1170		11.7	12	22	83	45	0.1	2	●	○
5502R302GM-1200		12	12	22	83	45	0.1	2	●	○
5502R302GM-1370		13.7	14	22	83	45	0.1	2	●	○
5502R302GM-1400		14	14	22	83	45	0.15	2	●	○
5502R302GM-1500		15	16	26	92	45	0.15	2	●	○
5502R302GM-1570		15.7	16	26	92	45	0.15	2	●	○
5502R302GM-1600		16	16	26	92	45	0.15	2	●	○
5502R302GM-1700		17	18	26	92	45	0.15	2	○	○
5502R302GM-1800		18	18	26	92	45	0.15	2	●	○
5502R302GM-2000		20	20	32	104	45	0.15	2	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



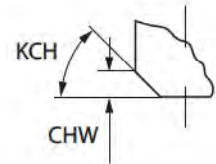
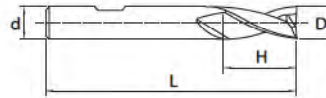
End mill long cutting edge

Semi-finishing

5602R302GM



- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5602R302GM-0200		2	6	6	57	0	0	2	●	○
5602R302GM-0250		2.5	6	7	57	0	0	2	●	○
5602R302GM-0280		2.8	6	7	57	0	0	2	●	○
5602R302GM-0300		3	6	7	57	0	0	2	●	○
5602R302GM-0350		3.5	6	7	57	0	0	2	●	○
5602R302GM-0380		3.8	6	8	57	0	0	2	●	○
5602R302GM-0400		4	6	8	57	0	0	2	●	○
5602R302GM-0450		4.5	6	8	57	0	0	2	●	○
5602R302GM-0480		4.8	6	8	57	0	0	2	●	○
5602R302GM-0500		5	6	10	57	0	0	2	●	○
5602R302GM-0550		5.5	6	10	57	0	0	2	●	○
5602R302GM-0575		5.75	6	10	57	0	0	2	●	○
5602R302GM-0600		6	6	10	57	45	0.1	2	●	○
5602R302GM-0675		6.75	8	13	63	45	0.1	2	○	○
5602R302GM-0700		7	8	13	63	45	0.1	2	●	○
5602R302GM-0750		7.5	8	16	63	45	0.1	2	●	○
5602R302GM-0775		7.75	8	16	63	45	0.1	2	●	○
5602R302GM-0800		8	8	16	63	45	0.1	2	●	○
5602R302GM-0870		8.7	10	16	72	45	0.1	2	●	○
5602R302GM-0900		9	10	16	72	45	0.1	2	●	○
5602R302GM-1000		10	10	19	72	45	0.1	2	●	○
5602R302GM-1170		11.7	12	22	83	45	0.1	2	●	○
5602R302GM-1200		12	12	22	83	45	0.1	2	●	○
5602R302GM-1370		13.7	14	22	83	45	0.1	2	●	○
5602R302GM-1400		14	14	22	83	45	0.15	2	●	○
5602R302GM-1570		15.7	16	26	92	45	0.15	2	●	○
5602R302GM-1600		16	16	26	92	45	0.15	2	●	○
5602R302GM-1800		18	18	26	92	45	0.15	2	●	○
5602R302GM-2000		20	20	32	104	45	0.15	2	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



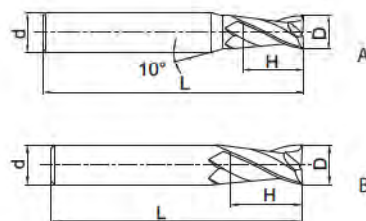
End mill

Semi-finishing

GM-2E



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-2E-D1.0S		1	4	3	50	2	A	●
GM-2E-D1.5S		1.5	4	4	50	2	A	●
GM-2E-D2.0S		2	4	6	50	2	A	●
GM-2E-D2.5S		2.5	4	8	50	2	A	●
GM-2E-D3.0S		3	4	8	50	2	A	●
GM-2E-D4.0S		4	4	11	50	2	B	●
GM-2E-D1.0		1	6	3	50	2	A	●
GM-2E-D1.5		1.5	6	4	50	2	A	●
GM-2E-D2.0		2	6	6	50	2	A	●
GM-2E-D2.5		2.5	6	8	50	2	A	●
GM-2E-D3.0		3	6	8	50	2	A	●
GM-2E-D3.5		3.5	6	10	50	2	A	●
GM-2E-D4.0		4	6	11	50	2	A	●
GM-2E-D4.5		4.5	6	11	50	2	A	●
GM-2E-D5.0		5	6	13	50	2	A	●
GM-2E-D5.5		5.5	6	16	50	2	A	●
GM-2E-D6.0		6	6	16	50	2	B	●
GM-2E-D7.0		7	8	20	60	2	A	●
GM-2E-D8.0		8	8	20	60	2	B	●
GM-2E-D9.0		9	10	22	75	2	A	●
GM-2E-D10.0		10	10	25	75	2	B	●
GM-2E-D11.0		11	12	26	75	2	A	●
GM-2E-D12.0		12	12	30	75	2	B	●
GM-2E-D14.0		14	14	32	75	2	B	●
GM-2E-D16.0		16	16	45	100	2	B	●
GM-2E-D18.0		18	18	45	100	2	B	●
GM-2E-D20.0		20	20	45	100	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

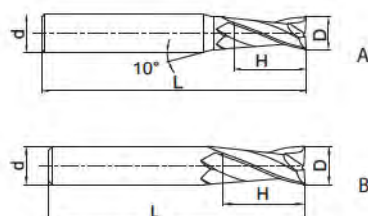
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill long cutting edge
Semi-finishing
GM-2EL


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-2EL-D3.0		3	6	12	75	2	A	●
GM-2EL-D4.0		4	6	15	75	2	A	●
GM-2EL-D5.0		5	6	20	75	2	A	●
GM-2EL-D6.0		6	6	20	75	2	B	●
GM-2EL-D8.0		8	8	25	100	2	B	●
GM-2EL-D10.0		10	10	30	100	2	B	●
GM-2EL-D12.0		12	12	35	100	2	B	●
GM-2EL-D14.0		14	14	40	100	2	B	●
GM-2EL-D16.0		16	16	50	150	2	B	●
GM-2EL-D20.0		20	20	55	150	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



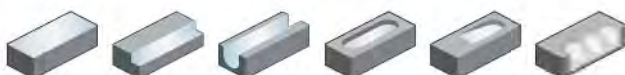
A

Turning

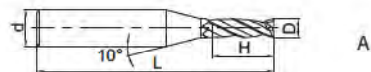
End mill extra long cutting edge

Semi-finishing

GM-2EX



- Factory standard
- Centre cutting
- Helix angle 35°



A



B

B

Milling

Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-2EX-D3.0		3	6	20	75	2	A	●
GM-2EX-D4.0		4	6	25	75	2	A	●
GM-2EX-D5.0		5	6	30	75	2	A	●
GM-2EX-D6.0		6	6	30	75	2	B	○
GM-2EX-D8.0		8	8	40	100	2	B	○
GM-2EX-D10.0		10	10	50	110	2	B	○
GM-2EX-D12.0		12	12	50	110	2	B	○
GM-2EX-D16.0		16	16	70	150	2	B	○
GM-2EX-D20.0		20	20	75	150	2	B	○

● Ex stock ○ On demand

* With internal cooling

C

Drilling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

D

Technical
Information

E

Index

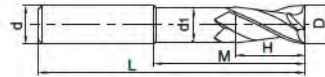
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill short cutting edge **Semi-finishing**
GM-2EFP


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	d ₁	H	M	L		
GM-2EFP-D6.0		6	6	5.8	9	30	30	2	◊
GM-2EFP-D8.0		8	8	7.8	12	40	40	2	◊
GM-2EFP-D10.0		10	10	9.6	15	50	50	2	◊
GM-2EFP-D12.0		12	12	11.5	18	50	50	2	◊
GM-2EFP-D16.0		16	16	15.5	24	50	50	2	◊

● Ex stock ◊ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



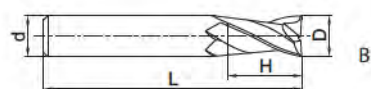
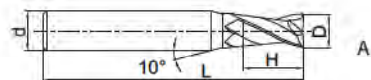
End mill

Semi-finishing

GM-2F



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-2F-D1.0		1	6	3	50	2	A	○
GM-2F-D1.5		1.5	6	4	50	2	A	○
GM-2F-D2.0		2	6	6	50	2	A	○
GM-2F-D2.5		2.5	6	8	50	2	A	○
GM-2F-D3.0		3	6	8	50	2	A	●
GM-2F-D3.5		3.5	6	10	50	2	A	○
GM-2F-D4.0		4	6	11	50	2	A	●
GM-2F-D4.5		4.5	6	11	50	2	A	●
GM-2F-D5.0		5	6	13	50	2	A	●
GM-2F-D5.5		5.5	6	16	50	2	A	○
GM-2F-D6.0		6	6	16	50	2	B	●
GM-2F-D7.0		7	8	20	60	2	A	●
GM-2F-D8.0		8	8	20	60	2	B	●
GM-2F-D9.0		9	10	22	75	2	A	○
GM-2F-D10.0		10	10	25	75	2	B	○
GM-2F-D11.0		11	12	26	75	2	A	○
GM-2F-D12.0		12	12	30	75	2	B	●
GM-2F-D14.0		14	14	32	75	2	B	○
GM-2F-D16.0		16	16	45	100	2	B	○
GM-2F-D18.0		18	18	45	100	2	B	○
GM-2F-D20.0		20	20	45	100	2	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

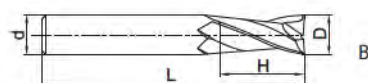
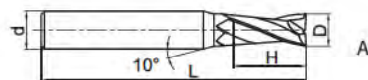
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill long cutting edge**Semi-finishing****GM-2FL**

- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-2FL-D3.0		3	6	12	75	2	A	○
GM-2FL-D4.0		4	6	15	75	2	A	○
GM-2FL-D5.0		5	6	20	75	2	A	○
GM-2FL-D6.0		6	6	20	75	2	B	○
GM-2FL-D8.0		8	8	25	100	2	B	○
GM-2FL-D10.0		10	10	30	100	2	B	○
GM-2FL-D12.0		12	12	35	100	2	B	○
GM-2FL-D14.0		14	14	40	100	2	B	○
GM-2FL-D16.0		16	16	50	150	2	B	○
GM-2FL-D20.0		20	20	55	150	2	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

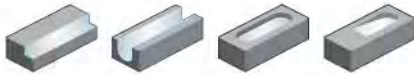
Cutting data > B436

Nonstandard order > B477

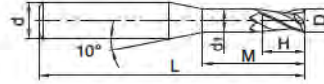
End mill

Semi-finishing

GM-2EP



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	d ₁	H	M	L		
GM-2EP-D0.5-M04		0.5	4	0.45	0.7	4	50	2	●
GM-2EP-D0.5-M06		0.5	4	0.45	0.7	6	50	2	●
GM-2EP-D0.5-M08		0.5	4	0.45	0.7	8	50	2	●
GM-2EP-D0.8-M04		0.8	4	0.75	1.2	4	50	2	●
GM-2EP-D0.8-M06		0.8	4	0.75	1.2	6	50	2	●
GM-2EP-D0.8-M08		0.8	4	0.75	1.2	8	50	2	●
GM-2EP-D0.8-M10		0.8	4	0.75	1.2	10	50	2	●
GM-2EP-D1.0-M04		1	4	0.95	1.5	4	50	2	●
GM-2EP-D1.0-M06		1	4	0.95	1.5	6	50	2	●
GM-2EP-D1.0-M08		1	4	0.95	1.5	8	50	2	●
GM-2EP-D1.0-M10		1	4	0.95	1.5	10	50	2	●
GM-2EP-D1.0-M12		1	4	0.95	1.5	12	50	2	●
GM-2EP-D1.0-M14		1	4	0.95	1.5	14	50	2	●
GM-2EP-D1.2-M06		1.2	4	1.15	1.8	6	50	2	●
GM-2EP-D1.2-M08		1.2	4	1.15	1.8	8	50	2	●
GM-2EP-D1.2-M10		1.2	4	1.15	1.8	10	50	2	●
GM-2EP-D1.2-M12		1.2	4	1.15	1.8	12	50	2	○
GM-2EP-D1.5-M06		1.5	4	1.45	2.3	6	50	2	●
GM-2EP-D1.5-M08		1.5	4	1.45	2.3	8	50	2	●
GM-2EP-D1.5-M10		1.5	4	1.45	2.3	10	50	2	●
GM-2EP-D1.5-M12		1.5	4	1.45	2.3	12	50	2	●
GM-2EP-D1.5-M14		1.5	4	1.45	2.3	14	50	2	●
GM-2EP-D2.0-M06		2	4	1.95	3	6	50	2	●
GM-2EP-D2.0-M08		2	4	1.95	3	8	50	2	●
GM-2EP-D2.0-M10		2	4	1.95	3	10	50	2	●
GM-2EP-D2.0-M12		2	4	1.95	3	12	50	2	●
GM-2EP-D2.0-M14		2	4	1.95	3	14	50	2	●
GM-2EP-D2.0-M16		2	4	1.95	3	16	50	2	●
GM-2EP-D2.5-M08		2.5	4	2.4	3.7	8	50	2	●
GM-2EP-D2.5-M10		2.5	4	2.4	3.7	10	50	2	●
GM-2EP-D2.5-M12		2.5	4	2.4	3.7	12	50	2	●
GM-2EP-D2.5-M14		2.5	4	2.4	3.7	14	50	2	●
GM-2EP-D2.5-M16		2.5	4	2.4	3.7	16	60	2	●
GM-2EP-D2.5-M18		2.5	4	2.4	3.7	18	60	2	●
GM-2EP-D2.5-M20		2.5	4	2.4	3.7	20	60	2	●
GM-2EP-D3.0-M06		3	6	2.85	4.5	6	50	2	●
GM-2EP-D3.0-M08		3	6	2.85	4.5	8	50	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

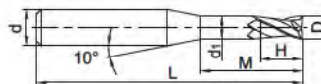
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill**Semi-finishing****GM-2EP**

- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]						Teeth	Grade KMG303
		D	d (h6)	d ₁	H	M	L		
GM-2EP-D3.0-M10		3	6	2.85	4.5	10	50	2	●
GM-2EP-D3.0-M12		3	6	2.85	4.5	12	50	2	●
GM-2EP-D3.0-M14		3	6	2.85	4.5	14	60	2	●
GM-2EP-D3.0-M16		3	6	2.85	4.5	16	60	2	●
GM-2EP-D3.0-M18		3	6	2.85	4.5	18	60	2	●
GM-2EP-D3.0-M20		3	6	2.85	4.5	20	60	2	●
GM-2EP-D4.0-M12		4	6	3.85	6	12	50	2	●
GM-2EP-D4.0-M14		4	6	3.85	6	14	60	2	●
GM-2EP-D4.0-M16		4	6	3.85	6	16	60	2	●
GM-2EP-D4.0-M20		4	6	3.85	6	20	60	2	●
GM-2EP-D4.0-M25		4	6	3.85	6	25	60	2	●
GM-2EP-D5.0-M16		5	6	4.85	7.5	16	60	2	●
GM-2EP-D5.0-M25		5	6	4.85	7.5	25	70	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

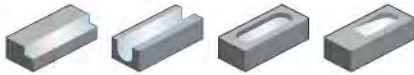
✓ Very suitable

✓ Suitable

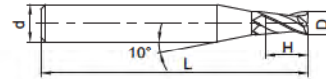
End mill

Semi-finishing

GM-2ES



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		
GM-2ES-D0.3		0.3	4	0.6	50	2	●
GM-2ES-D0.4		0.4	4	0.8	50	2	●
GM-2ES-D0.5		0.5	4	1	50	2	●
GM-2ES-D0.6		0.6	4	1.2	50	2	●
GM-2ES-D0.7		0.7	4	1.4	50	2	●
GM-2ES-D0.8		0.8	4	1.6	50	2	●
GM-2ES-D0.9		0.9	4	1.8	50	2	●
GM-2ES-D1.0		1	4	2	50	2	●
GM-2ES-D1.1		1.1	4	2	50	2	●
GM-2ES-D1.2		1.2	4	2.5	50	2	●
GM-2ES-D1.3		1.3	4	2.5	50	2	●
GM-2ES-D1.4		1.4	4	3	50	2	●
GM-2ES-D1.5		1.5	4	3	50	2	●
GM-2ES-D1.6		1.6	4	3.5	50	2	●
GM-2ES-D1.7		1.7	4	3.5	50	2	●
GM-2ES-D1.8		1.8	4	4	50	2	●
GM-2ES-D1.9		1.9	4	4	50	2	●
GM-2ES-D2.0		2	4	4	50	2	●
GM-2ES-D2.1		2.1	4	4	50	2	●
GM-2ES-D2.2		2.2	4	4.5	50	2	●
GM-2ES-D2.3		2.3	4	4.5	50	2	●
GM-2ES-D2.4		2.4	4	5	50	2	●
GM-2ES-D2.5		2.5	4	5	50	2	●
GM-2ES-D2.6		2.6	4	5	50	2	●
GM-2ES-D2.7		2.7	4	5.5	50	2	●
GM-2ES-D2.8		2.8	4	5.5	50	2	●
GM-2ES-D2.9		2.9	4	6	50	2	●
GM-2ES-D3.0		3	4	6	50	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

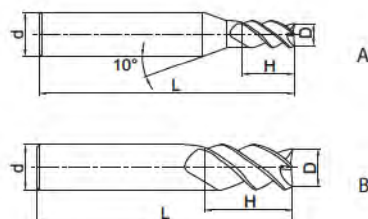
End mill

Semi-finishing

GM-3E



- Factory standard
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade KMG303
		D	d (h6)	H	L			
GM-3E-D1.0S		1	4	3	50	3	A	○
GM-3E-D1.5S		1.5	4	4	50	3	A	○
GM-3E-D2.0S		2	4	6	50	3	A	○
GM-3E-D2.5S		2.5	4	8	50	3	A	○
GM-3E-D3.0S		3	4	8	50	3	A	○
GM-3E-D4.0S		4	4	11	50	3	B	○
GM-3E-D1.0		1	6	3	50	3	A	○
GM-3E-D1.5		1.5	6	4	50	3	A	○
GM-3E-D2.0		2	6	6	50	3	A	○
GM-3E-D2.5		2.5	6	8	50	3	A	○
GM-3E-D3.0		3	6	8	50	3	A	○
GM-3E-D3.5		3.5	6	10	50	3	A	○
GM-3E-D4.0		4	6	11	50	3	A	○
GM-3E-D4.5		4.5	6	11	50	3	A	○
GM-3E-D5.0		5	6	13	50	3	A	○
GM-3E-D5.5		5.5	6	16	50	3	A	○
GM-3E-D6.0		6	6	16	50	3	B	○
GM-3E-D7.0		7	8	20	60	3	A	○
GM-3E-D8.0		8	8	20	60	3	B	○
GM-3E-D9.0		9	10	22	75	3	A	○
GM-3E-D10.0		10	10	25	75	3	B	○
GM-3E-D11.0		11	12	26	75	3	A	○
GM-3E-D12.0		12	12	30	75	3	B	○
GM-3E-D14.0		14	14	32	75	3	B	○
GM-3E-D16.0		16	16	45	100	3	B	○
GM-3E-D18.0		18	18	45	100	3	B	○
GM-3E-D20.0		20	20	45	100	3	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



A

Turning

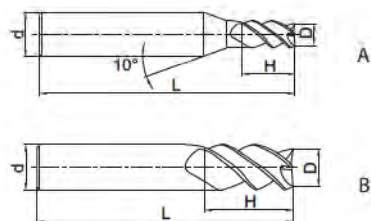
End mill long cutting edge

Semi-finishing

GM-3EL



- Factory standard
- Centre cutting
- Helix angle 45°



B

Milling

Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-3EL-D3.0		3	6	12	75	3	A	●
GM-3EL-D4.0		4	6	15	75	3	A	●
GM-3EL-D5.0		5	6	20	75	3	A	●
GM-3EL-D6.0		6	6	20	75	3	B	●
GM-3EL-D8.0		8	8	25	100	3	B	●
GM-3EL-D10.0		10	10	30	100	3	B	●
GM-3EL-D12.0		12	12	35	100	3	B	●
GM-3EL-D14.0		14	14	40	100	3	B	●
GM-3EL-D16.0		16	16	50	150	3	B	●
GM-3EL-D20.0		20	20	55	150	3	B	●

● Ex stock ○ On demand

* With internal cooling

C

Drilling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

D

Technical Information

E

Index

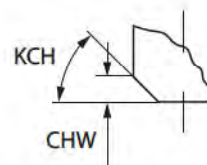
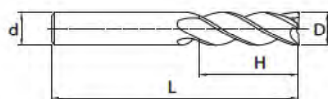
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill**Semi-finishing****5501R303GM**

- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5501R303GM-0300		3	6	4	50	0	0	3	●	○
5501R303GM-0400		4	6	5	54	0	0	3	●	○
5501R303GM-0500		5	6	6	54	0	0	3	●	○
5501R303GM-0600		6	6	7	54	45	0.1	3	●	○
5501R303GM-0800		8	8	9	58	45	0.1	3	●	○
5501R303GM-1000		10	10	11	66	45	0.1	3	●	○
5501R303GM-1200		12	12	12	73	45	0.1	3	●	○
5501R303GM-1400		14	14	14	75	45	0.15	3	●	○
5501R303GM-1600		16	16	16	82	45	0.15	3	●	○
5501R303GM-1800		18	18	18	84	45	0.15	3	●	○
5501R303GM-2000		20	20	20	92	45	0.15	3	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

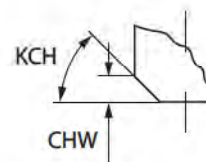
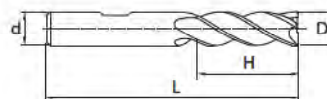
End mill

Semi-finishing

5601R303GM



- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5601R303GM-0300		3	6	4	50	0	0	3	●	○
5601R303GM-0400		4	6	5	54	0	0	3	●	○
5601R303GM-0500		5	6	6	54	0	0	3	●	○
5601R303GM-0600		6	6	7	54	45	0.1	3	●	○
5601R303GM-0800		8	8	9	58	45	0.1	3	●	○
5601R303GM-1000		10	10	11	66	45	0.1	3	●	○
5601R303GM-1200		12	12	12	73	45	0.1	3	●	○
5601R303GM-1400		14	14	14	75	45	0.15	3	●	○
5601R303GM-1600		16	16	16	82	45	0.15	3	●	○
5601R303GM-1800		18	18	18	84	45	0.15	3	●	○
5601R303GM-2000		20	20	20	92	45	0.15	3	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

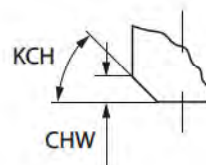
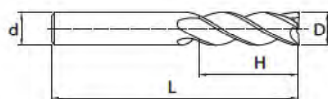
P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

End mill long cutting edge**Semi-finishing****5502R303GM**

- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5502R303GM-0300		3	6	7	57	0	0	3	●	○
5502R303GM-0400		4	6	8	57	0	0	3	●	○
5502R303GM-0500		5	6	10	57	0	0	3	●	○
5502R303GM-0600		6	6	10	57	45	0.1	3	●	○
5502R303GM-0800		8	8	16	63	45	0.1	3	●	○
5502R303GM-1000		10	10	19	72	45	0.1	3	●	○
5502R303GM-1200		12	12	22	83	45	0.1	3	●	○
5502R303GM-1400		14	14	22	83	45	0.15	3	●	○
5502R303GM-1600		16	16	26	92	45	0.15	3	●	○
5502R303GM-1800		18	18	26	92	45	0.15	3	●	○
5502R303GM-2000		20	20	32	104	45	0.15	3	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

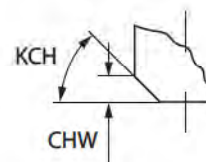
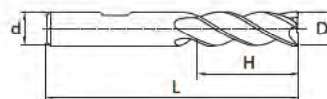
End mill long cutting edge

Semi-finishing

5602R303GM



- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5602R303GM-0300		3	6	7	57	0	0	3	●	○
5602R303GM-0400		4	6	8	57	0	0	3	●	○
5602R303GM-0500		5	6	10	57	0	0	3	●	○
5602R303GM-0600		6	6	10	57	45	0.1	3	●	○
5602R303GM-0800		8	8	16	63	45	0.1	3	●	○
5602R303GM-1000		10	10	19	72	45	0.1	3	●	○
5602R303GM-1200		12	12	22	83	45	0.1	3	●	○
5602R303GM-1400		14	14	22	83	45	0.15	3	●	○
5602R303GM-1600		16	16	26	92	45	0.15	3	●	○
5602R303GM-1800		18	18	26	92	45	0.15	3	●	○
5602R303GM-2000		20	20	32	104	45	0.15	3	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

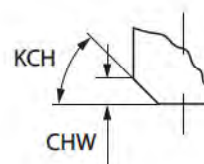
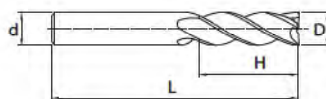
P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

End mill long cutting edge
Semi-finishing
5502R453GM


- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	H	L	KCH	CHW		
5502R453GM-0300		3	6	7	57	0	0	3	●
5502R453GM-0400		4	6	8	57	0	0	3	●
5502R453GM-0500		5	6	10	57	0	0	3	●
5502R453GM-0600		6	6	10	57	45	0.1	3	●
5502R453GM-0800		8	8	16	63	45	0.1	3	●
5502R453GM-1000		10	10	19	72	45	0.1	3	●
5502R453GM-1200		12	12	22	83	45	0.1	3	●
5502R453GM-1400		14	14	22	83	45	0.15	3	●
5502R453GM-1600		16	16	26	92	45	0.15	3	●
5502R453GM-1800		18	18	26	92	45	0.15	3	●
5502R453GM-2000		20	20	32	104	45	0.15	3	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



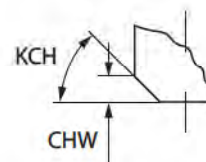
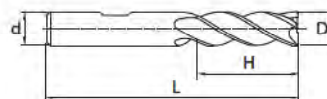
End mill long cutting edge

Semi-finishing

5602R453GM



- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	KMG405
5602R453GM-0300		3	6	7	57	0	0	3	●	●
5602R453GM-0400		4	6	8	57	0	0	3	●	●
5602R453GM-0500		5	6	10	57	0	0	3	●	●
5602R453GM-0600		6	6	10	57	45	0.1	3	●	●
5602R453GM-0800		8	8	16	63	45	0.1	3	●	●
5602R453GM-1000		10	10	19	72	45	0.1	3	●	●
5602R453GM-1200		12	12	22	83	45	0.1	3	●	●
5602R453GM-1400		14	14	22	83	45	0.15	3	●	●
5602R453GM-1600		16	16	26	92	45	0.15	3	●	●
5602R453GM-1800		18	18	26	92	45	0.15	3	●	●
5602R453GM-2000		20	20	32	104	45	0.15	3	●	●

● Ex stock ○ On demand

* With internal cooling

Application field

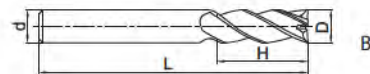
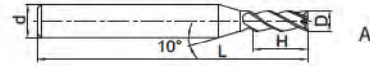
P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

End mill**Semi-finishing****GM-4F-G**

- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade KMG303
		D	d (h6)	H	L			
GM-4F-D2.0S-G		2	4	6	50	4	A	○
GM-4F-D4.0S-G		4	4	11	50	4	B	○
GM-4F-D1.0-G		1	6	3	50	4	A	○
GM-4F-D1.5-G		1.5	6	4	50	4	A	○
GM-4F-D2.0-G		2	6	6	50	4	A	○
GM-4F-D2.5-G		2.5	6	8	50	4	A	○
GM-4F-D3.0-G		3	6	8	50	4	A	○
GM-4F-D3.5-G		3.5	6	10	50	4	A	○
GM-4F-D4.0-G		4	6	11	50	4	A	○
GM-4F-D4.5-G		4.5	6	11	50	4	A	○
GM-4F-D5.0-G		5	6	13	50	4	A	○
GM-4F-D5.5-G		5.5	6	16	50	4	A	○
GM-4F-D6.0-G		6	6	16	50	4	B	○
GM-4F-D7.0-G		7	8	20	60	4	A	○
GM-4F-D8.0-G		8	8	20	60	4	B	○
GM-4F-D9.0-G		9	10	22	75	4	A	○
GM-4F-D10.0-G		10	10	25	75	4	B	○
GM-4F-D11.0-G		11	12	26	75	4	A	○
GM-4F-D12.0-G		12	12	30	75	4	B	○
GM-4F-D14.0-G		14	14	32	75	4	B	○
GM-4F-D16.0-G		16	16	45	100	4	B	○
GM-4F-D18.0-G		18	18	45	100	4	B	○
GM-4F-D20.0-G		20	20	45	100	4	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

A

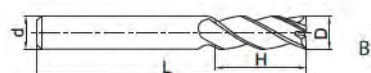
End mill long cutting edge

Semi-finishing

GM-4EL-G



- Factory standard
- Centre cutting
- Helix angle 30°



B

Milling

Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-4EL-D3.0-G		3	6	12	75	4	A	○
GM-4EL-D4.0-G		4	6	15	75	4	A	○
GM-4EL-D5.0-G		5	6	20	75	4	A	○
GM-4EL-D6.0-G		6	6	20	75	4	B	○
GM-4EL-D8.0-G		8	8	25	100	4	B	○
GM-4EL-D10.0-G		10	10	30	100	4	B	○
GM-4EL-D12.0-G		12	12	35	100	4	B	○
GM-4EL-D14.0-G		14	14	40	100	4	B	○
GM-4EL-D16.0-G		16	16	50	150	4	B	○
GM-4EL-D20.0-G		20	20	55	150	4	B	○

● Ex stock ○ On demand

* With internal cooling

C

Drilling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

D

Technical Information

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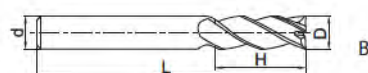
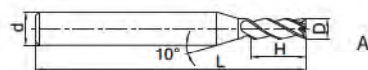
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill long cutting edge**Semi-finishing****GM-4FL-G**

- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-4FL-D3.0-G		3	6	12	75	4	A	○
GM-4FL-D4.0-G		4	6	15	75	4	A	○
GM-4FL-D5.0-G		5	6	20	75	4	A	●
GM-4FL-D6.0-G		6	6	20	75	4	B	●
GM-4FL-D8.0-G		8	8	25	100	4	B	●
GM-4FL-D10.0-G		10	10	30	100	4	B	●
GM-4FL-D12.0-G		12	12	35	100	4	B	●
GM-4FL-D14.0-G		14	14	40	100	4	B	○
GM-4FL-D16.0-G		16	16	50	150	4	B	○
GM-4FL-D20.0-G		20	20	55	150	4	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

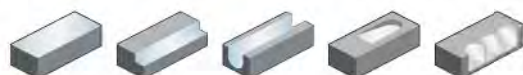
Cutting data > B436

Nonstandard order > B477

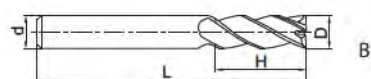
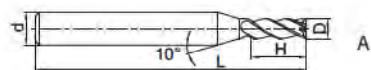
A

End mill extra long cutting edge **Semi-finishing**

GM-4EX-G



- Factory standard
- Centre cutting
- Helix angle 30°



B

Milling

Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-4EX-D3.0-G		3	6	20	75	4	A	●
GM-4EX-D4.0-G		4	6	25	75	4	A	●
GM-4EX-D5.0-G		5	6	30	75	4	A	●
GM-4EX-D6.0-G		6	6	30	75	4	B	●
GM-4EX-D8.0-G		8	8	40	100	4	B	●
GM-4EX-D10.0-G		10	10	50	110	4	B	●
GM-4EX-D12.0-G		12	12	50	110	4	B	●
GM-4EX-D16.0-G		16	16	70	150	4	B	●
GM-4EX-D20.0-G		20	20	75	150	4	B	●

● Ex stock ○ On demand

* With internal cooling

C

Drilling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

D

Technical Information

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System code > B268

Cutting data > B436

Nonstandard order > B477

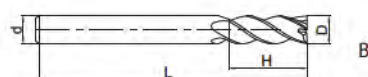
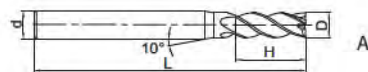
End mill

Semi-finishing

GM-4E



- Factory standard
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade KMG303
		D	d (h6)	H	L			
GM-4E-D1.0S		1	4	3	50	4	A	●
GM-4E-D1.5S		1.5	4	4	50	4	A	●
GM-4E-D2.0S		2	4	6	50	4	A	●
GM-4E-D2.5S		2.5	4	8	50	4	A	●
GM-4E-D3.0S		3	4	8	50	4	A	●
GM-4E-D4.0S		4	4	11	50	4	B	●
GM-4E-D1.0		1	6	3	50	4	A	●
GM-4E-D1.5		1.5	6	4	50	4	A	●
GM-4E-D2.0		2	6	6	50	4	A	●
GM-4E-D2.5		2.5	6	8	50	4	A	●
GM-4E-D3.0		3	6	8	50	4	A	●
GM-4E-D3.5		3.5	6	10	50	4	A	●
GM-4E-D4.0		4	6	11	50	4	A	●
GM-4E-D4.5		4.5	6	11	50	4	A	●
GM-4E-D5.0		5	6	13	50	4	A	●
GM-4E-D5.5		5.5	6	16	50	4	A	●
GM-4E-D6.0		6	6	16	50	4	B	●
GM-4E-D7.0		7	8	20	60	4	A	●
GM-4E-D8.0		8	8	20	60	4	B	●
GM-4E-D9.0		9	10	22	75	4	A	●
GM-4E-D10.0		10	10	25	75	4	B	●
GM-4E-D11.0		11	12	26	75	4	A	●
GM-4E-D12.0		12	12	30	75	4	B	●
GM-4E-D14.0		14	14	32	75	4	B	●
GM-4E-D16.0		16	16	45	100	4	B	●
GM-4E-D18.0		18	18	45	100	4	B	●
GM-4E-D20.0		20	20	45	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

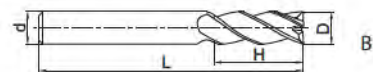
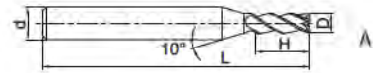
End mill

Semi-finishing

GM-4E-G



- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-4E-D1.0S-G		1	4	3	50	4	A	●
GM-4E-D1.5S-G		1.5	4	4	50	4	A	●
GM-4E-D2.0S-G		2	4	6	50	4	A	●
GM-4E-D2.5S-G		2.5	4	8	50	4	A	●
GM-4E-D3.0S-G		3	4	8	50	4	A	●
GM-4E-D4.0S-G		4	4	11	50	4	B	●
GM-4E-D1.0-G		1	6	3	50	4	A	●
GM-4E-D1.5-G		1.5	6	4	50	4	A	●
GM-4E-D2.0-G		2	6	6	50	4	A	●
GM-4E-D2.5-G		2.5	6	8	50	4	A	●
GM-4E-D3.0-G		3	6	8	50	4	A	●
GM-4E-D3.5-G		3.5	6	10	50	4	A	●
GM-4E-D4.0-G		4	6	11	50	4	A	●
GM-4E-D4.5-G		4.5	6	11	50	4	A	○
GM-4E-D5.0-G		5	6	13	50	4	A	●
GM-4E-D5.5-G		5.5	6	16	50	4	A	●
GM-4E-D6.0-G		6	6	16	50	4	B	●
GM-4E-D7.0-G		7	8	20	60	4	A	●
GM-4E-D8.0-G		8	8	20	60	4	B	●
GM-4E-D9.0-G		9	10	22	75	4	A	●
GM-4E-D10.0-G		10	10	25	75	4	B	●
GM-4E-D11.0-G		11	12	26	75	4	A	●
GM-4E-D12.0-G		12	12	30	75	4	B	●
GM-4E-D14.0-G		14	14	32	75	4	B	●
GM-4E-D16.0-G		16	16	45	100	4	B	●
GM-4E-D18.0-G		18	18	45	100	4	B	●
GM-4E-D20.0-G		20	20	45	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

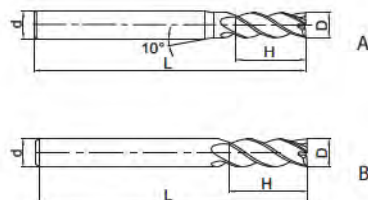
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill long cutting edge
Semi-finishing
GM-4EL


- Factory standard
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG303
GM-4EL-D3.0		3	6	12	75	4	A	●
GM-4EL-D4.0		4	6	15	75	4	A	●
GM-4EL-D5.0		5	6	20	75	4	A	●
GM-4EL-D6.0		6	6	20	75	4	B	●
GM-4EL-D8.0		8	8	25	100	4	B	●
GM-4EL-D10.0		10	10	30	100	4	B	●
GM-4EL-D12.0		12	12	35	100	4	B	●
GM-4EL-D14.0		14	14	40	100	4	B	●
GM-4EL-D16.0		16	16	50	150	4	B	●
GM-4EL-D20.0		20	20	55	150	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

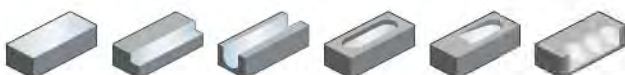


A

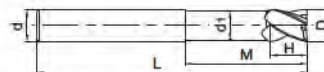
End mill short cutting edge

Semi-finishing

GM-4EFP



- Factory standard
- Centre cutting
- Helix angle 45°



B

Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	d ₁	H	M	L		
GM-4EFP-D6.0		6	6	5.8	9	30	75	4	◊
GM-4EFP-D8.0		8	8	7.8	12	40	100	4	◊
GM-4EFP-D10.0		10	10	9.6	15	50	100	4	◊
GM-4EFP-D12.0		12	12	11.5	18	50	100	4	◊
GM-4EFP-D16.0		16	16	15.5	24	50	150	4	◊
GM-4EFP-D20.0		20	20	19.5	30	60	150	4	◊

● Ex stock ◊ On demand

* With internal cooling

C

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

D

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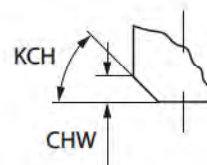
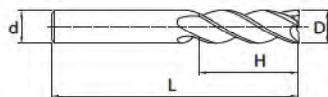
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill**Finishing****5501R304GF**

- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5501R304GF-0300		3	6	5	50	0	0	4	●	○
5501R304GF-0400		4	6	8	54	0	0	4	●	○
5501R304GF-0500		5	6	9	54	0	0	4	●	○
5501R304GF-0600		6	6	10	54	45	0.1	4	●	○
5501R304GF-0800		8	8	12	58	45	0.1	4	●	○
5501R304GF-1000		10	10	14	66	45	0.1	4	●	○
5501R304GF-1200		12	12	16	73	45	0.1	4	●	○
5501R304GF-1400		14	14	18	75	45	0.15	4	●	○
5501R304GF-1600		16	16	22	82	45	0.15	4	●	○
5501R304GF-1800		18	18	24	84	45	0.15	4	●	○
5501R304GF-2000		20	20	26	92	45	0.15	4	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

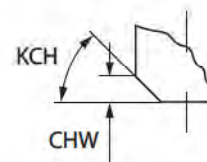
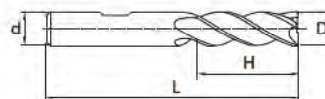


End mill

Finishing

5601R304GF

- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5601R304GF-0300		3	6	5	50	0	0	4	●	○
5601R304GF-0400		4	6	8	54	0	0	4	●	○
5601R304GF-0500		5	6	9	54	0	0	4	●	○
5601R304GF-0600		6	6	10	54	45	0.1	4	●	○
5601R304GF-0800		8	8	12	58	45	0.1	4	●	○
5601R304GF-1000		10	10	14	66	45	0.1	4	●	○
5601R304GF-1200		12	12	16	73	45	0.1	4	●	●
5601R304GF-1400		14	14	18	75	45	0.15	4	●	○
5601R304GF-1600		16	16	22	82	45	0.15	4	●	○
5601R304GF-1800		18	18	24	84	45	0.15	4	●	○
5601R304GF-2000		20	20	26	92	45	0.15	4	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

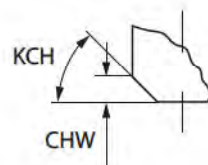
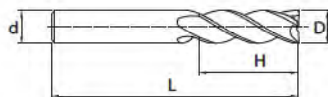
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill long cutting edge
Finishing
5502R304GF


- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5502R304GF-0300		3	6	8	57	0	0	4	●	○
5502R304GF-0400		4	6	11	57	0	0	4	●	○
5502R304GF-0500		5	6	13	57	0	0	4	●	○
5502R304GF-0600		6	6	13	57	45	0.1	4	●	○
5502R304GF-0800		8	8	19	63	45	0.1	4	●	○
5502R304GF-1000		10	10	22	72	45	0.1	4	●	○
5502R304GF-1200		12	12	26	83	45	0.1	4	●	○
5502R304GF-1400		14	14	26	83	45	0.15	4	●	○
5502R304GF-1600		16	16	32	92	45	0.15	4	●	○
5502R304GF-1800		18	18	32	92	45	0.15	4	●	○
5502R304GF-2000		20	20	38	104	45	0.15	4	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



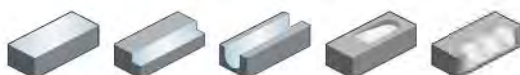
A

Turning

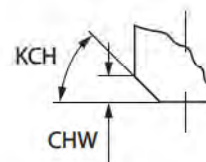
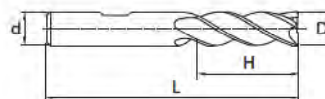
End mill long cutting edge

Finishing

5602R304GF



- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 30°



B

Milling

Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5602R304GF-0300		3	6	8	57	0	0	4	●	○
5602R304GF-0400		4	6	11	57	0	0	4	●	○
5602R304GF-0500		5	6	13	57	0	0	4	●	○
5602R304GF-0600		6	6	13	57	45	0.1	4	●	○
5602R304GF-0800		8	8	19	63	45	0.1	4	●	○
5602R304GF-1000		10	10	22	72	45	0.1	4	●	○
5602R304GF-1200		12	12	26	83	45	0.1	4	●	○
5602R304GF-1400		14	14	26	83	45	0.15	4	●	○
5602R304GF-1600		16	16	32	92	45	0.15	4	●	○
5602R304GF-1800		18	18	32	92	45	0.15	4	●	○
5602R304GF-2000		20	20	38	104	45	0.15	4	●	○

● Ex stock ○ On demand

* With internal cooling

C

Drilling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

D

Technical Information

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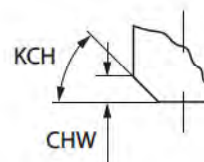
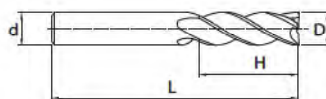
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill long cutting edge **Semi-finishing**
5508R454GM


- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG303	YK30F
5508R454GM-0300		3	3	8	45	0	0	4	●	○
5508R454GM-0400		4	4	11	50	0	0	4	●	○
5508R454GM-0500		5	5	13	50	0	0	4	●	○
5508R454GM-0600		6	6	13	57	45	0.1	4	●	○
5508R454GM-0800		8	8	19	63	45	0.1	4	●	○
5508R454GM-1000		10	10	22	72	45	0.1	4	●	○
5508R454GM-1200		12	12	26	83	45	0.1	4	●	○
5508R454GM-1400		14	14	26	83	45	0.15	4	●	○
5508R454GM-1600		16	16	32	92	45	0.15	4	●	○
5508R454GM-1800		18	18	32	92	45	0.15	4	●	○
5508R454GM-2000		20	20	38	104	45	0.15	4	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



A

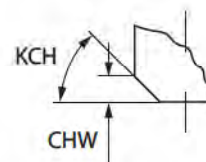
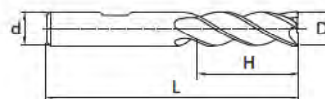
End mill long cutting edge

Semi-finishing

5602R454GM



- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 45°



Turning

B

Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	H	L	KCH	CHW		
5602R454GM-0300		3	6	8	57	0	0	4	●
5602R454GM-0400		4	6	11	57	0	0	4	●
5602R454GM-0500		5	6	13	57	0	0	4	●
5602R454GM-0600		6	6	13	57	45	0.1	4	●
5602R454GM-0800		8	8	19	63	45	0.1	4	●
5602R454GM-1000		10	10	22	72	45	0.1	4	●
5602R454GM-1200		12	12	26	83	45	0.1	4	●
5602R454GM-1400		14	14	26	83	45	0.15	4	●
5602R454GM-1600		16	16	32	92	45	0.15	4	●
5602R454GM-1800		18	18	32	92	45	0.15	4	●
5602R454GM-2000		20	20	38	104	45	0.15	4	●

● Ex stock ○ On demand

* With internal cooling

Milling

C

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

Drilling

D

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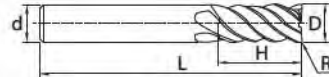
System code > B268

Cutting data > B436

Nonstandard order > B477

Torus mill long cutting edge**Finishing****5589R45MGF**

- Type of shank DIN 6535HA
- Helix angle 45°



Article	*	Dimensions [mm]					Teeth	Grade
		D	R	d (h6)	H	L		KMG405
5589R45MGFR02-0600		6	0.2	6	19	63	6	●
5589R45MGFR02-0800		8	0.2	8	28	72	6	●
5589R45MGFR02-1000		10	0.2	10	34	84	6	●
5589R45MGFR02-1200		12	0.2	12	40	97	6	●
5589R45MGFR03-1600		16	0.3	16	48	108	8	○
5589R45MGFR03-2000		20	0.3	20	56	122	10	○

● Ex stock ○ On demand

* With internal cooling

Application field

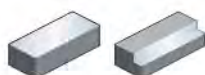
P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

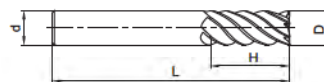
✓ Suitable

End mill Semi-finishing

GM-6E



- Factory standard
- Non-centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		KMG303
GM-6E-D6.0		6	6	18	60	6	●
GM-6E-D8.0		8	8	20	60	6	●
GM-6E-D10.0		10	10	30	75	6	●
GM-6E-D12.0		12	12	32	75	6	●
GM-6E-D16.0		16	16	40	100	6	●
GM-6E-D20.0		20	20	45	100	6	●

● Ex stock ○ On demand

* With internal cooling

Application field

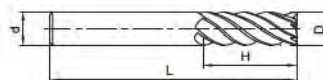
P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

End mill long cutting edge**Semi-finishing****GM-6EL**

- Factory standard
- Non-centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		KMG303
GM-6EL-D6.0		6	6	24	75	6	●
GM-6EL-D8.0		8	8	32	75	6	●
GM-6EL-D10.0		10	10	40	100	6	●
GM-6EL-D12.0		12	12	45	100	6	●
GM-6EL-D16.0		16	16	64	150	6	●
GM-6EL-D20.0		20	20	75	150	6	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

A

Turning

B

Milling

C

Drilling

DTechnical
Information**E**

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System code > B268

Cutting data > B436

Nonstandard order > B477

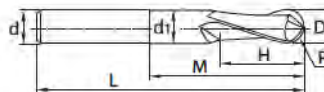
Ball nose cutter

Finishing

5565R302GF



- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade
		D	R	d (h6)	d ₁	H	M	L		
5565R302GF-0300		3	1.5	6	2.8	4	9	57	2	●
5565R302GF-0400		4	2	6	3.7	5	12	57	2	●
5565R302GF-0500		5	2.5	6	4.6	6	15	57	2	●
5565R302GF-0600		6	3	6	5.5	7	20	57	2	●
5565R302GF-0800		8	4	8	7.4	9	26	63	2	●
5565R302GF-1000		10	5	10	9.2	11	31	72	2	●
5565R302GF-1200		12	6	12	11	12	37	83	2	●
5565R302GF-1600		16	8	16	15	16	43	92	2	●
5565R302GF-2000		20	10	20	19	20	50	104	2	●

● Ex stock ○ On demand

* With internal cooling

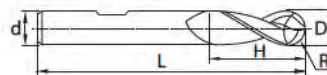
Application field

P	M	K	N	S	H
✓	✓	✓			

- ✓ Very suitable
- ✓ Suitable

Ball nose cutter**Semi-finishing****5665R202GM**

- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 20°



Article	*	Dimensions [mm]						Teeth	Grade KMG303
		D	R	d (h6)	d ₁	H	L		
5665R202GM-0300		3	1.5	6	2.8	4	57	2	●
5665R202GM-0400		4	2	6	3.7	5	57	2	●
5665R202GM-0500		5	2.5	6	4.6	6	57	2	●
5665R202GM-0600		6	3	6	5.5	7	57	2	●
5665R202GM-0800		8	4	8	7.4	9	63	2	●
5665R202GM-1000		10	5	10	9.2	11	72	2	●
5665R202GM-1200		12	6	12	11	12	83	2	●
5665R202GM-1600		16	8	16	15	16	92	2	●
5665R202GM-2000		20	10	20	19	20	104	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

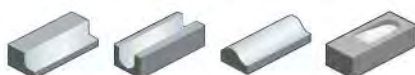
✓ Very suitable

✓ Suitable

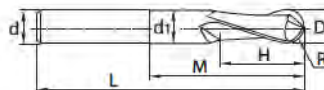
A

Ball nose cutter long shank Finishing

5566R302GF



- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



B

Article	*	Dimensions [mm]							Teeth	Grade
		D	R	d (h6)	d ₁	H	M	L		
5566R302GF-0300		3	1.5	6	2.8	4	15	75	2	●
5566R302GF-0400		4	2	6	3.7	5	20	75	2	●
5566R302GF-0500		5	2.5	6	4.6	6	25	80	2	●
5566R302GF-0600		6	3	6	5.5	7	30	80	2	●
5566R302GF-0800		8	4	8	7.4	9	35	90	2	●
5566R302GF-1000		10	5	10	9.2	11	40	100	2	●
5566R302GF-1200		12	6	12	11	12	50	120	2	●

● Ex stock ○ On demand

* With internal cooling

C

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

Drilling

D

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System code > B268

Cutting data > B436

Nonstandard order > B477

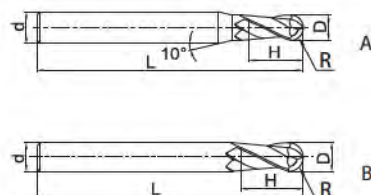
Ball nose cutter

Semi-finishing

GM-2B



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG303
		R	D	d (h6)	H	L			
GM-2B-R0.5S		0.5	1	4	2	50	2	A	●
GM-2B-R0.75S		0.75	1.5	4	3	50	2	A	●
GM-2B-R1.0S		1	2	4	4	50	2	A	●
GM-2B-R1.25S		1.25	2.5	4	5	50	2	A	●
GM-2B-R1.5S		1.5	3	4	6	50	2	A	●
GM-2B-R2.0S		2	4	4	8	50	2	B	●
GM-2B-R0.5		0.5	1	6	2	50	2	A	○
GM-2B-R0.75		0.75	1.5	6	3	50	2	A	○
GM-2B-R1.0		1	2	6	4	50	2	A	●
GM-2B-R1.25		1.25	2.5	6	5	50	2	A	○
GM-2B-R1.5		1.5	3	6	6	50	2	A	●
GM-2B-R1.75		1.75	3.5	6	8	50	2	A	○
GM-2B-R2.0		2	4	6	8	50	2	A	●
GM-2B-R2.5		2.5	5	6	10	50	2	A	●
GM-2B-R2.75		2.75	5.5	6	12	50	2	A	○
GM-2B-R3.0		3	6	6	12	50	2	B	●
GM-2B-R3.5		3.5	7	8	14	60	2	A	○
GM-2B-R4.0		4	8	8	16	60	2	B	●
GM-2B-R4.5		4.5	9	10	18	75	2	A	○
GM-2B-R5.0		5	10	10	20	75	2	B	●
GM-2B-R6.0		6	12	12	24	75	2	B	●
GM-2B-R7.0		7	14	14	28	75	2	B	●
GM-2B-R8.0		8	16	16	32	100	2	B	●
GM-2B-R10.0		10	20	20	40	100	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

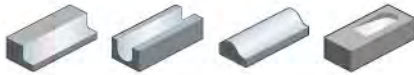
Cutting data > B436

Nonstandard order > B477

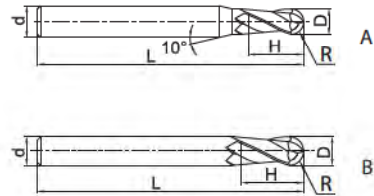


Ball nose cutter long shank Semi-finishing

GM-2BL



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
GM-2BL-R1.0		1	2	6	4	75	2	A	●
GM-2BL-R1.25		1.25	2.5	6	5	75	2	A	●
GM-2BL-R1.5		1.5	3	6	6	75	2	A	●
GM-2BL-R1.75		1.75	3.5	6	8	75	2	A	●
GM-2BL-R2.0		2	4	6	8	75	2	A	●
GM-2BL-R2.5		2.5	5	6	10	75	2	A	●
GM-2BL-R2.75		2.75	5.5	6	12	75	2	A	●
GM-2BL-R3.0		3	6	6	12	75	2	B	●
GM-2BL-R3.5		3.5	7	8	14	75	2	A	●
GM-2BL-R4.0		4	8	8	16	100	2	B	●
GM-2BL-R4.5		4.5	9	10	18	100	2	A	●
GM-2BL-R5.0		5	10	10	20	100	2	B	●
GM-2BL-R6.0		6	12	12	24	100	2	B	●
GM-2BL-R7.0		7	14	14	28	100	2	B	●
GM-2BL-R8.0		8	16	16	32	150	2	B	●
GM-2BL-R10.0		10	20	20	40	150	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

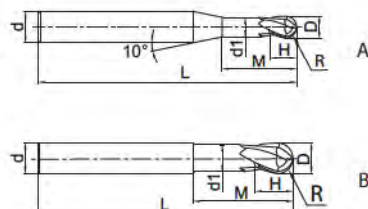
System code > B268

Cutting data > B436

Nonstandard order > B477

Ball nose cutter short cutting edge **Semi-finishing****GM-2BFP**

- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]							Teeth	Geometry	Grade
		R	D	d (h6)	d ₁	H	M	L			
GM-2BFP-R0.5		0.5	1	6	0.95	1	2.5	75	2	A	○
GM-2BFP-R0.75		0.75	1.5	6	1.45	1	3	75	2	A	○
GM-2BFP-R1.0		1	2	6	1.95	2	4	75	2	A	●
GM-2BFP-R1.5		1.5	3	6	2.85	3	6	75	2	A	○
GM-2BFP-R2.0		2	4	6	3.85	4	8	75	2	A	○
GM-2BFP-R2.5		2.5	5	6	4.85	5	10	75	2	A	○
GM-2BFP-R3.0		3	6	6	5.8	6	12	75	2	B	○
GM-2BFP-R4.0		4	8	8	7.8	8	16	100	2	B	○
GM-2BFP-R5.0		5	10	10	9.6	10	20	100	2	B	○
GM-2BFP-R6.0		6	12	12	11.5	12	24	100	2	B	○
GM-2BFP-R8.0		8	16	16	15.5	16	32	150	2	B	○
GM-2BFP-R10.0		10	20	20	19.5	20	40	150	2	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



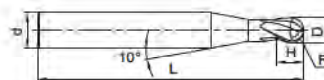
Ball nose cutter

Semi-finishing

GM-2BS



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Grade
		R	D	d (h6)	H	L		
GM-2BS-R0.15		0.15	0.3	4	0.5	50	2	●
GM-2BS-R0.20		0.2	0.4	4	0.6	50	2	●
GM-2BS-R0.25		0.25	0.5	4	0.8	50	2	●
GM-2BS-R0.30		0.3	0.6	4	0.9	50	2	●
GM-2BS-R0.35		0.35	0.7	4	1	50	2	●
GM-2BS-R0.40		0.4	0.8	4	1.2	50	2	●
GM-2BS-R0.45		0.45	0.9	4	1.3	50	2	●
GM-2BS-R0.50		0.5	1	4	1.5	50	2	●
GM-2BS-R0.60		0.6	1.2	4	1.8	50	2	●
GM-2BS-R0.70		0.7	1.4	4	2	50	2	●
GM-2BS-R0.75		0.75	1.5	4	2.3	50	2	●
GM-2BS-R0.80		0.8	1.6	4	2.5	50	2	●
GM-2BS-R0.90		0.9	1.8	4	2.7	50	2	●
GM-2BS-R1.00		1	2	4	3	50	2	●
GM-2BS-R1.25		1.25	2.5	4	3.7	50	2	●
GM-2BS-R1.50		1.5	3	4	4.5	50	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

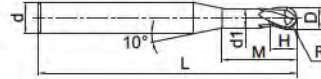
P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

Ball nose cutter **Semi-finishing****GM-2BP**

- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]							Teeth	Grade KMG303
		R	D	d (h6)	d ₁	H	M	L		
GM-2BP-R0.25-M04		0.25	0.5	4	0.45	0.7	4	50	2	●
GM-2BP-R0.25-M06		0.25	0.5	4	0.45	0.7	6	50	2	●
GM-2BP-R0.3-M04		0.3	0.6	4	0.55	0.9	4	50	2	●
GM-2BP-R0.3-M06		0.3	0.6	4	0.55	0.9	6	50	2	●
GM-2BP-R0.3-M08		0.3	0.6	4	0.55	0.9	8	50	2	●
GM-2BP-R0.4-M04		0.4	0.8	4	0.75	1.2	4	50	2	●
GM-2BP-R0.4-M06		0.4	0.8	4	0.75	1.2	6	50	2	●
GM-2BP-R0.4-M08		0.4	0.8	4	0.75	1.2	8	50	2	●
GM-2BP-R0.4-M10		0.4	0.8	4	0.75	1.2	10	50	2	●
GM-2BP-R0.5-M04		0.5	1	4	0.95	1.5	4	50	2	●
GM-2BP-R0.5-M06		0.5	1	4	0.95	1.5	6	50	2	●
GM-2BP-R0.5-M08		0.5	1	4	0.95	1.5	8	50	2	●
GM-2BP-R0.5-M10		0.5	1	4	0.95	1.5	10	50	2	●
GM-2BP-R0.5-M12		0.5	1	4	0.95	1.5	12	50	2	●
GM-2BP-R0.6-M06		0.6	1.2	4	1.15	1.8	6	50	2	●
GM-2BP-R0.6-M08		0.6	1.2	4	1.15	1.8	8	50	2	●
GM-2BP-R0.6-M12		0.6	1.2	4	1.15	1.8	12	50	2	●
GM-2BP-R0.6-M16		0.6	1.2	4	1.15	1.8	16	50	2	●
GM-2BP-R0.75-M08		0.75	1.5	4	1.45	2.3	8	50	2	●
GM-2BP-R0.75-M12		0.75	1.5	4	1.45	2.3	12	50	2	●
GM-2BP-R0.75-M16		0.75	1.5	4	1.45	2.3	16	50	2	●
GM-2BP-R1.0-M06		1	2	4	1.95	3	6	50	2	●
GM-2BP-R1.0-M08		1	2	4	1.95	3	8	50	2	●
GM-2BP-R1.0-M10		1	2	4	1.95	3	10	50	2	●
GM-2BP-R1.0-M12		1	2	4	1.95	3	12	50	2	●
GM-2BP-R1.0-M16		1	2	4	1.95	3	16	50	2	●
GM-2BP-R1.0-M20		1	2	4	1.95	3	20	50	2	●
GM-2BP-R1.25-M08		1.25	2.5	4	2.4	3.7	8	50	2	●
GM-2BP-R1.25-M12		1.25	2.5	4	2.4	3.7	12	50	2	●
GM-2BP-R1.25-M16		1.25	2.5	4	2.4	3.7	16	60	2	●
GM-2BP-R1.25-M20		1.25	2.5	4	2.4	3.7	20	60	2	●
GM-2BP-R1.5-M08		1.5	3	6	2.85	4.5	8	50	2	●
GM-2BP-R1.5-M10		1.5	3	6	2.85	4.5	10	50	2	●
GM-2BP-R1.5-M12		1.5	3	6	2.85	4.5	12	50	2	●
GM-2BP-R1.5-M16		1.5	3	6	2.85	4.5	16	60	2	●
GM-2BP-R1.5-M20		1.5	3	6	2.85	4.5	20	60	2	●
GM-2BP-R2.0-M10		2	4	6	3.85	6	10	60	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



A

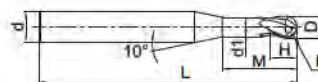
Ball nose cutter

Semi-finishing

GM-2BP



- Factory standard
- Centre cutting
- Helix angle 35°



B

Article	*	Dimensions [mm]							Teeth	Grade
		R	D	d (h6)	d ₁	H	M	L		
GM-2BP-R2.0-M16		2	4	6	3.85	6	16	60	2	●
GM-2BP-R2.0-M20		2	4	6	3.85	6	20	60	2	●
GM-2BP-R2.0-M25		2	4	6	3.85	6	25	60	2	●
GM-2BP-R2.5-M16		2.5	5	6	4.85	7.5	16	60	2	●
GM-2BP-R2.5-M25		2.5	5	6	4.85	7.5	25	70	2	●

● Ex stock ○ On demand

* With internal cooling

C

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

D

E

Technical Information

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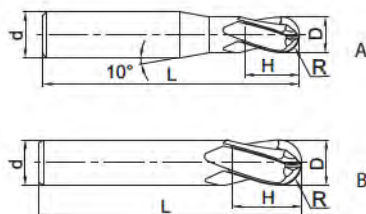
System code > B268

Cutting data > B436

Nonstandard order > B477

Ball nose cutter
Semi-finishing
GM-4B


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG303
		R	D	d (h6)	H	L			
GM-4B-R1.5		1.5	3	6	6	50	4	A	●
GM-4B-R2.0		2	4	6	8	50	4	A	●
GM-4B-R2.5		2.5	5	6	10	50	4	A	●
GM-4B-R3.0		3	6	6	12	50	4	B	●
GM-4B-R4.0		4	8	8	16	60	4	B	●
GM-4B-R5.0		5	10	10	20	75	4	B	●
GM-4B-R6.0		6	12	12	24	75	4	B	●
GM-4B-R7.0		7	14	14	28	75	4	B	●
GM-4B-R8.0		8	16	16	32	100	4	B	●
GM-4B-R9.0		9	18	18	36	100	4	B	●
GM-4B-R10.0		10	20	20	40	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

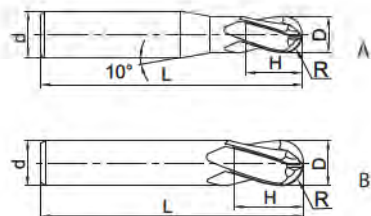


Ball nose cutter long shank Semi-finishing

GM-4BL



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
GM-4BL-R1.5		1.5	3	6	6	75	4	A	○
GM-4BL-R2.0		2	4	6	8	75	4	A	○
GM-4BL-R2.5		2.5	5	6	10	75	4	A	○
GM-4BL-R3.0		3	6	6	12	75	4	B	○
GM-4BL-R4.0		4	8	8	16	100	4	B	○
GM-4BL-R5.0		5	10	10	20	100	4	B	○
GM-4BL-R6.0		6	12	12	24	100	4	B	○
GM-4BL-R7.0		7	14	14	28	100	4	B	○
GM-4BL-R8.0		8	16	16	32	150	4	B	○
GM-4BL-R9.0		9	18	18	36	150	4	B	○
GM-4BL-R10.0		10	20	20	40	150	4	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

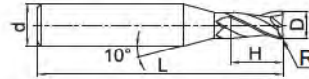
Torus mill

Semi-finishing

GM-2R



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Grade KMG303
		R	D	d (h6)	H	L		
GM-2R-D1.0R0.2		0.2	1	4	3	50	2	○
GM-2R-D1.5R0.2		0.2	1.5	4	4	50	2	○
GM-2R-D2.0R0.2		0.2	2	4	6	50	2	○
GM-2R-D2.0R0.5		0.5	2	4	6	50	2	○
GM-2R-D2.5R0.2		0.2	2.5	4	8	50	2	○
GM-2R-D2.5R0.5		0.5	2.5	4	8	50	2	○
GM-2R-D3.0R0.2		0.2	3	4	8	50	2	○
GM-2R-D3.0R0.3		0.3	3	4	8	50	2	○
GM-2R-D3.0R0.5		0.5	3	4	8	50	2	○
GM-2R-D4.0R0.2		0.2	4	4	11	50	2	○
GM-2R-D4.0R0.3		0.3	4	4	11	50	2	○
GM-2R-D4.0R0.5		0.5	4	4	11	50	2	○
GM-2R-D4.0R1.0		1	4	4	11	50	2	○
GM-2R-D5.0R0.3		0.3	5	6	13	50	2	○
GM-2R-D5.0R0.5		0.5	5	6	13	50	2	○
GM-2R-D5.0R1.0		1	5	6	13	50	2	○
GM-2R-D6.0R0.3		0.3	6	6	16	50	2	○
GM-2R-D6.0R0.5		0.5	6	6	16	50	2	○
GM-2R-D6.0R1.0		1	6	6	16	50	2	○
GM-2R-D8.0R0.3		0.3	8	8	20	60	2	○
GM-2R-D8.0R0.5		0.5	8	8	20	60	2	○
GM-2R-D8.0R1.0		1	8	8	20	60	2	○
GM-2R-D10.0R0.5		0.5	10	10	25	75	2	○
GM-2R-D10.0R1.0		1	10	10	25	75	2	○
GM-2R-D10.0R1.5		1.5	10	10	25	75	2	●
GM-2R-D10.0R2.0		2	10	10	25	75	2	○
GM-2R-D12.0R0.5		0.5	12	12	30	75	2	○
GM-2R-D12.0R1.0		1	12	12	30	75	2	○
GM-2R-D12.0R1.5		1.5	12	12	30	75	2	○
GM-2R-D12.0R2.0		2	12	12	30	75	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



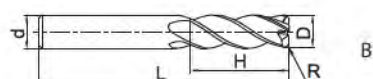
Torus mill

Semi-finishing

GM-4R



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
GM-4R-D3.0R0.2		0.2	3	4	8	50	4	A	●
GM-4R-D4.0R0.3		0.3	4	4	10	50	4	B	○
GM-4R-D4.0R0.5		0.5	4	4	10	50	4	B	●
GM-4R-D5.0R0.5		0.5	5	6	13	50	4	A	●
GM-4R-D5.0R1.0		1	5	6	13	50	4	A	●
GM-4R-D6.0R0.5		0.5	6	6	16	50	4	B	●
GM-4R-D6.0R1.0		1	6	6	16	50	4	B	●
GM-4R-D8.0R0.5		0.5	8	8	20	60	4	B	●
GM-4R-D8.0R1.0		1	8	8	20	60	4	B	●
GM-4R-D10.0R0.5		0.5	10	10	25	75	4	B	●
GM-4R-D10.0R1.0		1	10	10	25	75	4	B	●
GM-4R-D10.0R2.0		2	10	10	25	75	4	B	●
GM-4R-D10.0R3.0		3	10	10	25	75	4	B	●
GM-4R-D12.0R0.5		0.5	12	12	30	75	4	B	●
GM-4R-D12.0R1.0		1	12	12	30	75	4	B	●
GM-4R-D12.0R2.0		2	12	12	30	75	4	B	●
GM-4R-D12.0R3.0		3	12	12	30	75	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

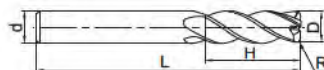
System code > B268

Cutting data > B436

Nonstandard order > B477

Torus mill long shank **Semi-finishing**
GM-4RL


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Grade KMG303
		R	D	d (h6)	H	L		
GM-4RL-D6.0R0.5		0.5	6	6	16	75	4	●
GM-4RL-D6.0R1.0		1	6	6	16	75	4	●
GM-4RL-D8.0R0.5		0.5	8	8	20	100	4	●
GM-4RL-D8.0R1.0		1	8	8	20	100	4	●
GM-4RL-D10.0R0.5		0.5	10	10	25	100	4	●
GM-4RL-D10.0R1.0		1	10	10	25	100	4	●
GM-4RL-D10.0R2.0		2	10	10	25	100	4	●
GM-4RL-D12.0R0.5		0.5	12	12	30	100	4	○
GM-4RL-D12.0R1.0		1	12	12	30	100	4	●
GM-4RL-D12.0R2.0		2	12	12	30	100	4	●
GM-4RL-D16.0R1.0		1	16	16	45	150	4	●
GM-4RL-D16.0R2.0		2	16	16	45	150	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



A

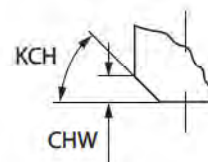
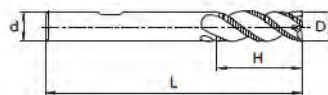
End mill long cutting edge

General roughing

5602R303GR



- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 30°



Turning

B

Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	H	L	KCH	CHW		
5602R303GR-0600		6	6	13	57	45	0.25	3	●
5602R303GR-0800		8	8	19	63	45	0.25	3	●

● Ex stock ○ On demand

* With internal cooling

Milling

C

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

Drilling

D

Technical
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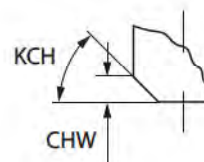
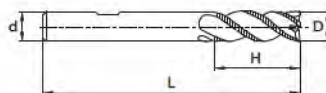
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill long cutting edge
General roughing
5602R304GR


- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	H	L	KCH	CHW		KMG303
5602R304GR-1000		10	10	22	72	45	0.5	4	●
5602R304GR-1200		12	12	26	83	45	0.5	4	●
5602R304GR-1400		14	14	30	90	45	0.5	4	○
5602R304GR-1600		16	16	32	92	45	0.5	4	●
5602R304GR-2000		20	20	38	104	45	0.5	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

A

Turning

B

Milling

C

Drilling

D

Technical
Information

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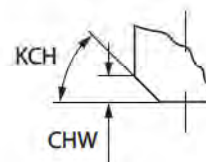
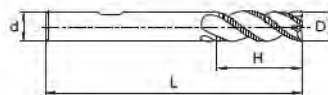
End mill long cutting edge

General roughing

5602R305GR



- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	H	L	KCH	CHW		
5602R305GR-2500		25	25	45	121	45	0.5	5	◯

● Ex stock ◯ On demand

* With internal cooling

Application field

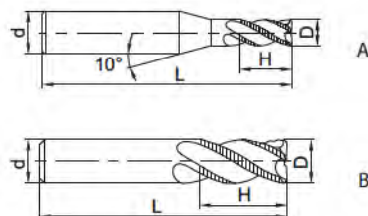
P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

End mill serrated teeth
Semi-finishing
GM-4W


- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG405
GM-4W-D6.0		6	6	16	50	4	B	●
GM-4W-D7.0		7	8	20	60	4	A	●
GM-4W-D8.0		8	8	20	60	4	B	●
GM-4W-D9.0		9	10	22	75	4	A	●
GM-4W-D10.0		10	10	25	75	4	B	●
GM-4W-D11.0		11	12	26	75	4	A	●
GM-4W-D12.0		12	12	30	75	4	B	●
GM-4W-D16.0		16	16	45	100	4	B	●
GM-4W-D20.0		20	20	45	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



Notes

A

Turning

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Milling

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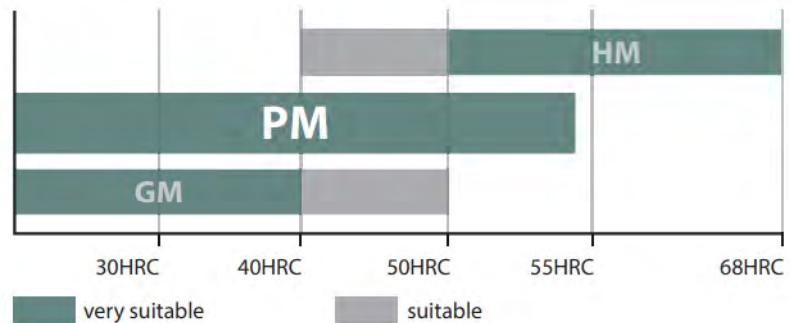


PM series

For demanding applications

- For machining of steel to max. 55 HRC and cast iron to heat-resistant alloys.
- Very solid cutting edge with high stiffness for higher cutting speeds and feed rates.
- End mills, ball nose cutters, torus mills and high feed mills
- Diameter range 3.0–20.0 mm

Application fields for machining of steel



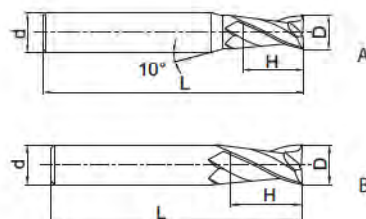
End mill

High-performance machining

PM-2E



- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG405
PM-2E-D1.0S		1	4	3	50	2	A	●
PM-2E-D1.5S		1.5	4	4	50	2	A	●
PM-2E-D2.0S		2	4	6	50	2	A	●
PM-2E-D2.5S		2.5	4	8	50	2	A	●
PM-2E-D3.0S		3	4	8	50	2	A	●
PM-2E-D4.0S		4	4	11	50	2	B	●
PM-2E-D1.0		1	6	3	50	2	A	●
PM-2E-D1.5		1.5	6	4	50	2	A	●
PM-2E-D2.0		2	6	6	50	2	A	●
PM-2E-D2.5		2.5	6	8	50	2	A	●
PM-2E-D3.0		3	6	8	50	2	A	●
PM-2E-D3.5		3.5	6	10	50	2	A	●
PM-2E-D4.0		4	6	11	50	2	A	●
PM-2E-D4.5		4.5	6	11	50	2	A	●
PM-2E-D5.0		5	6	13	50	2	A	●
PM-2E-D5.5		5.5	6	16	50	2	A	●
PM-2E-D6.0		6	6	16	50	2	B	●
PM-2E-D7.0		7	8	20	60	2	A	●
PM-2E-D8.0		8	8	20	60	2	B	●
PM-2E-D9.0		9	10	22	75	2	A	●
PM-2E-D10.0		10	10	25	75	2	B	●
PM-2E-D11.0		11	12	26	75	2	A	○
PM-2E-D12.0		12	12	30	75	2	B	●
PM-2E-D14.0		14	14	32	75	2	B	●
PM-2E-D16.0		16	16	45	100	2	B	●
PM-2E-D18.0		18	18	45	100	2	B	○
PM-2E-D20.0		20	20	45	100	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

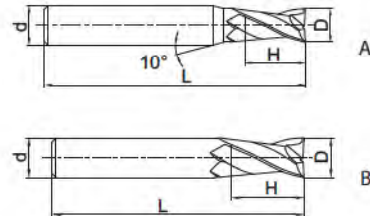
Cutting data > B436

Nonstandard order > B477

End mill long cutting edge **High-performance machining**

PM-2EL

- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG405
PM-2EL-D3.0		3	6	12	75	2	A	●
PM-2EL-D4.0		4	6	15	75	2	A	●
PM-2EL-D5.0		5	6	20	75	2	A	●
PM-2EL-D6.0		6	6	20	75	2	B	●
PM-2EL-D8.0		8	8	25	100	2	B	●
PM-2EL-D10.0		10	10	30	100	2	B	●
PM-2EL-D12.0		12	12	35	100	2	B	●
PM-2EL-D14.0		14	14	40	100	2	B	○
PM-2EL-D16.0		16	16	50	150	2	B	●
PM-2EL-D20.0		20	20	55	150	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

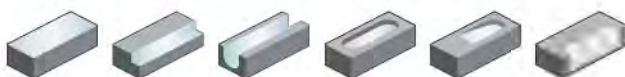
Nonstandard order > B477



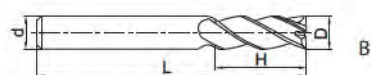
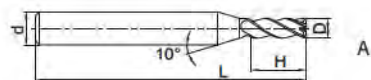
End mill

High-performance machining

PM-4E-G



- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade KMG405
		D	d (h6)	H	L			
PM-4E-D1.0S-G		1	4	3	50	4	A	●
PM-4E-D1.5S-G		1.5	4	4	50	4	A	●
PM-4E-D2.0S-G		2	4	6	50	4	A	●
PM-4E-D2.5S-G		2.5	4	8	50	4	A	●
PM-4E-D3.0S-G		3	4	8	50	4	A	●
PM-4E-D4.0S-G		4	4	11	50	4	B	●
PM-4E-D1.0-G		1	6	3	50	4	A	●
PM-4E-D1.5-G		1.5	6	4	50	4	A	●
PM-4E-D2.0-G		2	6	6	50	4	A	●
PM-4E-D2.5-G		2.5	6	8	50	4	A	●
PM-4E-D3.0-G		3	6	8	50	4	A	●
PM-4E-D3.5-G		3.5	6	10	50	4	A	●
PM-4E-D4.0-G		4	6	11	50	4	A	●
PM-4E-D4.5-G		4.5	6	11	50	4	A	●
PM-4E-D5.0-G		5	6	13	50	4	A	●
PM-4E-D5.5-G		5.5	6	16	50	4	A	●
PM-4E-D6.0-G		6	6	16	50	4	B	●
PM-4E-D7.0-G		7	8	20	60	4	A	●
PM-4E-D8.0-G		8	8	20	60	4	B	●
PM-4E-D9.0-G		9	10	22	75	4	A	●
PM-4E-D10.0-G		10	10	25	75	4	B	●
PM-4E-D11.0-G		11	12	26	75	4	A	●
PM-4E-D12.0-G		12	12	30	75	4	B	●
PM-4E-D14.0-G		14	14	32	75	4	B	●
PM-4E-D16.0-G		16	16	45	100	4	B	●
PM-4E-D18.0-G		18	18	45	100	4	B	●
PM-4E-D20.0-G		20	20	45	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

- ✓ Very suitable
- ✓ Suitable

System code > B268

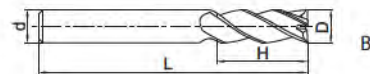
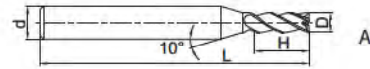
Cutting data > B436

Nonstandard order > B477



End mill long cutting edge **High-performance machining**
PM-4EL-G

- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG405
PM-4EL-D3.0-G		3	6	12	75	4	A	○
PM-4EL-D4.0-G		4	6	15	75	4	A	○
PM-4EL-D5.0-G		5	6	20	75	4	A	○
PM-4EL-D6.0-G		6	6	20	75	4	B	○
PM-4EL-D8.0-G		8	8	25	100	4	B	○
PM-4EL-D10.0-G		10	10	30	100	4	B	○
PM-4EL-D12.0-G		12	12	35	100	4	B	○
PM-4EL-D14.0-G		14	14	40	100	4	B	○
PM-4EL-D16.0-G		16	16	50	150	4	B	○
PM-4EL-D20.0-G		20	20	55	150	4	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

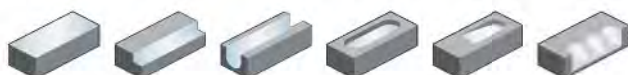
Cutting data > B436

Nonstandard order > B477

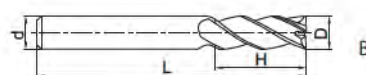
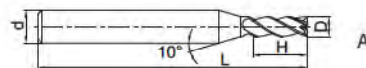


A

Turning

End mill extra long cutting edge
High-performance machining
PM-4EX-G


- Factory standard
- Centre cutting
- Helix angle 30°


B

Milling

Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG405
PM-4EX-D3.0-G		3	6	20	75	4	A	●
PM-4EX-D4.0-G		4	6	25	75	4	A	●
PM-4EX-D5.0-G		5	6	30	75	4	A	●
PM-4EX-D6.0-G		6	6	30	75	4	B	●
PM-4EX-D8.0-G		8	8	40	100	4	B	●
PM-4EX-D10.0-G		10	10	50	110	4	B	●
PM-4EX-D12.0-G		12	12	50	110	4	B	●
PM-4EX-D16.0-G		16	16	70	150	4	B	●
PM-4EX-D20.0-G		20	20	75	150	4	B	●

● Ex stock ○ On demand

* With internal cooling

C

Drilling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

D

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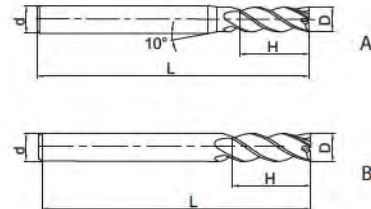
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill **High-performance machining**
PM-4E


- Factory standard
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade KMG405
		D	d (h6)	H	L			
PM-4E-D1.0S		1	4	3	50	4	A	●
PM-4E-D1.5S		1.5	4	4	50	4	A	●
PM-4E-D2.0S		2	4	6	50	4	A	●
PM-4E-D2.5S		2.5	4	8	50	4	A	●
PM-4E-D3.0S		3	4	8	50	4	A	●
PM-4E-D4.0S		4	4	11	50	4	B	●
PM-4E-D1.0		1	6	3	50	4	A	●
PM-4E-D1.5		1.5	6	4	50	4	A	●
PM-4E-D2.0		2	6	6	50	4	A	●
PM-4E-D2.5		2.5	6	8	50	4	A	●
PM-4E-D3.0		3	6	8	50	4	A	●
PM-4E-D3.5		3.5	6	10	50	4	A	●
PM-4E-D4.0		4	6	11	50	4	A	●
PM-4E-D4.5		4.5	6	11	50	4	A	●
PM-4E-D5.0		5	6	13	50	4	A	●
PM-4E-D5.5		5.5	6	16	50	4	A	●
PM-4E-D6.0		6	6	16	50	4	B	●
PM-4E-D7.0		7	8	20	60	4	A	●
PM-4E-D8.0		8	8	20	60	4	B	●
PM-4E-D9.0		9	10	22	75	4	A	●
PM-4E-D10.0		10	10	25	75	4	B	●
PM-4E-D11.0		11	12	26	75	4	A	●
PM-4E-D12.0		12	12	30	75	4	B	●
PM-4E-D14.0		14	14	32	75	4	B	●
PM-4E-D16.0		16	16	45	100	4	B	●
PM-4E-D18.0		18	18	45	100	4	B	●
PM-4E-D20.0		20	20	45	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



A

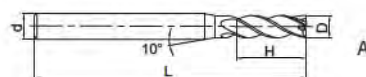
End mill long cutting edge

High-performance machining

PM-4EL



- Factory standard
- Centre cutting
- Helix angle 45°



Turning

B

Milling

C

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Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG405
PM-4EL-D3.0		3	6	12	75	4	A	●
PM-4EL-D4.0		4	6	15	75	4	A	●
PM-4EL-D5.0		5	6	20	75	4	A	●
PM-4EL-D6.0		6	6	20	75	4	B	●
PM-4EL-D8.0		8	8	25	100	4	B	●
PM-4EL-D10.0		10	10	30	100	4	B	●
PM-4EL-D12.0		12	12	35	100	4	B	●
PM-4EL-D14.0		14	14	40	100	4	B	●
PM-4EL-D16.0		16	16	50	150	4	B	●
PM-4EL-D20.0		20	20	55	150	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

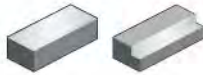
✓ Very suitable

✓ Suitable

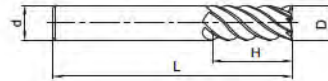
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill **High-performance machining**
PM-6E


- Factory standard
- Non-centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		KMG405
PM-6E-D6.0		6	6	18	60	6	●
PM-6E-D8.0		8	8	20	60	6	●
PM-6E-D10.0		10	10	30	75	6	●
PM-6E-D12.0		12	12	32	75	6	●
PM-6E-D16.0		16	16	40	100	6	●
PM-6E-D20.0		20	20	45	100	6	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

A

Turning

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C

Drilling

D

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System code > B268

Cutting data > B436

Nonstandard order > B477

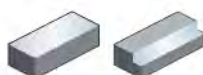


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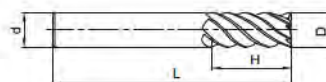
End mill long cutting edge

High-performance machining

PM-6EL



- Factory standard
- Non-centre cutting
- Helix angle 45°



B

Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		KMG405
PM-6EL-D6.0		6	6	24	75	6	●
PM-6EL-D8.0		8	8	32	75	6	●
PM-6EL-D10.0		10	10	40	100	6	●
PM-6EL-D12.0		12	12	45	100	6	●
PM-6EL-D16.0		16	16	64	150	6	●
PM-6EL-D20.0		20	20	75	150	6	●

● Ex stock ○ On demand

* With internal cooling

C

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

D

E

Technical
Information

F

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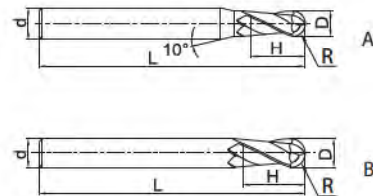
System code > B268

Cutting data > B436

Nonstandard order > B477

Ball nose cutter **High-performance machining**
PM-2B


- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG405
		R	D	d (h6)	H	L			
PM-2B-R0.5S		0.5	1	4	2	50	2	A	●
PM-2B-R0.75S		0.75	1.5	4	3	50	2	A	●
PM-2B-R1.0S		1	2	4	4	50	2	A	●
PM-2B-R1.25S		1.25	2.5	4	5	50	2	A	●
PM-2B-R1.5S		1.5	3	4	6	50	2	A	●
PM-2B-R2.0S		2	4	4	8	50	2	B	●
PM-2B-R0.5		0.5	1	6	2	50	2	A	●
PM-2B-R0.75		0.75	1.5	6	3	50	2	A	●
PM-2B-R1.0		1	2	6	4	50	2	A	●
PM-2B-R1.25		1.25	2.5	6	5	50	2	A	●
PM-2B-R1.5		1.5	3	6	6	50	2	A	●
PM-2B-R1.75		1.75	3.5	6	8	50	2	A	●
PM-2B-R2.0		2	4	6	8	50	2	A	●
PM-2B-R2.5		2.5	5	6	10	50	2	A	●
PM-2B-R2.75		2.75	5.5	6	12	50	2	A	●
PM-2B-R3.0		3	6	6	12	50	2	B	●
PM-2B-R3.5		3.5	7	8	14	60	2	A	●
PM-2B-R4.0		4	8	8	16	60	2	B	●
PM-2B-R4.5		4.5	9	10	18	75	2	A	●
PM-2B-R5.0		5	10	10	20	75	2	B	●
PM-2B-R6.0		6	12	12	24	75	2	B	●
PM-2B-R7.0		7	14	14	28	75	2	B	●
PM-2B-R8.0		8	16	16	32	100	2	B	●
PM-2B-R10.0		10	20	20	40	100	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

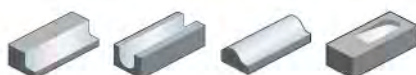
Cutting data > B436

Nonstandard order > B477

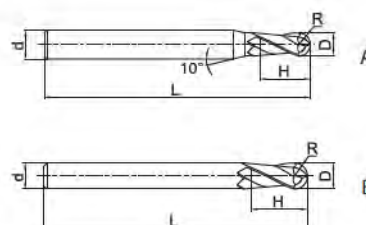


Ball nose cutter long shank High-performance machining

PM-2BL



- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
PM-2BL-R1.0		1	2	6	4	75	2	A	●
PM-2BL-R1.25		1.25	2.5	6	5	75	2	A	●
PM-2BL-R1.5		1.5	3	6	6	75	2	A	●
PM-2BL-R1.75		1.75	3.5	6	8	75	2	A	●
PM-2BL-R2.0		2	4	6	8	75	2	A	●
PM-2BL-R2.5		2.5	5	6	10	75	2	A	●
PM-2BL-R2.75		2.75	5.5	6	12	75	2	A	●
PM-2BL-R3.0		3	6	6	12	75	2	B	●
PM-2BL-R3.5		3.5	7	8	14	75	2	A	●
PM-2BL-R4.0		4	8	8	16	100	2	B	●
PM-2BL-R4.5		4.5	9	10	18	100	2	A	●
PM-2BL-R5.0		5	10	10	20	100	2	B	●
PM-2BL-R6.0		6	12	12	24	100	2	B	●
PM-2BL-R7.0		7	14	14	28	100	2	B	●
PM-2BL-R8.0		8	16	16	32	150	2	B	●
PM-2BL-R10.0		10	20	20	40	150	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

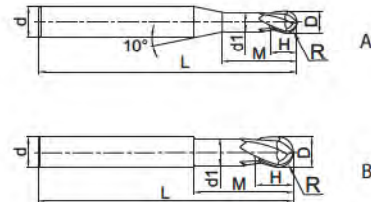
System code > B268

Cutting data > B436

Nonstandard order > B477

Ball nose cutter short cutting edge **High-performance machining**
PM-2BFP


- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Geometry	Grade KMG405
		R	D	d (h6)	d ₁	H	M	L			
PM-2BFP-R0.5		0.5	1	6	0.95	1	2.5	75	2	A	●
PM-2BFP-R0.75		0.75	1.5	6	1.45	1.5	3	75	2	A	●
PM-2BFP-R1.0		1	2	6	1.95	2	4	75	2	A	●
PM-2BFP-R1.5		1.5	3	6	2.85	3	6	75	2	A	●
PM-2BFP-R2.0		2	4	6	3.85	4	8	75	2	A	●
PM-2BFP-R2.5		2.5	5	6	4.85	5	10	75	2	A	●
PM-2BFP-R3.0		3	6	6	5.8	6	12	75	2	B	●
PM-2BFP-R4.0		4	8	8	7.8	8	16	100	2	B	●
PM-2BFP-R5.0		5	10	10	9.6	10	20	100	2	B	●
PM-2BFP-R6.0		6	12	12	11.5	12	24	100	2	B	●
PM-2BFP-R8.0		8	16	16	15.5	16	32	150	2	B	●
PM-2BFP-R10.0		10	20	20	19.5	20	40	150	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

- ✓ Very suitable
- ✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



Ball nose cutter conical neck

High-performance machining

PM-2BC



- Straight shank
- Centre cutting
- Helix angle 30°



Article	✱	Dimensions [mm]									Teeth	Grade
		R	D	d (h6)	d ₁	M	H	L	α	I ₁		KMG405
PM-2BC05-R0.25-M03		0.25	0.5	4	0.49	3	0.5	50	0.5	1.5	2	○
PM-2BC05-R0.25-M05		0.25	0.5	4	0.53	5	0.5	50	0.5	1.5	2	○
PM-2BC10-R0.25-M03		0.25	0.5	4	0.52	3	0.5	50	1	1.5	2	○
PM-2BC10-R0.25-M05		0.25	0.5	4	0.59	5	0.5	50	1	1.5	2	○
PM-2BC15-R0.25-M03		0.25	0.5	4	0.54	3	0.5	50	1.5	1.5	2	○
PM-2BC15-R0.25-M05		0.25	0.5	4	0.65	5	0.5	50	1.5	1.5	2	○
PM-2BC05-R0.30-M05		0.3	0.6	4	0.62	5	0.6	50	0.5	1.6	2	○
PM-2BC05-R0.30-M08		0.3	0.6	4	0.68	8	0.6	50	0.5	1.6	2	○
PM-2BC10-R0.30-M05		0.3	0.6	4	0.68	5	0.6	50	1	1.6	2	○
PM-2BC10-R0.30-M08		0.3	0.6	4	0.79	8	0.6	50	1	1.6	2	○
PM-2BC10-R0.30-M10		0.3	0.6	4	0.86	10	0.6	50	1	1.6	2	○
PM-2BC10-R0.30-M12		0.3	0.6	4	0.93	12	0.6	50	1	1.6	2	○
PM-2BC10-R0.30-M15		0.3	0.6	4	1.03	15	0.6	50	1	1.6	2	○
PM-2BC15-R0.30-M05		0.3	0.6	4	0.74	5	0.6	50	1.5	1.6	2	○
PM-2BC15-R0.30-M08		0.3	0.6	4	0.9	8	0.6	50	1.5	1.6	2	○
PM-2BC05-R0.40-M08		0.4	0.8	4	0.87	8	0.8	50	0.5	1.8	2	○
PM-2BC10-R0.40-M08		0.4	0.8	4	0.98	8	0.8	50	1	1.8	2	○
PM-2BC15-R0.40-M08		0.4	0.8	4	1.09	8	0.8	50	1.5	1.8	2	○
PM-2BC05-R0.40-M12		0.4	0.8	4	0.94	12	0.8	60	0.5	1.8	2	○
PM-2BC10-R0.40-M12		0.4	0.8	4	1.12	12	0.8	60	1	1.8	2	○
PM-2BC15-R0.40-M12		0.4	0.8	4	1.3	12	0.8	60	1.5	1.8	2	○
PM-2BC05-R0.50-M10		0.5	1	6	1.08	10	1	60	0.5	2.5	2	○
PM-2BC05-R0.50-M15		0.5	1	6	1.16	15	1	60	0.5	2.5	2	○
PM-2BC10-R0.50-M10		0.5	1	6	1.21	10	1	60	1	2.5	2	○
PM-2BC10-R0.50-M15		0.5	1	6	1.38	15	1	60	1	2.5	2	○
PM-2BC15-R0.50-M10		0.5	1	6	1.34	10	1	60	1.5	2.5	2	○
PM-2BC15-R0.50-M15		0.5	1	6	1.6	15	1	60	1.5	2.5	2	○
PM-2BC20-R0.50-M15		0.5	1	6	1.82	15	1	60	2	2.5	2	○
PM-2BC05-R0.50-M20		0.5	1	6	1.25	20	1	70	0.5	2.5	2	○
PM-2BC05-R0.50-M25		0.5	1	6	1.34	25	1	70	0.5	2.5	2	○
PM-2BC05-R0.50-M30		0.5	1	6	1.42	30	1	70	0.5	2.5	2	○
PM-2BC10-R0.50-M20		0.5	1	6	1.56	20	1	70	1	2.5	2	○
PM-2BC10-R0.50-M25		0.5	1	6	1.73	25	1	70	1	2.5	2	○
PM-2BC10-R0.50-M30		0.5	1	6	1.91	30	1	70	1	2.5	2	○
PM-2BC15-R0.50-M20		0.5	1	6	1.86	20	1	70	1.5	2.5	2	○
PM-2BC20-R0.50-M20		0.5	1	6	2.17	20	1	70	2	2.5	2	○
PM-2BC30-R0.50-M20		0.5	1	6	2.78	20	1	70	3	2.5	2	○

● Ex stock ◊ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



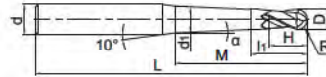
Ball nose cutter conical neck

High-performance machining

PM-2BC



- Straight shank
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]									Teeth	Grade KMG405
		R	D	d (h6)	d ₁	M	H	L	α	l ₁		
PM-2BC50-R0.50-M20		0.5	1	6	4.01	20	1	70	5	2.5	2	○
PM-2BC10-R0.50-M35		0.5	1	6	2.08	35	1	80	1	2.5	2	○
PM-2BC05-R0.60-M12		0.6	1.2	6	1.31	12	1.2	60	0.5	2.7	2	○
PM-2BC10-R0.60-M12		0.6	1.2	6	1.47	12	1.2	60	1	2.7	2	○
PM-2BC15-R0.60-M12		0.6	1.2	6	1.63	12	1.2	60	1.5	2.7	2	○
PM-2BC05-R0.60-M24		0.6	1.2	6	1.52	24	1.2	70	0.5	2.7	2	○
PM-2BC10-R0.60-M24		0.6	1.2	6	1.89	24	1.2	70	1	2.7	2	○
PM-2BC15-R0.60-M24		0.6	1.2	6	2.26	24	1.2	70	1.5	2.7	2	○
PM-2BC05-R0.75-M10		0.75	1.5	6	1.57	10	1.5	60	0.5	3	2	○
PM-2BC05-R0.75-M15		0.75	1.5	6	1.65	15	1.5	60	0.5	3	2	○
PM-2BC10-R0.75-M10		0.75	1.5	6	1.69	10	1.5	60	1	3	2	○
PM-2BC10-R0.75-M15		0.75	1.5	6	1.86	15	1.5	60	1	3	2	○
PM-2BC15-R0.75-M10		0.75	1.5	6	1.81	10	1.5	60	1.5	3	2	○
PM-2BC15-R0.75-M15		0.75	1.5	6	2.07	15	1.5	60	1.5	3	2	○
PM-2BC05-R0.75-M30		0.75	1.5	6	1.92	30	1.5	70	0.5	3	2	○
PM-2BC10-R0.75-M20		0.75	1.5	6	2.04	20	1.5	70	1	3	2	○
PM-2BC10-R0.75-M30		0.75	1.5	6	2.39	30	1.5	70	1	3	2	○
PM-2BC15-R0.75-M30		0.75	1.5	6	2.86	30	1.5	70	1.5	3	2	○
PM-2BC05-R1.0-M20		1	2	6	2.18	20	2	60	0.5	4	2	○
PM-2BC10-R1.0-M20		1	2	6	2.46	20	2	60	1	4	2	○
PM-2BC10-R1.0-M25		1	2	6	2.64	25	2	60	1	4	2	○
PM-2BC15-R1.0-M20		1	2	6	2.74	20	2	60	1.5	4	2	○
PM-2BC05-R1.0-M30		1	2	6	2.36	30	2	70	0.5	4	2	○
PM-2BC10-R1.0-M30		1	2	6	2.81	30	2	70	1	4	2	○
PM-2BC15-R1.0-M30		1	2	6	3.27	30	2	70	1.5	4	2	○
PM-2BC20-R1.0-M30		1	2	6	3.72	30	2	70	2	4	2	○
PM-2BC30-R1.0-M30		1	2	6	4.63	30	2	70	3	4	2	○
PM-2BC05-R1.0-M40		1	2	6	2.53	40	2	80	0.5	4	2	○
PM-2BC10-R1.0-M35		1	2	6	2.99	35	2	80	1	4	2	○
PM-2BC10-R1.0-M40		1	2	6	3.16	40	2	80	1	4	2	○
PM-2BC15-R1.0-M40		1	2	6	3.79	40	2	80	1.5	4	2	○
PM-2BC20-R1.0-M40		1	2	6	4.42	40	2	80	2	4	2	○
PM-2BC30-R1.0-M40		1	2	6	5.68	40	2	80	3	4	2	○
PM-2BC10-R1.0-M50		1	2	6	3.51	50	2	90	1	4	2	○
PM-2BC05-R1.5-M30		1.5	3	6	3.32	30	3	70	0.5	6	2	○
PM-2BC10-R1.5-M30		1.5	3	6	3.74	30	3	70	1	6	2	○
PM-2BC15-R1.5-M30		1.5	3	6	4.16	30	3	70	1.5	6	2	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

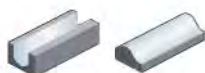


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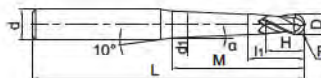
Ball nose cutter conical neck

High-performance machining

PM-2BC



- Straight shank
- Centre cutting
- Helix angle 30°



B

Article	✱	Dimensions [mm]									Teeth	Grade
		R	D	d (h6)	d ₁	M	H	L	α	I ₁		KMG405
PM-2BC05-R1.5-M40		1.5	3	6	3.5	40	3	80	0.5	6	2	◊
PM-2BC10-R1.5-M40		1.5	3	6	4.09	40	3	80	1	6	2	◊
PM-2BC15-R1.5-M40		1.5	3	6	4.69	40	3	80	1.5	6	2	◊
PM-2BC05-R1.5-M50		1.5	3	6	3.67	50	3	90	0.5	6	2	◊
PM-2BC10-R1.5-M50		1.5	3	6	4.44	50	3	90	1	6	2	◊
PM-2BC15-R1.5-M50		1.5	3	6	5.21	50	3	90	1.5	6	2	◊
PM-2BC05-R2.0-M60		2	4	6	4.83	60	4	110	0.5	7	2	◊
PM-2BC10-R2.0-M60		2	4	6	5.76	60	4	110	1	7	2	◊

● Ex stock ◊ On demand

* With internal cooling

C

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

Drilling

D

Technical Information

E

Index

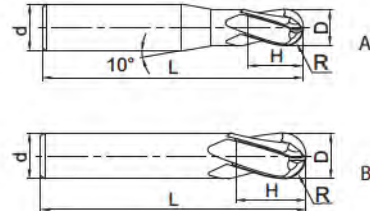
System code > B268

Cutting data > B436

Nonstandard order > B477

Ball nose cutter **High-performance machining**
PM-4B


- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG405
		R	D	d (h6)	H	L			
PM-4B-R1.5		1.5	3	6	6	50	4	A	●
PM-4B-R2.0		2	4	6	8	50	4	A	●
PM-4B-R2.5		2.5	5	6	10	50	4	A	●
PM-4B-R3.0		3	6	6	12	50	4	B	●
PM-4B-R4.0		4	8	8	16	60	4	B	●
PM-4B-R5.0		5	10	10	20	75	4	B	●
PM-4B-R6.0		6	12	12	24	75	4	B	●
PM-4B-R7.0		7	14	14	28	75	4	B	●
PM-4B-R8.0		8	16	16	32	100	4	B	●
PM-4B-R9.0		9	18	18	36	100	4	B	●
PM-4B-R10.0		10	20	20	40	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

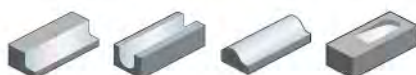
Nonstandard order > B477



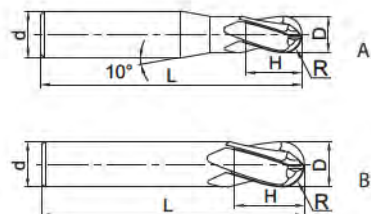
Ball nose cutter long shank

High-performance machining

PM-4BL



- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
PM-4BL-R1.5		1.5	3	6	6	75	4	A	●
PM-4BL-R2.0		2	4	6	8	75	4	A	●
PM-4BL-R2.5		2.5	5	6	10	75	4	A	●
PM-4BL-R3.0		3	6	6	12	75	4	B	●
PM-4BL-R4.0		4	8	8	16	100	4	B	●
PM-4BL-R5.0		5	10	10	20	100	4	B	●
PM-4BL-R6.0		6	12	12	24	100	4	B	●
PM-4BL-R7.0		7	14	14	28	100	4	B	●
PM-4BL-R8.0		8	16	16	32	150	4	B	●
PM-4BL-R9.0		9	18	18	36	150	4	B	●
PM-4BL-R10.0		10	20	20	40	150	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

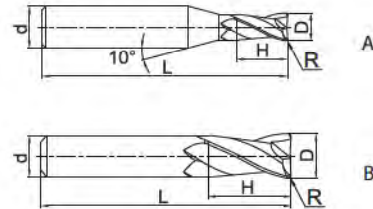
P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

Torus mill
High-performance machining
PM-2R


- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG405
		R	D	d (h6)	H	L			
PM-2R-D1.0R0.2		0.2	1	4	3	50	2	A	●
PM-2R-D1.5R0.2		0.2	1.5	4	4	50	2	A	●
PM-2R-D2.0R0.2		0.2	2	4	6	50	2	A	●
PM-2R-D2.0R0.5		0.5	2	4	6	50	2	A	●
PM-2R-D2.5R0.2		0.2	2.5	4	8	50	2	A	●
PM-2R-D2.5R0.5		0.5	2.5	4	8	50	2	A	●
PM-2R-D3.0R0.2		0.2	3	4	8	50	2	A	●
PM-2R-D3.0R0.3		0.3	3	4	8	50	2	A	○
PM-2R-D3.0R0.5		0.5	3	4	8	50	2	A	●
PM-2R-D4.0R0.2		0.2	4	4	11	50	2	B	●
PM-2R-D4.0R0.3		0.3	4	4	11	50	2	B	●
PM-2R-D4.0R0.5		0.5	4	4	11	50	2	B	●
PM-2R-D4.0R1.0		1	4	4	11	50	2	B	●
PM-2R-D5.0R0.3		0.3	5	6	13	50	2	A	○
PM-2R-D5.0R0.5		0.5	5	6	13	50	2	A	●
PM-2R-D5.0R1.0		1	5	6	13	50	2	A	●
PM-2R-D6.0R0.3		0.3	6	6	16	50	2	B	●
PM-2R-D6.0R0.5		0.5	6	6	16	50	2	B	●
PM-2R-D6.0R1.0		1	6	6	16	50	2	B	●
PM-2R-D8.0R0.3		0.3	8	8	20	60	2	B	○
PM-2R-D8.0R0.5		0.5	8	8	20	60	2	B	●
PM-2R-D8.0R1.0		1	8	8	20	60	2	B	●
PM-2R-D10.0R0.5		0.5	10	10	25	75	2	B	●
PM-2R-D10.0R1.0		1	10	10	25	75	2	B	●
PM-2R-D10.0R1.5		1.5	10	10	25	75	2	B	●
PM-2R-D10.0R2.0		2	10	10	25	75	2	B	●
PM-2R-D12.0R0.5		0.5	12	12	30	75	2	B	●
PM-2R-D12.0R1.0		1	12	12	30	75	2	B	●
PM-2R-D12.0R1.5		1.5	12	12	30	75	2	B	●
PM-2R-D12.0R2.0		2	12	12	30	75	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



A

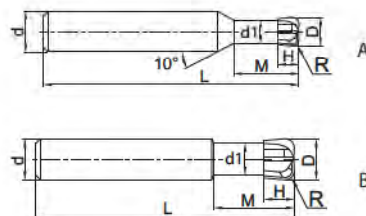
Turning

End mill High-performance machining

PM-4H



- Factory standard
- Centre cutting
- Helix angle 0°



B

Milling

Article	*	Dimensions [mm]							Teeth	Geometry	Grade
		R	D	d (h6)	d ₁	H	M	L			
PM-4H-D3.0R0.8		0.8	3	6	2.7	1.2	8	50	4	A	●
PM-4H-D4.0R1.0		1	4	6	3.6	1.6	10	50	4	A	●
PM-4H-D5.0R1.2		1.2	5	6	4.5	2	12.5	50	4	A	●
PM-4H-D6.0R1.0		1	6	6	5.4	2.5	12	50	4	B	●
PM-4H-D6.0R1.5		1.5	6	6	5.4	2.5	12	50	4	B	●
PM-4H-D6.0R2.0		2	6	6	5.4	2.5	12	50	4	B	●
PM-4H-D8.0R1.0		1	8	8	7	3.5	16	60	4	B	●
PM-4H-D8.0R2.0		2	8	8	7	3.5	16	60	4	B	●
PM-4H-D10.0R1.0		1	10	10	9	4	20	75	4	B	●
PM-4H-D10.0R2.0		2	10	10	9	4	20	75	4	B	●
PM-4H-D10.0R3.0		3	10	10	9	4	20	75	4	B	●
PM-4H-D12.0R2.0		2	12	12	11	5	24	75	4	B	●
PM-4H-D12.0R3.0		3	12	12	11	5	24	75	4	B	●

● Ex stock ○ On demand

* With internal cooling

C

Drilling

D

Technical Information

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

E

Index

System code > B268

Cutting data > B436

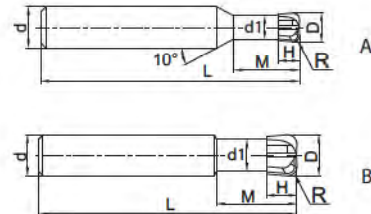
Nonstandard order > B477

End mill long shank **High-performance machining**

PM-4HL



- Factory standard
- Centre cutting
- Helix angle 0°



Article	*	Dimensions [mm]							Teeth	Geometry	Grade
		R	D	d (h6)	d ₁	H	M	L			
PM-4HL-D4.0R1.0		1	4	6	3.6	1.6	10	75	4	A	●
PM-4HL-D5.0R1.2		1.2	5	6	4.5	2	12.5	75	4	A	●
PM-4HL-D6.0R1.0		1	6	6	5.4	2.5	12	75	4	B	●
PM-4HL-D6.0R1.5		1.5	6	6	5.4	2.5	12	75	4	B	●
PM-4HL-D6.0R2.0		2	6	6	5.4	2.5	12	75	4	B	●
PM-4HL-D8.0R1.0		1	8	8	7	3.5	16	100	4	B	●
PM-4HL-D8.0R2.0		2	8	8	7	3.5	16	100	4	B	●
PM-4HL-D10.0R1.0		1	10	10	9	4	20	100	4	B	●
PM-4HL-D10.0R2.0		2	10	10	9	4	20	100	4	B	●
PM-4HL-D10.0R3.0		3	10	10	9	4	20	100	4	B	●
PM-4HL-D12.0R2.0		2	12	12	11	5	24	100	4	B	●
PM-4HL-D12.0R3.0		3	12	12	11	5	24	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

- ✓ Very suitable
- ✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



Torus mill

High-performance machining

PM-4R



- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
PM-4R-D3.0R0.2		0.2	3	6	8	50	4	A	●
PM-4R-D4.0R0.3		0.3	4	6	10	50	4	A	●
PM-4R-D4.0R0.5		0.5	4	6	10	50	4	A	●
PM-4R-D5.0R0.5		0.5	5	6	13	50	4	A	●
PM-4R-D5.0R1.0		1	5	6	13	50	4	A	●
PM-4R-D6.0R0.5		0.5	6	6	16	50	4	B	●
PM-4R-D6.0R1.0		1	6	6	16	50	4	B	●
PM-4R-D8.0R0.5		0.5	8	8	20	60	4	B	●
PM-4R-D8.0R1.0		1	8	8	20	60	4	B	●
PM-4R-D10.0R0.5		0.5	10	10	25	75	4	B	●
PM-4R-D10.0R1.0		1	10	10	25	75	4	B	●
PM-4R-D10.0R2.0		2	10	10	25	75	4	B	●
PM-4R-D10.0R3.0		3	10	10	25	75	4	B	●
PM-4R-D12.0R0.5		0.5	12	12	30	75	4	B	●
PM-4R-D12.0R1.0		1	12	12	30	75	4	B	●
PM-4R-D12.0R2.0		2	12	12	30	75	4	B	●
PM-4R-D12.0R3.0		3	12	12	30	75	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

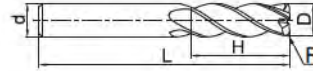
System code > B268

Cutting data > B436

Nonstandard order > B477

Torus mill long shank **High-performance machining**
PM-4RL


- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]					Teeth	Grade KMG405
		R	D	d (h6)	H	L		
PM-4RL-D6.0R0.5		0.5	6	6	16	75	4	●
PM-4RL-D6.0R1.0		1	6	6	16	75	4	●
PM-4RL-D8.0R0.5		0.5	8	8	20	100	4	●
PM-4RL-D8.0R1.0		1	8	8	20	100	4	○
PM-4RL-D10.0R0.5		0.5	10	10	25	100	4	○
PM-4RL-D10.0R1.0		1	10	10	25	100	4	●
PM-4RL-D10.0R2.0		2	10	10	25	100	4	●
PM-4RL-D12.0R0.5		0.5	12	12	30	100	4	●
PM-4RL-D12.0R1.0		1	12	12	30	100	4	●
PM-4RL-D12.0R2.0		2	12	12	30	100	4	●
PM-4RL-D16.0R1.0		1	16	16	45	150	4	●
PM-4RL-D16.0R2.0		2	16	16	45	150	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



Notes

A

Turning

B

Milling

C

Drilling

D

Technical
Information

E

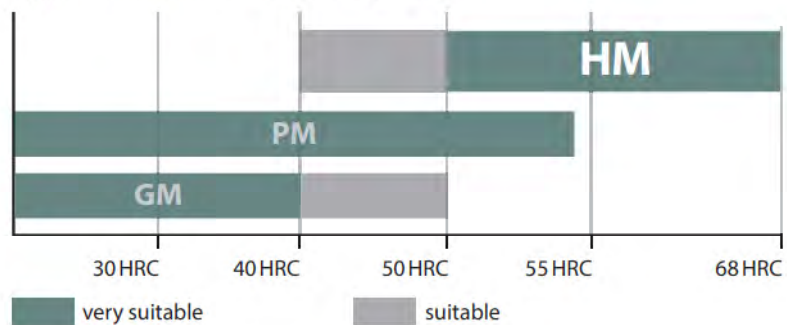
Index

HM series

For machining of hardened materials

- For machining of steel up to 68 HRC.
- Very stable cutting edge with high stiffness and newest coating technology for high cutting speeds and feed rates.
- End mills, ball nose cutters, torus mills and mini cutters
- Diameter range 0.3–20.0 mm

Application fields for machining of steel



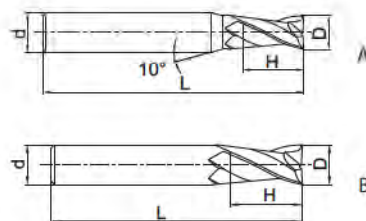
End mill

Hard machining

HM-2E



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG555
HM-2E-D1.0S		1	4	3	50	2	A	●
HM-2E-D1.5S		1.5	4	4	50	2	A	●
HM-2E-D2.0S		2	4	6	50	2	A	●
HM-2E-D2.5S		2.5	4	8	50	2	A	●
HM-2E-D3.0S		3	4	8	50	2	A	●
HM-2E-D4.0S		4	4	11	50	2	B	●
HM-2E-D1.0		1	6	3	50	2	A	●
HM-2E-D1.5		1.5	6	4	50	2	A	●
HM-2E-D2.0		2	6	6	50	2	A	●
HM-2E-D2.5		2.5	6	8	50	2	A	●
HM-2E-D3.0		3	6	8	50	2	A	●
HM-2E-D3.5		3.5	6	10	50	2	A	●
HM-2E-D4.0		4	6	11	50	2	A	●
HM-2E-D4.5		4.5	6	11	50	2	A	●
HM-2E-D5.0		5	6	13	50	2	A	●
HM-2E-D5.5		5.5	6	16	50	2	A	●
HM-2E-D6.0		6	6	16	50	2	B	●
HM-2E-D7.0		7	8	20	60	2	A	●
HM-2E-D8.0		8	8	20	60	2	B	●
HM-2E-D9.0		9	10	22	75	2	A	●
HM-2E-D10.0		10	10	25	75	2	B	●
HM-2E-D11.0		11	12	26	75	2	A	○
HM-2E-D12.0		12	12	30	75	2	B	●
HM-2E-D14.0		14	14	32	100	2	B	●
HM-2E-D16.0		16	16	45	100	2	B	●
HM-2E-D18.0		18	18	45	100	2	B	○
HM-2E-D20.0		20	20	45	100	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

End mill short cutting edge
Hard machining
HM-2EFP


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	d ₁	H	M	L		
HM-2EFP-D6.0		6	6	5.8	9	30	75	2	◊
HM-2EFP-D8.0		8	8	7.8	12	40	100	2	◊
HM-2EFP-D10.0		10	10	9.6	15	50	100	2	◊
HM-2EFP-D12.0		12	12	11.5	18	50	100	2	◊
HM-2EFP-D16.0		16	16	15.5	24	50	150	2	◊
HM-2EFP-D20.0		20	20	19.5	30	60	150	2	◊

● Ex stock ◊ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

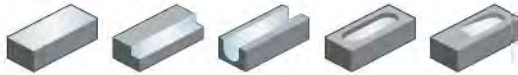
Nonstandard order > B477



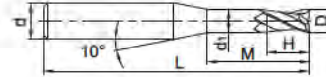
End mill

Hard machining

HM-2EP



- Straight shank
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	d ₁	H	M	L		
HM-2EP-D0.5-M04		0.5	4	0.45	0.7	4	50	2	●
HM-2EP-D0.5-M06		0.5	4	0.45	0.7	6	50	2	●
HM-2EP-D0.5-M08		0.5	4	0.45	0.7	8	50	2	●
HM-2EP-D0.8-M04		0.8	4	0.75	1.2	4	50	2	●
HM-2EP-D0.8-M06		0.8	4	0.75	1.2	6	50	2	●
HM-2EP-D0.8-M08		0.8	4	0.75	1.2	8	50	2	●
HM-2EP-D0.8-M10		0.8	4	0.75	1.2	10	50	2	●
HM-2EP-D1.0-M04		1	4	0.95	1.5	4	50	2	●
HM-2EP-D1.0-M06		1	4	0.95	1.5	6	50	2	●
HM-2EP-D1.0-M08		1	4	0.95	1.5	8	50	2	●
HM-2EP-D1.0-M10		1	4	0.95	1.5	10	50	2	●
HM-2EP-D1.0-M12		1	4	0.95	1.5	12	50	2	●
HM-2EP-D1.0-M14		1	4	0.95	1.5	14	50	2	●
HM-2EP-D1.2-M06		1.2	4	1.15	1.8	6	50	2	●
HM-2EP-D1.2-M08		1.2	4	1.15	1.8	8	50	2	●
HM-2EP-D1.2-M10		1.2	4	1.15	1.8	10	50	2	●
HM-2EP-D1.2-M12		1.2	4	1.15	1.8	12	50	2	●
HM-2EP-D1.5-M06		1.5	4	1.45	2.3	6	50	2	●
HM-2EP-D1.5-M08		1.5	4	1.45	2.3	8	50	2	●
HM-2EP-D1.5-M10		1.5	4	1.45	2.3	10	50	2	●
HM-2EP-D1.5-M12		1.5	4	1.45	2.3	12	50	2	●
HM-2EP-D1.5-M14		1.5	4	1.45	2.3	14	50	2	●
HM-2EP-D2.0-M06		2	4	1.95	3	6	50	2	●
HM-2EP-D2.0-M08		2	4	1.95	3	8	50	2	●
HM-2EP-D2.0-M10		2	4	1.95	3	10	50	2	●
HM-2EP-D2.0-M12		2	4	1.95	3	12	50	2	●
HM-2EP-D2.0-M14		2	4	1.95	3	14	50	2	●
HM-2EP-D2.0-M16		2	4	1.95	3	16	50	2	●
HM-2EP-D2.5-M08		2.5	4	2.4	3.7	8	50	2	●
HM-2EP-D2.5-M10		2.5	4	2.4	3.7	10	50	2	●
HM-2EP-D2.5-M12		2.5	4	2.4	3.7	12	50	2	●
HM-2EP-D2.5-M14		2.5	4	2.4	3.7	14	50	2	●
HM-2EP-D2.5-M16		2.5	4	2.4	3.7	16	60	2	●
HM-2EP-D2.5-M18		2.5	4	2.4	3.7	18	60	2	●
HM-2EP-D2.5-M20		2.5	4	2.4	3.7	20	60	2	●
HM-2EP-D3.0-M06		3	6	2.85	4.5	6	50	2	●
HM-2EP-D3.0-M08		3	6	2.85	4.5	8	50	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

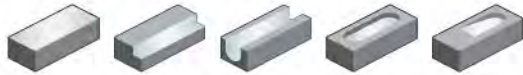
✓ Very suitable

✓ Suitable

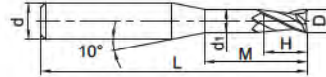
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill
Hard machining
HM-2EP


- Straight shank
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]						Teeth	Grade KMG555
		D	d (h6)	d ₁	H	M	L		
HM-2EP-D3.0-M10		3	6	2.85	4.5	10	50	2	●
HM-2EP-D3.0-M12		3	6	2.85	4.5	12	50	2	●
HM-2EP-D3.0-M14		3	6	2.85	4.5	14	60	2	●
HM-2EP-D3.0-M16		3	6	2.85	4.5	16	60	2	●
HM-2EP-D3.0-M18		3	6	2.85	4.5	18	60	2	●
HM-2EP-D3.0-M20		3	6	2.85	4.5	20	60	2	●
HM-2EP-D4.0-M12		4	6	3.85	6	12	60	2	●
HM-2EP-D4.0-M16		4	6	3.85	6	16	60	2	●
HM-2EP-D4.0-M20		4	6	3.85	6	20	60	2	●
HM-2EP-D4.0-M25		4	6	3.85	6	25	60	2	●
HM-2EP-D5.0-M16		5	6	4.85	7.5	16	60	2	●
HM-2EP-D5.0-M25		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

System code > B268

Cutting data > B436

Nonstandard order > B477



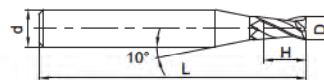
End mill

Hard machining

HM-2ES



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		
HM-2ES-D0.3		0.3	4	0.6	50	2	●
HM-2ES-D0.4		0.4	4	0.8	50	2	●
HM-2ES-D0.5		0.5	4	1	50	2	●
HM-2ES-D0.6		0.6	4	1.2	50	2	●
HM-2ES-D0.7		0.7	4	1.4	50	2	●
HM-2ES-D0.8		0.8	4	1.6	50	2	●
HM-2ES-D0.9		0.9	4	1.8	50	2	●
HM-2ES-D1.0		1	4	2	50	2	●
HM-2ES-D1.1		1.1	4	2	50	2	●
HM-2ES-D1.2		1.2	4	2.5	50	2	●
HM-2ES-D1.3		1.3	4	2.5	50	2	●
HM-2ES-D1.4		1.4	4	3	50	2	●
HM-2ES-D1.5		1.5	4	3	50	2	●
HM-2ES-D1.6		1.6	4	3.5	50	2	●
HM-2ES-D1.7		1.7	4	3.5	50	2	●
HM-2ES-D1.8		1.8	4	4	50	2	●
HM-2ES-D1.9		1.9	4	4	50	2	●
HM-2ES-D2.0		2	4	4	50	2	●
HM-2ES-D2.1		2.1	4	4	50	2	●
HM-2ES-D2.2		2.2	4	4.5	50	2	●
HM-2ES-D2.3		2.3	4	4.5	50	2	●
HM-2ES-D2.4		2.4	4	5	50	2	●
HM-2ES-D2.5		2.5	4	5	50	2	●
HM-2ES-D2.6		2.6	4	5	50	2	●
HM-2ES-D2.7		2.7	4	5.5	50	2	●
HM-2ES-D2.8		2.8	4	5.5	50	2	●
HM-2ES-D2.9		2.9	4	6	50	2	●
HM-2ES-D3.0		3	4	6	50	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

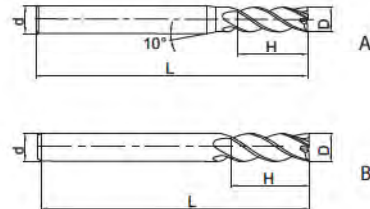
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill
Hard machining
HM-4E


- Factory standard
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade KMG555
		D	d (h6)	H	L			
HM-4E-D1.0S		1	4	3	50	4	A	●
HM-4E-D1.5S		1.5	4	4	50	4	A	●
HM-4E-D2.0S		2	4	6	50	4	A	●
HM-4E-D2.5S		2.5	4	8	50	4	A	●
HM-4E-D3.0S		3	4	8	50	4	A	●
HM-4E-D4.0S		4	4	11	50	4	B	●
HM-4E-D1.0		1	6	3	50	4	A	●
HM-4E-D1.5		1.5	6	4	50	4	A	●
HM-4E-D2.0		2	6	6	50	4	A	●
HM-4E-D2.5		2.5	6	8	50	4	A	●
HM-4E-D3.0		3	6	8	50	4	A	●
HM-4E-D3.5		3.5	6	10	50	4	A	●
HM-4E-D4.0		4	6	11	50	4	A	●
HM-4E-D4.5		4.5	6	11	50	4	A	●
HM-4E-D5.0		5	6	13	50	4	A	●
HM-4E-D5.5		5.5	6	16	50	4	A	●
HM-4E-D6.0		6	6	16	50	4	B	●
HM-4E-D7.0		7	8	20	60	4	A	●
HM-4E-D8.0		8	8	20	60	4	B	●
HM-4E-D9.0		9	10	22	75	4	A	●
HM-4E-D10.0		10	10	25	75	4	B	●
HM-4E-D11.0		11	12	26	75	4	A	●
HM-4E-D12.0		12	12	30	75	4	B	●
HM-4E-D14.0		14	14	32	75	4	B	●
HM-4E-D16.0		16	16	45	100	4	B	●
HM-4E-D18.0		18	18	45	100	4	B	●
HM-4E-D20.0		20	20	45	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



A

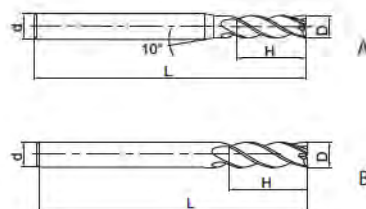
End mill long shank

Hard machining

HM-4EL



- Factory standard
- Centre cutting
- Helix angle 45°



Turning

B

Milling

C

Drilling

D

Technical Information

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Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG555
HM-4EL-D3.0		3	6	12	75	4	A	●
HM-4EL-D4.0		4	6	15	75	4	A	●
HM-4EL-D5.0		5	6	20	75	4	A	●
HM-4EL-D6.0		6	6	20	75	4	B	●
HM-4EL-D8.0		8	8	25	100	4	B	●
HM-4EL-D10.0		10	10	30	100	4	B	●
HM-4EL-D12.0		12	12	35	100	4	B	●
HM-4EL-D14.0		14	14	40	100	4	B	●
HM-4EL-D16.0		16	16	50	150	4	B	●
HM-4EL-D20.0		20	20	55	150	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

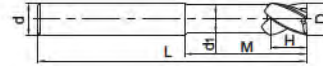
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill short cutting edge
Hard machining
HM-4EFP


- Factory standard
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]						Teeth	Grade KMG555
		D	d (h6)	d ₁	H	M	L		
HM-4EFP-D6.0		6	6	5.8	9	30	75	4	●
HM-4EFP-D8.0		8	8	7.8	12	40	100	4	●
HM-4EFP-D10.0		10	10	9.6	15	50	100	4	●
HM-4EFP-D12.0		12	12	11.5	18	50	100	4	●
HM-4EFP-D16.0		16	16	15.5	24	50	150	4	●
HM-4EFP-D20.0		20	20	19.5	30	60	150	4	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

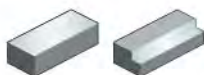
Nonstandard order > B477



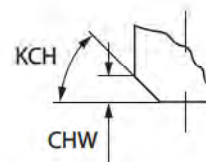
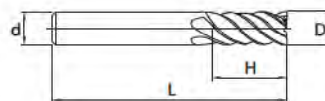
End mill long cutting edge

High-speed hard machining

5502R55MHH



- Type of shank DIN 6535HA
- Non-centre cutting
- Helix angle 55°



Article	*	Dimensions [mm]						Teeth	Grade	
		D	d (h6)	H	L	KCH	CHW		KMG40S	KMG55S
5502R55MHH-0300		3	6	8	57	0	0	4	●	●
5502R55MHH-0400		4	6	11	57	0	0	4	●	●
5502R55MHH-0500		5	6	13	57	0	0	5	●	●
5502R55MHH-0600		6	6	13	57	45	0.1	6	●	●
5502R55MHH-0800		8	8	19	63	45	0.1	6	●	●
5502R55MHH-1000		10	10	22	72	45	0.1	6	●	●
5502R55MHH-1200		12	12	26	83	45	0.1	6	●	●
5502R55MHH-1600		16	16	32	92	45	0.1	6	●	●
5502R55MHH-2000		20	20	38	104	45	0.1	8	●	●

● Ex stock ○ On demand

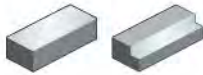
* With internal cooling

Application field

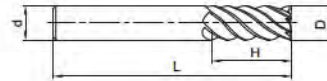
P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

End mill
Hard machining
HM-6E


- Factory standard
- Non-centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		KMG555
HM-6E-D6.0		6	6	18	60	6	○
HM-6E-D8.0		8	8	20	60	6	○
HM-6E-D10.0		10	10	30	75	6	○
HM-6E-D12.0		12	12	32	75	6	○
HM-6E-D16.0		16	16	40	100	6	○
HM-6E-D20.0		20	20	45	100	6	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

A

Turning

B

Milling

C

Drilling

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System code > B268

Cutting data > B436

Nonstandard order > B477

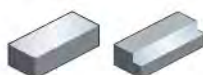


A

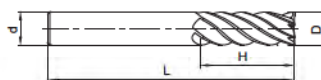
End mill long shank

Hard machining

HM-6EL



- Factory standard
- Non-centre cutting
- Helix angle 45°



Turning

B

Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		KMG555
HM-6EL-D6.0		6	6	24	75	6	●
HM-6EL-D8.0		8	8	32	75	6	●
HM-6EL-D10.0		10	10	40	100	6	●
HM-6EL-D12.0		12	12	45	100	6	●
HM-6EL-D16.0		16	16	64	150	6	●
HM-6EL-D20.0		20	20	75	150	6	●

● Ex stock ○ On demand

* With internal cooling

Milling

C

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

Drilling

D

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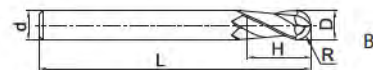
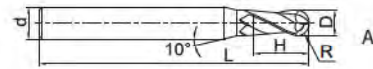
System code > B268

Cutting data > B436

Nonstandard order > B477

Ball nose cutter **Hard machining**
HM-2B


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG555
		R	D	d (h6)	H	L			
HM-2B-R0.5S		0.5	1	4	2	50	2	A	●
HM-2B-R0.75S		0.75	1.5	4	3	50	2	A	●
HM-2B-R1.0S		1	2	4	4	50	2	A	●
HM-2B-R1.25S		1.25	2.5	4	5	50	2	A	●
HM-2B-R1.5S		1.5	3	4	6	50	2	A	●
HM-2B-R2.0S		2	4	4	8	50	2	B	●
HM-2B-R0.5		0.5	1	6	2	50	2	A	●
HM-2B-R0.75		0.75	1.5	6	3	50	2	A	●
HM-2B-R1.0		1	2	6	4	50	2	A	●
HM-2B-R1.25		1.25	2.5	6	5	50	2	A	●
HM-2B-R1.5		1.5	3	6	6	50	2	A	●
HM-2B-R1.75		1.75	3.5	6	8	50	2	A	●
HM-2B-R2.0		2	4	6	8	50	2	A	●
HM-2B-R2.5		2.5	5	6	10	50	2	A	●
HM-2B-R2.75		2.75	5.5	6	12	50	2	A	●
HM-2B-R3.0		3	6	6	12	50	2	B	●
HM-2B-R3.5		3.5	7	8	14	60	2	A	●
HM-2B-R4.0		4	8	8	16	60	2	B	●
HM-2B-R4.5		4.5	9	10	18	75	2	A	●
HM-2B-R5.0		5	10	10	20	75	2	B	●
HM-2B-R6.0		6	12	12	24	75	2	B	●
HM-2B-R7.0		7	14	14	28	75	2	B	●
HM-2B-R8.0		8	16	16	32	100	2	B	●
HM-2B-R10.0		10	20	20	40	100	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



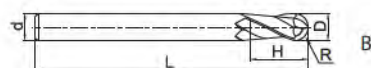
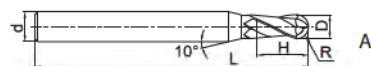
Ball nose cutter long shank

Hard machining

HM-2BL



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
HM-2BL-R1.0		1	2	6	4	75	2	A	●
HM-2BL-R1.25		1.25	2.5	6	6	75	2	A	●
HM-2BL-R1.5		1.5	3	6	6	75	2	A	●
HM-2BL-R1.75		1.75	3.5	6	8	75	2	A	●
HM-2BL-R2.0		2	4	6	8	75	2	A	●
HM-2BL-R2.5		2.5	5	6	10	75	2	A	●
HM-2BL-R2.75		2.75	5.5	6	12	75	2	A	●
HM-2BL-R3.0		3	6	6	12	75	2	B	●
HM-2BL-R3.5		3.5	7	8	14	75	2	A	●
HM-2BL-R4.0		4	8	8	16	100	2	B	●
HM-2BL-R4.5		4.5	9	10	18	100	2	A	●
HM-2BL-R5.0		5	10	10	20	100	2	B	●
HM-2BL-R6.0		6	12	12	24	100	2	B	●
HM-2BL-R7.0		7	14	14	28	100	2	B	●
HM-2BL-R8.0		8	16	16	32	150	2	B	●
HM-2BL-R10.0		10	20	20	40	150	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

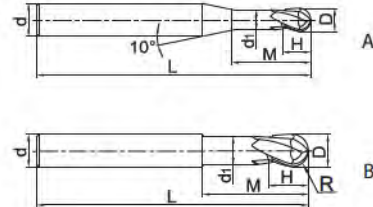
System code > B268

Cutting data > B436

Nonstandard order > B477

Ball nose cutter short cutting edge **Hard machining**
HM-2BFP


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]							Teeth	Geometry	Grade
		R	D	d (h6)	d ₁	H	M	L			
HM-2BFP-R0.5		0.5	1	6	0.95	1	2.5	75	2	A	●
HM-2BFP-R0.75		0.75	1.5	6	1.45	1.5	3	75	2	A	●
HM-2BFP-R1.0		1	2	6	1.95	2	4	75	2	A	●
HM-2BFP-R1.5		1.5	3	6	2.85	3	6	75	2	A	●
HM-2BFP-R2.0		2	4	6	3.85	4	8	75	2	A	●
HM-2BFP-R2.5		2.5	5	6	4.85	5	10	75	2	A	●
HM-2BFP-R3.0		3	6	6	5.8	6	12	75	2	B	●
HM-2BFP-R4.0		4	8	8	7.8	8	16	100	2	B	●
HM-2BFP-R5.0		5	10	10	9.6	10	20	100	2	B	●
HM-2BFP-R6.0		6	12	12	11.5	12	24	100	2	B	●
HM-2BFP-R8.0		8	16	16	15.5	16	32	150	2	B	●
HM-2BFP-R10.0		10	20	20	19.5	20	40	150	2	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

- ✓ Very suitable
- ✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



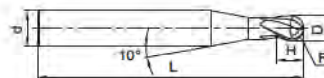
Ball nose cutter

Hard machining

HM-2BS



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Grade
		R	D	d (h6)	H	L		
HM-2BS-R0.15		0.15	0.3	4	0.5	50	2	●
HM-2BS-R0.20		0.2	0.4	4	0.6	50	2	●
HM-2BS-R0.25		0.25	0.5	4	0.8	50	2	●
HM-2BS-R0.30		0.3	0.6	4	0.9	50	2	●
HM-2BS-R0.35		0.35	0.7	4	1	50	2	●
HM-2BS-R0.40		0.4	0.8	4	1.2	50	2	●
HM-2BS-R0.45		0.45	0.9	4	1.3	50	2	●
HM-2BS-R0.50		0.5	1	4	1.5	50	2	●
HM-2BS-R0.60		0.6	1.2	4	1.8	50	2	●
HM-2BS-R0.70		0.7	1.4	4	2	50	2	●
HM-2BS-R0.75		0.75	1.5	4	2.3	50	2	●
HM-2BS-R0.80		0.8	1.6	4	2.5	50	2	●
HM-2BS-R0.90		0.9	1.8	4	2.7	50	2	●
HM-2BS-R1.00		1	2	4	3	50	2	●
HM-2BS-R1.25		1.25	2.5	4	3.7	50	2	●
HM-2BS-R1.50		1.5	3	4	4.5	50	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

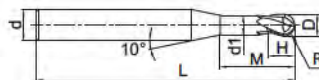
P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

End mill
Hard machining
HM-2BP


- Straight shank
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]							Teeth	Grade KMG555
		R	D	d (h6)	d ₁	H	M	L		
HM-2BP-R0.25-M04		0.25	0.5	4	0.45	0.7	4	50	2	●
HM-2BP-R0.25-M06		0.25	0.5	4	0.45	0.7	6	50	2	●
HM-2BP-R0.3-M04		0.3	0.6	4	0.55	0.9	4	50	2	●
HM-2BP-R0.3-M06		0.3	0.6	4	0.55	0.9	6	50	2	●
HM-2BP-R0.3-M08		0.3	0.6	4	0.55	0.9	8	50	2	●
HM-2BP-R0.4-M04		0.4	0.8	4	0.75	1.2	4	50	2	●
HM-2BP-R0.4-M06		0.4	0.8	4	0.75	1.2	6	50	2	●
HM-2BP-R0.4-M08		0.4	0.8	4	0.75	1.2	8	50	2	●
HM-2BP-R0.4-M10		0.4	0.8	4	0.75	1.2	10	50	2	●
HM-2BP-R0.5-M04		0.5	1	4	0.95	1.5	4	50	2	●
HM-2BP-R0.5-M06		0.5	1	4	0.95	1.5	6	50	2	●
HM-2BP-R0.5-M08		0.5	1	4	0.95	1.5	8	50	2	●
HM-2BP-R0.5-M10		0.5	1	4	0.95	1.5	10	50	2	●
HM-2BP-R0.5-M12		0.5	1	4	0.95	1.5	12	50	2	●
HM-2BP-R0.6-M06		0.6	1.2	4	1.15	1.8	6	50	2	●
HM-2BP-R0.6-M08		0.6	1.2	4	1.15	1.8	8	50	2	●
HM-2BP-R0.6-M12		0.6	1.2	4	1.15	1.8	12	50	2	●
HM-2BP-R0.6-M16		0.6	1.2	4	1.15	1.8	16	50	2	●
HM-2BP-R0.75-M08		0.75	1.5	4	1.45	2.3	8	50	2	●
HM-2BP-R0.75-M12		0.75	1.5	4	1.45	2.3	12	50	2	●
HM-2BP-R0.75-M16		0.75	1.5	4	1.45	2.3	16	50	2	●
HM-2BP-R1.0-M06		1	2	4	1.95	3	6	50	2	●
HM-2BP-R1.0-M08		1	2	4	1.95	3	8	50	2	●
HM-2BP-R1.0-M10		1	2	4	1.95	3	10	50	2	●
HM-2BP-R1.0-M12		1	2	4	1.95	3	12	50	2	●
HM-2BP-R1.0-M16		1	2	4	1.95	3	16	50	2	●
HM-2BP-R1.0-M20		1	2	4	1.95	3	20	50	2	●
HM-2BP-R1.25-M08		1.25	2.5	4	2.4	3.7	8	50	2	●
HM-2BP-R1.25-M12		1.25	2.5	4	2.4	3.7	12	50	2	●
HM-2BP-R1.25-M16		1.25	2.5	4	2.4	3.7	16	60	2	●
HM-2BP-R1.25-M20		1.25	2.5	4	2.4	3.7	20	60	2	●
HM-2BP-R1.5-M08		1.5	3	6	2.85	4.5	8	50	2	●
HM-2BP-R1.5-M10		1.5	3	6	2.85	4.5	10	50	2	●
HM-2BP-R1.5-M12		1.5	3	6	2.85	4.5	12	50	2	●
HM-2BP-R1.5-M16		1.5	3	6	2.85	4.5	16	60	2	●
HM-2BP-R1.5-M20		1.5	3	6	2.85	4.5	20	60	2	●
HM-2BP-R2.0-M10		2	4	6	3.85	6	10	60	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



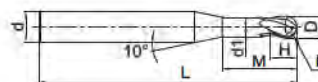
End mill

Hard machining

HM-2BP



- Straight shank
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]							Teeth	Grade
		R	D	d (h6)	d ₁	H	M	L		
HM-2BP-R2.0-M16		2	4	6	3.85	6	16	60	2	●
HM-2BP-R2.0-M20		2	4	6	3.85	6	20	60	2	●
HM-2BP-R2.0-M25		2	4	6	3.85	6	25	60	2	●
HM-2BP-R2.5-M16		2.5	5	6	4.85	7.5	16	60	2	●
HM-2BP-R2.5-M25		2.5	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

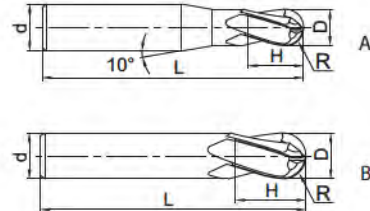
Ball nose cutter

Hard machining

HM-4B



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG555
		R	D	d (h6)	H	L			
HM-4B-R1.5		1.5	3	6	6	50	4	A	●
HM-4B-R2.0		2	4	6	8	50	4	A	●
HM-4B-R2.5		2.5	5	6	10	50	4	A	●
HM-4B-R3.0		3	6	6	12	50	4	B	●
HM-4B-R4.0		4	8	8	16	60	4	B	●
HM-4B-R5.0		5	10	10	20	75	4	B	●
HM-4B-R6.0		6	12	12	24	75	4	B	●
HM-4B-R7.0		7	14	14	28	75	4	B	●
HM-4B-R8.0		8	16	16	32	100	4	B	●
HM-4B-R9.0		9	18	18	36	100	4	B	●
HM-4B-R10.0		10	20	20	40	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



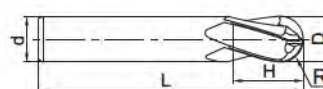
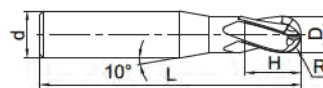
Ball nose cutter long shank

Hard machining

HM-4BL



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
HM-4BL-R1.5		1.5	3	6	6	75	4	A	●
HM-4BL-R2.0		2	4	6	8	75	4	A	●
HM-4BL-R2.5		2.5	5	6	10	75	4	A	●
HM-4BL-R3.0		3	6	6	12	75	4	B	●
HM-4BL-R4.0		4	8	8	16	100	4	B	●
HM-4BL-R5.0		5	10	10	20	100	4	B	●
HM-4BL-R6.0		6	12	12	24	100	4	B	●
HM-4BL-R7.0		7	14	14	28	100	4	B	●
HM-4BL-R8.0		8	16	16	32	150	4	B	●
HM-4BL-R9.0		9	18	18	36	150	4	B	●
HM-4BL-R10.0		10	20	20	40	150	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

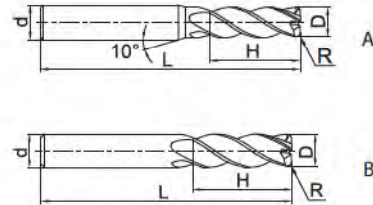
System code > B268

Cutting data > B436

Nonstandard order > B477

Torus mill
Hard machining
HM-4R


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG555
		R	D	d (h6)	H	L			
HM-4R-D3.0R0.2		0.2	3	4	8	50	4	A	●
HM-4R-D4.0R0.3		0.3	4	4	10	50	4	B	●
HM-4R-D4.0R0.5		0.5	4	4	10	50	4	B	●
HM-4R-D5.0R0.5		0.5	5	6	13	50	4	A	●
HM-4R-D5.0R1.0		1	5	6	13	50	4	A	●
HM-4R-D6.0R0.5		0.5	6	6	16	50	4	B	●
HM-4R-D6.0R1.0		1	6	6	16	50	4	B	●
HM-4R-D8.0R0.5		0.5	8	8	20	60	4	B	●
HM-4R-D8.0R1.0		1	8	8	20	60	4	B	●
HM-4R-D10.0R0.5		0.5	10	10	25	75	4	B	●
HM-4R-D10.0R1.0		1	10	10	25	75	4	B	●
HM-4R-D10.0R2.0		2	10	10	25	75	4	B	●
HM-4R-D10.0R3.0		3	10	10	25	75	4	B	●
HM-4R-D12.0R0.5		0.5	12	12	30	75	4	B	●
HM-4R-D12.0R1.0		1	12	12	30	75	4	B	●
HM-4R-D12.0R2.0		2	12	12	30	75	4	B	●
HM-4R-D12.0R3.0		3	12	12	30	75	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



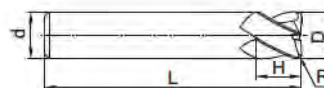
Torus mill short cutting edge

Hard machining

HM-4RF



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Grade
		R	D	d (h6)	H	L		KMG555
HM-4RF-D6.0R0.5		0.5	6	6	6	50	4	○
HM-4RF-D6.0R1.0		1	6	6	6	50	4	○
HM-4RF-D8.0R0.5		0.5	8	8	8	60	4	○
HM-4RF-D8.0R1.0		1	8	8	8	60	4	○
HM-4RF-D10.0R1.0		1	10	10	10	75	4	○
HM-4RF-D10.0R2.0		2	10	10	10	75	4	○
HM-4RF-D12.0R0.5		0.5	12	12	12	75	4	○
HM-4RF-D12.0R1.0		1	12	12	12	75	4	○
HM-4RF-D12.0R2.0		2	12	12	12	75	4	○

● Ex stock ○ On demand

* With internal cooling

Application field

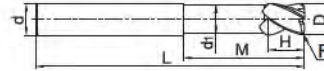
P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

Torus mill long shank **Hard machining**
HM-4RP


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]							Teeth	Grade
		R	D	d (h6)	d ₁	H	M	L		
HM-4RP-D6.0R0.5		0.5	6	6	5.8	6	18	75	4	○
HM-4RP-D6.0R1.0		1	6	6	5.8	6	18	75	4	○
HM-4RP-D8.0R0.5		0.5	8	8	7.8	8	24	100	4	○
HM-4RP-D8.0R1.0		1	8	8	7.8	8	24	100	4	○
HM-4RP-D10.0R0.5		0.5	10	10	9.6	10	30	100	4	○
HM-4RP-D10.0R1.0		1	10	10	9.6	10	30	100	4	○
HM-4RP-D10.0R2.0		2	10	10	9.6	10	30	100	4	○
HM-4RP-D12.0R0.5		0.5	12	12	11.5	12	36	100	4	○
HM-4RP-D12.0R1.0		1	12	12	11.5	12	36	100	4	○
HM-4RP-D12.0R2.0		2	12	12	11.5	12	36	100	4	○
HM-4RP-D16.0R1.0		1	16	16	15.5	16	40	150	4	●
HM-4RP-D16.0R2.0		2	16	16	15.5	16	40	150	4	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
					✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



Notes

A

Turning

B

Milling

C

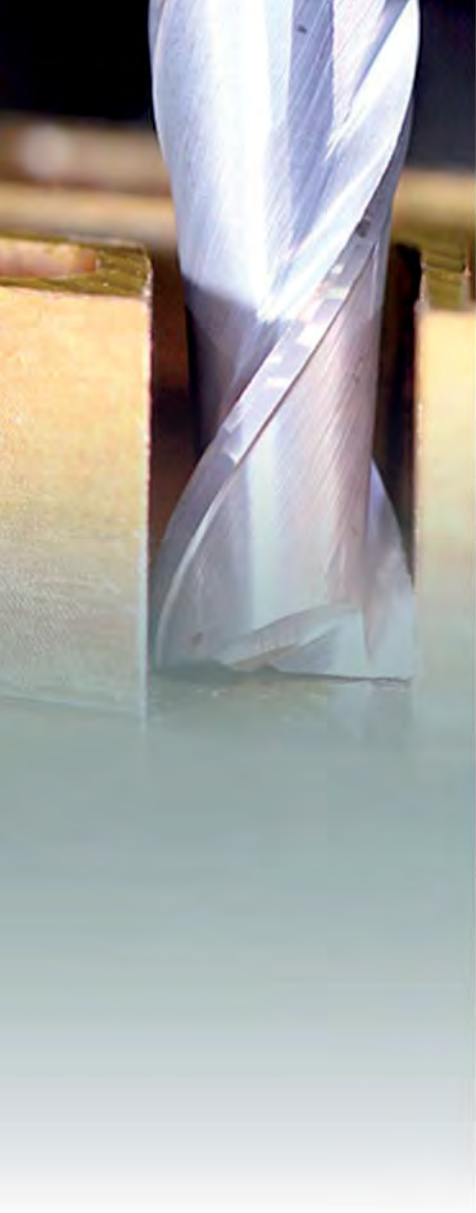
Drilling

D

Technical
Information

E

Index



NM series

For machining of copper

- For machining of copper and copper alloys (brass, bronze).
- Excellent sharpness of cutting edge for very good surface quality.
- End mills, ball nose cutters and mini cutters.
- Diameter range 0.5–20.0 mm

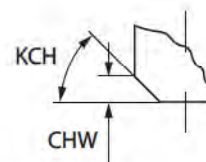
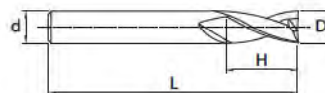


End mill **General machining of non-ferrous metals**

5502R402NM



- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 40°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	H	L	KCH	CHW		
5502R402NM-0300		3	6	8	57	0	0	2	●
5502R402NM-0400		4	6	11	57	0	0	2	●
5502R402NM-0500		5	6	13	57	0	0	2	●
5502R402NM-0600		6	6	13	57	45	0.1	2	●
5502R402NM-0800		8	8	19	63	45	0.1	2	●
5502R402NM-1000		10	10	22	72	45	0.1	2	●
5502R402NM-1200		12	12	26	83	45	0.1	2	●
5502R402NM-1400		14	14	26	83	45	0.15	2	●
5502R402NM-1600		16	16	32	92	45	0.15	2	●
5502R402NM-1800		18	18	32	92	45	0.15	2	●
5502R402NM-2000		20	20	38	104	45	0.15	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

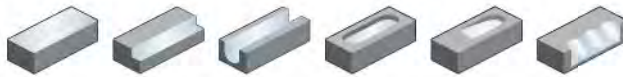
P	M	K	N	S	H
			✓		

✓ Very suitable

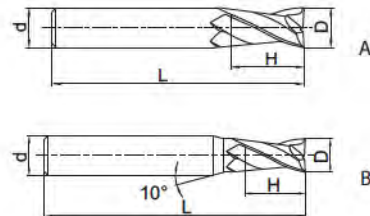
✓ Suitable

End mill **General machining of non-ferrous metals**

NM-2E



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG309
NM-2E-D1.0		1	4	3	50	2	A	●
NM-2E-D2.0		2	4	6	50	2	A	●
NM-2E-D3.0		3	6	8	50	2	A	●
NM-2E-D4.0		4	6	11	50	2	A	●
NM-2E-D5.0		5	6	13	50	2	A	●
NM-2E-D6.0		6	6	16	50	2	B	●
NM-2E-D8.0		8	8	20	60	2	B	●
NM-2E-D10.0		10	10	25	75	2	B	●
NM-2E-D12.0		12	12	30	75	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

A

Turning

B

Milling

C

Drilling

D

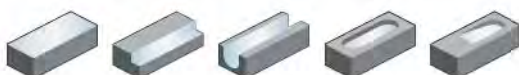
Technical
Information

E

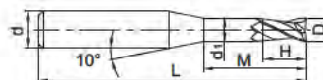
Index

End mill General machining of non-ferrous metals

NM-2EP



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	d ₁	H	M	L		
NM-2EP-D0.5-M08		0.5	4	0.45	0.7	8	50	2	●
NM-2EP-D0.5-M06		0.5	4	0.45	0.7	6	50	2	●
NM-2EP-D0.5-M04		0.5	4	0.45	0.7	4	50	2	●
NM-2EP-D0.8-M10		0.8	4	0.75	1.2	10	50	2	●
NM-2EP-D0.8-M04		0.8	4	0.75	1.2	4	50	2	●
NM-2EP-D0.8-M06		0.8	4	0.75	1.2	6	50	2	●
NM-2EP-D0.8-M08		0.8	4	0.75	1.2	8	50	2	●
NM-2EP-D1.0-M08		1	4	0.95	1.5	8	50	2	●
NM-2EP-D1.0-M14		1	4	0.95	1.5	14	50	2	●
NM-2EP-D1.0-M04		1	4	0.95	1.5	4	50	2	●
NM-2EP-D1.0-M12		1	4	0.95	1.5	12	50	2	●
NM-2EP-D1.0-M10		1	4	0.95	1.5	10	50	2	●
NM-2EP-D1.0-M06		1	4	0.95	1.5	6	50	2	●
NM-2EP-D1.5-M08		1.5	4	1.45	2.3	8	50	2	●
NM-2EP-D1.5-M16		1.5	4	1.45	2.3	16	50	2	●
NM-2EP-D2.0-M14		2	4	1.95	3	14	50	2	●
NM-2EP-D2.0-M12		2	4	1.95	3	12	50	2	●
NM-2EP-D2.0-M08		2	4	1.95	3	8	50	2	●
NM-2EP-D2.0-M10		2	4	1.95	3	10	50	2	●
NM-2EP-D2.0-M06		2	4	1.95	3	6	50	2	●
NM-2EP-D2.0-M16		2	4	1.95	3	16	50	2	●
NM-2EP-D2.5-M10		2.5	4	2.4	3.7	10	50	2	●
NM-2EP-D2.5-M20		2.5	4	2.4	3.7	20	60	2	●
NM-2EP-D3.0-M10		3	6	2.85	4.5	10	50	2	●
NM-2EP-D3.0-M20		3	6	2.85	4.5	20	60	2	●
NM-2EP-D4.0-M25		4	6	3.85	6	25	60	2	●
NM-2EP-D4.0-M16		4	6	3.85	6	16	60	2	●
NM-2EP-D5.0-M25		5	6	4.85	7.5	25	70	2	●
NM-2EP-D5.0-M16		5	6	4.85	7.5	16	60	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

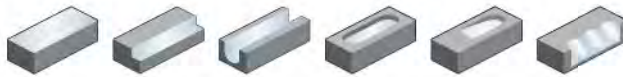
System code > B268

Cutting data > B436

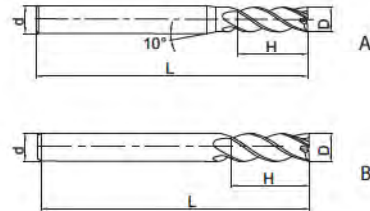
Nonstandard order > B477

End mill **General machining of non-ferrous metals**

NM-4E



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMG309
NM-4E-D3.0		3	6	8	50	4	A	●
NM-4E-D4.0		4	6	11	50	4	A	●
NM-4E-D5.0		5	6	13	50	4	A	●
NM-4E-D6.0		6	6	16	50	4	B	●
NM-4E-D8.0		8	8	20	60	4	B	●
NM-4E-D10.0		10	10	25	75	4	B	●
NM-4E-D12.0		12	12	30	75	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



A

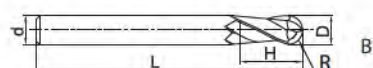
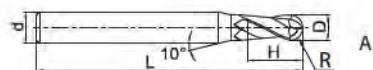
Turning

Ball nose cutter **General machining of non-ferrous metals**

NM-2B



- Factory standard
- Centre cutting
- Helix angle 35°



B

Milling

Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
NM-2B-R0.5		0.5	1	4	2	50	2	A	●
NM-2B-R0.75		0.75	1.5	4	3	50	2	A	●
NM-2B-R1.0		1	2	4	4	50	2	A	●
NM-2B-R1.25		1.25	2.5	4	5	50	2	A	●
NM-2B-R1.5		1.5	3	6	6	50	2	A	●
NM-2B-R1.75		1.75	3.5	6	8	50	2	A	●
NM-2B-R2.0		2	4	6	8	50	2	A	●
NM-2B-R2.5		2.5	5	6	10	50	2	A	●
NM-2B-R3.0		3	6	6	12	50	2	B	●
NM-2B-R4.0		4	8	8	16	60	2	B	●
NM-2B-R5.0		5	10	10	20	75	2	B	●
NM-2B-R6.0		6	12	12	24	75	2	B	●

● Ex stock ○ On demand

* With internal cooling

C

Drilling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

D

Technical Information

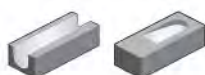
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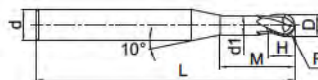
System code > B268

Cutting data > B436

Nonstandard order > B477

Ball nose cutter **General machining of non-ferrous metals**
NM-2BP


- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]							Teeth	Grade KMG309
		R	D	d (h6)	d ₁	H	M	L		
NM-2BP-R0.25-M04		0.25	0.5	4	0.45	0.7	4	50	2	●
NM-2BP-R0.25-M06		0.25	0.5	4	0.45	0.7	6	50	2	●
NM-2BP-R0.3-M04		0.3	0.6	4	0.55	0.9	4	50	2	●
NM-2BP-R0.3-M06		0.3	0.6	4	0.55	0.9	6	50	2	●
NM-2BP-R0.3-M08		0.3	0.6	4	0.55	0.9	8	50	2	●
NM-2BP-R0.4-M04		0.4	0.8	4	0.75	1.2	4	50	2	●
NM-2BP-R0.4-M06		0.4	0.8	4	0.75	1.2	6	50	2	●
NM-2BP-R0.4-M08		0.4	0.8	4	0.75	1.2	8	50	2	●
NM-2BP-R0.4-M10		0.4	0.8	4	0.75	1.2	10	50	2	●
NM-2BP-R0.5-M04		0.5	1	4	0.95	1.5	4	50	2	●
NM-2BP-R0.5-M06		0.5	1	4	0.95	1.5	6	50	2	●
NM-2BP-R0.5-M08		0.5	1	4	0.95	1.5	8	50	2	●
NM-2BP-R0.5-M10		0.5	1	4	0.95	1.5	10	50	2	●
NM-2BP-R0.5-M12		0.5	1	4	0.95	1.5	12	50	2	●
NM-2BP-R0.75-M08		0.75	1.5	4	1.45	2.3	8	50	2	●
NM-2BP-R0.75-M16		0.75	1.5	4	1.45	2.3	16	50	2	●
NM-2BP-R1.0-M06		1	2	4	1.95	3	6	50	2	●
NM-2BP-R1.0-M08		1	2	4	1.95	3	8	50	2	●
NM-2BP-R1.0-M10		1	2	4	1.95	3	10	50	2	●
NM-2BP-R1.0-M12		1	2	4	1.95	3	12	50	2	●
NM-2BP-R1.0-M16		1	2	4	1.95	3	16	50	2	●
NM-2BP-R1.0-M20		1	2	4	1.95	3	20	60	2	●
NM-2BP-R1.5-M10		1.5	3	6	2.85	4.5	10	50	2	●
NM-2BP-R1.5-M20		1.5	3	6	2.85	4.5	20	60	2	●
NM-2BP-R2.0-M10		2	4	6	3.85	6	10	60	2	●
NM-2BP-R2.0-M16		2	4	6	3.85	6	16	60	2	●
NM-2BP-R2.0-M20		2	4	6	3.85	6	20	60	2	●
NM-2BP-R2.0-M25		2	4	6	3.85	6	25	60	2	●
NM-2BP-R2.5-M16		2.5	5	6	4.85	7.5	16	60	2	●
NM-2BP-R2.5-M25		2.5	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

System code > B268

Cutting data > B436

Nonstandard order > B477



Notes

A

Turning

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Milling

C

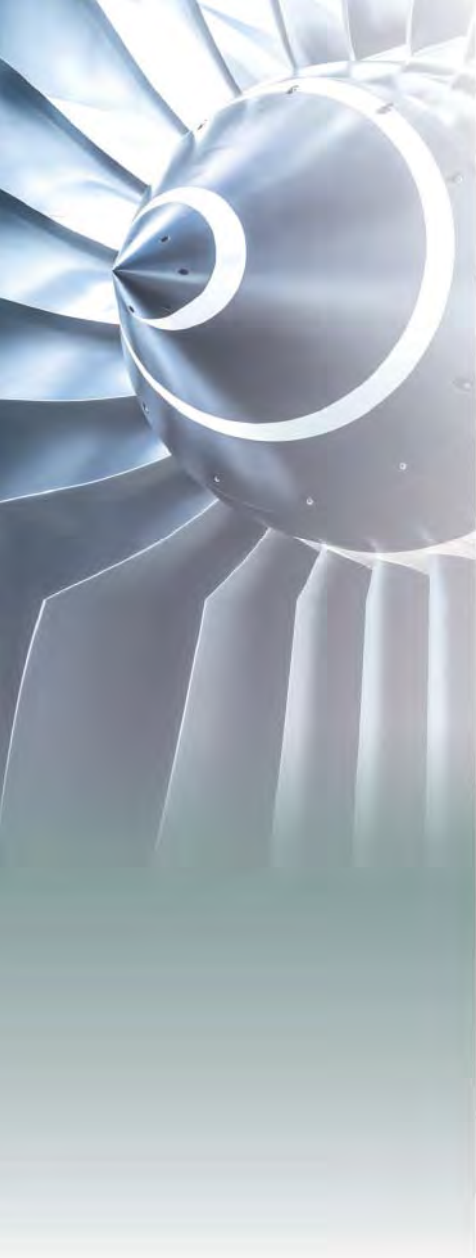
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AL series

For machining of aluminium alloys

- Newly developed geometries expand our standard program:
 - ALP for high-speed roughing
 - ALG for finishing with very good surface quality
 - AIR torus mills for ultra high-speed machining
- With our diamond-like carbon grade KMD401, tool life is significantly increased.
- End mills, ball nose cutters, torus mills and rippers
- Diameter range 1.0–20.0 mm



A

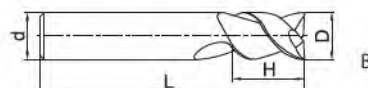
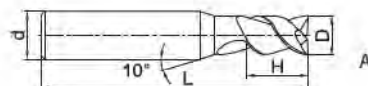
Turning

End mill **General machining of Al and Al alloys**

AL-2E



- Factory standard
- Centre cutting
- Helix angle 55°



B

Milling

Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			YK30F
AL-2E-D1.0		1	4	3	50	2	A	●
AL-2E-D1.5		1.5	4	4	50	2	A	●
AL-2E-D2.0		2	4	6	50	2	A	●
AL-2E-D2.5		2.5	4	7	50	2	A	●
AL-2E-D3.0		3	6	9	50	2	A	●
AL-2E-D4.0		4	6	12	50	2	A	●
AL-2E-D5.0		5	6	15	50	2	A	●
AL-2E-D6.0		6	6	18	60	2	B	●
AL-2E-D8.0		8	8	20	60	2	B	●
AL-2E-D10.0		10	10	30	75	2	B	●
AL-2E-D12.0		12	12	32	75	2	B	●
AL-2E-D16.0		16	16	45	100	2	B	●
AL-2E-D20.0		20	20	45	100	2	B	●

● Ex stock ○ On demand

* With internal cooling

C

Drilling

D

Technical Information

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

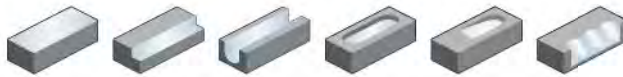
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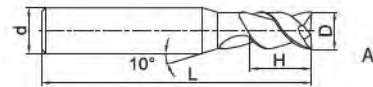
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill long cutting edge **General machining of Al and Al alloys****AL-2EL**

- Factory standard
- Centre cutting
- Helix angle 55°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			YK30F
AL-2EL-D3.0		3	6	12	60	2	A	●
AL-2EL-D4.0		4	6	16	60	2	A	●
AL-2EL-D5.0		5	6	20	60	2	A	●
AL-2EL-D6.0		6	6	25	75	2	B	●
AL-2EL-D8.0		8	8	32	75	2	B	●
AL-2EL-D10.0		10	10	45	100	2	B	●
AL-2EL-D12.0		12	12	45	100	2	B	●
AL-2EL-D16.0		16	16	65	150	2	B	●
AL-2EL-D20.0		20	20	75	150	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

A

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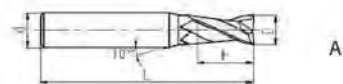
End mill

General machining of Al and Al alloys

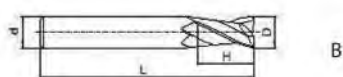
ALG-2E



- Factory standard
- Centre cutting
- Helix angle 30°



A



B

Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			YK40F
ALG-2E-D1.0		1	4	3	50	2	A	●
ALG-2E-D1.5		1.5	4	4	50	2	A	○
ALG-2E-D2.0		2	4	6	50	2	A	●
ALG-2E-D2.5		2.5	4	8	50	2	A	○
ALG-2E-D3.0S		3	4	8	50	2	A	●
ALG-2E-D3.5S		3.5	4	10	50	2	A	○
ALG-2E-D4.0S		4	4	11	50	2	B	○
ALG-2E-D3.0		3	6	8	50	2	A	●
ALG-2E-D3.5		3.5	6	10	50	2	A	○
ALG-2E-D4.0		4	6	11	50	2	A	●
ALG-2E-D4.5		4.5	6	11	50	2	A	○
ALG-2E-D5.0		5	6	13	50	2	A	●
ALG-2E-D5.5		5.5	6	16	50	2	A	○
ALG-2E-D6.0		6	6	16	50	2	B	●
ALG-2E-D7.0		7	8	20	60	2	A	○
ALG-2E-D8.0		8	8	20	60	2	B	●
ALG-2E-D9.0		9	10	22	75	2	A	○
ALG-2E-D10.0		10	10	25	75	2	B	●
ALG-2E-D11.0		11	12	26	75	2	A	○
ALG-2E-D12.0		12	12	30	75	2	B	●
ALG-2E-D14.0		14	14	32	75	2	B	●
ALG-2E-D16.0		16	16	45	100	2	B	●
ALG-2E-D18.0		18	18	45	100	2	B	○
ALG-2E-D20.0		20	20	45	100	2	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

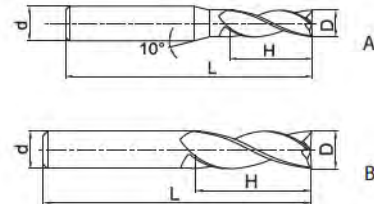
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill **General machining of Al and Al alloys**
AL-3E


- Factory standard
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			YK30F
AL-3E-D1.0		1	4	3	50	3	A	•
AL-3E-D1.5		1.5	4	4	50	3	A	•
AL-3E-D2.0		2	4	6	50	3	A	•
AL-3E-D2.5		2.5	4	7	50	3	A	•
AL-3E-D3.0		3	6	9	50	3	A	•
AL-3E-D4.0		4	6	12	50	3	A	•
AL-3E-D5.0		5	6	15	50	3	A	•
AL-3E-D6.0		6	6	18	60	3	B	•
AL-3E-D8.0		8	8	20	60	3	B	•
AL-3E-D10.0		10	10	30	75	3	B	•
AL-3E-D12.0		12	12	32	75	3	B	•
AL-3E-D16.0		16	16	45	100	3	B	•
AL-3E-D20.0		20	20	45	100	3	B	•

• Ex stock ◦ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



A

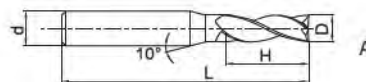
End mill long cutting edge

General machining of Al and Al alloys

AL-3EL



- Factory standard
- Centre cutting
- Helix angle 45°



Turning

B

Milling

C

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Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			YK30F
AL-3EL-D3.0		3	6	12	60	3	A	●
AL-3EL-D4.0		4	6	16	60	3	A	●
AL-3EL-D5.0		5	6	20	60	3	A	●
AL-3EL-D6.0		6	6	25	75	3	B	●
AL-3EL-D8.0		8	8	32	75	3	B	●
AL-3EL-D10.0		10	10	45	100	3	B	●
AL-3EL-D12.0		12	12	45	100	3	B	●
AL-3EL-D16.0		16	16	65	150	3	B	●
AL-3EL-D20.0		20	20	75	150	3	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

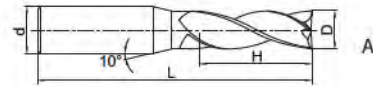
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill**General machining of Al and Al alloys****ALG-3E**

- Factory standard
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade	
		D	d (h6)	H	L			KMD401	YK40F
ALG-3E-D1.0		1	4	3	50	3	A	○	●
ALG-3E-D1.5		1.5	4	4	50	3	A	○	●
ALG-3E-D2.0		2	4	6	50	3	A	○	●
ALG-3E-D2.5		2.5	4	8	50	3	A	○	○
ALG-3E-D3.0S		3	4	8	50	3	A	○	●
ALG-3E-D3.5S		3.5	4	10	50	3	A	○	○
ALG-3E-D4.0S		4	4	11	50	3	B	○	●
ALG-3E-D3.0		3	6	8	50	3	A	●	●
ALG-3E-D3.5		3.5	6	10	50	3	A	●	○
ALG-3E-D4.0		4	6	11	50	3	A	●	●
ALG-3E-D4.5		4.5	6	11	50	3	A	●	○
ALG-3E-D5.0		5	6	13	50	3	A	●	●
ALG-3E-D5.5		5.5	6	16	50	3	A	●	○
ALG-3E-D6.0		6	6	16	50	3	B	●	●
ALG-3E-D7.0		7	8	20	60	3	A	●	○
ALG-3E-D8.0		8	8	20	60	3	B	●	●
ALG-3E-D9.0		9	10	22	75	3	A	●	○
ALG-3E-D10.0		10	10	25	75	3	B	●	●
ALG-3E-D11.0		11	12	26	75	3	A	●	○
ALG-3E-D12.0		12	12	30	75	3	B	●	●
ALG-3E-D14.0		14	14	32	75	3	B	●	●
ALG-3E-D16.0		16	16	45	100	3	B	●	●
ALG-3E-D18.0		18	18	45	100	3	B	●	○
ALG-3E-D20.0		20	20	45	100	3	B	○	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

System code > B268

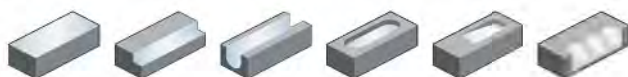
Cutting data > B436

Nonstandard order > B477

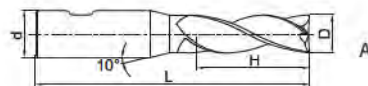
End mill

General machining of Al and Al alloys

ALG-3E-W



- Factory standard with weldon clamping surface
- Centre cutting
- Helix angle 45°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMD401
ALG-3E-D3.0-W		3	6	8	50	3	A	●
ALG-3E-D3.5-W		3.5	6	10	50	3	A	●
ALG-3E-D4.0-W		4	6	11	50	3	A	●
ALG-3E-D4.5-W		4.5	6	11	50	3	A	●
ALG-3E-D5.0-W		5	6	13	50	3	A	●
ALG-3E-D5.5-W		5.5	6	16	50	3	A	●
ALG-3E-D6.0-W		6	6	16	50	3	B	●
ALG-3E-D7.0-W		7	8	20	60	3	A	●
ALG-3E-D8.0-W		8	8	20	60	3	B	●
ALG-3E-D9.0-W		9	10	22	75	3	A	●
ALG-3E-D10.0-W		10	10	25	75	3	B	●
ALG-3E-D11.0-W		11	12	26	75	3	A	●
ALG-3E-D12.0-W		12	12	30	75	3	B	●
ALG-3E-D14.0-W		14	14	32	75	3	B	●
ALG-3E-D16.0-W		16	16	45	100	3	B	●
ALG-3E-D18.0-W		18	18	45	100	3	B	●
ALG-3E-D20.0-W		20	20	45	100	3	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

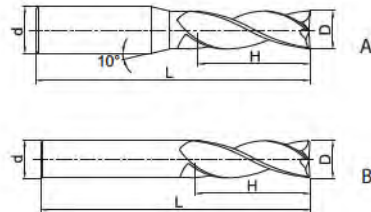
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill High-performance machining of Al and Al alloys**ALP-3E**

- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade	
		D	d (h6)	H	L			KMD401	YK40F
ALP-3E-D1.0		1	4	3	50	3	A	○	○
ALP-3E-D1.5		1.5	4	4	50	3	A	○	●
ALP-3E-D2.0		2	4	6	50	3	A	○	●
ALP-3E-D2.5		2.5	4	8	50	3	A	○	○
ALP-3E-D3.0S		3	4	8	50	3	A	○	●
ALP-3E-D4.0S		4	4	11	50	3	B	○	●
ALP-3E-D3.0		3	6	8	50	3	A	●	●
ALP-3E-D4.0		4	6	11	50	3	A	●	●
ALP-3E-D4.5		4.5	6	11	50	3	A	●	○
ALP-3E-D5.0		5	6	13	50	3	A	●	●
ALP-3E-D5.5		5.5	6	16	50	3	A	●	○
ALP-3E-D6.0		6	6	16	50	3	B	●	●
ALP-3E-D7.0		7	8	20	60	3	B	●	○
ALP-3E-D8.0		8	8	20	60	3	B	●	●
ALP-3E-D9.0		9	10	22	75	3	B	●	○
ALP-3E-D10.0		10	10	25	75	3	B	●	●
ALP-3E-D11.0		11	12	26	75	3	B	●	●
ALP-3E-D12.0		12	12	30	75	3	B	●	●
ALP-3E-D14.0		14	14	32	75	3	B	●	●
ALP-3E-D16.0		16	16	45	100	3	B	●	●
ALP-3E-D20.0		20	20	45	100	3	B	●	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

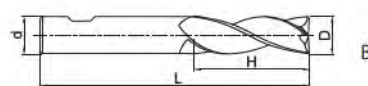
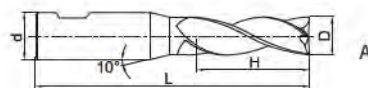
Nonstandard order > B477

End mill **High-performance machining of Al and Al alloys**

ALP-3E-W



- Factory standard with weldon clamping surface
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMD401
ALP-3E-D3.0-W		3	6	8	50	3	A	●
ALP-3E-D4.0-W		4	6	11	50	3	A	●
ALP-3E-D4.5-W		4.5	6	11	50	3	A	●
ALP-3E-D5.0-W		5	6	13	50	3	A	●
ALP-3E-D5.5-W		5.5	6	16	50	3	A	●
ALP-3E-D6.0-W		6	6	16	50	3	B	●
ALP-3E-D7.0-W		7	8	20	60	3	B	●
ALP-3E-D8.0-W		8	8	20	60	3	B	●
ALP-3E-D9.0-W		9	10	22	75	3	B	●
ALP-3E-D10.0-W		10	10	25	75	3	B	●
ALP-3E-D11.0-W		11	12	26	75	3	B	●
ALP-3E-D12.0-W		12	12	30	75	3	B	●
ALP-3E-D14.0-W		14	14	32	75	3	B	●
ALP-3E-D16.0-W		16	16	45	100	3	B	●
ALP-3E-D20.0-W		20	20	45	100	3	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

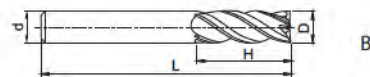
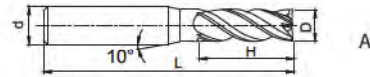
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill High-performance machining of Al and Al alloys**ALP-4E**

- Factory standard
- Centre cutting
- Helix angle 38°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade	
		D	d (h6)	H	L			KMD401	YK40F
ALP-4E-D3.0S		3	4	9	50	4	A	○	●
ALP-4E-D4.0S		4	4	11	50	4	B	○	●
ALP-4E-D3.0		3	6	9	50	4	A	●	●
ALP-4E-D4.0		4	6	11	50	4	A	●	●
ALP-4E-D5.0		5	6	13	50	4	A	●	●
ALP-4E-D6.0		6	6	16	50	4	B	●	●
ALP-4E-D8.0		8	8	20	60	4	B	●	●
ALP-4E-D10.0		10	10	25	75	4	B	●	●
ALP-4E-D12.0		12	12	30	75	4	B	●	●
ALP-4E-D16.0		16	16	45	100	4	B	●	●
ALP-4E-D18.0		18	18	45	100	4	B	●	○
ALP-4E-D20.0		20	20	45	100	4	B	●	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

System code > B268

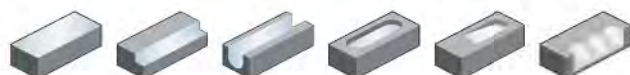
Cutting data > B436

Nonstandard order > B477

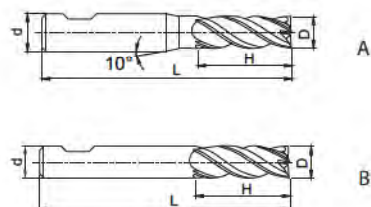
End mill

High-performance machining of Al and Al alloys

ALP-4E-W



- Factory standard with weldon clamping surface
- Centre cutting
- Helix angle 38°



Article	*	Dimensions [mm]				Teeth	Geometry	Grade
		D	d (h6)	H	L			KMD401
ALP-4E-D3.0-W		3	6	9	50	4	A	●
ALP-4E-D4.0-W		4	6	11	50	4	A	●
ALP-4E-D5.0-W		5	6	13	50	4	A	●
ALP-4E-D6.0-W		6	6	16	50	4	B	●
ALP-4E-D8.0-W		8	8	20	60	4	B	●
ALP-4E-D10.0-W		10	10	25	75	4	B	●
ALP-4E-D12.0-W		12	12	30	75	4	B	●
ALP-4E-D16.0-W		16	16	45	100	4	B	●
ALP-4E-D18.0-W		18	18	45	100	4	B	●
ALP-4E-D20.0-W		20	20	45	100	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

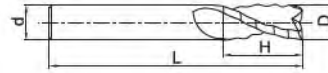
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill serrated teeth**General machining of Al and Al alloys****AL-3W**

- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		YK30F
AL-3W-D6.0		6	6	16	50	3	●
AL-3W-D8.0		8	8	20	60	3	●
AL-3W-D10.0		10	10	25	75	3	●
AL-3W-D12.0		12	12	30	75	3	●
AL-3W-D16.0		16	16	45	100	3	●
AL-3W-D20.0		20	20	45	100	3	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

A

Turning

B

Milling

C

Drilling

DTechnical
Information**E**

Index

System code > B268

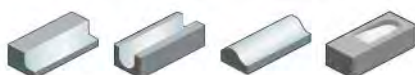
Cutting data > B436

Nonstandard order > B477

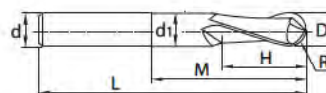
Ball nose cutter

High performance machining of heat-resistant alloys

5565R302NH



- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade
		D	R	d (h6)	d ₁	H	M	L		
5565R302NH-0300		3	1.5	6	2.8	6	9	57	2	●
5565R302NH-0400		4	2	6	3.7	8	12	57	2	●
5565R302NH-0500		5	2.5	6	4.6	10	15	57	2	●
5565R302NH-0600		6	3	6	5.5	12	20	57	2	●
5565R302NH-0800		8	4	8	7.4	16	26	63	2	●
5565R302NH-1000		10	5	10	9.2	20	31	72	2	●
5565R302NH-1200		12	6	12	11	24	37	83	2	●
5565R302NH-1600		16	8	16	15	32	43	92	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

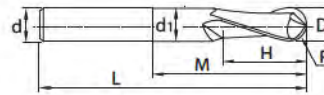
P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

Ball nose cutter long shank **High performance machining of heat-resistant alloys****5566R302NH**

- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade YK40F
		D	R	d (h6)	d ₁	H	M	L		
5566R302NH-0300		3	1.5	6	2.8	6	9	75	2	●
5566R302NH-0400		4	2	6	3.7	8	12	75	2	●
5566R302NH-0500		5	2.5	6	4.6	10	15	80	2	●
5566R302NH-0600		6	3	6	5.5	12	20	80	2	●
5566R302NH-0800		8	4	8	7.4	16	26	90	2	●
5566R302NH-1000		10	5	10	9.2	20	31	100	2	●
5566R302NH-1200		12	6	12	11	24	37	120	2	●
5566R302NH-1600		16	8	16	15	32	43	140	2	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

A

Turning

B

Milling

C

Drilling

D

Technical Information

E

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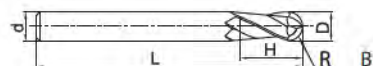
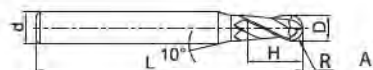
Ball nose cutter

General machining of Al and Al alloys

AL-2B



- Factory standard
- Centre cutting
- Helix angle 35°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		R	D	d (h6)	H	L			
AL-2B-R1.0		1	2	6	4	60	2	A	○
AL-2B-R1.5		1.5	3	6	6	60	2	A	○
AL-2B-R2.0		2	4	6	8	60	2	A	○
AL-2B-R2.5		2.5	5	6	10	60	2	A	○
AL-2B-R3.0		3	6	6	12	60	2	B	○
AL-2B-R4.0		4	8	8	16	75	2	B	○
AL-2B-R5.0		5	10	10	20	75	2	B	○
AL-2B-R6.0		6	12	12	24	75	2	B	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

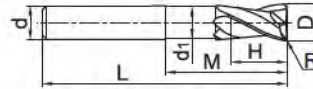
System code > B268

Cutting data > B436

Nonstandard order > B477

Torus mill**General machining of Al and Al alloys****AL-2R-AIR**

- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade YK40F
		R	D	d (h6)	d ₁	H	M	L		
AL-2R-D6.0R1.0-AIR		1	6	6	5.5	7	20	57	2	●
AL-2R-D8.0R1.0-AIR		1	8	8	7.4	9	26	63	2	●
AL-2R-D10.0R1.0-AIR		1	10	10	9.2	11	31	72	2	○
AL-2R-D10.0R2.0-AIR		2	10	10	9.2	11	31	72	2	○
AL-2R-D12.0R1.0-AIR		1	12	12	11	12	37	83	2	●
AL-2R-D12.0R2.0-AIR		2	12	12	11	12	37	83	2	○
AL-2R-D12.0R3.0-AIR		3	12	12	11	12	37	83	2	○
AL-2R-D16.0R1.0-AIR		1	16	16	15	16	43	92	2	○
AL-2R-D16.0R2.0-AIR		2	16	16	15	16	43	92	2	○
AL-2R-D16.0R3.0-AIR		3	16	16	15	16	43	92	2	○
AL-2R-D16.0R4.0-AIR		4	16	16	15	16	43	92	2	○
AL-2R-D20.0R1.0-AIR		1	20	20	19	20	53	104	2	●
AL-2R-D20.0R2.0-AIR		2	20	20	19	20	53	104	2	○
AL-2R-D20.0R3.0-AIR		3	20	20	19	20	53	104	2	○
AL-2R-D20.0R4.0-AIR		4	20	20	19	20	53	104	2	○
AL-2R-D20.0R5.0-AIR		5	20	20	19	20	53	104	2	●
AL-2R-D20.0R6.0-AIR		6	20	20	19	20	53	104	2	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



Torus mill long shank

General machining of Al and Al alloys

AL-2RL-AIR



- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade
		R	D	d (h6)	d ₁	H	M	L		
AL-2RL-D6.0R1.0-AIR		1	6	6	5.5	7	43	80	2	●
AL-2RL-D8.0R1.0-AIR		1	8	8	7.4	9	53	90	2	●
AL-2RL-D10.0R1.0-AIR		1	10	10	9.2	11	59	100	2	●
AL-2RL-D10.0R2.0-AIR		2	10	10	9.2	11	59	100	2	●
AL-2RL-D12.0R1.0-AIR		1	12	12	11	12	74	120	2	●
AL-2RL-D12.0R2.0-AIR		2	12	12	11	12	74	120	2	●
AL-2RL-D12.0R3.0-AIR		3	12	12	11	12	74	120	2	●
AL-2RL-D16.0R1.0-AIR		1	16	16	15	16	84	140	2	●
AL-2RL-D16.0R2.0-AIR		2	16	16	15	16	84	140	2	●
AL-2RL-D16.0R3.0-AIR		3	16	16	15	16	84	140	2	●
AL-2RL-D16.0R4.0-AIR		4	16	16	15	16	84	140	2	●
AL-2RL-D20.0R1.0-AIR		1	20	20	19	20	89	140	2	○
AL-2RL-D20.0R2.0-AIR		2	20	20	19	20	89	140	2	●
AL-2RL-D20.0R3.0-AIR		3	20	20	19	20	89	140	2	●
AL-2RL-D20.0R4.0-AIR		4	20	20	19	20	89	140	2	●
AL-2RL-D20.0R5.0-AIR		5	20	20	19	20	89	140	2	○
AL-2RL-D20.0R6.0-AIR		6	20	20	19	20	89	140	2	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

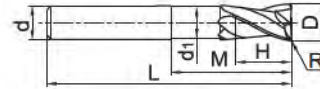
Nonstandard order > B477

End mill General machining of Al and Al alloys

ALG-2R



- Straight shank
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade	
		R	D	d (h6)	d ₁	H	M	L		KMD401	YK40F
ALG-2R-D6.0R0.3		0.3	6	6	5.7	8	16	75	2	●	●
ALG-2R-D6.0R0.5		0.5	6	6	5.7	8	16	75	2	●	●
ALG-2R-D6.0R1.0		1	6	6	5.7	8	16	75	2	●	●
ALG-2R-D8.0R0.3		0.3	8	8	7.4	10	20	75	2	●	●
ALG-2R-D8.0R0.5		0.5	8	8	7.4	10	20	75	2	●	●
ALG-2R-D8.0R1.0		1	8	8	7.4	10	20	75	2	●	●
ALG-2R-D10.0R0.5		0.5	10	10	9.4	12	35	100	2	●	●
ALG-2R-D10.0R1.0		1	10	10	9.4	12	35	100	2	●	●
ALG-2R-D10.0R1.6		1.6	10	10	9.4	12	35	100	2	●	●
ALG-2R-D10.0R2.5		2.5	10	10	9.4	12	35	100	2	●	●
ALG-2R-D12.0R0.5		0.5	12	12	11.4	15	35	100	2	●	●
ALG-2R-D12.0R1.0		1	12	12	11.4	15	35	100	2	●	●
ALG-2R-D12.0R1.6		1.6	12	12	11.4	15	35	100	2	●	●
ALG-2R-D12.0R2.5		2.5	12	12	11.4	15	35	100	2	●	●
ALG-2R-D12.0R3.2		3.2	12	12	11.4	15	35	100	2	●	●
ALG-2R-D12.0R4.0		4	12	12	11.4	15	35	100	2	●	●
ALG-2R-D16.0R1.0		1	16	16	15.4	15	45	125	2	●	●
ALG-2R-D16.0R1.6		1.6	16	16	15.4	15	45	125	2	●	●
ALG-2R-D16.0R2.5		2.5	16	16	15.4	15	45	125	2	●	●
ALG-2R-D16.0R3.2		3.2	16	16	15.4	15	45	125	2	●	●
ALG-2R-D16.0R4.0		4	16	16	15.4	15	45	125	2	●	●
ALG-2R-D16.0R6.3		6.3	16	16	15.4	15	45	125	2	○	○
ALG-2R-D20.0R1.0		1	20	20	18	20	50	125	2	●	●
ALG-2R-D20.0R1.6		1.6	20	20	18	20	50	125	2	●	●
ALG-2R-D20.0R2.5		2.5	20	20	18	20	50	125	2	●	●
ALG-2R-D20.0R3.2		3.2	20	20	18	20	50	125	2	●	●
ALG-2R-D20.0R4.0		4	20	20	18	20	50	125	2	●	●
ALG-2R-D20.0R6.3		6.3	20	20	18	20	50	125	2	○	○
ALG-2R-D25.0R6.3		6.3	25	25	23	25	75	150	2	○	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



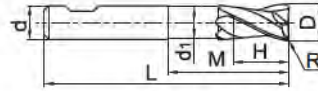
End mill

General machining of Al and Al alloys

ALG-2R-W



- Factory standard with weldon clamping surface
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade
		R	D	d (h6)	d ₁	H	M	L		
ALG-2R-D6.0R0.3-W		0.3	6	6		8		75	2	●
ALG-2R-D6.0R0.5-W		0.5	6	6		8		75	2	●
ALG-2R-D6.0R1.0-W		1	6	6		8		75	2	●
ALG-2R-D8.0R0.3-W		0.3	8	8		10		75	2	●
ALG-2R-D8.0R0.5-W		0.5	8	8		10		75	2	●
ALG-2R-D8.0R1.0-W		1	8	8		10		75	2	●
ALG-2R-D10.0R0.5-W		0.5	10	10		12		100	2	●
ALG-2R-D10.0R1.0-W		1	10	10		12		100	2	●
ALG-2R-D10.0R1.6-W		1.6	10	10		12		100	2	●
ALG-2R-D10.0R2.5-W		2.5	10	10		12		100	2	●
ALG-2R-D12.0R0.5-W		0.5	12	12		15		100	2	●
ALG-2R-D12.0R1.0-W		1	12	12		15		100	2	●
ALG-2R-D12.0R1.6-W		1.6	12	12		15		100	2	●
ALG-2R-D12.0R2.5-W		2.5	12	12		15		100	2	●
ALG-2R-D12.0R3.2-W		3.2	12	12		15		100	2	●
ALG-2R-D12.0R4.0-W		4	12	12		15		100	2	●
ALG-2R-D16.0R1.0-W		1	16	16		15		125	2	●
ALG-2R-D16.0R1.6-W		1.6	16	16		15		125	2	●
ALG-2R-D16.0R2.5-W		2.5	16	16		15		125	2	●
ALG-2R-D16.0R3.2-W		3.2	16	16		15		125	2	●
ALG-2R-D16.0R4.0-W		4	16	16		15		125	2	●
ALG-2R-D16.0R6.3-W		6.3	16	16		15		125	2	○
ALG-2R-D20.0R1.0-W		1	20	20		20		125	2	●
ALG-2R-D20.0R1.6-W		1.6	20	20		20		125	2	●
ALG-2R-D20.0R2.5-W		2.5	20	20		20		125	2	●
ALG-2R-D20.0R3.2-W		3.2	20	20		20		125	2	●
ALG-2R-D20.0R4.0-W		4	20	20		20		125	2	●
ALG-2R-D20.0R6.3-W		6.3	20	20		20		125	2	○
ALG-2R-D25.0R6.3-W		6.3	25	25		25		150	2	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

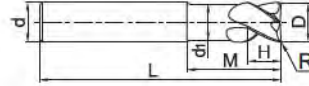
System code > B268

Cutting data > B436

Nonstandard order > B477

Torus mill**General machining of Al and Al alloys****AL-3R-AIR**

- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade
		R	D	d (h6)	d ₁	H	M	L		
AL-3R-D12.0R1.0-AIR		1	12	12	11	12	37	83	3	●
AL-3R-D12.0R2.0-AIR		2	12	12	11	12	37	83	3	●
AL-3R-D12.0R3.0-AIR		3	12	12	11	12	37	83	3	●
AL-3R-D16.0R1.0-AIR		1	16	16	15	16	43	92	3	●
AL-3R-D16.0R2.0-AIR		2	16	16	15	16	43	92	3	●
AL-3R-D16.0R3.0-AIR		3	16	16	15	16	43	92	3	●
AL-3R-D16.0R4.0-AIR		4	16	16	15	16	43	92	3	●
AL-3R-D20.0R1.0-AIR		1	20	20	19	20	53	104	3	●
AL-3R-D20.0R2.0-AIR		2	20	20	19	20	53	104	3	○
AL-3R-D20.0R3.0-AIR		3	20	20	19	20	53	104	3	○
AL-3R-D20.0R4.0-AIR		4	20	20	19	20	53	104	3	○
AL-3R-D20.0R5.0-AIR		5	20	20	19	20	53	104	3	●
AL-3R-D20.0R6.0-AIR		6	20	20	19	20	53	104	3	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

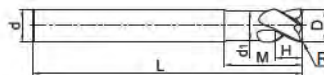
Torus mill long shank

General machining of Al and Al alloys

AL-3RL-AIR



- Factory standard
- Centre cutting
- Helix angle 30°



Article	*	Dimensions [mm]							Teeth	Grade
		R	D	d (h6)	d ₁	H	M	L		
AL-3RL-D12.0R1.0-AIR		1	12	12	11	12	74	120	3	●
AL-3RL-D12.0R2.0-AIR		2	12	12	11	12	74	120	3	●
AL-3RL-D12.0R3.0-AIR		3	12	12	11	12	74	120	3	●
AL-3RL-D16.0R1.0-AIR		1	16	16	15	16	84	140	3	●
AL-3RL-D16.0R2.0-AIR		2	16	16	15	16	84	140	3	○
AL-3RL-D16.0R3.0-AIR		3	16	16	15	16	84	140	3	●
AL-3RL-D16.0R4.0-AIR		4	16	16	15	16	84	140	3	●
AL-3RL-D20.0R1.0-AIR		1	20	20	19	20	89	140	3	●
AL-3RL-D20.0R2.0-AIR		2	20	20	19	20	89	140	3	○
AL-3RL-D20.0R3.0-AIR		3	20	20	19	20	89	140	3	○
AL-3RL-D20.0R4.0-AIR		4	20	20	19	20	89	140	3	○
AL-3RL-D20.0R5.0-AIR		5	20	20	19	20	89	140	3	○
AL-3RL-D20.0R6.0-AIR		6	20	20	19	20	89	140	3	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
			✓		

✓ Very suitable

✓ Suitable

HPC series

High Performance Cutter (HPC)

- For roughing and finishing of steel up to 55 HRC, stainless steel and cast iron.
- Geometry with unequal helix angle (38°/41°) and unequal pitch for smooth machining without vibrations.
- End mills and torus mills
- Diameter range 4.0–20.0 mm



5501R38414GM



5502R38414GM



5502R38414GM-R

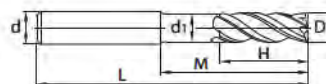


End mill HSC/HPC machining

5501R38414GM



- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	d ₁	H	M	L		
5501R38414GM-0400		4	6	3.7	8	16	54	4	●
5501R38414GM-0500		5	6	4.7	9	17	54	4	●
5501R38414GM-0600		6	6	5.7	10	18	54	4	●
5501R38414GM-0800		8	8	7.7	12	22	58	4	●
5501R38414GM-1000		10	10	9.5	14	26	66	4	●
5501R38414GM-1200		12	12	11.5	16	28	73	4	●
5501R38414GM-1400		14	14	13.5	18	30	75	4	●
5501R38414GM-1600		16	16	15.5	22	34	82	4	●
5501R38414GM-1800		18	18	17.5	24	36	84	4	●
5501R38414GM-2000		20	20	19.5	26	42	92	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

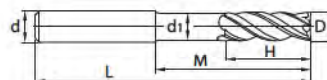
P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

End mill long cutting edge **HSC/HPC machining****5502R38414GM**

- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]						Teeth	Grade KMG405
		D	d (h6)	d ₁	H	M	L		
5502R38414GM-0400		4	6	3.7	11	19	57	4	●
5502R38414GM-0500		5	6	4.7	13	21	57	4	●
5502R38414GM-0600		6	6	5.7	13	21	57	4	●
5502R38414GM-0800		8	8	7.7	19	27	63	4	●
5502R38414GM-1000		10	10	9.5	22	32	72	4	●
5502R38414GM-1200		12	12	11.5	26	38	83	4	●
5502R38414GM-1400		14	14	13.5	26	38	83	4	●
5502R38414GM-1600		16	16	15.5	32	44	92	4	●
5502R38414GM-1800		18	18	17.5	32	44	92	4	●
5502R38414GM-2000		20	20	19.5	38	54	104	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

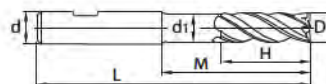
✓ Suitable

End mill HSC/HPC machining

5601R38414GM



- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	d ₁	H	M	L		
5601R38414GM-0400		4	6	3.7	8	16	54	4	●
5601R38414GM-0500		5	6	4.7	9	17	54	4	●
5601R38414GM-0600		6	6	5.7	10	18	54	4	●
5601R38414GM-0800		8	8	7.7	12	22	58	4	●
5601R38414GM-1000		10	10	9.5	14	26	66	4	●
5601R38414GM-1200		12	12	11.5	16	28	73	4	●
5601R38414GM-1400		14	14	13.5	18	30	75	4	●
5601R38414GM-1600		16	16	15.5	22	34	82	4	●
5601R38414GM-1800		18	18	17.5	24	36	84	4	●
5601R38414GM-2000		20	20	19.5	26	42	92	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

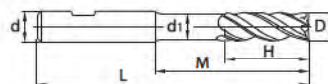
P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

End mill long cutting edge HSC/HPC machining**5602R38414GM**

- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]						Teeth	Grade KMG405
		D	d (h6)	d ₁	H	M	L		
5602R38414GM-0300L		3	6	2.7	6.5	15	58	4	○
5602R38414GM-0400L		4	6	3.7	8.5	20	62	4	○
5602R38414GM-0400		4	6	3.7	11	19	57	4	●
5602R38414GM-0500		5	6	4.7	13	21	57	4	●
5602R38414GM-0500L		5	6	4.7	10.5	25	70	4	○
5602R38414GM-0600L		6	6	5.7	13	30	70	4	○
5602R38414GM-0600		6	6	5.7	13	21	57	4	●
5602R38414GM-0800		8	8	7.7	19	27	63	4	●
5602R38414GM-0800L		8	8	7.7	17	40	80	4	○
5602R38414GM-1000		10	10	9.5	22	32	72	4	●
5602R38414GM-1000L		10	10	9.5	21	50	94	4	○
5602R38414GM-1200		12	12	11.5	26	38	83	4	●
5602R38414GM-1200L		12	12	11.5	25	60	109	4	○
5602R38414GM-1400		14	14	13.5	26	38	83	4	●
5602R38414GM-1600L		16	16	15.5	33	80	132	4	○
5602R38414GM-1600		16	16	15.5	32	44	92	4	●
5602R38414GM-1800		18	18	17.5	32	44	92	4	●
5602R38414GM-2000		20	20	19.5	38	54	104	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

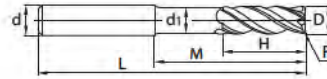
✓ Suitable

Torus mill long cutting edge HSC/HPC machining

5502R38414GM-R



- Type of shank DIN 6535HA
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]							Teeth	Grade
		D	R	d (h6)	d ₁	H	M	L		
5502R38414GM-R02-0400		4	0.2	6	3.7	11	19	57	4	●
5502R38414GM-R05-0400		4	0.5	6	3.7	11	19	57	4	●
5502R38414GM-R02-0500		5	0.2	6	4.7	13	21	57	4	●
5502R38414GM-R05-0500		5	0.5	6	4.7	13	21	57	4	●
5502R38414GM-R02-0600		6	0.2	6	5.7	13	21	57	4	●
5502R38414GM-R05-0600		6	0.5	6	5.7	13	21	57	4	●
5502R38414GM-R10-0600		6	1	6	5.7	13	21	57	4	●
5502R38414GM-R02-0800		8	0.2	8	7.7	19	27	63	4	●
5502R38414GM-R05-0800		8	0.5	8	7.7	19	27	63	4	●
5502R38414GM-R10-0800		8	1	8	7.7	19	27	63	4	●
5502R38414GM-R15-0800		8	1.5	8	7.7	19	27	63	4	●
5502R38414GM-R20-0800		8	2	8	7.7	19	27	63	4	●
5502R38414GM-R02-1000		10	0.2	10	9.5	22	32	72	4	●
5502R38414GM-R05-1000		10	0.5	10	9.5	22	32	72	4	●
5502R38414GM-R10-1000		10	1	10	9.5	22	32	72	4	●
5502R38414GM-R15-1000		10	1.5	10	9.5	22	32	72	4	●
5502R38414GM-R20-1000		10	2	10	9.5	22	32	72	4	●
5502R38414GM-R05-1200		12	0.5	12	11.5	26	38	83	4	●
5502R38414GM-R10-1200		12	1	12	11.5	26	38	83	4	●
5502R38414GM-R15-1200		12	1.5	12	11.5	26	38	83	4	●
5502R38414GM-R20-1200		12	2	12	11.5	26	38	83	4	●
5502R38414GM-R10-1600		16	1	16	15.5	32	44	92	4	●
5502R38414GM-R15-1600		16	1.5	16	15.5	32	44	92	4	●
5502R38414GM-R20-1600		16	2	16	15.5	32	44	92	4	●
5502R38414GM-R30-1600		16	3	16	15.5	32	44	92	4	●
5502R38414GM-R10-2000		20	1	20	19.5	38	54	104	4	●
5502R38414GM-R15-2000		20	1.5	20	19.5	38	54	104	4	●
5502R38414GM-R20-2000		20	2	20	19.5	38	54	104	4	●
5502R38414GM-R30-2000		20	3	20	19.5	38	54	104	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

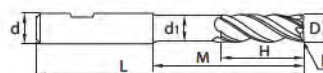
System code > B268

Cutting data > B436

Nonstandard order > B477

Torus mill long cutting edge HSC/HPC machining**5602R38414GM-R**

- Type of shank: DIN 6535HB
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]							Teeth	Grade KMG405
		D	R	d (h6)	d ₁	H	M	L		
5602R38414GM-R02-0400		4	0.2	6	3.7	11	19	57	4	●
5602R38414GM-R05-0400		4	0.5	6	3.7	11	19	57	4	●
5602R38414GM-R02-0500		5	0.2	6	4.7	13	21	57	4	●
5602R38414GM-R05-0500		5	0.5	6	4.7	13	21	57	4	●
5602R38414GM-R02-0600		6	0.2	6	5.7	13	21	57	4	●
5602R38414GM-R05-0600		6	0.5	6	5.7	13	21	57	4	●
5602R38414GM-R10-0600		6	1	6	5.7	13	21	57	4	●
5602R38414GM-R02-0800		8	0.2	8	7.7	19	27	63	4	●
5602R38414GM-R05-0800		8	0.5	8	7.7	19	27	63	4	●
5602R38414GM-R10-0800		8	1	8	7.7	19	27	63	4	●
5602R38414GM-R15-0800		8	1.5	8	7.7	19	27	63	4	●
5602R38414GM-R20-0800		8	2	8	7.7	19	27	63	4	●
5602R38414GM-R02-1000		10	0.2	10	9.5	22	32	72	4	●
5602R38414GM-R05-1000		10	0.5	10	9.5	22	32	72	4	●
5602R38414GM-R10-1000		10	1	10	9.5	22	32	72	4	●
5602R38414GM-R15-1000		10	1.5	10	9.5	22	32	72	4	●
5602R38414GM-R20-1000		10	2	10	9.5	22	32	72	4	●
5602R38414GM-R05-1200		12	0.5	12	11.5	26	38	83	4	●
5602R38414GM-R10-1200		12	1	12	11.5	26	38	83	4	●
5602R38414GM-R15-1200		12	1.5	12	11.5	26	38	83	4	●
5602R38414GM-R20-1200		12	2	12	11.5	26	38	83	4	●
5602R38414GM-R10-1600		16	1	16	15.5	32	44	92	4	●
5602R38414GM-R15-1600		16	1.5	16	15.5	32	44	92	4	●
5602R38414GM-R20-1600		16	2	16	15.5	32	44	92	4	●
5602R38414GM-R30-1600		16	3	16	15.5	32	44	92	4	●
5602R38414GM-R10-2000		20	1	20	19.5	38	54	104	4	●
5602R38414GM-R15-2000		20	1.5	20	19.5	38	54	104	4	●
5602R38414GM-R20-2000		20	2	20	19.5	38	54	104	4	●
5602R38414GM-R30-2000		20	3	20	19.5	38	54	104	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



Notes

A

Turning

B

Milling

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UM series

High Speed Cutter (HSC)

- For roughing and finishing of steel up to 55 HRC, stainless steel and cast iron with high metal removal rate.
- Optimised geometry with unequal helix angle (38°/41°) and unequal pitch.
- End mills and torus mills
- Diameter range 4.0–20.0 mm

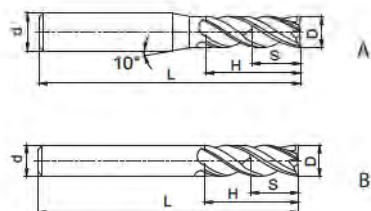


End mill HSC/HPC machining

UM-4E



- Factory standard
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		D	d (h6)	H	L	S			
UM-4E-D4.0S		4	4	11	50	6	4	B	●
UM-4E-D4.0		4	6	11	50	6	4	A	●
UM-4E-D4.5		4.5	6	11	50	6.75	4	A	●
UM-4E-D5.0		5	6	13	50	7.5	4	A	●
UM-4E-D5.5		5.5	6	16	50	8.25	4	A	●
UM-4E-D6.0		6	6	16	50	9	4	B	●
UM-4E-D7.0		7	8	20	60	10.5	4	A	●
UM-4E-D8.0		8	8	20	60	12	4	B	●
UM-4E-D9.0		9	10	22	75	13.5	4	A	●
UM-4E-D10.0		10	10	25	75	15	4	B	●
UM-4E-D11.0		11	12	26	75	16.5	4	A	●
UM-4E-D12.0		12	12	30	75	18	4	B	●
UM-4E-D14.0		14	14	32	75	21	4	B	●
UM-4E-D16.0		16	16	45	100	24	4	B	●
UM-4E-D18.0		18	18	45	100	27	4	B	●
UM-4E-D20.0		20	20	45	100	30	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

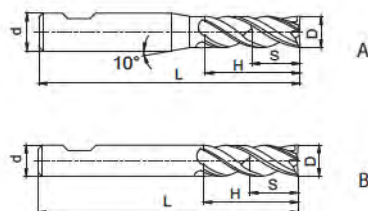
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill **HSC/HPC machining**
UM-4E-W


- Factory standard with weldon clamping surface
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG405
		D	d (h6)	H	L	S			
UM-4E-D4.0-W		4	6	11	50	6	4	A	●
UM-4E-D4.5-W		4.5	6	11	50	6.75	4	A	●
UM-4E-D5.0-W		5	6	13	50	7.5	4	A	●
UM-4E-D5.5-W		5.5	6	16	50	8.25	4	A	●
UM-4E-D6.0-W		6	6	16	50	9	4	B	●
UM-4E-D7.0-W		7	8	20	60	10.5	4	A	●
UM-4E-D8.0-W		8	8	20	60	12	4	B	●
UM-4E-D9.0-W		9	10	22	75	13.5	4	A	●
UM-4E-D10.0-W		10	10	25	75	15	4	B	●
UM-4E-D11.0-W		11	12	26	75	16.5	4	A	●
UM-4E-D12.0-W		12	12	30	75	18	4	B	●
UM-4E-D14.0-W		14	14	32	75	21	4	B	●
UM-4E-D16.0-W		16	16	45	100	24	4	B	●
UM-4E-D18.0-W		18	18	45	100	27	4	B	●
UM-4E-D20.0-W		20	20	45	100	30	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

- ✓ Very suitable
- ✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



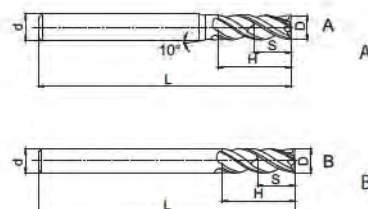
A

End mill long cutting edge HSC/HPC machining

UM-4EL



- Factory standard
- Centre cutting
- Helix angle 38°/41°



Turning

B

Milling

C

Drilling

D

Technical
Information

E

Index

Article	*	Dimensions [mm]					Teeth	Geometry	Grade
		D	d (h6)	H	L	S			
UM-4EL-D4.0		4	6	15	75	6	4	A	●
UM-4EL-D5.0		5	6	20	75	7.5	4	A	●
UM-4EL-D6.0		6	6	20	75	9	4	B	●
UM-4EL-D8.0		8	8	25	100	12	4	B	●
UM-4EL-D10.0		10	10	30	100	15	4	B	●
UM-4EL-D12.0		12	12	35	100	18	4	B	●
UM-4EL-D14.0		14	14	40	100	21	4	B	●
UM-4EL-D16.0		16	16	50	150	24	4	B	●
UM-4EL-D20.0		20	20	55	150	30	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

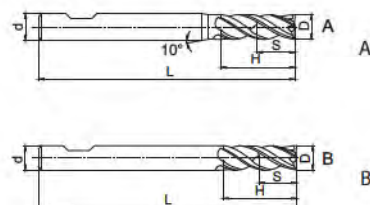
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill long cutting edge **HSC/HPC machining**
UM-4EL-W


- Factory standard with weldon clamping surface
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]					Teeth	Geometry	Grade KMG405
		D	d (h6)	H	L	S			
UM-4EL-D4.0-W		4	6	15	75	6	4	A	●
UM-4EL-D5.0-W		5	6	20	75	7.5	4	A	●
UM-4EL-D6.0-W		6	6	20	75	9	4	B	●
UM-4EL-D8.0-W		8	8	25	100	12	4	B	●
UM-4EL-D10.0-W		10	10	30	100	15	4	B	●
UM-4EL-D12.0-W		12	12	35	100	18	4	B	●
UM-4EL-D14.0-W		14	14	40	100	21	4	B	●
UM-4EL-D16.0-W		16	16	50	150	24	4	B	●
UM-4EL-D20.0-W		20	20	55	150	30	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



End mill reduced neck HSC/HPC machining

UM-4ELP-W



- Factory standard with weldon clamping surface
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]						Teeth	Grade
		D	d (h6)	d ₁	H	M	L		
UM-4ELP-D4.0-W		4	6	3.8	15	36	75	4	●
UM-4ELP-D5.0-W		5	6	4.8	20	36	75	4	●
UM-4ELP-D6.0-W		6	6	5.7	20	36	75	4	●
UM-4ELP-D8.0-W		8	8	7.7	25	60	100	4	●
UM-4ELP-D10.0-W		10	10	9.5	30	55	100	4	●
UM-4ELP-D12.0-W		12	12	11.5	35	50	100	4	●
UM-4ELP-D14.0-W		14	14	13.5	40	50	100	4	●
UM-4ELP-D16.0-W		16	16	15.5	50	100	150	4	●
UM-4ELP-D20.0-W		20	20	19.5	55	98	150	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

- ✓ Very suitable
- ✓ Suitable

End mill short cutting edge **HSC/HPC machining**
UM-4EFP


- Factory standard
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]						Teeth	Grade KMG405
		D	d (h6)	d ₁	H	M	L		
UM-4EFP-D6.0		6	6	5.8	9	30	75	4	●
UM-4EFP-D8.0		8	8	7.8	12	40	100	4	●
UM-4EFP-D10.0		10	10	9.6	15	50	100	4	●
UM-4EFP-D12.0		12	12	11.5	18	50	100	4	●
UM-4EFP-D16.0		16	16	15.5	24	50	150	4	●
UM-4EFP-D20.0		20	20	19.5	30	60	150	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477



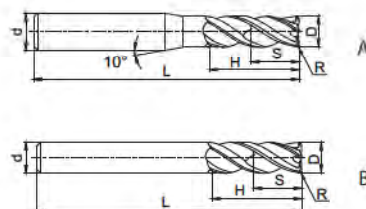
Torus mill

HSC/HPC machining

UM-4R



- Factory standard
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]						Teeth	Geometry	Grade
		R	D	d (h6)	H	L	S			
UM-4R-D4.0R0.3		0.3	4	6	10	50	6	4	A	●
UM-4R-D4.0R0.5		0.5	4	6	10	50	6	4	A	●
UM-4R-D5.0R0.5		0.5	5	6	13	50	7.5	4	A	●
UM-4R-D5.0R1.0		1	5	6	13	50	7.5	4	A	●
UM-4R-D6.0R0.5		0.5	6	6	16	50	9	4	B	●
UM-4R-D6.0R1.0		1	6	6	16	50	9	4	B	●
UM-4R-D8.0R0.5		0.5	8	8	20	60	12	4	B	●
UM-4R-D8.0R1.0		1	8	8	20	60	12	4	B	●
UM-4R-D10.0R0.5		0.5	10	10	25	75	15	4	B	●
UM-4R-D10.0R1.0		1	10	10	25	75	15	4	B	●
UM-4R-D10.0R2.0		2	10	10	25	75	15	4	B	●
UM-4R-D10.0R3.0		3	10	10	25	75	15	4	B	●
UM-4R-D12.0R0.5		0.5	12	12	30	75	18	4	B	●
UM-4R-D12.0R1.0		1	12	12	30	75	18	4	B	●
UM-4R-D12.0R2.0		2	12	12	30	75	18	4	B	●
UM-4R-D12.0R3.0		3	12	12	30	75	18	4	B	●
UM-4R-D16.0R1.0		1	16	16	45	100	24	4	B	●
UM-4R-D16.0R2.0		2	16	16	45	100	24	4	B	●
UM-4R-D16.0R3.0		3	16	16	45	100	24	4	B	●
UM-4R-D20.0R1.0		1	20	20	45	100	30	4	B	●
UM-4R-D20.0R2.0		2	20	20	45	100	30	4	B	●
UM-4R-D20.0R3.0		3	20	20	45	100	30	4	B	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

Torus mill long shank HSC/HPC machining
UM-4RL


- Factory standard
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]						Teeth	Grade KMG405
		R	D	d (h6)	H	L	S		
UM-4RL-D6.0R0.5		0.5	6	6	16	75	9	4	●
UM-4RL-D6.0R1.0		1	6	6	16	75	9	4	●
UM-4RL-D8.0R0.5		0.5	8	8	20	100	12	4	●
UM-4RL-D8.0R1.0		1	8	8	20	100	12	4	●
UM-4RL-D10.0R0.5		0.5	10	10	25	100	15	4	●
UM-4RL-D10.0R1.0		1	10	10	25	100	15	4	●
UM-4RL-D10.0R2.0		2	10	10	25	100	15	4	●
UM-4RL-D12.0R0.5		0.5	12	12	30	100	18	4	●
UM-4RL-D12.0R1.0		1	12	12	30	100	18	4	●
UM-4RL-D12.0R2.0		2	12	12	30	100	18	4	●
UM-4RL-D16.0R1.0		1	16	16	45	150	24	4	●
UM-4RL-D16.0R2.0		2	16	16	45	150	24	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

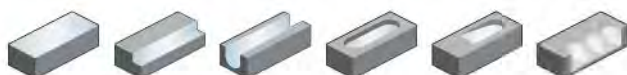


A

Turning

Torus mill short cutting edge **HSC/HPC machining**

UM-4RFP



- Factory standard
- Centre cutting
- Helix angle 38°/41°



B

Milling

Article	*	Dimensions [mm]							Teeth	Grade
		R	D	d (h6)	d ₁	H	M	L		
UM-4RFP-D6.0R0.5		0.5	6	6	5.8	6	18	75	4	●
UM-4RFP-D6.0R1.0		1	6	6	5.8	6	18	75	4	●
UM-4RFP-D8.0R0.5		0.5	8	8	7.7	8	24	100	4	●
UM-4RFP-D8.0R1.0		1	8	8	7.7	8	24	100	4	●
UM-4RFP-D10.0R0.5		0.5	10	10	9.6	10	30	100	4	●
UM-4RFP-D10.0R1.0		1	10	10	9.6	10	30	100	4	●
UM-4RFP-D10.0R2.0		2	10	10	9.6	10	30	100	4	●
UM-4RFP-D12.0R0.5		0.5	12	12	11.5	12	36	100	4	●
UM-4RFP-D12.0R1.0		1	12	12	11.5	12	36	100	4	●
UM-4RFP-D12.0R2.0		2	12	12	11.5	12	36	100	4	●
UM-4RFP-D16.0R1.0		1	16	16	15.5	16	40	150	4	●
UM-4RFP-D16.0R2.0		2	16	16	15.5	16	40	150	4	●

● Ex stock ○ On demand

* With internal cooling

C

Drilling

Application field

P	M	K	N	S	H
✓	✓	✓			✓

✓ Very suitable

✓ Suitable

D

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System code > B268

Cutting data > B436

Nonstandard order > B477



VSM series

With sharp cutting edge for heat-resistant alloys

- For roughing and finishing of steel, stainless steel and heat-resistant alloys with high metal removal rates.
- Sharp cutting edge with unequal helix angle (38°/41°) and unequal pitch.
- Smooth machining without vibrations.
- End mills and torus mills
- Diameter range 4.0–20.0 mm

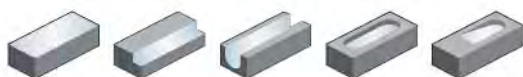


A

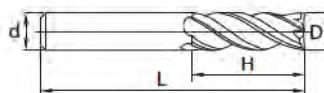
Turning

End mill **General machining of heat-resistant alloys**

VSM-4E



- Factory standard
- Centre cutting
- Helix angle 38°/41°



B

Milling

Article	*	Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		KMG405
VSM-4E-D4.0		4	6	11	50	4	●
VSM-4E-D5.0		5	6	13	50	4	●
VSM-4E-D6.0		6	6	16	50	4	●
VSM-4E-D8.0		8	8	20	60	4	●
VSM-4E-D10.0		10	10	25	75	4	●
VSM-4E-D12.0		12	12	30	75	4	●
VSM-4E-D16.0		16	16	45	100	4	●
VSM-4E-D20.0		20	20	45	100	4	●

● Ex stock ○ On demand

* With internal cooling

C

Drilling

Application field

P	M	K	N	S	H
✓	✓			✓	

- ✓ Very suitable
- ✓ Suitable

D

Technical Information

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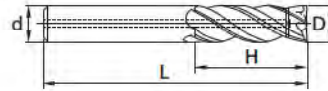
System code > B268

Cutting data > B436

Nonstandard order > B477

End mill **General machining of heat-resistant alloys**
VSM-4E-C


- Factory standard
- Coolant exit, radial
- Centre cutting
- Helix angle 38°/41°



Article		Dimensions [mm]				Teeth	Grade
		D	d (h6)	H	L		KMG405
VSM-4E-C-D10.0	*	10	10	25	75	4	○
VSM-4E-C-D12.0	*	12	12	30	75	4	○
VSM-4E-C-D16.0	*	16	16	45	100	4	○
VSM-4E-C-D20.0	*	20	20	45	100	4	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓			✓	

✓ Very suitable

✓ Suitable

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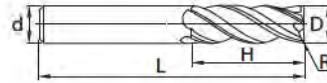
Torus mill

General machining of heat-resistant alloys

VSM-4R



- Factory standard
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]					Teeth	Grade
		D	R	d (h6)	H	L		
VSM-4R-D4.0R0.2		4	0.2	6	11	50	4	●
VSM-4R-D4.0R0.5		4	0.5	6	11	50	4	●
VSM-4R-D5.0R0.2		5	0.2	6	13	50	4	●
VSM-4R-D5.0R0.5		5	0.5	6	13	50	4	●
VSM-4R-D6.0R0.2		6	0.2	6	16	50	4	●
VSM-4R-D6.0R0.5		6	0.5	6	16	50	4	●
VSM-4R-D6.0R1.0		6	1	6	16	50	4	●
VSM-4R-D6.0R1.5		6	1.5	6	16	50	4	●
VSM-4R-D8.0R0.5		8	0.5	8	20	63	4	●
VSM-4R-D8.0R0.8		8	0.8	8	20	63	4	●
VSM-4R-D8.0R1.0		8	1	8	20	63	4	●
VSM-4R-D8.0R1.5		8	1.5	8	20	63	4	●
VSM-4R-D8.0R2.0		8	2	8	20	63	4	●
VSM-4R-D10.0R0.5		10	0.5	10	25	75	4	●
VSM-4R-D10.0R0.8		10	0.8	10	25	75	4	●
VSM-4R-D10.0R1.0		10	1	10	25	75	4	●
VSM-4R-D10.0R1.5		10	1.5	10	25	75	4	●
VSM-4R-D10.0R2.0		10	2	10	25	75	4	●
VSM-4R-D12.0R0.5		12	0.5	12	30	75	4	●
VSM-4R-D12.0R0.8		12	0.8	12	30	75	4	●
VSM-4R-D12.0R1.0		12	1	12	30	75	4	●
VSM-4R-D12.0R1.5		12	1.5	12	30	75	4	●
VSM-4R-D12.0R2.0		12	2	12	30	75	4	●
VSM-4R-D12.0R2.5		12	2.5	12	30	75	4	●
VSM-4R-D12.0R3.0		12	3	12	30	75	4	●
VSM-4R-D12.0R4.0		12	4	12	30	75	4	●
VSM-4R-D16.0R0.5		16	0.5	16	45	100	4	●
VSM-4R-D16.0R0.8		16	0.8	16	45	100	4	●
VSM-4R-D16.0R1.0		16	1	16	45	100	4	●
VSM-4R-D16.0R1.5		16	1.5	16	45	100	4	●
VSM-4R-D16.0R2.0		16	2	16	45	100	4	●
VSM-4R-D16.0R2.5		16	2.5	16	45	100	4	●
VSM-4R-D16.0R3.0		16	3	16	45	100	4	●
VSM-4R-D16.0R4.0		16	4	16	45	100	4	●
VSM-4R-D20.0R0.5		20	0.5	20	45	100	4	●
VSM-4R-D20.0R1.0		20	1	20	45	100	4	●
VSM-4R-D20.0R1.5		20	1.5	20	45	100	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓			✓	

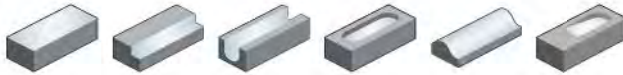
✓ Very suitable

✓ Suitable

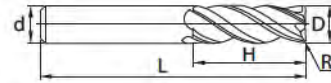
System code > B268

Cutting data > B436

Nonstandard order > B477

Torus mill **General machining of heat-resistant alloys**
VSM-4R


- Factory standard
- Centre cutting
- Helix angle 38°/41°



Article	*	Dimensions [mm]					Teeth	Grade
		D	R	d (h6)	H	L		KMG405
VSM-4R-D20.0R2.0		20	2	20	45	100	4	●
VSM-4R-D20.0R2.5		20	2.5	20	45	100	4	●
VSM-4R-D20.0R3.0		20	3	20	45	100	4	●
VSM-4R-D20.0R4.0		20	4	20	45	100	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓			✓	

✓ Very suitable

✓ Suitable

System code > B268

Cutting data > B436

Nonstandard order > B477

Notes

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FM series

Deburring Cutter



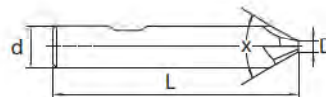
Deburring cutter 60°

General machining

5501/5601R60*FM



- Type of shank DIN 6535HA
- Type of shank: DIN 6535HB
- Non-centre cutting
- Helix angle 0°



Article	*	Dimensions [mm]					Teeth	Grade
		d(h6)	L	D	Shank	X		KMG303
5501R603FM-0300		3	48	0.2	HA	60	3	●
5501R604FM-0400		4	48	0.2	HA	60	4	●
5601R604FM-0600		6	55	0.2	HB	60	4	●
5601R604FM-0800		8	58	0.5	HB	60	4	●
5601R604FM-1000		10	65	0.5	HB	60	4	●
5601R606FM-1000		10	65	0.7	HB	60	6	○
5601R604FM-1200		12	75	0.5	HB	60	4	●
5601R606FM-1200		12	75	0.7	HB	60	6	○
5601R604FM-1600		16	85	0.7	HB	60	4	●
5601R606FM-1600		16	85	0.7	HB	60	6	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓	✓		

✓ Very suitable

✓ Suitable

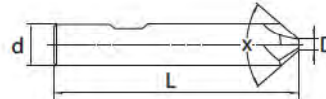
Deburring cutter 90°

General machining

5501/5601R90*FM



- Type of shank DIN 6535HA
- Type of shank: DIN 6535HB
- Non-centre cutting
- Helix angle 0°



Article	*	Dimensions [mm]					Teeth	Grade
		d(h6)	L	D	Shank	X		KMG303
5501R903FM-0300		3	48	0.2	HA	90	3	●
5501R904FM-0400		4	48	0.2	HA	90	4	●
5601R904FM-0600		6	55	0.2	HB	90	4	●
5601R904FM-0800		8	58	0.5	HB	90	4	●
5601R904FM-1000		10	65	0.5	HB	90	4	●
5601R906FM-1000		10	65	0.7	HB	90	6	○
5601R904FM-1200		12	75	0.5	HB	90	4	●
5601R906FM-1200		12	75	0.7	HB	90	6	○
5601R904FM-1600		16	85	0.7	HB	90	4	●
5601R906FM-1600		16	85	0.7	HB	90	6	○

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓	✓		

✓ Very suitable

✓ Suitable

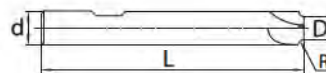
Quarter round profile mill

General machining

5601R90*FM-R



- Type of shank: DIN 6535HB
- Non-centre cutting
- Helix angle 0°



Article	*	Dimensions [mm]				Teeth	Grade KMG303
		d(h6)	L	D	R		
5601R904FM-R02-0600		6	60	5.6	0.2	4	●
5601R904FM-R03-0600		6	60	5.4	0.3	4	●
5601R904FM-R04-0600		6	60	5.2	0.4	4	●
5601R904FM-R05-0800		8	70	7	0.5	4	●
5601R904FM-R06-0800		8	70	6.8	0.6	4	●
5601R904FM-R075-0800		8	70	6.5	0.75	4	●
5601R904FM-R08-0800		8	70	6.4	0.8	4	●
5601R904FM-R10-0800		8	70	6	1	4	●
5601R904FM-R15-1000		10	75	7	1.5	4	●
5601R904FM-R20-1000		10	75	6	2	4	●
5601R904FM-R25-1200		12	75	7	2.5	4	●
5601R904FM-R30-1200		12	75	6	3	4	●
5601R904FM-R40-1600		16	80	8	4	4	●
5601R904FM-R50-2000		20	80	10	5	4	●

● Ex stock ○ On demand

* With internal cooling

Application field

P	M	K	N	S	H
✓	✓	✓	✓		

✓ Very suitable

✓ Suitable

[illegible]

Turning

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Guide for recommended cutting data – solid carbide milling

End mill – GM series

1	Material group	Composition / structure / heat treatment	hardness HB	Machining group	Starting values for cutting speed v_c [m/min]									
					5501R302GM 5601R302GM 5502R302GM 5602R302GM				GM-2E GM-2EFP GM-2F					
					Slot milling		Shoulder milling		Slot milling		Shoulder milling			
					$\varnothing$ [mm]	$a_{p\max}$	$\varnothing$ [mm]	$a_{e\max}$	$\varnothing$ [mm]	$a_{p\max}$	$\varnothing$ [mm]	$a_{e\max}$		
					$0 < x \leq 3$	$0,1 \times D$	$0 < x \leq 20$	$< 0,5 \times D$	$0 < x \leq 3$	$0,1 \times D$	$0 < x \leq 20$	$< 0,5 \times D$		
					$3 \leq x \leq 20$	$0,8 \times D$			$3 \leq x \leq 20$	$0,8 \times D$				
					KMG303				KMG303					
					a_p / D				a_p / D					
						1/1	1/2	1/10	f-group		1/1	1/2	1/10	f-group
P	Unalloyed steel	ca. 0,15 % C	annealed	125	1	150	200	270	2	150	200	270	2	
		ca. 0,45 % C	annealed	190	2	185	190	260	2	145	190	260	2	
		ca. 0,45 % C	tempered	250	3	175	140	190	2	155	140	190	2	
		ca. 0,75 % C	annealed	270	4	90	120	165	2	90	120	165	2	
		ca. 0,75 % C	tempered	300	5	85	110	150	2	85	110	150	2	
	Low-alloyed steel		annealed	180	6	115	150	205	2	115	150	205	2	
			tempered	275	7	90	120	165	2	90	120	165	2	
			tempered	300	8	85	110	150	2	85	110	150	2	
			tempered	350	9	80	105	145	2	80	105	145	2	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	105	140	190	2	105	140	190	2	
			hardened and tempered	325	11	80	110	145	2	80	110	145	2	
M	Stainless steel	ferritic/martensitic	annealed	200	12	50	65	90	2	50	65	90	2	
		martensitic	tempered	240	13	45	60	80	2	45	60	80	2	
		austenitic	quench hardened	180	14	55	70	95	2	55	70	95	2	
		austenitic-ferritic		230	15	45	60	80	2	45	60	80	2	
K	Grey cast iron	perlitic/ferritic		180	16	110	150	200	2	110	150	200	2	
		perlitic (martensitic)		260	17	90	120	165	2	90	120	165	2	
	Cast iron with spheroidal graphite	ferritic		160	18	135	180	245	2	135	180	245	2	
		perlitic		250	19	105	140	190	2	105	140	190	2	
	Malleable cast iron	ferritic		130	20	150	200	270	2	150	200	270	2	
perlitic			230	21	120	160	220	2	120	160	220	2		
N	Aluminium wrought alloys	cannot be hardened		60	22									
		hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24									
		$\leq 12\%$ 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 B450
For examples of material for cutting tool groups view page D22.

Recommend feed rate

Solid carbide milling group 2 – Square shoulder mills GM series

4	a_p [mm]	Feed rate per cutting edge (f_z) [mm]															
		Ø0,5	Ø0,8	Ø1	Ø2	Ø3	Ø4	Ø5	Ø6	Ø8	Ø10	Ø12	Ø14	Ø16	Ø18	Ø20	
P	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09	
	1/2	0,01	0,03	0,03	0,03	0,03	0,03	0,04	0,04	0,05	0,08	0,09	0,09	0,10	0,10	0,12	
M	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,06	0,06	0,08	0,12	0,14	0,14	0,16	0,16	0,18	
	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,03	0,05	0,06	0,06	0,06	0,06	0,07	
K	1/2	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09	
	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,06	0,06	0,08	0,12	0,14	0,14	0,16	0,16	0,18	

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

1. Select the appropriate product series.
2. Determine the immersion.
3. Select the used material and read the cutting speed.
4. Determine the feed rate group and have a look at the appropriate feed rate recommendations.
5. Select the diameter of tool and determine the immersion.

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End mill – GM series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
						5501R302GM 5601R302GM 5502R302GM 5602R302GM				GM-2E GM-2EFP GM-2F				
						Slot milling		Shoulder milling		Slot milling		Shoulder milling		
						$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$	$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$	
						$0 < x < 3$	$0,1 \times D$	$0 < x \leq 20$	$< 0,5 \times D$	$0 < x < 3$	$0,1 \times D$	$0 < x \leq 20$	$< 0,5 \times D$	
						$3 \leq x \leq 20$	$0,8 \times D$			$3 \leq x \leq 20$	$0,8 \times D$			
						KMG303				KMG303				
a_e / D				a_e / D										
1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group							
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	150	200	270	2	150	200	270	2	
		approx. 0,45 % C	annealed	190	2	145	190	260	2	145	190	260	2	
		approx. 0,45 % C	tempered	250	3	105	140	190	2	105	140	190	2	
		approx. 0,75 % C	annealed	270	4	90	120	165	2	90	120	165	2	
		approx. 0,75 % C	tempered	300	5	85	110	150	2	85	110	150	2	
	Low-alloyed steel		annealed	180	6	115	150	205	2	115	150	205	2	
			tempered	275	7	90	120	165	2	90	120	165	2	
			tempered	300	8	85	110	150	2	85	110	150	2	
			tempered	350	9	80	105	145	2	80	105	145	2	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	105	140	190	2	105	140	190	2	
			hardened and tempered	325	11	80	110	145	2	80	110	145	2	
	M	Stainless steel	ferritic/martensitic	annealed	200	12	50	65	90	2	50	65	90	2
martensitic			tempered	240	13	45	60	80	2	45	60	80	2	
austenitic			quench hardened	180	14	55	70	95	2	55	70	95	2	
austenitic-ferritic				230	15	45	60	80	2	45	60	80	2	
K	Grey cast iron	perlitic/ferritic		180	16	110	150	200	2	110	150	200	2	
		perlitic (martensitic)		260	17	90	120	165	2	90	120	165	2	
	Cast iron with spheroidal graphite	ferritic		160	18	135	180	245	2	135	180	245	2	
		perlitic		250	19	105	140	190	2	105	140	190	2	
	Malleable cast iron	ferritic		130	20	150	200	270	2	150	200	270	2	
		perlitic		230	21	120	160	220	2	120	160	220	2	
N	Aluminium wrought alloys	cannot be hardened		60	22									
		hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24									
		$\leq 12\%$ 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 B460.
For examples of material for cutting tool groups view page D22.

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End mill – GM series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
						5501R304GF 5601R304GF 5502R304GF 5602R304GF				GM-4F-G GM-4EFP				
						Slot milling		Shoulder milling		Slot milling		Shoulder milling		
						$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$	$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$	
						$0 < x < 3$	$0,1 \times D$	$0 < x \leq 20$	$< 0,5 \times D$	$0 < x < 3$	$0,1 \times D$	$0 < x \leq 20$	$< 0,5 \times D$	
						$3 \leq x \leq 20$	$0,8 \times D$			$3 \leq x \leq 20$	$0,8 \times D$			
						KMG303				KMG303				
a_e / D				a_e / D										
1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group							
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	155	200	265	2	150	200	270	2	
		approx. 0,45 % C	annealed	190	2	150	190	255	2	145	190	260	2	
		approx. 0,45 % C	tempered	250	3	110	140	190	2	105	140	190	2	
		approx. 0,75 % C	annealed	270	4	95	120	160	2	90	120	165	2	
		approx. 0,75 % C	tempered	300	5	90	110	150	2	85	110	150	2	
	Low-alloyed steel		annealed	180	6	120	150	200	2	115	150	205	2	
			tempered	275	7	95	120	160	2	90	120	165	2	
			tempered	300	8	90	110	150	2	85	110	150	2	
			tempered	350	9	85	105	140	2	80	105	145	2	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	110	140	190	2	105	140	190	2	
			hardened and tempered	325	11	85	110	145	2	80	110	145	2	
	M	Stainless steel	ferritic/martensitic	annealed	200	12	50	65	85	2	50	65	90	2
martensitic			tempered	240	13	45	60	75	2	45	60	80	2	
austenitic			quench hardened	180	14	55	70	95	2	55	70	95	2	
austenitic-ferritic				230	15	45	60	75	2	45	60	80	2	
K	Grey cast iron	perlitic/ferritic		180	16	115	150	195	2	110	150	200	2	
		perlitic (martensitic)		260	17	95	120	160	2	90	120	165	2	
	Cast iron with spheroidal graphite	ferritic		160	18	140	180	240	2	135	180	245	2	
		perlitic		250	19	110	140	190	2	105	140	190	2	
	Malleable cast iron	ferritic		130	20	155	200	265	2	150	200	270	2	
		perlitic		230	21	125	160	215	2	120	160	220	2	
N	Aluminium wrought alloys	cannot be hardened		60	22									
		hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24									
		$\leq 12\%$ 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 B460.
For examples of material for cutting tool groups view page D22.

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End mill – GM series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
						GM-2BL GM-4BL GM-2BFP				GM-2R GM-4R				
										Slot milling		Shoulder milling		
										$\varnothing$ [mm]	$a_{p\max}$	$\varnothing$ [mm]	$a_{e\max}$	
										$0 < x < 3$	$0,1 \times D$	$0 < x \leq 20$	$< 0,5 \times D$	
										$3 \leq x \leq 20$	$0,8 \times D$			
				KMG303				KMG303						
				a_e / D				a_e / D						
				1/1	1/10	1/20	f-group	1/1	1/2	1/10	f-group			
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1		220	250	5	160	215	275	2	
		approx. 0,45 % C	annealed	190	2		210	240	5	155	205	265	2	
		approx. 0,45 % C	tempered	250	3		155	175	5	115	155	195	2	
		approx. 0,75 % C	annealed	270	4		135	150	5	100	130	165	2	
		approx. 0,75 % C	tempered	300	5		125	140	5	90	120	155	2	
	Low-alloyed steel		annealed	180	6		165	190	5	120	165	210	2	
			tempered	275	7		135	150	5	100	130	165	2	
			tempered	300	8		125	140	5	90	120	155	2	
			tempered	350	9		115	130	5	85	115	145	2	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10		155	175	5	115	155	195	2	
			hardened and tempered	325	11		120	135	5	85	115	150	2	
M	Stainless steel	ferritic/martensitic	annealed	200	12		75	80	5	55	70	90	2	
		martensitic	tempered	240	13		65	70	5	45	65	80	2	
		austenitic	quench hardened	180	14		75	85	5	55	75	95	2	
		austenitic-ferritic		230	15		65	70	5	45	65	80	2	
K	Grey cast iron	perlitic/ferritic		180	16		165	185	5	120	160	205	2	
		perlitic (martensitic)		260	17		135	150	5	100	130	165	2	
	Cast iron with spheroidal graphite	ferritic		160	18		200	225	5	145	195	250	2	
		perlitic		250	19		155	175	5	115	155	195	2	
	Malleable cast iron	ferritic		130	20		220	250	5	160	215	275	2	
		perlitic		230	21		180	200	5	130	175	220	2	
N	Aluminium wrought alloys	cannot be hardened		60	22									
		hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24									
		$\leq 12\%$ 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 B460.
For examples of material for cutting tool groups view page D22.

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End mill – HM series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
						HM-2E HM-2EP HM-2ES HM-4E				HM-2EFP HM-4EL HM-4EFP				
						Shoulder milling				Shoulder milling				
						$\varnothing$ [mm]		a_e max		$\varnothing$ [mm]		a_e max		
						$0 < x \leq 20$		$0,05 \times D$		$0 < x \leq 20$		$0,05 \times D$		
KMG555				KMG555										
a_e / D				a_e / D										
1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group							
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1									
		approx. 0,45 % C	annealed	190	2									
		approx. 0,45 % C	tempered	250	3									
		approx. 0,75 % C	annealed	270	4									
		approx. 0,75 % C	tempered	300	5									
	Low-alloyed steel		annealed	180	6									
			tempered	275	7									
			tempered	300	8									
			tempered	350	9									
	High-alloyed steel and high-alloyed tool steel		annealed	200	10									
		hardened and tempered	325	11										
M	Stainless steel	ferritic/martensitic	annealed	200	12									
		martensitic	tempered	240	13									
		austenitic	quench hardened	180	14									
		austenitic-ferritic		230	15									
K	Grey cast iron	perlitic/ferritic		180	16									
		perlitic (martensitic)		260	17									
	Cast iron with spheroidal graphite	ferritic		160	18									
		perlitic		250	19									
	Malleable cast iron	ferritic		130	20									
		perlitic		230	21									
N	Aluminium wrought alloys	cannot be hardened		60	22									
		hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24									
		$\leq 12\%$ 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	55	100	125	3	50	95	115	3	
			hardened and tempered	60 HRC	38	55	95	120	3	50	95	110	3	
	Hard cast iron		cast	400	39	70	125	160	3	65	120	145	3	
	Hardened cast iron		hardened and tempered	55 HRC	40	55	100	125	3	50	95	115	3	
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 B460.
For examples of material for cutting tool groups view page D22.

[illegible]

End mill – NM series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
						NM-2E 5502R402NM NM-4E NM-2EP				NM-2B NM-4BP				
						Slot milling		Shoulder milling						
						$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$					
						$0 < x < 12$	$0.5 \times D$	$0 < x \leq 20$	$< 0.5 \times D$					
						$12 \leq x \leq 20$	$1.0 \times D$							
				KMG309				KMG309						
				a_e / D				a_e / D						
				1/1	1/2	1/10	f-group	1/1	1/10	1/20	f-group			
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1									
		approx. 0,45 % C	annealed	190	2									
		approx. 0,45 % C	tempered	250	3									
		approx. 0,75 % C	annealed	270	4									
		approx. 0,75 % C	tempered	300	5									
	Low-alloyed steel		annealed	180	6									
			tempered	275	7									
			tempered	300	8									
			tempered	350	9									
	High-alloyed steel and high-alloyed tool steel		annealed	200	10									
			hardened and tempered	325	11									
M	Stainless steel	ferritic/martensitic	annealed	200	12									
		martensitic	tempered	240	13									
		austenitic	quench hardened	180	14									
		austenitic-ferritic		230	15									
K	Grey cast iron	perlitic/ferritic		180	16									
		perlitic (martensitic)		260	17									
	Cast iron with spheroidal graphite	ferritic		160	18									
		perlitic		250	19									
	Malleable cast iron	ferritic		130	20									
		perlitic		230	21									
N	Aluminium wrought alloys	cannot be hardened		60	22	920	1100	1200	4		1400	1550	4	
		hardenable	hardened	100	23	555	660	720	4		840	930	4	
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24	370	440	480	4		560	620	4	
		$\leq 12\%$ Si, hardenable	hardened	90	25	460	550	600	4		700	775	4	
		$> 12\%$ Si, cannot be hardened		130	26	140	165	180	4		210	235	4	
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%			110	27	280	330	360	4		420	465	4
		CuZn, CuSnZn			90	28	325	385	420	4		490	545	4
CuSn, Pb-free copper, electrolytic copper			100	29	280	330	360	4		420	465	4		
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 B460.
For examples of material for cutting tool groups view page D22.

[illegible]

End mill – AL series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]									
						AL-1E AL-2E AL-3E (W) ALG-2E				AL-2EL AL-3EL					
						Slot milling		Shoulder milling		Slot milling		Shoulder milling			
						$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$	$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$		
						$0 < x < 12$	$0.5 \times D$	$0 < x \leq 20$	$< 0.5 \times D$	$0 < x < 12$	$0.5 \times D$	$0 < x \leq 20$	$< 0.5 \times D$		
						$12 \leq x \leq 20$	$1.0 \times D$			$12 \leq x \leq 20$	$1.0 \times D$				
YK30F / YK40F				YK30F											
a_e / D				a_e / D											
1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group								
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1										
		approx. 0,45 % C	annealed	190	2										
		approx. 0,45 % C	tempered	250	3										
		approx. 0,75 % C	annealed	270	4										
		approx. 0,75 % C	tempered	300	5										
	Low-alloyed steel		annealed	180	6										
			tempered	275	7										
			tempered	300	8										
			tempered	350	9										
	High-alloyed steel and high-alloyed tool steel		annealed	200	10										
			hardened and tempered	325	11										
M	Stainless steel	ferritic/martensitic	annealed	200	12										
		martensitic	tempered	240	13										
		austenitic	quench hardened	180	14										
		austenitic-ferritic		230	15										
K	Grey cast iron	perlitic/ferritic		180	16										
		perlitic (martensitic)		260	17										
	Cast iron with spheroidal graphite	ferritic		160	18										
		perlitic		250	19										
	Malleable cast iron	ferritic		130	20										
		perlitic		230	21										
N	Aluminium wrought alloys	cannot be hardened		60	22	920	1100	1200	4	830	990	1080	4		
		hardenable	hardened	100	23	555	660	720	4	500	595	650	4		
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24	370	440	480	4	335	400	435	4		
		$\leq 12\%$ Si, hardenable	hardened	90	25	460	550	600	4	415	495	540	4		
		$> 12\%$ Si, cannot be hardened		130	26	140	165	180	4	125	150	165	4		
	Copper and copper alloys (bronze/brass)	machining steel, Pb> 1%			110	27	280	330	360	4	250	300	325	4	
		CuZn, CuSnZn			90	28	325	385	420	4	295	350	380	4	
CuSn, Pb-free copper, electrolytic copper			100	29	280	330	360	4	250	300	325	4			
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 B460.
For examples of material for cutting tool groups view page D22.

[illegible]

End mill – AL series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]							
						AL-2RL-AIR AL-3RL-AIR							
						Slot milling		Shoulder milling					
						$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$				
						$0 < x < 12$	$0.5x_D$	$0 < x \leq 20$	$< 0.5x_D$				
						$12 \leq x \leq 20$	$1.0x_D$						
				YK40F									
				a_e / D									
						1/1	1/2	1/10	f-group				
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1								
		approx. 0,45 % C	annealed	190	2								
		approx. 0,45 % C	tempered	250	3								
		approx. 0,75 % C	annealed	270	4								
		approx. 0,75 % C	tempered	300	5								
	Low-alloyed steel		annealed	180	6								
			tempered	275	7								
			tempered	300	8								
			tempered	350	9								
	High-alloyed steel and high-alloyed tool steel		annealed	200	10								
			hardened and tempered	325	11								
M	Stainless steel	ferritic/martensitic	annealed	200	12								
		martensitic	tempered	240	13								
		austenitic	quench hardened	180	14								
		austenitic-ferritic		230	15								
K	Grey cast iron	perlitic/ferritic		180	16								
		perlitic (martensitic)		260	17								
	Cast iron with spheroidal graphite	ferritic		160	18								
		perlitic		250	19								
	Malleable cast iron	ferritic		130	20								
		perlitic		230	21								
N	Aluminium wrought alloys	cannot be hardened		60	22	1035	1250	1350	8				
		hardenable	hardened	100	23	625	750	810	8				
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24	415	500	540	8				
		$\leq 12\%$ Si, hardenable	hardened	90	25	520	625	675	8				
		$> 12\%$ Si, cannot be hardened		130	26	160	190	205	8				
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%			110	27	315	375	405	8			
		CuZn, CuSnZn			90	28	365	440	475	8			
CuSn, Pb-free copper, electrolytic copper			100	29	315	375	405	8					
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 B460.
For examples of material for cutting tool groups view page D22.

A

Turning

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Milling

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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-2E PM-4E PM-4E-G				PM-4EL PM-4EL-G PM-4EX-G				
						Slot milling		Shoulder milling		Slot milling		Shoulder milling		
						$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$	$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$	
						$0 < x < 3$	$0,15 \times D$	$0 < x \leq 20$	$0,15 \times D$	$0 < x < 3$	$0,15 \times D$	$0 < x \leq 20$	$0,15 \times D$	
						$3 \leq x < 6$	$0,3 \times D$			$3 \leq x < 6$	$0,3 \times D$			
$6 \leq x \leq 20$		$0,5 \times D$			$6 \leq x \leq 20$		$0,5 \times D$							
KMG405				KMG405										
a_e / D				a_e / D										
1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group							
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	165	220	300	1	140	190	255	1	
		approx. 0,45 % C	annealed	190	2	160	210	285	1	135	185	245	1	
		approx. 0,45 % C	tempered	250	3	120	155	210	1	100	135	180	1	
		approx. 0,75 % C	annealed	270	4	100	135	180	1	85	115	155	1	
		approx. 0,75 % C	tempered	300	5	95	125	165	1	80	105	145	1	
	Low-alloyed steel		annealed	180	6	125	165	225	1	110	145	195	1	
			tempered	275	7	100	135	180	1	85	115	155	1	
			tempered	300	8	95	125	165	1	80	105	145	1	
			tempered	350	9	90	115	160	1	75	100	135	1	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	120	155	210	1	100	135	180	1	
		hardened and tempered	325	11	90	120	160	1	75	105	140	1		
M	Stainless steel	ferritic/martensitic	annealed	200	12	55	75	100	1	45	65	85	1	
		martensitic	tempered	240	13	50	65	85	1	40	55	75	1	
		austenitic	quench hardened	180	14	60	75	105	1	50	65	90	1	
		austenitic-ferritic		230	15	50	65	85	1	40	55	75	1	
K	Grey cast iron	perlitic/ferritic		180	16	125	165	220	1	105	140	190	1	
		perlitic (martensitic)		260	17	100	135	180	1	85	115	155	1	
	Cast iron with spheroidal graphite	ferritic		160	18	150	200	270	1	130	175	230	1	
		perlitic		250	19	120	155	210	1	100	135	180	1	
	Malleable cast iron	ferritic		130	20	165	220	300	1	145	190	255	1	
		perlitic		230	21	135	180	240	1	115	155	205	1	
N	Aluminium wrought alloys	cannot be hardened		60	22									
		hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24									
		$\leq 12\%$ Si, hardenable	hardened	90	25									
		$> 12\%$ Si, cannot be hardened		130	26									
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27									
CuZn, CuSnZn		90	28											
CuSn, Pb-free copper, electrolytic copper		100	29											
S	Heat-resistant alloys	Fe-based alloys	annealed	200	30									
			hardened	280	31									
		Ni or Co bass	annealed	250	32									
			hardened	350	33									
			cast	320	34									
	Titanium alloys	pure titanium		R_m 400	35									
α and β alloys		hardened	R_m 1050	36										
H	Hardened steel		hardened and tempered	55 HRC	37	80	105	140	1	65	90	120	1	
			hardened and tempered	60 HRC	38									
	Hard cast iron		cast	400	39	105	140	185	1	85	120	160	1	
	Hardened cast iron		hardened and tempered	55 HRC	40									
X	Non-metallic materials	Thermoplasts			41									
		Thermosetting plastics			42									
		Plastic, glass-fibre reinforced GFRP			43									
		Plastic, carbon fibre reinforced CFRP			44									
		Graphite			45									
		Wood			46									

Note: The given cutting values are guide values, which were determined under ideal conditions.
The values have to be adapted in individual cases.
Feed rate recommendations on page B460.
For examples of material for cutting tool groups view page D22.

[illegible]

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-2R PM-4R				PM-4RL				
						Slot milling		Shoulder milling		Slot milling		Shoulder milling		
						$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$	$\varnothing$ [mm]	$a_{p \max}$	$\varnothing$ [mm]	$a_{e \max}$	
						$0 < x < 3$	$0,15 \times D$	$0 < x \leq 20$	$0,15 \times D$	$0 < x < 3$	$0,15 \times D$	$0 < x \leq 20$	$0,15 \times D$	
						$3 \leq x < 6$	$0,3 \times D$			$3 \leq x < 6$	$0,3 \times D$			

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 B460.
For examples of material for cutting tool groups view page D22.

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End mill – UM/HPC/VSM series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]								
						5501R38414GM (-R) 5502R38414GM (-R) 5602R38414GM (-R)				5501R38414GM (-R) long series 5502R38414GM (-R) long series 5602R38414GM (-R) long series				
						Slot milling		Shoulder milling		Slot milling		Shoulder milling		
						$\varnothing$ [mm]	a_p max	$\varnothing$ [mm]	a_e max	$\varnothing$ [mm]	a_p max	$\varnothing$ [mm]	a_e max	
						$0 < x < 3$	$0,3 \times D$	$0 < x < 3$	$0,15 \times D$	$0 < x < 3$	$0,3 \times D$	$0 < x < 3$	$0,15 \times D$	
						$3 \leq x < 12$	$0,7 \times D$	$3 \leq x < 20$	$0,3 \times D$	$3 \leq x < 12$	$0,7 \times D$	$3 \leq x < 20$	$0,3 \times D$	
				KMG405				KMG405						
				a_e / D				a_e / D						
						1/1	1/2	1/10	f-group	1/1	1/2	1/10	f-group	
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1	250	300	380	9	190	225	285	9	
		approx. 0,45 % C	annealed	190	2	240	285	365	9	185	215	275	9	
		approx. 0,45 % C	tempered	250	3	175	210	270	9	135	160	200	9	
		approx. 0,75 % C	annealed	270	4	150	180	230	9	115	135	175	9	
		approx. 0,75 % C	tempered	300	5	140	165	210	9	105	125	160	9	
	Low-alloyed steel		annealed	180	6	190	225	285	9	145	170	215	9	
			tempered	275	7	150	180	230	9	115	135	175	9	
			tempered	300	8	140	165	210	9	105	125	160	9	
			tempered	350	9	130	160	200	9	100	120	150	9	
	High-alloyed steel and high-alloyed tool steel		annealed	200	10	175	210	270	9	135	160	200	9	
		hardened and tempered	325	11	135	160	205	9	105	120	155	9		
M	Stainless steel	ferritic/martensitic	annealed	200	12	80	100	125	9	65	75	95	9	
		martensitic	tempered	240	13	70	85	110	9	55	65	80	9	
		austenitic	quench hardened	180	14	85	105	130	9	65	80	100	9	
		austenitic-ferritic		230	15	70	85	110	9	55	65	80	9	
K	Grey cast iron	perlitic/ferritic		180	16	185	220	280	9	140	165	210	9	
		perlitic (martensitic)		260	17	150	180	230	9	115	135	175	9	
	Cast iron with spheroidal graphite	ferritic		160	18	225	270	345	9	175	205	260	9	
		perlitic		250	19	175	210	270	9	135	160	200	9	
	Malleable cast iron	ferritic		130	20	250	300	380	9	190	225	285	9	
		perlitic		230	21	200	240	305	9	155	180	230	9	
N	Aluminium wrought alloys	cannot be hardened		60	22									
		hardenable	hardened	100	23									
	Cast aluminium alloys	$\leq 12\%$ Si, cannot be hardened		75	24									
		$\leq 12\%$ 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	115	140	175	9					
			hardened and tempered	60 HRC	38									
	Hard cast iron		cast	400	39	135	165	205	9					
	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									

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Deburring cutters – FM series

Material group		Composition / structure / heat treatment		Brinell hardness HB	Machining group	Starting values for cutting speed v_c [m/min]				
						5501 / 5601 5501 / 5601 5601				
						KMG303				
						a_e / D				
		1/1	1/2	1/10	f-group					
P	Unalloyed steel	approx. 0,15 % C	annealed	125	1			230	11	
		approx. 0,45 % C	annealed	190	2			220	11	
		approx. 0,45 % C	tempered	250	3			165	11	
		approx. 0,75 % C	annealed	270	4			140	11	
		approx. 0,75 % C	tempered	300	5			130	11	
	Low-alloyed steel		annealed	180	6			175	11	
			tempered	275	7			140	11	
			tempered	300	8			130	11	
			tempered	350	9			120	11	
High-alloyed steel and high-alloyed tool steel		annealed	200	10			165	11		
		hardened and tempered	325	11			125	11		
M	Stainless steel	ferritic/martensitic	annealed	200	12			75	11	
		martensitic	tempered	240	13			65	11	
		austenitic	quench hardened	180	14			80	11	
		austenitic-ferritic		230	15			65	11	
K	Grey cast iron	perlitic/ferritic		180	16			170	11	
		perlitic (martensitic)		260	17			140	11	
	Cast iron with spheroidal graphite	ferritic		160	18			210	11	
		perlitic		250	19			165	11	
	Malleable cast iron	ferritic		130	20			230	11	
		perlitic		230	21			185	11	
N	Aluminium wrought alloys	cannot be hardened		60	22			1200	11	
		hardenable	hardened	100	23			720	11	
	Cast aluminium alloys	≤ 12 % Si, cannot be hardened		75	24			480	11	
		≤ 12 % Si, hardenable	hardened	90	25			600	11	
		> 12 % Si, cannot be hardened		130	26			180	11	
	Copper and copper alloys (bronze/brass)	machining steel, PB> 1%		110	27			360	11	
		CuZn, CuSnZn		90	28			420	11	
CuSn, Pb-free copper, electrolytic copper		100	29			360	11			
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 B460.
For examples of material for cutting tool groups view page D22.

[illegible]

Recommended feed rate

Solid carbide milling group 1 – Square shoulder mills 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	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,05	0,07	0,08	0,08	0,09	0,09	0,10									
	1/2	0,01	0,03	0,03	0,03	0,03	0,03	0,04	0,04	0,06	0,09	0,10	0,10	0,12	0,12	0,13									
	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									
M	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,05	0,06	0,06	0,07	0,07	0,08									
	1/2	0,01	0,02	0,02	0,02	0,02	0,02	0,04	0,04	0,05	0,07	0,08	0,08	0,10	0,10	0,11									
	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									
K	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,05	0,07	0,08	0,08	0,09	0,09	0,10									
	1/2	0,01	0,03	0,03	0,03	0,03	0,03	0,04	0,04	0,06	0,09	0,10	0,10	0,12	0,12	0,13									
	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									
H	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,05	0,06	0,06	0,07	0,07	0,08									
	1/2	0,01	0,02	0,02	0,02	0,02	0,02	0,04	0,04	0,05	0,07	0,08	0,08	0,10	0,10	0,11									
	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									

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

Solid carbide milling group 2 – Square shoulder mills GM 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	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09									
	1/2	0,01	0,03	0,03	0,03	0,03	0,03	0,04	0,04	0,05	0,08	0,09	0,09	0,10	0,10	0,12									
	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,06	0,06	0,08	0,12	0,14	0,14	0,16	0,16	0,18									
M	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,03	0,05	0,06	0,06	0,06	0,06	0,07									
	1/2	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09									
	1/10	0,02	0,03	0,03	0,03	0,03	0,03	0,05	0,05	0,06	0,10	0,11	0,11	0,13	0,13	0,15									
K	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09									
	1/2	0,01	0,03	0,03	0,03	0,03	0,03	0,04	0,04	0,05	0,08	0,09	0,09	0,10	0,10	0,12									
	1/10	0,02	0,04	0,04	0,04	0,04	0,04	0,06	0,06	0,08	0,12	0,14	0,14	0,16	0,16	0,18									

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

Solid carbide milling group 3 – Square shoulder mills HM 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					
H	1/1	0,01	0,02	0,02	0,02	0,02	0,02	0,02	0,02	0,03	0,05	0,06	0,06	0,06	0,06	0,07					
	1/2	0,01	0,02	0,02	0,02	0,02	0,02	0,03	0,03	0,04	0,06	0,07	0,07	0,08	0,08	0,09					
	1/10	0,02	0,03	0,03	0,03	0,03	0,03	0,05	0,05	0,06	0,10	0,11	0,11	0,13	0,13	0,15					

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

Solid carbide milling group 4 – Square shoulder mills AL/NM 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				
N	1/1	0,02	0,03	0,03	0,03	0,03	0,03	0,05	0,05	0,06	0,09	0,11	0,11	0,12	0,12	0,14				
	3/4	0,02	0,04	0,04	0,04	0,04	0,04	0,06	0,06	0,08	0,12	0,14	0,14	0,16	0,16	0,18				
	1/10	0,03	0,06	0,06	0,06	0,06	0,06	0,09	0,09	0,12	0,19	0,22	0,22	0,25	0,25	0,28				
	1/20	0,04	0,08	0,08	0,08	0,08	0,08	0,12	0,12	0,16	0,23	0,27	0,27	0,31	0,31	0,35				

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 GM 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.

Solid carbide milling group 6 – High feed mills PM series

	a_e / D	Feed rate per cutting edge (f_z) [mm]															
		Ø 3	Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12									
P	1/1																
	1/10																
	1/20	0,15	0,25	0,28	0,33	0,44	0,55	0,66									
M	1/1																
	1/10																
	1/20	0,12	0,22	0,25	0,30	0,41	0,52	0,63									
K	1/1																
	1/10																
	1/20	0,15	0,25	0,28	0,33	0,44	0,55	0,66									
H	1/1																
	1/10																
	1/20	0,12	0,22	0,25	0,30	0,41	0,52	0,63									

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

Solid carbide milling group 7 – Ball nose cutters HM 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	
H	1/1																
	1/2	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	
	1/10	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	0,21	

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

Solid carbide milling group 8 – High feed mills AL series

	a_e / D	Feed rate per cutting edge (f_z) [mm]															
		Ø 6	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 18	Ø 20								
N	1/1	0,04	0,05	0,08	0,09	0,11	0,13	0,16	0,18								
	3/4	0,05	0,07	0,10	0,12	0,14	0,16	0,20	0,23								
	1/10	0,08	0,11	0,16	0,19	0,22	0,25	0,31	0,36								

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

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Solid carbide milling group 9 – Square shoulder mills UM series HSC/HPC

	a_e / D	Feed rate per cutting edge (f_z) [mm]																			
		Ø 4	Ø 5	Ø 6	Ø 8	Ø 10	Ø 12	Ø 14	Ø 16	Ø 18	Ø 20										
P	1/1	0,06	0,06	0,06	0,07	0,07	0,07	0,07	0,08	0,08	0,08										
	1/2	0,08	0,08	0,08	0,09	0,09	0,09	0,09	0,10	0,10	0,10										
	1/10	0,14	0,14	0,16	0,18	0,22	0,25	0,27	0,3	0,32	0,36										
M	1/1	0,05	0,05	0,05	0,05	0,05	0,05	0,05	0,06	0,06	0,06										
	1/2	0,06	0,06	0,06	0,07	0,07	0,07	0,07	0,08	0,08	0,08										
	1/10	0,10	0,10	0,10	0,12	0,12	0,14	0,16	0,16	0,18	0,18										
K	1/1	0,06	0,06	0,06	0,07	0,07	0,07	0,07	0,08	0,08	0,08										
	1/2	0,08	0,08	0,08	0,09	0,09	0,09	0,09	0,10	0,10	0,10										
	1/10	0,14	0,14	0,16	0,18	0,22	0,25	0,27	0,3	0,32	0,36										
H	1/1	0,045	0,045	0,045	0,053	0,053	0,053	0,053	0,06	0,06	0,06										
	1/2	0,06	0,06	0,06	0,07	0,07	0,07	0,07	0,08	0,08	0,08										
	1/10	0,10	0,10	0,10	0,12	0,12	0,14	0,16	0,16	0,18	0,18										

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

Solid carbide milling group 10 – Square shoulder mills VSM series

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

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

Solid carbide milling group 11 – Deburring cutters FM series

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

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

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Technical information – milling

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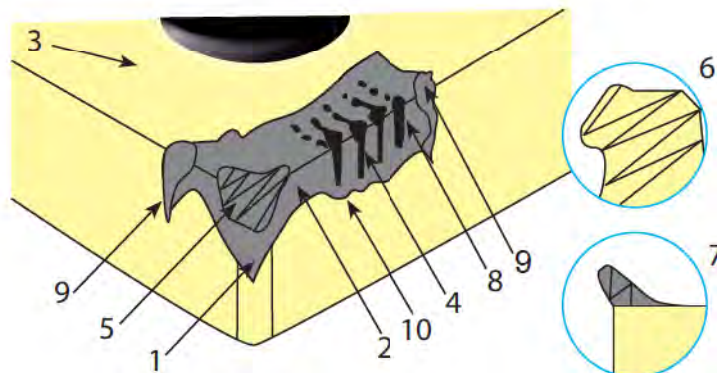
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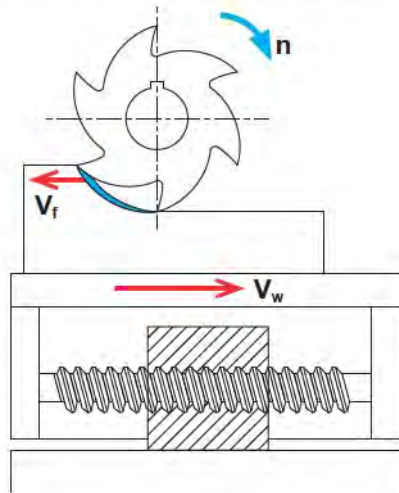
Trouble shooting – indexable milling

Fig.	Type of wear	Effects	Reason	Countermeasure
1+2	Flank wear	– Bad surface quality and dimensional stability – Increase of cutting force	– Grade not wear-resistant enough – Cutting speed too high – Clearance angle too small – Feed rate too low	– Grade with higher wear-resistance – Reduce cutting speed – Increase clearance angle – Reduce feed rate
3	Crater wear	– Bad surface quality and chip control	– Grade not wear-resistant enough – Cutting speed too high – Feed rate too low	– Grade with higher wear-resistance – Reduce cutting speed – Reduce feed rate
4	Chipping	– Unstable tool life – Sudden breakage of cutting edge	– Grade too hard – Feed rate too high – Cutting edge not stable enough – Stability of the holder or tension insufficient	– Grade with higher toughness – Reduce feed rate – Change honing of cutting edge – Use a more stable tool holder
5	Breakage	– Increase of cutting force – Bad surface quality and dimensional stability	– Grade too hard – Feed rate too high – Cutting edge not stable enough – Stability of the holder or tension insufficient	– Grade with higher toughness – Reduce feed rate – Change honing of cutting edge – Use a more stable tool holder
6	Plastic deformation	– Bad dimensional stability – Damage to cutting edge	– Grade not wear-resistant enough – Cutting speed too high – Cutting depth and/or feed rate too high – Temperature on the cutting edge too high	– Grade with higher toughness – Reduce cutting speed – Reduce cutting depth and feed rate – Grade with higher heat-resistance
7	Welding	– Increase of cutting force – Bad surface quality	– Cutting speed too low – Cutting edge not sharp enough – Grade not suitable	– Increase cutting speed – Increase rake angle – Use a more suitable grade
8	Thermal cracks	– Breakage due to thermal interaction, often caused when cutting is interrupted (milling)	– Temperature fluctuation when machining – Grade too hard	– Dry machining – Grade with higher toughness
9	Notch wear	– Burr formation – Increase of cutting force	– Damage through chips (jagged edges) – Feed rate and cutting speed too high	– Grade with higher wear-resistance – Increase rake angle to get a sharper cutting edge – Reduce cutting speed
10	Flaking (coating)	– Often appears when machining hardened materials or caused by vibration	– Cutting edge adhesion and chipping – Bad chip removal	– Increase rake angle to get a sharper cutting edge – Chip breaker with bigger chip space

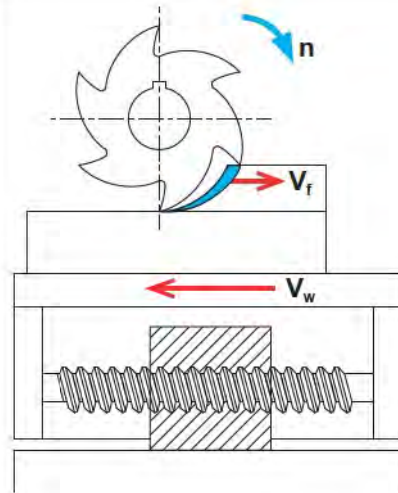


Indexable milling

Difference between up-millinging and down-millinging



Up-millinging



Down-millinging

V_f Feed rate tool
 V_w Feed rate work piece
 n Rotation

Up-millinging: the feed direction of the work piece is opposite to that of the milling rotation at the connecting position.

Down-millinging: the feed direction of the work piece is the same as that of the milling rotation at the connecting position.

Advantages and disadvantages

Direction	Advantages	Disadvantages
Up-millinging	– Prevents hooking of tool – More smooth cut	– Bigger stress on cutting edge – Shorter tool life
Down-millinging	– Higher tool life – Less thermal stress	– Hooking of tool possible

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Pitch selection

The pitch is the distance between one point on one cutting edge and the same point on the next edge. Milling cutters are mainly classified into wide, normal and fine pitches.

Operational stability		
L (low)	M (medium)	H (high)
Wide pitch	Normal pitch	Fine pitch
		
When the milling width is equal to the diameter of the cutter, the machining system is stable and main power of machine is sufficient, selecting a wide pitch can achieve high productive efficiency.	General milling function and multiple mixed productions.	When the milling width is less than the diameter of cutter, cutting by maximum edges can achieve high productive efficiency.

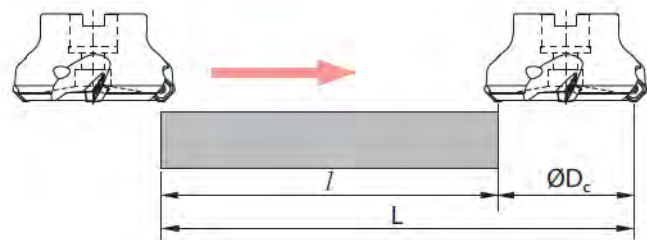
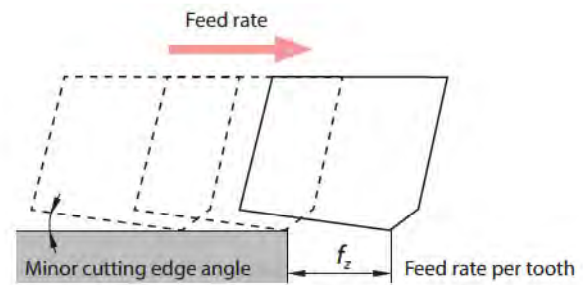
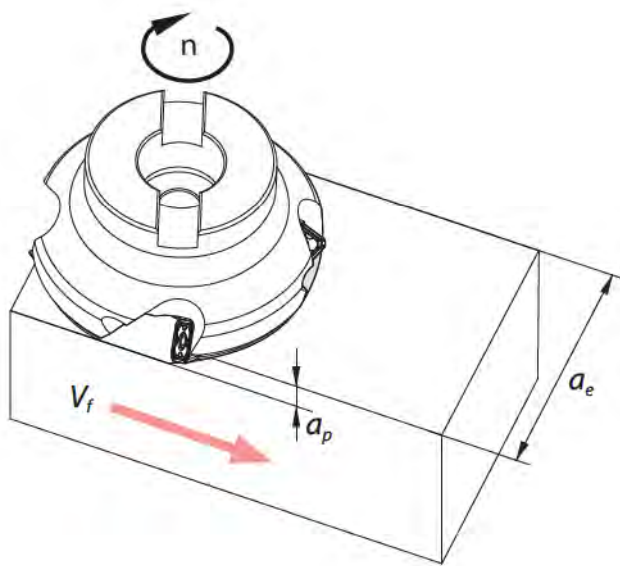
Approach angle

The approach angle is composed by insert. Tool body, chip thickness, cutting forces and tool life are affected especially by the approach angle. Decreasing the approach angle reduces chip thickness and spreads the cutting area between cutting edge and work piece for a given feed rate. A smaller approach angle also guarantees stable entering or exiting the work piece, to protect the cutting edge and extend tool life. However this will increase higher axial cutting forces on the work piece, thus it is not suitable for machining thin work pieces such as thin plates.

Approach angle	Feed rate per tooth	Max. cutting depth
90°	f_z	$h_{ex} = f_z \times \sin \kappa_r$
75°		$h_{ex} = 0,96 \times f_z$
60°		$h_{ex} = 0,86 \times f_z$
45°		$h_{ex} = 0,707 \times f_z$
Round		$h_{ex} = \frac{\sqrt{IC^2 \times (IC - 2a_p)^2}}{IC} \times f_z$

Indexable milling

General formulas



V_c : Feed rate [m/min]
 D_c : Nominal diameter of milling tool [mm]
 n : Spindle speed [u/min]
 z_n : Number of teeth
 Q : Metal removal rate [cm³/min]

V_f : Feed rate of worktable (feed speed) [mm/min]
 f_z : Feed rate per tooth [mm/z]
 π : ~3,14
 T_c : Machining time [min]
 f_n : Feed rate per revolution [mm/u]

Cutting speed	$V_c = \frac{\pi \times D_c \times n}{1000} \text{ [m/min]}$
Spindle speed	$n = \frac{1000 \times V_c}{\pi \times D_c} \text{ [rev/min]}$
Feed rate of work table	$V_f = f_z \times n \times z_n \text{ [mm/min]}$
Feed rate per tooth	$f_z = \frac{V_f}{n \times z_n} \text{ [mm/z]}$
Feed rate per revolution	$f_n = \frac{V_f}{n} \text{ [mm/rev]}$
Machining time	$T_c = \frac{1000 \times V_c}{\pi \times D_c} \text{ [min]}$
Metal removal rate	$Q = \frac{a_p \times a_e \times V_f}{1000} \text{ [cm}^3\text{/min]}$

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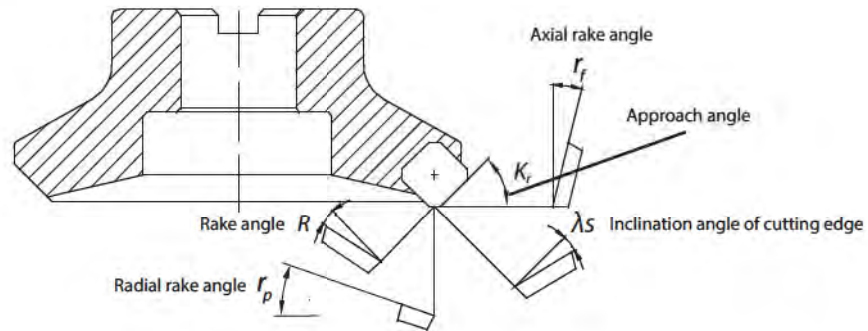
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Indexable milling

Function of angles when face milling



Main angles

Angle	Feature	Effet		
Axial rake angle r_f	Influences chip direction	Negative angle, good chip removal		
Radial rake angle r_p	Influences cutting edge sharpness	Positive angle, good cutting performance		
Approach angle K_r	Influences chip thickness	$K_r \uparrow$, chip thickness $\uparrow$; $K_r \downarrow$, chip thickness $\downarrow$;		
Rake angle R	Influences cutting force	Poor cutting performance, stable cutting edge	$(-) \leftarrow 0 \rightarrow (+)$	Good cutting performance, unstable cutting edge
Inclination angle λ_s	Influences chip flow direction	Poor cutting performance, stable cutting edge	$(-) \leftarrow 0 \rightarrow (+)$	Good cutting performance, unstable cutting edge

Combination of different rake angles

		Double positive	Double negative	Positive/Negative
Negative rake angle				
Neutral angle				
Positive angle				
Axial rake angle r_f		+	-	+
Radial rake angle r_p		+	-	-
Application field	P	✓		✓
	M	✓		✓
	K		✓	✓
	N	✓		
	S	✓		✓

Indexable milling

Cutting performances of different approach angles

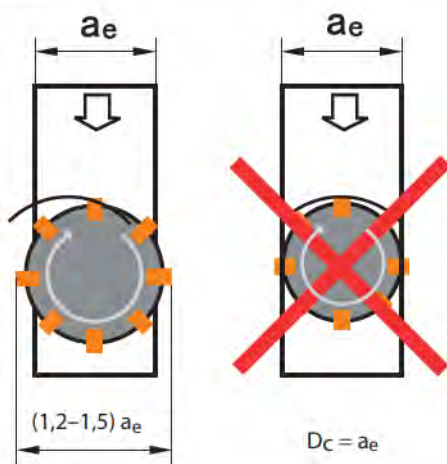
Approach angle	Depiction	Explanation
45°		Axial force is largest. It will bend when machining thin-wall work piece, and reduces the precision of work piece. It is benefit to avoid fringe breakage of work piece when machining cast iron.
75°		The main purpose is to resolve the radial cutting force, it is often used for general face milling.
90°		The axial force is zero in theory, suitable for milling thin plate workpiece.

Inserts with wiper

Using standard inserts	Using inserts with wiper
Normal surface quality	High surface quality

The wiper insert must protrude below the other inserts by 0.03–0.10 mm at axial direction, only that the wiping function can take into effect. Generally speaking, a cutter can assemble only one wiper insert. If the diameter of cutter is much bigger or cutter's feed rate per revolution is bigger than the length of wiper edge, 2 to 3 wiper inserts can be assembled.

Cutting width



Generally speaking, the relation between cutting width and tool cutting diameter is $D_c = (1.2-1.5) a_e$.

In the machining practice, it needs to avoid coincidence of tool center and workpiece center as much as possible.

D_c : Tool diameter
 a_e : Lateral infeed

A

Turning

B

Milling

C

Drilling

D

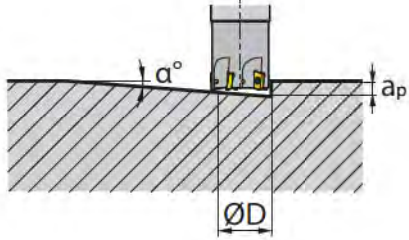
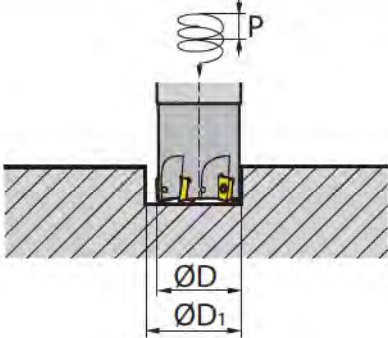
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Indexable milling

Plunging and circular milling with insert APKT

		Plunging		Circular milling	
					
		$L_m = \frac{a_p}{\tan \alpha}$ α : Angle de plongée		$P = \tan \alpha \times \pi \times D_1$ α : Angle d'hélice	
Insert	Diameter $\varnothing D$ [mm]	Max. cutting depth a_p [mm]	Max. plunge angle α°	Min. diameter $\varnothing D_1$ [mm]	Max. diameter [mm]
AP**11**	16	10	10	20	30
	20	10	5	28	38
	25	10	4	40	48
	32	10	3	56	60
	40	10	2	70	76

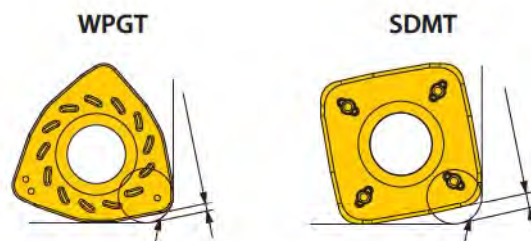
Reduce the feed rate when plunging and circular milling.
For drilling operations (axial) set the feed rate under 0.2 mm.
„Attention“ – drilling can form long chips.

Indexable milling

Plunging and circular milling with insert WPGT or SDMT

Approx. programmed radius

Insert	approx. R [mm]	Residual material K [mm]
WPGT050315ZSR	2	0,5
WPGT060415ZSR	2,5	0,7
WPGT080615ZSR	2,5	0,7
WPGT090725ZSR	4,5	1,2
SDMT06T208	1,6	0,5
SDMT09T312	2,5	0,87
SDMT120412	4,0	0,93
SDMT150620	4,0	1,38



Insert WPGT

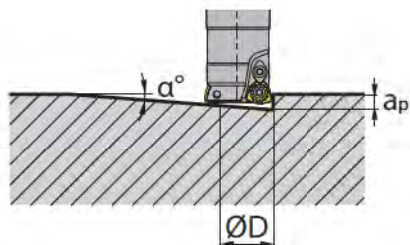
		Plunging		Circular milling	
		$L_m = \frac{a_p}{\tan \alpha}$ α : Angle de plongée		$P = \tan \alpha \times \pi \times D_1$ α : Angle d'hélice	
Insert	Diameter ØD [mm]	Max. cutting depth ap [mm]	Max. plunge angle alpha°	Min. diameter ØD1 [mm]	Max. diameter [mm]
WP**05**	20	1,5	12	24	37
WP**06**	25	1,5	8,8	31	47
	32	1,5	5	45	61
	40	1,5	3,2	61	77
	50	1,5	2,8	81	97
WP**08**	40	1,5	9	52	77
	50	1,5	5,4	71	97
	63	1,5	4,3	97	123
	80	1,5	2,9	131	157
	100	1,5	2,1	171	197
	125	1,5	1,3	221	247
	160	1,5	1,1	291	317
WP**09**	50	3,0	7,2	70	96
	63	3,0	4,5	96	122
	80	3,0	2,8	130	156
	100	3,0	2,2	170	196
	125	3,0	1,6	220	246
	160	3,0	1,2	290	316

Reduce the feed rate when plunging and circular milling.
For drilling operations (axial) set the feed rate under 0.2 mm.
„Attention“ – drilling can form long chips.

Indexable milling

Insert SDMT

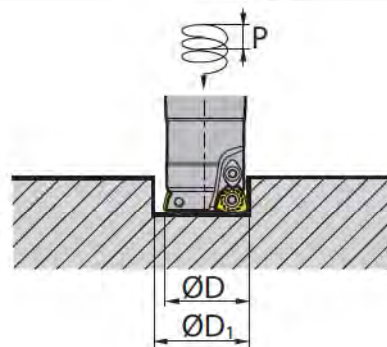
Plunging



$$L_m = \frac{a_p}{\tan \alpha}$$

α : Plunge angle

Circular milling



$$P = \tan \alpha \times \pi \times D_1$$

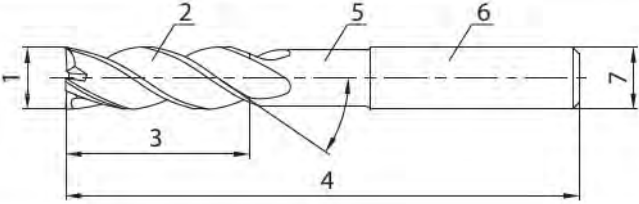
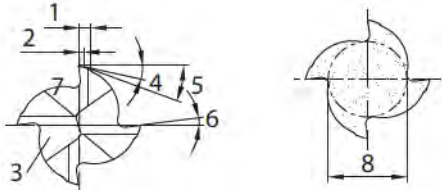
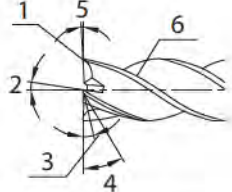
α : Helix angle

Insert	Diameter ØD (mm)	Max. cutting depth a_p [mm]	Max. plunge angle α°	Min. diameter ØD ₁ [mm]	Max. diameter [mm]
SD**06**	20	0,8	3,6	30	38
	25	0,8	2,8	40	48
	32	0,8	1,6	52	60
	40	0,8	1,1	70	78
	50	0,8	0,8	90	98
	63	0,8	0,7	114	122
SD**09**	25	1,4	6,5	34	48
	32	1,4	4,5	48	62
	35	1,4	3,6	54	68
	50	1,4	1,8	84	98
	63	1,4	1,3	110	124
SD**12**	32	1,8	10,4	44	60
	40	1,8	5,7	60	76
	50	1,8	3,5	80	96
	63	1,8	2,5	106	122
	80	1,8	1,6	140	156
	100	1,8	1,2	180	196
SD**15**	40	2,2	7,3	54	76
	80	2,2	1,4	134	156
	100	2,2	1,0	174	196
	125	2,2	0,9	234	246
	160	2,2	0,6	304	316

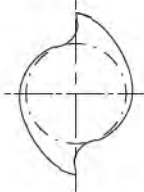
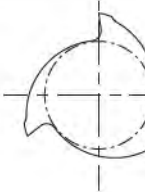
Reduce the feed rate when plunging and circular milling.
For drilling operations (axial) set the feed rate under 0,2 mm.
„Attention“ – drilling can form long chips.

Solid carbide mills

Terminology

A		1. Cutting edge diameter 2. Chip pocket 3. Length of cutting edge 4. Total length 5. Neck 6. Shank 7. Shank diameter
B		1. Chamfer width, main cutting edge 2. Chamfer width, diameter 3. Neck, front side 4. Primary radial clearance angle 5. Secondary radial clearance angle 6. Radial rake angle 7. Axial main cutting edge 8. Core diameter
C		1. Cutting edge 2. Axial rake angle 3. Primary axial clearance angle 4. Secondary axial clearance angle 5. Inclination angle 6. Radial cutting edge

Teeth, chip pocket and tool rigidity

Teeth	2 flutes	3 flutes	4 flutes
Cross section			
Cutting edge ratio	54 %	56 %	60 %
Advantages	- Large chip pocket - Good chip removal	- Good chip removal - Good surface quality	- Good rigidity - Good surface
Application	- Slot milling - Square shoulder milling - Drilling	- Slot milling - Square shoulder milling - Finishing	- Slot milling (flat) - Square shoulder milling - Finishing

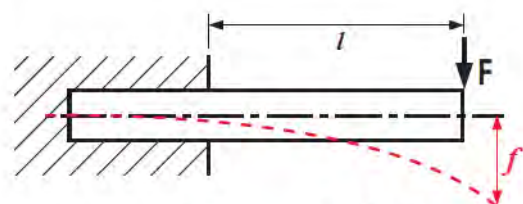
Length of cutting edge (overhang) and cutting diameter

The shorter the overhang, the stronger the rigidity. Thus isn't easy to generate. Bend and vibration in the cutting process may occur.

Length (overhang) increases by 1 time, the deflection degree (f) will be 8 times of the former one.

Reduce the overhang by 20 %
the deflection degree (f) will decrease by 50 %

Increase the diameter by 20 %
the deflection degree (f) will decrease by 50 %



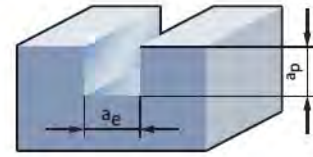
$$f = \frac{F \times l^3}{3 \times E \times I} = \frac{F \times l^3 \times 64}{3 \times E \times I}$$

Solid carbide mills

Machining strategy – HPC/UM (HSC) milling cutters

HPC = High Performance Cutting

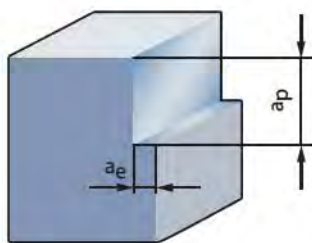
Machining with significantly increased metal removal rate through higher cutting speeds and feed rates compared with conventional machine cutting processes.



Full-slot milling

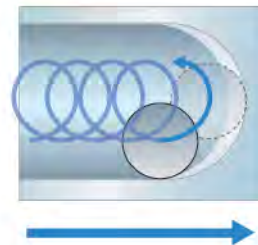
HSC (UM) = High Speed Cutting

High cutting speeds and feed rates in combination with low cutting depths lead to lower chip thickness as in normal machining.



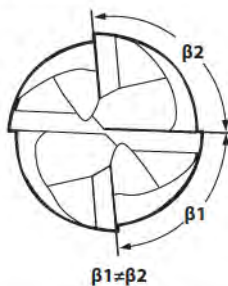
Profiling

$a_e < 15\%$
 $a_p = \max$

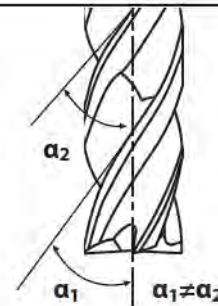


Trochoidal milling

The UM milling cutter is specifically optimised for HSC machining.



$\beta_1 = \beta_2$



$\alpha_1 \neq \alpha_2$

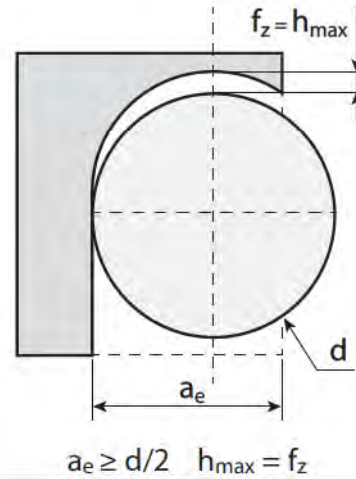
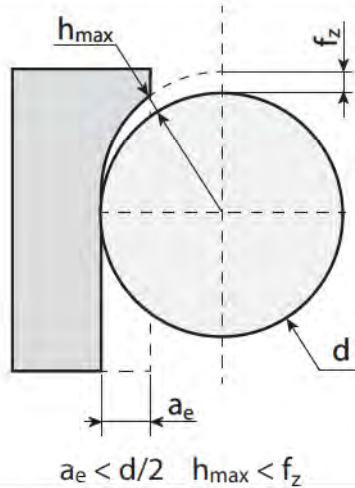
High metal removal rates can be realised with this tool.

Especially on highly dynamic machines with optimised tool paths this milling cutter shows its full potential.

Solid carbide mills

HSC strategy

It's important to use the right strategy. When programming make sure the width of cut is kept. The width of cut is usually not higher than 15 %. Regarding the depth of cut, the total length of the cutting edge can be used.



$$h_{\max} = 2f_z \sqrt{\frac{a_e}{d} \left(1 - \frac{a_e}{d}\right)}$$

When changing the width of cut the cutting data needs to be adjusted.

As calculatory size applies a chip thickness from approx. 0.15 – 0.2 mm on basis of the usual steel types.

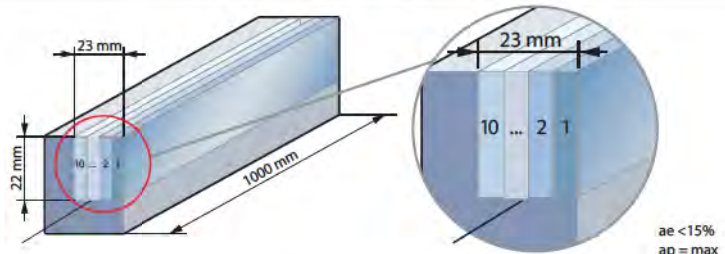
Example

Tool



UM-4E-D20.0-W KMG405

Machining



HSC strategy

Workpiece material

16MnCr5 (1.7131) ca. 700 N/mm³

Cutting data

V_c	550 m/min
n	8750 1/min
f_z	0,3 mm ($h_{\max} = 0,19$ mm)
V_f	10500 mm/min
a_p	22 mm
a_e	2,3 mm

Result

Chip removal rate **530 cm³/min!** Machining time 58 seconds! The maximum chip thickness is 0.19 mm.

A

Turning

B

Milling

C

Drilling

D

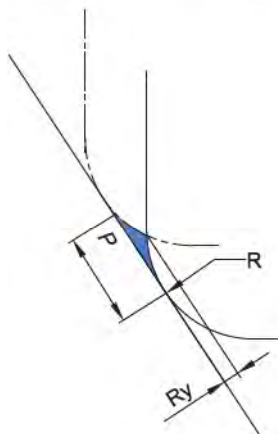
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Solid carbide mills

Feed rate selecting table for profile machining with ball nose cutters and torus mills



$$R_y = R \times \{1 - \cos [\arcsin (fr/2R)]\}$$

Ry: Theoretical values of surface quality

P: Feed rate

R: Radius of the ball nose cutter or torus mill

R	Ry	Feed rate									
		0,1	0,2	0,3	0,4	0,5	0,6	0,7	0,8	0,9	1,0
0,5		0,003	0,010	0,023	0,042	0,067	0,100				
1,0		0,001	0,005	0,011	0,020	0,032	0,046	0,063	0,083	0,107	
1,5		0,001	0,003	0,008	0,013	0,021	0,030	0,041	0,054	0,069	0,086
2,0		0,001	0,003	0,006	0,010	0,015	0,023	0,031	0,040	0,051	0,064
2,5		0,001	0,002	0,005	0,008	0,013	0,018	0,025	0,032	0,041	0,051
3,0			0,001	0,004	0,007	0,010	0,015	0,020	0,027	0,034	0,042
4,0			0,001	0,003	0,005	0,008	0,011	0,015	0,020	0,025	0,031
5,0			0,001	0,002	0,004	0,006	0,009	0,012	0,016	0,020	0,025
6,0				0,002	0,003	0,005	0,008	0,010	0,013	0,017	0,021
8,0				0,001	0,003	0,004	0,006	0,008	0,010	0,013	0,016
10,0				0,001	0,002	0,003	0,005	0,006	0,008	0,010	0,013
12,5				0,001	0,002	0,003	0,004	0,005	0,006	0,008	0,010

R	Ry	Feed rate									
		1,1	1,2	1,3	1,4	1,5	1,6	1,7	1,8	1,9	2,0
0,5											
1,0											
1,5		0,104									
2,0		0,077	0,092	0,109							
2,5		0,061	0,073	0,086	0,100						
3,0		0,051	0,061	0,071	0,083	0,095	0,109				
4,0		0,038	0,045	0,053	0,062	0,071	0,081	0,091	0,103		
5,0		0,030	0,036	0,042	0,049	0,057	0,064	0,073	0,082	0,091	0,101
6,0		0,025	0,030	0,035	0,041	0,047	0,054	0,061	0,068	0,076	0,084
8,0		0,019	0,023	0,026	0,031	0,035	0,040	0,045	0,051	0,057	0,063
10,0		0,015	0,018	0,021	0,025	0,028	0,032	0,036	0,041	0,045	0,050
12,5		0,012	0,014	0,017	0,020	0,023	0,026	0,029	0,032	0,036	0,040

Nonstandard – solid carbide end mills

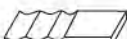
Name/Company:	 Wanheimer Str. 57 40472 Düsseldorf, Germany Fax: +49-(0)211-989240-111 E-mail: technik@zccct-europe.com
Address:	
Tel.:	
Fax:	
E-mail:	

Material	
Material	
Tensile strength (N/mm ²)	
Hardness	

Coating	
Yes ☐	No ☐

Centre cutting	
Yes ☐	No ☐

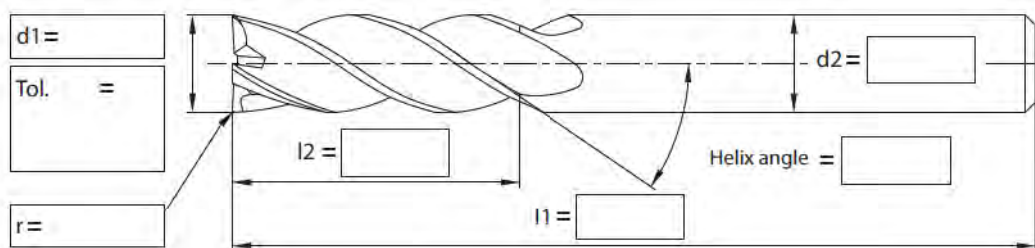
Series			
GM		NM	
PM		AL	
UM		VSM	
HM		HPC	

Machining operations		
		
☐ Slot milling	☐ Square shoulder milling	☐ Profile milling

Tool holder type			
DIN6535			Special type ☐
			
Form HA ☐	Form HB ☐	Normal straight shaft ☐	

Type		
		
☐ Square shoulder mill	☐ Ball nose cutter	☐ Torus mill

Number of teeth



Remarks:	
Order quantity:	Desired delivery date:
Date:	Signature:

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B

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