

# SINAMASTER® Cutting Tools

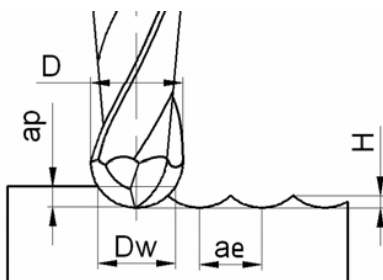


**Solid Carbide End Mills**

# 切削定义及计算

## 切削定义及计算

### Cutting calculations and definitions

铣刀直径 Mills diameter	D (mm)
每分钟转速 n [min <sup>-1</sup> ] RPM	$n = v_c \cdot 1000 / (D\pi)$
切削速度 V <sub>c</sub> [m/min] Cutting speed	$V_c = D \cdot \pi \cdot n / 1000$
每齿进给量 f <sub>z</sub> [mm/tooth] [mm/z] Feed rate per tooth	$f_z = V_f / (z \cdot n)$
每转进给量 f [mm/rev.] Feed rate per revolution	$f = f_z \cdot z$
进给速度 V <sub>f</sub> [mm/min] Feed speed	$V_f = f_z \cdot z \cdot n = f \cdot n$
金属切除率 Q [cm <sup>3</sup> /min] Metal removal rate	$Q = a_e \cdot a_p \cdot v_f$
球头铣刀的实际工作直径 D <sub>w</sub> [mm] Working diameter of Ball nose end mill	$D_w = 2 \cdot \sqrt{a_p(D - a_p)}$
	
铣刀的实际工作切削速度 V <sub>w</sub> [m/min] Cutting speed of Working	$V_w = D_w \cdot \pi \cdot n / 1000$
径向切深 a <sub>e</sub> [mm] Width of cutting/radial depth of cut	
轴向切深 a <sub>p</sub> [mm] Depth of cutting/axial depth of cut	

### 概要:

#### Summary:

– 刀具的跳动量应达到下列指标:

– Decrease run-out of the tool in relation to:

- ⊙ 常规切削: 最大 0.02mm
- ⊙ 高速加工: 最大 0.01mm
- ⊙ Conventional: maximum 0,02 mm
- ⊙ High speed: maximum 0,01 mm

– 尽量选用短系列立铣刀, 这样可降低刀具的悬伸量。悬伸长度减少 20%, 会使刀具变形减小 50%

– Decrease overhang length of the tool: 20% reduction of overhang length results in 50% reduction of the tool deflection

ap 对悬伸长度的计算:

Calculation of ap vs. overhang length

如果悬伸长度超过 4XD, 采用另一种切削深度 ap 值是重要的。

使用下面的公式计算新的 ap 值:

If the overhang length is longer than 4 x Dc and Cylindrical shanks is used it is important to adopt another depth of cut

(ap) indicated in the table.

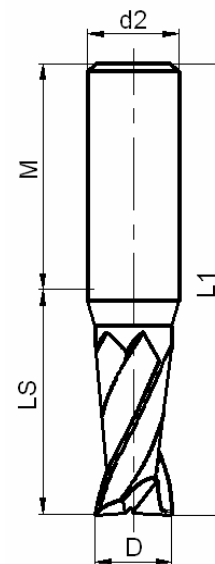
Use the following formula to calculate the new ap value

$$ap(new) = ap (4 D/LS)^2$$

$$LS = L1 - M$$

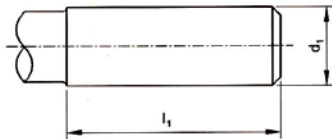
式中: ap(new) – 新的 ap 值

- |    |            |    |                           |    |
|----|------------|----|---------------------------|----|
| ap | – 样本推荐值    | mm | – catalogue value         | mm |
| D  | – 刀具刃径     | mm | – Cutter diameter         | mm |
| LS | – 新的悬伸长度   | mm | – New overhang length     | mm |
| M  | – 刀具最小夹持长度 | mm | – Minimum clamping length | mm |



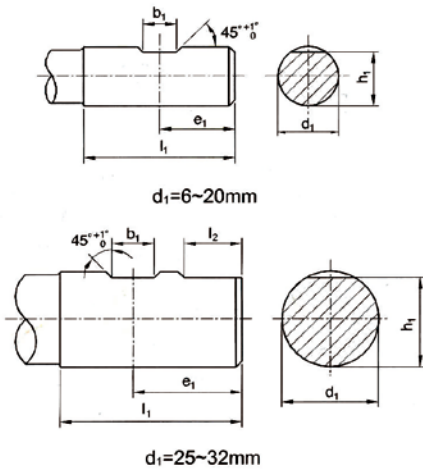
**柄部标准** *The structure of shank*

**DIN 6535-HA**



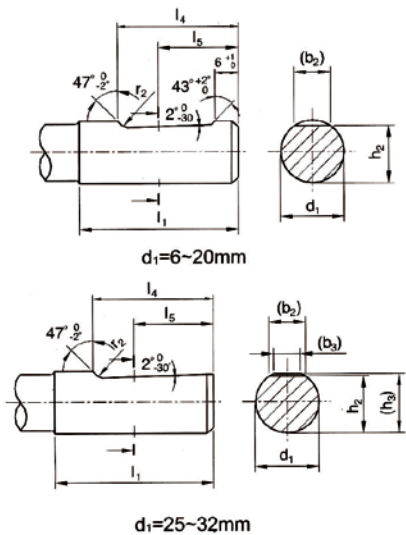
$d_1, h_6$	2	3	4	5	6	8	10	12	14	16	18	20	25	32
$l_1 \begin{smallmatrix} +2 \\ 0 \end{smallmatrix}$	28				36		40	45	48	50	56	60		

**DIN 6535-HB**



$d_1$	$b_1 \begin{smallmatrix} +0.05 \\ 0 \end{smallmatrix}$	$e_1 \begin{smallmatrix} 0 \\ -1 \end{smallmatrix}$	$h_1$	$l_1 \begin{smallmatrix} +2 \\ 0 \end{smallmatrix}$	$l_2 \begin{smallmatrix} +1 \\ 0 \end{smallmatrix}$
6	4.2	18.0	5.1	36.0	
8	5.5		6.9		
10	7.0	20.0	8.5	40.0	
12	8.0	22.5	10.4	45.0	
14			12.7		
16	10.0	24.0	14.2	48.0	
18			16.2		
20	11.0	25.0	18.2	50.0	
25	12.0	32.0	23.0	56.0	17.0
32	14.0	36.0	30.0	60.0	19.0

**DIN 6535-HE**



$d_1$	$(b_2)$	$(b_3)$	$(h_2)$	$(h_3)$	$l_1$	$l_4$	$l_5$	$r_2$
6.0	4.3	-	5.1	-	36.0	25.0	18.0	1.2
8.0	5.5	-	6.9	-	40.0	28.0	20.0	
10.0	7.1	-	8.5	-				
12.0	8.2	-	10.4	-	45.0	33.0	22.5	
14.0	8.1	-	12.7	-	48.0	36.0	24.0	
16.0	10.1	-	14.2	-				
18.0	10.8	-	16.2	-	50.0	38.0	25.0	1.6
20.0	11.4	-	18.2	-				
25.0	13.6	9.3	23.0	24.1	56.0	44.0	32.0	
32.0	15.5	9.9	30.0	31.2	60.0	48.0	35.0	



# 图标说明

# Icon Explain

图标 Icon	说明 Explanation	图标 Icon	说明 Explanation
	圆柱平头立铣刀刀尖 Tool nose of cylindrical flattened end mill	$\beta = 18^\circ$	18° 螺旋角 Helix angle 18°
	圆弧头立铣刀刀尖 Toric end mill nose	$\beta = 25^\circ$	25° 螺旋角 Helix angle 25°
	球头立铣刀 Ball nose end mills	$\beta = 28^\circ$	28° 螺旋角 Helix angle 28°
	两齿铣刀中心铣削一齿过中心 2-tooth mill with one teeth overpass the center	$\beta = 35^\circ$	35° 螺旋角 Helix angle 35°
	两齿铣刀中心铣削 2-tooth mill for center milling	$\beta = 30^\circ$	30° 螺旋角 Helix angle 30°
	三齿铣刀中心铣削一齿过中心 3-tooth mill with one teeth overpass the center	$\beta = 40^\circ$	40° 螺旋角 Helix angle 40°
	三齿铣刀 齿不过中心 3-tooth mill with teeth non-overpass the center	$\beta = 45^\circ$	45° 螺旋角 Helix angle 45°
	四齿铣刀中心铣削 4-tooth mill for center milling	$\beta = 50^\circ$	50° 螺旋角 Helix angle 50°
	五齿及五齿以上铣刀非中心铣削 Mills with 5 teeth or above not for center milling	<b>3D</b>	钻孔深度为钻头直径的3倍 The maximum depth of drilling is 3D
	DIN6535HA 圆柱直柄 DIN6535HA straight shank	<b>5D</b>	钻孔深度为钻头直径的5倍 The maximum depth of drilling is 5D
	DIN6535HB 削平直柄 DIN6535HB Weldon		小径多用途麻花钻 Small diameter twist drills
	DIN6535HE 斜削直柄 DIN6535HE whistle notch shank		小径多用途麻花钻 Small diameter twist drills
	普通圆柱直柄 Straight shank		普通麻花钻 General twist drills
	方头直柄 Square and straight shank		外冷多用途麻花钻 Multi-purpose twist drill with outer cooling
<b>H7</b>	铰刀被加工孔精度等级 Precision class for hole with reamers		内冷多用途麻花钻 Multi-purpose twist drill with inner cooling
<b>H8</b>	铰刀被加工孔精度等级 Precision class for hole with reamers		三刃钻 3-lip drills
<b>P</b>	钢 Steel		内冷直槽钻 Straight flute Drills with inner cooling
<b>M</b>	不锈钢 Stainless steel		丝锥切削锥长度 Cutting length of the tap
<b>K</b>	铸铁 Cast iron		丝锥牙型角 The tooth-like angle of tap
<b>N</b>	非铁材料 Non-ferrous materials	<b>4HX</b>	丝锥精度 Tap precision
<b>S</b>	高温合金, 钛合金 Superalloy and Titanium alloy.	<b>6GX</b>	丝锥精度 Tap precision
<b>H</b>	硬材料 Hardened material	<b>6HX</b>	丝锥精度 Tap precision

## 抗拉强度、布氏硬度、洛氏硬度对照表




























### 抗拉强度、布氏硬度、洛氏硬度对照表

Comparison Table for tensile strength, Vickers hardness, Brinell hardness and Rockwell hardness

N/mm <sup>2</sup>	HV10	HB	HRC
240	75	71	
255	80	76	
270	85	81	
285	90	86	
305	95	90	
320	100	95	
335	105	100	
350	110	105	
370	115	109	
385	120	114	
400	125	119	
415	130	124	
430	135	128	
450	140	133	
465	145	138	
480	150	143	
495	155	147	
510	160	152	
530	165	157	
545	170	162	
560	175	166	
575	180	171	
595	185	176	
610	190	181	
625	195	185	
640	200	190	
660	205	195	
675	210	199	
690	215	204	
705	220	209	
720	225	214	
740	230	219	
755	235	223	
770	240	228	
785	245	233	
800	250	238	22
820	255	242	23
835	260	247	24
860	268	255	25
870	272	258	26
900	280	266	27












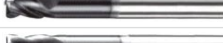





















N/mm <sup>2</sup>	HV10	HB	HRC
920	287	273	28
940	293	278	29
970	302	287	30
995	310	295	31
1020	317	301	32
1050	327	311	33
1080	336	319	34
1110	345	328	35
1140	355	337	36
1170	364	346	37
1200	373	354	38
1230	382	363	39
1260	392	372	40
1260	403	383	41
1330	413	393	42
1360	423	402	43
1400	434	413	44
1440	446	424	45
1480	458	435	46
1530	473	449	47
1570	484	460	48
1620	497	472	49
1680	514	488	50
1730	527	501	51
1790	544	517	52
1845	560	632	53
1910	578	549	54
1980	596	567	55
2050	615	584	56
2140	639	607	57
	655	622	58
	675		59
	698		60
	720		61
	745		62
	773		63
	800		64
	829		65
	864		66
	900		67
	940		68

立铣刀目录Content for end mill

应用 Application	工件材料 Work-piece material						型号 Type	图形 Profile	刀尖型式 Type of geometries	刃径 Dimension	齿数 No. Of teeth	螺旋角 Helix angle	涂层种类 Coating type	未涂层 Non-coating	页次 Page
	钢 Steel	不锈钢 Stainless steel	铸铁 Cast iron	有色金属 Non-ferrous materials	高温合金 Superalloys	淬硬材料 Hardened material									
	P	M	K	N	S	H									
通用型立铣刀 General end Mills															
○		P	M	K	N		MG-2EA35M		平头	1-20	2	35	M		M5
○		P	M	K	N		MG-2EA35L		平头	3-20	2	35	M		M6
	○	P	M	K	N		MG-4EA45M		平头	1-20	4	45	M		M7
	○	P	M	K	N		MG-4EA45L		平头	3-20	4	45	M		M8
○	●	P	M	K	N		MG-2BA35M		球头	1-20	2	35	M		M9
○	●	P	M	K	N		MG-2BA35L		球头	2-20	2	35	M		M10
	●	P	M	K	N		MG-4BA35M		球头	3-20	4	35	M		M11
○		P	M	K	N		MG-2EA30M		平头	1.5-25	2	30	M		M12
○		P	M	K	N		MG-2EA30L		平头	3-20	2	30	M		M13
○		P	M	K	N		MG-2EA30X		平头	12-25	2	30	M		M13
○	○	P	M	K	N		MG-3EA40S		平头	1-20	3	40	M		M14
○	○	P	M	K	N		MG-3EA40M		平头	1.5-25	3	40	M		M15
○	○	P	M	K	N		MG-3EA40L		平头	2-25	3	40	M		M16
○	○	P	M	K	N		MG-3EA40X		平头	10-25	3	40	M		M16
○		P	M	K			MG-3EA30M		平头	1.5-10	3	30	M		M17
○		P	M	K			MG-3EA30L		平头	6-10	3	30	M		M17
	○	P	M	K	N		MG-4EA30S		平头	1-16	4	30	M		M18
	○	P	M	K	N		MG-4EA30M		平头	1.5-25	4	30	M		M19
	○	P		K	N		MG-MEA40M		平头	6-25	5/6/8	40	M		M20
	○	P		K	N		MG-MEA40L		平头	12-25	5/6/8	40	M		M20
	○	P	M				MG-3TA50M		圆弧头	2-25	3	50	M		M21
○	○	P	M	K			MG-3TA40M		圆弧头	3-6	3	40	M		M22
	●	P	M	K	N		MG-2BA30M		球头	1-25	2	30	M		M23
	●	P	M	K	N		MG-2BA30L		球头	1-25	2	30	M		M24
	●	P	M	K	N		MG-2BA30X		球头	16-20	2	30	M		M24
	●	P	M	K	N		MG-3BA40S		球头	1-20	3	40	M		M25
	●	P	M	K	N		MG-3BA40L		球头	3-20	3	40	M		M26



# 整体硬质合金立铣刀 Solid carbide end mills

		●	P	M	K	N			MG-3BA40X		球头	6-20	3	40	M		M26
		●	P	M	K	N			MG-4BA30M		球头	2-25	4	30	M		M27
		●	P	M	K	N			MG-4BA30L		球头	4-20	4	30	M		M28
		●	P	M	K	N			MG-4BA30X		球头	16-20	4	30	M		M28
高速加工钢HRC<48/铸铁用立铣刀 High Speed Machining (HSM) Mills for steel HRC<48 and cast iron																	
○	○		P		K				MP-3TA40M		圆弧头	2-20	3	40	M		M29
○	○		P		K				MP-3TA40L		圆弧头	2-16	3	40	M		M30
	○		P		K		S	H	MP-MTA40M		圆弧头	6-20	5/6/8	40	M		M31
高速加工淬硬材料用立铣刀 High speed Machining (HSM) Mills for Hardened material																	
		●	P		K			H	MH-2TA28M		圆弧头	2-4	2	28	C		M32
		●	P		K			H	MH-2TA28L		圆弧头	2-4	2	28	C		M32
○	○								MH-4TA20M		圆弧头	6-16	4	20	C		M33
		●	P		K			H	MH-4TA28M		圆弧头	6-16	4	28	C		M34
		●	P		K			H	MH-4TA28L		圆弧头	6-12	4	28	C		M35
		●	P		K			H	MH-4TA28X		圆弧头	6-16	4	28	C		M35
	○								MH-MTA45M		圆弧头	6-20	5/6/8	45	C		M36
		●			K			H	MH-2BA18S		球头	2-10	2	18	C		M37
		●			K			H	MH-2BA18M		球头	2-16	2	18	C		M37
		●			K			H	MH-2BA18L		球头	2-16	2	18	C		M38
		●			K			H	MH-4BA18M		球头	6-12	4	18	C		M39
高速加工不锈钢/高温合金用立铣刀 High speed Machining (HSM) Mills for Stainless steel and superalloys																	
○	○			M		N	S		MM-3TA40M		圆弧头	2-20	3	40	N		M40
○	○			M		N	S		MM-3TA40L		圆弧头	2-16	3	40	N		M41
		●		M		N	S		MM-3BA40M		球头	2-16	3	40	N		M42
		●	P	M			S		MM-2BA30M		球头	2-16	2	30	N		M43
		●	P	M			S		MM-2BA30L		球头	2-16	2	30	N		M43
高速加工铝合金用立铣刀 High speed Machining (HSM) Mills for Aluminum alloy																	
○	○					N			MN-2EA50M		平头	2-20	2	50		Y	M44
○						N			MN-2EA25M		平头	2-20	2	25		Y	M45
○	○	●				N			MN-2TA30M		圆弧头	2-25	2	30		Y	M46
○	○	●				N			MN-2TA30L		圆弧头	8-20	2	30		Y	M48
		●				N			MN-2BA50M		球头	2-20	2	50		Y	M49
粗加工用立铣刀 Roughing end mills																	
○	○		P		K				MP-4WB30M		波形平头	10-20	4	30	M		M50
经济型立铣刀 Economical end mills																	
○			P	M	K	N			ME-2EA30M		平头	1.5-25	2	30	B	Y	M51
○			P	M	K	N			ME-2EA30L		平头	3-20	2	30	B	Y	M52
○	○		P	M	K	N			ME-3EA40S		平头	1-20	3	40	B	Y	M53
○	○		P	M	K	N			ME-3EA40M		平头	1.5-25	3	40	B	Y	M54

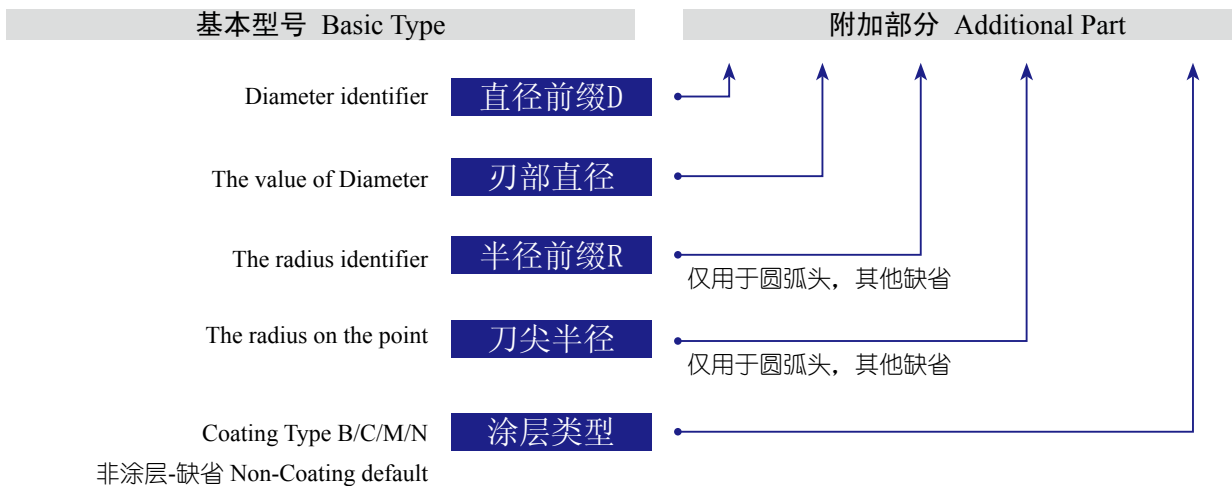
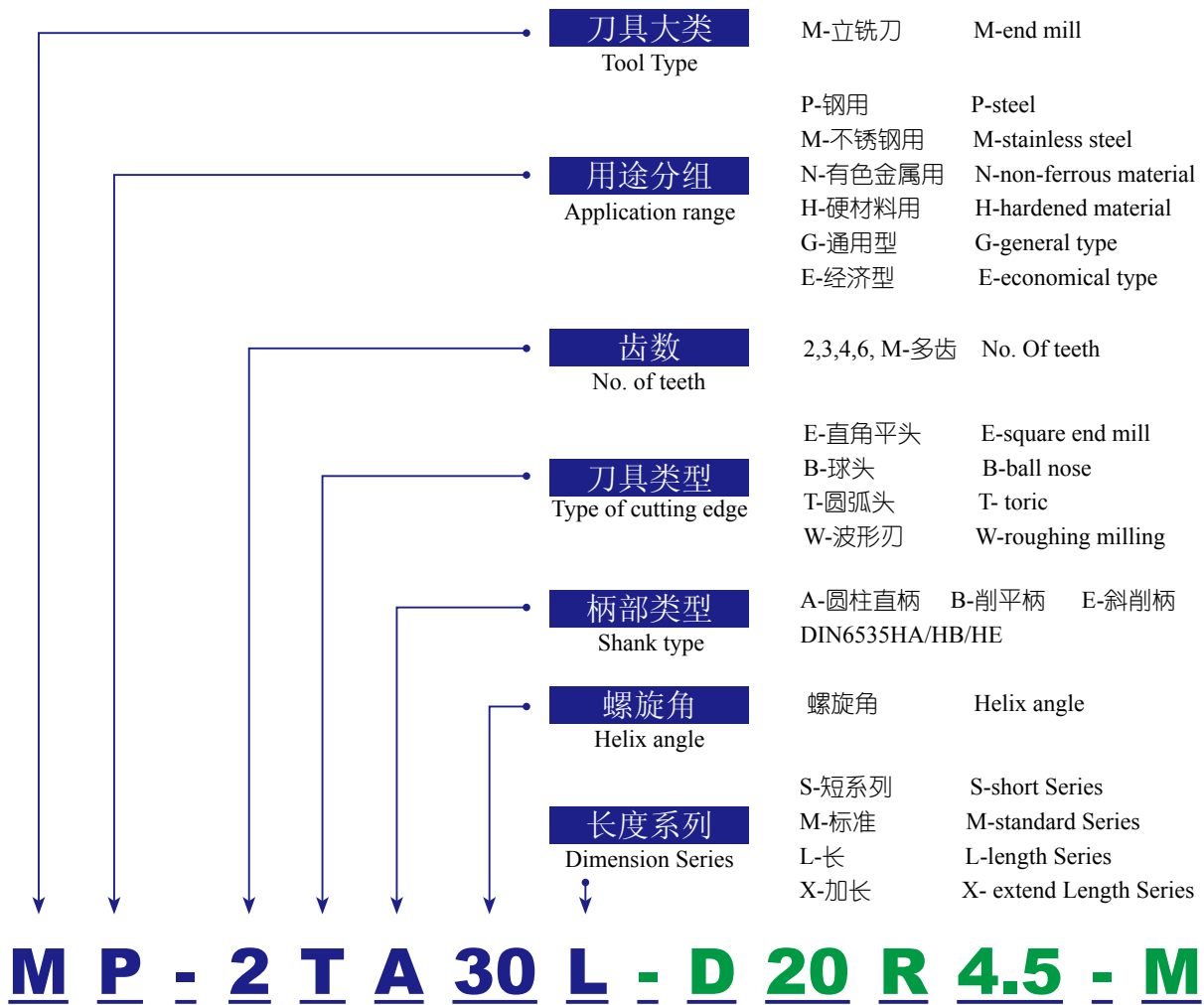
## 整体硬质合金立铣刀 Solid carbide end mills

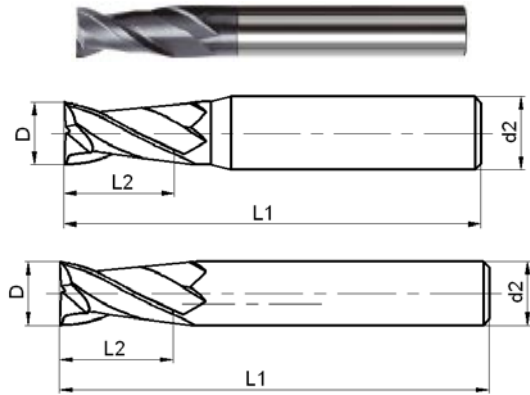
○			P	M	K			ME-3EA30M		平头	1.5-10	3	30	B	Y	M55
○			P	M	K			ME-3EA30L		平头	6-10	3	30	B	Y	M55
	○		P	M	K	N		ME-4EA30S		平头	1-16	4	30	B	Y	M56
	○		P	M	K	N		ME-4EA30M		平头	1.5-25	4	30	B	Y	M57
○		●	P	M	K	N		ME-2BA30M		球头	1-25	2	30	B	Y	M58
○		●	P	M	K	N		ME-2BA30L		球头	1-25	2	30	B	Y	M59
		●	P	M	K	N		ME-4BA30M		球头	2-25	4	30	B	Y	M60



# 整体硬质合金立铣刀 Solid carbide end mills

## 整体硬质合金立铣刀编码规则 Code rule of the solid carbide end mill





<b>MG-2EA35M</b>	
两刃直柄平头立铣刀 <i>2-fluted end mills with straight shank</i>	
螺旋角 Helix angle	35°
齿数 No. of cutting edges	2
端面形式 Type	过中心 Centre cut
长度系列 Series of lengths	M-标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于 <b>HRC≤50(HB460)</b> 的钢、不锈钢、铸 铁、有色金属 Suitable for Steels, stainless steels, Castiron, Non-ferrous materials with HRC≤50(HB460).



型号 Type	规格尺寸Dimension					涂层Coating		
	D (e8)	d2 (h6)	L1	L2	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-2EA35M-D1	1.0	4.0	50	3	2		M	●
MG-2EA35M-D1.5	1.5	4.0	50	4	2		M	●
MG-2EA35M-D2	2.0	4.0	50	6	2		M	●
MG-2EA35M-D2.5	2.5	4.0	50	8	2		M	●
MG-2EA35M-D3	3.0	4.0	50	8	2		M	●
MG-2EA35M-D3.5	3.5	4.0	50	10	2		M	●
MG-2EA35M-D4	4.0	4.0	50	11	2		M	●
MG-2EA35M-D4.5	4.5	6.0	50	11	2		M	●
MG-2EA35M-D5	5.0	6.0	60	13	2		M	●
MG-2EA35M-D5.5	5.5	6.0	60	16	2		M	●
MG-2EA35M-D6	6.0	6.0	60	16	2		M	●
MG-2EA35M-D7	7.0	8.0	60	20	2		M	●
MG-2EA35M-D8	8.0	8.0	60	20	2		M	●
MG-2EA35M-D9	9.0	10.0	75	22	2		M	●
MG-2EA35M-D10	10.0	10.0	75	25	2		M	●
MG-2EA35M-D11	11.0	12.0	75	26	2		M	●
MG-2EA35M-D12	12.0	12.0	75	30	2		M	●
MG-2EA35M-D14	14.0	14.0	75	32	2		M	●
MG-2EA35M-D16	16.0	16.0	100	45	2		M	●
MG-2EA35M-D18	18.0	18.0	100	45	2		M	●
MG-2EA35M-D20	20.0	20.0	100	45	2		M	●

订货示例： 涂层产品 MG-2EA35M-D5-M

Ordering guide: Coating MG-2EA35M-D5-M

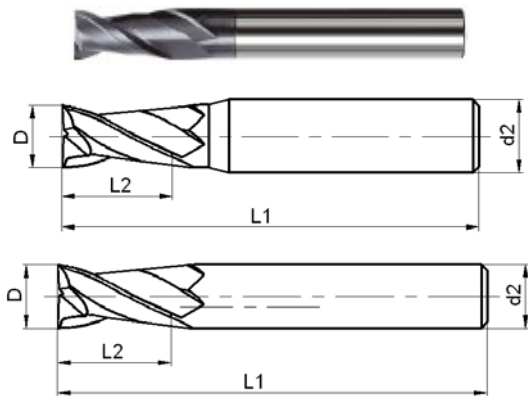
推荐切削用量见M61页。The page M61 for the recommendable cutting date.

●：表示有库存



# 通用型立铣刀 General end Mills

M



<b>MG-2EA35L</b>	
<b>两刃直柄长刃平头立铣刀</b> <b>2-fluted end mills with straight shank</b>	
螺旋角 Helix angle	35°
齿数 No. of cutting edges	2
端面形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-标准系列 L-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于 <b>HRC≤50(HB460)</b> 的钢、不锈钢、铸铁、有色金属 Suitable for Steels, stainless steels, Castiron, Non-ferrous materials with HRC≤50(HB460).



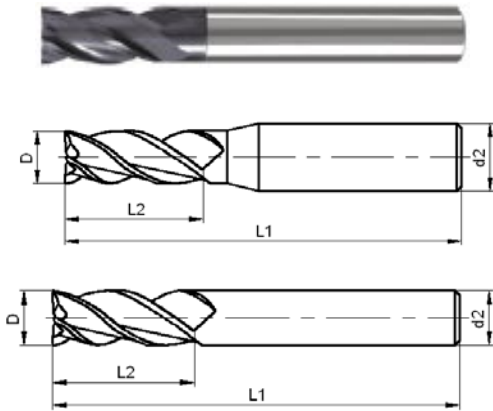
型号 Type	规格尺寸Dimension					涂层Coating		
	D (e8)	d2 (h6)	L1	L2	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-2EA35L-D3	3.0	6.0	75	12	2		M	●
MG-2EA35L-D4	4.0	6.0	75	15	2		M	●
MG-2EA35L-D5	5.0	6.0	75	20	2		M	●
MG-2EA35L-D6	6.0	6.0	75	20	2		M	●
MG-2EA35L-D8	8.0	8.0	100	25	2		M	●
MG-2EA35L-D10	10.0	10.0	100	30	2		M	●
MG-2EA35L-D12	12.0	12.0	100	35	2		M	●
MG-2EA35L-D14	14.0	14.0	100	40	2		M	●
MG-2EA35L-D16	16.0	16.0	150	50	2		M	●
MG-2EA35L-D20	20.0	20.0	150	55	2		M	●

订货示例： 涂层产品 MG-2EA35L-D5-M

Ordering guide: Coating MG-2EA35L-D5-M

推荐切削用量见M61页。The page M61 for the recommendable cutting date.

●：表示有库存



<b>MG-4EA45M</b>	
四刃直柄平头立铣刀 <i>4-fluted end mills with straight shank</i>	
螺旋角 Helix angle	45°
齿数 No. of cutting edges	4
端刃形式 Type	两刃过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于 HRC≤50(HB460) 的钢、不锈钢、铸铁、有色金属 Suitable for Steels, stainless steels, Castiron, Non-ferrous materials with HRC≤50(HB460).

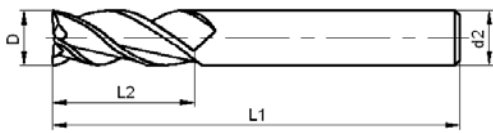
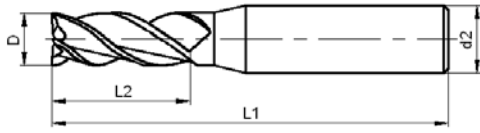


型号 Type	规格尺寸Dimension					涂层Coating		库存 Stock
	D(h10)	d2(h6)	L1	L2	Z	未涂层 Non-Coating	牌号 Grade	
MG-4EA45M-D1	1.0	4.0	50	3	4		M	●
MG-4EA45M-D1.5	1.5	4.0	50	4	4		M	●
MG-4EA45M-D2	2.0	4.0	50	6	4		M	●
MG-4EA45M-D2.5	2.5	4.0	50	8	4		M	●
MG-4EA45M-D3	3.0	4.0	50	8	4		M	●
MG-4EA45M-D3.5	3.5	4.0	50	10	4		M	●
MG-4EA45M-D4	4.0	4.0	50	11	4		M	●
MG-4EA45M-D4.5	4.5	6.0	60	11	4		M	●
MG-4EA45M-D5	5.0	6.0	60	13	4		M	●
MG-4EA45M-D5.5	5.5	6.0	60	16	4		M	●
MG-4EA45M-D6	6.0	6.0	60	16	4		M	●
MG-4EA45M-D7	7.0	8.0	60	20	4		M	●
MG-4EA45M-D8	8.0	8.0	60	20	4		M	●
MG-4EA45M-D9	9.0	10.0	75	22	4		M	●
MG-4EA45M-D10	10.0	10.0	75	25	4		M	●
MG-4EA45M-D11	11.0	12.0	75	26	4		M	●
MG-4EA45M-D12	12.0	12.0	75	30	4		M	●
MG-4EA45M-D14	14.0	14.0	75	32	4		M	●
MG-4EA45M-D16	16.0	16.0	100	45	4		M	●
MG-4EA45M-D18	18.0	18.0	100	45	4		M	●
MG-4EA45M-D20	20.0	20.0	100	45	4		M	●

订货示例： 涂层产品                    MG-4EA45M-D20-M  
 Ordering guide: Coating                MG-4EA45M-D20-M  
 推荐切削用量见M62页。The page M62 for the recommendable cutting date.  
 ●：表示有库存



# 通用型立铣刀 General end Mills



## MG-4EA45L

### 四刃直柄长刃平头立铣刀 4-fluted end mills with straight shank

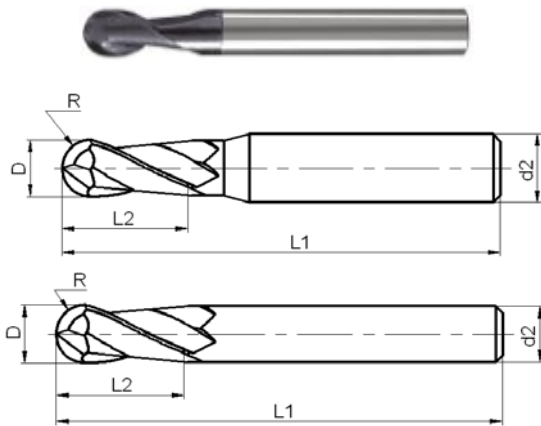
螺旋角 Helix angle	45°
齿数 No. of cutting edges	4
端刃形式 Type	两刃过中心 Centre cut
长度系列 Series of lengths	L-标准系列 L-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于 HRC≤50(HB460) 的钢、不锈钢、铸铁、有色金属 Suitable for Steels, stainless steels, Castiron, Non-ferrous materials with HRC≤50(HB460).



型号 Type	规格尺寸Dimension					涂层Coating		库存 Stock
	D(h10)	d2(h6)	L1	L2	Z	未涂层 Non-Coating	牌号 Grade	
MG-4EA45L-D3	3.0	6.0	75	12	4		M	●
MG-4EA45L-D4	4.0	6.0	75	15	4		M	●
MG-4EA45L-D5	5.0	6.0	75	20	4		M	●
MG-4EA45L-D6	6.0	6.0	75	20	4		M	●
MG-4EA45L-D8	8.0	8.0	100	25	4		M	●
MG-4EA45L-D10	10.0	10.0	100	30	4		M	●
MG-4EA45L-D12	12.0	12.0	100	35	4		M	●
MG-4EA45L-D14	14.0	14.0	100	40	4		M	●
MG-4EA45L-D16	16.0	16.0	150	50	4		M	●
MG-4EA45L-D20	20.0	20.0	150	55	4		M	●

订货示例： 涂层产品 MG-4EA45L-D20-M  
 Ordering guide: Coating MG-4EA45L-D20-M  
 推荐切削用量见M62页。 The page M62 for the recommendable cutting date.

●：表示有库存



<b>MG-2BA35M</b>	
两刃直柄球头立铣刀 <b>2-fluted Ball nose end mill</b>	
螺旋角 Helix angle	35°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于 HRC≤50(HB460) 的钢、不锈钢、铸铁、有色金属 Suitable for Steels, stainless steels, Castiron, Non-ferrous materials with HRC≤50(HB460).



型号 Type	规格尺寸Dimension						涂层Coating		
	D(h10)	d2(h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-2BA35M-D1	1.0	4	50	2	0.50	2		M	●
MG-2BA35M-D1.5	1.5	4	50	3	0.75	2		M	●
MG-2BA35M-D2	2.0	4	50	4	1.00	2		M	●
MG-2BA35M-D2.5	2.5	4	50	5	1.25	2		M	●
MG-2BA35M-D3	3.0	4	50	6	1.50	2		M	●
MG-2BA35M-D3.5	3.5	4	50	8	1.75	2		M	●
MG-2BA35M-D4	4.0	4	50	8	2.00	2		M	●
MG-2BA35M-D5	5.0	6	50	10	2.50	2		M	●
MG-2BA35M-D5.5	5.5	6	60	12	2.75	2		M	●
MG-2BA35M-D6	6.0	6	60	12	3.00	2		M	●
MG-2BA35M-D7	7.0	8	60	14	3.50	2		M	●
MG-2BA35M-D8	8.0	8	60	16	4.00	2		M	●
MG-2BA35M-D9	9.0	10	75	18	4.50	2		M	●
MG-2BA35M-D10	10.0	10	75	20	5.00	2		M	●
MG-2BA35M-D12	12.0	12	75	24	6.00	2		M	●
MG-2BA35M-D14	14.0	14	75	28	7.00	2		M	●
MG-2BA35M-D16	16.0	16	100	32	8.00	2		M	●
MG-2BA35M-D20	20.0	20	100	40	10.00	2		M	●

订货示例：涂层产品

MG-2BA35M-D10-M

Ordering guide: Coating

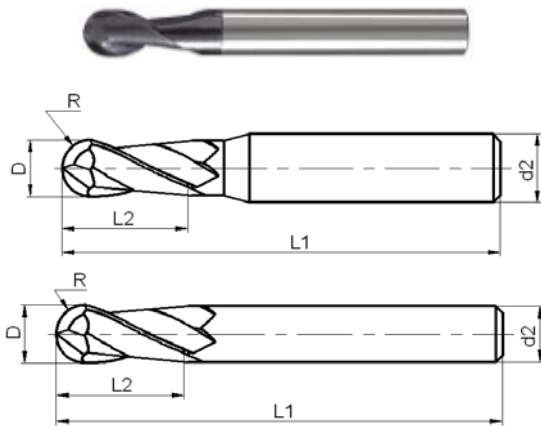
MG-2BA35M-D10-M

推荐切削用量见M63页。The page M63 for the recommendable cutting date.

●：表示有库存



# 通用型立铣刀 General end Mills



<b>MG-2BA35L</b>	
两刃直柄长柄球头立铣刀 <b>2-fluted Ball nose end mill</b>	
螺旋角 Helix angle	35°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-标准系列 L-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于 HRC≤50(HB460) 的钢、不锈钢、铸铁、有色金属 Suitable for Steels, stainless steels, Castiron, Non-ferrous materials with HRC≤50(HB460).



型号 Type	规格尺寸Dimension						涂层Coating		
	D(h10)	d2(h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-2BA35L-D2	2.0	6	75	4	1.00	2		M	●
MG-2BA35L-D2.5	2.5	6	75	5	1.25	2		M	●
MG-2BA35L-D3	3.0	6	75	6	1.50	2		M	●
MG-2BA35L-D3.5	3.5	6	75	8	1.75	2		M	●
MG-2BA35L-D4	4.0	6	75	8	2.00	2		M	●
MG-2BA35L-D5	5.0	6	75	10	2.50	2		M	●
MG-2BA35L-D5.5	5.5	6	75	12	2.75	2		M	●
MG-2BA35L-D6	6.0	6	75	12	3.00	2		M	●
MG-2BA35L-D7	7.0	8	75	14	3.50	2		M	●
MG-2BA35L-D8	8.0	8	100	16	4.00	2		M	●
MG-2BA35L-D9	9.0	10	100	18	4.50	2		M	●
MG-2BA35L-D10	10.0	10	100	20	5.00	2		M	●
MG-2BA35L-D12	12.0	12	100	24	6.00	2		M	●
MG-2BA35L-D14	14.0	14	100	28	7.00	2		M	●
MG-2BA35L-D16	16.0	16	150	32	8.00	2		M	●
MG-2BA35L-D20	20.0	20	150	40	10.00	2		M	●

订货示例：涂层产品

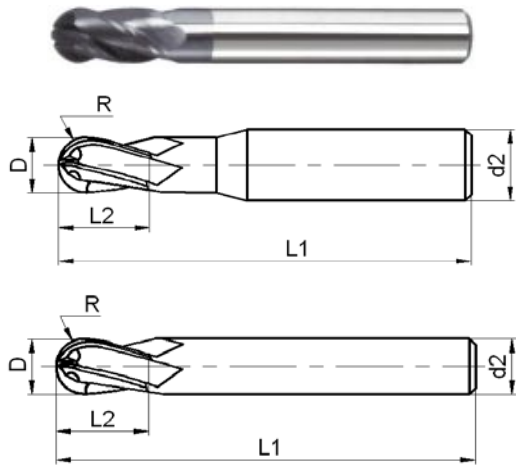
MG-2BA35L-D10-M

Ordering guide: Coating

MG-2BA35L-D10-M

推荐切削用量见M63页。The page M63 for the recommendable cutting date.

●：表示有库存



<b>MG-4BA35M</b>	
四刃球头立铣刀 <i>4-fluted Ball nose end mill</i>	
螺旋角 Helix angle	35°
齿数 No. of cutting edges	4
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于 HRC≤50(HB460) 的钢、不锈钢、铸铁、有色金属 Suitable for Steels, stainless steels, Castiron, Non-ferrous materials with HRC≤50(HB460).



型号 Type	规格尺寸Dimension						涂层Coating		库存 Stock
	D (e8)	d2 (h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	
MG-4BA35M-D3	3.0	6.0	50	6	1.5	4		M	●
MG-4BA35M-D4	4.0	6.0	50	8	2.0	4		M	●
MG-4BA35M-D5	5.0	6.0	50	10	2.5	4		M	●
MG-4BA35M-D6	6.0	6.0	50	12	3.0	4		M	●
MG-4BA35M-D8	8.0	8.0	60	16	4.0	4		M	●
MG-4BA35M-D10	10.0	10.0	75	20	5.0	4		M	●
MG-4BA35M-D12	12.0	12.0	75	24	6.0	4		M	●
MG-4BA35M-D14	14.0	14.0	75	28	7.0	4		M	●
MG-4BA35M-D16	16.0	16.0	100	32	8.0	4		M	●
MG-4BA35M-D18	18.0	18.0	100	36	9.0	4		M	●
MG-4BA35M-D20	20.0	20.0	100	40	10.0	4		M	●

订货示例： 涂层产品

MG-4BA35M-D10-M

Ordering guide: Coating

MG-4BA35M-D10-M

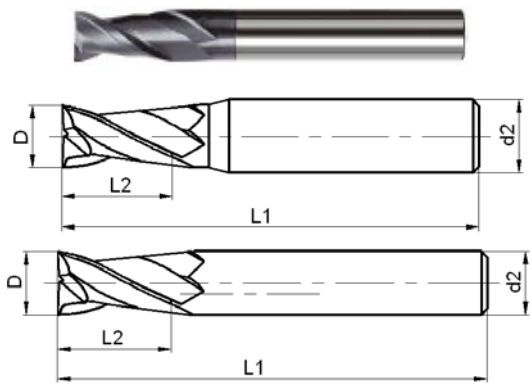
推荐切削用量见M64页。 The page M64 for the recommendable cutting date.

●：表示有库存





# 通用型立铣刀 General end Mills



## MG-2EA30M

两刃直柄立铣刀

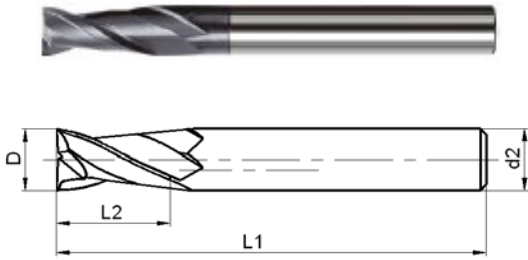
2-fluted end mills with straight shank

螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M-标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (e8)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-2EA30M-D1.5	1.5	3	40	6		2		M	
MG-2EA30M-D2	2	3	40	9		2		M	
MG-2EA30M-D2.5	2.5	3	40	9		2		M	
MG-2EA30M-D3	3	3	40	12		2		M	
MG-2EA30M-D3.5	3.5	4	50	12		2		M	
MG-2EA30M-D4	4	4	50	14		2		M	
MG-2EA30M-D4.5	4.5	6	60	14		2		M	
MG-2EA30M-D5	5	6	65	20		2		M	
MG-2EA30M-D5.5	5.5	6	65	20		2		M	
MG-2EA30M-D6	6	6	65	20		2		M	
MG-2EA30M-D6.5	6.5	8	70	20		2		M	
MG-2EA30M-D7	7	8	70	20		2		M	
MG-2EA30M-D7.5	7.5	8	70	20		2		M	
MG-2EA30M-D8	8	8	70	20		2		M	
MG-2EA30M-D8.5	8.5	10	80	20		2		M	
MG-2EA30M-D9	9	10	80	20		2		M	
MG-2EA30M-D9.5	9.5	10	80	25		2		M	
MG-2EA30M-D10	10	10	80	25		2		M	
MG-2EA30M-D11	11	12	90	25		2		M	
MG-2EA30M-D12	12	12	90	25		2		M	
MG-2EA30M-D13	13	14	100	30		2		M	
MG-2EA30M-D14	14	14	90	30		2		M	
MG-2EA30M-D15	15	16	100	30		2		M	
MG-2EA30M-D16	16	16	90	30		2		M	
MG-2EA30M-D18	18	18	90	30		2		M	
MG-2EA30M-D20	20	20	100	35		2		M	
MG-2EA30M-D22	22	20	100	35		2		M	
MG-2EA30M-D25	25	25	125	40		2		M	

订货示例： 涂层产品 MG-2EA30M-D5-M  
 Ordering guide: Coating MG-2EA30M-D5-M  
 推荐切削用量见M65页。The page M65 for the recommendable cutting date.  
 ●: 表示有库存



### MG-2EA30L, MG-2EA30X

两刃直柄立铣刀

2-fluted end mills with straight shank

螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-长系列 X-加长系列
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



型号 Type	规格尺寸 Dimension					涂层 Coating		
	D (e8)	d2 (h6)	L1	L2	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
L-长系列								
L- Long series								
MG-2EA30L-D3	3	3	60	30	2		M	
MG-2EA30L-D4	4	4	60	30	2		M	
MG-2EA30L-D5	5	6	70	35	2		M	
MG-2EA30L-D6	6	6	100	40	2		M	
MG-2EA30L-D8	8	8	100	40	2		M	
MG-2EA30L-D10	10	10	100	40	2		M	
MG-2EA30L-D12	12	12	100	45	2		M	
MG-2EA30L-D14	14	14	100	45	2		M	
MG-2EA30L-D16	16	16	100	45	2		M	
MG-2EA30L-D18	18	18	125	50	2		M	
MG-2EA30L-D20	20	20	125	55	2		M	
X-加长系列								
X-Extra long series								
MG-2EA30X-D12	12	12	150	30	2		M	
MG-2EA30X-D14	14	14	150	65	2		M	
MG-2EA30X-D16	16	16	150	65	2		M	
MG-2EA30X-D18	18	18	150	65	2		M	
MG-2EA30X-D20	20	20	150	65	2		M	
MG-2EA30X-D25	25	25	150	75	2		M	

订货示例： 涂层产品 MG-2EA30L-D3-M

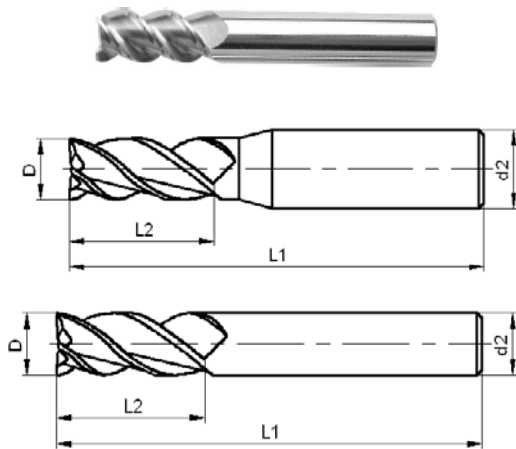
Ordering guide: Coating MG-2EA30L-D3-M

推荐切削用量见M65页。The page M65 for the recommendable cutting data.

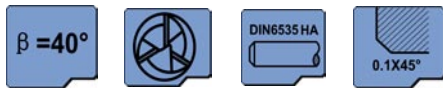
●: 表示有库存



# 通用型立铣刀 General end Mills

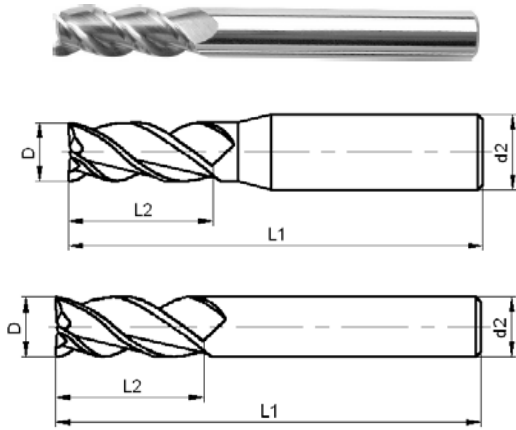


<b>MG-3EA40S</b>	
三刃直柄立铣刀 <i>3-fluted end mills with straight shank</i>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	S-短系列 S- Short series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (h10)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-3EA40S-D1	1	3	40	2		3		M	
MG-3EA40S-D1.5	1.5	3	40	3		3		M	
MG-3EA40S-D2	2	3	40	4		3		M	
MG-3EA40S-D2.5	2.5	3	40	5		3		M	
MG-3EA40S-D3	3	3	40	5		3		M	
MG-3EA40S-D3.5	3.5	4	50	6		3		M	
MG-3EA40S-D4	4	4	50	6		3		M	
MG-3EA40S-D4.5	4.5	6	50	7		3		M	
MG-3EA40S-D5	5	6	50	7		3		M	
MG-3EA40S-D6	6	6	50	8		3		M	
MG-3EA40S-D8	8	8	50	10		3		M	
MG-3EA40S-D10	10	10	50	12		3		M	
MG-3EA40S-D12	12	12	65	15		3		M	
MG-3EA40S-D16	16	16	65	20		3		M	
MG-3EA40S-D20	20	20	90	24		3		M	

订货示例： 涂层产品 MG-3EA40S-D6-M  
 Ordering guide: Coating MG-3EA40S-D6-M  
 推荐切削用量见M66页。The page M66 for the recommendable cutting date.  
 ●: 表示有库存



<b>MG-3EA40M</b>	
三刃直柄立铣刀	
<b>3-fluted end mills with straight shank</b>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端面形式 Type	过中心 Centre cut
长度系列 Series of lengths	M-标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.

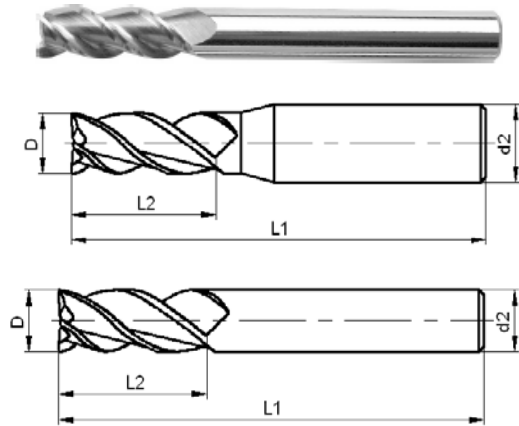


型号 Type	规格尺寸 Dimension						涂层 Coating		库存 Stock
	D (h10)	d2 (h6)	L1	L2	Z	未涂层 Non-Coating	牌号 Grade		
MG-3EA40M-D1.5	1.5	3	40	6	3		M		
MG-3EA40M-D2	2	3	40	6	3		M		
MG-3EA40M-D2.5	2.5	3	50	12	3		M		
MG-3EA40M-D3	3	3	50	12	3		M		
MG-3EA40M-D3.5	3.5	4	50	14	3		M		
MG-3EA40M-D4	4	4	50	14	3		M		
MG-3EA40M-D4.5	4.5	6	60	16	3		M		
MG-3EA40M-D5	5	6	65	16	3		M		
MG-3EA40M-D5.5	5.5	6	65	16	3		M		
MG-3EA40M-D6	6	6	65	20	3		M		
MG-3EA40M-D6.5	6.5	8	65	20	3		M		
MG-3EA40M-D7	7	8	65	20	3		M		
MG-3EA40M-D7.5	7.5	8	65	20	3		M		
MG-3EA40M-D8	8	8	65	20	3		M		
MG-3EA40M-D8.5	8.5	10	75	20	3		M		
MG-3EA40M-D9	9	10	75	20	3		M		
MG-3EA40M-D9.5	9.5	10	75	25	3		M		
MG-3EA40M-D10	10	10	75	25	3		M		
MG-3EA40M-D11	11	12	75	25	3		M		
MG-3EA40M-D12	12	12	75	25	3		M		
MG-3EA40M-D14	14	14	90	30	3		M		
MG-3EA40M-D15	15	16	90	30	3		M		
MG-3EA40M-D16	16	16	90	30	3		M		
MG-3EA40M-D18	18	18	90	35	3		M		
MG-3EA40M-D20	20	20	100	40	3		M		
MG-3EA40M-D25	25	25	125	40	3		M		

订货示例： 涂层产品 MG-3EA40M-D16-M  
 Ordering guide: Coating MG-3EA40M-D16-M  
 推荐切削用量见M66页。The page M66 for the recommendable cutting date.  
 ●：表示有库存



# 通用型立铣刀 General end Mills



## MG-3EA40L, MG-3EA40X

### 三刃直柄立铣刀

#### 3-fluted end mills with straight shank

螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-长系列 X-加长系列 L- Long series X- Extra long series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



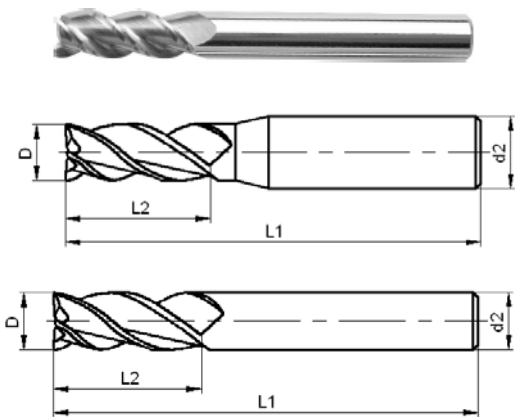
型号 Type	规格尺寸 Dimension						涂层 Coating		库存 Stock
	D (h10)	d2 (h6)	L1	L2	Z	未涂层 Non-Coating	牌号 Grade		
L-长系列 L- Long series									
MG-3EA40L-D2	2	3	60	9	3		M		
MG-3EA40L-D3	3	3	60	30	3		M		
MG-3EA40L-D4	4	4	60	30	3		M		
MG-3EA40L-D5	5	6	70	35	3		M		
MG-3EA40L-D6	6	6	100	40	3		M		
MG-3EA40L-D8	8	8	100	40	3		M		
MG-3EA40L-D10	10	10	100	40	3		M		
MG-3EA40L-D12	12	12	100	45	3		M		
MG-3EA40L-D14	14	14	100	45	3		M		
MG-3EA40L-D16	16	16	100	45	3		M		
MG-3EA40L-D18	18	18	125	50	3		M		
MG-3EA40L-D20	20	20	125	55	3		M		
MG-3EA40L-D25	25	25	125	55	3		M		
X-加长系列 X-Extra long series					3		M		
MG-3EA40X-D10	10	10	125	55	3		M		
MG-3EA40X-D12	12	12	125	55	3		M		
MG-3EA40X-D14	14	14	150	65	3		M		
MG-3EA40X-D16	16	16	150	65	3		M		
MG-3EA40X-D18	18	18	150	65	3		M		
MG-3EA40X-D20	20	20	150	65	3		M		
MG-3EA40X-D25	25	25	150	75	3		M		

订货示例： 涂层产品 MG-3EA40L-D16-M

Ordering guide: Coating MG-3EA40L-D16-M

推荐切削用量见M66页。The page M66 for the recommendable cutting date.

●: 表示有库存

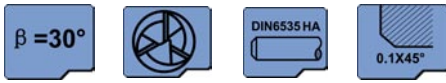


**MG-3EA30M, MG-3EA30L**

三刃直柄立铣刀

**3-fluted end mills with straight shank**

螺旋角 Helix angle	30°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 L-长系列 M-standard series L- Long series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁的铣削加工 Suitable for steels, stainless steels, Cast iron.



型号 Type	规格尺寸 Dimension					涂层 Coating		库存 Stock
	D (h10)	d2 (h6)	L1	L2	Z	未涂层 Non-Coating	牌号 Grade	
M-标准系列								
M-standard series								
MG-3EA30M-D1.5	1.5	3	40	6	3		M	
MG-3EA30M-D2	2	3	40	9	3		M	
MG-3EA30M-D2.5	2.5	3	50	12	3		M	
MG-3EA30M-D3	3	3	50	12	3		M	
MG-3EA30M-D3.5	3.5	4	50	12	3		M	
MG-3EA30M-D4	4	4	50	14	3		M	
MG-3EA30M-D4.5	4.5	6	60	14	3		M	
MG-3EA30M-D5	5	6	65	20	3		M	
MG-3EA30M-D5.5	5.5	6	65	20	3		M	
MG-3EA30M-D6	6	6	65	20	3		M	
MG-3EA30M-D6.5	6.5	8	65	20	3		M	
MG-3EA30M-D7	7	8	65	20	3		M	
MG-3EA30M-D7.5	7.5	8	65	20	3		M	
MG-3EA30M-D8	8	8	65	20	3		M	
MG-3EA30M-D8.5	8.5	10	75	20	3		M	
MG-3EA30M-D9	9	10	75	20	3		M	
MG-3EA30M-D9.5	9.5	10	75	25	3		M	
MG-3EA30M-D10	10	10	75	25	3		M	
L-长系列								
L- Long series								
MG-3EA30L-D6	6	6	100	40	3		M	
MG-3EA30L-D8	8	8	100	40	3		M	
MG-3EA30L-D10	10	10	100	40	3		M	

订货示例： 涂层产品 MG-3EA30M-D10-M

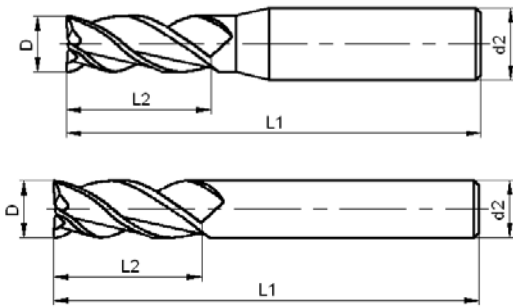
Ordering guide: Coating MG-3EA30M-D10-M

推荐切削用量见M67页。The page M67 for the recommendable cutting date.

●: 表示有库存



## 通用型立铣刀 General end Mills



### MG-4EA30S

#### 四刃直柄立铣刀

#### 4-fluted end mills with straight shank

螺旋角 Helix angle	30°
齿数 No. of cutting edges	4
端刃形式 Type	两刃过中心 Centre cut
长度系列 Series of lengths	S-短系列 S- Short series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



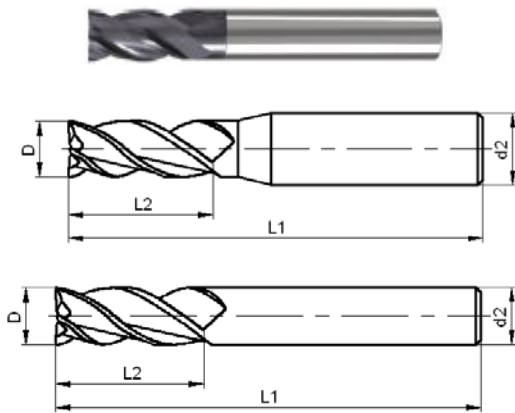
型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (h10)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-4EA30S-D1	1	3	40	2		4		M	
MG-4EA30S-D1.5	1.5	3	40	3		4		M	
MG-4EA30S-D2	2	3	40	4		4		M	
MG-4EA30S-D2.5	2.5	3	40	5		4		M	
MG-4EA30S-D3	3	3	40	6		4		M	
MG-4EA30S-D4	4	4	50	8		4		M	
MG-4EA30S-D5	5	6	60	13		4		M	
MG-4EA30S-D6	6	6	60	13		4		M	
MG-4EA30S-D8	8	8	50	13		4		M	
MG-4EA30S-D10	10	10	50	16		4		M	
MG-4EA30S-D12	12	12	65	19		4		M	
MG-4EA30S-D16	16	16	65	20		4		M	

订货示例： 涂层产品 MG-4EA30S-D10-M

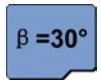
Ordering guide: Coating MG-4EA30S-D10-M

推荐切削用量见M68页。The page M68 for the recommendable cutting date.

●：表示有库存



<b>MG-4EA30M</b>	
四刃直柄立铣刀 <i>4-fluted end mills with straight shank</i>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	4
端刃形式 Type	两刃过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



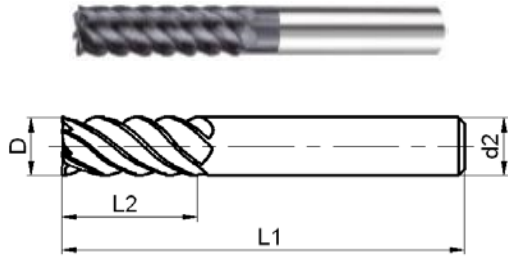
型号 Type	规格尺寸 Dimension							涂层 Coating		
	D (h10)	d2 (h6)	L1	L2			Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-4EA30M-D1.5	1.5	3	40	6			4		M	
MG-4EA30M-D2	2	3	40	9			4		M	
MG-4EA30M-D2.5	2.5	3	50	12			4		M	
MG-4EA30M-D3	3	3	50	12			4		M	
MG-4EA30M-D3.5	3.5	4	50	12			4		M	
MG-4EA30M-D4	4	4	50	14			4		M	
MG-4EA30M-D4.5	4.5	6	60	14			4		M	
MG-4EA30M-D5	5	6	65	20			4		M	
MG-4EA30M-D5.5	5.5	6	65	20			4		M	
MG-4EA30M-D6	6	6	65	20			4		M	
MG-4EA30M-D6.5	6.5	8	65	20			4		M	
MG-4EA30M-D7	7	8	65	20			4		M	
MG-4EA30M-D7.5	7.5	8	65	20			4		M	
MG-4EA30M-D8	8	8	65	20			4		M	
MG-4EA30M-D8.5	8.5	10	75	20			4		M	
MG-4EA30M-D9	9	10	75	20			4		M	
MG-4EA30M-D9.5	9.5	10	75	25			4		M	
MG-4EA30M-D10	10	10	75	25			4		M	
MG-4EA30M-D11	11	12	80	25			4		M	
MG-4EA30M-D12	12	12	80	25			4		M	
MG-4EA30M-D13	13	14	90	30			4		M	
MG-4EA30M-D14	14	14	90	30			4		M	
MG-4EA30M-D15	15	16	90	30			4		M	
MG-4EA30M-D16	16	16	90	30			4		M	
MG-4EA30M-D18	18	18	90	30			4		M	
MG-4EA30M-D20	20	20	100	35			4		M	
MG-4EA30M-D22	22	20	100	35			4		M	
MG-4EA30M-D25	25	25	125	40			4		M	

订货示例： 涂层产品 MG-4EA30M-D20-M  
 Ordering guide: Coating MG-4EA30M-D20-M  
 推荐切削用量见M68页。The page M68 for the recommendable cutting date.  
 ●: 表示有库存





# 通用型立铣刀 General end Mills

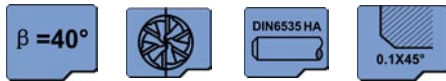


## MG-MEA40M, MG-MEA40L

### 多刃直柄立铣刀

### Multi-fluted end mills with straight shank

螺旋角 Helix angle	40°
齿数 No. of cutting edges	5/6/8
端刃形式 Type	不过中心 Non-Centre cut
长度系列 Series of lengths	M标准系列 L-长系列 M-standard series L-Long series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、铸铁、有色金属的铣削加工 Suitable for steels, Cast iron, Non-ferrous materials.



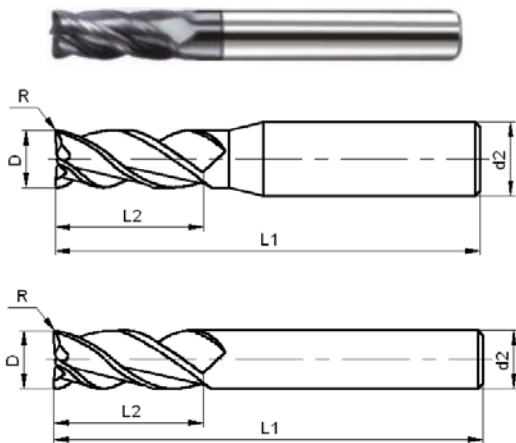
型号 Type	规格尺寸 Dimension						涂层 Coating		库存 Stock
	D (h10)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	
M-标准系列 M-standard series									
MG-MEA40M-D6	6	6	65	20		5		M	
MG-MEA40M-D8	8	8	65	20		5		M	
MG-MEA40M-D10	10	10	75	25		6		M	
MG-MEA40M-D12	12	12	80	25		6		M	
MG-MEA40M-D14	14	14	90	30		6		M	
MG-MEA40M-D16	16	16	90	30		6		M	
MG-MEA40M-D20	20	20	100	35		8		M	
MG-MEA40M-D25	25	25	125	50		8		M	
L-长系列 L-Long series									
MG-MEA40L-D12	12	12	100	45		6		M	
MG-MEA40L-D16	16	16	125	65		6		M	
MG-MEA40L-D20	20	20	125	65		8		M	
MG-MEA40L-D25	25	25	150	75		8		M	

订货示例： 涂层产品 MG-MEA40M-D12-M

Ordering guide: Coating MG-MEA40M-D12-M

推荐切削用量见M69页。The page M69 for the recommendable cutting data.

●: 表示有库存



<b>MG-3TA50M</b>	
三刃圆弧头立铣刀	
<b>3-fluted Toric nose end mill</b>	
螺旋角 Helix angle	50°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢的铣削加工 Suitable for steels, stainless steels.



型号 Type	规格尺寸 Dimension						涂层 Coating		库存 Stock
	D (h10)	d2 (h6)	L1	L2	R (±0.03)	Z	未涂层 Non-Coating	牌号 Grade	
MG-3TA50M-D2 R0.1	2	3	40	9	0.1	3		M	
MG-3TA50M-D3 R0.1	3	3	40	12	0.1	3		M	
MG-3TA50M-D4 R0.1	4	4	50	14	0.1	3		M	
MG-3TA50M-D5 R0.1	5	6	65	20	0.1	3		M	
MG-3TA50M-D6 R0.1	6	6	65	20	0.1	3		M	
MG-3TA50M-D8 R0.2	8	8	65	20	0.2	3		M	
MG-3TA50M-D10 R0.2	10	10	75	25	0.2	3		M	
MG-3TA50M-D12 R0.2	12	12	75	25	0.2	3		M	
MG-3TA50M-D14 R0.5	14	14	90	30	0.5	3		M	
MG-3TA50M-D16 R0.5	16	16	90	30	0.5	3		M	
MG-3TA50M-D18 R0.5	18	18	90	35	0.5	3		M	
MG-3TA50M-D20 R0.5	20	20	100	40	0.5	3		M	
MG-3TA50M-D25 R0.5	25	25	125	40	0.5	3		M	

订货示例： 涂层产品 MG-3TA50M-D16 R0.5-M

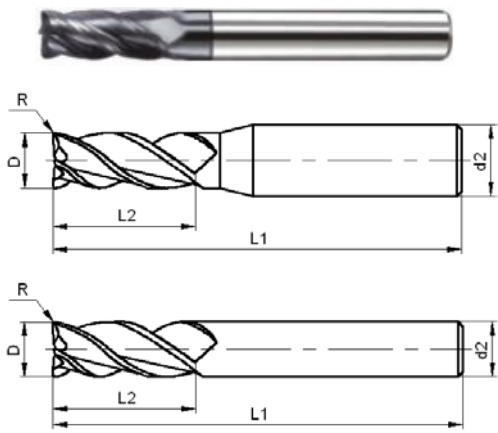
Ordering guide: Coating MG-3TA50M-D16 R0.5-M

推荐切削用量见M70页。The page M70 for the recommendable cutting date.

●: 表示有库存



# 通用型立铣刀 General end Mills

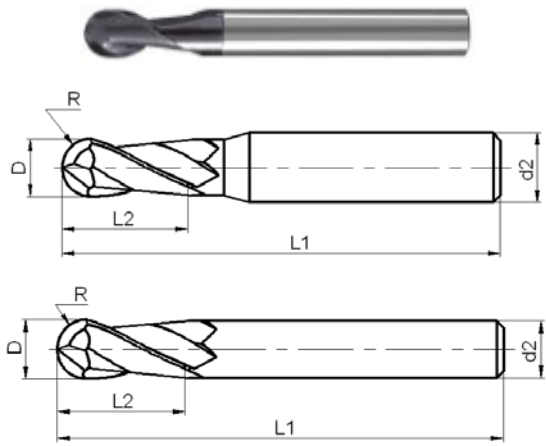


<b>MG-3TA40M</b>	
三刃圆弧头立铣刀 <b>3-fluted Toric nose end mill</b>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.

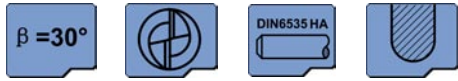


型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (h10)	d2 (h6)	L1	L2	R (±0.03)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-3TA40M-D3 R0.15	3	6	50	9	0.15	3		M	
MG-3TA40M-D4 R0.2	4	6	60	14	0.20	3		M	
MG-3TA40M-D5 R0.2	5	6	60	14	0.20	3		M	
MG-3TA40M-D6 R0.2	6	6	60	14	0.20	3		M	

订货示例： 涂层产品 MG-3TA40M-D5 R0.2-M  
 Ordering guide: Coating MG-3TA40M-D5 R0.2-M  
 推荐切削用量见M71页。The page M71 for the recommendable cutting date.  
 ●：表示有库存



<b>MG-2BA30M</b>	
两刃球头立铣刀 <b>2-fluted Ball nose end mill</b>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.

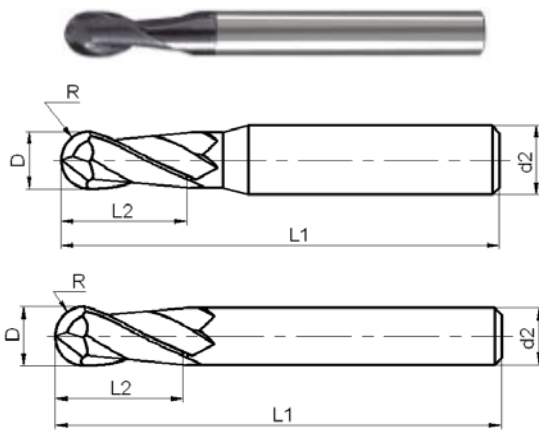


型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (e8)	d2 (h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-2BA30M-D1	1	3	40	2	0.50	2		M	
MG-2BA30M-D1.5	1.5	3	40	3	0.75	2		M	
MG-2BA30M-D2	2	3	40	4	1.00	2		M	
MG-2BA30M-D2.5	2.5	3	40	5	1.25	2		M	
MG-2BA30M-D3	3	3	40	8	1.50	2		M	
MG-2BA30M-D3.5	3.5	4	50	12	1.75	2		M	
MG-2BA30M-D4	4	4	50	14	2.00	2		M	
MG-2BA30M-D4.5	4.5	6	60	14	2.25	2		M	
MG-2BA30M-D5	5	6	65	20	2.50	2		M	
MG-2BA30M-D5.5	5.5	6	65	20	2.75	2		M	
MG-2BA30M-D6	6	6	65	20	3.00	2		M	
MG-2BA30M-D7	7	8	65	20	3.50	2		M	
MG-2BA30M-D8	8	8	65	20	4.00	2		M	
MG-2BA30M-D9	9	10	65	20	4.50	2		M	
MG-2BA30M-D10	10	10	75	25	5.00	2		M	
MG-2BA30M-D11	11	12	75	25	5.50	2		M	
MG-2BA30M-D12	12	12	75	25	6.00	2		M	
MG-2BA30M-D14	14	14	90	30	7.00	2		M	
MG-2BA30M-D15	15	16	90	30	7.50	2		M	
MG-2BA30M-D16	16	16	90	30	8.00	2		M	
MG-2BA30M-D18	18	18	90	35	9.00	2		M	
MG-2BA30M-D20	20	20	100	40	10.00	2		M	
MG-2BA30M-D25	25	25	100	40	12.50	2		M	

订货示例： 涂层产品 MG-2BA30M-D10-M  
 Ordering guide: Coating MG-2BA30M-D10-M  
 推荐切削用量见M72页。The page M72 for the recommendable cutting date.  
 ●: 表示有库存



# 通用型立铣刀 General end Mills



## MG-2BA30L, MG-2BA30X

两刃球头立铣刀

**2-fluted Ball nose end mill**

螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-长系列 X-加长系列 L- Long series X- Extra long series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



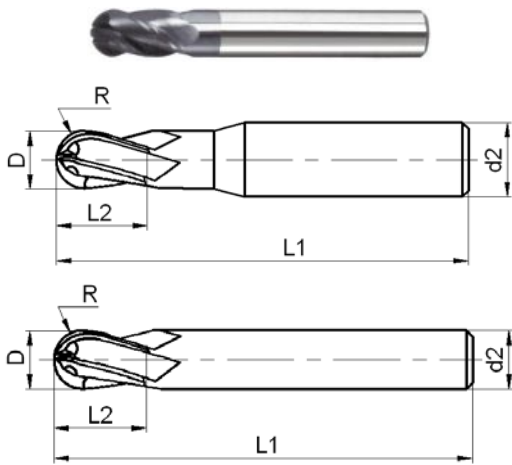
型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (e8)	d2 (h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
L-长系列									
L- Long series									
MG-2BA30L-D1	1	3	40	5	0.50	2		M	
MG-2BA30L-D1.5	1.5	3	40	6	0.75	2		M	
MG-2BA30L-D2	2	3	40	9	1.00	2		M	
MG-2BA30L-D3	3	3	60	20	1.50	2		M	
MG-2BA30L-D4	4	4	60	30	2.00	2		M	
MG-2BA30L-D5	5	6	70	35	2.50	2		M	
MG-2BA30L-D6	6	6	100	40	3.00	2		M	
MG-2BA30L-D8	8	8	100	40	4.00	2		M	
MG-2BA30L-D10	10	10	100	40	5.00	2		M	
MG-2BA30L-D12	12	12	100	45	6.00	2		M	
MG-2BA30L-D16	16	16	100	45	8.00	2		M	
MG-2BA30L-D20	20	20	125	55	10.00	2		M	
MG-2BA30L-D25	25	25	150	65	12.50	2		M	
X-加长系列									
X-Extra long series									
MG-2BA30X-D16	16	16	150	65	8.00	2		M	
MG-2BA30X-D20	20	20	150	65	10.00	2		M	

订货示例： 涂层产品 MG-2BA30L-D16-M

Ordering guide: Coating MG-2BA30L-D16-M

推荐切削用量见M72页。The page M72 for the recommendable cutting date.

●: 表示有库存



<b>MG-3BA40S</b>	
三刃球头立铣刀	
<b>3-fluted Ball nose end mill</b>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	S-短系列 S- Short series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.

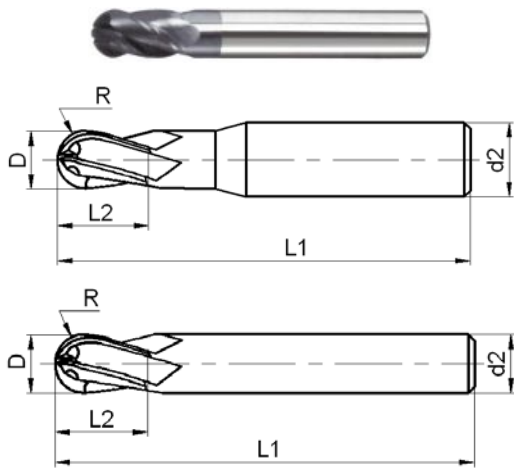


M

型号 Type	规格尺寸 Dimension						涂层 Coating		
	D(e8)	d2(h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-3BA40S-D1	1	3	40	2	0.50	3		M	
MG-3BA40S-D1.5	1.5	3	40	2	0.75	3		M	
MG-3BA40S-D2	2	3	40	3	1.00	3		M	
MG-3BA40S-D3	3	6	50	5	1.50	3		M	
MG-3BA40S-D4	4	6	55	6	2.00	3		M	
MG-3BA40S-D5	5	6	55	7	2.50	3		M	
MG-3BA40S-D6	6	6	55	8	3.00	3		M	
MG-3BA40S-D8	8	8	65	10	4.00	3		M	
MG-3BA40S-D10	10	10	65	12	5.00	3		M	
MG-3BA40S-D12	12	12	75	15	6.00	3		M	
MG-3BA40S-D16	16	16	90	20	8.00	3		M	
MG-3BA40S-D20	20	20	90	28	10.00	3		M	

订货示例： 涂层产品 MG-3BA40S-D10-M  
 Ordering guide: Coating MG-3BA40S-D10-M  
 推荐切削用量见M73页。The page M73 for the recommendable cutting date.  
 ●：表示有库存

# 通用型立铣刀 General end Mills



## MG-3BA40L MG-3BA40X

三刃球头立铣刀

**3-fluted Ball nose end mill**

螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-长系列 X-加长系列
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



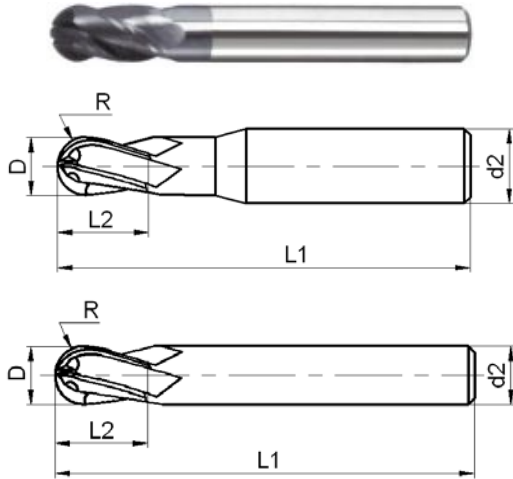
型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (e8)	d2 (h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
L-长系列									
L- Long series									
MG-3BA40L-D3	3	4	75	20	1.50	3		M	
MG-3BA40L-D4	4	4	75	25	2.00	3		M	
MG-3BA40L-D6	6	6	100	40	3.00	3		M	
MG-3BA40L-D8	8	8	100	40	4.00	3		M	
MG-3BA40L-D10	10	10	100	40	5.00	3		M	
MG-3BA40L-D12	12	12	100	45	6.00	3		M	
MG-3BA40L-D16	16	16	100	45	8.00	3		M	
MG-3BA40L-D20	20	20	125	55	10.00	3		M	
X-加长系列									
X-Extra long series									
MG-3BA40X-D6	6	6	100	15	3.00	3		M	
MG-3BA40X-D8	8	8	100	20	4.00	3		M	
MG-3BA40X-D10	10	10	125	25	5.00	3		M	
MG-3BA40X-D12	12	12	125	25	6.00	3		M	
MG-3BA40X-D16	16	16	150	65	8.00	3		M	
MG-3BA40X-D20	20	20	150	65	10.00	3		M	

订货示例： 涂层产品 MG-3BA40L-D10-M

Ordering guide: Coating MG-3BA40L-D10-M

推荐切削用量见M73页。The page M73 for the recommendable cutting data.

●: 表示有库存



<b>MG-4BA30M</b>	
四刃球头立铣刀 <b>4-fluted Ball nose end mill</b>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	4
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



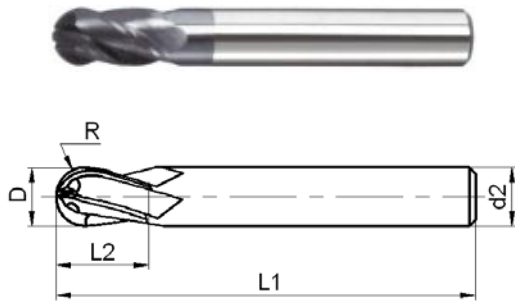
型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (e8)	d2 (h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MG-4BA30M-D2	2	3	40	4	1.00	4		M	
MG-4BA30M-D3	3	3	40	9	1.50	4		M	
MG-4BA30M-D4	4	4	50	14	2.00	4		M	
MG-4BA30M-D5	5	6	65	20	2.50	4		M	
MG-4BA30M-D6	6	6	65	20	3.00	4		M	
MG-4BA30M-D8	8	8	65	20	4.00	4		M	
MG-4BA30M-D10	10	10	75	25	5.00	4		M	
MG-4BA30M-D12	12	12	75	25	6.00	4		M	
MG-4BA30M-D14	14	14	90	30	7.00	4		M	
MG-4BA30M-D16	16	16	90	30	8.00	4		M	
MG-4BA30M-D20	20	20	100	40	10.00	4		M	
MG-4BA30M-D22	22	22	100	40	11.00	4		M	
MG-4BA30M-D25	25	25	100	40	12.50	4		M	

订货示例： 涂层产品 MG-4BA30M-D10-M  
 Ordering guide: Coating MG-4BA30M-D10-M  
 推荐切削用量见M74页。The page M74 for the recommendable cutting date.  
 ●：表示有库存





# 通用型立铣刀 General end Mills



## MG-4BA30L MG-4BA30X

### 四刃球头立铣刀

### 4-fluted Ball nose end mill

螺旋角 Helix angle	30°
齿数 No. of cutting edges	4
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-长系列 X-加长系列
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、铸铁、有色金属的铣削加工 Suitable for steels, stainless steels, Cast iron, Non-ferrous materials.



型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (e8)	d2 (h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
L-长系列									
L- Long series									
MG-4BA30L-D4	4	4	60	30	2.00	4		M	
MG-4BA30L-D6	6	6	100	40	3.00	4		M	
MG-4BA30L-D8	8	8	100	40	4.00	4		M	
MG-4BA30L-D8	10	10	100	40	5.00	4		M	
MG-4BA30L-D12	12	12	100	45	6.00	4		M	
MG-4BA30L-D16	16	16	100	45	8.00	4		M	
MG-4BA30L-D20	20	20	125	55	10.00	4		M	
X-加长系列									
X-Extra long series									
MG-4BA30X-D16	16	16	150	65	8.00	4		M	
MG-4BA30X-D20	20	20	150	65	10.00	4		M	

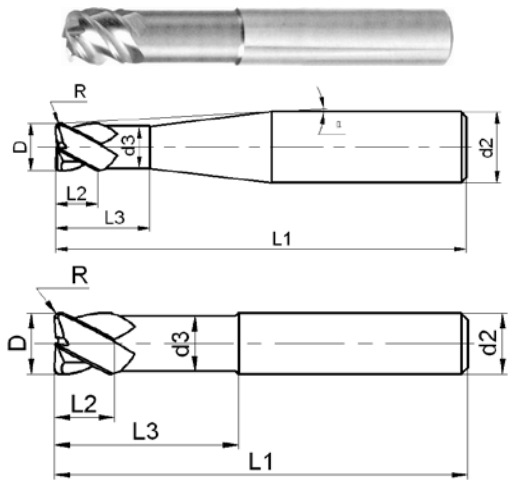
订货示例： 涂层产品 MG-4BA30L-D12-M

Ordering guide: Coating MG-4BA30L-D12-M

推荐切削用量见M74页。The page M74 for the recommendable cutting date.

●: 表示有库存

高速加工钢HRC<48/铸铁用立铣刀 High Speed Machining (HSM) Mills for steel HRC<48 and cast iron



**MP-3TA40M**

三刃圆弧头立铣刀

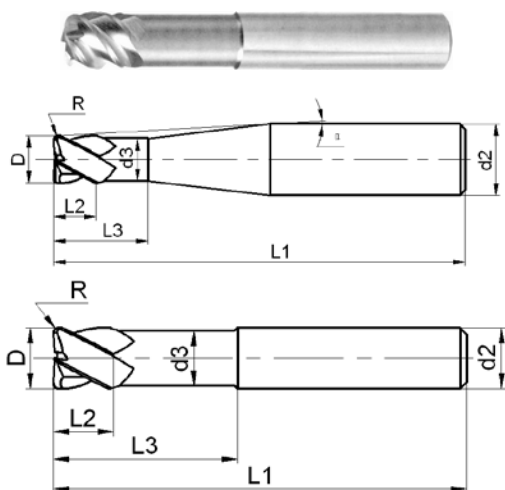
**3-fluted Toric nose end mill**

螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	不过中心 Non-centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢HRC < 48和铸铁的高速铣削加工 Suitable for steels HRC < 48, Cast iron with High Speed Machining (HSM)



型号 Type	规格尺寸Dimension									涂层Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	R (±0.03)	α°	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MP-3TA40M-D2 R0.2	2	3	1.9	40	3	6	0.2	4°	3		M	
MP-3TA40M-D2.5 R0.2	2.5	3	2.4	40	4	6	0.2	2°	3		M	
MP-3TA40M-D3 R0.1	3	3	2.8	40	4	7	0.1	-	3		M	
MP-3TA40M-D3 R0.2	3	3	2.8	40	4	7	0.2	-	3		M	
MP-3TA40M-D3.5 R0.2	3.5	6	3.2	50	5	9	0.2	6°	3		M	
MP-3TA40M-D4 R0.2	4	6	3.7	50	5	9	0.2	5°	3		M	
MP-3TA40M-D4 R0.3	4	6	3.7	50	5	9	0.3	5°	3		M	
MP-3TA40M-D4 R0.5	4	6	3.7	50	5	9	0.5	5°	3		M	
MP-3TA40M-D5 R0.2	5	6	4.6	50	6	11	0.2	2° 30'	3		M	
MP-3TA40M-D6 R0.2	6	6	5.6	60	7	14	0.2	-	3		M	
MP-3TA40M-D6 R0.3	6	6	5.6	60	7	14	0.3	-	3		M	
MP-3TA40M-D6 R0.5	6	6	5.6	60	7	14	0.5	-	3		M	
MP-3TA40M-D8 R0.2	8	8	7.4	60	9	18	0.2	-	3		M	
MP-3TA40M-D8 R0.5	8	8	7.4	60	9	18	0.5	-	3		M	
MP-3TA40M-D10 R0.2	10	10	9.4	70	12	25	0.2	-	3		M	
MP-3TA40M-D10 R0.5	10	10	9.4	70	12	25	0.5	-	3		M	
MP-3TA40M-D10 R1	10	10	9.4	70	12	25	1	-	3		M	
MP-3TA40M-D12 R0.5	12	12	11.4	80	15	30	0.5	-	3		M	
MP-3TA40M-D12 R1	12	12	11.4	80	15	30	1	-	3		M	
MP-3TA40M-D12 R1.5	12	12	11.4	80	15	30	1.5	-	3		M	
MP-3TA40M-D16 R1	16	16	15.4	90	18	38	1	-	3		M	
MP-3TA40M-D20 R1	20	20	19.2	100	22	40	1	-	3		M	

订货示例： 涂层产品 MP-3TA40M-D10 R0.5-M  
 Ordering guide: Coating MP-3TA40M-D10 R0.5-M  
 推荐切削用量见M75页。The page M75 for the recommendable cutting date.  
 ●: 表示有库存



### MP-3TA40L

#### 三刃圆弧头立铣刀

#### 3-fluted Toric nose end mill

螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	不过中心 Non-centre cut
长度系列 Series of lengths	L-长系列 L- Long series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢HRC < 48和铸铁的高速铣削加工 Suitable for steels HRC < 48, Cast iron with High Speed Machining (HSM)



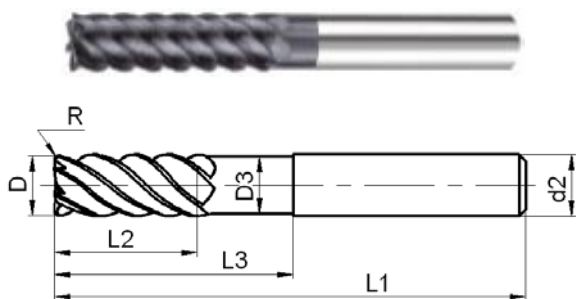
型号 Type	规格尺寸Dimension									涂层Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	R (±0.03)	α°	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MP-3TA40L-D2 R0.2	2	3	1.9	60	3	10	0.2	2° 30'	3		M	
MP-3TA40L-D3 R0.2	3	3	2.8	60	4	14	0.2	-	3		M	
MP-3TA40L-D4 R0.2	4	6	3.7	65	5	18	0.2	3°	3		M	
MP-3TA40L-D5 R0.2	5	6	4.6	65	6	22	0.2	1° 30'	3		M	
MP-3TA40L-D6 R0.3	6	6	5.4	80	7	26	0.3	-	3		M	
MP-3TA40L-D8 R0.5	8	8	7.4	85	9	36	0.5	-	3		M	
MP-3TA40L-D10 R0.5	10	10	9.4	100	12	45	0.5	-	3		M	
MP-3TA40L-D12 R0.5	12	12	11.4	125	15	54	0.5	-	3		M	
MP-3TA40L-D16 R1	16	16	15.4	125	18	65	1	-	3		M	

订货示例： 涂层产品 MP-3TA40L-D8 R0.5-M

Ordering guide: Coating MP-3TA40L-D8 R0.5-M

推荐切削用量见M75页。The page M75 for the recommendable cutting data.

●: 表示有库存



<b>MP-MTA40M</b>	
多刃圆弧头立铣刀 <i>Multi-fluted Toric nose end mill</i>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	5/6/8
端刃形式 Type	不过中心 Non-centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、铸铁、高温合金、钛合金、淬硬钢 的高速加工 Suitable for steels, Cast iron, Superalloys, Titanium alloys, Hardened steels with High Speed Machining (HSM)



型号 Type	规格尺寸Dimension								涂层Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	R(±0.03)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MP-MTA40M-D6 R0.2	6	6	5.6	55	9	15	0.2	5		M	
MP-MTA40M-D6 R0.5	6	6	5.6	55	9	15	0.5	5		M	
MP-MTA40M-D8 R0.2	8	8	7.4	60	12	18	0.2	5		M	
MP-MTA40M-D8 R0.5	8	8	7.4	60	12	18	0.5	5		M	
MP-MTA40M-D10 R0.3	10	10	9.4	70	15	25	0.3	6		M	
MP-MTA40M-D10 R1	10	10	9.4	70	15	25	1.0	6		M	
MP-MTA40M-D12 R0.5	12	12	11.4	80	18	30	0.5	6		M	
MP-MTA40M-D12 R1	12	12	11.4	80	18	30	1.0	6		M	
MP-MTA40M-D16 R0.5	16	16	15.4	90	24	35	0.5	8		M	
MP-MTA40M-D16 R1	16	16	15.4	90	24	35	1.0	8		M	
MP-MTA40M-D20 R0.5	20	20	19.2	100	30	38	0.5	8		M	
MP-MTA40M-D20 R1	20	20	19.2	100	30	38	1.0	8		M	

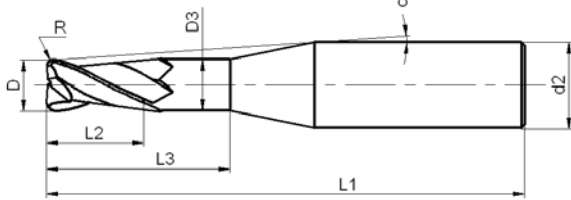
订货示例： 涂层产品 MP-MTA40M-D16 R0.5-M

Ordering guide: Coating MP-MTA40M-D16 R0.5-M

推荐切削用量见M76页。The page M76 for the recommendable cutting date.

●: 表示有库存

# 高速加工淬硬材料用立铣刀 High speed Machining (HSM) Mills for Hardened material

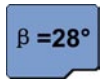


## MH-2TA28M MH-2TA28L

### 两刃圆弧头立铣刀

### 2-fluted Toric nose end mill

螺旋角 Helix angle	28°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 L-长系列
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、铸铁和淬硬钢的高速铣削加工 Suitable for steels, Cast iron, Hardened steels with High Speed Machining (HSM)



型号 Type	规格尺寸 Dimension									涂层 Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	R (±0.03)	α°	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
M-标准系列												
M-standard series												
MH-2TA28M-D2 R0.5	2	4	1.9	40	2	6	0.5	6°	2		C	
MH-2TA28M-D3 R0.5	3	4	2.8	40	3	9	0.5	2° 30'	2		C	
MH-2TA28M-D3 R1	3	4	2.8	40	3	9	1	2° 30'	2		C	
MH-2TA28M-D4 R0.5	4	6	3.7	50	4	10	0.5	4° 30'	2		C	
MH-2TA28M-D4 R1	4	6	3.7	50	4	10	1	4° 30'	2		C	
L-长系列												
L- Long series												
MH-2TA28L-D2 R0.5	2	6	1.9	80	2	35	0.5	3° 30'	2		C	
MH-2TA28L-D3 R1	3	6	2.8	80	3	40	1	2° 30'	2		C	
MH-2TA28L-D4 R1	4	6	3.7	80	4	50	1	1° 30'	2		C	

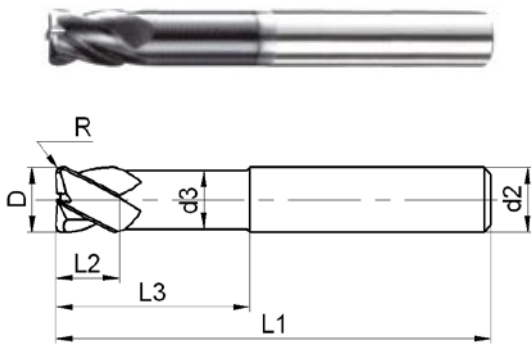
订货示例： 涂层产品 MH-2TA28L-D4 R1-C

Ordering guide: Coating MH-2TA28L-D4 R1-C

推荐切削用量见M77页。The page M77 for the recommendable cutting date.

●：表示有库存

# 高速加工淬硬材料用立铣刀 High speed Machining (HSM) Mills for Hardened material



<b>MH-4TA20M</b>	
四刃圆弧头立铣刀 <i>4-fluted Toric nose end mill</i>	
螺旋角 Helix angle	20°
齿数 No. of cutting edges	4
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于淬硬钢的高速铣削加工 Suitable for Hardened steels with High Speed Machining (HSM)

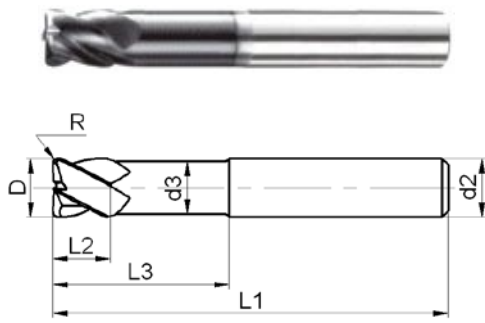


型号 Type	规格尺寸Dimension								涂层Coating		
	D(e8)	d2(h6)	d3	L1	L2	L3	R(±0.05)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MH-4TA20M-D6 R0.6	6	6	5.6	55	7	14	0.6	4		C	
MH-4TA20M-D8 R0.8	8	8	7.4	60	10	18	0.8	4		C	
MH-4TA20M-D10 R1	10	10	9.4	70	12	25	1	4		C	
MH-4TA20M-D12 R1.2	12	12	11.4	80	15	30	1.2	4		C	
MH-4TA20M-D16 R1.6	16	16	15.4	90	18	35	1.6	4		C	

订货示例： 涂层产品 MH-4TA20M-D16 R1.6-C  
 Ordering guide: Coating MH-4TA20M-D16 R1.6-C  
 推荐切削用量见M78页。The page M78 for the recommendable cutting date.  
 ●：表示有库存



# 高速加工淬硬材料用立铣刀 High speed Machining (HSM) Mills for Hardened material



<b>MH-4TA28M</b>	
四刃圆弧头立铣刀 <b>4-fluted Toric nose end mill</b>	
螺旋角 Helix angle	28°
齿数 No. of cutting edges	4
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、铸铁和淬硬钢的高速铣削加工 Suitable for steels, Cast iron, Hardened steels with High Speed Machining (HSM)



型号 Type	规格尺寸 Dimension								涂层 Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	R (±0.10)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MH-4TA28M-D6 R1	6	6	5.6	55	6	15	1	4		C	
MH-4TA28M-D6 R1.5	6	6	5.6	55	6	15	1.5	4		C	
MH-4TA28M-D8 R1	8	8	7.4	60	8	20	1	4		C	
MH-4TA28M-D8 R1.5	8	8	7.4	60	8	20	1.5	4		C	
MH-4TA28M-D8 R2	8	8	7.4	60	8	20	2	4		C	
MH-4TA28M-D10 R1	10	10	9.4	70	8	25	1	4		C	
MH-4TA28M-D10 R2	10	10	9.4	70	8	25	2	4		C	
MH-4TA28M-D10 R2.5	10	10	9.4	70	8	25	2.5	4		C	
MH-4TA28M-D12 R2	12	12	11.4	80	10	25	2	4		C	
MH-4TA28M-D12 R3	12	12	11.4	80	10	25	3	4		C	
MH-4TA28M-D16 R4	16	16	15.4	90	12	32	4	4		C	

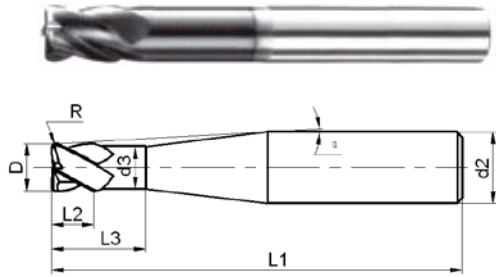
订货示例： 涂层产品 MH-4TA28M-D10 R2.5-C

Ordering guide: Coating MH-4TA28M-D10 R2.5-C

推荐切削用量见M79页。The page M79 for the recommendable cutting date.

●：表示有库存

# 高速加工淬硬材料用立铣刀 High speed Machining (HSM) Mills for Hardened material



## MH-4TA28L MH-4TA28X

### 四刃圆弧头立铣刀

### 4-fluted Toric nose end mill

螺旋角 Helix angle	28°
齿数 No. of cutting edges	4
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-长系列 X-加长系列
柄部型式 Type of shank	直柄 d2
适用场合 Application	适用于钢、铸铁和淬硬钢的高速铣削加工 Suitable for steels, Cast iron, Hardened steels with High Speed Machining (HSM)



型号 Type	规格尺寸Dimension									涂层Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	R(±0.1)	α °	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
L-长系列												
L- Long series									4		C	
MH-4TA28L-D6 R1.5	6	8	5.6	100	6	55	1.5	1° 30'	4		C	
MH-4TA28L-D8 R2	8	10	7.4	100	8	60	2	1° 30'	4		C	
MH-4TA28L-D10 R2.5	10	12	9.4	125	8	60	2.5	1° 30'	4		C	
MH-4TA28L-D12 R3	12	16	11.4	125	10	70	3.0	2°	4		C	
X-加长系列												
X- Extra long series												
MH-4TA28X-D6 R1.5	6	10	5.6	125	6	60	1.5	2°	4		C	
MH-4TA28X-D8 R2	8	12	7.4	150	8	65	2	2°	4		C	
MH-4TA28X-D10 R2.5	10	12	9.4	150	8	80	2.5	1°	4		C	
MH-4TA28X-D12 R3	12	16	11.4	175	10	100	3	1° 30'	4		C	
MH-4TA28X-D16 R4	16	20	15.4	200	12	100	4	1° 30'	4		C	

订货示例: 涂层产品 MH-4TA28L-D10 R2.5-C

Ordering guide: Coating MH-4TA28L-D10 R2.5-C

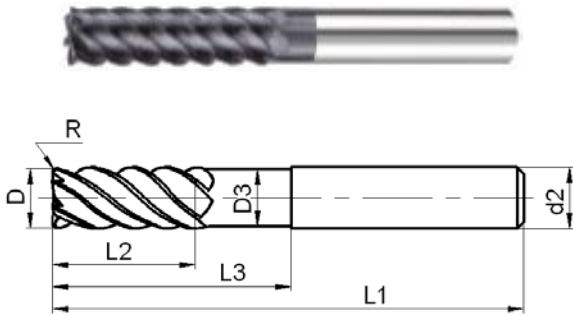
推荐切削用量见M79页。The page M79 for the recommendable cutting date.

●: 表示有库存





# 高速加工淬硬材料用立铣刀 High speed Machining (HSM) Mills for Hardened material



<b>MH-MTA45M</b>	
多刃圆弧头立铣刀 <i>Multi-fluted Toric nose end mill</i>	
螺旋角 Helix angle	45°
齿数 No. of cutting edges	5/6/8
端刃形式 Type	不过中心 Non-centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于淬硬钢的高速铣削加工 Suitable for Hardened steels with High Speed Machining (HSM)



型号 Type	规格尺寸 Dimension								涂层 Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	R (±0.03)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MH-MTA45M-D6 R0.2	6	6	5.6	55	6	12	0.2	5		C	
MH-MTA45M-D8 R0.2	8	8	7.4	60	8	16	0.2	5		C	
MH-MTA45M-D10 R0.3	10	10	9.4	70	10	20	0.3	6		C	
MH-MTA45M-D12 R0.5	12	12	11.4	80	12	24	0.5	6		C	
MH-MTA45M-D16 R0.5	16	16	15.4	90	16	30	0.5	8		C	
MH-MTA45M-D20 R0.5	20	20	19.2	100	20	35	0.5	8		C	

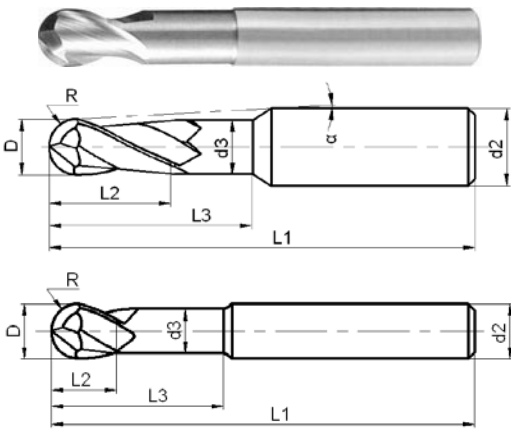
订货示例： 涂层产品 MH-MTA45M-D10 R0.3-C

Ordering guide: Coating MH-MTA45M-D10 R0.3-C

推荐切削用量见M80页。The page M80 for the recommendable cutting date.

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# 高速加工淬硬材料用立铣刀 High speed Machining (HSM) Mills for Hardened material

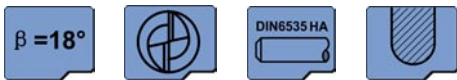


## MH-2BA18S, MH-2BA18M

两刃球头立铣刀

**2-fluted Ball nose end mill**

螺旋角 Helix angle	18°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	S-短系列 M标准系列 S- Short series M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于铸铁和淬硬钢的高速铣削加工 Suitable for Cast iron, Hardened steels with High Speed Machining (HSM)



型号 Type	规格尺寸 Dimension									涂层 Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	α °	R (±0.01)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
S-短系列												
S- Short series									2		C	
MH-2BA18S-D2	2	4	1.9	40	2	4	6° 30'	1.00	2		C	
MH-2BA18S-D3	3	4	2.9	40	3	6	3° 30'	1.50	2		C	
MH-2BA18S-D4	4	4	-	40	4	-	-	2.00	2		C	
MH-2BA18S-D5	5	6	4.6	50	5	10	2°	2.50	2		C	
MH-2BA18S-D6	6	6	-	50	6	-	-	3.00	2		C	
MH-2BA18S-D8	8	8	-	65	8	-	-	4.00	2		C	
MH-2BA18S-D10	10	10	-	65	10	-	-	5.00	2		C	
M-标准系列												
M-standard series												
MH-2BA18M-D2	2	3	1.9	50	2	10	4°	1.00	2		C	
MH-2BA18M-D2.5	2.5	6	2.4	60	2.5	5	7° 30'	1.25	2		C	
MH-2BA18M-D3	3	6	2.8	60	3	6	5° 30'	1.50	2		C	
MH-2BA18M-D3.5	3.5	6	3.2	65	3.5	7	4°	1.75	2		C	
MH-2BA18M-D4	4	6	3.7	65	4	8	3° 30'	2.00	2		C	
MH-2BA18M-D5	5	6	4.6	65	5	10	2°	2.50	2		C	
MH-2BA18M-D6	6	8	5.6	75	6	12	3°	3.00	2		C	
MH-2BA18M-D8	8	8	-	75	8	-	-	4.00	2		C	
MH-2BA18M-D10	10	10	-	80	10	-	-	5.00	2		C	
MH-2BA18M-D12	12	12	-	90	12	-	-	6.00	2		C	
MH-2BA18M-D16	16	16	-	100	16	-	-	8.00	2		C	

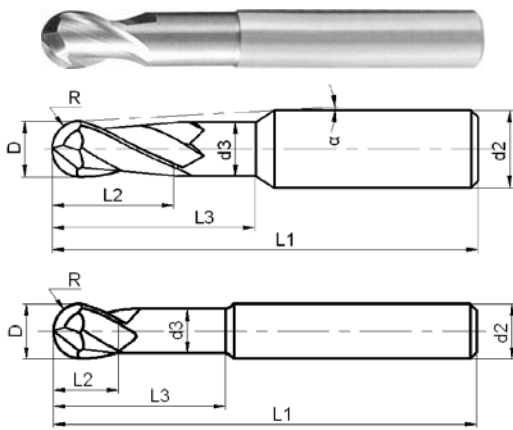
订货示例： 涂层产品 MH-2BA18M-D4-C

Ordering guide: Coating MH-2BA18M-D4-C

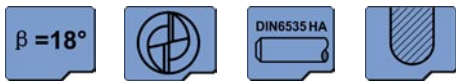
推荐切削用量见M81页。The page M81 for the recommendable cutting date.

●: 表示有库存

# 高速加工淬硬材料用立铣刀 High speed Machining (HSM) Mills for Hardened material



<b>MH-2BA18L</b>	
两刃球头立铣刀 <b>2-fluted Ball nose end mill</b>	
螺旋角 Helix angle	18°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-长系列
柄部型式 Type of shank	直柄 d2
适应场合 Application	适用于铸铁和淬硬钢的高速铣削加工 Suitable for Cast iron, Hardened steels with High Speed Machining (HSM)



型号 Type	规格尺寸Dimension									涂层Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	$\alpha^\circ$	R ( $\pm 0.01$ )	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MH-2BA18L-D2	2	6	1.9	80	2	4	8°	1.00	2		C	
MH-2BA18L-D3	3	6	2.8	80	3	6	5° 30'	1.50	2		C	
MH-2BA18L-D4	4	6	3.7	80	4	8	3° 30'	2.00	2		C	
MH-2BA18L-D5	5	6	4.6	100	5	10	2°	2.50	2		C	
MH-2BA18L-D6	6	8	5.6	100	6	12	3°	3.00	2		C	
MH-2BA18L-D8	8	8	-	110	8	-	-	4.00	2		C	
MH-2BA18L-D10	10	10	-	125	10	-	-	5.00	2		C	
MH-2BA18L-D12	12	12	-	125	12	-	-	6.00	2		C	
MH-2BA18L-D16	16	16	-	150	16	-	-	8.00	2		C	

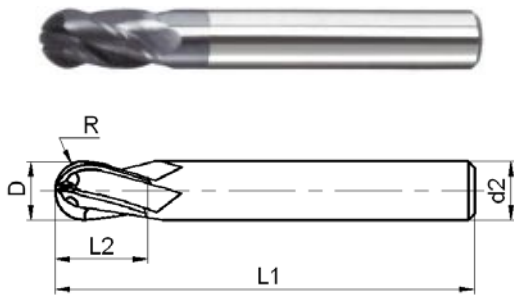
订货示例： 涂层产品 MH-2BA18L-D10-C

Ordering guide: Coating MH-2BA18L-D10-C

推荐切削用量见M81页。The page M81 for the recommendable cutting date.

●: 表示有库存

# 高速加工淬硬材料用立铣刀 High speed Machining (HSM) Mills for Hardened material



<b>MH-4BA18M</b>	
四刃球头立铣刀 <b>4-fluted Ball nose end mill</b>	
螺旋角 Helix angle	18°
齿数 No. of cutting edges	4
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于铸铁和淬硬钢的高速铣削加工 Suitable for Cast iron, Hardened steels with High Speed Machining (HSM)



M

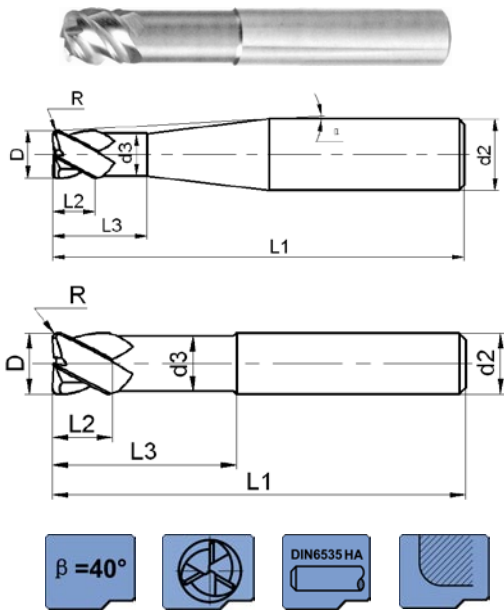
型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (e8)	d2 (h6)	L1	L2	R (±0.01)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MH-4BA18M-D6	6	6	80	6	3.00	4		C	
MH-4BA18M-D8	8	8	85	8	4.00	4		C	
MH-4BA18M-D10	10	10	100	10	5.00	4		C	
MH-4BA18M-D12	12	12	100	12	6.00	4		C	

订货示例： 涂层产品 MH-4BA18M-D10-C

Ordering guide: Coating MH-4BA18M-D10-C

推荐切削用量见M82页。The page M82 for the recommendable cutting date.

●：表示有库存

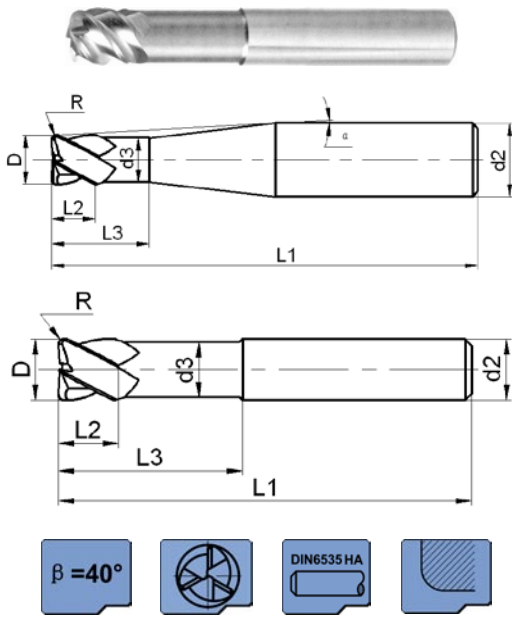


<b>MM-3TA40M</b>	
三刃圆弧头立铣刀 <b>3-fluted Toric nose end mill</b>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	不过中心 Non-centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于不锈钢、有色金属和高温合金、钛合金的高速铣削加工 Suitable for stainlesssteels, Non-ferrous materials, Superalloys, Titanium alloys. with High Speed Machining (HSM)



型号 Type	规格尺寸Dimension									涂层Coating		
	D(e8)	d2(h6)	d3	L1	L2	L3	R(±0.01)	α°	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MM-3TA40M-D2 R0.2	2	3	1.9	40	3	6	0.2	4°	3		N	
MM-3TA40M-D2.5 R0.2	2.5	3	2.4	40	4	6	0.2	2°	3		N	
MM-3TA40M-D3 R0.1	3	3	2.8	40	4	7	0.1	-	3		N	
MM-3TA40M-D3 R0.2	3	3	2.8	40	4	7	0.2	-	3		N	
MM-3TA40M-D3.5 R0.2	3.5	6	3.2	50	5	9	0.2	6°	3		N	
MM-3TA40M-D4 R0.2	4	6	3.7	50	5	9	0.2	5°	3		N	
MM-3TA40M-D4 R0.3	4	6	3.7	50	5	9	0.3	5°	3		N	
MM-3TA40M-D4 R0.5	4	6	3.7	50	5	9	0.5	5°	3		N	
MM-3TA40M-D5 R0.2	5	6	4.6	50	6	11	0.2	2° 30'	3		N	
MM-3TA40M-D6 R0.2	6	6	5.6	60	7	14	0.2	-	3		N	
MM-3TA40M-D6 R0.3	6	6	5.6	60	7	14	0.3	-	3		N	
MM-3TA40M-D6 R0.5	6	6	5.6	60	7	14	0.5	-	3		N	
MM-3TA40M-D8 R0.2	8	8	7.4	60	9	18	0.2	-	3		N	
MM-3TA40M-D8 R0.5	8	8	7.4	60	9	18	0.5	-	3		N	
MM-3TA40M-D10 R0.2	10	10	9.4	70	12	25	0.2	-	3		N	
MM-3TA40M-D10 R0.5	10	10	9.4	70	12	25	0.5	-	3		N	
MM-3TA40M-D10 R1	10	10	9.4	70	12	25	1	-	3		N	
MM-3TA40M-D12 R0.5	12	12	11.4	80	15	30	0.5	-	3		N	
MM-3TA40M-D12 R1	12	12	11.4	80	15	30	1	-	3		N	
MM-3TA40M-D12 R1.5	12	12	11.4	80	15	30	1.5	-	3		N	
MM-3TA40M-D16 R1	16	16	15.4	90	18	38	1	-	3		N	
MM-3TA40M-D20 R1	20	20	19.2	100	22	40	1	-	3		N	

订货示例： 涂层产品 MM-3TA40M-D10 R0.5-N  
 Ordering guide: Coating MM-3TA40M-D10 R0.5-N  
 推荐切削用量见M83页。 The page M83 for the recommendable cutting date.  
 ●: 表示有库存



<b>MM-3TA40L</b>	
三刃圆弧头立铣刀 <b>3-fluted Toric nose end mill</b>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	不过中心 Non-centre cut
长度系列 Series of lengths	L-长系列
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于不锈钢、有色金属和高温合金、钛合金 的高速铣削加工 Suitable for stainlesssteels, Non-ferrous materials Superalloys, Titanium alloys. with High Speed Machining (HSM)

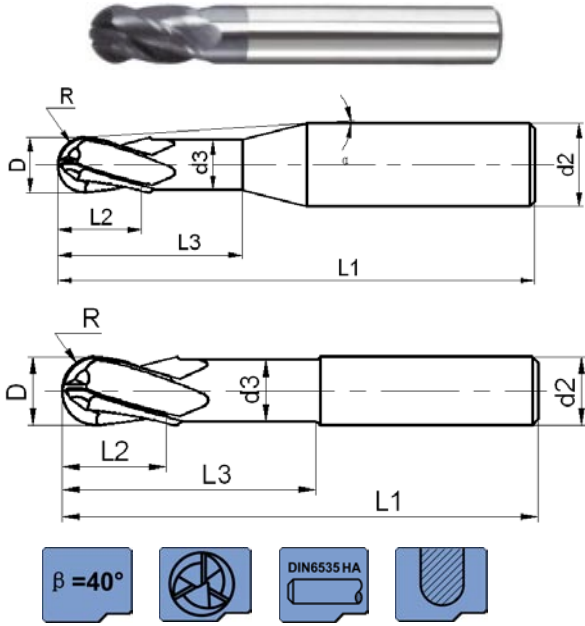


型号 Type	规格尺寸Dimension									涂层Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	R (±0.01)	α °	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MM-3TA40L-D2 R0.2	2	3	1.9	60	3	10	0.2	2° 30'	3		N	
MM-3TA40L-D3 R0.2	3	3	2.8	60	4	14	0.2	-	3		N	
MM-3TA40L-D4 R0.2	4	6	3.7	65	5	18	0.2	3°	3		N	
MM-3TA40L-D5 R0.2	5	6	4.6	65	6	22	0.2	1° 30'	3		N	
MM-3TA40L-D6 R0.3	6	6	5.6	80	7	26	0.3	-	3		N	
MM-3TA40L-D8 R0.5	8	8	7.4	85	9	36	0.5	-	3		N	
MM-3TA40L-D10 R0.5	10	10	9.4	100	12	45	0.5	-	3		N	
MM-3TA40L-D12 R0.5	12	12	11.4	125	15	54	0.5	-	3		N	
MM-3TA40L-D16 R1	16	16	15.4	125	18	65	1	-	3		N	

订货示例： 涂层产品 MM-3TA40L-D10 R0.5-N  
 Ordering guide: Coating MM-3TA40L-D10 R0.5-N  
 推荐切削用量见M83页。The page M83 for the recommendable cutting date.  
 ●：表示有库存



高速加工不锈钢/高温合金用立铣刀 High speed Machining (HSM) Mills for Stainless steel and superalloys

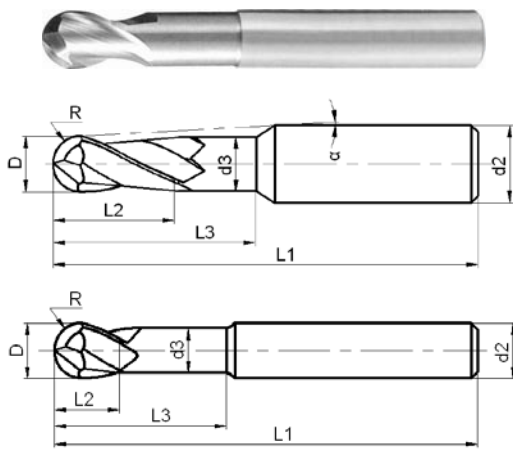


<b>MM-3BA40M</b>	
三刃球头立铣刀 <b>3-fluted Ball nose end mill</b>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于不锈钢、有色金属和高温合金、钛合金 的高速铣削加工 Suitable for stainless steels, Non-ferrous materials Superalloys, Titanium alloys. with High Speed Machining (HSM)



型号 Type	规格尺寸 Dimension									涂层 Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	$\alpha^\circ$	R ( $\pm 0.01$ )	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MM-3BA40M-D2	2	6	1.9	60	3	3	7° 30'	1.00	3		N	
MM-3BA40M-D2.5	2.5	6	2.4	60	4	6	7°	1.25	3		N	
MM-3BA40M-D3	3	6	2.8	60	4.5	6.5	5° 30'	1.50	3		N	
MM-3BA40M-D3.5	3.5	6	3.2	65	5	7	4°	1.75	3		N	
MM-3BA40M-D4	4	6	3.7	65	6	8	3° 30'	2.00	3		N	
MM-3BA40M-D5	5	6	4.6	65	7.5	10	2° 30'	2.50	3		N	
MM-3BA40M-D6	6	6	6	75	9	-	-	3.00	3		N	
MM-3BA40M-D8	8	8	8	75	12	-	-	4.00	3		N	
MM-3BA40M-D10	10	10	10	80	15	-	-	5.00	3		N	
MM-3BA40M-D12	12	12	12	90	18	-	-	6.00	3		N	
MM-3BA40M-D16	16	16	16	100	24	-	-	8.00	3		N	

订货示例： 涂层产品 MM-3BA40M-D8-N  
 Ordering guide: Coating MM-3BA40M-D8-N  
 推荐切削用量见M84页。The page M84 for the recommendable cutting date.  
 ●: 表示有库存



<b>MM-2BA30M MM-2BA30L</b>	
两刃球头立铣刀 <b>2-fluted Ball nose end mill</b>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 L-长系列
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、不锈钢、高温合金、钛合金的高 速铣削加工 Suitable for steels stainless steels, Superalloys, Titanium alloys. with High Speed Machining (HSM)

型号 Type	规格尺寸Dimension									涂层Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	α °	R (±0.01)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
M-标准系列												
MM-2BA30M-D2	2	6	1.9	60	3	4	10° 30'	1.00	2		N	
MM-2BA30M-D2.5	2.5	6	2.4	60	4	5	8°	1.25	2		N	
MM-2BA30M-D3	3	6	2.8	60	4.5	6	7°	1.50	2		N	
MM-2BA30M-D3.5	3.5	6	3.2	60	5	7	6°	1.75	2		N	
MM-2BA30M-D4	4	6	3.7	60	6	8	5°	2.00	2		N	
MM-2BA30M-D5	5	6	4.6	60	7.5	10	2°	2.50	2		N	
MM-2BA30M-D6	6	8	5.6	75	9	12	3°	3.00	2		N	
MM-2BA30M-D8	8	8	8	75	12	-	-	4.00	2		N	
MM-2BA30M-D10	10	10	10	80	15	-	-	5.00	2		N	
MM-2BA30M-D12	12	12	12	90	18	-	-	6.00	2		N	
MM-2BA30M-D16	16	16	16	100	24	-	-	8.00	2		N	
L-长系列												
MM-2BA30L-D2	2	6	1.9	80	3	4	10° 30'	1.00	2		N	
MM-2BA30L-D3	3	6	2.8	80	4.5	6	7°	1.50	2		N	
MM-2BA30L-D4	4	6	3.7	80	6	8	5°	2.00	2		N	
MM-2BA30L-D5	5	6	4.6	100	7.5	10	2°	2.50	2		N	
MM-2BA30L-D6	6	8	5.6	100	9	12	3°	3.00	2		N	
MM-2BA30L-D8	8	8	8	110	12	-	-	4.00	2		N	
MM-2BA30L-D10	10	10	10	125	15	-	-	5.00	2		N	
MM-2BA30L-D12	12	12	12	125	18	-	-	6.00	2		N	
MM-2BA30L-D16	16	16	16	150	24	-	-	8.00	2		N	

订货示例： 涂层产品 MM-2BA30M-D8-N

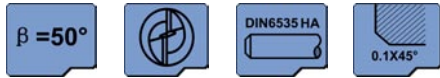
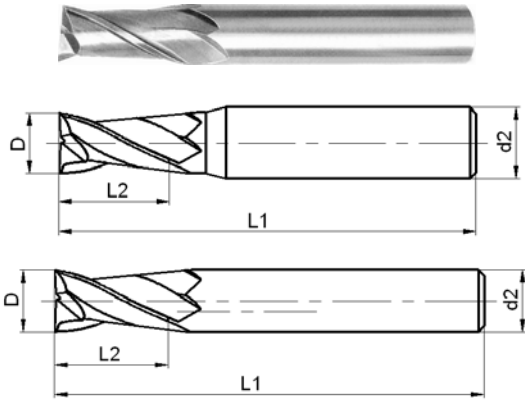
Ordering guide: Coating MM-2BA30M-D8-N

推荐切削用量见M85页。The page M85 for the recommendable cutting date.

●：表示有库存



# 高速加工铝合金用立铣刀 High speed Machining (HSM) Mills for Aluminum alloy



<b>MN-2EA50M</b>	
两刃直柄立铣刀 <i>2-fluted end mills with straight shank</i>	
螺旋角 Helix angle	50°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于含Si量 < 12%的铝合金, 非金属的高速铣削加工 Suitable for Aluminium alloys with < 12% Si, Non-ferrous materials with High Speed Machining (HSM)

型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (e8)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MN-2EA50M-D2	2	6	60	4		2	○		
MN-2EA50M-D3	3	6	60	6		2	○		
MN-2EA50M-D4	4	6	65	10		2	○		
MN-2EA50M-D5	5	6	65	12		2	○		
MN-2EA50M-D6	6	6	65	20		2	○		
MN-2EA50M-D8	8	8	65	20		2	○		
MN-2EA50M-D10	10	10	75	25		2	○		
MN-2EA50M-D12	12	12	75	25		2	○		
MN-2EA50M-D16	16	16	90	30		2	○		
MN-2EA50M-D20	20	20	100	40		2	○		

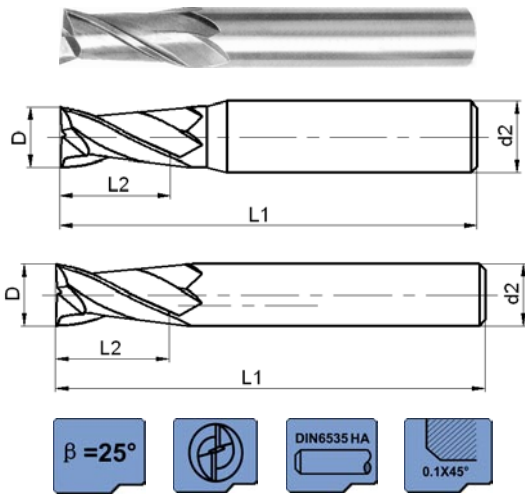
订货示例: 未涂层产品 MN-2EA50M-D8

Ordering guide: Non-Coating MN-2EA50M-D8

推荐切削用量见M86页。The page M86 for the recommendable cutting date.

●: 表示有库存

# 高速加工铝合金用立铣刀 High speed Machining (HSM) Mills for Aluminum alloy



<b>MN-2EA25M</b>	
两刃平头立铣刀 <i>2-fluted end mills with straight shank</i>	
螺旋角 Helix angle	25°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于含Si量 < 12%的铝合金, 非金属的高速铣削加工 Suitable for Aluminium alloys with < 12% Si, Non-ferrous materials with High Speed Machining (HSM)

型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (e8)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MN-2EA25M-D2	2	3	40	3		2	○		
MN-2EA25M-D3	3	3	40	5		2	○		
MN-2EA25M-D4	4	4	50	6		2	○		
MN-2EA25M-D5	5	6	50	8		2	○		
MN-2EA25M-D6	6	6	65	18		2	○		
MN-2EA25M-D8	8	8	70	18		2	○		
MN-2EA25M-D10	10	10	80	22		2	○		
MN-2EA25M-D12	12	12	90	22		2	○		
MN-2EA25M-D16	16	16	90	25		2	○		
MN-2EA25M-D20	20	20	100	35		2	○		

订货示例： 未涂层产品 MN-2EA25M-D8

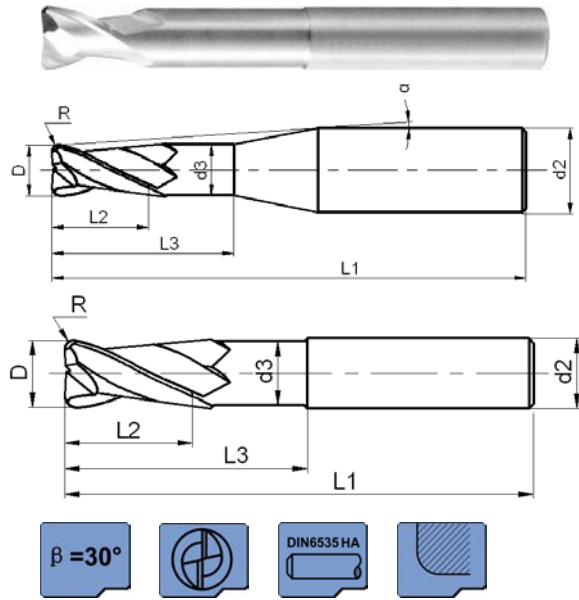
Ordering guide: Non-Coating MN-2EA25M-D8

推荐切削用量见M86页。The page M86 for the recommendable cutting date.

●：表示有库存



# 高速加工铝合金用立铣刀 High speed Machining (HSM) Mills for Aluminum alloy



<b>MN-2TA30M</b>	
两刃圆弧头立铣刀 <i>2-fluted Toric nose end mill</i>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于含Si量 < 12%的铝合金, 非金属的高速铣削加工 Suitable for Aluminium alloys with < 12% Si, Non-ferrous materials with High Speed Machining (HSM)

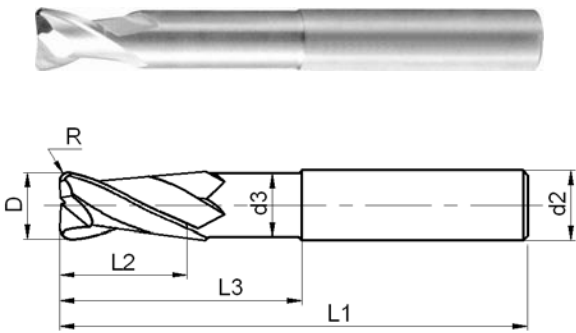
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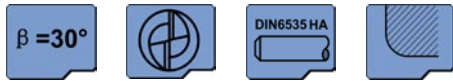
型号 Type	规格尺寸Dimension									涂层Coating		
	D(e8)	d2(h6)	d3	L1	L2	L3	R(±0.03)	α°	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MN-2TA30M-D2 R0.2	2	3	1.8	40	3	8	0.2	3°	2	○		
MN-2TA30M-D3 R0.2	3	3	2.7	40	4	12	0.2	-	2	○		
MN-2TA30M-D4 R0.2	4	6	3.6	50	5	16	0.2	3° 15'	2	○		
MN-2TA30M-D4 R0.3	4	6	3.6	50	5	16	0.3	3° 15'	2	○		
MN-2TA30M-D5 R1	5	6	4.5	50	6	18	1	2°	2	○		
MN-2TA30M-D6 R0.3	6	6	5.4	65	8	20	0.3	-	2	○		
MN-2TA30M-D6 R0.5	6	6	5.4	65	8	20	0.5	-	2	○		
MN-2TA30M-D6 R1	6	6	5.4	65	8	20	1	-	2	○		
MN-2TA30M-D8 R0.3	8	8	7.2	75	10	30	0.3	-	2	○		
MN-2TA30M-D8 R0.6	8	8	7.2	75	10	30	0.6	-	2	○		
MN-2TA30M-D8 R1	8	8	7.2	75	10	30	1	-	2	○		
MN-2TA30M-D10 R0.3	10	10	9	80	12	36	0.3	-	2	○		
MN-2TA30M-D10 R0.8	10	10	9	80	12	36	0.8	-	2	○		
MN-2TA30M-D10 R1.5	10	10	9	80	12	36	1.5	-	2	○		
MN-2TA30M-D10 R2	10	10	9	80	12	36	2	-	2	○		
MN-2TA30M-D10 R2.5	10	10	9	80	12	36	2.5	-	2	○		
MN-2TA30M-D10 R3	10	10	9	80	12	36	3	-	2	○		
MN-2TA30M-D12 R0.3	12	12	11	90	14	40	0.3	-	2	○		
MN-2TA30M-D12 R0.5	12	12	11	90	14	40	0.5	-	2	○		
MN-2TA30M-D12 R1	12	12	11	90	14	40	1	-	2	○		
MN-2TA30M-D12 R1.5	12	12	11	90	14	40	1.5	-	2	○		
MN-2TA30M-D12 R2	12	12	11	90	14	40	2	-	2	○		
MN-2TA30M-D12 R2.5	12	12	11	90	14	40	2.5	-	2	○		
MN-2TA30M-D12 R3	12	12	11	90	14	40	3	-	2	○		

订货示例: 未涂层产品 MN-2TA30M-D12 R3  
 Ordering guide: Non-Coating MN-2TA30M-D12 R3  
 推荐切削用量见M87页。The page M87 for the recommendable cutting data.  
 ●: 表示有库存

# 高速加工铝合金用立铣刀 High speed Machining (HSM) Mills for Aluminum alloy



<b>MN-2TA30M</b>	
<b>两刃圆弧头立铣刀</b> <b>2-fluted Toric nose end mill</b>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于含Si量 < 12%的铝合金, 非金属的高速铣削加工 Suitable for Aluminium alloys with < 12% Si, Non-ferrous materials with High Speed Machining (HSM)



型号 Type	规格尺寸Dimension									涂层Coating		
	D(e8)	d2(h6)	d3	L1	L2	L3	R(±0.03)	α°	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MN-2TA30M-D16 R0.5	16	16	14.5	100	18	45	0.5	-	2	○		
MN-2TA30M-D16 R1.3	16	16	14.5	100	18	45	1.3	-	2	○		
MN-2TA30M-D16 R2	16	16	14.5	100	18	45	2	-	2	○		
MN-2TA30M-D16 R2.5	16	16	14.5	100	18	45	2.5	-	2	○		
MN-2TA30M-D16 R3	16	16	14.5	100	18	45	3	-	2	○		
MN-2TA30M-D16 R4	16	16	14.5	100	18	45	4	-	2	○		
MN-2TA30M-D20 R1.6	20	20	18	100	24	45	1.6	-	2	○		
MN-2TA30M-D20 R2	20	20	18	100	24	45	2	-	2	○		
MN-2TA30M-D20 R2.5	20	20	18	100	24	45	2.5	-	2	○		
MN-2TA30M-D20 R3	20	20	18	100	24	45	3	-	2	○		
MN-2TA30M-D20 R4	20	20	18	100	24	45	4	-	2	○		
MN-2TA30M-D20 R5	20	20	18	100	24	45	5	-	2	○		
MN-2TA30M-D20 R6	20	20	18	100	24	45	6	-	2	○		
MN-2TA30M-D25 R2.5	25	25	23	110	30	45	2.5	-	2	○		
MN-2TA30M-D25 R3	25	25	23	110	30	45	3	-	2	○		
MN-2TA30M-D25 R4	25	25	23	110	30	45	4	-	2	○		
MN-2TA30M-D25 R5	25	25	23	110	30	45	5	-	2	○		
MN-2TA30M-D25 R6	25	25	23	110	30	45	6	-	2	○		
MN-2TA30M-D25 R8	25	25	23	110	30	45	8	-	2	○		

订货示例： 未涂层产品 MN-2TA30M-D25 R8

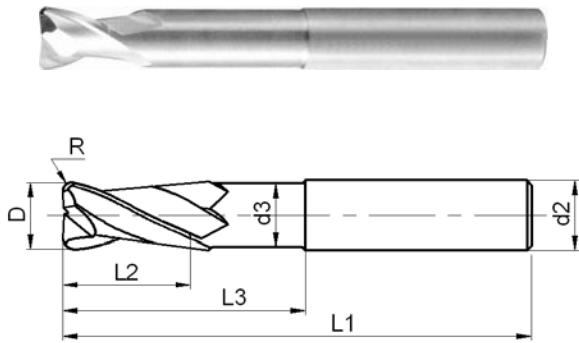
Ordering guide: Non-Coating MN-2TA30M-D25 R8

推荐切削用量见M87页。The page M87 for the recommendable cutting date.

●：表示有库存

# 高速加工铝合金用立铣刀 High speed Machining (HSM) Mills for Aluminum alloy

M



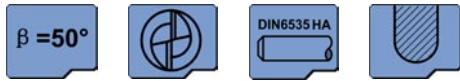
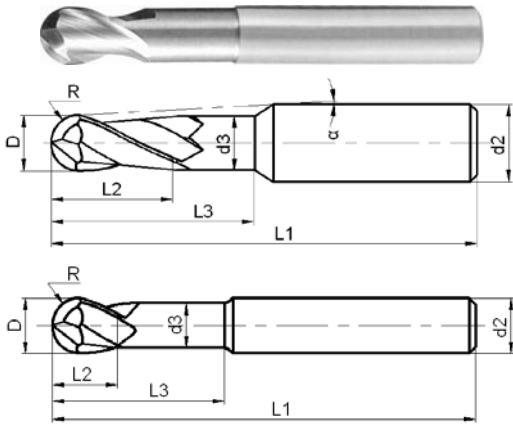
<b>MN-2TA30L</b>	
两刃圆弧头立铣刀 <i>2-fluted Toric nose end mill</i>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-长系列
柄部型式 Type of shank	直柄 d2
适用场合 Application	适用于含Si量 < 12%的铝合金, 非金属的高速铣削加工 Suitable for Aluminium alloys with < 12% Si, Non-ferrous materials with High Speed Machining (HSM)



型号 Type	规格尺寸Dimension								涂层Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	R (±0.03)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MN-2TA30L-D8 R0.2	8	8	7.2	100	6	40	0.2	2	○		
MN-2TA30L-D10 R0.5	10	10	9	100	8	50	0.5	2	○		
MN-2TA30L-D10 R2.5	10	10	9	100	8	50	2.5	2	○		
MN-2TA30L-D10 R3	10	10	9	100	8	50	3	2	○		
MN-2TA30L-D12 R0.5	12	12	11	125	10	70	0.5	2	○		
MN-2TA30L-D12 R1	12	12	11	125	10	70	1	2	○		
MN-2TA30L-D12 R1.5	12	12	11	125	10	70	1.5	2	○		
MN-2TA30L-D12 R2	12	12	11	125	10	70	2	2	○		
MN-2TA30L-D12 R2.5	12	12	11	125	10	70	2.5	2	○		
MN-2TA30L-D12 R3	12	12	11	125	10	70	3	2	○		
MN-2TA30L-D16 R0.5	16	16	14.5	150	13	80	0.5	2	○		
MN-2TA30L-D16 R1	16	16	14.5	150	13	80	1	2	○		
MN-2TA30L-D16 R2	16	16	14.5	150	13	80	2	2	○		
MN-2TA30L-D16 R2.5	16	16	14.5	150	13	80	2.5	2	○		
MN-2TA30L-D16 R3	16	16	14.5	150	13	80	3	2	○		
MN-2TA30L-D16 R4	16	16	14.5	150	13	80	4	2	○		
MN-2TA30L-D20 R0.5	20	20	18	175	16	100	0.5	2	○		
MN-2TA30L-D20 R2	20	20	18	175	16	100	2	2	○		
MN-2TA30L-D20 R2.5	20	20	18	175	16	100	2.5	2	○		
MN-2TA30L-D20 R3	20	20	18	175	16	100	3	2	○		
MN-2TA30L-D20 R4	20	20	18	175	16	100	4	2	○		
MN-2TA30L-D20 R5	20	20	18	175	16	100	5	2	○		
MN-2TA30L-D20 R6	20	20	18	175	16	100	6	2	○		

订货示例: 未涂层产品 MN-2TA30L-D20 R6  
 Ordering guide: Non-Coating MN-2TA30L-D20 R6  
 推荐切削用量见M87页。The page M87 for the recommendable cutting date.  
 ●: 表示有库存

# 高速加工铝合金用立铣刀 High speed Machining (HSM) Mills for Aluminum alloy



<b>MN-2BA50M</b>	
两刃球头立铣刀	
<b>2-fluted Ball nose end mill</b>	
螺旋角 Helix angle	50°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于硅铝合金, 非金属的高速铣削加工 Suitable for Si-Al alloy, Non-ferrous materials with High Speed Machining (HSM)

型号 Type	规格尺寸Dimension									涂层Coating		
	D (e8)	d2 (h6)	d3	L1	L2	L3	α °	R (±0.01)	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MN-2BA50M-D2	2	3	1.5	40	1.78	10	3°	1.00	2	○		
MN-2BA50M-D3	3	3	2.7	40	2.5	12	-	1.50	2	○		
MN-2BA50M-D4	4	6	3.6	50	3.5	21	3°	2.00	2	○		
MN-2BA50M-D5	5	6	4.6	50	4.5	22.5	2°	2.50	2	○		
MN-2BA50M-D6	6	6	5.4	55	5.5	25	-	3.00	2	○		
MN-2BA50M-D8	8	8	7.2	65	7	30	-	4.00	2	○		
MN-2BA50M-D10	10	10	9	75	8.5	35	-	5.00	2	○		
MN-2BA50M-D12	12	12	11	75	10.5	40	-	6.00	2	○		
MN-2BA50M-D16	16	16	14.5	90	14	50	-	8.00	2	○		
MN-2BA50M-D20	20	20	18	100	17	50	-	10.00	2	○		

订货示例: 未涂层产品 MN-2BA50M-D12

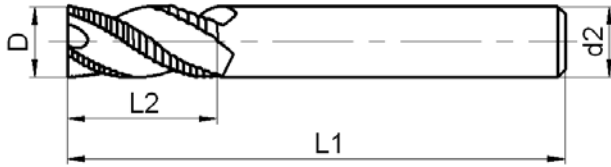
Ordering guide: Non-Coating MN-2BA50M-D12

推荐切削用量见M88页。The page M88 for the recommendable cutting data.

●: 表示有库存



# 粗加工用立铣刀 Roughing end mills



## MP-4WB30M

### 波形刃削平柄立铣刀

#### Corrugated edges end mills with weldon

螺旋角 Helix angle	30°
齿数 No. of cutting edges	4
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于钢、铸铁的铣削粗加工 Suitable for roughing steels, Cast iron,



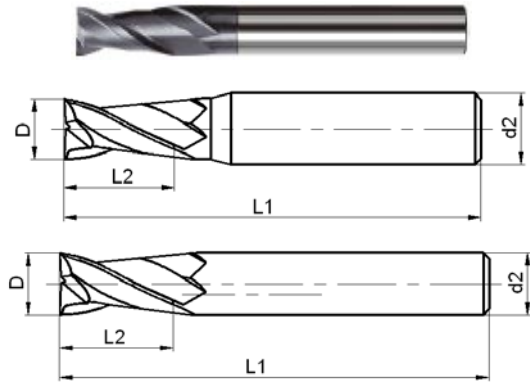
型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (h12)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
MP-4WB30M-D10	10	10	75	25		4		M	
MP-4WB30M-D12	12	12	80	25		4		M	
MP-4WB30M-D16	16	16	90	30		4		M	
MP-4WB30M-D20	20	20	100	35		4		M	

订货示例： 涂层产品 MP-4EB30M-D12-M

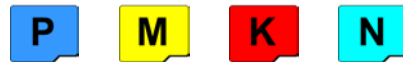
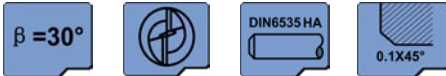
Ordering guide: Coating MP-4EB30M-D12-M

推荐切削用量见M88页。The page M88 for the recommendable cutting date.

●: 表示有库存



<b>ME-2EA30M</b>	
<b>两刃直柄立铣刀</b> <b>2-fluted end mills with straight shank</b>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M-标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属 未涂层： 铸铁、有色金属 Coating： Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating： Castiron, Non-ferrous materials.



型号 Type	规格尺寸Dimension						涂层Coating		
	D (e8)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
ME-2EA30M-D1.5	1.5	3	40	6		2	○	B	●
ME-2EA30M-D2	2	3	40	9		2	○	B	●
ME-2EA30M-D2.5	2.5	3	40	9		2	○	B	●
ME-2EA30M-D3	3	3	40	12		2	○	B	●
ME-2EA30M-D3.5	3.5	4	50	12		2	○	B	●
ME-2EA30M-D4	4	4	50	14		2	○	B	●
ME-2EA30M-D4.5	4.5	6	60	14		2	○	B	●
ME-2EA30M-D5	5	6	65	20		2	○	B	●
ME-2EA30M-D5.5	5.5	6	65	20		2	○	B	●
ME-2EA30M-D6	6	6	65	20		2	○	B	●
ME-2EA30M-D6.5	6.5	8	70	20		2	○	B	●
ME-2EA30M-D7	7	8	70	20		2	○	B	●
ME-2EA30M-D7.5	7.5	8	70	20		2	○	B	●
ME-2EA30M-D8	8	8	70	20		2	○	B	●
ME-2EA30M-D8.5	8.5	10	80	20		2	○	B	●
ME-2EA30M-D9	9	10	80	20		2	○	B	●
ME-2EA30M-D9.5	9.5	10	80	25		2	○	B	●
ME-2EA30M-D10	10	10	80	25		2	○	B	●
ME-2EA30M-D11	11	12	90	25		2	○	B	●
ME-2EA30M-D12	12	12	90	25		2	○	B	●
ME-2EA30M-D13	13	14	100	30		2	○	B	●
ME-2EA30M-D14	14	14	90	30		2	○	B	●
ME-2EA30M-D15	15	16	100	30		2	○	B	●
ME-2EA30M-D16	16	16	90	30		2	○	B	●
ME-2EA30M-D18	18	18	90	30		2	○	B	●
ME-2EA30M-D20	20	20	100	35		2	○	B	●
ME-2EA30M-D22	22	20	100	35		2	○	B	●
ME-2EA30M-D25	25	25	125	40		2	○	B	●

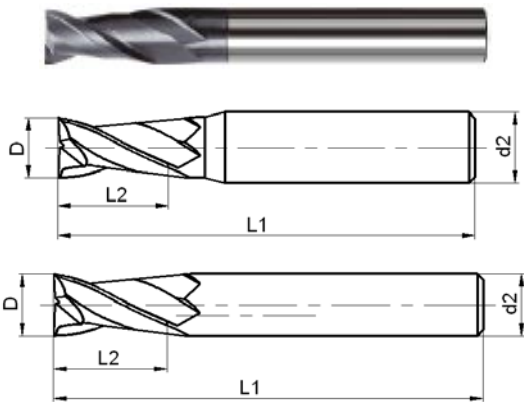
订货示例： 涂层产品 ME-2EA30M-D5-B 未涂层产品 ME-2EA30M-D5  
 Ordering guide: Coating ME-2EA30M-D5-B Ordering guide: Non-Coating ME-2EA30M-D5  
 推荐切削用量见M89页。The page M89 for the recommendable cutting date.

●：表示有库存





# 经济型立铣刀 Economical end mills



<b>ME-2EA30L</b>	
两刃直柄立铣刀 <i>2-fluted end mills with straight shank</i>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L- 长系列
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属 未涂层： 铸铁、有色金属 Coating: Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating: Castiron, Non-ferrous materials.



型号 Type	规格尺寸Dimension						涂层Coating		
	D (e8)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
ME-2EA30L-D3	3	3	60	30		2	○	B	
ME-2EA30L-D4	4	4	60	30		2	○	B	
ME-2EA30L-D5	5	5	70	35		2	○	B	
ME-2EA30L-D6	6	6	100	40		2	○	B	
ME-2EA30L-D8	8	8	100	40		2	○	B	
ME-2EA30L-D10	10	10	100	40		2	○	B	
ME-2EA30L-D12	12	12	100	45		2	○	B	
ME-2EA30L-D14	14	14	100	45		2	○	B	
ME-2EA30L-D16	16	16	100	45		2	○	B	
ME-2EA30L-D18	18	18	125	50		2	○	B	
ME-2EA30L-D20	20	20	125	55		2	○	B	

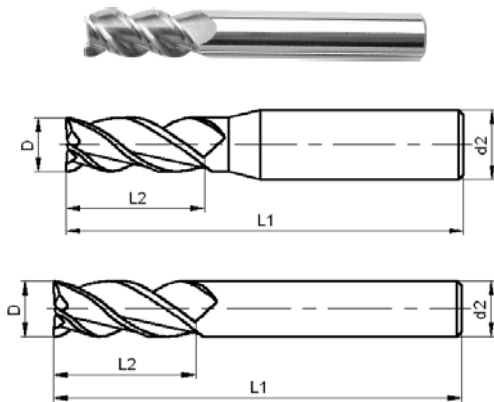
订货示例： 涂层产品 ME-2EA30L-D3-B  
未涂层产品 ME-2EA30L-D3

Ordering guide: Coating ME-2EA30L-D3-B

Ordering guide: Non-Coating ME-2EA30L-D3

推荐切削用量见M89页。The page M89 for the recommendable cutting date.

●: 表示有库存



<b>ME-3EA40S</b>	
三刃直柄立铣刀	
<b>3-fluted end mills with straight shank</b>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	S- Short series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属 未涂层： 铸铁、有色金属 Coating: Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating: Castiron, Non-ferrous materials.



型号 Type	规格尺寸Dimension						涂层Coating		
	D (h10)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
ME-3EA40S-D1	1	3	40	2		3	○	B	
ME-3EA40S-D1.5	1.5	3	40	3		3	○	B	
ME-3EA40S-D2	2	3	40	4		3	○	B	
ME-3EA40S-D2.5	2.5	3	40	5		3	○	B	
ME-3EA40S-D3	3	3	40	5		3	○	B	
ME-3EA40S-D3.5	3.5	4	50	6		3	○	B	
ME-3EA40S-D4	4	4	50	6		3	○	B	
ME-3EA40S-D4.5	4.5	6	50	7		3	○	B	
ME-3EA40S-D5	5	6	50	7		3	○	B	
ME-3EA40S-D6	6	6	50	8		3	○	B	
ME-3EA40S-D8	8	8	50	10		3	○	B	
ME-3EA40S-D10	10	10	50	12		3	○	B	
ME-3EA40S-D12	12	12	65	15		3	○	B	
ME-3EA40S-D16	16	16	65	20		3	○	B	
ME-3EA40S-D20	20	20	90	24		3	○	B	

订货示例： 涂层产品 ME-3EA40S-D6-B

未涂层产品 ME-3EA40S-D6

Ordering guide: Coating ME-3EA40S-D6-B

Ordering guide: Non-Coating ME-3EA40S-D6

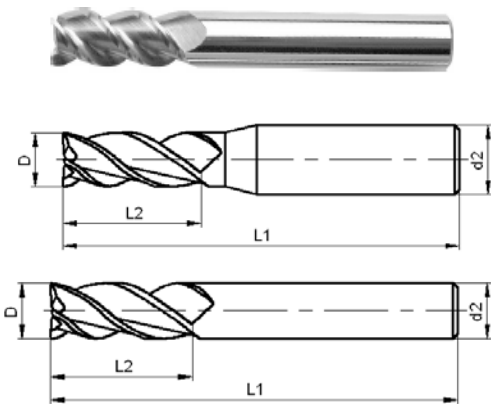
推荐切削用量见M90页。The page M90 for the recommendable cutting date.

●: 表示有库存



# 经济型立铣刀 Economical end mills

M



<b>ME-3EA40M</b>	
三刃直柄立铣刀 <b>3-fluted end mills with straight shank</b>	
螺旋角 Helix angle	40°
齿数 No. of cutting edges	3
端刀形式 Type	过中心 Centre cut
长度系列 Series of lengths	M-标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属 未涂层： 铸铁、有色金属 Coating: Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating: Castiron, Non-ferrous materials.



型号 Type	规格尺寸Dimension						涂层Coating		
	D (h10)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
ME-3EA40M-D1.5	1.5	3	40	6		3	○	B	
ME-3EA40M-D2	2	3	40	6		3	○	B	
ME-3EA40M-D2.5	2.5	3	50	12		3	○	B	
ME-3EA40M-D3	3	3	50	12		3	○	B	
ME-3EA40M-D3.5	3.5	4	50	14		3	○	B	
ME-3EA40M-D4	4	4	50	14		3	○	B	
ME-3EA40M-D4.5	4.5	6	50	16		3	○	B	
ME-3EA40M-D5	5	6	50	16		3	○	B	
ME-3EA40M-D5.5	5.5	6	65	16		3	○	B	
ME-3EA40M-D6	6	6	65	20		3	○	B	
ME-3EA40M-D6.5	6.5	8	65	20		3	○	B	
ME-3EA40M-D7	7	8	65	20		3	○	B	
ME-3EA40M-D7.5	7.5	8	65	20		3	○	B	
ME-3EA40M-D8	8	8	65	20		3	○	B	
ME-3EA40M-D8.5	8.5	10	75	20		3	○	B	
ME-3EA40M-D9	9	10	75	20		3	○	B	
ME-3EA40M-D9.5	9.5	10	75	25		3	○	B	
ME-3EA40M-D10	10	10	75	25		3	○	B	
ME-3EA40M-D11	11	12	75	25		3	○	B	
ME-3EA40M-D12	12	12	75	25		3	○	B	
ME-3EA40M-D14	14	14	90	30		3	○	B	
ME-3EA40M-D15	15	16	90	30		3	○	B	
ME-3EA40M-D16	16	16	90	30		3	○	B	
ME-3EA40M-D18	18	18	90	35		3	○	B	
ME-3EA40M-D20	20	20	100	40		3	○	B	
ME-3EA40M-D25	25	25	125	40		3	○	B	

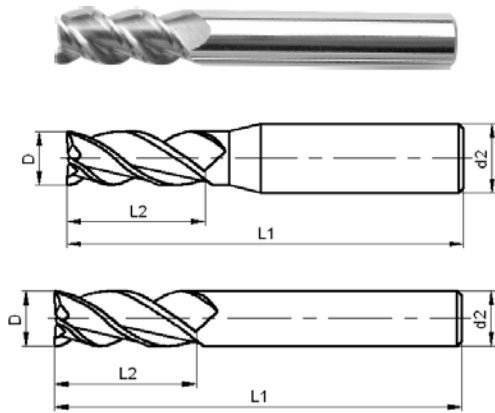
订货示例： 涂层产品 ME-3EA40M-D16-B  
未涂层产品 ME-3EA40M-D16

Ordering guide: Coating ME-3EA40M-D16-B

Ordering guide: Non-Coating ME-3EA40M-D16

推荐切削用量见M90页。The page M90 for the recommendable cutting date.

●: 表示有库存



**ME-3EA30M, ME-3EA30L**

三刃直柄立铣刀

**3-fluted end mills with straight shank**

螺旋角 Helix angle	30°
齿数 No. of cutting edges	3
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 L-长系列 M-standard series L- Long series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属未涂层： 铸铁、有色金属 Coating: Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating: Castiron, Non-ferrous materials.



型号 Type	规格尺寸Dimension						涂层Coating		
	D (h10)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
M-标准系列									
M-standard series									
ME-3EA30M-D1.5	1.5	3	40	6		3	○	B	
ME-3EA30M-D2	2	3	40	9		3	○	B	
ME-3EA30M-D2.5	2.5	3	50	12		3	○	B	
ME-3EA30M-D3	3	3	50	12		3	○	B	
ME-3EA30M-D3.5	3.5	4	50	12		3	○	B	
ME-3EA30M-D4	4	4	50	14		3	○	B	
ME-3EA30M-D4.5	4.5	6	60	14		3	○	B	
ME-3EA30M-D5	5	6	65	20		3	○	B	
ME-3EA30M-D5.5	5.5	6	65	20		3	○	B	
ME-3EA30M-D6	6	6	65	20		3	○	B	
ME-3EA30M-D6.5	6.5	8	65	20		3	○	B	
ME-3EA30M-D7	7	8	65	20		3	○	B	
ME-3EA30M-D7.5	7.5	8	65	20		3	○	B	
ME-3EA30M-D8	8	8	65	20		3	○	B	
ME-3EA30M-D8.5	8.5	10	75	20		3	○	B	
ME-3EA30M-D9	9	10	75	20		3	○	B	
ME-3EA30M-D9.5	9.5	10	75	25		3	○	B	
ME-3EA30M-D10	10	10	75	25		3	○	B	
L-长系列									
L- Long series									
ME-3EA30L-D6	6	6	100	40		3	○	B	
ME-3EA30L-D8	8	8	100	40		3	○	B	
ME-3EA30L-D10	10	10	100	40		3	○	B	

订货示例： 涂层产品 ME-3EA30M-D10-B  
未涂层产品 ME-3EA30M-D10

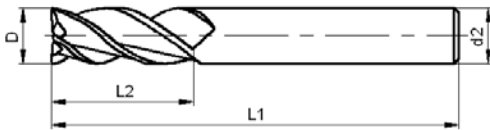
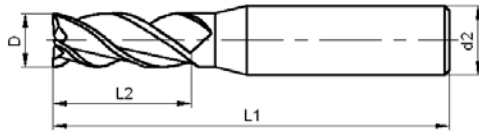
Ordering guide: Coating ME-3EA30M-D10-B

Ordering guide: Non-Coating ME-3EA30M-D10

推荐切削用量见M91页。The page M91 for the recommendable cutting date.

●：表示有库存

# 经济型立铣刀 Economical end mills



## ME-4EA30S

### 四刃直柄立铣刀

#### 4-fluted end mills with straight shank

螺旋角 Helix angle	30°
齿数 No. of cutting edges	4
端刃形式 Type	两刃过中心 Centre cut
长度系列 Series of lengths	S-短系列
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属 未涂层： 铸铁、有色金属 Coating: Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating: Castiron, Non-ferrous materials.



型号 Type	规格尺寸 Dimension						涂层 Coating		
	D (h10)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
ME-4EA30S-D1	1	3	40	2		4	○	B	
ME-4EA30S-D1.5	1.5	3	40	3		4	○	B	
ME-4EA30S-D2	2	3	40	4		4	○	B	
ME-4EA30S-D2.5	2.5	3	40	5		4	○	B	
ME-4EA30S-D3	3	3	40	6		4	○	B	
ME-4EA30S-D4	4	4	50	8		4	○	B	
ME-4EA30S-D5	5	6	50	11		4	○	B	
ME-4EA30S-D6	6	6	50	13		4	○	B	
ME-4EA30S-D8	8	8	50	13		4	○	B	
ME-4EA30S-D10	10	10	50	16		4	○	B	
ME-4EA30S-D12	12	12	65	19		4	○	B	
ME-4EA30S-D16	16	16	65	20		4	○	B	

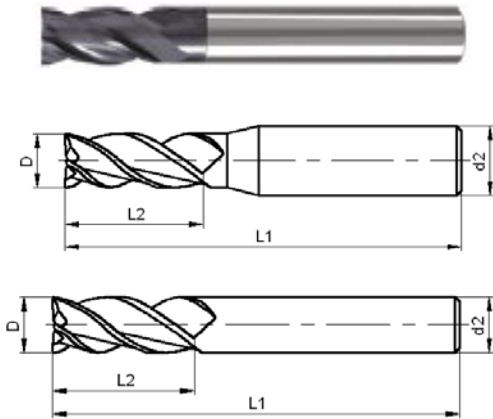
订货示例： 涂层产品 ME-4EA30S-D10-B  
未涂层产品 ME-4EA30S-D10

Ordering guide: Coating ME-4EA30S-D10-B

Ordering guide: Non-Coating ME-4EA30S-D10

推荐切削用量见M92页。The page M92 for the recommendable cutting date.

●: 表示有库存



<b>ME-4EA30M</b>	
四刃直柄立铣刀 <i>4-fluted end mills with straight shank</i>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	4
端刃形式 Type	两刃过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属 未涂层： 铸铁、有色金属 Coating: Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating: Castiron, Non-ferrous materials.



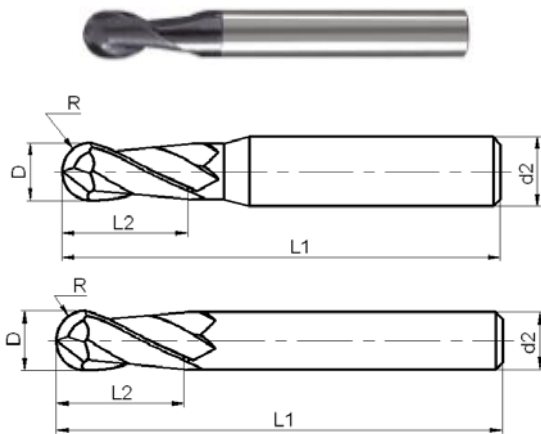
型号 Type	规格尺寸Dimension						涂层Coating		
	D (h10)	d2 (h6)	L1	L2		Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
ME-4EA30M-D1.5	1.5	3	40	6		4	○	B	●
ME-4EA30M-D2	2	3	40	9		4	○	B	●
ME-4EA30M-D2.5	2.5	3	40	12		4	○	B	●
ME-4EA30M-D3	3	3	40	12		4	○	B	●
ME-4EA30M-D3.5	3.5	4	50	12		4	○	B	●
ME-4EA30M-D4	4	4	50	14		4	○	B	●
ME-4EA30M-D4.5	4.5	6	60	14		4	○	B	●
ME-4EA30M-D5	5	6	65	20		4	○	B	●
ME-4EA30M-D5.5	5.5	6	65	20		4	○	B	●
ME-4EA30M-D6	6	6	65	20		4	○	B	●
ME-4EA30M-D6.5	6.5	8	65	20		4	○	B	●
ME-4EA30M-D7	7	8	65	20		4	○	B	●
ME-4EA30M-D7.5	7.5	8	65	20		4	○	B	●
ME-4EA30M-D8	8	8	65	20		4	○	B	●
ME-4EA30M-D8.5	8.5	10	75	20		4	○	B	●
ME-4EA30M-D9	9	10	75	20		4	○	B	●
ME-4EA30M-D9.5	9.5	10	75	25		4	○	B	●
ME-4EA30M-D10	10	10	75	25		4	○	B	●
ME-4EA30M-D11	11	12	80	25		4	○	B	●
ME-4EA30M-D12	12	12	80	25		4	○	B	●
ME-4EA30M-D13	13	14	90	30		4	○	B	●
ME-4EA30M-D14	14	14	90	30		4	○	B	●
ME-4EA30M-D15	15	16	90	30		4	○	B	●
ME-4EA30M-D16	16	16	90	30		4	○	B	●
ME-4EA30M-D18	18	18	90	30		4	○	B	●
ME-4EA30M-D20	20	20	100	35		4	○	B	●
ME-4EA30M-D22	22	20	100	35		4	○	B	●
ME-4EA30M-D25	25	25	125	40		4	○	B	●

订购示例： 涂层产品 ME-4EA30M-D20-B      未涂层产品 ME-4EA30M-D20  
 Ordering guide: Coating ME-4EA30M-D20-B      Ordering guide: Non-Coating ME-4EA30M-D20  
 推荐切削用量见M92页。The page M92 for the recommendable cutting date.

●: 表示有库存



# 经济型立铣刀 Economical end mills



<b>ME-2BA30M</b>	
两刃球头立铣刀 <b>2-fluted Ball nose end mill</b>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属 未涂层： 铸铁、有色金属 Coating: Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating: Castiron, Non-ferrous materials.



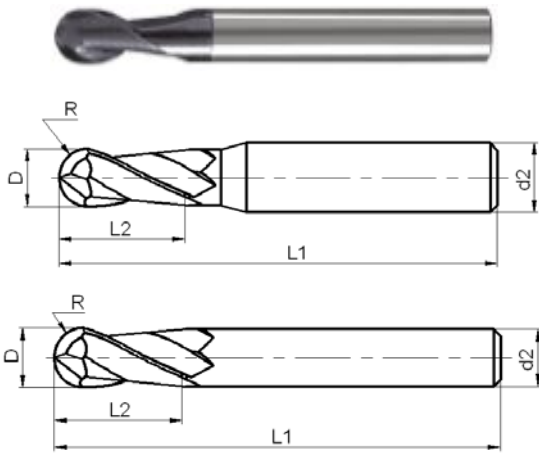
型号 Type	规格尺寸Dimension						涂层Coating		库存 Stock
	D (h10)	d2 (h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	
ME-2BA30M-D1	1	3	40	2	0.50	2	○	B	●
ME-2BA30M-D1.5	1.5	3	40	3	0.75	2	○	B	●
ME-2BA30M-D2	2	3	40	4	1.00	2	○	B	●
ME-2BA30M-D2.5	2.5	3	40	5	1.25	2	○	B	●
ME-2BA30M-D3	3	3	40	8	1.50	2	○	B	●
ME-2BA30M-D3.5	3.5	4	50	12	1.75	2	○	B	●
ME-2BA30M-D4	4	4	50	14	2.00	2	○	B	●
ME-2BA30M-D4.5	4.5	6	60	14	2.25	2	○	B	●
ME-2BA30M-D5	5	6	65	20	2.50	2	○	B	●
ME-2BA30M-D5.5	5.5	6	65	20	2.75	2	○	B	●
ME-2BA30M-D6	6	6	65	20	3.00	2	○	B	●
ME-2BA30M-D7	7	8	65	20	3.50	2	○	B	●
ME-2BA30M-D8	8	8	65	20	4.00	2	○	B	●
ME-2BA30M-D9	9	10	65	20	4.50	2	○	B	●
ME-2BA30M-D10	10	10	75	25	5.00	2	○	B	●
ME-2BA30M-D11	11	12	75	25	5.50	2	○	B	●
ME-2BA30M-D12	12	12	75	25	6.00	2	○	B	●
ME-2BA30M-D14	14	14	90	30	7.00	2	○	B	●
ME-2BA30M-D15	15	16	90	30	7.50	2	○	B	●
ME-2BA30M-D16	16	16	90	30	8.00	2	○	B	●
ME-2BA30M-D18	18	18	90	35	9.00	2	○	B	●
ME-2BA30M-D20	20	20	100	40	10.00	2	○	B	●
ME-2BA30M-D25	25	25	100	40	12.50	2	○	B	●

订货示例： 涂层产品 ME-2BA30M-D10-B  
未涂层产品 ME-2BA30M-D10

Ordering guide: Coating ME-2BA30M-D10-B  
Ordering guide: Non-Coating ME-2BA30M-D10

推荐切削用量见M93页。The page M93 for the recommendable cutting date.

●: 表示有库存



<b>ME-2BA30L</b>	
两刃球头立铣刀 <i>2-fluted Ball nose end mill</i>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	2
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	L-长系列
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属 未涂层： 铸铁、有色金属 Coating: Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating: Castiron, Non-ferrous materials.



型号 Type	规格尺寸Dimension						涂层Coating		
	D (h10)	d2 (h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
ME-2BA30L-D1	1	3	40	5	0.50	2	○	B	
ME-2BA30L-D1.5	1.5	3	40	6	0.75	2	○	B	
ME-2BA30L-D2	2	3	40	9	1.00	2	○	B	
ME-2BA30L-D3	3	3	60	20	1.50	2	○	B	
ME-2BA30L-D4	4	4	60	30	2.00	2	○	B	
ME-2BA30L-D5	5	6	70	35	2.50	2	○	B	
ME-2BA30L-D6	6	6	100	40	3.00	2	○	B	
ME-2BA30L-D8	8	8	100	40	4.00	2	○	B	
ME-2BA30L-D10	10	10	100	40	5.00	2	○	B	
ME-2BA30L-D12	12	12	100	45	6.00	2	○	B	
ME-2BA30L-D16	16	16	100	45	8.00	2	○	B	
ME-2BA30L-D20	20	20	125	55	10.00	2	○	B	
ME-2BA30L-D25	25	25	150	65	12.50	2	○	B	

订货示例： 涂层产品 ME-2BA30L-D16-B

未涂层产品 ME-2BA30L-D16

Ordering guide: Coating ME-2BA30L-D16-B

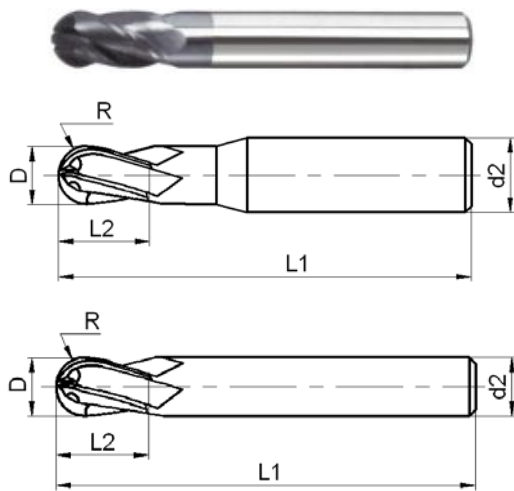
Ordering guide: Non-Coating ME-2BA30L-D16

推荐切削用量见M93页。The page M93 for the recommendable cutting date.

●: 表示有库存



# 经济型立铣刀 Economical end mills



<b>ME-4BA30M</b>	
四刃球头立铣刀	
<b>4-fluted Ball nose end mill</b>	
螺旋角 Helix angle	30°
齿数 No. of cutting edges	4
端刃形式 Type	过中心 Centre cut
长度系列 Series of lengths	M标准系列 M-standard series
柄部型式 Type of shank	直柄 d2 Straight shank d2
适应场合 Application	适用于HRC≤40的钢、不锈钢、铸铁、有色金属 未涂层： 铸铁、有色金属 Coating： Steels, stainless steels, Castiron, Non-ferrous materials. Non-Coating： Castiron, Non-ferrous materials.



型号 Type	规格尺寸Dimension						涂层Coating		
	D (e8)	d2 (h6)	L1	L2	R	Z	未涂层 Non-Coating	牌号 Grade	库存 Stock
ME-4BA30M-D2	2	3	40	4	1.00	4	○	B	●
ME-4BA30M-D3	3	3	40	9	1.50	4	○	B	●
ME-4BA30M-D4	4	4	50	14	2.00	4	○	B	●
ME-4BA30M-D5	5	6	65	20	2.50	4	○	B	●
ME-4BA30M-D6	6	6	65	20	3.00	4	○	B	●
ME-4BA30M-D8	8	8	65	20	4.00	4	○	B	●
ME-4BA30M-D10	10	10	75	25	5.00	4	○	B	●
ME-4BA30M-D12	12	12	75	25	6.00	4	○	B	●
ME-4BA30M-D14	14	14	90	30	7.00	4	○	B	●
ME-4BA30M-D16	16	16	90	30	8.00	4	○	B	●
ME-4BA30M-D20	20	20	100	40	10.00	4	○	B	●
ME-4BA30M-D22	22	22	100	40	11.00	4	○	B	●
ME-4BA30M-D25	25	25	100	40	12.50	4	○	B	●

订货示例： 涂层产品 ME-4BA30M-D10-B  
 未涂层产品 ME-4BA30M-D10  
 Ordering guide: Coating ME-4BA30M-D10-B  
 Ordering guide: Non-Coating ME-4BA30M-D10  
 推荐切削用量见M94页。The page M94 for the recommendable cutting date.  
 ●：表示有库存

## 整体硬质合金立铣刀 Solid carbide end mills

### MG-2EA35M MG-2EA35L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
铣槽 Slotting							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	88	0.005 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	70	0.005 × D	0.40 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	63	0.005 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	60	0.005 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	46	0.005 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Nodular cast iron.	< 300HB	E	63	0.005 × D	0.40 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	39	0.005 × D	0.20 × D	
N	含Si量 > 12%的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	105	0.014 × D	0.40 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	210	0.010 × D	0.50 × D	
N	石墨 Graphite		A	123	0.009 × D	0.60 × D	
N	软塑料 Soft plastics		E	350	0.007 × D	0.50 × D	

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix



# 整体硬质合金立铣刀 Solid carbide end mills

## MG-4EA45M MG-4EA45L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
侧铣精加工 Side milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	112	0.008 × D	1.00 × D	0.04 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	105	0.008 × D	0.80 × D	0.03 × D
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	91	0.008 × D	0.80 × D	0.03 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	84	0.008 × D	1.00 × D	0.03 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	63	0.008 × D	0.80 × D	0.02 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	98	0.008 × D	0.80 × D	0.03 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	56	0.008 × D	0.80 × D	0.02 × D
N	含Si量 > 12的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	245	0.020 × D	1.00 × D	0.03 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	350	0.015 × D	0.80 × D	0.02 × D
N	石墨 Graphite		A	126	0.012 × D	1.00 × D	0.10 × D
侧铣粗加工 Side milling roughing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	98	0.007 × D	1.00 × D	0.30 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	91	0.007 × D	1.00 × D	0.20 × D
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	81	0.007 × D	1.00 × D	0.10 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	74	0.007 × D	1.00 × D	0.20 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	56	0.007 × D	1.00 × D	0.10 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	88	0.007 × D	1.00 × D	0.30 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	49	0.007 × D	1.00 × D	0.15 × D
N	含Si量 > 12的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	210	0.019 × D	1.00 × D	0.30 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	210	0.014 × D	1.00 × D	0.40 × D
N	石墨 Graphite		A	140	0.012 × D	1.00 × D	0.50 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

# 整体硬质合金立铣刀 Solid carbide end mills

## MG-2BA35M MG-2BA35L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
铣槽 Slotting							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	88	0.006 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content, Low-alloy steels, Ferritic and martensitic stainless steels.	140-220HB	E	70	0.006 × D	0.40 × D	
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels, Harder steels for toughening, High-alloy steels, Martensitic stainless steels.	220-350HB	E	63	0.006 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels, Austenitic and duplex stainless steels.	180-200HB	E	60	0.006 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels, Austenitic and duplex stainless steels.	200-250HB	E	46	0.006 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron, Grey iron, Low-alloy cast iron, Nodular cast iron.	< 300HB	E	63	0.006 × D	0.40 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	39	0.006 × D	0.20 × D	
N	含Si量 < 12% 的铝合金 Aluminium alloy with < 12% Si	< 130HB	E	210	0.019 × D	0.60 × D	
N	含Si量 > 12% 的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	105	0.017 × D	0.40 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	175	0.013 × D	0.50 × D	
N	石墨 Graphite		A	140	0.011 × D	1.00 × D	
N	硬塑料 Hard plastics		M	70	0.009 × D	0.50 × D	
仿形精加工 Copy milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	126	0.009 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content, Low-alloy steels, Ferritic and martensitic stainless steels.	140-220HB	E	119	0.009 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels, Harder steels for toughening, High-alloy steels, Martensitic stainless steels.	220-350HB	E	98	0.009 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels, Austenitic and duplex stainless steels.	180-200HB	E	70	0.009 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels, Austenitic and duplex stainless steels.	200-250HB	E	49	0.009 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron, Grey iron, Low-alloy cast iron, Nodular cast iron.	< 300HB	E	102	0.009 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	84	0.009 × D	0.01 × D	0.01 × D
N	含Si量 < 12% 的铝合金 Aluminium alloy with < 12% Si	< 130HB	E	350	0.027 × D	0.03 × D	0.02 × D
N	含Si量 > 12% 的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	224	0.024 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	280	0.018 × D	0.02 × D	0.01 × D
N	石墨 Graphite		A	350	0.015 × D	0.03 × D	0.03 × D
N	硬塑料 Hard plastics		M	123	0.012 × D	0.02 × D	0.02 × D
仿形粗加工 Copy milling roughing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	112	0.010 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content, Low-alloy steels, Ferritic and martensitic stainless steels.	140-220HB	E	98	0.010 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels, Harder steels for toughening, High-alloy steels, Martensitic stainless steels.	220-350HB	E	84	0.010 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels, Austenitic and duplex stainless steels.	180-200HB	E	63	0.010 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels, Austenitic and duplex stainless steels.	200-250HB	E	42	0.010 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron, Grey iron, Low-alloy cast iron, Nodular cast iron.	< 300HB	E	84	0.010 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	70	0.010 × D	0.01 × D	0.01 × D
N	含Si量 < 12% 的铝合金 Aluminium alloy with < 12% Si	< 130HB	E	300	0.030 × D	0.03 × D	0.02 × D
N	含Si量 > 12% 的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	175	0.027 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	245	0.020 × D	0.02 × D	0.01 × D
N	石墨 Graphite		A	245	0.017 × D	0.03 × D	0.03 × D
N	硬塑料 Hard plastics		M	105	0.013 × D	0.02 × D	0.02 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刀径 E= Emulsion M= Mist spray A= Air D=dia. of milling cutter  
 注: 切削速度总是建立在实际工作直径基础之上的。 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。 详见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter. L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix



## 整体硬质合金立铣刀 Solid carbide end mills

### MG-4BA35M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
仿形精加工 Copy milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	126	0.009 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	119	0.009 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	98	0.009 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	70	0.009 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	49	0.009 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	102	0.009 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	84	0.009 × D	0.01 × D	0.01 × D
N	含Si量 < 12%的铝合金 Aluminium alloy with < 12% Si	< 130HB	E	350	0.027 × D	0.03 × D	0.02 × D
N	含Si量 > 12%的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	224	0.024 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	280	0.018 × D	0.02 × D	0.01 × D
N	硬塑料 Hard plastics 硬塑料		M	400	0.015 × D	0.03 × D	0.03 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 切削速度总是建立在实际工作直径基础之上的。更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详细见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter. L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

## 整体硬质合金立铣刀 Solid carbide end mills

### MG-2EA30M MG-2EA30L MG-2EA30X 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.006 × D	0.10 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.006 × D	0.08 × D	
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.006 × D	0.05 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	85-76	0.006 × D	0.08 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	65-58	0.006 × D	0.05 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Nodular cast iron.	< 300HB	E	90-80	0.006 × D	0.10 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.006 × D	0.08 × D	
N	含Si量 > 12的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	150-135	0.017 × D	0.10 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	250-225	0.013 × D	0.05 × D	
N	石墨 Graphite		A	160-145	0.011 × D	0.10 × D	
N	软塑料 Soft plastics		E	100-90	0.009 × D	0.08 × D	
铣槽 Slotting							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.005 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.005 × D	0.40 × D	
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.005 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	85-76	0.005 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	65-58	0.005 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Nodular cast iron.	< 300HB	E	90-80	0.005 × D	0.40 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.005 × D	0.20 × D	
N	含Si量 > 12的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	150-135	0.014 × D	0.40 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	300-270	0.010 × D	0.50 × D	
N	石墨 Graphite		A	175-155	0.009 × D	0.60 × D	
N	软塑料 Soft plastics		E	500-450	0.007 × D	0.50 × D	

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 更长系列L,X的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: L and X series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix



# 整体硬质合金立铣刀 Solid carbide end mills

## MG-3EA40S MG-3EA40M MG-3EA40L MG-3EA40X 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
铣槽 Slotting							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.005 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.005 × D	0.40 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.005 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	85-76	0.005 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	65-58	0.005 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Nodular cast iron.	< 300HB	E	90-80	0.005 × D	0.40 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.005 × D	0.20 × D	
N	含Si量 < 12的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.015 × D	0.40 × D	
N	含Si量 > 12的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	150-135	0.014 × D	0.20 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	250-225	0.010 × D	0.50 × D	
N	石墨 Graphite		A	200-180	0.009 × D	0.60 × D	
N	软塑料 Soft plastics		M	200-180	0.009 × D	1.00 × D	
N	硬塑料 Hard plastics		M	100-90	0.007 × D	0.50 × D	
侧铣粗加工 Side milling roughing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	135-120	0.007 × D	1.00 × D	0.30 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	120-110	0.007 × D	1.00 × D	0.20 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	110-100	0.007 × D	1.00 × D	0.10 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	105-95	0.007 × D	1.00 × D	0.20 × D
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	80-72	0.007 × D	1.00 × D	0.10 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Nodular cast iron.	< 300HB	E	110-100	0.007 × D	1.00 × D	0.30 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	60-54	0.007 × D	1.00 × D	0.15 × D
N	含Si量 < 12的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.021 × D	1.00 × D	0.40 × D
N	含Si量 > 12的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	300-270	0.019 × D	1.00 × D	0.30 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	400-360	0.014 × D	1.00 × D	0.40 × D
N	石墨 Graphite		A	200-180	0.012 × D	1.00 × D	0.50 × D
N	软塑料 Soft plastics		M	max	0.012 × D	1.50 × D	0.80 × D
N	硬塑料 Hard plastics		M	600-540	0.010 × D	1.00 × D	0.50 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: S系列的刀具可按M系列切削用量

Note that: The cutting data of the S series of the tool may be according to the M series.

## 整体硬质合金立铣刀 Solid carbide end mills

### MG-3EA30M MG-3EA30L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.006 × D	0.10 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.006 × D	0.08 × D	
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.006 × D	0.05 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	85-76	0.006 × D	0.08 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	65-58	0.006 × D	0.05 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	90-80	0.006 × D	0.10 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.006 × D	0.08 × D	
铣槽 Slotting							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.005 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.005 × D	0.40 × D	
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.005 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	85-76	0.005 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	65-58	0.005 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	90-80	0.005 × D	0.40 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.005 × D	0.20 × D	

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and define nititions" of appendix





# 整体硬质合金立铣刀 Solid carbide end mills

## MG-4EA30S MG-4EA30M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.006 × D	0.10 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.006 × D	0.08 × D	
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.006 × D	0.05 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	85-76	0.006 × D	0.08 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	65-58	0.006 × D	0.05 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	90-80	0.006 × D	0.10 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.006 × D	0.08 × D	
N	含Si量 > 12的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	150-135	0.017 × D	0.10 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	250-225	0.013 × D	0.05 × D	
N	石墨 Graphite		A	160-145	0.011 × D	0.10 × D	
侧铣精加工 Side milling finishing							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	E	160-145	0.008 × D	1.00 × D	0.04 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	150-135	0.008 × D	0.80 × D	0.03 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	130-120	0.008 × D	0.80 × D	0.03 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	120-110	0.008 × D	1.00 × D	0.03 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	90-80	0.008 × D	0.80 × D	0.02 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	140-125	0.008 × D	0.80 × D	0.03 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	80-72	0.008 × D	0.80 × D	0.02 × D
N	含Si量 > 12的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	350-315	0.020 × D	1.00 × D	0.03 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	500-450	0.015 × D	0.80 × D	0.02 × D
N	石墨 Graphite		A	180-160	0.012 × D	1.00 × D	0.10 × D
侧铣粗加工 Side milling roughing							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	E	140-125	0.007 × D	1.00 × D	0.30 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	130-120	0.007 × D	1.00 × D	0.20 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	115-100	0.007 × D	1.00 × D	0.10 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	105-95	0.007 × D	1.00 × D	0.20 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	80-72	0.007 × D	1.00 × D	0.10 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	125-112	0.007 × D	1.00 × D	0.30 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	70-63	0.007 × D	1.00 × D	0.15 × D
N	含Si量 > 12的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	300-270	0.019 × D	1.00 × D	0.30 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	400-360	0.014 × D	1.00 × D	0.40 × D
N	石墨 Graphite		A	200-180	0.012 × D	1.00 × D	0.50 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: S系列的刀具可按M系列切削用量, 更长系列L,X的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: The cutting data of the S series of the tool may be according to the M series. L and X series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

## 整体硬质合金立铣刀 Solid carbide end mills

### MG-MEA40M MG-MEA40L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.006 × D	0.10 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.006 × D	0.08 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.006 × D	0.05 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Nodular cast iron.	< 300HB	E	90-80	0.006 × D	0.10 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.011 × D	0.08 × D	
N	石墨 Graphite		A	160-145	0.006 × D	0.10 × D	
侧铣精加工 Side milling finishing							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	E	160-145	0.008 × D	1.00 × D	0.04 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	150-135	0.008 × D	0.80 × D	0.03 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	130-120	0.008 × D	0.80 × D	0.03 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Nodular cast iron.	< 300HB	E	140-125	0.008 × D	0.80 × D	0.03 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	80-72	0.008 × D	0.80 × D	0.02 × D
N	石墨 Graphite		A	180-160	0.012 × D	1.00 × D	0.10 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详细见附录《切削定义及计算》

Note that: L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix



# 整体硬质合金立铣刀 Solid carbide end mills

## MG-3TA50M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	M	125-112	0.006 × D	0.10 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	100-90	0.006 × D	0.08 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	90-80	0.006 × D	0.05 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	85-76	0.006 × D	0.08 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	65-58	0.006 × D	0.05 × D	
侧铣精加工 Side milling finishing							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	M	160-145	0.008 × D	1.00 × D	0.04 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	150-135	0.008 × D	0.80 × D	0.03 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	130-120	0.008 × D	0.80 × D	0.03 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	120-110	0.008 × D	1.00 × D	0.03 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	90-80	0.008 × D	0.80 × D	0.02 × D
侧铣粗加工 Side milling roughing							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	M	140-125	0.007 × D	1.00 × D	0.30 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	130-120	0.007 × D	1.00 × D	0.20 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	115-100	0.007 × D	1.00 × D	0.10 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	105-95	0.007 × D	1.00 × D	0.20 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	80-72	0.007 × D	1.00 × D	0.10 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

## 整体硬质合金立铣刀 Solid carbide end mills

### MG-3TA40M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
铣槽 Slotting							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.005 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.005 × D	0.40 × D	
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.005 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	85-76	0.005 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	65-58	0.005 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	90-80	0.005 × D	0.40 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.005 × D	0.20 × D	
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.015 × D	0.40 × D	
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	150-135	0.014 × D	0.20 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	250-225	0.010 × D	0.50 × D	
N	石墨 Graphite		A	200-180	0.009 × D	0.60 × D	
N	软塑料 Soft plastics		M	200-180	0.009 × D	1.00 × D	
N	硬塑料 Hard plastics		M	100-90	0.007 × D	0.50 × D	
侧铣粗加工 Side milling roughing							
P	低碳钢、易切钢 low-carbon steels. Free-cutting steels.	125-220HB	E	135-120	0.007 × D	1.00 × D	0.30 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	120-110	0.007 × D	1.00 × D	0.20 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	110-100	0.007 × D	1.00 × D	0.10 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	105-95	0.007 × D	1.00 × D	0.20 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	80-72	0.007 × D	1.00 × D	0.10 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	110-100	0.007 × D	1.00 × D	0.30 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	60-54	0.007 × D	1.00 × D	0.15 × D
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.021 × D	1.00 × D	0.40 × D
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	300-270	0.019 × D	1.00 × D	0.30 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	400-360	0.014 × D	1.00 × D	0.40 × D
N	石墨 Graphite		A	200-180	0.012 × D	1.00 × D	0.50 × D
N	软塑料 Soft plastics		M	max	0.012 × D	1.50 × D	0.80 × D
N	硬塑料 Hard plastics		M	600-540	0.010 × D	1.00 × D	0.50 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter



# 整体硬质合金立铣刀 Solid carbide end mills

## MG-2BA30M MG-2BA30L MG-2BA30X 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
仿形精加工 Copy milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	180-160	0.009 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	170-150	0.009 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	140-125	0.009 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	100-90	0.009 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	70-63	0.009 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	145-130	0.009 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	120-110	0.009 × D	0.01 × D	0.01 × D
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.027 × D	0.03 × D	0.02 × D
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	320-280	0.024 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	400-360	0.018 × D	0.02 × D	0.01 × D
N	石墨 Graphite		A	max	0.015 × D	0.03 × D	0.03 × D
N	硬塑料 Hard plastics		M	175-155	0.012 × D	0.02 × D	0.02 × D
仿形粗加工 Copy milling roughing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	160-145	0.010 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	140-125	0.010 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	120-110	0.010 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	90-80	0.010 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	60-55	0.010 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	120-110	0.010 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	100-90	0.010 × D	0.01 × D	0.01 × D
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.030 × D	0.03 × D	0.02 × D
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	250-225	0.027 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	350-315	0.020 × D	0.02 × D	0.01 × D
N	石墨 Graphite		A	350-315	0.017 × D	0.03 × D	0.03 × D
N	硬塑料 Hard plastics		M	150-135	0.013 × D	0.02 × D	0.02 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径 E= Emulsion M= Mist spray A= Air D=dia. of milling cutter

注: 切削速度总是建立在实际工作直径基础之上的

更长系列L,X的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter.

L and X series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

## 整体硬质合金立铣刀 Solid carbide end mills

### MG-3BA40S MG-3BA40L MG-3BA40X 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.006 × D	0.10 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.006 × D	0.08 × D	
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.006 × D	0.05 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	85-76	0.006 × D	0.08 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	65-58	0.006 × D	0.05 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	90-80	0.006 × D	0.10 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.006 × D	0.08 × D	
N	含Si量 < 12的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.019 × D	0.10 × D	
N	含Si量 > 12的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	150-135	0.017 × D	0.10 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	250-225	0.013 × D	0.05 × D	
N	硬塑料 Hard plastics硬塑料		M	100-90	0.009 × D	0.10 × D	
仿形精加工 Copy milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	180-160	0.009 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	170-150	0.009 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	140-125	0.009 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	100-90	0.009 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	70-63	0.009 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	145-130	0.009 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	120-110	0.009 × D	0.01 × D	0.01 × D
N	含Si量 < 12的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.027 × D	0.03 × D	0.02 × D
N	含Si量 > 12的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	320-280	0.024 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	400-360	0.018 × D	0.02 × D	0.01 × D
N	硬塑料 Hard plastics硬塑料		M	max	0.015 × D	0.03 × D	0.03 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 切削速度总是建立在实际工作直径基础之上的。

S系列的刀具可按M系列切削用量, 更长系列L,X的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter.

Note that: cutting speed is always given at the working diameter. See section "Cutting calculations and definitions" of appendix

The cutting data of the S series of the tool may be according to the M series. L and X series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

# 整体硬质合金立铣刀 Solid carbide end mills

## MG-4BA30M MG-4BA30L MG-4BA30X 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	125-112	0.006 × D	0.10 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	100-90	0.006 × D	0.08 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	90-80	0.006 × D	0.05 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	85-76	0.006 × D	0.08 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	65-58	0.006 × D	0.05 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	90-80	0.006 × D	0.10 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	55-50	0.006 × D	0.08 × D	
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.019 × D	0.10 × D	
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	150-135	0.017 × D	0.10 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	250-225	0.013 × D	0.05 × D	
N	硬塑料 Hard plastics硬塑料		M	100-90	0.011 × D	0.10 × D	
仿形精加工 Copy milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	180-160	0.009 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	170-150	0.009 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	140-125	0.009 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	100-90	0.009 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	70-63	0.009 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	145-130	0.009 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	120-110	0.009 × D	0.01 × D	0.01 × D
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.027 × D	0.03 × D	0.02 × D
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	320-280	0.024 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	400-360	0.018 × D	0.02 × D	0.01 × D
N	硬塑料 Hard plastics硬塑料		M	max	0.015 × D	0.03 × D	0.03 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刀径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 切削速度总是建立在实际工作直径基础之上的

更长系列L,X的工具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter.

L and X series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

## 整体硬质合金立铣刀 Solid carbide end mills

### MP-3TA40M MP-3TA40L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢, 易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	250-175	0.007 × D	0.04 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	210-130	0.007 × D	0.04 × D	
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	180-125	0.006 × D	0.03 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	185-130	0.007 × D	0.03 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	160-110	0.007 × D	0.02 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	450-315	0.008 × D	0.04 × D	
N	石墨 Graphite		A	600-420	0.009 × D	0.03 × D	
N	硬塑料 Hard plastics		M	175-120	0.007 × D	0.02 × D	
铣槽 Slotting							
P	低碳钢, 易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	200-140	0.006 × D	1.20 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	180-125	0.005 × D	0.80 × D	
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	160-110	0.005 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	175-120	0.006 × D	0.32 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	150-105	0.005 × D	0.16 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	350-315	0.006 × D	0.25 × D	
N	石墨 Graphite		A	600-420	0.007 × D	0.48 × D	
N	硬塑料 Hard plastics		M	150-105	0.006 × D	0.25 × D	
侧铣精加工 Side milling finishing							
P	低碳钢, 易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	450-315	0.011 × D	1.00 × D	0.04 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	390-275	0.010 × D	0.80 × D	0.04 × D
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	350-245	0.010 × D	0.80 × D	0.03 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	285-200	0.011 × D	0.80 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	245-170	0.010 × D	0.64 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	550-385	0.011 × D	1.00 × D	0.05 × D
N	石墨 Graphite		A	400-280	0.013 × D	1.00 × D	0.05 × D
N	硬塑料 Hard plastics		M	250-175	0.011 × D	0.80 × D	0.04 × D
侧铣粗加工 Side milling roughing							
P	低碳钢, 易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	350-245	0.010 × D	1.50 × D	0.05 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	310-220	0.010 × D	1.00 × D	0.04 × D
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	280-195	0.009 × D	1.00 × D	0.04 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	250-175	0.010 × D	1.00 × D	0.04 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	200-140	0.010 × D	0.80 × D	0.03 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	450-315	0.011 × D	1.25 × D	0.25 × D
N	石墨 Graphite		A	600-420	0.012 × D	1.00 × D	0.05 × D
N	硬塑料 Hard plastics		M	190-130	0.010 × D	1.00 × D	0.15 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刀径 E= Emulsion M= Mist spray A= Air D=dia. of milling cutter

注: 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix



# 整体硬质合金立铣刀 Solid carbide end mills

## MP-MTA40M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	250-175	0.007 × D	0.04 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	210-130	0.007 × D	0.04 × D	
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels .Martensitic stainless steels.	220-350HB	M	180-125	0.006 × D	0.03 × D	
H	淬硬钢 Hardened steels	48-56 HRC	M	150-105	0.004 × D	0.03 × D	
H	淬硬钢 Hardened steels	56-62 HRC	M	90-70	0.003 × D	0.02 × D	
H	淬硬钢 Hardened steels	62-65 HRC	A	55-40	0.003 × D	0.01 × D	
H	淬硬钢 Hardened steels	>65 HRC	A	35-25	0.002 × D	0.01 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	185-130	0.007 × D	0.03 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	160-110	0.007 × D	0.02 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	60-40	0.006 × D	0.03 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	30-21	0.006 × D	0.01 × D	
S	钛合金 Titanium alloys	250-300HB	E	80-55	0.007 × D	0.03 × D	
侧铣精加工 Side milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	450-315	0.011 × D	1.00 × D	0.04 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	390-275	0.010 × D	0.80 × D	0.04 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels .Martensitic stainless steels.	220-350HB	M	350-245	0.010 × D	0.80 × D	0.03 × D
H	淬硬钢 Hardened steels	48-56 HRC	M	300-210	0.006 × D	0.80 × D	0.03 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	175-120	0.006 × D	0.64 × D	0.02 × D
H	淬硬钢 Hardened steels	62-65 HRC	A	90-70	0.004 × D	0.40 × D	0.02 × D
H	淬硬钢 Hardened steels	>65 HRC	A	60-40	0.004 × D	0.30 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	285-200	0.011 × D	0.80 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	245-170	0.010 × D	0.64 × D	0.02 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	120-85	0.010 × D	0.56 × D	0.02 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	50-45	0.009 × D	0.40 × D	0.01 × D
S	钛合金 Titanium alloys	250-300HB	E	145-100	0.010 × D	0.80 × D	0.03 × D
侧铣粗加工 Side milling roughing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	350-245	0.010 × D	1.50 × D	0.05 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	310-220	0.010 × D	1.00 × D	0.04 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels .Martensitic stainless steels.	220-350HB	M	280-195	0.009 × D	1.00 × D	0.04 × D
H	淬硬钢 Hardened steels	48-56 HRC	M	250-175	0.005 × D	1.00 × D	0.03 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	150-105	0.004 × D	0.80 × D	0.03 × D
H	淬硬钢 Hardened steels	62-65 HRC	A	80-55	0.003 × D	0.50 × D	0.02 × D
H	淬硬钢 Hardened steels	>65 HRC	A	55-35	0.003 × D	0.30 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	250-175	0.010 × D	1.00 × D	0.04 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	200-140	0.010 × D	0.80 × D	0.03 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	80-55	0.009 × D	0.70 × D	0.03 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	40-30	0.008 × D	0.52 × D	0.02 × D
S	钛合金 Titanium alloys	250-300HB	E	120-85	0.010 × D	1.00 × D	0.04 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径 E= Emulsion M= Mist spray A= Air D=dia. of milling cutter

## 整体硬质合金立铣刀 Solid carbide end mills

### MH-2TA28M MH-2TA28L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	250-175	0.007 × D	0.04 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	210-130	0.007 × D	0.04 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	180-125	0.006 × D	0.03 × D	
H	淬硬钢 Hardened steels	48-56 HRC	M	150-105	0.004 × D	0.03 × D	
H	淬硬钢 Hardened steels	56-62 HRC	M	90-70	0.003 × D	0.02 × D	
H	淬硬钢 Hardened steels	62-65 HRC	M	55-45	0.003 × D	0.01 × D	
H	淬硬钢 Hardened steels	>65 HRC	M	35-25	0.002 × D	0.01 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	185-130	0.007 × D	0.03 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	160-110	0.007 × D	0.02 × D	
仿形精加工 Copy milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	500-350	0.015 × D	0.03 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	385-240	0.014 × D	0.03 × D	0.02 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	325-220	0.013 × D	0.02 × D	0.02 × D
H	淬硬钢 Hardened steels	48-56 HRC	M	280-190	0.013 × D	0.02 × D	0.01 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	150-105	0.012 × D	0.02 × D	0.01 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	110-70	0.010 × D	0.01 × D	0.01 × D
H	淬硬钢 Hardened steels	>65 HRC	M	85-60	0.010 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	345-240	0.015 × D	0.03 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	290-200	0.014 × D	0.02 × D	0.02 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刀径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

# 整体硬质合金立铣刀 Solid carbide end mills

## MH-4TA20M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
H	淬硬钢 Hardened steels	48-56 HRC	M	150-105	0.004 × D	0.03 × D	
H	淬硬钢 Hardened steels	56-62 HRC	M	90-70	0.003 × D	0.02 × D	
H	淬硬钢 Hardened steels	62-65 HRC	M	55-35	0.003 × D	0.01 × D	
H	淬硬钢 Hardened steels	>65 HRC	M	35-25	0.002 × D	0.01 × D	
铣槽 Slotting							
H	淬硬钢 Hardened steels	48-56 HRC	M	110-70	0.004 × D	0.18 × D	
H	淬硬钢 Hardened steels	56-62 HRC	M	70-50	0.003 × D	0.08 × D	
H	淬硬钢 Hardened steels	62-65 HRC	M	50-35	0.002 × D	0.05 × D	
H	淬硬钢 Hardened steels	>65 HRC	M	35-25	0.002 × D	0.03 × D	
侧铣精加工 Side milling finishing							
H	淬硬钢 Hardened steels	48-56 HRC	M	300-210	0.006 × D	0.80 × D	0.03 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	175-120	0.006 × D	0.64 × D	0.02 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	90-70	0.004 × D	0.40 × D	0.02 × D
H	淬硬钢 Hardened steels	>65 HRC	M	60-40	0.004 × D	0.30 × D	0.01 × D
侧铣粗加工 Side milling roughing							
H	淬硬钢 Hardened steels	48-56 HRC	M	250-175	0.005 × D	1.00 × D	0.03 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	150-105	0.004 × D	0.80 × D	0.03 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	80-55	0.003 × D	0.50 × D	0.02 × D
H	淬硬钢 Hardened steels	>65 HRC	M	55-35	0.003 × D	0.30 × D	0.01 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
 E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

## 整体硬质合金立铣刀 Solid carbide end mills

### MH-4TA28M MH-4TA28L MH-4TA28X 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	250-175	0.007 × D	0.04 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	210-130	0.007 × D	0.04 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	180-125	0.006 × D	0.03 × D	
H	淬硬钢 Hardened steels	48-56 HRC	M	150-105	0.004 × D	0.03 × D	
H	淬硬钢 Hardened steels	56-62 HRC	M	90-70	0.003 × D	0.02 × D	
H	淬硬钢 Hardened steels	62-65 HRC	M	55-45	0.003 × D	0.01 × D	
H	淬硬钢 Hardened steels	>65 HRC	M	35-25	0.002 × D	0.01 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	185-130	0.007 × D	0.03 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	160-110	0.007 × D	0.02 × D	
仿形精加工 Copy milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	500-350	0.015 × D	0.03 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	385-240	0.014 × D	0.03 × D	0.02 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	325-220	0.013 × D	0.02 × D	0.02 × D
H	淬硬钢 Hardened steels	48-56 HRC	M	280-190	0.013 × D	0.02 × D	0.01 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	150-105	0.012 × D	0.02 × D	0.01 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	110-70	0.010 × D	0.01 × D	0.01 × D
H	淬硬钢 Hardened steels	>65 HRC	M	85-60	0.010 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	345-240	0.015 × D	0.03 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	290-200	0.014 × D	0.02 × D	0.02 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刀径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 更长系列L,X的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: L and X series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

# 整体硬质合金立铣刀 Solid carbide end mills

## MH-MTA45M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
H	淬硬钢 Hardened steels	48-56 HRC	M	150-105	0.004 × D	0.03 × D	
H	淬硬钢 Hardened steels	56-62 HRC	M	90-70	0.003 × D	0.02 × D	
H	淬硬钢 Hardened steels	62-65 HRC	M	55-35	0.003 × D	0.01 × D	
H	淬硬钢 Hardened steels	>65 HRC	M	35-25	0.002 × D	0.01 × D	
侧铣精加工 Side milling finishing							
H	淬硬钢 Hardened steels	48-56 HRC	M	300-210	0.006 × D	0.80 × D	0.03 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	175-120	0.006 × D	0.64 × D	0.02 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	90-70	0.004 × D	0.40 × D	0.02 × D
H	淬硬钢 Hardened steels	>65 HRC	M	60-40	0.004 × D	0.30 × D	0.01 × D
侧铣粗加工 Side milling roughing							
H	淬硬钢 Hardened steels	48-56 HRC	M	250-175	0.005 × D	1.00 × D	0.03 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	150-105	0.004 × D	0.80 × D	0.03 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	80-55	0.003 × D	0.50 × D	0.02 × D
H	淬硬钢 Hardened steels	>65 HRC	M	55-35	0.003 × D	0.30 × D	0.01 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

## 整体硬质合金立铣刀 Solid carbide end mills

**MH-2BA18S MH-2BA18M MH-2BA18L** 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
H	淬硬钢 Hardened steels	48-56 HRC	M	150-105	0.004 × D	0.03 × D	
H	淬硬钢 Hardened steels	56-62 HRC	M	90-70	0.003 × D	0.02 × D	
H	淬硬钢 Hardened steels	62-65 HRC	M	55-40	0.003 × D	0.01 × D	
H	淬硬钢 Hardened steels	>65 HRC	M	35-25	0.002 × D	0.01 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	<300HB	A	185-130	0.007 × D	0.03 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	<300HB	A	160-110	0.007 × D	0.02 × D	
仿形精加工 Copy milling finishing							
H	淬硬钢 Hardened steels	48-56 HRC	M	350-210	0.013 × D	0.03 × D	0.01 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	210-130	0.012 × D	0.02 × D	0.01 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	130-90	0.010 × D	0.01 × D	0.01 × D
H	淬硬钢 Hardened steels	>65 HRC	M	90-70	0.010 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	<300HB	A	345-240	0.015 × D	0.03 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	<300HB	A	290-200	0.014 × D	0.02 × D	0.02 × D
仿形粗加工 Copy milling roughing							
H	淬硬钢 Hardened steels	48-56 HRC	M	200-140	0.019 × D	0.10 × D	0.30 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	140-100	0.015 × D	0.07 × D	0.25 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	100-60	0.013 × D	0.05 × D	0.20 × D
H	淬硬钢 Hardened steels	>65 HRC	M	60-40	0.011 × D	0.04 × D	0.15 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	<300HB	A	250-175	0.013 × D	0.15 × D	0.30 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	<300HB	A	200-140	0.012 × D	0.15 × D	0.20 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 切削速度总是建立在实际工作直径基础之上的。

S系列的刀具可按M系列切削用量, 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详细见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter. The cutting data of the S series of the tool may be according to the M series. L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

## 整体硬质合金立铣刀 Solid carbide end mills

### MH-4BA18M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
H	淬硬钢 Hardened steels	48-56 HRC	M	150-105	0.004 × D	0.03 × D	
H	淬硬钢 Hardened steels	56-62 HRC	M	90-70	0.003 × D	0.02 × D	
H	淬硬钢 Hardened steels	62-65 HRC	M	55-40	0.003 × D	0.01 × D	
H	淬硬钢 Hardened steels	>65 HRC	M	35-25	0.002 × D	0.01 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	185-130	0.007 × D	0.03 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	160-110	0.007 × D	0.02 × D	
仿形精加工 Copy milling finishing							
H	淬硬钢 Hardened steels	48-56 HRC	M	280-190	0.013 × D	0.02 × D	0.01 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	150-105	0.012 × D	0.02 × D	0.01 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	110-70	0.010 × D	0.01 × D	0.01 × D
H	淬硬钢 Hardened steels	>65 HRC	M	85-60	0.010 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	345-240	0.015 × D	0.03 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	290-200	0.014 × D	0.02 × D	0.02 × D
仿形粗加工 Copy milling roughing							
H	淬硬钢 Hardened steels	48-56 HRC	M	170-120	0.014 × D	0.06 × D	0.20 × D
H	淬硬钢 Hardened steels	56-62 HRC	M	100-60	0.013 × D	0.04 × D	0.15 × D
H	淬硬钢 Hardened steels	62-65 HRC	M	80-50	0.011 × D	0.03 × D	0.10 × D
H	淬硬钢 Hardened steels	>65 HRC	M	60-40	0.011 × D	0.02 × D	0.05 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	A	250-175	0.013 × D	0.15 × D	0.30 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	A	250-175	0.012 × D	0.15 × D	0.20 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 切削速度总是建立在实际工作直径基础之上的。详细见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter. See section "Cutting calculations and definitions" of appendix

## 整体硬质合金立铣刀 Solid carbide end mills

### MM-3TA40M MM-3TA40L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	100-70	0.007 × D	0.03 × D	
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	70-50	0.007 × D	0.02 × D	
N	有色金属,铜合金 Non-ferrous materials, Brass	< 180HB	E	450-315	0.008 × D	0.04 × D	
N	石墨 Graphite		A	600-420	0.009 × D	0.03 × D	
N	硬塑料 Hard plastics		M	175-120	0.007 × D	0.02 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	60-40	0.006 × D	0.03 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	30-21	0.006 × D	0.01 × D	
S	钛合金 Titanium alloys	250-300HB	E	80-55	0.007 × D	0.03 × D	
铣槽 Slotting							
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	95-65	0.006 × D	0.10 × D	
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	60-40	0.005 × D	0.10 × D	
N	有色金属,铜合金 Non-ferrous materials, Brass	< 180HB	E	350-315	0.006 × D	0.25 × D	
N	石墨 Graphite		A	600-420	0.007 × D	0.48 × D	
N	硬塑料 Hard plastics		M	150-105	0.006 × D	0.25 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	50-35	0.005 × D	0.15 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	25-20	0.005 × D	0.08 × D	
S	钛合金 Titanium alloys	250-300HB	E	75-50	0.005 × D	0.24 × D	
侧铣精加工 Side milling finishing							
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	200-140	0.011 × D	0.80 × D	0.03 × D
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	145-100	0.010 × D	0.64 × D	0.02 × D
N	有色金属,铜合金 Non-ferrous materials, Brass	< 180HB	E	550-385	0.011 × D	1.00 × D	0.05 × D
N	石墨 Graphite		A	400-280	0.013 × D	1.00 × D	0.05 × D
N	硬塑料 Hard plastics		M	250-175	0.011 × D	0.80 × D	0.04 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	120-85	0.010 × D	0.56 × D	0.02 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	50-45	0.009 × D	0.40 × D	0.01 × D
S	钛合金 Titanium alloys	250-300HB	E	145-100	0.010 × D	0.80 × D	0.03 × D
侧铣粗加工 Side milling roughing							
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	155-110	0.010 × D	1.00 × D	0.04 × D
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	120-85	0.010 × D	0.80 × D	0.03 × D
N	有色金属,铜合金 Non-ferrous materials, Brass	< 180HB	E	450-315	0.011 × D	1.25 × D	0.25 × D
N	石墨 Graphite		A	600-420	0.012 × D	1.00 × D	0.05 × D
N	硬塑料 Hard plastics		M	190-130	0.010 × D	1.00 × D	0.15 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	80-55	0.009 × D	0.70 × D	0.03 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	40-30	0.008 × D	0.52 × D	0.02 × D
S	钛合金 Titanium alloys	250-300HB	E	120-85	0.010 × D	1.00 × D	0.04 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix



# 整体硬质合金立铣刀 Solid carbide end mills

## MM-3BA40M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	100-70	0.007 × D	0.03 × D	
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	70-50	0.007 × D	0.02 × D	
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.010 × D	0.05 × D	
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	280-190	0.008 × D	0.03 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	450-315	0.008 × D	0.04 × D	
N	石墨 Graphite		M	400-280	0.008 × D	0.04 × D	
N	硬塑料 Hard plastics		M	175-120	0.007 × D	0.02 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	60-40	0.006 × D	0.03 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	30-21	0.006 × D	0.01 × D	
S	钛合金 Titanium alloys	250-300HB	E	80-55	0.007 × D	0.03 × D	
仿形精加工 Copy milling finishing							
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	210-130	0.015 × D	0.03 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	125-90	0.014 × D	0.02 × D	0.01 × D
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.020 × D	0.05 × D	0.05 × D
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	345-240	0.016 × D	0.05 × D	0.03 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	max	0.016 × D	0.04 × D	0.03 × D
N	石墨 Graphite		M	max	0.016 × D	0.05 × D	0.02 × D
N	硬塑料 Hard plastics		M	175-120	0.015 × D	0.04 × D	0.02 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	150-105	0.013 × D	0.02 × D	0.01 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	75-50	0.012 × D	0.02 × D	0.01 × D
S	钛合金 Titanium alloys	250-300HB	E	170-120	0.014 × D	0.03 × D	0.02 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注：切削速度总是建立在实际工作直径基础之上的。详见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter. See section "Cutting calculations and definitions" of appendix

## 整体硬质合金立铣刀 Solid carbide end mills

### MM-2BA30M MM-2BA30L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	250-175	0.007 × D	0.04 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	210-130	0.007 × D	0.04 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	180-125	0.006 × D	0.03 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	100-70	0.007 × D	0.03 × D	
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	70-50	0.007 × D	0.02 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	60-40	0.006 × D	0.03 × D	
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	30-21	0.006 × D	0.01 × D	
S	钛合金 Titanium alloys	250-300HB	E	80-55	0.007 × D	0.03 × D	
仿形精加工 Copy milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	500-350	0.015 × D	0.03 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	385-240	0.014 × D	0.03 × D	0.02 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	325-220	0.013 × D	0.02 × D	0.02 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	210-130	0.015 × D	0.03 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	125-90	0.014 × D	0.02 × D	0.01 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	150-105	0.013 × D	0.02 × D	0.01 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	75-50	0.012 × D	0.02 × D	0.01 × D
S	钛合金 Titanium alloys	250-300HB	E	170-120	0.014 × D	0.03 × D	0.02 × D
仿形粗加工 Copy milling roughing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	M	290-200	0.019 × D	0.17 × D	0.44 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	M	250-175	0.018 × D	0.13 × D	0.33 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	M	215-150	0.018 × D	0.11 × D	0.31 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	M	110-80	0.014 × D	0.13 × D	0.17 × D
M	难加工的奥氏体与双相不锈钢 Moderately Difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	M	70-50	0.013 × D	0.09 × D	0.13 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	< 280HB	E	90-60	0.012 × D	0.17 × D	0.22 × D
S	镍基、钴基、铁基高温合金 Nickel-, Cobalt- and Iron-based superalloys	> 280HB	E	45-30	0.011 × D	0.11 × D	0.13 × D
S	钛合金 Titanium alloys	250-300HB	E	90-60	0.012 × D	0.22 × D	0.33 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 切削速度总是建立在实际工作直径基础之上的

更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter.

L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

## 整体硬质合金立铣刀 Solid carbide end mills

### MN-2EA50M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.019 × D	0.10 × D	
N	软塑料 Soft plastics		M	200-180	0.011 × D	0.10 × D	
铣槽 Slotting							
N	软塑料 Soft plastics		M	max	0.009 × D	1.00 × D	
侧铣精加工 Side milling finishing							
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.022 × D	1.00 × D	0.05 × D
N	软塑料 Soft plastics		M	max	0.012 × D	1.00 × D	0.10 × D
侧铣粗加工 Side milling roughing							
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.021 × D	1.00 × D	0.40 × D
N	软塑料 Soft plastics		M	max	0.012 × D	1.50 × D	0.80 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

### MN-2EA25M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.019 × D	0.10 × D	
N	软塑料 Soft plastics		M	200-180	0.011 × D	0.10 × D	
铣槽 Slotting							
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.015 × D	0.60 × D	
N	软塑料 Soft plastics		M	max	0.009 × D	1.00 × D	

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径  
E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

## 整体硬质合金立铣刀 Solid carbide end mills

### MN-2TA30M MN-2TA30L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
N	含Si量 < 12的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.007 × D	0.50 × D	
N	有色金属,铜合金 Non-ferrous materials, Brass	< 180HB	E	400-280	0.004 × D	0.50 × D	
N	软塑料 Soft plastics		A	max	0.007 × D	0.50 × D	
N	硬塑料 Hard plastics		M	400-280	0.005 × D	0.50 × D	
铣槽 Slotting							
N	含Si量 < 12的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.013 × D	0.50 × D	
N	有色金属,铜合金 Non-ferrous materials, Brass	< 180HB	E	400-280	0.008 × D	0.50 × D	
N	软塑料 Soft plastics		A	max	0.013 × D	1.00 × D	
N	硬塑料 Hard plastics		M	400-280	0.010 × D	0.70 × D	
侧铣精加工 Side milling finishing							
N	含Si量 < 12的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.005 × D	max	0.20 × D
N	有色金属,铜合金 Non-ferrous materials, Brass	< 180HB	E	600-420	0.005 × D	max	0.20 × D
N	软塑料 Soft plastics		A	max	0.005 × D	max	0.20 × D
N	硬塑料 Hard plastics		M	600-420	0.005 × D	max	0.20 × D
侧铣粗加工 Side milling roughing							
N	含Si量 < 12的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.015 × D	1.00 × D	0.40 × D
N	有色金属,铜合金 Non-ferrous materials, Brass	< 180HB	E	400-280	0.010 × D	1.00 × D	0.40 × D
N	软塑料 Soft plastics		A	max	0.015 × D	1.00 × D	0.50 × D
N	硬塑料 Hard plastics		M	400-280	0.012 × D	1.00 × D	0.40 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注： 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详细见附录《切削定义及计算》

Note that: L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix



## 整体硬质合金立铣刀 Solid carbide end mills

### MN-2BA50M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
螺旋斜坡铣 Helical or ramping							
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.010 × D	0.05 × D	
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	280-190	0.008 × D	0.03 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	450-315	0.008 × D	0.04 × D	
N	软塑料 Soft plastics		M	400-280	0.008 × D	0.04 × D	
N	硬塑料 Hard plastics		M	175-120	0.007 × D	0.02 × D	
仿形精加工 Copy milling finishing							
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.020 × D	0.05 × D	0.05 × D
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	345-240	0.016 × D	0.05 × D	0.03 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	max	0.016 × D	0.04 × D	0.03 × D
N	软塑料 Soft plastics		M	max	0.016 × D	0.05 × D	0.02 × D
N	硬塑料 Hard plastics		M	175-120	0.015 × D	0.04 × D	0.02 × D
仿形粗加工 Copy milling roughing							
N	含Si量 < 12%的铝合金 Aluminium alloys with < 12% Si	< 130HB	E	max	0.022 × D	0.20 × D	0.40 × D
N	含Si量 > 12%的铝合金 Aluminium alloys with > 12% Si	< 180HB	E	300-210	0.018 × D	0.20 × D	0.30 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	max	0.017 × D	0.20 × D	0.30 × D
N	软塑料 Soft plastics		M	max	0.018 × D	0.50 × D	0.50 × D
N	硬塑料 Hard plastics		M	200-140	0.016 × D	0.20 × D	0.20 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 切削速度总是建立在实际工作直径基础之上的。详见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter. See section "Cutting calculations and definitions" of appendix

### MP-4WB30M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
侧铣粗加工 Side milling roughing							
P	低碳钢, 易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	98	0.005 × D	1.00 × D	0.50 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	91	0.005 × D	1.00 × D	0.50 × D
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	81	0.005 × D	1.00 × D	0.50 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Nodular cast iron.	< 300HB	E	110	0.006 × D	1.00 × D	0.50 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	110	0.006 × D	1.00 × D	0.50 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

## 整体硬质合金立铣刀 Solid carbide end mills

### ME-2EA30M ME-2EA30L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
铣槽 Slotting							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	88	0.005 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	70	0.005 × D	0.40 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	63	0.005 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	60	0.005 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	46	0.005 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	63	0.005 × D	0.40 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	39	0.005 × D	0.20 × D	
N	含Si量 > 12的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	105	0.014 × D	0.40 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	210	0.010 × D	0.50 × D	
N	石墨 Graphite		A	123	0.009 × D	0.60 × D	
N	软塑料 Soft plastics		E	350	0.007 × D	0.50 × D	

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 未涂层牌号适用于ISO-K/N/S, 其切削速度Vc (m/min) 为表中的75-80%

Note that: Non-Coating Grade Suitable for ISO-K/N/S, the cutting speed Vc is 75-80% ratio of the table above.



# 整体硬质合金立铣刀 Solid carbide end mills

## ME-3EA40S ME-3EA40M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
铣槽 Slotting							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	88	0.005 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	70	0.005 × D	0.40 × D	
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	63	0.005 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	60	0.005 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	46	0.005 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	63	0.005 × D	0.40 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	39	0.005 × D	0.20 × D	
N	含Si量 < 12%的铝合金 Aluminium alloy with < 12% Si	< 130HB	E	210	0.015 × D	0.40 × D	
N	含Si量 > 12%的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	105	0.014 × D	0.20 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	175	0.010 × D	0.50 × D	
N	石墨 Graphite		A	140	0.009 × D	0.60 × D	
N	软塑料 Soft plastics		M	140	0.009 × D	1.00 × D	
N	硬塑料 Hard plastics		M	70	0.007 × D	0.50 × D	
侧铣粗加工 Side milling roughing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	95	0.007 × D	1.00 × D	0.30 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	84	0.007 × D	1.00 × D	0.20 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	77	0.007 × D	1.00 × D	0.10 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	74	0.007 × D	1.00 × D	0.20 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	56	0.007 × D	1.00 × D	0.10 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	77	0.007 × D	1.00 × D	0.30 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	42	0.007 × D	1.00 × D	0.15 × D
N	含Si量 < 12%的铝合金 Aluminium alloy with < 12% Si	< 130HB	E	250	0.021 × D	1.00 × D	0.40 × D
N	含Si量 > 12%的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	210	0.019 × D	1.00 × D	0.30 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	280	0.014 × D	1.00 × D	0.40 × D
N	石墨 Graphite		A	140	0.012 × D	1.00 × D	0.50 × D
N	软塑料 Soft plastics		M	500	0.012 × D	1.50 × D	0.80 × D
N	硬塑料 Hard plastics		M	420	0.010 × D	1.00 × D	0.50 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径 E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: S系列的刀具可按M系列切削用量, 未涂层牌号适用于ISO-K/N/S, 其切削速度Vc (m/min) 为表中的75-80%

Note that: The cutting data of the S series of the tool may be according to the M series

Non-Coating Grade Suitable for ISO-K/N/S, the cutting speed Vc is 75-80% ratio of the table above.

## 整体硬质合金立铣刀 Solid carbide end mills

### ME-3EA30M ME-3EA30L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
铣槽 Slotting							
P	低碳钢, 易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	88	0.005 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	70	0.005 × D	0.40 × D	
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	63	0.005 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	60	0.005 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	46	0.005 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	63	0.005 × D	0.40 × D	
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	39	0.005 × D	0.20 × D	

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 更长系列L的刀具可能需要降低推荐的轴向切削深度ap。详细见附录《切削定义及计算》

未涂层牌号适用于ISO-K/N/S,其切削速度Vc ( m/min) 为表中的75-80%

Note that: L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix

Non-Coating Grade Suitable for ISO-K/N/S, the cutting speed Vc is 75-80% ratio of the table above.





# 整体硬质合金立铣刀 Solid carbide end mills

## ME-4EA30S ME-4EA30M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
侧铣精加工 Side milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	112	0.008 × D	1.00 × D	0.04 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	105	0.008 × D	0.80 × D	0.03 × D
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	91	0.008 × D	0.80 × D	0.03 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	84	0.008 × D	1.00 × D	0.03 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	63	0.008 × D	0.80 × D	0.02 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	98	0.008 × D	0.80 × D	0.03 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	56	0.008 × D	0.80 × D	0.02 × D
N	含Si量 > 12%的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	245	0.020 × D	1.00 × D	0.03 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	350	0.015 × D	0.80 × D	0.02 × D
N	石墨 Graphite		A	126	0.012 × D	1.00 × D	0.10 × D
侧铣粗加工 Side milling roughing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	98	0.007 × D	1.00 × D	0.30 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	91	0.007 × D	1.00 × D	0.20 × D
P	工具钢, 调质钢, 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	81	0.007 × D	1.00 × D	0.10 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	74	0.007 × D	1.00 × D	0.20 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	56	0.007 × D	1.00 × D	0.10 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	88	0.007 × D	1.00 × D	0.30 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	49	0.007 × D	1.00 × D	0.15 × D
N	含Si量 > 12%的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	210	0.019 × D	1.00 × D	0.30 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	210	0.014 × D	1.00 × D	0.40 × D
N	石墨 Graphite		A	140	0.012 × D	1.00 × D	0.50 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: S系列的刀具可按M系列切削用量, 未涂层牌号适用于ISO-K/N/S, 其切削速度Vc (m/min) 为表中的75-80%

Note that: The cutting data of the S series of the tool may be according to the M series.  
Non-Coating Grade Suitable for ISO-K/N/S, the cutting speed Vc is 75-80% ratio of the table above.

# 整体硬质合金立铣刀 Solid carbide end mills

## ME-2BA30M ME-2BA30L 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
铣槽 Slotting							
P	低碳钢, 易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	88	0.006 × D	0.50 × D	
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels. Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	70	0.006 × D	0.40 × D	
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	63	0.006 × D	0.30 × D	
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	60	0.006 × D	0.35 × D	
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	46	0.006 × D	0.20 × D	
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁. Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	<300HB	E	63	0.006 × D	0.40 × D	
K	难加工的高合金铸铁. 球墨铸铁. Difficult-cutting high-alloy cast iron. Nodular cast iron.	<300HB	E	39	0.006 × D	0.20 × D	
N	含Si量 < 12% 的铝合金 Aluminium alloy with < 12% Si	<130HB	E	210	0.019 × D	0.60 × D	
N	含Si量 > 12% 的铝合金 Aluminium alloy with > 12% Si	<180HB	E	105	0.017 × D	0.40 × D	
N	有色金属, 铜合金 Non-ferrous materials, Brass	<180HB	E	175	0.013 × D	0.50 × D	
N	石墨 Graphite		A	140	0.011 × D	1.00 × D	
N	硬塑料 Hard plastics		M	70	0.009 × D	0.50 × D	
仿形精加工. Copy milling finishing							
P	低碳钢, 易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	126	0.009 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels. Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	119	0.009 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	98	0.009 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	70	0.009 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	49	0.009 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁. Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	<300HB	E	102	0.009 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁. 球墨铸铁. Difficult-cutting high-alloy cast iron. Nodular cast iron.	<300HB	E	84	0.009 × D	0.01 × D	0.01 × D
N	含Si量 < 12% 的铝合金 Aluminium alloy with < 12% Si	<130HB	E	350	0.027 × D	0.03 × D	0.02 × D
N	含Si量 > 12% 的铝合金 Aluminium alloy with > 12% Si	<180HB	E	224	0.024 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	<180HB	E	280	0.018 × D	0.02 × D	0.01 × D
N	石墨 Graphite		A	350	0.015 × D	0.03 × D	0.03 × D
N	硬塑料 Hard plastics		M	123	0.012 × D	0.02 × D	0.02 × D
仿形粗加工. Copy milling roughing							
P	低碳钢, 易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	112	0.010 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels. Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	98	0.010 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢. 高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	84	0.010 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	63	0.010 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	42	0.010 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁. Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	<300HB	E	84	0.010 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁. 球墨铸铁. Difficult-cutting high-alloy cast iron. Nodular cast iron.	<300HB	E	70	0.010 × D	0.01 × D	0.01 × D
N	含Si量 < 12% 的铝合金 Aluminium alloy with < 12% Si	<130HB	E	300	0.030 × D	0.03 × D	0.02 × D
N	含Si量 > 12% 的铝合金 Aluminium alloy with > 12% Si	<180HB	E	175	0.027 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	<180HB	E	245	0.020 × D	0.02 × D	0.01 × D
N	石墨 Graphite		A	245	0.017 × D	0.03 × D	0.03 × D
N	硬塑料 Hard plastics		M	105	0.013 × D	0.02 × D	0.02 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径 E= Emulsion M= Mist spray A= Air D= dia. of milling cutter  
 注: 切削速度总是建立在实际工作直径基础之上的, 未涂层牌号适用于ISO-K/N/S, 其切削速度Vc (m/min) 为表中的75-80%  
 更长系列L的刀具可能需要降低推荐的轴向切削深度ap. 详见附录《切削定义及计算》

Note that: cutting speed is always given at the working diameter. Non-Coating Grade Suitable for ISO-K/N/S, the cutting speed Vc is 75-80% ratio of the table above.  
 L series of the tool may need a reduction of recommended axial depth of cut ap. See section "Cutting calculations and definitions" of appendix



## 整体硬质合金立铣刀 Solid carbide end mills

### ME-4BA30M 推荐切削用量 Recommendable cutting data

ISO	工件材料 Workpiece material	硬度 Hardness	冷却 Coolant	Vc	fz	ap	ae
				m/min	mm/z	mm	mm
仿形精加工 Copy milling finishing							
P	低碳钢、易切钢 Low-carbon steels. Free-cutting steels.	125-220HB	E	126	0.009 × D	0.02 × D	0.02 × D
P	结构钢, 碳钢, 低合金钢, 铁素体和马氏体不锈钢 Structural steels, Carbon content. Low-alloy steels. Ferritic and martensitic stainless steels.	140-220HB	E	119	0.009 × D	0.02 × D	0.02 × D
P	工具钢, 调质钢。高合金钢, 马氏体不锈钢 Tool steels. Harder steels for toughening. High-alloy steels. Martensitic stainless steels.	220-350HB	E	98	0.009 × D	0.01 × D	0.01 × D
M	易切削或中等加工难度的奥氏体和双相不锈钢 Free-cutting or Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	180-200HB	E	70	0.009 × D	0.02 × D	0.02 × D
M	难加工的奥氏体与双相不锈钢 Moderately difficult-cutting stainless steels. Austenitic and duplex stainless steels.	200-250HB	E	49	0.009 × D	0.01 × D	0.01 × D
K	中等硬度铸铁, 灰铸铁, 低合金铸铁, 球墨铸铁。 Medium hard cast iron. Grey iron. Low-alloy cast iron. Nodular cast iron.	< 300HB	E	102	0.009 × D	0.02 × D	0.02 × D
K	难加工的高合金铸铁。球墨铸铁。 Difficult-cutting high-alloy cast iron. Nodular cast iron.	< 300HB	E	84	0.009 × D	0.01 × D	0.01 × D
N	含Si量 < 12%的铝合金 Aluminium alloy with < 12% Si	< 130HB	E	350	0.027 × D	0.03 × D	0.02 × D
N	含Si量 > 12%的铝合金 Aluminium alloy with > 12% Si	< 180HB	E	224	0.024 × D	0.02 × D	0.02 × D
N	有色金属, 铜合金 Non-ferrous materials, Brass	< 180HB	E	280	0.018 × D	0.02 × D	0.01 × D
N	硬塑料 Hard plastics 硬塑料		M	400	0.015 × D	0.03 × D	0.03 × D

E=乳化液 M=喷雾冷却 A=空气冷却 D=铣刀刃径

E= Emulsion M= Mist spray A= Air D= dia. of milling cutter

注: 切削速度总是建立在实际工作直径基础之上的, 详见附录《切削定义及计算》

未涂层牌号适用于ISO-K/N/S, 其切削速度Vc (m/min) 为表中的75-80%

Note that: cutting speed is always given at the working diameter. See section "Cutting calculations and definitions" of appendix Non-Coating Grade Suitable for ISO-K/N/S, the cutting speed Vc is 75-80% ratio of the table above.