

# B

## 铣削

### GENERAL MILLING



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# 铣刀命名规则

## Code Key for Milling Cutters

FM45	-125	B	40	S	N	12			-Z09	1
1	2	3	4	5	6	7	8	9	10	11
Face milling 45°	刀具直径	接口型式	接口尺寸	刀片形状	刀片后角	切削刃长度	螺钉空白 C: 刀卡式 W: 模块式	标准空白 特质标明长度	刀具齿数	R空白 左手标注L

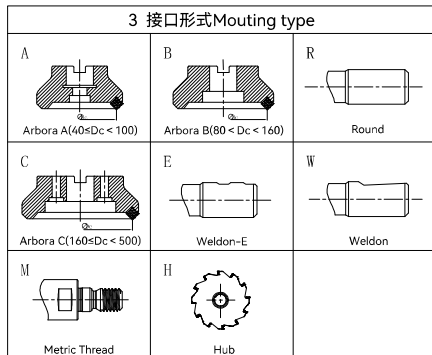
### ● 1 铣刀类型和主偏角

#### Mill Type and Cutting Edge Angle

FMxx	Face milling (xx:45°/60°/75°/88°)
HFxx	High feed milling (xx:10°/12°/13°/15°/20°)
SM90	Shoulder milling 90°
SF90	Slot & Face milling 90°
PM00	Profile milling
PG10	Plunge milling 10°
CMxx	Chamfer milling (xx:15°/30°/45°/60°/75°)
LE90	Long edge milling 90 玉米铣刀
FF90	Fine face mill 90°

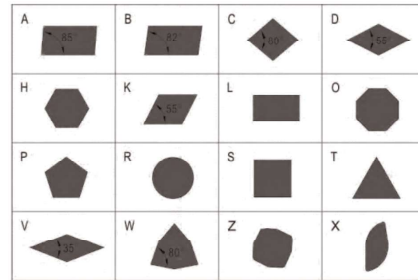
### ● 2 铣刀盘的直径 Mill Diameter

### ● 3 接口型式 Mouting Type

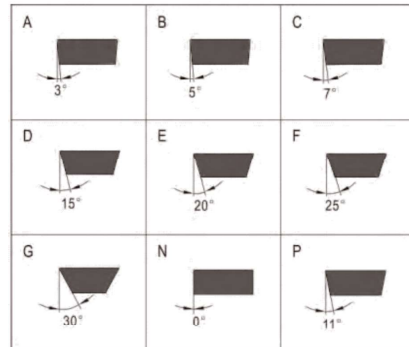


### ● 4 接口尺寸 Mouting Size

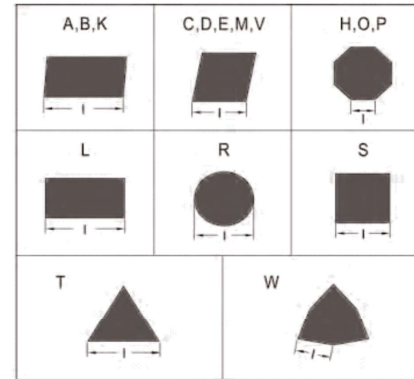
### ● 5 刀片形状 Insert Shape



### ● 6 刀片后角 Insert Relief Angle



### ● 5 刀片形状 Insert Shape



### ● 10 齿数 Tooth Number

### ● 8 可选编号 Optional Number

空白(blank)	螺钉压紧型式 Screw clamping
C (Cartridge)	带刀夹的设计 Cartridge design
W(Wedge)	模块式设计 Wedge design

### ● 9 可选编号 Optional Number

空白(blank)	标准长度 Standard length
L(length)	特殊长度 Special length














### ● 11 可选编号 Optional Number

空白(blank)	标准长度
L(left)	左手设计

# 铣刀选择指南 Milling Cutter Selection Guides

系列 Serie	FM45-SN	FM75-SN	FM88-SN	FM45-SE	FM45-HN	FM45-ON	HF10-LN	HF10-SD	SM90-AO
									
主偏角 Cutting edge angle	45°	75°	88°	45°	45°	45°	15°	15°	90°
最大切深 Max. depth of cut(mm)	6.5	6.5	6.5	6	5	3.8	0.7-1.0	1.3 1.7 3.2	10.1 15.7
直径范围 Diameter range(mm)	50-250	40-250	50-250	50-250	50-250	50-250	16-63	22-125	16-125
刀片刃口数 Insert edges	8	8	8	4	14	16	4	4	2
刀片类型 Insert	SN12	SN12	SN12	SE13	HN09	ON08	LN06	SD09 SD13 SD15	AO07 AO11 AO17 AO18
应用 Application	面铣 Face milling	●	●	●	●	●	●	●	●
	快进给铣削 High feed milling						●	●	
	方肩铣 Shoulder milling			○					●
	槽铣 Slotting			○			●	●	●
	坡走铣 Straight ramping						●	●	●
	螺旋插补铣 Helical ramping						●	●	●
	倒角铣 Chamfer milling	●			●	●	●		
	插铣 Plunging								○
	仿形铣 Profiling						●	●	●
	螺旋镗孔铣 Counter boring								○
	镜面铣 Mirror milling	●			●				
	长悬伸铣削 Long overhang						●	●	
	背铣 Back face milling								

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SM90-SO	SM90-AN	SM90-ZN	SM90-SD	SM90-AD	SM90-XC	SM90-VC	PM00-RP	PM00-XO	PM00-RO	CM	SF90-MN	FF90-AN&LN
												
90°	90°	90°	90°	90°	90°	90°	/	/	/	15° 30° 45° 60°	/	90°
5.5 10	8 11	7	9.2	10 13 18	16	16	4 5 6	10 14 18	/	/	7.9-26.5 (槽宽)	0.5
20-160	20-160	40-160	50-200	16-125	25-63	32-80	20-160	12-20	10-20	0-43.3	80-315	100-250
4	4	6	4	2	2	2	/	1	1	4	2	/
SO08 SO14	AN08 AN11	ZN08	SD12	AD11 AD15 AD19	XP16	VC22	RP08 RP10 RP12	XO12 XO15 XO19	RO10 RO12 RO16 RO20	SD11 TC16	05 08 11 14	AN11 & LN15
●	●	●	●	●	●	●	●	●	○		●	●
				●	●	●	●	●	●			
●	●	●	●	●	●	●					●	
	○			●	●	●	●	●				
	○			●	●	●	●	●				
										●		
●			●	●	●							
				●	●		●	●	●			
○											●	
○				●	●							●
											●	

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# 铣刀选择指南 Milling Cutter Selection Guides

铣削刀片材质推荐一览表 List of material recommendations for milling insert						
ISO使用 ISO Application	主推荐号 Main Grade			补充推荐号 Supplementary Grade		
代号 Code	涂层 Coating		未涂层硬质合金 Un-coated Cemented carbide	补充涂层牌 Coating		
	CVD	PVD		CVD	PVD	
P 钢 Steel	01					
	10					
	20	BM4230	BM4120	BM6220	BM4130	
	30		BM2220	BM4230		
40						
M 不锈钢 Stainless steel	01					
	10					
	20		BM412			
	30		BM2220	BM4230	BM2230	
40				BM4130		
K 铸铁 Cast iron	01	BM3210				
	10					
	20	BM3230	BM2220			
	30				BM4120	
40						
N 有色金属 Non-ferrous metal	01					
	10			BM5210		
	20				BM6220	
	30					
40						
S 耐热合金、钛合金 Heat-resistant alloy	01					
	10				BM4120	
	20		BM4230			
	30				BM4130	
40						

# 铣削材质说明 Milling Grades Introduction

材料分类 Material classification	ISO材料分类 ISO Material classification	牌号 Grade	应用推荐 Application recommendations
P	P20 (P05-P30)	BM6220	·CVD涂层硬质合金牌号，补充钢件铣削牌号。高线速度加工，推荐干切。 ·CVD coated milling grade, supplementary grade for steel milling. High cutting speed, dry milling.
	P30 (P15-P35)	BM6230	·CVD涂层硬质合金牌号，钢件铣削首选。高金属去除率，可获得最佳生产效率和刀具使用寿命，推荐干切。 ·CVD coated milling grade, first choice for steel milling. High metal removal rate, achieves high productivity and tool life, dry milling.
M	M20 (M15-M35)	BM2220	* PVD涂层硬质合金牌号。不锈钢铣削首选。高金属去除率下确保铣削的安全性。也可以用于大部分钢件和铸铁的加工。 ·PVD coated milling grade, first choice for stainless steel. Safety milling in high metal removal condition. Also be used to most steel and cast iron machining.
	M30 (M15-M35)	BM2230	* CVD涂层硬质合金牌号，推荐用于铸铁高线速度，高进给加工。 ·CVD coated milling grade. First choice cast iron milling in high cutting speed and high feed rates condition.
K	K10 (K05-25)	BM3210	* CVD涂层硬质合金牌号，推荐用于铸铁高线速度，高进给加工。 ·CVD coated milling grade. First choice cast iron milling in high cutting speed and high feed rates condition.
	K30 (K15-K40)	KM3230	* CVD涂层硬质合金牌号，推荐用于铸铁中等切削速度，高进给加工。 ·CVD coated milling grade. First choice cast iron milling in medium cutting speed and high feed rates condition.
N	N10 (N05-N25)	BM5210	* 非涂层牌号，表面抛光处理可降低积屑瘤，从而获得高表面质量。适于铝、镁、铜、黄铜、塑料等的精加工到粗加工，最高铝合金加工线速度的牌号。 ·Uncoated milling grade. Surface polishing process can reduce BUE, achieves high surface quality. Suitable for aluminum, magnesium, copper, brass, plastic finishing to roughing processing. Highest cutting speed grade for aluminum.
	N20 (N15-N30)	BM5220	* 非涂层牌号，表面抛光处理可降低积屑瘤，从而获得高表面质量。适于铝、镁、铜、黄铜、塑料等的精加工到粗加工。 ·Uncoated milling grade. Surface polishing process can reduce BUE, achieves high surface quality. Suitable for aluminum, magnesium, copper, brass, plastic finishing to roughing processing.
S	S20 (S05-S30)	BM4120	·PVD涂层硬质合金牌号。耐热合金铣削补充牌号。高金属去除率，可获得最佳生产效率和刀具使用寿命，也可以用于钢件，不锈钢，铸铁的高速铣削。 ·PVD coated, Supplementary grade for heat-resistant alloy milling. High metal removal rate, achieves high productivity and tool life. It can be used to steel, cast iron and stainless steel high speed milling.
	S30 (S05-S40)	BM4130	·PVD涂层硬质合金牌号。综合性能优异的耐热合金加工补充牌号，用于耐热合金中等线速度加工，寿命良好。也可以用于钢件，不锈钢的中速铣削。 ·PVD coated milling grade, supplementary grade for heat-resistant alloy milling. Excellent overall performance, medium cutting speed, excellent tool life. It can be used to steel and stainless steel medium speed milling.
	S30 (S05-S40)	BM4230	·PVD涂层硬质合金牌号。综合性能优异的耐热合金加工首选牌号，用于耐热合金中到高线速度加工，耐磨刃能力强，寿命良好。也可以用于钢件，不锈钢的高速铣削。 ·PVD coated milling grade, first choice for heat-resistant alloy milling. Excellent overall performance, medium to high cutting speed, high resistance to edge break, excellent tool life. It can be used to steel and stainless steel high speed milling.

# 面铣刀FM45-SN

## Face Mill FM45-SN

### ● 45°通用面铣刀

General purpose 45° face mill

生产率、经济性及安全性

Productivity ,economy and safety

刀片8个切削刃,最大切深6.5mm

8 edges insert, A<sub>max</sub>. 6.5mm

适合钢件、铸铁粗到精加工

Suitable for steel, cast iron parts, rough to finish machining

修光刃刀片无需预调

Wiper insert without pre-adjusting

D100直径以下刀盘带内冷(含D100)

Mill with internal coolant under D100(including D100)

可定制左手刀盘

Left-hand mill can be made

75°和88°主偏角的刀盘, 使用和45°刀盘相同刀片

Approach 75° and 88° milling cutters use same inserts as 45° cutters

### ● 刀片槽型

F槽型: 精磨刀片, 低至中等进给, 精加工首选

F geometry: fine grinding insert, low to medium feed rates, first choice for finish machining

M槽型: 通用槽型,用于半精加工

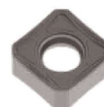
M geometry: general purpose face milling, for semi-finish machining

E-W槽型: 修光刃槽型, 可搭配所有SNMX12刀片槽型使用

E-W geometry: wiper insert, can be used with all SNMX12 inserts



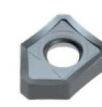
直径范围: 40-250mm  
Diameter range: 40-250mm



F 槽型  
F Geometry



M 槽型  
M Geometry



E-W 槽型  
E-W Geometry



面铣  
Face milling

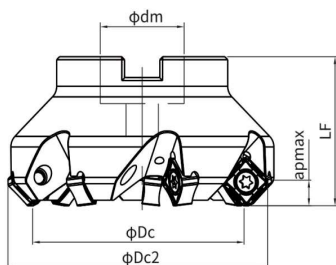
### ● 刀片进给切削参数推荐

Feed recommendations

刀片尺寸	刀片槽形	推荐每齿进给(mm)	最小每齿进给(mm)	最大每齿进给(mm)
Insert size	Geometry	Rec. Fz	Min. Fz	Max. Fz
12	F	0.15	0.10	0.25
12	M (r=0.8)	0.18	0.10	0.25
12	M (r=1.8)	0.25	0.10	0.40
12	R	0.30	0.12	0.50

## 面铣刀FM45-SN

### Face Mill FM45-SN

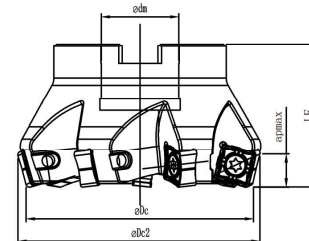
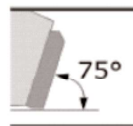


直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF							
40	FM45-040A16SN12-Z04	●	53	16	6.5	40				A	4	+	0.40
50	FM45-050A22SN12-Z04	○	63	22	6.5	40				A	4	+	0.40
50	FM45-050A22SN12-Z05	●	63	22	6.5	40				A	5	+	0.40
50	FM45-050A22SN12-Z06	○	63	22	6.5	40				A	6	+	0.40
63	FM45-063A22SN12-Z05	●	76	22	6.5	40				A	5	+	0.60
63	FM45-063A22SN12-Z06	●	76	22	6.5	40				A	6	+	0.60
63	FM45-063A22SN12-Z08	○	76	22	6.5	40				A	8	+	0.60
80	FM45-080A27SN12-Z05	○	93	27	6.5	50				A	5	+	1.40
80	FM45-080A27SN12-Z06	●	93	27	6.5	50				A	6	+	1.40
80	FM45-080A27SN12-Z07	●	93	27	6.5	50				A	7	+	1.40
100	FM45-100A32SN12-Z07	●	113	32	6.5	50				A	7	+	1.90
100	FM45-100A32SN12-Z08	●	113	32	6.5	50				A	8	+	1.90
100	FM45-100A32SN12-Z10	○	113	32	6.5	50				A	10	+	1.90
125	FM45-125B40SN12-Z08	○	138	40	6.5	63				B	8		3.20
125	FM45-125B40SN12-Z10	●	138	40	6.5	63				B	10		3.20
125	FM45-125B40SN12-Z14	○	138	40	6.5	63				B	14		3.20
160	FM45-160C40SN12-Z10	○	173	40	6.5	63				C	10		5.90
160	FM45-160C40SN12-Z12	●	173	40	6.5	63				C	12		5.90
160	FM45-160C40SN12-Z16	○	173	40	6.5	63				C	12		5.90
200	FM45-200C60SN12-Z12	○	213	60	6.5	63				C	14		9.10
200	FM45-200C60SN12-Z14	○	213	60	6.5	63				C	14		9.10
200	FM45-200C60SN12-Z16	○	213	60	6.5	63				C	18		9.10
250	FM45-250C60SN12-Z16	○	263	60	6.5	63				C	16		9.10
250	FM45-250C60SN12-Z20	○	263	60	6.5	63				C	20		9.10

● 常备库存In stock ○ 按订单生产Make to order

## 面铣刀FM75-SN

### Face Mill FM75-SN

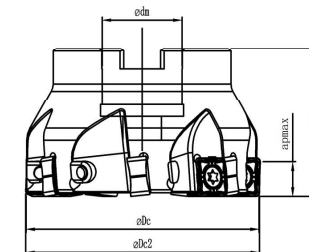
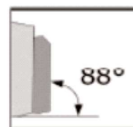


直径 Dc	型号	库存 状态	尺寸(mm)							接口类 型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF							
63	FM75-063A27SN12-Z05	●	68.52	27	8	40				A	5	+	0.60
63	FM75-063A27SN12-Z06	○	68.52	27	8	40				A	6	+	0.60
80	FM75-080A27SN12-Z06	●	85.52	27	8	50				A	6	+	1.40
100	FM75-100A32SN12-Z07	●	105.52	32	8	50				A	7	+	1.90
125	FM75-125B40SN12-Z09	●	130.52	40	8	63				B	10		3.20
160	FM45-160C40SN12-Z10	●	165.52	40	8	63				C	10		5.90

● 常备库存In stock ○ 按订单生产Make to order

## 面铣刀FM88-SN

### Face Mill FM88-SN

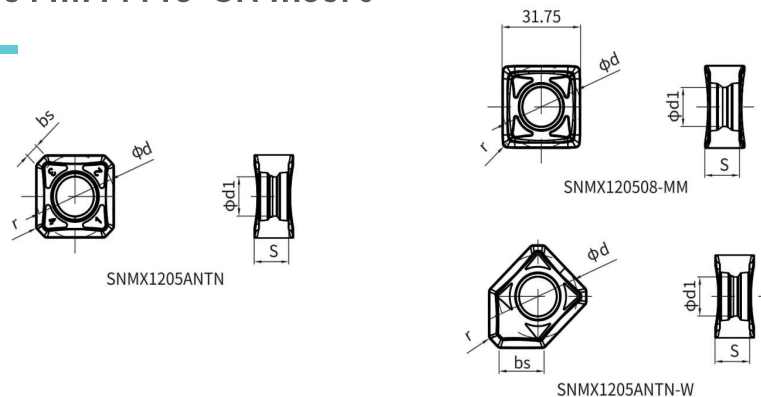


直径 Dc	型号	库存 状态	尺寸(mm)							接口类 型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF							
63	FM88-063A27SN12-Z05	●	-	27	8	40				A	5	+	0.60
63	FM88-063A27SN12-Z06	○	-	27	8	40				A	6	+	0.60
80	FM88-080A27SN12-Z06	●	-	27	8	50				A	6	+	1.40
100	FM88-100A32SN12-Z07	●	-	32	8	50				A	7	+	1.90
125	FM88-125B40SN12-Z09	●	-	40	8	63				B	10		3.20
160	FM45-160C40SN12-Z10	●	-	40	8	63				C	10		5.90

● 常备库存In stock ○ 按订单生产Make to order

# 面铣刀FM45-SN刀片

## Face Mill FM45-SN Insert



刀片 Insert	型号 Type	基本尺寸 Dimension (mm)					P	M	K	N	S
		d	s	d1	r	bs					
	SNMX1205ANEN-F (*)	12.7	5.56	6	0.8	1.5	*	*	*	*	*
	SNMX1205ANTN-M	12.7	5.56	6	0.8		*	*	*	*	*
	SNMX120508-M	12.7	5.56	6	0.8		*	*	*	*	*
	SNMX120512-M	12.7	5.56	6	1.2		*	*	*	*	*
	SNMX120508E-W (*)	12.7	5.56	6	0.8	6.7	*	*	*	*	*

\*SNMX1205ANEN-F为磨制刀片，用于精面铣

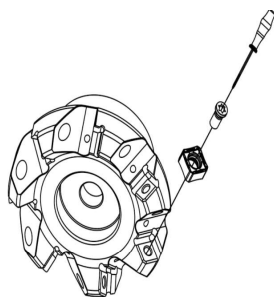
\*SNMX1205ANEN-F is fine grinding insert, first choice for finish milling

\*SNMX1205ANTN-W为修光刃刀片

\*SNMX1205ANTN-W is wiper insert

首选★ 备选☆

First choice ★ Second choice ☆



配件/SPARE PARTS

刀片尺寸 Insert size	刀具直径 Diameter	刀片夹紧螺钉 Clamping srew	刀片螺钉扳手 Screw Wrench
12	50-250	S01-045120	D01-115

# 面铣刀FM45-SE13

## Face Mill FM45-SE13

### ● 轻型切削45°面铣刀

Light cutting 45° face mill

4个切削刃,最大切深可达6mm

4 edges insert, A<sub>p</sub>max. 6mm

刀体双前角设计, 切削轻快

Dual-positive rake angle designing to make sure light cutting

可提供修光刃刀片用于精面铣到镜面精铣

Wiper insert can be used in face milling to mirror finish face milling

适用于钢件、不锈钢、耐热合金、铸铁和铝合金等各种材料的加工

Suitable for machining steel, stainless steel, heat resistant alloy, cast iron and aluminium alloy materials

广泛应用于通用机械、工程机械和汽车零部件等加工领域

Widely used in general engineering, construction and automotive components machining

### ● 刀片槽型

PM 槽型: 钢件通用面铣

PM geometry: general purpose for steel face milling

KM 槽型: 钢件通用面铣

KM geometry: general purpose for cast iron face milling

W 修光刃槽型: 镜面铣削

W wiper geometry: mirror finish face milling



直径范围: 50-250mm  
Diameter range: 50-250mm



PM 槽型  
PM Geometry



镜面铣  
Mirror finish face milling



面铣  
Face milling



KM 槽型  
KM Geometry



W 修光刃槽型  
W wiper Geometry



大悬伸面铣  
Long overhang face milling

### ● 刀片进给切削参数推荐

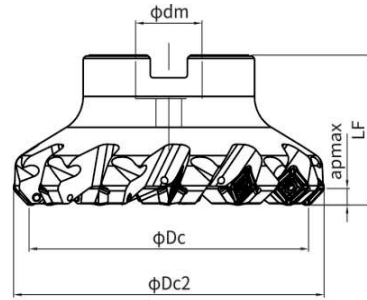
Feed recommendations

刀片尺寸 Insert size	刀片槽形 Geometry	推荐每齿进给(mm) Rec. Fz	最小每齿进给(mm) Min. Fz	最大每齿进给(mm) Max. Fz
13	PM	0.34	0.14	0.40
13	KM	0.34	0.14	0.40



## 面铣刀FM45-SE13

### Face Mill FM45-SE13

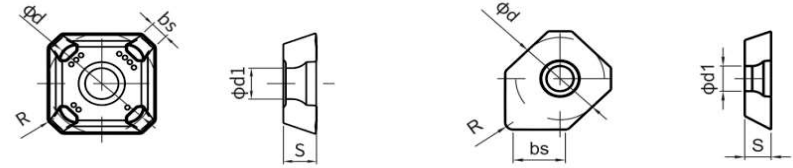


直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF							
50	FM45-050A22SE13-Z03	○	62.5	22	6	40				A	3	+	0.40
50	FM45-050A22SE13-Z04	●	62.5	22	6	40				A	4	+	0.40
50	FM45-050A22SE13-Z05	○	62.5	22	6	40				A	5	+	0.40
63	FM45-063A22SE13-Z04	○	75.5	22	6	40				A	4	+	0.50
63	FM45-063A22SE13-Z05	●	75.5	22	6	40				A	5	+	0.50
63	FM45-063A22SE13-Z06	○	75.5	22	6	40				A	6	+	0.50
80	FM45-080A27SE13-Z04	○	92.5	27	6	50				A	4	+	0.90
80	FM45-080A27SE13-Z06	●	92.5	27	6	50				A	6	+	0.90
80	FM45-080A27SE13-Z08	○	92.5	27	6	50				A	8	+	0.90
100	FM45-100A32SE13-Z05	○	112.5	32	6	50				A	5	+	1.40
100	FM45-100A32SE13-Z07	●	112.5	32	6	50				A	7	+	1.40
100	FM45-100A32SE13-Z10	○	112.5	32	6	50				A	10	+	1.40
125	FM45-125B40SE13-Z06	○	137.5	40	6	63				B	6		2.50
125	FM45-125B40SE13-Z08	●	137.5	40	6	63				B	8		2.50
125	FM45-125B40SE13-Z12	○	137.5	40	6	63				B	12		2.50
160	FM45-160C40SE13-Z07	○	172.5	40	6	63				C	7		5.00
160	FM45-160C40SE13-Z10	●	172.5	40	6	63				C	10		5.00
160	FM45-160C40SE13-Z16	○	172.5	40	6	63				C	16		5.00
200	FM45-200C60SE13-Z08	○	212.5	60	6	63				C	8		6.70
200	FM45-200C60SE13-Z12	○	212.5	60	6	63				C	12		6.70
200	FM45-200C60SE13-Z20	○	212.5	60	6	63				C	20		6.70
250	FM45-250C60SE13-Z10	○	262.5	60	6	63				C	10		8.50
250	FM45-250C60SE13-Z14	○	262.5	60	6	63				C	14		8.50
250	FM45-250C60SE13-Z24	○	262.5	60	6	63				C	24		8.50

● 常备库存In stock ○ 按订单生产Make to order

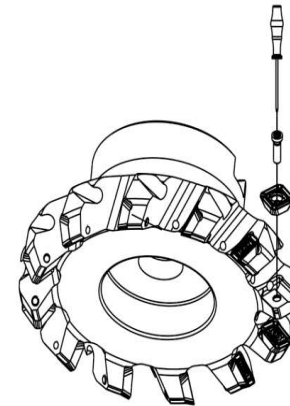
## 面铣刀FM45-SE13刀片

### Face Mill FM45-SE13 Insert



刀片 Insert	型号 Type	基本尺寸					P	M	K	N	S								
		Dimension (mm)																	
		d	s	d1	r	bs	BM4220	BM4230	BM42210	BM4230	BM43210	BM42220	BM43230	BM45220	BM45210	BM44220	BM4430	BM44230	
	SEGT13T3AGSN-PM	13.4	3.97	5.5	1.5	2	*			*		*							*
	SEGT13T3AGSN-KM	13.4	3.97	5.5	1.5	2	*			*		*							*
	SEGT13T3-W	13.4	3.97	5.5	1.5	8.2	*			*		*		*					

首选★ 备选☆  
First choice ★ Second choice ☆



#### 配件/SPARE PARTS

刀片尺寸/Insert size	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
13	50-250	S01-035120	D01-115

# 面铣刀FM45-HN

## Face Mill FM45-HN

### ● 45°经济型面铣刀

#### Economical 45° face mill

高每齿进给与密齿结合以取得最大的金属去除率  
High feed rate and close pitch to get maximum metal removal rate  
刀片12个切削刃,最大切深5mm  
12 edges insert, A<sub>pm</sub>max. 5mm  
适合钢件、铸铁粗到半精加工  
Suitable for steel, cast iron parts, rough to semi-finish machining  
广泛应用于通用机械、工程机械和汽车零部件等加工领域  
D100直径以下刀盘带内冷 (含D100)  
Mill with internal coolant under D100(including D100)

### ● 刀片槽型

F 槽型: 低至中等进给, 软材料, 良好工况首选

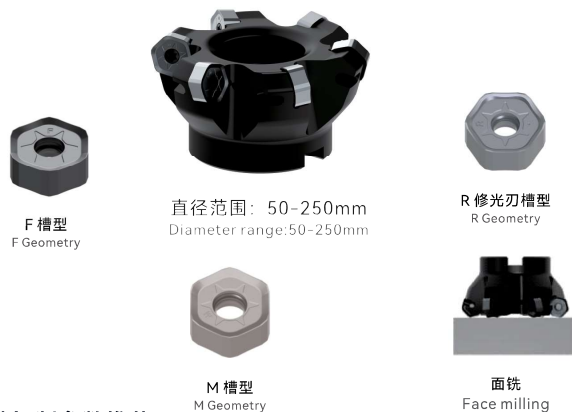
F Geometry: low to medium feed rates, first choice for soft materials and good machining condition

M 槽型: 通用槽型, 中等进给。

M Geometry: general purpose face milling, medium feed rates

R 槽型: 高进给, 恶劣工况首选

R Geometry: high feed rates, first choice for difficult machining condition

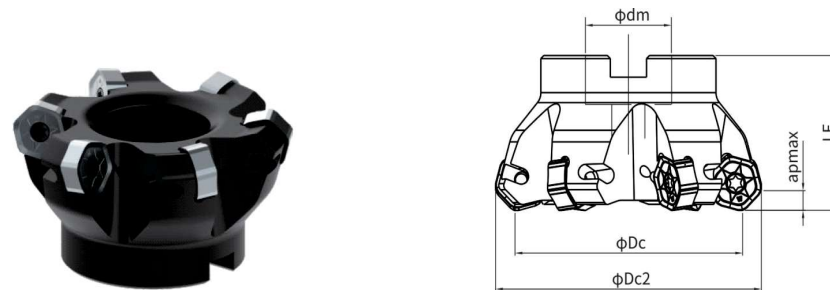


### ● 刀片进给切削参数推荐 Feed recommendations

刀片尺寸 Insert size	刀片槽形 Geometry	推荐每齿进给(mm) Rec. Fz	最小每齿进给(mm) Min. Fz	最大每齿进给(mm) Max. Fz
09	F	0.15	0.10	0.25
09	M	0.20	0.10	0.30
09	R	0.25	0.12	0.40

# 面铣刀FM45-HN

## Face Mill FM45-HN

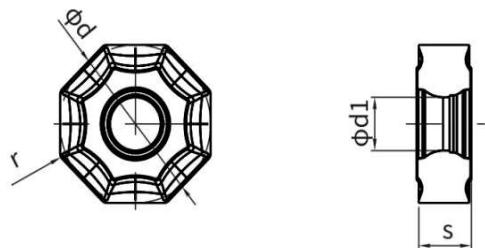



直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF							
50	FM45-050A22HN09-Z04	●	62.4	22	5	40				A	04	+	0.35
63	FM45-063A22HN09-Z05	●	75.4	22	5	40				A	05	+	0.49
80	FM45-080A27HN09-Z06	●	92.4	27	5	50				A	06	+	1.06
100	FM45-100A32HN09-Z07	○	112.4	32	5	50				A	07	+	1.74
100	FM45-100A32HN09-Z08	●	112.4	32	5	50				A	08	+	1.74
125	FM45-125B40HN09-Z08	○	137.4	40	5	63				B	08		3.24
125	FM45-125B40HN09-Z10	●	137.4	40	5	63				B	10		3.24
160	FM45-160C40HN09-Z09	○	172.4	40	5	63				C	09		5.70
160	FM45-160C40HN09-Z12	●	172.4	40	5	63				C	12		5.70
200	FM45-200C60HN09-Z12	○	212.4	60	5	63				C	12		9.00
250	FM45-250C60HN09-Z14	○	262.4	60	5	63				C	14		12.80
80	FM45-080A27HN09W-Z09	○	92.4	27	5	50				A	Z0	+	1.06
100	FM45-100A32HN09W-Z12	○	112.4	32	5	50				A	Z1	+	1.74
125	FM45-125B40HN09W-Z16	○	137.4	40	5	63				B	Z1		3.24
160	FM45-160C40HN09W-Z20	○	172.4	40	5	63				C	Z2		5.70
160	FM45-160C40HN09W-Z20-L	○	172.4	40	5	63				C	Z2		5.70
200	FM45-200C60HN09W-Z26	○	212.4	60	5	63				C	Z2		9.00
200	FM45-200C60HN09W-Z26-L	○	212.4	60	5	63				C	Z2		12.80

● 常备库存 In stock ○ 按订单生产 Make to order

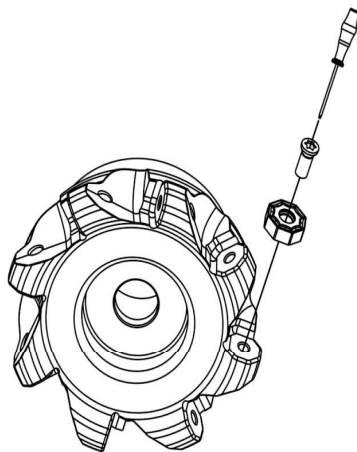
# 面铣刀FM45-ON 刀片

## Face Mill FM45-ON Insert



刀片 Insert	型号 Type	基本尺寸 Dimension (mm)					P	M	K	N	S
		d	s	d1	r	bs					
	ONGU08TX08-F	20.2	6	5.4	0.8		*	*	*	*	*
	ONMU08TX08-M	20.2	6	5.3	0.8		*	*	*	*	*

首选★ 备选☆  
First choice ★ Second choice ☆



### 配件/SPARE PARTS

刀片尺寸/Insert	刀具直径/Diameter	刀片夹紧螺钉/Clamping Screw	刀片螺钉扳手/Screw Wrench
08	50-160	S02-045110	D01-120

# 快进给铣刀HF15-LN

## High Feed Mill HF15-LN

小直径快进给铣刀首选

First choice for small dia. mill cutter

极小的切深和极高的每齿进给量进行切削

Extremely high feed rate with low depth of cut

卓越的刀片几何槽型设计，配合优异的刀片材质，确保了安全及优异的切削性能

Outstanding design of insert geometry combining unique insert grades, secures safe and excellent cutting performance

四个刃口4 edges insert适用于钢件、不锈钢、耐热合金、铸铁等各种材料的加工

Suitable for machining steel, stainless steel, heat resistant alloy, cast iron materials

适用于高进给面铣, 斜面加工 螺旋插补铣

Suitable for high feed milling, inclined plane machining, helix interpolation milling

广泛应用于大多数加工领域

Widely used in most industries



L槽型  
L Geometry



M槽型  
M Geometry

L槽型：软材料加工首选。

L geometry: first choice for sticky materials.

M槽型：通用槽型。

M geometry: general purpose geometry.



直径16-35mm  
Dia. 16-35mm  
直柄铣刀图



直径16-40mm  
Dia. 16-40mm  
螺纹接口铣刀图



直径40-63mm  
Dia. 40-63mm  
心轴铣刀图



面铣



插铣



坡走铣



螺旋差补铣



仿形加工

● 推荐的切深 Cutting depth recommendations

刀片尺寸	刀片槽形	最小切深(mm)	推荐切深ap(mm)	最大切深(mm)
Insert size	Geometry	Min. ap	Rec. ap	Max. ap
06	L	0.1	0.3-0.6	1.0
06	M	0.1	0.3-0.6	1.0

● 推荐的进给 Cutting feed rates recommendations

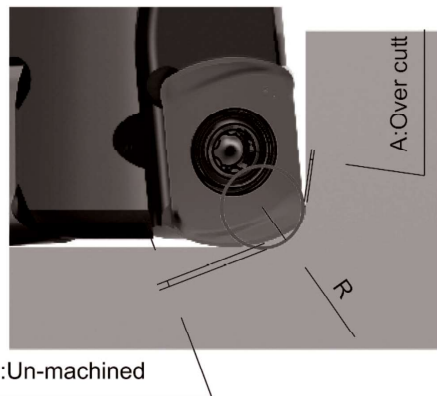
刀片尺寸	刀片槽形	最小进给(mm/r)	推荐进给fz(mm/tooth)	最大进给(mm/r)
Insert size	Geometry	Min. fz	Rec. fz	Max. fz
06	L	0.3	0.6-1.5	2.5
06	M	0.3	0.8-2.0	2.5

● 编程圆角, 过切量及欠切量

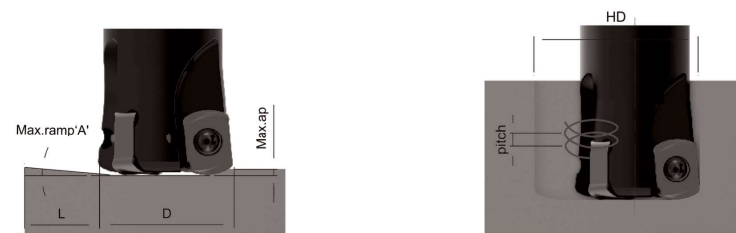
Programming R, over cut and un-machined thickness

铣刀直径	编程圆角R	A 过切量	B 欠切量
Cutter dia.	Programming radius R	Over cut A	Un-machined B
16,17,18	1.5	0	0.35
	2	0.1	0.22
	2.5	0.27	0.1
>20	2	0	0.42
	2.5	0.12	0.26
	3	0.29	0.17

Programming Technical Data



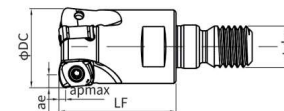
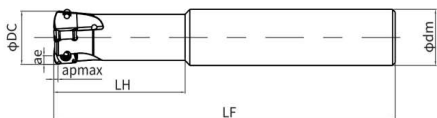
● 坡走铣及螺旋插补铣参数推荐 Ramping date recommendation



铣刀直径	坡走铣 Straight ramping			螺旋插补铣 Helical ramping		
	最大坡铣角度(A°)	最大切深(mm)	最小长度(L)	最小直径	最大直径	最大螺距/转
Cutter dia.	Max. ramp(A°)	Max. ap	Min. length(L)	Min. dia.	Max. Dia.	Max. pitch/rev.
16.0	2.0	0.7	13.0	23.0	32.0	0.7
17.0	2.0	0.7	15.0	25.0	34.0	0.7
18.0	2.3	0.7	16.0	27.0	36.0	0.7
20.0	1.5	1.0	38.0	31.0	/	0.8
20.0	1.5	1.0	38.0	/	40.0	1.0
21.0	1.5	1.0	38.0	33.0	/	0.8
21.0	1.5	1.0	38.0	/	42.0	1.0
25.0	1.3	1.0	41.0	41.0	50.0	1.0
26.0	1.2	1.0	44.0	43.0	52.0	1.0
32.0	0.9	1.0	57.0	55.0	64.0	1.0
33.0	0.9	1.0	57.0	57.0	66.0	1.0
35.0	0.8	1.0	57.0	61.0	70.0	1.0
40.0	0.7	1.0	64.0	71.0	80.0	1.0
50.0	0.6	1.0	96.0	91.0	100.0	1.0
52.0	0.6	1.0	96.0	95.0	104.0	1.0
63.0	0.5	1.0	115.0	117.0	126.0	1.0

# 快进给铣刀HF15-LN

## High Feed Mill HF15-LN



直径 Dc	型号	库存 状态	尺寸(mm)								接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			DC2	dm	apmax	ae	LF	LH						
16	HF15-016R16LN06-Z02	●	/	16	0.7	3.3	30	100			R	2	+	0.12
17	HF15-017R16LN06-Z02	○	/	16	0.7	3.45	40	150			R	2	+	0.15
20	HF15-020R20LN06-Z03	●	/	20	0.7	3.8	50	130			R	3	+	0.32
21	HF15-021R20LN06-Z03	○	/	20	1.0	3.8	20	160			R	3	+	0.39
25	HF15-025R25LN06-Z03	●	/	25	1.0	3.85	60	140			R	3	+	0.57
26	HF15-026R25LN06-Z03	○	/	25	1.0	3.85	30	180			R	3	+	0.68
32	HF15-032R32LN06-Z04	○	/	32	1.0	3.85	70	150			R	4	+	0.97
33	HF15-033R32LN06-Z04	○	/	32	1.0	3.85	40	200			R	4	+	0.99
35	HF15-035R32LN06-Z05	○	/	32	1.0	3.85	50	200			R	5	+	0.99

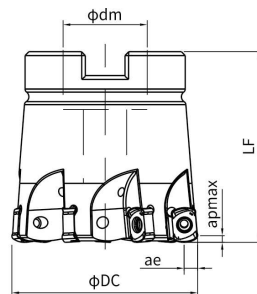
● 常备库存In stock ○ 按订单生产Make to order

直径 Dc	型号	库存 状态	尺寸(mm)								接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			DC2	dm	apmax	ae	LF	LH						
16	HF15-016M08LN06-Z02	●	/	08	0.7	3.3	25	42.5			M	2	+	0.10
17	HF15-017M08LN06-Z02	○	/	08	0.7	3.45	25	42.5			M	2	+	0.11
20	HF15-020M10LN06-Z03	●	/	10	1.0	4.3	30	50			M	3	+	0.12
21	HF15-021M10LN06-Z03	○	/	10	1.0	3.8	30	50			M	3	+	0.12
25	HF15-025M12LN06-Z04	●	/	12	1.0	3.85	35	57			M	4	+	0.22
26	HF15-026M12LN06-Z03	○	/	12	1.0	3.85	35	57			M	3	+	0.22
26	HF15-026M12LN06-Z04	○	/	12	1.0	3.85	35	57			M	4	+	0.22
32	HF15-032M16LN06-Z04	○	/	16	1.0	3.85	43	65			M	4	+	0.25
32	HF15-032M16LN06-Z05	○	/	16	1.0	3.85	43	65			M	5	+	0.27
33	HF15-033M16LN06-Z05	○	/	16	1.0	3.85	43	65			M	5	+	0.27
35	HF15-035M16LN06-Z05	○	/	16	1.0	3.85	43	68			M	5	+	0.27
40	HF15-040M16LN06-Z06	○	/	16	1.0	3.9	43	68			M	6	+	0.29

● 常备库存In stock ○ 按订单生产Make to order

# 快进给铣刀HF15-LN

## High Feed Mill HF15-LN

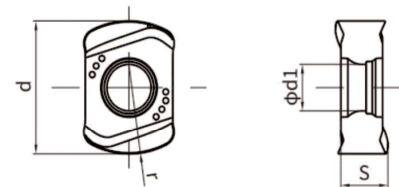


直径 Dc	型号 Type	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			DC2	dm	apmax	ae	LF						
40	HF15-040A16LN06-Z06	○	/	16	1.0	3.9	40			A	6	+	0.25
50	HF15-050A22LN06-Z07	○	/	22	1.0	3.9	40			A	7	+	0.35
52	HF15-052A22LN06-Z07	●	/	22	1.0	3.9	40			A	7	+	0.40
63	HF15-063A22LN06-Z08	○	/	22	1.0	3.9	40			A	8	+	0.60

● 常备库存In stock ○按订单生产Make to order

# 快进给铣刀HF15-LN刀片

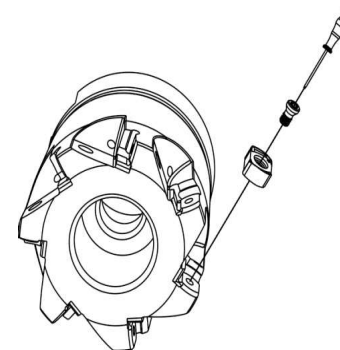
## High Feed Mill HF15-LN Insert



刀片 Insert	型号 Type	基本尺寸						P	M	K	N	S			
		Dimension (mm)													
		d	s	d1	r	bs	BM4220	BM4230	BM4220	BM4210	BM4220	BM4210	BM4120	BM4130	BM4230
	LNMU0603R-L	9	3.73	3.2	6									*	*
	LNMU0603R-M	9	3.73	3.2	6		*		*	*					

首选★ 备选☆

First choice ★ Second choice ☆



### 配件/SPARE PARTS

安装形式	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
06	16-32	S01-025060	D01-108
06	32-63	S01-025073	D01-108

# 快进给铣刀HF15-SD

## High Feed Mill HF15-SD

生产率，安全性和多用途性

Productivity, safety and versatility

高每齿进给与密齿结合以取得最大的金属去除率。

High feed rate and close pitch to get maximum metal removal rate.

卓越的刀片几何槽型设计，配合优异的刀片材质，确保了安全及优异的切削性能。

Outstanding design of insert geometry combining unique insert grades, secures safe and excellent cutting performance.

精于各种铣削方式:面铣、插铣、坡走铣、螺旋差补铣、仿形加工、大悬伸加工。

Proficient in wide variety of milling applications: face milling, plunge milling, ramping, helical interpolation, profile milling, long overhang machining

适用于钢件、不锈钢、耐热合金、铸铁等各种材料的加工。

Suitable for machining steel, stainless steel, heat resistant alloy, cast iron materials.

广泛应用于航空航天、石油天然气、模具等领域。

Widely used in Aerospace, Oil and Gas, Die and Mould industries.



SF



SM



SH

### 刀片槽型

SF槽型：不锈钢、耐热合金材料加工首选

SF geometry: first choice for stainless steel, heat resistant alloy materials

SM槽型：通用槽型

SM geometry: general purpose geometry

SH槽型：耐冲击重载加工首选

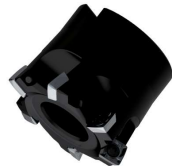
SH geometry: first choice for impact-resistant and heavy-duty machining



直径22-40mm  
Dia.22-40mm



直径20-40mm  
Dia.20-40mm



直径40-125mm  
Dia.40-125mm



面铣



插铣



坡走铣



螺旋差补铣



仿形铣

# 刀片进给切削参数推荐

## Feed Recommendations

### 推荐的切深 Cutting depth recommendations

刀片尺寸	刀片槽形	最小切深(mm)	推荐切深ap(mm)	最大切深(mm)
Insert size	Geometry	Min. ap	Rec. ap	Max. ap
09	SF	0.1	0.5-1.2	1.3
13	SF	0.1	0.5-1.6	1.7
09	SM	0.2	0.5-1.2	1.3
13	SM	0.2	0.5-1.6	1.7
09	SH	0.1	0.5-1.2	1.3
13	SH	0.2	0.5-1.6	1.7

\*09刀片型腔铣削编程圆角R为2.0

Programming R of insert 09 is 2.0 for cavity or pocketing machining

\*13刀片型腔铣削编程圆角R为3.5

Programming R of insert 13 is 3.5 for cavity or pocketing machining

不同切宽(ae)百分比情况下的推荐每齿进给fz fz recommendations for different ae %						
ap=0.5mm						
刀片尺寸	刀片槽形	5% ae	10% ae	20% ae	30% ae	40%-100% ae
Insert size	Geometry					
09	SF	1.58(0.50-2.00)	1.10(0.38-1.64)	0.81(0.28-1.22)	0.70(0.25-1.05)	0.7(0.23-0.92)
09	SM	1.58(0.52-2.00)	1.10(0.40-1.64)	0.81(0.30-1.22)	0.70(0.30-1.05)	0.7(0.25-0.92)
09	SH	1.58(0.52-2.00)	1.10(0.40-1.64)	0.81(0.30-1.22)	0.70(0.30-1.05)	0.7(0.25-0.92)

不同切宽(ae)百分比情况下的推荐每齿进给fz fz recommendations for different ae %						
ap=0.8mm						
刀片尺寸	刀片槽形	5% ae	10% ae	20% ae	30% ae	40%-100% ae
Insert size	Geometry					0
09	SF	1.42(0.48-2.00)	1.00(0.35-1.52)	0.74(0.26-1.11)	0.64(0.23-0.96)	0.6(0.21-0.88)
09	SM	1.42(0.52-2.00)	1.00(0.40-1.52)	0.74(0.30-1.11)	0.64(0.30-0.96)	0.6(0.25-0.88)
09	SH	1.42(0.52-2.00)	1.00(0.40-1.52)	0.74(0.30-1.11)	0.64(0.30-0.96)	0.6(0.25-0.88)
13	SF	1.79(0.55-2.80)	1.26(0.38-2.10)	0.94(0.30-1.45)	0.80(0.26-1.22)	0.72(0.23-1.14)
13	SM	1.79(0.60-2.80)	1.26(0.42-2.10)	0.94(0.33-1.45)	0.80(0.29-1.22)	0.72(0.25-1.14)
13	SH	2.00(0.78-3.00)	1.44(0.57-2.18)	1.06(0.43-1.55)	0.93(0.37-1.32)	0.84(0.33-1.23)

## 刀片进给切削参数推荐

### Feed Recommendations

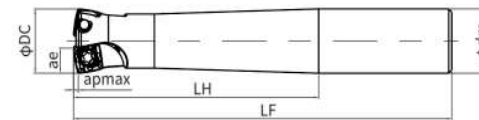
不同切宽(ae)百分比情况下的推荐每齿进给fz fz recommendations for different ae %						
ap=1.0mm						
刀片尺寸	刀片槽形	5% ae	10% ae	20% ae	30% ae	40%-100% ae
Insert size	Geometry					0
09	SF	1.28(0.44-2.00)	0.90(0.32-1.37)	0.67(0.24-1.00)	0.58(0.21-0.87)	0.45(0.19-0.80)
09	SM	1.28(0.50-2.00)	0.90(0.36-1.37)	0.67(0.30-1.00)	0.58(0.26-0.87)	0.45(0.22-0.80)
09	SH	1.28(0.50-2.00)	0.90(0.36-1.37)	0.67(0.30-1.00)	0.58(0.26-0.87)	0.45(0.22-0.80)
13	SF	1.59(0.49-2.50)	1.13(0.35-1.78)	0.84(0.26-1.31)	0.73(0.23-1.14)	0.67(0.21-1.04)
13	SM	1.59(0.53-2.50)	1.13(0.40-1.78)	0.84(0.30-1.31)	0.73(0.26-1.14)	0.67(0.25-1.04)
13	SH	1.80(0.70-2.70)	1.28(0.51-1.94)	0.95(0.38-1.41)	0.83(0.33-1.22)	0.76(0.30-1.12)

不同切宽(ae)百分比情况下的推荐每齿进给fz fz recommendations for different ae %						
ap=1.2mm						
刀片尺寸	刀片槽形	5% ae	10% ae	20% ae	30% ae	40%-100% ae
Insert size	Geometry					0
09	SF	1.10(0.38-1.70)	0.80(0.27-1.10)	0.58(0.20-0.87)	0.50(0.18-0.75)	0.46(0.16-0.69)
09	SM	1.10(0.40-1.70)	0.80(0.30-1.20)	0.58(0.23-0.87)	0.50(0.20-0.75)	0.46(0.20-0.70)
09	SH	1.10(0.40-1.70)	0.80(0.30-1.20)	0.58(0.23-0.87)	0.50(0.20-0.75)	0.46(0.20-0.70)
13	SF	1.39(0.43-2.20)	1.00(0.31-1.56)	0.74(0.23-1.15)	0.64(0.20-1.00)	0.59(0.19-0.92)
13	SM	1.39(0.50-2.20)	1.00(0.36-1.29)	0.74(0.26-1.15)	0.64(0.25-1.00)	0.59(0.24-0.92)
13	SH	1.57(0.62-2.41)	1.12(0.45-1.70)	0.84(0.33-1.26)	0.73(0.29-1.10)	0.67(0.27-1.00)

不同切宽(ae)百分比情况下的推荐每齿进给fz fz recommendations for different ae %						
ap=1.6mm						
刀片尺寸	刀片槽形	5% ae	10% ae	20% ae	30% ae	40%-100% ae
Insert size	Geometry					1
13	SF	1.15(0.36-1.81)	0.83(0.26-1.29)	0.62(0.20-0.96)	0.54(0.17-0.83)	0.45(0.15-0.76)
13	SM	1.15(0.40-1.81)	0.83(0.30-1.29)	0.62(0.23-0.96)	0.54(0.20-0.83)	0.45(0.20-0.76)
13	SH	1.30(0.51-1.99)	0.93(0.37-1.41)	0.70(0.28-1.05)	0.61(0.24-0.91)	0.55(0.22-0.83)

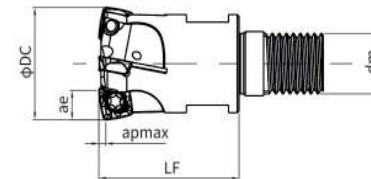
## 快进给铣刀HF15-SD

### High Feed Mill HF15-SD



直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)
			DC2	dm	apmax	ae	LF	LH					
22	HF15-022R20SD09-Z02	●	/	20	1.3	7	140	65		R	2	+	0.35
25	HF15-025R25SD09-Z03	●	/	25	1.3	7	145	80		R	3	+	0.50
30	HF15-030R25SD09-Z04	○	/	25	1.3	7	145	80		R	4	+	0.75
32	HF15-032R32SD09-Z04	●	/	32	1.3	7	145	80		R	4	+	0.80
40	HF15-040R32SD09-Z05	○	/	32	1.3	7	145	80		R	5	+	1.30

● 常备库存In stock ○ 按订单生产Make to order



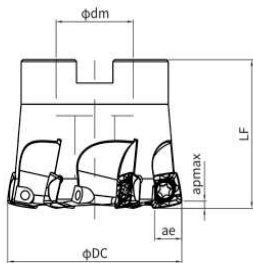
直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)
			DC2	dm	apmax	ae	LF						
20	HF15-020M08SD09-Z02	○	/	M08	1.3	7	30			M	2	+	0.10
22	HF15-022M10SD09-Z02	○	/	M10	1.3	7	30			M	2	+	0.11
25	HF15-025M12SD09-Z02	○	/	M12	1.3	7	35			M	2	+	0.12
25	HF15-025M12SD09-Z03	●	/	M12	1.3	7	35			M	3	+	0.12
32	HF15-032M16SD09-Z03	●	/	M16	1.3	7	43			M	3	+	0.22
32	HF15-032M16SD09-Z04	○	/	M16	1.3	7	43			M	4	+	0.25
40	HF15-040M16SD09-Z05	○	/	M16	1.3	7	43			M	2	+	0.27

● 常备库存In stock ○ 按订单生产Make to order



# 快进给铣刀HF15-SD

## High Feed Mill HF15-SD

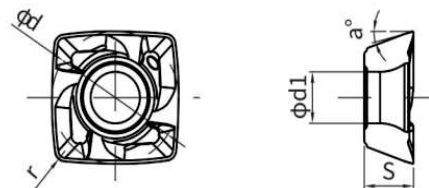


直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)
			DC2	dm	apmax	ae	LF						
40	HF15-040A16SD09-Z04	○	/	16	1.3	7	35			A	4	+	0.30
40	HF15-040A16SD09-Z05	●	/	16	1.3	7	35			A	5	+	0.30
50	HF15-050A22SD09-Z04	○	/	22	1.3	7	40			A	4	+	0.40
50	HF15-050A22SD09-Z06	●	/	22	1.3	7	40			A	6	+	0.40
63	HF15-063A22SD09-Z05	○	/	22	1.3	7	40			A	5	+	0.70
63	HF15-063A22SD09-Z07	○	/	22	1.3	7	40			A	7	+	0.60
63	HF15-063A22SD09-Z08	○	/	22	1.3	7	40			A	8	+	0.60
80	HF15-080B27SD09-Z07	○	/	27	1.3	7	50			B	7	+	1.20
80	HF15-080B27SD09-Z09	○	/	27	1.3	7	50			B	9	+	1.10
80	HF15-080B27SD09-Z10	○	/	27	1.3	7	50			B	0	+	1.10
50	HF15-050A22SD13-Z04	○	/	22	1.7	10	40			A	4	+	0.50
50	HF15-050A22SD13-Z05	●	/	22	1.7	10	40			A	5	+	0.40
52	HF15-052A22SD13-Z05	●	/	22	1.7	10	40			A	5	+	0.40
50	HF15-050A22SD13-Z06	○	/	22	1.7	10	40			A	6	+	0.40
63	HF15-063A22SD13-Z05	●	/	22	1.7	10	40			A	5	+	0.70
63	HF15-063A22SD13-Z06	○	/	22	1.7	10	40			A	6	+	0.60
63	HF15-063A22SD13-Z07	●	/	22	1.7	10	40			A	7	+	0.60
80	HF15-080A27SD13-Z05	○	/	27	1.7	10	50			A	5	+	1.20
80	HF15-080A27SD13-Z06	●	/	27	1.7	10	50			A	6	+	1.20
80	HF15-080A27SD13-Z08	●	/	27	1.7	10	50			A	8	+	1.20
80	HF15-080A27SD13-Z09	○	/	27	1.7	10	50			A	9	+	1.10
100	HF15-100A32SD13-Z07	●	/	32	1.7	10	50			A	7	+	1.60
100	HF15-100A32SD13-Z09	●	/	32	1.7	10	50			A	9	+	1.60
100	HF15-100A32SD13-Z11	○	/	32	1.7	10	50			A	1	+	1.60
125	HF15-125B40SD13-Z08	○	/	40	1.7	10	63			B	8	+	3.30
125	HF15-125B40SD13-Z10	●	/	40	1.7	10	63			B	10		3.30
125	HF15-125B40SD13-Z12	○	/	40	1.7	10	63			B	12		3.30

● 常备库存In stock ○ 按订单生产Make to order

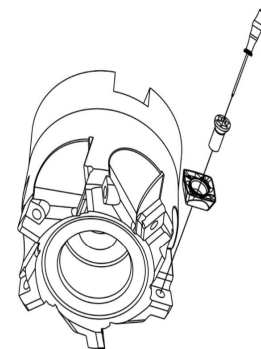
# 快进给铣刀HF15-SD 刀片

## High Feed Mill HF15-SD Insert



刀片 Insert	型号 Type	基本尺寸 Dimension (mm)						P		M		K		N		S				
		d	s	d1	r	bs	α	BM4220	BM2230	BM2210	BM4230	BM3210	BM2220	BM3230	BM5210	BM4210	BM4120	BM4130	BM4230	
	SDGT090307-SF	9	3.5	3.5	0.7		15°		☆		*								*	*
	SDMT130512-SF	13.0	5.0	5.5	1.2		15°		☆		*								*	*
	SDMT090307-SM	9.0	3.5	3.5	0.7		15°		*		*	☆							*	*
	SDMT130512-SM	13.0	5.0	5.5	1.2		15°		*		*	☆							*	*
	SDMW090307-SH	9	3.5	3.5	0.7		15°		*		*			*						
	SDGW130512-SH	13.0	5.0	5.5	1.2		15°		☆		☆			☆						

首选★ 备选☆  
First choice ★ Second choice ☆



### 配件/SPARE PARTS

刀片/Insert	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片扳手/Screw Wrench
09	20-80	S01-030072	D01-109
13	40-125	S01-045110	D01-120

# 方肩铣刀SM90-AO

## Square Shoulder Mill SM90-AO

### 全能的深/浅方肩铣刀

Comprehensive deep/shallow shoulder milling cutter

### 加工精度和多用途性

Precision and versatility

卓越的切削刃几何形状设计，配合锋利的刀片槽型，确保了优异的加工表面质量和光洁度

Outstanding design of insert geometry combining sharp insert edge, secures high precision and surface finish

精于各种铣削方式:面铣、方肩铣、槽铣、插铣、坡走铣、螺旋差补铣、等高分层铣加工

Proficient in wide variety of milling applications: face milling, square shoulder milling, slot milling, plunge milling, ramping, helical interpolation and contour milling

适用于钢件、不锈钢、耐热合金、铸铁等各种材料的加工

Suitable for machining steel, stainless steel, heat resistant alloy, cast iron materials

广泛应用于航空航天、汽车零部件、能源、模具、通用机械等领域

Widely used in aerospace, automotive components, energy, die and mould, general engineering industries



直径范围: 16-40mm  
Diameter range: 16-40mm



直径范围: 40-125mm  
Diameter range: 40-125mm



直径范围: 30-40mm  
Diameter range: 30-40mm



直径范围: 40-100mm  
Diameter range: 40-100mm



面铣  
Face milling



插铣  
Plunge milling



坡走铣  
Ramping



螺旋差补铣  
Helical interpolation



槽铣  
Slot milling



方肩铣  
Square shoulder milling



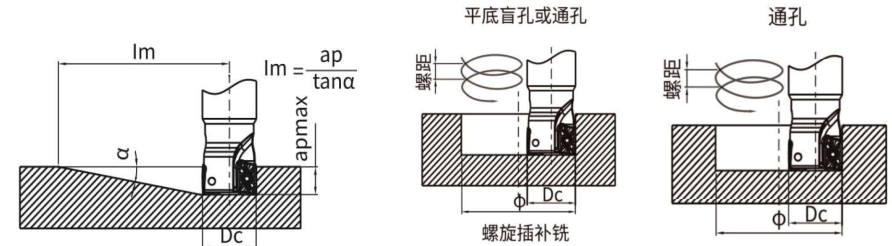
等高分层铣  
Contour milling

### ● 刀片进给切削参数推荐 Feed recommendations

刀片尺寸	刀片槽形	推荐每齿进给(mm)	最小每齿进给(mm)	最大每齿进给(mm)
Insert size	Geometry	Rec. Fz	Min. Fz	Max. Fz
11 (r=0.8)	PL	0.08	0.05	0.12
17 (r=0.8)	PL	0.08	0.05	0.12
11 (r=0.8)	PM	0.10	0.08	0.15
17 (r=0.8)	PM	0.10	0.08	0.15

### ● 坡走铣螺旋插补铣参数推荐 (立铣刀)

Ramping and helical interpolation cutting data recommendations



基本信息 Basic info.		坡走限制 Ramping limit			平底盲孔或通孔 Blind hole with flat bottom or through hole				无平底要求盲孔或通孔 Blind hole without flat bottom or through hole	
刀片尺寸	刀具直径	最大切深	最大坡走角 $\alpha^{\circ}$	最小距离 $l_{min}$	平底孔最大直径	最大螺距	平底孔最小直径	最大螺距	最小孔径	最大螺距
Insert size	DC	apmax	Max ramping angle $\alpha^{\circ}$	Minimum distance $l_{min}$	Max $\Phi$ with flat bottom	Max pitch	Min $\Phi$	Max pitch	Min $\Phi$	Max pitch
11 (r=0.8)	16	10.3	10.5	54	30.0	9.0	28.0	7.0	21.0	2.0
	20	10.2	5.5	103.9	38.0	5.0	36.0	4.5	29.0	2.0
	25	10.1	5.0	114.3	48.0	6.0	46.0	5.0	39.0	3.0
17 (r=0.8)	32	10.0	3.6	158.9	62.0	4.5	60.0	4.0	53.0	2.0
	40	10.0	2.0	286.4	78.0	4.0	76.0	3.5	69.0	2.0
	25	16.0	15.5	57.7	48.0	15.5	45.4	14.0	33.0	6.0
	32	15.9	6.7	135.4	62.0	11.5	59.4	10.0	47.0	4.5
	40	15.8	3.9	231.8	78.0	8.0	75.4	7.5	63.0	4.0

### ● 方肩铣和插铣参数推荐

Square shoulder milling and plunge milling cutting data recommendations

刀片尺寸 Insert size	刀具直径 DC	方肩铣最大切深 Square shoulder milling apmax	插铣最大切宽 Plunge milling aemax
11 (r=0.8)	16	9.5	5.5
	20	9.4	5.5
	25	9.3	5.5
	32	9.2	5.5
	40-80	5.9	5.5
17 (r=0.8)	25	15.2	5.5
	32	15.1	5.5
	40	15.0	5.5
	50	14.9	5.5
	63-125	9.6	5.5



## 方肩铣刀SM90-AO

Square Shoulder Mill SM90-AO



直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	L	LH						
16	SM90-016R16AO11-Z02	●	/	16	10	145	25			R	2	+	0.38
20	SM90-020R20AO11-Z02	○	/	20	10	170	40			R	2	+	0.50
20	SM90-020R20AO11-Z03	●	/	20	10	110	25			R	3	+	0.38
25	SM90-025R25AO11-Z02	○	/	25	10	210	50			R	2	+	0.54
25	SM90-025R25AO11-Z03	●	/	25	10	120	32			R	3	+	0.54
32	SM90-032R32AO11-Z02	○	/	32	10	250	65			R	2	+	1.45
32	SM90-032R32AO11-Z03	●	/	32	10	130	40			R	3	+	0.82
25	SM90-025R25AO17-Z02	●	/	25	15.7	210	50			R	2	+	0.50
32	SM90-032R32AO17-Z02	○	/	32	15.7	250	65			R	2	+	1.50
32	SM90-032R32AO17-Z03	●	/	32	15.7	130	40			R	3	+	0.80
40	SM90-040R32AO17-Z02	○	/	32	15.7	250	65			R	2	+	1.70
40	SM90-040R32AO17-Z03	○	/	32	15.7	170	50			R	3	+	1.10
40	SM90-040R32AO17-Z04	●	/	32	15.7	170	50			R	4	+	1.10

● 常备库存In stock ○ 按订单生产Make to order

## 方肩铣刀SM90-AO

Square Shoulder Mill SM90-AO

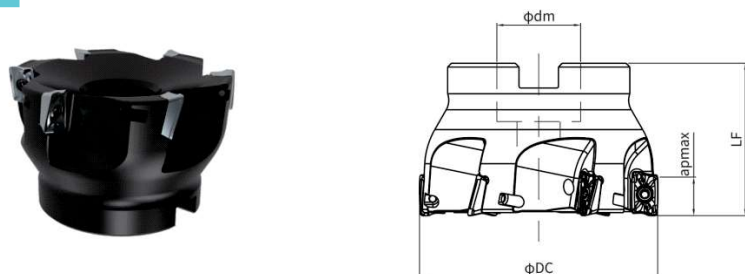


直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF	LH						
16	SM90-016E16AO11-Z02	●	/	16	10	73	25			E	2	+	0.22
20	SM90-020E20AO11-Z02	●	/	20	10	81	25			E	2	+	0.29
20	SM90-020E20AO11-Z03	○	/	20	10	81	25			E	3	+	0.29
25	SM90-025E25AO11-Z02	●	/	25	10	88	32			E	2	+	0.40
25	SM90-025E25AO11-Z03	○	/	25	10	88	32			E	3	+	0.38
32	SM90-032E32AO11-Z02	●	/	32	10	100	40			E	2	+	0.65
32	SM90-032E32AO11-Z03	○	/	32	10	100	40			E	3	+	0.68
25	SM90-025E25AO17-Z02	○	/	25	15.7	88	32			E	2	+	0.41
32	SM90-032E32AO17-Z02	●	/	32	15.7	100	40			E	2	+	0.64
32	SM90-032E32AO17-Z03	○	/	32	15.7	100	40			E	3	+	0.62
40	SM90-040E32AO17-Z02	○	/	32	15.7	110	/			E	2	+	0.82
40	SM90-040E32AO17-Z03	●	/	32	15.7	110	/			E	3	+	0.80
40	SM90-040E32AO17-Z04	○	/	32	15.7	110	/			E	4	+	0.80

● 常备库存In stock ○ 按订单生产Make to order

## 方肩铣刀SM90-AO

## Square Shoulder Mill SM90-AO



直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF							
40	SM90-040A16AO11-Z04	●	/	16	10	40				A	4	+	0.38
40	SM90-040A16AO11-Z06	●	/	16	10	40				A	6	+	0.38
50	SM90-050A22AO11-Z05	○	/	22	10	40				A	5	+	0.48
50	SM90-050A22AO11-Z07	●	/	22	10	40				A	7	+	0.48
63	SM90-063A22AO11-Z06	○	/	22	10	40				A	6	+	0.58
63	SM90-063A22AO11-Z08	●	/	22	10	40				A	8	+	0.59
80	SM90-080A27AO11-Z07	○	/	27	10	50				A	7	+	0.99
80	SM90-080A27AO11-Z10	●	/	27	10	50				A	10	+	0.86
40	SM90-040A16AO17-Z02	○	/	16	15.7	40				A	2	+	0.38
40	SM90-040A16AO17-Z03	○	/	16	15.7	40				A	3	+	0.46
40	SM90-040A16AO17-Z04	●	/	16	15.7	40				A	4	+	0.44
50	SM90-050A22AO17-Z03	○	/	22	15.7	40				A	3	+	0.54
50	SM90-050A22AO17-Z04	●	/	22	15.7	40				A	4	+	0.59
50	SM90-050A22AO17-Z05	○	/	22	15.7	40				A	5	+	0.54
63	SM90-063A22AO17-Z04	○	/	22	15.7	40				A	4	+	0.72
63	SM90-063A22AO17-Z05	●	/	22	15.7	40				A	5	+	0.72
63	SM90-063A22AO17-Z06	○	/	22	15.7	40				A	6	+	0.68
80	SM90-080A27AO17-Z04	○	/	27	15.7	50				A	4	+	0.96
80	SM90-080A27AO17-Z06	●	/	27	15.7	50				A	6	+	0.96
80	SM90-080A27AO17-Z08	○	/	27	15.7	50				A	8	+	0.94
100	SM90-100A32AO17-Z05	○	/	32	15.7	50				A	5	+	1.77
100	SM90-100A32AO17-Z07	●	/	32	15.7	50				A	7	+	1.73
100	SM90-100A32AO17-Z09	○	/	32	15.7	50				A	9	+	1.57
125	SM90-125B40AO17-Z06	○	/	40	15.7	63				B	6		2.71
125	SM90-125B40AO17-Z08	●	/	40	15.7	63				B	8		2.70
125	SM90-125B40AO17-Z11	○	/	40	15.7	63				B	11		2.74

● 常备库存In stock ○ 按订单生产Make to order

## 方肩铣刀SM90-AO

## Square Shoulder Mill SM90-AO

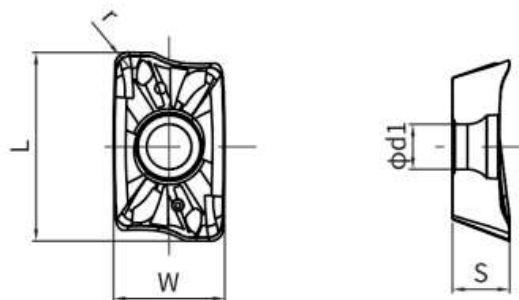


直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF	LH						
32	LE90-032E25AO11-Z02	○	/	25	32	109	/			E	2/8	+	0.60
32	LE90-032E25AO11-Z03	○	/	32	32	113	48			E	2/8	+	0.90
40	LE90-040E25AO11-Z04	○	/	40	39	131	58			E	3/15	+	1.40
40	LE90-040A16AO11-Z03	○	/	16	36	57	/			A	3/12	+	0.80
40	LE90-040A16AO11-Z04	○	/	16	36	57	/			A	4/16	+	0.80
44	LE90-044A16AO11-Z03	○	/	16	45	65	/			A	3/15	+	0.90
50	LE90-050A22AO11-Z03	●	/	22	54	74	/			A	3/18	+	1.10
50	LE90-050A22AO11-Z04	○	/	22	36	57	/			A	4/16	+	1.00
50	LE90-050A22AO11-Z05	○	/	22	36	57	/			A	5/20	+	1.00
54	LE90-054A22AO11-Z04	○	/	22	36	57	/			A	4/16	+	1.10
44	LE90-044A16AO17-Z02	○	/	16	40	65	/			A	2/6	+	0.91
50	LE90-050A22AO17-Z02	○	/	22	52	82	/			A	2/8	+	1.30
63	LE90-063A27AO17-Z03	●	/	27	52	82	/			A	3/12	+	1.58
80	LE90-080A32AO17-Z03	●	/	32	65	96	/			A	3/15	+	2.88
100	LE90-100A40AO17-Z04	○	/	40	52	82	/			A	4/16	+	3.37

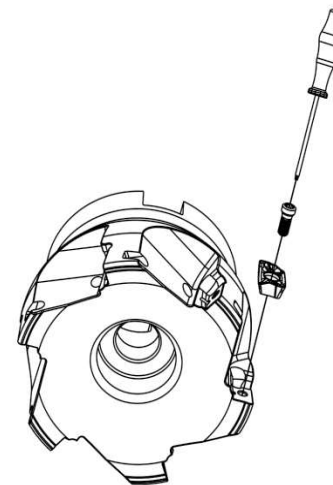
● 常备库存In stock ○ 按订单生产Make to order

# 方肩铣刀SM90-AO

## Square Shoulder Mill SM90-AO



### 配件/SPARE PARTS



刀片 Insert	型号 Type	基本尺寸 Dimension (mm)						P		M		K	N		S					
		d	s	d1	r	bs	BM6220	BM6230	BM2220	BM4120	BM2210	BM2220	BM4120	BM4130	BM4210	BM4120	BM4130	BM4230		
	AOGX11T304-PL	11	6.8	3.59	2.8	0.4			☆	★		☆	★					☆	★	
	AOGX11T304-NL	11	6.8	3.59	2.8	0.4														
	AOGX11T308-PL	11	6.8	3.59	2.8	0.8			☆	★		☆	★						☆	★
	AOGX11T308-NL	11	6.8	3.59	2.8	0.8														
	AOGX170408-PL	17	9.6	4.76	4.1	0.8			☆	★		☆	★						☆	★
	AOGX11T304-PM	11	6.8	3.59	2.8	0.4			☆	★		☆	★					☆	★	
	AOGX11T308-PM	11	6.8	3.59	2.8	0.8			☆	★		☆	★					☆	★	
	AOGX11T312-PM	11	6.8	3.59	2.8	1.2			☆	★		☆	★					☆	★	
	AOGX11T320-PM	11	6.8	3.59	2.8	2.0			☆	★		☆	★					☆	★	
	AOGX11T331-PM	11	6.8	3.59	2.8	3.1			☆	★		☆	★					☆	★	
	AOGX170408-PM	17	9.6	4.76	4.1	0.8			☆	★		☆	★					☆	★	
	AOGX170412-PM	17	9.6	4.76	4.1	1.2			☆	★		☆	★					☆	★	
	AOGX170416-PM	17	9.6	4.76	4.1	1.6			☆	★		☆	★					☆	★	
	AOGX170420-PM	17	9.6	4.76	4.1	2.0			☆	★		☆	★					☆	★	
	AOGX170440-PM	17	9.6	4.76	4.1	4.0			☆	★		☆	★					☆	★	
	AOGX170464-PM	17	9.6	4.76	4.1	6.4			☆	★		☆	★					☆	★	
	AOGX180612-PM	18	11.1	5.35	4.2	1.2			☆	★		☆	★					☆	★	
	AOGX180631-PM	18	11.1	5.35	4.2	3.1			☆	★		☆	★					☆	★	

刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrenc
16-20	S01-025060	D01-108
20-80	S01-025073	D01-108
25	S01-040070	D01-115
32-125	S01-040090	D01-115

首选 ★ 备选 ☆  
First choice ★ Second choice ☆

# 方肩铣刀SM90-SO

## Square Shoulder Mill SM90-SO

### 通用四刃方肩铣刀

General purpose 4 edges shoulder milling cutter

优异的加工表面质量和光洁度

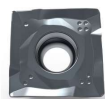
High precision and surface finish

适用于钢件、不锈钢、耐热合金、铸铁等各种材料的加工

Suitable for machining steel, stainless steel, heat resistant alloy, cast iron materials

广泛应用于航空航天、汽车零部件、能源、模具、通用机械等领域

Widely used in aerospace, automotive components, energy, die and mould, general engineering industries



PL



PM

### 刀片槽型

PL 槽型：轻型加工，高表面质量要求首选

PL geometry: first choice for light cutting, high precision and surface finish request

PM 槽型：通用槽型

PM geometry: general purpose geometry



直径范围：20-40mm  
Diameter range: 20-40mm



直径范围：20-40mm  
Diameter range: 20-40mm



直径范围：40-160mm  
Diameter range: 40-160mm



插铣  
Plunge milling



槽铣  
Slot milling



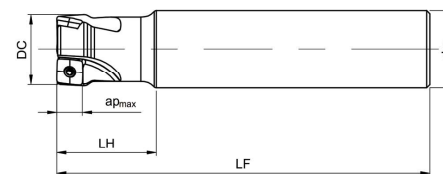
方肩铣  
Square shoulder milling

### 刀片进给切削参数推荐 Feed recommendations

刀片尺寸	刀片槽形	推荐每齿进给(mm)	最小每齿进给(mm)	最大每齿进给(mm)
Insert size	Geometry	Rec. Fz	Min. Fz	Max. Fz
08 (r=0.4)	PL	0.08	0.05	0.12
08 (r=0.8)	PM	0.12	0.08	0.15
14 (r=0.8)	PM	0.12	0.08	0.16

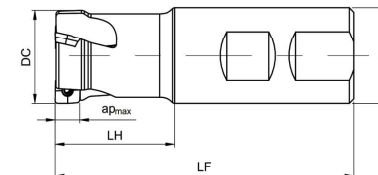
# 方肩铣刀SM90-SO

## Square Shoulder Mill SM90-SO



直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)
			Dc2	dm	apmax	LF	LH						
20	SM90-020R16SO08-Z02	●	/	16	5.5	110	25			R	2	+	0.10
20	SM90-020R20SO08-Z02	●	/	20	5.5	110	25			R	2	+	0.20
22	SM90-022R20SO08-Z02	●	/	20	5.5	170	30			R	2	+	0.30
25	SM90-025R20SO08-Z02	●	/	20	5.5	120	32			R	2	+	0.40
25	SM90-025R25SO08-Z03	●	/	25	5.5	120	32			R	3	+	0.40
28	SM90-028R25SO08-Z03	●	/	25	5.5	210	35			R	3	+	0.70
32	SM90-032R25SO08-Z03	●	/	25	5.5	130	40			R	3	+	0.70
32	SM90-032R32SO08-Z04	●	/	32	5.5	130	40			R	4	+	0.70
40	SM90-040R32SO08-Z04	●	/	32	5.5	170	50			R	4	+	1.10
40	SM90-040R32SO14-Z03	●	/	32	10	170	50			R	3	+	1.00

● 常备库存 In stock ○ 按订单生产 Make to order

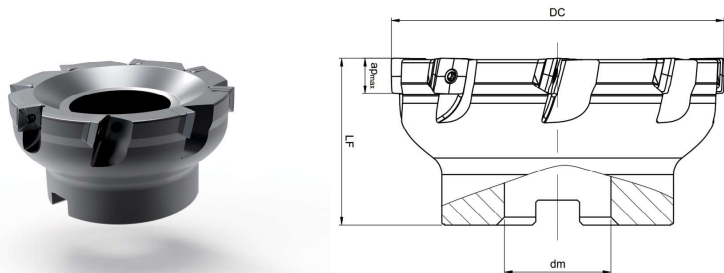


直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)
			Dc2	dm	apmax	LF	LH						
20	SM90-020E16SO08-Z02	●	/	16	5.5	80	25			E	2	+	0.10
20	SM90-020E20SO08-Z02	●	/	20	5.5	80	25			E	2	+	0.10
25	SM90-025E20SO08-Z02	●	/	20	5.5	90	32			E	2	+	0.20
25	SM90-025E25SO08-Z03	●	/	25	5.5	90	32			E	3	+	0.20
32	SM90-032E25SO08-Z03	●	/	25	5.5	100	40			E	3	+	0.50
32	SM90-032E32SO08-Z04	●	/	32	5.5	100	40			E	4	+	0.70
40	SM90-040E32SO08-Z04	●	/	32	5.5	120	50			E	4	+	1.10
40	SM90-040E32SO14-Z03	●	/	32	10	120	50			E	3	+	1.00

● 常备库存 In stock ○ 按订单生产 Make to order

# 方肩铣刀SM90-SO

## Square Shoulder Mill SM90-SO

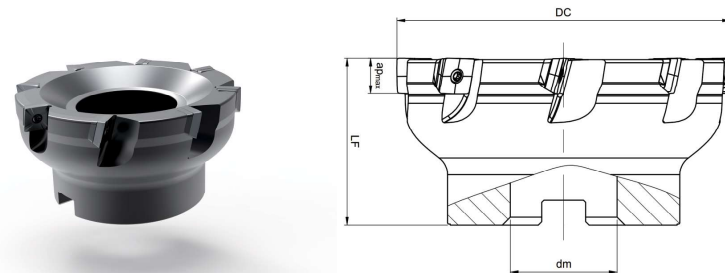




直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数(Z)	内冷状态	重量(kg)
			Dc2	dm	apmax	LF							
40	SM90-040A16SO08-Z04	○	/	16	5.5	40			A	4	+	0.20	
40	SM90-040A16SO08-Z06	○	/	16	5.5	40			A	6	+	0.20	
44	SM90-044A16SO08-Z05	○	/	16	5.5	40			A	5	+	0.20	
50	SM90-050A22SO08-Z05	●	/	22	5.5	40			A	5	+	0.40	
50	SM90-050A22SO08-Z07	○	/	22	5.5	40			A	7	+	0.40	
54	SM90-054A22SO08-Z05	○	/	22	5.5	40			A	5	+	0.40	
63	SM90-063A22SO08-Z05	●	/	22	5.5	40			A	5	+	0.50	
63	SM90-063A22SO08-Z08	○	/	22	5.5	40			A	8	+	0.50	
80	SM90-080A27SO08-Z09	●	/	27	5.5	50			A	9	+	1.20	
80	SM90-080A27SO08-Z13	○	/	27	5.5	50			A	13	+	1.20	
50	SM90-050A22SO14-Z04	●	/	22	10	40			A	4	+	0.30	
50	SM90-050A22SO14-Z05	○	/	22	10	40			A	5	+	0.30	
63	SM90-063A22SO14-Z05	○	/	22	10	40			A	5	+	0.40	
63	SM90-063A22SO14-Z06	●	/	22	10	40			A	6	+	0.40	
80	SM90-080A27SO14-Z06	○	/	27	10	50			A	6	+	1	
80	SM90-080A27SO14-Z08	●	/	27	10	50			A	8	+	1	
100	SM90-100A32SO14-Z05	○	/	32	10	50			A	5	+	1.40	
100	SM90-100A32SO14-Z07	●	/	32	10	50			A	7	+	1.40	
100	SM90-100A32SO14-Z10	○	/	32	10	50			A	10	+	1.40	
125	SM90-125B40SO14-Z06	○	/	40	10	63			B	6		1.60	
125	SM90-125B40SO14-Z08	●	/	40	10	63			B	8		2.60	
125	SM90-125B40SO14-Z16	○	/	40	10	63			B	16		2.60	
160	SM90-160C40SO14-Z08	○	/	40	10	63			C	8		4.40	
160	SM90-160C40SO14-Z12	○	/	40	10	63			C	12		4.40	

● 常备库存In stock ○ 按订单生产Make to order

# 方肩铣刀SM90-SO

## Square Shoulder Mill SM90-SO



刀片 Insert	型号 Type	基本尺寸 Dimension (mm)					p	M	K	N	S
		d	s	d1	r	bs					
	SOMX08T304M-PL	8.5	3.5	2.8	0.4	1.5					
	SOMX08T308M-PM	8.5	3.5	2.8	0.8	1.5					
	SOMX140408M-PM	14	3.8	4.1	0.8						

首选★ 备选☆  
First choice ★ Second choice ☆

### 配件/SPARE PARTS

刀片尺寸/Insert size	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
08	20-80	S01-025073	D01-108
14	40-160	S01-035100	D01-115

# 方肩铣刀SM90-AN

## Square Shoulder Mill SM90-AN

### 通用四刃方肩铣刀

General purpose 4 edges shoulder milling cutter

切削非常轻快

Extremely light cutting

优异的加工表面质量和光洁度

High precision and surface finish

适用于钢件、不锈钢、耐热合金、铸铁等各种材料的加工

Suitable for machining steel, stainless steel, heat resistant alloy, cast iron materials

广泛应用于航空航天、汽车零部件、能源、模具、通用机械等领域

Widely used in aerospace, automotive components, energy die and mould, general engineering industries



PL



PM

### 刀片槽型

PL 槽型: 轻型加工, 高表面质量要求首选

PL geometry: first choice for light cutting, high precision and surface finish request

PM 槽型: 通用槽型

PM geometry: general purpose geometry



直径范围: 20-32mm  
Diameter range: 20-32mm



直径范围: 25-40mm  
Diameter range: 25-40mm



直径范围: 40-160mm  
Diameter range: 40-160mm



插铣  
Plunge milling



槽铣  
Slot milling



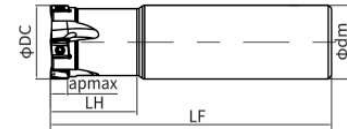
方肩铣  
Square shoulder milling

### 刀片进给切削参数推荐 Feed recommendations

刀片尺寸	刀片槽形	推荐每齿进给(mm)	最小每齿进给(mm)	最大每齿进给(mm)
Insert size	Geometry	Rec. Fz	Min. Fz	Max. Fz
04 (r=0.4)	PL	0.08	0.05	0.12
11 (r=0.8)	PM	0.10	0.08	0.15

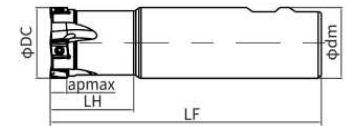
# 方肩铣刀SM90-AN

## Square Shoulder Mill SM90-AN



直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)	
			Dc2	dm	apmax	LF	LH							
20	SM90-020R20AN08-Z02	○	/	20	8	110	25				R	2	+	0.50
20	SM90-020R20AN08-Z03	●	/	20	8	110	25				R	3	+	0.50
25	SM90-025R25AN08-Z03	○	/	25	8	120	32				R	3	+	0.60
25	SM90-025R25AN08-Z04	●	/	25	8	120	32				R	4	+	0.60
32	SM90-032R32AN08-Z04	○	/	32	8	130	40				R	4	+	0.71
32	SM90-032R32AN08-Z05	●	/	32	8	130	40				R	5	+	0.70

● 常备库存 In stock ○ 按订单生产 Make to order



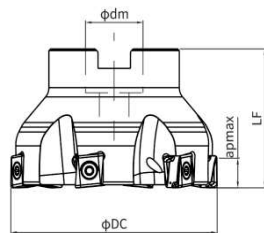
直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)	
			Dc2	dm	apmax	LF	LH							
25	SM90-025E25AN08-Z03	○	/	25	8	100	32				E	3	+	0.60
25	SM90-025E25AN08-Z04	○	/	25	8	100	32				E	4	+	0.60
32	SM90-032E32AN08-Z04	○	/	32	8	110	40				E	4	+	0.70
32	SM90-032E32AN08-Z05	○	/	32	8	110	40				E	5	+	0.70
40	SM90-040E32AN08-Z04	○	/	32	8	120	25				E	4	+	1.20
40	SM90-040E32AN08-Z06	●	/	32	8	120	25				E	6	+	1.25
40	SM90-040E32AN11-Z05	○	/	32	11	120	25				E	5	+	1.25

● 常备库存 In stock ○ 按订单生产 Make to order



## 方肩铣刀SM90-AN

### Square Shoulder Mill SM90-AN

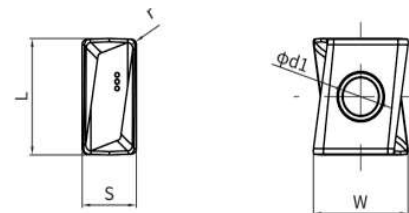


直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF	LH						
40	SM90-040A16AN08-Z04	○	/	16	8	40				A	4	+	0.38
40	SM90-040A16AN08-Z06	○	/	16	8	40				A	6	+	0.38
50	SM90-050A22AN08-Z05	●	/	22	8	40				A	5	+	0.48
50	SM90-050A22AN08-Z07	○	/	22	8	40				A	7	+	0.48
63	SM90-063A22AN08-Z07	●	/	22	8	40				A	7	+	0.58
63	SM90-063A22AN08-Z10	○	/	22	8	40				A	10	+	0.59
80	SM90-080B27AN08-Z09	●	/	27	8	50				B	9	+	0.99
80	SM90-080B27AN08-Z13	○	/	27	8	50				B	13	+	0.86
40	SM90-040A16AN11-Z04	○	/	16	11	40				A	4	+	0.38
40	SM90-040A16AN11-Z05	○	/	16	11	40				A	5	+	0.38
50	SM90-050A22AN11-Z05	●	/	22	11	40				A	5	+	0.54
50	SM90-050A22AN11-Z06	○	/	22	11	40				A	6	+	0.59
63	SM90-063A22AN11-Z04	○	/	22	11	40				A	4	+	0.72
63	SM90-063A22AN11-Z06	●	/	22	11	40				A	6	+	0.72
63	SM90-063A22AN11-Z08	○	/	22	11	40				A	8	+	0.68
80	SM90-080A27AN11-Z05	○	/	27	11	50				A	5	+	0.94
80	SM90-080A27AN11-Z07	●	/	27	11	50				A	7	+	0.96
80	SM90-080A27AN11-Z10	○	/	27	11	50				A	10	+	0.99
100	SM90-100A32AN11-Z07	○	/	32	11	50				A	7	+	1.77
100	SM90-100A32AN11-Z09	●	/	32	11	50				A	9	+	1.73
100	SM90-100A32AN11-Z13	○	/	32	11	50				A	3	+	1.57
125	SM90-125B40AN11-Z09	○	/	40	11	63				B	9		2.71
125	SM90-125B40AN11-Z11	●	/	40	11	63				B	11		2.70
125	SM90-125B40AN11-Z16	○	/	40	11	63				B	16		2.74
160	SM90-160C40AN11-Z09	○	/	40	11	63				C	9		5.00
160	SM90-160C40AN11-Z13	○	/	40	11	63				C	13		5.00

● 常备库存 In stock ○ 按订单生产 Make to order

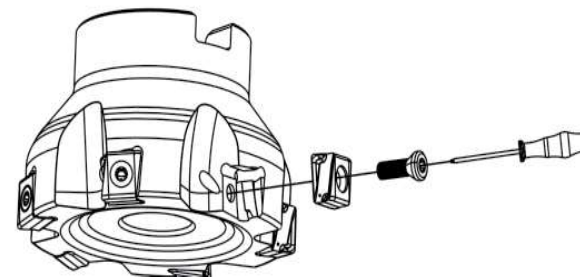
## 方肩铣刀SM90-AN刀片

### Square Shoulder Mill SM90-AN Insert



刀片 Insert	型号 Type	基本尺寸					P	M	K	N	S												
		Dimension (mm)																					
		d	s	d1	r	bs	BM6220	BM6230	BM4120	BM2210	BM4120	BM2220	BM4130	BM3210	BM2220	BM4120	BM5210	BM5220	BM4210	BM4130	BM4230		
	ANGX080404-PL	8.39	7.73	4.3	3.3	0.8			☆	★		☆	★		☆	★						☆	★
	ANGX110708-PM	11.5	11.76	7.11	4.5	0.8			☆	★		☆	★		☆	★						☆	★
	ANGX110712-PM	11.5	11.76	7.11	4.5	1.2			☆	★		☆	★		☆	★						☆	★

首选★ 备选☆  
First choice ★ Second choice ☆



#### 配件/SPARE PARTS

刀片尺寸/Insert size	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
08	20-80	S01-030085	D01-109
11	40-160	S01-040121	D01-115

# 方肩铣刀SM90-ZN

## Square Shoulder Mill SM90-ZN

### 六刃方肩铣刀

6 edges shoulder milling cutter

最具经济性的90°铣刀

Most economical milling cutter

适用于钢件、不锈钢、耐热合金、铸铁等各种材料的加工

Suitable for machining steel, stainless steel, heat resistant alloy, cast iron materials

广泛应用于航空航天、汽车零部件、能源、模具、通用机械等领域

Widely used in aerospace, automotive components, energy, die and mould, general engineering industries



M

### 刀片槽型

M槽型：通用槽型

M geometry: general purpose geometry

AL槽型，铝合金专用

AL geometry: only for aluminum



直径范围：40mm  
Diameter range: 40mm



直径范围：25-40mm  
Diameter range: 25-40mm



面铣  
Face milling



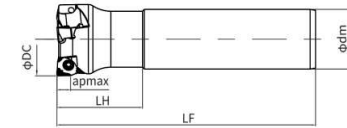
方肩铣  
Square shoulder milling

### 刀片进给切削参数推荐 Feed recommendations

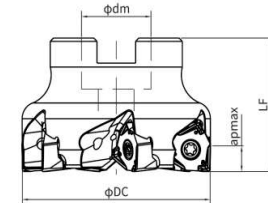
刀片尺寸	刀片槽形	推荐每齿进给(mm)	最小每齿进给(mm)	最大每齿进给(mm)
Insert size	Geometry	Rec. Fz	Min. Fz	Max. Fz
08 (r=0.8)	M	0.10	0.08	0.15
08 (r=0.8)	AL	0.15	0.08	0.30

# 方肩铣刀SM90-ZN

## Square Shoulder Mill SM90-ZN



直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)	
			Dc2	dm	apmax	LF	LH							
40	SM90-040E32ZN08-Z03	●	/	32	7	120	45				E	3	+	1.25
40	SM90-040E32ZN08-Z04	○	/	32	7	120	45				E	4	+	1.20

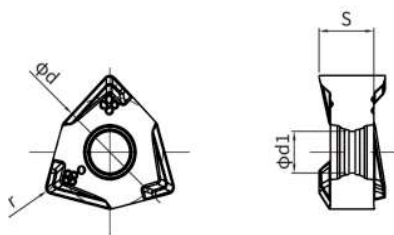



直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)
			Dc2	dm	apmax	LF							
50	SM90-050A22ZN08-Z04	●	/	22	7	40				A	4	+	0.48
50	SM90-050A22ZN08-Z05	○	/	22	7	40				A	5	+	0.48
63	SM90-063A22ZN08-Z04	●	/	22	7	40				A	4	+	0.58
63	SM90-063A22ZN08-Z06	○	/	22	7	40				A	6	+	0.58
63	SM90-063A22ZN08-Z07	○	/	22	7	40				A	7	+	0.58
80	SM90-080A27ZN08-Z05	●	/	27	7	50				A	5	+	0.99
80	SM90-080A27ZN08-Z07	○	/	27	7	50				A	7	+	0.90
80	SM90-080A27ZN08-Z09	○	/	27	7	50				A	9	+	0.86
100	SM90-100A32ZN08-Z06	○	/	32	7	50				A	6	+	1.77
100	SM90-100A32ZN08-Z08	●	/	32	7	50				A	8	+	1.73
100	SM90-100A32ZN08-Z11	○	/	32	7	50				A	11	+	1.70
125	SM90-125B40ZN08-Z07	○	/	40	7	63				B	7		2.71
125	SM90-125B40ZN08-Z11	●	/	40	7	63				B	11		2.66
125	SM90-125B40ZN08-Z13	○	/	40	7	63				B	13		2.60
160	SM90-160C40ZN08-Z08	○	/	40	7	63				C	8		5.00
160	SM90-160C40ZN08-Z12	●	/	40	7	63				C	12		5.00
200	SM90-200C60ZN08-Z14	○	/	60	7	63				C	14		6.70
250	SM90-250C60ZN08-Z16	○	/	60	7	63				C	16		8.50

● 常备库存In stock ○ 按订单生产Make to order

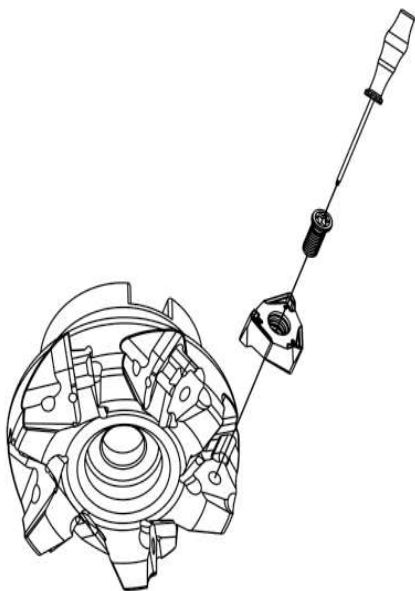
# 方肩铣刀SM90-ZN刀片

## Square Shoulder Mill SM90-ZN Insert



刀片 Insert	型号 Type	基本尺寸 Dimension (mm)					P		M		K		N		S				
		d	s	d1	r	bs	BM6220	BM6230	BM2220	BM2230	BM4120	BM4130	BM2210	BM2220	BM2230	BM4210	BM4220	BM4230	
	ZNMX080608R-M	14.02	6.65	4.7	0.8	1.3	*	*		*	*	*							
	ZNGX080608R-M	14.02	6.65	4.7	0.8	1.3	*	*		*	*	*							
	ZNGX080608R-AL	14.02	6.65	4.7	0.8	1.3									*				

首选★ 备选☆  
First choice ★ Second choice ☆



### 配件/SPARE PARTS

刀片尺寸/Insert size	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
08	S01-040121	D01-115

# 方肩铣刀SM90-SD

## Square Shoulder Mill SM90-SD

四刃方肩铣刀  
4 edges shoulder milling cutter

专用于铝合金材料的加工，加工精度高，粗糙度好  
Only for aluminum materials, high precision, high surface quality



AL

### 刀片槽型

LHC 槽型：轻型加工，高表面质量

LHC geometry: light cutting, high precision and surface finish



直径范围：50-200mm  
Diameter range: 50-200mm



面铣  
Face milling



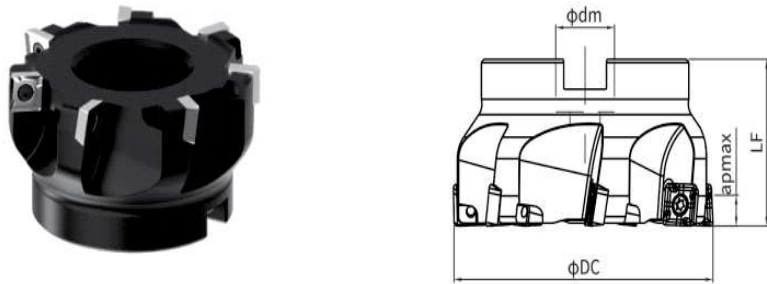
方肩铣  
Square shoulder milling

### 刀片进给切削参数推荐 Feed recommendations

刀片尺寸 Insert size	刀片槽形 Geometry	推荐每齿进给(mm) Rec. Fz	最小每齿进给(mm) Min. Fz	最大每齿进给(mm) Max. Fz
11 (r=0.8)	LHC	0.08	0.06	0.12
17 (r=1.0)	LHC	0.10	0.08	0.15

## 方肩铣刀SM90-SD

### Square Shoulder Mill SM90-SD

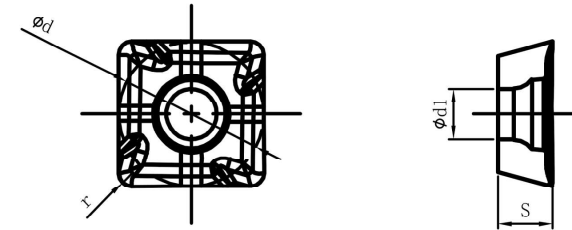



直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF							
50	SM90-050A22SD12-Z03	○	/	22	9.2	40				A	3	+	0.30
50	SM90-050A22SD12-Z04	○	/	22	9.2	40				A	4	+	0.30
63	SM90-063A22SD12-Z04	○	/	22	9.2	40				A	4	+	0.50
63	SM90-063A27SD12-Z05	○	/	27	9.2	40				A	5	+	0.50
80	SM90-080A27SD12-Z05	○	/	27	9.2	50				A	5	+	1.00
80	SM90-080A27SD12-Z06	○	/	27	9.2	50				A	6	+	1.00
100	SM90-100A32SD12-Z06	○	/	32	9.2	50				A	6	+	1.60
100	SM90-100A32SD12-Z08	○	/	32	9.2	50				A	8	+	1.70
125	SM90-125B40SD12-Z07	○	/	40	9.2	63				B	7		2.80
125	SM90-125B40SD12-Z10	○	/	40	9.2	63				B	10		2.90
160	SM90-160C40SD12-Z08	○	/	40	9.2	63				C	8		4.30
160	SM90-160C40SD12-Z12	○	/	40	9.2	63				C	12		4.40
200	SM90-200C60SD12-Z11	○	/	60	9.2	63				C	11		6.80
200	SM90-200C60SD12-Z14	○	/	60	9.2	63				C	14		6.83

● 常备库存In stock ○ 按订单生产Make to order

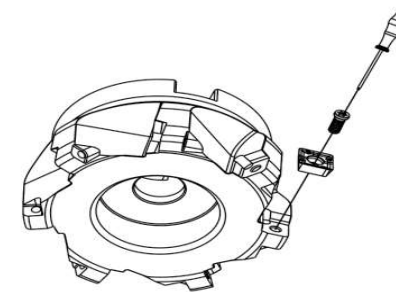
## 方肩铣刀SM90-SD 刀片

### Square Shoulder Mill SM90-SD Insert



刀片 外形	型号 Type	基本尺寸 Dimension (mm)						N	
		d	s	d1	r	bs		BM5210	BM5220
	SDGT120408PDER-AL	12.7	4.76	4.4	0.8				*
	SDGT120412PDER-AL	12.7	4.76	4.4	1.2				*

首选★ 备选☆  
First choice ★ Second choice ☆



#### 配件/SPARE PARTS

刀片尺寸Insert size	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
12	40-250	S01-040110	D01-115

# 方肩铣刀SM90-AD

## Square Shoulder Mill SM90-AD

### 两刃方肩铣刀

2 edges shoulder milling cutter

高性能铝合金铣刀，精磨刀片

High performance mills for aluminum materials, fine grinding inserts

多种圆角刀片，满足多种需求，大圆角刀片可用于快进给铣削

Various insert radius to meet customer needs, big radius insert can be used to high feed milling

前刀面镜面处理，出屑流畅，减少积屑瘤

Mirror polishing to rake face, best chip flow, decrease possibility of BUE

刃口大前角设计，降低切削负载，提高加工品质

Big rake angle design, decrease cutting force, promote machining quality

### 刀片槽型

AL 槽型：轻型加工，高表面质量

AL geometry: light cutting, high precision and surface finish



直径范围：20-32mm  
Diameter range: 20-32mm



直径范围：25-40mm  
Diameter range: 25-40mm



直径范围：40-160mm  
Diameter range: 40-160mm



面铣  
Face milling



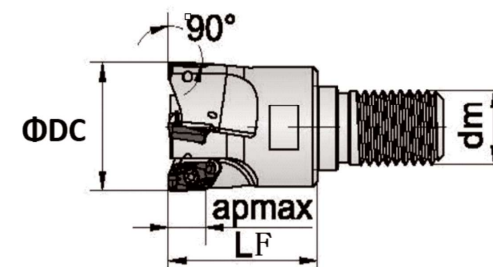
方肩铣  
Square shoulder milling

# 方肩铣刀SM90-AD

## Square Shoulder Mill SM90-AD

### 刀片进给切削参数推荐 Feed recommendations

刀片尺寸	刀片槽形	推荐每齿进给(mm)	最小每齿进给(mm)	最大每齿进给(mm)
Insert size	Geometry	Rec. Fz	Min. Fz	Max. Fz
11 (r=0.2)	AL	0.08	0.05	0.16
11 (r=0.4)	AL	0.12	0.06	0.24
11 (r=0.8)	AL	0.14	0.07	0.28
11 (r=2.0)	AL	0.16	0.08	0.32
11 (r=3.0)	AL	0.20	0.10	0.40
15 (r=0.8)	AL	0.14	0.12	0.28
15 (r=1.2)	AL	0.16	0.08	0.32
19 (r=0.4)	AL	0.12	0.06	0.24
19 (r=0.8)	AL	0.14	0.07	0.28
19 (r=1.2)	AL	0.16	0.08	0.32
19 (r=2.0)	AL	0.16	0.08	0.32
19 (r=2.4)	AL	0.18	0.10	0.33
19 (r=3.0)	AL	0.20	0.10	0.35
19 (r=3.2)	AL	0.25	0.12	0.35

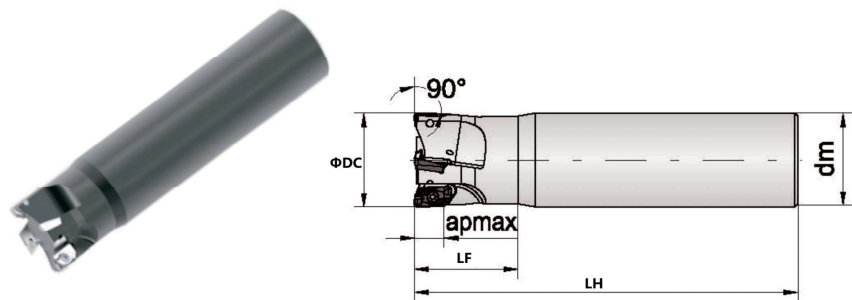


直径 Dc	型号	库存状态	尺寸(mm)						接口类型	齿数 (Z)	内冷状态	重量 (kg)	
			DC2	dm	aPmax	LF							
16	SM90-016M08AD11-Z02	●	/	M8	10	25				M	2	+	0.35
20	SM90-020M10AD11-Z03	●	/	M10	10	30				M	3	+	0.50
25	SM90-025M12AD11-Z04	●	/	M12	10	35				M	4	+	0.75
32	SM90-032M16AD11-Z05	●	/	M16	10	43				M	5	+	0.80
25	SM90-025M12AD15-Z02	●	/	M12	13	45				M	2	+	0.50
32	SM90-032M16AD15-Z02	●	/	M16	13	52				M	2	+	0.75
40	SM90-040M16AD15-Z03	●	/	M16	13	52				M	3	+	0.80

● 常备库存 In stock ○ 按订单生产 Make to order

# 方肩铣刀SM90-AD

## Square Shoulder Mill SM90-AD

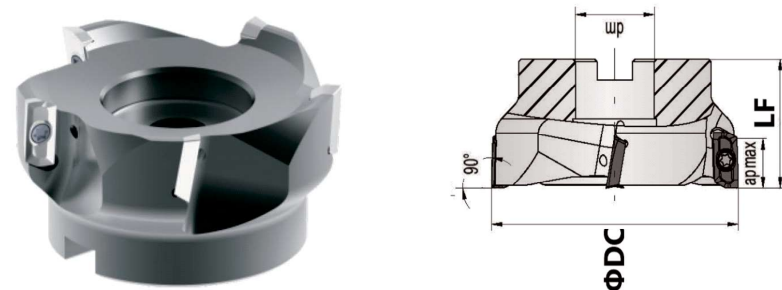


直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF	LH						
16	SM90-016R16AD11-Z02	●	/	16	10	32	165			R	2	+	0.38
20	SM90-020R20AD11-Z03	○	/	20	10	40	165			R	3	+	0.50
25	SM90-025R25AD11-Z04	●	/	25	10	50	225			R	4	+	0.38
32	SM90-032R32AD11-Z05	○	/	32	10	50	225			R	5	+	0.54
40	SM90-040R16AD11-Z05	●	/	16	10	/	40			R	5	+	0.54
50	SM90-050R22AD11-Z06	○	/	22	10	/	40			R	6	+	1.45
25	SM90-025R25AD15-Z02	●	/	25	13	40	100			R	2	+	0.38
32	SM90-032R32AD15-Z02	○	/	32	13	40	110			R	2	+	0.54
40	SM90-040R32AD15-Z03	○	/	32	13	40	110			R	3	+	0.54
25	SM90-025R25AD19-Z02	●	/	25	18	45	125			R	2	+	0.38
32	SM90-032R32AD19-Z03	○	/	32	18	5	125			R	3	+	0.54

● 常备库存In stock ○ 按订单生产Make to order

# 方肩铣刀SM90-AD

## Square Shoulder Mill SM90-AD

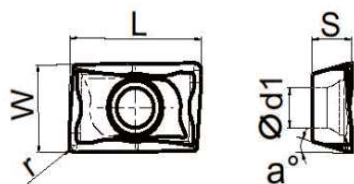


直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	ae	LF						
40	SM90-040A16AD11-Z05	○	/	16	10	/	40			A	5	+	0.30
50	SM90-050A22AD11-Z06	○	/	22	10	/	40			A	6	+	0.40
40	SM90-040A16AD15-Z04	○	/	16	13	/	40			A	4	+	0.30
50	SM90-050A22AD15-Z05	○	/	22	13	/	40			A	5	+	0.40
63	SM90-063A22AD15-Z06	○	/	22	13	/	40			A	6	+	0.60
80	SM90-080A27AD15-Z07	○	/	27	13	/	50			A	7	+	0.80
100	SM90-100A32AD15-Z08	○	/	32	13	/	50			A	8	+	1.60
125	SM90-125A40AD15-Z10	○	/	40	13	/	63			A	10	+	1.70
40	SM90-040A16AD19-Z03	○	/	16	18	/	50			A	3	+	0.30
50	SM90-050A22AD19-Z04	○	/	22	18	/	50			A	4	+	0.40
63	SM90-063A22AD19-Z05	○	/	22	18	/	50			A	5	+	0.60
80	SM90-080A27AD19-Z05	○	/	27	18	/	50			A	5	+	0.80
100	SM90-100A32AD19-Z05	○	/	32	18	/	50			A	5	+	1.60
125	SM90-125A40AD19-Z06	○	/	40	18	/	63			A	6	+	1.70

● 常备库存In stock ○ 按订单生产Make to order

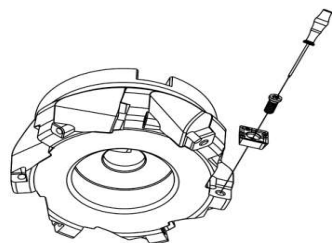
# 方肩铣刀SM90-AD Insert

## Square Shoulder Mill SM90-AD Insert



刀片外形	型号 Type	基本尺寸 Dimension (mm)					N	
		l	w	s	d1	r	BM5210	BM5220
	ADGT113502FR-AL	12.58	6.60	3.55	2.80	0.20		★
	ADGT113504FR-AL	12.58	6.60	3.55	2.80	0.40		★
	ADGT113508FR-AL	12.58	6.60	3.55	2.80	0.80		★
	ADGT113520FR-AL	12.58	6.60	3.55	2.80	2.00		★
	ADGT113530FR-AL	12.58	6.60	3.55	2.80	3.00		★
	ADGT150408PDFR-AL	15.60	9.70	3.55	2.80	0.80		★
	ADGT150412PDFR-AL	15.60	9.70	3.55	2.80	1.20		★
	ADGT190404FR-AL	22.10	9.52	4.76	4.70	0.40		★
	ADGT190408FR-AL	22.10	9.52	4.76	4.70	0.80		★
	ADGT190412FR-AL	22.10	9.52	4.76	4.70	1.20		★
	ADGT190420FR-AL	22.10	9.52	4.76	4.70	2.00		★
	ADGT190424FR-AL	22.10	9.52	4.76	4.70	2.40		★
	ADGT190430FR-AL	22.10	9.52	4.76	4.70	3.00		★
	ADGT190432FR-AL	22.10	9.52	4.76	4.70	3.20		★

首选★ 备选☆  
First choice ★ Second choice ☆



配件/SPARE PARTS

刀片尺寸/Insert size	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
11	16-50	S025L06S	WT07-F
15	25-125	S035L08T	T15-F
19	25-125	S040L09T	T15-F

# 方肩铣刀SM90-XP

## Square Shoulder Mill SM90-XP

铝合金专用两刃方肩铣刀

2 edges shoulder milling cutter for aluminum

高性能铝合金铣刀，精磨刀片

High performance mills for aluminum materials, fine grinding inserts

多种圆角刀片，满足多种需求，大圆角刀片可用于快进给铣削

可用于面铣，插铣，坡走铣等

Can be used to face milling, plunge milling, ramp milling, etc

刃口大前角设计，降低切削负载，提高加工品质

Big rake angle design, decrease cutting force, promote machining quality

### 刀片槽型

AL 槽型：轻型加工，高表面质量

AL geometry: light cutting, high precision and surface finish



AL



直径范围：50-200mm  
Diameter range: 50-200mm



直径范围：50-200mm  
Diameter range: 50-200mm



直径范围：50-200mm  
Diameter range: 50-200mm



面铣  
Face milling



插铣  
Plunge milling



坡走铣  
Ramping



螺旋差补铣  
Helical interpolation



槽铣  
Slot milling



方肩铣  
Square shoulder milling



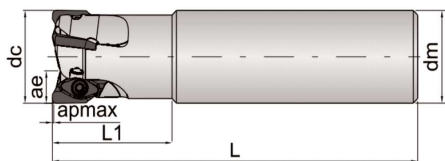
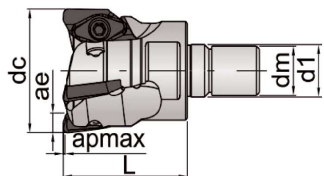
等高分层铣  
Contour milling

### 刀片进给切削参数推荐 Feed recommendations

刀片尺寸 Insert size	刀片槽形 Geometry	推荐每齿进给(mm) Rec. Fz	最小每齿进给(mm) Min. Fz	最大每齿进给(mm) Max. Fz
16 (r=0.4)	AL	0.12	0.06	0.24
16 (r=0.8)	AL	0.14	0.07	0.28
16 (r=1.2)	AL	0.16	0.08	0.32
16 (r=1.6)	AL	0.16	0.08	0.32
16 (r=2.0)	AL	0.18	0.10	0.33
16 (r=2.4)	AL	0.20	0.10	0.35
16 (r=3.0)	AL	0.25	0.12	0.35

## 方肩铣刀SM90-XP

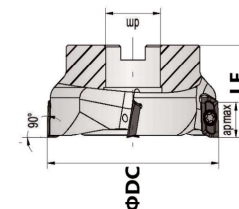
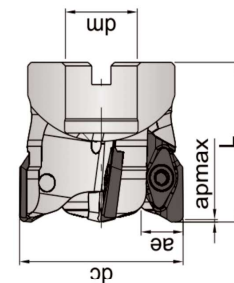
### Square Shoulder Mill SM90-XP



直径 Dc	型号	库存 状态	尺寸(mm)								接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	ae	LF	LH						
25	SM90-025M12XP16-Z02	●	/	M12	15	/	45	/			M	2	+	0.25
30	SM90-030M16XP16-Z02	●	/	M16	15	/	52	/			M	2	+	0.32
32	SM90-032M16XP16-Z02	●	/	M16	15	/	52	/			M	2	+	0.32
40	SM90-040M16XP16-Z03	●	/	M16	15	/	52	/			M	3	+	0.40
25	SM90-032R25XP16-Z02	●	/	25	15	/	40	100			R	2	+	0.52
32	SM90-040R32XP16-Z02	●	/	32	15	/	40	110			R	2	+	0.67
40	SM90-040R32XP16-Z03	●	/	40	15	/	40	110			R	3	+	0.82

## 方肩铣刀SM90-XP

### Square Shoulder Mill SM90-XP



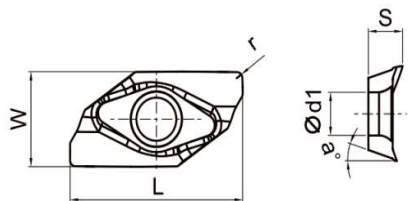
直径 Dc	型号	库存 状态	尺寸(mm)								接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	ae	LF							
50	SM90-050A22XP16-Z04	○	/	22	15	/	40				A	4	+	0.40
63	SM90-063A22XP16-Z05	○	/	22	15	/	40				A	5	+	0.60

● 常备库存 In stock ○ 按订单生产 Make to order



# 方肩铣刀SM90-XP刀片

## Square Shoulder Mill SM90-XP Insert



刀片外形	型号 Type	基本尺寸 Dimension (mm)						N	
		l	w	s	d1	r	BM5210	BM5220	
	XPCT160404-AL	25.00	12.90	4.80	5.90	0.40		*	
	XPCT160408-AL	25.00	12.90	4.80	5.90	0.80		*	
	XPCT160412-AL	25.00	12.90	4.80	5.90	1.20		*	
	XPCT160416-AL	25.00	12.90	4.80	5.90	1.60		*	
	XPCT160420-AL	25.00	12.90	4.80	5.90	2.00		*	
	XPCT160424-AL	25.00	12.90	4.80	5.90	2.40		*	
	XPCT160430-AL	25.00	12.90	4.80	5.90	3.00		*	

首选★ 备选☆  
First choice ★ Second choice ☆

### 配件/SPARE PARTS

刀片尺寸/Insert size	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
16	25-63	S050L12S	WT-20T

# 方肩铣刀SM90-VC

## Square Shoulder Mill SM90-VC

### 两刃方肩铣刀

2 edges shoulder milling cutter

高性能铝合金铣刀，精磨刀片

High performance mills for aluminum materials, fine grinding inserts

大圆角刀片可用于快进给铣削

Suitable for pocket rough milling, high MRR

Mirror polishing to rake face, best chip flow, decrease possibility of BUE

刃口大前角设计，降低切削负载，提高加工品质

Big rake angle design, decrease cutting force, promote machining quality

铝合金加工专用铣刀

Aluminum milling

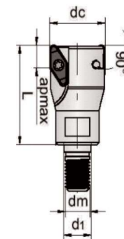
### ● 刀片槽型

AL 槽型：轻型加工，高表面质量

AL geometry: light cutting, high precision and surface finish



AL



直径范围：50-200mm  
Diameter range: 50-200mm



直径范围：50-200mm  
Diameter range: 50-200mm



直径范围：50-200mm  
Diameter range: 50-200mm



面铣  
Face milling



坡走铣  
Ramping



螺旋差补铣  
Helical interpolation



槽铣  
Slot milling



方肩铣  
Square shoulder milling



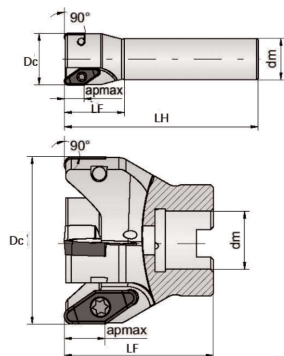
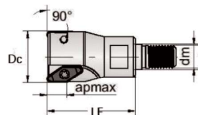
等高分层铣  
Contour milling

### ● 刀片进给切削参数推荐 Feed recommendations

刀片尺寸 Insert size	刀片槽形 Geometry	推荐每齿进给(mm) Rec. Fz	最小每齿进给(mm) Min. Fz	最大每齿进给(mm) Max. Fz
22 (r=3.0)	AL			

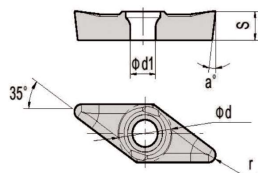
## 方肩铣刀SM90-VC

### Square Shoulder Mill SM90-VC



直径 Dc	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)
			Dc2	dm	apmax	ae	LF	LH					
32	SM90-032M16VC22-Z02	●	/	M16	16	/	43	/		M	2	+	0.75
40	SM90-040M16VC22-Z03	●	/	M16	16	/	43	/		M	3	+	0.80
32	SM90-032R25VC22-Z02	●	/	25	16	/	45	120		R	2	+	0.54
40	SM90-040R32VC22-Z03	●	/	32	16	/	45	120		R	3	+	0.54
50	SM90-050A22VC22-Z03	●	/	22	18	/	56	/		A	3	+	0.40
63	SM90-063A22VC22-Z04	●	/	22	18	/	56	/		A	4	+	0.60
80	SM90-080A27VC22-Z05	●	/	27	18	/	56	/		A	5	+	0.80

首选★ 备选☆  
First choice ★ Second choice ☆



刀片外形	型号 Type	基本尺寸 Dimension (mm)					N	
		d	w	s	d1	r	BM5210	BM5220
	VCGT220530E-AL	12.70		5.56	5.50	3.00		★

首选★ 备选☆  
First choice ★ Second choice ☆

#### 配件/SPARE PARTS

刀片尺寸/Insert size	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
16	25-63	S050L12S	WT-20T

## 仿形铣刀PM00-RP

### Profile Mill PM00-RP

加工精度和多用途性  
Precision and versatility  
面铣, 旋插补铣镗孔, 仿形铣  
face milling, helical interpolation, profiling

#### ● 刀片槽型

MV 槽型: 精磨刀片, 轻型加工, 高精度高表面质量要求首选  
MV geometry: fine grinding insert, first choice for light cutting, high precision and surface finish request



MV



直径范围: 20-50mm  
Diameter range: 20-50mm



直径范围: 40-160mm  
Diameter range: 40-160mm



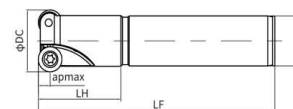
面铣  
Face milling



仿形铣  
Profile milling



螺旋差补铣  
Helical Interpolation

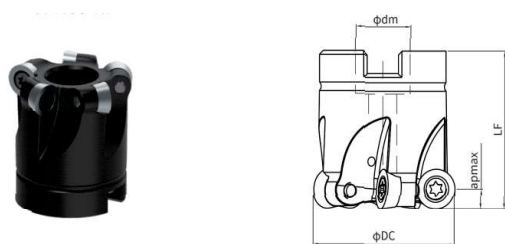


直径(mm) Diameter	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)
			Dc2	dm	apmax	LF	LH						
20	PM00-020R20RP08-Z02	●	/	20	4	120	35			R	2	+	0.20
25	PM00-025R20RP08-Z03	○	/	20	4	120	35			R	3	+	0.30
32	PM00-032R25RP08-Z04	○	/	25	4	120	35			R	4	+	0.35
25	PM00-025R20RP10-Z02	●	/	20	5	100	35			R	2	+	0.20
32	PM00-032R25RP10-Z02	●	/	25	5	120	40			R	2	+	0.50
40	PM00-040R32RP10-Z03	○	/	32	5	120	40			R	3	+	0.70
50	PM00-050R32RP10-Z03	○	/	32	5	120	40			R	3	+	0.80
32	PM00-032R25RP12-Z02	○	/	25	6	135	40			R	2	+	0.90
40	PM00-040R32RP12-Z02	○	/	32	6	150	40			R	2	+	1.00
50	PM00-050R32RP12-Z03	○	/	32	6	150	40			R	3	+	1.10

● 常备库存 In stock ○ 按订单生产 Make to order

# 仿形铣刀PM00-RP

## Profile Mill PM00-RP

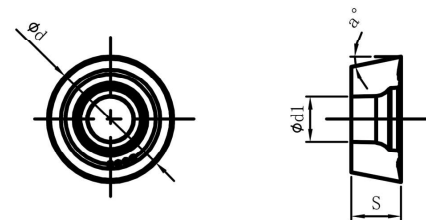


直径(mm) Diameter	型号	库存状态	尺寸(mm)							接口类型	齿数(Z)	内冷状态	重量(kg)
			Dc2	dm	apmax	LF							
40	PM00-040A16RP08-Z05	○	/	16	4	40				A	5	+	0.44
50	PM00-050A22RP08-Z05	○	/	22	4	40				A	5	+	0.87
63	PM00-063A22RP08-Z06	○	/	22	4	40				A	6	+	0.60
80	PM00-080A27RP08-Z07	○	/	27	4	50				B	7	+	1.40
100	PM00-100A32RP08-Z08	○	/	32	4	50				B	8	+	1.90
125	PM00-125B40RP08-Z10	○	/	40	4	63				B	10	+	3.20
160	PM00-160C40RP08-Z12	○	/	40	4	63				C	12	+	5.90
40	PM00-040A16RP10-Z05	○	/	16	5	40				A	5	+	0.44
50	PM00-050A22RP10-Z05	●	/	22	5	40				A	5	+	0.87
63	PM00-063A22RP10-Z06	●	/	22	5	40				A	6	+	0.60
80	PM00-080B27RP10-Z07	●	/	27	5	50				A	7	+	1.40
100	PM00-100B32RP10-Z08	○	/	32	5	50				A	8	+	1.90
125	PM00-125B40RP10-Z10	○	/	40	5	63				B	10		3.20
160	PM00-160C40RP10-Z12	○	/	40	5	63				C	12		5.90
50	PM00-050A22RP12-Z04	○	/	22	6	45				A	4	+	0.40
63	PM00-063A22RP12-Z04	○	/	22	6	45				A	4	+	0.60
80	PM00-080A27RP12-Z05	○	/	27	6	50				A	5	+	1.10
100	PM00-100A32RP12-Z06	○	/	32	6	50				A	6	+	1.80
125	PM00-125B40RP12-Z07	○	/	40	6	63				B	7		3.70
160	PM00-160C40RP12-Z08	○	/	40	6	63				C	8		4.90

● 常备库存In stock ○ 按订单生产Make to order

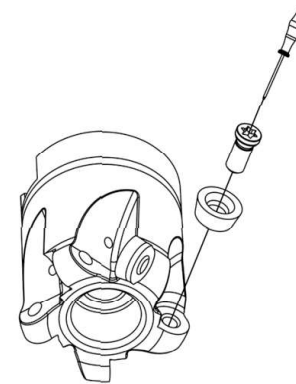
# 仿形铣刀PM00-RP 刀片

## Profile Mill PM00-RP Insert



刀片 Insert	型号 Type	基本尺寸 Dimension (mm)						P		M	K		N	S					
		d	s	d1	r	bs	BM4220	BM4230	BM4130	BM4230	BM3210	BM2220	BM3230	BM5210	BM4210	BM4220	BM4130	BM4230	
	RPMT0803MOE-M	8	3.18	3.4	11°					*	*							*	*
	RPMT10T3MOE-M	10	3.97	4.4	11°					*	*							*	*
	RPMT1204MOE-M	12	4.76	4.4	11°					*	*							*	*
	RPGT10T3MO-AL	10	3.97	4.4	11°								*						
	RPGT1204MO-AL	12	4.76	4.4	11°								*						

首选★ 备选☆  
First choice ★ Second choice ☆



### 配件/SPARE PARTS

刀片/Insert	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
8	20-160	S01-030085	D01-109
10	25-160	S01-040110	D01-115
12	32-160	S01-040110	D01-115

## 仿形铣刀PM00-XO

## Profile Mill PM00-XO

加工精度和多用途性

Precision and versatility

面铣, 旋插补铣镗孔, 仿形铣

face milling, helical interpolation, profiling

内冷设计

Internal coolant supply

## ● 刀片槽型

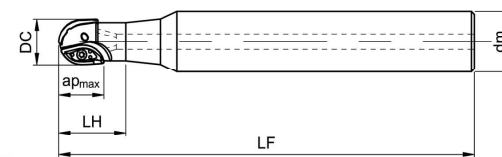
MM 槽型: 精磨刀片, 中等加工, 粗加工仿形首选

MM geometry: fine grinding insert, first choice for rough profiling on medium feedrate

直径范围: 20-50mm  
Diameter range: 20-50mm直径范围: 40-160mm  
Diameter range: 40-160mm面铣  
Face milling仿形铣  
Profile milling螺旋差补铣  
Helical interpolation

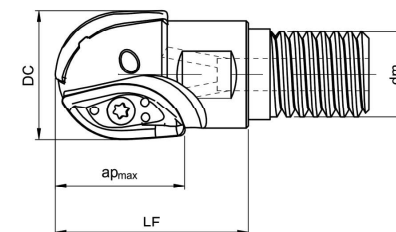
## 仿形铣刀PM00-XO

## Profile Mill PM00-XO



直径(mm) Diameter	型号	库存 状态	尺寸(mm)								接口 类型	齿数 (Z)	内冷 状态	重量 (kg)	
			Dc2	dm	apmax	LF	LH								
12	PM00-012R16XO12-Z02	●	/	12	10	160	25					R	2	+	0.30
16	PM00-016R16XO15-Z02	●	/	16	14	120	36					R	2	+	0.30
16	PM00-016R20XO15-Z02	●	/	20	14	165	49					R	2	+	0.50
20	PM00-020R25XO19-Z02	●	/	25	18	176	54					R	2	+	0.50

● 常备库存In stock ○ 按订单生产Make to order

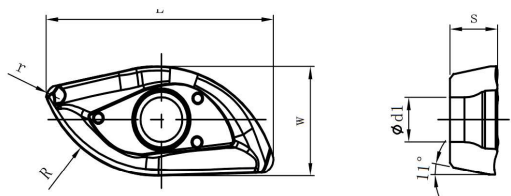


直径(mm) Diameter	型号	库存 状态	尺寸(mm)								接口 类型	齿数 (Z)	内冷 状态	重量 (kg)	
			Dc2	dm	apmax	LF									
12	PM00-012M06XO12-Z02	●	/	M6	10	20						M	2	+	0.10
12	PM00-012R16XO12-Z02	●	/	M8	10	23						M	2	+	0.10
16	PM00-016R16XO15-Z02	●	/	M8	14	23						M	2	+	0.10
16	PM00-016R16XO15-Z02	●	/	M10	14	28						M	2	+	0.10
20	PM00-020R25XO19-Z02	●	/	M10	18	28						M	2	+	0.10
20	PM00-020R25XO19-Z02	●	/	M12	18	35						M	2	+	0.20

● 常备库存In stock ○ 按订单生产Make to order

# 仿形铣刀PM00-XO 刀片

## Profile Mill PM00-XO Insert



刀片 Insert	型号 Type	基本尺寸 Dimension (mm)						P		M		K		N		S					
		L	W	d1	s	R	r	BM6220	BM6230	BM4130	BM2210	BM4130	BM2220	BM3210	BM3230	BM5210	BM4210	BM4220	BM4130	BM4230	
	XOMT1202R6-MM	11.47	5.18	2	2.38	6	0.5			*	*									*	.
	XOMT1503R8-MM	15.1	6.83	2.8	3.18	8	0.8			*	*									*	.
	XOMT19T3R10-MM	19.04	8.59	3.5	3.97	10	1			*	*									*	.

首选★ 备选☆  
First choice ★ Second choice ☆

### 配件/SPARE PARTS

刀片大小	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
12	12	S01805-T06P	T06P
15	16	S02506-T08P	T08P
19	20	S03007-T09P	T09P

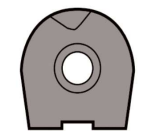
# 仿形铣刀PM00-RO

## Profile Mill PM00-RO

仿形精铣刀  
Finish profiling mill  
高速切削  
High speed milling

### 刀片槽型

L 槽型：精磨刀片，轻型，仿形精加工首选  
L geometry: fine grinding insert, light geometry, first choice for finish profiling



直径范围：20-50mm  
Diameter range: 20-50mm



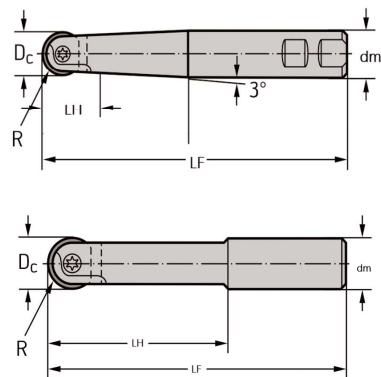
直径范围：40-160mm  
Diameter range: 40-160mm



仿形铣  
Profile milling

## 仿形铣刀PM00-RO

Profile Mill PM00-RO

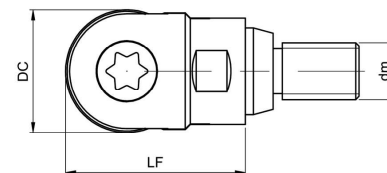


直径(mm) Diameter	型号	库存 状态	尺寸(mm)						接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF	LH					
10	PM00-010E12RO10-Z01	●	/	12	/	150	15		E	1	-	0.13
12	PM00-012E16RO12-Z01	●	/	16	/	160	20		E	1	-	0.22
16	PM00-016E20RO16-Z01	●	/	20	/	175	26		E	1	-	0.38
20	PM00-020E25RO25-Z01	●	/	25	/	190	18		E	1	-	0.64
												1
10	PM00-010R10RO10-Z01	●	/	10	/	80	30		R	1	-	0.08
10	PM00-010R10RO10L-Z01	●	/	10	/	120	70		R	1	-	0.12
12	PM00-012R12RO12-Z01	●	/	12	/	90	32		R	1	-	0.13
12	PM00-012R12RO12-Z01	●	/	12	/	145	87		R	1	-	0.21
16	PM00-016R16RO16-Z01	●	/	16	/	110	43		R	1	-	0.27
16	PM00-016R16RO16L-Z01	●	/	16	/	195	128		R	1	-	0.45
20	PM00-020R20RO25-Z01	●	/	20	/	130	47		R	1	-	0.49
20	PM00-020R20RO25L-Z01	●	/	20	/	240	157		R	1	-	0.92

● 常备库存In stock ○ 按订单生产Make to order

## 仿形铣刀PM00-RO

Profile Mill PM00-RO



直径(mm) Diameter	型号	库存 状态	尺寸(mm)						接口 类型	齿数(Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF						
10	PM00-010M06RO10-Z01	●	/	M4	/	25			M	1	+	0.10
12	PM00-012M12RO12-Z01	●	/	M6	/	25			M	1	+	0.10
16	PM00-016M10RO16-Z01	●	/	M8	/	25			M	1	+	0.10
20	PM00-020M12RO20-Z01	●	/	M10	/	30			M	1	+	0.10

● 常备库存In stock ○ 按订单生产Make to order

## 仿形铣刀PM00-RO 刀片

Profile Mill PM00-RO insert

刀片外形	型号 Type	基本尺寸 Dimension (mm)						P	M	K	N	S	H
		Dc	R					BM2100	BM2100	BM2100	BM2100	BM2100	BM2100
	ROHT1025-L	10	5					★	★	★	☆	☆	★
	ROHT1225-L	12	6					★	★	★	☆	☆	★
	ROHT1630-L	16	8					★	★	★	☆	☆	★
	ROHT2030-L	20	10										

首选★ 备选☆

First choice ★ Second choice ☆

## 配件/SPARE PARTS

刀片/Insert	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
10	10	RO10-S390	T15
12	12	RO12-S391	T20
16	16	RO16-S392	T20
20	20	RO20-S393	T20

# 倒角铣刀

## Chamfer Mill

CM-SD & CM-TC系列倒角铣刀  
CM-SD & CM-TC series chamfering mill  
应用于各类倒角加工

For various chamfering application

15° 30° 45° 60° 倒角，满足客户各种需求

15°, 30°, 45°, 60°, for different chamfering needs

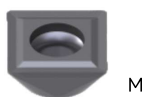
长切削刃扩大倒角加工范围

Long cutting edge for short and big chamfering

### 刀片槽型

M槽型：中等进口，通用倒角刀片

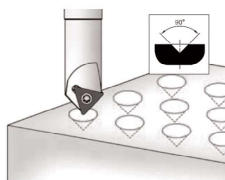
M geometry: Medium feedrate, general insert for chamfering



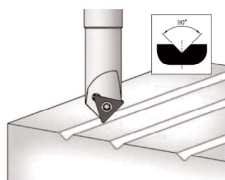
直径范围：20-50mm  
Diameter range: 20-50mm



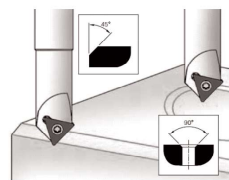
直径范围：40-160mm  
Diameter range: 40-160mm



定心



开槽



倒角

应用范围和推荐切削条件 Application and parameter recommendation

被加工件 Material	硬度 (HrC)	定心、开槽		倒角	
		VC (m/min)	fz (mm/t)	VC (m/min)	fz (mm/t)
软钢, 碳钢, 合金钢 Steel	Under HRC 30	80-200	0.01-0.04	100-250	0.04-0.06
高碳钢、合金钢 High carbon steel	HRC 30-40	150-250	0.02-0.06	150-300	0.05-0.10
铝、铜 Aluminium		150-300	0.04-0.08	150-350	0.05-0.10
铸铁 Cast iron		80-150	0.02-0.06	100-250	0.05-0.10
不锈钢 Stainless steel		60-120	0.01-0.03	60-150	0.03-0.06
耐热合金 HRSA		60-80	0.01-0.03	60-100	0.03-0.06

# 倒角铣刀

## Chamfer Mill

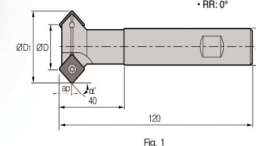


Fig. 1

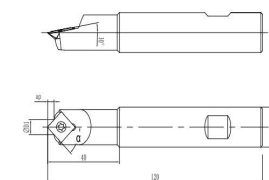


Fig. 2

直径(mm) Diameter	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)		
			Dc2	dm	apmax	LF	LH	刀具形式 Type	前倒角角度 Forward chamfering angle					后倒角角度 Back chamfering angle	倒角范围 Chamfering range
25	CM15-025W20SD11-Z02	●	30.5	20	9.5	40	120	1	15°	/	Ø25-Ø30	W	2	-	0.13
25	CM30-025W20SD11-Z02	●	35.5	20	8.5	40	120	1	30°	60°	Ø25-Ø35	W	2	-	0.15
7	CM45-007W20SD11-Z01	●	21.9	20	7	40	120	1	45°	/	Ø7-Ø21	W	1	-	0.15
19	CM45-019W20SD11-Z02	●	33.9	20	7	40	120	1	45°	45°	Ø19-Ø33	W	2	-	0.26
25	CM45-025W20SD11-Z03	●	39.9	20	7	40	120	1	45°	45°	Ø25-Ø39	W	3	-	0.25
25	CM60-025W32SD11-Z03	●	43.3	32	5	40	120	1	60°	30°	Ø25-Ø42	W	3	-	0.30
0	CM45-000W20SD11-Z01	●	7.5	20	3.5	40	120	2	45°	45°	Ø19-Ø33	W	1	-	0.32

● 常备库存 In stock ○ 按订单生产 Make to order

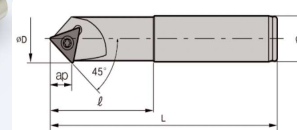


Fig. 1

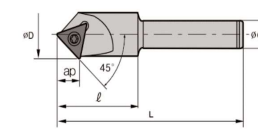
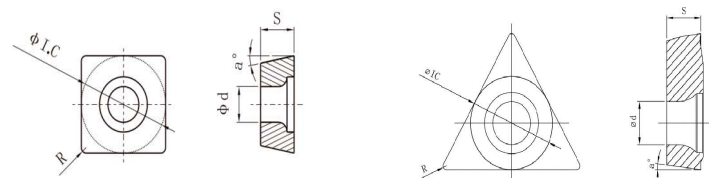



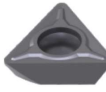
Fig. 2

直径(mm) Diameter	型号	库存状态	尺寸(mm)							接口类型	齿数 (Z)	内冷状态	重量 (kg)		
			Dc2	dm	apmax	LF	LH	刀具形式 Type	前倒角角度 Forward chamfering angle					后倒角角度 Back chamfering angle	倒角范围 Chamfering range
0	CM45-000R20TC16-Z01	●	22	12	10	40	90	2	15°	12-20	Ø0-Ø20	R	1	-	0.28
0	CM45-000R20TC16-Z01	●	22	12	10	50	110	1	30°	6-20	Ø0-Ø20	R	1	-	0.28
0	CM45-000R20TC16-Z01	●	22	20	10	60	200	1	45°	0-20	Ø0-Ø20	R	1	-	0.28

● 常备库存 In stock ○ 按订单生产 Make to order

## 倒角铣刀刀片 Chamfer Mill Insert



刀片 Insert	型号 Type	基本尺寸 Dimension (mm)						P	M	K	S	N	H
		d	s	d1	r	bs		BM2220	BM2220	BM2220	BM2220	BM2220	BM2220
	SDMT11T3-M	10.94	3.97	4.4	0.8			*	*	*	*	*	*
	TCMT16T3-M	9.525	3.97	4.4	0.8			*	*	*	*	*	*

首选★ 备选☆  
First choice ★ Second choice ☆

### 配件/SPARE PARTS

刀片大小	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
SD11	All	CM040	CM040-T15
TC16	All	CM040	CM040-T15

## 三面刃铣刀SF90-MN Full side and face mill SF90-MN

加工精度和多用途性

Precision and versatility

多用途槽铣刀

Multi-purpose side and face mill

槽铣、背铣、切断，面铣、螺旋插补铣镗孔

Slot milling, back face milling, parting, face milling, helical interpolation boring



E-L

E-W

### 刀片槽型

E-L 槽型：精磨刀片，轻型加工，高表面质量要求首选

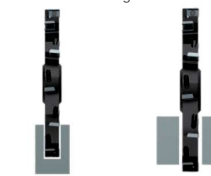
E-L geometry: fine grinding insert, first choice for light cutting, high precision and surface finish request

E-M 槽型：精磨刀片，通用槽型

E-M geometry: fine grinding insert, general purpose geometry



直径范围：20-50mm

直径范围：40-160mm  
Diameter range: 40-160mm直径范围：40-160mm  
Diameter range: 40-160mm面铣  
Face milling背铣  
Back face milling螺旋差补铣  
Helical interpolation槽铣  
Slot milling切断  
Parting

### 刀片进给切削参数推荐 Feed recommendations

刀片尺寸 Insert size	刀片槽形 Geometry	推荐每齿进给(mm) Rec. Fz	最小每齿进给(mm) Min. Fz	最大每齿进给(mm) Max. Fz
05	WL	0.05	0.02	0.15
08\11\14	WL	0.06	0.03	0.15
05	WM	0.07	0.04	0.18
08\11\14	WM	0.09	0.05	0.20



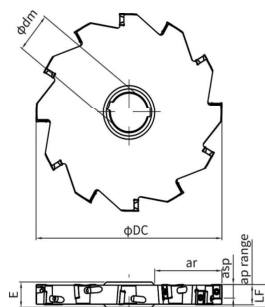
# 固定槽式三面刃铣刀SF90

## Full Side and Face Mill with Fixed Pockets SF90

直径范围: 80-315mm  
Diameter range: 80-315mm

槽宽范围: 7.9-26.5mm  
Slot width range: 7.9-26.5mm

带键槽的孔  
Bore with keyway

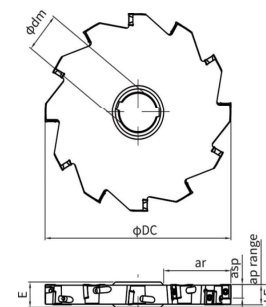


直径(mm) Diameter	订货号 Ordering code	库存状态	刀片尺寸 Insert size	刀片圆角范围 Insert radius range	尺寸(mm) Dimensions					接口类型	齿数 No. of teeth	重量(Kg) Weight	
					dm	槽宽范围 ap range	E	LF (min.-max.)	ar				asp
80	SF90-080H27-05DMXX.XX	○	05	0.2-1.54	27	7.9-10.0	16	12-13	19.5	5.6	H	6	0.30
100	SF90-100H32-05DMXX.XX	○	05	0.2-1.54	32	7.9-10.0	16	12-13	25.5	5.6	H	8	0.50
125	SF90-125H40-05DMXX.XX	○	05	0.2-1.54	40	7.9-10.0	16	12-13	34.0	5.6	H	10	0.80
160	SF90-160H40-05DMXX.XX	○	05	0.2-1.54	40	7.9-10.0	16	12-13	51.5	5.6	H	12	1.30
200	SF90-200H50-05DMXX.XX	○	05	0.2-1.54	50	7.9-10.0	16	12-13	64.5	5.6	H	16	2.10
080	SF90-080H27-08EMXX.XX	○	08	0.2-1.54	27	10.0-12.0	16	13-14	19.5	6.2	H	6	0.30
100	SF90-100H32-08EMXX.XX	○	08	0.2-1.54	32	10.0-12.0	16	13-14	25.5	6.2	H	8	0.50
125	SF90-125H40-08EMXX.XX	○	08	0.2-1.54	40	10.0-12.0	16	13-14	34.0	6.2	H	10	0.80
160	SF90-160H40-08EMXX.XX	○	08	0.2-1.54	40	10.0-12.0	16	13-14	51.5	6.2	H	12	1.30
200	SF90-200H50-08EMXX.XX	○	08	0.2-1.54	50	10.0-12.0	16	13-14	64.5	6.2	H	16	2.10
80	SF90-080H27-08FMXX.XX	○	08	0.2-1.54	27	12.0-15.0	16	14-15.5	19.5	7.6	H	6	0.40
100	SF90-100H32-08FMXX.XX	○	08	0.2-1.54	32	12.0-15.0	16	14-15.5	25.5	7.6	H	8	0.60
125	SF90-125H40-08FMXX.XX	○	08	0.2-1.54	40	12.0-15.0	16	14-15.5	34.0	7.6	H	10	0.90
160	SF90-160H40-08FMXX.XX	○	08	0.2-1.54	40	12.0-15.0	16	14-15.5	51.5	7.6	H	12	1.60
200	SF90-200H50-08FMXX.XX	○	08	0.2-1.54	50	12.0-15.0	16	14-15.5	64.5	7.6	H	16	2.50
100	SF90-100H32-11KMXX.XX	○	11	0.2-1.54	32	15.0-17.5	18.5	16.8-18	25.5	10.6	H	6	0.80
125	SF90-125H40-11KMXX.XX	○	11	0.2-1.54	40	15.0-17.5	18.5	16.8-18	34.0	10.6	H	8	1.20
160	SF90-160H40-11KMXX.XX	○	11	0.2-1.54	40	15.0-17.5	18.5	16.8-18	51.5	10.6	H	10	2.00
200	SF90-200H50-11KMXX.XX	○	11	0.2-1.54	50	15.0-17.5	18.5	16.8-18	64.5	10.6	H	12	3.20
250	SF90-250H50-11KMXX.XX	○	11	0.2-1.54	50	15.0-17.5	18.5	16.8-18	89.5	10.6	H	16	5.10
315	SF90-315H60-11KMXX.XX	○	11	0.2-1.54	60	15.0-17.5	18.5	16.8-18	114.5	10.6	H	20	8.10
125	SF90-125H40-11LMXX.XX	○	11	0.2-1.54	40	17.5-20.5	21.5	19.5-21	34.0	10.6	H	8	1.40
160	SF90-160H40-11LMXX.XX	○	11	0.2-1.54	40	17.5-20.5	21.5	19.5-21	51.5	10.6	H	10	2.40
200	SF90-200H50-11LMXX.XX	○	11	0.2-1.54	50	17.5-20.5	21.5	19.5-21	64.5	10.6	H	12	3.70

● 常备库存In stock ○ 按订单生产Make to order

# 固定槽式三面刃铣刀SF90

## Full Side and Face Mill with Fixed Pockets SF90



直径(mm) Diameter	订货号 Ordering code	库存状态	刀片尺寸 Insert size	刀片圆角范围 Insert radius range	尺寸(mm) Dimensions					接口类型	齿数 No. of teeth	重量(Kg) Weight	
					dm	槽宽范围 ap range	E	LF (min.-max.)	ar				asp
250	SF90-250H50-11LMXX.XX	○	11	0.2-1.54	50	17.5-20.5	21.5	19.5-21	89.5	10.6	H	16	6.00
315	SF90-315H60-11LMXX.XX	○	11	0.2-1.54	60	17.5-20.5	21.5	19.5-21	114.5	10.6	H	20	9.50
160	SF90-160H40-11QMXX.XX	○	14	0.2-1.54	40	20.5-23.5	24.5	22.5-24	51.5	13.6	H	10	2.80
200	SF90-200H50-11QMXX.XX	○	14	0.2-1.54	50	20.5-23.5	24.5	22.5-24	64.5	13.6	H	12	4.40
250	SF90-250H50-11QMXX.XX	○	14	0.2-1.54	50	20.5-23.5	24.5	22.5-24	89.5	13.6	H	16	7.10
315	SF90-315H60-11QMXX.XX	○	14	0.2-1.54	60	20.5-23.5	24.5	22.5-24	114.5	13.6	H	20	11.30
160	SF90-160H40-11RMXX.XX	○	14	0.2-1.54	40	23.5-26.5	27.5	25.5-27	51.5	13.6	H	10	3.30
200	SF90-200H50-11RMXX.XX	○	14	0.2-1.54	50	23.5-26.5	27.5	25.5-27	64.5	13.6	H	12	4.30
250	SF90-250H50-11RMXX.XX	○	14	0.2-1.54	50	23.5-26.5	27.5	25.5-27	89.5	13.6	H	16	8.20
315	SF90-315H60-11RMXX.XX	○	14	0.2-1.54	60	23.5-26.5	27.5	25.5-27	114.5	13.6	H	20	13.10

订购刀盘时, 需注明槽宽 (XX.XX)

When ordering mill, state slot width(XX.XX)in the ordering code

订货示例 Ordering example:SF90-125H40-08EM10.00

订购刀片圆角r大于1.54的刀片时, 需注明圆角r要求 (rX.XX)

When ordering insert radius bigger than 1.54, state radius(rX.XX)in the ordering code

订货示例 Ordering example:SF90-125H40-08EM10.00r3.00

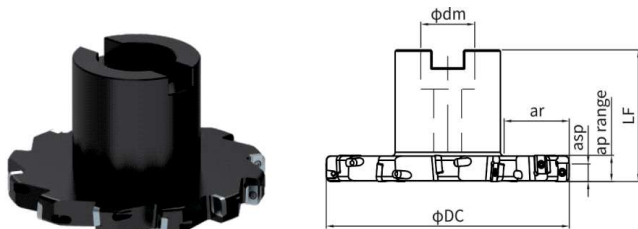
# 固定槽式三面刃铣刀SF90

## Full Side and Face Mill with Fixed Pockets SF90

直径范围: 80-315mm  
Diameter range: 80-315mm

槽宽范围: 7.9-26.5mm  
Slot width range: 7.9-26.5mm

心轴式

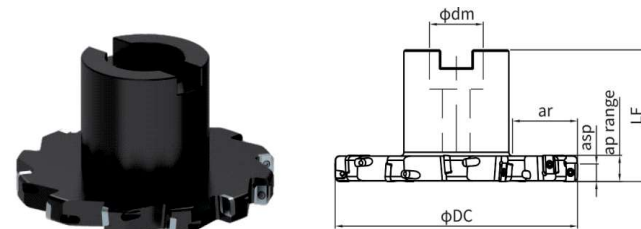


直径 (mm) Diameter	订货号 Ordering code	库存状态	刀片尺寸 Insert size	刀片圆角范围 Insert radius range	尺寸(mm) Dimensions						接口类型	齿数 No. of teeth	重量(Kg) Weight
					d m	槽宽范围 ap range	E	LF min.-max.	ar	asp			
80	SF90-080A27-05DMXX.XX	○	05	0.2-1.54	27	7.9-10.0	63-64	A	20	5.6	A	6	0.80
100	SF90-100A27-05DMXX.XX	○	05	0.2-1.54	27	7.9-10.0	63-64	A	22	5.6	A	8	1.20
125	SF90-125B32-05DMXX.XX	○	05	0.2-1.54	32	7.9-10.0	63-64	B	29.5	5.6	B	10	1.80
160	SF90-160B40-05DMXX.XX	○	05	0.2-1.54	40	7.9-10.0	63-64	B	41	5.6	B	12	2.60
200	SF90-200C40-05DMXX.XX	○	05	0.2-1.54	40	7.9-10.0	63-64	C	51.0	5.6	C	16	7.00
080	SF90-080A27-08EMXX.XX	○	08	0.2-1.54	27	10.0-12.0	63-64	A	20.0	6.2	A	6	1.10
100	SF90-100A27-08EMXX.XX	○	08	0.2-1.54	27	10.0-12.0	63-64	A	22.0	6.2	A	8	1.70
125	SF90-125B32-08EMXX.XX	○	08	0.2-1.54	32	10.0-12.0	63-64	B	29.5	6.2	B	10	1.80
160	SF90-160B40-08EMXX.XX	○	08	0.2-1.54	40	10.0-12.0	63-64	B	41.0	6.2	B	12	2.60
200	SF90-200C40-08EMXX.XX	○	08	0.2-1.54	40	10.0-12.0	63-64	C	51.0	6.2	C	16	4.30
80	SF90-080A27-08FMXX.XX	○	08	0.2-1.54	27	12.0-15.0	63-64.5	A	20.0	7.6	A	6	1.20
100	SF90-100A27-08FMXX.XX	○	08	0.2-1.54	27	12.0-15.0	63-64.5	A	22.0	7.6	A	8	1.80
125	SF90-125B32-08FMXX.XX	○	08	0.2-1.54	32	12.0-15.0	63-64.5	B	29.5	7.6	B	10	2.00
160	SF90-160B40-08FMXX.XX	○	08	0.2-1.54	40	12.0-15.0	63-64.5	B	41.0	7.6	B	12	3.00
200	SF90-200C40-08FMXX.XX	○	08	0.2-1.54	40	12.0-15.0	63-64.5	C	51.0	7.6	C	16	7.60
100	SF90-100A27-11KMXX.XX	○	11	0.2-1.54	27	15.0-17.5	63-64.25	A	25.7	10.6	A	6	1.70
125	SF90-125B32-11KMXX.XX	○	11	0.2-1.54	32	15.0-17.5	63-64.25	B	29.5	10.6	B	8	2.30
160	SF90-160B40-11KMXX.XX	○	11	0.2-1.54	40	15.0-17.5	63-64.25	B	41.0	10.6	B	10	3.30
200	SF90-200C40-11KMXX.XX	○	11	0.2-1.54	40	15.0-17.5	63-64.25	C	51.0	10.6	C	12	8.00
250	SF90-250C60-11KMXX.XX	○	11	0.2-1.54	60	15.0-17.5	63-64.25	C	56.0	10.6	C	16	9.50
315	SF90-315C60-11KMXX.XX	○	11	0.2-1.54	60	15.0-17.5	63-64.25	C	88.5	10.6	C	20	16.70
125	SF90-125B32-11LMXX.XX	○	11	0.2-1.54	32	17.5-20.5	63-64.5	B	29.5	10.6	B	8	2.50
160	SF90-160B40-11LMXX.XX	○	11	0.2-1.54	40	17.5-20.5	63-64.5	B	41.0	10.6	B	10	3.70
200	SF90-200C40-11LMXX.XX	○	11	0.2-1.54	40	17.5-20.5	63-64.5	C	51.0	10.6	C	12	5.90

● 常备库存In stock ○ 按订单生产Make to order

# 固定槽式三面刃铣刀SF90

## Full Side and Face Mill with Fixed Pockets SF90



直径 (mm) Diameter	订货号 Ordering code	库存状态	刀片尺寸 Insert size	刀片圆角范围 Insert radius range	尺寸(mm) Dimensions						接口类型	齿数 No. of teeth	重量(Kg) Weight
					d m	槽宽范围 ap range	E	LF min.-max.	ar	asp			
250	SF90-250C60-11LMXX.XX	○	11	0.2-1.54	60	17.5-20.5	63-64.5	C	56.0	10.6	C	16	10.00
315	SF90-315C60-11LMXX.XX	○	11	0.2-1.54	60	17.5-20.5	63-64.5	C	88.5	10.6	C	20	13.60
160	SF90-160B40-11QMXX.XX	○	14	0.2-1.54	40	20.5-23.5	63-64.5	B	41.0	13.6	B	10	3.60
200	SF90-200C40-11QMXX.XX	○	14	0.2-1.54	40	20.5-23.5	63-64.5	C	51.0	13.6	C	12	8.80
250	SF90-250C60-11QMXX.XX	○	14	0.2-1.54	60	20.5-23.5	63-64.5	C	56.0	13.6	C	16	13.30
315	SF90-315C60-11QMXX.XX	○	14	0.2-1.54	60	20.5-23.5	63-64.5	C	88.5	13.6	C	20	19.20
160	SF90-160B40-11RMXX.XX	○	14	0.2-1.54	40	23.5-26.5	63-64.5	B	41.0	13.6	B	10	4.50
200	SF90-200C40-11RMXX.XX	○	14	0.2-1.54	40	23.5-26.5	63-64.5	C	51.0	13.6	C	12	9.20
250	SF90-250C60-11RMXX.XX	○	14	0.2-1.54	60	23.5-26.5	63-64.5	C	56.0	13.6	C	16	13.90
315	SF90-315C60-11RMXX.XX	○	14	0.2-1.54	60	23.5-26.5	63-64.5	C	88.5	13.6	C	20	20.40

订购刀盘时, 需注明槽宽 (XX.XX)

When ordering mill, state slot width(XX.XX)in the ordering code

订货示例 Ordering example:SF90-125H40-08EM10.00

订购刀片圆角r大于1.54的刀片时, 需注明圆角r要求 (rX.XX)

When ordering insert radius bigger than 1.54, state radius(rX.XX)in the ordering code

订货示例 Ordering example:SF90-125H40-08EM10.00r3.00

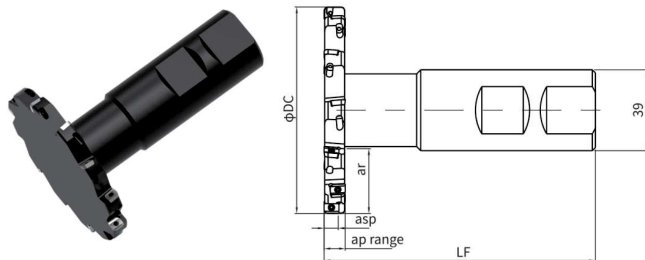
# 固定槽式三面刃铣刀SF90

## Full Side and Face Mill with Fixed Pockets SF90

直径范围: 80-100mm  
Diameter range: 80-100mm

槽宽范围: 7.9-12mm  
Slot width range: 7.9-12mm

侧压式  
Weldon



直径(mm) Diameter	订货号 Ordering code	库存状态	刀片尺寸 Insert size	刀片圆角范围 Insert radius range	尺寸(mm) Dimensions							接口类型	齿数 No. of teeth	重量(Kg) Weight
					dm	槽宽范围 ap range	E	LF min.-max.	ar	asp				
80	SF90-080E32-05DMXX.XX	○	05	0.2-1.54	32	7.9-10.0	63-64	132	23	6.2	B	6	1.00	
100	SF90-100E40-05DMXX.XX	○	05	0.2-1.54	40	7.9-10.0	63-64	152	28	6.2	B	8	1.90	
080	SF90-080E32-08EMXX.XX	○	08	0.2-1.54	32	10.0-12.0	63-64	132	23	6.2	B	6	1.00	
100	SF90-100E40-08EMXX.XX	○	08	0.2-1.54	40	10.0-12.0	63-64	152	28	6.2	B	8	1.90	

● 常备库存In stock ○ 按订单生产Make to order

订购刀盘时, 需注明槽宽 (XX.XX)

When ordering mill, state slot width(XX.XX)in the ordering code

订货示例 Ordering example:SF90-125H40-08EM10.00

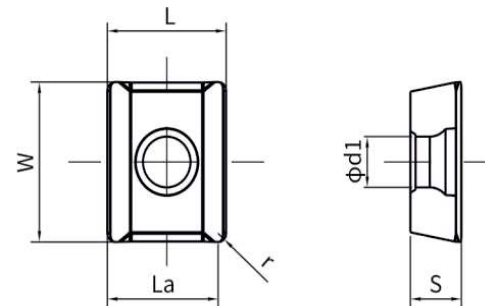
订购刀片圆角r大于1.54的刀片时, 需注明圆角r要求 (rX.XX)

When ordering insert radius bigger than 1.54, state radius(rX.XX)in the ordering code

订货示例 Ordering example:SF90-125H40-08EM10.00r3.00

# 三面刃铣刀刀片

## Full Side and Face Mill Inserts



刀片尺寸	型号 Type	基本尺寸 Dimension (mm)							P		M	K	N	S				
		l	la	W	S	d1	r											
08	MN084504E-L	8.5	8.1	9.5	4.45	2.9	0.4			☆	☆		☆		☆	☆		☆
	MN084508E-L	8.5	7.7	9.5	4.45	2.9	0.8			☆	☆		☆		☆	☆		☆
	MR/L084515E-L	8.5	-	9.5	4.45	2.9	1.52			☆	☆		☆		☆	☆		☆
	MR/L084515E-L	8.5	-	9.5	4.45	2.9	1.52			☆	☆		☆		☆	☆		☆
	MR/L084523E-L	8.5	-	9.5	4.45	2.9	2.29			☆	☆		☆		☆	☆		☆
	MR/L084523E-L	8.5	-	9.5	4.45	2.9	2.29			☆	☆		☆		☆	☆		☆
	MR/L084530E-L	8.5	-	9.5	4.45	2.9	3.05			☆	☆		☆		☆	☆		☆
	MR/L084530E-L	8.5	-	9.5	4.45	2.9	3.05			☆	☆		☆		☆	☆		☆

● 常备库存In stock ○ 按订单生产Make to order

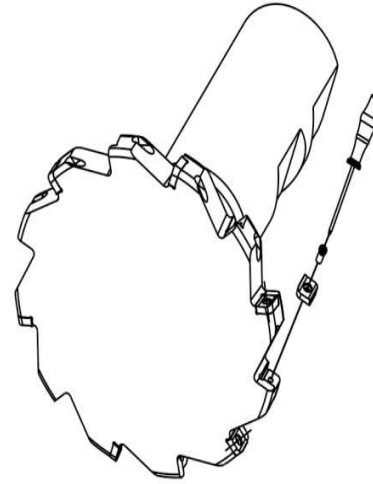
## 三面刃铣刀刀片

## Full Side and Face Mill Inserts

刀片尺寸 Insert size	型号 Type	基本尺寸 Dimension (mm)						P		M	K	N	S					
		L	W	d1	s	R	r	BM6220	BM6230	BM4120	BM2220	BM4120	BM3230	BM5220	BM4210	BM4220	BM4120	BM4230
05	MN054508E-M	6.5	5.7	9.5	4.45	2.9	0.8	*	☆		*	☆	*					*
	MR/L054515E-M	6.5	-	9.5	4.45	2.9	1.52	*	☆		*	☆	*					*
	MR/L054515E-M	6.5	-	9.5	4.45	2.9	1.52	*	☆		*	☆	*					*
	MR/L054523E-M	6.5	-	9.5	4.45	2.9	2.29	*	☆		*	☆	*					*
	MR/L054523E-M	6.5	-	9.5	4.45	2.9	2.29	*	☆		*	☆	*					*
	MR/L054530E-M	6.5	-	9.5	4.45	2.9	3.05	*	☆		*	☆	*					*
MR/L054530E-M	6.5	-	9.5	4.45	2.9	3.05	*	☆		*	☆	*					*	
08	MN084504E-M	8.5	8.1	9.5	4.45	2.9	0.4	*	☆		*	☆	*					*
	MN084508E-M	8.5	7.7	9.5	4.45	2.9	0.8	*	☆		*	☆	*					*
	MR/L084515E-M	8.5	-	9.5	4.45	2.9	1.52	*	☆		*	☆	*					*
	MR/L084515E-M	8.5	-	9.5	4.45	2.9	1.52	*	☆		*	☆	*					*
	MR/L084523E-M	8.5	-	9.5	4.45	2.9	2.29	*	☆		*	☆	*					*
	MR/L084523E-M	8.5	-	9.5	4.45	2.9	2.29	*	☆		*	☆	*					*
MR/L084530E-M	8.5	-	9.5	4.45	2.9	3.05	*	☆		*	☆	*					*	
MR/L084530E-M	8.5	-	9.5	4.45	2.9	3.05	*	☆		*	☆	*					*	
11	MN115008E-M	11.5	10.7	11.5	4.95	4.6	0.8	*	☆		*	☆	*					*
	MR/L115023E-M	11.5	-	11.5	4.95	4.6	2.29	*	☆		*	☆	*					*
	MR/L115023E-M	11.5	-	11.5	4.95	4.6	2.29	*	☆		*	☆	*					*
	MR/L115030E-M	11.5	-	11.5	4.95	4.6	3.05	*	☆		*	☆	*					*
	MR/L115030E-M	11.5	-	11.5	4.95	4.6	3.05	*	☆		*	☆	*					*
	MR/L115048E-M	11.5	-	11.5	4.95	4.6	4.83	*	☆		*	☆	*					*
MR/L115048E-M	11.5	-	11.5	4.95	4.6	4.83	*	☆		*	☆	*					*	
MR/L115063E-M	11.5	-	11.5	4.95	4.6	6.35	*	☆		*	☆	*					*	
MR/L115063E-M	11.5	-	11.5	4.95	4.6	6.35	*	☆		*	☆	*					*	
14	MN145008E-M	14.5	13.7	11.5	4.95	4.6	0.8	*	☆		*	☆	*					*
	MR/L145015E-M	14.5	-	11.5	4.95	4.6	1.52	*	☆		*	☆	*					*
	MR/L145015E-M	14.5	-	11.5	4.95	4.6	1.52	*	☆		*	☆	*					*
	MR/L145023E-M	14.5	-	11.5	4.95	4.6	2.29	*	☆		*	☆	*					*
	MR/L145023E-M	14.5	-	11.5	4.95	4.6	2.29	*	☆		*	☆	*					*
	MR/L145030E-M	14.5	-	11.5	4.95	4.6	3.05	*	☆		*	☆	*					*
	MR/L145030E-M	14.5	-	11.5	4.95	4.6	3.05	*	☆		*	☆	*					*
	MR/L145048E-M	14.5	-	11.5	4.95	4.6	4.83	*	☆		*	☆	*					*
	MR/L145048E-M	14.5	-	11.5	4.95	4.6	4.83	*	☆		*	☆	*					*
	MR/L145063E-M	14.5	-	11.5	4.95	4.6	6.35	*	☆		*	☆	*					*
MR/L145063E-M	14.5	-	11.5	4.95	4.6	6.35	*	☆		*	☆	*					*	

首选★ 备选☆

First choice ★ Second choice ☆



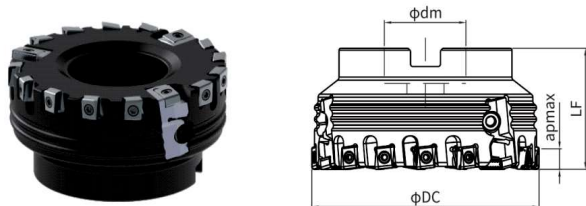
## 配件/SPARE PARTS

刀片尺寸 Insert size	刀具直径/Diameter	刀片夹紧螺钉/Clamping screw	刀片螺钉扳手/Screw Wrench
	DC		
05	80-200	S01-025087	D01-107
08	80-200	S01-030085	D01-108
11	100-315	S01-040110	D01-115
14	160-315	S01-040110	D01-115

# 可调式精铣面铣刀FF90-AN&LN

## Adjustable Finish Mill FF90-AN&LN

不等齿距设计  
Uneven pitch

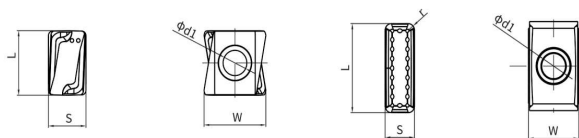


直径 Dc	型号	库存 状态	尺寸(mm)							接口 类型	齿数 (Z)	内冷 状态	重量 (kg)
			Dc2	dm	apmax	LF							
100	FF90-100A32AN11_LN15-Z09	○	/	32	8	63				A	9+2		3.20
125	FF90-125B40AN11_LN15-Z13	○	/	40	8	63				B	13+3		4.60
160	FF90-160C40AN11_LN15-Z17	○	/	40	8	63				C	17+3		8.40
200	FF90-200C60AN11_LN15-Z23	○	/	60	8	63				C	23+3		9.80
250	FF90-250C60AN11_LN15-Z29	○	/	60	8	63				C	29+3		14.70

● 常备库存In stock ○ 按订单生产Make to order


# 可调式精铣面铣刀FF90-AN&LN 刀片

## Adjustable Finish Mill FF90-AN&LN Inserts

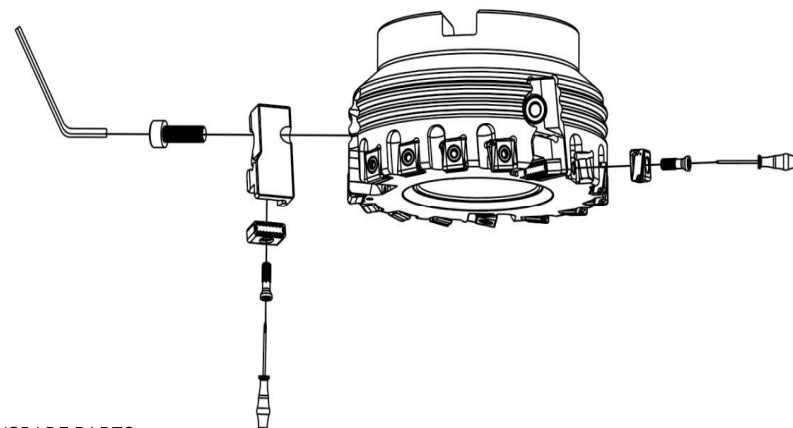


ANGX110708-PM

LNHQ150512AN-W

刀片 外形	型号 Type	基本尺寸 Dimension (mm)							P		K	
		l	w	s	d1	r	α	BM2220	BM4120	BM2220	BM4120	
	ANGX110708-PM	11.5	11.76	7.11	4.5	0.8	0	☆	★	☆	★	
	LNHQ150512E-W	15.875	9.525	5.56	4.5	1.2	0	☆	★	☆	★	

首选 ★ 备选 ☆  
First choice ★ Second choice ☆

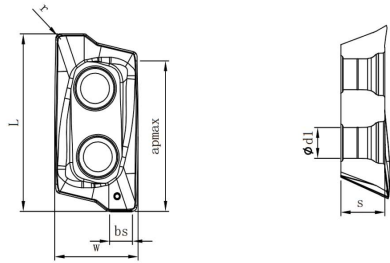


配件/SPARE PARTS

刀片尺寸 Insert size	刀具直径 Diameter	刀片夹紧螺钉 Clamping screw	刀片螺钉扳手 Screw Wrench	修光刀座	修光刀片 调整螺钉型号	修光刀座 锁紧螺钉型号	调整螺钉 扳手型号	锁紧螺钉 扳手型号
AN11	100-250	S01-040121	D01-115	FF90-CA2036-LN15	S06-050100F	S03-060250	L02-0025	L02-0005
LN15	100-250	S01-040121	D01-115					

## 其它常用铣削刀片

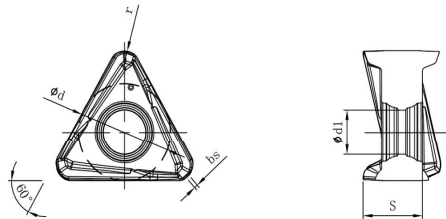
### Commonly Used Milling Inserts




大切深方肩铣刀AO刀片  
Shoulder Mill AO insert

刀片 Insert	型号 Type	基本尺寸							P	M	K	N	S
		Dimension (mm)											
		L	W	S	d1	r	bs	apmax					
	AOMT190608PDER-HP	21.95	10.82	6.85	3.81	0.8	2.6	18.1	*	*	*		
	AOMT190610PDER-HP	21.95	10.82	6.85	3.81	1.0	2.6	18.1	*	*	*		
	AOMT190616PDER-HP	21.95	10.82	6.85	3.81	1.6	2.6	18.1	*	*	*		
	AOMT220708PDER-HP	25.91	12.8	7.57	4.5	0.8	3.43	22.6	*	*	*		

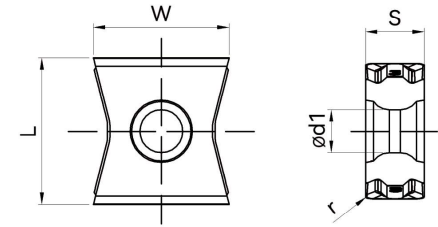
首选★ 备选☆  
First choice ★ Second choice ☆



大切深方肩铣刀TN16刀片  
Shoulder Mill TN16 Insert

刀片 Insert	型号 Type	基本尺寸						P	M	K	N	S
		Dimension (mm)										
		d	s	d1	r	bs	apmax					
	TNGU160610PNTR-42	11.9	7.67	5.5	1	0.7		*	*	*		

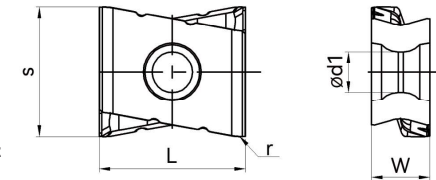
首选★ 备选☆  
First choice ★ Second choice ☆




方肩铣刀SM90-LN刀片  
Shoulder Mill SM90-LN Insert

刀片 Insert	型号 Type	基本尺寸							P	M	K	N	S	
		Dimension (mm)												
		L	W	S	d1	r	bs	apmax						
	LNKG1206EN-2	11.6	11	6	4.4	0.8			☆	★	☆	★	★	☆
	LNKX1506PN-N MM	15	13.88	6	4.4	0.8			☆	★	☆	★	★	☆
	LNKX1506PN-N MR	15	13.88	6	4.4	0.8			☆	★	☆	★	★	☆

首选★ 备选☆  
First choice ★ Second choice ☆



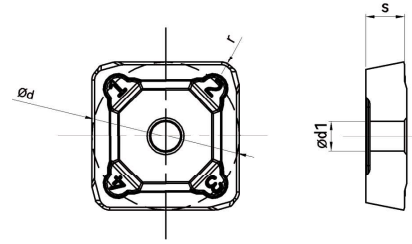
重载方肩铣刀SM90-LN刀片  
Heavy Duty Shoulder Mill SM90-LN Insert

刀片 Insert	型号 Type	基本尺寸						P	M	K	N	S		
		Dimension (mm)												
		d	s	d1	r	bs	apmax							
	LNKT1506-ZR	15.94	14.12	6.35	4.4	1.2			☆	★	☆	☆	★	
	LNKT2510-ZR	25.5	18	10	5.6	1.0			☆	★	☆	☆	★	

首选★ 备选☆  
First choice ★ Second choice ☆

# 其它常用铣削刀片

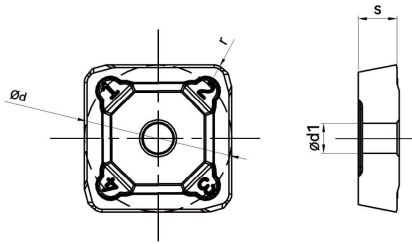
## Commonly Used Milling Inserts



面铣SPKN刀片  
Face Mill SPKN Insert

刀片 Insert	型号 Type	基本尺寸																	
		Dimension (mm)								P	M	K	N	S					
		L	W	d	s	d1	r	bs	BP05E	BP02E	BP05E	BP02E	BP05E	BU810	BU810	BP02E	BM4120	BM4130	
	SPKN1203EDSR-SU	-	-	12.70	3.18	2.60	1.0		☆	☆	☆	☆	☆	☆					
	SPKN1504EDSR-SU	-	-	15.88	4.76	2.60	1.20		☆	☆	☆	☆	☆	☆					

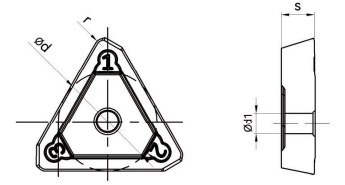
首选★ 备选☆  
First choice ★ Second choice ☆



面铣SDKN刀片  
Face Mill SDKN Insert

刀片 Insert	型号 Type	基本尺寸																	
		Dimension (mm)								P	M	K	N	S					
		L	W	d	s	d1	r	bs	BP05E	BP02E	BP05E	BP02E	BP05E	BU810	BU810	BP02E	BM4120	BM4130	
	SDKN1203EDSR-SU	-	-	12.70	3.18	2.60			☆	☆	☆	☆	☆	☆					
	SDKN1504EDSR-SU	-	-	15.88	4.76	2.60			☆	☆	☆	☆	☆	☆					

首选★ 备选☆  
First choice ★ Second choice ☆

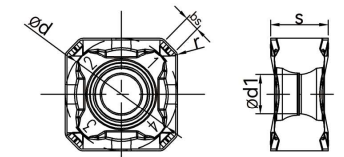


面铣TPKN刀片  
Face Mill TPKN Insert

刀片 Insert	型号 Type	基本尺寸																
		Dimension (mm)								P	M	K	N	S				
		L	W	d	s	d1	r	bs	BP05E	BP02E	BP05E	BP02E	BP05E	BU810	BP02E	BM4120	BM4130	
	TPKN1603PDSR-SU	-	-	9.53	3.18	2.60	0.60		☆	☆	☆	☆	☆	☆				
	TPKN2204PDSR-SU	-	-	12.70	4.76	2.60	0.60		☆	☆	☆	☆	☆	☆				

首选★ 备选☆  
First choice ★ Second choice ☆

面铣SNMX1206刀片  
Face Mill TPKN Insert



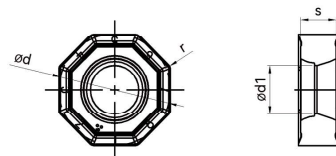
刀片 Insert	型号 Type	基本尺寸																
		Dimension (mm)								P	M	K	N	S				
		L	W	d	s	d1	r	bs	BM220	BP02E	BM220	BP02E	BM3210	BP02E	BM5220	BM4120	BM4130	
	SNMX1206ANEN-MQ	-	-	12.70	5.78	5.25	0.60	0.60	☆	☆	☆	☆	☆	☆				
																		



首选★ 备选☆  
First choice ★ Second choice ☆

# 其它常用铣削刀片

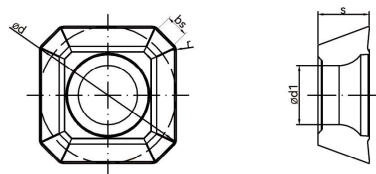
## Commonly Used Milling Inserts

面铣ONMU刀片  
Face Mill ONMU Insert




刀片 Insert	型号 Type	基本尺寸							P	M	K	N	S	
		Dimension (mm)												
		L	W	d	s	d1	r	bs						
	ONMU060508-M1	-	-	16.00	5.50	5.40	0.80		★	☆	☆	☆	☆	
	ONMU0705ANPN-MJ	-	-	17.50	6.18	7.50	0.80		★	☆	☆	☆	☆	

首选★ 备选☆  
First choice ★ Second choice ☆

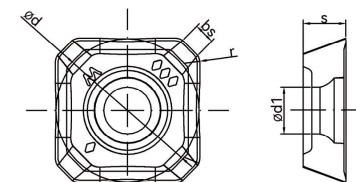



面铣SE12刀片  
Face Mill SE12 Insert

刀片 Insert	型号 Type	基本尺寸							P	M	K	N	S	
		Dimension (mm)												
		L	W	d	s	d1	r	bs						
	SEKT1204AFSN	-	-	12.70	3.18	2.60		2.1	★	☆	☆	☆	☆	

首选★ 备选☆  
First choice ★ Second choice ☆

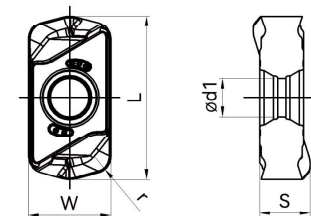
面铣SE13刀片  
Face Mill SE13 Insert




刀片 Insert	型号 Type	基本尺寸							P	M	K	N	S	
		Dimension (mm)												
		L	W	d	s	d1	r	bs						
	SEMT13T3AGSN-JM	-	-	13.40	3.97	4.4	1.50	1.90	★	☆	☆	☆	☆	

首选★ 备选☆  
First choice ★ Second choice ☆

快进给LNGU刀片  
Face Mill LNGU Insert



刀片 Insert	型号 Type	基本尺寸							P	M	K	N	S	
		Dimension (mm)												
		L	W	d	s	d1	r	bs						
	LNGU030310R-GM	11.9	6.20	-	3.96	3.45	1.0		★	☆	☆	☆	☆	★

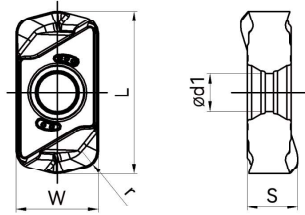
首选★ 备选☆  
First choice ★ Second choice ☆




## 其它常用铣削刀片

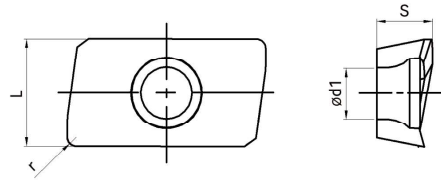
### Commonly Used Milling Inserts



快进给LNMU刀片  
Face Mill LNGU Insert



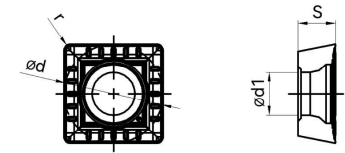
刀片 Insert	型号 Type	基本尺寸							P	M	K	N	S
		Dimension (mm)											
		L	W	d	s	d1	r	bs					
	LNMU030312R-JM	11.88	6.00	-	3.67	2.80	1.2	*	*	*			


方肩铣刀AP刀片  
Shoulder Mill AP Insert



刀片 Insert	型号 Type	基本尺寸							P	M	K	N	S
		Dimension (mm)											
		L	W	d	s	d1	r	bs					
	APMT1135PDER-M2	11.20	6.20	-	3.50	2.80	0.80	*	*	*	*	*	*
	APMT1604PDER-M2	17.15	9.30	-	4.76	4.40	0.80	*	*	*	*	*	*
	APMT1135PDER-H2	11.20	6.20	-	3.50	2.80	0.80	*	*	*	*	*	*
	APMT1604PDER-H2	17.15	9.30	-	4.76	4.40	0.80	*	*	*	*	*	*
	APMT1604PDER-H6	17.15	9.30	-	4.76	4.40	3.10	*		*			
	APMT1135PDER-EM	11.20	6.20	-	3.50	2.80	0.80	*		*			
	APMT1604PDER-EM	17.25	9.30	-	5.30	4.40	0.80	*		*			
	APMT170508R-EM	18.52	10.63	-	5.60	4.40	0.80	*					
	APMT170516R-EM	18.52	10.63	-	5.60	4.40	1.60	*					
	APMT170524R-EM	18.52	10.63	-	5.60	4.40	2.40	*					

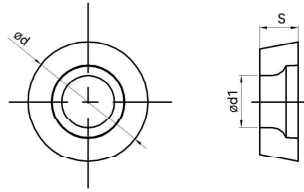
方肩铣刀SP刀片  
Shoulder Mill SP Insert



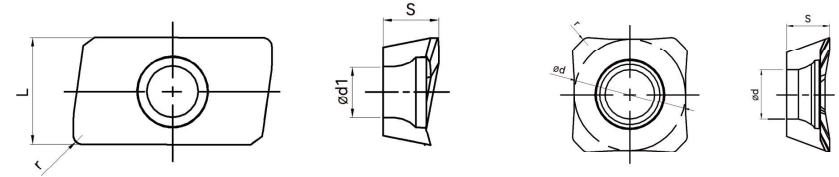
刀片 Insert	型号 Type	基本尺寸							P	M	K	N	S
		Dimension (mm)											
		L	W	d	s	d1	r	bs					
	SPMT09T308-D51	-	-	9.53	3.97	4.40	0.80	*	*	*	*	*	*
	SPMT120408-D51	-	-	12.70	4.76	5.50	0.80	*	*	*	*	*	*
	SPMT120408-MQ	-	-	12.70	4.76	5.50	0.80	*	*	*	*	*	*

## 其它常用铣削刀片

## Commonly Used Milling Inserts

仿形铣R刀片  
Profil Milling R Insert

刀片 Insert	型号 Type	基本尺寸 Dimension (mm)							P	M	K	N	S
		L	W	d	s	d1	r	bs					
	RPMW0803MOT	-	-	8.00	3.18	4.40			*	*		*	
	RPMW1003MOT	-	-	10.00	3.97	4.40			*	*		*	
	RPMW1204MOT	-	-	12.00	4.76	4.40			*			*	
	RDMW10T3MOT	-	-	10.00	3.97	4.40			*			*	
	RDMW1204MOT	-	-	12.00	4.76	4.40			*	*		*	
	RDMW1604MOT	-	-	16.00	4.76	5.50			*			*	
	RPMT0827MOE-BJS	-	-	8.00	2.70	3.40			*	*		*	
	RPMT10T3MOE-BJS	-	-	10.00	3.97	4.40			*	*	*	*	
	RPMT1204MOE-BJS	-	-	12.00	4.76	4.40			*	*	*	*	
	ROMT10T3MOE-MM	-	-	10.00	3.97	4.40					*		
	ROMT1204MOE-MM	-	-	12.00	4.76	4.40					*		
	RPMT10T3MOE-BDL	-	-	10.00	3.97	4.40					*		
	ROMT1204MOE-BDL	-	-	12.00	4.76	4.40					*		
	RPGT1003MO-LHC	-	-	10.00	3.18	4.40						*	
	RDGT10T3MO-LHC	-	-	10.00	3.97	4.40						*	
	RDGT10T3MO-LHC	-	-	12.00	4.76	4.40						*	

铝合金专用刀片  
Aluminum Mill Insert

刀片外形	型号 Type	基本尺寸 Dimension (mm)							N	
		L	W	d	s	d1	r	bs	BM5210	BM5220
	APKT113502PDFR-G2C	11.31	6.17	-	3.50	2.80	0.20		*	
	APKT113504PDFR-G2C	11.31	6.17	-	3.50	2.80	0.40		*	
	APKT113508PDFR-G2C	11.31	6.17	-	3.50	2.80	0.80		*	
	APKT1604PDFR-G2C	17.00	9.62	-	4.76	4.40	0.80			
	APKT160402FR-LHC	16.88	9.53	-	4.76	4.40	0.20		*	
	APKT160404FR-LHC	16.88	9.53	-	4.76	4.40	0.40		*	
	APKT160408FR-LHC	16.88	9.53	-	4.76	4.40	0.80		*	
	APKT160412FR-LHC	16.88	9.53	-	4.76	4.40	1.20		*	
	APKT160416FR-LHC	16.88	9.53	-	4.76	4.40	1.60		*	
	SEKT120404AFFN-LH-2C	-	-	12.70	4.76	5.50	0.40		*	
	SEKT1204AFFN-LH-2C	-	-	12.70	4.76	5.50	0.80		*	
	SEKT13T3AZFN-LHC	-	-	13.40	3.97	4.40	0.40		*	

## 75%切宽下切削速度推荐

## Cutting Speed Recommendations on 75% ae

ISO	材料Material	单位切削力 Cutting force	布氏硬度 Hardness		
		N/mm <sup>2</sup>		BM6220	
P	非合金钢Carbon steel				
	C=0.1-0.25%	1500	125	400-275	
	C=0.25-0.55%	1600	150	360-245	
	C=0.55-0.80%	1700	170	340-235	
	低合金钢 (合金元素≤5%) Low carbon steel (alloy ≤5%)				
	非淬硬钢Not-hardended steel	1700	180	290-200	
	轴承钢Bearing steel	1800	210	245-150	
	调质Tempered steel	1850	275	265-145	
	调质Tempered steel	2050	350	190-125	
	高合金钢 (合金元素 > 5%) High carbon steel (alloy > 5%)				
	退火Annealed steel	1950	200	190-160	
	淬硬工具钢Hardended tool steel	3000	325	120-80	
	铸钢Casting steel				
	非合金Non-alloy	1550	180	280-180	
	低合金 (合金元素≤5%) Low alloy (alloy ≤5%)	1600	200	205-140	
	高合金 (合金元素 > 5%) High alloy (alloy > 5%)	2050	225	210-175	
	M	铁素体/马氏体/棒材/锻件Ferrite/Martensite/Bar/Forging			
		非淬硬Not-hardended	1800	200	
沉淀硬化Precipitation hardening		2850	330		
淬硬钢Hardended		2350	330		
奥氏体 棒材/锻件 Austenitic bars/forgings					
奥氏体 Austenitic		1800	180		
沉淀硬化Precipitation hardening		2850	330		
超级奥氏体 Super austenitic		2250	200		
奥氏体-铁素体 (双相) 棒材/锻件 Austenitic-ferrite (duplex) bars/forgings					
不可焊接Unweldable≥0.05% C		2000	230		
可焊接Weldable < 0.05% C		2450	260		
铁素体/马氏体 铸件 Ferrite/Martensite Castings					
非淬硬Not-hardended		1700	200		
沉淀硬化Precipitation hardening		2450	330		
淬硬钢Hardended		2150	330		
奥氏体 铸件 Austenitic castings					
奥氏体Austenitic		1700	180		
沉淀硬化Precipitation hardening		2450	330		
超级奥氏体Super austenitic	2150	200			
奥氏体-铁素体 (双相) 铸件Austenitic-Ferrite (duplex)					
不可焊接Unweldable≥0.05% C	1800	230			
可焊接weldable < 0.05% C	2250	260			

切削速度Cutting Speed Vc(m/min)									
涂层Coated Grade									
BM6230	BM2220	BM2230	BM3210	BM3230	BM5210	BM5220	BM4120	BM4130	BM4230
340-230	375-280						375-280	245-225	340-255
305-225	215-175						215-175	245-200	215-175
290-195	200-165						200-165	235-190	200-165
250-185	180-145						180-145	200-165	180-145
220-140	130-105						130-105	150-125	130-105
205-125	165-140						165-140	195-160	165-140
155-105	110-90						110-90	125-105	110-90
145-135	125-105						125-105	135-110	125-105
75-50	90-75						90-75	100-80	90-75
200-140	170-140								
150-100	140-115						200-140	170-140	170-140
180-145	120-115						150-100	140-115	140-115
	255-180	200-140					255-180	200-140	200-140
	180-130	130-70					180-130	150-70	150-70
	185-125	135-70					185-125	155-70	155-70
	250-180	180-145					250-180	190-145	190-145
	175-120	100-80					175-120	140-80	140-80
	160-115	125-70					160-115	145-70	145-70
	225-160	200-130					225-160	210-130	210-130
	185-120	160-100					185-120	180-100	180-100
	225-160	190-130					225-160	220-130	220-130
	155-110	110-90					155-110	150-90	150-90
	110-75	90-40					110-75	100-40	100-40
	195-140	160-120					195-140	190-120	190-120
	160-115	130-100					160-115	160-100	160-100
	110-70	90-60					110-70	100-60	100-60
	160-130	100-180					160-130	150-120	150-120
	170-115	90-160					170-115	160-110	160-110

ISO	材料Material	单位切削力 Cutting force	布氏硬度 Hardness	
		N/mm <sup>2</sup>		BM6220
		K	可锻铸铁 Malleable iron	
铁素体 (短切屑) Ferrite (short chip)	790		130	
珠光体 (长切屑) Pearlite (long chips)	900		230	
灰口铸铁 Grey cast iron				
低抗拉强度 Low tensile strength	890		180	
高抗拉强度 High tensile strength	970		220	
球墨铸铁 SG nodular cast iron				
铁素体 Ferrite	900		160	
珠光体 Pearlite	1350		250	
马氏体 Martensite	2100		380	
N	铝合金 Aluminum alloy			
	锻造或锻造+冷作, 非时效处理 Forging or forging+cold work	400	60	
	锻造或锻造加时效处理 Forging or forging+aging treatment	650	100	
	铝合金 Aluminum alloy			
	铸造, 非时效 Casting	600	75	
	铸造或铸造加时效处理 Casting or casting + aging treatment	700	90	
	铝合金 Aluminum alloy			
	铸造, 13-15% 硅 Casting	700	130	
	铸造, 16-22% 硅 Casting	700	130	
	铜和铜合金 Copper and copper alloy			
	易切合金, ≥1% 铅 Easy cutting alloy	550	110	
	黄铜, 铅青铜, ≤1% 铅 Brass	550	90	
	青铜与无铅铜, 包括电解铜 Bronze and lead-free copper	1350	100	
	高温合金 铁基 High-temperature alloy steel based			
	退火或固溶处理 Annealing or solution treatment	2400	200	
时效处理或固溶处理加时效处理 Aging treatment or solution treatment plus aging treatment	2500	280		
S	镍基 Nickel based			
	退火或固溶处理 Annealing or solution treatment"	2650	250	
	时效处理或固溶处理加时效处理 Aging treatment or solution treatment plus aging treatment	2900	350	
	铸造或铸造加时效处理 Casting or casting plus aging treatment	3000	320	
	钴基 Cobalt based			
	退火或固溶处理 Annealing or solution treatment	2700	200	
	固溶处理加时效处理 Solution treatment plus aging treatment	3000	300	
	铸造或铸造加时效处理 Casting or casting plus aging treatment	3100	320	
	钛合金 Titanium alloy 2)		Rm3)	
	商业纯 Commercial pure (99.5% Ti)	1300	400	
α, 近α与α+β合金, 退火 α, close to α and α+β Alloy, Annealed	1400	950		
α+β合金时效处理, β合金, 退火或时效处理 Alloy aging treatment, β Alloy, annealed or aged treatment	1400	1050		
H	超硬钢 调质处理	4200	59 HRC	55-36
	冷硬铸铁	2200	400	100-70

RM= 最终的拉伸强度测量 UTS (Mpa)

切削速度Cutting Speed Vc(m/min)									
涂层Coated Grade									
BM6230	BM2220	BM2230	BM3210	BM3230	BM5210	BM5220	BM4120	BM4130	BM4230
	295-200		305-200	260-130			260-130		
	240-170		255-170	230-105			230-105		
	335-225		335-225	265-140			265-140		
	250-170		270-180	240-115			240-115		
	200-135		210-140	160-90			160-90		
	185-150		195-130	150-80			150-80		
	120-90		130-90	120-70			120-70		
					940-730	750-650			
					850-720	680-580			
					940-810	1600-1450			
					850-720	1450-1250			
					320-300	300-260			
					285-245	225-190			
					470-405	370-320			
					470-405	370-320			
					330-285	260-220			
							65-55	55-40	65-55
							45-40	40-30	45-40
							60-55	48-38	60-55
							37-32	36-29	37-32
							45-39	44-35	45-39
							28-22	27-22	28-22
							26-18	22-16	26-18
							18-14	18-14	18-14
							130-110	130-110	130-110
							60-50	50-35	60-50
							45-40	42-35	45-40
45-29							40-29		
85-55							70-55		

# 25%切宽下切削速度推荐

## Cutting Speed Recommendations on 25% ae

ISO	材料Material	单位切削力 Cutting force	布氏硬度 Hardness	
		N/mm <sup>2</sup>		BM6220
P	非合金钢Carbon steel			
	C=0.1-0.25%	1500	125	570-500
	C=0.25-0.55%	1600	150	510-470
	C=0.55-0.80%	1700	170	485-445
	低合金钢 (合金元素≤5%) Low carbon steel (alloy ≤5%)			
	非淬硬钢Not-hardened steel	1700	180	425-390
	轴承钢Bearing steel	1800	210	310-285
	调质Tempered steel	1850	275	400-365
	调质Tempered steel	2050	350	260-245
	高合金钢 (合金元素 > 5%) High carbon steel (alloy > 5%)			
	退火Annealed steel	1950	200	350-320
	淬硬工具钢Hardened tool steel	3000	325	135-125
	铸钢Casting steel			
	非合金Non-alloy	1550	180	410-375
	低合金 (合金元素≤5%) Low alloy (alloy ≤5%)	1600	200	320-290
	高合金 (合金元素 > 5%) High alloy (alloy > 5%)	2050	225	245-220
M	铁素体/马氏体/棒材/锻件Ferrite/Martensite/Bar/Forging			
	非淬硬Not-hardened	1800	200	
	沉淀硬化Precipitation hardening	2850	330	
	淬硬钢Hardened	2350	330	
	奥氏体 棒材/锻件 Austenitic bars/forgings			
	奥氏体 Austenitic	1800	180	
	沉淀硬化Precipitation hardening	2850	330	
	超级奥氏体 Super austenitic	2250	200	
	奥氏体-铁素体 (双相) 棒材/锻件 Austenitic-ferrite (duplex) bars/forgings			
	不可焊接Unweldable≥0.05% C	2000	230	
	可焊接Weldable < 0.05% C	2450	260	
	铁素体/马氏体 铸件 Ferrite/Martensite Castings			
	非淬硬Not-hardened	1700	200	
	沉淀硬化Precipitation hardening	2450	330	
	淬硬钢Hardened	2150	330	
	奥氏体 铸件 Austenitic castings			
	奥氏体Austenitic	1700	180	
	沉淀硬化Precipitation hardening	2450	330	
	超级奥氏体Super austenitic	2150	200	
	奥氏体-铁素体 (双相) 铸件Austenitic-Ferrite (duplex)			
不可焊接Unweldable≥0.05% C	1800	230		
可焊接weldable < 0.05% C	2250	260		

切削速度Cutting Speed Vc(m/min)									
涂层Coated Grade									
BM6230	BM2220	BM2230	BM3210	BM3230	BM5210	BM5220	BM4120	BM4130	BM4230
395-360	345-310						395-360	345-310	395-360
355-325	305-275						355-325	305-275	355-325
335-305	285-255						335-305	285-255	335-305
280-265	230-215						280-265	230-215	280-265
220-200	170-150						220-200	170-150	220-200
280-255	230-205						280-255	230-205	280-255
185-165	135-115						185-165	135-115	185-165
195-175	145-125						195-175	145-125	195-175
85-80	65-50						85-80	65-50	85-80
255-235	235-215						255-235	205-215	255-235
195-185	155-135						195-185	155-135	195-185
150-135	120-105						150-135	120-105	150-135
	275-255	210-185					275-255	285-265	285-265
	195-180	145-130					195-180	195-180	195-180
	200-190	155-145					200-190	205-190	205-190
	270-255	205-175					270-255	240-225	240-225
	190-175	140-125					190-175	195-175	195-175
	150-120	140-120					150-120	170-120	170-120
	245-230	185-160					245-230	250-235	250-235
	185-175	130-110					185-175	170-160	170-160
	260-240	195-170					260-240	235-170	235-170
	170-160	130-110					170-160	170-110	170-110
	130-105	120-100					130-105	160-100	160-100
	180-130	170-100					180-130	180-100	180-100
	215-180	160-140					215-180	210-140	210-140
	175-160	120-100					175-160	170-100	170-100
	210-190	180-110					210-190	200-180	200-180
	175-165	160-90					175-165	170-160	170-160

## 25%切宽下切削速度推荐

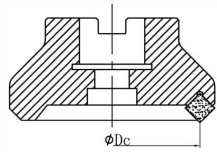
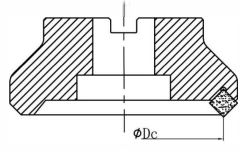
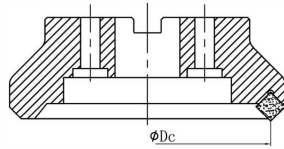
## Cutting Speed Recommendations on 25% ae

ISO	材料Material	单位切削力 Cutting force	布氏硬度 Hardness	
		N/mm2		BM6220
P	非合金钢Carbon steel			
	C=0.1-0.25%	1500	125	570-500
	C=0.25-0.55%	1600	150	510-470
	C=0.55-0.80%	1700	170	485-445
	低合金钢 (合金元素≤5%) Low carbon steel (alloy ≤5%)			
	非淬硬钢Not-hardended steel	1700	180	425-390
	轴承钢Bearing steel	1800	210	310-285
	调质Tempered steel	1850	275	400-365
	调质Tempered steel	2050	350	260-245
	高合金钢 (合金元素 > 5%) High carbon steel (alloy > 5%)			
	退火Annealed steel	1950	200	350-320
	淬硬工具钢Hardended tool steel	3000	325	135-125
	铸钢Casting steel			
	非合金Non-alloy	1550	180	410-375
低合金 (合金元素≤5%) Low alloy (alloy ≤5%)	1600	200	320-290	
高合金 (合金元素 > 5%) High alloy (alloy > 5%)	2050	225	245-220	
M	铁素体/马氏体/棒材/锻件Ferrite/Martensite/Bar/Forging			
	非淬硬Not-hardended	1800	200	
	沉淀硬化Precipitation hardening	2850	330	
	淬硬钢Hardended	2350	330	
	奥氏体 棒材/锻件 Austenitic bars/forgings			
	奥氏体 Austenitic	1800	180	
	沉淀硬化Precipitation hardening	2850	330	
	超级奥氏体 Super austenitic	2250	200	
	奥氏体-铁素体 (双相) 棒材/锻件 Austenitic-ferrite (duplex) bars/forgings			
	不可焊接Unweldable≥0.05% C	2000	230	
	可焊接Weldable < 0.05% C	2450	260	
	铁素体/马氏体 铸件 Ferrite/Martensite Castings			
	非淬硬Not-hardended	1700	200	
	沉淀硬化Precipitation hardening	2450	330	
淬硬钢Hardended	2150	330		
奥氏体 铸件 Austenitic castings				
奥氏体Austenitic	1700	180		
沉淀硬化Precipitation hardening	2450	330		
超级奥氏体Super austenitic	2150	200		
奥氏体-铁素体 (双相) 铸件Austenitic-Ferrite (duplex)				
不可焊接Unweldable≥0.05% C	1800	230		
可焊接weldable < 0.05% C	2250	260		

切削速度Cutting Speed Vc(m/min)									
涂层Coated Grade									
BM6230	BM2220	BM2230	BM3210	BM3230	BM5210	BM5220	BM4120	BM4130	BM4230
395-360	345-310						395-360	345-310	395-360
355-325	305-275						355-325	305-275	355-325
335-305	285-255						335-305	285-255	335-305
280-265	230-215						280-265	230-215	280-265
220-200	170-150						220-200	170-150	220-200
280-255	230-205						280-255	230-205	280-255
185-165	135-115						185-165	135-115	185-165
195-175	145-125						195-175	145-125	195-175
85-80	65-50						85-80	65-50	85-80
255-235	235-215						255-235	205-215	255-235
195-185	155-135						195-185	155-135	195-185
150-135	120-105						150-135	120-105	150-135
	275-255	210-185					275-255	285-265	285-265
	195-180	145-130					195-180	195-180	195-180
	200-190	155-145					200-190	205-190	205-190
	270-255	205-175					270-255	240-225	240-225
	190-175	140-125					190-175	195-175	195-175
	150-120	140-120					150-120	170-120	170-120
	245-230	185-160					245-230	250-235	250-235
	185-175	130-110					185-175	170-160	170-160
	260-240	195-170					260-240	235-170	235-170
	170-160	130-110					170-160	170-110	170-110
	130-105	120-100					130-105	160-100	160-100
	180-130	170-100					180-130	180-100	180-100
	215-180	160-140					215-180	210-140	210-140
	175-160	120-100					175-160	170-100	170-100
	210-190	180-110					210-190	200-180	200-180
	175-165	160-90					175-165	170-160	170-160

# 芯轴铣刀接口尺寸

## Dimension of Milling Cutter Arbor

Arbora A ( $40 \leq D_c < 100$ )Arbora B ( $80 < D_c < 160$ )

DC	DCONMS	Dimension(mm)									Fig.	Arbor
		A	B	E	DHUB		d1	d2	d3			
					For mold&die	For general						
32	16	8.4	5.6	20	30	-	-	-	-	E		
32	16	8.4	5.6	20	30	-	9	13.5	-	A		
40	16	8.4	5.6	20	38	-	9	13.5	-	A		
40	22	10.4	6.3	22	38	-	11	17	-	A		
50	22	10.4	6.3	22	40	45	11	17	-	A		
63	22	10.4	6.3	22	47	-	11	17	-	A		
80	25.4	9.526	6	26	-	70	13	20	-	A		
80	27	12.4	7	28	58	70	13	22	-	A		
100	31.75	12.7	8	32	-	80	18	26	-	A		
100	31.75	12.7	8	32	-	80	-	46	-	B		
100	32	14.4	8	26	66	85	18	26	-	A		
100	32	14.4	8	26	66	85	-	46	-	B		
125	38.1	15.875	10	38	80	-	-	56	-	B		
125	40	16.4	9	32	85	-	22	32	-	A		
125	40	16.4	9	32	85	-	-	56	-	B		
160	40	16.4	9	32	110	-	-	90	66.7	C		
160	50.8	19.05	11	38	100	-	-	72	-	B		
200	47.625	25.4	14	38	130	-	-	132	101.6	C		
200	60	25.7	14	40	130	-	-	132	101.6	C		
250	47.625	25.4	14	38	160	-	-	150	101.6	C		
250	60	25.7	14	40	160	-	-	150	101.6	C		
315	60	25.7	14	40	225	-	-	225	-	C		