

PCB Milling Cutter and Drill Needle  
Product Catalog  
**PCB铣刀钻针产品册**

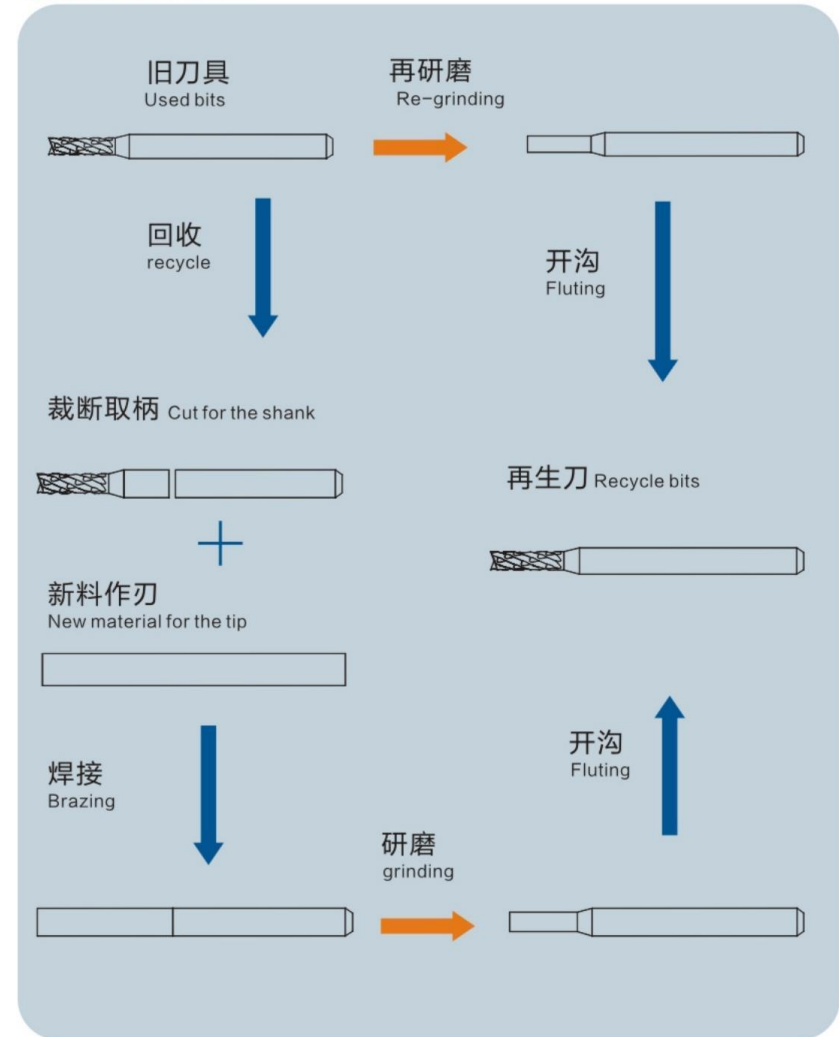


厦门合一钨精密科技有限公司  
Xiamen HYW precision technology company  
[www.hywprecision.com](http://www.hywprecision.com)

# 目录 CONTENTS

- 06 刀具回收  
Recycle Process
- 07 刀型说明  
INSTRUCTION
- 08 菱齿型铣刀  
RCF/RFL
- 09 单旋型铣刀  
RRS/RLS/RCB
- 10 断屑型铣刀  
RRC
- 11 逆刃铣刀  
RNL
- 12 软板铣刀  
PRS/PLS/PRB
- 13 金刚石系列PCB涂层铣刀  
PCB Router With Diamond coating series
- 14 铠甲系列PCB涂层铣刀  
PCB router with armor-J coating series
- 15 MD型标准钻头  
MICRO DRILL SERIES ( MD )
- 16 LD型标准钻头  
MICRO DRILL SERIES ( LD )
- 17 标准型槽刀  
SLOT DRILL SERIES ( SX )
- 18 UC型钻头  
UC DRILL SERIES ( UC )
- 19 标准型钻头  
STAND DRILL SERIES ( ST )
- 20 EA系列槽刀  
SLOT KNIFE SERIES ( EA )
- 21 断屑槽系列钻头  
CHIP BREAKER BIT SERIES
- 22 LST系列钻头  
LST BIT SERIES
- 23 铝基板铣刀  
RRD
- 24 盲捞、倒角  
PRD/PRT/PRF/PDJ
- 25 V槽刀、盲钻  
PVC/PMZ
- 26 槽刀、锥度成型  
PLL/PZD
- 27 复合纤维刀、半月  
PFH/PBY
- 28 内倒角精修刀、金属板精修  
PND/PJS
- 29 切削参数计算公式  
Machining Parameter Calculation Formula
- 30 套环说明  
RING SETTING

## 回收再生新刀 Recycle Process



## 铣刀说明 INSTRUCTION

### 刀尖分类 End type

类型	示意图
鱼尾型 Fish Tail	
钻尖型 Drill Point	
平底型 Flat-End	

★鱼尾型为标准型铣刀，若需平底型、钻尖型，请在订单标示。  
Fish tail type is standard router; Flat-end and drill types can be provided upon the requirement.

### 上下排屑分类 Draft type

上排屑 Up Draft	下排屑 Down Draft

★上排屑为标准型铣刀，若需下排屑铣刀，请在订单标示。  
Up draft type is supplied as standard; Down draft can be provided upon the requirement.

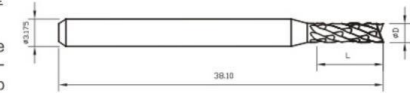
### 客制产品 customized product

★可依客户需求订制客制化产品。  
Customer design is possible.

## RCF

菱齿型铣刀适用于各种普通板材、无卤素板的成型加工，具有通用性强、高寿命等特点。

RCF Series have diamond cut geometry and suitable for contouring on most general PCBs and Halogen-free PCBs. The range offers good swarf/chip evacuation and long-life.

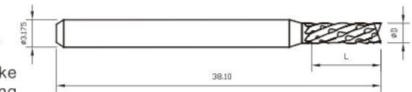


规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 $\phi D$ Mill Dia	刃长 L Flute Length	转速 (Krpm) Spindle Speed	走刀速 (mm/s) Table Feed
1.0	7.0	40-45	5-7
1.1	7.0	42-46	8-12
1.2	7.0	41-45	8-14
1.3	7.0	38-42	8-14
1.5	8.0	31-35	10-16
1.6	8.0	28-33	11-16
1.8	10.0	26-30	12-18
1.9	10.0	25-29	12-18
2.0	10.0	24-29	11-16
2.2	10.0	23-27	16-20
2.4	10.0	22-26	16-20
2.5	10.0	21-25	16-20
3.0	10.0	18-22	16-20
3.175	12.0	18-22	16-20

## RFL

左槽刀适用于PCB下排屑成型的加工场合，如SMT板的成型切割，亦可满足板面毛刺的精修加工。

RFL series suitable for down draft processing, like SMT contouring; and also suitable for the finishing condition.



规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 $\phi D$ Mill Dia	刃长 L Flute Length	转速 (Krpm) Spindle Speed	走刀速 (mm/s) Table Feed
1.0	7.0	40-45	5-7
1.2	8.0	41-45	8-14
1.5	8.0	31-35	10-16
1.8	8.5	26-30	12-18
2.0	9.0	27-32	11-16
2.2	10.0	24-29	11-16

## RRS/RLS

单旋型铣刀，适用于精修场合，尤其适用于如金手指类板材的成型加工，具有板边光滑、无拉丝等特点。

RRS/RLS series suitable for finishing, especially for gold finger PCBs, with high surface quality.

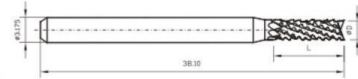


规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
0.6	4.0	40-48	3-5
0.8	5.5	40-78	3-5
1.0	7.0	40-45	5-7
1.2	8.0	38-43	9-11
1.6	8.0	28-33	11-16
1.8	9.0	27-32	11-16
2.0	10.0	24-29	11-16

## RCB

断屑型铣刀，适用于各种普通板材和Hi-Tg板的成型加工，具有高尺寸精度、高进给速、优异的板边质量等特点。

RCB series suitable for contouring on most general printed circuit boards and High-Tg printed circuit boards, high dimensional accuracy, high feed speed and excellent surface quality.

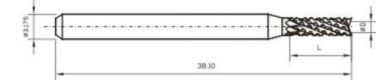


规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
0.8	5.5	40-78	3-5
1.0	7.0	40-45	5-7
1.2	8.0	38-43	9-11
1.5	8.0	28-33	11-16
1.6	8.0	28-33	11-16
1.8	9.0	27-32	11-16
2.0	9.0	24-29	11-16
2.4	10.0	22-26	16-20
3.175	10.0	18-22	16-20

## RRC

断屑型铣刀，适用于各种普通板材和Hi-Tg板的成型加工，具有高尺寸精度、高进给速、优异的板边质量等特点。

RRC series suitable for contouring on most general printed circuit boards and High-Tg printed circuit boards, it offers high dimensional accuracy, high feed speed, and excellent surface quality.

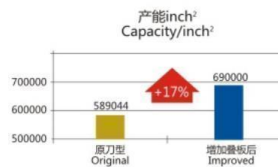


规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
0.6	4.0	40-48	3-5
1.2	7.5	41-45	8-14
1.6	8.0	28-32	10-16
1.8	10.0	26-30	12-18
2.0	10.0	24-28	14-20
2.5	10.0	21-25	16-20

### 应用案例 Example of case

RC1.0×8.5D铣刀的使用寿命提升 RC1.0×8.5D Life improved

刀具名称 Tool type	双右旋铣刀 RRC router
刀具规格 Dimension	RC1.0×8.5D
加工材料 Workpiece material	7100655-1 (H/F), NB板
主轴转速 Spindle speed	S36 KRPM
进给速度 Feed speed	8.5mm/s
加工作用 Working piont	内槽直线往复铣 line cutting
叠板高度 Panel high	1.3mm*5PNL
冷却方式 Type of cooling	无none
切削效果 Achievement	<p>增加叠板后，原刀型断刀率提高至50%，寿命降低至200inch；改善后，断刀率降低至4%，寿命提高至300inch。同时，其每月产能提升约17.1%，合计提升产能约10000inch。</p> <p>The rate of tool breaking fall from 50% to 4% and life increase by 300 inch. The output promote to approximately 17.1% annual month, improving capacity 10000inch in total.</p>



## RNL

逆刃型铣刀, 适用于加工路径覆盖PTH孔、对板边质量要求较高的成型加工。

RNL router is suitable for cutting PCBs with PTH, especially for the high demand of boards edge.



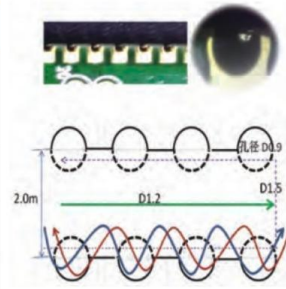
规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
0.5	4.0	46-50	3-5
0.8	5.0	40-48	3-5
1.0	8.0	40-45	5-7
1.4	10.0	38-43	9-11

### 应用案例 Example of case

逆刃NL0.5\*4.0改善PTH孔加工拉丝

Reverse router NL0.5\*4.0 improve machining drawbench

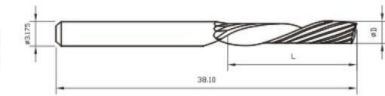
刀具名称 Tool type	逆刃左单旋铣刀
刀具规格 Dimension	NL0.5*4.0C
加工材料 Workpiece material	路径覆盖PTH孔的PCB板材
主轴转速 Spindle speed	S38 KRPM
进给速度 Feed speed	4mm/s
加工作用 Working piont	精修
叠板高度 Panel high	0.8mm*4PNL
冷却方式 Type of cooling	无 none
切削效果 Achievement	<p>原工艺下, 需经过镀锡、酸洗、碱洗等工艺, 流程多, 耗能大; 采用NL铣刀后无需经过镀锡、酸洗、碱洗等工序, 节能降耗, PTH孔拉丝得到有效抑制, 品质得到认可。</p> <p>The original technology cost vast power with many process; Improving the drawbench and PCB quality with NL router.</p>



## PRS/PLS

亚克力铣刀, 适用于亚克力板、PVC、塑料板、木板等的成型加工, 具有大容量排屑槽、锋利刀刃、优异的板边质量等特点。

PRS /PLS router is suitable for routing PVC and boards with high dimensional accuracy, high feed speed, excellent surface quality.

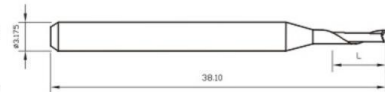


规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.0	5.0	40-45	0.2-0.3
1.5	7.0	30-35	0.5-0.6
2.0	8.0	20-25	0.8-1.0
3.175	10.0		
3.175	22.0	12-15	0.8-1.0
4.0	17.0		

## PRB

软性板用铣刀, 适用于软性板的成型加工, 如FPCB、PP、Teflon等的成型加工, 具有切削锋利, 排屑性能优异等特点。

PRB router is suitable for machining soft-materials, such as FPCB, PP, Teflon, with sharp cutting edge and good chip evacuation.



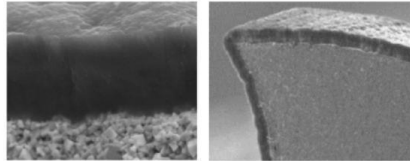
规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.0	5.0	35-40	0.2-0.4
1.2	6.0		
1.6	6.0	30-35	0.4-0.6
1.8	8.0		
2.0	8.0	25-30	0.4-0.8
3.175	10.0		

## 金刚石系列PCB涂层铣刀

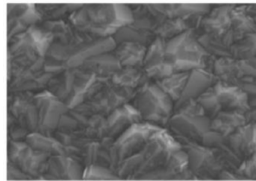
PCB Router With Diamond coating series

金刚石涂层系列PCB铣刀，适用于各种High-TG、金属基板场合的成型加工，具有高寿命和极佳尺寸保持性等特点。

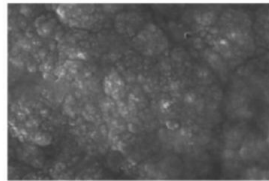
PCB router with diamond coating, suited for routing contours of High-TG and metal-based board situations with long life and dimensional stability.



- 卓越的刀型维持能力，提供轻快的切削  
The excellent design maintain sharp cuttill
- 减缓扩散磨损的过程  
Best wear resistance
- 有效抑制加工发热或粘屑  
Good heat resistance



普通涂层  
normal coating



超细纳米晶金刚石涂层  
ultra-fine nano CVD diamond coating

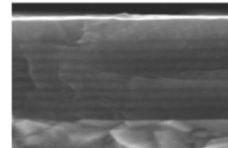
规格 Dimension(mm)		推荐切削条件 Parameters	
刃径ΦD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.0	7.0	40-45	5-7
1.1	7.0	42-46	8-12
1.2	7.0	41-45	8-14
1.3	7.0	38-42	8-14
1.5	8.0	31-35	10-16
1.6	8.0	28-33	11-16
1.8	10.0	26-30	12-18
1.9	10.0	25-29	12-18
2.0	10.0	24-29	11-16
2.2	10.0	23-27	16-20
2.4	12.0	22-26	16-20
2.5	12.0	21-25	16-20
3.0	12.0	18-22	16-20
3.175	12.0	18-22	16-20

## 铠甲系列PCB涂层铣刀

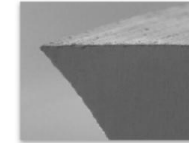
PCB router with armor-J coating series

铠甲系列PCB涂层铣刀，采用先进、新型涂层，具有超高的硬度及优异的耐磨性，使铣刀获得超强的切削性能。

PCB router with Armor-J coating, high hardness, perfect wear resistance ,super performance with new and advanced Armor-J coating.



- 多层高硬涂层设计  
Multilayer coating with high hardness
- 超高的隔热效果  
Fine heat resistance
- 抑制铣刀刃口的磨损和突发性崩缺  
Superior wear resistance and fracture resistance.



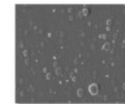
<高锋利度>  
High sharpness

卓越的刀型维持能力，提供轻快的切削  
The excellent design maintain sharp cutting



金鸞铠甲  
Armor-J coating

- <高光铣刀表面> High tool surface quality
- 有效抑制加工发热或粘屑 Avoid the heat and the stick-chip in the production process effectively
- 减缓扩散磨损的过程 Slow down the diffusion process of wear and tear
- 保证PCB拥有光滑板边 Provide the excellent surface quality



一般涂层铣刀  
General coating

- <高寿命> High tool life
- 高耐久性，维持稳定的成型尺寸 High-durability ensures consistency of dimensions during the contour routing
- 特别适合用于捞覆铜板 Supper better for coutouring the CCL
- 寿命可比普通PCB铣刀提升200% Tool life lifted 200%

规格 Dimension(mm)		推荐切削条件 Parameters	
刃径ΦD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.0	7.0	40-45	5-7
1.2	7.0	41-45	8-14
1.3	7.0	38-42	8-14
1.5	8.0	31-35	10-16
1.6	8.0	28-33	11-16
1.8	10.0	26-30	12-18
2.0	10.0	24-29	11-16
2.2	10.0	23-27	16-20
2.4	12.0	22-26	16-20
2.5	12.0	21-25	16-20
3.175	12.0	18-22	16-20

## MD型标准钻头 MICRO DRILL SERIES ( MD )

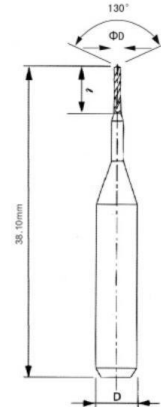


◎ 产品技术参数  
Product Technical Parameters

直径 ( D ) Diameter ( D )		刃长 ( L ) Flute Length ( L )
Metric	Lnch	Metric
0.10	0.0036	1.5
0.15	0.0059	2.5
0.20	0.0079	3.5
0.25	0.0098	4.0
0.30	0.0118	5.5
0.35	0.0138	5.5
0.40	0.0157	7.0
0.45	0.0177	7.0

特殊尺寸可依客户需求订制  
Custom Router Bits Are Made To Your Specifications

◎ 产品标准图  
Product Standard Chart



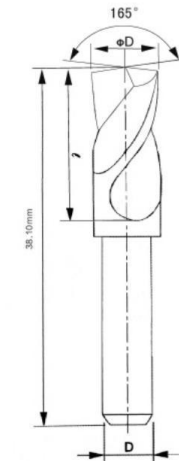
## LD型标准钻头 DRILL SERIES ( LD )



◎ 产品技术参数  
Product Technical Parameters

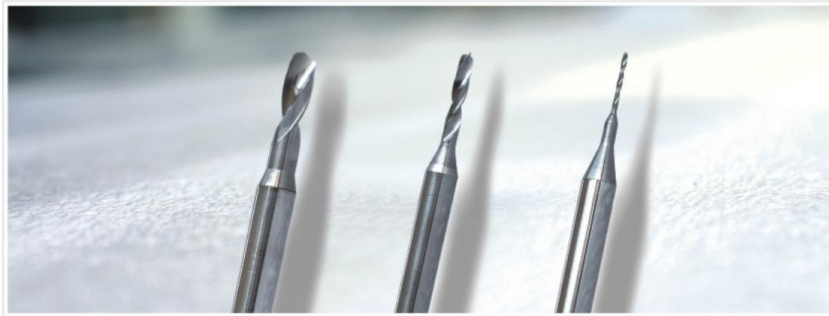
直径 ( D ) Diameter ( D )		刃长 ( L ) Flute Length ( L )	直径 ( D ) Diameter ( D )		刃长 ( L ) Flute Length ( L )
Metric	Lnch	Metric	Metric	Lnch	Metric
3.20	0.1260	12.0	4.85	0.1909	12.0
3.25	0.1280	12.0	4.90	0.1929	12.0
3.30	0.1299	12.0	4.95	0.1949	12.0
3.35	0.1319	12.0	5.00	0.1969	12.0
3.40	0.1339	12.0	5.05	0.1988	12.0
3.45	0.1358	12.0	5.10	0.2008	12.0
3.50	0.1378	12.0	5.15	0.2028	12.0
3.55	0.1398	12.0	5.20	0.2047	12.0
3.60	0.1417	12.0	5.25	0.2067	12.0
3.65	0.1437	12.0	5.30	0.2087	12.0
3.70	0.1457	12.0	5.35	0.2106	12.0
3.75	0.1476	12.0	5.40	0.2126	12.0
3.80	0.1496	12.0	5.45	0.2146	12.0
3.85	0.1516	12.0	5.50	0.2164	12.0
3.90	0.1535	12.0	5.55	0.2185	12.0
3.95	0.1555	12.0	5.60	0.2205	12.0
4.00	0.1575	12.0	5.65	0.2224	12.0
4.05	0.1594	12.0	5.70	0.2244	12.0
4.10	0.1614	12.0	5.75	0.2265	12.0
4.15	0.1634	12.0	5.80	0.2283	12.0
4.20	0.1654	12.0	5.85	0.2303	12.0
4.25	0.1673	12.0	5.90	0.2323	12.0
4.30	0.1693	12.0	5.95	0.2343	12.0
4.35	0.1713	12.0	6.00	0.2362	12.0
4.40	0.1732	12.0	6.05	0.2382	12.0
4.45	0.1752	12.0	6.10	0.2402	12.0
4.50	0.1772	12.0	6.15	0.2421	12.0
4.55	0.1791	12.0	6.20	0.2441	12.0
4.60	0.1811	12.0	6.25	0.2461	12.0
4.65	0.1831	12.0	6.30	0.2480	12.0
4.70	0.1850	12.0	6.35	0.2500	12.0
4.75	0.1870	12.0	6.40	0.2525	12.0
4.80	0.1890	12.0	6.45	0.2539	12.0
			6.50	0.2559	12.0

◎ 产品标准图  
Product Standard Chart



特殊尺寸可依客户需求订制  
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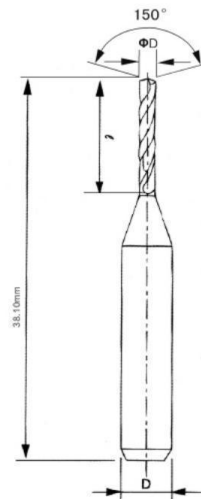
## 标准型槽刀 SLOT DRILL SERIES (SX)



### 产品技术参数 Product Technical Parameters

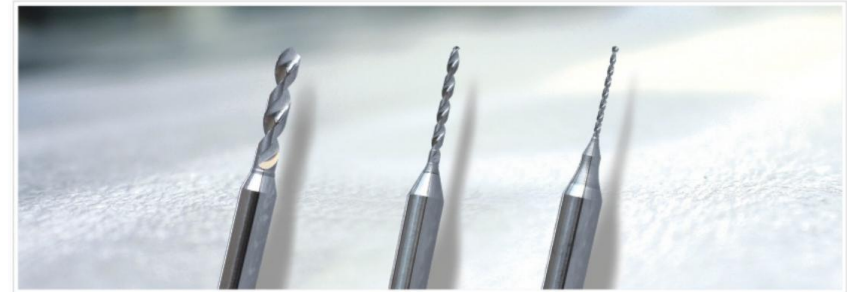
直径 (D) Diameter (D)		刃长 (L) Flute Length (L)		直径 (D) Diameter (D)		刃长 (L) Flute Length (L)	
Metric	Lnch	Metric	Lnch	Metric	Lnch	Metric	Lnch
0.40	0.0157	5.5	1.95	0.0768	8.7		
0.45	0.0177	5.5	2.00	0.0787	8.7		
0.50	0.0197	5.5	2.05	0.0807	8.7		
0.55	0.0217	5.5	2.10	0.0827	8.7		
0.60	0.0236	6.7	2.15	0.0846	8.7		
0.65	0.0256	6.7	2.20	0.0866	8.7		
0.70	0.0276	8.7	2.25	0.0886	8.7		
0.75	0.0295	8.7	2.30	0.0906	8.7		
0.80	0.0315	8.7	2.35	0.0925	8.7		
0.85	0.0335	8.7	2.40	0.0945	8.7		
0.90	0.0354	8.7	2.45	0.0965	8.7		
0.95	0.0374	8.7	2.50	0.0984	8.7		
1.00	0.0394	8.7	2.55	0.1004	8.7		
1.05	0.0413	8.7	2.60	0.1024	8.7		
1.10	0.0433	8.7	2.65	0.1043	8.7		
1.15	0.0453	8.7	2.70	0.1063	8.7		
1.20	0.0472	8.7	2.75	0.1083	8.7		
1.25	0.0492	8.7	2.80	0.1102	8.7		
1.30	0.0512	8.7	2.85	0.1122	8.7		
1.35	0.0531	8.7	2.90	0.1142	8.7		
1.40	0.0551	8.7	2.95	0.1161	8.7		
1.45	0.0571	8.7	3.00	0.1181	8.7		
1.50	0.0591	8.7	3.05	0.1201	8.7		
1.55	0.0610	8.7	3.10	0.1220	8.7		
1.60	0.0630	8.7	3.15	0.1240	8.7		
1.65	0.0650	8.7					
1.70	0.0669	8.7					
1.75	0.0689	8.7					
1.80	0.0709	8.7					
1.85	0.0728	8.7					
1.90	0.0748	8.7					

### 产品标准图 Product Standard Chart



特殊尺寸可依客户需求订制  
Custom Router Bits Are Made To Your Specifications

## UC型钻头 UC DRILL SERIES (UC)



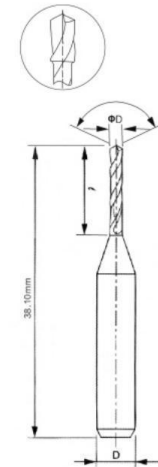
### 产品特性 Product Characteristics

主要用于孔壁粗糙度要求较高的板材。

### 产品技术参数 Product Technical Parameters

直径 (D) Diameter (D)		刃长(L) Flute Length(L)
Metric	Lnch	Metric
0.20	0.0079	3.5
0.25	0.0098	4.0
0.30	0.0118	5.5
0.35	0.0138	6.0
0.40	0.0157	6.5
0.45	0.0177	7.0
0.50	0.0197	7.0
0.55	0.0217	7.0
0.60	0.0236	7.0
0.65	0.0256	8.0
0.70	0.0276	8.0
0.75	0.0295	8.5
0.80	0.0315	8.5
0.85	0.0335	9.5
0.90	0.0354	9.5
0.95	0.0374	9.5
1.00	0.0394	9.5
1.05	0.0413	10.5
1.10	0.0433	10.5
1.15	0.0453	10.5
1.20	0.0472	10.5
1.25	0.0492	10.5
1.30	0.0512	10.5
1.35	0.0531	10.5
1.40	0.0551	10.5
1.45	0.0571	10.5
1.50	0.0591	10.5
1.55	0.0610	10.5
1.60	0.0630	10.5
1.65	0.0650	10.5
1.70	0.0669	10.5
1.75	0.0689	10.5
1.80	0.0709	10.5
1.85	0.0728	10.5
1.90	0.0748	10.5
1.95	0.0768	10.5
2.00	0.0788	10.5

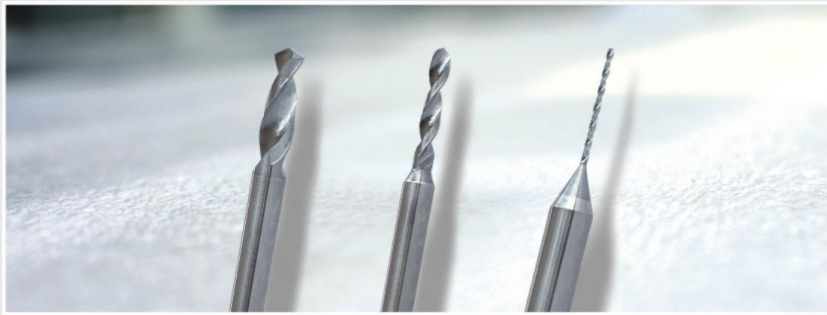
### 产品标准图 Product Standard Chart



特殊尺寸可依客户需求订制  
Custom Router Bits Are Made To Your Specifications



## 标准型钻头 STAND DRILL SERIES ( ST )



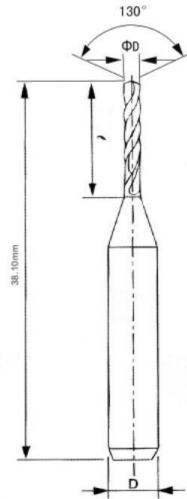
### 产品技术参数

Product Technical Parameters

直径 (D) Diameter (D)		刃长 (l) Flute Length (l)		直径 (D) Diameter (D)		刃长 (l) Flute Length (l)	
Metric	Lnch	Metric	Lnch	Metric	Lnch	Metric	Lnch
0.50	0.0197	8.5	2.05	0.0807	12.0		
0.55	0.0217	8.5	2.10	0.0827	12.0		
0.60	0.0236	8.5	2.15	0.0846	12.0		
0.65	0.0256	8.5	2.20	0.0866	12.0		
0.70	0.0276	10.0	2.25	0.0886	12.0		
0.75	0.0295	10.0	2.30	0.0906	12.0		
0.80	0.0315	10.0	2.35	0.0925	12.0		
0.85	0.0335	10.0	2.40	0.0945	12.0		
0.90	0.0354	10.0	2.45	0.0965	12.0		
0.95	0.0374	10.0	2.50	0.0984	12.0		
1.00	0.0394	10.0	2.55	0.1004	12.0		
1.05	0.0413	10.0	2.60	0.1024	12.0		
1.10	0.0433	10.0	2.65	0.1043	12.0		
1.15	0.0453	10.0	2.70	0.1063	12.0		
1.20	0.0472	10.0	2.75	0.1083	12.0		
1.25	0.0492	12.0	2.80	0.1102	12.0		
1.30	0.0512	12.0	2.85	0.1122	12.0		
1.35	0.0531	12.0	2.90	0.1142	12.0		
1.40	0.0551	12.0	2.95	0.1161	12.0		
1.45	0.0571	12.0	3.00	0.1181	12.0		
1.50	0.0591	12.0	3.05	0.1201	12.0		
1.55	0.0610	12.0	3.10	0.1220	12.0		
1.60	0.0630	12.0	3.15	0.1240	12.0		
1.65	0.0650	12.0	3.175	0.1250	12.0		
1.70	0.0669	12.0					
1.75	0.0689	12.0					
1.80	0.0709	12.0					
1.85	0.0728	12.0					
1.90	0.0748	12.0					
1.95	0.0768	12.0					
2.00	0.0787	12.0					

### 产品标准图

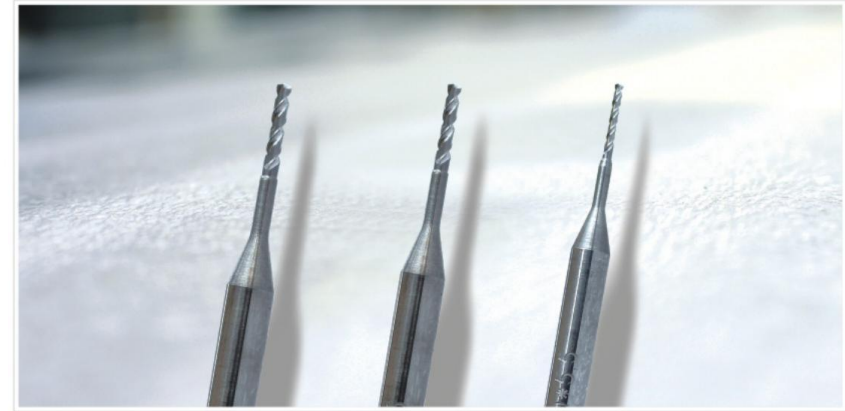
Product Standard Chart



特殊尺寸可依客户需求订制

Custom Router Bits Are Made To Your Specifications

## EA系列槽刀 SLOT OUTER SERIES ( EA )



### 产品特性

Product Characteristics

EA系列槽刀具有刃口特别锋利的优点，特别适合用于板边要求较高的板材。

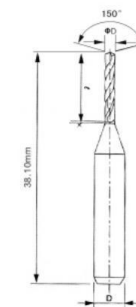
### 产品技术参数

Product Technical Parameters

直径 (D) Diameter (D)		刃长 (l) Flute Length (l)		角度 Angle	全长 Overall Length
Metric	Lnch	Metric	Lnch		Metric
0.60	0.0236	5.5	150°	37.2	
0.65	0.0256	5.5	150°	37.2	
0.70	0.0276	5.5	150°	37.2	
0.75	0.0295	5.5	150°	37.2	
0.80	0.0315	5.5	150°	37.2	
0.85	0.0335	5.5	150°	37.2	
0.90	0.0354	5.5	150°	37.2	
0.95	0.0374	5.5	150°	37.2	
1.00	0.0394	5.5	150°	37.2	

### 产品标准图

Product Standard Chart



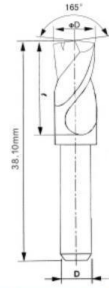
特殊尺寸可依客户需求订制

Custom Router Bits Are Made To Your Specifications

## 断屑槽系列钻头 CHIP BREAKER BIT SERIES



◎ 产品标准图  
Product Standard Chart



◎ 产品特性  
Product Characteristics

断屑槽系列钻针在主切削刃的适当位置再加开断屑槽提高断屑效果，有效改善孔壁粗糙度及定位精度。

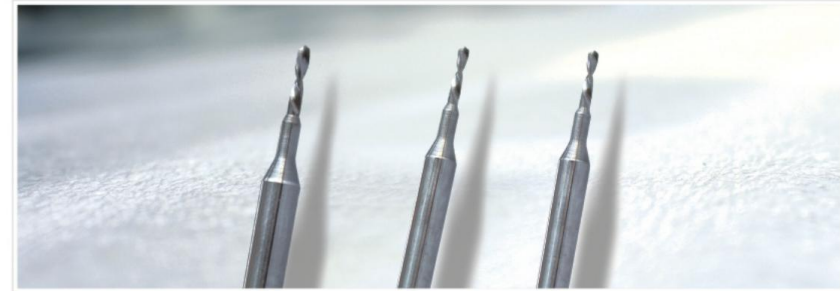
◎ 产品技术参数  
Product Technical Parameters

直径 (D) Diameter (D)		刃长 (L) Flute Length (L)		角度 Angle	全长 Overall Length
Metric	Lnch	Metric	Metric		Metric
2.00	0.0787	12	165°	38.1	
2.05	0.0807	12	165°	38.1	
2.10	0.0827	12	165°	38.1	
2.15	0.0846	12	165°	38.1	
2.20	0.0866	12	165°	38.1	
2.25	0.0886	12	165°	38.1	
2.30	0.0906	12	165°	38.1	
2.35	0.0925	12	165°	38.1	
2.40	0.0945	12	165°	38.1	
2.45	0.0965	12	165°	38.1	
2.50	0.0977	12	165°	38.1	
2.55	0.1004	12	165°	38.1	
2.60	0.1024	12	165°	38.1	
2.65	0.1043	12	165°	38.1	
2.70	0.1063	12	165°	38.1	
2.75	0.1083	12	165°	38.1	
2.80	0.1102	12	165°	38.1	
2.85	0.1122	12	165°	38.1	
2.90	0.1161	12	165°	38.1	
2.95	0.1181	12	165°	38.1	
3.00	0.1201	12	165°	38.1	
3.05	0.1220	12	165°	38.1	
3.15	0.1240	12	165°	38.1	
3.175	0.1250	12	165°	38.1	
3.20	0.1250	12	165°	38.1	
3.25	0.1260	12	165°	38.1	
3.30	0.1280	12	165°	38.1	
3.35	0.1299	12	165°	38.1	
3.40	0.1319	12	165°	38.1	
3.45	0.1358	12	165°	38.1	
3.50	0.1378	12	165°	38.1	
3.55	0.1398	12	165°	38.1	
3.60	0.1417	12	165°	38.1	
3.65	0.1437	12	165°	38.1	
3.70	0.1457	12	165°	38.1	
3.75	0.1476	12	165°	38.1	
3.80	0.1496	12	165°	38.1	
3.85	0.1516	12	165°	38.1	
3.90	0.1535	12	165°	38.1	
3.95	0.1555	12	165°	38.1	
4.00	0.1575	12	165°	38.1	
4.05	0.1594	12	165°	38.1	
4.10	0.1614	12	165°	38.1	
4.15	0.1634	12	165°	38.1	
4.20	0.1654	12	165°	38.1	
4.25	0.1673	12	165°	38.1	

特殊尺寸可依客户需求订制  
Custom Router Bits Are Made To Your Specifications

直径 (D) Diameter (D)		刃长 (L) Flute Length (L)		角度 Angle	全长 Overall Length
Metric	Lnch	Metric	Metric		Metric
4.30	0.1693	12	165°	38.1	
4.35	0.1713	12	165°	38.1	
4.40	0.1732	12	165°	38.1	
4.45	0.1752	12	165°	38.1	
4.50	0.1772	12	165°	38.1	
4.55	0.1791	12	165°	38.1	
4.60	0.1811	12	165°	38.1	
4.65	0.1831	12	165°	38.1	
4.70	0.1850	12	165°	38.1	
4.75	0.1870	12	165°	38.1	
4.80	0.1890	12	165°	38.1	
4.85	0.1909	12	165°	38.1	
4.90	0.1929	12	165°	38.1	
4.95	0.1949	12	165°	38.1	
5.00	0.1969	12	165°	38.1	
5.05	0.1988	12	165°	38.1	
5.10	0.2008	12	165°	38.1	
5.15	0.2028	12	165°	38.1	
5.20	0.2047	12	165°	38.1	
5.25	0.2067	12	165°	38.1	
5.30	0.2087	12	165°	38.1	
5.35	0.2106	12	165°	38.1	
5.40	0.2126	12	165°	38.1	
5.45	0.2146	12	165°	38.1	
5.50	0.2165	12	165°	38.1	
5.55	0.2185	12	165°	38.1	
5.60	0.2205	12	165°	38.1	
5.65	0.2224	12	165°	38.1	
5.70	0.2244	12	165°	38.1	
5.75	0.2264	12	165°	38.1	
5.80	0.2283	12	165°	38.1	
5.85	0.2303	12	165°	38.1	
5.90	0.2323	12	165°	38.1	
5.95	0.2343	12	165°	38.1	
6.00	0.2362	12	165°	38.1	
6.05	0.2382	12	165°	38.1	
6.10	0.2402	12	165°	38.1	
6.15	0.2421	12	165°	38.1	
6.20	0.2441	12	165°	38.1	
6.25	0.2461	12	165°	38.1	
6.30	0.2480	12	165°	38.1	
6.35	0.2500	12	165°	38.1	
6.40	0.2520	12	165°	38.1	
6.45	0.2539	12	165°	38.1	
6.50	0.2559	12	165°	38.1	

## LST系列钻头 LST BIT SERIES



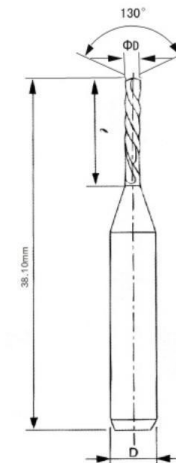
◎ 产品特性  
Product Characteristics

左旋系列钻头主要用于向下排屑的加工，刃长可特殊定制。

◎ 产品技术参数  
Product Technical Parameters

直径 (D) Diameter (D)		刃长 (L) Flute Length (L)
Metric	Lnch	Metric
0.40	0.0157	3.5
0.45	0.0177	3.5
0.50	0.0197	4.5
0.55	0.0217	4.5
0.60	0.0236	4.5
0.65	0.0256	4.5
0.70	0.0276	5.5
0.75	0.0295	5.5
0.80	0.0315	5.5
0.85	0.0335	5.5
0.90	0.0354	5.5
0.95	0.0374	5.5
1.00	0.0394	5.5
1.05	0.0413	6.5
1.10	0.0433	6.5
1.15	0.0453	6.5
1.20	0.0472	6.5

◎ 产品标准图  
Product Standard Chart



特殊尺寸可依客户需求订制  
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## RRD

双刃型铣刀，适用于特别板材的成型加工，如铝基板、紫铜箔板等，具有切削锋利，排屑性能良好等特点。

RRD router is suitable for machining special PCBs, such as Aluminum PCBs, copper PCBs and so on, sharp cutting edge, good chip evacuation.

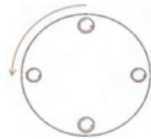


规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 $\phi D$ Mill Dia	刃长 L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
0.8	4.0	25 ~ 30	0.05 ~ 0.2
1.0	5.0		
1.2	6.0		
1.5	7.0		
1.6	8.0		0.3 ~ 0.6
1.8	9.0		
2.0	9.0		

### 应用案例 Example of case

铝基板铣刀测试成功案例 Double-flute router success example

刀具名称 Tool type	PCB铝基板铣刀 Double-flute Router
刀具规格 Dimension	RD2.0 × 9.0A
加工材料 Workpiece material	KPS600A, 高纯铝 KPS600A aluminum substrate
主轴转速 Spindle speed	S28KRPM
进给速度 Feed speed	5.0mm/s
加工作用 Working point	精修 Finish procedure
叠板高度 Panel high	2.5mm*1PNL
冷却方式 Type of cooling	无 none
切削效果 Achievement	我司铣刀较客户现用铣刀在刀具寿命提升12.5%，且切削过程中的板边质量也要优于客户现用铣刀。 Our tools increase by 12.5% than SZPA in life and get better quality.



## PRD/PRT/PRF

盲捞铣刀，特殊的槽型结构设计，切削刃锋利且排屑性能好，适用于各类PCB板材加工，可加工较高要求的槽和平面。

PRD/PRT/PRF router, the special design can get sharp cutting edge and good chip removal, be suitable for PCBs with high requirements of the groove and flat processing.

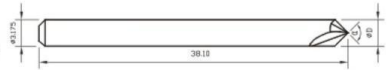


规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 $\phi D$ Mill Dia	刃长 L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
0.5	2.0	46 ~ 50	0.15 ~ 0.3
0.8	2.0	35 ~ 40	
1.0	3.5		
1.5	4.5	31 ~ 35	0.3 ~ 0.5
2.0	6.5	25 ~ 31	0.4 ~ 0.6
3.0	9.5		

## PDJ

倒角刀适用于电路板内槽倒角、螺丝孔沉头的加工。

PDJ cutter is suitable for the PCB inside chamfering, screw hole processing.



规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 $\phi D$ Mill Dia	刃长 L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.0	90	30 ~ 50	0.3 ~ 0.5
1.5	90	25 ~ 30	0.5 ~ 0.8
2.0	90		
2.5	90	20 ~ 27	0.8 ~ 1.0
3.0	90		

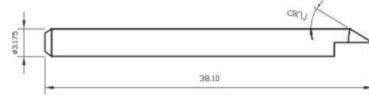
★倒角刀有刀柄部切环、定位，可特殊定制，可增加涂层工艺。  
Position with the handle ring and coating can be customized.

★可依客户需求订制角度。  
Special angle can be made upon customer needs.

## PVC

V槽刀适用于加工线路上铣削无毛刺V型槽，以便于折断。

A special V-groove router for standard PCBs enable stable V-groove routing without burring or unevenness.



规格 Dimension(mm)		推荐切削条件 Parameters	
刃径ΦD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.0	90	30~35	0.6~0.8
1.2	90		
1.5	90		
2.0	90		
2.5	90		
3.0	90	25~30	0.8~1.0

## PLL

槽刀适用于加工V型槽与螺丝孔等盲槽。

PLL cutter is suitable for machining V-shape groove and screw hole.

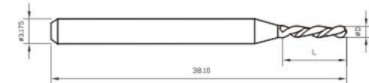


规格 Dimension(mm)		推荐切削条件 Parameters	
刃径ΦD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
0.5	90	30~35	0.1~0.2
0.8	90		
1.0	90		
1.3	90		
1.5	90		
1.6	90		0.2~0.4
2.0	90		0.4~0.8
3.0	90		
3.175	90		

## PMZ

盲钻适用于加工铜基板、HDI基板及其他基板。

A sharp rake angle on peripheral cutting edges and suitable for cooper PCBs and HDI, etc.



规格 Dimension(mm)		推荐切削条件 Parameters	
刃径ΦD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
0.8	3.0	25~30	0.1~0.3
1.0	4.0		
1.2	5.0		
1.6	6.5		
2.0	8.0		
2.4		15~25	0.5~0.8
3.0			

## PZD

锥度成型刀适用于各种PCB板材的锥度成型，具有高寿命、高精度等特点。

PZD cutter is suitable for all kinds of PCBs taper shape, it offers long tool life and high precision.



规格 Dimension(mm)		推荐切削条件 Parameters	
刃径ΦD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.0	60	30~35	0.2~0.6
2.0	60	25~30	0.8~0.1
2.5	60	20~27	
3.0	60		
4.0	60		

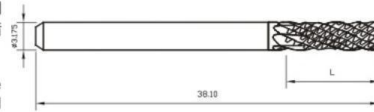
★可依客户需求订制特殊刃径或角度的产品。

Speical flute diameter &The Angle can be supplied according to request.

## PFH

复合碳纤维铣刀适用于航空复合材料的铣边及铣槽加工；采用金刚石涂层，提高刀具使用寿命；采用左右交错的菱齿型设计，可有效抑制工件上下表面翻边、毛刺等。

PFH series suitable for machining composite materials and slot milling processing; Diamond coating can provide the longer tool life; The special diamond cut geometry can effectively control the flanging and the burr, etc.



规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.1	5.0	30	1.1
1.4	5.0		
1.9	8.0		
2.2		21	1.25
2.3	9.5	20	1.25
2.9		17	1.3
3.0	10.0	17	
3.2		16	

## PBY

半月牙型刀适用于在表面需要组装电子部件的电子基板的表面上加工微小的盲捞孔，可以在简单的形状上加工出底面组装部件时所需要的合适的粗糙度。

PBY cutter is suitable for small spot facing on the surface of PCBs for surface mounted components. It's simple shape allows the finishing of the recess face with suitable roughness for mounting components. Easy to re-point and economical.



规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.0	3.0	30~35	0.3~0.5
1.5	4.0	25~30	0.5~0.8
2.0	6.0		
2.5	6.0	20~27	0.8~1.0
3.0	6.0		

## PND

内倒角精修刀用于线路上内槽倒角，极小的端齿跳动保证了倒角后平整无毛刺。

PND series suitable for the inside chamfering on PCBs, the minimal end-teeth runout can guarantee the good finishing.

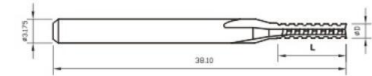


规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
1.0	3.0	30~50	0.3~0.5
1.5	4.0	25~30	0.5~0.8
2.0	6.0		
3.0	9.0	20~27	0.8~1.0
4.0	11.0		

## PJS

金属板精修刀用于各种PCB金属板的精修，具有高耐磨，排屑性能好，刚性好的特点。

PJS series suitable for all kinds of metal PCB finishing, which can provide high wear-resistance, good chip evacuation, good rigidity.



规格 Dimension(mm)		推荐切削条件 Parameters	
刃径 φD Mill Dia	刃长L Flute Length	转速(Krpm) Spindle Speed	走刀速(mm/s) Table Feed
0.8	4.0	30~35	0.1~0.3
1.0	4.5		
1.5	6.5		
2.8	8.0	15~25	0.5~0.8
3.0	10.0		
3.175			

## 切削参数计算公式

Machining Parameter Calculation Formula

### 切削参数定义 Machining Parameter Definition :

$V_s$ =切削速度 cutting speed[m/min]

$n$ =转速 spindle speed[rpm]

$f_{xy}$ =每转进给量 chip load[mm/rev.]

$D$ =直径 diameter[mm]

$F_{xy}$ =行刀速 feed rate[m/min]

### 切削速度 cutting speed $V_s$ :

$$V_s = \frac{n \times D \times \pi}{1000}$$

### 每转进给量 feed per revolution $f_{xy}$ :

$$f_{xy} = \frac{F_{xy} \times 1000}{n}$$

### 行刀速 feed rate $F_{xy}$ :

$$F_{xy} = \frac{f_{xy} \times n}{1000}$$

### 转速 spindle speed $n$ :

$$n = \frac{V_s \times 1000}{D \times \pi}$$

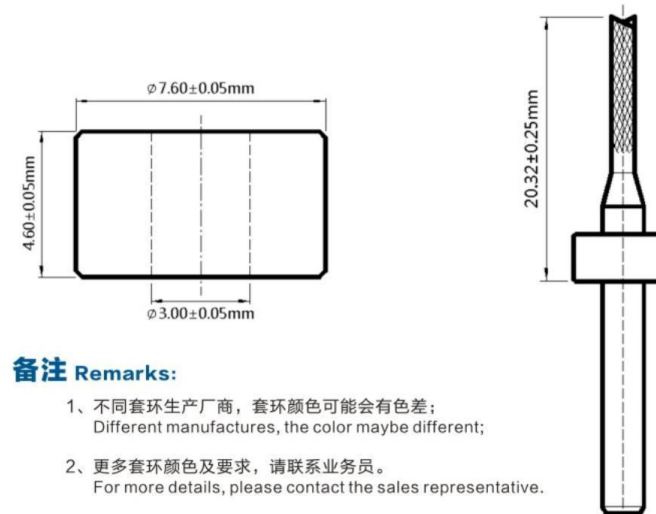
## 套环说明

RING SETTING

颜色 Color	灰色 Grey	深蓝色 Dark Blue	粉红色 Pink	大红色 Red	白色 White
示例 Example					
颜色 Color	深绿色 Dark Green	黑色 Black	咖啡色 Coffee	深紫色 Dark Purple	冻黄色 Yellow
示例 Example					

### 套环 RING

### 套环尺寸标准 RING SETTING SPECIFICATION



### 备注 Remarks:

- 1、不同套环生产厂商，套环颜色可能会有色差；  
Different manufactures, the color maybe different;
- 2、更多套环颜色及要求，请联系业务员。  
For more details, please contact the sales representative.