

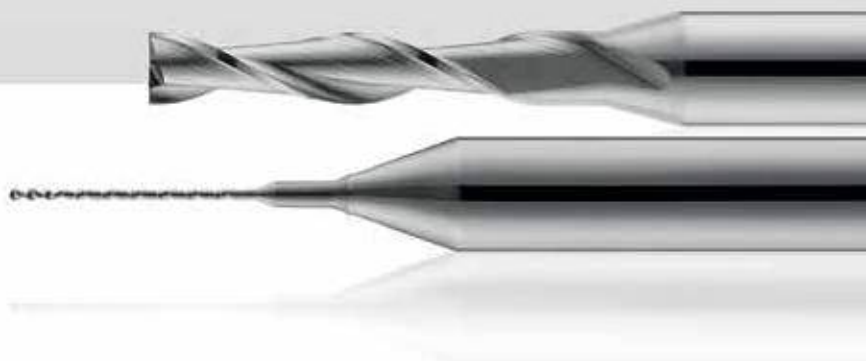


KONTECH-KEMMER

哥達 - 克默爾(中國)有限公司

product catalogue

产品目录



品质

我们只使用来自世界领先材料制造商的碳化钨材料。为了保证产品质量的一致性，我们使用我们的全光学检验系统进行全面的光学检验。这个设备可以让我们保持严格的产品公差，保证我们的微型钻头 and 锣刀具有最高的精度。

QUALITY

To guarantee the consistent quality of our products we carry out a full optical inspection with our Vialog Inspection System. This equipment allows us to maintain our tight tolerances. To guarantee maximum quality for our micro drills and routers we only use tungsten carbide micrograin materials from worldwide leading material manufacturers.



哥达-克默尔刀具（珠海）有限公司
有 ISO 9001 认证的，该标准适用于公司内部的所有流程。

The KONTECH-KEMMER (ZHUHAI) LTD.
is accredited to ISO 9001. The standard applies for all processes within
the company.

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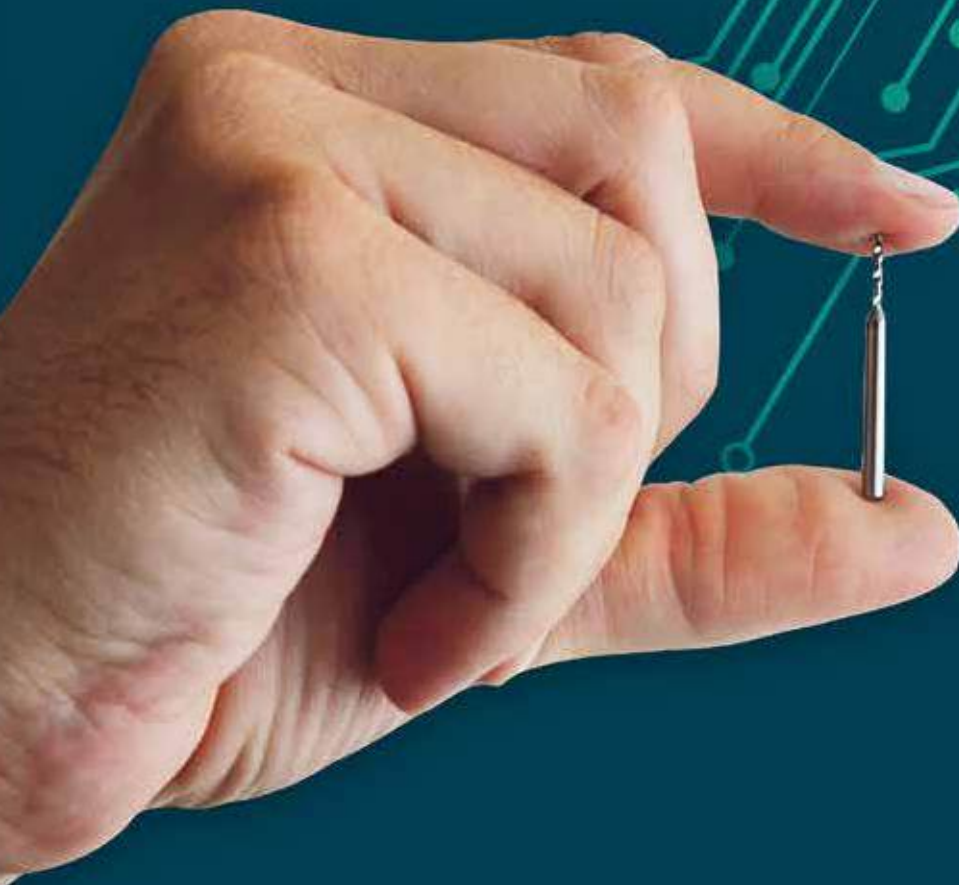
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最高精度的微型刀具

Highest precision
for smallest products

“



钻咀精度 General drill tolerances

直径范围 Diameter		< 2,0 mm	2,0 mm 3,175 mm	> 3,175 mm
柄直径 Shank dia. D	3,175 mm	-0,002 mm / -0,005 mm		-0,001 mm / -0,008 mm
刀刃直径 Nominal dia.* d		0 / -0,005 mm	0 / -0,006 mm	0 / -0,007 mm
总长 Overall length L ₁	38,1 mm	+0,1 / -0,1 mm		+0,1 mm / -0,20 mm
刃长 Flute length L ₂		+0,2 / -0 mm		+0,2 mm / -0,20 mm
钻身长度 Body length L ₃		+0,2 / -0 mm		+0,2 mm / -0,20 mm
边刀长 Relief length L ₄		+0,2 / -0 mm		+0,2 mm / -0,20 mm
钻尖角 Point angle δ		130° +/- 2° (alternativ/variant LX30S 150° +/- 2°)		165° +/- 2°
主刀面角 Primary angle α ₁		15° +/- 1° (alternativ/alternatively 12° +/- 1°)		10° +/- 2°
次刀面角 Secondary angle α ₂		30° +/- 2°		30° +/- 2°

*MU42S 型的标称 偏差: +0.005 mm / +0.01 mm

*Deviating nominal tolerance for type MU42S: +0.005 mm / +0.01 mm

钻孔应用技术 Application technology drilling

钻咀类型 Type of drill	几何特征 Geometry feature	PCB材料 Diameter		电路板材料 PCB material
SX30	E	0,50	3,00	CEM3, FR2, FR3, FR4, ML 4 layer, PTFE
SD30	E	3,05	6,50	all
UX30	E	0,85	2,00	FR4, ML 4 layer, Aramid
SX35	M	0,10	0,50	ML > 4 layer, Polyimid, high TG resins
MU42	S	0,15	0,45	ML > 4 layer, laminates with filler, flex-rigid ML
UX40	S	0,15	0,50	ML > 4 layer, Polyimid, high TG and BT resins, laminates with filler
UX42	S	0,15	0,80	ML > 4 layer, Polyimid, high TG and BT resins, laminates with filler
LX30	S	0,50	2,00	all
microdrills	M	0,025	0,095	all
blind via drills	M	0,15	1,20	all

型号说明 Nomenclature drills

S = Straight 标准钻咀

U = Undercut 大头钻咀

L = Slotdrill 槽钻

钢柄 X = Steel Shank
全碳化钨 D = Solid tungsten carbide drill
特殊 P = Special

螺旋角度
Helix angle ≈ 30

E = Elastic 薄心
M = Medium 厚心
S = Strong 加厚心

EC.-No. = 0

刀刃直径
Dia. = 1,000 mm

刃长
Flute = 10,5 mm

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

S	X	3	0	E	-	1	0	0	0	1	0	5	-	0
M	U													

并沟钻咀
Semi single flute undercut

MU42S

Artikel-Nr.

Ød (mm)	L ₂ (mm)	零件编号 Part no.	L ₂ (mm)	零件编号 Part no.
0,15	3,0	MU42S-0150030-0		
0,20	4,0	MU42S-0200040-0		
0,225	4,0	MU42S-0225040-0		
0,25	5,0	MU42S-0250050-0		
0,275	5,5	MU42S-0275055-0		
0,30	5,5	MU42S-0300055-0	6,5	MU42S-0300065-0
0,35	5,5	MU42S-0350055-0	6,7	MU42S-0350067-0
0,40	5,5	MU42S-0400055-0	6,7	MU42S-0400067-0
0,45	5,5	MU42S-0450055-0	6,7	MU42S-0450067-0
0,50	6,7	MU42S-0500067-0		
0,55	7,0	MU42S-0550070-0		



MU42S钢柄钻咀，特别刃刃设计，钻柄为3.175mm，钻咀直径范围为0.15–0.5mm，用于纤维填充料和复合材料线路板。能减少偏孔，提高钻孔的精准度，并大大减少断刀问题。

Tungsten Carbide Drills with steel shank and special flute design (Undercut / semi-single flute). Shank-Ø of 3.175 mm, in the Ø-range 0.15 – 0.45 mm, to be used for filled and non-filled materials. Reduction of drilling costs. Very low drill breakage and excellent drill deflection values

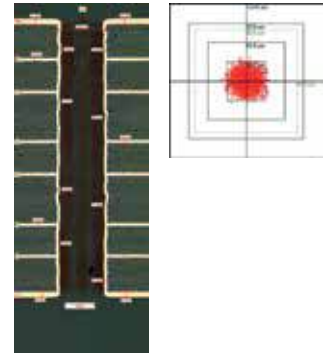
应用示例：

钻咀型号MU42S 0.25 mm 刃长 5.0 毫米

Application example: drill type MU42S Ø 0.25 mm
flute length 5.0 mm

生产条件 Production conditions

Material	PCL370HR	
Stack	2 x 1.5	mm
Ø	0.25	mm
RPM	184.000	RPM
Infeed	2	m/min
Chipload	11	µm/1
Retract	6	m/min
Hitcount	2.000	hits
Entry material	Alu	0.20
Cpk = 1.48		



加工：堆叠高度2 x 1.5 mm； PCL370HR， 8层
Processing: Stack height 2 x 1.5 mm; PCL370HR, 8 layers

最大公差：50m 钻头偏差/25 孔壁粗糙度/50 % 钉头
Maximum tolerances: 50m drill deviation/25 hole wall roughness/50 % nail head

有效改善 Vorteile Benefits

更好的定位精度
better positional accuracy

偏差小
less deviation

延长刀具寿命 (>30)
increased tool life (>30)

可能增加堆叠高度
increase of stack height possible

破损率极低
very low breakage rate

偏孔 + 3Mittelwert + 3 σ <39,6 m
drill deviation ave. + 3 σ <39,6 m

孔壁粗糙度 <15 m
hole wall roughness <15 m

钉头 <30%
nail head <30%

UX42S



d (mm)	L ₂ (mm)	零件编号 Part no.	L ₂ (mm)	零件编号 Part no.
0,15	2,5	UX42S-0150025-0		
0,20	3,5	UX42S-0200035-0	4,0	UX42S-0200040-1
0,25	3,5	UX42S-0250035-0	4,0	UX42S-0250040-1
0,25	4,5	UX42S-0250045-0	5,0	UX42S-0250050-1
0,30	5,5	UX42S-0300055-0	7,0	UX42S-0300070-1
0,35	5,5	UX42S-0350055-0	7,0	UX42S-0350070-1
0,40	5,5	UX42S-0400055-0	7,0	UX42S-0400070-1
0,45	5,5	UX42S-0450055-0	7,0	UX42S-0450070-1
0,50	5,5	UX42S-0500055-0	7,0	UX42S-0500070-1
0,55	7,0	UX42S-0550070-0		
0,60	7,5	UX42S-0600075-0		
0,65	8,5	UX42S-0650085-1		
0,70	8,5	UX42S-0700085-1		
0,75	8,5	UX42S-0750085-1		
0,80	10,5	UX42S-0800105-1		

UX42S钢柄钻咀，带特殊形状槽形设计（大头/铲形），及心厚变化设计和钻柄为3.175mm，钻咀直径范围为0.15–0.80mm，用于加工高TG和BT树脂多层线路板，特别设计用于主轴转速大于200000转钻孔机。能有良好的排屑，提高钻孔的精准度，并大大减少断刀问题。

Tungsten Carbide Drills with steel shank, special flute (Undercut/Spade Type), variable Web design and a shank dia. of 3.175 mm, in the dia. range of 0.15–0.80 mm, to be used for multilayer PCBs with filled materials and for high TG and BT resins, specially designed for high RPM drilling spindles > 200.000 U/min, stands out for good chip removal, extremely low drill breakage and improved drill deflection values

UX40S



d (mm)	L ₂ (mm)	零件编号 Part no.	L ₂ (mm)	零件编号 Part no.
0,15	2,5	UX40S-0150025-0		
0,175	3,0	UX40S-0175030-0		
0,20	3,5	UX40S-0200035-0	4,0	UX40S-0200040-0
			5,0	UX40S-0200050-0
0,225	3,5	UX40S-0225035-0		
0,25	3,5	UX40S-0250035-0	4,0	UX40S-0250040-0
0,25	4,5	UX40S-0250045-0	5,0	UX40S-0250050-0
0,275	5,0	UX40S-0275050-0		
0,30	5,5	UX40S-0300055-0	7,0	UX40S-0300070-0
0,35	5,5	UX40S-0350055-0	7,0	UX40S-0350070-0
0,40	5,5	UX40S-0400055-0	7,0	UX40S-0400070-0
0,45	5,5	UX40S-0450055-0	7,0	UX40S-0450070-0
0,50	5,5	UX40S-0500055-0	7,0	UX40S-0500070-0

UX40S钢柄钻咀，带特殊形状槽形设计（大头/铲形），具有特别刃刃设计和钻柄为3.175mm，钻咀直径范围为0.15–0.50mm，用于加工高TG和BT树脂多层线路板。能做出良好的排屑，提高钻孔的精准度，并大大减少断刀问题。

Tungsten carbide drills with steel shank and special flute (undercut/spade type) and a shank dia. of 3.175 mm, in a dia. range of 0.15–0.50 mm, to be used for multilayer PCBs with filled materials and for high TG and BT resins, stands out for good chip removal, extremely low drill breakage and improved drill deflection values

UX30E

Ød (mm)	L ₂ (mm)	零件编号 Part no.	Ød (mm)	L ₂ (mm)	零件编号 Part no.
0,85	10,5	UX30E-0850105-0	1,45	10,5	UX30E-1450105-0
0,90	10,5	UX30E-0900105-0	1,50	10,5	UX30E-1500105-0
0,95	10,5	UX30E-0950105-0	1,55	10,5	UX30E-1550105-0
1,00	10,5	UX30E-1000105-0	1,60	10,5	UX30E-1600105-0
1,05	10,5	UX30E-1050105-0	1,65	10,5	UX30E-1650105-0
1,10	10,5	UX30E-1100105-0	1,70	10,5	UX30E-1700105-0
1,15	10,5	UX30E-1150105-0	1,75	10,5	UX30E-1750105-0
1,20	10,5	UX30E-1200105-0	1,80	10,5	UX30E-1800105-0
1,25	10,5	UX30E-1250105-0	1,85	10,5	UX30E-1850105-0
1,30	10,5	UX30E-1300105-0	1,90	10,5	UX30E-1900105-0
1,35	10,5	UX30E-1350105-0	1,95	10,5	UX30E-1950105-0
1,40	10,5	UX30E-1400105-0	2,00	10,5	UX30E-2000105-0



该系列钢柄钻咀，採用特殊的刀刃设计，钻柄为3.175mm，刀刃直径范围0.85–2.00mm，适用於加工高TG，树脂多层线路板，具有极低的钻咀磨损以及能大大减少断刀问题。

Tungsten carbide drills with steel shank and special flute (undercut/spade type) and a shank dia. of 3.175 mm, in a dia. range of 0.85 – 2.00 mm, to be used for multilayer PCBs made of high TG resins, stands out for low drill breakage and good drill deflection values

SX35M



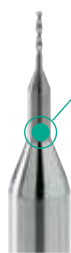
Ød (mm)	L ₂ (mm)	零件编号 Part no.	L ₂ (mm)	零件编号 Part no.
0,10	1,5	SX35M-0100015-0		
0,125	2,0	SX35M-0125020-0		
0,15	2,5	SX35M-0150025-0		
0,20	3,5	SX35M-0200035-0	5,0	SX35M-0200050-0
0,225	3,5	SX35M-0225035-0		
0,25	3,5	SX35M-0250035-0	5,0	SX35M-0250050-0
0,275	5,0	SX35M-0275050-0		
0,30	5,5	SX35M-0300055-0	7,0	SX35M-0300070-0
0,35	5,5	SX35M-0350055-0	7,0	SX35M-0350070-0
0,40	5,5	SX35M-0400055-0	7,0	SX35M-0400070-0
0,45	5,5	SX35M-0450055-0	7,0	SX35M-0450070-0
0,50	5,5	SX35M-0500055-0	7,0	SX35M-0500070-0

该系列钢柄钻咀，钻柄为3.175mm，刀刃直径范围为0.10–0.50mm，适用于加工高TG树脂多层线路板，具有极低的钻咀磨损以及能大大减少断刀问题。

Tungsten carbide drills with a steel shank dia. of 3.175 mm, in a dia. range of 0.10 – 0.50 mm, to be used for multilayer PCBs made of high TG resins, stands out for low drill breakage and good drill deflection values

盲孔钻咀

SX35M Blind Via Drills SX35M



d (mm)	L ₂ (mm)	零件编号 Part no.	d (mm)	L ₂ (mm)	零件编号 Part no.
0,15	0,8	SX35M-0150008-1	0,60	3,5	SX35M-0600035-0
0,175	1,5	SX35M-0175015-1	0,65	3,5	SX35M-0650035-0
0,20	1,2	SX35M-0200012-1	0,70	4,0	SX35M-0700040-0
0,20	2,0	SX35M-0200020-1	0,75	4,0	SX35M-0750040-0
0,25	1,5	SX35M-0250015-0	0,80	4,0	SX35M-0800040-0
0,25	2,0	SX35M-0250020-0	0,85	4,5	SX35M-0850045-0
0,30	2,0	SX35M-0300020-0	0,90	4,5	SX35M-0900045-0
0,35	2,5	SX35M-0350025-0	0,95	4,5	SX35M-0950045-0
0,40	2,5	SX35M-0400025-0	1,00	5,0	SX35M-1000050-0
0,45	3,0	SX35M-0450030-0	1,05	5,0	SX35M-1050050-0
0,50	3,0	SX35M-0500030-0	1,10	5,0	SX35M-1100050-0
0,55	3,5	SX35M-0550035-0	1,15	5,5	SX35M-1150055-0

该系列钢柄钻咀，钻柄为3.175mm，刀刃直径范围为0.15–1.15mm，特别适用于加工盲孔，能提高精度及大大减少断刀问题。

Tungsten carbide drills with a steel shank dia. of 3.175 mm, in a dia. range of 0.15–1.15 mm, very well suitable for blind via drilling, stands out for low drill deflection values and less drill breakage

SX30E

d (mm)	L ₂ (mm)	零件编号 Part no.	L ₂ (mm)	零件编号 Part no.
0,50	5,5	SX30E-0500055-0	7,0	SX30E-0500070-0
0,55	7,0	SX30E-0550070-0	8,5	SX30E-0550085-0
0,60	7,0	SX30E-0600070-0	8,5	SX30E-0600085-0
0,65	7,0	SX30E-0650070-0	8,5	SX30E-0650085-0
0,70	8,5	SX30E-0700085-0	10,5	SX30E-0700105-0
0,75	8,5	SX30E-0750085-0	10,5	SX30E-0750105-0
0,80	3,175 10,5	SX30E-0800105-0		

该系列钢柄钻咀，钻柄为3.175mm，刀刃直径范围为0.50-3.175mm,适合用於加工标准的PCB板材。

Tungsten carbide drills with a steel shank dia. of 3.175 mm, in a dia. range of 0.30-3.175 mm, to be well used for standard PCBs



坑槽钻咀 LX30S Slot Drills LX30S

d (mm)	L ₂ (mm)	零件编号 Part no.	d (mm)	L ₂ (mm)	零件编号 Part no.
0,50	5,0	LX30S-0500050-0	1,30	8,5	LX30S-1300085-0
0,55	5,0	LX30S-0550050-0	1,35	8,5	LX30S-1350085-0
0,60	7,0	LX30S-0600070-0	1,40	8,5	LX30S-1400085-0
0,65	7,0	LX30S-0650070-0	1,45	8,5	LX30S-1450085-0
0,70	8,5	LX30S-0700085-0	1,50	8,5	LX30S-1500085-0
0,75	8,5	LX30S-0750085-0	1,55	8,5	LX30S-1550085-0
0,80	8,5	LX30S-0800085-0	1,60	8,5	LX30S-1600085-0
0,85	8,5	LX30S-0850085-0	1,65	8,5	LX30S-1650085-0
0,90	8,5	LX30S-0900085-0	1,70	8,5	LX30S-1700085-0
0,95	8,5	LX30S-0950085-0	1,75	8,5	LX30S-1750085-0
1,00	8,5	LX30S-1000085-0	1,80	8,5	LX30S-1800085-0
1,05	8,5	LX30S-1050085-0	1,85	8,5	LX30S-1850085-0
1,10	8,5	LX30S-1100085-0	1,90	8,5	LX30S-1900085-0
1,15	8,5	LX30S-1150085-0	1,95	8,5	LX30S-1950085-0
1,20	8,5	LX30S-1200085-0	2,00	8,5	LX30S-2000085-0
1,25	8,5	LX30S-1250085-0			

LX系列钢柄钻咀，钻柄为3.175mm，刀刃直径范围为0.50-2.00mm，特别适用於生产精密坑槽。

Tungsten carbide drills with a steel shank dia. of 3.175 mm, in a dia. range of 0.50 2.00 mm, excellent suitable to manufacture precise slots



SD30E

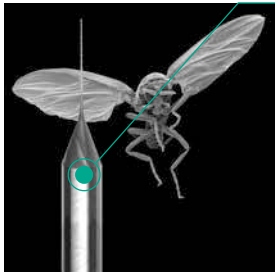


d (mm)		L ₂ (mm)	零件编号 Part no.	L ₂ (mm)	零件编号 Part no.
3,20	6,50	12,0	SD30E-3200120-0		

该系列整体碳化钨硬质合金钻咀，钻柄为3.175mm，刀刃直径范围为3.20-6.50mm，适合用于加工标准的PCB板材。

Solid tungsten carbide drills with shank dia. of 3.175 mm, in a dia. range of 3.20 - 6.50 mm, to be well used for standard PCBs

微型钻咀 Microdrills



d (mm)	(mm)	零件编号 Part no.	L ₂ (mm)	零件编号 Part no.
0,025	0,4	SD20M-0025004-0		
0,03	0,6	SD20M-0030006-0		
0,04	0,5	SD20M-0040005-0		
0,043	0,5	SD30M-0043005-0		
0,046	0,5	SD30M-0046005-0		
0,05	0,5	SD30M-0050005-0		
0,06	0,8	SD30M-0060008-0		
0,063	0,8	SD35M-0063008-0		
0,07	1,0	SD35M-0070010-0		
0,075	1,5	SD35M-0075015-0		
0,08	1,5	SD35M-0080015-0		
0,09	1,5	SD35M-0090015-0		
0,095	1,5	SD35M-0095015-0		

整体碳化钨硬质合金微型钻咀，钻柄为3.175mm，钻咀直径范围为0.025-0.095mm，适合用于所有的PCB物料的微孔加工

Solid tungsten carbide drills with shank dia. of 3.175 mm, in a dia. range of 0.025-0.095 mm, to be well used for microholes in all PCB materials. Tighter tolerances available on request

” 最高性能的锣刀

Routing with highest cutting performance “



锣刀精度 General router tolerances

刀柄直径 ϕ	Shank dia.	D	3,175 mm	-0,002 mm /-0,005 mm
刀刃直径 ϕ	Nominal dia.	d		+0 mm /-0,02 mm
总长	Overall length	L ₁	38,1 mm	+0,10 mm /-0,10 mm
有效长度	Flute length	L ₂		+0,500 mm /-0,000 mm

铣削应用技术 Application technology routing

锣刀类型 Type of router	几何特征 Geometry feature	PCB材料 PCB material
DA30-R	30° 钻石齿锣刀 fine diamond pattern 30°	FR3, FR4, FR4-ML, Polyimide, high Tg resins
DA20-R	20° 钻石齿锣刀 coarse diamond pattern 20°	FR3, FR4, FR4-ML, Polyimide, high Tg resins
CA20-R	20° 断屑齿锣刀 spiral fluted with chip breaker	CEM3, FR2, FR3, FR4, FR4-ML, PTFE, Aramide
CA30-R	30° 断屑齿锣刀 spiral fluted with chip breaker	high TG and BT resins, laminates with fillers
EA30-R	两刃螺旋型锣刀 two flute endmill	CEM3, FR2, FR3, PTFE, Aramide, Prepregs
CA20-L	带断屑槽的螺旋槽，左旋设计适用于顺时针切削 spiral fluted with chip breaker, left hand flute with right hand cut	CEM3, FR2, FR3, FR4, FR4-ML, PTFE, Aramide
CA20LL	带断屑槽的螺旋槽，左旋设计适用于逆时针切削 spiral fluted with chip breaker, left hand flute with left hand cut	CEM3, FR2, FR3, FR4, FR4-ML, PTFE, Aramide
SC30-R	单刃螺旋型锣刀 single flute cutter	Flex, Starrflex, PTFE, Pepreg, Polyimide
EP30-R	排式锣刀 array router	all
ZW	倒角刀 counter sink	all
SW30E	倒角工具 chamfering tool	
VG	V型雕刻刀 v-groove cutter	all
EA30-L	两刃锣刀，左旋设计适用于顺时针切削 two flute endmill, left hand flute with right hand cut	all
EA30LL	两刃锣刀，左旋设计适用于逆时针切削 two flute endmill, left hand flute with left hand cut	all
ECA30-R	铝基板专用锣刀 router for aluminium	all
EAC30-R	涂层两刃螺旋形锣刀 Two flute end mill diamond coated	IMS, aluminium, copper, laminates with ceramic fillers

型号说明

D = Diamondcut 钻石齿形
C = Chipbreaker 断屑齿形
E = Endmill 螺旋型锣刀
V = V-Groove V型槽刀
Z = Specialtool 特殊工具
S = Single Flute 单刃刀

鱼尾型 A = Fishtail
钻咀式刀口 C = Drillpoint
中切 D = Centercut
平型 E = Flat
槽刀 G = Groove
特殊 P = Special
尖角 W = Changed Point Angle
螺旋角 Helixangle =30

-R = Right hand flute with right hand cut 右旋
LL = Left hand flute with left hand cut 左旋
-L = Left hand flute with right hand cut 左旋

EC.-No. ϕ

直径 Dia. = 2,4 mm
刃长 Flute = 9,0 mm

1 2 3 4 5 6 7 8 9 10 11 12 13 14 15

E A C 3 0 R 2 0 0 0 0 6 0 - 0

DA30-R

d (mm)	L ₂ (mm)	零件编号 Part no.	d (mm)	L ₂ (mm)	零件编号 Part no.
0,50	3,0	DA30-R0500030-0	1,40	7,0	DA30-R1400070-0
0,60	3,0	DA30-R0600030-0	1,50	8,0	DA30-R1500080-0
0,70	4,0	DA30-R0700040-0	1,60	8,0	DA30-R1600080-0
0,80	5,0	DA30-R0800050-0	1,70	8,0	DA30-R1700080-0
0,80	7,0	DA30-R0800070-0	1,80	8,0	DA30-R1800080-0
0,90	5,0	DA30-R0900050-0	1,90	8,0	DA30-R1900080-0
0,90	7,0	DA30-R0900070-0	2,00	9,0	DA30-R2000090-0
1,00	5,0	DA30-R1000050-0	2,00	10,0	DA30-R2000100-0
1,00	7,0	DA30-R1000070-0	2,10	9,0	DA30-R2100090-0
1,10	5,0	DA30-R1100050-0	2,20	9,0	DA30-R2200090-0
1,10	7,0	DA30-R1100070-0	2,30	9,0	DA30-R2300090-0
1,20	7,0	DA30-R1200070-0	2,40	9,0	DA30-R2400090-0
1,30	7,0	DA30-R1300070-0	2,40	10,0	DA30-R2400100-0

该款整体碳化钨硬质合金锣刀，刀柄直径为3.175mm，30°右旋钻石齿设计，刀刃直径范围为0.50-2.40mm，特别适用于较硬的PCB材料。

Solid tungsten carbide contour routers with a shank dia. of 3.175 mm and right-hand cutting, fine diamond pattern, with 30° helix angle, in a dia. range of 0.50- 2.40 mm, excellent suitable for hard PCB materials



DA20-R

d (mm)	L ₂ (mm)	零件编号 Part no.	d (mm)	L ₂ (mm)	零件编号 Part no.
1,00	7,0	DA20-R1000070-0	2,00	10,0	DA20-R2000100-0
1,20	7,0	DA20-R1200070-0	2,40	9,0	DA20-R2400090-0
1,50	8,0	DA20-R1500080-0	2,40	10,0	DA20-R2400100-0
1,60	8,0	DA20-R1600080-0			
2,00	9,0	DA20-R2000090-0			

该款整体碳化钨硬质合金锣刀，刀柄直径为3.175mm，20°右旋钻石齿设计，具有更高的切削速度。刀刃直径范围 1.0/1.2/1.5/1.6/2.0/2.4mm，特别适用于较硬的PCB材料。

Solid tungsten carbide contour routers with a shank dia. of 3.175 mm and right-hand cutting, coarse diamond pattern, with 20° helix angle for higher routing speeds, in a dia. range of 1.0 / 1.2 / 1.5 / 1.6 / 2.0 / 2.4 mm, excellent suitable for hard PCB materials



CA20-R

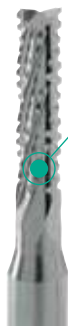
d (mm)	L ₂ (mm)	零件编号 Part no.	d (mm)	L ₂ (mm)	零件编号 Part no.
0,50	3,0	CA20-R0500030-5	1,50	8,0	CA20-R1500080-0
0,60	3,0	CA20-R0600030-5	1,60	8,0	CA20-R1600080-0
0,70	3,0	CA20-R0700030-5	1,70	8,0	CA20-R1700080-0
0,80	5,0	CA20-R0800050-5	1,80	8,0	CA20-R1800080-0
0,80	7,0	CA20-R0800070-5	1,90	8,0	CA20-R1900080-0
0,90	5,0	CA20-R0900050-5	2,00	9,0	CA20-R2000090-0
0,90	7,0	CA20-R0900070-5	2,00	10,0	CA20-R2000100-0
1,00	5,0	CA20-R1000050-5	2,10	9,0	CA20-R2100090-0
1,00	7,0	CA20-R1000070-5	2,20	9,0	CA20-R2200090-0
1,10	5,0	CA20-R1100050-5	2,30	9,0	CA20-R2300090-0
1,10	7,0	CA20-R1100070-5	2,40	9,0	CA20-R2400090-0
1,20	7,0	CA20-R1200070-5	2,40	10,0	CA20-R2400100-0
1,30	7,0	CA20-R1300070-0	3,00	10,0	CA20-R3000100-0
1,40	7,0	CA20-R1400070-0			

该款整体碳化钨硬质合金锣刀，刀柄直径为3.175mm，20°右旋断屑齿设计，刀刃直径范围为0.50-3.00mm，适用于一些软身和较硬的PCB材料。

Solid tungsten carbide chip breaker routers with a shank dia. of 3.175 mm and right-hand cutting, 20° helix angle, in a dia. range of 0.50 -3.00 mm, excellent suitable for hard and soft PCB materials



CA30-R

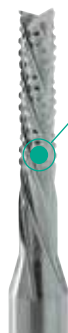


d (mm)	L ₂ (mm)	零件编号 Part no.	d (mm)	L ₂ (mm)	零件编号 Part no.
0,80	5,0	CA30-R0800050-1	1,80	8,0	CA30-R1800080-1
1,00	5,0	CA30-R1000050-1	1,90	8,0	CA30-R1900080-1
1,00	7,0	CA30-R1000070-1	2,00	8,0	CA30-R2000080-1
1,20	7,0	CA30-R1200070-1	2,10	8,0	CA30-R2100080-1
1,50	8,0	CA30-R1500080-1	2,20	8,0	CA30-R2200080-1
1,60	8,0	CA30-R1600080-1	2,30	8,0	CA30-R2300080-1
1,70	8,0	CA30-R1700080-1	2,40	9,0	CA30-R2400090-1

该款整体碳化钨硬质合金锣刀，刀柄直径为3.175mm，30°右旋断削齿设计，直径为0.80-2.40mm，非常适合硬质和软质PCB材料，尤其适用于High-TG和BT树脂，以及纤维材料

Solid tungsten carbide chip breaker routers with a shank dia. of 3.175 mm and right-hand cutting, 30° helix angle, in a dia. range of 0.80 - 2.40 mm, excellent suitable for hard and soft PCB materials and especially for High-TG and BT resins, as well as for laminates with fillers

CA20-L



d (mm)	L ₂ (mm)	零件编号 Part no.	d (mm)	L ₂ (mm)	零件编号 Part no.
1,00	7,0	CA20-L1000070-0	1,60	8,0	CA20-L1600080-0
1,20	7,0	CA20-L1200070-0	1,80	8,0	CA20-L1800080-0
1,30	7,0	CA20-L1300070-0	2,00	10,0	CA20-L2000100-0
1,50	7,0	CA20-L1500070-0	2,40	10,0	CA20-L2400100-0

该款整体碳化钨硬质合金锣刀，刀柄直径为3.175mm，20°左旋右切式断削齿设计，有效减少毛刺，非常适用于硬质和软质材料PCB材料。

Solid tungsten carbide chip breaker router with a shank dia. of 3.175 mm and left hand flute and right-hand cutting, 20° helix angle, excellent suitable for hard and soft PCB materials to reduce burrs

CA20LL



d (mm)	L ₂ (mm)	零件编号 Part no.	d (mm)	L ₂ (mm)	零件编号 Part no.
0,80	5,0	CA20LL0800050-0	1,50	8,0	CA20LL1500080-0
1,00	7,0	CA20LL1000070-0	1,60	9,0	CA20LL1600090-0
1,20	7,0	CA20LL1200070-0	2,00	9,0	CA20LL2000090-0
1,40	7,0	CA20LL1400070-0	2,40	9,0	CA20LL2400090-0

该款整体碳化钨硬质合金锣刀，刀柄直径为3.175mm、20°左旋左切式断削齿设计、非常适用于以在贯穿镀层分离处布线的硬质和软质PCB材料。

Solid tungsten carbide chip breaker router with a shank dia. of 3.175mm and left hand flute and left-hand cutting, 20° helix angle, excellent suitable for hard and soft PCB materials to rout in throughplatted breakaways

两刃螺旋形锣刀 Two Flute Endmill EA30-R

Ød (mm)	L ₂ (mm)	零件编号 Part no.	Ød (mm)	L ₂ (mm)	零件编号 Part no.
0,30	2,0	EA30-R0300020-0	1,50	8,0	EA30-R1500080-0
0,40	2,5	EA30-R0400025-0	1,60	8,0	EA30-R1600080-0
0,50	3,0	EA30-R0500030-0	1,70	8,0	EA30-R1700080-0
0,60	3,0	EA30-R0600030-0	1,80	8,0	EA30-R1800080-0
0,70	4,0	EA30-R0700040-0	1,90	8,0	EA30-R1900080-0
0,80	5,0	EA30-R0800050-0	2,00	9,0	EA30-R2000090-0
0,90	5,0	EA30-R0900050-0	2,10	9,0	EA30-R2100090-0
1,00	5,0	EA30-R1000050-0	2,20	9,0	EA30-R2200090-0
1,10	5,0	EA30-R1100050-0	2,30	9,0	EA30-R2300090-0
1,20	7,0	EA30-R1200070-0	2,40	9,0	EA30-R2400090-0
1,30	7,0	EA30-R1300070-0	3,00	10,0	EA30-R3000100-0
1,40	7,0	EA30-R1400070-0	3,175	10,0	EA30-R3175100-0

刀柄直径为3.175mm，刀刃直径范围为0.30–3.175mm的硬质合金碳化钨双刃螺旋形锣刀，特别适合柔性的PCB材料。

Solid tungsten carbide two flute endmill with a shank dia. of 3.175 mm, in a dia. range of 0.30–3.175 mm, excellent suitable for soft PCB materials



EA30-L

Ød (mm)	L ₂ (mm)	零件编号 Part no.	Ød (mm)	L ₂ (mm)	零件编号 Part no.
0,60	3,0	EA30-L0600030-0	1,50	7,0	EA30-L1500070-0
0,80	5,0	EA30-L0800050-0	1,60	7,0	EA30-L1600070-0
1,00	5,0	EA30-L1000050-0	1,80	7,0	EA30-L1800070-0
1,20	5,0	EA30-L1200050-0	2,00	7,0	EA30-L2000070-0
1,40	7,0	EA30-L1400070-0	2,40	9,0	EA30-L2400090-0

该款整体碳化钨硬质合金左旋两刃螺旋形锣刀，适用于顺时切削，刀柄直径为3.175mm，刀刃直径范围为0.60–2.40mm，特别适合柔性的PCB材料。

Solid tungsten carbide two flute endmill left hand flute and right hand cut with a shank dia. of 3.175 mm, in a dia. range of 0.60 – 2.40 mm, excellent suitable for soft PCB materials



EA30LL

Ød (mm)	L ₂ (mm)	零件编号 Part no.	Ød (mm)	L ₂ (mm)	零件编号 Part no.
0,80	5,0	EA30LL0800050-0	1,60	7,0	EA30LL1600070-0
1,00	5,0	EA30LL1000050-0	1,80	7,0	EA30LL1800070-0
1,20	5,0	EA30LL1200050-0	2,00	7,0	EA30LL2000070-0
1,40	7,0	EA30LL1400070-0	2,40	9,0	EA30LL2400090-0
1,50	7,0	EA30LL1500070-0			

该款整体碳化钨硬质合金左旋两刃螺旋形锣刀，适用于逆时切削，刀柄直径为3.175mm，刀刃直径范围为0.80–2.40mm，特别适合柔性的PCB材料。

Solid tungsten carbide two flute endmill left hand flute and left hand cut with a shank dia. of 3.175 mm, in a dia. range of 0.80 – 2.40 mm, excellent suitable for soft PCB materials



SW30E



角度 Angle	Ød (mm)	零件编号 Part no.	角度 Angle	Ød (mm)	零件编号 Part no.
60°	5,40	SW30E-5400 130B0	110°	5,85	SW30E-5850 130B4
80°	5,60	SW30E-5600 130B1	120°	5,90	SW30E-5900 130B5
90°	5,70	SW30E-5700 130B2	130°	6,00	SW30E-6000 130B6
100°	5,80	SW30E-5800 130B3	140°	6,10	SW30E-6100 130B7

新型沉头刀具SW30E，钻尖角范围为 60~140°，刀刃直径范围5.40-6.10mm，适用于压层PCB。

Chamfering of contact connectors with new type SW30E Point angle available from 60 to 140, field of application all common PCB laminates

倒角刀 ZW90°/100°/120°/140° Senker ZW Counter Sink 90°/100°/120°/140°



刀刃直径范围5.00mm/5.5mm/6.00mm/6.5 mm以及
可按要求提供其他直径和角度规格的倒角刀。

Counter Sink Dia. 5.00 mm/5.50 mm/6.00 mm/6.50 mm, other diameter, angles and special designs on request

V型雕刻刀 V-Groove Cutter



刀尖角 Angle	零件编号 Part no.
22,5°	VG23-R3175000-0
30°	VG30-R3175000-0
45°	VG45-R3175000-0
60°	VG60-R3175000-0
90°	VG90-R3175000-0

刀柄直径为3.175mm、刀尖角范围为22.5-90° 的硬质合金碳化钨刀具，特别适合标准的材料PCB。

Solid tungsten carbide tools with a shank dia. of 3.175 mm, in a point angle range of 22.5 – 90°, excellent suitable for standard PCBs. Fluted V-groove cutter on request

V形雕刻刀参数 V-Groove parameter

类型 Type		22,5°	30°	45°	60°	90°
转速 Speed	U/min	80.000	60.000	50.000	40.000	30.000
进给 Feed	m/min	1,0 – 1,5	1,5 – 2,5	2,5 – 3,5	3,0 – 4,5	5,0 – 6,0

ECA30-R

Ød (mm)	L ₂ (mm)	零件编号 Part no.	Ød (mm)	L ₂ (mm)	零件编号 Part no.
0,80	3,0	ECA30-R0800030-0	1,60	5,0	ECA30-R1600050-0
1,00	4,0	ECA30-R1000040-0	1,80	6,0	ECA30-R1800060-0
1,20	4,0	ECA30-R1200040-0	2,00	7,0	ECA30-R2000070-0
1,40	4,0	ECA30-R1400040-0	2,40	7,0	ECA30-R2400070-0
1,50	5,0	ECA30-R1500050-0	3,00	8,0	ECA30-R3000080-0

该款整体碳化钨硬质合金两刃螺旋形锣刀，钻尖型设计，刀柄直径为3.175mm，刀刃直径范围为0.80–3.00mm，适用于铝质板材料。

Solid tungsten carbide two flute endmill with drill point design and a shank dia. of 3.175 mm, right hand cut, in a dia. range of 0.80 – 3.00 mm, excellent suitable for aluminium



EAC30-R

Ød (mm)	L ₂ (mm)	零件编号 Part no.	Ød (mm)	L ₂ (mm)	零件编号 Part no.
0,80	2,0	EAC30R0800020-0			
1,00	3,0	EAC30R1000030-0			
1,20	3,0	EAC30R1200030-0			
1,60	5,0	EAC30R1600050-0			
2,00	4,0	EAC30R2000040-0	2,00	6,0	EAC30R2000060-0
2,40	6,0	EAC30R2400060-0			

钻柄直径为3.175mm、直径范围为0.80–2.40mm的硬质合金碳化钨双刃锣刀，特别适合IMS，铝和铜，陶瓷板材料。能提高加工准确性和锣刀寿命提升12倍

Solid tungsten carbide two flute end mill with diamond coating and shank-Ø 3.175 mm, right hand cut, in dia. range 0.80-2.40mm. Perfectly suitable for routing of inner and outer contours as well as for depaneling of IMS made of aluminium and copper. Ideally suited for depth routing of IMS, aluminium and copper, laminate with ceramic fillers. Excellent dimensional accuracy. Tool life increase up to 12 times



SC30-R

Ød (mm)	L ₂ (mm)	零件编号 Part no.	Ød (mm)	L ₂ (mm)	零件编号 Part no.
0,50	3,0	SC30-R0500030-0	1,60	5,0	SC30-R1600050-0
0,60	3,0	SC30-R0600030-0	1,80	5,0	SC30-R1800050-0
0,70	3,0	SC30-R0700030-0	2,00	8,0	SC30-R2000080-0
0,80	3,0	SC30-R0800030-0	2,40	8,0	SC30-R2400080-0
1,00	3,0	SC30-R1000030-0	3,00	9,0	SC30-R3000009-0
1,20	4,0	SC30-R1200040-0			

该款整体碳化钨硬质合金锣刀，右旋设计，刀柄直径为3.175mm、刀刃直径范围为0.50–3.00mm，非常适用于柔性板料及一些塑胶物料。

Single flute router in solid tungsten carbide, right hand cut with a shank dia. of 3.175 mm, in a dia. range of 0.50- 3.00 mm, very well suitable for routing of flexible materials, rigid/flex PCBs and routing of plastics



铣削参数 Routing Parameters

PCB材质 刀刃直径 Material/router typeØd (mm)	High Speed routing		FR4, FR4-ML		Fr4, FR4-ML, Polyimid, High-Tg-FR4, BT resins, filled material		Nonferrous metals, Prepregs, Teflon, Aramid, Polyimid, High-Tg-FR4, BT resins, filled material	
Vc	250 m/min		180 m/min		150 m/min		100 m/min	
Diameter (mm)	Spindle speed RPM	Table feed m/min	Spindle speed RPM	Table feed m/min	Spindle speed RPM	Table feed m/min	Spindle speed RPM	Table feed m/min
0,30	100.000	0,5	100.000	0,5	100.000	0,5	100.000	0,5
0,40	100.000	0,7	100.000	0,7	100.000	0,7	79.700	0,6
0,50	100.000	0,9	100.000	0,9	95.600	0,9	63.700	0,6
0,60	100.000	1,1	95.600	1,1	79.700	0,9	53.100	0,6
0,70	100.000	1,3	81.900	1,2	68.300	0,9	45.500	0,6
0,80	99.600	1,5	71.700	1,2	59.800	0,9	39.900	0,6
0,90	88.500	1,5	63.700	1,2	53.100	0,9	35.400	0,6
1,00	79.700	1,5	57.400	1,2	47.800	0,9	31.900	0,6
1,10	72.400	1,5	52.200	1,2	43.500	0,9	29.000	0,6
1,20	66.400	1,5	47.800	1,3	39.900	0,9	26.600	0,6
1,30	61.300	1,6	44.100	1,3	36.800	0,9	24.500	0,6
1,40	56.900	1,6	41.000	1,3	34.200	0,9	22.800	0,6
1,50	53.100	1,6	38.300	1,3	31.900	1,0	21.300	0,6
1,60	49.800	1,6	35.900	1,3	29.900	1,0	20.000	0,7
1,70	46.900	1,7	33.800	1,3	28.200	1,0	20.000	0,7
1,80	44.300	1,7	31.900	1,3	26.600	1,0	20.000	0,8
1,90	42.000	1,7	30.200	1,4	25.200	1,0	20.000	0,9
2,00	39.900	1,7	28.700	1,4	23.900	1,0	20.000	0,9
2,10	38.000	1,8	27.300	1,4	22.800	1,1	20.000	1,0
2,20	36.200	1,8	26.100	1,4	21.800	1,1	20.000	1,1
2,30	34.700	1,8	25.000	1,5	20.800	1,1	20.000	1,1
2,40	33.200	1,8	23.900	1,5	20.000	1,1	20.000	1,1
2,50	31.900	1,9	23.000	1,5	20.000	1,2	20.000	1,1
2,60	30.700	1,9	22.100	1,5	20.000	1,2	20.000	1,1
2,70	29.500	1,9	21.300	1,5	20.000	1,3	20.000	1,1
2,80	28.500	2,0	20.500	1,6	20.000	1,4	20.000	1,1
2,90	27.500	2,0	20.000	1,6	20.000	1,4	20.000	1,1
3,00	26.600	2,0	20.000	1,6	20.000	1,5	20.000	1,1

钻孔参数 Drilling Parameters

Spindle Speed

Fr4 DS, ML 4 layer

max. RPM	min. RPM	Cutting speed		Chip load		6,00 %
		m/min	150	Retract	max. stack	
160.000	20.000	max. hit counts	4.000	2,5	4,8	
Diameter (mm)	Spindle speed RPM	Chip load μm/U	Infeed m/min	Retract m/min		
0,05	160.000	2,5	0,4	1,0		
0,06	160.000	3,0	0,5	1,2		
0,07	160.000	3,5	0,6	1,4		
0,08	160.000	4,0	0,6	1,7		
0,09	160.000	4,5	0,7	1,9		
0,10	160.000	5,0	0,8	2,1		
0,15	160.000	7,5	1,2	3,2		
0,20	160.000	10,0	1,6	4,3		
0,25	160.000	12,5	2,0	5,5		
0,30	159.200	15,0	2,4	6,7		
0,35	136.500	17,5	2,4	6,8		
0,40	119.400	20,0	2,4	6,9		
0,45	106.200	22,0	2,4	7,0		
0,50	95.500	25,0	2,4	7,2		
0,55	86.900	27,5	2,4	7,3		
0,60	79.600	30,0	2,4	7,4		
0,65	73.500	32,5	2,4	7,5		
0,70	68.200	35,0	2,4	7,6		
0,75	63.700	37,5	2,4	7,8		
0,80	59.700	40,0	2,4	7,9		
0,85	56.200	42,5	2,4	8,0		
0,90	53.100	45,0	2,4	8,1		
0,95	50.300	47,5	2,4	8,2		
1,00	47.800	50,0	2,4	8,4		
1,05	45.500	52,5	2,4	max		
1,10	43.400	55,0	2,4	max		
1,15	41.500	57,5	2,4	max		
1,20	39.800	60,0	2,4	max		
1,25	38.200	62,5	2,4	max		
1,30	36.700	65,0	2,4	max		
1,35	35.400	67,5	2,4	max		
1,40	34.100	70,0	2,4	max		
1,45	32.900	70,0	2,3	max		
1,50	31.800	70,0	2,2	max		
2,00	23.900	70,0	1,7	max		
2,50	20.000	70,0	1,4	max		
3,00	20.000	70,0	1,4	max		
3,50	20.000	70,0	1,4	max		
4,00	20.000	60,0	1,2	max		
4,50	20.000	55,0	1,1	max		
5,00	20.000	50,0	1,0	max		
5,50	20.000	45,0	0,9	max		
6,00	20.000	40,0	0,8	max		

filled material, ML >600 m copper

max. hit counts	Cutting speed		Chip load		5,0 %
	m/min	130	Retract	max. stack	
2.000	max. hit counts	2.000	3,2	3,2	
Spindle speed RPM	Chip load μm/U	Infeed m/min	Retract m/min		
160.000	2,0	0,3	1,6		
160.000	2,4	0,4	1,9		
160.000	2,8	0,4	2,3		
160.000	3,2	0,5	2,6		
160.000	3,6	0,6	2,9		
160.000	4,0	0,6	3,3		
160.000	6,0	1,0	4,9		
160.000	8,0	1,3	6,7		
160.000	1,0	1,6	8,4		
138.000	12,0	1,7	8,8		
118.300	14,0	1,7	8,9		
103.500	16,0	1,7	8,9		
92.000	18,0	1,7	9,0		
82.800	20,0	1,7	9,1		
75.300	22,0	1,7	9,2		
69.000	24,0	1,7	9,3		
63.700	26,0	1,7	9,4		
59.100	28,0	1,7	9,4		
55.200	30,0	1,7	9,5		
51.800	32,0	1,7	9,6		
48.700	34,0	1,7	9,7		
46.000	36,0	1,7	9,8		
43.600	38,0	1,7	9,9		
41.400	40,0	1,7	9,9		
39.400	42,0	1,7	max		
37.600	44,0	1,7	max		
36.000	46,0	1,7	max		
34.500	48,0	1,7	max		
33.100	50,0	1,7	max		
31.800	52,0	1,7	max		
30.700	54,0	1,7	max		
29.600	56,0	1,7	max		
28.600	58,0	1,7	max		
27.600	60,0	1,7	max		
20.700	60,0	1,2	max		
20.000	60,0	1,2	max		
20.000	60,0	1,2	max		
20.000	60,0	1,2	max		
20.000	55,0	1,1	max		
20.000	50,0	1,0	max		
20.000	45,0	0,9	max		
20.000	40,0	0,8	max		

Teflon (PTFE), Polyimid (Flex)

max. hit counts	Cutting speed		Chip load		15,00 %
	m/min	100	Retract	max. stack	
2.000	max. hit counts	2.000	2,5	2,5	
Spindle speed RPM	Chip load μm/U	Infeed m/min	Retract m/min		
160.000	7,0	1,1	2,3		
160.000	8,4	1,3	2,8		
160.000	9,8	1,6	3,2		
160.000	11,2	1,8	3,7		
160.000	12,6	2,0	4,2		
160.000	14,0	2,2	4,7		
160.000	21,0	3,4	7,2		
159.200	28,0	4,5	9,8		
127.400	35,0	4,5	max		
106.200	42,0	4,5	max		
91.000	49,0	4,5	max		
79.600	56,0	4,5	max		
70.800	63,0	4,5	max		
63.700	70,0	4,5	max		
57.900	77,0	4,5	max		
53.100	84,0	4,5	max		
49.000	91,0	4,5	max		
45.500	98,0	4,5	max		
42.500	100,0	4,3	max		
39.800	100,0	4,0	max		
37.500	100,0	3,8	max		
35.400	100,0	3,5	max		
33.500	100,0	3,4	max		
31.800	100,0	3,2	max		
30.300	100,0	3,0	max		
29.000	100,0	2,9	max		
27.700	100,0	2,8	max		
26.500	100,0	2,7	max		
25.500	100,0	2,6	max		
24.500	100,0	2,5	max		
23.600	100,0	2,4	max		
22.700	100,0	2,3	max		
22.000	100,0	2,2	max		
21.200	100,0	2,1	max		
20.000	100,0	2,0	max		
20.000	100,0	2,0	max		
20.000	100,0	2,0	max		
20.000	90,0	1,8	max		
20.000	80,0	1,6	max		
20.000	70,0	1,4	max		
20.000	60,0	1,2	max		
20.000	50,0	1,0	max		



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