

**WXL 涂层铣刀系列**  
WXL Coating Series

Vol. ⑤

**WXL  
NEW!**



新WXL涂层带来了铣削技术的辉煌,为全球的制造工业奠定了基础。

我们再次扩大了硬质合金铣刀的阵容!

To brighten the future of milling technology, which lays the foundation for the worlds' manufacturing industry; we have reinforced our carbide end mill series.

# 新WXL涂层

New coating WXL end mill series

## 切削范围广泛!

Handles a wide range of materials and applications!

润滑性·耐磨性能优异

新涂层WXL

涂层切削范围广泛!

The new WXL coating excels in lubricity and wear resistance to accommodate a wide range of milling applications!

与WXS系列并用可以加工各种类型的加工材料!

Together with the WXS Series, the WXL Series handles every possible type of material!

只需这一支!

不论铜还是HRC50 调制钢

A single tool handles from copper to materials up to 50 HRC.

## 新WXL涂层的开发

New WXL coating development concept

该涂层切削范围广泛,从非铁合金、软钢到HRC50的调制钢,都可以提高其切削性能。无论是干式还是湿式,您不用操心冷却方式,铣刀仍可以稳定切削。其切削条件也有很大的容许范围,不论是切削力小的低速切削还是大切削力的高速切削,就算是实际切削速度极易变动的球头铣刀,该涂层也可以保证铣刀发挥较为稳定的切削性能。

This coating has been developed to improve performance in a wide range of materials including nonferrous materials, mild steels, and refined steels up to 50 HRC. Its' stable performance remains consistent in both wet and dry applications. It is intended for a wide range of cutting conditions, from low speed / reduced cutting force applications to high speed / large cutting force applications. Therefore, it ensures stable performance with ball end mills, which are susceptible to cutting speed fluctuations.

	硬度 (Hv) Surface Hardness	摩擦系数 Coefficient of Friction	氧化开始温度 (°C) Oxidation Temperature	耐热性 Heat Resistance	付着力 Adhesion Strength	表面粗糙度 Surface Roughness	耐磨擦性 Wear Resistance	耐腐蚀性 Corrosion Resistance
<b>WXL</b>	<b>3,100</b>	<b>0.25</b>	<b>1,100</b>	◎	◎	○	◎	◎
<b>WXS</b>	3,500	0.3	1,300	○	◎	○	◎	○

## WXL推荐加工材质 WXL Suggested Work Material

炭素钢 CARBON STEELS	合金钢 ALLOY STEELS	预硬钢 PREHARDENED STEELS	淬硬钢 HARDENED STEELS		不锈钢 STAINLESS STEELS	铝合金 ALUMINUM ALLOY	钛合金 TITANIUM ALLOY	铜合金 COPPER ALLOY	树脂 PLASTIC
		~40RC	~55HRC	55HRC ~					
◎	◎	◎	◎	※	○	○	○	◎	○

※推荐使用WXS涂层系列。  
WXS Coating Series is recommended.



## WXL 涂层铣刀系列

**7大种类汹涌而来, 合计追加699种尺寸!!**

A new surge for the WXL Coating End Mill Series: an increase of seven types, a total of 699 sizes!!

### 丰富的尺寸范围对应各种加工情况

Plentiful variety of sizes to handle a wide range of applications

#### 平头系列 (P7 ~) Square

**NEW** WXL-DE (1.5D/2D/3D/4D) (P7 ~) **268** 种尺寸 sizes (φ0.1 ~ 20)

WXL-EDS (P15 ~) **37** 种尺寸 sizes (φ0.1 ~ 12)

WXL-EMS (P17 ~) **22** 种尺寸 sizes (φ1 ~ 30)

**NEW** WXL-LN-EDS (P19 ~) **187** 种尺寸 sizes (φ0.2 ~ 5)

**NEW** WXL-LN-EMS (P27 ~) **65** 种尺寸 sizes (φ1 ~ 3)

#### 球头系列 (P31 ~) Ball

WXL-EBD (P31 ~) **52** 种尺寸 sizes (R0.05 ~ 10)

WXL-LN-EBD (P33 ~) **284** 种尺寸 sizes (R0.05 ~ 3)

**NEW** WXL-PC-EBD (P49 ~) **179** 种尺寸 sizes (R0.1 ~ 3)

WXL-HS-EBD (P61 ~) **15** 种尺寸 sizes (R0.1 ~ 6)

WXL-HS-LN-EBD (P63 ~) **60** 种尺寸 sizes (R0.1 ~ 1.5)

### 稳定加工和圆弧精度高的刃型

The cutting edge achieves a high level of radius precision and stable machining

外周刃圆弧部位的连接没有接痕!

Seamless ball-side tangency

WXL-EBD WXL-HS-EBD	$R < 3$	$\pm 0.005\text{mm}$
	$3 \leq R \leq 6$	$0.003 \sim -0.007\text{mm}$
	$6 < R$	$\pm 0.01\text{mm}$
注) $6 < \text{圆弧角}$ 无接缝 Tools with a radius below 6 are not seamless.		

WXL-LN-EBD WXL-HS-LN-EBD	所有尺寸 All sizes	$\pm 0.005\text{mm}$
	注) $R \leq 0.1$ 圆弧角无接缝 Tools with a radius below 0.1 are not seamless.	



# 加工数据 Cutting Data

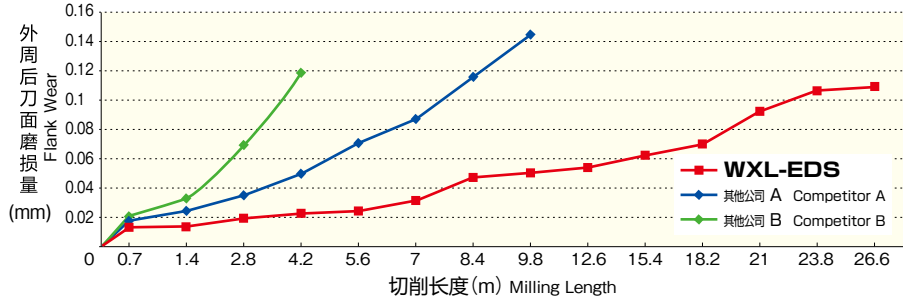
**与其他公司的产品相比磨耗小，加工更稳定！**

Even the square type achieves stable milling with less wear than the competitor's.

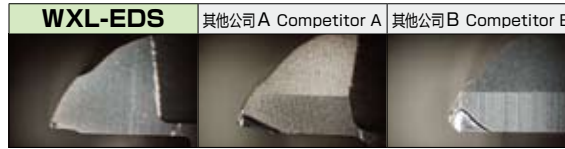
## WXL-EDS S50C 的加工

WXL-EDS Milling in S50C

使用工具 Tool	WXL-EDS
尺寸 Size	φ2
加工材质 Work Material	S50C
切削速度 Milling Speed	69m/min (10,987min <sup>-1</sup> )
进给速度 Feed	135mm/min
切削方法 Milling Method	底面加工 Pick Milling
切深量 Depth of Cut	a <sub>p</sub> = 0.6mm a <sub>e</sub> = 1.6mm
切削油剂 Coolant	气冷式 Air Blow
使用机床 Machine	立式加工中心 Vertical Machining Center



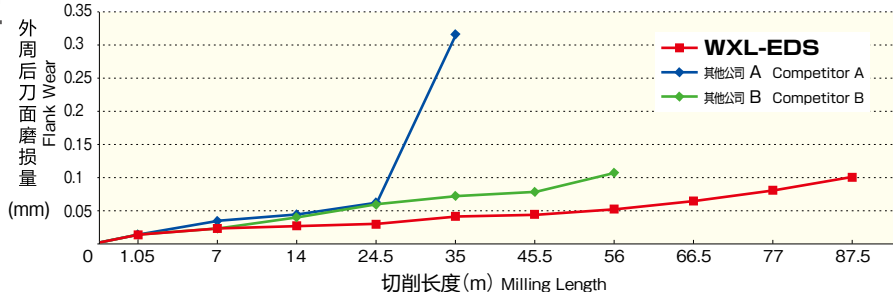
切削长度4.2m时的磨耗状况 After Milling 4.2m



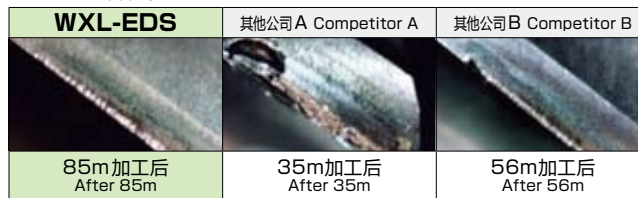
## WXL-EDS SUS304 的加工

WXL-EDS Milling in SUS304

使用工具 Tool	WXL-EDS
尺寸 Size	φ6
加工材质 Work Material	SUS304
切削速度 Milling Speed	38m/min (2,000min <sup>-1</sup> )
进给速度 Feed	80mm/min
切削方法 Milling Method	a <sub>p</sub> = 3mm a <sub>e</sub> = 4.8mm
切深量 Depth of Cut	正面切削 Face Milling
切削油剂 Coolant	水溶性切削油剂 Water Soluble
使用机床 Machine	立式加工中心 Vertical Machining Center



加工后的磨耗状况 Tool Wear After Milling



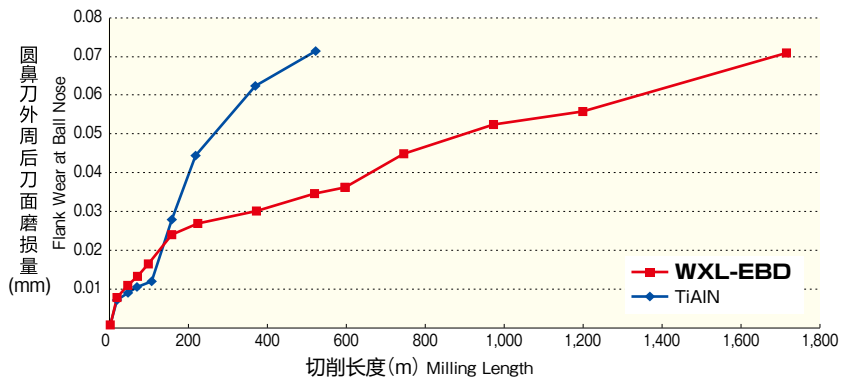
**WXL系列切削范围广！铜加工时寿命比TiAlN涂层产品提高3倍！能稳定加工高硬度材料！**

The WXL Series handles a wide range of materials! When working in copper, its durability level is three times greater than TiAlN coating. Also, it ensures stable milling in hard materials.

## WXL-EBD C1100 的加工

WXL-EBD Milling in C1100

使用工具 Tool	WXL-EBD
尺寸 Size	R3×12
加工材质 Work Material	C1100
切削速度 Milling Speed	244.92m/min (13,000min <sup>-1</sup> )
进给速度 Feed	3,900mm/min (0.15mm/t)
切削方法 Milling Method	底面加工 Pick Milling
切深量 Depth of Cut	a <sub>p</sub> = 0.3mm P <sub>f</sub> = 0.6mm
切削油剂 Coolant	水溶性切削油剂 (EZ-30) Water-Soluble
使用机床 Machine	立式加工中心 Vertical Machining Center



## 以前的 TiAlN 涂层刀具寿命和表面粗糙度都得到了提升!

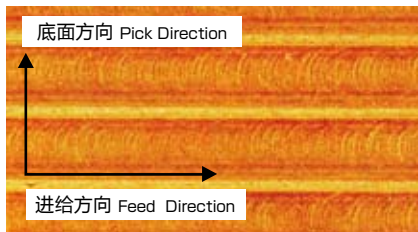
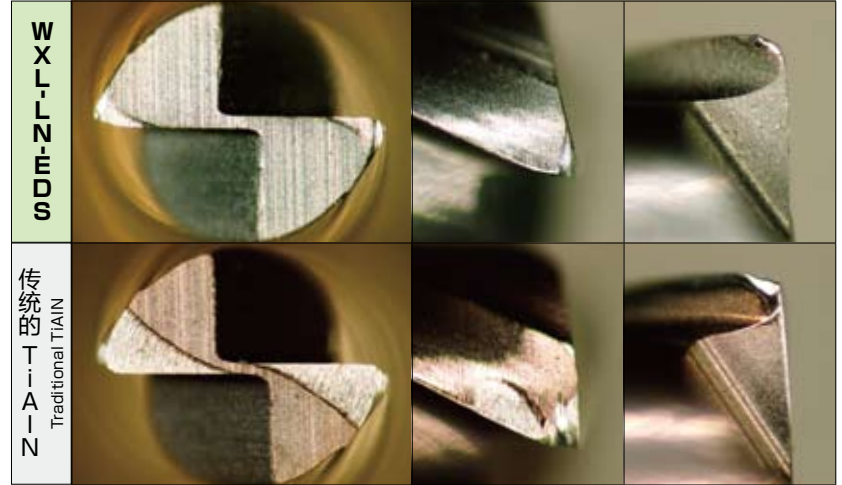
Both tool life and surface roughness are improved over traditional TiAlN!

### WXL-LN-EDS C1100的加工

WXL-LN-EDS Milling in C1100

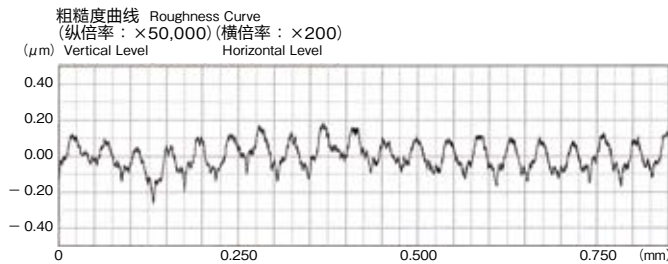
使用工具 Tool	WXL-LN-EDS <b>NEW</b>
尺寸 Size	φ1×6
加工材质 Work Material	C1100
切削速度 Milling Speed	63m/min (20,000min <sup>-1</sup> )
进给速度 Feed	864mm/min (0.022mm/t)
切削方法 Milling Method	底面加工 Surface Pick Machining
切深量 Depth of Cut	a <sub>p</sub> = 0.05mm a <sub>e</sub> = 0.9mm
切削油剂 Coolant	水溶性切削油剂 Water Soluble
使用机床 Machine	立式加工中心 Vertical Machining Center

4小时加工后的磨损状况 Wear of damage after milling 4 hours.

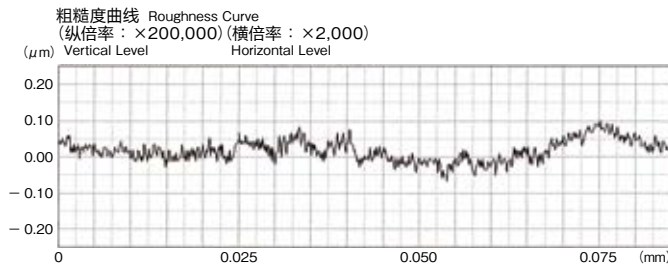


#### WXL-LN-EDS

●进给方向 Rz 0.32 μm  
Feed Direction

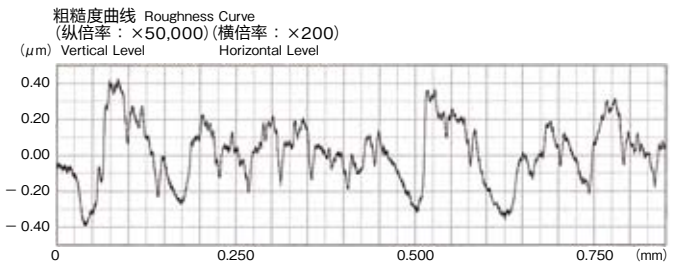


●底面方向 Rz 0.21 μm  
Pick Direction

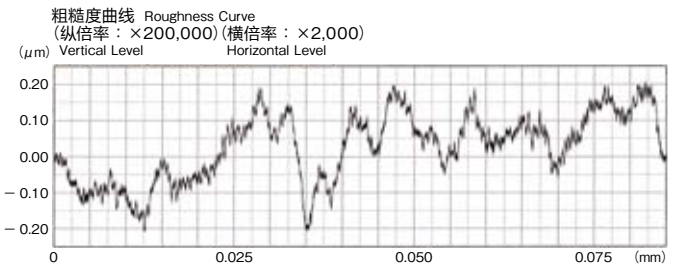


#### 传统的 TiAlN Traditional TiAlN

●进给方向 Rz 0.64 μm  
Feed Direction



●底面方向 Rz 0.50 μm  
Pick Direction



# 加工数据 Cutting Data

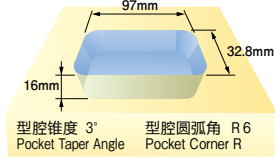
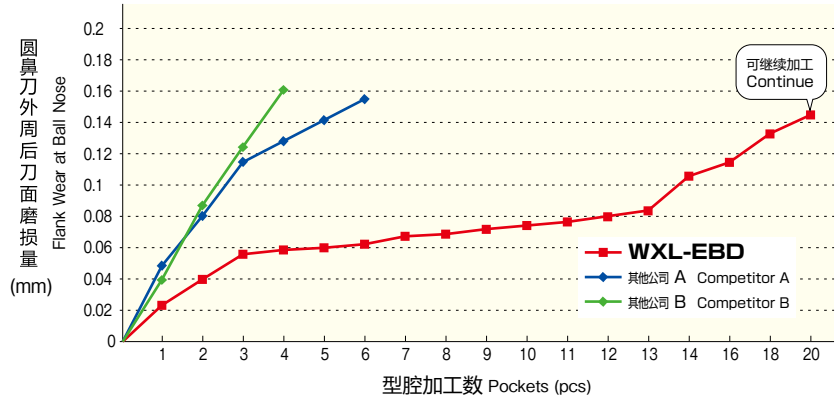
**无论是湿式还是干式加工寿命提高3倍!**

Offers three times the durability in both dry or wet applications!

## WXL-EBD 干式加工

WXL-EBD Dry Milling

使用工具 Tool	WXL-EBD
尺寸 Size	R5×18
加工材质 Work Material	S50C
切削速度 Milling Speed	200m/min (6,366min <sup>-1</sup> )
进给速度 Feed	1,604mm/min (0.126mm/t)
切削方法 Milling Method	型腔加工 Pocket Milling
切深量 Depth of Cut	a <sub>p</sub> = 1mm P <sub>f</sub> = 2mm
悬长 Projection Length	4D
切削油剂 Coolant	气冷式 Air Blow
使用机床 Machine	立式加工中心 Vertical Machining Center



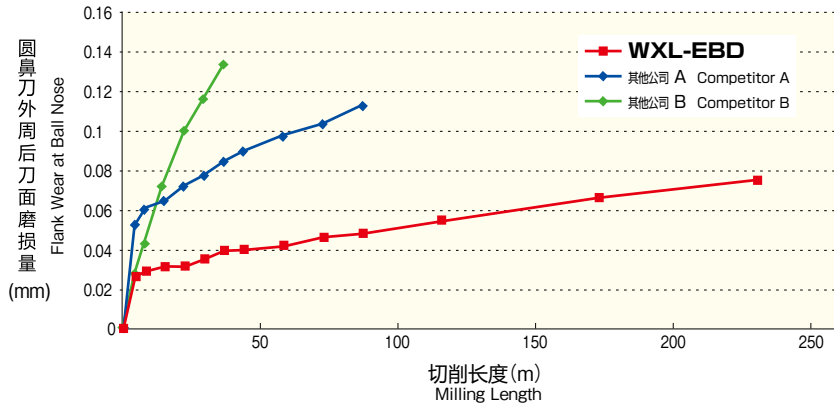
加工后的磨损状况 Tool Wear After Milling



## WXL-EBD 湿式加工

WXL-EBD Wet Milling

使用工具 Tool	WXL-EBD
尺寸 Size	R3×12
加工材质 Work Material	S50C
切削速度 Milling Speed	199.7m/min (10,600min <sup>-1</sup> )
进给速度 Feed	2,570mm/min (0.121mm/t)
切削方法 Milling Method	底面加工 Pick Milling
切深量 Depth of Cut	a <sub>p</sub> = 0.3mm P <sub>f</sub> = 0.6mm
切削油剂 Coolant	水溶性切削油剂(乳液) Water-Soluble (Emulsion)
使用机床 Machine	立式加工中心 Vertical Machining Center



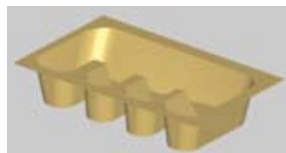
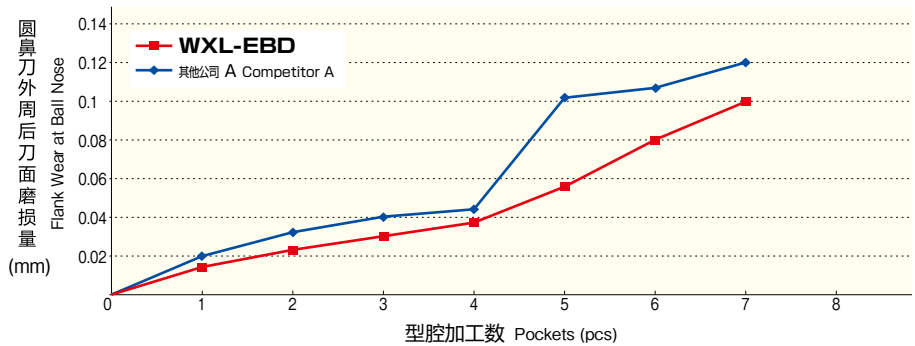
## WXL系列能广泛应用于各种材料加工。

The WXL series handles a wide range of materials and applications.

## WXL-EBD DH31S (48HRC) 的加工

WXL-EBD Milling in DH31S(48HRC)

使用工具 Tool	WXL-EBD
尺寸 Size	R5×18
加工材质 Work Material	DH31S (48HRC)
切削速度 Milling Speed	180m/min (5,700min <sup>-1</sup> )
进给速度 Feed	1,350mm/min (0.118mm/t)
切削方法 Milling Method	模具加工 Model Milling
切深量 Depth of Cut	a <sub>p</sub> = 1mm P <sub>f</sub> = 2mm
悬长 Projection Length	5D
切削油剂 Coolant	气冷式 Air Blow
使用机床 Machine	卧式加工中心 Horizontal Machining Center



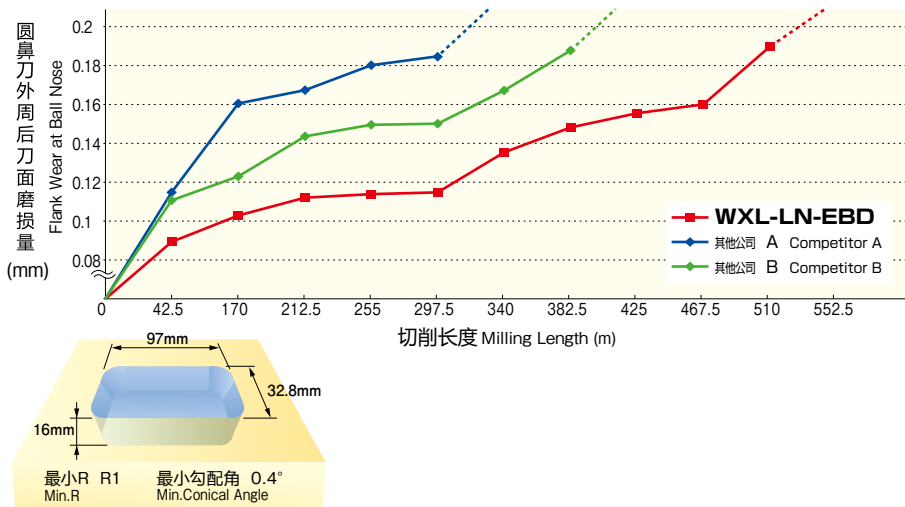
型腔锥度 Pocket Taper Angle	3°	型腔尺寸 Pocket Size	86.25×48.75mm
型腔圆弧角 Pocket Corner R	R6	型腔深度 Pocket Depth	16mm

# 加工数据 Cutting Data

## WXL-LN-EBD NAK80(40HRC) 的加工

WXL-LN-EBD Milling in NAK80(40HRC)

使用工具 Tool	WXL-LN-EBD
尺寸 Size	R1 × 10
加工材质 Work Material	NAK80 (40HRC)
切削速度 Milling Speed	126m/min (20,000min <sup>-1</sup> )
进给速度 Feed	2,000mm/min (0.05mm/t)
切削方法 Milling Method	型腔加工 Pocket Milling
切深量 Depth of Cut	a <sub>p</sub> = 0.1mm Pf = 0.4mm
悬长 Projection Length	7D
切削油剂 Coolant	气冷式 Air Blow
使用机床 Machine	立式加工中心 Vertical Machining Center (BT30)



## WXL系列 铜电极加工

WXL series copper electrode milling



电极模具加工 Electrode model milling

工程 Process	使用工具 Tool		转速 Speed (min <sup>-1</sup> )	进给速度 Feed (mm/min)	切深量 Depth of Cut (mm)	加工余量 Semi-finishing (mm)	加工时间(分) Cutting Time (min)	切削油剂 Coolant
粗加工 Roughing	WX-CR-PHS	φ8 × R0.5	4,000	2,000	0.4	0.3	24	半干式 Mist
半粗加工 Semi-roughing	WXL-EDS	φ4	6,000	1,000	0.2	0.1	30	半干式 Mist
精加工 Finishing	WXL-HS-LN-EBD	R1 × 16 × 4	20,000	1,150	0.1	0	88	半干式 Mist

## WXL系列 NAK80加工

WXL series NAK milling



压铸微型模型 Diecast miniature model

工程 Process	使用工具 Tool	转速 Speed (min <sup>-1</sup> )	进给速度 Feed (mm/min)	切深量 Depth of Cut		加工余量 Semi-finishing (mm)	加工时间(分) Cutting Time (min)	切削油剂 Coolant
				a <sub>a</sub> (mm)	Pf (mm)			
粗加工 Roughing	WXL-HS-EBD R3 × 10	8,000	2,700	0.4	1.5	0.2	63	半干式 Mist
半粗加工 Semi-roughing	WXL-LN-EBD R1.5 × 10 × 6	13,000	1,500	0.15	0.25	0.1	154	半干式 Mist
半精加工 Semi-finishing	WXL-LN-EBD R1 × 10 × 4	15,000	1,200	0.1	0.1	0.05	130	半干式 Mist
	WXL-LN-EBD R0.8 × 8 × 4	20,000	1,800	0.1	0.05	0.05	26	半干式 Mist
精加工 Finishing	WXL-LN-EBD R0.8 × 8 × 4	20,000	1,800	0.05	0.03	0	132	半干式 Mist

1把刀具能完成所有加工! 高寿命的 WXL! A single tool for finishing! With the high durability of the WXL!

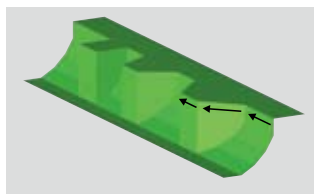
## WXL 涂层能有效抑制中心部的磨损!

Thanks to the WXL Coating, wear on the central portion of the tool has been reduced!

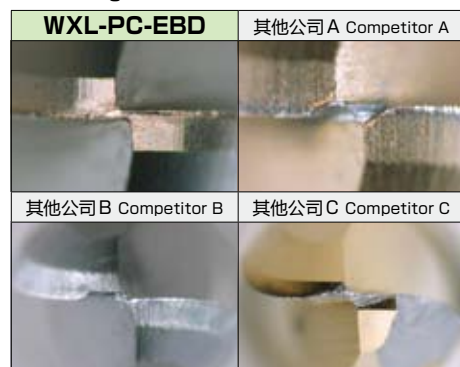
## WXL-PC-EBD STAVAX (52HRC) 的加工

WXL-PC-EBD Milling in STAVAX (52HRC)

使用工具 Tool	WXL-PC-EBD <b>NEW</b>
尺寸 Size	R1 × 1° × 20
加工材质 Work Material	STAVAX (52HRC)
切削速度 Milling Speed	63m/min (10,000min <sup>-1</sup> )
进给速度 Feed	2,000mm/min (0.1mm/t)
切削方法 Milling Method	等高线加工 Contoured Milling
切深量 Depth of Cut	a <sub>p</sub> = 0.05mm Pf = 0.05mm
切削油剂 Coolant	半干式 Mist
使用机床 Machine	立式加工中心 Vertical Machining Center



240m 加工后的磨损状况  
After Milling 240m

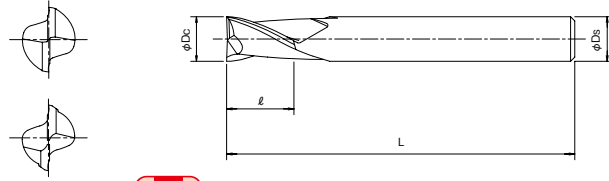


# WXL 涂层2刃 1.5D 刃长形

WXL Coating Two Flute · Short 1.5D Flute Length Type



## WXL-1.5D-DE



● 材质 ..... 超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide

● 表面处理 ..... WXL 涂层  
Surface Treatment WXL Coating

● 螺旋角 ..... 30°  
Helix Angle

● 外径公差 ..... 0 ~ -0.02mm  
Tolerance for Outer Diameter



铣刀的底刃刃角为尖角形状。  
Indicates that the end mill has a sharp corner edge.

单位 :mm Unit:mm

商品号 EDP No.	外径 Dc	全长 L	刃长 l	柄径 Ds	库存 Stock
3181801	0.1	45	0.15	4	B
3181802	0.2	45	0.3	4	B
3181803	0.3	45	0.45	4	B
3181804	0.4	45	0.6	4	B
3181805	0.5	45	0.75	4	A
3181806	0.6	45	0.9	4	B
3181807	0.7	45	1.1	4	B
3181808	0.8	45	1.2	4	B
3181809	0.9	45	1.4	4	B
3181810	1	45	1.5	4	A
3181811	1.1	45	1.7	4	B
3181812	1.2	45	1.8	4	A
3181813	1.3	45	2	4	B
3181814	1.4	45	2.1	4	B
3181815	1.5	45	2.3	4	A
3181816	1.6	45	2.4	4	B
3181817	1.7	45	2.6	4	B
3181818	1.8	45	2.7	4	A
3181819	1.9	45	2.9	4	B
3181820	2	45	3	4	A
3181821	2.1	45	3.2	4	B
3181822	2.2	45	3.3	4	B
3181823	2.3	45	3.5	4	B
3181824	2.4	45	3.6	4	B
3181825	2.5	45	3.8	4	A
3181826	2.6	45	3.9	4	B
3181827	2.7	45	4.1	4	B
3181828	2.8	45	4.2	4	B
3181829	2.9	45	4.4	4	B
3181830	3	45	4.5	6	A

商品号 EDP No.	外径 Dc	全长 L	刃长 l	柄径 Ds	库存 Stock
3181831	3.1	45	4.7	6	B
3181832	3.2	45	4.8	6	B
3181833	3.3	45	5	6	B
3181834	3.4	45	5.1	6	B
3181835	3.5	45	5.3	6	A
3181836	3.6	45	5.4	6	B
3181837	3.7	45	5.6	6	B
3181838	3.8	45	5.7	6	B
3181839	3.9	45	5.9	6	B
3181840	4	45	6	6	A
3181841	4.1	50	6.2	6	B
3181842	4.2	50	6.3	6	B
3181843	4.3	50	6.5	6	B
3181844	4.4	50	6.6	6	B
3181845	4.5	50	6.8	6	A
3181846	4.6	50	6.9	6	B
3181847	4.7	50	7.1	6	B
3181848	4.8	50	7.2	6	B
3181849	4.9	50	7.4	6	B
3181850	5	50	7.5	6	A
3181851	5.1	50	7.7	6	B
3181852	5.2	50	7.8	6	B
3181853	5.3	50	8	6	B
3181854	5.4	50	8.1	6	B
3181855	5.5	50	8.3	6	A
3181856	5.6	50	8.4	6	B
3181857	5.7	50	8.6	6	B
3181858	5.8	50	8.7	6	B
3181859	5.9	50	8.9	6	B
3181860	6	50	9	6	A

A= 标准库存品 A=Standard stock item.  
B= 库存中心标准库存品 B=Inventory center stock item.

形状寸法表 WXL-1.5D-DE

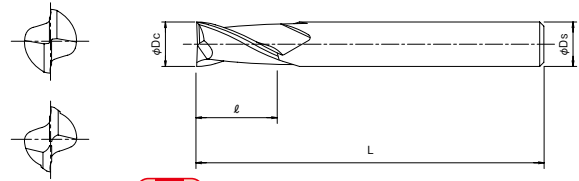


# WXL 涂层2刃 2D刃长形

WXL Coating Two Flute · Short 2D Flute Length Type



## WXL-2D-DE



● 材质 ..... 超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide

● 表面处理 ..... WXL 涂层  
Surface Treatment WXL Coating

● 螺旋角 ..... 30°  
Helix Angle

● 外径公差 .....  $D_c \leq 12$  0 ~ -0.02mm  
Tolerance for Outer Diameter  $12 < D_c$  0 ~ -0.03mm



铣刀的底刃刃角为尖角形状。  
Indicates that the end mill has a sharp corner edge.

单位 :mm Unit:mm

商品号 EDP No.	外径 Dc	全长 L	刃长 ℓ	柄径 Ds	库存 Stock
3182001	0.1	45	0.2	4	B
3182002	0.2	45	0.4	4	B
3182003	0.3	45	0.6	4	B
3182004	0.4	45	0.8	4	B
3182005	0.5	45	1	4	A
3182006	0.6	45	1.2	4	B
3182007	0.7	45	1.4	4	B
3182008	0.8	45	1.6	4	B
3182009	0.9	45	1.8	4	B
3182010	1	45	2	4	A
3182011	1.1	45	2.2	4	B
3182012	1.2	45	2.4	4	A
3182013	1.3	45	2.6	4	B
3182014	1.4	45	2.8	4	B
3182015	1.5	45	3	4	A
3182016	1.6	45	3.2	4	B
3182017	1.7	45	3.4	4	B
3182018	1.8	45	3.6	4	A
3182019	1.9	45	3.8	4	B
3182020	2	45	4	4	A
3182021	2.1	45	4.2	4	B
3182022	2.2	45	4.4	4	B
3182023	2.3	45	4.6	4	B
3182024	2.4	45	4.8	4	B
3182025	2.5	45	5	4	A
3182026	2.6	45	5.2	4	B
3182027	2.7	45	5.4	4	B
3182028	2.8	45	5.6	4	B
3182029	2.9	45	5.8	4	B
3182030	3	45	6	6	A
3182031	3.1	45	6.2	6	B
3182032	3.2	45	6.4	6	B
3182033	3.3	45	6.6	6	B
3182034	3.4	45	6.8	6	B
3182035	3.5	45	7	6	A
3182036	3.6	45	7.2	6	B
3182037	3.7	45	7.4	6	B

商品号 EDP No.	外径 Dc	全长 L	刃长 ℓ	柄径 Ds	库存 Stock
3182038	3.8	45	7.6	6	B
3182039	3.9	45	7.8	6	B
3182040	4	45	8	6	B
3182041	4.1	50	8.2	6	A
3182042	4.2	50	8.4	6	B
3182043	4.3	50	8.6	6	B
3182044	4.4	50	8.8	6	B
3182045	4.5	50	9	6	B
3182046	4.6	50	9.2	6	A
3182047	4.7	50	9.4	6	B
3182048	4.8	50	9.6	6	B
3182049	4.9	50	9.8	6	B
3182050	5	50	10	6	B
3182051	5.1	50	10.2	6	A
3182052	5.2	50	10.4	6	B
3182053	5.3	50	10.6	6	B
3182054	5.4	50	10.8	6	B
3182055	5.5	50	11	6	B
3182056	5.6	50	11.2	6	A
3182057	5.7	50	11.4	6	B
3182058	5.8	50	11.6	6	A
3182059	5.9	50	11.8	6	B
3182060	6	50	12	6	A
3182065	6.5	60	13	8	B
3182070	7	60	14	8	A
3182075	7.5	60	15	8	B
3182080	8	60	16	8	A
3182085	8.5	70	17	10	A
3182090	9	70	18	10	A
3182095	9.5	70	19	10	B
3182100	10	70	20	10	B
3182110	11	75	22	12	B
3182120	12	75	24	12	B
3182160	16	90	32	16	B
3182180	18	90	36	16	A
3182200	20	100	40	20	B

A= 标准库存品 A=Standard stock item.  
B= 库存中心标准库存品 B=Inventory center stock item.

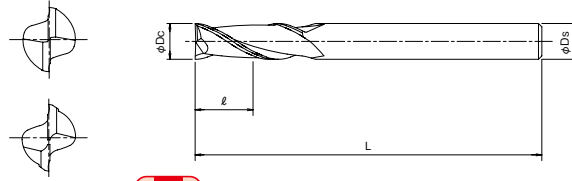
SPECIFICATION CHART  
形状寸法表  
WXL-2D-DE

# WXL 涂层2刃 3D 刃长形

WXL Coating Two Flute · Short 3D Flute Length Type



## WXL-3D-DE



- 材质.....超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide
- 表面处理.....WXL 涂层  
Surface Treatment WXL Coating
- 螺旋角.....35°  
Helix Angle



铣刀的底刃刃角为尖角形状。  
Indicates that the end mill has a sharp corner edge.

- 外径公差..... $Dc \leq 12$  0 ~ -0.02mm  
Tolerance for Outer Diameter  $12 < Dc$  0 ~ -0.03mm

单位:mm Unit:mm

商品号 EDP No.	外径 Dc	全长 L	刃长 ℓ	柄径 Ds	库存 Stock
3182401	0.1	45	0.3	4	B
3182402	0.2	45	0.6	4	B
3182403	0.3	45	0.9	4	B
3182404	0.4	45	1.2	4	B
3182405	0.5	45	1.5	4	A
3182406	0.6	45	1.8	4	B
3182407	0.7	45	2.1	4	B
3182408	0.8	45	2.4	4	B
3182409	0.9	45	2.7	4	B
3182410	1	45	3	4	A
3182411	1.1	45	3.3	4	B
3182412	1.2	45	3.6	4	A
3182413	1.3	45	3.9	4	B
3182414	1.4	45	4.2	4	B
3182415	1.5	45	4.5	4	A
3182416	1.6	45	4.8	4	B
3182417	1.7	45	5.1	4	B
3182418	1.8	45	5.4	4	A
3182419	1.9	45	5.7	4	B
3182420	2	45	6	4	A
3182421	2.1	45	6.3	4	B
3182422	2.2	45	6.6	4	B
3182423	2.3	45	6.9	4	B
3182424	2.4	45	7.2	4	B
3182425	2.5	45	7.5	4	A
3182426	2.6	45	7.8	4	B
3182427	2.7	45	8.1	4	B
3182428	2.8	45	8.4	4	B
3182429	2.9	45	8.7	4	B
3182430	3	45	9	6	A
3182431	3.1	45	9.3	6	B
3182432	3.2	45	9.6	6	B
3182433	3.3	45	9.9	6	B
3182434	3.4	45	10.2	6	B
3182435	3.5	45	10.5	6	A
3182436	3.6	45	10.8	6	B
3182437	3.7	45	11.1	6	B

商品号 EDP No.	外径 Dc	全长 L	刃长 ℓ	柄径 Ds	库存 Stock
3182438	3.8	45	11.4	6	B
3182439	3.9	45	11.7	6	B
3182440	4	50	12	6	A
3182441	4.1	50	12.3	6	B
3182442	4.2	50	12.6	6	B
3182443	4.3	50	12.9	6	B
3182444	4.4	50	13.2	6	B
3182445	4.5	50	13.5	6	A
3182446	4.6	55	13.8	6	B
3182447	4.7	55	14.1	6	B
3182448	4.8	55	14.4	6	B
3182449	4.9	55	14.7	6	B
3182450	5	55	15	6	A
3182451	5.1	55	15.3	6	B
3182452	5.2	55	15.6	6	B
3182453	5.3	55	15.9	6	B
3182454	5.4	55	16.2	6	B
3182455	5.5	60	16.5	6	A
3182456	5.6	60	16.8	6	B
3182457	5.7	60	17.1	6	B
3182458	5.8	60	17.4	6	B
3182459	5.9	60	17.7	6	B
3182460	6	60	18	6	A
3182465	6.5	65	19.5	8	B
3182470	7	65	21	8	A
3182475	7.5	70	22.5	8	B
3182480	8	70	24	8	A
3182485	8.5	70	25.5	10	B
3182490	9	75	27	10	A
3182495	9.5	75	28.5	10	B
3182500	10	80	30	10	A
3182510	11	80	33	12	A
3182520	12	90	36	12	A
3182560	16	110	48	16	B
3182580	18	130	54	16	B
3182600	20	130	60	20	B

A= 标准库存品 A=Standard stock item.  
B= 库存中心标准库存品 B=Inventory center stock item.

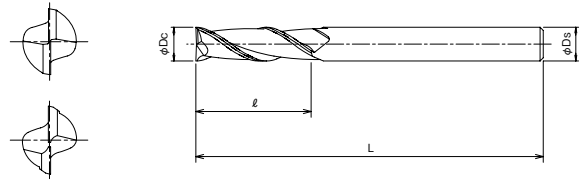
SPECIFICATION CHART WXL-3D-DE 形状寸法表

# WXL 涂层2刃 4D 刃长形

WXL Coating Two Flute · Short 4D Flute Length Type



## WXL-4D-DE



● 材质 ..... 超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide

● 表面处理 ..... WXL 涂层  
Surface Treatment WXL Coating

● 螺旋角 ..... 40°  
Helix Angle

● 外径公差 ..... 0 ~ -0.02mm  
Tolerance for Outer Diameter

单位 :mm Unit:mm

商品号 EDP No.	外径 Dc	全长 L	刃长 l	柄径 Ds	库存 Stock
3182602	0.2	45	0.8	4	B
3182603	0.3	45	1.2	4	B
3182604	0.4	45	1.6	4	B
3182605	0.5	45	2	4	A
3182606	0.6	45	2.4	4	B
3182607	0.7	45	2.8	4	B
3182608	0.8	45	3.2	4	B
3182609	0.9	45	3.6	4	B
3182610	1	45	4	4	A
3182611	1.1	45	4.4	4	B
3182612	1.2	45	4.8	4	A
3182613	1.3	45	5.2	4	B
3182614	1.4	45	5.6	4	B
3182615	1.5	45	6	4	A
3182616	1.6	45	6.4	4	B
3182617	1.7	45	6.8	4	B
3182618	1.8	45	7.2	4	A
3182619	1.9	45	7.6	4	B
3182620	2	45	8	4	A
3182621	2.1	45	8.4	4	B
3182622	2.2	45	8.8	4	B
3182623	2.3	45	9.2	4	B
3182624	2.4	45	9.6	4	B
3182625	2.5	45	10	4	A
3182626	2.6	50	10.4	4	B
3182627	2.7	50	10.8	4	B
3182628	2.8	50	11.2	4	B
3182629	2.9	50	11.6	4	B
3182630	3	50	12	6	A
3182631	3.1	50	12.4	6	B
3182632	3.2	50	12.8	6	B

商品号 EDP No.	外径 Dc	全长 L	刃长 l	柄径 Ds	库存 Stock
3182633	3.3	50	13.2	6	B
3182634	3.4	50	13.6	6	B
3182635	3.5	50	14	6	A
3182636	3.6	50	14.4	6	B
3182637	3.7	50	14.8	6	B
3182638	3.8	50	15.2	6	B
3182639	3.9	50	15.6	6	B
3182640	4	55	16	6	A
3182641	4.1	55	16.4	6	B
3182642	4.2	55	16.8	6	B
3182643	4.3	55	17.2	6	B
3182644	4.4	55	17.6	6	B
3182645	4.5	55	18	6	A
3182646	4.6	55	18.4	6	B
3182647	4.7	55	18.8	6	B
3182648	4.8	55	19.2	6	B
3182649	4.9	55	19.6	6	B
3182650	5	60	20	6	A
3182651	5.1	60	20.4	6	B
3182652	5.2	60	20.8	6	B
3182653	5.3	60	21.2	6	B
3182654	5.4	60	21.6	6	B
3182655	5.5	65	22	6	A
3182656	5.6	65	22.4	6	B
3182657	5.7	65	22.8	6	B
3182658	5.8	65	23.2	6	B
3182659	5.9	65	23.6	6	B
3182660	6	65	24	6	A
3182680	8	80	32	8	A
3182700	10	90	40	10	A
3182720	12	100	48	12	A

A= 标准库存品 A=Standard stock item.  
B= 库存中心标准库存品 B=Inventory center stock item.

SPECIFICATION CHART  
形状寸法表  
WXL4DDE

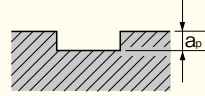
## WXL-1.5D-DE 槽切削 SLOTTING

RECOMMENDED MILLING CONDITIONS  
WXL-1.5D-DE  
切削条件表

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY		普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC		调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH				
	尺寸 MILL DIA. (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	33~41HRC		42~50HRC	
					转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	
0.1	50,000	120	40,000	80	40,000	75	40,000	38	
0.2	50,000	170	40,000	110	40,000	90	40,000	45	
0.3	50,000	210	40,000	140	40,000	100	40,000	70	
0.4	50,000	230	40,000	150	40,000	110	34,500	75	
0.5	50,000	250	38,500	150	31,000	110	27,500	75	
0.6	50,000	280	33,500	150	24,500	110	21,000	75	
0.7	50,000	310	30,000	150	21,500	110	18,500	75	
0.8	50,000	360	27,000	150	19,500	110	17,000	80	
0.9	50,000	400	23,500	150	17,000	110	15,000	80	
1	50,000	430	22,000	150	15,500	110	13,500	80	
1.1	50,000	420	20,000	150	14,000	110	12,500	80	
1.2	50,000	420	18,500	150	13,500	110	11,500	80	
1.3	47,000	410	17,500	150	12,500	110	11,000	80	
1.4	44,000	410	16,000	150	11,500	110	10,000	80	
1.5	40,000	400	15,500	150	11,000	110	9,900	80	
1.6	39,000	400	15,000	150	10,500	110	9,400	80	
1.7	36,500	400	14,000	150	9,900	110	8,800	80	
1.8	34,500	400	13,500	160	9,400	110	8,500	80	
1.9	32,500	400	12,500	160	8,800	110	7,900	85	
2	30,000	380	12,000	160	8,700	110	7,900	90	
2.1	29,000	410	11,500	170	8,300	110	7,400	90	
2.2	28,000	410	11,000	170	8,200	110	7,200	90	
2.3	27,500	410	11,000	180	8,000	110	7,000	90	
2.4	26,000	430	10,500	180	7,900	110	6,900	90	
2.5	24,500	430	10,500	200	7,600	110	6,600	90	
2.6	23,500	470	9,800	200	7,400	125	6,300	90	
2.7	23,000	470	9,500	200	7,100	125	6,100	90	
2.8	22,000	470	9,100	210	6,900	125	5,800	95	
2.9	21,500	470	8,800	210	6,700	125	5,700	95	
3	21,000	540	8,900	230	6,800	130	5,700	100	
3.1	20,000	550	8,700	240	6,700	130	5,600	100	
3.2	19,500	560	8,400	240	6,500	145	5,400	105	
3.3	19,000	560	8,100	250	6,300	145	5,200	105	
3.4	18,000	560	7,900	250	6,100	145	5,100	105	
3.5	18,000	560	7,800	250	6,000	155	5,000	105	
3.6	17,500	580	7,600	270	5,900	155	4,900	110	
3.7	16,500	580	7,400	270	5,700	155	4,700	110	
3.8	16,000	590	7,300	280	5,700	155	4,600	110	
3.9	15,500	590	7,100	280	5,500	160	4,500	110	
4	15,500	600	7,000	280	5,500	160	4,500	115	
4.1	15,500	640	6,900	290	5,400	160	4,400	115	
4.2	15,000	640	6,800	290	5,300	160	4,400	115	
4.3	14,000	640	6,700	310	5,200	160	4,300	115	
4.4	14,000	670	6,600	320	5,100	170	4,200	125	
4.5	14,000	670	6,600	320	5,100	170	4,200	125	
4.6	13,500	700	6,500	330	4,900	170	4,100	125	
4.7	13,500	700	6,500	350	4,900	170	4,100	125	
4.8	13,500	710	6,400	350	4,800	170	4,100	125	
4.9	13,500	710	6,300	360	4,700	170	4,000	125	
5	12,500	720	6,200	370	4,600	170	3,900	130	
5.1	12,500	720	6,100	370	4,500	170	3,900	130	
5.2	12,000	720	6,000	370	4,400	170	3,800	130	
5.3	12,000	720	5,900	370	4,400	170	3,800	130	
5.4	11,500	720	5,800	370	4,300	170	3,600	130	
5.5	11,500	720	5,700	370	4,200	170	3,500	130	
5.6	11,500	720	5,600	370	4,100	170	3,500	130	
5.7	11,000	720	5,500	370	4,000	170	3,400	130	
5.8	11,000	710	5,400	370	3,900	170	3,300	130	
5.9	10,500	710	5,300	370	3,800	170	3,300	130	
6	10,000	710	5,200	370	3,800	170	3,200	130	

切深量  
DEPTH OF CUT

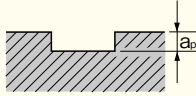
$D_c < \phi 1$	0.1D
$\phi 1 \leq D_c < \phi 3$	0.3D
$\phi 3 \leq D_c$	0.5D



1. 请使用刚性较高的机床和刀柄。  
1. Use a rigid and precise machine and holder.
2. 当发生振动时请同比下降转速和进给速度。  
2. When chattering occurs, reduce the speed and feed simultaneously.
3. 请使用适合工件材料发烟性少的切削油剂。  
3. Use a suitable cutting fluid with high smoke retardant properties.
4. 上表仅做参考实际加工时根据实际情况参照上表制定切削条件。  
4. Refer to the table above to set the milling conditions in accordance with the actual situation.

WXL-2D-DE 槽切削 SLOTTING

被削材 WORK MATERIAL	銅・銅合金 COPPER・COPPER ALLOY		普通结构用钢・炭素钢 MILD STEELS・CARBON STEELS FC250・S3400・S55C ~32HRC		调质钢・预硬钢 HARDENED STEELS・PREHARDENED STEELS SKT・SKD61・NAK55・NAK80・HPM1・DH				
	尺寸 MILL. DIA. (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	33~41HRC		42~50HRC	
					转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	
0.1	50,000	100	32,000	70	32,000	60	32,000	30	
0.2	50,000	140	32,000	90	32,000	75	32,000	35	
0.3	50,000	170	32,000	110	32,000	80	32,000	55	
0.4	50,000	190	32,000	120	32,000	90	27,500	60	
0.5	50,000	200	31,000	120	25,000	90	22,000	60	
0.6	50,000	230	27,000	120	19,500	90	17,000	60	
0.7	50,000	250	24,000	120	17,000	90	15,000	60	
0.8	50,000	290	21,500	120	15,500	90	13,500	65	
0.9	49,000	320	19,000	120	13,500	90	12,000	65	
1	47,500	350	17,500	120	12,500	90	11,000	65	
1.1	43,000	340	16,000	120	11,500	90	9,900	65	
1.2	40,500	340	15,000	120	10,500	90	9,300	65	
1.3	38,000	330	14,000	120	9,900	90	8,700	65	
1.4	35,000	330	13,000	120	9,200	90	8,100	65	
1.5	32,000	320	12,500	120	8,900	90	7,900	65	
1.6	31,000	320	12,000	120	8,500	90	7,500	65	
1.7	29,000	320	11,000	120	7,900	90	7,000	65	
1.8	28,000	320	10,500	130	7,500	90	6,800	68	
1.9	26,000	320	10,000	130	7,100	90	6,300	68	
2	24,000	310	9,700	130	7,000	90	6,300	70	
2.1	23,000	330	9,300	140	6,600	90	5,900	70	
2.2	22,500	330	9,000	140	6,500	90	5,700	70	
2.3	22,000	330	8,800	150	6,400	90	5,600	70	
2.4	20,500	350	8,600	150	6,300	90	5,500	70	
2.5	20,000	350	8,200	160	6,100	90	5,300	70	
2.6	19,000	380	7,900	160	5,900	100	5,000	70	
2.7	18,000	380	7,600	160	5,700	100	4,900	70	
2.8	17,500	380	7,300	170	5,500	100	4,700	75	
2.9	17,000	380	7,100	170	5,300	100	4,500	75	
3	16,000	400	6,900	170	5,300	100	4,400	75	
3.1	15,500	410	6,700	180	5,100	100	4,300	75	
3.2	15,000	420	6,500	180	5,000	110	4,200	80	
3.3	14,500	420	6,300	190	4,800	110	4,000	80	
3.4	14,000	420	6,100	190	4,600	110	3,900	80	
3.5	14,000	420	6,000	190	4,600	120	3,800	80	
3.6	13,500	430	5,900	200	4,500	120	3,700	85	
3.7	12,500	430	5,700	200	4,400	120	3,600	85	
3.8	12,500	440	5,600	210	4,400	120	3,600	85	
3.9	12,000	440	5,500	210	4,200	125	3,500	85	
4	12,000	450	5,400	210	4,200	125	3,500	90	
4.1	11,500	480	5,300	220	4,100	125	3,400	90	
4.2	11,500	480	5,300	220	4,100	125	3,300	90	
4.3	11,000	480	5,200	230	4,000	125	3,300	90	
4.4	11,000	500	5,100	240	3,900	130	3,200	95	
4.5	10,500	500	5,100	240	3,900	130	3,200	95	
4.6	10,500	520	5,000	250	3,800	130	3,200	95	
4.7	10,500	520	5,000	260	3,800	130	3,100	95	
4.8	10,500	530	4,900	260	3,700	130	3,100	95	
4.9	10,000	530	4,900	270	3,600	130	3,100	95	
5	9,500	540	4,800	270	3,500	130	3,000	100	
5.1	9,500	540	4,700	270	3,500	130	3,000	100	
5.2	9,300	540	4,600	270	3,400	130	2,900	100	
5.3	9,200	540	4,600	270	3,400	130	2,900	100	
5.4	9,000	540	4,500	270	3,300	130	2,800	100	
5.5	8,800	540	4,400	270	3,200	130	2,700	100	
5.6	8,700	540	4,300	270	3,100	130	2,600	100	
5.7	8,500	540	4,200	270	3,100	130	2,600	100	
5.8	8,400	530	4,200	270	3,000	130	2,600	100	
5.9	8,200	530	4,100	270	2,900	130	2,500	100	
6	7,900	530	4,000	270	2,900	130	2,500	100	
6.5	7,500	530	3,700	270	2,700	130	2,300	100	
7	6,900	530	3,400	270	2,500	130	2,100	100	
7.5	6,400	530	3,200	270	2,300	130	2,000	100	
8	5,900	520	3,000	260	2,200	125	1,900	100	
8.5	5,600	520	2,800	260	2,000	125	1,700	100	
9	5,300	510	2,600	260	1,900	125	1,500	100	
9.5	5,100	510	2,500	260	1,800	125	1,400	95	
10	4,700	500	2,400	250	1,700	125	1,500	95	
11	4,400	500	2,200	250	1,600	125	1,100	95	
12	4,000	510	2,000	250	1,400	125	1,200	95	
16	3,000	400	1,500	200	1,100	115	800	80	
18	2,700	360	1,300	180	900	100	700	70	
20	2,400	300	1,200	150	800	90	600	60	

切深量 DEPTH OF CUT	<table border="1" style="width: 100%; border-collapse: collapse;"> <tr><td style="padding: 2px;"><math>D_c &lt; \phi 1</math></td><td style="padding: 2px;">0.1D</td></tr> <tr><td style="padding: 2px;"><math>\phi 1 \leq D_c &lt; \phi 3</math></td><td style="padding: 2px;">0.3D</td></tr> <tr><td style="padding: 2px;"><math>\phi 3 \leq D_c</math></td><td style="padding: 2px;">0.5D</td></tr> </table>	$D_c < \phi 1$	0.1D	$\phi 1 \leq D_c < \phi 3$	0.3D	$\phi 3 \leq D_c$	0.5D	
$D_c < \phi 1$	0.1D							
$\phi 1 \leq D_c < \phi 3$	0.3D							
$\phi 3 \leq D_c$	0.5D							

1. 请使用刚性较高的机床和刀柄。
  2. 当发生振动时请同比下降转速和进给速度。
  3. 请使用适合工件材料发烟性少的切削油剂。
  4. 上表仅做参考实际加工时根据实际情况参照上表制定切削条件。
1. Use a rigid and precise machine and holder.
  2. When chattering occurs, reduce the speed and feed simultaneously.
  3. Use a suitable cutting fluid with high smoke retardant properties.
  4. Refer to the table above to set the milling conditions in accordance with the actual situation.

RECOMMENDED MILLING CONDITIONS  
WXL-2D-DE

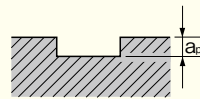
## WXL-3D-DE 槽切削 SLOTTING

RECOMMENDED MILLING CONDITIONS  
WXL-3D-DE

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY		普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC		调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH				
	尺寸 MILL DIA. (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	33~41HRC		42~50HRC	
						转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)
0.1	50,000	100	32,000	70	32,000	60	32,000	30	
0.2	50,000	140	32,000	90	32,000	75	32,000	35	
0.3	50,000	170	32,000	110	32,000	80	32,000	55	
0.4	50,000	190	32,000	120	32,000	90	27,500	60	
0.5	50,000	200	31,000	120	25,000	90	22,000	60	
0.6	50,000	230	27,000	120	19,500	90	17,000	60	
0.7	50,000	250	24,000	120	17,000	90	15,000	60	
0.8	50,000	290	21,500	120	15,500	90	13,500	65	
0.9	49,000	320	19,000	120	13,500	90	12,000	65	
1	47,500	350	17,500	120	12,500	90	11,000	65	
1.1	43,000	340	16,000	120	11,500	90	9,900	65	
1.2	40,500	340	15,000	120	10,500	90	9,300	65	
1.3	38,000	330	14,000	120	9,900	90	8,700	65	
1.4	35,000	330	13,000	120	9,200	90	8,100	65	
1.5	32,000	320	12,500	120	8,900	90	7,900	65	
1.6	31,000	320	12,000	120	8,500	90	7,500	65	
1.7	29,000	320	11,000	120	7,900	90	7,000	65	
1.8	28,000	320	10,500	130	7,500	90	6,800	68	
1.9	26,000	320	10,000	130	7,100	90	6,300	68	
2	24,000	310	9,700	130	7,000	90	6,300	70	
2.1	23,000	330	9,300	140	6,600	90	5,900	70	
2.2	22,500	330	9,000	140	6,500	90	5,700	70	
2.3	22,000	330	8,800	150	6,400	90	5,600	70	
2.4	20,500	350	8,600	150	6,300	90	5,500	70	
2.5	20,000	350	8,200	160	6,100	90	5,300	70	
2.6	19,000	380	7,900	160	5,900	100	5,000	70	
2.7	18,000	380	7,600	160	5,700	100	4,900	70	
2.8	17,500	380	7,300	170	5,500	100	4,700	75	
2.9	17,000	380	7,100	170	5,300	100	4,500	75	
3	16,000	400	6,900	170	5,300	100	4,400	75	
3.1	15,500	410	6,700	180	5,100	100	4,300	75	
3.2	15,000	420	6,500	180	5,000	110	4,200	80	
3.3	14,500	420	6,300	190	4,800	110	4,000	80	
3.4	14,000	420	6,100	190	4,600	110	3,900	80	
3.5	14,000	420	6,000	190	4,600	120	3,800	80	
3.6	13,500	430	5,900	200	4,500	120	3,700	85	
3.7	12,500	430	5,700	200	4,400	120	3,600	85	
3.8	12,500	440	5,600	210	4,400	120	3,600	85	
3.9	12,000	440	5,500	210	4,200	125	3,500	85	
4	12,000	450	5,400	210	4,200	125	3,500	90	
4.1	11,500	480	5,300	220	4,100	125	3,400	90	
4.2	11,500	480	5,300	220	4,100	125	3,300	90	
4.3	11,000	480	5,200	230	4,000	125	3,300	90	
4.4	11,000	500	5,100	240	3,900	130	3,200	95	
4.5	10,500	500	5,100	240	3,900	130	3,200	95	
4.6	10,500	520	5,000	250	3,800	130	3,200	95	
4.7	10,500	520	5,000	260	3,800	130	3,100	95	
4.8	10,500	530	4,900	260	3,700	130	3,100	95	
4.9	10,000	530	4,900	270	3,600	130	3,100	95	
5	9,500	540	4,800	270	3,500	130	3,000	100	
5.1	9,500	540	4,700	270	3,500	130	3,000	100	
5.2	9,300	540	4,600	270	3,400	130	2,900	100	
5.3	9,200	540	4,600	270	3,400	130	2,900	100	
5.4	9,000	540	4,500	270	3,300	130	2,800	100	
5.5	8,800	540	4,400	270	3,200	130	2,700	100	
5.6	8,700	540	4,300	270	3,100	130	2,600	100	
5.7	8,500	540	4,200	270	3,100	130	2,600	100	
5.8	8,400	530	4,200	270	3,000	130	2,600	100	
5.9	8,200	530	4,100	270	2,900	130	2,500	100	
6	7,900	530	4,000	270	2,900	130	2,500	100	
6.5	7,500	530	3,700	270	2,700	130	2,300	100	
7	6,900	530	3,400	270	2,500	130	2,100	100	
7.5	6,400	530	3,200	270	2,300	130	2,000	100	
8	5,900	520	3,000	260	2,200	125	1,900	100	
8.5	5,600	520	2,800	260	2,000	125	1,700	100	
9	5,300	510	2,600	260	1,900	125	1,500	100	
9.5	5,100	510	2,500	260	1,800	125	1,400	95	
10	4,700	500	2,400	250	1,700	125	1,500	95	
11	4,400	500	2,200	250	1,600	125	1,100	95	
12	4,000	510	2,000	250	1,400	125	1,200	95	
16	3,000	400	1,500	200	1,100	115	800	80	
18	2,700	360	1,300	180	900	100	700	70	
20	2,400	300	1,200	150	800	90	600	60	

切深量  
DEPTH OF CUT

$D_c < \phi 1$	0.1D
$\phi 1 \leq D_c < \phi 3$	0.3D
$\phi 3 \leq D_c$	0.5D



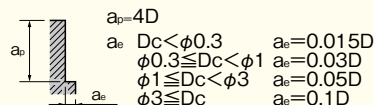
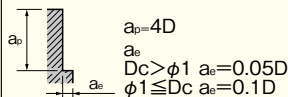
1. 请使用刚性较高的机床和刀柄。
2. 当发生振动时请同比下降转速和进给速度。
3. 请使用适合工件材料发烟性少的切削油剂。
4. 上表仅作参考实际加工时根据实际情况参照上表制定切削条件。

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.
4. Refer to the table above to set the milling conditions in accordance with the actual situation.

## WXL-4D-DE 槽切削 SLOTTING

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY		普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · S3400 · S55C ~32HRC		调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH				
	尺寸 MILL. DIA. (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	33 ~ 41HRC		42 ~ 50HRC	
						转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)
0.2	32,000	90	22,500	30	19,000	30	—	—	—
0.3	32,000	110	22,500	40	19,000	35	—	—	—
0.4	25,000	110	16,000	45	14,500	35	—	—	—
0.5	20,000	120	13,000	45	13,000	40	—	—	—
0.6	16,000	120	11,000	45	10,000	40	—	—	—
0.7	16,000	120	9,400	45	6,800	40	—	—	—
0.8	12,000	120	8,400	45	6,000	40	—	—	—
0.9	12,000	120	7,500	45	5,400	40	—	—	—
1	9,800	120	5,700	45	5,400	40	—	—	—
1.1	9,500	140	5,200	45	5,000	40	—	—	—
1.2	8,600	130	4,800	45	4,500	40	—	—	—
1.3	8,100	130	4,500	45	4,200	40	—	—	—
1.4	7,500	130	4,200	45	3,900	40	—	—	—
1.5	7,000	130	3,900	45	3,600	40	—	—	—
1.6	6,400	120	3,700	45	3,500	40	—	—	—
1.7	6,200	120	3,600	45	3,400	40	—	—	—
1.8	5,800	120	3,300	45	3,100	40	—	—	—
1.9	5,500	120	3,200	45	3,000	40	—	—	—
2	5,200	120	3,000	45	2,800	40	—	—	—
2.1	4,800	120	2,900	45	2,800	40	—	—	—
2.2	4,600	130	2,700	50	2,600	40	—	—	—
2.3	4,500	130	2,700	50	2,600	40	—	—	—
2.4	4,400	130	2,600	55	2,500	40	—	—	—
2.5	4,100	140	2,500	55	2,500	40	—	—	—
2.6	3,900	140	2,400	55	2,400	40	—	—	—
2.7	3,700	150	2,300	55	2,300	45	—	—	—
2.8	3,600	150	2,200	55	2,200	45	—	—	—
2.9	3,500	150	2,100	60	2,100	45	—	—	—
3	3,400	150	2,100	60	2,100	50	1,900	30	—
3.1	3,200	160	2,000	60	2,000	50	1,800	30	—
3.2	3,000	160	2,000	65	2,000	50	1,800	30	—
3.3	2,900	160	1,900	65	1,900	55	1,700	30	—
3.4	2,800	160	1,800	70	1,800	55	1,700	30	—
3.5	2,800	160	1,800	70	1,800	55	1,600	30	—
3.6	2,700	160	1,800	70	1,800	60	1,600	30	—
3.7	2,700	170	1,700	70	1,700	60	1,500	35	—
3.8	2,500	170	1,700	70	1,700	60	1,500	35	—
3.9	2,400	170	1,600	75	1,600	60	1,500	35	—
4	2,400	170	1,600	75	1,600	65	1,400	35	—
4.1	2,400	180	1,600	75	1,600	65	1,400	35	—
4.2	2,300	190	1,600	80	1,600	65	1,400	35	—
4.3	2,300	190	1,500	80	1,500	65	1,400	35	—
4.4	2,100	190	1,500	80	1,500	65	1,400	35	—
4.5	2,100	200	1,500	85	1,500	65	1,300	40	—
4.6	2,100	200	1,500	85	1,500	65	1,300	40	—
4.7	2,100	200	1,500	90	1,500	65	1,300	40	—
4.8	2,100	200	1,500	90	1,500	65	1,300	40	—
4.9	2,000	210	1,400	90	1,400	65	1,300	40	—
5	2,000	210	1,400	95	1,400	65	1,300	40	—
5.1	1,900	210	1,400	95	1,400	65	1,200	40	—
5.2	1,900	210	1,400	95	1,400	65	1,200	40	—
5.3	1,800	210	1,300	95	1,300	65	1,200	40	—
5.4	1,800	210	1,300	95	1,300	65	1,200	40	—
5.5	1,800	210	1,300	95	1,300	65	1,100	40	—
5.6	1,700	210	1,300	95	1,300	65	1,100	40	—
5.7	1,700	210	1,300	95	1,300	65	1,100	40	—
5.8	1,700	210	1,200	95	1,200	65	1,100	40	—
5.9	1,600	210	1,200	95	1,200	65	1,000	40	—
6	1,600	210	1,200	95	1,200	65	1,000	40	—
8	1,100	200	900	95	900	65	800	40	—
10	900	200	700	90	700	65	630	40	—
12	800	200	600	90	600	65	525	40	—

切深量  
DEPTH OF CUT



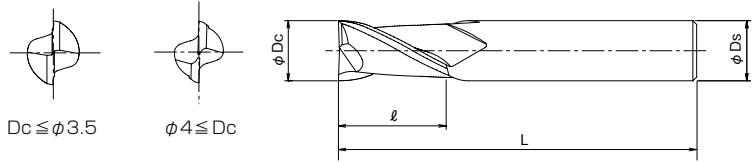
1. 请使用刚性较高的机床和刀柄。
2. 当发生振动时请同比下降转速和进给速度。
3. 请使用适合工件材料发烟性少的切削油剂。
4. 上表仅做参考实际加工时根据实际情况参照上表制定切削条件

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.
4. Refer to the table above to set the milling conditions in accordance with the actual situation.

# WXL 涂层 2刃短刃形

WXL Coating Two Flute Short

## WXL-EDS



● 材质.....超微粒子超硬合金  
Tool Material Ultra Micro Grain Carbide

● 表面处理.....WXL 涂层  
Surface Treatment WXL Coating

● 螺旋角.....30°  
Helix Angle

● 外径公差.....0 ~ -0.02mm  
Tolerance for Outer Diameter



铣刀的底刃刃角为尖角形状。  
Indicates that the end mill has a sharp corner edge.

单位:mm Unit:mm

商品号 EDP No.	外径 Dc	全长 L	刃长 l	柄径 Ds	库存 Stock
3130001	0.1	40	0.2	4	D
3130002	0.2	40	0.4	4	A
3130003	0.3	40	0.6	4	A
3130004	0.4	40	0.8	4	A
3130005	0.5	40	1	4	A
3130006	0.6	40	1.2	4	A
3130007	0.7	40	1.4	4	A
3130008	0.8	40	1.6	4	A
3130009	0.9	40	2	4	A
3130010	1	40	2.5	4	A
3130011	1.1	40	2.5	4	D
3130012	1.2	40	4	4	A
3130013	1.3	40	4	4	D
3130014	1.4	40	4	4	D
3130015	1.5	40	4	4	A
3130016	1.6	40	5	4	D
3130017	1.7	40	5	4	D
3130018	1.8	40	5	4	A
3130019	1.9	40	5	4	D
3130020	2	40	6	4	A
3130025	2.5	40	8	4	A
3130028	2.8	40	8	4	A
3130030	3	45	8	6	A
3130035	3.5	45	10	6	A
3130040	4	45	11	6	A
3130045	4.5	45	11	6	A
3130050	5	50	13	6	A
3130055	5.5	50	13	6	A
3130060	6	50	13	6	A
3130065	6.5	60	16	8	D
3130070	7	60	16	8	A
3130075	7.5	60	16	8	D
3130080	8	60	19	8	A
3130090	9	70	19	10	A
3130100	10	70	22	10	A
3130110	11	75	22	12	D
3130120	12	75	26	12	A

A=标准库存品 A= Standard stock item. D=库存中心标准库存品 D=Inventory center stock item.



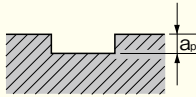
## WXL-EDS

### 槽切削 SLOTTING

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY		普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC		调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH			
	尺寸 MILL DIA. (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	33 ~ 41HRC		42 ~ 50HRC
转速 SPEED (min <sup>-1</sup> )						进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)
0.1	50,000	100	32,000	70	32,000	60	32,000	30
0.2	50,000	140	32,000	90	32,000	75	32,000	35
0.3	50,000	170	32,000	115	32,000	80	32,000	55
0.4	50,000	190	32,000	125	32,000	90	27,500	60
0.5	50,000	200	31,000	125	25,000	90	22,000	60
0.8	50,000	290	21,500	125	15,500	90	13,500	65
1	47,500	350	17,000	125	12,500	90	11,000	65
1.5	32,000	320	12,500	125	8,900	90	7,950	65
2	24,000	310	9,700	130	7,000	90	6,350	70
3	16,000	400	6,900	175	5,300	100	4,450	75
4	12,000	450	5,450	210	4,250	125	3,500	90
5	9,500	540	4,800	275	3,550	130	3,050	100
6	7,900	530	4,050	275	2,950	130	2,500	100
8	5,900	520	3,000	265	2,200	125	1,900	100
10	4,750	500	2,400	255	1,750	125	1,500	95
12	4,000	510	2,000	255	1,450	125	1,250	95

切深量 DEPTH OF CUT	$D_c < \phi 1$	0.1D
	$\phi 1 \leq D_c < \phi 3$	0.3D
	$\phi 3 \leq D_c$	0.5D



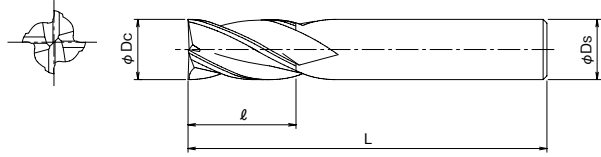
1. 请使用刚性较高的机床和刀柄。
2. 当发生振动时请同比下降转速和进给速度。。
3. 请使用适合工件材料发烟性少的切削油剂。
4. 上表仅做参考实际加工时根据实际情况参照上表制定切削条件。

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.
4. Refer to the table above to set the milling conditions in accordance with the actual situation.

# WXL 涂层 4刃短刃形

WXL Coating Four Flute Short

## WXL-EMS



● 材质.....超微粒子超硬合金  
Tool Material Ultra Micro Grain Carbide

● 表面处理.....WXL涂层  
Surface Treatment WXL Coating

● 螺旋角.....30°  
Helix Angle

● 外径公差 ..... Dc ≤ 12 0 ~ -0.02mm  
Tolerance for Outer Diameter 12 < Dc 0 ~ -0.03mm

单位:mm Unit:mm

商品号 EDP No.	外径 Dc	全长 L	刃长 ℓ	柄径 Ds	库存 Stock
3130510	1	40	2.5	4	D
3130515	1.5	40	4	4	D
3130520	2	40	6	4	A
3130525	2.5	40	8	4	A
3130530	3	45	8	6	A
3130535	3.5	45	10	6	D
3130540	4	45	11	6	A
3130545	4.5	45	11	6	D
3130550	5	50	13	6	A
3130560	6	50	13	6	A
3130570	7	60	16	8	A
3130580	8	60	19	8	A
3130590	9	70	19	10	A
3130600	10	70	22	10	A
3130620	12	75	26	12	A
3130640	14	85	26	12	D
3130650	15	90	26	16	D
3130660	16	100	32	16	D
3130680	18	100	32	16	D
3130700	20	105	38	20	D
3130750	25	120	45	25	D
3130800	30	125	45	32	D

A = 标准库存品 A = Standard stock item. D = 库存中心标准库存品 D = Inventory center stock item.

## WXL-EMS

### 侧面切削 SIDE MILLING

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY		普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC		调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH			
					33 ~ 41HRC		42 ~ 50HRC	
尺寸 MILL DIA. (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)
1	50,000	440	24,000	210	14,000	78	12,500	70
1.5	50,000	975	16,000	310	9,250	115	8,400	105
2	47,500	1,100	12,000	295	7,000	110	6,350	100
2.5	38,000	1,900	9,600	480	6,200	140	5,550	125
3	32,000	1,600	8,150	430	5,300	125	4,750	110
4	24,000	1,700	6,050	450	4,250	135	3,700	115
5	19,000	2,000	4,900	520	3,550	140	3,150	125
6	16,000	2,000	4,100	520	2,950	145	2,650	130
8	12,000	1,900	3,050	505	2,200	145	1,950	130
10	9,500	1,900	2,450	505	1,750	145	1,550	130
12	7,900	1,900	2,050	505	1,450	145	1,300	130
14	6,800	1,900	1,750	495	1,250	145	1,100	125
15	6,300	1,900	1,600	490	1,150	135	1,050	120
16	5,900	1,800	1,500	480	1,100	130	995	115
18	5,300	1,800	1,350	470	990	115	880	105
20	4,700	1,700	1,200	445	890	105	795	95
25	3,800	1,400	970	360	710	85	635	75
30	3,100	1,100	815	300	590	70	530	60

切深量 DEPTH OF CUT	$D_c < \phi 3$	$a_p$	$a_e$
	$\phi 3 \leq D_c$	1.5D	0.1D

$a_p$	$a_e$
1D	0.02D

1. 请使用刚性较高的机床和刀柄。
2. 当发生振动时请同比下降转速和进给速度。
3. 请使用适合工件材料发烟性少的切削油剂。
4. 上表仅做参考实际加工时根据实际情况参照上表制定切削条件。

1. Use a rigid and precise machine and holder.
2. When chattering occurs, reduce the speed and feed simultaneously.
3. Use a suitable cutting fluid with high smoke retardant properties.
4. Refer to the table above to set the milling conditions in accordance with the actual situation.

### 高速侧面切削 HIGH-SPEED SIDE MILLING

**!** 加工时产生的火花以及破损造成的发热现象有导致火灾的危险。请做好防火措施。

**Caution:** Sparks generated during operation or heat caused by tool breakage can cause fire. Be sure to use all proper fire-prevention measures.

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY		普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC		调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH			
					33 ~ 41HRC		42 ~ 50HRC	
尺寸 MILL DIA. (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)
6	26,000	2,900	20,000	2,300	13,000	1,500	7,950	795
8	19,500	3,000	14,500	2,300	9,900	1,450	5,950	795
10	15,500	2,900	12,000	2,300	7,950	1,450	4,750	795
12	13,000	3,000	9,900	2,300	6,600	1,450	3,950	790
14	11,000	2,800	8,500	2,200	5,650	1,350	3,400	740
15	10,500	2,800	7,950	2,150	5,250	1,350	3,150	730
16	9,700	2,700	7,450	2,100	4,950	1,350	2,950	715
18	8,600	2,700	6,600	2,100	4,400	1,300	2,650	705
20	7,800	2,600	5,950	2,000	3,950	1,300	2,350	665
25	6,200	2,000	4,750	1,600	3,150	1,050	1,900	560
30	5,200	1,700	3,950	1,350	2,650	890	1,550	455

切深量 DEPTH OF CUT	$D_c < \phi 8$	$a_p$	$a_e$
	$\phi 8 \leq D_c$	1.5D	0.02D

$a_p$	$a_e$
1D	0.02D

1. 此基准条件表适用于使用高精度的数控加工中心进行轻切削。
2. 刀具磨损后易在加工中产生火花，因此请不要使用易燃切削液。
3. 推荐使用空气冷却。使用切削油剂时请使用发烟性小的。
4. 上表仅做参考实际加工时根据实际情况参照上表制定切削条件。

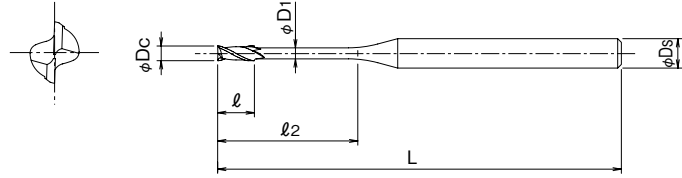
1. The indicated speeds and feeds are for high speed light milling with high speed/high precision machining centers.
2. Tools can cause sparks. Do not use flammable fluids.
3. We recommend using an air blow. When using cutting fluids, use a high-quality fluid with high smoke retardant properties.
4. Refer to the table above to set the milling conditions in accordance with the actual situation.

# WXL 涂层2刃长颈短刃形(深槽加工型)

WXL Coating Two Flute · Short · with Long Neck (for Rib processing)



## WXL-LN-EDS



● 材质..... 超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide

● 表面处理..... WXL 涂层  
Surface Treatment WXL Coating

● 螺旋角..... 30°  
Helix Angle

● 外径公差..... 0 ~ -0.015mm  
Tolerance of Outer Diameter

单位:mm Unit:mm

商品号 EDP No.	外径 × 颈长 Dc × l2	全长 L	刃长 l	柄径 Ds	劲径 D1	■相对于工件倾斜角α的实际有效长(Le)※1						库存 Stock
						0.5°	1°	1.5°	2°	2.5°	3°	
3131201	0.2 × 0.5	45	0.3	4	0.18	0.55	0.6	0.66	0.73	0.81	0.96	B
3131202	0.2 × 1	45	0.3	4	0.18	1.09	1.19	1.3	1.41	1.53	1.66	B
3131203	0.2 × 1.5	45	0.3	4	0.18	1.64	1.78	1.92	2.07	2.22	2.37	B
3131204	0.2 × 2	45	0.3	4	0.18	2.18	2.35	2.53	2.7	2.88	3.05	B
3131205	0.2 × 2.5	45	0.3	4	0.18	2.72	2.93	3.13	3.33	3.52	3.71	B
3131206	0.2 × 3	45	0.3	4	0.18	3.26	3.49	3.72	3.94	4.15	4.36	B
3131207	0.2 × 3.5	45	0.3	4	0.18	3.79	4.06	4.31	4.54	4.77	4.99	B
3131208	0.2 × 4	45	0.3	4	0.18	4.33	4.62	4.89	5.14	5.38	5.61	B
3131302	0.3 × 1	45	0.45	4	0.28	1.09	1.19	1.3	1.41	1.53	1.66	B
3131303	0.3 × 1.5	45	0.45	4	0.28	1.64	1.78	1.92	2.07	2.22	2.37	B
3131304	0.3 × 2	45	0.45	4	0.28	2.12	2.35	2.53	2.7	2.88	3.05	B
3131305	0.3 × 2.5	45	0.45	4	0.28	2.72	2.93	3.13	3.33	3.52	3.71	B
3131306	0.3 × 3	45	0.45	4	0.28	3.26	3.5	3.72	3.94	4.15	4.36	B
3131308	0.3 × 4	45	0.45	4	0.28	4.33	4.62	4.89	5.14	5.38	5.61	B
3131310	0.3 × 5	45	0.45	4	0.28	5.4	5.74	6.04	6.32	6.59	6.86	B
3131312	0.3 × 6	45	0.45	4	0.28	6.46	6.84	7.18	7.49	7.79	8.1	B
3131318	0.3 × 9	45	0.45	4	0.28	9.64	10.13	10.55	10.94	11.37	11.83	B
3131403	0.4 × 1.5	45	0.6	4	0.37	1.63	1.76	1.9	2.04	2.19	2.34	B
3131404	0.4 × 2	45	0.6	4	0.37	2.17	2.34	2.51	2.68	2.85	3.02	B
3131406	0.4 × 3	45	0.6	4	0.37	3.24	3.48	3.7	3.91	4.12	4.32	B
3131408	0.4 × 4	45	0.6	4	0.37	4.32	4.6	4.86	5.11	5.35	5.58	B
3131410	0.4 × 5	45	0.6	4	0.37	5.38	5.71	6.01	6.29	6.55	6.82	B
3131412	0.4 × 6	45	0.6	4	0.37	6.45	6.82	7.15	7.46	7.75	8.06	B
3131414	0.4 × 7	45	0.6	4	0.37	7.51	7.92	8.28	8.61	8.94	9.31	B
3131416	0.4 × 8	45	0.6	4	0.37	8.56	9.01	9.4	9.76	10.14	10.55	B
3131418	0.4 × 9	45	0.6	4	0.37	9.62	10.1	10.51	10.91	11.33	11.79	B
3131420	0.4 × 10	45	0.6	4	0.37	10.68	11.19	11.62	12.06	12.53	13.04	B
3131424	0.4 × 12	45	0.6	4	0.37	12.78	13.35	13.84	14.36	14.92	15.52	B
3131501	0.5 × 1.5	45	0.7	4	0.45	1.62	1.74	1.87	2	2.14	2.28	B
3131502	0.5 × 2	45	0.7	4	0.45	2.16	2.31	2.47	2.63	2.79	2.96	B
3131503	0.5 × 3	45	0.7	4	0.45	3.23	3.44	3.65	3.86	4.06	4.25	B
3131504	0.5 × 4	45	0.7	4	0.45	4.29	4.56	4.81	5.06	5.29	5.51	B
3131505	0.5 × 5	45	0.7	4	0.45	5.36	5.67	5.96	6.23	6.49	6.75	B
3131506	0.5 × 6	45	0.7	4	0.45	6.42	6.77	7.1	7.39	7.68	7.99	B
3131507	0.5 × 7	45	0.7	4	0.45	7.48	7.87	8.22	8.54	8.88	9.24	B
3131508	0.5 × 8	45	0.7	4	0.45	8.53	8.96	9.34	9.69	10.07	10.48	B
3131509	0.5 × 9	45	0.7	4	0.45	9.59	10.05	10.45	10.84	11.27	11.72	B
3131510	0.5 × 10	45	0.7	4	0.45	10.64	11.13	11.56	11.99	12.46	12.97	B
3131512	0.5 × 12	45	0.7	4	0.45	12.74	13.29	13.78	14.29	14.85	15.45	B
3131515	0.5 × 15	50	0.7	4	0.45	15.88	16.51	17.1	17.74	18.43	19.18	B
3131602	0.6 × 2	45	0.9	4	0.55	2.16	2.31	2.47	2.63	2.79	2.96	B
3131603	0.6 × 3	45	0.9	4	0.55	3.23	3.44	3.65	3.86	4.06	4.25	B
3131604	0.6 × 4	45	0.9	4	0.55	4.29	4.56	4.81	5.06	5.29	5.51	B
3131605	0.6 × 5	45	0.9	4	0.55	5.36	5.67	5.96	6.23	6.49	6.75	B
3131606	0.6 × 6	45	0.9	4	0.55	6.42	6.77	7.1	7.39	7.68	7.99	B

B= 标准库存品 B=Standard stock item.



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SPECIFICATION CHART WXL-LN-EDS

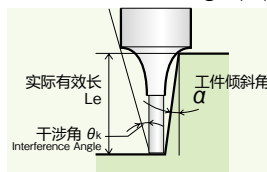
# WXL 涂层2刃长颈短刃形(深槽加工型)

WXL Coating Two Flute · Short · with Long Neck (for Rib processing)



## WXL-LN-EDS

※1: 相对于工件倾斜角 $\alpha$ 的实际有效长 (Le)  
Effective Neck length (Le) depending on Inclined Angle ( $\alpha$ ) of workpiece



上表中实际有效长栏里无数值时意味加工时不存在干涉。  
No numerical value means no interference with workpiece.



接上页

商品号 EDP No.	外径 × 颈长 Dc × ℓ <sub>2</sub>	全长 L	刃长 ℓ	柄径 Ds	劲径 D <sub>1</sub>	■相对于工件倾斜角 $\alpha$ 的实际有效长(Le)※1						库存 Stock
						0.5°	1°	1.5°	2°	2.5°	3°	
3131607	0.6 × 7	45	0.9	4	0.55	7.48	7.87	8.22	8.54	8.88	9.24	B
3131608	0.6 × 8	45	0.9	4	0.55	8.53	8.96	9.34	9.69	10.07	10.48	B
3131610	0.6 × 10	45	0.9	4	0.55	10.64	11.13	11.56	11.99	12.46	12.97	B
3131612	0.6 × 12	45	0.9	4	0.55	12.74	13.29	13.78	14.29	14.85	15.45	B
3131615	0.6 × 15	50	0.9	4	0.55	15.88	16.51	17.1	17.74	18.43	19.18	B
3131618	0.6 × 18	50	0.9	4	0.55	19.01	19.71	20.43	21.19	22.02	22.91	B
3131702	0.7 × 2	45	1	4	0.65	2.16	2.31	2.47	2.63	2.79	2.96	B
3131704	0.7 × 4	45	1	4	0.65	4.29	4.56	4.81	5.06	5.29	5.51	B
3131706	0.7 × 6	45	1	4	0.65	6.42	6.77	7.1	7.39	7.68	7.99	B
3131708	0.7 × 8	45	1	4	0.65	8.53	8.96	9.34	9.69	10.07	10.48	B
3131710	0.7 × 10	45	1	4	0.65	10.64	11.13	11.56	11.99	12.46	12.97	B
3131804	0.8 × 4	45	1.2	4	0.75	4.29	4.56	4.81	5.06	5.29	5.51	B
3131806	0.8 × 6	45	1.2	4	0.75	6.42	6.77	7.1	7.39	7.68	7.99	B
3131808	0.8 × 8	45	1.2	4	0.75	8.53	8.96	9.34	9.69	10.07	10.48	B
3131810	0.8 × 10	45	1.2	4	0.75	10.64	11.13	11.56	11.99	12.46	12.97	B
3131812	0.8 × 12	45	1.2	4	0.75	12.74	13.29	13.78	14.29	14.85	15.45	B
3131814	0.8 × 14	50	1.2	4	0.75	14.83	15.44	15.99	16.59	17.24	17.94	B
3131816	0.8 × 16	50	1.2	4	0.75	16.92	17.58	18.21	18.89	19.63	20.43	B
3131820	0.8 × 20	55	1.2	4	0.75	21.09	21.85	22.64	23.49	24.41	25.4	B
3131824	0.8 × 24	60	1.2	4	0.75	25.24	26.13	27.08	28.09	29.19	30.37	B
3131904	0.9 × 4	45	1.35	4	0.85	4.29	4.56	4.81	5.05	5.28	5.51	B
3131906	0.9 × 6	45	1.35	4	0.85	6.42	6.77	7.1	7.39	7.68	7.99	B
3131908	0.9 × 8	45	1.35	4	0.85	8.53	8.96	9.34	9.69	10.07	10.48	B
3131910	0.9 × 10	45	1.35	4	0.85	10.64	11.13	11.56	11.99	12.46	12.97	B
3131915	0.9 × 15	50	1.35	4	0.85	15.88	16.51	17.1	17.74	18.43	19.18	B
3132003	1 × 3	45	1.5	4	0.95	3.23	3.44	3.65	3.86	4.06	4.25	B
3132004	1 × 4	45	1.5	4	0.95	4.29	4.56	4.81	5.05	5.28	5.51	B
3132005	1 × 5	45	1.5	4	0.95	5.36	5.67	5.96	6.23	6.49	6.75	B
3132006	1 × 6	45	1.5	4	0.95	6.42	6.77	7.1	7.39	7.68	7.99	B
3132007	1 × 7	45	1.5	4	0.95	7.48	7.87	8.22	8.54	8.88	9.24	B
3132008	1 × 8	45	1.5	4	0.95	8.53	8.96	9.34	9.69	10.07	10.48	B
3132009	1 × 9	45	1.5	4	0.95	9.59	10.05	10.45	10.84	11.27	11.72	B
3132010	1 × 10	45	1.5	4	0.95	10.64	11.13	11.56	11.99	12.46	12.97	B
3132012	1 × 12	45	1.5	4	0.95	12.74	13.29	13.78	14.29	14.85	15.45	B
3132014	1 × 14	50	1.5	4	0.95	14.83	15.44	15.99	16.59	17.24	17.94	B
3132016	1 × 16	50	1.5	4	0.95	16.92	17.58	18.21	18.89	19.63	20.43	B
3132018	1 × 18	55	1.5	4	0.95	19.01	19.71	20.43	21.19	22.02	22.91	B
3132020	1 × 20	55	1.5	4	0.95	21.09	21.85	22.64	23.49	24.41	25.4	B
3132022	1 × 22	60	1.5	4	0.95	23.17	23.99	24.86	25.79	26.8	27.88	B
3132025	1 × 25	60	1.5	4	0.95	26.28	27.2	28.19	29.24	30.38	—	B
3132030	1 × 30	70	1.5	4	0.95	31.46	32.55	33.73	34.99	—	—	B
3132204	1.2 × 4	45	1.8	4	1.15	4.29	4.56	4.81	5.05	5.28	5.51	B
3132206	1.2 × 6	45	1.8	4	1.15	6.42	6.77	7.1	7.39	7.68	7.99	B
3132208	1.2 × 8	45	1.8	4	1.15	8.53	8.96	9.34	9.69	10.07	10.48	B
3132210	1.2 × 10	45	1.8	4	1.15	10.64	11.13	11.56	11.99	12.46	12.97	B
3132212	1.2 × 12	45	1.8	4	1.15	12.74	13.29	13.78	14.29	14.85	15.45	B
3132214	1.2 × 1.4	50	1.8	4	1.15	14.83	15.44	15.99	16.59	17.24	17.94	B
3132216	1.2 × 16	50	1.8	4	1.15	16.92	17.58	18.21	18.89	19.63	20.43	B
3132220	1.2 × 20	55	1.8	4	1.15	21.09	21.85	22.64	23.49	24.41	25.4	B
3132406	1.4 × 6	45	2.1	4	1.35	6.42	6.77	7.1	7.39	7.68	7.99	B

B= 标准库存品 B=Standard stock item.

SPECIFICATION CHART  
形状寸法表

WXL-LN-EDS



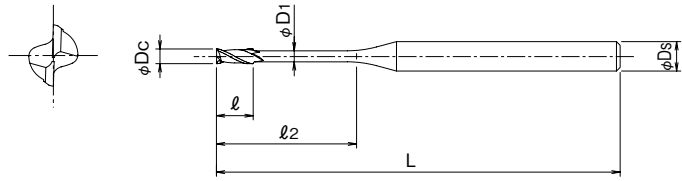
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# WXL 涂层2刃长颈短刃形(深槽加工型)

WXL Coating Two Flute · Short · with Long Neck (for Rib processing)



## WXL-LN-EDS



接上页

单位:mm Unit:mm

商品号 EDP No.	外径 × 颈长 Dc × ℓ2	全长 L	刃长 ℓ	柄径 Ds	颈径 D1	■相对于工件倾斜角α的实际有效长(Le)※1						库存 Stock
						0.5°	1°	1.5°	2°	2.5°	3°	
3132408	1.4 × 8	45	2.1	4	1.35	8.53	8.96	9.34	9.69	10.07	10.48	B
3132410	1.4 × 10	45	2.1	4	1.35	10.64	11.13	11.56	11.99	12.46	12.97	B
3132412	1.4 × 12	45	2.1	4	1.35	12.74	13.29	13.78	14.29	14.85	15.45	B
3132414	1.4 × 14	50	2.1	4	1.35	14.83	15.44	15.99	16.59	17.24	17.94	B
3132416	1.4 × 16	50	2.1	4	1.35	16.92	17.58	18.21	18.89	19.63	20.43	B
3132422	1.4 × 22	60	2.1	4	1.35	23.17	23.99	24.86	25.79	26.8	—	B
3132504	1.5 × 4	45	2.3	4	1.45	4.29	4.56	4.81	5.05	5.28	5.51	B
3132506	1.5 × 6	45	2.3	4	1.45	6.42	6.77	7.1	7.39	7.68	7.99	B
3132508	1.5 × 8	45	2.3	4	1.45	8.53	8.96	9.34	9.69	10.07	10.48	B
3132510	1.5 × 10	45	2.3	4	1.45	10.64	11.13	11.56	11.99	12.46	12.97	B
3132512	1.5 × 12	45	2.3	4	1.45	12.74	13.29	13.78	14.29	14.85	15.45	B
3132514	1.5 × 14	50	2.3	4	1.45	14.83	15.44	15.99	16.59	17.24	17.94	B
3132516	1.5 × 16	50	2.3	4	1.45	16.92	17.58	18.21	18.89	19.63	20.43	B
3132518	1.5 × 18	55	2.3	4	1.45	19.01	19.71	20.43	21.19	22.02	22.91	B
3132520	1.5 × 20	55	2.3	4	1.45	21.09	21.85	22.64	23.49	24.41	—	B
3132525	1.5 × 25	60	2.3	4	1.45	26.28	27.2	28.19	29.24	—	—	B
3132530	1.5 × 30	70	2.3	4	1.45	31.46	32.55	33.73	34.99	—	—	B
3132538	1.5 × 38	80	2.3	4	1.45	39.72	41.11	42.59	—	—	—	B
3132540	1.5 × 40	80	2.3	4	1.45	41.79	43.25	44.81	—	—	—	B
3132545	1.5 × 45	80	2.3	4	1.45	46.96	48.6	—	—	—	—	B
3132606	1.6 × 6	45	2.4	4	1.55	6.42	6.77	7.1	7.39	7.68	7.99	B
3132608	1.6 × 8	45	2.4	4	1.55	8.53	8.96	9.34	9.69	10.07	10.48	B
3132610	1.6 × 10	45	2.4	4	1.55	10.64	11.13	11.56	11.99	12.46	12.97	B
3132612	1.6 × 12	45	2.4	4	1.55	12.74	13.29	13.78	14.29	14.85	15.45	B
3132614	1.6 × 14	50	2.4	4	1.55	14.83	15.44	15.99	16.59	17.24	17.94	B
3132616	1.6 × 16	50	2.4	4	1.55	16.92	17.58	18.21	18.89	19.63	20.43	B
3132618	1.6 × 18	55	2.4	4	1.55	19.01	19.71	20.43	21.19	22.02	22.91	B
3132620	1.6 × 20	55	2.4	4	1.55	21.09	21.85	22.64	23.49	24.41	—	B
3132806	1.8 × 6	45	2.7	4	1.75	6.42	6.77	7.1	7.39	7.68	7.99	B
3132808	1.8 × 8	45	2.7	4	1.75	8.53	8.96	9.34	9.69	10.07	10.48	B
3132810	1.8 × 10	45	2.7	4	1.75	10.64	11.13	11.56	11.99	12.46	12.97	B
3132812	1.8 × 12	45	2.7	4	1.75	12.74	13.29	13.78	14.29	14.85	15.45	B
3132814	1.8 × 14	50	2.7	4	1.75	14.83	15.44	15.99	16.59	17.24	17.94	B
3132816	1.8 × 16	50	2.7	4	1.75	16.92	17.58	18.21	18.89	19.63	20.43	B
3132818	1.8 × 18	55	2.7	4	1.75	19.01	19.71	20.43	21.19	22.02	22.91	B
3132820	1.8 × 20	55	2.7	4	1.75	21.09	21.85	22.64	23.49	24.41	—	B
3132825	1.8 × 25	60	2.7	4	1.75	26.28	27.2	28.19	29.24	—	—	B
3133006	2 × 6	45	3	4	1.95	6.42	6.77	7.1	7.39	7.68	7.99	B
3133008	2 × 8	45	3	4	1.95	8.53	8.96	9.34	9.69	10.07	10.48	B
3133010	2 × 10	45	3	4	1.95	10.64	11.13	11.56	11.99	12.46	12.97	B
3133012	2 × 12	45	3	4	1.95	12.74	13.29	13.78	14.29	14.85	15.45	B
3133014	2 × 14	50	3	4	1.95	14.83	15.44	15.99	16.59	17.24	17.94	B
3133016	2 × 16	50	3	4	1.95	16.92	17.58	18.21	18.89	19.63	20.43	B
3133018	2 × 18	55	3	4	1.95	19.01	19.71	20.43	21.19	22.02	22.91	B
3133020	2 × 20	55	3	4	1.95	21.09	21.85	22.64	23.49	—	—	B
3133025	2 × 25	60	3	4	1.95	26.28	27.2	28.19	—	—	—	B
3133030	2 × 30	70	3	4	1.95	31.46	32.55	33.73	—	—	—	B
3133035	2 × 35	80	3	4	1.95	36.62	37.9	—	—	—	—	B
3133040	2 × 40	90	3	4	1.95	41.79	43.25	—	—	—	—	B

B= 标准库存品 B=Standard stock item.



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SPECIFICATION CHART WXL-LN-EDS

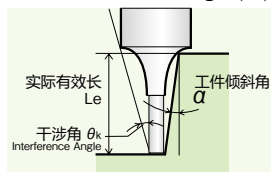
# WXL 涂层2刃长颈短刃形(深槽加工型)

WXL Coating Two Flute · Short · with Long Neck (for Rib processing)



## WXL-LN-EDS

※1: 相对于工件倾斜角 $\alpha$ 的实际有效长 (Le)  
Effective Neck length (Le) depending on Inclined Angle ( $\alpha$ ) of workpiece



上表中实际有效长栏里无数值时意味着加工时不存在干涉。  
No numerical value means no interference with workpiece.



接上页

单位:mm Unit:mm

商品号 EDP No.	外径 × 颈长 Dc × L2	全长 L	刃长 l	柄径 Ds	劲径 D1	■相对于工件倾斜角 $\alpha$ 的实际有效长(Le)※1						库存 Stock
						0.5°	1°	1.5°	2°	2.5°	3°	
3133050	2 × 50	100	3	4	1.95	52.13	53.94	—	—	—	—	B
3133060	2 × 60	110	3	4	1.95	62.47	—	—	—	—	—	B
3133508	2.5 × 8	45	3.7	4	2.4	8.47	8.87	9.22	9.57	9.94	10.34	B
3133510	2.5 × 10	45	3.7	4	2.4	10.57	11.03	11.44	11.87	12.33	12.83	B
3133512	2.5 × 12	45	3.7	4	2.4	12.66	13.18	13.66	14.17	14.72	—	B
3133514	2.5 × 14	50	3.7	4	2.4	14.75	15.32	15.87	16.47	17.11	—	B
3133516	2.5 × 16	55	3.7	4	2.4	16.83	17.46	18.09	18.77	—	—	B
3133518	2.5 × 18	55	3.7	4	2.4	18.91	19.6	20.31	21.07	—	—	B
3133520	2.5 × 20	60	3.7	4	2.4	20.99	21.74	22.52	—	—	—	B
3133525	2.5 × 25	70	3.7	4	2.4	26.17	27.09	28.06	—	—	—	B
3133530	2.5 × 30	80	3.7	4	2.4	31.34	32.43	—	—	—	—	B
3133540	2.5 × 40	90	3.7	4	2.4	41.68	—	—	—	—	—	B
3133550	2.5 × 50	100	3.7	4	2.4	52.02	—	—	—	—	—	B
3134008	3 × 8	45	4.5	6	2.85	8.42	8.79	9.13	9.47	9.84	10.24	B
3134010	3 × 10	45	4.5	6	2.85	10.51	10.95	11.35	11.77	12.23	12.73	B
3134012	3 × 12	45	4.5	6	2.85	12.6	13.09	13.56	14.07	14.62	15.21	B
3134014	3 × 14	50	4.5	6	2.85	14.68	15.23	15.78	16.37	17.01	17.7	B
3134016	3 × 16	55	4.5	6	2.85	16.76	17.37	18	18.67	19.4	20.19	B
3134018	3 × 18	55	4.5	6	2.85	18.84	19.51	20.21	20.97	21.79	22.67	B
3134020	3 × 20	60	4.5	6	2.85	20.91	21.65	22.43	23.27	24.18	25.16	B
3134025	3 × 25	65	4.5	6	2.85	26.09	27	27.97	29.02	30.15	—	B
3134030	3 × 30	80	4.5	6	2.85	31.26	32.35	33.51	34.77	—	—	B
3134035	3 × 35	90	4.5	6	2.85	36.43	37.69	39.06	40.52	—	—	B
3134040	3 × 40	90	4.5	6	2.85	41.59	43.04	44.6	—	—	—	B
3134050	3 × 50	100	4.5	6	2.85	51.93	53.74	55.68	—	—	—	B
3135012	4 × 12	50	6	6	3.85	12.6	13.09	13.56	14.07	14.62	15.21	B
3135016	4 × 16	60	6	6	3.85	16.76	17.37	18	18.67	19.4	—	B
3135020	4 × 20	60	6	6	3.85	20.91	21.65	22.43	23.27	—	—	B
3135025	4 × 25	70	6	6	3.85	26.09	27	27.97	—	—	—	B
3135030	4 × 30	80	6	6	3.85	31.26	32.35	33.51	—	—	—	B
3135035	4 × 35	90	6	6	3.85	36.43	37.69	—	—	—	—	B
3135040	4 × 40	90	6	6	3.85	41.59	43.04	—	—	—	—	B
3135045	4 × 45	100	6	6	3.85	46.76	48.39	—	—	—	—	B
3135050	4 × 50	100	6	6	3.85	51.93	53.74	—	—	—	—	B
3135060	4 × 60	110	6	6	3.85	62.27	—	—	—	—	—	B
3136016	5 × 16	60	7.5	6	4.85	16.76	17.37	18	—	—	—	B
3136020	5 × 20	70	7.5	6	4.85	20.91	21.65	—	—	—	—	B
3136025	5 × 25	70	7.5	6	4.85	29.09	27	—	—	—	—	B
3136030	5 × 30	90	7.5	6	4.85	31.26	—	—	—	—	—	B
3136035	5 × 35	90	7.5	6	4.85	36.43	—	—	—	—	—	B
3136040	5 × 40	100	7.5	6	4.85	41.59	—	—	—	—	—	B
3136050	5 × 50	110	7.5	6	4.85	51.93	—	—	—	—	—	B
3136060	5 × 60	120	7.5	6	4.85	—	—	—	—	—	—	B

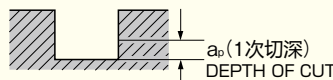
B= 标准库存品 B=Standard stock item.

WXL-LN-EDS

RECOMMENDED MILLING CONDITIONS  
切削条件表  
WXL-LN-EDS

加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY			普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC			调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH					
外径 Dc	颈长 ℓ <sub>2</sub>	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	33 ~ 41HRC			42 ~ 50HRC		
								转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap
0.2	0.5	35,200	490	0.022	32,000	450	0.018	32,000	450	0.015	29,000	250	0.012
	1	35,200	380	0.016	32,000	350	0.013	32,000	350	0.011	29,000	200	0.009
	1.5	31,000	270	0.01	28,000	250	0.008	28,000	250	0.007	25,000	150	0.005
	2	24,000	220	0.006	22,000	200	0.005	22,000	200	0.004	20,000	120	0.003
	2.5	22,000	190	0.005	20,000	180	0.004	20,000	170	0.004	20,000	100	0.003
	3	22,000	180	0.004	20,000	170	0.003	20,000	160	0.003	20,000	90	0.002
	3.5	22,000	150	0.004	20,000	140	0.003	20,000	130	0.003	20,000	80	0.002
4	22,000	40	0.002	20,000	40	0.002	20,000	35	0.002	20,000	30	0.002	
0.3	1	38,500	480	0.032	32,000	400	0.027	32,000	350	0.023	29,000	300	0.018
	1.5	38,500	430	0.028	32,000	360	0.023	32,000	300	0.02	29,000	250	0.015
	2	33,500	360	0.024	28,000	300	0.02	28,000	250	0.017	25,000	200	0.013
	2.5	33,500	330	0.017	28,000	280	0.014	28,000	230	0.012	25,000	190	0.008
	3	26,500	300	0.011	22,000	250	0.009	22,000	160	0.007	20,000	150	0.005
	4	24,000	220	0.008	20,000	190	0.007	20,000	150	0.005	20,000	130	0.003
	5	24,000	190	0.006	20,000	160	0.005	20,000	140	0.003	18,000	120	0.002
6	24,000	100	0.002	20,000	90	0.002	20,000	80	0.002	16,000	60	0.002	
9	19,000	30	0.002	16,000	30	0.002	16,000	30	0.002	13,000	20	0.002	
0.4	1.5	38,500	520	0.032	32,000	440	0.027	32,000	380	0.023	29,000	330	0.018
	2	38,500	480	0.031	32,000	400	0.026	32,000	350	0.022	29,000	300	0.018
	3	33,500	360	0.02	28,000	300	0.017	28,000	250	0.014	25,000	200	0.011
	4	26,500	300	0.014	22,000	250	0.012	22,000	200	0.01	20,000	150	0.008
	5	24,000	240	0.007	20,000	200	0.006	20,000	160	0.005	20,000	130	0.003
	6	24,000	210	0.006	20,000	180	0.005	20,000	140	0.004	20,000	120	0.002
	7	24,000	160	0.005	20,000	140	0.004	20,000	120	0.003	20,000	110	0.002
	8	24,000	150	0.002	20,000	130	0.002	20,000	110	0.002	20,000	100	0.002
	9	24,000	140	0.002	20,000	120	0.002	20,000	100	0.002	20,000	80	0.002
	10	24,000	130	0.002	20,000	110	0.002	20,000	85	0.002	18,000	70	0.002
	12	24,000	100	0.002	20,000	90	0.002	20,000	80	0.002	16,000	60	0.002
	15	21,500	100	0.002	18,000	90	0.002	16,000	80	0.002	16,000	70	0.002
0.5	1.5	38,500	660	0.054	32,000	550	0.045	32,000	420	0.038	29,000	330	0.03
	2	38,500	600	0.054	32,000	500	0.045	32,000	400	0.038	29,000	300	0.03
	3	36,000	540	0.036	30,000	450	0.03	30,000	360	0.028	27,000	280	0.022
	4	33,500	480	0.025	28,000	400	0.021	28,000	320	0.018	25,000	250	0.014
	5	33,500	450	0.017	28,000	380	0.014	25,000	300	0.01	22,000	230	0.008
	6	26,500	420	0.007	22,000	350	0.006	22,000	220	0.005	20,000	180	0.004
	7	24,000	380	0.006	20,000	320	0.005	20,000	200	0.004	20,000	170	0.003
	8	24,000	320	0.006	20,000	270	0.005	20,000	180	0.003	20,000	150	0.003
	9	24,000	300	0.002	20,000	250	0.002	18,000	160	0.002	18,000	140	0.002
	10	24,000	240	0.002	20,000	200	0.002	18,000	150	0.002	18,000	130	0.002
	12	24,000	190	0.002	20,000	160	0.002	18,000	120	0.002	18,000	100	0.002
	15	21,500	100	0.002	18,000	90	0.002	16,000	80	0.002	16,000	70	0.002
0.6	2	38,500	720	0.065	32,000	600	0.054	32,000	400	0.045	27,000	300	0.036
	3	38,500	660	0.06	32,000	550	0.05	32,000	360	0.04	27,000	280	0.03
	4	33,500	540	0.048	28,000	450	0.04	28,000	300	0.033	25,000	200	0.026
	5	33,500	480	0.036	28,000	400	0.03	25,000	220	0.02	22,000	180	0.02
	6	26,500	300	0.022	22,000	250	0.018	22,000	200	0.015	20,000	150	0.012
	7	26,500	300	0.012	22,000	250	0.01	22,000	200	0.008	20,000	150	0.007
	8	26,500	300	0.008	22,000	250	0.007	22,000	200	0.006	20,000	150	0.005
	10	24,000	240	0.006	20,000	200	0.005	18,000	150	0.004	18,000	130	0.003
	12	21,500	220	0.002	18,000	190	0.002	18,000	150	0.002	18,000	120	0.002
	15	21,500	150	0.002	18,000	130	0.002	16,000	110	0.002	16,000	100	0.002
	18	18,000	90	0.002	15,000	80	0.002	14,000	70	0.002	14,000	60	0.002
	0.7	2	38,500	720	0.076	32,000	600	0.063	32,000	500	0.053	26,000	400
4		33,500	540	0.055	28,000	450	0.046	28,000	300	0.039	22,000	300	0.031
6		33,500	540	0.035	28,000	450	0.029	28,000	200	0.025	22,000	200	0.02

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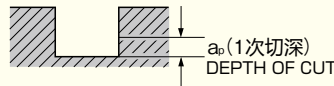
## WXL-LN-EDS



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加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY			普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC			调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH					
								33 ~ 41HRC			42 ~ 50HRC		
外径 Dc	颈长 ℓz	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap
0.7	8	26,500	300	0.02	22,000	250	0.017	22,000	200	0.014	20,000	150	0.011
	10	26,500	300	0.01	22,000	250	0.008	22,000	200	0.007	20,000	150	0.006
	4	38,500	720	0.064	32,000	600	0.053	32,000	600	0.044	25,000	400	0.035
0.8	6	31,000	540	0.041	26,000	450	0.034	26,000	400	0.028	21,000	300	0.022
	8	26,500	420	0.029	22,000	350	0.024	22,000	300	0.02	18,000	250	0.016
	10	26,500	420	0.012	22,000	350	0.01	22,000	300	0.008	18,000	240	0.006
	12	20,500	360	0.008	17,000	300	0.007	17,000	300	0.006	15,000	200	0.004
	14	20,500	320	0.004	17,000	270	0.003	17,000	250	0.003	13,000	170	0.002
	16	19,000	270	0.002	16,000	230	0.002	16,000	220	0.002	12,000	150	0.002
	20	17,000	200	0.002	14,000	170	0.002	14,000	160	0.002	12,000	130	0.002
	24	14,500	100	0.002	12,000	90	0.002	12,000	80	0.002	10,000	70	0.002
0.9	4	38,500	1,450	0.072	32,000	1,200	0.06	30,000	860	0.06	23,000	650	0.04
	6	36,000	1,200	0.071	30,000	1,000	0.059	28,000	780	0.05	22,000	600	0.04
	8	31,000	960	0.046	26,000	800	0.038	25,000	600	0.032	19,000	400	0.025
	10	24,000	720	0.032	20,000	600	0.027	20,000	500	0.023	16,000	300	0.018
	15	20,500	360	0.01	17,000	300	0.008	17,000	300	0.006	16,000	300	0.005
1	3	36,000	1,450	0.108	30,000	1,200	0.09	30,000	1,100	0.08	22,000	800	0.06
	4	36,000	1,400	0.096	30,000	1,150	0.08	30,000	1,100	0.07	22,000	650	0.05
	5	36,000	1,300	0.096	30,000	1,100	0.08	28,000	950	0.07	20,000	600	0.045
	6	32,500	1,200	0.084	27,000	1,000	0.07	26,000	900	0.06	20,000	600	0.04
	7	30,000	1,200	0.06	25,000	1,000	0.05	24,000	800	0.05	20,000	500	0.03
	8	27,500	960	0.048	23,000	800	0.04	22,000	700	0.04	18,000	400	0.03
	9	24,000	840	0.036	20,000	700	0.03	19,000	600	0.03	18,000	400	0.025
	10	23,000	720	0.036	19,000	600	0.03	18,000	500	0.028	15,000	300	0.02
	12	23,000	720	0.024	19,000	600	0.02	18,000	500	0.019	15,000	300	0.01
	14	18,000	480	0.012	15,000	400	0.01	15,000	400	0.009	12,000	200	0.008
	16	18,000	360	0.01	15,000	300	0.008	15,000	300	0.007	12,000	200	0.006
	18	15,500	270	0.007	13,000	230	0.006	13,000	220	0.005	11,000	180	0.004
	20	14,500	220	0.005	12,000	190	0.004	11,000	180	0.004	10,000	130	0.003
	22	13,000	190	0.004	11,000	160	0.003	10,000	150	0.003	9,000	100	0.003
25	11,000	100	0.004	9,000	90	0.003	9,000	85	0.003	8,500	80	0.003	
30	9,600	40	0.002	8,000	40	0.002	8,000	35	0.002	8,000	30	0.002	
1.2	4	29,000	1,300	0.108	24,000	1,100	0.09	23,000	1,000	0.08	18,000	700	0.06
	6	27,500	1,200	0.096	23,000	1,000	0.08	22,000	900	0.07	17,000	600	0.05
	8	24,000	840	0.084	20,000	700	0.07	19,000	700	0.05	14,000	400	0.04
	10	24,000	840	0.06	20,000	700	0.05	19,000	700	0.04	14,000	400	0.03
	12	20,500	720	0.048	17,000	600	0.04	16,000	500	0.03	11,000	300	0.02
	14	18,000	540	0.018	15,000	450	0.015	13,000	380	0.013	11,000	250	0.011
	16	14,500	360	0.01	12,000	300	0.008	11,000	250	0.007	10,000	220	0.006
20	12,000	240	0.006	10,000	200	0.005	10,000	190	0.005	9,000	180	0.004	

切深量  
DEPTH OF CUT



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1. 请使用刚性较高的机床和刀柄。
2. 推荐使用 MQL (半干式) 或空气冷却加工炭素钢预硬钢。
3. 请使用适合工件材料的发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
5. 根据加工精度、加工形状、加工刀路适当调整加工条件。
6. φ0.5以下或劲长 / 刃径 (L/D) 大于10时, 微小的负荷增大也会导致折损, 根据切削状况适当调节切削条件。
7. 转速不足时请根据上表同比下降转速和进给速度。
1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
3. When using cutting fluid, choose based on work material and cutting conditions.
4. The cutting conditions shown for 3D milling are low - load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with a diameter of φ 0.5 or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
7. When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

## WXL-LN-EDS

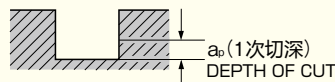


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RECOMMENDED MILLING CONDITIONS  
WXL-LN-EDS  
切削条件表

加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY			普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC			调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH					
								33 ~ 41HRC			42 ~ 50HRC		
外径 Dc	颈长 L2	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap
1.4	6	24,000	1,200	0.156	20,000	1,000	0.13	19,000	900	0.11	15,000	600	0.09
	8	21,500	960	0.108	18,000	800	0.09	17,000	700	0.08	13,000	400	0.06
	10	21,500	960	0.072	18,000	800	0.06	17,000	700	0.05	13,000	400	0.04
	12	21,500	960	0.06	18,000	800	0.05	17,000	700	0.04	13,000	400	0.03
	14	18,000	720	0.048	15,000	600	0.04	14,000	500	0.035	11,000	300	0.03
	16	18,000	720	0.036	15,000	600	0.03	14,000	500	0.02	11,000	300	0.02
1.5	22	12,000	300	0.006	10,000	250	0.005	9,000	210	0.005	8,000	180	0.004
	4	21,500	1,200	0.168	18,000	1,000	0.14	18,000	900	0.11	14,000	600	0.09
	6	21,500	1,200	0.168	18,000	1,000	0.14	18,000	900	0.11	14,000	600	0.09
	8	19,000	960	0.12	16,000	800	0.1	15,000	700	0.08	12,000	400	0.07
	10	19,000	960	0.096	16,000	800	0.08	15,000	700	0.07	12,000	400	0.05
	12	19,000	960	0.072	16,000	800	0.06	15,000	700	0.05	12,000	400	0.04
	14	19,000	960	0.06	16,000	800	0.05	15,000	700	0.045	12,000	400	0.035
	16	17,000	720	0.06	14,000	600	0.05	13,000	500	0.04	10,000	300	0.03
	18	17,000	720	0.036	14,000	600	0.03	13,000	500	0.02	10,000	300	0.02
	20	14,500	500	0.024	12,000	420	0.02	11,000	380	0.015	10,000	300	0.01
	25	12,000	340	0.01	10,000	290	0.008	9,000	230	0.007	8,000	210	0.006
	30	9,000	200	0.006	7,500	170	0.005	7,400	150	0.004	7,000	130	0.003
	38	8,150	100	0.005	6,800	90	0.004	6,700	85	0.003	6,000	75	0.003
	40	7,200	90	0.004	6,000	75	0.003	5,900	70	0.002	5,600	60	0.002
45	6,600	50	0.004	5,500	45	0.003	5,400	40	0.002	5,400	40	0.001	
1.6	6	20,500	1,200	0.18	17,000	1,000	0.15	17,000	900	0.13	13,000	600	0.1
	8	18,000	960	0.168	15,000	800	0.14	15,000	700	0.12	11,000	400	0.1
	10	18,000	960	0.132	15,000	800	0.11	15,000	700	0.09	11,000	400	0.07
	12	18,000	960	0.084	15,000	800	0.07	15,000	700	0.06	11,000	400	0.05
	14	18,000	960	0.072	15,000	800	0.06	15,000	700	0.05	11,000	400	0.04
	16	15,500	720	0.06	13,000	600	0.05	13,000	500	0.04	9,000	300	0.035
	18	15,500	720	0.048	13,000	600	0.04	13,000	500	0.03	9,000	300	0.03
1.8	20	15,500	720	0.024	13,000	600	0.02	13,000	500	0.02	9,000	300	0.01
	6	19,000	1,300	0.264	16,000	1,100	0.22	15,000	1,000	0.18	12,000	700	0.14
	8	19,000	1,300	0.252	16,000	1,100	0.21	15,000	1,000	0.17	12,000	700	0.13
	10	17,000	960	0.144	14,000	800	0.12	14,000	700	0.1	10,000	500	0.08
	12	17,000	960	0.12	14,000	800	0.1	14,000	700	0.08	10,000	500	0.07
	14	17,000	960	0.096	14,000	800	0.08	14,000	700	0.06	10,000	500	0.05
	16	17,000	960	0.084	14,000	800	0.07	14,000	700	0.05	10,000	500	0.04
	18	14,500	720	0.06	12,000	600	0.05	12,000	500	0.045	8,000	400	0.035
2	20	14,500	720	0.048	12,000	600	0.04	12,000	500	0.04	8,000	400	0.03
	25	9,600	360	0.011	8,000	300	0.009	7,000	250	0.008	6,000	200	0.007
	6	18,000	1,300	0.372	15,000	1,100	0.31	14,000	1,000	0.26	11,000	700	0.21
	8	18,000	1,300	0.312	15,000	1,100	0.26	14,000	1,000	0.22	11,000	700	0.18
	10	15,500	960	0.288	13,000	800	0.24	12,000	700	0.2	9,000	500	0.16
	12	15,500	960	0.156	13,000	800	0.13	12,000	700	0.11	9,000	500	0.09
	14	15,500	960	0.132	13,000	800	0.11	12,000	700	0.09	9,000	500	0.07
	16	15,500	960	0.096	13,000	800	0.08	12,000	700	0.07	9,000	500	0.06
	18	15,500	960	0.084	13,000	800	0.07	12,000	700	0.06	9,000	500	0.05
	20	13,000	720	0.06	11,000	600	0.05	10,000	500	0.05	7,000	400	0.04
	25	13,000	720	0.036	11,000	600	0.03	10,000	500	0.02	7,000	400	0.02
	30	13,000	720	0.024	11,000	600	0.02	10,000	500	0.01	7,000	400	0.01
	35	11,000	460	0.011	9,000	390	0.009	8,000	380	0.008	6,000	270	0.007
40	7,800	240	0.006	6,500	200	0.005	6,000	180	0.004	6,000	140	0.003	
50	6,950	120	0.002	5,800	100	0.002	5,700	95	0.002	5,000	80	0.002	
60	6,000	60	0.001	5,000	50	0.001	5,000	45	0.001	5,000	40	0.001	
2.5	8	14,500	1,300	0.468	12,000	1,100	0.39	11,000	1,000	0.33	9,000	700	0.26
	10	14,500	1,300	0.396	12,000	1,100	0.33	11,000	1,000	0.28	9,000	700	0.22

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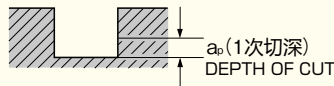
## WXL-LN-EDS



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加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY			普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC			调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH					
		外径 Dc	颈长 ℓz	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	33 ~ 41HRC			42 ~ 50HRC
转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)									ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap
2.5	12	14,500	1,300	0.276	12,000	1,100	0.23	11,000	1,000	0.19	9,000	700	0.15
	14	12,000	960	0.204	10,000	800	0.17	9,000	700	0.14	7,000	500	0.11
	16	12,000	960	0.144	10,000	800	0.12	9,000	700	0.1	7,000	500	0.08
	18	12,000	960	0.132	10,000	800	0.11	9,000	700	0.09	7,000	500	0.07
	20	12,000	960	0.108	10,000	800	0.09	9,000	700	0.08	7,000	500	0.06
	25	9,600	720	0.096	8,000	600	0.08	8,000	500	0.06	6,000	400	0.05
	30	9,600	720	0.036	8,000	600	0.03	8,000	500	0.03	6,000	400	0.02
3	40	7,800	330	0.008	6,500	280	0.007	6,000	270	0.005	6,000	240	0.005
	50	6,950	200	0.002	5,800	170	0.002	5,700	160	0.002	5,000	130	0.002
	8	12,000	1,300	0.432	10,000	1,100	0.36	10,000	1,000	0.3	8,000	700	0.24
	10	12,000	1,300	0.348	10,000	1,100	0.29	10,000	1,000	0.24	8,000	700	0.19
	12	12,000	1,300	0.324	10,000	1,100	0.27	10,000	1,000	0.23	8,000	700	0.18
	14	12,000	1,300	0.3	10,000	1,100	0.25	10,000	1,000	0.21	8,000	700	0.17
	16	12,000	960	0.24	10,000	800	0.2	9,000	700	0.17	6,000	500	0.13
	18	12,000	960	0.168	10,000	800	0.14	9,000	700	0.12	6,000	500	0.1
	20	12,000	960	0.156	10,000	800	0.13	9,000	700	0.11	6,000	500	0.08
	25	12,000	960	0.132	10,000	800	0.11	9,000	700	0.09	6,000	500	0.07
4	30	9,600	720	0.108	8,000	600	0.09	7,000	500	0.08	5,000	400	0.06
	35	9,600	720	0.084	8,000	600	0.07	7,000	500	0.06	5,000	400	0.05
	40	9,600	720	0.048	8,000	600	0.04	7,000	500	0.03	5,000	400	0.02
	50	6,950	320	0.011	5,800	270	0.009	5,700	240	0.005	5,000	200	0.004
	12	8,550	1,350	0.456	7,000	1,100	0.38	7,000	1,000	0.32	6,000	700	0.26
	16	8,550	1,350	0.432	7,000	1,100	0.36	7,000	1,000	0.3	6,000	700	0.24
	20	8,550	970	0.408	7,000	800	0.34	6,000	700	0.28	5,000	500	0.22
	25	8,550	970	0.312	7,000	800	0.26	6,000	700	0.22	5,000	500	0.18
5	30	8,550	970	0.228	7,000	800	0.19	6,000	700	0.16	5,000	500	0.13
	35	8,550	970	0.204	7,000	800	0.17	6,000	700	0.14	5,000	500	0.11
	40	7,300	730	0.168	6,000	600	0.14	5,000	600	0.12	4,000	400	0.1
	45	7,300	730	0.144	6,000	600	0.12	5,000	600	0.1	4,000	400	0.08
	50	7,300	730	0.06	6,000	600	0.05	5,000	600	0.04	4,000	400	0.03
	60	6,100	340	0.024	5,000	280	0.02	5,000	270	0.02	4,000	250	0.01
	16	7,300	1,350	0.54	6,000	1,100	0.45	5,000	900	0.38	5,000	600	0.3
6	20	7,300	1,150	0.516	6,000	950	0.43	5,000	780	0.36	5,000	600	0.29
	25	6,100	970	0.504	5,000	800	0.42	5,000	700	0.35	5,000	600	0.28
	30	6,100	970	0.456	5,000	800	0.38	5,000	700	0.3	5,000	600	0.25
	35	6,100	970	0.396	5,000	800	0.33	5,000	700	0.28	5,000	600	0.22
	40	6,100	730	0.34	5,000	600	0.28	4,000	580	0.2	4,000	500	0.18
	50	4,900	610	0.18	4,000	500	0.15	3,000	400	0.13	3,000	400	0.1
60	4,900	420	0.072	4,000	350	0.06	3,000	330	0.06	3,000	300	0.04	

切深量  
DEPTH OF CUT



1. 请使用刚性较高的机床和刀柄。
  2. 推荐使用MQL(半干式)或空气冷却加工炭素钢预硬钢。
  3. 请使用适合工件材料的发烟性少的切削油剂。
  4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
  5. 根据加工精度、加工形状、加工刀路适当调整加工条件。
  6. φ0.5以下或劲长/刃径(L/D)大于10时,微小的负荷增大也会导致折损,根据切削状况适当调节切削条件。
  7. 转速不足时请根据上表同比下降转速和进给速度。
1. Use a rigid and precise machine and holder.
  2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
  3. When using cutting fluid, choose based on work material and cutting conditions.
  4. The cutting conditions shown for 3D milling are low — load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
  5. Please adjust conditions based on machining accuracy, machining shape and machining path.
  6. When using a tool with a diameter of φ 0.5 or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
  7. When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

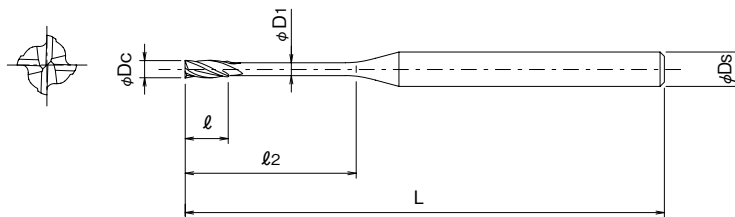
RECOMMENDED MILLING CONDITIONS  
WXL-LN-EDS

# WXL 涂层4刃长颈短刃形(深槽加工型)

WXL Coating Four Flute · Short · with Long Neck (for Rib processing)



## WXL-LN-EMS



● 材质..... 超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide

● 表面处理..... WXL 涂层  
Surface Treatment WXL Coating

● 螺旋角..... 35°      ● 外径公差..... 0 ~ -0.015mm  
Helix Angle Tolerance for Outer Diameter

单位:mm Unit:mm

商品号 EDP No.	外径 × 颈长 Dc × l2	全长 L	刃长 l	柄径 Ds	刃径 D1	■相对于工件倾斜角α的实际有效长(Le)※1						库存 Stock
						0.5°	1°	1.5°	2°	2.5°	3°	
3172004	1 × 4	45	1.5	4	0.95	4.29	4.56	4.81	5.05	5.28	5.51	B
3172006	1 × 6	45	1.5	4	0.95	6.42	6.77	7.1	7.39	7.68	7.99	B
3172008	1 × 8	45	1.5	4	0.95	8.53	8.96	9.34	9.69	10.07	10.48	B
3172010	1 × 10	45	1.5	4	0.95	10.64	11.13	11.56	11.99	12.46	12.97	B
3172012	1 × 12	45	1.5	4	0.95	12.74	13.29	13.78	14.29	14.85	15.45	B
3172016	1 × 16	50	1.5	4	0.95	16.92	17.58	18.21	18.89	19.63	20.43	B
3172206	1.2 × 6	45	1.8	4	1.15	6.42	6.77	7.1	7.39	7.68	7.99	B
3172208	1.2 × 8	45	1.8	4	1.15	8.53	8.96	9.34	9.69	10.07	10.48	B
3172210	1.2 × 10	45	1.8	4	1.15	10.64	11.13	11.56	11.99	12.46	12.97	B
3172212	1.2 × 12	45	1.8	4	1.15	12.74	13.29	13.78	14.29	14.85	15.45	B
3172216	1.2 × 16	50	1.8	4	1.15	16.92	17.58	18.21	18.89	19.63	20.43	B
3172406	1.4 × 6	45	2.1	4	1.35	6.42	6.77	7.1	7.39	7.68	7.99	B
3172408	1.4 × 8	45	2.1	4	1.35	8.53	8.96	9.34	9.69	10.07	10.48	B
3172410	1.4 × 10	45	2.1	4	1.35	10.64	11.13	11.56	11.99	12.46	12.97	B
3172412	1.4 × 12	45	2.1	4	1.35	12.74	13.29	13.78	14.29	14.85	15.45	B
3172414	1.4 × 14	50	2.1	4	1.35	14.83	15.44	15.99	16.59	17.24	17.94	B
3172416	1.4 × 16	50	2.1	4	1.35	16.92	17.58	18.21	18.89	19.63	20.43	B
3172422	1.4 × 22	60	2.1	4	1.35	23.17	23.99	24.86	25.79	26.8	—	B
3172506	1.5 × 6	45	2.3	4	1.45	6.42	6.77	7.1	7.39	7.68	7.99	B
3172508	1.5 × 8	45	2.3	4	1.45	8.53	8.96	9.34	9.69	10.07	10.48	B
3172510	1.5 × 10	45	2.3	4	1.45	10.64	11.13	11.56	11.99	12.46	12.97	B
3172512	1.5 × 12	45	2.3	4	1.45	12.74	13.29	13.78	14.29	14.85	15.45	B
3172514	1.5 × 14	50	2.3	4	1.45	14.83	15.44	15.99	16.59	17.24	17.94	B
3172516	1.5 × 16	50	2.3	4	1.45	16.92	17.58	18.21	18.89	19.63	20.43	B
3172518	1.5 × 18	55	2.3	4	1.45	19.01	19.71	20.43	21.19	22.02	22.91	B
3172520	1.5 × 20	55	2.3	4	1.45	21.09	21.85	22.64	23.49	24.41	—	B
3172606	1.6 × 6	45	2.4	4	1.55	6.42	6.77	7.1	7.39	7.68	7.99	B
3172608	1.6 × 8	45	2.4	4	1.55	8.53	8.96	9.34	9.69	10.07	10.48	B
3172610	1.6 × 10	45	2.4	4	1.55	10.64	11.13	11.56	11.99	12.46	12.97	B
3172612	1.6 × 12	45	2.4	4	1.55	12.74	13.29	13.78	14.29	14.85	15.45	B
3172614	1.6 × 14	50	2.4	4	1.55	14.83	15.44	15.99	16.59	17.24	17.94	B
3172616	1.6 × 16	50	2.4	4	1.55	16.92	17.58	18.21	18.89	19.63	20.43	B
3172618	1.6 × 18	55	2.4	4	1.55	19.01	19.71	20.43	21.19	22.02	—	B
3172620	1.6 × 20	55	2.4	4	1.55	21.09	21.85	22.64	23.49	24.41	—	B
3172625	1.6 × 25	60	2.4	4	1.55	26.28	27.2	28.19	29.24	—	—	B
3172806	1.8 × 6	45	2.7	4	1.75	6.42	6.77	7.1	7.39	7.68	7.99	B
3172808	1.8 × 8	45	2.7	4	1.75	8.53	8.96	9.34	9.69	10.07	10.48	B
3172810	1.8 × 10	45	2.7	4	1.75	10.64	11.13	11.56	11.99	12.46	12.97	B
3172812	1.8 × 12	45	2.7	4	1.75	12.74	13.29	13.78	14.29	14.85	15.45	B
3172814	1.8 × 14	50	2.7	4	1.75	14.83	15.44	15.99	16.59	17.24	17.94	B
3172816	1.8 × 16	50	2.7	4	1.75	16.92	17.58	18.21	18.89	19.63	20.43	B
3172818	1.8 × 18	55	2.7	4	1.75	19.01	19.71	20.43	21.19	22.02	—	B
3172820	1.8 × 20	55	2.7	4	1.75	21.09	21.85	22.64	23.49	24.41	—	B
3172825	1.8 × 25	60	2.7	4	1.75	26.28	27.2	28.19	29.24	—	—	B
3173006	2 × 6	45	3	4	1.95	6.42	6.77	7.1	7.39	7.68	7.99	B

B= 标准库存品 B=Standard stock item.



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SPECIFICATION CHART WXL-LN-EMS

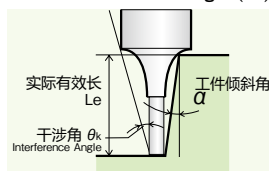
# WXL 涂层4刃长颈短刃形(深槽加工型)

WXL Coating Four Flute · Short · with Long Neck (for Rib processing)



## WXL-LN-EMS

※1:相对于工件倾斜角 $\alpha$ 的实际有效长 (Le)  
Effective Neck length (Le) depending on Inclined Angle ( $\alpha$ ) of workpiece



上表中实际有效长栏里无数值时意味加工时不存在干涉。  
No numerical value means no interference with workpiece.



接上页

单位 :mm Unit:mm

商品号 EDP No.	外径 × 颈长 Dc × ℓ2	全长 L	刃长 ℓ	柄径 Ds	刃径 D1	■相对于工件倾斜角 $\alpha$ 的实际有效长(Le)※1						库存 Stock
						0.5°	1°	1.5°	2°	2.5°	3°	
3173008	2 × 8	45	3	4	1.95	8.53	8.96	9.34	9.69	10.07	10.48	B
3173010	2 × 10	45	3	4	1.95	10.64	11.13	11.56	11.99	12.46	12.97	B
3173012	2 × 12	45	3	4	1.95	12.74	13.29	13.78	14.29	14.85	15.45	B
3173014	2 × 14	50	3	4	1.95	14.83	15.44	15.99	16.59	17.24	17.94	B
3173016	2 × 16	50	3	4	1.95	16.92	17.58	18.21	18.89	19.63	—	B
3173018	2 × 18	55	3	4	1.95	19.01	19.71	20.43	21.19	22.02	—	B
3173020	2 × 20	55	3	4	1.95	21.09	21.85	22.64	23.49	—	—	B
3173025	2 × 25	60	3	4	1.95	26.28	27.2	28.19	—	—	—	B
3173030	2 × 30	70	3	4	1.95	31.46	32.55	33.73	—	—	—	B
3173508	2.5 × 8	45	3.7	4	2.4	8.47	8.87	9.22	9.57	9.94	10.34	B
3173512	2.5 × 12	45	3.7	4	2.4	12.66	13.18	13.66	14.17	14.72	—	B
3173516	2.5 × 16	55	3.7	4	2.4	16.83	17.46	18.09	18.77	—	—	B
3173520	2.5 × 20	60	3.7	4	2.4	20.99	21.74	22.52	—	—	—	B
3173525	2.5 × 25	70	3.7	4	2.4	26.17	27.09	28.06	—	—	—	B
3174008	3 × 8	45	4.5	6	2.85	8.42	8.79	9.13	9.47	9.84	10.24	B
3174012	3 × 12	45	4.5	6	2.85	12.6	13.09	13.56	14.07	14.62	15.21	B
3174016	3 × 16	55	4.5	6	2.85	16.76	17.37	18	18.67	19.4	20.19	B
3174020	3 × 20	60	4.5	6	2.85	20.91	21.65	22.43	23.27	24.18	25.16	B
3174025	3 × 25	65	4.5	6	2.85	26.09	27	27.97	29.02	30.15	—	B
3174030	3 × 30	80	4.5	6	2.85	31.26	32.35	33.51	34.77	—	—	B

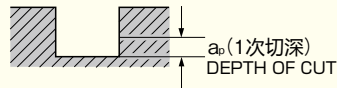
B= 标准库存品 B=Standard stock item.

## WXL-LN-EMS

RECOMMENDED MILLING CONDITIONS  
WXL-LN-EMS  
切削条件表

加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY			普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC			调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH					
								33 ~ 41HRC			42 ~ 50HRC		
外径 Dc	颈长 ℓ <sub>2</sub>	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	a <sub>p</sub>	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	a <sub>p</sub>	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	a <sub>p</sub>	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	a <sub>p</sub>
1	4	36,000	2,300	0.08	30,000	1,900	0.07	30,000	1,650	0.07	22,000	980	0.05
	6	32,500	1,900	0.08	27,000	1,600	0.07	26,000	1,350	0.06	20,000	900	0.04
	8	27,500	1,450	0.05	23,000	1,200	0.04	22,000	1,050	0.04	18,000	600	0.03
	10	23,000	1,100	0.04	19,000	940	0.03	18,000	750	0.028	15,000	450	0.02
	12	23,000	1,100	0.02	19,000	940	0.02	18,000	750	0.019	15,000	450	0.01
1.2	16	18,000	480	0.01	15,000	400	0.008	15,000	450	0.007	12,000	300	0.006
	6	27,500	1,900	0.1	23,000	1,600	0.08	22,000	1,350	0.07	17,000	900	0.05
	8	24,000	1,450	0.08	20,000	1,200	0.07	19,000	1,050	0.05	14,000	600	0.04
	10	24,000	1,100	0.06	20,000	940	0.05	19,000	1,050	0.04	14,000	600	0.03
	12	20,500	1,100	0.05	17,000	940	0.04	16,000	750	0.03	11,000	450	0.02
1.4	16	14,500	600	0.01	12,000	500	0.008	11,000	370	0.007	10,000	330	0.006
	6	24,000	1,950	0.14	20,000	1,600	0.12	19,000	1,350	0.11	15,000	900	0.09
	8	21,500	1,450	0.11	18,000	1,200	0.09	17,000	1,050	0.08	13,000	600	0.06
	10	21,500	1,450	0.07	18,000	1,200	0.06	17,000	1,050	0.05	13,000	600	0.04
	12	21,500	1,450	0.06	18,000	1,200	0.05	17,000	1,050	0.04	13,000	600	0.03
	14	18,000	1,100	0.05	15,000	940	0.04	14,000	750	0.035	11,000	450	0.03
	16	18,000	1,100	0.04	15,000	940	0.03	14,000	750	0.02	11,000	450	0.02
1.5	22	12,000	510	0.01	10,000	430	0.005	9,000	310	0.005	8,000	270	0.004
	6	21,500	2,050	0.14	18,000	1,700	0.12	18,000	1,350	0.11	14,000	900	0.09
	8	19,000	1,450	0.12	16,000	1,200	0.1	15,000	1,050	0.08	12,000	600	0.07
	10	19,000	1,450	0.1	16,000	1,200	0.08	15,000	1,050	0.07	12,000	600	0.05
	12	19,000	1,450	0.07	16,000	1,200	0.06	15,000	1,050	0.05	12,000	600	0.04
	14	19,000	1,450	0.06	16,000	1,200	0.05	15,000	1,050	0.045	12,000	600	0.035
	16	17,000	1,100	0.06	14,000	940	0.05	13,000	750	0.04	10,000	450	0.03
	18	17,000	1,100	0.04	14,000	940	0.03	13,000	750	0.02	10,000	450	0.02
1.6	20	14,500	800	0.02	12,000	670	0.02	11,000	570	0.015	10,000	450	0.01
	6	20,500	2,050	0.17	17,000	1,700	0.14	17,000	1,350	0.13	13,000	900	0.1
	8	18,000	1,550	0.16	15,000	1,300	0.13	15,000	1,050	0.12	11,000	600	0.1
	10	18,000	1,450	0.13	15,000	1,200	0.11	15,000	1,050	0.09	11,000	600	0.07
	12	18,000	1,450	0.08	15,000	1,200	0.07	15,000	1,050	0.06	11,000	600	0.05
	14	18,000	1,450	0.07	15,000	1,200	0.06	15,000	1,050	0.05	11,000	600	0.04
	16	15,500	1,100	0.06	13,000	940	0.05	13,000	750	0.04	9,000	450	0.035
	18	15,500	1,100	0.05	13,000	940	0.04	13,000	750	0.03	9,000	450	0.03
	20	15,500	1,100	0.02	13,000	940	0.02	13,000	750	0.02	9,000	450	0.01
25	10,500	550	0.01	8,900	460	0.01	8,900	360	0.01	6,100	220	0.008	

切深量  
DEPTH OF CUT



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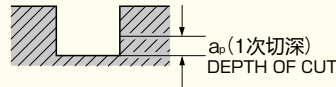
## WXL-LN-EMS



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加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY			普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC			调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH					
		外径 Dc	颈长 ℓz	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	33 ~ 41HRC			42 ~ 50HRC			
转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)						ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	ap
1.8	6	19,000	2,250	0.24	16,000	1,900	0.2	15,000	1,500	0.18	12,000	1,050	0.14
	8	19,000	2,550	0.23	16,000	1,900	0.19	15,000	1,500	0.17	12,000	1,050	0.13
	10	17,000	1,450	0.14	14,000	1,200	0.12	14,000	1,050	0.1	10,000	750	0.08
	12	17,000	1,450	0.12	14,000	1,200	0.1	14,000	1,050	0.08	10,000	750	0.07
	14	17,000	1,450	0.1	14,000	1,200	0.08	14,000	1,050	0.06	10,000	750	0.05
	16	17,000	1,450	0.08	14,000	1,200	0.07	14,000	1,050	0.05	10,000	750	0.04
	18	14,500	1,100	0.06	12,000	940	0.05	12,000	750	0.045	8,000	600	0.035
	20	14,500	1,100	0.05	12,000	940	0.04	12,000	750	0.04	8,000	600	0.03
2	25	9,600	570	0.01	8,000	480	0.009	7,000	370	0.008	6,000	300	0.007
	6	18,000	2,350	0.34	15,000	1,900	0.28	14,000	1,500	0.26	11,000	1,050	0.21
	8	18,000	2,350	0.31	15,000	1,900	0.26	14,000	1,500	0.22	11,000	1,050	0.18
	10	15,500	1,610	0.29	13,000	1,300	0.24	12,000	1,050	0.2	9,000	750	0.16
	12	15,500	1,500	0.16	13,000	1,200	0.13	12,000	1,050	0.11	9,000	750	0.09
	14	15,500	1,500	0.13	13,000	1,200	0.11	12,000	1,050	0.09	9,000	750	0.07
	16	15,500	1,500	0.1	13,000	1,200	0.08	12,000	1,050	0.07	9,000	750	0.06
	18	15,500	1,500	0.08	13,000	1,200	0.07	12,000	1,050	0.06	9,000	750	0.05
	20	13,000	1,150	0.06	11,000	940	0.05	10,000	750	0.05	7,000	600	0.04
2.5	25	13,000	1,150	0.04	11,000	940	0.03	10,000	750	0.02	7,000	600	0.02
	30	13,000	1,150	0.02	11,000	940	0.02	10,000	750	0.01	7,000	600	0.01
	8	14,500	2,350	0.42	12,000	1,900	0.35	11,000	1,500	0.33	9,000	1,050	0.26
	12	14,500	2,350	0.28	12,000	1,900	0.23	11,000	1,500	0.19	9,000	1,050	0.15
	16	12,000	1,500	0.14	10,000	1,200	0.12	9,000	1,050	0.1	7,000	750	0.08
3	20	12,000	1,500	0.11	10,000	1,200	0.09	9,000	1,050	0.08	7,000	750	0.06
	25	9,600	1,150	0.1	8,000	940	0.08	8,000	750	0.06	6,000	600	0.05
	8	12,000	2,350	0.38	10,000	1,900	0.32	10,000	1,500	0.3	8,000	1,050	0.24
	12	12,000	2,150	0.32	10,000	1,750	0.27	10,000	1,500	0.23	8,000	1,050	0.18
	16	12,000	1,500	0.24	10,000	1,200	0.2	9,000	1,050	0.17	6,000	750	0.13
	20	12,000	1,500	0.16	10,000	1,200	0.13	9,000	1,050	0.11	6,000	750	0.08
3	25	12,000	1,500	0.13	10,000	1,200	0.11	9,000	1,050	0.09	6,000	750	0.07
	30	9,600	1,150	0.11	8,000	940	0.09	7,000	750	0.08	5,000	600	0.06

切深量  
DEPTH OF CUT

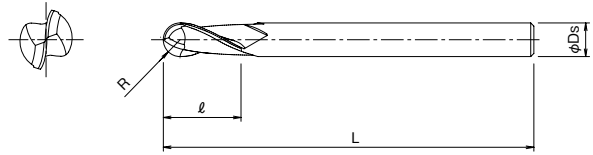


1. 请使用刚性较高的机床和刀柄。
2. 推荐使用MQL(半干式)或空气冷却加工炭素钢预硬钢。
3. 请使用适合工件材料的发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
5. 根据加工精度、加工形状、加工刀路适当调整加工条件。
6. φ0.5以下或劲长/刃径(L/D)大于10时,微小的负荷增大也会导致折损,根据切削状况适当调节切削条件。
7. 转速不足时请根据上表同比下降转速和进给速度。
1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
3. When using cutting fluid, choose based on work material and cutting conditions.
4. The cutting conditions shown for 3D milling are low - load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
7. When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

# WXL 涂层 2刃球头形

WXL Coating Two Flute Ball Nose

## WXL-EBD



● 材质.....超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide

● 表面处理.....WXL涂层  
Surface Treatment WXL Coating

● 圆弧角公差..... $R < 3$   $\pm 0.005\text{mm}$   
 $3 \leq R \leq 6$   $0.003 \sim -0.007\text{mm}$   
 $6 < R$   $\pm 0.01\text{mm}$

注) 圆弧无缝  
Tools with a radius below 6 are not seamless.

单位:mm Unit:mm

商品号 EDP No.	R × 刃长 × 柄径 R × l × Ds	全长 L	刃长 l	柄径 Ds	库存 Stock
3105010	R 0.05 × 0.2 × 4	40	0.2	4	A
3105020	R 0.1 × 0.4 × 4	40	0.4	4	A
3105030	R 0.15 × 0.6 × 4	40	0.6	4	A
3106030	R 0.15 × 0.6 × 6	50	0.6	6	D
3105040	R 0.2 × 0.8 × 4	40	0.8	4	A
3106040	R 0.2 × 0.8 × 6	50	0.8	6	D
3105050	R 0.25 × 1.1 × 4	40	1.1	4	A
3106050	R 0.25 × 1.1 × 6	50	1.1	6	D
3105060	R 0.3 × 1.1 × 4	40	1.1	4	A
3106060	R 0.3 × 1.1 × 6	50	1.1	6	D
3105080	R 0.4 × 2 × 4	40	2	4	A
3106080	R 0.4 × 2 × 6	50	2	6	D
3105100	R 0.5 × 1.5 × 4	50	1.5	4	A
3105101	R 0.5 × 2.5 × 4	50	2.5	4	D
3106100	R 0.5 × 2.5 × 6	60	2.5	6	A
3105120	R 0.6 × 3 × 4	50	3	4	A
3105140	R 0.7 × 3.5 × 4	50	3.5	4	D
3105150	R 0.75 × 2 × 4	50	2	4	D
3105151	R 0.75 × 4 × 4	50	4	4	A
3106150	R 0.75 × 4 × 6	50	4	6	D
3105160	R 0.8 × 4 × 4	50	4	4	D
3105200	R 1 × 3 × 4	50	3	4	A
3106200	R 1 × 5 × 6	50	5	6	A
3105201	R 1 × 6 × 4	50	6	4	D
3105250	R 1.25 × 3 × 4	50	3	4	A
3105251	R 1.25 × 6 × 4	50	6	4	D
3106250	R 1.25 × 6 × 6	60	6	6	A
3105300	R 1.5 × 4.5 × 4	60	4.5	4	A
3106300	R 1.5 × 4.5 × 6	60	4.5	6	D
3106301	R 1.5 × 8 × 6	60	8	6	D
3106350	R 1.75 × 8 × 6	70	8	6	D
3106400	R 2 × 6 × 6	70	6	6	A
3105400	R 2 × 8 × 4	60	8	4	D
3106401	R 2 × 8 × 6	70	8	6	D
3106500	R 2.5 × 8	80	8	6	A
3106501	R 2.5 × 10	80	10	6	D
3106502	R 2.5 × 12	80	12	6	D
3106600	R 3 × 10	90	10	6	D
3106601	R 3 × 12	90	12	6	A
3106610	R 3.5 × 14	90	14	6	D
3106620	R 4 × 12	100	12	8	D
3106621	R 4 × 14	100	14	8	A
3106630	R 4.5 × 18	100	18	8	D
3106640	R 5 × 15	100	15	10	D
3106641	R 5 × 18	100	18	10	A
3106650	R 5.5 × 22	100	22	10	D
3106660	R 6 × 18	110	18	12	D
3106661	R 6 × 22	110	22	12	A
3106670	R 7 × 26	110	26	12	A
3106680	R 8 × 30	140	30	16	A
3106690	R 9 × 34	140	34	16	D
3106700	R 10 × 38	160	38	20	A

A = 标准库存品 A = Standard stock item. D = 库存中心标准库存品 D = Inventory center stock item.

SPECIFICATION CHART  
形状寸法表  
WXL-EBD

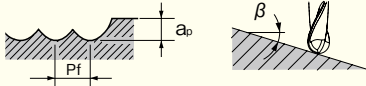


## WXL-EBD

### 标准切削 REGULAR MILLING

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · S4400 · S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH								
	R	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量 (mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量 (mm) DEPTH OF CUT		33 ~ 41HRC				42 ~ 50HRC			
				a <sub>p</sub>	Pf			a <sub>p</sub>	Pf	SPEED (min <sup>-1</sup> )	FEED (mm/min)	a <sub>p</sub>	Pf	SPEED (min <sup>-1</sup> )	FEED (mm/min)	a <sub>p</sub>	Pf
R 0.05	40,000	150	0.003	0.005	32,000	75	0.005	0.005	32,000	50	0.005	0.005	32,000	35	0.005	0.005	
R 0.1	40,000	300	0.01	0.02	32,000	200	0.01	0.01	32,000	200	0.01	0.01	32,000	200	0.005	0.005	
R 0.2	40,000	490	0.02	0.08	32,000	410	0.02	0.08	32,000	330	0.04	0.08	32,000	205	0.02	0.04	
R 0.3	40,000	580	0.03	0.12	32,000	490	0.03	0.12	32,000	420	0.06	0.12	32,000	265	0.03	0.06	
R 0.4	40,000	660	0.04	0.16	32,000	550	0.04	0.16	31,500	420	0.08	0.16	27,500	290	0.04	0.08	
R 0.5	32,000	750	0.05	0.2	31,500	620	0.05	0.2	25,000	400	0.1	0.2	22,000	285	0.05	0.1	
R 1	19,000	750	0.2	0.4	15,500	620	0.2	0.4	12,500	400	0.2	0.4	11,000	290	0.1	0.2	
R 1.5	12,500	760	0.3	0.6	10,500	630	0.3	0.6	8,450	405	0.3	0.6	7,400	290	0.15	0.3	
R 2	9,500	760	0.4	0.8	7,950	630	0.4	0.8	6,350	445	0.4	0.8	5,550	370	0.2	0.4	
R 3	6,300	800	0.6	1.2	5,300	670	0.6	1.2	4,200	465	0.6	1.2	3,700	390	0.3	0.6	
R 4	4,750	950	0.8	1.6	3,950	790	0.8	1.6	3,150	555	0.8	1.6	2,750	455	0.4	0.8	
R 5	3,800	890	1	2	3,150	745	1	2	2,500	525	1	2	2,200	430	0.5	1	
R 6	3,170	840	1.2	2.4	2,650	700	1.2	2.4	2,100	490	1.2	2.4	1,850	430	0.6	1.2	
R 8	2,400	630	1.6	3.2	1,990	525	1.6	3.2	1,580	370	1.6	3.2	1,390	325	0.8	1.6	
R 10	1,900	500	2	4	1,590	420	2	4	1,260	290	2	4	1,110	260	1	2	

切深量 DEPTH OF CUT



- 请使用刚性较高的机床和刀柄。
- 请使用适合工件材料发烟性少的切削油剂。
- 上表仅做参考实际加工时根据实际情况参照上表制定切削条件。  
※ 当转速不足时请根据上表同比下降转速和进给速度。  
※ 倾斜角  $\beta$  低于  $15^\circ$  时可上表的转速和进给速度提高 1.5~2 倍。

- Use a rigid and precise machine and holder.
- Use a suitable cutting fluid with high smoke retardant properties.
- Refer to the table above to set the milling conditions in accordance with the actual situation.  
※ When the length of tool extension from the machine is long, reduce the speed and feed.  
※ When  $\beta$  is less than  $15^\circ$ , speed and feed in the above table can be increased 1.5 ~ 2 times.

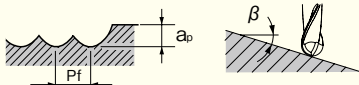
### 高速切削 HIGH-SPEED LIGHT MILLING

**!** 加工时产生的火花以及破损造成的发热现象有导致火灾的危险。请做好防火措施。

Caution: Sparks generated during operation or heat caused by tool breakage can cause fire. Be sure to use all proper fire-prevention measures.

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · S4400 · S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH								
	R	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量 (mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量 (mm) DEPTH OF CUT		33 ~ 41HRC				42 ~ 50HRC			
				a <sub>p</sub>	Pf			a <sub>p</sub>	Pf	SPEED (min <sup>-1</sup> )	FEED (mm/min)	a <sub>p</sub>	Pf	SPEED (min <sup>-1</sup> )	FEED (mm/min)	a <sub>p</sub>	Pf
R 0.5	50,000	3,350	0.02	0.05	50,000	2,800	0.02	0.05	50,000	2,500	0.02	0.05	47,500	2,250	0.02	0.05	
R 1	31,500	3,350	0.04	0.1	25,000	2,800	0.04	0.1	24,500	2,500	0.04	0.1	23,500	2,250	0.04	0.1	
R 1.5	21,000	3,350	0.06	0.15	16,500	2,800	0.06	0.15	16,000	2,500	0.06	0.15	15,500	2,250	0.06	0.15	
R 2	15,500	4,080	0.08	0.2	15,500	3,400	0.08	0.2	15,000	2,750	0.08	0.2	13,500	2,450	0.08	0.2	
R 3	10,500	5,160	0.12	0.3	13,500	4,300	0.3	0.6	11,500	2,750	0.3	0.6	9,500	2,250	0.12	0.3	
R 4	7,900	3,840	0.16	0.4	10,000	3,200	0.4	0.8	8,950	2,100	0.4	0.8	7,150	1,700	0.16	0.4	
R 5	6,300	3,120	0.2	0.5	8,250	2,600	0.5	1	7,150	1,700	0.5	1	5,700	1,350	0.2	0.5	
R 6	5,250	2,580	0.24	0.6	6,850	2,150	0.5	2.4	5,950	1,400	0.5	2.4	4,750	1,100	0.24	0.6	
R 8	4,950	1,550	0.32	0.8	4,110	1,290	0.5	3.2	4,460	1,050	0.5	3.2	3,560	820	0.32	0.8	
R 10	3,950	1,240	0.4	1	3,290	1,030	0.5	4	3,570	840	0.5	4	2,850	660	0.32	1	

切深量 DEPTH OF CUT



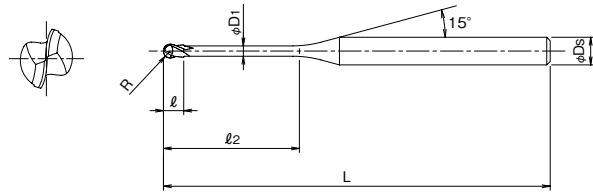
- 此基准条件适用于使用高精度的数控加工中心进行轻切削。
- 刀具磨损后易在加工中产生火花，因此请不要使用易燃切削液。
- 推荐使用空气冷却。使用切削油剂时请使用发烟性小的。
- 上表仅做参考实际加工时根据实际情况参照上表制定切削条件。  
※ 倾斜角  $\beta$  低于  $15^\circ$  时可上表的转速和进给速度提高 1.2~1.5 倍。

- The indicated speeds and feeds are for high speed light milling with high speed/high precision machining centers.
- Because tools can cause sparks, do not use flammable fluids.
- We recommend using an air blow. If using cutting fluids, use a high quality fluid with smoke retardant properties.
- Refer to the table above to set the milling conditions in accordance with the actual situation.  
※ When  $\beta$  is less than  $15^\circ$ , speed and feed in the above table can be increased 1.2 ~ 1.5 times.

# WXL 涂层 2刃长颈球头形(深槽加工型)

WXL Coating Two Flute Ball Nose · with Long Neck (for Rib processing)

## WXL-LN-EBD



● 材质.....超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide

● 表面处理.....WXL 涂层  
Surface Treatment WXL Coating

● 圆弧角公差.....±0.005mm 注)R≤0.1圆弧无接缝  
Tolerance of Ball Nose Radius Tools with a radius below 0.1 are not seamless.

单位:mm Unit:mm

商品号 EDP No.	球半径×颈长×柄径 R×L <sub>2</sub> ×D <sub>s</sub>	全长 L	刃长 ℓ	柄径 D <sub>s</sub>	刃径 D <sub>1</sub>	干涉角度 θ <sub>k</sub>	■相对于工件倾斜角α的实际有效长(Le)※1						库存 Stock
							0.5°	1°	1.5°	2°	2.5°	3°	
3110103	R0.05×0.3×4	45	0.08	4	0.085	13.59	0.32	0.35	0.39	0.43	0.48	0.54	A
3110105	R0.05×0.5×4	45	0.08	4	0.085	13.27	0.54	0.59	0.65	0.72	0.79	0.88	A
3110203	R0.1×0.3×4	45	0.16	4	0.18	13.93	0.32	0.34	0.37	0.4	0.44	0.49	A
3110205	R0.1×0.5×4	45	0.16	4	0.18	13.59	0.54	0.58	0.63	0.69	0.76	0.83	A
3120205	R0.1×0.5×6	50	0.16	6	0.18	14.04	0.54	0.58	0.63	0.69	0.76	0.83	D
3110207	R0.1×0.75×4	45	0.16	4	0.18	13.2	0.81	0.88	0.96	1.04	1.13	1.23	D
3110210	R0.1×1×4	45	0.16	4	0.18	12.83	1.08	1.18	1.27	1.38	1.49	1.61	A
3120210	R0.1×1×6	50	0.16	6	0.18	13.49	1.08	1.18	1.27	1.38	1.49	1.61	D
3110212	R0.1×1.25×4	45	0.16	4	0.18	12.48	1.36	1.47	1.59	1.71	1.84	1.98	D
3110215	R0.1×1.5×4	45	0.16	4	0.18	12.14	1.63	1.76	1.9	2.04	2.18	2.33	A
3120215	R0.1×1.5×6	50	0.16	6	0.18	12.98	1.63	1.76	1.9	2.04	2.18	2.33	D
3110217	R0.1×1.75×4	45	0.16	4	0.18	11.83	1.9	2.05	2.2	2.36	2.52	2.68	D
3110220	R0.1×2×4	45	0.16	4	0.18	11.53	2.17	2.34	2.51	2.68	2.85	3.02	A
3120220	R0.1×2×6	50	0.16	6	0.18	12.51	2.17	2.34	2.51	2.68	2.85	3.02	D
3110225	R0.1×2.5×4	45	0.16	4	0.18	10.97	2.71	2.91	3.11	3.3	3.49	3.68	D
3110230	R0.1×3×4	45	0.16	4	0.18	10.46	3.25	3.48	3.7	3.92	4.13	4.33	D
3110305	R0.15×0.5×4	45	0.24	4	0.28	13.9	0.53	0.57	0.62	0.67	0.73	0.8	D
3110306	R0.15×0.6×4	45	0.24	4	0.28	13.74	0.64	0.69	0.75	0.81	0.89	0.97	A
3110307	R0.15×0.75×4	45	0.24	4	0.28	13.49	0.81	0.87	0.94	1.02	1.11	1.21	D
3110310	R0.15×1×4	45	0.24	4	0.28	13.1	1.08	1.17	1.26	1.36	1.47	1.59	A
3120310	R0.15×1×6	50	0.24	6	0.28	13.69	1.08	1.17	1.26	1.36	1.47	1.59	D
3110312	R0.15×1.25×4	45	0.24	4	0.28	12.74	1.35	1.46	1.58	1.7	1.82	1.96	D
3110315	R0.15×1.5×4	45	0.24	4	0.28	12.39	1.62	1.75	1.89	2.02	2.17	2.31	A
3120315	R0.15×1.5×6	50	0.24	6	0.28	13.17	1.62	1.75	1.89	2.02	2.17	2.31	D
3110317	R0.15×1.75×4	45	0.24	4	0.28	12.06	1.89	2.04	2.19	2.35	2.5	2.66	D
3110320	R0.15×2×4	45	0.24	4	0.28	11.75	2.16	2.33	2.5	2.66	2.83	3	A
3120320	R0.15×2×6	50	0.24	6	0.28	12.68	2.16	2.33	2.5	2.66	2.83	3	D
3110322	R0.15×2.25×4	45	0.24	4	0.28	11.45	2.44	2.62	2.8	2.98	3.16	3.33	D
3110325	R0.15×2.5×4	45	0.24	4	0.28	11.17	2.7	2.9	3.1	3.29	3.48	3.66	A
3120325	R0.15×2.5×6	50	0.24	6	0.28	12.23	2.7	2.9	3.1	3.29	3.48	3.66	D
3110327	R0.15×2.75×4	45	0.24	4	0.28	10.9	2.97	3.19	3.4	3.6	3.8	3.99	D
3110330	R0.15×3×4	45	0.24	4	0.28	10.64	3.24	3.47	3.69	3.91	4.11	4.31	A
3120330	R0.15×3×6	50	0.24	6	0.28	11.81	3.24	3.47	3.69	3.91	4.11	4.31	D
3110335	R0.15×3.5×4	45	0.24	4	0.28	10.17	3.78	4.04	4.28	4.51	4.74	4.95	D
3110340	R0.15×4×4	45	0.24	4	0.28	9.73	4.32	4.6	4.87	5.11	5.35	5.58	D
3110345	R0.15×4.5×4	45	0.24	4	0.28	9.33	4.85	5.16	5.44	5.71	5.96	6.2	D
3110350	R0.15×5×4	45	0.24	4	0.28	8.95	5.39	5.72	6.02	6.3	6.56	6.81	A
3110405	R0.2×0.5×4	45	0.3	4	0.37	14.28	0.53	0.56	0.6	0.64	0.69	0.75	A
3110407	R0.2×0.75×4	45	0.3	4	0.37	13.85	0.8	0.86	0.92	0.99	1.07	1.16	D
3110410	R0.2×1×4	45	0.3	4	0.37	13.44	1.07	1.15	1.24	1.33	1.43	1.54	A
3120410	R0.2×1×6	50	0.3	6	0.37	13.93	1.07	1.15	1.24	1.33	1.43	1.54	D
3110415	R0.2×1.5×4	45	0.3	4	0.37	12.69	1.61	1.73	1.86	1.99	2.12	2.26	A
3120415	R0.2×1.5×6	50	0.3	6	0.37	13.39	1.61	1.73	1.86	1.99	2.12	2.26	D
3110420	R0.2×2×4	45	0.3	4	0.37	12.02	2.15	2.31	2.47	2.63	2.79	2.95	A

A = 标准库存品 A = Standard stock item. D = 库存中心标准库存品 D = Inventory center stock item. 转下页



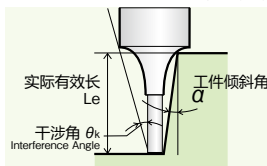
# WXL 涂层 2刃长颈球头形(深槽加工型)

WXL Coating Two Flute Ball Nose · with Long Neck (for Rib processing)

## WXL-LN-EBD

※1:相对于工件倾斜角 $\alpha$ 的实际有效长 (Le)

Effective Neck length (Le) depending on Inclined Angle ( $\alpha$ ) of workpiece



上表中实际有效长栏里无数值时意味加工时不存在干涉。  
No numerical value means no interference with workpiece.



接上页

单位:mm Unit:mm

商品号 EDP No.	球半径×颈长×柄径 $R \times \ell_e \times D_s$	全长 L	刃长 $\ell$	柄径 $D_s$	劲径 $D_1$	干涉角度 $\theta_k$	■相对于工件倾斜角 $\alpha$ 的实际有效长(Le)※1						库存 Stock
							0.5°	1°	1.5°	2°	2.5°	3°	
3120420	R0.2 × 2 × 6	50	0.3	6	0.37	12.89	2.15	2.31	2.47	2.63	2.79	2.95	D
3110425	R0.2 × 2.5 × 4	45	0.3	4	0.37	11.41	2.69	2.88	3.07	3.25	3.43	3.61	A
3120425	R0.2 × 2.5 × 6	50	0.3	6	0.37	12.42	2.69	2.88	3.07	3.25	3.43	3.61	D
3110430	R0.2 × 3 × 4	45	0.3	4	0.37	10.87	3.23	3.45	3.66	3.87	4.07	4.26	A
3120430	R0.2 × 3 × 6	50	0.3	6	0.37	11.99	3.23	3.45	3.66	3.87	4.07	4.26	D
3110435	R0.2 × 3.5 × 4	45	0.3	4	0.37	10.37	3.77	4.01	4.25	4.47	4.69	4.9	D
3110440	R0.2 × 4 × 4	45	0.3	4	0.37	9.91	4.3	4.58	4.83	5.07	5.31	5.53	A
3120440	R0.2 × 4 × 6	50	0.3	6	0.37	11.21	4.3	4.58	4.83	5.07	5.31	5.53	D
3110445	R0.2 × 4.5 × 4	45	0.3	4	0.37	9.5	4.84	5.13	5.41	5.67	5.91	6.15	D
3110450	R0.2 × 5 × 4	45	0.3	4	0.37	9.11	5.37	5.69	5.98	6.26	6.52	6.76	A
3120450	R0.2 × 5 × 6	50	0.3	6	0.37	10.52	5.37	5.69	5.98	6.26	6.52	6.76	D
3110455	R0.2 × 5.5 × 4	45	0.3	4	0.37	8.76	5.9	6.25	6.56	6.84	7.11	7.37	D
3110460	R0.2 × 6 × 4	45	0.3	4	0.37	8.43	6.43	6.8	7.12	7.42	7.71	7.97	A
3120460	R0.2 × 6 × 6	50	0.3	6	0.37	9.91	6.43	6.8	7.12	7.42	7.71	7.97	D
3110510	R0.25 × 1 × 4	45	0.4	4	0.45	13.84	1.06	1.13	1.21	1.3	1.39	1.49	A
3110515	R0.25 × 1.5 × 4	45	0.4	4	0.45	13.04	1.6	1.71	1.83	1.95	2.08	2.21	A
3120515	R0.25 × 1.5 × 6	50	0.4	6	0.45	13.65	1.6	1.71	1.83	1.95	2.08	2.21	D
3110520	R0.25 × 2 × 4	45	0.4	4	0.45	12.34	2.14	2.29	2.44	2.59	2.75	2.9	A
3120520	R0.25 × 2 × 6	50	0.4	6	0.45	13.13	2.14	2.29	2.44	2.59	2.75	2.9	D
3110525	R0.25 × 2.5 × 4	45	0.4	4	0.45	11.7	2.68	2.86	3.04	3.22	3.39	3.57	A
3120525	R0.25 × 2.5 × 6	50	0.4	6	0.45	12.64	2.68	2.86	3.04	3.22	3.39	3.57	D
3110530	R0.25 × 3 × 4	45	0.4	4	0.45	11.12	3.22	3.43	3.63	3.83	4.02	4.22	A
3120530	R0.25 × 3 × 6	50	0.4	6	0.45	12.2	3.22	3.43	3.63	3.83	4.02	4.22	D
3110535	R0.25 × 3.5 × 4	45	0.4	4	0.45	10.6	3.74	3.97	4.2	4.41	4.62	4.82	D
3110540	R0.25 × 4 × 4	45	0.4	4	0.45	10.13	4.28	4.53	4.78	5.01	5.23	5.45	A
3120540	R0.25 × 4 × 6	50	0.4	6	0.45	11.39	4.28	4.53	4.78	5.01	5.23	5.45	D
3110545	R0.25 × 4.5 × 4	45	0.4	4	0.45	9.69	4.81	5.09	5.35	5.6	5.84	6.07	D
3110550	R0.25 × 5 × 4	45	0.4	4	0.45	9.29	5.34	5.65	5.93	6.19	6.44	6.68	A
3120550	R0.25 × 5 × 6	50	0.4	6	0.45	10.68	5.34	5.65	5.93	6.19	6.44	6.68	D
3110555	R0.25 × 5.5 × 4	45	0.4	4	0.45	8.93	5.87	6.2	6.5	6.77	7.04	7.29	D
3110560	R0.25 × 6 × 4	45	0.4	4	0.45	8.59	6.4	6.75	7.06	7.35	7.63	7.89	A
3120560	R0.25 × 6 × 6	50	0.4	6	0.45	10.05	6.4	6.75	7.06	7.35	7.63	7.89	D
3110570	R0.25 × 7 × 4	45	0.4	4	0.45	7.98	7.46	7.85	8.19	8.51	8.8	9.08	D
3110580	R0.25 × 8 × 4	45	0.4	4	0.45	7.45	8.52	8.94	9.31	9.65	9.96	10.42	A
3120580	R0.25 × 8 × 6	50	0.4	6	0.45	8.99	8.52	8.94	9.31	9.65	9.96	10.42	D
3110590	R0.25 × 9 × 4	45	0.4	4	0.45	6.99	9.57	10.03	10.42	10.78	11.11	11.66	D
3110600	R0.25 × 10 × 4	45	0.4	4	0.45	6.58	10.62	11.11	11.53	11.91	12.41	12.91	D
3110610	R0.3 × 1 × 4	45	0.5	4	0.55	14.16	1.06	1.12	1.19	1.27	1.35	1.45	A
3110615	R0.3 × 1.5 × 4	45	0.5	4	0.55	13.33	1.6	1.71	1.82	1.94	2.06	2.19	A
3120615	R0.3 × 1.5 × 6	50	0.5	6	0.55	13.85	1.6	1.71	1.82	1.94	2.06	2.19	D
3110620	R0.3 × 2 × 4	45	0.5	4	0.55	12.59	2.14	2.28	2.43	2.58	2.73	2.88	A
3120620	R0.3 × 2 × 6	50	0.5	6	0.55	13.32	2.14	2.28	2.43	2.58	2.73	2.88	D
3110625	R0.3 × 2.5 × 4	45	0.5	4	0.55	11.93	2.68	2.85	3.03	3.2	3.38	3.55	A
3120625	R0.3 × 2.5 × 6	50	0.5	6	0.55	12.82	2.68	2.85	3.03	3.2	3.38	3.55	D
3110630	R0.3 × 3 × 4	45	0.5	4	0.55	11.33	3.21	3.42	3.62	3.82	4.01	4.2	A
3120630	R0.3 × 3 × 6	50	0.5	6	0.55	12.36	3.21	3.42	3.62	3.82	4.01	4.2	D
3110635	R0.3 × 3.5 × 4	45	0.5	4	0.55	10.79	3.75	3.98	4.21	4.43	4.64	4.84	D
3110640	R0.3 × 4 × 4	45	0.5	4	0.55	10.3	4.28	4.54	4.79	5.03	5.25	5.47	A

A = 标准库存品 A = Standard stock item. D = 库存中心标准库存品 D = Inventory center stock item.

SPECIFICATION CHART  
形状尺寸表

WXL-LN-EBD

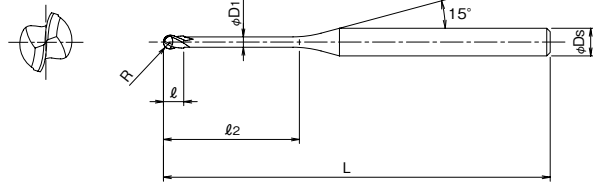


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# WXL 涂层2刃长颈短刃形(深槽加工型)

WXL Coating Two Flute Ball Nose · with Long Neck (for Rib processing)

## WXL-LN-EBD



接上页

单位:mm Unit:mm

商品号 EDP No.	球半径×颈长×柄径 R × ℓ × Ds	全长 L	刃长 ℓ	柄径 Ds	劲径 D1	干涉角度 θ <sub>k</sub>	■相对于工件倾斜角α的实际有效长(Le)※1					库存 Stock	
							0.5°	1°	1.5°	2°	2.5°		3°
3120640	R0.3 × 4 × 6	50	0.5	6	0.55	11.53	4.28	4.54	4.79	5.03	5.25	5.47	D
3110645	R0.3 × 4.5 × 4	45	0.5	4	0.55	9.85	4.82	5.1	5.37	5.62	5.86	6.09	D
3110650	R0.3 × 5 × 4	45	0.5	4	0.55	9.44	5.35	5.66	5.94	6.21	6.46	6.71	A
3120650	R0.3 × 5 × 6	50	0.5	6	0.55	10.8	5.35	5.66	5.94	6.21	6.46	6.71	D
3110655	R0.3 × 5.5 × 4	45	0.5	4	0.55	9.06	5.88	6.21	6.51	6.79	7.06	7.33	D
3110660	R0.3 × 6 × 4	45	0.5	4	0.55	8.71	6.41	6.77	7.08	7.38	7.66	7.96	A
3120660	R0.3 × 6 × 6	50	0.5	6	0.55	10.16	6.41	6.77	7.08	7.38	7.66	7.96	D
3110665	R0.3 × 6.5 × 4	45	0.5	4	0.55	8.39	6.93	7.29	7.62	7.92	8.21	8.48	D
3110670	R0.3 × 7 × 4	45	0.5	4	0.55	8.08	7.46	7.84	8.19	8.5	8.79	9.07	D
3110675	R0.3 × 7.5 × 4	45	0.5	4	0.55	7.8	7.99	8.39	8.75	9.07	9.38	9.66	D
3110680	R0.3 × 8 × 4	45	0.5	4	0.55	7.54	8.51	8.94	9.31	9.64	9.95	10.25	A
3120680	R0.3 × 8 × 6	50	0.5	6	0.55	9.08	8.51	8.94	9.31	9.64	9.95	10.25	D
3110685	R0.3 × 8.5 × 4	45	0.5	4	0.55	7.3	9.04	9.48	9.86	10.21	10.53	10.83	D
3110690	R0.3 × 9 × 4	45	0.5	4	0.55	7.07	9.57	10.02	10.42	10.78	11.11	11.65	D
3110695	R0.3 × 9.5 × 4	45	0.5	4	0.55	6.85	10.1	10.57	10.97	11.34	11.68	12.27	D
3110700	R0.3 × 10 × 4	45	0.5	4	0.55	6.65	10.62	11.11	11.53	11.9	12.25	12.9	A
3120700	R0.3 × 10 × 6	50	0.5	6	0.55	8.2	10.62	11.11	11.53	11.9	12.25	12.9	D
3110711	R0.3 × 11 × 4	45	0.5	4	0.55	6.28	11.67	12.19	12.63	13.02	13.6	14.14	D
3110712	R0.3 × 12 × 4	45	0.5	4	0.55	5.94	12.72	13.27	13.73	14.14	14.79	15.38	D
3110820	R0.4 × 2 × 4	45	0.6	4	0.75	13.13	2.13	2.27	2.41	2.55	2.7	2.85	A
3120820	R0.4 × 2 × 6	50	0.6	6	0.75	13.71	2.13	2.27	2.41	2.55	2.7	2.85	D
3110830	R0.4 × 3 × 4	45	0.6	4	0.75	11.77	3.21	3.41	3.6	3.8	3.99	4.17	A
3120830	R0.4 × 3 × 6	50	0.6	6	0.75	12.7	3.21	3.41	3.6	3.8	3.99	4.17	D
3110840	R0.4 × 4 × 4	45	0.6	4	0.75	10.66	4.28	4.53	4.77	5.01	5.23	5.45	A
3120840	R0.4 × 4 × 6	50	0.6	6	0.75	11.83	4.28	4.53	4.77	5.01	5.23	5.45	D
3110850	R0.4 × 5 × 4	45	0.6	4	0.75	9.74	5.34	5.65	5.93	6.19	6.44	6.69	A
3120850	R0.4 × 5 × 6	50	0.6	6	0.75	11.06	5.34	5.65	5.93	6.19	6.44	6.69	D
3110860	R0.4 × 6 × 4	45	0.6	4	0.75	8.97	6.39	6.73	7.04	7.33	7.6	7.86	A
3120860	R0.4 × 6 × 6	50	0.6	6	0.75	10.39	6.39	6.73	7.04	7.33	7.6	7.86	D
3110870	R0.4 × 7 × 4	45	0.6	4	0.75	8.31	7.45	7.83	8.17	8.49	8.78	9.05	D
3110880	R0.4 × 8 × 4	45	0.6	4	0.75	7.74	8.51	8.93	9.29	9.63	9.94	10.23	A
3120880	R0.4 × 8 × 6	50	0.6	6	0.75	9.26	8.51	8.93	9.29	9.63	9.94	10.23	D
3110890	R0.4 × 9 × 4	45	0.6	4	0.75	7.24	9.56	10.02	10.41	10.76	11.09	11.4	D
3110900	R0.4 × 10 × 4	45	0.6	4	0.75	6.8	10.62	11.1	11.52	11.89	12.24	12.56	A
3120900	R0.4 × 10 × 6	50	0.6	6	0.75	8.35	10.62	11.1	11.52	11.89	12.24	12.56	D
3110912	R0.4 × 12 × 4	45	0.5	4	0.75	6.06	12.72	13.26	13.72	14.13	14.5	15.36	D
3111025	R0.5 × 2.5 × 4	45	0.8	4	0.95	12.94	2.66	2.81	2.97	3.13	3.3	3.46	A
3111030	R0.5 × 3 × 4	45	0.8	4	0.95	12.25	3.19	3.38	3.57	3.75	3.93	4.11	A
3121030	R0.5 × 3 × 6	50	0.8	6	0.95	13.06	3.19	3.38	3.57	3.75	3.93	4.11	D
3111040	R0.5 × 4 × 4	45	0.8	4	0.95	11.05	4.26	4.5	4.74	4.96	5.18	5.39	A
3121040	R0.5 × 4 × 6	50	0.8	6	0.95	12.14	4.26	4.5	4.74	4.96	5.18	5.39	D
3111050	R0.5 × 5 × 4	45	0.8	4	0.95	10.07	5.33	5.62	5.89	6.15	6.39	6.63	A
3121050	R0.5 × 5 × 6	50	0.8	6	0.95	11.34	5.33	5.62	5.89	6.15	6.39	6.63	D
3111060	R0.5 × 6 × 4	45	0.8	4	0.95	9.24	6.39	6.72	7.03	7.32	7.59	7.88	A
3121060	R0.5 × 6 × 6	50	0.8	6	0.95	10.63	6.39	6.72	7.03	7.32	7.59	7.88	D
3111070	R0.5 × 7 × 4	45	0.8	4	0.95	8.54	7.45	7.82	8.16	8.47	8.76	9.03	A
3121070	R0.5 × 7 × 6	50	0.8	6	0.95	10.01	7.45	7.82	8.16	8.47	8.76	9.03	D
3111080	R0.5 × 8 × 4	45	0.8	4	0.95	7.94	8.5	8.92	9.28	9.62	9.98	10.36	A

A = 标准库存品 A = Standard stock item. D = 库存中心标准库存品 D = Inventory center stock item.



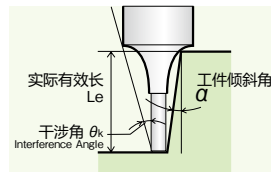
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# WXL 涂层2刃长颈短刃形(深槽加工型)

WXL Coating Two Flute Ball Nose · with Long Neck (for Rib processing)

## WXL-LN-EBD

※1:相对于工件倾斜角 $\alpha$ 的实际有效长 (Le)  
Effective Neck length (Le) depending on Inclined Angle ( $\alpha$ ) of workpiece



上表中实际有效长栏里无数值时意味着加工时不存在干涉。

No numerical value means no interference with workpiece.



接上页

单位:mm Unit:mm

商品号 EDP No.	球半径×颈长×柄径 R × ℓ <sub>e</sub> × D <sub>s</sub>	全长 L	刃长 ℓ	柄径 D <sub>s</sub>	劲径 D <sub>1</sub>	干涉角度 θ <sub>k</sub>	■相对于工件倾斜角 $\alpha$ 的实际有效长(Le)※1						库存 Stock
							0.5°	1°	1.5°	2°	2.5°	3°	
3121080	R0.5 × 8 × 6	50	0.8	6	0.95	9.45	8.5	8.92	9.28	9.62	9.98	10.36	D
3111090	R0.5 × 9 × 4	45	0.8	4	0.95	7.42	9.56	10.01	10.4	10.75	11.08	11.38	D
3111100	R0.5 × 10 × 4	45	0.8	4	0.95	6.96	10.61	11.09	11.51	11.92	12.37	12.85	A
3121100	R0.5 × 10 × 6	50	0.8	6	0.95	8.51	10.61	11.09	11.51	11.92	12.37	12.85	D
3111112	R0.5 × 12 × 4	45	0.8	4	0.95	6.19	12.71	13.25	13.71	14.12	14.49	14.83	A
3121112	R0.5 × 12 × 6	50	0.8	6	0.95	7.74	12.71	13.25	13.71	14.12	14.49	14.83	D
3111114	R0.5 × 14 × 4	50	0.8	4	0.95	5.57	14.81	15.4	15.9	16.34	16.73	17.82	A
3121114	R0.5 × 14 × 6	60	0.8	6	0.95	7.09	14.81	15.4	15.9	16.34	16.73	17.82	D
3111116	R0.5 × 16 × 4	50	0.8	4	0.95	5.07	16.9	17.54	18.07	18.54	19.53	20.31	A
3121116	R0.5 × 16 × 6	60	0.8	6	0.95	6.54	16.9	17.54	18.07	18.54	19.53	20.31	D
3111118	R0.5 × 18 × 4	55	0.8	4	0.95	4.65	18.99	19.67	20.23	20.73	21.92	22.79	D
3111120	R0.5 × 20 × 4	55	0.8	4	0.95	4.29	21.07	21.8	22.39	23.42	24.31	25.28	A
3121120	R0.5 × 20 × 6	60	0.8	6	0.95	5.67	21.07	21.8	22.39	23.42	24.31	25.28	D
3121122	R0.5 × 22 × 6	60	0.8	6	0.95	5.31	23.15	23.91	24.54	25.72	26.7	27.77	D
3111240	R0.6 × 4 × 4	45	1	4	1.15	11.47	4.25	4.49	4.72	4.94	5.16	5.36	A
3111260	R0.6 × 6 × 4	45	1	4	1.15	9.53	6.38	6.71	7.02	7.3	7.57	7.82	A
3121260	R0.6 × 6 × 6	50	1	6	1.15	10.88	6.38	6.71	7.02	7.3	7.57	7.82	D
3111280	R0.6 × 8 × 4	45	1	4	1.15	8.15	8.5	8.91	9.27	9.6	9.91	10.2	A
3121280	R0.6 × 8 × 6	50	1	6	1.15	9.65	8.5	8.91	9.27	9.6	9.91	10.2	D
3111300	R0.6 × 10 × 4	45	1	4	1.15	7.12	10.61	11.08	11.5	11.87	12.21	12.53	A
3121300	R0.6 × 10 × 6	50	1	6	1.15	8.67	10.61	11.08	11.5	11.87	12.21	12.53	D
3111312	R0.6 × 12 × 4	45	1	4	1.15	6.32	12.71	13.24	13.7	14.11	14.48	14.82	A
3121312	R0.6 × 12 × 6	50	1	6	1.15	7.87	12.71	13.24	13.7	14.11	14.48	14.82	D
3111314	R0.6 × 14 × 4	50	1	4	1.15	5.68	14.8	15.39	15.89	16.32	16.72	17.09	D
3111316	R0.6 × 16 × 4	50	1	4	1.15	5.16	16.89	17.53	18.06	18.53	18.95	20.28	A
3121316	R0.6 × 16 × 6	60	1	6	1.15	6.64	16.89	17.53	18.06	18.53	18.95	20.28	D
3111318	R0.6 × 18 × 4	55	1	4	1.15	4.72	18.98	19.66	20.23	20.72	21.9	22.77	D
3111320	R0.6 × 20 × 4	60	1	4	1.15	4.35	21.06	21.79	22.38	22.9	24.29	25.26	D
3111324	R0.6 × 24 × 4	60	1	4	1.15	3.77	25.22	26.02	26.67	28	29.07	30.23	D
3111480	R0.7 × 8 × 4	45	1.1	4	1.35	8.38	8.49	8.9	9.26	9.59	9.89	10.18	D
3111512	R0.7 × 12 × 4	45	1.1	4	1.35	6.46	12.7	13.24	13.69	14.09	14.46	14.81	D
3111516	R0.7 × 16 × 4	50	1.1	4	1.35	5.25	16.89	17.53	18.05	18.52	18.94	19.32	D
3111530	R0.75 × 3 × 4	45	1.2	4	1.45	13.61	3.17	3.35	3.52	3.7	3.87	4.04	D
3111540	R0.75 × 4 × 4	45	1.2	4	1.45	12.16	4.24	4.47	4.7	4.91	5.12	5.33	A
3111560	R0.75 × 6 × 4	45	1.2	4	1.45	10.01	6.37	6.7	7	7.28	7.54	7.82	A
3121560	R0.75 × 6 × 6	50	1.2	6	1.45	11.29	6.37	6.7	7	7.28	7.54	7.82	D
3111580	R0.75 × 8 × 4	45	1.2	4	1.45	8.5	8.49	8.89	9.25	9.58	9.93	10.3	A
3121580	R0.75 × 8 × 6	50	1.2	6	1.45	9.97	8.49	8.89	9.25	9.58	9.93	10.3	D
3111600	R0.75 × 10 × 4	45	1.2	4	1.45	7.38	10.6	11.07	11.48	11.88	12.32	12.79	A
3121600	R0.75 × 10 × 6	50	1.2	6	1.45	8.93	10.6	11.07	11.48	11.88	12.32	12.79	D
3111612	R0.75 × 12 × 4	45	1.2	4	1.45	6.53	12.7	13.23	13.69	14.09	14.46	14.8	A
3121612	R0.75 × 12 × 6	50	1.2	6	1.45	8.08	12.7	13.23	13.69	14.09	14.46	14.8	D
3111614	R0.75 × 14 × 4	50	1.2	4	1.45	5.85	14.8	15.38	15.87	16.31	16.7	17.07	D
3111616	R0.75 × 16 × 4	55	1.2	4	1.45	5.29	16.89	17.52	18.05	18.51	18.93	19.31	A
3121616	R0.75 × 16 × 6	60	1.2	6	1.45	6.79	16.89	17.52	18.05	18.51	18.93	19.31	D
3111618	R0.75 × 18 × 4	55	1.2	4	1.45	4.84	18.97	19.66	20.22	20.7	21.14	22.73	D
3111620	R0.75 × 20 × 4	55	1.2	4	1.45	4.45	21.06	21.78	22.37	22.88	23.34	25.22	A
3121620	R0.75 × 20 × 6	60	1.2	6	1.45	5.85	21.06	21.78	22.37	22.88	23.34	25.22	D

A = 标准库存品 A = Standard stock item. D = 库存中心标准库存品 D = Inventory center stock item.

SPECIFICATION CHART  
形状尺寸表

WXL-LN-EBD

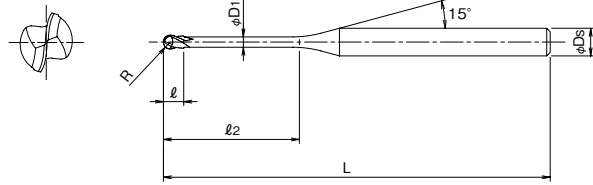


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# WXL 涂层2刃长颈短刃形(深槽加工型)

WXL Coating Two Flute Ball Nose · with Long Neck (for Rib processing)

## WXL-LN-EBD



接上页

单位:mm Unit:mm

商品号 EDP No.	球半径×颈长×柄径 R × ℓ × D <sub>s</sub>	全长 L	刃长 ℓ	柄径 D <sub>s</sub>	劲径 D <sub>1</sub>	干涉角度 θ <sub>k</sub>	■相对于工件倾斜角α的实际有效长(Le)※1						库存 Stock
							0.5°	1°	1.5°	2°	2.5°	3°	
3111622	R0.75 × 22 × 4	55	1.2	4	1.45	4.12	23.14	23.9	24.52	25.05	26.65	27.71	D
3111630	R0.75 × 30 × 4	65	1.2	4	1.45	3.18	31.43	32.33	33.04	34.88	36.21	37.65	D
3111640	R0.8 × 4 × 4	45	1.3	4	1.55	12.41	4.24	4.47	4.69	4.9	5.11	5.31	D
3111680	R0.8 × 8 × 4	45	1.3	4	1.55	8.62	8.49	8.89	9.25	9.57	9.88	10.16	D
3111712	R0.8 × 12 × 4	45	1.3	4	1.55	6.6	12.7	13.23	13.68	14.08	14.45	14.79	D
3111716	R0.8 × 16 × 4	50	1.3	4	1.55	5.34	16.89	17.52	18.05	18.51	18.93	19.31	D
3111720	R0.8 × 20 × 4	55	1.3	4	1.55	4.48	21.06	21.78	22.37	22.88	23.33	25.21	D
3111880	R0.9 × 8 × 4	45	1.4	4	1.75	8.87	8.48	8.88	9.24	9.56	9.86	10.15	D
3111912	R0.9 × 12 × 4	45	1.4	4	1.75	6.74	12.69	13.22	13.67	14.07	14.44	14.78	D
3111916	R0.9 × 16 × 4	50	1.4	4	1.75	5.44	16.88	17.51	18.04	18.5	18.91	19.3	D
3111920	R0.9 × 20 × 4	55	1.4	4	1.75	4.55	21.05	21.77	22.36	22.87	23.33	23.74	D
3112030	R1 × 3 × 4	45	1.6	4	1.95	15.32	3.15	3.3	3.46	3.62	3.78	3.94	A
3112040	R1 × 4 × 4	45	1.6	4	1.95	13.51	4.22	4.43	4.64	4.84	5.04	5.23	A
3122040	R1 × 4 × 6	50	1.6	6	1.95	13.98	4.22	4.43	4.64	4.84	5.04	5.23	D
3112060	R1 × 6 × 4	45	1.6	4	1.95	10.91	6.35	6.65	6.94	7.21	7.46	7.73	A
3122060	R1 × 6 × 6	50	1.6	6	1.95	12.02	6.35	6.65	6.94	7.21	7.46	7.73	D
3112080	R1 × 8 × 4	45	1.6	4	1.95	9.14	8.46	8.85	9.2	9.52	9.85	10.21	A
3122080	R1 × 8 × 6	50	1.6	6	1.95	10.54	8.46	8.85	9.2	9.52	9.85	10.21	D
3112100	R1 × 10 × 4	45	1.6	4	1.95	7.87	10.57	11.03	11.43	11.82	12.24	12.7	A
3122100	R1 × 10 × 6	50	1.6	6	1.95	9.38	10.57	11.03	11.43	11.82	12.24	12.7	D
3112112	R1 × 12 × 4	45	1.6	4	1.95	6.9	12.67	13.19	13.64	14.12	14.63	15.19	A
3122112	R1 × 12 × 6	50	1.6	6	1.95	8.45	12.67	13.19	13.64	14.12	14.63	15.19	D
3112114	R1 × 14 × 4	50	1.6	4	1.95	6.14	14.77	15.34	15.86	16.42	17.02	17.67	D
3112116	R1 × 16 × 4	50	1.6	4	1.95	5.54	16.86	17.48	18.08	18.72	19.41	—	A
3122116	R1 × 16 × 6	60	1.6	6	1.95	7.05	16.86	17.48	18.08	18.72	19.41	19.28	D
3112118	R1 × 18 × 4	55	1.6	4	1.95	5.04	18.94	19.62	20.29	21.02	21.8	—	D
3112120	R1 × 20 × 4	55	1.6	4	1.95	4.62	21.03	21.76	22.51	23.18	—	—	A
3122120	R1 × 20 × 6	65	1.6	6	1.95	6.05	21.03	21.76	22.51	23.18	24	24.98	D
3112122	R1 × 22 × 4	60	1.6	4	1.95	4.27	23.13	23.89	24.5	25.03	25.5	25.93	D
3112125	R1 × 25 × 4	65	1.6	4	1.95	3.83	26.24	27.06	27.71	28.27	28.77	31.38	A
3122125	R1 × 25 × 6	70	1.6	6	1.95	5.13	26.24	27.06	27.71	28.27	28.77	31.38	D
3112130	R1 × 30 × 4	70	1.6	4	1.95	3.27	31.42	32.32	33.03	33.63	36.16	37.59	A
3122130	R1 × 30 × 6	75	1.6	6	1.95	4.46	31.42	32.32	33.03	33.63	36.16	37.59	D
3112135	R1 × 35 × 4	75	1.6	4	1.95	2.85	36.59	37.56	38.32	40.59	42.14	—	A
3122135	R1 × 35 × 6	80	1.6	6	1.95	3.94	36.59	37.56	38.32	40.59	42.14	43.81	D
3112140	R1 × 40 × 4	80	1.6	4	1.95	2.53	41.74	42.78	43.59	46.34	48.11	—	D
3112560	R1.25 × 6 × 4	45	2	4	2.35	12.23	6.26	6.52	6.76	6.99	7.21	7.43	A
3112600	R1.25 × 10 × 4	50	2	4	2.35	8.54	10.46	10.85	11.21	11.54	11.85	12.14	A
3112615	R1.25 × 15 × 4	55	2	4	2.35	6.19	15.67	16.21	16.68	17.09	17.47	17.83	A
3112620	R1.25 × 20 × 4	60	2	4	2.35	4.85	20.87	21.52	22.07	22.55	22.99	23.39	A
3112625	R1.25 × 25 × 4	65	2	4	2.35	3.99	26.05	26.8	27.42	27.95	28.43	28.87	D
3112630	R1.25 × 30 × 4	70	2	4	2.35	3.38	31.21	32.05	32.73	33.31	33.83	37.3	D
3112635	R1.25 × 35 × 4	70	2	4	2.35	2.94	36.37	37.28	38.01	38.64	41.86	—	D
3123059	R1.5 × 6 × 3	45	2.4	3	2.85	13.17	6.25	6.49	6.72	6.95	7.17	7.38	D
3113060	R1.5 × 6 × 4	45	2.4	4	2.85	13.6	6.25	6.49	6.72	6.95	7.17	7.38	A
3123060	R1.5 × 6 × 6	50	2.4	6	2.85	14.04	6.25	6.49	6.72	6.95	7.17	7.38	D
3123080	R1.5 × 8 × 6	50	2.4	6	2.85	12.07	8.35	8.67	8.97	9.25	9.51	9.77	A
3123100	R1.5 × 10 × 6	50	2.4	6	2.85	10.58	10.45	10.83	11.19	11.51	11.81	12.1	A

A = 标准库存品 A = Standard stock item. D = 库存中心标准库存品 D = Inventory center stock item.



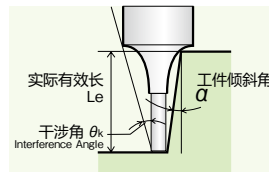
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# WXL 涂层2刃长颈短刃形(深槽加工型)

WXL Coating Two Flute Ball Nose · with Long Neck (for Rib processing)

## WXL-LN-EBD

※1:相对于工件倾斜角 $\alpha$ 的实际有效长 (Le)  
Effective Neck length (Le) depending on Inclined Angle ( $\alpha$ ) of workpiece



上表中实际有效长栏里无数值时意味着加工时不存在干涉。

No numerical value means no interference with workpiece.



接上页

单位:mm Unit:mm

商品号 EDP No.	球半径×颈长×柄径 $R \times \ell_n \times D_s$	全长 L	刃长 $\ell$	柄径 $D_s$	劲径 $D_1$	干涉角度 $\theta_k$	■相对于工件倾斜角 $\alpha$ 的实际有效长(Le)※1						库存 Stock
							0.5°	1°	1.5°	2°	2.5°	3°	
3123112	R1.5 × 12 × 6	55	2.4	6	2.85	9.41	12.54	12.99	13.38	13.75	14.08	14.4	A
3123114	R1.5 × 14 × 6	55	2.4	6	2.85	8.48	14.62	15.13	15.57	15.96	16.33	16.67	A
3123115	R1.5 × 15 × 6	55	2.4	6	2.85	8.08	15.66	16.19	16.65	17.07	17.44	17.8	A
3123116	R1.5 × 16 × 6	55	2.4	6	2.85	7.71	16.7	17.26	17.74	18.17	18.56	18.92	A
3123120	R1.5 × 20 × 6	60	2.4	6	2.85	6.53	20.86	21.51	22.05	22.53	22.96	23.36	D
3123125	R1.5 × 25 × 6	65	2.4	6	2.85	5.47	26.04	26.78	27.4	27.94	28.41	28.85	D
3123130	R1.5 × 30 × 6	70	2.4	6	2.85	4.71	31.2	32.04	32.71	33.3	33.81	34.27	D
3123135	R1.5 × 35 × 6	80	2.4	6	2.85	4.14	36.36	37.27	38	38.62	39.16	43.45	D
3123140	R1.5 × 40 × 6	85	2.4	6	2.85	3.69	41.51	42.49	43.26	43.92	47.79	49.67	D
3123600	R1.75 × 10 × 6	60	2.8	6	3.35	11.23	10.44	10.82	11.16	11.48	11.78	12.06	D
3123615	R1.75 × 15 × 6	60	2.8	6	3.35	8.45	15.65	16.18	16.63	17.04	17.42	17.76	D
3123620	R1.75 × 20 × 6	65	2.8	6	3.35	6.77	20.85	21.49	22.03	22.51	22.94	23.34	D
3123625	R1.75 × 25 × 6	65	2.8	6	3.35	5.64	26.03	26.77	27.38	27.92	28.39	28.82	D
3123630	R1.75 × 30 × 6	70	2.8	6	3.35	4.84	31.2	32.03	32.7	33.28	33.79	34.25	D
3123635	R1.75 × 35 × 6	80	2.8	6	3.35	4.23	36.35	37.26	37.99	38.61	39.15	39.63	D
3123640	R1.75 × 40 × 6	90	2.8	6	3.35	3.76	41.5	42.48	43.25	43.91	44.47	49.61	D
3123645	R1.75 × 45 × 6	90	2.8	6	3.35	3.39	46.64	47.68	48.5	49.18	53.71	55.82	D
3114080	R2 × 8 × 4	55	3.2	4	3.85	13.38	8.33	8.63	8.91	9.18	9.43	9.68	A
3124080	R2 × 8 × 6	60	3.2	6	3.85	13.89	8.33	8.63	8.91	9.18	9.43	9.68	D
3124100	R2 × 10 × 6	60	3.2	6	3.85	11.96	10.42	10.8	11.13	11.45	11.74	12.02	A
3124112	R2 × 12 × 6	60	3.2	6	3.85	10.49	12.51	12.95	13.34	13.69	14.02	14.33	A
3124114	R2 × 14 × 6	60	3.2	6	3.85	9.35	14.6	15.09	15.52	15.91	16.27	16.61	A
3124115	R2 × 15 × 6	60	3.2	6	3.85	8.86	15.64	16.16	16.61	17.02	17.39	17.73	A
3124116	R2 × 16 × 6	60	3.2	6	3.85	8.42	16.68	17.23	17.7	18.12	18.5	18.86	A
3124120	R2 × 20 × 6	65	3.2	6	3.85	7.03	20.84	21.48	22.01	22.49	22.92	23.31	A
3124125	R2 × 25 × 6	70	3.2	6	3.85	5.82	26.02	26.76	27.37	27.9	28.37	28.8	A
3124130	R2 × 30 × 6	80	3.2	6	3.85	4.97	31.19	32.01	32.68	33.26	33.77	34.23	D
3124135	R2 × 35 × 6	80	3.2	6	3.85	4.33	36.34	37.25	37.97	38.59	39.13	39.62	D
3124140	R2 × 40 × 6	90	3.2	6	3.85	3.84	41.49	42.47	43.24	43.89	44.46	44.96	D
3124145	R2 × 45 × 6	90	3.2	6	3.85	3.45	46.63	47.67	48.49	49.17	49.76	55.77	D
3124150	R2 × 50 × 6	100	3.2	6	3.85	3.13	51.76	52.86	53.72	54.43	59.64	61.98	D
3125100	R2.5 × 10	65	5	6	4.85	13.74	10.4	10.76	11.08	11.38	11.67	11.94	D
3125115	R2.5 × 15	70	5	6	4.85	9.81	15.62	16.13	16.57	16.97	17.33	17.67	D
3125120	R2.5 × 20	70	5	6	4.85	7.62	20.82	21.45	21.98	22.45	22.87	23.26	D
3125125	R2.5 × 25	70	5	6	4.85	6.22	26	26.73	27.33	27.86	28.33	28.76	D
3125130	R2.5 × 30	80	5	6	4.85	5.26	31.17	31.99	32.65	33.23	33.73	34.19	D
3125135	R2.5 × 35	80	5	6	4.85	4.55	36.33	37.23	37.95	38.56	39.1	39.58	D
3125140	R2.5 × 40	90	5	6	4.85	4.01	41.48	42.44	43.21	43.86	44.43	44.93	D
3125145	R2.5 × 45	100	5	6	4.85	3.59	46.62	47.65	48.46	49.14	49.73	50.25	D
3125150	R2.5 × 50	100	5	6	4.85	3.24	51.75	52.84	53.69	54.4	55.01	55.54	D
3126100	R3 × 10	60	6	6	5.85	16.14	10.38	10.71	11.03	11.32	11.6	11.86	A
3126120	R3 × 20	70	6	6	5.85	8.31	20.8	21.42	21.94	22.4	22.82	23.21	A
3126125	R3 × 25	70	6	6	5.85	6.68	25.99	26.7	27.3	27.82	28.29	28.71	A
3126130	R3 × 30	80	6	6	5.85	5.58	31.16	31.96	32.62	33.19	33.7	34.15	A
3126135	R3 × 35	80	6	6	5.85	4.79	36.31	37.2	37.92	38.53	39.06	39.54	D
3126140	R3 × 40	90	6	6	5.85	4.2	41.46	42.42	43.19	43.83	44.4	44.9	D
3126145	R3 × 45	100	6	6	5.85	3.73	46.6	47.63	48.44	49.12	49.7	50.22	D
3126150	R3 × 50	120	6	6	5.85	3.36	51.74	52.82	53.67	54.38	54.98	55.51	D

A = 标准库存品 A = Standard stock item. D = 库存中心标准库存品 D = Inventory center stock item.



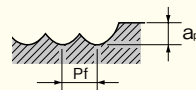




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R	加工材料 WORK MATERIAL		铜·铜合金 COPPER·COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS·CARBON STEELS FC250·SS400·S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS·PREHARDENED STEELS SKT·SKD61·NAK55·NAK80·HPM1·DH						
	颈长 φ <sub>2</sub> (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT	
				ap	Pf			ap	Pf			ap	Pf			ap	Pf
0.25	6	21,000	300	0.02	0.03	20,000	200	0.01	0.015	20,000	150	0.01	0.01	20,000	150	0.01	0.01
	7	21,000	300	0.02	0.03	20,000	200	0.01	0.015	20,000	150	0.01	0.01	20,000	150	0.01	0.01
	8	21,000	300	0.02	0.03	15,000	200	0.01	0.015	15,000	150	0.01	0.01	15,000	150	0.005	0.01
	9	18,000	150	0.02	0.02	15,000	100	0.01	0.01	15,000	80	0.005	0.01	15,000	80	0.005	0.005
	10	18,000	150	0.01	0.01	15,000	100	0.005	0.005	15,000	80	0.005	0.005	15,000	80	0.003	0.005
0.3	1	32,000	900	0.045	0.12	32,000	600	0.03	0.06	32,000	500	0.03	0.05	32,000	500	0.03	0.03
	1.5	32,000	900	0.045	0.12	32,000	600	0.03	0.06	32,000	500	0.03	0.05	32,000	500	0.03	0.03
	2	32,000	675	0.045	0.12	32,000	450	0.03	0.06	32,000	300	0.03	0.05	32,000	300	0.03	0.03
	2.5	30,000	675	0.045	0.12	32,000	450	0.03	0.06	32,000	300	0.03	0.05	32,000	300	0.03	0.03
	3	30,000	375	0.045	0.12	25,000	250	0.03	0.06	24,000	200	0.03	0.05	24,000	200	0.03	0.03
	3.5	30,000	375	0.045	0.12	25,000	250	0.03	0.06	24,000	200	0.03	0.04	24,000	200	0.03	0.03
	4	30,000	375	0.045	0.12	25,000	250	0.03	0.06	24,000	200	0.03	0.04	24,000	200	0.03	0.03
	4.5	30,000	375	0.045	0.12	25,000	250	0.03	0.06	24,000	200	0.03	0.04	24,000	200	0.03	0.03
	5	30,000	375	0.045	0.12	25,000	250	0.03	0.06	24,000	200	0.03	0.04	24,000	200	0.02	0.02
	5.5	25,000	300	0.045	0.12	20,000	200	0.03	0.06	20,000	200	0.03	0.04	20,000	200	0.02	0.02
	6	25,000	225	0.045	0.12	20,000	150	0.03	0.06	20,000	150	0.03	0.04	20,000	150	0.02	0.02
	6.5	25,000	225	0.045	0.12	20,000	150	0.03	0.06	20,000	150	0.03	0.04	20,000	150	0.02	0.02
	7	25,000	225	0.045	0.12	20,000	150	0.03	0.06	20,000	150	0.03	0.04	20,000	150	0.02	0.02
	7.5	25,000	225	0.045	0.12	20,000	150	0.03	0.06	20,000	150	0.03	0.04	20,000	150	0.02	0.02
	8	25,000	225	0.045	0.12	20,000	150	0.03	0.06	20,000	150	0.03	0.04	20,000	150	0.02	0.02
	8.5	22,000	225	0.045	0.12	20,000	150	0.03	0.06	20,000	150	0.02	0.04	20,000	150	0.01	0.01
	9	22,000	225	0.03	0.1	20,000	150	0.02	0.05	20,000	150	0.02	0.04	20,000	150	0.01	0.01
9.5	22,000	225	0.03	0.1	17,000	150	0.02	0.05	17,000	150	0.02	0.04	17,000	150	0.01	0.01	
10	20,000	150	0.025	0.05	17,000	100	0.015	0.025	17,000	100	0.015	0.02	17,000	100	0.005	0.005	
11	20,000	150	0.025	0.05	17,000	100	0.015	0.025	17,000	100	0.01	0.02	17,000	100	0.005	0.005	
12	20,000	120	0.025	0.05	17,000	80	0.015	0.025	17,000	80	0.01	0.012	17,000	80	0.005	0.005	
0.4	2	27,000	675	0.06	0.16	23,000	450	0.04	0.08	21,000	300	0.04	0.06	21,000	300	0.04	0.04
	3	27,000	675	0.06	0.16	23,000	450	0.04	0.08	21,000	300	0.04	0.06	21,000	300	0.04	0.04
	4	27,000	675	0.06	0.16	23,000	450	0.04	0.08	21,000	300	0.04	0.06	21,000	300	0.04	0.04
	5	24,000	375	0.06	0.12	21,000	250	0.04	0.06	19,000	200	0.04	0.05	19,000	200	0.02	0.025
	6	24,000	375	0.06	0.12	21,000	250	0.04	0.06	19,000	200	0.04	0.05	19,000	200	0.02	0.025
	7	24,000	375	0.06	0.12	21,000	250	0.04	0.06	19,000	200	0.04	0.05	19,000	200	0.02	0.025
	8	22,000	225	0.06	0.12	19,000	150	0.04	0.06	17,000	150	0.04	0.05	17,000	150	0.02	0.025
	9	22,000	225	0.06	0.12	19,000	150	0.04	0.06	17,000	150	0.04	0.05	17,000	150	0.02	0.025
	10	22,000	225	0.06	0.12	19,000	150	0.04	0.06	17,000	150	0.04	0.05	17,000	150	0.02	0.025
	11	22,000	225	0.06	0.12	19,000	150	0.04	0.06	17,000	150	0.04	0.05	17,000	150	0.02	0.025
	12	20,000	225	0.06	0.12	19,000	150	0.04	0.06	17,000	150	0.04	0.05	17,000	150	0.02	0.025

切深量  
DEPTH OF CUT



- 请使用刚性较高的机床和刀柄。
  - 推荐使用MQL(半干式)或空气冷却加工炭素钢预硬钢。
  - 请使用适合工件材料的发烟性少的切削油剂。
  - 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
  - 根据加工精度、加工形状、加工刀路适当调整加工条件。
  - φ0.5 (R0.25)以下或劲长/刃径(L/D)大于10时,微小的负荷增大也会导致折损,根据切削状况适当调节切削条件。
  - 转速不足时请根据上表同比下降转速和进给速度。
- Use a rigid and precise machine and holder.
  - When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
  - When using cutting fluid, choose based on work material and cutting conditions.
  - The cutting conditions shown for 3D milling are low — load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
  - Please adjust conditions based on machining accuracy, machining shape and machining path.
  - When using a tool with a diameter of φ 0.5 (R0.25) or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
  - When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

RECOMMENDED MILLING CONDITIONS

切削条件表  
W X L I N E I N D U S T R Y



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# 切削条件基准表

# Recommended Milling Conditions

## WXL-LN-EBD 标准切削 REGULAR MILLING

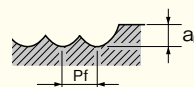


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RECOMMENDED MILLING CONDITIONS  
WXL-LN-EBD  
切削条件表

加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT·SKD61 · NAK55 · NAK80 · HPM1 · DH							
R	颈长 $l_2$ (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT	
				$a_p$	Pf			$a_p$	Pf			$a_p$	Pf			$a_p$	Pf
0.5	2.5	28,000	900	0.075	0.2	25,000	600	0.05	0.1	21,000	400	0.05	0.08	21,000	400	0.05	0.05
	3	28,000	750	0.075	0.2	25,000	500	0.05	0.1	21,000	300	0.05	0.08	21,000	300	0.05	0.05
	4	28,000	750	0.075	0.2	25,000	500	0.05	0.1	21,000	300	0.05	0.08	21,000	300	0.05	0.05
	5	21,000	450	0.075	0.2	19,000	300	0.05	0.1	16,000	200	0.05	0.08	16,000	200	0.05	0.05
	6	21,000	450	0.075	0.2	19,000	300	0.05	0.1	16,000	200	0.05	0.08	16,000	200	0.05	0.05
	7	21,000	450	0.075	0.15	19,000	300	0.05	0.075	16,000	200	0.05	0.06	16,000	200	0.03	0.03
	8	21,000	450	0.075	0.15	19,000	300	0.05	0.075	16,000	200	0.05	0.06	16,000	200	0.03	0.03
	9	21,000	450	0.075	0.15	19,000	300	0.05	0.075	16,000	200	0.05	0.06	16,000	200	0.03	0.03
	10	18,000	300	0.06	0.12	17,000	200	0.03	0.05	14,000	150	0.03	0.04	14,000	150	0.01	0.015
	12	18,000	300	0.06	0.12	17,000	200	0.03	0.05	14,000	150	0.03	0.04	14,000	150	0.01	0.015
	14	18,000	300	0.06	0.12	17,000	200	0.03	0.05	14,000	150	0.03	0.04	14,000	150	0.01	0.015
	16	16,000	300	0.06	0.12	13,000	200	0.03	0.05	10,000	150	0.03	0.04	10,000	150	0.01	0.015
	0.6	4	20,000	750	0.09	0.24	17,000	500	0.06	0.12	14,000	300	0.06	0.1	14,000	300	0.06
6		20,000	450	0.09	0.24	17,000	300	0.06	0.12	14,000	200	0.06	0.1	14,000	200	0.06	0.06
8		20,000	450	0.09	0.24	17,000	300	0.06	0.12	14,000	200	0.06	0.1	14,000	200	0.06	0.06
10		20,000	450	0.09	0.18	17,000	300	0.06	0.09	14,000	200	0.06	0.07	14,000	200	0.03	0.03
12		16,000	300	0.09	0.18	14,000	200	0.06	0.09	11,000	150	0.06	0.07	11,000	150	0.03	0.03
14		16,000	300	0.09	0.18	14,000	200	0.06	0.09	11,000	150	0.06	0.07	11,000	150	0.01	0.03
16		16,000	300	0.09	0.18	14,000	200	0.06	0.09	11,000	150	0.06	0.07	11,000	150	0.01	0.03
18		16,000	300	0.09	0.18	14,000	200	0.06	0.09	11,000	150	0.06	0.07	11,000	150	0.01	0.03
0.7	8	18,000	450	0.1	0.28	15,500	300	0.07	0.14	12,000	250	0.07	0.1	12,000	250	0.07	0.07
	12	18,000	450	0.1	0.2	15,500	300	0.07	0.1	12,000	250	0.07	0.08	12,000	250	0.07	0.07
	16	13,000	300	0.09	0.18	12,000	200	0.06	0.09	9,000	150	0.04	0.07	9,000	150	0.01	0.03
	3	20,000	900	0.12	0.3	15,000	600	0.08	0.15	12,000	500	0.08	0.12	12,000	300	0.08	0.1
0.75	4	20,000	900	0.12	0.3	15,000	600	0.08	0.15	12,000	500	0.08	0.12	12,000	300	0.08	0.1
	6	18,000	750	0.12	0.3	15,000	500	0.08	0.15	12,000	350	0.08	0.12	12,000	300	0.08	0.1
	8	17,000	450	0.12	0.3	15,000	300	0.08	0.15	12,000	250	0.08	0.12	12,000	250	0.08	0.1
	10	17,000	450	0.12	0.3	15,000	300	0.08	0.15	12,000	250	0.08	0.12	12,000	250	0.08	0.1
	12	17,000	450	0.12	0.24	15,000	300	0.08	0.12	12,000	250	0.08	0.09	12,000	250	0.05	0.06
	14	17,000	450	0.12	0.24	15,000	300	0.08	0.12	12,000	250	0.08	0.09	12,000	250	0.05	0.06
	16	13,000	300	0.09	0.18	12,000	200	0.06	0.1	9,500	150	0.06	0.07	9,500	150	0.01	0.03
	18	13,000	300	0.09	0.18	12,000	200	0.06	0.1	9,500	150	0.06	0.07	9,500	150	0.01	0.03
	20	13,000	300	0.09	0.18	12,000	200	0.06	0.1	9,500	150	0.06	0.07	9,500	150	0.01	0.03
	22	13,000	300	0.09	0.18	12,000	200	0.06	0.1	9,500	150	0.06	0.07	9,500	150	0.01	0.03
0.8	4	20,000	900	0.12	0.32	14,000	600	0.08	0.16	11,000	500	0.08	0.13	11,000	350	0.08	0.1
	8	16,500	450	0.12	0.32	14,000	300	0.08	0.16	11,000	250	0.08	0.13	11,000	250	0.08	0.1
	12	16,500	450	0.12	0.24	14,000	300	0.08	0.12	11,000	250	0.08	0.08	11,000	250	0.05	0.05
	16	11,500	300	0.12	0.24	11,000	200	0.08	0.12	9,000	150	0.08	0.08	9,000	150	0.05	0.05
	20	11,500	300	0.09	0.2	11,000	200	0.06	0.12	9,000	150	0.06	0.075	9,000	150	0.015	0.03
0.9	8	16,500	600	0.13	0.36	14,000	400	0.09	0.18	11,000	300	0.09	0.16	11,000	300	0.09	0.12
	12	16,500	600	0.13	0.36	14,000	400	0.09	0.18	11,000	300	0.09	0.16	11,000	300	0.09	0.12
	16	16,500	600	0.13	0.27	14,000	400	0.09	0.14	11,000	300	0.09	0.12	11,000	300	0.05	0.06

切深量  
DEPTH OF CUT



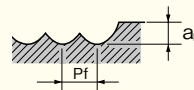
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加工材料 WORK MATERIAL	铜·铜合金 COPPER·COPPER ALLOY					普通结构用钢·炭素钢 MILD STEELS·CARBON STEELS FC250·SS400·S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS·PREHARDENED STEELS SKT·SKD61·NAK55·NAK80·HPM1·DH							
	R	颈长 φ <sub>2</sub> (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)		切深量(mm) DEPTH OF CUT a <sub>p</sub>	Pf	33~41HRC			42~50HRC			
				进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT a <sub>p</sub>		Pf	转速 SPEED (min <sup>-1</sup> )			进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT a <sub>p</sub>	Pf	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT a <sub>p</sub>	Pf
0.9	20	11,000	300	0.1	0.22	11,000	200	0.06	0.13	8,000	200	0.06	0.08	8,000	200	0.02	0.03
	3	16,500	1,350	0.15	0.56	16,500	900	0.1	0.28	13,500	800	0.1	0.28	13,500	700	0.1	0.2
	4	16,500	1,050	0.15	0.56	16,500	700	0.1	0.28	13,500	500	0.1	0.28	13,500	500	0.1	0.2
	6	16,500	1,050	0.15	0.56	16,500	700	0.1	0.28	13,500	500	0.1	0.28	13,500	500	0.1	0.2
	8	16,500	1,050	0.15	0.56	16,500	700	0.1	0.28	13,500	500	0.1	0.28	13,500	500	0.1	0.2
	10	14,000	750	0.15	0.56	13,000	500	0.1	0.28	10,000	300	0.1	0.28	10,000	300	0.1	0.2
	12	14,000	750	0.15	0.56	13,000	500	0.1	0.28	10,000	300	0.1	0.28	10,000	300	0.1	0.2
	14	14,000	750	0.15	0.56	13,000	500	0.1	0.28	10,000	300	0.1	0.28	10,000	300	0.1	0.2
	16	14,000	750	0.15	0.42	13,000	500	0.1	0.21	10,000	300	0.1	0.18	10,000	300	0.06	0.1
	18	14,000	750	0.15	0.42	13,000	500	0.1	0.21	10,000	300	0.1	0.18	10,000	300	0.06	0.1
	20	11,000	375	0.15	0.42	10,000	250	0.1	0.21	8,000	200	0.1	0.18	8,000	200	0.06	0.1
	22	11,000	375	0.15	0.42	10,000	250	0.1	0.21	8,000	200	0.1	0.18	8,000	200	0.06	0.1
	25	11,000	375	0.15	0.42	10,000	250	0.1	0.21	8,000	200	0.1	0.18	8,000	200	0.06	0.1
	30	11,000	375	0.15	0.42	10,000	250	0.1	0.21	8,000	200	0.1	0.18	8,000	200	0.06	0.1
35	10,000	375	0.15	0.42	10,000	250	0.1	0.21	8,000	200	0.1	0.18	8,000	200	0.06	0.1	
40	10,000	300	0.15	0.42	10,000	200	0.1	0.21	8,000	160	0.1	0.18	8,000	160	0.06	0.1	
1.25	6	16,000	1,050	0.18	0.7	12,000	700	0.12	0.35	10,000	600	0.12	0.3	10,000	600	0.1	0.25
	10	14,000	1,050	0.18	0.7	12,000	700	0.12	0.35	10,000	600	0.12	0.3	10,000	600	0.1	0.25
	15	14,000	600	0.18	0.7	10,000	400	0.12	0.35	8,500	300	0.12	0.3	8,500	300	0.1	0.25
	20	12,000	600	0.18	0.56	10,000	400	0.12	0.28	8,500	300	0.12	0.2	8,500	300	0.08	0.15
	25	12,000	450	0.18	0.56	8,000	300	0.12	0.28	6,500	250	0.12	0.2	6,500	250	0.08	0.15
1.5	6	15,000	1,200	0.2	0.84	9,500	800	0.15	0.42	7,500	600	0.15	0.42	7,500	600	0.15	0.3
	8	12,000	900	0.2	0.84	9,500	600	0.15	0.42	7,500	400	0.15	0.36	7,500	400	0.15	0.3
	10	12,000	900	0.2	0.84	9,500	600	0.15	0.42	7,500	400	0.15	0.36	7,500	400	0.15	0.3
	12	10,000	900	0.2	0.84	9,500	600	0.15	0.42	7,500	400	0.15	0.36	7,500	400	0.15	0.3
	14	10,000	900	0.2	0.84	9,500	600	0.15	0.42	7,500	400	0.15	0.36	7,500	400	0.15	0.3
	15	10,000	600	0.2	0.84	8,500	400	0.15	0.42	6,500	250	0.15	0.36	6,500	250	0.15	0.3
	16	10,000	450	0.2	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.36	6,500	250	0.15	0.3
	20	10,000	450	0.2	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.36	6,500	250	0.15	0.3
	25	10,000	450	0.2	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.3	6,500	250	0.09	0.15
	30	9,000	375	0.2	0.84	7,500	250	0.15	0.42	6,000	200	0.15	0.3	6,000	200	0.09	0.15
	35	9,000	375	0.2	0.84	7,500	250	0.15	0.42	6,000	200	0.15	0.3	6,000	200	0.09	0.15
1.75	10	10,000	1,050	0.4	0.98	8,500	700	0.15	0.49	6,500	500	0.15	0.42	6,500	500	0.15	0.35
	15	10,000	900	0.4	0.98	8,500	600	0.15	0.49	6,500	400	0.15	0.42	6,500	400	0.15	0.35

切深量  
DEPTH OF CUT



- 请使用刚性较高的机床和刀柄。
- 推荐使用MQL(半干式)或空气冷却加工炭素钢预硬钢。
- 请使用适合工件材料的发烟性少的切削油剂。
- 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
- 根据加工精度、加工形状、加工刀路适当调整加工条件。
- φ0.5 (R0.25)以下或动长/刃径(L/D)大于10时,微小的负荷增大也会导致折损,根据切削状况适当调节切削条件。
- 转速不足时请根据上表同比下降转速和进给速度。

- Use a rigid and precise machine and holder.
- When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
- When using cutting fluid, choose based on work material and cutting conditions.
- The cutting conditions shown for 3D milling are low — load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
- Please adjust conditions based on machining accuracy, machining shape and machining path.
- When using a tool with a diameter of φ 0.5 (R0.25) or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
- When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.



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## WXL-LN-EBD 标准切削 REGULAR MILLING

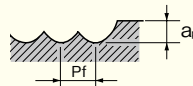


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RECOMMENDED MILLING CONDITIONS  
WXL-LN-EBD  
切削条件表

加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH							
		33 ~ 41HRC		42 ~ 50HRC		33 ~ 41HRC		42 ~ 50HRC		33 ~ 41HRC		42 ~ 50HRC		33 ~ 41HRC		42 ~ 50HRC	
R	颈长 L <sub>2</sub> (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT	
				ap	Pf			ap	Pf			ap	Pf			ap	Pf
1.75	20	8,000	750	0.4	0.98	7,500	500	0.15	0.49	5,500	300	0.15	0.42	5,500	300	0.15	0.35
	25	8,000	600	0.4	0.98	7,500	400	0.15	0.49	5,500	275	0.15	0.42	5,500	275	0.15	0.35
	30	8,000	450	0.4	0.98	7,500	300	0.15	0.49	5,500	250	0.15	0.35	5,500	250	0.1	0.2
	35	8,000	375	0.4	0.98	6,000	250	0.15	0.49	5,000	200	0.15	0.35	5,000	200	0.1	0.2
	40	6,000	375	0.3	0.98	6,000	250	0.15	0.49	5,000	200	0.15	0.35	5,000	200	0.1	0.2
2	8	11,000	1,200	0.5	1.28	7,500	800	0.2	0.64	6,000	700	0.2	0.6	6,000	700	0.2	0.4
	10	9,000	900	0.5	1.28	7,500	600	0.2	0.64	6,000	400	0.2	0.6	6,000	400	0.2	0.4
	12	9,000	900	0.5	1.28	7,500	600	0.2	0.64	6,000	400	0.2	0.6	6,000	400	0.2	0.4
	14	9,000	900	0.5	1.28	7,500	600	0.2	0.64	6,000	400	0.2	0.6	6,000	400	0.2	0.4
	15	9,000	900	0.5	1.28	7,500	600	0.2	0.64	6,000	400	0.2	0.6	6,000	400	0.2	0.4
	16	9,000	900	0.5	1.28	7,500	600	0.2	0.64	6,000	400	0.2	0.6	6,000	400	0.2	0.4
	20	7,000	600	0.5	1.28	6,000	400	0.2	0.64	5,000	250	0.2	0.6	5,000	250	0.2	0.4
	25	7,000	600	0.5	1.28	6,000	400	0.2	0.64	5,000	250	0.2	0.6	5,000	250	0.2	0.4
	30	7,000	600	0.4	1.28	6,000	400	0.2	0.64	5,000	250	0.2	0.56	5,000	250	0.12	0.2
	35	7,000	600	0.4	1.28	6,000	400	0.2	0.64	5,000	250	0.2	0.56	5,000	250	0.12	0.2
	40	5,000	375	0.35	1.28	5,000	250	0.2	0.64	4,000	200	0.2	0.56	4,000	200	0.12	0.2
2.5	45	5,000	375	0.35	1.28	5,000	250	0.2	0.64	4,000	200	0.2	0.56	4,000	200	0.12	0.2
	50	5,000	375	0.35	1.28	5,000	250	0.2	0.64	4,000	200	0.2	0.56	4,000	200	0.12	0.2
	10	9,000	1,350	0.6	1.8	6,500	900	0.25	0.9	5,000	750	0.25	0.7	5,000	750	0.25	0.5
	15	9,000	1,350	0.6	1.8	6,500	900	0.25	0.9	5,000	750	0.25	0.7	5,000	750	0.25	0.5
	20	7,000	750	0.6	1.8	6,500	500	0.25	0.9	5,000	400	0.25	0.7	5,000	400	0.25	0.5
	25	6,000	750	0.6	1.8	5,000	500	0.25	0.9	4,000	250	0.25	0.7	4,000	250	0.25	0.5
	30	6,000	750	0.6	1.8	5,000	500	0.25	0.9	4,000	250	0.25	0.7	4,000	250	0.25	0.5
3	35	6,000	750	0.6	1.8	5,000	500	0.25	0.9	4,000	250	0.25	0.7	4,000	250	0.25	0.5
	40	5,000	600	0.4	1.8	4,000	400	0.25	0.9	4,000	200	0.25	0.6	4,000	200	0.2	0.25
	45	5,000	600	0.4	1.8	4,000	400	0.25	0.9	4,000	200	0.25	0.6	4,000	200	0.2	0.25
	50	5,000	450	0.4	1.8	4,000	300	0.25	0.9	4,000	200	0.25	0.6	4,000	200	0.2	0.25
	10	7,000	1,500	0.75	2.4	5,500	1,000	0.3	1.2	4,500	800	0.3	0.96	4,500	800	0.3	0.6
	20	7,000	1,200	0.75	2.4	5,500	800	0.3	1.2	4,500	600	0.3	0.96	4,500	600	0.3	0.6
	25	6,000	900	0.75	2.4	5,500	600	0.3	1.2	4,500	400	0.3	0.96	4,500	400	0.3	0.6
	30	5,000	600	0.75	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.6
3	35	5,000	600	0.75	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.6
	40	5,000	600	0.6	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.6
	45	5,000	600	0.6	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.6
	45	5,000	600	0.6	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.6
	50	5,000	600	0.6	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.3

切深量  
DEPTH OF CUT

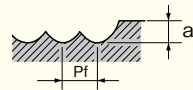


- 请使用刚性较高的机床和刀柄。
- 推荐使用MQL(半干式)或空气冷却加工炭素钢预硬钢。
- 请使用适合工件材料的发烟性少的切削油剂。
- 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
- 根据加工精度、加工形状、加工刀路适当调整加工条件。
- $\phi 0.5$  (R0.25)以下或动径/刃径(L/D)大于10时,微小的负荷增大也会导致折损,根据切削状况适当调节切削条件。
- 转速不足时请根据上表同比下降转速和进给速度。
- Use a rigid and precise machine and holder.
- When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
- When using cutting fluid, choose based on work material and cutting conditions.
- The cutting conditions shown for 3D milling are low — load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
- Please adjust conditions based on machining accuracy, machining shape and machining path.
- When using a tool with a diameter of  $\phi 0.5$  (R0.25) or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
- When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

## WXL-LN-EBD 高速切削 HIGH-SPEED LIGHT MILLING

加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH								
		33~41HRC		42~50HRC		33~41HRC		42~50HRC		33~41HRC		42~50HRC		33~41HRC		42~50HRC		
R	颈长 $\phi_a$ (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		
				$a_p$	Pf			$a_p$	Pf			$a_p$	Pf			$a_p$	Pf	
0.05	0.3	50,000	280	0.003	0.005	50,000	150	0.003	0.003	50,000	100	0.003	0.003	50,000	70	0.003	0.003	
	0.5	50,000	220	0.003	0.005	50,000	120	0.003	0.003	50,000	80	0.003	0.003	50,000	50	0.003	0.003	
0.1	0.3	50,000	490	0.0075	0.01	50,000	400	0.005	0.005	50,000	380	0.005	0.005	50,000	380	0.005	0.005	
	0.5	50,000	490	0.0075	0.01	50,000	400	0.005	0.005	50,000	380	0.005	0.005	50,000	380	0.005	0.005	
	0.75	50,000	440	0.0075	0.01	50,000	360	0.005	0.005	50,000	340	0.005	0.005	50,000	340	0.005	0.005	
	1	50,000	440	0.0075	0.01	50,000	360	0.005	0.005	50,000	340	0.005	0.005	50,000	340	0.005	0.005	
	1.25	50,000	390	0.0075	0.01	47,000	320	0.005	0.005	47,000	300	0.005	0.005	47,000	300	0.005	0.005	
	1.5	50,000	360	0.0075	0.01	45,000	300	0.005	0.005	45,000	280	0.005	0.005	45,000	280	0.005	0.005	
	1.75	50,000	350	0.0075	0.01	42,000	260	0.005	0.005	42,000	240	0.005	0.005	42,000	240	0.005	0.005	
	2	50,000	320	0.0075	0.01	38,000	230	0.005	0.005	38,000	210	0.005	0.005	37,000	200	0.005	0.005	
	2.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	3	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
0.15	0.5	50,000	750	0.0075	0.02	50,000	620	0.005	0.01	50,000	600	0.005	0.01	50,000	600	0.005	0.01	
	0.6	50,000	730	0.0075	0.02	50,000	600	0.005	0.01	50,000	570	0.005	0.01	50,000	570	0.005	0.01	
	0.75	50,000	730	0.0075	0.02	50,000	600	0.005	0.01	50,000	570	0.005	0.01	50,000	570	0.005	0.01	
	1	50,000	730	0.0075	0.02	50,000	600	0.005	0.01	50,000	570	0.005	0.01	50,000	570	0.005	0.01	
	1.25	50,000	730	0.0075	0.02	50,000	600	0.005	0.01	50,000	570	0.005	0.01	50,000	570	0.005	0.01	
	1.5	50,000	730	0.0075	0.02	50,000	600	0.005	0.01	50,000	570	0.005	0.01	50,000	570	0.005	0.01	
	1.75	50,000	610	0.0075	0.02	47,000	510	0.005	0.01	47,000	480	0.005	0.01	47,000	480	0.005	0.01	
	2	50,000	580	0.0075	0.01	45,000	480	0.005	0.005	45,000	450	0.005	0.005	45,000	450	0.005	0.005	
	2.25	50,000	490	0.0075	0.01	45,000	400	0.005	0.005	45,000	380	0.005	0.005	45,000	380	0.005	0.005	
	2.5	50,000	360	0.0075	0.01	40,000	300	0.005	0.005	40,000	280	0.005	0.005	40,000	280	0.005	0.005	
	2.75	50,000	320	0.0075	0.01	38,000	250	0.005	0.005	38,000	230	0.005	0.005	38,000	230	0.005	0.005	
	3	50,000	290	0.0075	0.01	38,000	250	0.005	0.005	38,000	230	0.005	0.005	37,000	230	0.005	0.005	
	3.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
0.2	0.5	50,000	1,100	0.015	0.04	50,000	920	0.01	0.02	50,000	870	0.01	0.02	50,000	870	0.01	0.02	
	0.75	50,000	1,090	0.015	0.04	50,000	900	0.01	0.02	50,000	850	0.01	0.02	50,000	850	0.01	0.02	
	1	50,000	1,090	0.015	0.04	50,000	900	0.01	0.02	50,000	850	0.01	0.02	50,000	850	0.01	0.02	
	1.5	50,000	970	0.015	0.04	50,000	800	0.01	0.02	50,000	760	0.01	0.02	50,000	760	0.01	0.02	
	2	50,000	850	0.015	0.04	50,000	700	0.01	0.02	50,000	660	0.01	0.02	50,000	660	0.01	0.02	
	2.5	50,000	670	0.012	0.03	45,000	550	0.008	0.015	45,000	520	0.008	0.015	45,000	520	0.008	0.015	
	3	48,000	540	0.0075	0.02	43,000	500	0.005	0.01	43,000	470	0.005	0.01	43,000	470	0.005	0.01	
	3.5	45,000	460	0.0075	0.02	40,000	420	0.005	0.01	40,000	400	0.005	0.01	40,000	400	0.005	0.01	
	4	40,000	400	0.0075	0.01	36,000	370	0.005	0.005	36,000	350	0.005	0.005	35,000	340	0.005	0.005	
	4.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

切深量  
DEPTH OF CUT



- 请使用刚性较高的机床和刀柄。
  - 推荐使用MQL(半干式)或空气冷却加工炭素钢预硬钢。
  - 请使用适合工件材料的发烟性少的切削油剂。
  - 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
  - 根据加工精度、加工形状、加工刀路适当调整加工条件。
  - $\phi 0.5$  (R0.25)以下或刃长/刃径(L/D)大于10时,微小的负荷增大也会导致折损,根据切削状况适当调节切削条件。
  - 转速不足时请根据上表同比下降转速和进给速度。
- Use a rigid and precise machine and holder.
  - When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
  - When using cutting fluid, choose based on work material and cutting conditions.
  - The cutting conditions shown for 3D milling are low — load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
  - Please adjust conditions based on machining accuracy, machining shape and machining path.
  - When using a tool with a diameter of  $\phi 0.5$  (R0.25) or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
  - When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

# 切削条件基准表

# Recommended Milling Conditions

## WXL-LN-EBD 高速切削 HIGH-SPEED LIGHT MILLING

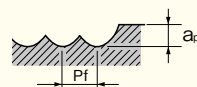


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RECOMMENDED MILLING CONDITIONS  
WXL-LN-EBD  
切削条件表

加工材料 WORK MATERIAL		铜·铜合金 COPPER·COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS·CARBON STEELS FC250·SS400·S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS·PREHARDENED STEELS SKT·SKD61·NAK55·NAK80·HPM1·DH								
										33~41HRC				42~50HRC				
R	颈长 ℓ <sub>s</sub> (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		
				a <sub>p</sub>	Pf			a <sub>p</sub>	Pf			a <sub>p</sub>	Pf			a <sub>p</sub>	Pf	
0.25	1	50,000	1,420	0.0225	0.045	50,000	1,100	0.015	0.03	50,000	1,050	0.015	0.03	50,000	1,050	0.015	0.03	
	1.5	50,000	1,420	0.0225	0.045	50,000	1,100	0.015	0.03	50,000	1,050	0.015	0.03	50,000	1,050	0.015	0.03	
	2	50,000	1,400	0.0225	0.045	50,000	1,000	0.015	0.03	50,000	950	0.015	0.03	50,000	950	0.015	0.03	
	2.5	50,000	1,380	0.0225	0.045	50,000	1,000	0.015	0.03	50,000	950	0.015	0.03	50,000	950	0.015	0.03	
	3	50,000	1,190	0.015	0.04	48,000	900	0.01	0.02	48,000	850	0.01	0.02	48,000	850	0.01	0.02	
	3.5	50,000	1,140	0.015	0.04	45,000	700	0.01	0.02	45,000	650	0.01	0.02	45,000	650	0.01	0.02	
	4	45,000	1,000	0.015	0.02	43,000	600	0.01	0.01	43,000	570	0.01	0.01	43,000	570	0.01	0.01	
	4.5	38,000	940	0.015	0.02	38,000	500	0.01	0.01	38,000	470	0.01	0.01	38,000	470	0.01	0.01	
	5	30,000	760	0.0075	0.02	30,000	400	0.005	0.01	30,000	380	0.005	0.01	29,000	360	0.005	0.01	
	5.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
6	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0.3	1	50,000	1,660	0.045	0.1	50,000	1,400	0.03	0.05	50,000	1,300	0.03	0.05	50,000	1,300	0.03	0.05	
	1.5	50,000	1,600	0.045	0.1	50,000	1,300	0.03	0.05	50,000	1,200	0.03	0.05	50,000	1,200	0.03	0.05	
	2	50,000	1,600	0.045	0.1	50,000	1,300	0.03	0.05	50,000	1,200	0.03	0.05	50,000	1,200	0.03	0.05	
	2.5	50,000	1,550	0.045	0.1	50,000	1,200	0.03	0.05	50,000	1,100	0.03	0.05	50,000	1,100	0.03	0.05	
	3	50,000	1,550	0.03	0.06	50,000	1,200	0.02	0.03	50,000	1,100	0.02	0.03	50,000	1,100	0.02	0.03	
	3.5	50,000	1,340	0.03	0.06	45,000	1,000	0.02	0.03	45,000	950	0.02	0.03	45,000	950	0.02	0.03	
	4	50,000	1,200	0.015	0.04	40,000	900	0.01	0.02	40,000	850	0.01	0.02	40,000	850	0.01	0.02	
	4.5	45,000	1,040	0.015	0.04	34,000	780	0.01	0.02	34,000	740	0.01	0.02	34,000	740	0.01	0.02	
	5	30,000	960	0.015	0.04	30,000	680	0.01	0.02	30,000	640	0.01	0.02	30,000	640	0.01	0.02	
	5.5	30,000	820	0.015	0.04	28,000	650	0.01	0.02	28,000	610	0.01	0.02	28,000	610	0.01	0.02	
	6	30,000	720	0.015	0.04	26,000	600	0.01	0.02	26,000	570	0.01	0.02	25,000	540	0.01	0.02	
	6.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	7.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
8	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
8.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
9.5	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
11	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0.4	2	50,000	2,200	0.06	0.16	50,000	2,000	0.04	0.08	50,000	1,900	0.04	0.08	50,000	1,900	0.04	0.08	
	3	50,000	1,740	0.06	0.16	48,000	1,600	0.04	0.08	48,000	1,500	0.04	0.08	48,000	1,500	0.04	0.08	
	4	50,000	1,680	0.06	0.16	40,000	1,200	0.04	0.08	40,000	1,100	0.04	0.08	40,000	1,100	0.04	0.08	
	5	43,000	1,600	0.045	0.1	34,000	950	0.03	0.05	34,000	900	0.03	0.05	34,000	900	0.03	0.05	
	6	32,000	1,260	0.045	0.1	30,000	800	0.03	0.05	30,000	760	0.03	0.05	30,000	760	0.03	0.05	
	7	30,000	1,000	0.02	0.08	25,000	600	0.01	0.02	25,000	570	0.01	0.02	25,000	570	0.01	0.02	
	8	24,000	720	0.01	0.04	23,000	450	0.005	0.01	23,000	420	0.005	0.01	23,000	420	0.005	0.01	
	9	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	10	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0.5	2.5	50,000	3,270	0.075	0.2	50,000	3,400	0.05	0.1	50,000	3,200	0.05	0.1	50,000	3,200	0.05	0.1	
	3	50,000	3,060	0.075	0.2	45,000	3,200	0.05	0.1	45,000	3,000	0.05	0.1	45,000	3,000	0.05	0.1	

切深量  
DEPTH OF CUT



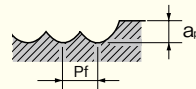
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加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH								
										33~41HRC				42~50HRC				
R	颈长 ℓ <sub>2</sub> (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		
				ap	Pf			ap	Pf			ap	Pf			ap	Pf	
0.5	4	50,000	3,000	0.075	0.2	40,000	3,000	0.05	0.1	40,000	2,850	0.05	0.1	40,000	2,850	0.05	0.1	
	5	47,000	2,870	0.075	0.2	36,000	2,300	0.05	0.1	36,000	2,100	0.05	0.1	36,000	2,100	0.05	0.1	
	6	43,000	2,600	0.075	0.2	30,000	2,000	0.05	0.1	30,000	1,900	0.05	0.1	30,000	1,900	0.05	0.1	
	7	30,000	2,350	0.075	0.15	27,000	1,700	0.05	0.1	27,000	1,600	0.05	0.1	27,000	1,600	0.05	0.1	
	8	27,000	2,000	0.075	0.15	26,000	1,600	0.05	0.1	26,000	1,500	0.05	0.1	26,000	1,500	0.05	0.1	
	9	26,000	1,540	0.045	0.075	24,000	1,200	0.03	0.05	24,000	1,100	0.03	0.05	24,000	1,100	0.03	0.05	
	10	24,000	1,400	0.015	0.04	22,000	1,100	0.01	0.02	22,000	1,000	0.01	0.02	21,000	950	0.01	0.02	
	12	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0.6	4	40,000	3,000	0.12	0.21	40,000	3,000	0.06	0.12	40,000	2,850	0.06	0.12	40,000	2,850	0.06	0.12	
	6	35,000	2,600	0.09	0.21	32,000	2,100	0.06	0.12	32,000	2,000	0.06	0.12	32,000	2,000	0.06	0.12	
	8	30,000	2,000	0.09	0.21	25,000	1,700	0.06	0.12	25,000	1,600	0.06	0.12	25,000	1,600	0.06	0.12	
	10	21,000	1,400	0.075	0.12	20,000	1,200	0.05	0.1	20,000	1,100	0.05	0.1	18,000	990	0.05	0.1	
	12	20,000	1,000	0.045	0.1	19,000	900	0.03	0.05	17,000	850	0.03	0.05	16,000	800	0.03	0.05	
	14	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
24	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
0.7	8	30,000	2,100	0.14	0.245	25,000	1,700	0.07	0.14	25,000	1,600	0.07	0.14	25,000	1,600	0.07	0.14	
	12	22,000	1,210	0.06	0.14	19,000	1,000	0.03	0.07	19,000	950	0.03	0.07	19,000	950	0.03	0.07	
	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
0.75	3	50,000	5,330	0.15	0.3	50,000	4,800	0.075	0.15	50,000	4,800	0.075	0.15	50,000	4,800	0.075	0.15	
	4	42,000	4,110	0.15	0.3	40,000	3,900	0.075	0.15	40,000	3,700	0.075	0.15	40,000	3,700	0.075	0.15	
	6	32,000	3,000	0.15	0.3	30,000	2,900	0.075	0.15	30,000	2,700	0.075	0.15	30,000	2,700	0.075	0.15	
	8	30,000	2,650	0.15	0.3	24,000	2,300	0.075	0.15	24,000	2,100	0.075	0.15	24,000	2,100	0.075	0.15	
	10	30,000	2,400	0.15	0.3	24,000	2,000	0.075	0.15	24,000	1,900	0.075	0.15	24,000	1,900	0.075	0.15	
	12	24,000	1,400	0.15	0.2	21,000	1,400	0.075	0.1	21,000	1,300	0.075	0.1	21,000	1,300	0.075	0.1	
	14	22,000	1,400	0.1	0.2	18,000	1,200	0.05	0.1	18,000	1,100	0.05	0.1	17,000	1,100	0.05	0.1	
	16	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	18	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	
	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	

切深量  
DEPTH OF CUT



1. 请使用刚性较高的机床和刀柄。
2. 推荐使用MQL(半干式)或空气冷却加工炭素钢预硬钢。
3. 请使用适合工件材料的发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
5. 根据加工精度、加工形状、加工刀路适当调整加工条件。
6. φ0.5 (R0.25)以下或劲长/刃径(L/D)大于10时,微小的负荷增大也会导致折损,根据切削状况适当调节切削条件。
7. 转速不足时请根据上表同比下降转速和进给速度。

1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
3. When using cutting fluid, choose based on work material and cutting conditions.
4. The cutting conditions shown for 3D milling are low — load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with a diameter of φ 0.5 (R0.25) or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
7. When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

WXL-LN-EBD 高速切削 HIGH-SPEED LIGHT MILLING



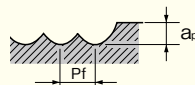
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RECOMMENDED MILLING CONDITIONS

WXL-LN-EBD

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY					普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC					调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH								
	R	颈长 $l_s$ (mm)	转速 SPEED ( $\text{min}^{-1}$ )	进给速度 FEED ( $\text{mm}/\text{min}$ )	切深量(mm) DEPTH OF CUT		转速 SPEED ( $\text{min}^{-1}$ )	进给速度 FEED ( $\text{mm}/\text{min}$ )	切深量(mm) DEPTH OF CUT		转速 SPEED ( $\text{min}^{-1}$ )	进给速度 FEED ( $\text{mm}/\text{min}$ )	33~41HRC		42~50HRC				
					$a_p$	Pf			$a_p$	Pf			$a_p$	Pf	$a_p$	Pf			
0.8	4	40,000	4,500	0.16	0.32	38,000	4,000	0.08	0.16	38,000	3,800	0.08	0.16	38,000	3,600	0.08	0.16		
	8	26,000	3,000	0.16	0.32	24,000	3,000	0.08	0.16	24,000	2,800	0.08	0.16	23,000	2,600	0.08	0.16		
	12	24,000	2,400	0.12	0.2	21,000	1,800	0.05	0.1	21,000	1,700	0.05	0.1	20,000	1,600	0.05	0.1		
	16	18,000	1,600	0.1	0.2	16,000	800	0.05	0.1	16,000	760	0.05	0.1	15,000	700	0.05	0.1		
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
0.9	8	25,000	3,200	0.18	0.54	24,000	3,000	0.09	0.27	24,000	2,800	0.09	0.27	23,000	2,600	0.09	0.27		
	12	22,000	2,500	0.18	0.36	18,000	1,800	0.09	0.18	15,800	1,500	0.09	0.18	14,700	1,350	0.09	0.18		
	16	16,000	1,200	0.1	0.24	16,000	980	0.05	0.12	14,000	850	0.05	0.12	13,000	780	0.05	0.12		
	20	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1	3	50,000	5,800	0.2	0.4	50,000	5,600	0.1	0.2	50,000	5,600	0.1	0.2	47,000	5,300	0.1	0.2		
	4	50,000	5,800	0.2	0.4	50,000	5,600	0.1	0.2	50,000	5,600	0.1	0.2	47,000	5,300	0.1	0.2		
	6	38,000	4,000	0.2	0.4	36,000	3,000	0.1	0.2	36,000	2,800	0.1	0.2	34,000	2,600	0.1	0.2		
	8	27,000	3,360	0.2	0.4	25,000	2,600	0.1	0.2	25,000	2,400	0.1	0.2	23,000	2,200	0.1	0.2		
	10	22,000	3,050	0.2	0.4	20,000	2,400	0.1	0.2	20,000	2,200	0.1	0.2	19,000	2,000	0.1	0.2		
	12	16,000	2,580	0.2	0.4	16,000	2,000	0.1	0.2	16,000	1,900	0.1	0.2	15,000	1,700	0.1	0.2		
	14	15,000	2,400	0.2	0.3	15,000	1,800	0.1	0.2	15,000	1,700	0.1	0.2	14,000	1,500	0.1	0.2		
	16	14,000	2,200	0.2	0.2	14,000	1,700	0.1	0.1	14,000	1,600	0.1	0.1	13,000	1,400	0.1	0.1		
	18	13,000	2,000	0.2	0.2	13,000	1,600	0.1	0.1	13,000	1,500	0.1	0.1	12,000	1,300	0.1	0.1		
	20	12,000	1,200	0.1	0.2	12,000	1,200	0.05	0.1	11,000	1,100	0.05	0.1	10,000	1,000	0.05	0.1		
	22	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	25	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
	30	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
1.25	6	32,000	5,550	0.25	0.4	28,000	4,600	0.1	0.2	28,000	4,300	0.1	0.2	25,000	3,700	0.1	0.2		
	10	21,000	4,000	0.25	0.4	20,000	3,300	0.1	0.2	20,000	3,100	0.1	0.2	18,000	2,700	0.1	0.2		
	15	17,000	3,000	0.25	0.4	17,000	2,800	0.1	0.2	17,000	2,600	0.1	0.2	16,000	2,400	0.1	0.2		
	20	15,000	1,800	0.25	0.4	15,000	1,800	0.1	0.2	15,000	1,700	0.1	0.2	14,000	1,500	0.1	0.2		
	25	12,000	1,010	0.06	0.1	12,000	1,000	0.03	0.05	12,000	950	0.03	0.05	10,000	860	0.03	0.05		
	30	10,000	800	0.06	0.1	-	-	-	-	-	-	-	-	-	-	-	-		
	35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-		
1.5	6	42,000	6,800	0.3	0.6	41,500	6,200	0.15	0.3	41,500	6,200	0.15	0.3	32,000	4,800	0.15	0.3		
	8	32,000	4,600	0.3	0.6	30,000	4,500	0.15	0.3	30,000	4,200	0.15	0.3	25,000	3,500	0.15	0.3		
	10	28,000	4,000	0.3	0.6	25,000	3,800	0.15	0.3	25,000	3,600	0.15	0.3	20,000	2,800	0.15	0.3		
	12	24,000	3,100	0.3	0.6	20,000	3,000	0.15	0.3	20,000	2,800	0.15	0.3	18,000	2,500	0.15	0.3		
	14	22,000	2,900	0.3	0.6	18,000	2,700	0.15	0.3	18,000	2,500	0.15	0.3	15,000	2,000	0.15	0.3		
	15	20,000	2,800	0.25	0.6	16,000	2,400	0.1	0.3	16,000	2,200	0.1	0.3	13,000	1,700	0.1	0.3		
	16	20,000	2,600	0.25	0.4	16,000	2,000	0.1	0.2	16,000	1,900	0.1	0.2	13,000	1,500	0.1	0.2		
	20	16,000	2,200	0.25	0.4	14,000	1,800	0.1	0.2	14,000	1,700	0.1	0.2	11,000	1,300	0.1	0.2		
	25	16,000	1,800	0.125	0.2	12,000	1,200	0.05	0.1	12,000	1,100	0.05	0.1	9,000	820	0.05	0.1		
	30	12,000	1,000	0.075	0.1	10,000	800	0.03	0.05	9,000	760	0.03	0.05	7,800	590	0.03	0.05		
35	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
40	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-			
1.75	10	26,000	5,400	0.375	0.6	25,000	3,750	0.15	0.3	25,000	3,500	0.15	0.3	19,500	2,660	0.15	0.3		
	15	20,000	4,000	0.3	0.6	18,000	3,000	0.1	0.3	18,000	2,800	0.1	0.3	14,000	2,180	0.1	0.3		
	20	18,000	3,000	0.3	0.4	16,000	2,700	0.1	0.2	16,000	2,500	0.1	0.2	12,000	1,850	0.1	0.2		
	25	14,000	2,800	0.2	0.2	12,000	2,000	0.1	0.1	12,000	1,900	0.1	0.1	9,000	1,400	0.1	0.1		
	30	10,000	2,200	0.125	0.2	10,000	1,600	0.05	0.1	10,000	1,500	0.05	0.1	8,000	1,200	0.05	0.1		

切深量  
DEPTH OF CUT



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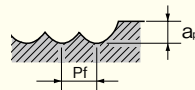




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加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH							
										33~41HRC				42~50HRC			
R	颈长 ℓ <sub>2</sub> (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT	
				ap	Pf			ap	Pf			ap	Pf			ap	Pf
1.75	35	10,000	1,200	0.1	0.1	10,000	1,000	0.05	0.05	10,000	950	0.05	0.05	7,000	670	0.05	0.05
	40	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
	45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—
2	8	31,000	5,700	0.4	1	31,000	5,700	0.2	0.5	31,000	5,700	0.2	0.5	24,000	4,400	0.2	0.5
	10	25,000	4,500	0.4	1	25,000	4,500	0.2	0.5	25,000	4,200	0.2	0.5	20,000	3,300	0.2	0.5
	12	20,000	4,000	0.4	1	20,000	3,600	0.2	0.5	20,000	3,400	0.2	0.5	16,000	2,700	0.2	0.5
	14	20,000	4,000	0.4	1	20,000	3,600	0.2	0.5	20,000	3,400	0.2	0.5	16,000	2,700	0.2	0.5
	15	20,000	4,000	0.4	1	20,000	3,600	0.2	0.5	20,000	3,400	0.2	0.5	16,000	2,700	0.2	0.5
	16	20,000	3,460	0.4	0.6	18,000	3,200	0.2	0.5	18,000	3,000	0.2	0.5	14,000	2,300	0.2	0.5
	20	18,000	3,000	0.4	0.5	16,000	2,800	0.2	0.4	16,000	2,600	0.2	0.4	12,000	1,900	0.2	0.4
	25	18,000	3,000	0.25	0.6	16,000	2,800	0.1	0.3	16,000	2,600	0.1	0.3	12,000	1,900	0.1	0.3
	30	16,000	2,850	0.25	0.4	14,000	2,400	0.1	0.2	14,000	2,200	0.1	0.2	11,000	1,700	0.1	0.2
	35	14,000	2,200	0.25	0.4	12,000	1,800	0.1	0.2	12,000	1,700	0.1	0.2	9,000	1,700	0.1	0.2
	40	12,000	1,600	0.125	0.2	10,000	1,300	0.05	0.1	10,000	1,200	0.05	0.1	7,000	840	0.05	0.1
45	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
50	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	—	
2.5	10	25,000	5,600	0.5	1.25	25,000	5,400	0.25	0.5	25,000	5,400	0.25	0.5	19,000	4,000	0.25	0.5
	15	20,000	4,400	0.5	1.25	20,000	4,200	0.25	0.5	20,000	3,900	0.25	0.5	16,000	3,100	0.25	0.5
	20	18,000	3,800	0.5	1.25	16,000	3,500	0.25	0.5	16,000	3,300	0.25	0.5	12,000	2,400	0.25	0.5
	25	20,000	3,400	0.4	0.75	15,000	3,200	0.2	0.3	15,000	3,000	0.2	0.3	12,000	2,400	0.2	0.3
	30	16,000	2,900	0.25	0.75	14,000	2,500	0.1	0.3	14,000	2,300	0.1	0.3	11,000	1,800	0.1	0.3
	35	14,000	2,200	0.25	0.75	12,000	1,600	0.1	0.3	12,000	1,500	0.1	0.3	9,000	1,100	0.1	0.3
	40	12,000	1,800	0.25	0.5	10,000	1,200	0.1	0.2	10,000	1,100	0.1	0.2	8,000	880	0.1	0.2
	45	9,000	1,200	0.2	0.25	9,000	900	0.1	0.1	9,000	850	0.1	0.1	7,000	660	0.1	0.1
50	8,000	1,100	0.2	0.25	8,000	800	0.1	0.1	8,000	760	0.1	0.1	6,000	570	0.1	0.1	
3	10	22,000	5,900	0.75	1.25	20,000	5,400	0.3	0.5	20,000	5,000	0.3	0.5	15,000	3,750	0.3	0.5
	20	18,000	4,400	0.75	1.25	16,000	4,200	0.3	0.5	16,000	3,900	0.3	0.5	12,000	2,900	0.3	0.5
	25	14,000	4,000	0.6	1.25	12,000	3,200	0.3	0.5	12,000	3,000	0.3	0.5	9,000	2,250	0.3	0.5
	30	10,000	3,200	0.6	1.25	10,000	2,600	0.3	0.5	10,000	2,400	0.3	0.5	8,000	1,900	0.3	0.5
	35	9,000	3,000	0.4	1	9,000	2,300	0.2	0.4	9,000	2,100	0.2	0.4	7,000	1,600	0.2	0.4
	40	9,000	2,800	0.4	0.75	9,000	2,000	0.2	0.3	9,000	1,900	0.2	0.3	7,000	1,400	0.2	0.3
	45	8,000	2,500	0.4	0.75	8,000	1,800	0.2	0.3	8,000	1,700	0.2	0.3	6,500	1,300	0.2	0.3
50	7,000	2,300	0.4	0.75	7,000	1,600	0.2	0.3	7,000	1,500	0.2	0.3	5,500	1,100	0.2	0.3	

切深量  
DEPTH OF CUT



1. 请使用刚性较高的机床和刀柄。
2. 推荐使用MQL(半干式)或空气冷却加工炭素钢预硬钢。
3. 请使用适合工件材料的发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
5. 根据加工精度、加工形状、加工刀路适当调整加工条件。
6. φ0.5 (R0.25)以下或劲长/刃径(L/D)大于10时,微小的负荷增大也会导致折损,根据切削状况适当调节切削条件。
7. 转速不足时请根据上表同比下降转速和进给速度。
1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
3. When using cutting fluid, choose based on work material and cutting conditions.
4. The cutting conditions shown for 3D milling are low — load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with a diameter of φ 0.5 (R0.25) or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
7. When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

RECOMMENDED MILLING CONDITIONS  
切削条件表  
W X L I N I U M

# WXL 涂层2刃锥颈球头形

WXL Coating Four Flute · Short · with Pencil Neck



## WXL-PC-EBD



● 材质..... 超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide

● 表面处理..... WXL 涂层  
Surface Treatment WXL Coating

● 圆弧角公差..... ±0.005mm 注)R≤0.1圆弧无缝  
Tolerance of Ball Nose Radius Tools with a radius below 0.1 are not seamless.

单位:mm Unit:mm

商品号 EDP No.	球半径×颈部锥半角×颈长 R × θ <sub>n</sub> × ℓ <sub>2</sub>	全长 L	刃长 ℓ	颈径 D <sub>1</sub>	颈根径 d <sub>2</sub>	刃尖至柄部的有效长(参考值) L <sub>2</sub>	柄径 D <sub>s</sub>	形状 Type	库存 Stock
3170011	R 0.1 × 0.5 × 1	45	0.16	0.18	0.19	8.1	4	1	A
3170012	R 0.1 × 0.5 × 1.5	45	0.16	0.18	0.2	8.6	4	1	A
3170013	R 0.1 × 0.5 × 2	45	0.16	0.18	0.21	9	4	1	A
3170014	R 0.1 × 0.5 × 2.5	45	0.16	0.18	0.22	9.5	4	1	A
3170015	R 0.1 × 0.5 × 3	45	0.16	0.18	0.23	10	4	1	A
3170021	R 0.1 × 1 × 3.5	45	0.16	0.18	0.23	9	4	1	A
3170022	R 0.1 × 1 × 4	45	0.16	0.18	0.25	9.5	4	1	A
3170023	R 0.1 × 1 × 4.5	45	0.16	0.18	0.27	9.9	4	1	A
3170031	R 0.15 × 0.5 × 2	45	0.24	0.28	0.31	8.9	4	1	A
3170032	R 0.15 × 0.5 × 3	45	0.24	0.28	0.32	9.8	4	1	A
3170041	R 0.15 × 1 × 3	45	0.24	0.28	0.36	9.8	4	1	A
3170042	R 0.15 × 1 × 4	45	0.24	0.28	0.4	10.7	4	1	A
3170051	R 0.2 × 0.5 × 2	45	0.3	0.38	0.41	8.7	4	1	A
3170052	R 0.2 × 0.5 × 3	45	0.3	0.38	0.42	9.6	4	1	A
3170053	R 0.2 × 0.5 × 4	45	0.3	0.38	0.44	10.6	4	1	A
3170054	R 0.2 × 0.5 × 5	45	0.3	0.38	0.46	11.6	4	1	A
3170055	R 0.2 × 0.5 × 6	45	0.3	0.38	0.48	12.5	4	1	A
3170061	R 0.2 × 1 × 4	45	0.3	0.38	0.5	10.5	4	1	A
3170062	R 0.2 × 1 × 5	45	0.3	0.38	0.54	11.4	4	1	A
3170063	R 0.2 × 1 × 6	45	0.3	0.38	0.57	12.4	4	1	A
3170071	R 0.25 × 0.5 × 4	45	0.4	0.48	0.54	10.4	4	1	A
3170072	R 0.25 × 0.5 × 6	45	0.4	0.48	0.57	12.4	4	1	A
3170073	R 0.25 × 0.5 × 8	45	0.4	0.48	0.61	14.3	4	1	A
3170074	R 0.25 × 0.5 × 10	45	0.4	0.48	0.64	16.2	4	1	A
3170081	R 0.25 × 1 × 4	45	0.4	0.48	0.6	10.3	4	1	A
3170082	R 0.25 × 1 × 6	45	0.4	0.48	0.67	12.2	4	1	A
3170083	R 0.25 × 1 × 8	45	0.4	0.48	0.74	14.1	4	1	A
3170084	R 0.25 × 1 × 10	45	0.4	0.48	0.81	15.9	4	1	A
3170085	R 0.25 × 1 × 12	50	0.4	0.48	0.88	17.8	4	1	A
3170091	R 0.3 × 0.5 × 2	45	0.5	0.58	0.6	8.3	4	1	A
3170092	R 0.3 × 0.5 × 4	45	0.5	0.58	0.64	10.2	4	1	A
3170093	R 0.3 × 0.5 × 6	45	0.5	0.58	0.67	12.2	4	1	A
3170094	R 0.3 × 0.5 × 8	45	0.5	0.58	0.71	14.1	4	1	A
3170095	R 0.3 × 0.5 × 10	45	0.5	0.58	0.74	16	4	1	A
3170096	R 0.3 × 0.5 × 12	45	0.5	0.58	0.78	18	4	1	A
3170097	R 0.3 × 0.5 × 16	50	0.5	0.58	0.85	21.9	4	1	A
3170101	R 0.3 × 1 × 4	45	0.5	0.58	0.7	10.1	4	1	A
3170102	R 0.3 × 1 × 6	45	0.5	0.58	0.77	12	4	1	A
3170103	R 0.3 × 1 × 8	45	0.5	0.58	0.83	13.9	4	1	A
3170104	R 0.3 × 1 × 10	45	0.5	0.58	0.9	15.7	4	1	A
3170105	R 0.3 × 1 × 12	45	0.5	0.58	0.97	17.6	4	1	A
3170106	R 0.3 × 1 × 16	50	0.5	0.58	1.11	21.4	4	1	A
3170111	R 0.4 × 0.5 × 4	45	0.6	0.78	0.84	9.9	4	1	A
3170112	R 0.4 × 0.5 × 6	45	0.6	0.78	0.87	11.8	4	1	A
3170113	R 0.4 × 0.5 × 8	45	0.6	0.78	0.91	13.7	4	1	A

A= 标准库存品 A=Standard stock item.



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SPECIFICATION CHART WXL-PC-EBD

# WXL 涂层2刃锥颈球头形

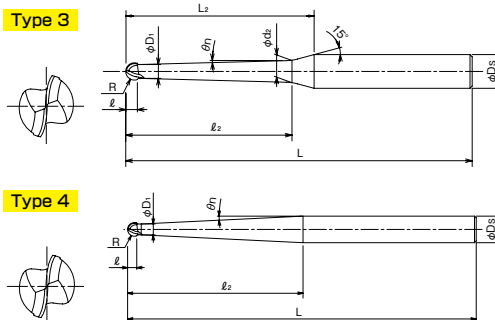
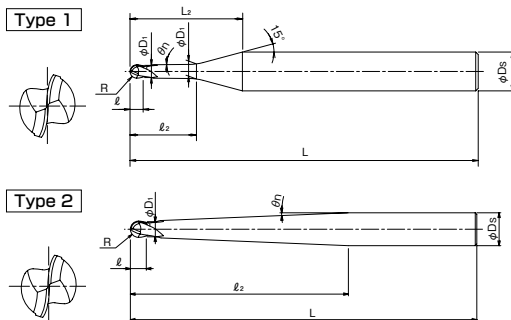
WXL Coating Four Flute • Short • with Pencil Neck



## WXL-PC-EBD

球型 Ball Type

Q 球型 Q-Ball Type



接上页

单位:mm Unit:mm

商品号 EDP No.	球半径×颈部锥半角×颈长 $R \times \theta_n \times \ell_2$	全长 L	刃长 $\ell$	颈径 D <sub>1</sub>	颈根径 D <sub>2</sub>	刃尖至柄部的有效长(参考值) L <sub>2</sub>	柄径 D <sub>S</sub>	形状 Type	库存 Stock
3170114	R 0.4 × 0.5 × 12	45	0.6	0.78	0.98	17.6	4	1	A
3170121	R 0.4 × 1 × 8	45	0.6	0.78	1.03	13.5	4	1	A
3170122	R 0.4 × 1 × 12	45	0.6	0.78	1.17	17.2	4	1	A
3170123	R 0.4 × 1 × 16	50	0.6	0.78	1.31	21	4	1	A
3170131	R 0.5 × 0.5 × 6	45	0.63	0.95	0.98	11.5	4	3	A
3170132	R 0.5 × 0.5 × 8	45	0.63	0.95	1.02	13.4	4	3	A
3170133	R 0.5 × 0.5 × 10	45	0.63	0.95	1.05	15.4	4	3	A
3170134	R 0.5 × 0.5 × 12	45	0.63	0.95	1.09	17.3	4	3	A
3170135	R 0.5 × 0.5 × 16	50	0.63	0.95	1.16	21.2	4	3	A
3170136	R 0.5 × 0.5 × 18	55	0.63	0.95	1.19	23.1	4	3	A
3170137	R 0.5 × 0.5 × 20	55	0.63	0.95	1.23	25.1	4	3	A
3170138	R 0.5 × 0.5 × 25	60	0.63	0.95	1.31	29.9	4	3	A
3170139	R 0.5 × 0.5 × 30	65	0.63	0.95	1.4	34.7	4	3	A
3170140	R 0.5 × 0.5 × 35	70	0.63	0.95	1.49	39.6	4	3	A
3170141	R 0.5 × 1 × 10	45	0.63	0.95	1.2	15.1	4	3	A
3170142	R 0.5 × 1 × 16	50	0.63	0.95	1.41	20.7	4	3	A
3170143	R 0.5 × 1 × 20	55	0.63	0.95	1.55	24.4	4	3	A
3170144	R 0.5 × 1 × 25	60	0.63	0.95	1.73	29.1	4	3	A
3170145	R 0.5 × 1 × 30	65	0.63	0.95	1.9	33.8	4	3	A
3170146	R 0.5 × 1 × 35	70	0.63	0.95	2.07	38.5	4	3	A
3170147	R 0.5 × 1 × 40	80	0.63	0.95	2.25	43.1	4	3	A
3170148	R 0.5 × 1 × 50	90	0.63	0.95	2.6	52.5	4	3	A
3170149	R 0.5 × 1 × 60	100	0.63	0.95	2.95	61.8	4	3	A
3170150	R 0.5 × 1 × 70	110	0.63	0.95	3.3	71.2	4	3	A
3170151	R 0.5 × 1.5 × 8	45	0.63	0.95	1.25	13	4	3	A
3170152	R 0.5 × 1.5 × 10	45	0.63	0.95	1.35	14.8	4	3	A
3170153	R 0.5 × 1.5 × 12	45	0.63	0.95	1.46	16.6	4	3	A
3170154	R 0.5 × 1.5 × 16	50	0.63	0.95	1.67	20.2	4	3	A
3170155	R 0.5 × 1.5 × 20	55	0.63	0.95	1.88	23.8	4	3	A
3170156	R 0.5 × 1.5 × 25	60	0.63	0.95	2.14	28.4	4	3	A
3170157	R 0.5 × 1.5 × 30	65	0.63	0.95	2.4	32.9	4	3	A
3170158	R 0.5 × 1.5 × 35	70	0.63	0.95	2.66	37.4	4	3	A
3170161	R 0.5 × 2 × 45	80	0.63	0.95	4	—	4	4	A
3170171	R 0.6 × 0.5 × 12	45	0.76	1.15	1.28	16.9	4	3	A
3170172	R 0.6 × 0.5 × 25	60	0.76	1.15	1.51	29.5	4	3	A
3170181	R 0.6 × 1 × 12	45	0.76	1.15	1.47	16.6	4	3	A
3170182	R 0.6 × 1 × 25	60	0.76	1.15	1.92	28.8	4	3	A
3170191	R 0.6 × 1.5 × 12	45	0.76	1.15	1.65	16.3	4	3	A
3170192	R 0.6 × 1.5 × 25	60	0.76	1.15	2.33	28	4	3	A
3170211	R 0.75 × 0.5 × 8	45	0.95	1.42	1.48	12.6	4	3	A
3170212	R 0.75 × 0.5 × 10	45	0.95	1.42	1.51	14.5	4	3	A
3170213	R 0.75 × 0.5 × 12	45	0.95	1.42	1.55	16.4	4	3	A
3170214	R 0.75 × 0.5 × 16	55	0.95	1.42	1.62	20.3	4	3	A
3170215	R 0.75 × 0.5 × 20	55	0.95	1.42	1.69	24.2	4	3	A
3170216	R 0.75 × 0.5 × 25	60	0.95	1.42	1.78	29	4	3	A

A= 标准库存品 A=Standard stock item.

SPECIFICATION CHART  
形状寸法表

WXL-PC-EBD



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# WXL 涂层2刃锥颈球头形

WXL Coating Four Flute · Short · with Pencil Neck



## WXL-PC-EBD



接上页

单位:mm Unit:mm

商品号 EDP No.	球半径×颈部锥半角×颈长 $R \times \theta_1 \times \ell_2$	全长 L	刃长 $\ell$	颈径 $D_1$	颈根径 $d_2$	刃尖至柄部的有效长(参考值) $L_2$	柄径 $D_s$	形状 Type	库存 Stock
3170217	R 0.75 × 0.5 × 30	65	0.95	1.42	1.86	33.9	4	3	A
3170218	R 0.75 × 0.5 × 35	70	0.95	1.42	1.95	38.7	4	3	A
3170221	R 0.75 × 1 × 10	45	0.95	1.42	1.66	14.2	4	3	A
3170222	R 0.75 × 1 × 12	45	0.95	1.42	1.73	16.1	4	3	A
3170223	R 0.75 × 1 × 16	55	0.95	1.42	1.87	19.9	4	3	A
3170224	R 0.75 × 1 × 20	55	0.95	1.42	2.01	23.6	4	3	A
3170225	R 0.75 × 1 × 25	60	0.95	1.42	2.18	28.3	4	3	A
3170226	R 0.75 × 1 × 30	65	0.95	1.42	2.36	32.9	4	3	A
3170227	R 0.75 × 1 × 35	70	0.95	1.42	2.53	37.6	4	3	A
3170230	R 0.75 × 1.5 × 10	45	0.95	1.42	1.8	14	4	3	A
3170231	R 0.75 × 1.5 × 12	45	0.95	1.42	1.91	15.8	4	3	A
3170232	R 0.75 × 1.5 × 16	55	0.95	1.42	2.12	19.4	4	3	A
3170233	R 0.75 × 1.5 × 20	55	0.95	1.42	2.33	23	4	3	A
3170234	R 0.75 × 1.5 × 25	60	0.95	1.42	2.59	27.5	4	3	A
3170235	R 0.75 × 1.5 × 30	65	0.95	1.42	2.85	32	4	3	A
3170236	R 0.75 × 1.5 × 35	70	0.95	1.42	3.11	36.5	4	3	A
3170241	R 0.75 × 2 × 38.6	70	0.95	1.42	4	—	4	4	A
3170271	R 1 × 0.5 × 8	45	1.26	1.93	1.98	11.6	4	3	A
3170272	R 1 × 0.5 × 10	45	1.26	1.93	2.02	13.6	4	3	A
3170273	R 1 × 0.5 × 12	45	1.26	1.93	2.05	15.5	4	3	A
3170274	R 1 × 0.5 × 16	50	1.26	1.93	2.12	19.4	4	3	A
3170275	R 1 × 0.5 × 20	55	1.26	1.93	2.19	23.2	4	3	A
3170276	R 1 × 0.5 × 25	65	1.26	1.93	2.28	28.1	4	3	A
3170277	R 1 × 0.5 × 30	70	1.26	1.93	2.37	32.9	4	3	A
3170278	R 1 × 0.5 × 35	75	1.26	1.93	2.46	37.8	4	3	A
3170279	R 1 × 0.5 × 40	80	1.26	1.93	2.54	42.6	4	3	A
3170281	R 1 × 1 × 16	50	1.26	1.93	2.37	18.9	4	3	A
3170282	R 1 × 1 × 20	55	1.26	1.93	2.51	22.7	4	3	A
3170283	R 1 × 1 × 25	65	1.26	1.93	2.68	27.3	4	3	A
3170284	R 1 × 1 × 30	70	1.26	1.93	2.86	32	4	3	A
3170285	R 1 × 1 × 35	75	1.26	1.93	3.03	36.7	4	3	A
3170286	R 1 × 1 × 40	80	1.26	1.93	3.21	41.4	4	3	A
3170287	R 1 × 1 × 50	90	1.26	1.93	3.56	54.4	6	3	A
3170288	R 1 × 1 × 60	100	1.26	1.93	3.9	63.8	6	3	A
3170289	R 1 × 1 × 70	110	1.26	1.93	4.25	73.1	6	3	A
3170291	R 1 × 1.5 × 16	50	1.26	1.93	2.61	18.5	4	3	A
3170292	R 1 × 1.5 × 20	55	1.26	1.93	2.82	22.1	4	3	A
3170293	R 1 × 1.5 × 25	65	1.26	1.93	3.08	26.6	4	3	A
3170294	R 1 × 1.5 × 30	70	1.26	1.93	3.35	31.1	4	3	A
3170295	R 1 × 1.5 × 35	75	1.26	1.93	3.61	36	4	3	A
3170296	R 1 × 1.5 × 41.4	80	1.26	1.93	4	—	4	4	A
3170301	R 1 × 2 × 31.5	70	1.26	1.93	4	—	4	4	A
3170321	R 1.5 × 0.5 × 8	50	2.4	2.95	2.99	14.1	6	1	A
3170322	R 1.5 × 0.5 × 10	50	2.4	2.95	3.03	16	6	1	A
3170323	R 1.5 × 0.5 × 12	55	2.4	2.95	3.06	17.9	6	1	A

A= 标准库存品 A=Standard stock item.



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# WXL 涂层2刃锥颈球头形

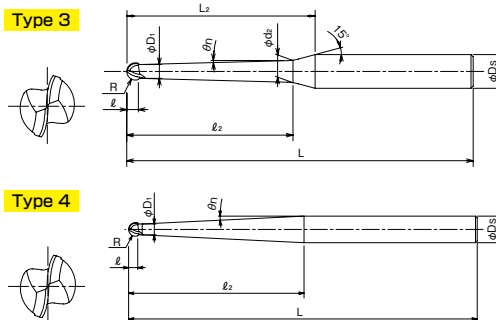
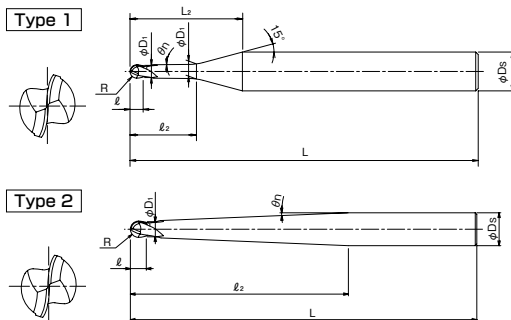
WXL Coating Four Flute • Short • with Pencil Neck



## WXL-PC-EBD

球型 Ball Type

Q球型 Q-Ball Type



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单位:mm Unit:mm

商品号 EDP No.	球半径×颈部锥半角×颈长 R × θn × ℓz	全长 L	刃长 ℓ	颈径 D1	颈根径 D2	刃尖至柄部的有效长(参考值) L2	柄径 Ds	形状 Type	库存 Stock
3170324	R 1.5 × 0.5 × 16	55	2.4	2.95	3.13	21.8	6	1	A
3170325	R 1.5 × 0.5 × 20	60	2.4	2.95	3.2	25.7	6	1	A
3170326	R 1.5 × 0.5 × 25	65	2.4	2.95	3.29	30.5	6	1	A
3170327	R 1.5 × 0.5 × 30	70	2.4	2.95	3.38	35.4	6	1	A
3170328	R 1.5 × 0.5 × 35	80	2.4	2.95	3.47	40.2	6	1	A
3170329	R 1.5 × 0.5 × 40	85	2.4	2.95	3.55	45	6	1	A
3170330	R 1.5 × 0.5 × 50	90	2.4	2.95	3.73	54.7	6	1	A
3170331	R 1.5 × 1 × 20	60	2.4	2.95	3.51	25.1	6	1	A
3170332	R 1.5 × 1 × 25	65	2.4	2.95	3.68	29.8	6	1	A
3170333	R 1.5 × 1 × 30	70	2.4	2.95	3.86	34.5	6	1	A
3170334	R 1.5 × 1 × 35	80	2.4	2.95	4.03	39.1	6	1	A
3170335	R 1.5 × 1 × 40	85	2.4	2.95	4.21	43.8	6	1	A
3170336	R 1.5 × 1 × 50	90	2.4	2.95	4.55	53.2	6	1	A
3170337	R 1.5 × 1 × 60	100	2.4	2.95	4.9	62.5	6	1	A
3170338	R 1.5 × 1 × 70	110	2.4	2.95	5.25	71.9	6	1	A
3170341	R 1.5 × 1.5 × 20	60	2.4	2.95	3.81	24.6	6	1	A
3170342	R 1.5 × 1.5 × 25	65	2.4	2.95	4.07	29.1	6	1	A
3170343	R 1.5 × 1.5 × 30	70	2.4	2.95	4.33	33.6	6	1	A
3170344	R 1.5 × 1.5 × 35	80	2.4	2.95	4.6	38.1	6	1	A
3170345	R 1.5 × 1.5 × 40	85	2.4	2.95	4.86	42.6	6	1	A
3170346	R 1.5 × 1.5 × 50	90	2.4	2.95	5.38	51.6	6	1	A
3170347	R 1.5 × 1.5 × 62.5	100	2.4	2.95	6	—	6	2	A
3170351	R 1.5 × 2 × 47.5	100	2.4	2.95	6	—	6	2	A
3170371	R 2 × 1 × 20	65	3.2	3.93	4.5	23.4	6	1	A
3170372	R 2 × 1 × 30	80	3.2	3.93	4.84	32.7	6	1	A
3170373	R 2 × 1 × 40	90	3.2	3.93	5.19	42.1	6	1	A
3170374	R 2 × 1 × 50	100	3.2	3.93	5.54	55.1	8	1	A
3170375	R 2 × 1 × 60	110	3.2	3.93	5.89	64.5	8	1	A
3170381	R 2 × 1.5 × 44.2	80	3.2	3.93	6.05	44.7	6	1	A
3170391	R 2 × 2 × 34	80	3.2	3.93	6.04	34.5	6	1	A
3170401	R 2.5 × 1 × 30	100	5	4.95	5.8	34.7	8	1	A
3170402	R 2.5 × 1 × 40	100	5	4.95	6.15	44	8	1	A
3170403	R 2.5 × 1 × 60	130	5	4.95	6.85	62.7	8	1	A
3170411	R 2.5 × 1.5 × 26.9	100	5	4.95	6	—	6	2	A
3170412	R 2.5 × 1.5 × 65.1	130	5	4.95	8	—	8	2	A
3170421	R 2.5 × 2 × 50.1	130	5	4.95	8	—	8	2	A
3170431	R 3 × 1 × 30	100	6	5.95	6.77	32.9	8	1	A
3170432	R 3 × 1 × 40	100	6	5.95	7.12	42.2	8	1	A
3170433	R 3 × 1 × 50	100	6	5.95	7.47	51.6	8	1	A
3170434	R 3 × 1 × 60	110	6	5.95	7.81	64.6	10	1	A
3170435	R 3 × 1 × 70	120	6	5.95	8.16	74	10	1	A
3170436	R 3 × 1 × 80	130	6	5.95	8.51	87.1	12	1	A
3170441	R 3 × 1.5 × 49	100	6	5.95	8	—	8	2	A
3170451	R 3 × 2 × 36	100	6	5.95	8	—	8	2	A

A= 标准库存品 A=Standard stock item.





WXL-PC-EBD 标准切削 REGULAR MILLING

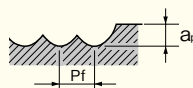


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RECOMMENDED MILLING CONDITIONS  
切削条件表  
WXL-PC-EBD

Table with columns for Work Material (Copper, Carbon Steels, Hardened Steels), R, Neck Diameter, Neck Length, Cutting Angle, Speed, Feed, and Depth of Cut. It provides recommended values for various milling parameters across different materials and conditions.

切深量  
DEPTH OF CUT



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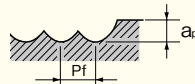
## WXL-PC-EBD



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加工材料 WORK MATERIAL			铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C · NAK55 ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH										
R	颈部 半径 R <sub>n</sub>	颈长 L <sub>2</sub>	推荐 切入角 Recommended Cutting Angle	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT			
						a <sub>p</sub>	Pf			a <sub>p</sub>	Pf			a <sub>p</sub>	Pf			a <sub>p</sub>	Pf		
1.5	0.5°	40	0.3°	9,000	375	0.2	0.84	7,500	250	0.15	0.42	6,000	200	0.15	0.3	6,000	200	0.09	0.15		
		50		9,000	375	0.2	0.84	7,500	250	0.15	0.42	6,000	200	0.15	0.3	6,000	200	0.09	0.15		
	1°	20		10,000	900	0.2	0.84	9,500	600	0.15	0.42	7,500	400	0.15	0.36	7,500	400	0.15	0.3		
		25		10,000	450	0.2	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.36	6,500	250	0.15	0.3		
		30		10,000	450	0.2	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.36	6,500	250	0.15	0.3		
		35		10,000	450	0.2	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.3	6,500	250	0.09	0.15		
		40		10,000	450	0.2	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.3	6,500	250	0.09	0.15		
		50		9,000	375	0.2	0.84	7,500	250	0.15	0.42	6,000	200	0.15	0.3	6,000	200	0.09	0.15		
	1.5°	60		9,000	375	0.2	0.84	7,500	250	0.15	0.42	6,000	200	0.15	0.3	6,000	200	0.09	0.15		
		70		9,000	375	0.2	0.84	7,500	250	0.15	0.42	6,000	200	0.15	0.3	6,000	200	0.09	0.15		
		20		10,000	900	0.3	0.84	9,500	600	0.15	0.42	7,500	400	0.15	0.36	7,500	400	0.15	0.3		
		25		10,000	450	0.25	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.36	6,500	250	0.15	0.3		
		30		10,000	450	0.25	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.36	6,500	250	0.15	0.3		
		35		10,000	450	0.25	0.84	8,500	300	0.15	0.42	6,500	250	0.15	0.36	6,500	250	0.15	0.3		
	2	1°		40	0.5°	9,000	900	0.5	1.28	7,500	600	0.2	0.64	6,000	400	0.2	0.6	6,000	400	0.2	0.4
				30		7,000	600	0.5	1.28	6,000	400	0.2	0.64	5,000	250	0.2	0.6	5,000	250	0.2	0.4
40			7,000	600		0.4	1.28	6,000	400	0.2	0.64	5,000	250	0.2	0.56	5,000	250	0.12	0.3		
50			7,000	600		0.4	1.28	6,000	400	0.2	0.64	5,000	250	0.2	0.56	5,000	250	0.12	0.2		
60			5,000	375		0.35	1.28	5,000	250	0.2	0.64	4,000	200	0.2	0.56	4,000	200	0.12	0.2		
1.5°		44.2	7,000	600		0.5	1.28	6,000	400	0.2	0.64	5,000	250	0.2	0.6	5,000	250	0.2	0.4		
2°		34	7,000	600		0.5	1.28	6,000	400	0.2	0.64	5,000	250	0.2	0.6	5,000	250	0.2	0.5		
2.5		1°	30	0.5°		7,000	750	0.6	1.8	6,500	500	0.25	0.9	5,000	400	0.25	0.7	5,000	400	0.25	0.5
	40		6,000		750	0.6	1.8	5,000	500	0.25	0.9	4,000	250	0.25	0.7	4,000	250	0.25	0.5		
	60		5,000		600	0.4	1.8	4,000	400	0.25	0.9	4,000	200	0.25	0.6	4,000	200	0.2	0.25		
	1.5°	26.9	9,000		1,350	0.6	1.8	6,500	900	0.25	0.9	5,000	750	0.25	0.7	5,000	750	0.25	0.5		
		65.1	6,000		750	0.6	1.8	5,000	500	0.25	0.9	4,000	250	0.25	0.7	4,000	250	0.25	0.5		
		2°	50.1		6,000	750	0.6	1.8	5,000	500	0.25	0.9	4,000	250	0.25	0.7	4,000	250	0.25	0.5	
3	1°	30	0.5°	7,000	1,200	0.75	2.4	5,500	800	0.3	1.2	4,500	600	0.3	0.96	4,500	600	0.3	0.6		
		40		5,000	600	0.75	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.6		
		50		5,000	600	0.6	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.6		
		60		5,000	600	0.6	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.6		
		70		5,000	600	0.6	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.3		
		80		5,000	600	0.45	2.4	4,000	400	0.2	1.2	4,000	300	0.2	0.96	4,000	300	0.2	0.3		
	1.5°	49		5,000	600	0.6	2.4	4,000	400	0.3	1.2	4,000	300	0.3	0.96	4,000	300	0.3	0.6		
		2°		36	7,000	1,200	0.75	2.4	5,500	800	0.3	1.2	4,500	600	0.3	0.96	4,500	600	0.3	0.6	

切深量  
DEPTH OF CUT



1. 请使用刚性较高的机床和刀柄，刚性较差时下调切削条件。
2. 最大限度控制工具的跳动精度。
3. 请使用适合工件材料发烟性少的切削油剂，通常推荐空气冷却。
4. 圆弧角部切削或去残加工时将切深和进给速度下降至70%左右。
5. 通过CAM或者机床设定中的R插入或减速可实现更稳定的高进给加工。
6. 切削负荷变动较大或加工精度要求较高时请适当降低转速。
7. 倾斜切入角度超过推荐值以上时请降低进给速度。
8. 切削负荷变动较大或加工精度要求较高时请适当降低加工条件。
9. 转速无法达到要求时，配合机床的转速同比降低进给速度。
10. 上述条件表仅为参考，请根据实际加工条件调节。
11. 切削条件适用于粗加工后的半精加工。
12. 包含平坦部的粗加工较多时容易产生振刀。
13. 切深较小时请提高转速使其达到合适的切削速度抑制振刀。

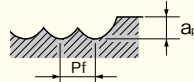
1. Highly rigid machines and tool holders should be used. If not, machining should be kept below above-mentioned conditions.
2. Tool vibrations should be kept at a minimum level for maximum accuracy.
3. Use a suitable cutting fluid with high smoke retardant properties.
4. For the milling of corners or removal of residue, reduce the cutting depth and feed to 70%.
5. More stable high-feed machining in corners can be attained by setting an R insertion or deceleration on the CAM or machine side.
6. When cutting load fluctuates (in the corners, etc.) or when high precision is required, be sure to control the rotational speed.
7. When cutting at greater than the recommended cutting angle, reduce the feed.
8. When cutting load is fluctuating, or when higher milling accuracy is required, keep machining conditions below the above-mentioned values.
9. When the rotational speed does not meet the recommended conditions, reduce the feed in proportion to the RPM that is suitable for your machine.
10. The chart above is intended as general guidelines for reference only. The given values should be adjusted individually based on actual machining conditions.
11. The cutting conditions are intended for intermediate machining after roughing.
12. When the work includes extensive roughing including flat areas, chatter is more likely to occur.
13. If the cutting depth is shallow, increase the cutting speed appropriately to minimize chatter.

## WXL-PC-EBD 高速切削 HIGH-SPEED LIGHT MILLING

RECOMMENDED MILLING CONDITIONS  
WXL-PC-EBD  
切削条件表

加工材料 WORK MATERIAL				铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C · NAK55 ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH							
				33~41HRC			42~50HRC												
R	颈部 半角 $\theta_n$	颈长 $\ell_2$	推入倾斜 切入角度 Recommended Cutting Angle	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT					
				$a_p$	$P_f$	$a_p$	$P_f$	$a_p$	$P_f$	$a_p$	$P_f$	$a_p$	$P_f$	$a_p$	$P_f$				
0.1	0.5°	1	0.3°	50,000	440	0.007	0.01	50,000	360	0.005	0.005	50,000	340	0.005	0.005	50,000	340	0.005	0.005
		1.5		50,000	440	0.007	0.01	50,000	360	0.005	0.005	50,000	340	0.005	0.005	50,000	340	0.005	0.005
		2		50,000	360	0.007	0.01	45,000	300	0.005	0.005	45,000	280	0.005	0.005	45,000	280	0.005	0.005
		2.5		50,000	320	0.007	0.01	38,000	230	0.005	0.005	38,000	210	0.005	0.005	37,000	200	0.005	0.005
		3		50,000	250	0.007	0.01	38,000	200	0.005	0.005	38,000	180	0.005	0.005	37,000	150	0.003	0.005
	1°	3.5	50,000	440	0.007	0.01	50,000	360	0.005	0.005	50,000	340	0.005	0.005	50,000	340	0.005	0.005	
		4	50,000	360	0.007	0.01	45,000	300	0.005	0.005	45,000	280	0.005	0.005	45,000	280	0.005	0.005	
0.15	0.5°	2	0.3°	50,000	730	0.007	0.02	50,000	600	0.005	0.01	50,000	570	0.005	0.01	50,000	570	0.005	0.005
		3		50,000	580	0.007	0.01	45,000	480	0.005	0.005	45,000	450	0.005	0.005	45,000	450	0.005	0.005
	3	50,000		610	0.007	0.02	47,000	510	0.005	0.01	47,000	480	0.005	0.01	47,000	480	0.005	0.005	
	4	50,000		580	0.007	0.01	45,000	480	0.005	0.005	45,000	450	0.005	0.005	45,000	450	0.005	0.005	
0.2	0.5°	2	0.3°	50,000	970	0.015	0.04	50,000	800	0.01	0.02	50,000	760	0.01	0.02	50,000	760	0.01	0.01
		3		50,000	670	0.012	0.03	45,000	550	0.008	0.015	45,000	520	0.008	0.015	45,000	520	0.008	0.01
		4		48,000	540	0.007	0.02	43,000	500	0.005	0.01	43,000	470	0.005	0.01	43,000	470	0.005	0.01
		5		45,000	480	0.007	0.02	40,000	420	0.005	0.01	40,000	400	0.005	0.01	40,000	400	0.005	0.01
		6		40,000	400	0.007	0.01	36,000	370	0.005	0.005	36,000	350	0.005	0.005	35,000	340	0.005	0.005
	1°	4		50,000	670	0.012	0.03	45,000	550	0.008	0.015	45,000	520	0.008	0.015	45,000	520	0.008	0.01
0.25	0.5°	4	0.3°	50,000	1,200	0.015	0.04	48,000	900	0.01	0.02	48,000	850	0.01	0.02	48,000	850	0.01	0.015
		6		38,000	940	0.015	0.02	38,000	500	0.01	0.01	38,000	470	0.01	0.01	38,000	470	0.01	0.01
		8		30,000	760	0.007	0.02	30,000	400	0.005	0.01	30,000	380	0.005	0.01	29,000	360	0.005	0.01
		10		30,000	500	0.005	0.02	30,000	400	0.005	0.01	30,000	300	0.005	0.01	29,000	250	0.005	0.01
	1°	4		50,000	1,200	0.015	0.04	48,000	900	0.01	0.02	48,000	850	0.01	0.02	48,000	850	0.01	0.01
		6		50,000	1,200	0.015	0.04	48,000	900	0.01	0.02	48,000	850	0.01	0.02	48,000	850	0.01	0.01
		8		50,000	1,200	0.015	0.04	48,000	900	0.01	0.02	48,000	850	0.01	0.02	48,000	850	0.01	0.01
		12		30,000	760	0.007	0.02	30,000	400	0.005	0.01	30,000	380	0.005	0.01	29,000	360	0.005	0.01
0.3	0.5°	2	0.3°	50,000	1,550	0.03	0.06	50,000	1,200	0.02	0.03	50,000	1,100	0.02	0.03	50,000	1,100	0.02	0.03
		4		50,000	1,350	0.03	0.06	45,000	1,000	0.02	0.03	45,000	950	0.02	0.03	45,000	950	0.02	0.03
		6		35,000	960	0.015	0.04	30,000	680	0.01	0.02	30,000	640	0.01	0.02	30,000	640	0.01	0.02
		8		30,000	720	0.015	0.04	26,000	600	0.01	0.02	26,000	570	0.01	0.02	25,000	540	0.01	0.02
		10		30,000	500	0.015	0.04	26,000	480	0.01	0.02	26,000	450	0.01	0.02	25,000	380	0.01	0.02
		12		30,000	500	0.01	0.04	26,000	480	0.007	0.02	26,000	450	0.007	0.02	25,000	380	0.007	0.01
	1°	16		30,000	400	0.007	0.04	26,000	380	0.005	0.02	26,000	360	0.005	0.02	25,000	300	0.005	0.01
		4		50,000	1,350	0.03	0.06	45,000	1,000	0.02	0.03	45,000	950	0.02	0.03	45,000	950	0.02	0.03
		6		35,000	960	0.015	0.04	30,000	680	0.01	0.02	30,000	640	0.01	0.02	30,000	640	0.01	0.02
		8		35,000	960	0.015	0.04	30,000	680	0.01	0.02	30,000	640	0.01	0.02	30,000	640	0.01	0.02
		10		30,000	720	0.015	0.04	26,000	600	0.01	0.02	26,000	570	0.01	0.02	25,000	540	0.01	0.02
		12		30,000	720	0.015	0.04	26,000	600	0.01	0.02	26,000	570	0.01	0.02	25,000	540	0.01	0.02
0.4	0.5°	4	0.3°	50,000	1,750	0.06	0.16	48,000	1,600	0.04	0.08	48,000	1,500	0.04	0.06	48,000	1,500	0.04	0.04
		6		43,000	1,600	0.045	0.1	34,000	950	0.03	0.05	34,000	900	0.03	0.05	34,000	900	0.02	0.025
		8		32,000	1,250	0.045	0.1	30,000	800	0.03	0.05	30,000	760	0.03	0.05	30,000	760	0.02	0.025
		12		24,000	720	0.01	0.04	23,000	450	0.005	0.01	23,000	420	0.005	0.01	23,000	420	0.005	0.025
	1°	8		43,000	1,600	0.045	0.1	34,000	950	0.03	0.05	34,000	900	0.03	0.05	34,000	900	0.02	0.025
		12		32,000	1,250	0.045	0.1	30,000	800	0.03	0.05	30,000	760	0.03	0.05	30,000	760	0.02	0.025
0.4	1°	16	24,000	720	0.01	0.04	23,000	450	0.005	0.01	23,000	420	0.005	0.01	23,000	420	0.005	0.015	

切深量  
DEPTH OF CUT



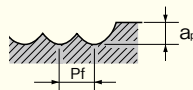
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加工材料 WORK MATERIAL				铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C · NAK55 ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH							
R	颈部 半径 $r_n$	颈长 $l_2$	推入倾斜 切入角度 Recommended Cutting Angle	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		33~41HRC		42~50HRC					
						$a_p$	Pf			$a_p$	Pf	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT $a_p$	Pf	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT $a_p$	Pf
0.5	0.5°	6	0.3°	47,000	2,850	0.075	0.2	36,000	2,300	0.05	0.1	36,000	2,100	0.05	0.08	36,000	2,100	0.05	0.05
		8		30,000	2,350	0.075	0.15	27,000	1,700	0.05	0.1	27,000	1,600	0.05	0.08	27,000	1,600	0.05	0.05
		10		27,000	2,000	0.075	0.15	26,000	1,600	0.05	0.1	26,000	1,500	0.05	0.08	26,000	1,500	0.05	0.05
		12		24,000	1,400	0.015	0.04	22,000	1,100	0.01	0.02	22,000	1,000	0.01	0.05	21,000	950	0.01	0.02
		16		24,000	1,000	0.015	0.04	22,000	770	0.01	0.02	22,000	700	0.01	0.02	21,000	680	0.01	0.02
		18		24,000	1,000	0.01	0.04	22,000	770	0.007	0.02	22,000	700	0.007	0.02	21,000	680	0.007	0.02
		20		24,000	1,000	0.01	0.03	22,000	770	0.007	0.015	22,000	700	0.007	0.015	21,000	680	0.007	0.015
		25		20,000	800	0.01	0.03	18,000	600	0.007	0.015	18,000	480	0.007	0.015	17,000	550	0.007	0.015
		30		20,000	800	0.007	0.03	18,000	600	0.005	0.015	18,000	480	0.005	0.015	17,000	550	0.005	0.015
	35	15,000	550	0.005	0.03	14,000	450	0.005	0.01	12,000	400	0.005	0.01	11,000	350	0.005	0.01		
	1°	10	30,000	2,350	0.075	0.15	27,000	1,700	0.05	0.1	27,000	1,600	0.05	0.05	27,000	1,600	0.05	0.05	
		16	24,000	1,400	0.015	0.04	22,000	1,100	0.01	0.02	22,000	1,000	0.01	0.02	21,000	950	0.01	0.02	
		20	24,000	1,000	0.015	0.04	22,000	770	0.01	0.02	22,000	700	0.01	0.02	21,000	680	0.01	0.015	
		25	24,000	1,000	0.015	0.04	22,000	770	0.01	0.02	22,000	700	0.01	0.02	21,000	680	0.01	0.015	
		30	24,000	1,000	0.01	0.04	22,000	770	0.007	0.02	22,000	700	0.007	0.02	21,000	680	0.007	0.015	
		35	24,000	1,000	0.01	0.03	22,000	770	0.007	0.015	22,000	700	0.007	0.015	21,000	680	0.007	0.015	
		40	22,000	1,000	0.01	0.03	20,000	770	0.007	0.015	20,000	700	0.007	0.015	19,000	680	0.007	0.015	
		50	20,000	800	0.01	0.03	18,000	600	0.007	0.015	18,000	480	0.007	0.015	17,000	550	0.007	0.01	
		60	18,000	800	0.007	0.03	16,000	600	0.005	0.015	16,000	480	0.005	0.015	15,000	550	0.005	0.015	
	70	15,000	600	0.005	0.03	14,000	480	0.005	0.015	13,000	380	0.005	0.015	12,000	450	0.005	0.015		
	1.5°	8	47,000	2,850	0.075	0.2	36,000	2,300	0.05	0.1	36,000	2,100	0.05	0.08	36,000	2,100	0.05	0.05	
		10	30,000	2,350	0.075	0.15	27,000	1,700	0.05	0.1	27,000	1,600	0.05	0.08	27,000	1,600	0.05	0.05	
		12	30,000	2,350	0.075	0.15	27,000	1,700	0.05	0.1	27,000	1,600	0.05	0.08	27,000	1,600	0.05	0.05	
		16	24,000	1,400	0.015	0.04	22,000	1,100	0.01	0.02	22,000	1,000	0.01	0.02	21,000	950	0.01	0.02	
		20	24,000	1,400	0.015	0.04	22,000	1,100	0.01	0.02	22,000	1,000	0.01	0.02	21,000	950	0.01	0.02	
		25	24,000	1,400	0.015	0.04	22,000	1,100	0.01	0.02	22,000	1,000	0.01	0.02	21,000	950	0.01	0.02	
		30	24,000	1,000	0.015	0.04	22,000	770	0.01	0.02	22,000	700	0.01	0.02	21,000	680	0.01	0.02	
		35	24,000	1,000	0.015	0.04	22,000	770	0.01	0.02	22,000	700	0.01	0.02	21,000	680	0.01	0.02	
		45	24,000	1,400	0.015	0.04	22,000	1,100	0.01	0.02	22,000	1,000	0.01	0.02	21,000	950	0.01	0.02	
	0.6	0.5°	12	0.3°	30,000	2,000	0.09	0.21	25,000	1,700	0.06	0.12	25,000	1,600	0.06	0.1	25,000	1,600	0.06
25			24,000		1,000	0.02	0.04	22,000	770	0.015	0.02	22,000	700	0.015	0.02	21,000	680	0.015	0.03
1°		12	30,000		2,200	0.09	0.21	25,000	2,000	0.06	0.12	25,000	2,000	0.06	0.1	25,000	1,900	0.06	0.06
		25	30,000		2,000	0.04	0.21	25,000	1,700	0.06	0.09	25,000	1,600	0.06	0.05	25,000	1,600	0.02	0.03
1.5°		12	30,000		2,200	0.09	0.21	25,000	2,000	0.06	0.12	25,000	2,000	0.06	0.1	25,000	1,900	0.06	0.06
		25	30,000		2,000	0.05	0.21	25,000	1,700	0.06	0.12	25,000	1,600	0.06	0.1	25,000	1,600	0.05	0.06

切深量  
DEPTH OF CUT



- 请使用刚性较高的机床和刀柄，刚性较差时下调切削条件。
- 最大限度控制工具的跳动精度。
- 请使用适合工件材料发烟性少的切削油剂，通常推荐空气冷却。
- 圆弧角部切削或去残加工时请将切深和进给速度下降至70%左右。
- 通过CAM或者机床设定中的R插入或减速可实现更稳定的高进给加工。
- 切削负荷变动较大或加工精度要求较高时请适当降低转速。
- 倾斜切入角度超过推荐值以上时请降低进给速度。
- 切削负荷变动较大或加工精度要求较高时请适当降低加工条件。
- 转速无法达到要求时，配合机床的转速同比降低进给速度。
- 上述条件表仅为参考。请根据实际加工条件调节。
- 切削条件适用于粗加工后的半精加工。
- 包含平坦部的粗加工较多时容易产生振动。
- 切深较小时请提高转速使其达到合适的切削速度抑制振动。
- Highly rigid machines and tool holders should be used. If not, machining should be kept below above-mentioned conditions.
- Tool vibrations should be kept at a minimum level for maximum accuracy.
- Use a suitable cutting fluid with high smoke retardant properties.
- For the milling of corners or removal of residue, reduce the cutting depth and feed to 70% .
- More stable high-feed machining in corners can be attained by setting an R insertion or deceleration on the CAM or machine side.
- When cutting load fluctuates (in the corners, etc.) or when high precision is required, be sure to control the rotational speed.
- When cutting at greater than the recommended cutting angle, reduce the feed.
- When cutting load is fluctuating, or when higher milling accuracy is required, keep machining conditions below the above-mentioned values.
- When the rotational speed does not meet the recommended conditions, reduce the feed in proportion to the RPM that is suitable for your machine.
- The chart above is intended as general guidelines for reference only. The given values should be adjusted individually based on actual machining conditions.
- The cutting conditions are intended for intermediate machining after roughing.
- When the work includes extensive roughing including flat areas, chattering is more likely to occur.
- If the cutting depth is shallow, increase the cutting speed appropriately to minimize chattering.



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# WXL 涂层 2刃球头形(强力型)

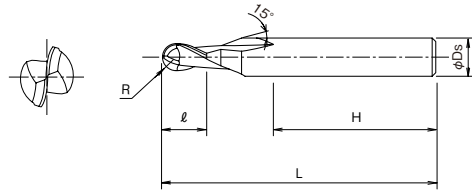
WXL Coating Two Flute Ball Nose (HSK type)

## WXL-HS-EBD

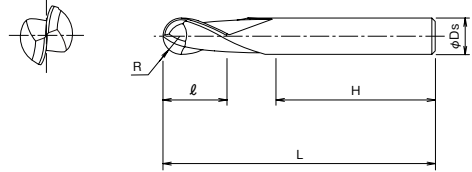


- 材质.....超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide
- 表面处理.....WXL 涂层  
Surface Treatment WXL Coating
- 圆弧角公差..... $R < 3 \pm 0.005\text{mm}$   
Tolerance of Ball Nose Radius  $3 \leq R \leq 6 \quad 0.003 \sim -0.007\text{mm}$

Type 1



Type 2



单位:mm Unit:mm

商品号 EDP No.	球半径 × 刃长 × 柄径 $R \times \ell \times D_s$	全长 L	刃长 $\ell$	柄径 $D_s$	夹持长度 (参考值) H	形状 Type	库存 Stock
3107020	R0.1 × 0.4 × 4	35	0.4	4	27	1	D
3107040	R0.2 × 0.8 × 4	35	0.8	4	27	1	D
3107060	R0.3 × 1.1 × 4	35	1.1	4	27	1	D
3107080	R0.4 × 2 × 4	35	2	4	26	1	D
3107100	R0.5 × 1.5 × 4	40	1.5	4	32	1	D
3107120	R0.6 × 3 × 4	40	3	4	31	1	D
3107150	R0.75 × 2 × 4	40	2	4	32	1	D
3107200	R1 × 3 × 4	40	3	4	31	1	D
3107300	R1.5 × 4.5 × 4	40	4.5	4	30	1	D
3107400	R2 × 6 × 6	40	6	6	26	1	D
3108500	R2.5 × 8	40	8	6	25	1	D
3108600	R3 × 10	45	10	6	26	2	D
3108620	R4 × 12	55	12	8	32	2	D
3108640	R5 × 15	65	15	10	38	2	D
3108660	R6 × 18	70	18	12	38	2	D

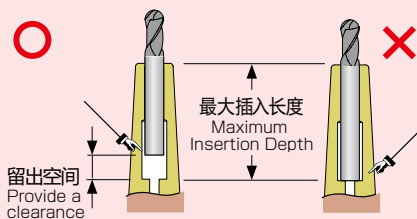
D= 库存中心标准库存品 D=Inventory center stock item.

### 使用注意 Operating Precautions

#### 最大插入长度 Maximum Insertion Depth

刀具插入时,若刀具底端紧贴刀柄底部,容易造成精度不良。所以请务必遵守最大插入长度的规定。

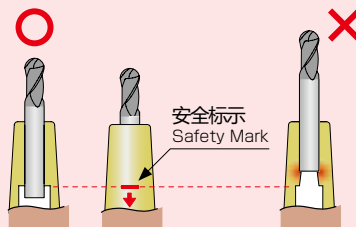
If the cutting tool is inserted until its end bottoms out, it can result in poor precision. Make sure to adhere to the maximum insertion depth.



#### 安全标示 Safety Mark

刀具插入时,若插入长度过短会造成刀柄破损。所以请一定将刀具插入至安全标示以下。

If the insertion depth of the cutting tool is too short, it can damage the holder. Make sure the cutting tool is inserted deeper than the safety mark.

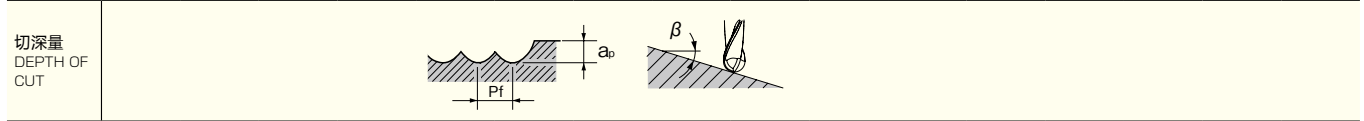


## WXL-HS-EBD

**⚠** 加工時产生的火花以及破损造成的发热现象有导致火灾的危险。  
请做好防火措施。

**Caution:** Sparks generated during operation or heat caused by tool breakage can cause fire. Be sure to use all proper fire-prevention measures.

加工材料 WORK MATERIAL	铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH								
	R	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		33 ~ 41HRC				42 ~ 50HRC			
				a <sub>p</sub>	Pf			a <sub>p</sub>	Pf	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT	
RO.1	50,000	540	0.01	0.02	50,000	540	0.01	0.02	50,000	540	0.01	0.02	50,000	440	0.01	0.02	
RO.2	50,000	880	0.02	0.04	50,000	750	0.02	0.04	50,000	750	0.02	0.04	50,000	680	0.02	0.04	
RO.3	50,000	1,840	0.02	0.04	50,000	910	0.02	0.04	50,000	910	0.02	0.04	50,000	840	0.02	0.04	
RO.4	50,000	2,210	0.02	0.05	50,000	1,850	0.02	0.05	50,000	1,850	0.02	0.05	50,000	1,250	0.02	0.05	
RO.5	50,000	3,350	0.02	0.05	50,000	2,800	0.02	0.05	50,000	2,500	0.02	0.05	47,500	2,250	0.02	0.05	
R1	31,500	3,350	0.04	0.1	25,000	2,800	0.04	0.1	24,500	2,500	0.04	0.1	23,500	2,250	0.04	0.1	
R1.5	21,000	3,350	0.06	0.15	16,500	2,800	0.06	0.15	16,000	2,500	0.06	0.15	15,500	2,250	0.06	0.15	
R2	15,500	4,080	0.08	0.2	15,500	3,400	0.08	0.2	15,000	2,750	0.08	0.2	13,500	2,450	0.08	0.2	
R3	10,500	5,160	0.12	0.3	13,500	4,300	0.3	0.6	11,500	2,750	0.3	0.6	9,500	2,250	0.12	0.3	
R4	7,900	3,840	0.16	0.4	10,000	3,200	0.4	0.8	8,950	2,100	0.4	0.8	7,150	1,700	0.16	0.4	
R5	6,300	3,120	0.2	0.5	8,250	2,600	0.5	1	7,150	1,700	0.5	1	5,700	1,350	0.2	0.5	
R6	5,250	2,580	0.24	0.6	6,850	2,150	0.5	2.4	5,950	1,400	0.5	2.4	4,750	1,100	0.24	0.6	



1. 此基准条件表适用于使用高速高精度的数控加工中心进行轻切削。
  2. 磨损会产生火花因此禁止使用易燃性切削油剂。
  3. 推荐使用空气冷却。使用切削油剂时请使用发烟性小的。
  4. 上表仅做参考实际加工时根据实际情况参照上表制定切削条件。
- ※ 倾斜角β低于15°时可上表的转速和进给速度提高1.2~1.5倍。  
※※ 如果您使用的机床无法达到推荐的转速请使用最高转速。

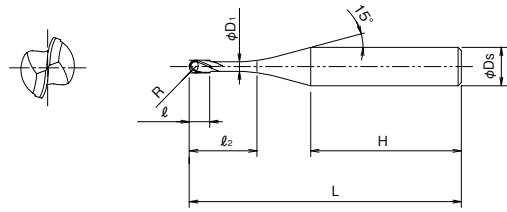
1. The indicated speeds and feeds are for high speed light milling with high speed/high precision machining centers.
  2. Because tools can cause sparks, do not use flammable fluids.
  3. We recommend using an air blow. If using cutting fluids, use a high quality fluid with smoke retardant properties.
  4. Refer to the table above to set the milling conditions in accordance with the actual situation.
- ※ When β is less than 15°, speed and feed in the above table can be increased 1.2 ~ 1.5 times.  
※※ If your machine tool does not attain the indicated speed, operate it at the highest possible speed.

RECOMMENDED MILLING CONDITIONS  
WXL-HS-EBD  
切削条件表

# WXL 涂层2刃长颈球头形(深槽加工型·强力型)

WXL Coating Two Flute Ball Nose · with Long Neck (for Rib processing · HSK type)

## WXL-HS-LN-EBD



● 材质.....超微粒子超硬合金  
Tool Material Ultra Fine Grain Carbide

● 表面处理.....WXL 涂层  
Surface Treatment WXL Coating

● 圆弧角公差.....±0.005mm 注)R≤0.1圆弧无缝隙  
Tolerance of Ball Nose Radius Tools with a radius below 0.1 are not seamless.

单位:mm Unit:mm

商品号 EDP No.	球半径×颈长×柄径 R × l <sub>2</sub> × D <sub>s</sub>	全长 L	刃长 l	柄径 D <sub>s</sub>	刃径 D <sub>1</sub>	干涉角度 θ <sub>k</sub>	有效夹持长度 H	■相对于工件倾斜角α的实际有效长(Le)※1						库存 Stock
								0.5°	1°	1.5°	2°	2.5°	3°	
3140205	R0.1 × 0.5 × 4	35	0.16	4	0.18	13.59	27.3	0.54	0.58	0.63	0.69	0.76	0.83	D
3140207	R0.1 × 0.75 × 4	35	0.16	4	0.18	13.2	27.1	0.81	0.88	0.96	1.04	1.13	1.23	D
3140210	R0.1 × 1 × 4	35	0.16	4	0.18	12.83	26.8	1.08	1.18	1.27	1.38	1.49	1.61	D
3140212	R0.1 × 1.25 × 4	35	0.16	4	0.18	12.48	26.6	1.36	1.47	1.59	1.71	1.84	1.98	D
3140305	R0.15 × 0.5 × 4	35	0.24	4	0.28	13.9	27.5	0.53	0.57	0.62	0.67	0.73	0.8	D
3140306	R0.15 × 0.6 × 4	35	0.24	4	0.28	13.74	27.4	0.64	0.69	0.75	0.81	0.89	0.97	D
3140307	R0.15 × 0.75 × 4	35	0.24	4	0.28	13.49	27.3	0.81	0.87	0.94	1.02	1.11	1.21	D
3140310	R0.15 × 1 × 4	35	0.24	4	0.28	13.1	27	1.08	1.17	1.26	1.36	1.47	1.59	D
3140312	R0.15 × 1.25 × 4	35	0.24	4	0.28	12.74	26.8	1.35	1.46	1.58	1.7	1.82	1.96	D
3140315	R0.15 × 1.5 × 4	35	0.24	4	0.28	12.39	26.5	1.62	1.75	1.89	2.02	2.17	2.31	D
3140317	R0.15 × 1.75 × 4	35	0.24	4	0.28	12.06	26.3	1.89	2.04	2.19	2.35	2.5	2.66	D
3140407	R0.2 × 0.75 × 4	35	0.3	4	0.37	13.85	27.5	0.8	0.86	0.92	0.99	1.07	1.16	D
3140410	R0.2 × 1 × 4	35	0.3	4	0.37	13.44	27.1	1.07	1.15	1.24	1.33	1.43	1.54	D
3140415	R0.2 × 1.5 × 4	35	0.3	4	0.37	12.69	26.6	1.61	1.73	1.86	1.99	2.12	2.26	D
3140420	R0.2 × 2 × 4	35	0.3	4	0.37	12.02	26.1	2.15	2.31	2.47	2.63	2.79	2.95	D
3140425	R0.2 × 2.5 × 4	35	0.3	4	0.37	11.41	25.6	2.69	2.88	3.07	3.25	3.43	3.61	D
3140510	R0.25 × 1 × 4	35	0.4	4	0.45	13.84	27.2	1.06	1.13	1.21	1.3	1.39	1.49	D
3140515	R0.25 × 1.5 × 4	35	0.4	4	0.45	13.04	26.7	1.6	1.71	1.83	1.95	2.08	2.21	D
3140520	R0.25 × 2 × 4	35	0.4	4	0.45	12.34	26.2	2.14	2.29	2.44	2.59	2.75	2.9	D
3140525	R0.25 × 2.5 × 4	35	0.4	4	0.45	11.7	25.7	2.68	2.86	3.04	3.22	3.39	3.57	D
3140530	R0.25 × 3 × 4	35	0.4	4	0.45	11.12	25.2	3.22	3.43	3.63	3.83	4.02	4.22	D
3140615	R0.3 × 1.5 × 4	35	0.5	4	0.55	13.33	26.5	1.6	1.71	1.82	1.94	2.06	2.19	D
3140620	R0.3 × 2 × 4	35	0.5	4	0.55	12.59	26	2.14	2.28	2.43	2.58	2.73	2.88	D
3140625	R0.3 × 2.5 × 4	35	0.5	4	0.55	11.93	25.5	2.68	2.85	3.03	3.2	3.38	3.55	D
3140630	R0.3 × 3 × 4	35	0.5	4	0.55	11.33	25	3.21	3.42	3.62	3.82	4.01	4.2	D
3140635	R0.3 × 3.5 × 4	35	0.5	4	0.55	10.79	24.5	3.75	3.98	4.21	4.43	4.64	4.84	D
3140640	R0.3 × 4 × 4	40	0.5	4	0.55	10.3	29	4.28	4.54	4.79	5.03	5.25	5.47	D
3140645	R0.3 × 4.5 × 4	40	0.5	4	0.55	9.85	28.5	4.82	5.1	5.37	5.62	5.86	6.09	D
3140650	R0.3 × 5 × 4	40	0.5	4	0.55	9.44	28	5.35	5.66	5.94	6.21	6.46	6.71	D
3140655	R0.3 × 5.5 × 4	40	0.5	4	0.55	9.06	27.5	5.88	6.21	6.51	6.79	7.06	7.33	D
3140660	R0.3 × 6 × 4	40	0.5	4	0.55	8.71	27	6.41	6.77	7.08	7.38	7.66	7.96	D
3140820	R0.4 × 2 × 4	35	0.6	4	0.75	13.13	26.4	2.13	2.27	2.41	2.55	2.7	2.85	D
3140830	R0.4 × 3 × 4	35	0.6	4	0.75	11.77	25.4	3.21	3.41	3.6	3.8	3.99	4.17	D
3140840	R0.4 × 4 × 4	40	0.6	4	0.75	10.66	29.4	4.28	4.53	4.77	5.01	5.23	5.45	D
3140850	R0.4 × 5 × 4	40	0.6	4	0.75	9.74	28.4	5.34	5.65	5.93	6.19	6.44	6.69	D
3141030	R0.5 × 3 × 4	35	0.8	4	0.95	12.25	25.8	3.19	3.38	3.57	3.75	3.93	4.11	D
3141040	R0.5 × 4 × 4	35	0.8	4	0.95	11.05	24.8	4.26	4.5	4.74	4.96	5.18	5.39	D
3141050	R0.5 × 5 × 4	40	0.8	4	0.95	10.07	28.8	5.33	5.62	5.89	6.15	6.39	6.63	D

D= 库存中心标准库存品 D=Inventory center stock item.



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SPECIFICATION CHART WXL-HS-LN-EBD 形状寸法表



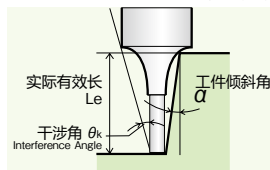
# WXL 涂层2刃长颈球头形(深槽加工型·强力型)

WXL Coating Two Flute Ball Nose · with Long Neck (for Rib processing · HSK type)

## WXL-HS-LN-EBD

※1:相对于工件倾斜角 $\alpha$ 的实际有效长 ( Le )

Effective Neck length (Le) depending on Inclined Angle ( $\alpha$ ) of workpiece



上表中实际有效长栏里无数值时意味加工时不存在干涉。  
No numerical value means no interference with workpiece.



接上页

单位 :mm Unit:mm

商品号 EDP No.	球半径×颈长×柄径 R × $\ell_2$ × Ds	全长 L	刃长 $\ell$	柄径 Ds	劲径 Dt	干涉角度 $\theta_k$	有效夹持长度 H	■相对于工件倾斜角 $\alpha$ 的实际有效长( Le )※1						库存 Stock
								0.5°	1°	1.5°	2°	2.5°	3°	
3141060	R0.5 × 6 × 4	40	0.8	4	0.95	9.24	27.8	6.39	6.72	7.03	7.32	7.59	7.88	D
3141080	R0.5 × 8 × 4	40	0.8	4	0.95	7.94	25.8	8.5	8.92	9.28	9.62	9.98	10.36	D
3141100	R0.5 × 10 × 4	40	0.8	4	0.95	6.96	23.8	10.61	11.09	11.51	11.92	12.37	12.85	D
3141530	R0.75 × 3 × 4	35	1.2	4	1.45	13.61	26.7	3.17	3.35	3.52	3.7	3.87	4.04	D
3141540	R0.75 × 4 × 4	35	1.2	4	1.45	12.16	25.7	4.24	4.47	4.7	4.91	5.12	5.33	D
3141560	R0.75 × 6 × 4	40	1.2	4	1.45	10.01	28.7	6.37	6.7	7	7.28	7.54	7.82	D
3141580	R0.75 × 8 × 4	40	1.2	4	1.45	8.5	26.7	8.49	8.89	9.25	9.58	9.93	10.3	D
3141600	R0.75 × 10 × 4	40	1.2	4	1.45	7.38	24.7	10.6	11.07	11.48	11.88	12.32	12.79	D
3142030	R1 × 3 × 4	35	1.6	4	1.95	15.32	27.6	3.15	3.3	3.46	3.62	3.78	3.94	D
3142040	R1 × 4 × 4	35	1.6	4	1.95	13.51	26.6	4.22	4.43	4.64	4.84	5.04	5.23	D
3142060	R1 × 6 × 4	35	1.6	4	1.95	10.91	24.6	6.35	6.65	6.94	7.21	7.46	7.73	D
3142080	R1 × 8 × 4	40	1.6	4	1.95	9.14	27.6	8.46	8.85	9.2	9.52	9.85	10.21	D
3142100	R1 × 10 × 4	40	1.6	4	1.95	7.87	25.6	10.57	11.03	11.43	11.82	12.24	12.7	D
3142112	R1 × 12 × 4	40	1.6	4	1.95	6.9	23.6	12.67	13.19	13.64	14.12	14.63	15.19	D
3142114	R1 × 14 × 4	45	1.6	4	1.95	6.14	26.6	14.77	15.34	15.86	16.42	17.02	17.67	D
3142116	R1 × 16 × 4	45	1.6	4	1.95	5.54	24.6	16.86	17.48	18.08	18.72	19.41	—	D
3142118	R1 × 18 × 4	50	1.6	4	1.95	5.04	27.6	18.94	19.62	20.29	21.02	21.8	—	D
3142120	R1 × 20 × 4	50	1.6	4	1.95	4.62	25.6	21.03	21.76	22.51	23.18	—	—	D
3143060	R1.5 × 6 × 4	40	2.4	4	2.85	13.6	31.7	6.25	6.49	6.72	6.95	7.17	7.4	D
3143080	R1.5 × 8 × 4	40	2.4	4	2.85	10.97	29.7	8.35	8.67	8.97	9.25	9.56	9.89	D
3143100	R1.5 × 10 × 4	40	2.4	4	2.85	9.19	27.7	10.45	10.83	11.19	11.55	11.95	—	D
3143112	R1.5 × 12 × 4	40	2.4	4	2.85	7.9	25.7	12.54	12.99	13.4	13.85	—	—	D

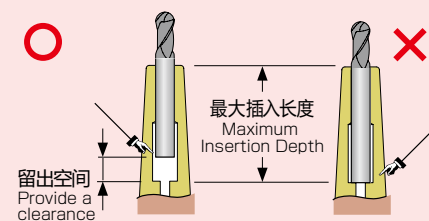
D= 库存中心标准库存品 D=Inventory center stock item.

### 使用注意 Operating Precautions

#### 最大插入长度 Maximum Insertion Depth

刀具插入时,若刀具底端紧贴刀柄底部,容易造成精度不良。所以请务必遵守最大插入长度的规定。

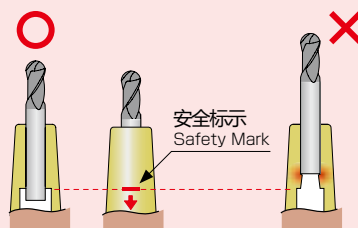
If the cutting tool is inserted until its end bottoms out, it can result in poor precision. Make sure to adhere to the maximum insertion depth.



#### 安全标示 Safety Mark

刀具插入时,若插入长度过短会造成刀柄破损。所以请一定将刀具插入至安全标示以下。

If the insertion depth of the cutting tool is too short, it can damage the holder. Make sure the cutting tool is inserted deeper than the safety mark.







接上页

加工材料 WORK MATERIAL		铜·铜合金 COPPER · COPPER ALLOY				普通结构用钢·炭素钢 MILD STEELS · CARBON STEELS FC250 · SS400 · S55C ~32HRC				调质钢·预硬钢 HARDENED STEELS · PREHARDENED STEELS SKT · SKD61 · NAK55 · NAK80 · HPM1 · DH							
										33 ~ 41HRC				42 ~ 50HRC			
R	颈长 ℓ <sub>2</sub> (mm)	转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT		转速 SPEED (min <sup>-1</sup> )	进给速度 FEED (mm/min)	切深量(mm) DEPTH OF CUT	
				ap	Pf			ap	Pf			ap	Pf			ap	Pf
0.75	3	50,000	5,330	0.15	0.3	50,000	4,800	0.075	0.15	50,000	4,800	0.075	0.15	50,000	4,800	0.075	0.15
	4	42,000	4,110	0.15	0.3	40,000	3,900	0.075	0.15	40,000	3,700	0.075	0.15	40,000	3,700	0.075	0.15
	6	32,000	3,000	0.15	0.3	30,000	2,900	0.075	0.15	30,000	2,700	0.075	0.15	30,000	2,700	0.075	0.15
	8	30,000	2,650	0.15	0.3	24,000	2,300	0.075	0.15	24,000	2,100	0.075	0.15	24,000	2,100	0.075	0.15
	10	30,000	2,400	0.15	0.3	24,000	2,000	0.075	0.15	24,000	1,900	0.075	0.15	24,000	1,900	0.075	0.15
1	3	50,000	5,800	0.2	0.4	50,000	5,600	0.1	0.2	50,000	5,600	0.1	0.2	47,000	5,300	0.1	0.2
	4	50,000	5,800	0.2	0.4	50,000	5,600	0.1	0.2	50,000	5,600	0.1	0.2	47,000	5,300	0.1	0.2
	6	38,000	4,000	0.2	0.4	36,000	3,000	0.1	0.2	36,000	2,800	0.1	0.2	34,000	2,600	0.1	0.2
	8	27,000	3,360	0.2	0.4	25,000	2,600	0.1	0.2	25,000	2,400	0.1	0.2	23,000	2,200	0.1	0.2
	10	22,000	3,050	0.2	0.4	20,000	2,400	0.1	0.2	20,000	2,200	0.1	0.2	19,000	2,000	0.1	0.2
	12	16,000	2,580	0.2	0.4	16,000	2,000	0.1	0.2	16,000	1,900	0.1	0.2	15,000	1,700	0.1	0.2
	14	15,000	2,400	0.2	0.3	15,000	1,800	0.1	0.2	15,000	1,700	0.1	0.2	14,000	1,500	0.1	0.2
	16	14,000	2,200	0.2	0.2	14,000	1,700	0.1	0.1	14,000	1,600	0.1	0.1	13,000	1,400	0.1	0.1
	18	13,000	2,000	0.2	0.2	13,000	1,600	0.1	0.1	13,000	1,500	0.1	0.1	12,000	1,300	0.1	0.1
20	12,000	1,200	0.1	0.2	12,000	1,200	0.05	0.1	11,000	1,100	0.05	0.1	10,000	1,000	0.05	0.1	
1.5	6	42,000	6,800	0.3	0.6	41,500	6,200	0.15	0.3	41,500	6,200	0.15	0.3	32,000	4,800	0.15	0.3
	8	32,000	4,600	0.3	0.6	30,000	4,500	0.15	0.3	30,000	4,200	0.15	0.3	25,000	3,500	0.15	0.3
	10	28,000	4,000	0.3	0.6	25,000	3,800	0.15	0.3	25,000	3,600	0.15	0.3	20,000	2,800	0.15	0.3
	12	24,000	3,100	0.3	0.6	20,000	3,000	0.15	0.3	20,000	2,800	0.15	0.3	18,000	2,500	0.15	0.3
切深量 DEPTH OF CUT																	

1. 请使用刚性较高的机床和刀柄。
2. 推荐使用MQL(半干式)或空气冷却加工炭素钢预硬钢。
3. 请使用适合工件材料的发烟性少的切削油剂。
4. 上表为等高线加工等负荷较少可稳定加工状态下的标准。实际加工时可根据切削状况适当调节切削条件。
5. 根据加工精度、加工形状、加工刀路适当调整加工条件。
6. φ0.5以下或劲长/刃径(L/D)大于10时、微小的负荷增大也会导致折损、根据切削状况适当调节切削条件。
7. 转速不足时请根据上表同比下降转速和进给速度。

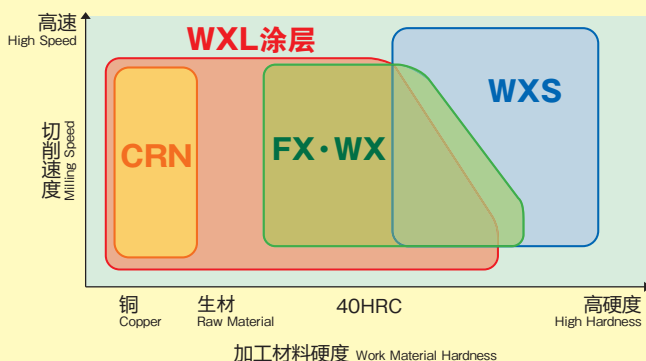
1. Use a rigid and precise machine and holder.
2. When machining carbon steels or hardened steels, using MQL (Minimum Quantity Lubrication / mist coolant) or air blow is recommended.
3. When using cutting fluid, choose based on work material and cutting conditions.
4. The cutting conditions shown for 3D milling are low — load, safe conditions for reference. Refer to the table above to set the milling conditions in accordance with the actual situation.
5. Please adjust conditions based on machining accuracy, machining shape and machining path.
6. When using a tool with a diameter of φ 0.5 (R0.25) or less, or an L/D (effective length/tool diameter) ratio of greater than 10, high loads can cause tool breakage. Therefore, adjust the cutting conditions based on the machining situation.
7. When the available RPM are insufficient, please reduce the RPM and feed rates in proportion.

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