2022

THE PROFESSIONAL ENDMILL

由超精密加工技术打造的立铣刀

立铣刀综合目录

End mill general catalog

TOWA

WHAT's TOWA End Mill?

TOWA 在半导体制造的超精密模具领域，是拥有领先全球，高市场占比的领导企业。能够实现此超精密的模具制造技术，说是由TOWA自有的"TOWA立铣刀"所达成也不为过 。"TOWA立铣刀"精度高、耐磨性好、锋利、寿命长。 "TOWA立铣刀"的优越性可以由他的"最大用户" = "TOWA"来证明。 TOWA既是制造商又是用户，能够提供满足每个客户需求的产品。此外，从"用户"的角度，我们可以充分展现多年来对加工条件的经验，对需求提出建议。 TOWA作为综合性刀具制造商，将为实现进一步降低成本及达成理想的金属加工而努力。

Towa is a World Leader in the manufacturing of Ultra-Precision Molds for the Semiconductor Industry.
It is no exaggeration to state that the manufacturing of TOWA's Ultra-Precision Molds is achieved through the use of TOWA's own "TOWA End Mill".
"TOWA End Mill" is designed for high accuracy, with excellent wear resistance, sharpness and long life. The superiority of the "TOWA End Mill" is continuously shown by its use with their Number One Customer, TOWA!
TOWA, which is both a manufacturer and a user, can deliver products that meet the needs of each customer in detail.
In addition, from the standpoint of the "user", we can fully demonstrate our many years of experience in giving recommendations regarding the part's machining process.
As a comprehensive manufacturer of cutting tools, TOWA will continue to strive for a greater cost performance ratio with efficient metal processing.

由超精密加工 TOWA 所创造的立铣刀

End mill created by TOWA for ultra-precision machining

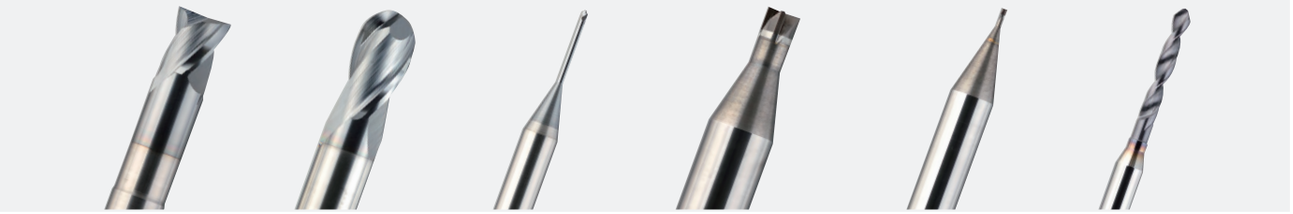
CBN&超硬立铣刀系列

我们的立铣刀，源于对超精密模具加工的内部需求。
为了满足客户逐年严格的模具规格要求，以及最大限度的发挥TOWA公司的技术能力，
制造更高精度和更耐用的切削工具是必不可少的。

Our end mills were born out of our in-house needs for ultra-precision mold machining.
In order to meet the customer's mold specifications, which are becoming stricter each year,
TOWA tapped into our company's technological capabilities to the maximum.
Proven design and developed cutting tools manufactured in-house, because tools with higher precision and durability are indispensable.

长寿命! 可以降低刀具采购成本!!

Longer life than conventional tooling. Reduced number of tools needed = reduced cost.



高精度 High precision

●刀具直径：根据所需尺寸控制公差在 -3μm 内

Tool diameter: For required dimensions
We will produce within 3 μm!

●R精度：±2μm

R accuracy: ± 2 μm

多数刃 Multiple Flutes

●活用3 ~ 6 的刃数，缩短了加工时间

Processing time is shortened by utilizing 3 to 6 flutes

长寿命 Long life

●使用独创涂层使寿命增长

Long life with original coating

CBN&超硬立铣刀
CBN&Carbide End Mill

再研磨 Regrinding

●CBN立铣刀最多可重新研磨8次，总加工成本减半！

We can regrind CBN end mills up to 8 times with overall cost reduction for the Customer up to 50%.

●实现硬质合金立铣刀涂层的完全剥离！将涂层完全剥离，重磨后再次覆涂，使硬质合金立铣刀再生，并以合理的价格提供！

We remove the carbide coating completely.
Completely remove the coating, re-grind and then re-coat.
We offer recondition carbide end mills at a reasonable cost.

短交期 Quick delivery

●目录产品本地在库

Standard items have local stock.

●定制产品/再研磨 制作周期7天

Customize items or regrinding items can be manufactured within 1 week.

Point 1.
用于超精密加工的高精度刀具

Our high-precision tools are capable of ultra-precision machining.

Point 2.
通过再研磨显著地降低加工成本

Significant cost reduction with Re-grinding end mills.

Point 3.
在短时间内提供满足客户需求的定制刀具

Providing custom-made tools that meet customer requirements in a short delivery time.

再研磨(再生)和定制产品最小起订量1支

Re-grinding (recondition) and Custom-made products can be quoted, even if one pack of tool.

CONTENTS

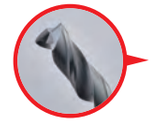
立铣刀 / End Mill

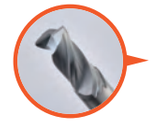
CBN Series

Hard Star A Series

Hard Star TI Series

Hard Star TT Series


ion Depo A Series


ion Depo U Series

DLC Series

Non-Coat Series

钻头 / Drill

ion Depo R Series

图案解说　Icon Guide

表面处理　Coating

- Hard A — Hard Star Type A Coating
- Hard TI — Hard Star Type TI Coating
- Hard TT — Hard Star Type TT Coating
- ion A — ion Depo Type A Coating
- ion U — ion Depo Type U Coating
- ion R — ion Depo Type R Coating
- DLC — DLC Coating
- Non — Non Coating
- BANCERA — BANCERA Coating

刀具材质　Material

- CBN — CBN（立方氮化硼）Cubic Boron Nitride
- super MG — 超超微粒硬质合金 Super Micro Grain Carbide

刃数　Number of Flutes

- 刃数 2 — 二刃 2Flutes
- 刃数 4 — 四刃 4Flutes
- 刃数 2·3 — 二・三刃 2Flutes·3Flutes
- 刃数 2·4 — 二・四刃 2Flutes·4Flutes
- 刃数 2~6 — 二・三・四・六刃 2Flutes·3Flutes·4Flutes·6Flutes

螺旋角　Helix Angle

- 螺旋角 0° — Angle 0°
- 螺旋角 30° — Angle 30°
- 螺旋角 45° — Angle 45°
- 螺旋角 40°/42° — Angle 40/42°

仰角　Neck Taper Angle

- 仰角 15° — Angle 15°

柄径公差　Shank Diameter Tolerance

- Shank 0/-0.005 — Tolerance 0/-0.005

按目的检索　Search

- 按「切削材料」检索 Search from Material　P007
- 按「系列」检索 Search from Series　P009
- 按「形状」检索 Search from Shape　P019
- 按「型号」检索 Search from Model　P029

类别 Category				CBN End Mill				Carbide End Mill							Carbide Drill
硬度 Hardness	记号 Mark	分类 Classification	切削材料 Material	CBN	CBN BANCERA	HARD STAR Type A		HARD STAR Type TI	HARD STAR Type TT	HARD STAR Type TN	ion Depo Type A	ion Depo Type U	DLC	Non-Coat	ion Depo Type R
Hardness ~HRC50	K	铸铁 Cast Iron	FCD								◎				◎
	P	碳钢 Carbon Steels	S50C／SS400								◎				◎
		预硬钢 Prehardened Steels	PX5／NAK80								◎				◎
		合金钢 Die Steels	SKD11·SKD61								◎				◎
		高速钢 High Speed Steels	HAP5R·HAP72/ASP23								◎				◎
	M	不锈钢 Stainless Steels	SUS304						◎		◎				◎
			HPM/STAVAX								◎				◎
~HRC55	H	不锈钢 Stainless Steels	HPM	◎	◎(★)	◎ 精加工 Finishing				◎(★)		◎粗/中Roughing ○精加工Finishing			
			STAVAX	◎	◎(★)	◎ 精加工 Finishing				◎(★)		◎粗/中Roughing ○精加工Finishing			
		模具钢 Die Steels	SKD61			◎ 精加工 Finishing						◎粗/中Roughing ○精加工Finishing			
~HRC60		模具钢 Die Steels	SKD11	◎	◎(★)	◎ 精加工 Finishing						◎粗/中Roughing ○精加工Finishing			
		高速钢 High Speed Steels	SKH51	◎	◎(★)	◎ 精加工 Finishing						◎粗/中Roughing ○精加工Finishing			
HRC60 over		高速钢 High Speed Steels	ASP23	◎	◎(★)	◎ 精加工 Finishing						◎粗/中Roughing ○精加工Finishing			
			HAP5R	◎	◎(★)	◎ 精加工 Finishing						◎粗/中Roughing ○精加工Finishing			
			HAP72	◎	◎(★)	◎ 精加工 Finishing						◎粗/中Roughing ○精加工Finishing			
非铁系 Non-ferrous Metal	N	铜合金 Copper Alloy	铜 Copper	◎	◎(★)					◎(★)	◎				
			钨铜 Copper Tungsten								◎				
		铝合金 Aluminum Alloy	A5000号系列 A5000 Series			◎ 精加工 Finishing					○		◎	◎	
			A7000号系列 A7000 Series			◎ 精加工 Finishing					○		◎	◎	
		石墨 Graphite	石墨 Graphite										○		
	S	耐热合金 Heat Resistant Alloy	铬镍铁合金 Inconel					◎							
			铁镍钴合金 Kovar			◎ 精加工 Finishing									
			钛合金 Titanium Alloy						◎		○				
金属3D打印机	P	铁合金 Iron Alloy	马氏体时效钢 Maraging Steels									◎粗/中Roughing ○精加工Finishing			
	M		不锈钢 Stainless Steels							◎(★)					

◎:最佳 Excellent ○适合 Good ★:定制品 Ordered product

切削材料

系列

图片 Photo	品名 Product Name	型号 Model	尺寸 Size	材质 Material	涂层 Coating	刃数 Number of Flutes	螺旋角 Helix Angle	适合加工形状 Processes Shape: 侧面加工 Side Milling	沟槽加工 Slot Milling	平面加工 Face Milling	曲面加工 3D Milling	钻孔加工 Drilling		适合切削材料 Work Material: K 铸铁 Cast Iron: FCD	P ~HRC50: 碳钢 Carbon Steel: S50C	S400	预硬钢 Prehardened Steel: PX5	NAK80	模具钢 Die Steels: SKD11	SKD61	高速钢 High Speed Steels: ASP23	HAP5R-HAP72	M ~HRC50: 不锈钢 Stainless Steel: SUS304	HPM	STAVAX	H ~HRC55: 不锈钢 Stainless Steel: HPM	STAVAX	模具钢 Die Steels: SKD61	~HRC60: 模具钢 Die Steels: SKD11	高速钢 High Speed Steels: SKH51	HRC60 over: 高速钢 High Speed Steels: ASP23	HAP5R	HAP72	N 非铁系 Non-ferrous Metal: 铜合金 Copper Alloy: 铜 Copper	铬铜 Copper Tungsten	铝合金 Aluminum Alloy: A5000 series	A7000 series	石墨 Graphite: 石墨 Graphite	S 耐热合金 Heat Resistant Alloy: 镍铁铬合金 Inconel	铁镍铬合金 Kovar	钛合金 Titanium Alloy	P 金属3D打印机: 铁合金 Iron Alloy: 马氏体时效钢 Maraging Steels	不锈钢 Stainless Steels	M	页码 Page
CBN Series																																																	
圆角 Radius																																																	
	CBN圆角铣刀 CBN Radius End Mill	CR200	φ0.1~3.0	CBN	Non-coat/ BANCERA	2	0	◎	◎	◎																◎	◎		◎	◎	◎	◎	◎	◎															35
	CBN圆角铣刀 CBN Radius End Mill	CR300	φ0.6/φ0.8	CBN	Non-coat/ BANCERA	3	0	◎	◎	◎																◎	◎		◎	◎	◎	◎	◎	◎															41
	CBN圆角铣刀 CBN Radius End Mill	CR400	φ1.0~6.0	CBN	Non-coat/ BANCERA	4	0	◎	◎	◎																◎	◎		◎	◎	◎	◎	◎	◎															43
	CBN圆角铣刀 CBN Radius End Mill	CR600	φ4.0~6.0	CBN	Non-coat/ BANCERA	6	0	◎	◎	◎																◎	◎		◎	◎	◎	◎	◎	◎															47
球头 Ball																																																
	CBN球头铣刀 CBN Ball End Mill	CB200	φ0.1~3.0	CBN	Non-coat/ BANCERA	2	0				◎																◎	◎		◎	◎	◎	◎	◎	◎															57
长颈圆角 Long Neck Radius																																																
	CBN长颈圆角铣刀 CBN Long Neck Radius End Mill	CLR200	φ0.1~3.0	CBN	Non-coat/ BANCERA	2	0	◎	◎	◎																◎	◎		◎	◎	◎	◎	◎	◎															49
	CBN长颈圆角铣刀 CBN Long Neck Radius End Mill	CLR400	φ1.0~5.0	CBN	Non-coat/ BANCERA	4	0	◎	◎	◎																◎	◎		◎	◎	◎	◎	◎	◎															53
长颈球头 Long Neck Ball																																																
	CBN长颈球头铣刀 CBN Long Neck Ball End Mill	CLB200	φ1.0~3.0	CBN	Non-coat/ BANCERA	2	0				◎																◎	◎		◎	◎	◎	◎	◎	◎															61
锥形 Taper																																																
	CBN锥形铣刀 CBN Taper End Mill	CTP200	φ0.05~0.1	CBN	Non-coat/ BANCERA	2	0	◎	◎																	◎	◎		◎	◎	◎	◎	◎	◎															63
抛光圆角 Lapping Radius																																																
	CBN抛光圆角铣刀 CBN Lapping Radius End Mill	CRL200	φ0.4~3.0	CBN	Non-coat/ BANCERA	2	0		◎	◎	◎																◎	◎		◎	◎	◎	◎	◎	◎															65
抛光球头 Lapping Ball																																																
	CBN抛光球头铣刀 CBN Lapping Ball End Mill	CBL200	φ0.4~3.0	CBN	Non-coat/ BANCERA	2	0				◎																◎	◎		◎	◎	◎	◎	◎	◎															67

◎:最佳 Excellent　○适合 Good

系列

| 图片 Photo | 品名 Product Name | 型号 Model | 尺寸 Size | 材质 Material | 涂层 Coating | 刀数 Number of Flutes | 螺旋角 Helix Angle | 适合加工形状 Processes Shape | | | | | | 适合切削材料 Work Material | | | | | |

| 图片 Photo | 品名 Product Name | 型号 Model | 尺寸 Size | 材质 Material | 涂层 Coating | 刃数 Number of Flutes | 螺旋角 Helix Angle | 适合加工形状 Processes Shape | | | | | | 适合切削材料 Work Material | | | | | |

适合切削材料 Work Material					页码 Page	301
	M	金属3D打印	铁合金 Iron Alloy	不锈钢 Stainless Steels		
	P			马氏体时效钢 Maraging Steels		
	S	非铁系 Non-ferrous Metal	耐热合金 Heat Resistant Alloy	钛合金 Titanium Alloy		
				殷瓦合金 Kovar		
				镍基合金 Inconel		
	N		石墨 Graphite	石墨 Graphite		○
			铝合金 Aluminum Alloy	A7000 series		◎
				A5000 series		◎
			铜合金 Copper Alloy	钨铜 Copper Tungsten		
				铜 Copper		
	H	HRC60 over	高速钢 High Speed Steels	HAP72		
				HAP5R		
				ASP23		
		~HRC60	高速钢 High Speed Steels	SKH51		
			模具钢 Die Steels	SKD11		
		~HRC55	模具钢 Die Steels	SKD61		
			不锈钢 Stainless Steel	STAVAX		
				HPM		
	M	~HRC50	不锈钢 Stainless Steel	STAVAX		
				HPM		
				SUS304		
	P		高速钢 High Speed Steels	HAP5R·HAP72		
				ASP23		
			合金钢 Die Steels	SKD61		
				SKD11		
			预硬钢 Prehardened Steel	NAK80		
				PX5		
			碳钢 Carbon Steel	SS400		
				S50C		
	K		铸铁 Cast Iron	FCD		
适合加工形状 Processes Shape			钻孔加工 Drilling			
			曲面加工 3D Milling			
			平面加工 Face Milling			◎
			沟槽加工 Slot Milling			◎
			侧面加工 Side Milling			◎
螺旋角 Helix Angle						45
刃数 Number of Flutes						2
涂层 Coating						DLC
材质 Material						WC
尺寸 Size						φ1.0~12.0
型号 Model						DLCS245
品名 Product Name						超薄平角铣刀 Carbide Square End Mill
图片 Photo						

DLC Series

平角 Square

◎:最佳 Excellent ○:适合 Good

| 图片 Photo | 品名 Product Name | 型号 Model | 尺寸 Size | 材质 Material | 涂层 Coating | 刃数 Number of Flutes | 螺旋角 Helix Angle | 适合加工形状 Processes Shape | | | | | | 适合切削材料 Work Material | | | | | |

| 图片 Photo | 品名 Product Name | 型号 Model | 尺寸 Size | 材质 Material | 涂层 Coating | 刃数 Number of Flutes | 螺旋角 Helix Angle | 适合加工形状 Processes Shape | | | | | | 适合切削材料 Work Material | | | | | |

| 图片 Photo | 品名 Product Name | 型号 Model | 尺寸 Size | 材质 Material | 涂层 Coating | 刃数 Number of Flutes | 螺旋角 Helix Angle | 适合加工形状 Processes Shape | | | | | | 适合切削材料 Work Material | | | | | |

| 图片 Photo | 品名 Product Name | 型号 Model | 尺寸 Size | 材质 Material | 涂层 Coating | 刃数 Number of Flutes | 螺旋角 Helix Angle | 适合加工形状 Processes Shape | | | | | | 适合切削材料 Work Material | | | | | |

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型号 Model	品名 Product Name	尺寸 Size	材质 Material	涂层 Coating	刃数 Number of Flutes	螺旋角 Helix Angle	适合加工形状 Processes Shape: 侧面加工 Side Milling	沟槽加工 Slot Milling	平面加工 Face Milling	曲面加工 3D Milling	钻孔加工 Drilling	适合切削材料 Work Material: K / P ~HRC50: 铸铁 Cast Iron FCD	P ~HRC50: 碳钢 Carbon Steel S50C	P ~HRC50: 碳钢 Carbon Steel SS400	P ~HRC50: 预硬钢 Prehardened Steel PX5	P ~HRC50: 预硬钢 Prehardened Steel NAK80	P ~HRC50: 铝合金钢 Die Steels SKD11	P ~HRC50: 铝合金钢 Die Steels SKD61	P ~HRC50: 高速钢 High Speed Steels ASP23	P ~HRC50: 高速钢 High Speed Steels HAP5R·HAP72	M ~HRC50: 不锈钢 Stainless Steel SUS304	M ~HRC50: 不锈钢 Stainless Steel HPM	M ~HRC50: 不锈钢 Stainless Steel STAVAX	H ~HRC55: 不锈钢 Stainless Steel HPM	H ~HRC55: 不锈钢 Stainless Steel STAVAX	H ~HRC55: 模具钢 Die Steels SKD61	H ~HRC60: 模具钢 Die Steels SKD11	H ~HRC60: 高速钢 High Speed Steels SKH51	H HRC60 over: 高速钢 High Speed Steels ASP23	H HRC60 over: 高速钢 High Speed Steels HAP5R	H HRC60 over: 高速钢 High Speed Steels HAP72	N 非铁系 Non-ferrous Metal: 铜合金 Copper Alloy 铜 Copper	N 非铁系 Non-ferrous Metal: 铜合金 Copper Alloy 钨铜 Copper Tungsten	N 非铁系 Non-ferrous Metal: 铝合金 Aluminum Alloy A5000 series	N 非铁系 Non-ferrous Metal: 铝合金 Aluminum Alloy A7000 series	N 非铁系 Non-ferrous Metal: 石墨 Graphite 石墨 Graphite	S 耐热合金 Heat Resistant Alloy: 超级镍铬合金 Inconel	S 耐热合金 Heat Resistant Alloy: 铁镍钴合金 Kovar	S 耐热合金 Heat Resistant Alloy: 钛合金 Titanium Alloy	P 铁合金 Iron Alloy: 马氏体时效钢 Maraging Steels	M 金属3D打印机: 不锈钢 Stainless Steels	页码 Page
ALLS345	超硬长颈平角铣刀 Carbide Long Neck Square End Mill	ϕ1.0~12.0	WC	Non-Coat	3	45	◎	◎	◎																							◎	◎											311
ALS245	超硬平角铣刀 Carbide Square End Mill	ϕ1.0~12.0	WC	Non-Coat	2	45	◎	◎	◎																							◎	◎											305
ALS345	超硬平角铣刀 Carbide Square End Mill	ϕ1.0~12.0	WC	Non-Coat	3	45	◎	◎	◎																							◎	◎											309
CB200	CBN球头铣刀 CBN Ball End Mill	ϕ0.1~3.0	CBN	Non-coat/ BANCERA	2	0			◎	◎																	◎	◎		◎	◎	◎	◎	◎	◎										57
CBL200	CBN抛光球头铣刀 CBN Lapping Ball End Mill	ϕ0.4~3.0	CBN	Non-coat/ BANCERA	2	0				◎																	◎	◎		◎	◎	◎	◎	◎	◎										67
CLB200	CBN长颈球头铣刀 CBN Long Neck Ball End Mill	ϕ1.0~3.0	CBN	Non-coat/ BANCERA	2	0			◎	◎																	◎	◎		◎	◎	◎	◎	◎	◎										61
CLR200	CBN长颈圆角铣刀 CBN Long Neck Radius End Mill	ϕ0.1~3.0	CBN	Non-coat/ BANCERA	2	0	◎	◎	◎																		◎	◎		◎	◎	◎	◎	◎	◎										49
CLR400	CBN长颈圆角铣刀 CBN Long Neck Radius End Mill	ϕ1.0~5.0	CBN	Non-coat/ BANCERA	4	0	◎	◎	◎																		◎	◎		◎	◎	◎	◎	◎	◎										53
CR200	CBN超硬圆角铣刀 CBN Radius End Mill	ϕ0.1~3.0	CBN	Non-coat/ BANCERA	2	0	◎	◎	◎																		◎	◎		◎	◎	◎	◎	◎	◎										35
CR300	CBN超硬圆角铣刀 CBN Radius End Mill	ϕ0.6/ϕ0.8	CBN	Non-coat/ BANCERA	3	0	◎	◎	◎																		◎	◎		◎	◎	◎	◎	◎	◎										41
CR400	CBN超硬圆角铣刀 CBN Radius End Mill	ϕ1.0~6.0	CBN	Non-coat/ BANCERA	4	0	◎	◎	◎																		◎	◎		◎	◎	◎	◎	◎	◎										43
CR600	CBN超硬圆角铣刀 CBN Radius End Mill	ϕ4.0~6.0	CBN	Non-coat/ BANCERA	6	0	◎	◎	◎																		◎	◎		◎	◎	◎	◎	◎	◎										47
CRL200	CBN抛光圆角铣刀 CBN Lapping Radius End Mill	ϕ0.4~3.0	CBN	Non-coat/ BANCERA	2	0		◎	◎	◎																	◎	◎		◎	◎	◎	◎	◎	◎										65
CTP200	CBN锥形铣刀 CBN Taper End Mill	ϕ0.05/0.1	CBN	Non-coat/ BANCERA	2	0	◎	◎																			◎	◎		◎	◎	◎	◎	◎	◎										63
DLCS245	超硬平角铣刀 Carbide Square End Mill	ϕ1.0~12.0	WC	DLC	2	45	◎	◎	◎																							◎	◎	○										301
HAB230	超硬球头铣刀 Carbide Ball End Mill	ϕ0.1~12.0	WC	Hard Star Type A	2	30			◎	◎																	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎							115
HALB230	超硬长颈球头铣刀 Carbide Long Neck Ball End Mill	ϕ0.1~6.0	WC	Hard Star Type A	2	30			◎	◎																	◎	◎	◎	◎	◎	◎	◎	◎	◎			◎							119
HALR230	超硬长颈圆角铣刀 Carbide Long Neck Radius End Mill	ϕ0.2~0.9	WC	Hard Star Type A	2	30	◎	◎	◎																		◎	◎	◎	◎	◎	◎	◎	◎	◎			◎							97
HALR330	超硬长颈圆角铣刀 Carbide Long Neck Radius End Mill	ϕ0.6~0.8	WC	Hard Star Type A	3	30	◎	◎	◎																		◎	◎	◎	◎	◎	◎	◎	◎	◎			◎							101
HALR430	超硬长颈圆角铣刀 Carbide Long Neck Radius End Mill	ϕ0.9~6.0	WC	Hard Star Type A	4	30	◎	◎	◎																		◎	◎	◎	◎	◎	◎	◎	◎	◎			◎							105
HALS230	超硬长颈平角铣刀 Carbide Long Neck Square End Mill	ϕ0.1~6.0	WC	Hard Star Type A	2	30	◎	◎	◎																		◎	◎	◎	◎	◎	◎	◎	◎	◎			◎							77
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HAS430	超硬平角铣刀 Carbide Square End Mill	ϕ1.0~12.0	WC	Hard Star Type A	4	30	◎	◎	◎																		◎	◎	◎	◎	◎	◎	◎	◎	◎			◎							73
HAS630	超硬平角铣刀 Carbide Square End Mill	ϕ5.0~12.0	WC	Hard Star Type A	6	30	◎	◎	◎																		◎	◎	◎	◎	◎	◎	◎	◎	◎			◎							75
HTIR499	超硬圆角铣刀 Carbide Radius End Mill	ϕ3.0~12.0	WC	Hard Star Type TI	4	40/42	◎	◎	◎																											◎							135
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IALB230	超硬长颈球头铣刀 Carbide Long Neck Ball End Mill	ϕ0.1~6.0	WC	ion Depo Type A	2	30				◎			◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎											◎	◎	○	○			○				235
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IALR430	超硬长颈圆角铣刀 Carbide Long Neck Radius End Mill	ϕ1.0~6.0	WC	ion Depo Type A	4	30	◎	◎	◎				◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎											◎	◎	○	○			○				213
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IAR430	超硬圆角铣刀 Carbide Radius End Mill	ϕ1.0~20.0	WC	ion Depo Type A	4	30	◎	◎	◎				◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎											◎	◎	○	○			○				197
IAS230	超硬平角铣刀 Carbide Square End Mill	ϕ0.1~20.0	WC	ion Depo Type A	2	30	◎	◎	◎				◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎											◎	◎	○	○			○				143
IAS430	超硬平角铣刀 Carbide Square End Mill	ϕ1.0~20.0	WC	ion Depo Type A	4	30	◎	◎	◎				◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎											◎	◎	○	○			○				159
IRD230	超硬钻头 Carbide Drill	ϕ1.0~20.0	WC	ion Depo Type R	2	30					◎		◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎											◎	◎	○	○			○				317

◎:最佳 Excellent　○适合 Good

| 型号 Model | 品名 Product Name | 尺寸 Size | 材质 Material | 涂层 Coating | 刃数 Number of Flutes | 螺旋角 Helix Angle | 适合加工形状 Processes Shape | | | | | | 适合切削材料 Work Material | | | | | |

立铣刀&钻头目录　End Mill & Drill table of contents

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CBN Series

CBN立铣刀 CBN End Mill

Non | BANCERA | CBN | 刀刃数 2~6 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005

特 征

- 高精度和长寿命的CBN立铣刀实现了超精密加工!
- 最多可进行 8 次再研磨,大幅降低总加工成本!
- 还可以提供可以提高耐磨性的BANCERA涂层(陶瓷材质)!
- 刀刃直径Φ0.1～6.0的标准产品种类齐全,定制产品制作周期短!

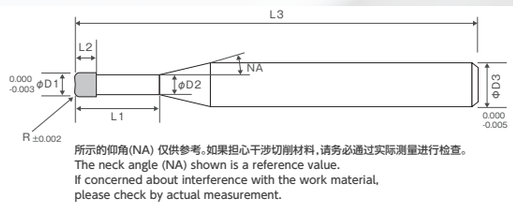
Features

- TOWA CBN end mill realizes ultra-precision machining with high accuracy and long life.
- Re-grinding is possible up to 8 times, reducing overall tooling cost.
- BANCERA coating (ceramic type) for improved wear resistance is available.
- Standard product lineup with diameters of Φ0.1 to 6.0, custom diameter/length available.

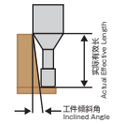
CBN圆角立铣刀 CBN Radius End Mill

■型号:CR200 Model number:CR200

Non | BANCERA | CBN | 刀刃数 2 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



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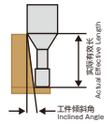
单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
										30'	1°	1°30'	2°	3°
CR200-0010-0010-0020	0.1	0.01	0.2	0.07	0.08	15	4	50	32,160	0.24	0.25	0.26	0.27	0.29
CR200-0010-0020-0020		0.02	0.2	0.04	0.08	15	4	50	32,160	0.24	0.25	0.26	0.27	0.29
CR200-0010-0020-0030		0.02	0.3	0.04	0.08	15	4	50	32,640	0.35	0.36	0.37	0.38	0.41
CR200-0010-0030-0020		0.03	0.2	0.04	0.08	15	4	50	30,720	0.24	0.25	0.26	0.27	0.29
CR200-0010-0030-0030		0.03	0.3	0.04	0.08	15	4	50	31,200	0.35	0.36	0.37	0.38	0.41
CR200-0015-0020-0020	0.15	0.02	0.2	0.06	0.13	15	4	50	32,160	0.24	0.25	0.26	0.27	0.29
CR200-0015-0020-0030		0.02	0.3	0.06	0.13	15	4	50	32,640	0.35	0.36	0.37	0.38	0.41
CR200-0015-0030-0020		0.03	0.2	0.06	0.13	15	4	50	30,720	0.24	0.25	0.26	0.27	0.29
CR200-0015-0030-0030		0.03	0.3	0.06	0.13	15	4	50	31,200	0.35	0.36	0.37	0.38	0.41
CR200-0020-0010-0050	0.2	0.01	0.5	0.3	0.17	15	4	50	24,480	0.57	0.59	0.62	0.64	0.69
CR200-0020-0020-0030		0.02	0.3	0.08	0.17	15	4	50	24,480	0.37	0.38	0.39	0.41	0.44
CR200-0020-0020-0050		0.02	0.5	0.08	0.17	15	4	50	24,480	0.57	0.59	0.61	0.64	0.69
CR200-0020-0030-0030		0.03	0.3	0.08	0.17	15	4	50	22,000	0.37	0.38	0.39	0.40	0.44
CR200-0020-0030-0050		0.03	0.5	0.3	0.17	15	4	50	22,000	0.57	0.59	0.61	0.63	0.68
CR200-0020-0050-0030		0.05	0.3	0.08	0.17	15	4	50	22,000	0.37	0.38	0.39	0.40	0.43
CR200-0020-0050-0050		0.05	0.5	0.08	0.17	15	4	50	22,000	0.57	0.59	0.61	0.63	0.68
CR200-0030-0020-0050	0.3	0.02	0.5	0.3	0.27	15	4	50	24,160	0.57	0.59	0.61	0.64	0.69
CR200-0030-0020-0075		0.02	0.75	0.13	0.27	15	4	50	24,320	0.83	0.86	0.89	0.92	1.00
CR200-0030-0030-0050		0.03	0.5	0.13	0.27	15	4	50	21,760	0.57	0.59	0.61	0.63	0.68
CR200-0030-0030-0075		0.03	0.75	0.13	0.27	15	4	50	21,920	0.83	0.86	0.89	0.92	0.99
CR200-0030-0050-0050		0.05	0.5	0.3	0.27	15	4	50	21,760	0.57	0.59	0.61	0.63	0.68
CR200-0030-0050-0075		0.05	0.75	0.13	0.27	15	4	50	21,920	0.83	0.86	0.89	0.92	0.99
CR200-0040-0020-0050	0.4	0.02	0.5	0.24	0.37	15	4	50	22,960	0.57	0.59	0.61	0.64	0.69
CR200-0040-0020-0100		0.02	1	0.24	0.37	15	4	50	23,120	1.09	1.13	1.17	1.21	1.31
CR200-0040-0030-0050		0.03	0.5	0.3	0.37	15	4	50	20,640	0.57	0.59	0.61	0.63	0.68
CR200-0040-0030-0100		0.03	1	0.24	0.37	15	4	50	20,800	1.09	1.13	1.17	1.21	1.31
CR200-0040-0050-0050		0.05	0.5	0.3	0.37	15	4	50	20,640	0.57	0.59	0.61	0.63	0.68
CR200-0040-0050-0100		0.05	1	0.24	0.37	15	4	50	20,800	1.09	1.13	1.17	1.21	1.30
CR200-0040-0100-0050		0.1	0.5	0.3	0.37	15	4	50	20,640	0.57	0.59	0.61	0.62	0.67
CR200-0040-0100-0100		0.1	1	0.24	0.37	15	4	50	20,800	1.09	1.12	1.16	1.20	1.29
CR200-0050-0020-0050	0.5	0.02	0.5	0.3	0.47	15	4	50	18,880	0.57	0.59	0.61	0.64	0.69
CR200-0050-0020-0100		0.02	1	0.3	0.47	15	4	50	19,040	1.09	1.13	1.17	1.21	1.31
CR200-0050-0030-0050		0.03	0.5	0.3	0.47	15	4	50	16,960	0.57	0.59	0.61	0.63	0.68
CR200-0050-0030-0100		0.03	1	0.3	0.47	15	4	50	17,120	1.09	1.13	1.17	1.21	1.31
CR200-0050-0050-0050		0.05	0.5	0.3	0.47	15	4	50	16,960	0.57	0.59	0.61	0.63	0.68
CR200-0050-0050-0100		0.05	1	0.3	0.47	15	4	50	17,120	1.09	1.13	1.17	1.21	1.30
CR200-0050-0100-0050		0.1	0.5	0.3	0.47	15	4	50	16,960	0.57	0.59	0.61	0.62	0.67
CR200-0050-0100-0100		0.1	1	0.3	0.47	15	4	50	17,120	1.09	1.12	1.16	1.20	1.29
CR200-0060-0020-0050	0.6	0.02	0.5	0.3	0.57	15	4	50	18,880	0.57	0.59	0.61	0.64	0.69
CR200-0060-0020-0100		0.02	1	0.3	0.57	15	4	50	19,040	1.09	1.13	1.17	1.21	1.31
CR200-0060-0020-0150		0.02	1.5	0.3	0.57	15	4	50	19,200	1.61	1.66	1.72	1.79	1.93
CR200-0060-0030-0050		0.03	0.5	0.3	0.57	15	4	50	16,960	0.57	0.59	0.61	0.63	0.68
CR200-0060-0030-0100		0.03	1	0.3	0.57	15	4	50	17,120	1.09	1.13	1.17	1.21	1.31
CR200-0060-0030-0150		0.03	1.5	0.3	0.57	15	4	50	17,280	1.61	1.66	1.72	1.78	1.93
CR200-0060-0030-0170		0.03	1.7	0.7	0.57	15	4	50	17,280	1.81	1.88	1.94	2.01	2.18



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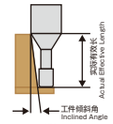
单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
										30'	1°	1°30'	2°	3°
CR200-0060-0050-0050	0.6	0.05	0.5	0.3	0.57	15	4	50	16,960	0.57	0.59	0.61	0.63	0.68
CR200-0060-0050-0100		0.05	1	0.3	0.57	15	4	50	17,120	1.09	1.13	1.17	1.21	1.30
CR200-0060-0050-0150		0.05	1.5	0.3	0.57	15	4	50	17,280	1.61	1.66	1.72	1.78	1.92
CR200-0060-0050-0170		0.05	1.7	0.7	0.57	15	4	50	17,280	1.81	1.87	1.94	2.01	2.17
CR200-0060-0100-0050		0.1	0.5	0.3	0.57	15	4	50	16,960	0.57	0.59	0.61	0.62	0.67
CR200-0060-0100-0100		0.1	1	0.3	0.57	15	4	50	17,120	1.09	1.12	1.16	1.20	1.29
CR200-0060-0100-0150		0.1	1.5	0.3	0.57	15	4	50	17,280	1.61	1.66	1.71	1.77	1.91
CR200-0060-0100-0170		0.1	1.7	0.7	0.57	15	4	50	17,280	1.81	1.87	1.94	2.00	2.16
CR200-0060-0200-0170		0.2	1.7	0.7	0.57	15	4	50	17,280	1.81	1.86	1.92	1.99	2.14
CR200-0080-0020-0150	0.8	0.02	1.5	0.56	0.77	15	4	50	19,200	1.61	1.66	1.72	1.79	1.93
CR200-0080-0030-0150		0.03	1.5	0.56	0.77	15	4	50	17,280	1.61	1.66	1.72	1.78	1.93
CR200-0080-0050-0150		0.05	1.5	0.56	0.77	15	4	50	17,280	1.61	1.66	1.72	1.78	1.92
CR200-0080-0100-0150		0.1	1.5	0.56	0.77	15	4	50	17,280	1.61	1.66	1.71	1.77	1.91
CR200-0100-0020-0100	1	0.02	1	0.7	0.96	15	4	50	17,600	1.11	1.15	1.19	1.23	1.33
CR200-0100-0020-0200		0.02	2	0.7	0.96	15	4	50	17,600	2.14	2.22	2.30	2.38	2.57
CR200-0100-0030-0100		0.03	1	0.7	0.96	15	4	50	15,840	1.11	1.15	1.19	1.23	1.33
CR200-0100-0030-0200		0.03	2	0.7	0.96	15	4	50	15,840	2.14	2.22	2.30	2.38	2.57
CR200-0100-0050-0100		0.05	1	0.7	0.96	15	4	50	15,840	1.11	1.15	1.19	1.23	1.32
CR200-0100-0050-0200		0.05	2	0.7	0.96	15	4	50	15,840	2.14	2.22	2.29	2.38	2.57
CR200-0100-0050-0220		0.05	2.2	1.2	0.96	15	4	50	15,840	2.35	2.43	2.52	2.61	2.82
CR200-0100-0100-0100		0.1	1	0.7	0.96	15	4	50	15,840	1.11	1.14	1.18	1.22	1.31
CR200-0100-0100-0200		0.1	2	0.7	0.96	15	4	50	15,840	2.14	2.21	2.29	2.37	2.56
CR200-0100-0100-0220		0.1	2.2	1.2	0.96	15	4	50	15,840	2.35	2.43	2.51	2.60	2.80
CR200-0100-0200-0100		0.2	1	0.7	0.96	15	4	50	15,840	1.10	1.14	1.17	1.21	1.29
CR200-0100-0200-0200		0.2	2	0.7	0.96	15	4	50	15,840	2.14	2.21	2.28	2.36	2.53
CR200-0100-0200-0220		0.2	2.2	1.2	0.96	15	4	50	15,840	2.34	2.42	2.50	2.59	2.78
CR200-0100-0300-0220		0.3	2.2	1.2	0.96	15	4	50	15,840	2.34	2.41	2.49	2.57	2.76
CR200-0150-0020-0200	1.5	0.02	2	1	1.44	15	4	50	20,720	2.18	2.26	2.34	2.43	2.62
CR200-0150-0020-0300		0.02	3	1	1.44	15	4	50	20,720	3.22	3.33	3.45	3.58	3.86
CR200-0150-0030-0200		0.03	2	1	1.44	15	4	50	18,640	2.18	2.26	2.34	2.42	2.62
CR200-0150-0030-0300		0.03	3	1	1.44	15	4	50	18,640	3.22	3.33	3.45	3.57	3.86
CR200-0150-0050-0200		0.05	2	1	1.44	15	4	50	18,640	2.18	2.26	2.34	2.42	2.61
CR200-0150-0050-0300		0.05	3	1.5	1.44	15	4	50	18,640	3.22	3.33	3.44	3.57	3.86
CR200-0150-0100-0200		0.1	2	1	1.44	15	4	50	18,640	2.18	2.25	2.33	2.41	2.60
CR200-0150-0100-0300		0.1	3	1.5	1.44	15	4	50	18,640	3.21	3.32	3.44	3.56	3.85
CR200-0150-0200-0200		0.2	2	1	1.44	15	4	50	18,640	2.18	2.25	2.32	2.40	2.58
CR200-0150-0200-0300		0.2	3	1.5	1.44	15	4	50	18,640	3.21	3.31	3.43	3.55	3.82
CR200-0150-0300-0200		0.3	2	1	1.44	15	4	50	18,640	2.17	2.24	2.31	2.38	2.56
CR200-0150-0300-0300		0.3	3	1.5	1.44	15	4	50	18,640	3.21	3.31	3.42	3.53	3.80
CR200-0200-0020-0300	2	0.02	3	1.2	1.96	15	4	50	21,360	3.18	3.29	3.41	3.53	3.82
CR200-0200-0020-0400		0.02	4	1.2	1.96	15	4	50	21,360	4.21	4.36	4.51	4.68	5.06
CR200-0200-0030-0300		0.03	3	1.2	1.96	15	4	50	19,200	3.18	3.29	3.40	3.53	3.82
CR200-0200-0030-0400		0.03	4	1.2	1.96	15	4	50	19,200	4.21	4.36	4.51	4.68	5.06
CR200-0200-0050-0300		0.05	3	1.2	1.96	15	4	50	19,200	3.18	3.29	3.40	3.53	3.81
CR200-0200-0050-0400		0.05	4	1.2	1.96	15	4	50	19,200	4.21	4.36	4.51	4.68	5.05



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
										30'	1°	1°30'	2°	3°
CR200-0200-0050-0500	2	0.05	5	2	1.96	15	4	50	19,200	5.24	5.42	5.62	5.83	6.30
CR200-0200-0100-0300		0.1	3	1.2	1.96	15	4	50	19,200	3.17	3.28	3.40	3.52	3.80
CR200-0200-0100-0400		0.1	4	1.2	1.96	15	4	50	19,200	4.21	4.35	4.51	4.67	5.04
CR200-0200-0100-0500		0.1	5	2	1.96	15	4	50	19,200	5.24	5.42	5.61	5.82	6.29
CR200-0200-0200-0300		0.2	3	1.2	1.96	15	4	50	19,200	3.17	3.28	3.39	3.51	3.78
CR200-0200-0200-0400		0.2	4	1.2	1.96	15	4	50	19,200	4.21	4.34	4.49	4.66	5.02
CR200-0200-0200-0500		0.2	5	2	1.96	15	4	50	19,200	5.24	5.41	5.60	5.81	6.26
CR200-0200-0300-0300		0.3	3	1.2	1.96	15	4	50	19,200	3.17	3.27	3.38	3.49	3.75
CR200-0200-0300-0400		0.3	4	1.2	1.96	15	4	50	19,200	4.20	4.34	4.48	4.64	5.00
CR200-0200-0300-0500		0.3	5	2	1.96	15	4	50	19,200	5.24	5.41	5.59	5.79	6.24
CR200-0200-0500-0300		0.5	3	1.2	1.96	15	4	50	19,200	3.16	3.25	3.35	3.46	3.71
CR200-0200-0500-0400		0.5	4	1.2	1.96	15	4	50	19,200	4.20	4.32	4.46	4.61	4.95
CR200-0300-0050-0500	3	0.05	5	2	2.92	15	6	50	21,120	5.32	5.50	5.70	5.91	6.39
CR200-0300-0100-0500		0.1	5	2	2.92	15	6	50	21,120	5.32	5.50	5.70	5.91	6.38
CR200-0300-0200-0500		0.2	5	2	2.92	15	6	50	21,120	5.32	5.49	5.69	5.89	6.35
CR200-0300-0300-0500		0.3	5	2	2.92	15	6	50	21,120	5.31	5.49	5.67	5.88	6.33

CBN Series

CBN 切削条件参考表
Recommended Milling Conditions

■型号:CR200
Model number:CR200

圆角立铣刀 Radius End Mill

切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.2	0.002	0.015	200	50,000	0.002	0.015	200	50,000	0.002	0.01	150	50,000	0.001	0.01	100	50,000
		0.3	0.002	0.015	150	50,000	0.002	0.015	150	50,000	0.001	0.01	100	50,000	0.001	0.01	50	50,000
	0.15	0.2	0.003	0.02	200	50,000	0.003	0.02	200	50,000	0.003	0.02	150	50,000	0.002	0.015	100	50,000
		0.3	0.003	0.02	200	50,000	0.003	0.02	200	50,000	0.003	0.02	150	50,000	0.002	0.015	100	50,000
	0.2	0.3	0.003	0.03	300	50,000	0.003	0.03	300	50,000	0.003	0.03	300	50,000	0.002	0.02	200	50,000
		0.5	0.003	0.03	300	50,000	0.003	0.03	300	50,000	0.003	0.03	300	50,000	0.002	0.02	200	50,000
	0.3	0.5	0.003	0.05	500	50,000	0.003	0.05	500	50,000	0.003	0.05	400	50,000	0.002	0.03	300	50,000
		0.75	0.003	0.05	500	50,000	0.003	0.05	500	50,000	0.003	0.05	400	50,000	0.002	0.03	300	50,000
	0.4	0.5	0.005	0.1	700	50,000	0.005	0.1	700	50,000	0.005	0.1	600	50,000	0.003	0.03	400	50,000
		1	0.005	0.1	700	50,000	0.005	0.1	700	50,000	0.005	0.1	600	50,000	0.003	0.03	400	50,000
	0.5	0.5	0.01	0.2	800	50,000	0.01	0.2	800	50,000	0.01	0.2	800	50,000	0.01	0.1	700	50,000
		1	0.01	0.2	800	50,000	0.01	0.2	800	50,000	0.01	0.2	800	50,000	0.01	0.1	700	50,000
	0.6	0.5	0.01	0.2	600	50,000	0.01	0.2	600	50,000	0.01	0.2	600	50,000	0.005	0.2	500	50,000
		1	0.01	0.2	600	50,000	0.01	0.2	600	50,000	0.01	0.2	600	50,000	0.005	0.2	500	50,000
		1.5	0.01	0.2	600	50,000	0.01	0.2	600	50,000	0.01	0.2	600	50,000	0.005	0.2	500	50,000
		1.7	0.01	0.2	600	50,000	0.01	0.2	600	50,000	0.01	0.2	600	50,000	0.005	0.2	500	50,000
	0.8	1.5	0.02	0.3	1,400	50,000	0.02	0.3	1,400	50,000	0.02	0.2	1,200	50,000	0.01	0.1	1,000	40,000
	1	1	0.02	0.4	1,500	48,000	0.02	0.4	1,500	48,000	0.02	0.3	1,200	48,000	0.01	0.2	1,000	32,000
		2	0.02	0.4	1,500	48,000	0.02	0.4	1,500	48,000	0.02	0.3	1,200	48,000	0.01	0.2	1,000	32,000
		2.2	0.02	0.4	1,500	48,000	0.02	0.4	1,500	48,000	0.02	0.3	1,200	48,000	0.01	0.2	1,000	32,000
	1.5	2	0.03	0.5	1,000	32,000	0.03	0.5	1,000	32,000	0.03	0.4	1,000	32,000	0.01	0.2	800	20,000
		3	0.02	0.5	2,000	32,000	0.02	0.5	2,000	32,000	0.02	0.4	1,500	32,000	0.01	0.2	1,200	20,000
	2	3	0.03	0.8	2,000	24,000	0.03	0.8	2,000	24,000	0.03	0.7	1,500	24,000	0.01	0.5	1,100	16,000
		4	0.03	0.8	2,000	24,000	0.03	0.8	2,000	24,000	0.03	0.7	1,500	24,000	0.01	0.5	1,100	16,000
		5	0.03	0.8	2,000	24,000	0.03	0.8	2,000	24,000	0.03	0.7	1,500	24,000	0.01	0.5	1,200	16,000
	3	5	0.03	0.6	2,000	24,000	0.03	0.6	2,000	24,000	0.03	0.5	1,500	24,000	0.01	0.3	1,200	16,000

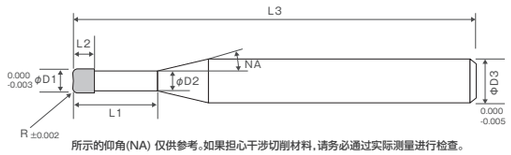
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.

●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

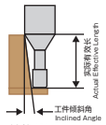
CBN圆角立铣刀 CBN Radius End Mill

■型号:CR300 Model number:CR300

Non | BANCERA | CBN | 刀刃数 3 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CR300-0060-0020-0050		0.02	0.5	0.3	0.57	15	4	50	22,720	0.57	0.59	0.61	0.64	0.69
CR300-0060-0020-0100		0.02	1	0.3	0.57	15	4	50	22,880	1.09	1.13	1.17	1.21	1.31
CR300-0060-0020-0150		0.02	1.5	0.3	0.57	15	4	50	23,040	1.61	1.66	1.72	1.79	1.93
CR300-0060-0020-0200		0.02	2	0.3	0.57	15	4	50	24,960	2.12	2.20	2.28	2.36	2.55
CR300-0060-0020-0250		0.02	2.5	0.3	0.57	15	4	50	25,200	2.64	2.73	2.83	2.94	3.17
CR300-0060-0030-0170		0.03	1.7	0.7	0.57	15	4	50	20,800	1.81	1.88	1.94	2.01	2.18
CR300-0060-0050-0050		0.05	0.5	0.3	0.57	15	4	50	20,400	0.57	0.59	0.61	0.63	0.68
CR300-0060-0050-0100		0.05	1	0.3	0.57	15	4	50	20,560	1.09	1.13	1.17	1.21	1.30
CR300-0060-0050-0150		0.05	1.5	0.3	0.57	15	4	50	20,800	1.61	1.66	1.72	1.78	1.92
CR300-0060-0050-0170	0.6	0.05	1.7	0.7	0.57	15	4	50	20,800	1.81	1.87	1.94	2.01	2.17
CR300-0060-0050-0200		0.05	2	0.3	0.57	15	4	50	21,600	2.12	2.20	2.27	2.36	2.54
CR300-0060-0050-0250		0.05	2.5	0.3	0.57	15	4	50	22,720	2.64	2.73	2.83	2.93	3.17
CR300-0060-0100-0050		0.1	0.5	0.3	0.57	15	4	50	20,400	0.57	0.59	0.61	0.62	0.67
CR300-0060-0100-0100		0.1	1	0.3	0.57	15	4	50	20,560	1.09	1.12	1.16	1.20	1.29
CR300-0060-0100-0150		0.1	1.5	0.3	0.57	15	4	50	20,800	1.61	1.66	1.71	1.77	1.91
CR300-0060-0100-0170		0.1	1.7	0.7	0.57	15	4	50	20,800	1.81	1.87	1.94	2.00	2.16
CR300-0060-0100-0200		0.1	2	0.3	0.57	15	4	50	21,600	2.12	2.19	2.27	2.35	2.53
CR300-0060-0100-0250		0.1	2.5	0.3	0.57	15	4	50	22,720	2.64	2.73	2.82	2.92	3.15
CR300-0060-0200-0170		0.2	1.7	0.7	0.57	15	4	50	20,800	1.81	1.86	1.92	1.99	2.14
CR300-0080-0020-0150		0.02	1.5	0.56	0.77	15	4	50	23,040	1.61	1.66	1.72	1.79	1.93
CR300-0080-0020-0250		0.02	2.5	0.56	0.77	15	4	50	25,280	2.64	2.73	2.83	2.94	3.17
CR300-0080-0020-0500		0.02	5	0.56	0.77	15	4	50	26,160	5.23	5.41	5.60	5.81	6.28
CR300-0080-0050-0150		0.05	1.5	0.56	0.77	15	4	50	20,800	1.61	1.66	1.72	1.78	1.92
CR300-0080-0050-0250	0.8	0.05	2.5	0.56	0.77	15	4	50	22,720	2.64	2.73	2.83	2.93	3.17
CR300-0080-0050-0500		0.05	5	0.56	0.77	15	4	50	23,440	5.22	5.40	5.60	5.81	6.27
CR300-0080-0100-0150		0.1	1.5	0.56	0.77	15	4	50	20,800	1.61	1.66	1.71	1.77	1.91
CR300-0080-0100-0250		0.1	2.5	0.56	0.77	15	4	50	22,720	2.64	2.73	2.82	2.92	3.15
CR300-0080-0100-0500		0.1	5	0.56	0.77	15	4	50	23,440	5.22	5.40	5.59	5.80	6.26

CBN 切削条件参考表 Recommended Milling Conditions

■型号:CR300 Model number:CR300

圆角立铣刀 Radius End Mill

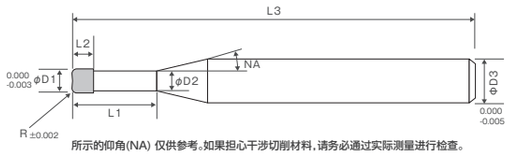
切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
3	0.6	0.5	0.008	0.2	1,500	50,000	0.008	0.2	1,500	50,000	0.005	0.15	800	50,000	0.003	0.1	600	50,000
		1	0.008	0.2	1,500	50,000	0.008	0.2	1,500	50,000	0.005	0.15	800	50,000	0.003	0.1	600	50,000
		1.5	0.008	0.2	1,500	50,000	0.008	0.2	1,500	50,000	0.005	0.15	800	50,000	0.003	0.1	600	50,000
		1.7	0.006	0.15	1,000	40,000	0.006	0.15	1,000	40,000	0.005	0.1	500	40,000	0.003	0.05	300	40,000
		2	0.006	0.15	1,000	40,000	0.006	0.15	1,000	40,000	0.005	0.1	500	40,000	0.003	0.05	300	40,000
		2.5	0.006	0.15	1,000	40,000	0.006	0.15	1,000	40,000	0.005	0.1	500	40,000	0.003	0.05	300	40,000
	0.8	1.5	0.012	0.4	2,000	40,000	0.012	0.4	2,000	40,000	0.007	0.25	1,000	40,000	0.006	0.15	800	35,000
		2.5	0.012	0.4	2,000	40,000	0.012	0.4	2,000	40,000	0.007	0.25	1,000	40,000	0.006	0.15	800	35,000
		5	0.008	0.3	1,500	30,000	0.008	0.3	1,500	30,000	0.005	0.15	800	30,000	0.004	0.1	400	25,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

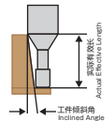
CBN圆角立铣刀 CBN Radius End Mill

■型号:CR400 Model number:CR400

Non | BANCERA | CBN | 刀刃数 4 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005



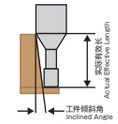
所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angler	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CR400-0100-0020-0100		0.02	1	0.7	0.96	15	4	50	21,120	1.11	1.15	1.19	1.23	1.33
CR400-0100-0020-0200		0.02	2	0.7	0.96	15	4	50	21,120	2.14	2.22	2.30	2.38	2.57
CR400-0100-0050-0100		0.05	1	0.7	0.96	15	4	50	19,040	1.11	1.15	1.19	1.23	1.32
CR400-0100-0050-0200		0.05	2	0.7	0.96	15	4	50	19,040	2.14	2.22	2.29	2.38	2.57
CR400-0100-0050-0220		0.05	2.2	1.2	0.96	15	4	50	19,040	2.35	2.43	2.52	2.61	2.82
CR400-0100-0100-0100		0.1	1	0.7	0.96	15	4	50	19,040	1.11	1.14	1.18	1.22	1.31
CR400-0100-0100-0200	1	0.1	2	0.7	0.96	15	4	50	19,040	2.14	2.21	2.29	2.37	2.56
CR400-0100-0100-0220		0.1	2.2	1.2	0.96	15	4	50	19,040	2.35	2.43	2.51	2.60	2.80
CR400-0100-0200-0100		0.2	1	0.7	0.96	15	4	50	19,040	1.10	1.14	1.17	1.21	1.29
CR400-0100-0200-0200		0.2	2	0.7	0.96	15	4	50	19,040	2.14	2.21	2.28	2.36	2.53
CR400-0100-0200-0220		0.2	2.2	1.2	0.96	15	4	50	19,040	2.34	2.42	2.50	2.59	2.78
CR400-0100-0300-0220		0.3	2.2	1.2	0.96	15	4	50	19,040	2.34	2.41	2.49	2.57	2.76
CR400-0150-0020-0200		0.02	2	1	1.44	15	4	50	24,880	2.18	2.26	2.34	2.43	2.62
CR400-0150-0020-0300		0.02	3	1	1.44	15	4	50	24,880	3.22	3.33	3.45	3.58	3.86
CR400-0150-0050-0200		0.05	2	1	1.44	15	4	50	22,400	2.18	2.26	2.34	2.42	2.61
CR400-0150-0050-0300		0.05	3	1.5	1.44	15	4	50	22,400	3.22	3.33	3.44	3.57	3.86
CR400-0150-0100-0200	1.5	0.1	2	1	1.44	15	4	50	22,400	2.18	2.25	2.33	2.41	2.60
CR400-0150-0100-0300		0.1	3	1.5	1.44	15	4	50	22,400	3.21	3.32	3.44	3.56	3.85
CR400-0150-0200-0200		0.2	2	1	1.44	15	4	50	22,400	2.18	2.25	2.32	2.40	2.58
CR400-0150-0200-0300		0.2	3	1.5	1.44	15	4	50	22,400	3.21	3.31	3.43	3.55	3.82
CR400-0150-0300-0300		0.3	3	1.5	1.44	15	4	50	22,400	3.21	3.31	3.42	3.53	3.80
CR400-0200-0020-0300		0.02	3	1.2	1.96	15	4	50	25,680	3.18	3.29	3.41	3.53	3.82
CR400-0200-0020-0400		0.02	4	1.2	1.96	15	4	50	25,680	4.21	4.36	4.51	4.68	5.06
CR400-0200-0050-0300		0.05	3	1.2	1.96	15	4	50	23,040	3.18	3.29	3.40	3.53	3.81
CR400-0200-0050-0400		0.05	4	1.2	1.96	15	4	50	23,040	4.21	4.36	4.51	4.68	5.05
CR400-0200-0050-0500	2	0.05	5	2	1.96	15	4	50	23,040	5.24	5.42	5.62	5.83	6.30
CR400-0200-0100-0300		0.1	3	1.2	1.96	15	4	50	23,040	3.17	3.28	3.40	3.52	3.80
CR400-0200-0100-0400		0.1	4	1.2	1.96	15	4	50	23,040	4.21	4.35	4.51	4.67	5.04
CR400-0200-0100-0500		0.1	5	2	1.96	15	4	50	23,040	5.24	5.42	5.61	5.82	6.29
CR400-0200-0200-0300		0.2	3	1.2	1.96	15	4	50	23,040	3.17	3.28	3.39	3.51	3.78



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CR400-0200-0200-0400	2	0.2	4	1.2	1.96	15	4	50	23,040	4.21	4.34	4.49	4.66	5.02
CR400-0200-0200-0500		0.2	5	2	1.96	15	4	50	23,040	5.24	5.41	5.60	5.81	6.26
CR400-0200-0300-0500		0.3	5	2	1.96	15	4	50	23,040	5.24	5.41	5.59	5.79	6.24
CR400-0300-0050-0500	3	0.05	5	2	2.92	15	6	50	29,760	5.32	5.50	5.70	5.91	6.39
CR400-0300-0100-0500		0.1	5	2	2.92	15	6	50	29,760	5.32	5.50	5.70	5.91	6.38
CR400-0300-0200-0500		0.2	5	2	2.92	15	6	50	29,760	5.32	5.49	5.69	5.89	6.35
CR400-0300-0300-0500		0.3	5	2	2.92	15	6	50	29,760	5.31	5.49	5.67	5.88	6.33
CR400-0400-0100-1000	4	0.1	10	2	3.92	15	6	50	36,480	10.49	10.85	11.24	11.66	12.59
CR400-0400-0300-1000		0.3	10	2	3.92	15	6	50	36,480	10.48	10.84	11.22	11.63	12.55
CR400-0600-0050-1500	6	0.05	15	2	5.92	15	6	50	52,590	FREE	FREE	FREE	FREE	FREE
CR400-0600-0100-1000		0.1	10	2	5.92	15	6	50	50,460	FREE	FREE	FREE	FREE	FREE
CR400-0600-0100-1500		0.1	15	2	5.92	15	6	50	52,590	FREE	FREE	FREE	FREE	FREE
CR400-0600-0300-1000		0.3	10	2	5.92	15	6	50	50,460	FREE	FREE	FREE	FREE	FREE
CR400-0600-0300-1500		0.3	15	2	5.92	15	6	50	52,590	FREE	FREE	FREE	FREE	FREE
CR400-0600-0500-1500		0.5	15	2	5.92	15	6	50	52,590	FREE	FREE	FREE	FREE	FREE

CBN Series

CBN 切削条件参考表
Recommended Milling Conditions

■型号:CR400
Model number:CR400

圆角立铣刀 Radius End Mill

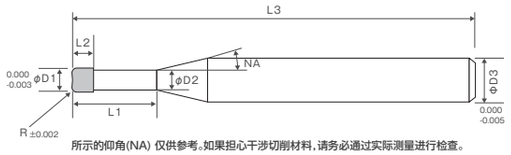
切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	1	0.02	0.4	2,200	40,000	0.02	0.4	2,200	40,000	0.02	0.3	2,000	40,000	0.01	0.2	1,500	36,000
		2	0.02	0.4	2,200	40,000	0.02	0.4	2,200	40,000	0.02	0.3	2,000	40,000	0.01	0.2	1,500	36,000
		2.2	0.02	0.3	2,200	40,000	0.02	0.3	2,200	40,000	0.02	0.2	2,000	40,000	0.01	0.1	1,500	36,000
	1.5	2	0.04	0.6	4,000	36,000	0.04	0.6	4,000	36,000	0.03	0.5	3,200	30,000	0.015	0.3	2,000	24,000
		3	0.04	0.6	3,500	36,000	0.04	0.6	3,500	36,000	0.03	0.5	2,800	30,000	0.015	0.3	1,800	24,000
	2	3	0.05	0.8	4,000	30,000	0.05	0.8	4,000	30,000	0.04	0.7	3,200	24,000	0.02	0.4	1,500	16,000
		4	0.05	0.8	3,500	30,000	0.05	0.8	3,500	30,000	0.04	0.7	2,800	24,000	0.02	0.3	1,500	16,000
		5	0.05	0.8	3,500	30,000	0.05	0.8	3,500	30,000	0.04	0.7	2,800	24,000	0.02	0.3	1,500	16,000
	3	5	0.05	1	3,500	24,000	0.05	1	3,500	24,000	0.04	0.85	3,200	20,000	0.02	0.6	1,500	12,000
	4	10	0.05	1.5	3,500	22,000	0.05	1.5	3,500	22,000	0.04	1	2,800	18,000	0.02	0.7	1,500	10,000
	6	10	0.07	2.5	3,000	18,000	0.07	2.5	3,000	18,000	0.06	2	2,800	16,000	0.05	1.5	1,400	9,000
		15	0.07	2	2,700	18,000	0.07	2	2,700	18,000	0.06	1.5	2,500	16,000	0.05	1	1,200	9,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

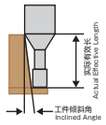
CBN圆角立铣刀 CBN Radius End Mill

■型号:CR600 Model number:CR600

Non | BANCERA | CBN | 刀刃数 6 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CR600-0400-0050-1500	4	0.05	15	2	3.92	15	6	50	45,620	15.66	16.20	16.78	17.41	18.82
CR600-0400-0100-1500		0.1	15	2	3.92	15	6	50	45,620	15.66	16.20	16.78	17.40	18.81
CR600-0400-0300-1500		0.3	15	2	3.92	15	6	50	45,620	15.65	16.18	16.76	17.38	18.76
CR600-0400-0500-1500		0.5	15	2	3.92	15	6	50	45,620	15.64	16.17	16.74	17.35	18.72
CR600-0500-0050-1500	5	0.05	15	2	4.92	15	6	50	53,180	15.66	16.20	16.78	FREE	FREE
CR600-0500-0100-1500		0.1	15	2	4.92	15	6	50	53,180	15.66	16.20	16.78	FREE	FREE
CR600-0500-0300-1500		0.3	15	2	4.92	15	6	50	53,180	15.65	16.18	16.76	FREE	FREE
CR600-0500-0500-1500		0.5	15	2	4.92	15	6	50	53,180	15.64	16.17	16.74	FREE	FREE
CR600-0600-0050-1500	6	0.05	15	2	5.92	15	6	50	63,120	FREE	FREE	FREE	FREE	FREE
CR600-0600-0100-1500		0.1	15	2	5.92	15	6	50	63,120	FREE	FREE	FREE	FREE	FREE
CR600-0600-0300-1500		0.3	15	2	5.92	15	6	50	63,120	FREE	FREE	FREE	FREE	FREE
CR600-0600-0500-1500		0.5	15	2	5.92	15	6	50	63,120	FREE	FREE	FREE	FREE	FREE

CBN 切削条件参考表
Recommended Milling Conditions

■型号:CR600
Model number:CR600

圆角立铣刀 Radius End Mill

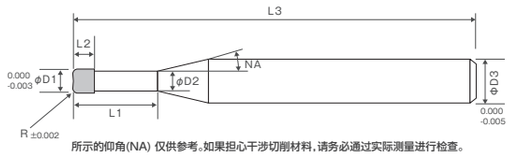
切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min^{-1}	∂p mm	∂e mm	mm/min	min^{-1}	∂p mm	∂e mm	mm/min	min^{-1}	∂p mm	∂e mm	mm/min	min^{-1}
6	4	15	0.06	1.5	3,200	18,000	0.06	1.5	3,200	18,000	0.05	1	3,000	16,000	0.04	0.7	1,600	8,000
	5	15	0.06	2	3,200	18,000	0.06	2	3,200	18,000	0.05	1.5	3,000	16,000	0.04	1	1,600	8,000
	6	15	0.07	2	2,900	16,000	0.07	2	2,900	16,000	0.06	1.5	2,700	14,000	0.05	1	1,400	7,000

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

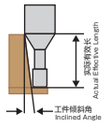
CBN长颈圆角立铣刀 CBN Long Neck Radius End Mill

Non | BANCERA | CBN | 刀刃数 2 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005

■型号:CLR200 Model number:CLR200



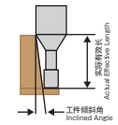
所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



单位(Size) : mm

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

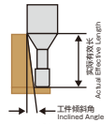
型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CLR200-0010-0020-0050	0.1	0.02	0.5	0.04	0.08	15	4	50	33,600	0.55	0.57	0.59	0.61	0.66
CLR200-0010-0030-0050		0.03	0.5	0.04	0.08	15	4	50	32,160	0.55	0.57	0.59	0.61	0.66
CLR200-0015-0020-0050	0.15	0.02	0.5	0.06	0.13	15	4	50	33,600	0.55	0.57	0.59	0.61	0.66
CLR200-0015-0030-0050		0.03	0.5	0.06	0.13	15	4	50	32,160	0.55	0.57	0.59	0.61	0.66
CLR200-0020-0020-0100	0.2	0.02	1	0.08	0.17	15	4	50	25,200	1.09	1.13	1.17	1.21	1.31
CLR200-0020-0030-0100		0.03	1	0.08	0.17	15	4	50	22,640	1.09	1.13	1.17	1.21	1.31
CLR200-0020-0050-0100		0.05	1	0.08	0.17	15	4	50	22,640	1.09	1.13	1.17	1.21	1.30
CLR200-0030-0020-0100	0.3	0.02	1	0.3	0.27	15	4	50	24,480	1.09	1.13	1.17	1.21	1.31
CLR200-0030-0020-0150		0.02	1.5	0.13	0.27	15	4	50	24,800	1.61	1.66	1.72	1.79	1.93
CLR200-0030-0020-0200		0.02	2	0.13	0.27	15	4	50	25,200	2.12	2.20	2.28	2.36	2.55
CLR200-0030-0030-0100		0.03	1	0.13	0.27	15	4	50	22,000	1.09	1.13	1.17	1.21	1.31
CLR200-0030-0030-0150		0.03	1.5	0.13	0.27	15	4	50	22,320	1.61	1.66	1.72	1.78	1.93
CLR200-0030-0030-0200		0.03	2	0.13	0.27	15	4	50	22,640	2.12	2.20	2.28	2.36	2.55
CLR200-0030-0050-0100		0.05	1	0.3	0.27	15	4	50	22,000	1.09	1.13	1.17	1.21	1.30
CLR200-0030-0050-0150		0.05	1.5	0.13	0.27	15	4	50	22,320	1.61	1.66	1.72	1.78	1.92
CLR200-0030-0050-0200		0.05	2	0.13	0.27	15	4	50	22,640	2.12	2.20	2.27	2.36	2.54
CLR200-0040-0020-0150	0.4	0.02	1.5	0.24	0.37	15	4	50	23,360	1.61	1.66	1.72	1.79	1.93
CLR200-0040-0020-0200		0.02	2	0.24	0.37	15	4	50	23,680	2.12	2.20	2.28	2.36	2.55
CLR200-0040-0030-0135		0.03	1.35	0.4	0.37	15	4	50	20,960	1.45	1.50	1.56	1.61	1.74
CLR200-0040-0030-0150		0.03	1.5	0.24	0.37	15	4	50	20,960	1.61	1.66	1.72	1.78	1.93
CLR200-0040-0030-0200		0.03	2	0.24	0.37	15	4	50	21,280	2.12	2.20	2.28	2.36	2.55
CLR200-0040-0050-0135		0.05	1.35	0.4	0.37	15	4	50	20,800	1.45	1.50	1.55	1.61	1.74
CLR200-0040-0050-0150		0.05	1.5	0.24	0.37	15	4	50	20,800	1.61	1.66	1.72	1.78	1.92
CLR200-0040-0050-0200		0.05	2	0.24	0.37	15	4	50	21,280	2.12	2.20	2.27	2.36	2.54
CLR200-0040-0100-0135		0.1	1.35	0.4	0.37	15	4	50	20,800	1.45	1.50	1.55	1.60	1.72
CLR200-0040-0100-0150		0.1	1.5	0.24	0.37	15	4	50	20,800	1.61	1.66	1.71	1.77	1.91
CLR200-0040-0100-0200		0.1	2	0.24	0.37	15	4	50	20,800	2.12	2.19	2.27	2.35	2.53
CLR200-0050-0020-0150	0.5	0.02	1.5	0.5	0.47	15	4	50	19,200	1.61	1.66	1.72	1.79	1.93
CLR200-0050-0020-0250		0.02	2.5	0.3	0.47	15	4	50	21,040	2.64	2.73	2.83	2.94	3.17
CLR200-0050-0030-0150		0.03	1.5	0.3	0.47	15	4	50	17,280	1.61	1.66	1.72	1.78	1.93



单位(Size) : mm

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CLR200-0050-0030-0250	0.5	0.03	2.5	0.3	0.47	15	4	50	18,880	2.64	2.73	2.83	2.93	3.17
CLR200-0050-0050-0150		0.05	1.5	0.5	0.47	15	4	50	17,280	1.61	1.66	1.72	1.78	1.92
CLR200-0050-0050-0250		0.05	2.5	0.3	0.47	15	4	50	18,880	2.64	2.73	2.83	2.93	3.17
CLR200-0050-0100-0150		0.1	1.5	0.5	0.47	15	4	50	17,280	1.61	1.66	1.71	1.77	1.91
CLR200-0050-0100-0250		0.1	2.5	0.3	0.47	15	4	50	18,880	2.64	2.73	2.82	2.92	3.15
CLR200-0060-0020-0250	0.6	0.02	2.5	0.3	0.57	15	4	50	21,040	2.64	2.73	2.83	2.94	3.17
CLR200-0060-0030-0250		0.03	2.5	0.3	0.57	15	4	50	18,880	2.64	2.73	2.83	2.93	3.17
CLR200-0060-0050-0250		0.05	2.5	0.3	0.57	15	4	50	18,880	2.64	2.73	2.83	2.93	3.17
CLR200-0060-0100-0250		0.1	2.5	0.3	0.57	15	4	50	18,880	2.64	2.73	2.82	2.92	3.15
CLR200-0080-0020-0250	0.8	0.02	2.5	0.56	0.77	15	4	50	18,880	2.64	2.73	2.83	2.94	3.17
CLR200-0080-0020-0500		0.02	5	0.56	0.77	15	4	50	21,760	5.23	5.41	5.60	5.81	6.28
CLR200-0080-0030-0250		0.03	2.5	0.56	0.77	15	4	50	18,880	2.64	2.73	2.83	2.93	3.17
CLR200-0080-0030-0500		0.03	5	0.56	0.77	15	4	50	19,520	5.23	5.41	5.60	5.81	6.28
CLR200-0080-0050-0250		0.05	2.5	0.56	0.77	15	4	50	18,880	2.64	2.73	2.83	2.93	3.17
CLR200-0080-0050-0500		0.05	5	0.56	0.77	15	4	50	19,520	5.22	5.40	5.60	5.81	6.27
CLR200-0080-0100-0250		0.1	2.5	0.56	0.77	15	4	50	18,880	2.64	2.73	2.82	2.92	3.15
CLR200-0080-0100-0500		0.1	5	0.56	0.77	15	4	50	19,520	5.22	5.40	5.59	5.80	6.26
CLR200-0100-0020-0300	1	0.02	3	0.7	0.96	15	4	50	17,600	3.18	3.29	3.41	3.53	3.82
CLR200-0100-0020-0500		0.02	5	0.7	0.96	15	4	50	19,920	5.24	5.43	5.62	5.83	6.30
CLR200-0100-0030-0300		0.03	3	0.7	0.96	15	4	50	15,840	3.18	3.29	3.40	3.53	3.82
CLR200-0100-0030-0500		0.03	5	0.7	0.96	15	4	50	17,920	5.24	5.43	5.62	5.83	6.30
CLR200-0100-0050-0300		0.05	3	1.2	0.96	15	4	50	15,840	3.18	3.29	3.40	3.53	3.81
CLR200-0100-0050-0500		0.05	5	1.2	0.96	15	4	50	17,920	5.24	5.42	5.62	5.83	6.30
CLR200-0100-0050-1000		0.05	10	1.2	0.96	15	4	50	20,000	10.41	10.77	11.16	11.58	12.51
CLR200-0100-0100-0300		0.1	3	1.2	0.96	15	4	50	15,840	3.17	3.28	3.40	3.52	3.80
CLR200-0100-0100-0500		0.1	5	1.2	0.96	15	4	50	17,920	5.24	5.42	5.61	5.82	6.29
CLR200-0100-0100-1000		0.1	10	1.2	0.96	15	4	50	20,000	10.41	10.77	11.16	11.57	12.50
CLR200-0100-0200-0300		0.2	3	0.7	0.96	15	4	50	15,840	3.17	3.28	3.39	3.51	3.78
CLR200-0100-0200-0500		0.2	5	0.7	0.96	15	4	50	17,920	5.24	5.41	5.60	5.81	6.26
CLR200-0150-0020-0450	1.5	0.02	4.5	1	1.44	15	4	50	20,720	4.77	4.93	5.11	5.30	5.73
CLR200-0150-0020-0750		0.02	7.5	1	1.44	15	4	50	23,520	7.87	8.14	8.43	8.75	9.46
CLR200-0150-0030-0450		0.03	4.5	1	1.44	15	4	50	18,640	4.77	4.93	5.11	5.30	5.73
CLR200-0150-0030-0750		0.03	7.5	1	1.44	15	4	50	21,120	7.87	8.14	8.43	8.75	9.46
CLR200-0150-0050-0450		0.05	4.5	1	1.44	15	4	50	18,640	4.77	4.93	5.11	5.30	5.72
CLR200-0150-0050-0500		0.05	5	1.5	1.44	15	4	50	18,640	5.28	5.46	5.66	5.87	6.34
CLR200-0150-0050-0750		0.05	7.5	1	1.44	15	4	50	21,120	7.87	8.14	8.43	8.75	9.45
CLR200-0150-0050-1000		0.05	10	1.5	1.44	15	4	50	21,120	10.45	10.81	11.20	11.62	12.56
CLR200-0150-0100-0450		0.1	4.5	1	1.44	15	4	50	18,640	4.76	4.93	5.10	5.29	5.71
CLR200-0150-0100-0500		0.1	5	1.5	1.44	15	4	50	18,640	5.28	5.46	5.65	5.86	6.33
CLR200-0150-0100-0750		0.1	7.5	1	1.44	15	4	50	21,120	7.86	8.14	8.43	8.74	9.44
CLR200-0150-0100-1000		0.1	10	1.5	1.44	15	4	50	21,120	10.45	10.81	11.20	11.61	12.55
CLR200-0150-0200-0450		0.2	4.5	1	1.44	15	4	50	18,640	4.76	4.92	5.09	5.27	5.69
CLR200-0150-0200-0750		0.2	7.5	1	1.44	15	4	50	21,120	7.86	8.13	8.42	8.72	9.42
CLR200-0150-0300-0450		0.3	4.5	1	1.44	15	4	50	18,640	4.76	4.91	5.08	5.26	5.66
CLR200-0150-0300-0750		0.3	7.5	1	1.44	15	4	50	21,120	7.86	8.12	8.40	8.71	9.39



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单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CLR200-0200-0020-0600	2	0.02	6	1.2	1.96	15	4	50	21,360	6.28	6.50	6.73	6.98	7.55
CLR200-0200-0020-1000		0.02	10	1.2	1.96	15	4	50	23,840	10.41	10.78	11.16	11.58	12.52
CLR200-0200-0030-0600		0.03	6	1.2	1.96	15	4	50	19,200	6.28	6.50	6.73	6.98	7.54
CLR200-0200-0030-1000		0.03	10	1.2	1.96	15	4	50	21,440	10.41	10.77	11.16	11.58	12.52
CLR200-0200-0050-0600		0.05	6	1.2	1.96	15	4	50	19,200	6.28	6.49	6.73	6.98	7.54
CLR200-0200-0050-1000		0.05	10	2	1.96	15	4	50	21,440	10.41	10.77	11.16	11.58	12.51
CLR200-0200-0050-1500		0.05	15	2	1.96	15	4	50	23,520	15.58	16.12	16.70	17.33	18.73
CLR200-0200-0100-0600		0.1	6	1.2	1.96	15	4	50	19,200	6.28	6.49	6.72	6.97	7.53
CLR200-0200-0100-1000		0.1	10	2	1.96	15	4	50	21,440	10.41	10.77	11.16	11.57	12.50
CLR200-0200-0100-1500		0.1	15	2	1.96	15	4	50	23,520	15.58	16.12	16.70	17.32	18.72
CLR200-0200-0200-0600		0.2	6	1.2	1.96	15	4	50	19,200	6.27	6.48	6.71	6.96	7.51
CLR200-0200-0300-0600		0.3	6	1.2	1.96	15	4	50	19,200	6.27	6.48	6.70	6.94	7.48
CLR200-0200-0300-1000		0.3	10	1.2	1.96	15	4	50	21,360	10.40	10.76	11.13	11.54	12.45
CLR200-0200-0500-0600		0.5	6	1.2	1.96	15	4	50	19,200	6.26	6.46	6.68	6.91	7.44
CLR200-0200-0500-1000		0.5	10	1.2	1.96	15	4	50	21,360	10.40	10.74	11.11	11.51	12.41
CLR200-0300-0050-1000	3	0.05	10	2	2.92	15	6	50	25,336	10.49	10.85	11.24	11.66	12.61
CLR200-0300-0050-1500		0.05	15	2	2.92	15	6	50	26,400	15.66	16.20	16.78	17.41	18.82
CLR200-0300-0100-1000		0.1	10	2	2.92	15	6	50	25,336	10.49	10.85	11.24	11.66	12.59
CLR200-0300-0100-1500		0.1	15	2	2.92	15	6	50	26,400	15.66	16.20	16.78	17.40	18.81

CBN 切削条件参考表
Recommended Milling Conditions

■型号:CLR200
Model number:CLR200

长颈圆角立铣刀 Long Neck Radius End Mill

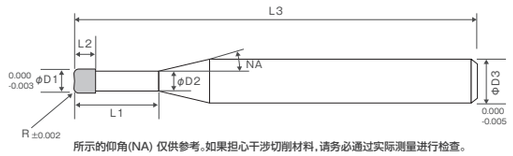
切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.1	0.5	0.002	0.01	150	50,000	0.002	0.01	150	50,000	0.001	0.01	100	50,000	0.001	0.01	50	50,000
	0.15	0.5	0.002	0.02	200	50,000	0.002	0.02	200	50,000	0.002	0.02	150	50,000	0.001	0.015	100	50,000
	0.2	1	0.003	0.02	200	50,000	0.003	0.02	200	50,000	0.003	0.02	200	50,000	0.002	0.01	100	50,000
	0.3	1	0.003	0.05	500	50,000	0.003	0.05	500	50,000	0.003	0.05	400	50,000	0.002	0.03	300	50,000
		1.5	0.003	0.03	400	50,000	0.003	0.03	400	50,000	0.003	0.03	300	50,000	0.002	0.02	200	50,000
		2	0.003	0.03	400	50,000	0.003	0.03	400	50,000	0.003	0.03	300	50,000	0.002	0.02	200	50,000
	0.4	1.35	0.005	0.05	500	50,000	0.005	0.05	500	50,000	0.005	0.05	400	50,000	0.003	0.02	300	50,000
		1.5	0.005	0.05	500	50,000	0.005	0.05	500	50,000	0.005	0.05	400	50,000	0.003	0.02	300	50,000
		2	0.005	0.05	500	50,000	0.005	0.05	500	50,000	0.005	0.05	400	50,000	0.003	0.02	300	50,000
	0.5	1.5	0.01	0.2	800	50,000	0.01	0.2	800	50,000	0.01	0.2	800	50,000	0.01	0.1	700	50,000
		2.5	0.005	0.1	600	50,000	0.005	0.1	600	50,000	0.005	0.1	600	50,000	0.003	0.05	500	50,000
	0.6	2.5	0.005	0.1	600	50,000	0.005	0.1	600	50,000	0.005	0.1	600	50,000	0.003	0.05	500	50,000
	0.8	2.5	0.005	0.2	800	50,000	0.005	0.2	800	50,000	0.005	0.2	800	50,000	0.003	0.1	600	40,000
		5	0.01	0.2	1,400	50,000	0.01	0.2	1,400	50,000	0.01	0.1	1,200	50,000	0.01	0.05	1,000	40,000
	1	3	0.02	0.4	1,500	48,000	0.02	0.4	1,500	48,000	0.02	0.3	1,200	48,000	0.01	0.2	1,000	32,000
		5	0.02	0.4	1,400	48,000	0.02	0.4	1,400	48,000	0.02	0.3	1,100	48,000	0.01	0.2	1,000	32,000
		10	0.02	0.4	1,300	48,000	0.02	0.4	1,300	48,000	0.02	0.3	1,000	48,000	0.01	0.2	1,000	32,000
	1.5	4.5	0.02	0.5	2,000	32,000	0.02	0.5	2,000	32,000	0.02	0.4	1,500	32,000	0.01	0.2	1,200	20,000
		5	0.02	0.5	1,800	32,000	0.02	0.5	1,800	32,000	0.02	0.4	1,300	32,000	0.01	0.2	1,000	20,000
		7.5	0.02	0.5	1,700	32,000	0.02	0.5	1,700	32,000	0.02	0.4	1,200	32,000	0.01	0.2	900	20,000
		10	0.02	0.5	1,500	32,000	0.02	0.5	1,500	32,000	0.02	0.4	1,100	32,000	0.01	0.2	800	20,000
	2	6	0.03	0.8	1,800	24,000	0.03	0.8	1,800	24,000	0.03	0.7	1,400	24,000	0.01	0.5	1,000	16,000
		10	0.03	0.8	1,600	24,000	0.03	0.8	1,600	24,000	0.03	0.7	1,200	24,000	0.01	0.5	900	16,000
		15	0.03	0.8	1,400	24,000	0.03	0.8	1,400	24,000	0.03	0.7	1,000	24,000	0.01	0.5	800	16,000
	3	10	0.03	0.6	2,000	24,000	0.03	0.6	2,000	24,000	0.03	0.5	1,500	24,000	0.01	0.3	1,200	16,000
		15	0.03	0.6	1,800	22,000	0.03	0.6	1,800	22,000	0.03	0.5	1,300	22,000	0.01	0.3	1,000	16,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

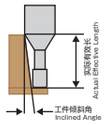
CBN长颈圆角立铣刀 CBN Long Neck Radius End Mill

Non | BANCERA | CBN | 刀刃数 4 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005

■型号:CLR400 Model number:CLR400



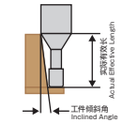
所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CLR400-0100-0020-0300	1	0.02	3	0.7	0.96	15	4	50	21,120	3.18	3.29	3.41	3.53	3.82
CLR400-0100-0020-0500		0.02	5	0.7	0.96	15	4	50	23,920	5.24	5.43	5.62	5.83	6.30
CLR400-0100-0050-0300		0.05	3	1.2	0.96	15	4	50	19,040	3.18	3.29	3.40	3.53	3.81
CLR400-0100-0050-0500		0.05	5	1.2	0.96	15	4	50	21,520	5.24	5.42	5.62	5.83	6.30
CLR400-0100-0050-1000		0.05	10	1.2	0.96	15	4	50	24,000	10.41	10.77	11.16	11.58	12.51
CLR400-0100-0100-0300		0.1	3	1.2	0.96	15	4	50	19,040	3.17	3.28	3.40	3.52	3.80
CLR400-0100-0100-0400		0.1	4	1.2	0.96	15	4	50	20,280	4.21	4.35	4.51	4.67	5.04
CLR400-0100-0100-0500		0.1	5	1.2	0.96	15	4	50	21,520	5.24	5.42	5.61	5.82	6.29
CLR400-0100-0100-1000		0.1	10	1.2	0.96	15	4	50	24,000	10.41	10.77	11.16	11.57	12.50
CLR400-0100-0200-0300		0.2	3	0.7	0.96	15	4	50	19,040	3.17	3.28	3.39	3.51	3.78
CLR400-0100-0200-0500		0.2	5	0.7	0.96	15	4	50	21,520	5.24	5.41	5.60	5.81	6.26
CLR400-0150-0020-0450	1.5	0.02	4.5	1	1.44	15	4	50	24,880	4.77	4.93	5.11	5.30	5.73
CLR400-0150-0020-0750		0.02	7.5	1	1.44	15	4	50	28,240	7.87	8.14	8.43	8.75	9.46
CLR400-0150-0050-0450		0.05	4.5	1	1.44	15	4	50	22,400	4.77	4.93	5.11	5.30	5.72
CLR400-0150-0050-0500		0.05	5	1.5	1.44	15	4	50	22,400	5.28	5.46	5.66	5.87	6.34
CLR400-0150-0050-0750		0.05	7.5	1	1.44	15	4	50	25,360	7.87	8.14	8.43	8.75	9.45
CLR400-0150-0050-1000		0.05	10	1.5	1.44	15	4	50	25,360	10.45	10.81	11.20	11.62	12.56
CLR400-0150-0100-0450		0.1	4.5	1	1.44	15	4	50	22,400	4.76	4.93	5.10	5.29	5.71
CLR400-0150-0100-0500		0.1	5	1.5	1.44	15	4	50	22,400	5.28	5.46	5.65	5.86	6.33
CLR400-0150-0100-0750		0.1	7.5	1	1.44	15	4	50	25,360	7.86	8.14	8.43	8.74	9.44
CLR400-0150-0100-1000		0.1	10	1.5	1.44	15	4	50	25,360	10.45	10.81	11.20	11.61	12.55
CLR400-0150-0200-0450		0.2	4.5	1	1.44	15	4	50	22,400	4.76	4.92	5.09	5.27	5.69
CLR400-0150-0200-0750		0.2	7.5	1	1.44	15	4	50	25,360	7.86	8.13	8.42	8.72	9.42
CLR400-0200-0020-0600	2	0.02	6	1.2	1.96	15	4	50	25,680	6.28	6.50	6.73	6.98	7.55
CLR400-0200-0050-0600		0.05	6	1.2	1.96	15	4	50	23,040	6.28	6.49	6.73	6.98	7.54
CLR400-0200-0050-1000-00120		0.05	10	1.2	1.96	15	4	50	25,760	10.41	10.77	11.16	11.58	12.51
CLR400-0200-0050-1000-00200		0.05	10	2	1.96	15	4	50	25,760	10.41	10.77	11.16	11.58	12.51
CLR400-0200-0050-1500		0.05	15	2	1.96	15	4	50	28,220	15.58	16.12	16.70	17.33	18.73
CLR400-0200-0100-0600		0.1	6	1.2	1.96	15	4	50	23,040	6.28	6.49	6.72	6.97	7.53
CLR400-0200-0100-1000		0.1	10	2	1.96	15	4	50	25,760	10.41	10.77	11.16	11.57	12.50



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CLR400-0200-0100-1500	2	0.1	15	2	1.96	15	4	50	28,220	15.58	16.12	16.70	17.32	18.72
CLR400-0200-0200-0600		0.2	6	1.2	1.96	15	4	50	23,040	6.27	6.48	6.71	6.96	7.51
CLR400-0200-0200-1000		0.2	10	1.2	1.96	15	4	50	25,680	10.41	10.76	11.14	11.55	12.48
CLR400-0200-0300-0500		0.3	5	2	1.96	15	4	50	23,040	5.24	5.41	5.59	5.79	6.24
CLR400-0200-0300-1000		0.3	10	2	1.96	15	4	50	25,680	10.40	10.76	11.13	11.54	12.45
CLR400-0300-0050-0600	3	0.05	6	1.8	2.92	15	6	50	29,760	6.35	6.57	6.81	7.06	7.63
CLR400-0300-0050-0900		0.05	9	1.8	2.92	15	6	50	30,400	9.46	9.78	10.13	10.51	11.36
CLR400-0300-0050-1000		0.05	10	2	2.92	15	6	50	30,400	10.49	10.85	11.24	11.66	12.61
CLR400-0300-0050-1200		0.05	12	1.8	2.92	15	6	50	31,040	12.56	12.99	13.46	13.96	15.09
CLR400-0300-0050-1500-00180		0.05	15	1.8	2.92	15	6	50	31,680	15.66	16.20	16.78	17.41	18.82
CLR400-0300-0050-1500-00200		0.05	15	2	2.92	15	6	50	31,680	15.66	16.20	16.78	17.41	18.82
CLR400-0300-0100-0600		0.1	6	1.8	2.92	15	6	50	29,760	6.35	6.57	6.80	7.06	7.62
CLR400-0300-0100-0900		0.1	9	1.8	2.92	15	6	50	30,400	9.45	9.78	10.13	10.51	11.35
CLR400-0300-0100-1000		0.1	10	2	2.92	15	6	50	30,400	10.49	10.85	11.24	11.66	12.59
CLR400-0300-0100-1200		0.1	12	1.8	2.92	15	6	50	31,040	12.55	12.99	13.45	13.96	15.08
CLR400-0300-0100-1500-00180		0.1	15	1.8	2.92	15	6	50	31,680	15.66	16.20	16.78	17.40	18.81
CLR400-0300-0100-1500-00200		0.1	15	2	2.92	15	6	50	31,680	15.66	16.20	16.78	17.40	18.81
CLR400-0300-0200-0600		0.2	6	1.8	2.92	15	6	50	29,760	6.35	6.56	6.79	7.04	7.60
CLR400-0300-0200-0900		0.2	9	1.8	2.92	15	6	50	30,400	9.45	9.77	10.12	10.49	11.33
CLR400-0300-0200-1200		0.2	12	1.8	2.92	15	6	50	31,040	12.55	12.98	13.44	13.94	15.06
CLR400-0300-0200-1500		0.2	15	1.8	2.92	15	6	50	31,680	15.65	16.19	16.77	17.39	18.79
CLR400-0300-0300-1000		0.3	10	2	2.92	15	6	50	30,400	10.48	10.84	11.22	11.63	12.55
CLR400-0400-0050-1500	4	0.05	15	2	3.92	15	6	50	38,020	15.66	16.20	16.78	17.41	18.82
CLR400-0400-0100-1500		0.1	15	2	3.92	15	6	50	38,020	15.66	16.20	16.78	17.40	18.81
CLR400-0400-0300-1500		0.3	15	2	3.92	15	6	50	38,020	15.65	16.18	16.76	17.38	18.76
CLR400-0400-0500-1500		0.5	15	2	3.92	15	6	50	38,020	15.64	16.17	16.74	17.35	18.72
CLR400-0500-0050-1500	5	0.05	15	2	4.92	15	6	50	44,320	15.66	16.20	16.78	FREE	FREE
CLR400-0500-0100-1500		0.1	15	2	4.92	15	6	50	44,320	15.66	16.20	16.78	FREE	FREE
CLR400-0500-0300-1500		0.3	15	2	4.92	15	6	50	44,320	15.65	16.18	16.76	FREE	FREE
CLR400-0500-0500-1500		0.5	15	2	4.92	15	6	50	44,320	15.64	16.17	16.74	FREE	FREE

CBN Series

CBN 切削条件参考表
Recommended Milling Conditions

■型号:CLR400
Model number:CLR400

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	3	0.03	0.4	2,500	40,000	0.03	0.4	2,500	40,000	0.03	0.3	2,000	40,000	0.01	0.2	1,500	36,000
		4	0.02	0.3	2,500	40,000	0.02	0.3	2,500	40,000	0.02	0.2	2,000	40,000	0.01	0.1	1,500	36,000
		5	0.02	0.3	2,500	40,000	0.02	0.3	2,500	40,000	0.02	0.2	2,000	40,000	0.007	0.1	1,500	36,000
		10	0.02	0.3	2,500	40,000	0.02	0.3	2,500	40,000	0.02	0.2	2,000	40,000	0.007	0.1	1,500	36,000
	1.5	4.5	0.04	0.6	3,500	36,000	0.04	0.6	3,500	36,000	0.03	0.5	2,800	30,000	0.015	0.3	1,800	24,000
		5	0.04	0.6	3,500	36,000	0.04	0.6	3,500	36,000	0.03	0.5	2,800	30,000	0.01	0.3	1,800	24,000
		7.5	0.03	0.5	3,000	36,000	0.03	0.5	3,000	36,000	0.02	0.4	2,500	30,000	0.01	0.2	1,600	24,000
		10	0.03	0.5	3,000	36,000	0.03	0.5	3,000	36,000	0.02	0.4	2,500	30,000	0.01	0.2	1,600	24,000
	2	5	0.04	0.8	3,500	30,000	0.04	0.8	3,500	30,000	0.03	0.7	2,800	24,000	0.02	0.3	1,500	16,000
		6	0.04	0.8	3,500	30,000	0.04	0.8	3,500	30,000	0.03	0.7	2,800	24,000	0.02	0.3	1,500	16,000
		10	0.03	0.6	3,000	30,000	0.03	0.6	3,000	30,000	0.02	0.5	2,400	24,000	0.01	0.3	1,300	16,000
		15	0.03	0.6	3,000	30,000	0.03	0.6	3,000	30,000	0.02	0.5	2,400	24,000	0.01	0.3	1,300	16,000
	3	6	0.05	1	4,000	24,000	0.05	1	4,000	24,000	0.04	0.85	3,200	20,000	0.02	0.6	1,500	12,000
		9	0.05	1	3,500	24,000	0.05	1	3,500	24,000	0.04	0.85	2,800	20,000	0.02	0.6	1,500	12,000
		10	0.05	1	3,500	24,000	0.05	1	3,500	24,000	0.04	0.85	2,800	20,000	0.02	0.6	1,500	12,000
		12	0.04	0.85	3,500	24,000	0.04	0.85	3,500	24,000	0.04	0.7	2,800	20,000	0.02	0.5	1,500	12,000
		15	0.03	0.85	3,000	24,000	0.03	0.85	3,000	24,000	0.03	0.7	2,400	20,000	0.015	0.5	1,300	12,000
	4	15	0.03	1	3,000	22,000	0.03	1	3,000	22,000	0.03	0.8	2,400	18,000	0.015	0.6	1,300	10,000
	5	15	0.03	2	2,300	20,000	0.03	2	2,300	20,000	0.03	1	1,800	20,000	0.03	0.75	1,000	20,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.

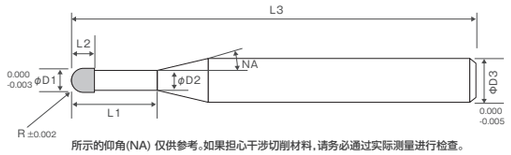
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

CBN Series

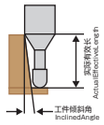
CBN球头立铣刀 CBN Ball End Mill

■型号:CB200 Model number:CB200

Non | BANCERA | CBN | 刀刃数 2 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005



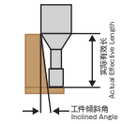
所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



单位(Size) : mm

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CB200-0010-0050-0020	0.05	0.2	0.07	0.1	0.08	15	4	50	21,600	0.24	0.25	0.26	0.27	0.28
CB200-0010-0050-0030		0.3	0.08	0.1	0.08	15	4	50	30,560	0.35	0.36	0.37	0.38	0.41
CB200-0010-0050-0050		0.5	0.08	0.1	0.08	15	4	50	30,560	0.55	0.57	0.59	0.61	0.66
CB200-0015-0075-0045	0.075	0.45	0.12	0.15	0.13	15	4	50	30,560	0.50	0.52	0.53	0.55	0.59
CB200-0015-0075-0075		0.75	0.12	0.15	0.13	15	4	50	31,840	0.81	0.84	0.86	0.89	0.96
CB200-0020-0100-0030	0.1	0.3	0.15	0.2	0.17	15	4	50	24,400	0.36	0.37	0.38	0.39	0.42
CB200-0020-0100-0050		0.5	0.3	0.2	0.17	15	4	50	20,800	0.57	0.59	0.61	0.62	0.67
CB200-0020-0100-0060		0.6	0.15	0.2	0.17	15	4	50	25,200	0.67	0.69	0.72	0.74	0.79
CB200-0020-0100-0100		1	0.15	0.2	0.17	15	4	50	24,000	1.09	1.12	1.16	1.20	1.29
CB200-0030-0150-0030	0.15	0.3	0.23	0.3	0.27	15	4	50	24,000	0.36	0.37	0.38	0.39	0.41
CB200-0030-0150-0050-00023		0.5	0.23	0.3	0.27	15	4	50	24,400	0.57	0.58	0.60	0.62	0.66
CB200-0030-0150-0050-00030		0.5	0.3	0.3	0.27	15	4	50	24,400	0.57	0.58	0.60	0.62	0.66
CB200-0030-0150-0075		0.75	0.23	0.3	0.27	15	4	50	24,800	0.83	0.85	0.88	0.90	0.97
CB200-0040-0200-0050	0.2	0.5	0.3	0.4	0.37	15	4	50	20,000	0.57	0.58	0.59	0.61	0.64
CB200-0040-0200-0075		0.75	0.3	0.4	0.37	15	4	50	22,080	0.83	0.85	0.87	0.90	0.96
CB200-0040-0200-0100		1	0.3	0.4	0.37	15	4	50	22,480	1.08	1.12	1.15	1.18	1.27
CB200-0040-0200-0120		1.2	0.3	0.4	0.37	15	4	50	22,880	1.29	1.33	1.37	1.41	1.52
CB200-0040-0200-0135		1.35	0.4	0.4	0.37	15	4	50	20,400	1.45	1.49	1.54	1.59	1.70
CB200-0040-0200-0200		2	0.3	0.4	0.37	15	4	50	24,000	2.12	2.19	2.26	2.33	2.51
CB200-0040-0200-0300		3	0.3	0.4	0.37	15	4	50	24,000	3.15	3.26	3.37	3.48	3.75
CB200-0050-0250-0100	0.25	1	0.38	0.5	0.47	15	4	50	22,480	1.08	1.11	1.14	1.18	1.26
CB200-0050-0250-0150		1.5	0.38	0.5	0.47	15	4	50	23,200	1.60	1.65	1.70	1.75	1.88
CB200-0050-0250-0250		2.5	0.38	0.5	0.47	15	4	50	23,200	2.63	2.72	2.81	2.90	3.12
CB200-0050-0250-0350		3.5	0.38	0.5	0.47	15	4	50	23,200	3.67	3.79	3.91	4.05	4.36
CB200-0060-0300-0120	0.3	1.2	0.5	0.6	0.57	15	4	50	20,720	1.29	1.32	1.36	1.40	1.49
CB200-0060-0300-0150		1.5	0.5	0.6	0.57	15	4	50	21,120	1.60	1.64	1.69	1.74	1.87
CB200-0060-0300-0170		1.7	0.7	0.6	0.57	15	4	50	19,200	1.81	1.86	1.91	1.97	2.11
CB200-0060-0300-0300		3	0.5	0.6	0.57	15	4	50	22,400	3.15	3.25	3.35	3.47	3.73
CB200-0060-0300-0400		4	0.5	0.6	0.57	15	4	50	22,400	4.18	4.32	4.46	4.62	4.97
CB200-0060-0300-0500		5	0.5	0.6	0.57	15	4	50	22,800	5.22	5.39	5.57	5.77	6.22



单位(Size) : mm

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型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CB200-0060-0300-0600	0.3	6	0.5	0.6	0.57	15	4	50	22,800	6.25	6.46	6.68	6.92	7.46
CB200-0080-0400-0160	0.4	1.6	0.6	0.8	0.77	15	4	50	20,720	1.70	1.74	1.79	1.85	1.97
CB200-0080-0400-0200		2	0.6	0.8	0.77	15	4	50	21,120	2.11	2.17	2.24	2.31	2.46
CB200-0080-0400-0400		4	0.6	0.8	0.77	15	4	50	22,400	4.18	4.31	4.45	4.60	4.95
CB200-0080-0400-0600		6	0.6	0.8	0.77	15	4	50	22,400	6.25	6.45	6.67	6.90	7.44
CB200-0100-0500-0200	0.5	2	0.7	1	0.96	15	4	50	20,720	2.13	2.18	2.25	2.31	2.46
CB200-0100-0500-0220		2.2	1.2	1	0.96	15	4	50	19,200	2.33	2.40	2.47	2.54	2.71
CB200-0100-0500-0250		2.5	0.7	1	0.96	15	4	50	21,120	2.64	2.72	2.80	2.89	3.09
CB200-0120-0600-0240	0.6	2.4	0.8	1.2	1.16	15	4	50	21,600	2.54	2.61	2.68	2.76	2.94
CB200-0120-0600-0300		3	0.8	1.2	1.16	15	4	50	22,000	3.16	3.25	3.34	3.45	3.68
CB200-0120-0600-0600		6	0.8	1.2	1.16	15	4	50	23,200	6.26	6.46	6.67	6.90	7.41
CB200-0150-0750-0300	0.75	3	1.5	1.5	1.44	15	4	50	20,000	3.19	3.28	3.37	3.47	3.70
CB200-0200-1000-0500	1	5	2	2	1.96	15	4	50	20,000	5.21	5.36	5.52	5.69	6.08
CB200-0300-1500-0500	1.5	5	2	3	2.92	15	6	50	23,200	5.27	5.40	5.55	5.70	6.06

CBN Series

CBN 切削条件参考表
Recommended Milling Conditions

■型号:CB200
Model number:CB200

球头立铣刀 Ball End Mill

切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.2	0.005	0.005	600	40,000	0.005	0.005	600	40,000	0.005	0.005	450	40,000	0.003	0.003	300	40,000
		0.3	0.005	0.005	600	40,000	0.005	0.005	600	40,000	0.005	0.005	450	40,000	0.003	0.003	300	40,000
		0.5	0.005	0.005	500	40,000	0.005	0.005	500	40,000	0.005	0.005	350	40,000	0.003	0.003	250	40,000
	0.15	0.45	0.005	0.005	750	40,000	0.005	0.005	750	40,000	0.005	0.005	550	40,000	0.003	0.003	400	40,000
		0.75	0.005	0.005	700	40,000	0.005	0.005	700	40,000	0.005	0.005	500	40,000	0.003	0.003	400	40,000
	0.2	0.3	0.005	0.01	1,200	40,000	0.005	0.01	1,200	40,000	0.005	0.01	900	40,000	0.005	0.005	600	40,000
		0.5	0.005	0.01	1,200	40,000	0.005	0.01	1,200	40,000	0.005	0.01	900	40,000	0.005	0.005	600	40,000
		0.6	0.005	0.01	1,100	40,000	0.005	0.01	1,100	40,000	0.005	0.01	850	40,000	0.005	0.005	550	40,000
		1	0.005	0.01	1,000	40,000	0.005	0.01	1,000	40,000	0.005	0.01	800	40,000	0.005	0.005	500	40,000
	0.3	0.3	0.01	0.02	1,800	40,000	0.01	0.02	1,800	40,000	0.01	0.02	1,500	40,000	0.005	0.01	1,000	40,000
		0.5	0.01	0.02	1,800	40,000	0.01	0.02	1,800	40,000	0.01	0.02	1,500	40,000	0.005	0.01	1,000	40,000
		0.75	0.01	0.02	1,500	40,000	0.01	0.02	1,500	40,000	0.01	0.02	1,200	40,000	0.005	0.01	800	40,000
	0.4	0.5	0.01	0.02	1,800	40,000	0.01	0.02	1,800	40,000	0.01	0.02	1,500	40,000	0.005	0.01	1,000	40,000
		0.75	0.01	0.02	1,800	40,000	0.01	0.02	1,800	40,000	0.01	0.02	1,500	40,000	0.005	0.01	1,000	40,000
		1	0.01	0.02	1,800	40,000	0.01	0.02	1,800	40,000	0.01	0.02	1,500	40,000	0.005	0.01	1,000	40,000
		1.2	0.01	0.02	1,500	40,000	0.01	0.02	1,500	40,000	0.01	0.02	1,200	40,000	0.005	0.01	800	40,000
		1.35	0.01	0.02	1,500	40,000	0.01	0.02	1,500	40,000	0.01	0.02	1,200	40,000	0.005	0.01	800	40,000
		2	0.01	0.02	1,500	40,000	0.01	0.02	1,500	40,000	0.01	0.02	1,200	40,000	0.005	0.01	800	40,000
		3	0.01	0.02	1,500	40,000	0.01	0.02	1,500	40,000	0.01	0.02	1,200	40,000	0.005	0.01	800	40,000
	0.5	1	0.02	0.04	2,500	40,000	0.02	0.04	2,500	40,000	0.02	0.03	1,800	40,000	0.01	0.02	1,200	40,000
		1.5	0.02	0.04	2,500	40,000	0.02	0.04	2,500	40,000	0.02	0.03	1,800	40,000	0.01	0.02	1,200	40,000
		2.5	0.02	0.04	2,000	40,000	0.02	0.04	2,000	40,000	0.02	0.03	1,500	40,000	0.01	0.02	1,000	40,000
		3.5	0.02	0.04	2,000	40,000	0.02	0.04	2,000	40,000	0.02	0.03	1,500	40,000	0.01	0.02	1,000	40,000
	0.6	1.2	0.02	0.04	2,500	40,000	0.02	0.04	2,500	40,000	0.02	0.03	2,000	40,000	0.01	0.02	1,500	40,000
		1.5	0.02	0.04	2,500	40,000	0.02	0.04	2,500	40,000	0.02	0.03	2,000	40,000	0.01	0.02	1,500	40,000
		1.7	0.02	0.04	2,500	40,000	0.02	0.04	2,500	40,000	0.02	0.03	2,000	40,000	0.01	0.02	1,500	40,000
		3	0.02	0.04	2,500	40,000	0.02	0.04	2,500	40,000	0.02	0.03	2,000	40,000	0.01	0.02	1,500	40,000
		4	0.02	0.04	2,500	40,000	0.02	0.04	2,500	40,000	0.02	0.03	2,000	40,000	0.01	0.02	1,500	40,000
		5	0.02	0.04	2,500	40,000	0.02	0.04	2,500	40,000	0.02	0.03	2,000	40,000	0.01	0.02	1,500	40,000
		6	0.02	0.04	2,500	40,000	0.02	0.04	2,500	40,000	0.02	0.03	2,000	40,000	0.01	0.02	1,500	40,000
	0.8	1.6	0.03	0.05	3,000	40,000	0.03	0.05	3,000	40,000	0.03	0.05	3,000	40,000	0.02	0.03	2,000	30,000
		2	0.03	0.05	3,000	40,000	0.03	0.05	3,000	40,000	0.03	0.05	3,000	40,000	0.02	0.03	2,000	30,000
		4	0.03	0.05	3,000	40,000	0.03	0.05	3,000	40,000	0.03	0.05	3,000	40,000	0.02	0.03	2,000	30,000
		6	0.03	0.05	3,000	40,000	0.03	0.05	3,000	40,000	0.03	0.05	3,000	40,000	0.02	0.03	2,000	30,000
	1	2	0.05	0.1	3,000	30,000	0.05	0.1	3,000	30,000	0.03	0.05	3,000	30,000	0.03	0.03	2,000	25,000
		2.2	0.05	0.1	3,000	30,000	0.05	0.1	3,000	30,000	0.03	0.05	3,000	30,000	0.03	0.03	2,000	25,000
		2.5	0.05	0.1	3,000	30,000	0.05	0.1	3,000	30,000	0.03	0.05	3,000	30,000	0.03	0.03	2,000	25,000
	1.2	2.4	0.08	0.15	2,300	20,000	0.08	0.15	2,300	20,000	0.05	0.075	2,100	20,000	0.04	0.06	1,300	15,000
		3	0.08	0.15	2,300	20,000	0.08	0.15	2,300	20,000	0.05	0.075	2,100	20,000	0.04	0.06	1,300	15,000
		6	0.04	0.12	2,200	20,000	0.04	0.12	2,200	20,000	0.03	0.06	2,000	20,000	0.03	0.05	1,200	15,000
	1.5	3	0.08	0.15	2,300	20,000	0.08	0.15	2,300	20,000	0.05	0.075	2,100	20,000	0.04	0.06	1,300	15,000
	2	5	0.08	0.15	2,000	17,000	0.08	0.15	2,000	17,000	0.05	0.08	1,700	15,000	0.04	0.06	1,200	12,000
	3	5	0.11	0.21	1,700	10,000	0.11	0.21	1,700	10,000	0.08	0.12	1,400	10,000	0.07	0.1	1,000	10,000

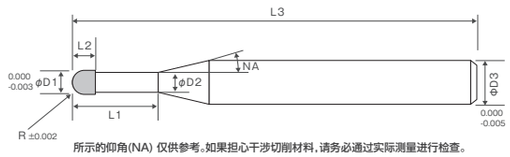
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

CBN Series 球头 Ball
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
Ion Depo A Series
Ion Depo U Series
DLC Series
Non-Coat Series
Ion Depo R Series

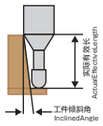
CBN长颈球头立铣刀 CBN Long Neck Ball End Mill

■型号:CLB200 Model number:CLB200

Non | BANCERA | CBN | 刀刃数 2 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 CodeNo.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Lengthof Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CLB200-0100-0500-0300	0.5	3	1.2	1	0.96	15	4	50	20,480	3.16	3.25	3.35	3.46	3.71
CLB200-0100-0500-0400		4	0.7	1	0.96	15	4	50	22,400	4.20	4.32	4.46	4.61	4.95
CLB200-0100-0500-0500		5	1.2	1	0.96	15	4	50	20,480	5.23	5.39	5.57	5.76	6.19
CLB200-0100-0500-0600		6	0.7	1	0.96	15	4	50	22,400	6.26	6.46	6.68	6.91	7.44
CLB200-0100-0500-0800		8	0.7	1	0.96	15	4	50	22,800	8.33	8.60	8.90	9.21	9.92
CLB200-0100-0500-1000		10	1.2	1	0.96	15	4	50	21,280	10.40	10.74	11.11	11.51	12.41
CLB200-0150-0750-0380	0.75	3.8	1	1.5	1.44	15	4	50	22,000	4.02	4.13	4.26	4.39	4.69
CLB200-0150-0750-0500		5	1.5	1.5	1.44	15	4	50	22,080	5.26	5.42	5.59	5.77	6.18
CLB200-0150-0750-0750		7.5	1	1.5	1.44	15	4	50	23,200	7.84	8.09	8.36	8.64	9.29
CLB200-0150-0750-1000		10	1.5	1.5	1.44	15	4	50	22,080	10.43	10.76	11.13	11.52	12.40
CLB200-0150-0750-1500		15	1	1.5	1.44	15	4	50	23,200	15.60	16.11	16.67	17.27	18.61
CLB200-0200-1000-0400	1	4	1.2	2	1.96	15	4	50	22,000	4.18	4.29	4.41	4.54	4.83
CLB200-0200-1000-0500		5	2	2	1.96	15	4	50	20,000	5.21	5.36	5.52	5.69	6.08
CLB200-0200-1000-0600		6	1.2	2	1.96	15	4	50	23,200	6.25	6.43	6.63	6.84	7.32
CLB200-0200-1000-0800		8	1.2	2	1.96	15	4	50	23,200	8.31	8.57	8.84	9.14	9.81
CLB200-0200-1000-1000		10	2	2	1.96	15	4	50	22,080	10.38	10.71	11.06	11.44	12.29
CLB200-0200-1000-1400		14	1.2	2	1.96	15	4	50	23,600	14.51	14.99	15.49	16.04	17.27
CLB200-0200-1000-1500		15	2	2	1.96	15	4	50	22,080	15.55	16.06	16.60	17.19	18.51
CLB200-0200-1000-2000		20	1.2	2	1.96	15	4	50	23,600	20.72	21.40	22.14	22.94	FREE
CLB200-0300-1500-0600	1.5	6	1.8	3	2.92	15	6	50	23,200	6.31	6.47	6.65	6.85	7.30
CLB200-0300-1500-0900		9	1.8	3	2.92	15	6	50	24,000	9.41	9.68	9.98	10.30	11.03
CLB200-0300-1500-1000		10	2	3	2.92	15	6	50	24,000	10.44	10.75	11.09	11.45	12.27
CLB200-0300-1500-1500		15	2	3	2.92	15	6	50	24,800	15.61	16.10	16.63	17.20	18.49

CBN 切削条件参考表
Recommended Milling Conditions

■型号:CLB200
Model number:CLB200

长颈球头立铣刀 Long Neck Ball End Mill

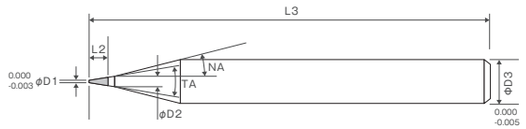
切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂pmm	∂emm	mm/min	min-1	∂pmm	∂emm	mm/min	min-1	∂pmm	∂emm	mm/min	min-1	∂pmm	∂emm	mm/min	min-1
2	1	3	0.05	0.1	3,000	30,000	0.05	0.1	3,000	30,000	0.03	0.05	3,000	30,000	0.03	0.03	2,000	25,000
		4	0.05	0.1	3,000	30,000	0.05	0.1	3,000	30,000	0.03	0.05	3,000	30,000	0.03	0.03	2,000	25,000
		5	0.05	0.1	3,000	30,000	0.05	0.1	3,000	30,000	0.03	0.05	3,000	30,000	0.03	0.03	2,000	25,000
		6	0.05	0.1	3,000	30,000	0.05	0.1	3,000	30,000	0.03	0.05	3,000	30,000	0.03	0.03	2,000	25,000
		8	0.04	0.09	2,800	28,000	0.04	0.09	2,800	28,000	0.02	0.04	2,800	28,000	0.02	0.02	1,800	23,000
		10	0.03	0.08	2,600	28,000	0.03	0.08	2,600	28,000	0.01	0.03	2,800	28,000	0.01	0.01	1,600	23,000
	1.5	3.8	0.08	0.15	2,300	20,000	0.08	0.15	2,300	20,000	0.05	0.075	2,100	20,000	0.04	0.06	1,300	16,000
		5	0.08	0.15	2,300	20,000	0.08	0.15	2,300	20,000	0.05	0.075	2,100	20,000	0.04	0.06	1,300	16,000
		7.5	0.07	0.12	2,100	20,000	0.07	0.12	2,100	20,000	0.04	0.065	2,000	20,000	0.03	0.05	1,200	16,000
		10	0.07	0.12	2,100	20,000	0.07	0.12	2,100	20,000	0.04	0.065	2,000	20,000	0.03	0.05	1,200	16,000
		15	0.06	0.1	2,000	18,000	0.06	0.1	2,000	18,000	0.03	0.06	1,900	18,000	0.02	0.04	1,100	15,000
	2	4	0.08	0.15	2,000	17,000	0.08	0.15	2,000	17,000	0.05	0.08	1,700	17,000	0.04	0.06	1,200	12,000
		5	0.08	0.15	2,000	17,000	0.08	0.15	2,000	17,000	0.05	0.08	1,700	17,000	0.04	0.06	1,200	12,000
		6	0.08	0.15	2,000	17,000	0.08	0.15	2,000	17,000	0.05	0.08	1,700	17,000	0.04	0.06	1,200	12,000
		8	0.07	0.13	1,800	17,000	0.07	0.13	1,800	17,000	0.04	0.06	1,500	17,000	0.03	0.04	1,100	12,000
		10	0.07	0.13	1,800	16,000	0.07	0.13	1,800	16,000	0.04	0.06	1,500	16,000	0.03	0.04	1,100	11,000
		14	0.06	0.12	1,700	16,000	0.06	0.12	1,700	16,000	0.03	0.05	1,400	16,000	0.02	0.04	1,000	11,000
		15	0.06	0.12	1,700	16,000	0.06	0.12	1,700	16,000	0.03	0.05	1,400	16,000	0.01	0.03	900	11,000
		20	0.04	0.1	1,600	16,000	0.04	0.1	1,600	16,000	0.02	0.04	1,300	16,000	0.01	0.02	800	11,000
	3	6	0.1	0.2	1,700	10,000	0.1	0.2	1,700	10,000	0.08	0.12	1,400	10,000	0.07	0.1	1,000	10,000
		9	0.1	0.2	1,700	10,000	0.1	0.2	1,700	10,000	0.08	0.12	1,400	10,000	0.07	0.1	1,000	10,000
		10	0.08	0.18	1,500	10,000	0.08	0.18	1,500	10,000	0.07	0.1	1,300	10,000	0.06	0.08	800	10,000
		15	0.07	0.16	1,500	10,000	0.07	0.16	1,500	10,000	0.05	0.09	1,300	10,000	0.04	0.07	800	10,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

CBN锥形立铣刀刻印用 CBN Taper End Mill(for Engraving)

■型号:CTP200 Model number:CTP200

Non | BANCERA | CBN | 刀刃数 2 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	角度 (TA)° Taper Angle	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
CTP200-0005	0.05	40	0.7	0.6	15	4	50	36,000
CTP200-0010	0.1	40	0.68	0.6	15	4	50	27,200

CBN 切削条件参考表
Recommended Milling Conditions

■型号:CTP200
Model number:CTP200

锥形立铣刀 Taper End Mill

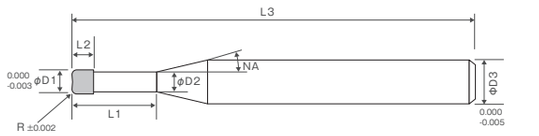
切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.05	0.7	0.003	0.03	300	50,000	0.003	0.03	300	50,000	0.003	0.03	300	50,000	0.002	0.02	250	50,000
	0.1	0.68	0.003	0.03	400	50,000	0.003	0.03	400	50,000	0.003	0.03	350	50,000	0.002	0.02	300	50,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

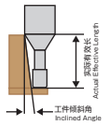
CBN抛光圆角立铣刀 CBN Lapping Radius End Mill

■型号:CRL200 Model number:CRL200

Non | BANCERA | CBN | 刀刃数 2 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CRL200-0040-0100-0135	0.4	0.1	1.35	0.4	0.37	15	4	50	22,880	1.45	1.50	1.55	1.60	1.72
CRL200-0050-0100-0150	0.5	0.1	1.5	0.5	0.47	15	4	50	19,010	1.61	1.66	1.71	1.77	1.91
CRL200-0060-0100-0170	0.6	0.1	1.7	0.7	0.57	15	4	50	19,010	1.81	1.87	1.94	2.00	2.16
CRL200-0060-0200-0170		0.2	1.7	0.7	0.57	15	4	50	19,010	1.81	1.86	1.92	1.99	2.14
CRL200-0100-0100-0220	1	0.1	2.2	1.2	0.96	15	4	50	17,420	2.35	2.43	2.51	2.60	2.80
CRL200-0100-0200-0220		0.2	2.2	1.2	0.96	15	4	50	17,420	2.34	2.42	2.50	2.59	2.78
CRL200-0100-0300-0220		0.3	2.2	1.2	0.96	15	4	50	17,420	2.34	2.41	2.49	2.57	2.76
CRL200-0150-0100-0300	1.5	0.1	3	1.5	1.44	15	4	50	20,500	3.21	3.32	3.44	3.56	3.85
CRL200-0150-0200-0300		0.2	3	1.5	1.44	15	4	50	20,500	3.21	3.31	3.43	3.55	3.82
CRL200-0150-0300-0300		0.3	3	1.5	1.44	15	4	50	20,500	3.21	3.31	3.42	3.53	3.80
CRL200-0200-0100-0500	2	0.1	5	2	1.96	15	4	50	21,120	5.24	5.42	5.61	5.82	6.29
CRL200-0200-0200-0500		0.2	5	2	1.96	15	4	50	21,120	5.24	5.41	5.60	5.81	6.26
CRL200-0200-0300-0500		0.3	5	2	1.96	15	4	50	21,120	5.24	5.41	5.59	5.79	6.24
CRL200-0300-0100-0500	3	0.1	5	2	2.92	15	6	50	23,230	5.32	5.50	5.70	5.91	6.38
CRL200-0300-0200-0500		0.2	5	2	2.92	15	6	50	23,230	5.32	5.49	5.69	5.89	6.35
CRL200-0300-0300-0500		0.3	5	2	2.92	15	6	50	23,230	5.31	5.49	5.67	5.88	6.33

CBN 切削条件参考表 Recommended Milling Conditions

■型号:CRL200 Model number:CRL200

抛光圆角立铣刀 Radius End Mill(for Lap)

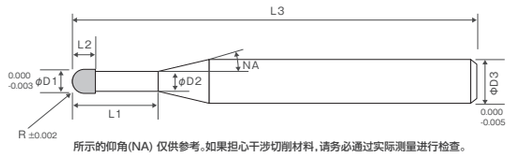
切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.4	1.35	0.005	0.01	900	30,000	0.005	0.05	800	30,000	0.005	0.05	700	30,000	0.005	0.05	600	30,000
	0.5	1.5	0.005	0.01	900	30,000	0.005	0.05	800	30,000	0.005	0.05	700	30,000	0.005	0.05	600	30,000
	0.6	1.7	0.005	0.01	900	30,000	0.005	0.1	800	30,000	0.005	0.1	700	30,000	0.005	0.1	600	30,000
	1	2.2	0.01	0.015	1,100	30,000	0.01	0.2	1,000	30,000	0.01	0.2	900	30,000	0.01	0.2	800	30,000
	1.5	3	0.01	0.02	1,100	20,000	0.01	0.5	1,000	20,000	0.01	0.5	900	20,000	0.01	0.5	800	20,000
	2	5	0.01	0.03	1,100	20,000	0.01	0.7	1,000	20,000	0.01	0.7	900	20,000	0.01	0.7	800	20,000
	3	5	0.01	0.04	1,100	20,000	0.01	1	1,000	20,000	0.01	1	900	20,000	0.01	1	800	20,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

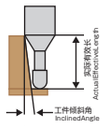
CBN抛光球头立铣刀 CBN Lapping Ball End Mill

■型号:CBL200 Model number:CBL200

Non | BANCERA | CBN | 刀刃数 2 | 螺旋角 0° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
CBL200-0040-0200-0135	0.2	1.35	0.4	0.4	0.37	15	4	50	22,880	1.45	1.49	1.54	1.59	1.70
CBL200-0060-0300-0170	0.3	1.7	0.7	0.6	0.57	15	4	50	21,120	1.81	1.86	1.91	1.97	2.11
CBL200-0100-0500-0220	0.5	2.2	1.2	1	0.96	15	4	50	20,720	2.33	2.40	2.47	2.54	2.71
CBL200-0150-0750-0300	0.75	3	1.5	1.5	1.44	15	4	50	21,600	3.19	3.28	3.37	3.47	3.70
CBL200-0150-0750-0500		5	1.5	1.5	1.44	15	4	50	23,200	5.26	5.42	5.59	5.77	6.18
CBL200-0150-0750-1000		10	1.5	1.5	1.44	15	4	50	23,200	10.43	10.76	11.13	11.52	12.40
CBL200-0200-1000-0500	1	5	2	2	1.96	15	4	50	22,000	5.21	5.36	5.52	5.69	6.08
CBL200-0200-1000-1000		10	2	2	1.96	15	4	50	23,600	10.38	10.71	11.06	11.44	12.29
CBL200-0200-1000-1500		15	2	2	1.96	15	4	50	23,600	15.55	16.06	16.60	17.19	18.51
CBL200-0300-1500-0500	1.5	5	2	3	2.92	15	6	50	23,200	5.27	5.40	5.55	5.70	6.06
CBL200-0300-1500-1000		10	2	3	2.92	15	6	50	24,000	10.44	10.75	11.09	11.45	12.27
CBL200-0300-1500-1500		15	2	3	2.92	15	6	50	24,800	15.61	16.10	16.63	17.20	18.49

CBN 切削条件参考表 Recommended Milling Conditions

■型号:CBL200 Model number:CBL200

抛光球头立铣刀 Ball End Mill(for Lap)

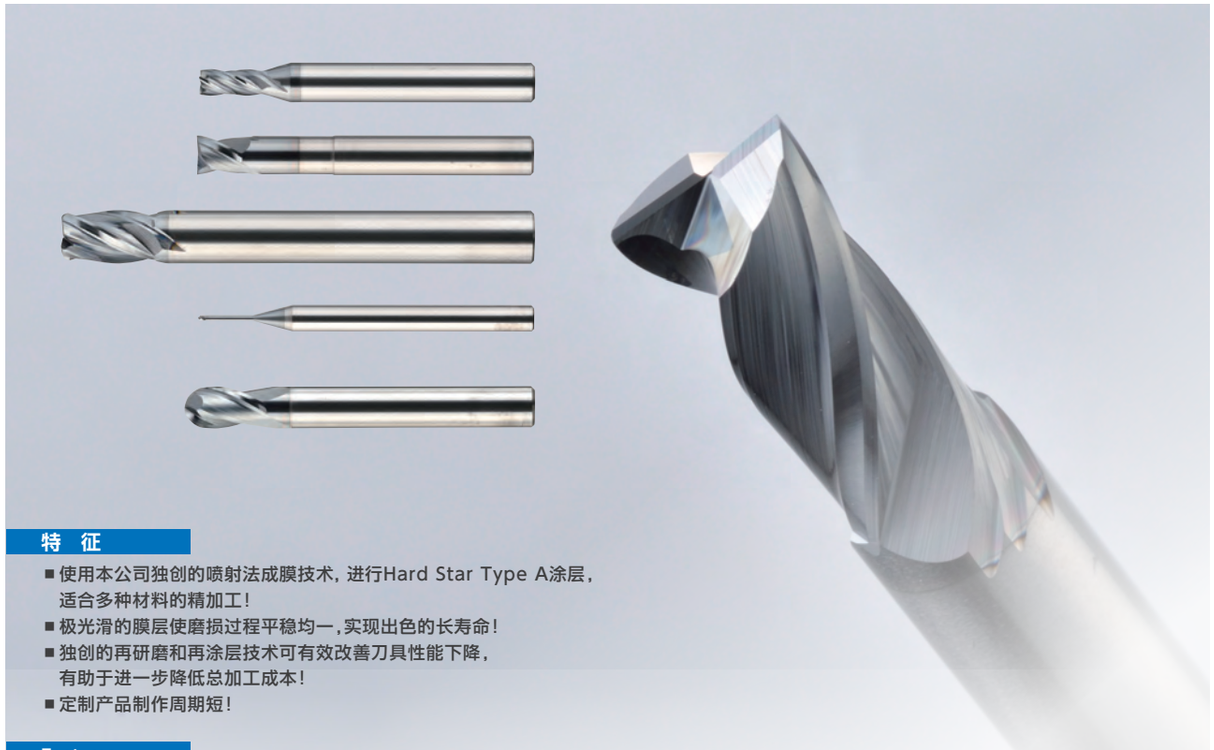
切削材料 Work Material			铜 Copper				淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.4	1.35	0.005	0.01	900	30,000	0.005	0.01	800	30,000	0.005	0.01	700	30,000	0.005	0.01	600	30,000
	0.6	1.7	0.005	0.01	900	30,000	0.005	0.01	800	30,000	0.005	0.01	700	30,000	0.005	0.01	600	30,000
	1	2.2	0.01	0.015	1,100	30,000	0.01	0.015	1,000	30,000	0.01	0.015	900	30,000	0.01	0.015	800	30,000
	1.5	3	0.01	0.02	1,100	30,000	0.01	0.02	1,000	30,000	0.01	0.02	900	30,000	0.01	0.02	800	30,000
		5	0.01	0.02	1,100	30,000	0.01	0.02	1,000	30,000	0.01	0.02	900	30,000	0.01	0.02	800	30,000
		10	0.01	0.015	1,100	30,000	0.01	0.015	1,000	30,000	0.01	0.015	900	30,000	0.01	0.015	800	30,000
	2	5	0.01	0.03	1,100	20,000	0.01	0.03	1,000	20,000	0.01	0.03	900	20,000	0.01	0.03	800	20,000
		10	0.01	0.03	1,100	20,000	0.01	0.03	1,000	20,000	0.01	0.03	900	20,000	0.01	0.03	800	20,000
		15	0.01	0.025	1,100	20,000	0.01	0.025	1,000	20,000	0.01	0.025	900	20,000	0.01	0.025	800	20,000
	3	5	0.01	0.04	1,100	20,000	0.01	0.04	1,000	20,000	0.01	0.04	900	20,000	0.01	0.04	800	20,000
		10	0.01	0.04	1,100	20,000	0.01	0.04	1,000	20,000	0.01	0.04	900	20,000	0.01	0.04	800	20,000
		15	0.01	0.035	1,100	20,000	0.01	0.035	1,000	20,000	0.01	0.035	900	20,000	0.01	0.035	800	20,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

超硬立铣刀 Carbide End Mill

Hard A | super MG | 刀刃数 2~6 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



特　征

- 使用本公司独创的喷射法成膜技术，进行Hard Star Type A涂层，适合多种材料的精加工！
- 极光滑的膜层使磨损过程平稳均一，实现出色的长寿命！
- 独创的再研磨和再涂层技术可有效改善刀具性能下降，有助于进一步降低总加工成本！
- 定制产品制作周期短！

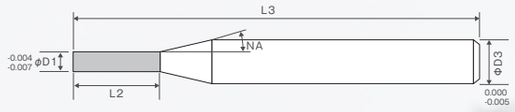
Features

- Hard Star Type A coating with our original Sputtering Method Coating Technology is ideal for finishing a wide range of work materials.
- Smooth surface of the coating creates uniformed wear achieving greater tool life.
- TOWA re-polishing and re-coating technology enhances cutting tool life and reduces overall tooling cost.
- Non-standard custom-made products available.

超硬平角立铣刀　Carbide Square End Mill

■型号:HAS230 Model number:HAS230

Hard A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HAS230-0010-00020	0.1	0.2	15	4	50	5,760
HAS230-0020-00040	0.2	0.4	15	4	50	3,680
HAS230-0030-00060	0.3	0.6	15	4	50	2,880
HAS230-0040-00080	0.4	0.8	15	4	50	3,360
HAS230-0050-00100	0.5	1	15	4	50	2,000
HAS230-0060-00120	0.6	1.2	15	4	50	2,800
HAS230-0070-00140	0.7	1.4	15	4	50	3,040
HAS230-0080-00160	0.8	1.6	15	4	50	2,000
HAS230-0090-00180	0.9	1.8	15	4	50	3,040
HAS230-0100-00200	1	2	15	4	50	1,760
HAS230-0110-00220	1.1	2.2	15	4	50	3,120
HAS230-0120-00240	1.2	2.4	15	4	50	2,000
HAS230-0130-00260	1.3	2.6	15	4	50	3,120
HAS230-0140-00280	1.4	2.8	15	4	50	3,120
HAS230-0150-00300	1.5	3	15	4	50	1,840
HAS230-0160-00320	1.6	3.2	15	4	50	3,120
HAS230-0170-00340	1.7	3.4	15	4	50	3,120
HAS230-0180-00360	1.8	3.6	15	4	50	2,000
HAS230-0190-00380	1.9	3.8	15	4	50	3,120
HAS230-0200-00400	2	4	15	4	50	1,840
HAS230-0210-00420	2.1	4.2	15	4	50	3,120
HAS230-0220-00440	2.2	4.4	15	4	50	3,120
HAS230-0230-00460	2.3	4.6	15	4	50	3,120
HAS230-0240-00480	2.4	4.8	15	4	50	3,120
HAS230-0250-00500	2.5	5	15	4	50	1,840
HAS230-0260-00520	2.6	5.2	15	4	50	4,000
HAS230-0270-00540	2.7	5.4	15	4	50	4,000
HAS230-0280-00560	2.8	5.6	15	4	50	4,000
HAS230-0290-00580	2.9	5.8	15	4	50	4,000
HAS230-0300-00600	3	6	15	4	50	2,320
HAS230-0350-00700	3.5	7	15	6	50	3,520
HAS230-0400-00800	4	8	15	6	50	2,560
HAS230-0450-00900	4.5	9	15	6	50	4,000
HAS230-0500-01000	5	10	15	6	50	2,720
HAS230-0550-01100	5.5	11	15	6	50	4,000
HAS230-0600-01200	6	12	—	6	50	2,960

HARD STAR Type A Series

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HAS230
Model number:HAS230

平角立铣刀 Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
	0.1	0.2	0.1	0.002	130	40,000	0.1	0.002	100	40,000	0.1	0.002	70	40,000
	0.2	0.4	0.2	0.004	200	30,000	0.2	0.004	160	30,000	0.2	0.004	120	30,000
	0.3	0.6	0.3	0.006	300	30,000	0.3	0.006	250	30,000	0.3	0.006	200	30,000
	0.4	0.8	0.4	0.008	370	30,000	0.4	0.008	340	30,000	0.4	0.008	260	25,000
	0.5	1	0.5	0.01	450	25,000	0.5	0.01	400	23,000	0.5	0.01	360	20,000
	0.6	1.2	0.6	0.012	530	25,000	0.6	0.012	430	23,000	0.6	0.012	380	20,000
	0.7	1.4	0.7	0.014	650	25,000	0.7	0.014	500	23,000	0.7	0.014	450	20,000
	0.8	1.6	0.8	0.016	780	25,000	0.8	0.016	650	23,000	0.8	0.016	550	20,000
	0.9	1.8	0.9	0.018	800	25,000	0.9	0.018	700	23,000	0.9	0.018	600	20,000
	1	2	1	0.02	1,000	23,000	1	0.02	900	18,000	1	0.02	600	14,000
	1.1	2.2	1.1	0.022	1,000	23,000	1.1	0.022	900	18,000	1.1	0.022	600	14,000
	1.2	2.4	1.2	0.024	1,000	23,000	1.2	0.024	900	18,000	1.2	0.024	600	14,000
	1.3	2.6	1.3	0.026	1,000	23,000	1.3	0.026	900	18,000	1.3	0.026	600	14,000
	1.4	2.8	1.4	0.028	1,000	23,000	1.4	0.028	900	18,000	1.4	0.028	600	14,000
	1.5	3	1.5	0.03	900	20,000	1.5	0.03	800	18,000	1.5	0.03	600	14,000
	1.6	3.2	1.6	0.032	900	20,000	1.6	0.032	800	18,000	1.6	0.032	600	14,000
	1.7	3.4	1.7	0.034	900	20,000	1.7	0.034	800	18,000	1.7	0.034	600	14,000
	1.8	3.6	1.8	0.036	900	20,000	1.8	0.036	800	18,000	1.8	0.036	600	14,000
	1.9	3.8	1.9	0.038	900	20,000	1.9	0.038	800	18,000	1.9	0.038	600	14,000
2	2	4	2	0.04	900	18,000	2	0.04	750	15,000	2	0.04	550	12,000
	2.1	4.2	2.1	0.042	900	18,000	2.1	0.042	750	15,000	2.1	0.042	550	12,000
	2.2	4.4	2.2	0.044	900	18,000	2.2	0.044	750	15,000	2.2	0.044	550	12,000
	2.3	4.6	2.3	0.046	900	18,000	2.3	0.046	750	15,000	2.3	0.046	550	12,000
	2.4	4.8	2.4	0.048	900	18,000	2.4	0.048	750	15,000	2.4	0.048	550	12,000
	2.5	5	2.5	0.05	800	14,000	2.5	0.05	700	10,000	2.5	0.05	500	8,000
	2.6	5.2	2.6	0.052	800	14,000	2.6	0.052	700	10,000	2.6	0.052	500	8,000
	2.7	5.4	2.7	0.054	800	14,000	2.7	0.054	700	10,000	2.7	0.054	500	8,000
	2.8	5.6	2.8	0.056	800	14,000	2.8	0.056	700	10,000	2.8	0.056	500	8,000
	2.9	5.8	2.9	0.058	800	14,000	2.9	0.058	700	10,000	2.9	0.058	500	8,000
	3	6	3	0.06	850	14,000	3	0.06	750	10,000	3	0.06	550	8,000
	3.5	7	3.5	0.07	850	14,000	3.5	0.07	750	10,000	3.5	0.07	550	8,000
	4	8	4	0.08	850	10,000	4	0.08	750	9,000	4	0.08	650	9,000
	4.5	9	4.5	0.09	850	10,000	4.5	0.09	750	9,000	4.5	0.09	650	9,000
	5	10	5	0.1	800	6,000	5	0.1	700	5,000	5	0.1	600	4,500
	5.5	11	5.5	0.11	800	6,000	5.5	0.11	700	5,000	5.5	0.11	600	4,500
	6	12	6	0.12	800	5,000	6	0.12	700	4,000	6	0.12	700	3,500

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量，∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

平角立铣刀 Square End Mill

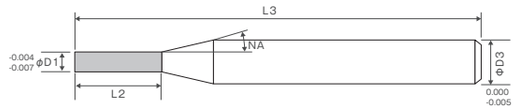
切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
	0.1	0.2	0.1	0.02	60	50,000	0.1	0.02	60	50,000	0.1	0.003	60	50,000
	0.2	0.4	0.2	0.04	90	50,000	0.2	0.04	90	50,000	0.2	0.006	90	50,000
	0.3	0.6	0.3	0.06	150	50,000	0.3	0.06	150	50,000	0.3	0.009	150	50,000
	0.4	0.8	0.4	0.08	200	50,000	0.4	0.08	200	50,000	0.4	0.012	200	50,000
	0.5	1	0.5	0.1	250	50,000	0.5	0.1	250	50,000	0.5	0.015	250	50,000
	0.6	1.2	0.6	0.12	250	50,000	0.6	0.12	250	50,000	0.6	0.018	250	50,000
	0.7	1.4	0.7	0.14	250	50,000	0.7	0.14	250	50,000	0.7	0.021	250	50,000
	0.8	1.6	0.8	0.16	450	50,000	0.8	0.16	450	50,000	0.8	0.024	450	50,000
	0.9	1.8	0.9	0.18	450	50,000	0.9	0.18	450	50,000	0.9	0.027	450	50,000
	1	2	1	0.2	550	48,000	1	0.2	550	48,000	0.2	0.03	550	48,000
	1.1	2.2	1.1	0.22	550	48,000	1.1	0.22	550	48,000	1.1	0.033	550	48,000
	1.2	2.4	1.2	0.24	550	48,000	1.2	0.24	550	48,000	1.2	0.036	550	48,000
	1.3	2.6	1.3	0.26	550	48,000	1.3	0.26	550	48,000	1.3	0.039	550	48,000
	1.4	2.8	1.4	0.28	550	48,000	1.4	0.28	550	48,000	1.4	0.042	550	48,000
	1.5	3	1.5	0.3	640	32,000	1	0.2	640	32,000	1	0.045	640	32,000
	1.6	3.2	1.6	0.32	640	32,000	1.6	0.32	640	32,000	1.6	0.048	640	32,000
	1.7	3.4	1.7	0.34	640	32,000	1.7	0.34	640	32,000	1.7	0.051	640	32,000
	1.8	3.6	1.8	0.36	640	32,000	1.8	0.36	640	32,000	1.8	0.054	640	32,000
	1.9	3.8	1.9	0.38	640	32,000	1.9	0.38	640	32,000	1.9	0.057	640	32,000
2	2	4	2	0.4	720	24,000	2	0.4	720	24,000	2	0.06	720	24,000
	2.1	4.2	2.1	0.42	720	24,000	2.1	0.42	720	24,000	2.1	0.063	720	24,000
	2.2	4.4	2.2	0.44	720	24,000	2.2	0.44	720	24,000	2.2	0.066	720	24,000
	2.3	4.6	2.3	0.46	720	24,000	2.3	0.46	720	24,000	2.3	0.069	720	24,000
	2.4	4.8	2.4	0.48	720	24,000	2.4	0.48	720	24,000	2.4	0.072	720	24,000
	2.5	5	2.5	0.5	760	20,000	2.5	0.5	760	20,000	2.5	0.075	760	20,000
	2.6	5.2	2.6	0.52	760	20,000	2.6	0.52	760	20,000	2.6	0.078	760	20,000
	2.7	5.4	2.7	0.54	760	20,000	2.7	0.54	760	20,000	2.7	0.081	760	20,000
	2.8	5.6	2.8	0.56	760	20,000	2.8	0.56	760	20,000	2.8	0.084	760	20,000
	2.9	5.8	2.9	0.58	760	20,000	2.9	0.58	760	20,000	2.9	0.087	760	20,000
	3	6	3	0.6	800	16,000	3	0.6	800	16,000	3	0.09	800	16,000
	3.5	7	3.5	0.7	800	16,000	3.5	0.7	800	16,000	3.5	0.105	800	16,000
	4	8	4	0.8	830	12,000	4	0.8	830	12,000	4	0.12	830	12,000
	4.5	9	4.5	0.9	830	12,000	4.5	0.9	830	12,000	4.5	0.135	830	12,000
	5	10	5	1	830	9,500	5	1	830	9,500	5	0.15	830	9,500
	5.5	11	5.5	1.1	860	9,500	5.5	1.1	860	9,500	5.5	0.165	860	9,500
	6	12	6	1.2	850	8,000	6	1.2	850	8,000	6	0.18	850	8,000

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量，∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬平角立铣刀　Carbide Square End Mill

■型号:HAS430 Model number:HAS430

Hard A | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HAS430-0100-00200	1	2	15	4	50	5,040
HAS430-0150-00300	1.5	3	15	4	50	5,040
HAS430-0200-00400	2	4	15	4	50	5,040
HAS430-0300-00600	3	6	15	4	50	5,840
HAS430-0400-00800	4	8	15	6	50	6,320
HAS430-0600-01200	6	12	—	6	60	6,640
HAS430-0600-01800		18	—	6	60	7,120
HAS430-0800-01600	8	16	—	8	70	11,520
HAS430-0800-02400		24	—	8	70	12,000
HAS430-1000-02000	10	20	—	10	80	15,520
HAS430-1000-03000		30	—	10	80	16,000
HAS430-1200-02400	12	24	—	12	110	19,600
HAS430-1200-03600		36	—	12	110	20,320

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HAS430
Model number:HAS430

平角立铣刀　Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	2	1	0.02	280	6,400	1	0.015	240	5,400	1	0.01	200	4,800
	1.5	3	1.5	0.03	300	4,200	1.5	0.02	230	3,600	1.5	0.01	180	3,200
	2	4	2	0.04	320	3,200	2	0.03	230	2,700	2	0.02	180	2,400
	3	6	3	0.06	520	3,700	3	0.05	380	3,200	3	0.05	260	2,600
	4	8	4	0.08	450	2,800	4	0.07	380	2,400	4	0.06	260	2,000
	6	12	6	0.12	500	2,300	6	0.1	400	2,000	6	0.08	300	1,900
		18	9	0.06	480	2,300	9	0.05	380	2,000	9	0.04	280	1,900
	8	16	8	0.16	300	1,800	8	0.13	250	1,700	8	0.1	200	1,600
		24	12	0.08	280	1,800	12	0.05	230	1,700	12	0.04	180	1,600
	10	20	10	0.2	250	1,600	10	0.17	200	1,500	10	0.13	200	1,400
		30	15	0.2	230	1,600	15	0.17	180	1,500	15	0.13	180	1,400
	12	24	12	0.24	240	1,500	12	0.2	200	1,400	12	0.15	200	1,300
		36	18	0.12	220	1,500	18	0.09	180	1,400	18	0.06	180	1,300

平角立铣刀　Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	2	1	0.2	840	6,400	1	0.2	840	6,400	1	0.02	280	6,400
	1.5	3	1.5	0.3	900	4,200	1.5	0.3	900	4,200	1.5	0.03	300	4,200
	2	4	2	0.4	960	3,200	2	0.4	960	3,200	2	0.04	320	3,200
	3	6	3	0.6	1,560	3,700	3	0.6	1,560	3,700	3	0.06	520	3,700
	4	8	4	0.8	1,350	2,800	4	0.8	1,350	2,800	4	0.08	450	2,800
	6	12	6	1.2	1,500	2,500	6	1.2	1,500	2,500	6	0.12	400	2,300
		18	9	1.2	1,440	2,500	9	1.2	1,440	2,500	9	0.06	350	2,300
	8	16	8	1.6	900	1,800	8	1.6	900	1,800	8	0.16	300	1,800
		24	12	1.6	840	1,800	12	1.6	840	1,800	12	0.08	280	1,800
	10	20	10	2	750	1,600	10	2	750	1,600	10	0.2	250	1,600
		30	15	2	690	1,600	15	2	690	1,600	15	0.2	230	1,600
	12	24	12	2.4	720	1,500	12	2.4	720	1,500	12	0.24	240	1,500
		36	18	2.4	660	1,500	18	2.4	660	1,500	18	0.12	220	1,500

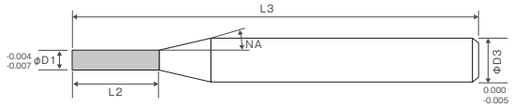
●请将刀具确实地固定在刀柄上,以防止刀具振动。　Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。　Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。　∂p=Axial Depth of Cut　∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。　We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。　Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。　Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

超硬平角立铣刀　Carbide Square End Mill

■型号:HAS630 Model number:HAS630

Hard A | super MG | 刀刃数 6 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HAS630-0500-01000	5	10	15	6	50	6,720
HAS630-0500-01500		15	15	6	60	7,440
HAS630-0600-01200	6	12	—	6	60	7,280
HAS630-0600-01800		18	—	6	60	8,080
HAS630-0800-01600	8	16	—	8	70	9,920
HAS630-0800-02400		24	—	8	80	11,040
HAS630-1000-02000	10	20	—	10	80	13,200
HAS630-1000-03000		30	—	10	90	14,720
HAS630-1200-02400	12	24	—	12	110	16,880
HAS630-1200-03600		36	—	12	110	18,720

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HAS630
Model number:HAS630

平角立铣刀　Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
6	5	10	5	0.1	1,200	5,100	5	0.1	1,000	4,500	5	0.05	800	3,800
		15	7.5	0.08	1,200	5,100	7.5	0.08	1,000	4,500	7.5	0.04	800	3,800
	6	12	6	0.12	1,300	4,200	6	0.12	1,100	3,700	6	0.06	680	3,200
		18	9	0.1	1,300	4,200	9	0.1	1,100	3,700	9	0.05	680	3,200
	8	16	8	0.16	1,500	3,200	8	0.16	1,300	2,800	8	0.08	750	2,400
		24	12	0.15	1,500	3,200	12	0.15	1,300	2,800	12	0.07	750	2,400
	10	20	10	0.2	1,500	2,600	10	0.2	1,300	2,200	10	0.1	900	1,900
		30	15	0.17	1,500	2,600	15	0.17	1,300	2,200	15	0.08	900	1,900
	12	24	12	0.24	1,300	2,100	12	0.24	1,100	1,900	12	0.12	960	1,600
		36	18	0.2	1,300	2,100	18	0.2	1,100	1,900	18	0.1	960	1,600

平角立铣刀　Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
6	5	10	5	0.1	1,000	5,100	5	0.1	1,000	5,100	5	0.1	1,200	5,100
		15	7.5	0.08	1,100	5,100	7.5	0.08	1,100	5,100	7.5	0.08	1,200	5,100
	6	12	6	0.12	1,200	4,200	6	0.12	1,200	4,200	6	0.12	1,300	4,200
		18	9	0.1	1,800	4,200	9	0.1	1,800	4,200	9	0.1	1,300	4,200
	8	16	8	0.16	1,600	3,200	8	0.16	1,600	3,200	8	0.16	1,500	3,200
		24	12	0.15	1,100	3,200	12	0.15	1,100	3,200	12	0.15	1,500	3,200
	10	20	10	0.2	1,000	2,600	10	0.2	1,000	2,600	10	0.2	1,500	2,600
		30	15	0.17	900	2,600	15	0.17	900	2,600	15	0.17	1,500	2,600
	12	24	12	0.24	800	2,100	12	0.24	800	2,100	12	0.24	1,300	2,100
		36	18	0.2	850	2,100	18	0.2	850	2,100	18	0.2	1,300	2,100

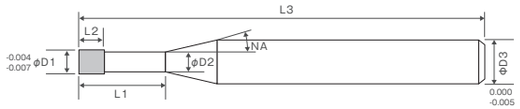
●请将刀具确实地固定在刀柄上，以防止刀具振动。　Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。　Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。　∂p=Axial Depth of Cut　∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。　We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。　Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。　Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

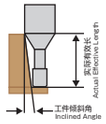
超硬长颈平角立铣刀 Carbide Long Neck Square End Mill

Hard A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:HALS230 Model number:HALS230



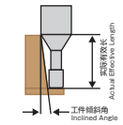
所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

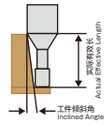
型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALS230-0010-0030	0.1	0.3	0.08	0.08	15	4	50	8,400	0.35	0.36	0.37	0.39	0.42
HALS230-0010-0050		0.5	0.08	0.08	15	4	50	9,120	0.56	0.57	0.60	0.62	0.67
HALS230-0015-0030	0.15	0.3	0.12	0.13	15	4	50	11,200	0.35	0.36	0.37	0.39	0.42
HALS230-0015-0050		0.5	0.12	0.13	15	4	50	8,400	0.56	0.57	0.60	0.62	0.67
HALS230-0020-0050	0.2	0.5	0.15	0.18	15	4	50	10,000	0.56	0.57	0.60	0.62	0.67
HALS230-0020-0075		0.75	0.15	0.18	15	4	50	5,760	0.81	0.84	0.87	0.91	0.98
HALS230-0020-0100		1	0.15	0.18	15	4	50	5,920	1.07	1.11	1.15	1.19	1.29
HALS230-0030-0100	0.3	1	0.25	0.27	15	4	50	8,800	1.09	1.13	1.17	1.21	1.31
HALS230-0030-0150		1.5	0.25	0.27	15	4	50	5,040	1.61	1.66	1.72	1.79	1.93
HALS230-0030-0200		2	0.25	0.27	15	4	50	5,040	2.13	2.20	2.28	2.36	2.56
HALS230-0030-0250		2.5	0.25	0.27	15	4	50	6,240	2.64	2.73	2.83	2.94	3.18
HALS230-0030-0300		3	0.25	0.27	15	4	50	6,480	3.16	3.27	3.39	3.51	3.80
HALS230-0040-0100	0.4	1	0.3	0.37	15	4	50	6,480	1.09	1.13	1.17	1.21	1.31
HALS230-0040-0150		1.5	0.3	0.37	15	4	50	3,680	1.61	1.66	1.72	1.79	1.93
HALS230-0040-0200		2	0.3	0.37	15	4	50	3,680	2.13	2.20	2.28	2.36	2.56
HALS230-0040-0250		2.5	0.3	0.37	15	4	50	3,680	2.64	2.73	2.83	2.94	3.18
HALS230-0040-0300		3	0.3	0.37	15	4	50	3,680	3.16	3.27	3.39	3.51	3.80
HALS230-0050-0100	0.5	1	0.4	0.47	15	4	50	2,640	1.09	1.13	1.17	1.21	1.31
HALS230-0050-0150		1.5	0.4	0.47	15	4	50	2,640	1.61	1.66	1.72	1.79	1.93
HALS230-0050-0200		2	0.4	0.47	15	4	50	2,640	2.13	2.20	2.28	2.36	2.56
HALS230-0050-0250		2.5	0.4	0.47	15	4	50	2,640	2.64	2.73	2.83	2.94	3.18
HALS230-0050-0300		3	0.4	0.47	15	4	50	2,640	3.16	3.27	3.39	3.51	3.80
HALS230-0050-0350		3.5	0.4	0.47	15	4	50	2,640	3.68	3.80	3.94	4.09	4.42
HALS230-0050-0400		4	0.4	0.47	15	4	50	2,640	4.19	4.34	4.50	4.66	5.04
HALS230-0060-0150	0.6	1.5	0.5	0.57	15	4	50	2,800	1.61	1.66	1.72	1.79	1.93
HALS230-0060-0200		2	0.5	0.57	15	4	50	2,800	2.13	2.20	2.28	2.36	2.56
HALS230-0060-0300		3	0.5	0.57	15	4	50	2,800	3.16	3.27	3.39	3.51	3.80
HALS230-0060-0400		4	0.5	0.57	15	4	50	2,800	4.19	4.34	4.50	4.66	5.04
HALS230-0060-0500		5	0.5	0.57	15	4	50	2,800	5.23	5.41	5.60	5.81	6.29
HALS230-0060-0600		6	0.5	0.57	15	4	50	2,800	6.26	6.48	6.71	6.96	7.53



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALS230-0070-0200	0.7	2	0.55	0.67	15	4	50	3,200	2.13	2.20	2.28	2.36	2.56
HALS230-0070-0400		4	0.55	0.67	15	4	50	3,200	4.19	4.34	4.50	4.66	5.04
HALS230-0070-0600		6	0.55	0.67	15	4	50	3,200	6.26	6.48	6.71	6.96	7.53
HALS230-0080-0300	0.8	3	0.65	0.77	15	4	50	3,120	3.16	3.27	3.39	3.51	3.80
HALS230-0080-0400		4	0.65	0.77	15	4	50	3,120	4.19	4.34	4.50	4.66	5.04
HALS230-0080-0500		5	0.65	0.77	15	4	50	3,120	5.23	5.41	5.60	5.81	6.29
HALS230-0080-0600		6	0.65	0.77	15	4	50	3,120	6.26	6.48	6.71	6.96	7.53
HALS230-0080-0800		8	0.65	0.77	15	4	50	3,120	8.33	8.62	8.93	9.26	10.01
HALS230-0100-0200	1	2	0.8	0.95	15	4	50	2,800	2.16	2.24	2.32	2.41	2.60
HALS230-0100-0300		3	0.8	0.95	15	4	50	2,800	3.20	3.31	3.43	3.56	3.85
HALS230-0100-0400		4	0.8	0.95	15	4	50	2,800	4.23	4.38	4.54	4.71	5.09
HALS230-0100-0500		5	0.8	0.95	15	4	50	2,800	5.26	5.45	5.64	5.86	6.33
HALS230-0100-0600		6	0.8	0.95	15	4	50	2,800	6.30	6.52	6.75	7.01	7.57
HALS230-0100-0700		7	0.8	0.95	15	4	50	2,800	7.33	7.59	7.86	8.16	8.82
HALS230-0100-0800		8	0.8	0.95	15	4	50	2,800	8.37	8.66	8.97	9.31	10.06
HALS230-0100-0900		9	0.8	0.95	15	4	50	2,800	9.40	9.73	10.08	10.46	11.30
HALS230-0100-1000		10	0.8	0.95	15	4	50	2,800	10.43	10.80	11.19	11.61	12.55
HALS230-0100-1200		12	0.8	0.95	15	4	50	2,800	12.50	12.94	13.40	13.91	15.03
HALS230-0120-0600	1.2	6	1	1.15	15	4	50	2,960	6.30	6.52	6.75	7.01	7.57
HALS230-0120-0800		8	1	1.15	15	4	50	2,960	8.37	8.66	8.97	9.31	10.06
HALS230-0120-1000		10	1	1.15	15	4	50	2,960	10.43	10.80	11.19	11.61	12.55
HALS230-0120-1200		12	1	1.15	15	4	50	2,960	12.50	12.94	13.40	13.91	15.03
HALS230-0120-1600		16	1	1.15	15	4	50	4,720	16.64	17.21	17.84	18.50	20.01
HALS230-0140-0600	1.4	6	1.1	1.35	15	4	50	3,040	6.30	6.52	6.75	7.01	7.57
HALS230-0140-1200		12	1.1	1.35	15	4	50	3,040	12.50	12.94	13.40	13.91	15.03
HALS230-0150-0400	1.5	4	1.2	1.45	15	4	50	2,960	4.23	4.38	4.54	4.71	5.09
HALS230-0150-0600		6	1.2	1.45	15	4	50	2,960	6.30	6.52	6.75	7.01	7.57
HALS230-0150-0800		8	1.2	1.45	15	4	50	2,960	8.37	8.66	8.97	9.31	10.06
HALS230-0150-1000		10	1.2	1.45	15	4	50	2,960	10.43	10.80	11.19	11.61	12.55
HALS230-0150-1200		12	1.2	1.45	15	4	50	2,960	12.50	12.94	13.40	13.91	15.03
HALS230-0150-1400		14	1.2	1.45	15	4	50	3,040	14.57	15.08	15.62	16.21	17.52
HALS230-0150-1600		16	1.2	1.45	15	4	50	3,040	16.64	17.21	17.84	18.50	20.01
HALS230-0160-0600	1.6	6	1.3	1.55	15	4	50	3,040	6.30	6.52	6.75	7.01	7.57
HALS230-0160-0800		8	1.3	1.55	15	4	50	3,040	8.37	8.66	8.97	9.31	10.06
HALS230-0180-0600	1.8	6	1.4	1.75	15	4	50	3,040	6.30	6.52	6.75	7.01	7.57
HALS230-0180-0800		8	1.4	1.75	15	4	50	3,040	8.37	8.66	8.97	9.31	10.06
HALS230-0180-1000		10	1.4	1.75	15	4	50	3,040	10.43	10.80	11.19	11.61	12.55
HALS230-0180-1200		12	1.4	1.75	15	4	50	3,040	12.50	12.94	13.40	13.91	15.03
HALS230-0180-1400		14	1.4	1.75	15	4	50	3,040	14.57	15.08	15.62	16.21	17.52
HALS230-0180-1600		16	1.4	1.75	15	4	50	3,040	16.64	17.21	17.84	18.50	20.01
HALS230-0200-0400	2	4	1.6	1.94	15	4	50	2,960	4.25	4.40	4.56	4.73	5.11
HALS230-0200-0600		6	1.6	1.94	15	4	50	2,960	6.32	6.54	6.77	7.03	7.60
HALS230-0200-0800		8	1.6	1.94	15	4	50	2,960	8.39	8.68	8.99	9.33	10.08
HALS230-0200-1000		10	1.6	1.94	15	4	50	2,960	10.45	10.82	11.21	11.63	12.57
HALS230-0200-1200		12	1.6	1.94	15	4	50	2,960	12.52	12.96	13.42	13.93	15.06



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单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALS230-0200-1400	2	14	1.6	1.94	15	4	50	2,960	14.59	15.10	15.64	16.23	17.54
HALS230-0200-1600		16	1.6	1.94	15	4	50	2,960	16.65	17.23	17.86	18.53	FREE
HALS230-0200-1800		18	1.6	1.94	15	4	50	2,960	18.72	19.37	20.07	20.83	FREE
HALS230-0200-2000		20	1.6	1.94	15	4	50	2,960	20.79	21.51	22.29	23.13	FREE
HALS230-0250-0800	2.5	8	2	2.44	15	4	50	3,120	8.39	8.68	8.99	9.33	10.08
HALS230-0250-1200		12	2	2.44	15	4	50	3,120	12.52	12.96	13.42	13.93	FREE
HALS230-0250-1600		16	2	2.44	15	4	50	3,120	16.65	17.23	17.86	18.53	FREE
HALS230-0250-2000		20	2	2.44	15	4	50	3,120	20.79	21.51	22.29	FREE	FREE
HALS230-0300-0800	3	8	4.5	2.85	15	4	50	4,000	8.56	8.86	9.18	9.52	FREE
HALS230-0300-1200		12	4.5	2.85	15	4	50	4,000	12.69	13.14	13.61	14.12	FREE
HALS230-0300-1600		16	4.5	2.85	15	4	50	4,000	16.83	17.41	18.04	FREE	FREE
HALS230-0300-2000		20	4.5	2.85	15	4	50	4,000	20.96	21.69	FREE	FREE	FREE
HALS230-0300-2500		25	4.5	2.85	15	4	60	4,000	26.13	27.04	FREE	FREE	FREE
HALS230-0300-3000		30	4.5	2.85	15	4	60	4,800	31.30	FREE	FREE	FREE	FREE
HALS230-0400-1000	4	10	3	3.8	15	6	50	4,180	10.72	11.10	11.50	11.93	12.89
HALS230-0400-1500		15	3	3.8	15	6	50	4,180	15.89	16.44	17.04	17.68	FREE
HALS230-0400-2000		20	3	3.8	15	6	50	4,180	21.06	21.79	22.58	23.43	FREE
HALS230-0500-1500	5	15	3.5	4.8	15	6	50	5,260	15.89	16.44	17.04	FREE	FREE
HALS230-0500-2000		20	3.5	4.8	15	6	50	5,490	21.06	21.79	FREE	FREE	FREE
HALS230-0600-1500	6	15	6	5.8	15	6	50	5,260	FREE	FREE	FREE	FREE	FREE
HALS230-0600-2000		20	6	5.8	15	6	50	5,260	FREE	FREE	FREE	FREE	FREE
HALS230-0600-3000		30	6	5.8	15	6	60	5,490	FREE	FREE	FREE	FREE	FREE

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALS230
Model number:HALS230

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.3	0.003	0.05	120	40,000	0.002	0.04	100	40,000	0.002	0.03	70	40,000
		0.5	0.003	0.05	80	40,000	0.002	0.04	60	40,000	0.002	0.03	50	40,000
	0.15	0.3	0.003	0.07	150	40,000	0.002	0.06	120	40,000	0.002	0.04	100	40,000
		0.5	0.003	0.07	120	40,000	0.002	0.06	100	40,000	0.002	0.04	80	40,000
	0.2	0.5	0.003	0.1	200	30,000	0.003	0.08	160	30,000	0.003	0.06	120	30,000
		0.75	0.003	0.1	180	30,000	0.003	0.08	140	30,000	0.003	0.06	100	30,000
		1	0.003	0.1	150	30,000	0.003	0.08	120	30,000	0.003	0.06	80	30,000
	0.3	1	0.003	0.15	300	30,000	0.003	0.12	250	30,000	0.003	0.09	200	30,000
		1.5	0.003	0.15	200	30,000	0.003	0.12	160	30,000	0.003	0.09	120	30,000
		2	0.003	0.15	150	30,000	0.003	0.12	120	30,000	0.003	0.09	100	25,000
		2.5	0.002	0.15	100	25,000	0.002	0.12	80	25,000	0.002	0.09	60	20,000
		3	0.002	0.15	50	25,000	0.002	0.12	40	25,000	0.002	0.09	30	20,000
	0.4	1	0.005	0.2	400	30,000	0.005	0.16	350	30,000	0.005	0.12	300	25,000
		1.5	0.005	0.2	360	30,000	0.005	0.16	330	30,000	0.005	0.12	250	25,000
		2	0.005	0.2	320	30,000	0.005	0.16	280	25,000	0.005	0.12	220	25,000
		2.5	0.005	0.2	280	25,000	0.004	0.16	250	25,000	0.004	0.12	200	20,000
		3	0.004	0.2	260	25,000	0.003	0.16	220	20,000	0.003	0.12	180	18,000
	0.5	1	0.01	0.25	500	25,000	0.007	0.2	450	23,000	0.005	0.15	400	20,000
		1.5	0.01	0.25	450	25,000	0.007	0.2	400	23,000	0.005	0.15	360	20,000
		2	0.01	0.25	420	25,000	0.007	0.2	380	23,000	0.005	0.15	320	20,000
		2.5	0.008	0.25	400	25,000	0.006	0.2	360	23,000	0.004	0.15	300	20,000
		3	0.007	0.25	350	25,000	0.005	0.2	320	23,000	0.003	0.15	280	20,000
		3.5	0.006	0.25	320	25,000	0.003	0.2	280	23,000	0.003	0.15	240	20,000
		4	0.005	0.25	280	25,000	0.003	0.2	240	23,000	0.002	0.15	200	20,000
	0.6	1.5	0.01	0.3	550	25,000	0.007	0.25	450	23,000	0.005	0.18	400	20,000
		2	0.01	0.3	500	25,000	0.007	0.25	400	23,000	0.005	0.18	350	20,000
		3	0.007	0.3	450	25,000	0.005	0.25	350	23,000	0.003	0.18	300	20,000
		4	0.005	0.3	400	25,000	0.003	0.25	300	23,000	0.002	0.18	250	20,000
		5	0.003	0.3	350	20,000	0.003	0.25	250	18,000	0.002	0.18	200	16,000
		6	0.002	0.3	300	20,000	0.002	0.25	200	18,000	0.001	0.18	150	16,000
	0.7	2	0.03	0.35	600	25,000	0.02	0.28	450	23,000	0.012	0.21	400	20,000
		4	0.02	0.35	560	25,000	0.015	0.28	400	23,000	0.007	0.21	320	20,000
		6	0.015	0.35	410	20,000	0.012	0.28	300	18,000	0.007	0.21	240	16,000
	0.8	3	0.03	0.4	780	25,000	0.02	0.32	650	23,000	0.012	0.24	550	20,000
		4	0.025	0.4	700	25,000	0.015	0.32	600	23,000	0.007	0.24	500	20,000
		5	0.02	0.4	630	23,000	0.012	0.32	530	20,000	0.006	0.24	450	18,000
		6	0.02	0.4	550	20,000	0.01	0.32	450	18,000	0.005	0.24	350	16,000
		8	0.007	0.4	400	16,000	0.005	0.32	300	14,000	0.003	0.24	200	12,000
	1	2	0.06	0.5	1,000	23,000	0.05	0.4	900	18,000	0.035	0.3	600	14,000
		3	0.05	0.5	1,000	23,000	0.04	0.4	900	18,000	0.03	0.3	600	14,000
		4	0.04	0.5	900	23,000	0.03	0.4	800	18,000	0.02	0.3	500	14,000
		5	0.03	0.5	800	20,000	0.02	0.4	700	16,000	0.012	0.3	450	12,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1	6	0.02	0.5	700	18,000	0.01	0.4	600	14,000	0.007	0.3	400	10,000
		7	0.02	0.5	650	18,000	0.01	0.4	550	14,000	0.006	0.3	370	10,000
		8	0.02	0.5	600	16,000	0.01	0.4	500	12,000	0.005	0.3	340	8,000
		9	0.015	0.5	550	16,000	0.007	0.4	450	12,000	0.005	0.3	300	8,000
		10	0.01	0.5	500	14,000	0.007	0.4	400	10,000	0.005	0.3	250	6,000
		12	0.01	0.5	400	13,000	0.005	0.4	300	10,000	0.004	0.3	180	6,000
	1.2	6	0.03	0.6	700	18,000	0.02	0.5	600	14,000	0.01	0.4	400	10,000
		8	0.02	0.6	600	16,000	0.01	0.5	500	12,000	0.007	0.4	340	8,000
		10	0.02	0.6	500	12,000	0.01	0.5	430	10,000	0.005	0.4	300	8,000
		12	0.01	0.6	500	10,000	0.007	0.5	400	9,000	0.005	0.4	250	7,000
		16	0.01	0.6	300	9,000	0.005	0.5	260	8,000	0.003	0.4	180	6,000
	1.4	6	0.04	0.7	800	20,000	0.03	0.56	700	18,000	0.02	0.42	450	12,000
		12	0.01	0.7	500	13,000	0.007	0.56	400	11,000	0.005	0.42	280	8,000
	1.5	4	0.05	0.75	900	20,000	0.04	0.6	800	18,000	0.03	0.45	600	14,000
		6	0.04	0.75	800	20,000	0.03	0.6	700	18,000	0.02	0.45	500	14,000
		8	0.03	0.75	600	18,000	0.03	0.6	600	14,000	0.01	0.45	380	10,000
		10	0.03	0.75	500	16,000	0.02	0.6	500	14,000	0.01	0.45	350	10,000
		12	0.02	0.75	500	14,000	0.02	0.6	430	12,000	0.007	0.45	310	8,000
		14	0.02	0.75	400	12,000	0.01	0.6	380	10,000	0.007	0.45	250	7,500
		16	0.01	0.75	360	10,000	0.007	0.6	300	9,000	0.005	0.45	200	6,800
	1.6	6	0.04	0.8	850	19,000	0.03	0.64	750	17,000	0.025	0.48	600	13,000
		8	0.03	0.8	750	17,000	0.03	0.64	600	14,000	0.015	0.48	430	10,000
	1.8	6	0.05	0.9	900	18,000	0.04	0.7	750	15,000	0.03	0.5	600	12,000
		8	0.04	0.9	800	16,000	0.03	0.7	600	12,000	0.02	0.5	500	9,500
		10	0.04	0.9	700	14,000	0.03	0.7	500	12,000	0.02	0.5	450	9,500
		12	0.03	0.9	600	12,000	0.02	0.7	500	10,000	0.01	0.5	400	8,200
		14	0.03	0.9	600	12,000	0.02	0.7	430	10,000	0.01	0.5	360	8,200
		16	0.02	0.9	500	10,000	0.01	0.7	400	9,200	0.007	0.5	340	7,500
	2	4	0.08	1	1,000	18,000	0.06	0.8	800	15,000	0.04	0.6	600	12,000
		6	0.06	1	900	18,000	0.05	0.8	750	15,000	0.03	0.6	600	12,000
		8	0.05	1	800	16,000	0.04	0.8	600	12,000	0.02	0.6	500	9,500
		10	0.05	1	700	14,000	0.04	0.8	500	12,000	0.02	0.6	450	9,500
		12	0.04	1	600	12,000	0.03	0.8	500	10,000	0.01	0.6	400	8,200
		14	0.03	1	600	12,000	0.02	0.8	430	10,000	0.007	0.6	360	8,200
		16	0.03	1	500	10,000	0.02	0.8	400	9,200	0.007	0.6	340	7,500
		18	0.02	1	410	9,200	0.01	0.8	370	8,500	0.005	0.6	320	6,000
		20	0.02	1	380	9,200	0.01	0.8	340	8,500	0.005	0.6	260	6,000
	2.5	8	0.07	1.25	800	14,000	0.05	1	700	10,000	0.03	0.75	500	8,000
		12	0.06	1.25	700	12,000	0.04	1	600	9,600	0.02	0.75	480	7,500
		16	0.05	1.25	600	10,000	0.02	1	500	8,500	0.01	0.75	400	7,000
		20	0.05	1.25	500	8,200	0.02	1	500	7,500	0.01	0.75	400	5,000

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	3	8	0.1	1.5	900	14,000	0.07	1.2	800	10,000	0.05	0.9	600	8,000
		12	0.08	1.5	800	12,000	0.06	1.2	700	9,200	0.04	0.9	500	7,200
		16	0.07	1.5	700	10,000	0.05	1.2	600	8,500	0.03	0.9	400	6,500
		20	0.07	1.5	700	9,000	0.04	1.2	600	7,800	0.02	0.9	400	5,800
		25	0.06	1.5	600	8,200	0.03	1.2	500	7,000	0.01	0.9	360	5,000
		30	0.03	1.5	600	7,000	0.02	1.2	500	6,500	0.007	0.9	330	4,500
	4	10	0.1	2	900	10,000	0.07	1.8	800	9,000	0.05	1.5	700	9,000
		15	0.07	2	800	8,000	0.05	1.8	700	7,000	0.04	1.5	600	6,500
		20	0.06	2	750	7,000	0.04	1.8	650	6,000	0.03	1.5	550	5,500
	5	15	0.1	2.5	850	6,000	0.07	2.3	750	5,000	0.06	2	650	4,500
		20	0.08	2.5	800	5,000	0.06	2.3	700	4,000	0.05	2	600	3,500
	6	15	0.12	3	850	5,000	0.09	2.8	750	4,000	0.08	2.5	650	3,500
		20	0.1	3	800	4,000	0.07	2.8	700	3,000	0.06	2.5	600	2,500
		30	0.08	3	700	3,000	0.06	2.8	600	2,000	0.05	2.5	500	1,500

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.3	0.012	0.05	120	40,000	0.012	0.05	120	40,000	0.003	0.05	120	40,000
		0.5	0.012	0.05	80	40,000	0.012	0.05	80	40,000	0.003	0.05	80	40,000
	0.15	0.3	0.012	0.07	150	40,000	0.012	0.07	150	40,000	0.003	0.07	150	40,000
		0.5	0.012	0.07	120	40,000	0.012	0.07	120	40,000	0.003	0.07	120	40,000
	0.2	0.5	0.012	0.1	200	30,000	0.012	0.1	200	30,000	0.003	0.1	200	30,000
		0.75	0.012	0.1	180	30,000	0.012	0.1	180	30,000	0.003	0.1	180	30,000
		1	0.012	0.1	150	30,000	0.012	0.1	150	30,000	0.003	0.1	150	30,000
	0.3	1	0.012	0.15	300	30,000	0.012	0.15	300	30,000	0.003	0.15	300	30,000
		1.5	0.012	0.15	200	30,000	0.012	0.15	200	30,000	0.003	0.15	200	30,000
		2	0.012	0.15	150	30,000	0.012	0.15	150	30,000	0.003	0.15	150	30,000
		2.5	0.008	0.15	100	25,000	0.008	0.15	100	25,000	0.002	0.15	100	25,000
		3	0.008	0.15	50	25,000	0.008	0.15	50	25,000	0.002	0.15	50	25,000
	0.4	1	0.02	0.2	400	30,000	0.02	0.2	400	30,000	0.005	0.2	400	30,000
		1.5	0.02	0.2	360	30,000	0.02	0.2	360	30,000	0.005	0.2	360	30,000
		2	0.02	0.2	320	30,000	0.02	0.2	320	30,000	0.005	0.2	320	30,000
		2.5	0.02	0.2	280	25,000	0.02	0.2	280	25,000	0.005	0.2	280	25,000
		3	0.016	0.2	260	25,000	0.016	0.2	260	25,000	0.004	0.2	260	25,000
	0.5	1	0.04	0.25	500	25,000	0.04	0.25	500	25,000	0.01	0.25	500	25,000
		1.5	0.04	0.25	450	25,000	0.04	0.25	450	25,000	0.01	0.25	450	25,000
		2	0.04	0.25	420	25,000	0.04	0.25	420	25,000	0.01	0.25	420	25,000
		2.5	0.032	0.25	400	25,000	0.032	0.25	400	25,000	0.008	0.25	400	25,000
		3	0.028	0.25	350	25,000	0.028	0.25	350	25,000	0.007	0.25	350	25,000
		3.5	0.024	0.25	320	25,000	0.024	0.25	320	25,000	0.006	0.25	320	25,000
		4	0.02	0.25	280	25,000	0.02	0.25	280	25,000	0.005	0.25	280	25,000
	0.6	1.5	0.04	0.3	550	25,000	0.04	0.3	550	25,000	0.01	0.3	550	25,000
		2	0.04	0.3	500	25,000	0.04	0.3	500	25,000	0.01	0.3	500	25,000
		3	0.028	0.3	450	25,000	0.028	0.3	450	25,000	0.007	0.3	450	25,000
		4	0.02	0.3	400	25,000	0.02	0.3	400	25,000	0.005	0.3	400	25,000
		5	0.012	0.3	350	20,000	0.012	0.3	350	20,000	0.003	0.3	350	20,000
		6	0.008	0.3	300	20,000	0.008	0.3	300	20,000	0.002	0.3	300	20,000
	0.7	2	0.12	0.35	600	25,000	0.12	0.35	600	25,000	0.03	0.35	600	25,000
		4	0.08	0.35	560	25,000	0.08	0.35	560	25,000	0.02	0.35	560	25,000
		6	0.06	0.35	410	20,000	0.06	0.35	410	20,000	0.015	0.35	410	20,000
	0.8	3	0.12	0.4	780	25,000	0.12	0.4	780	25,000	0.03	0.4	780	25,000
		4	0.1	0.4	700	25,000	0.1	0.4	700	25,000	0.025	0.4	700	25,000
		5	0.08	0.4	630	23,000	0.08	0.4	630	23,000	0.02	0.4	630	23,000
		6	0.08	0.4	550	20,000	0.08	0.4	550	20,000	0.02	0.4	550	20,000
		8	0.028	0.4	400	16,000	0.028	0.4	400	16,000	0.007	0.4	400	16,000
	1	2	0.24	0.5	1,000	23,000	0.24	0.5	1,000	23,000	0.06	0.5	1,000	23,000
		3	0.2	0.5	1,000	23,000	0.2	0.5	1,000	23,000	0.05	0.5	1,000	23,000
		4	0.16	0.5	900	23,000	0.16	0.5	900	23,000	0.04	0.5	900	23,000
		5	0.12	0.5	800	20,000	0.12	0.5	800	20,000	0.03	0.5	800	20,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1	6	0.08	0.5	700	18,000	0.08	0.5	700	18,000	0.02	0.5	700	18,000
		7	0.08	0.5	650	18,000	0.08	0.5	650	18,000	0.02	0.5	650	18,000
		8	0.08	0.5	600	16,000	0.08	0.5	600	16,000	0.02	0.5	600	16,000
		9	0.06	0.5	550	16,000	0.06	0.5	550	16,000	0.015	0.5	550	16,000
		10	0.04	0.5	500	14,000	0.04	0.5	500	14,000	0.01	0.5	500	14,000
		12	0.04	0.5	400	13,000	0.04	0.5	400	13,000	0.01	0.5	400	13,000
	1.2	6	0.12	0.6	700	18,000	0.12	0.6	700	18,000	0.03	0.6	700	18,000
		8	0.08	0.6	600	16,000	0.08	0.6	600	16,000	0.02	0.6	600	16,000
		10	0.08	0.6	500	12,000	0.08	0.6	500	12,000	0.02	0.6	500	12,000
		12	0.04	0.6	500	10,000	0.04	0.6	500	10,000	0.01	0.6	500	10,000
		16	0.04	0.6	300	9,000	0.04	0.6	300	9,000	0.01	0.6	300	9,000
	1.4	6	0.16	0.7	800	20,000	0.16	0.7	800	20,000	0.04	0.7	800	20,000
		12	0.04	0.7	500	13,000	0.04	0.7	500	13,000	0.01	0.7	500	13,000
	1.5	4	0.2	0.75	900	20,000	0.2	0.75	900	20,000	0.05	0.75	900	20,000
		6	0.16	0.75	800	20,000	0.16	0.75	800	20,000	0.04	0.75	800	20,000
		8	0.12	0.75	600	18,000	0.12	0.75	600	18,000	0.03	0.75	600	18,000
		10	0.12	0.75	500	16,000	0.12	0.75	500	16,000	0.03	0.75	500	16,000
		12	0.08	0.75	500	14,000	0.08	0.75	500	14,000	0.02	0.75	500	14,000
		14	0.08	0.75	400	12,000	0.08	0.75	400	12,000	0.02	0.75	400	12,000
		16	0.04	0.75	360	10,000	0.04	0.75	360	10,000	0.01	0.75	360	10,000
	1.6	6	0.16	0.8	850	19,000	0.16	0.8	850	19,000	0.04	0.8	850	19,000
		8	0.12	0.8	750	17,000	0.12	0.8	750	17,000	0.03	0.8	750	17,000
	1.8	6	0.2	0.9	900	18,000	0.2	0.9	900	18,000	0.05	0.9	900	18,000
		8	0.16	0.9	800	16,000	0.16	0.9	800	16,000	0.04	0.9	800	16,000
		10	0.16	0.9	700	14,000	0.16	0.9	700	14,000	0.04	0.9	700	14,000
		12	0.12	0.9	600	12,000	0.12	0.9	600	12,000	0.03	0.9	600	12,000
		14	0.12	0.9	600	12,000	0.12	0.9	600	12,000	0.03	0.9	600	12,000
		16	0.08	0.9	500	10,000	0.08	0.9	500	10,000	0.02	0.9	500	10,000
	2	4	0.32	1	1,000	18,000	0.32	1	1,000	18,000	0.08	1	1,000	18,000
		6	0.24	1	900	18,000	0.24	1	900	18,000	0.06	1	900	18,000
		8	0.2	1	800	16,000	0.2	1	800	16,000	0.05	1	800	16,000
		10	0.2	1	700	14,000	0.2	1	700	14,000	0.05	1	700	14,000
		12	0.16	1	600	12,000	0.16	1	600	12,000	0.04	1	600	12,000
		14	0.12	1	600	12,000	0.12	1	600	12,000	0.03	1	600	12,000
		16	0.12	1	500	10,000	0.12	1	500	10,000	0.03	1	500	10,000
		18	0.08	1	410	9,200	0.08	1	410	9,200	0.02	1	410	9,200
		20	0.08	1	380	9,200	0.08	1	380	9,200	0.02	1	380	9,200
	2.5	8	0.28	1.25	800	14,000	0.28	1.25	800	14,000	0.07	1.25	800	14,000
		12	0.24	1.25	700	12,000	0.24	1.25	700	12,000	0.06	1.25	700	12,000
		16	0.2	1.25	600	10,000	0.2	1.25	600	10,000	0.05	1.25	600	10,000
		20	0.2	1.25	500	8,200	0.2	1.25	500	8,200	0.05	1.25	500	8,200

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

长颈平角立铣刀 Long Neck Square End Mill

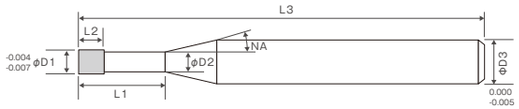
切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min^{-1}	∂p mm	∂e mm	mm/min	min^{-1}	∂p mm	∂e mm	mm/min	min^{-1}
2	3	8	0.4	1.5	900	14,000	0.4	1.5	900	14,000	0.1	1.5	900	14,000
		12	0.32	1.5	800	12,000	0.32	1.5	800	12,000	0.08	1.5	800	12,000
		16	0.28	1.5	700	10,000	0.28	1.5	700	10,000	0.07	1.5	700	10,000
		20	0.28	1.5	700	9,000	0.28	1.5	700	9,000	0.07	1.5	700	9,000
		25	0.24	1.5	600	8,200	0.24	1.5	600	8,200	0.06	1.5	600	8,200
		30	0.12	1.5	600	7,000	0.12	1.5	600	7,000	0.03	1.5	600	7,000
	4	10	0.4	2	900	10,000	0.4	2	900	10,000	0.1	2	900	10,000
		15	0.28	2	800	8,000	0.28	2	800	8,000	0.07	2	800	8,000
		20	0.24	2	750	7,000	0.24	2	750	7,000	0.06	2	750	7,000
	5	15	0.4	2.5	850	6,000	0.4	2.5	850	6,000	0.1	2.5	850	6,000
		20	0.32	2.5	800	5,000	0.32	2.5	800	5,000	0.08	2.5	800	5,000
	6	15	0.48	3	850	5,000	0.48	3	850	5,000	0.12	3	850	5,000
		20	0.4	3	800	4,000	0.4	3	800	4,000	0.1	3	800	4,000
		30	0.32	3	700	3,000	0.32	3	700	3,000	0.08	3	700	3,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

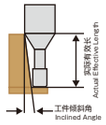
超硬长颈平角立铣刀　Carbide Long Neck Square End Mill

Hard A | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:HALS430 Model number:HALS430



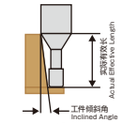
所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALS430-0100-0400	1	4	0.8	0.95	15	4	50	3,960	4.23	4.38	4.54	4.71	5.09
HALS430-0100-0600		6	0.8	0.95	15	4	50	3,960	6.30	6.52	6.75	7.01	7.57
HALS430-0100-0800		8	0.8	0.95	15	4	50	3,960	8.37	8.66	8.97	9.31	10.06
HALS430-0100-1000		10	0.8	0.95	15	4	50	3,960	10.43	10.80	11.19	11.61	12.55
HALS430-0120-0600	1.2	6	1	1.15	15	4	50	3,960	6.30	6.52	6.75	7.01	7.57
HALS430-0120-0800		8	1	1.15	15	4	50	3,960	8.37	8.66	8.97	9.31	10.06
HALS430-0120-1000		10	1	1.15	15	4	50	3,960	10.43	10.80	11.19	11.61	12.55
HALS430-0120-1200		12	1	1.15	15	4	50	3,960	12.50	12.94	13.40	13.91	15.03
HALS430-0150-0800	1.5	8	1.2	1.45	15	4	50	3,960	8.37	8.66	8.97	9.31	10.06
HALS430-0150-1000		10	1.2	1.45	15	4	50	3,960	10.43	10.80	11.19	11.61	12.55
HALS430-0150-1200		12	1.2	1.45	15	4	50	3,960	12.50	12.94	13.40	13.91	15.03
HALS430-0150-1400		14	1.2	1.45	15	4	50	3,960	14.57	15.08	15.62	16.21	17.52
HALS430-0150-1600		16	1.2	1.45	15	4	50	3,960	16.64	17.21	17.84	18.50	20.01
HALS430-0180-0600	1.8	6	1.4	1.75	15	4	50	3,960	6.30	6.52	6.75	7.01	7.57
HALS430-0180-0800		8	1.4	1.75	15	4	50	3,960	8.37	8.66	8.97	9.31	10.06
HALS430-0180-1000		10	1.4	1.75	15	4	50	3,960	10.43	10.80	11.19	11.61	12.55
HALS430-0180-1200		12	1.4	1.75	15	4	50	3,960	12.50	12.94	13.40	13.91	15.03
HALS430-0180-1400		14	1.4	1.75	15	4	50	3,960	14.57	15.08	15.62	16.21	17.52
HALS430-0180-1600		16	1.4	1.75	15	4	50	3,960	16.64	17.21	17.84	18.50	20.01
HALS430-0200-0600	2	6	1.6	1.94	15	4	50	3,960	6.32	6.54	6.77	7.03	7.60
HALS430-0200-0800		8	1.6	1.94	15	4	50	3,960	8.39	8.68	8.99	9.33	10.08
HALS430-0200-1000		10	1.6	1.94	15	4	50	3,960	10.45	10.82	11.21	11.63	12.57
HALS430-0200-1200		12	1.6	1.94	15	4	50	3,960	12.52	12.96	13.42	13.93	15.06
HALS430-0200-1400		14	1.6	1.94	15	4	50	3,960	14.59	15.10	15.64	16.23	17.54
HALS430-0200-1600		16	1.6	1.94	15	4	50	3,960	16.65	17.23	17.86	18.53	FREE
HALS430-0200-1800		18	1.6	1.94	15	4	50	3,960	18.72	19.37	20.07	20.83	FREE
HALS430-0200-2000		20	1.6	1.94	15	4	50	3,960	20.79	21.51	22.29	23.13	FREE
HALS430-0250-0800	2.5	8	2	2.44	15	4	50	3,960	8.39	8.68	8.99	9.33	10.08
HALS430-0250-1200		12	2	2.44	15	4	50	3,960	12.52	12.96	13.42	13.93	FREE
HALS430-0250-1600		16	2	2.44	15	4	50	3,960	16.65	17.23	17.86	18.53	FREE



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单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALS430-0250-2000	2.5	20	2	2.44	15	4	50	3,960	20.79	21.51	22.29	FREE	FREE
HALS430-0300-0800	3	8	4.5	2.85	15	4	50	5,600	8.56	8.86	9.18	9.52	FREE
HALS430-0300-1200		12	4.5	2.85	15	4	50	5,600	12.69	13.14	13.61	14.12	FREE
HALS430-0300-1600		16	4.5	2.85	15	4	50	5,600	16.83	17.41	18.04	FREE	FREE
HALS430-0300-2000		20	4.5	2.85	15	4	50	5,600	20.96	21.69	FREE	FREE	FREE
HALS430-0300-2500		25	4.5	2.85	15	4	60	5,920	26.13	27.04	FREE	FREE	FREE
HALS430-0300-3000		30	4.5	2.85	15	4	60	6,400	31.30	FREE	FREE	FREE	FREE
HALS430-0400-1200	4	12	6	3.8	15	6	50	5,840	12.79	13.24	13.71	14.23	15.38
HALS430-0400-1600		16	6	3.8	15	6	50	5,840	16.92	17.51	18.15	18.83	FREE
HALS430-0400-2000		20	6	3.8	15	6	50	5,840	21.06	21.79	22.58	23.43	FREE
HALS430-0400-2500		25	6	3.8	15	6	60	6,160	26.23	27.14	28.12	FREE	FREE
HALS430-0400-3000		30	6	3.8	15	6	60	6,800	31.40	32.49	33.66	FREE	FREE
HALS430-0400-3500		35	6	3.8	15	6	70	7,360	36.56	37.84	FREE	FREE	FREE
HALS430-0500-1600	5	16	7.5	4.8	15	6	50	7,360	16.92	17.51	18.15	FREE	FREE
HALS430-0500-2500		25	7.5	4.8	15	6	60	7,680	26.23	27.14	FREE	FREE	FREE
HALS430-0500-3500		35	7.5	4.8	15	6	70	8,000	36.56	FREE	FREE	FREE	FREE
HALS430-0600-2000	6	20	9	5.8	15	6	50	7,360	FREE	FREE	FREE	FREE	FREE
HALS430-0600-3000		30	9	5.8	15	6	60	7,680	FREE	FREE	FREE	FREE	FREE
HALS430-0600-4000		40	9	5.8	15	6	70	8,000	FREE	FREE	FREE	FREE	FREE
HALS430-0600-5000		50	9	5.8	15	6	80	11,200	FREE	FREE	FREE	FREE	FREE

HARD STAR Type A Series

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALS430
Model number:HALS430

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	4	0.04	0.5	1,800	23,000	0.03	0.4	1,600	18,000	0.02	0.3	1,000	14,000
		6	0.02	0.5	1,400	18,000	0.01	0.4	1,200	14,000	0.007	0.3	800	10,000
		8	0.02	0.5	1,200	16,000	0.01	0.4	1,000	12,000	0.005	0.3	680	8,000
		10	0.01	0.5	1,000	14,000	0.007	0.4	800	10,000	0.005	0.3	500	6,000
	1.2	6	0.03	0.6	1,400	18,000	0.02	0.5	1,200	14,000	0.01	0.4	800	10,000
		8	0.02	0.6	1,200	16,000	0.01	0.5	1,000	12,000	0.007	0.4	680	8,000
		10	0.02	0.6	1,000	12,000	0.01	0.5	850	10,000	0.005	0.4	600	8,000
		12	0.01	0.6	1,000	10,000	0.007	0.5	800	9,000	0.005	0.4	500	7,000
	1.5	8	0.03	0.75	1,200	18,000	0.03	0.6	1,200	14,000	0.01	0.45	750	10,000
		10	0.03	0.75	1,000	16,000	0.02	0.6	1,000	14,000	0.01	0.45	700	10,000
		12	0.02	0.75	1,000	14,000	0.02	0.6	850	12,000	0.007	0.45	620	8,000
		14	0.02	0.75	800	12,000	0.01	0.6	750	10,000	0.007	0.45	500	7,500
		16	0.01	0.75	720	10,000	0.007	0.6	600	9,000	0.005	0.45	400	6,800
	1.8	6	0.05	0.9	1,800	18,000	0.04	0.7	1,500	15,000	0.03	0.5	1,200	12,000
		8	0.04	0.9	1,600	16,000	0.03	0.7	1,200	12,000	0.02	0.5	1,000	9,500
		10	0.04	0.9	1,400	14,000	0.03	0.7	1,000	12,000	0.02	0.5	900	9,500
		12	0.03	0.9	1,200	12,000	0.02	0.7	1,000	10,000	0.01	0.5	800	8,200
		14	0.03	0.9	1,200	12,000	0.02	0.7	860	10,000	0.01	0.5	720	8,200
		16	0.02	0.9	1,000	10,000	0.01	0.7	800	9,200	0.007	0.5	680	7,500
	2	6	0.06	1	1,800	18,000	0.05	0.8	1,500	15,000	0.03	0.6	1,200	12,000
		8	0.05	1	1,600	16,000	0.04	0.8	1,200	12,000	0.02	0.6	1,000	9,500
		10	0.05	1	1,400	14,000	0.04	0.8	1,000	12,000	0.02	0.6	900	9,500
		12	0.04	1	1,200	12,000	0.03	0.8	1,000	10,000	0.01	0.6	800	8,200
		14	0.03	1	1,200	12,000	0.02	0.8	860	10,000	0.007	0.6	720	8,200
		16	0.03	1	1,000	10,000	0.02	0.8	800	9,200	0.007	0.6	680	7,500
		18	0.02	1	820	9,200	0.01	0.8	740	8,500	0.005	0.6	640	6,000
		20	0.02	1	760	9,200	0.01	0.8	680	8,500	0.005	0.6	520	6,000
	2.5	8	0.07	1.25	1,600	14,000	0.05	1	1,400	10,000	0.03	0.75	1,000	8,000
		12	0.06	1.25	1,400	12,000	0.04	1	1,200	9,600	0.02	0.75	960	7,500
		16	0.05	1.25	1,200	10,000	0.02	1	1,000	8,500	0.01	0.75	800	7,000
		20	0.05	1.25	1,000	8,200	0.02	1	1,000	7,500	0.01	0.75	800	5,000
	3	8	0.1	1.5	1,800	14,000	0.07	1.2	1,600	10,000	0.05	0.9	1,200	8,000
		12	0.08	1.5	1,600	12,000	0.06	1.2	1,400	9,200	0.04	0.9	1,000	7,200
		16	0.07	1.5	1,400	10,000	0.05	1.2	1,200	8,500	0.03	0.9	800	6,500
		20	0.07	1.5	1,400	9,000	0.04	1.2	1,200	7,800	0.02	0.9	800	5,800
		25	0.06	1.5	1,200	8,200	0.03	1.2	1,000	7,000	0.01	0.9	720	5,000
		30	0.03	1.5	1,200	7,000	0.02	1.2	1,000	6,500	0.007	0.9	650	4,500
	4	12	0.15	2	2,000	9,500	0.08	1.6	1,600	8,000	0.06	1.2	1,000	7,000
		16	0.1	2	1,800	8,000	0.06	1.6	1,400	7,000	0.05	1.2	1,200	6,000
		20	0.08	2	1,600	7,000	0.05	1.6	1,200	6,500	0.04	1.2	1,000	5,500
		25	0.07	2	1,400	6,000	0.04	1.6	1,200	5,200	0.03	1.2	1,000	4,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	5	30	0.05	2	1,000	4,800	0.03	1.6	850	4,200	0.02	1.2	620	3,500
		35	0.04	2	880	4,200	0.02	1.6	720	3,800	0.01	1.2	550	3,000
		16	0.12	2.5	1,800	7,000	0.08	2	1,600	5,500	0.06	1.5	1,000	4,500
	6	25	0.07	2.5	1,400	5,800	0.05	2	1,200	4,200	0.03	1.5	800	3,000
		35	0.05	2.5	900	4,200	0.03	2	800	3,500	0.02	1.5	600	2,500
		20	0.18	3	1,600	6,500	0.08	2.4	1,400	4,500	0.06	1.8	920	3,500
		30	0.12	3	1,200	4,500	0.06	2.4	1,000	3,500	0.04	1.8	660	2,500
		40	0.08	3	1,000	3,000	0.03	2.4	800	2,500	0.02	1.8	550	2,000
		50	0.05	3	700	2,500	0.02	2.4	500	2,000	0.01	1.8	380	1,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

CBN Series
Hard Star A Series 平角 Square
Hard Star TI Series
Hard Star TT Series
Ion Depo U Series
DLC Series
Non-Coat Series
Ion Depo R Series

HARD STAR Type A Series

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALS430
Model number:HALS430

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	4	0.16	0.5	1,800	23,000	0.16	0.5	1,800	23,000	0.04	0.5	1,800	23,000
		6	0.08	0.5	1,400	18,000	0.08	0.5	1,400	18,000	0.02	0.5	1,400	18,000
		8	0.08	0.5	1,200	16,000	0.08	0.5	1,200	16,000	0.02	0.5	1,200	16,000
		10	0.04	0.5	1,000	14,000	0.04	0.5	1,000	14,000	0.01	0.5	1,000	14,000
	1.2	6	0.12	0.6	1,400	18,000	0.12	0.6	1,400	18,000	0.03	0.6	1,400	18,000
		8	0.08	0.6	1,200	16,000	0.08	0.6	1,200	16,000	0.02	0.6	1,200	16,000
		10	0.08	0.6	1,000	12,000	0.08	0.6	1,000	12,000	0.02	0.6	1,000	12,000
		12	0.04	0.6	1,000	10,000	0.04	0.6	1,000	10,000	0.01	0.6	1,000	10,000
	1.5	8	0.12	0.75	1,200	18,000	0.12	0.75	1,200	18,000	0.03	0.75	1,200	18,000
		10	0.12	0.75	1,000	16,000	0.12	0.75	1,000	16,000	0.03	0.75	1,000	16,000
		12	0.08	0.75	1,000	14,000	0.08	0.75	1,000	14,000	0.02	0.75	1,000	14,000
		14	0.08	0.75	800	12,000	0.08	0.75	800	12,000	0.02	0.75	800	12,000
		16	0.04	0.75	720	10,000	0.04	0.75	720	10,000	0.01	0.75	720	10,000
	1.8	6	0.2	0.9	1,800	18,000	0.2	0.9	1,800	18,000	0.05	0.9	1,800	18,000
		8	0.16	0.9	1,600	16,000	0.16	0.9	1,600	16,000	0.04	0.9	1,600	16,000
		10	0.16	0.9	1,400	14,000	0.16	0.9	1,400	14,000	0.04	0.9	1,400	14,000
		12	0.12	0.9	1,200	12,000	0.12	0.9	1,200	12,000	0.03	0.9	1,200	12,000
		14	0.12	0.9	1,200	12,000	0.12	0.9	1,200	12,000	0.03	0.9	1,200	12,000
		16	0.08	0.9	1,000	10,000	0.08	0.9	1,000	10,000	0.02	0.9	1,000	10,000
	2	6	0.24	1	1,800	18,000	0.24	1	1,800	18,000	0.06	1	1,800	18,000
		8	0.2	1	1,600	16,000	0.2	1	1,600	16,000	0.05	1	1,600	16,000
		10	0.2	1	1,400	14,000	0.2	1	1,400	14,000	0.05	1	1,400	14,000
		12	0.16	1	1,200	12,000	0.16	1	1,200	12,000	0.04	1	1,200	12,000
		14	0.12	1	1,200	12,000	0.12	1	1,200	12,000	0.03	1	1,200	12,000
		16	0.12	1	1,000	10,000	0.12	1	1,000	10,000	0.03	1	1,000	10,000
		18	0.08	1	820	9,200	0.08	1	820	9,200	0.02	1	820	9,200
		20	0.08	1	760	9,200	0.08	1	760	9,200	0.02	1	760	9,200
	2.5	8	0.28	1.25	1,600	14,000	0.28	1.25	1,600	14,000	0.07	1.25	1,600	14,000
		12	0.24	1.25	1,400	12,000	0.24	1.25	1,400	12,000	0.06	1.25	1,400	12,000
		16	0.2	1.25	1,200	10,000	0.2	1.25	1,200	10,000	0.05	1.25	1,200	10,000
		20	0.2	1.25	1,000	8,200	0.2	1.25	1,000	8,200	0.05	1.25	1,000	8,200
	3	8	0.4	1.5	1,800	14,000	0.4	1.5	1,800	14,000	0.1	1.5	1,800	14,000
		12	0.32	1.5	1,600	12,000	0.32	1.5	1,600	12,000	0.08	1.5	1,600	12,000
		16	0.28	1.5	1,400	10,000	0.28	1.5	1,400	10,000	0.07	1.5	1,400	10,000
		20	0.28	1.5	1,400	9,000	0.28	1.5	1,400	9,000	0.07	1.5	1,400	9,000
		25	0.24	1.5	1,200	8,200	0.24	1.5	1,200	8,200	0.06	1.5	1,200	8,200
		30	0.12	1.5	1,200	7,000	0.12	1.5	1,200	7,000	0.03	1.5	1,200	7,000
	4	12	0.6	2	2,000	9,500	0.6	2	2,000	9,500	0.15	2	2,000	9,500
		16	0.4	2	1,800	8,000	0.4	2	1,800	8,000	0.1	2	1,800	8,000
		20	0.32	2	1,600	7,000	0.32	2	1,600	7,000	0.08	2	1,600	7,000
		25	0.28	2	1,400	6,000	0.28	2	1,400	6,000	0.07	2	1,400	6,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

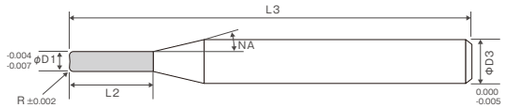
切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	4	30	0.2	2	1,000	4,800	0.2	2	1,000	4,800	0.05	2	1,000	4,800
		35	0.16	2	880	4,200	0.16	2	880	4,200	0.04	2	880	4,200
	5	16	0.48	2.5	1,800	7,000	0.48	2.5	1,800	7,000	0.12	2.5	1,800	7,000
		25	0.28	2.5	1,400	5,800	0.28	2.5	1,400	5,800	0.07	2.5	1,400	5,800
		35	0.2	2.5	900	4,200	0.2	2.5	900	4,200	0.05	2.5	900	4,200
	6	20	0.72	3	1,600	6,500	0.72	3	1,600	6,500	0.18	3	1,600	6,500
		30	0.48	3	1,200	4,500	0.48	3	1,200	4,500	0.12	3	1,200	4,500
		40	0.32	3	1,000	3,000	0.32	3	1,000	3,000	0.08	3	1,000	3,000
		50	0.2	3	700	2,500	0.2	3	700	2,500	0.05	3	700	2,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬圆角立铣刀 Carbide Radius End Mill

■型号:HAR430 Model number:HAR430

Hard A | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考,如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HAR430-0300-0200-00600	3	0.2	6	15	4	50	10,000
HAR430-0300-0300-00600		0.3	6	15	4	50	10,000
HAR430-0300-0500-00600		0.5	6	15	4	50	10,000
HAR430-0400-0200-00800	4	0.2	8	15	6	50	10,800
HAR430-0400-0300-00800		0.3	8	15	6	50	10,800
HAR430-0400-0500-00800		0.5	8	15	6	50	10,800
HAR430-0600-0200-01200	6	0.2	12	—	6	60	12,400
HAR430-0600-0300-01200		0.3	12	—	6	60	12,400
HAR430-0600-0500-01200		0.5	12	—	6	60	12,400
HAR430-0600-1000-01200		1	12	—	6	60	12,400
HAR430-0800-0300-01600	8	0.3	16	—	8	70	13,360
HAR430-0800-0500-01600		0.5	16	—	8	70	13,360
HAR430-0800-1000-01600		1	16	—	8	70	13,360
HAR430-1000-0300-02000	10	0.3	20	—	10	80	17,600
HAR430-1000-0500-02000		0.5	20	—	10	80	17,600
HAR430-1000-1000-02000		1	20	—	10	80	17,600
HAR430-1200-0500-02400	12	0.5	24	—	12	110	22,160
HAR430-1200-1000-02400		1	24	—	12	110	22,160
HAR430-1200-2000-02400		2	24	—	12	110	22,160

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HAR430
Model number:HAR430

圆角立铣刀 Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	3	6	4.5	0.09	1,000	10,000	4.5	0.06	700	8,000	4.5	0.06	560	7,000
	4	8	6	0.12	1,200	8,500	6	0.08	800	7,000	6	0.08	600	6,000
	6	12	9	0.18	1,200	5,600	9	0.12	800	4,700	9	0.12	600	4,000
	8	16	12	0.23	1,400	4,800	12	0.16	800	4,000	12	0.16	500	3,400
	10	20	15	0.3	1,500	3,800	15	0.2	900	3,200	15	0.2	600	2,600
	12	24	18	0.35	1,600	3,200	18	0.24	1,000	2,600	18	0.24	700	2,200

圆角立铣刀 Radius End Mill

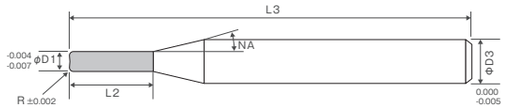
切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	3	6	4.5	0.25	1,000	10,000	4.5	0.25	1,000	10,000	4.5	0.08	1,000	10,000
	4	8	6	0.35	1,200	8,500	6	0.35	1,200	8,500	6	0.12	1,200	8,500
	6	12	9	0.55	1,200	5,600	9	0.55	1,200	5,600	9	0.18	1,200	5,600
	8	16	12	0.69	1,400	4,800	12	0.69	1,400	4,800	12	0.23	1,400	4,800
	10	20	15	0.9	1,500	3,800	15	0.9	1,500	3,800	15	0.3	1,500	3,800
	12	24	18	1.05	1,600	3,200	18	1.05	1,600	3,200	18	0.35	1,600	3,200

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬圆角立铣刀 Carbide Radius End Mill

■型号:HAR630 Model number:HAR630

Hard A | super MG | 刀刃数 6 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考,如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HAR630-0500-0200-01000	5	0.2	10	15	6	50	11,600
HAR630-0500-0300-01000		0.3	10	15	6	50	11,600
HAR630-0500-0500-01000		0.5	10	15	6	50	11,600
HAR630-0500-1000-01000		1	10	15	6	50	11,600
HAR630-0600-0200-01200	6	0.2	12	—	6	60	12,400
HAR630-0600-0300-01200		0.3	12	—	6	60	12,400
HAR630-0600-0500-01200		0.5	12	—	6	60	12,400
HAR630-0600-1000-01200		1	12	—	6	60	12,400
HAR630-0800-0300-01600	8	0.3	16	—	8	70	17,200
HAR630-0800-0500-01600		0.5	16	—	8	70	17,200
HAR630-0800-1000-01600		1	16	—	8	70	17,200
HAR630-0800-1500-01600		1.5	16	—	8	70	17,200
HAR630-1000-0300-02000	10	0.3	20	—	10	80	17,200
HAR630-1000-0500-02000		0.5	20	—	10	80	23,360
HAR630-1000-1000-02000		1	20	—	10	80	23,360
HAR630-1000-1500-02000		1.5	20	—	10	80	23,360
HAR630-1000-2000-02000		2	20	—	10	80	23,360
HAR630-1200-0500-02400	12	0.5	24	—	12	110	28,160
HAR630-1200-1000-02400		1	24	—	12	110	28,160
HAR630-1200-1500-02400		1.5	24	—	12	110	28,160
HAR630-1200-2000-02400		2	24	—	12	110	28,160

HARD STAR Type A 切削条件参考表 Recommended Milling Conditions

■型号:HAR630 Model number:HAR630

圆角立铣刀 Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61 (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
6	5	10	7.5	0.15	1,600	7,600	7.5	0.1	1,200	6,200	7.5	0.1	800	5,300
	6	12	9	0.18	1,800	6,400	9	0.12	1,200	5,300	9	0.12	800	4,600
	8	16	12	0.23	2,000	4,800	12	0.16	1,400	4,000	12	0.16	1,000	3,400
	10	20	15	0.3	2,000	3,800	15	0.2	1,600	3,200	15	0.2	1,000	2,600
	12	24	18	0.35	2,000	3,200	18	0.24	1,600	2,600	18	0.24	1,000	2,200

圆角立铣刀 Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
6	5	10	7.5	0.45	1,600	7,600	7.5	0.45	1,600	7,600	7.5	0.15	1,600	7,600
	6	12	9	0.54	1,800	6,400	9	0.54	1,800	6,400	9	0.18	1,800	6,400
	8	16	12	0.69	2,000	4,800	12	0.69	2,000	4,800	12	0.23	2,000	4,800
	10	20	15	0.9	2,000	3,800	15	0.9	2,000	3,800	15	0.3	2,000	3,800
	12	24	18	1.05	2,000	3,200	18	1.05	2,000	3,200	18	0.35	2,000	3,200

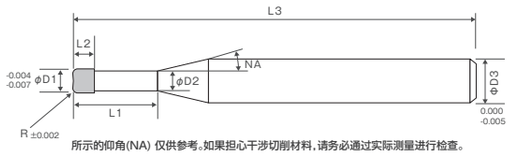
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

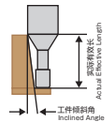
超硬长颈圆角立铣刀 Carbide Long Neck Radius End Mill

Hard A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:HALR230 Model number:HALR230



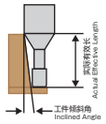
所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR230-0020-0020-0050	0.2	0.02	0.5	0.15	0.18	15	4	50	8,080	0.55	0.57	0.59	0.61	0.66
HALR230-0020-0020-0100		0.02	1	0.15	0.18	15	4	50	8,080	1.07	1.11	1.15	1.19	1.28
HALR230-0020-0050-0050		0.05	0.5	0.15	0.18	15	4	50	8,080	0.55	0.57	0.59	0.61	0.66
HALR230-0020-0050-0100		0.05	1	0.15	0.18	15	4	50	8,080	1.07	1.11	1.14	1.19	1.28
HALR230-0030-0020-0100	0.3	0.02	1	0.25	0.27	15	4	50	7,840	1.09	1.13	1.17	1.21	1.31
HALR230-0030-0020-0150		0.02	1.5	0.25	0.27	15	4	50	7,840	1.61	1.66	1.72	1.79	1.93
HALR230-0030-0020-0200		0.02	2	0.25	0.27	15	4	50	7,840	2.12	2.20	2.28	2.36	2.55
HALR230-0030-0020-0250		0.02	2.5	0.25	0.27	15	4	50	9,840	2.64	2.73	2.83	2.94	3.17
HALR230-0030-0020-0300		0.02	3	0.25	0.27	15	4	50	9,840	3.16	3.27	3.38	3.51	3.79
HALR230-0030-0050-0100		0.05	1	0.25	0.27	15	4	50	7,840	1.09	1.13	1.17	1.21	1.30
HALR230-0030-0050-0150		0.05	1.5	0.25	0.27	15	4	50	7,840	1.61	1.66	1.72	1.78	1.92
HALR230-0030-0050-0200		0.05	2	0.25	0.27	15	4	50	7,840	2.12	2.20	2.27	2.36	2.54
HALR230-0030-0050-0250		0.05	2.5	0.25	0.27	15	4	50	9,840	2.64	2.73	2.83	2.93	3.17
HALR230-0030-0050-0300		0.05	3	0.25	0.27	15	4	50	9,840	3.16	3.27	3.38	3.51	3.79
HALR230-0040-0020-0100	0.4	0.02	1	0.3	0.37	15	4	50	5,200	1.09	1.13	1.17	1.21	1.31
HALR230-0040-0020-0150		0.02	1.5	0.3	0.37	15	4	50	5,200	1.61	1.66	1.72	1.79	1.93
HALR230-0040-0020-0200		0.02	2	0.3	0.37	15	4	50	5,200	2.12	2.20	2.28	2.36	2.55
HALR230-0040-0020-0250		0.02	2.5	0.3	0.37	15	4	50	5,200	2.64	2.73	2.83	2.94	3.17
HALR230-0040-0020-0300		0.02	3	0.3	0.37	15	4	50	5,200	3.16	3.27	3.38	3.51	3.79
HALR230-0040-0050-0100		0.05	1	0.3	0.37	15	4	50	5,200	1.09	1.13	1.17	1.21	1.30
HALR230-0040-0050-0150		0.05	1.5	0.3	0.37	15	4	50	5,200	1.61	1.66	1.72	1.78	1.92
HALR230-0040-0050-0200		0.05	2	0.3	0.37	15	4	50	5,200	2.12	2.20	2.27	2.36	2.54
HALR230-0040-0050-0250		0.05	2.5	0.3	0.37	15	4	50	5,200	2.64	2.73	2.83	2.93	3.17
HALR230-0040-0050-0300		0.05	3	0.3	0.37	15	4	50	5,200	3.16	3.27	3.38	3.51	3.79
HALR230-0040-0100-0100		0.1	1	0.3	0.37	15	4	50	5,200	1.09	1.12	1.16	1.20	1.29
HALR230-0040-0100-0200		0.1	2	0.3	0.37	15	4	50	5,200	2.12	2.19	2.27	2.35	2.53
HALR230-0040-0100-0300		0.1	3	0.3	0.37	15	4	50	5,200	3.16	3.26	3.38	3.50	3.78
HALR230-0050-0020-0100	0.5	0.02	1	0.4	0.47	15	4	50	4,240	1.09	1.13	1.17	1.21	1.31
HALR230-0050-0020-0200		0.02	2	0.4	0.47	15	4	50	4,240	2.12	2.20	2.28	2.36	2.55
HALR230-0050-0020-0300		0.02	3	0.4	0.47	15	4	50	4,240	3.16	3.27	3.38	3.51	3.79



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR230-0050-0020-0400	0.5	0.02	4	0.4	0.47	15	4	50	4,240	4.19	4.34	4.49	4.66	5.04
HALR230-0050-0050-0100		0.05	1	0.4	0.47	15	4	50	4,240	1.09	1.13	1.17	1.21	1.30
HALR230-0050-0050-0200		0.05	2	0.4	0.47	15	4	50	4,240	2.12	2.20	2.27	2.36	2.54
HALR230-0050-0050-0300		0.05	3	0.4	0.47	15	4	50	4,240	3.16	3.27	3.38	3.51	3.79
HALR230-0050-0050-0400		0.05	4	0.4	0.47	15	4	50	4,240	4.19	4.34	4.49	4.66	5.03
HALR230-0050-0100-0100		0.1	1	0.4	0.47	15	4	50	4,240	1.09	1.12	1.16	1.20	1.29
HALR230-0050-0100-0200		0.1	2	0.4	0.47	15	4	50	4,240	2.12	2.19	2.27	2.35	2.53
HALR230-0050-0100-0300		0.1	3	0.4	0.47	15	4	50	4,240	3.16	3.26	3.38	3.50	3.78
HALR230-0050-0100-0400		0.1	4	0.4	0.47	15	4	50	4,240	4.19	4.33	4.48	4.65	5.02
HALR230-0060-0020-0200	0.6	0.02	2	0.5	0.57	15	4	50	4,560	2.12	2.20	2.28	2.36	2.55
HALR230-0060-0020-0400		0.02	4	0.5	0.57	15	4	50	4,560	4.19	4.34	4.49	4.66	5.04
HALR230-0060-0020-0600		0.02	6	0.5	0.57	15	4	50	4,560	6.26	6.48	6.71	6.96	7.52
HALR230-0060-0050-0200		0.05	2	0.5	0.57	15	4	50	4,560	2.12	2.20	2.27	2.36	2.54
HALR230-0060-0050-0400		0.05	4	0.5	0.57	15	4	50	4,560	4.19	4.34	4.49	4.66	5.03
HALR230-0060-0050-0600		0.05	6	0.5	0.57	15	4	50	4,560	6.26	6.47	6.71	6.96	7.52
HALR230-0060-0100-0200		0.1	2	0.5	0.57	15	4	50	4,240	2.12	2.19	2.27	2.35	2.53
HALR230-0060-0100-0400		0.1	4	0.5	0.57	15	4	50	4,240	4.19	4.33	4.48	4.65	5.02
HALR230-0060-0100-0600		0.1	6	0.5	0.57	15	4	50	4,240	6.26	6.47	6.70	6.95	7.51
HALR230-0070-0020-0200	0.7	0.02	2	0.55	0.67	15	4	50	4,800	2.12	2.20	2.28	2.36	2.55
HALR230-0070-0020-0400		0.02	4	0.55	0.67	15	4	50	4,800	4.19	4.34	4.49	4.66	5.04
HALR230-0070-0020-0600		0.02	6	0.55	0.67	15	4	50	4,800	6.26	6.48	6.71	6.96	7.52
HALR230-0070-0050-0200		0.05	2	0.55	0.67	15	4	50	4,800	2.12	2.20	2.27	2.36	2.54
HALR230-0070-0050-0400		0.05	4	0.55	0.67	15	4	50	4,800	4.19	4.34	4.49	4.66	5.03
HALR230-0070-0050-0600		0.05	6	0.55	0.67	15	4	50	4,800	6.26	6.47	6.71	6.96	7.52
HALR230-0070-0100-0200		0.1	2	0.55	0.67	15	4	50	4,800	2.12	2.19	2.27	2.35	2.53
HALR230-0070-0100-0400		0.1	4	0.55	0.67	15	4	50	4,800	4.19	4.33	4.48	4.65	5.02
HALR230-0070-0100-0600		0.1	6	0.55	0.67	15	4	50	4,800	6.26	6.47	6.70	6.95	7.51
HALR230-0080-0020-0200	0.8	0.02	2	0.65	0.77	15	4	50	4,800	2.12	2.20	2.28	2.36	2.55
HALR230-0080-0020-0400		0.02	4	0.65	0.77	15	4	50	4,800	4.19	4.34	4.49	4.66	5.04
HALR230-0080-0020-0600		0.02	6	0.65	0.77	15	4	50	4,800	6.26	6.48	6.71	6.96	7.52
HALR230-0080-0020-0800		0.02	8	0.65	0.77	15	4	50	4,960	8.33	8.62	8.93	9.26	10.01
HALR230-0080-0050-0200		0.05	2	0.65	0.77	15	4	50	4,800	2.12	2.20	2.27	2.36	2.54
HALR230-0080-0050-0400		0.05	4	0.65	0.77	15	4	50	4,800	4.19	4.34	4.49	4.66	5.03
HALR230-0080-0050-0600		0.05	6	0.65	0.77	15	4	50	4,800	6.26	6.47	6.71	6.96	7.52
HALR230-0080-0050-0800		0.05	8	0.65	0.77	15	4	50	4,960	8.33	8.61	8.92	9.26	10.00
HALR230-0080-0100-0200		0.1	2	0.65	0.77	15	4	50	4,800	2.12	2.19	2.27	2.35	2.53
HALR230-0080-0100-0400		0.1	4	0.65	0.77	15	4	50	4,800	4.19	4.33	4.48	4.65	5.02
HALR230-0080-0100-0600		0.1	6	0.65	0.77	15	4	50	4,800	6.26	6.47	6.70	6.95	7.51
HALR230-0080-0100-0800		0.1	8	0.65	0.77	15	4	50	4,960	8.32	8.61	8.92	9.25	9.99
HALR230-0080-0200-0200		0.2	2	0.65	0.77	15	4	50	4,800	2.12	2.19	2.26	2.33	2.51
HALR230-0080-0200-0400		0.2	4	0.65	0.77	15	4	50	4,800	4.19	4.32	4.47	4.63	5.00
HALR230-0080-0200-0600		0.2	6	0.65	0.77	15	4	50	4,800	6.25	6.46	6.69	6.93	7.48
HALR230-0080-0200-0800		0.2	8	0.65	0.77	15	4	50	4,960	8.32	8.60	8.91	9.23	9.97
HALR230-0090-0100-0400	0.9	0.1	4	0.7	0.87	15	4	50	5,440	4.19	4.33	4.48	4.65	5.02
HALR230-0090-0100-0800		0.1	8	0.7	0.87	15	4	50	5,440	8.32	8.61	8.92	9.25	9.99

HARD STAR Type A Series

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALR230
Model number:HALR230

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.2	0.5	0.003	0.04	200	30,000	0.003	0.02	160	30,000	0.003	0.01	120	30,000
		1	0.003	0.04	150	30,000	0.002	0.02	120	30,000	0.002	0.01	80	30,000
	0.3	1	0.003	0.08	300	30,000	0.003	0.04	250	30,000	0.003	0.03	200	30,000
		1.5	0.003	0.08	200	30,000	0.003	0.04	160	30,000	0.003	0.03	120	30,000
		2	0.003	0.08	150	30,000	0.003	0.04	120	30,000	0.003	0.03	100	25,000
		2.5	0.002	0.08	100	25,000	0.002	0.04	80	25,000	0.002	0.03	60	20,000
		3	0.002	0.08	50	25,000	0.002	0.04	40	25,000	0.002	0.03	30	20,000
	0.4	1	0.005	0.1	400	30,000	0.005	0.05	350	28,000	0.004	0.04	300	25,000
		1.5	0.005	0.1	350	30,000	0.005	0.05	300	28,000	0.004	0.04	260	25,000
		2	0.005	0.1	300	30,000	0.005	0.05	250	25,000	0.003	0.04	220	25,000
		2.5	0.004	0.1	280	28,000	0.004	0.05	240	25,000	0.003	0.04	180	20,000
		3	0.004	0.1	250	25,000	0.003	0.05	220	23,000	0.002	0.04	160	18,000
	0.5	1	0.008	0.15	500	25,000	0.006	0.1	450	23,000	0.004	0.08	400	20,000
		2	0.007	0.15	420	25,000	0.005	0.1	360	23,000	0.003	0.08	300	20,000
		3	0.006	0.15	350	25,000	0.004	0.1	320	23,000	0.003	0.08	280	20,000
		4	0.004	0.15	300	25,000	0.002	0.1	240	23,000	0.002	0.08	180	20,000
	0.6	2	0.012	0.2	500	25,000	0.006	0.15	400	23,000	0.004	0.1	320	20,000
		4	0.007	0.2	400	23,000	0.004	0.15	300	20,000	0.003	0.1	200	18,000
		6	0.005	0.2	200	20,000	0.003	0.15	150	18,000	0.002	0.1	100	12,000
	0.7	2	0.012	0.25	700	25,000	0.006	0.15	600	23,000	0.003	0.12	450	20,000
		4	0.008	0.25	600	25,000	0.005	0.15	500	23,000	0.002	0.12	350	20,000
		6	0.005	0.25	350	20,000	0.003	0.15	250	18,000	0.002	0.12	200	16,000
	0.8	2	0.014	0.25	800	25,000	0.006	0.16	700	23,000	0.005	0.14	500	20,000
		4	0.008	0.25	700	25,000	0.005	0.16	600	23,000	0.003	0.14	400	20,000
		6	0.006	0.25	550	20,000	0.004	0.16	450	18,000	0.002	0.14	320	16,000
		8	0.003	0.25	400	16,000	0.002	0.16	300	14,000	0.002	0.14	200	12,000
	0.9	4	0.03	0.3	850	25,000	0.02	0.2	700	20,000	0.01	0.15	600	18,000
		8	0.01	0.3	400	16,000	0.008	0.2	350	14,000	0.005	0.15	250	10,000

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.2	0.5	0.012	0.05	250	30,000	0.012	0.05	250	30,000	0.003	0.04	150	30,000
		1	0.008	0.05	200	30,000	0.008	0.05	200	30,000	0.003	0.04	100	30,000
	0.3	1	0.024	0.1	300	30,000	0.024	0.1	300	30,000	0.003	0.08	180	30,000
		1.5	0.018	0.1	260	30,000	0.018	0.1	260	30,000	0.003	0.08	130	30,000
		2	0.012	0.1	250	30,000	0.012	0.1	250	30,000	0.003	0.08	100	30,000
		2.5	0.008	0.1	240	30,000	0.008	0.1	240	30,000	0.002	0.08	80	25,000
		3	0.006	0.1	220	30,000	0.006	0.1	220	30,000	0.002	0.08	50	25,000
	0.4	1	0.03	0.12	450	30,000	0.03	0.12	450	30,000	0.005	0.1	300	30,000
		1.5	0.027	0.12	400	30,000	0.027	0.12	400	30,000	0.005	0.1	270	30,000
		2	0.024	0.12	360	30,000	0.024	0.12	360	30,000	0.005	0.1	180	25,000
		2.5	0.024	0.12	360	30,000	0.024	0.12	360	30,000	0.005	0.1	180	25,000
		3	0.018	0.12	300	30,000	0.018	0.12	300	30,000	0.004	0.1	150	25,000
	0.5	1	0.036	0.14	650	30,000	0.036	0.14	650	30,000	0.01	0.12	400	25,000
		2	0.03	0.14	600	30,000	0.03	0.14	600	30,000	0.01	0.12	300	25,000
		3	0.024	0.14	480	30,000	0.024	0.14	480	30,000	0.008	0.12	250	25,000
		4	0.018	0.14	430	30,000	0.018	0.14	430	30,000	0.005	0.12	180	20,000
	0.6	2	0.04	0.16	800	30,000	0.04	0.16	800	30,000	0.02	0.13	400	25,000
		4	0.03	0.16	650	30,000	0.03	0.16	650	30,000	0.015	0.13	250	20,000
		6	0.018	0.16	400	25,000	0.018	0.16	400	25,000	0.008	0.13	150	16,000
	0.7	2	0.04	0.2	1,000	30,000	0.04	0.2	1,000	30,000	0.02	0.16	400	20,000
		4	0.04	0.2	1,000	30,000	0.04	0.2	1,000	30,000	0.02	0.16	400	20,000
		6	0.025	0.2	700	25,000	0.025	0.2	700	25,000	0.01	0.16	250	16,000
	0.8	2	0.055	0.25	1,400	30,000	0.055	0.25	1,400	30,000	0.025	0.2	600	20,000
		4	0.055	0.25	1,400	30,000	0.055	0.25	1,400	30,000	0.025	0.2	600	20,000
		6	0.04	0.25	1,000	25,000	0.04	0.25	1,000	25,000	0.02	0.2	400	16,000
		8	0.025	0.25	600	22,000	0.025	0.25	600	22,000	0.01	0.2	250	14,000
	0.9	4	0.06	0.3	1,500	30,000	0.06	0.3	1,500	30,000	0.03	0.24	700	20,000
		8	0.04	0.3	800	22,000	0.04	0.3	800	22,000	0.01	0.24	350	14,000

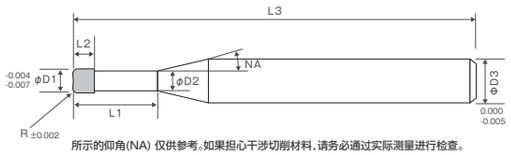
●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

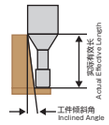
超硬长颈圆角立铣刀 Carbide Long Neck Radius End Mill

Hard A | super MG | 刀刃数 3 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:HALR330 Model number:HALR330



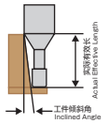
所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR330-0060-0020-0200	0.6	0.02	2	0.5	0.57	15	4	50	6,160	2.12	2.20	2.28	2.36	2.55
HALR330-0060-0020-0400		0.02	4	0.5	0.57	15	4	50	6,160	4.19	4.34	4.49	4.66	5.04
HALR330-0060-0020-0600		0.02	6	0.5	0.57	15	4	50	6,160	6.26	6.48	6.71	6.96	7.52
HALR330-0060-0050-0200		0.05	2	0.5	0.57	15	4	50	6,160	2.12	2.20	2.27	2.36	2.54
HALR330-0060-0050-0400		0.05	4	0.5	0.57	15	4	50	6,160	4.19	4.34	4.49	4.66	5.03
HALR330-0060-0050-0600		0.05	6	0.5	0.57	15	4	50	6,160	6.26	6.47	6.71	6.96	7.52
HALR330-0060-0100-0200		0.1	2	0.5	0.57	15	4	50	5,760	2.12	2.19	2.27	2.35	2.53
HALR330-0060-0100-0400		0.1	4	0.5	0.57	15	4	50	5,760	4.19	4.33	4.48	4.65	5.02
HALR330-0060-0100-0600		0.1	6	0.5	0.57	15	4	50	5,760	6.26	6.47	6.70	6.95	7.51
HALR330-0070-0020-0200	0.7	0.02	2	0.55	0.67	15	4	50	6,480	2.12	2.20	2.28	2.36	2.55
HALR330-0070-0020-0400		0.02	4	0.55	0.67	15	4	50	6,480	4.19	4.34	4.49	4.66	5.04
HALR330-0070-0020-0600		0.02	6	0.55	0.67	15	4	50	6,480	6.26	6.48	6.71	6.96	7.52
HALR330-0070-0050-0200		0.05	2	0.55	0.67	15	4	50	6,480	2.12	2.20	2.27	2.36	2.54
HALR330-0070-0050-0400		0.05	4	0.55	0.67	15	4	50	6,480	4.19	4.34	4.49	4.66	5.03
HALR330-0070-0050-0600		0.05	6	0.55	0.67	15	4	50	6,480	6.26	6.47	6.71	6.96	7.52
HALR330-0070-0100-0200		0.1	2	0.55	0.67	15	4	50	6,480	2.12	2.19	2.27	2.35	2.53
HALR330-0070-0100-0400		0.1	4	0.55	0.67	15	4	50	6,480	4.19	4.33	4.48	4.65	5.02
HALR330-0070-0100-0600		0.1	6	0.55	0.67	15	4	50	6,480	6.26	6.47	6.70	6.95	7.51
HALR330-0080-0020-0200	0.8	0.02	2	0.65	0.77	15	4	50	6,480	2.12	2.20	2.28	2.36	2.55
HALR330-0080-0020-0400		0.02	4	0.65	0.77	15	4	50	6,480	4.19	4.34	4.49	4.66	5.04
HALR330-0080-0020-0600		0.02	6	0.65	0.77	15	4	50	6,480	6.26	6.48	6.71	6.96	7.52
HALR330-0080-0020-0800		0.02	8	0.65	0.77	15	4	50	6,720	8.33	8.62	8.93	9.26	10.01
HALR330-0080-0050-0200		0.05	2	0.65	0.77	15	4	50	6,480	2.12	2.20	2.27	2.36	2.54
HALR330-0080-0050-0400		0.05	4	0.65	0.77	15	4	50	6,480	4.19	4.34	4.49	4.66	5.03
HALR330-0080-0050-0600		0.05	6	0.65	0.77	15	4	50	6,480	6.26	6.47	6.71	6.96	7.52
HALR330-0080-0050-0800		0.05	8	0.65	0.77	15	4	50	6,720	8.33	8.61	8.92	9.26	10.00
HALR330-0080-0100-0200		0.1	2	0.65	0.77	15	4	50	6,480	2.12	2.19	2.27	2.35	2.53
HALR330-0080-0100-0400		0.1	4	0.65	0.77	15	4	50	6,480	4.19	4.33	4.48	4.65	5.02
HALR330-0080-0100-0600		0.1	6	0.65	0.77	15	4	50	6,480	6.26	6.47	6.70	6.95	7.51
HALR330-0080-0100-0800		0.1	8	0.65	0.77	15	4	50	6,720	8.32	8.61	8.92	9.25	9.99



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR330-0080-0200-0200	0.8	0.2	2	0.65	0.77	15	4	50	6,480	2.12	2.20	2.28	2.36	2.55
HALR330-0080-0200-0400		0.2	4	0.65	0.77	15	4	50	6,480	4.19	4.32	4.47	4.63	5.00
HALR330-0080-0200-0600		0.2	6	0.65	0.77	15	4	50	6,480	6.25	6.46	6.69	6.93	7.48
HALR330-0080-0200-0800		0.2	8	0.65	0.77	15	4	50	6,720	8.32	8.60	8.91	9.23	9.97

HARD STAR Type A Series

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALR330
Model number:HALR330

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
3	0.6	2	0.012	0.2	750	25,000	0.006	0.15	600	23,000	0.004	0.1	480	20,000
		4	0.007	0.2	600	23,000	0.004	0.15	450	20,000	0.003	0.1	300	18,000
		6	0.005	0.2	300	20,000	0.003	0.15	225	18,000	0.002	0.1	150	12,000
	0.7	2	0.012	0.25	1,050	25,000	0.006	0.15	900	23,000	0.003	0.12	675	20,000
		4	0.008	0.25	900	25,000	0.005	0.15	750	23,000	0.002	0.12	525	20,000
		6	0.005	0.25	525	20,000	0.003	0.15	375	18,000	0.002	0.12	300	16,000
	0.8	2	0.014	0.25	1,200	25,000	0.006	0.16	1,050	23,000	0.005	0.14	750	20,000
		4	0.008	0.25	1,050	25,000	0.005	0.16	900	23,000	0.003	0.14	600	20,000
		6	0.006	0.25	825	20,000	0.004	0.16	675	18,000	0.002	0.14	480	16,000
		8	0.003	0.25	600	16,000	0.002	0.16	450	14,000	0.002	0.14	300	12,000

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
3	0.6	2	0.04	0.16	1,200	30,000	0.04	0.16	1,200	30,000	0.02	0.13	600	25,000
		4	0.03	0.16	975	30,000	0.03	0.16	975	30,000	0.015	0.13	375	20,000
		6	0.018	0.16	600	25,000	0.018	0.16	600	25,000	0.008	0.13	225	16,000
	0.7	2	0.04	0.2	1,500	30,000	0.04	0.2	1,500	30,000	0.02	0.16	600	20,000
		4	0.04	0.2	1,500	30,000	0.04	0.2	1,500	30,000	0.02	0.16	600	20,000
		6	0.025	0.2	1,050	25,000	0.025	0.2	1,050	25,000	0.01	0.16	375	16,000
	0.8	2	0.055	0.25	2,100	30,000	0.055	0.25	2,100	30,000	0.025	0.2	900	20,000
		4	0.04	0.25	1,500	25,000	0.04	0.25	1,500	25,000	0.02	0.2	600	16,000
		6	0.04	0.25	1,500	25,000	0.04	0.25	1,500	25,000	0.02	0.2	600	16,000
		8	0.025	0.25	900	22,000	0.025	0.25	900	22,000	0.01	0.2	375	14,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

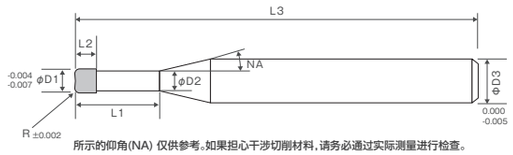
CBN Series
Hard Star A Series 圆角 Radius
Hard Star TI Series
Hard Star TT Series
ion Depo A Series
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series

HARD STAR Type A Series

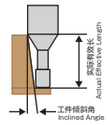
超硬长颈圆角立铣刀 Carbide Long Neck Radius End Mill

Hard A | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:HALR430 Model number:HALR430



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



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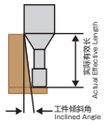
单位(Size) : mm

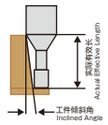
型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR430-0090-0100-0400	0.9	0.1	4	0.7	0.87	15	4	50	7,360	4.19	4.33	4.48	4.65	5.02
HALR430-0090-0100-0800		0.1	8	0.7	0.87	15	4	50	7,360	8.32	8.61	8.92	9.25	9.99
HALR430-0100-0020-0200	1	0.02	2	0.8	0.95	15	4	50	4,960	2.16	2.24	2.32	2.40	2.60
HALR430-0100-0020-0300		0.02	3	0.8	0.95	15	4	50	4,960	3.20	3.31	3.43	3.55	3.84
HALR430-0100-0020-0400		0.02	4	0.8	0.95	15	4	50	4,960	4.23	4.38	4.53	4.70	5.08
HALR430-0100-0020-0500		0.02	5	0.8	0.95	15	4	50	4,960	5.26	5.45	5.64	5.85	6.33
HALR430-0100-0020-0600		0.02	6	0.8	0.95	15	4	50	5,440	6.30	6.52	6.75	7.00	7.57
HALR430-0100-0020-0800		0.02	8	0.8	0.95	15	4	50	5,440	8.37	8.66	8.97	9.30	10.06
HALR430-0100-0020-1000		0.02	10	0.8	0.95	15	4	50	5,440	10.43	10.80	11.18	11.60	12.54
HALR430-0100-0050-0200		0.05	2	0.8	0.95	15	4	50	4,960	2.16	2.24	2.31	2.40	2.59
HALR430-0100-0050-0300		0.05	3	0.8	0.95	15	4	50	4,960	3.20	3.31	3.42	3.55	3.83
HALR430-0100-0050-0400		0.05	4	0.8	0.95	15	4	50	4,960	4.23	4.38	4.53	4.70	5.08
HALR430-0100-0050-0500		0.05	5	0.8	0.95	15	4	50	4,960	5.26	5.44	5.64	5.85	6.32
HALR430-0100-0050-0600		0.05	6	0.8	0.95	15	4	50	5,440	6.30	6.51	6.75	7.00	7.56
HALR430-0100-0050-0800		0.05	8	0.8	0.95	15	4	50	5,440	8.36	8.65	8.96	9.30	10.05
HALR430-0100-0050-1000		0.05	10	0.8	0.95	15	4	50	5,440	10.43	10.79	11.18	11.60	12.54
HALR430-0100-0100-0200		0.1	2	0.8	0.95	15	4	50	4,960	2.16	2.23	2.31	2.39	2.58
HALR430-0100-0100-0300		0.1	3	0.8	0.95	15	4	50	4,960	3.19	3.30	3.42	3.54	3.82
HALR430-0100-0100-0400		0.1	4	0.8	0.95	15	4	50	4,960	4.23	4.37	4.53	4.69	5.07
HALR430-0100-0100-0500		0.1	5	0.8	0.95	15	4	50	4,960	5.26	5.44	5.63	5.84	6.31
HALR430-0100-0100-0600		0.1	6	0.8	0.95	15	4	50	5,440	6.30	6.51	6.74	6.99	7.55
HALR430-0100-0100-0800		0.1	8	0.8	0.95	15	4	50	5,440	8.36	8.65	8.96	9.29	10.04
HALR430-0100-0100-1000		0.1	10	0.8	0.95	15	4	50	4,960	10.43	10.79	11.18	11.59	12.52
HALR430-0100-0200-0200		0.2	2	0.8	0.95	15	4	50	4,960	2.16	2.23	2.30	2.38	2.56
HALR430-0100-0200-0300		0.2	3	0.8	0.95	15	4	50	4,960	3.19	3.30	3.41	3.53	3.80
HALR430-0100-0200-0400		0.2	4	0.8	0.95	15	4	50	4,960	4.22	4.36	4.52	4.68	5.04
HALR430-0100-0200-0500		0.2	5	0.8	0.95	15	4	50	4,960	5.26	5.43	5.62	5.83	6.29
HALR430-0100-0200-0600		0.2	6	0.8	0.95	15	4	50	5,440	6.29	6.50	6.73	6.98	7.53
HALR430-0100-0200-0800		0.2	8	0.8	0.95	15	4	50	5,440	8.36	8.64	8.95	9.28	10.01
HALR430-0100-0200-1000		0.2	10	0.8	0.95	15	4	50	5,440	10.43	10.78	11.17	11.58	12.50



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR430-0100-0300-0200	1	0.3	2	0.8	0.95	15	4	50	4,960	2.15	2.22	2.29	2.36	2.53
HALR430-0100-0300-0300		0.3	3	0.8	0.95	15	4	50	4,960	3.19	3.29	3.40	3.51	3.78
HALR430-0100-0300-0400		0.3	4	0.8	0.95	15	4	50	4,960	4.22	4.36	4.50	4.66	5.02
HALR430-0100-0300-0500		0.3	5	0.8	0.95	15	4	50	4,960	5.25	5.43	5.61	5.81	6.26
HALR430-0100-0300-0600		0.3	6	0.8	0.95	15	4	50	5,440	6.29	6.50	6.72	6.96	7.51
HALR430-0100-0300-0800		0.3	8	0.8	0.95	15	4	50	5,440	8.36	8.64	8.94	9.26	9.99
HALR430-0100-0300-1000		0.3	10	0.8	0.95	15	4	50	5,440	10.42	10.78	11.15	11.56	12.48
HALR430-0120-0100-0500	1.2	0.1	5	1	1.15	15	4	50	5,600	5.26	5.44	5.63	5.84	6.31
HALR430-0120-0100-1000		0.1	10	1	1.15	15	4	50	5,600	10.43	10.79	11.18	11.59	12.52
HALR430-0120-0200-0500		0.2	5	1	1.15	15	4	50	5,600	5.26	5.43	5.62	5.83	6.29
HALR430-0120-0200-1000		0.2	10	1	1.15	15	4	50	5,600	10.43	10.78	11.17	11.58	12.50
HALR430-0120-0300-0500		0.3	5	1	1.15	15	4	50	5,600	5.25	5.43	5.61	5.81	6.26
HALR430-0120-0300-1000		0.3	10	1	1.15	15	4	50	5,600	10.42	10.78	11.15	11.56	12.48
HALR430-0150-0020-0300	1.5	0.02	3	1.2	1.45	15	4	50	5,280	3.20	3.31	3.43	3.55	3.84
HALR430-0150-0020-0400		0.02	4	1.2	1.45	15	4	50	5,280	4.23	4.38	4.53	4.70	5.08
HALR430-0150-0020-0600		0.02	6	1.2	1.45	15	4	50	5,280	6.30	6.52	6.75	7.00	7.57
HALR430-0150-0020-0800		0.02	8	1.2	1.45	15	4	50	5,600	8.37	8.66	8.97	9.30	10.06
HALR430-0150-0020-1200		0.02	12	1.2	1.45	15	4	50	5,600	12.50	12.93	13.40	13.90	15.03
HALR430-0150-0020-1500		0.02	15	1.2	1.45	15	4	50	5,600	15.60	16.14	16.73	17.35	18.76
HALR430-0150-0050-0300		0.05	3	1.2	1.45	15	4	50	5,280	3.20	3.31	3.42	3.55	3.83
HALR430-0150-0050-0400		0.05	4	1.2	1.45	15	4	50	5,280	4.23	4.38	4.53	4.70	5.08
HALR430-0150-0050-0600		0.05	6	1.2	1.45	15	4	50	5,280	6.30	6.51	6.75	7.00	7.56
HALR430-0150-0050-0800		0.05	8	1.2	1.45	15	4	50	5,600	8.36	8.65	8.96	9.30	10.05
HALR430-0150-0050-1200		0.05	12	1.2	1.45	15	4	50	5,600	12.50	12.93	13.40	13.90	15.02
HALR430-0150-0050-1500		0.05	15	1.2	1.45	15	4	50	5,600	15.60	16.14	16.72	17.35	18.75
HALR430-0150-0100-0300		0.1	3	1.2	1.45	15	4	50	5,280	3.19	3.30	3.42	3.54	3.82
HALR430-0150-0100-0400		0.1	4	1.2	1.45	15	4	50	5,280	4.23	4.37	4.53	4.69	5.07
HALR430-0150-0100-0600		0.1	6	1.2	1.45	15	4	50	5,280	6.30	6.51	6.74	6.99	7.55
HALR430-0150-0100-0800		0.1	8	1.2	1.45	15	4	50	5,600	8.36	8.65	8.96	9.29	10.04
HALR430-0150-0100-1200		0.1	12	1.2	1.45	15	4	50	5,600	12.50	12.93	13.39	13.89	15.01
HALR430-0150-0100-1500		0.1	15	1.2	1.45	15	4	50	5,600	15.60	16.14	16.72	17.34	18.74
HALR430-0150-0200-0300		0.2	3	1.2	1.45	15	4	50	5,280	3.19	3.30	3.41	3.53	3.80
HALR430-0150-0200-0400		0.2	4	1.2	1.45	15	4	50	5,280	4.22	4.36	4.52	4.68	5.04
HALR430-0150-0200-0600		0.2	6	1.2	1.45	15	4	50	5,280	6.29	6.50	6.73	6.98	7.53
HALR430-0150-0200-0800		0.2	8	1.2	1.45	15	4	50	5,600	8.36	8.64	8.95	9.28	10.01
HALR430-0150-0200-1200		0.2	12	1.2	1.45	15	4	50	5,600	12.49	12.92	13.38	13.88	14.99
HALR430-0150-0200-1500		0.2	15	1.2	1.45	15	4	50	5,600	15.59	16.13	16.71	17.33	18.72
HALR430-0150-0300-0300		0.3	3	1.2	1.45	15	4	50	5,280	3.19	3.29	3.40	3.51	3.78
HALR430-0150-0300-0400		0.3	4	1.2	1.45	15	4	50	5,280	4.22	4.36	4.50	4.66	5.02
HALR430-0150-0300-0600		0.3	6	1.2	1.45	15	4	50	5,280	6.29	6.50	6.72	6.96	7.51
HALR430-0150-0300-0800		0.3	8	1.2	1.45	15	4	50	5,600	8.36	8.64	8.94	9.26	9.99
HALR430-0150-0300-1200		0.3	12	1.2	1.45	15	4	50	5,600	12.49	12.92	13.37	13.86	14.96
HALR430-0150-0300-1500		0.3	15	1.2	1.45	15	4	50	5,600	15.59	16.12	16.70	17.31	18.69
HALR430-0150-0500-0300		0.5	3	1.2	1.45	15	4	50	5,280	3.18	3.27	3.37	3.48	3.73
HALR430-0150-0500-0400		0.5	4	1.2	1.45	15	4	50	5,280	4.21	4.34	4.48	4.63	4.97

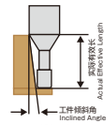


单位(Size)：mm

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR430-0150-0500-0600	1.5	0.5	6	1.2	1.45	15	4	50	5,280	6.28	6.48	6.70	6.93	7.46
HALR430-0150-0500-0800		0.5	8	1.2	1.45	15	4	50	5,600	8.35	8.62	8.92	9.23	9.95
HALR430-0150-0500-1200		0.5	12	1.2	1.45	15	4	50	5,600	12.48	12.90	13.35	13.83	14.92
HALR430-0150-0500-1500		0.5	15	1.2	1.45	15	4	50	5,600	15.58	16.11	16.67	17.28	18.65
HALR430-0200-0020-0400	2	0.02	4	1.6	1.94	15	4	50	5,280	4.25	4.40	4.56	4.73	5.11
HALR430-0200-0020-0600		0.02	6	1.6	1.94	15	4	50	5,280	6.32	6.54	6.77	7.02	7.59
HALR430-0200-0020-0800		0.02	8	1.6	1.94	15	4	50	5,600	8.38	8.68	8.99	9.32	10.08
HALR430-0200-0020-1200		0.02	12	1.6	1.94	15	4	50	5,600	12.52	12.95	13.42	13.92	15.05
HALR430-0200-0020-1600		0.02	16	1.6	1.94	15	4	50	5,600	16.65	17.23	17.85	18.52	FREE
HALR430-0200-0020-2000		0.02	20	1.6	1.94	15	4	50	5,600	20.79	21.51	22.29	23.12	FREE
HALR430-0200-0050-0400		0.05	4	1.6	1.94	15	4	50	5,280	4.25	4.40	4.55	4.72	5.10
HALR430-0200-0050-0600		0.05	6	1.6	1.94	15	4	50	5,280	6.32	6.53	6.77	7.02	7.59
HALR430-0200-0050-0800		0.05	8	1.6	1.94	15	4	50	5,600	8.38	8.67	8.99	9.32	10.07
HALR430-0200-0050-1200		0.05	12	1.6	1.94	15	4	50	5,600	12.52	12.95	13.42	13.92	15.05
HALR430-0200-0050-1600		0.05	16	1.6	1.94	15	4	50	5,600	16.65	17.23	17.85	18.52	FREE
HALR430-0200-0050-2000		0.05	20	1.6	1.94	15	4	50	5,600	20.79	21.51	22.28	23.12	FREE
HALR430-0200-0100-0400		0.1	4	1.6	1.94	15	4	50	5,280	4.25	4.39	4.55	4.71	5.09
HALR430-0200-0100-0600		0.1	6	1.6	1.94	15	4	50	5,280	6.31	6.53	6.76	7.01	7.57
HALR430-0200-0100-0800		0.1	8	1.6	1.94	15	4	50	5,600	8.38	8.67	8.98	9.31	10.06
HALR430-0200-0100-1200		0.1	12	1.6	1.94	15	4	50	5,600	12.52	12.95	13.41	13.91	15.03
HALR430-0200-0100-1600		0.1	16	1.6	1.94	15	4	50	5,600	16.65	17.23	17.85	18.51	FREE
HALR430-0200-0100-2000		0.1	20	1.6	1.94	15	4	50	5,600	20.79	21.51	22.28	23.11	FREE
HALR430-0200-0200-0400		0.2	4	1.6	1.94	15	4	50	5,280	4.24	4.38	4.54	4.70	5.07
HALR430-0200-0200-0600		0.2	6	1.6	1.94	15	4	50	5,280	6.31	6.52	6.75	7.00	7.55
HALR430-0200-0200-0800		0.2	8	1.6	1.94	15	4	50	5,600	8.38	8.66	8.97	9.30	10.04
HALR430-0200-0200-1200		0.2	12	1.6	1.94	15	4	50	5,600	12.51	12.94	13.40	13.90	15.01
HALR430-0200-0200-1600		0.2	16	1.6	1.94	15	4	50	5,600	16.65	17.22	17.84	18.50	FREE
HALR430-0200-0200-2000		0.2	20	1.6	1.94	15	4	50	5,600	20.78	21.50	22.27	23.10	FREE
HALR430-0200-0300-0400		0.3	4	1.6	1.94	15	4	50	5,280	4.24	4.38	4.53	4.68	5.04
HALR430-0200-0300-0600		0.3	6	1.6	1.94	15	4	50	5,280	6.31	6.52	6.74	6.98	7.53
HALR430-0200-0300-0800		0.3	8	1.6	1.94	15	4	50	5,600	8.37	8.66	8.96	9.28	10.02
HALR430-0200-0300-1200		0.3	12	1.6	1.94	15	4	50	5,600	12.51	12.94	13.39	13.88	14.99
HALR430-0200-0300-1600		0.3	16	1.6	1.94	15	4	50	5,600	16.64	17.21	17.83	18.48	FREE
HALR430-0200-0300-2000		0.3	20	1.6	1.94	15	4	50	5,600	20.78	21.49	22.26	23.08	FREE
HALR430-0200-0500-0400		0.5	4	1.6	1.94	15	4	50	5,280	4.23	4.36	4.50	4.65	5.00
HALR430-0200-0500-0600		0.5	6	1.6	1.94	15	4	50	5,280	6.30	6.50	6.72	6.95	7.48
HALR430-0200-0500-0800		0.5	8	1.6	1.94	15	4	50	5,600	8.37	8.64	8.94	9.25	9.97
HALR430-0200-0500-1200		0.5	12	1.6	1.94	15	4	50	5,600	12.50	12.92	13.37	13.85	14.94
HALR430-0200-0500-1600		0.5	16	1.6	1.94	15	4	50	5,600	16.64	17.20	17.80	18.45	FREE
HALR430-0200-0500-2000		0.5	20	1.6	1.94	15	4	50	5,600	20.77	21.48	22.24	23.05	FREE
HALR430-0250-0100-1000	2.5	0.1	10	2	2.44	15	4	50	5,760	10.45	10.81	11.20	11.61	12.55
HALR430-0250-0100-2000		0.1	20	2	2.44	15	4	50	6,000	20.79	21.51	22.28	FREE	FREE
HALR430-0250-0200-1000		0.2	10	2	2.44	15	4	50	5,760	10.45	10.80	11.19	11.60	12.52
HALR430-0250-0200-2000		0.2	20	2	2.44	15	4	50	6,000	20.78	21.50	22.27	FREE	FREE
HALR430-0250-0300-1000		0.3	10	2	2.44	15	4	50	5,760	10.44	10.80	11.18	11.58	12.50

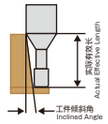
HARD STAR Type A Series



单位(Size)：mm

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

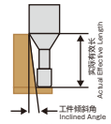
型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR430-0250-0300-2000	2.5	0.3	20	2	2.44	15	4	50	6,000	20.78	21.49	22.26	FREE	FREE
HALR430-0250-0500-1000		0.5	10	2	2.44	15	4	50	5,760	10.44	10.78	11.15	11.55	12.46
HALR430-0250-0500-2000		0.5	20	2	2.44	15	4	50	6,000	20.77	21.48	22.24	FREE	FREE
HALR430-0300-0050-0400	3	0.05	4	2.5	2.85	15	4	50	4,800	4.42	4.57	4.74	4.91	5.31
HALR430-0300-0050-0600		0.05	6	2.5	2.85	15	4	50	4,800	6.49	6.71	6.95	7.21	7.79
HALR430-0300-0050-0800		0.05	8	2.5	2.85	15	4	50	4,800	8.56	8.85	9.17	9.51	FREE
HALR430-0300-0050-1200		0.05	12	2.5	2.85	15	4	50	5,760	12.69	13.13	13.60	14.11	FREE
HALR430-0300-0050-1600		0.05	16	2.5	2.85	15	4	50	7,200	16.83	17.41	18.04	FREE	FREE
HALR430-0300-0050-2000		0.05	20	2.5	2.85	15	4	50	7,200	20.96	21.69	FREE	FREE	FREE
HALR430-0300-0100-0400		0.1	4	2.5	2.85	15	4	50	4,800	4.42	4.57	4.73	4.91	5.30
HALR430-0300-0100-0600		0.1	6	2.5	2.85	15	4	50	4,800	6.49	6.71	6.95	7.21	7.78
HALR430-0300-0100-0800		0.1	8	2.5	2.85	15	4	50	4,800	8.56	8.85	9.17	9.51	FREE
HALR430-0300-0100-1200		0.1	12	2.5	2.85	15	4	50	5,760	12.69	13.13	13.60	14.11	FREE
HALR430-0300-0100-1600		0.1	16	2.5	2.85	15	4	50	7,200	16.82	17.41	18.03	FREE	FREE
HALR430-0300-0100-2000		0.1	20	2.5	2.85	15	4	50	7,200	20.96	21.69	FREE	FREE	FREE
HALR430-0300-0100-2500		0.1	25	2.5	2.85	15	4	60	7,200	26.13	27.03	FREE	FREE	FREE
HALR430-0300-0100-3000		0.1	30	2.5	2.85	15	4	60	8,080	31.30	FREE	FREE	FREE	FREE
HALR430-0300-0200-0400		0.2	4	2.5	2.85	15	4	50	4,800	4.42	4.56	4.72	4.89	5.27
HALR430-0300-0200-0600		0.2	6	2.5	2.85	15	4	50	4,800	6.48	6.70	6.94	7.19	7.76
HALR430-0300-0200-0800		0.2	8	2.5	2.85	15	4	50	4,800	8.55	8.84	9.16	9.49	FREE
HALR430-0300-0200-1200		0.2	12	2.5	2.85	15	4	50	5,760	12.69	13.12	13.59	14.09	FREE
HALR430-0300-0200-1600		0.2	16	2.5	2.85	15	4	50	7,200	16.82	17.40	18.02	FREE	FREE
HALR430-0300-0200-2000		0.2	20	2.5	2.85	15	4	50	7,200	20.96	21.68	FREE	FREE	FREE
HALR430-0300-0200-2500		0.2	25	2.5	2.85	15	4	60	7,200	26.12	27.03	FREE	FREE	FREE
HALR430-0300-0200-3000		0.2	30	2.5	2.85	15	4	60	8,080	31.29	FREE	FREE	FREE	FREE
HALR430-0300-0300-0400		0.3	4	2.5	2.85	15	4	50	4,800	4.41	4.56	4.71	4.88	5.25
HALR430-0300-0300-0600		0.3	6	2.5	2.85	15	4	50	4,800	6.48	6.70	6.93	7.18	7.74
HALR430-0300-0300-0800		0.3	8	2.5	2.85	15	4	50	4,800	8.55	8.84	9.14	9.48	FREE
HALR430-0300-0300-1200		0.3	12	2.5	2.85	15	4	50	5,760	12.68	13.11	13.58	14.08	FREE
HALR430-0300-0300-1600		0.3	16	2.5	2.85	15	4	50	7,200	16.82	17.39	18.01	FREE	FREE
HALR430-0300-0300-2000		0.3	20	2.5	2.85	15	4	50	7,200	20.95	21.67	FREE	FREE	FREE
HALR430-0300-0300-2500		0.3	25	2.5	2.85	15	4	60	7,200	26.12	27.02	FREE	FREE	FREE
HALR430-0300-0300-3000		0.3	30	2.5	2.85	15	4	60	8,080	31.29	FREE	FREE	FREE	FREE
HALR430-0300-0500-0400		0.5	4	2.5	2.85	15	4	50	4,800	4.41	4.54	4.69	4.85	5.20
HALR430-0300-0500-0600		0.5	6	2.5	2.85	15	4	50	4,800	6.47	6.68	6.91	7.15	7.69
HALR430-0300-0500-0800		0.5	8	2.5	2.85	15	4	50	4,800	8.54	8.82	9.12	9.45	FREE
HALR430-0300-0500-1200		0.5	12	2.5	2.85	15	4	50	5,760	12.68	13.10	13.56	14.05	FREE
HALR430-0300-0500-1600		0.5	16	2.5	2.85	15	4	50	7,200	16.81	17.38	17.99	FREE	FREE
HALR430-0300-0500-2000		0.5	20	2.5	2.85	15	4	50	7,200	20.95	21.66	FREE	FREE	FREE
HALR430-0300-0500-2500		0.5	25	2.5	2.85	15	4	60	7,200	26.11	27.01	FREE	FREE	FREE
HALR430-0300-0500-3000		0.5	30	2.5	2.85	15	4	60	8,080	31.28	FREE	FREE	FREE	FREE
HALR430-0300-1000-0800		1	8	2.5	2.85	15	4	50	4,800	8.53	8.79	9.07	9.37	10.06
HALR430-0300-1000-1200		1	12	2.5	2.85	15	4	50	5,760	12.66	13.07	13.50	13.97	FREE
HALR430-0300-1000-1600		1	16	2.5	2.85	15	4	50	7,200	16.79	17.35	17.94	FREE	FREE
HALR430-0300-1000-2000		1	20	2.5	2.85	15	4	50	7,200	20.93	21.62	FREE	FREE	FREE



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR430-0300-1000-2500	3	1	25	2.5	2.85	15	4	60	7,200	26.10	26.97	FREE	FREE	FREE
HALR430-0300-1000-3000		1	30	2.5	2.85	15	4	60	8,080	31.27	FREE	FREE	FREE	FREE
HALR430-0400-0100-0800	4	0.1	8	3.2	3.8	15	6	50	7,200	8.65	8.95	9.27	9.61	10.39
HALR430-0400-0100-1200		0.1	12	3.2	3.8	15	6	50	7,200	12.79	13.23	13.70	14.21	15.36
HALR430-0400-0100-1600		0.1	16	3.2	3.8	15	6	50	7,200	16.92	17.51	18.14	18.81	FREE
HALR430-0400-0100-2400		0.1	24	3.2	3.8	15	6	60	8,000	25.19	26.06	27.00	28.01	FREE
HALR430-0400-0100-3200		0.1	32	3.2	3.8	15	6	70	8,000	33.46	34.62	35.87	FREE	FREE
HALR430-0400-0200-0800		0.2	8	3.2	3.8	15	6	50	7,200	8.65	8.94	9.26	9.60	10.36
HALR430-0400-0200-1200		0.2	12	3.2	3.8	15	6	50	7,200	12.78	13.22	13.69	14.20	15.33
HALR430-0400-0200-1600		0.2	16	3.2	3.8	15	6	50	7,200	16.92	17.50	18.13	18.80	FREE
HALR430-0400-0200-2400		0.2	24	3.2	3.8	15	6	60	8,000	25.19	26.06	26.99	28.00	FREE
HALR430-0400-0200-3200		0.2	32	3.2	3.8	15	6	70	8,000	33.46	34.62	35.86	FREE	FREE
HALR430-0400-0300-0800		0.3	8	3.2	3.8	15	6	50	7,200	8.65	8.94	9.25	9.58	10.34
HALR430-0400-0300-1200		0.3	12	3.2	3.8	15	6	50	7,200	12.78	13.21	13.68	14.18	15.31
HALR430-0400-0300-1600		0.3	16	3.2	3.8	15	6	50	7,200	16.91	17.49	18.11	18.78	FREE
HALR430-0400-0300-2400		0.3	24	3.2	3.8	15	6	60	8,000	25.18	26.05	26.98	27.98	FREE
HALR430-0400-0300-3200		0.3	32	3.2	3.8	15	6	70	8,000	33.45	34.61	35.85	FREE	FREE
HALR430-0400-0500-0800		0.5	8	3.2	3.8	15	6	50	7,200	8.64	8.92	9.23	9.55	10.29
HALR430-0400-0500-1200		0.5	12	3.2	3.8	15	6	50	7,200	12.77	13.20	13.66	14.15	15.27
HALR430-0400-0500-1600		0.5	16	3.2	3.8	15	6	50	7,200	16.91	17.48	18.09	18.75	FREE
HALR430-0400-0500-2400		0.5	24	3.2	3.8	15	6	60	8,000	25.18	26.04	26.96	27.95	FREE
HALR430-0400-0500-3200		0.5	32	3.2	3.8	15	6	70	8,000	33.45	34.59	35.83	FREE	FREE
HALR430-0400-1000-0800		1	8	3.2	3.8	15	6	50	7,200	8.62	8.89	9.17	9.48	10.18
HALR430-0400-1000-1200		1	12	3.2	3.8	15	6	50	7,200	12.76	13.17	13.61	14.08	15.15
HALR430-0400-1000-1600		1	16	3.2	3.8	15	6	50	7,200	16.89	17.45	18.04	18.68	FREE
HALR430-0400-1000-2400		1	24	3.2	3.8	15	6	60	8,000	25.16	26.00	26.91	27.88	FREE
HALR430-0400-1000-3200		1	32	3.2	3.8	15	6	70	8,000	33.43	34.56	35.77	FREE	FREE
HALR430-0500-0100-1500	5	0.1	15	4	4.8	15	6	50	10,240	15.89	16.44	17.03	FREE	FREE
HALR430-0500-0100-2000		0.1	20	4	4.8	15	6	50	10,240	21.06	21.79	FREE	FREE	FREE
HALR430-0500-0100-4000		0.1	40	4	4.8	15	6	70	12,800	41.73	FREE	FREE	FREE	FREE
HALR430-0500-0200-1500		0.2	15	4	4.8	15	6	50	10,240	15.88	16.43	17.02	FREE	FREE
HALR430-0500-0200-2000		0.2	20	4	4.8	15	6	50	10,240	21.05	21.78	FREE	FREE	FREE
HALR430-0500-0200-4000		0.2	40	4	4.8	15	6	70	12,800	41.73	FREE	FREE	FREE	FREE
HALR430-0500-0300-1500		0.3	15	4	4.8	15	6	50	10,240	15.88	16.42	17.01	FREE	FREE
HALR430-0500-0300-2000		0.3	20	4	4.8	15	6	50	10,240	21.05	21.77	FREE	FREE	FREE
HALR430-0500-0300-4000		0.3	40	4	4.8	15	6	70	12,800	41.72	FREE	FREE	FREE	FREE
HALR430-0500-0500-1500		0.5	15	4	4.8	15	6	50	10,240	15.87	16.41	16.98	FREE	FREE
HALR430-0500-0500-2000		0.5	20	4	4.8	15	6	50	10,240	21.04	21.76	FREE	FREE	FREE
HALR430-0500-0500-4000		0.5	40	4	4.8	15	6	70	12,800	41.72	FREE	FREE	FREE	FREE
HALR430-0500-1000-1500		1	15	4	4.8	15	6	50	10,240	15.86	16.38	16.93	FREE	FREE
HALR430-0500-1000-2000		1	20	4	4.8	15	6	50	10,240	21.03	21.72	FREE	FREE	FREE
HALR430-0500-1000-4000		1	40	4	4.8	15	6	70	12,800	41.70	FREE	FREE	FREE	FREE
HALR430-0600-0100-1200	6	0.1	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0100-1800		0.1	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0100-2400		0.1	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE



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单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALR430-0600-0100-4800	6	0.1	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0200-1200		0.2	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0200-1800		0.2	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0200-2400		0.2	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0200-4800		0.2	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0300-1200		0.3	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0300-1800		0.3	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0300-2400		0.3	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0300-4800		0.3	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0500-1200		0.5	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0500-1800		0.5	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0500-2400		0.5	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE
HALR430-0600-0500-4800		0.5	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE
HALR430-0600-1000-1200		1	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
HALR430-0600-1000-1800		1	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
HALR430-0600-1000-2400		1	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE
HALR430-0600-1000-4800		1	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE

HARD STAR Type A Series

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALR430
Model number:HALR430

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
	0.9	4	0.03	0.3	1,700	25,000	0.02	0.2	1,400	20,000	0.01	0.15	1,200	18,000
		8	0.01	0.3	800	16,000	0.008	0.2	700	14,000	0.005	0.15	500	10,000
	1.0	2	0.012	0.3	2,300	25,000	0.01	0.25	2,000	21,000	0.008	0.2	1,400	17,000
		3	0.012	0.3	2,100	23,000	0.01	0.25	1,800	20,000	0.008	0.2	1,300	16,000
		4	0.01	0.3	1,800	21,000	0.008	0.25	1,500	18,000	0.005	0.2	1,100	14,000
		5	0.008	0.3	1,600	19,000	0.005	0.25	1,400	16,000	0.003	0.2	1,000	13,000
		6	0.008	0.3	1,400	16,000	0.005	0.25	1,200	14,000	0.003	0.2	850	11,000
		8	0.006	0.3	1,100	15,000	0.005	0.25	900	13,000	0.002	0.2	650	10,000
		10	0.004	0.3	800	13,000	0.003	0.25	700	11,000	0.002	0.2	500	9,000
	1.2	5	0.045	0.4	1,800	20,000	0.03	0.3	1,500	17,000	0.02	0.2	1,100	14,000
		10	0.03	0.4	1,100	13,000	0.01	0.3	950	11,000	0.005	0.2	700	9,000
	1.5	3	0.012	0.5	2,300	23,000	0.01	0.4	2,000	20,000	0.008	0.3	1,400	16,000
		4	0.012	0.5	2,000	21,000	0.01	0.4	1,700	18,000	0.008	0.3	1,200	14,000
		6	0.01	0.5	1,800	19,000	0.008	0.4	1,500	16,000	0.005	0.3	1,100	13,000
		8	0.01	0.5	1,500	16,000	0.008	0.4	1,300	14,000	0.003	0.3	900	11,000
		12	0.008	0.5	1,100	13,000	0.005	0.4	950	11,000	0.002	0.3	650	9,000
		15	0.005	0.5	800	11,000	0.003	0.4	700	9,000	0.002	0.3	500	7,000
4	2	4	0.015	0.6	2,300	20,000	0.012	0.5	2,000	17,000	0.008	0.35	1,400	14,000
		6	0.015	0.6	2,100	18,000	0.012	0.5	1,800	15,000	0.008	0.35	1,300	12,000
		8	0.012	0.6	1,800	16,000	0.01	0.5	1,500	14,000	0.005	0.35	1,100	11,000
		12	0.01	0.6	1,400	13,000	0.008	0.5	1,200	11,000	0.003	0.35	850	9,000
		16	0.008	0.6	1,100	11,000	0.005	0.5	950	9,500	0.002	0.35	650	7,500
		20	0.005	0.6	650	8,000	0.003	0.5	550	7,000	0.002	0.35	400	5,500
	2.5	10	0.07	0.7	1,800	13,000	0.05	0.5	1,500	11,000	0.03	0.5	1,100	9,000
		20	0.04	0.7	1,100	9,000	0.02	0.5	950	7,500	0.01	0.5	650	6,000
	3	4	0.1	0.8	2,300	15,000	0.07	0.7	550	13,000	0.05	0.6	1,400	10,000
		6	0.1	0.8	2,100	13,000	0.07	0.7	2,000	11,000	0.05	0.6	1,300	9,000
		8	0.1	0.8	1,800	11,000	0.07	0.7	1,800	9,500	0.05	0.6	1,100	7,500
		12	0.08	0.8	1,600	11,000	0.06	0.7	1,400	9,500	0.04	0.6	1,000	7,500
		16	0.07	0.8	1,500	10,000	0.05	0.7	1,200	8,500	0.03	0.6	900	7,000
		20	0.05	0.8	1,100	8,000	0.04	0.7	950	7,000	0.02	0.6	700	5,500
		25	0.04	0.8	1,000	7,500	0.02	0.7	850	6,500	0.01	0.6	600	5,000
		30	0.03	0.8	650	6,500	0.02	0.7	550	5,500	0.007	0.6	400	4,500
	4	8	0.15	1.2	2,100	10,000	0.08	1	1,800	8,500	0.06	0.8	1,300	7,000
		12	0.15	1.2	2,100	10,000	0.08	1	1,800	8,500	0.06	0.8	1,300	7,000
		16	0.1	1.2	1,800	8,000	0.06	1	1,500	7,000	0.05	0.8	1,100	5,500
		24	0.08	1.2	1,300	6,500	0.05	1	1,100	5,500	0.03	0.8	750	4,500
		32	0.04	1.2	1,100	5,500	0.02	1	950	4,500	0.01	0.8	650	3,500
	5	15	0.15	2	2,000	8,000	0.08	1.6	1,700	7,000	0.06	1.2	1,200	5,500
		20	0.1	2	1,600	6,500	0.07	1.6	1,400	5,500	0.05	1.2	1,000	4,500
		40	0.05	2	1,000	4,000	0.02	1.6	850	3,500	0.01	1.2	600	3,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	6	12	0.18	2.5	2,100	6,500	0.08	2	1,800	5,500	0.06	1.5	1,300	4,500
		18	0.18	2.5	1,800	5,500	0.08	2	1,500	4,500	0.06	1.5	1,100	3,500
		24	0.15	2.5	1,500	5,000	0.07	2	1,300	4,000	0.05	1.5	900	3,000
		48	0.05	2.5	750	2,500	0.03	2	650	2,000	0.02	1.5	450	2,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALR430
Model number:HALR430

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	0.9	4	0.18	0.2	1,000	17,000	0.18	0.2	1,000	17,000	0.18	0.2	800	13,000
		8	0.15	0.2	1,000	17,000	0.15	0.2	1,000	17,000	0.15	0.2	700	13,000
	1.0	2	0.2	0.23	1,800	16,000	0.2	0.23	1,800	16,000	0.045	0.3	1,260	12,800
		3	0.15	0.23	1,500	16,000	0.15	0.23	1,500	16,000	0.04	0.3	1,050	12,800
		4	0.13	0.23	1,410	16,000	0.13	0.23	1,410	16,000	0.035	0.25	990	12,800
		5	0.12	0.2	1,200	14,500	0.12	0.2	1,200	14,500	0.03	0.25	840	11,600
		6	0.09	0.2	870	14,500	0.09	0.2	870	14,500	0.02	0.2	620	11,600
		8	0.075	0.15	660	11,100	0.075	0.15	660	11,100	0.015	0.1	470	8,900
		10	0.06	0.15	300	11,100	0.06	0.15	300	11,100	0.01	0.08	210	8,900
	1.2	5	0.18	0.28	1,740	15,500	0.18	0.28	1,740	15,500	0.045	0.35	1,220	12,400
		10	0.12	0.28	1,290	12,000	0.12	0.28	1,290	12,000	0.03	0.25	900	9,600
	1.5	3	0.24	0.35	1,910	14,000	0.24	0.35	1,910	14,000	0.05	0.4	1,340	11,200
		4	0.24	0.35	1,910	14,000	0.24	0.35	1,910	14,000	0.05	0.4	1,340	11,200
		6	0.24	0.35	1,910	14,000	0.24	0.35	1,910	14,000	0.05	0.4	1,340	11,200
		8	0.18	0.3	1,250	11,500	0.18	0.3	1,250	11,500	0.04	0.3	870	9,000
		12	0.18	0.3	1,250	11,500	0.18	0.3	1,250	11,500	0.04	0.3	870	9,000
		15	0.08	0.25	560	8,500	0.08	0.25	560	8,500	0.01	0.15	390	6,800
	2	4	0.24	0.45	2,150	11,100	0.24	0.45	2,150	11,100	0.05	0.5	1,500	8,800
		6	0.24	0.45	2,150	11,100	0.24	0.45	2,150	11,100	0.05	0.5	1,500	8,800
		8	0.24	0.45	2,150	11,100	0.24	0.45	2,150	11,100	0.05	0.5	1,500	8,800
		12	0.2	0.43	1,800	11,100	0.2	0.43	1,800	11,100	0.045	0.5	1,260	8,800
		16	0.15	0.39	1,500	9,600	0.15	0.39	1,500	9,600	0.04	0.35	1,050	7,700
		20	0.12	0.35	900	9,600	0.12	0.35	900	9,600	0.015	0.25	630	7,700
	2.5	10	0.3	0.5	2,280	9,200	0.3	0.5	2,280	9,200	0.07	0.7	1,590	7,400
		20	0.24	0.43	1,580	8,300	0.24	0.43	1,580	8,300	0.05	0.4	1,110	6,600
	3	4	0.38	0.55	2,400	8,000	0.38	0.55	2,400	8,000	0.1	0.8	1,680	6,400
		6	0.37	0.55	2,400	8,000	0.37	0.55	2,400	8,000	0.09	0.8	1,680	6,400
		8	0.36	0.55	2,400	8,000	0.36	0.55	2,400	8,000	0.08	0.8	1,680	6,400
		12	0.36	0.55	2,400	8,000	0.36	0.55	2,400	8,000	0.08	0.8	1,680	6,400
		16	0.3	0.5	1,850	7,700	0.3	0.5	1,850	7,700	0.06	0.6	1,250	6,200
		20	0.3	0.5	1,850	7,700	0.3	0.5	1,850	7,700	0.06	0.6	1,250	6,200
		25	0.3	0.45	1,620	7,500	0.3	0.45	1,620	7,500	0.06	0.5	1,140	6,000
		30	0.15	0.4	1,050	6,000	0.15	0.4	1,050	6,000	0.03	0.4	740	4,800
	4	8	0.45	0.75	2,520	6,000	0.45	0.75	2,520	6,000	0.1	1	1,770	4,800
		12	0.45	0.75	2,520	6,000	0.45	0.75	2,520	6,000	0.1	1	1,770	4,800
		16	0.45	0.75	2,520	6,000	0.45	0.75	2,520	6,000	0.1	1	1,770	4,800
		24	0.39	0.7	2,030	5,400	0.39	0.7	2,030	5,400	0.085	0.8	1,430	4,300
		32	0.25	0.6	1,350	4,800	0.25	0.6	1,350	4,800	0.04	0.7	950	3,800
	5	15	0.52	1	2,300	5,100	0.52	1	2,300	5,100	0.12	1.2	1,610	4,100
		20	0.52	1	2,300	5,100	0.52	1	2,300	5,100	0.12	1.2	1,610	4,100
		40	0.25	0.8	1,020	3,200	0.25	0.8	1,020	3,200	0.05	0.9	720	2,600

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈圆角立铣刀 Long Neck Radius End Mill

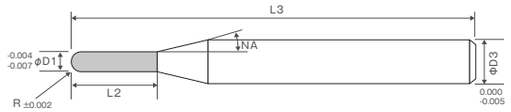
切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	6	12	0.65	1.2	2,100	3,700	0.65	1.2	2,100	3,700	0.15	1.5	1,470	3,000
		18	0.62	1.2	2,100	3,700	0.62	1.2	2,100	3,700	0.13	1.5	1,470	3,000
		24	0.32	0.9	950	2,600	0.32	0.9	950	2,600	0.05	1.2	660	2,100
		48	0.32	0.9	950	2,600	0.32	0.9	950	2,600	0.05	1.2	660	2,100

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬球头立铣刀 Carbide Ball End Mill

■型号:HAB230 Model number:HAB230

Hard A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	球头R (R) Ball R	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HAB230-0010-0050-00010	0.05	0.1	0.1	15	4	50	8,640
HAB230-0015-0075-00015	0.075	0.15	0.15	15	4	50	8,400
HAB230-0020-0100-00020	0.1	0.2	0.2	15	4	50	6,880
HAB230-0030-0150-00030	0.15	0.3	0.3	15	4	50	4,960
HAB230-0040-0200-00060	0.2	0.6	0.4	15	4	50	3,360
HAB230-0050-0250-00080	0.25	0.8	0.5	15	4	50	3,120
HAB230-0060-0300-00090	0.3	0.9	0.6	15	4	50	3,040
HAB230-0080-0400-00120	0.4	1.2	0.8	15	4	50	3,040
HAB230-0100-0500-00150	0.5	1.5	1	15	4	50	2,800
HAB230-0150-0750-00230	0.75	2.3	1.5	15	4	50	3,360
HAB230-0200-1000-00300	1	3	2	15	4	50	2,480
HAB230-0250-1250-00380	1.25	3.8	2.5	15	4	50	4,240
HAB230-0300-1500-00500	1.5	5	3	15	4	50	3,040
HAB230-0400-2000-00600	2	6	4	15	6	50	3,440
HAB230-0500-2500-00800	2.5	8	5	15	6	50	4,160
HAB230-0600-3000-01000	3	10	6	—	6	50	4,320
HAB230-0800-4000-01200	4	12	8	—	8	70	10,960
HAB230-1000-5000-01500	5	15	10	—	10	80	14,080
HAB230-1200-6000-02000	6	20	12	—	12	110	20,240

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HAB230
Model number:HAB230

球头立铣刀 Ball End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61 (~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.1	0.003	0.005	120	40,000	0.002	0.005	100	40,000	0.002	0.003	70	40,000
	0.15	0.15	0.003	0.005	180	40,000	0.002	0.005	150	40,000	0.002	0.003	100	40,000
	0.2	0.2	0.005	0.005	350	40,000	0.003	0.0025	300	40,000	0.0015	0.0015	200	40,000
	0.3	0.3	0.005	0.0075	350	40,000	0.0035	0.005	300	40,000	0.0015	0.0025	280	40,000
	0.4	0.6	0.015	0.025	800	40,000	0.015	0.015	720	40,000	0.0045	0.01	580	40,000
	0.5	0.8	0.015	0.025	1,000	40,000	0.01	0.015	860	40,000	0.005	0.01	650	40,000
	0.6	0.9	0.025	0.05	1,400	40,000	0.015	0.03	1,000	40,000	0.01	0.025	720	30,000
	0.8	1.2	0.05	0.075	2,000	40,000	0.035	0.05	1,600	40,000	0.025	0.05	1,200	30,000
	1	1.5	0.05	0.15	2,500	40,000	0.05	0.1	2,000	30,000	0.04	0.05	1,400	25,000
	1.5	2.3	0.075	0.15	3,000	30,000	0.05	0.15	2,500	30,000	0.05	0.1	2,000	25,000
	2	3	0.1	0.25	3,000	25,000	0.1	0.25	2,500	25,000	0.075	0.15	2,000	20,000
	2.5	3.8	0.15	0.2	2,800	20,000	0.1	0.25	2,300	20,000	0.075	0.2	2,000	18,000
	3	5	0.1	0.4	3,000	20,000	0.1	0.3	2,500	18,000	0.1	0.25	2,000	14,000
	4	6	0.15	0.75	3,000	20,000	0.1	0.4	2,500	16,000	0.1	0.3	2,000	12,000
	5	8	0.15	0.75	3,000	18,000	0.1	0.6	2,500	12,000	0.1	0.35	2,000	9,200
	6	10	0.15	1	3,000	16,000	0.15	0.6	2,500	8,000	0.1	0.5	2,000	7,000
	8	12	0.2	1.2	450	3,600	0.175	0.9	400	2,600	0.175	0.9	350	2,600
	10	15	0.25	1	450	2,900	0.225	0.75	400	1,900	0.225	0.75	350	1,900
	12	20	0.3	1.5	450	2,400	0.275	1	400	1,400	0.275	1	350	1,400

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HAB230
Model number:HAB230

球头立铣刀 Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.1	0.008	0.0012	500	50,000	0.008	0.0012	500	50,000	0.003	0.005	120	40,000
	0.15	0.15	0.012	0.0018	500	50,000	0.012	0.0018	500	50,000	0.003	0.005	180	40,000
	0.2	0.2	0.016	0.0024	600	50,000	0.016	0.0024	600	50,000	0.005	0.005	350	40,000
	0.3	0.3	0.024	0.0036	600	50,000	0.024	0.0036	600	50,000	0.005	0.0075	350	40,000
	0.4	0.6	0.032	0.0048	600	50,000	0.032	0.0048	600	50,000	0.015	0.025	800	40,000
	0.5	0.8	0.04	0.006	600	50,000	0.04	0.006	600	50,000	0.015	0.025	1,000	40,000
	0.6	0.9	0.048	0.0144	750	50,000	0.048	0.0144	750	50,000	0.025	0.05	1,400	40,000
	0.8	1.2	0.064	0.0192	1,000	50,000	0.064	0.0192	1,000	50,000	0.05	0.075	2,000	40,000
	1	1.5	0.08	0.024	1,250	50,000	0.08	0.024	1,250	50,000	0.05	0.15	2,500	40,000
	1.5	2.3	0.12	0.036	1,250	50,000	0.12	0.036	1,250	50,000	0.075	0.15	3,000	30,000
	2	3	0.16	0.048	2,400	48,000	0.16	0.048	2,400	48,000	0.1	0.25	3,000	25,000
	2.5	3.8	0.2	0.06	2,400	48,000	0.2	0.06	2,400	48,000	0.15	0.2	2,800	20,000
	3	5	0.375	0.1125	2,400	32,000	0.375	0.1125	2,400	32,000	0.1	0.4	3,000	20,000
	4	6	0.6	0.18	2,400	24,000	0.6	0.18	2,400	24,000	0.15	0.75	3,000	20,000
	5	8	0.75	0.225	2,400	19,000	0.75	0.225	2,400	19,000	0.15	0.75	3,000	18,000
	6	10	0.9	0.27	2,400	16,000	0.9	0.27	2,400	16,000	0.15	1	3,000	16,000
	8	12	1.2	0.36	2,400	12,000	1.2	0.36	2,400	12,000	0.2	1.2	450	3,600
	10	15	1.5	0.45	2,300	9,600	1.5	0.45	2,300	9,600	0.25	1	450	2,900
	12	20	1.8	0.54	2,100	8,000	1.8	0.54	2,100	8,000	0.3	1.5	450	2,400

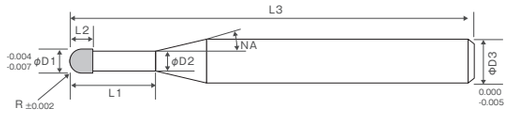
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

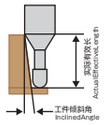
超硬长颈球头立铣刀 Carbide Long Neck Ball End Mill

Hard A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:HALB230 Model number:HALB230



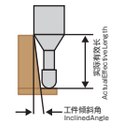
所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

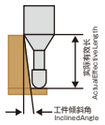
型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALB230-0010-0050-0020	0.05	0.2	0.07	0.1	0.08	15	4	50	9,360	0.24	0.25	0.26	0.27	0.28
HALB230-0010-0050-0030		0.3	0.07	0.1	0.08	15	4	50	8,240	0.35	0.36	0.37	0.38	0.41
HALB230-0010-0050-0050		0.5	0.07	0.1	0.08	15	4	50	8,960	0.55	0.57	0.59	0.61	0.66
HALB230-0015-0075-0030	0.075	0.3	0.1	0.15	0.13	15	4	50	9,600	0.35	0.36	0.37	0.38	0.40
HALB230-0015-0075-0050		0.5	0.1	0.15	0.13	15	4	50	10,160	0.55	0.57	0.59	0.61	0.65
HALB230-0020-0100-0030	0.1	0.3	0.15	0.2	0.18	15	4	50	5,760	0.35	0.35	0.36	0.37	0.40
HALB230-0020-0100-0050		0.5	0.15	0.2	0.18	15	4	50	5,760	0.55	0.57	0.58	0.60	0.64
HALB230-0020-0100-0075		0.75	0.15	0.2	0.18	15	4	50	5,760	0.81	0.84	0.86	0.89	0.96
HALB230-0020-0100-0100		1	0.15	0.2	0.18	15	4	50	5,760	1.07	1.10	1.14	1.18	1.27
HALB230-0030-0150-0050	0.15	0.5	0.2	0.3	0.27	15	4	50	5,680	0.57	0.58	0.60	0.62	0.66
HALB230-0030-0150-0060		0.6	0.2	0.3	0.27	15	4	50	5,680	0.67	0.69	0.71	0.73	0.78
HALB230-0030-0150-0075		0.75	0.2	0.3	0.27	15	4	50	5,680	0.83	0.85	0.88	0.90	0.97
HALB230-0030-0150-0100		1	0.2	0.3	0.27	15	4	50	5,680	1.09	1.12	1.15	1.19	1.28
HALB230-0030-0150-0125		1.25	0.2	0.3	0.27	15	4	50	6,080	1.34	1.39	1.43	1.48	1.59
HALB230-0030-0150-0150		1.5	0.2	0.3	0.27	15	4	50	6,080	1.60	1.65	1.71	1.77	1.90
HALB230-0030-0150-0175		1.75	0.2	0.3	0.27	15	4	50	6,080	1.86	1.92	1.99	2.05	2.21
HALB230-0030-0150-0200		2	0.2	0.3	0.27	15	4	50	6,080	2.12	2.19	2.26	2.34	2.52
HALB230-0030-0150-0225		2.25	0.2	0.3	0.27	15	4	50	6,240	2.38	2.46	2.54	2.63	2.83
HALB230-0030-0150-0250		2.5	0.2	0.3	0.27	15	4	50	6,240	2.64	2.72	2.82	2.92	3.14
HALB230-0030-0150-0300		3	0.2	0.3	0.27	15	4	50	6,240	3.15	3.26	3.37	3.49	3.76
HALB230-0040-0200-0050	0.2	0.5	0.3	0.4	0.37	15	4	50	3,920	0.57	0.58	0.59	0.61	0.64
HALB230-0040-0200-0080		0.8	0.3	0.4	0.37	15	4	50	3,920	0.88	0.90	0.93	0.95	1.02
HALB230-0040-0200-0100		1	0.3	0.4	0.37	15	4	50	3,920	1.08	1.12	1.15	1.18	1.27
HALB230-0040-0200-0150		1.5	0.3	0.4	0.37	15	4	50	4,000	1.60	1.65	1.70	1.76	1.89
HALB230-0040-0200-0200		2	0.3	0.4	0.37	15	4	50	4,080	2.12	2.19	2.26	2.33	2.51
HALB230-0040-0200-0250		2.5	0.3	0.4	0.37	15	4	50	4,240	2.64	2.72	2.81	2.91	3.13
HALB230-0040-0200-0300		3	0.3	0.4	0.37	15	4	50	4,480	3.15	3.26	3.37	3.48	3.75
HALB230-0050-0250-0100	0.25	1	0.35	0.5	0.47	15	4	50	3,920	1.08	1.11	1.14	1.18	1.26
HALB230-0050-0250-0150		1.5	0.35	0.5	0.47	15	4	50	3,920	1.60	1.65	1.70	1.75	1.88
HALB230-0050-0250-0200		2	0.35	0.5	0.47	15	4	50	3,920	2.12	2.18	2.25	2.33	2.50



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
HALB230-0050-0250-0250	0.25	2.5	0.35	0.5	0.47	15	4	50	3,920	2.63	2.72	2.81	2.90	3.12
HALB230-0050-0250-0300		3	0.35	0.5	0.47	15	4	50	3,920	3.15	3.25	3.36	3.48	3.74
HALB230-0050-0250-0350		3.5	0.35	0.5	0.47	15	4	50	3,920	3.67	3.79	3.91	4.05	4.36
HALB230-0050-0250-0400		4	0.35	0.5	0.47	15	4	50	3,920	4.18	4.32	4.47	4.63	4.98
HALB230-0060-0300-0100	0.3	1	0.45	0.6	0.57	15	4	50	3,360	1.08	1.11	1.14	1.17	1.24
HALB230-0060-0300-0150		1.5	0.45	0.6	0.57	15	4	50	3,040	1.60	1.64	1.69	1.74	1.87
HALB230-0060-0300-0200		2	0.45	0.6	0.57	15	4	50	3,040	2.12	2.18	2.25	2.32	2.49
HALB230-0060-0300-0250		2.5	0.45	0.6	0.57	15	4	50	3,120	2.63	2.71	2.80	2.89	3.11
HALB230-0060-0300-0300		3	0.45	0.6	0.57	15	4	50	3,120	3.15	3.25	3.35	3.47	3.73
HALB230-0060-0300-0350		3.5	0.45	0.6	0.57	15	4	50	3,200	3.67	3.78	3.91	4.04	4.35
HALB230-0060-0300-0400		4	0.45	0.6	0.57	15	4	50	3,200	4.18	4.32	4.46	4.62	4.97
HALB230-0060-0300-0450		4.5	0.45	0.6	0.57	15	4	50	3,200	4.70	4.85	5.02	5.19	5.59
HALB230-0060-0300-0500		5	0.45	0.6	0.57	15	4	50	3,200	5.22	5.39	5.57	5.77	6.22
HALB230-0060-0300-0550		5.5	0.45	0.6	0.57	15	4	50	3,200	5.73	5.92	6.13	6.34	6.84
HALB230-0060-0300-0600		6	0.45	0.6	0.57	15	4	50	3,200	6.25	6.46	6.68	6.92	7.46
HALB230-0070-0350-0200	0.35	2	0.5	0.7	0.67	15	4	50	3,440	2.11	2.18	2.24	2.31	2.48
HALB230-0070-0350-0400		4	0.5	0.7	0.67	15	4	50	3,680	4.18	4.31	4.46	4.61	4.96
HALB230-0070-0350-0600		6	0.5	0.7	0.67	15	4	50	3,680	6.25	6.45	6.67	6.91	7.45
HALB230-0080-0400-0200	0.4	2	0.6	0.8	0.77	15	4	50	3,040	2.11	2.17	2.24	2.31	2.46
HALB230-0080-0400-0300		3	0.6	0.8	0.77	15	4	50	3,200	3.15	3.24	3.34	3.46	3.71
HALB230-0080-0400-0400		4	0.6	0.8	0.77	15	4	50	3,200	4.18	4.31	4.45	4.60	4.95
HALB230-0080-0400-0500		5	0.6	0.8	0.77	15	4	50	3,200	5.21	5.38	5.56	5.75	6.19
HALB230-0080-0400-0600		6	0.6	0.8	0.77	15	4	50	3,200	6.25	6.45	6.67	6.90	7.44
HALB230-0080-0400-0700		7	0.6	0.8	0.77	15	4	50	3,200	7.28	7.52	7.78	8.05	8.68
HALB230-0080-0400-0800		8	0.6	0.8	0.77	15	4	50	3,200	8.31	8.59	8.89	9.20	9.92
HALB230-0090-0450-0200	0.45	2	0.65	0.9	0.87	15	4	50	3,440	2.11	2.17	2.23	2.30	2.45
HALB230-0090-0450-0400		4	0.65	0.9	0.87	15	4	50	3,680	4.18	4.31	4.45	4.60	4.94
HALB230-0090-0450-0600		6	0.65	0.9	0.87	15	4	50	3,680	6.24	6.45	6.66	6.90	7.42
HALB230-0090-0450-0800		8	0.65	0.9	0.87	15	4	50	3,680	8.31	8.59	8.88	9.20	9.91
HALB230-0100-0500-0200	0.5	2	0.75	1	0.95	15	4	50	2,560	2.15	2.20	2.27	2.33	2.49
HALB230-0100-0500-0250		2.5	0.75	1	0.95	15	4	50	2,560	2.66	2.74	2.82	2.91	3.11
HALB230-0100-0500-0300		3	0.75	1	0.95	15	4	50	2,560	3.18	3.27	3.37	3.48	3.73
HALB230-0100-0500-0400		4	0.75	1	0.95	15	4	50	2,880	4.21	4.34	4.48	4.63	4.97
HALB230-0100-0500-0500		5	0.75	1	0.95	15	4	50	2,880	5.25	5.41	5.59	5.78	6.22
HALB230-0100-0500-0600		6	0.75	1	0.95	15	4	50	3,120	6.28	6.48	6.70	6.93	7.46
HALB230-0100-0500-0700		7	0.75	1	0.95	15	4	50	3,120	7.32	7.55	7.81	8.08	8.70
HALB230-0100-0500-0800		8	0.75	1	0.95	15	4	50	3,120	8.35	8.62	8.92	9.23	9.95
HALB230-0100-0500-0900		9	0.75	1	0.95	15	4	50	3,120	9.38	9.69	10.02	10.38	11.19
HALB230-0100-0500-1000		10	0.75	1	0.95	15	4	50	3,120	10.42	10.76	11.13	11.53	12.43
HALB230-0100-0500-1200		12	0.75	1	0.95	15	4	50	3,120	12.48	12.90	13.35	13.83	14.92
HALB230-0120-0600-0240	0.6	2.4	0.9	1.2	1.15	15	4	50	3,840	2.56	2.63	2.70	2.78	2.96
HALB230-0120-0600-0400		4	0.9	1.2	1.15	15	4	50	3,840	4.21	4.34	4.47	4.62	4.95
HALB230-0120-0600-0600		6	0.9	1.2	1.15	15	4	50	4,160	6.28	6.48	6.69	6.92	7.44
HALB230-0120-0600-0800		8	0.9	1.2	1.15	15	4	50	4,160	8.35	8.62	8.91	9.22	9.92
HALB230-0120-0600-1000		10	0.9	1.2	1.15	15	4	50	4,160	10.41	10.76	11.12	11.52	12.41



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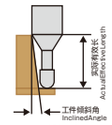
单位(Size)：mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
										30'	1°	1°30'	2°	3°
HALB230-0120-0600-1200	0.6	12	0.9	1.2	1.15	15	4	50	4,160	12.48	12.89	13.34	13.82	14.90
HALB230-0140-0700-0800	0.7	8	1	1.4	1.35	15	4	50	3,600	8.34	8.61	8.90	9.20	9.90
HALB230-0140-0700-1200		12	1	1.4	1.35	15	4	50	3,600	12.48	12.89	13.33	13.80	14.87
HALB230-0140-0700-1600		16	1	1.4	1.35	15	4	50	3,600	16.61	17.17	17.76	18.40	19.84
HALB230-0150-0750-0300	0.75	3	1.1	1.5	1.45	15	4	50	2,960	3.17	3.26	3.35	3.45	3.67
HALB230-0150-0750-0400		4	1.1	1.5	1.45	15	4	50	2,960	4.21	4.33	4.46	4.60	4.92
HALB230-0150-0750-0600		6	1.1	1.5	1.45	15	4	50	2,960	6.27	6.47	6.67	6.90	7.40
HALB230-0150-0750-0800		8	1.1	1.5	1.45	15	4	50	3,120	8.34	8.61	8.89	9.20	9.89
HALB230-0150-0750-1000		10	1.1	1.5	1.45	15	4	50	3,360	10.41	10.74	11.11	11.50	12.37
HALB230-0150-0750-1200		12	1.1	1.5	1.45	15	4	50	3,600	12.48	12.88	13.32	13.80	14.86
HALB230-0150-0750-1400		14	1.1	1.5	1.45	15	4	50	3,600	14.54	15.02	15.54	16.09	17.35
HALB230-0150-0750-1600		16	1.1	1.5	1.45	15	4	50	3,600	16.61	17.16	17.76	18.39	19.83
HALB230-0160-0800-0800	0.8	8	1.2	1.6	1.55	15	4	50	4,160	8.34	8.60	8.88	9.19	9.88
HALB230-0160-0800-1200		12	1.2	1.6	1.55	15	4	50	4,160	12.47	12.88	13.32	13.79	14.85
HALB230-0160-0800-1600		16	1.2	1.6	1.55	15	4	50	4,160	16.61	17.16	17.75	18.39	19.82
HALB230-0200-1000-0300	1	3	1.5	2	1.94	15	4	50	2,560	3.18	3.26	3.34	3.43	3.64
HALB230-0200-1000-0400		4	1.5	2	1.94	15	4	50	2,560	4.22	4.33	4.45	4.58	4.88
HALB230-0200-1000-0600		6	1.5	2	1.94	15	4	50	2,880	6.28	6.47	6.67	6.88	7.37
HALB230-0200-1000-0800		8	1.5	2	1.94	15	4	50	3,120	8.35	8.61	8.88	9.18	9.85
HALB230-0200-1000-1000		10	1.5	2	1.94	15	4	50	3,120	10.42	10.75	11.10	11.48	12.34
HALB230-0200-1000-1200		12	1.5	2	1.94	15	4	50	3,120	12.49	12.89	13.32	13.78	14.83
HALB230-0200-1000-1300		13	1.5	2	1.94	15	4	50	3,120	13.52	13.96	14.43	14.93	16.07
HALB230-0200-1000-1400		14	1.5	2	1.94	15	4	50	3,120	14.55	15.03	15.53	16.08	17.31
HALB230-0200-1000-1600		16	1.5	2	1.94	15	4	50	3,120	16.62	17.17	17.75	18.38	19.80
HALB230-0200-1000-1800		18	1.5	2	1.94	15	4	50	3,120	18.69	19.30	19.97	20.68	FREE
HALB230-0200-1000-2000		20	1.5	2	1.94	15	4	50	3,120	20.76	21.44	22.18	22.98	FREE
HALB230-0250-1250-0600	1.25	6	2.3	2.5	2.44	15	4	50	3,840	6.28	6.45	6.64	6.84	7.31
HALB230-0250-1250-0800		8	2.3	2.5	2.44	15	4	50	3,360	8.34	8.59	8.86	9.14	9.80
HALB230-0250-1250-1000		10	2.3	2.5	2.44	15	4	50	4,080	10.41	10.73	11.07	11.44	12.28
HALB230-0250-1250-1500		15	2.3	2.5	2.44	15	4	50	4,160	15.58	16.08	16.62	17.19	FREE
HALB230-0250-1250-2000		20	2.3	2.5	2.44	15	4	50	4,880	20.75	21.43	22.16	FREE	FREE
HALB230-0300-1500-0600	1.5	6	2.5	3	2.85	15	4	50	3,120	6.44	6.61	6.80	7.00	7.46
HALB230-0300-1500-0800		8	2.5	3	2.85	15	4	50	3,120	8.51	8.75	9.02	9.30	9.95
HALB230-0300-1500-1000		10	2.5	3	2.85	15	4	50	3,600	10.58	10.89	11.23	11.60	FREE
HALB230-0300-1500-1200		12	2.5	3	2.85	15	4	50	3,760	12.64	13.03	13.45	13.90	FREE
HALB230-0300-1500-1400		14	2.5	3	2.85	15	4	50	4,160	14.71	15.17	15.67	FREE	FREE
HALB230-0300-1500-1600		16	2.5	3	2.85	15	4	50	4,160	16.78	17.31	17.88	FREE	FREE
HALB230-0300-1500-2000		20	2.5	3	2.85	15	4	50	4,000	20.91	21.59	FREE	FREE	FREE
HALB230-0300-1500-2500		25	2.5	3	2.85	15	4	60	4,000	26.08	26.94	FREE	FREE	FREE
HALB230-0300-1500-3000		30	2.5	3	2.85	15	4	60	4,560	31.25	FREE	FREE	FREE	FREE
HALB230-0350-1750-1500	1.75	15	2.8	3.5	3.35	15	6	50	5,280	15.74	16.22	16.75	17.31	18.59
HALB230-0350-1750-2000		20	2.8	3.5	3.35	15	6	50	5,280	20.90	21.57	22.29	23.06	24.81
HALB230-0350-1750-2500		25	2.8	3.5	3.35	15	6	60	5,600	26.07	26.92	27.83	28.81	FREE
HALB230-0350-1750-3000		30	2.8	3.5	3.35	15	6	60	5,600	31.24	32.27	33.37	34.56	FREE
HALB230-0350-1750-3500		35	2.8	3.5	3.35	15	6	70	7,200	36.41	37.62	38.91	FREE	FREE

HARD STAR Type A Series



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
										30'	1°	1°30'	2°	3°
HALB230-0400-2000-0800	2	8	3	4	3.8	15	6	50	3,200	8.59	8.82	9.07	9.33	9.95
HALB230-0400-2000-1000		10	3	4	3.8	15	6	50	3,200	10.66	10.96	11.28	11.63	12.43
HALB230-0400-2000-1200		12	3	4	3.8	15	6	50	4,160	12.72	13.10	13.50	13.93	14.92
HALB230-0400-2000-1400		14	3	4	3.8	15	6	50	4,160	14.79	15.24	15.72	16.23	17.41
HALB230-0400-2000-1500		15	3	4	3.8	15	6	50	4,160	15.82	16.31	16.82	17.38	18.65
HALB230-0400-2000-2000		20	3	4	3.8	15	6	50	4,160	20.99	21.65	22.37	23.13	FREE
HALB230-0400-2000-2500		25	3	4	3.8	15	6	60	4,160	26.16	27.00	27.91	28.88	FREE
HALB230-0400-2000-3000		30	3	4	3.8	15	6	60	4,160	31.33	32.35	33.45	FREE	FREE
HALB230-0400-2000-3500		35	3	4	3.8	15	6	70	4,800	36.50	37.70	38.99	FREE	FREE
HALB230-0500-2500-1500	2.5	15	3.5	5	4.8	15	6	50	6,880	15.81	16.27	16.77	FREE	FREE
HALB230-0500-2500-2000		20	3.5	5	4.8	15	6	50	6,960	20.98	21.62	FREE	FREE	FREE
HALB230-0500-2500-2500		25	3.5	5	4.8	15	6	60	6,960	26.14	26.97	FREE	FREE	FREE
HALB230-0500-2500-3000		30	3.5	5	4.8	15	6	60	7,440	31.31	FREE	FREE	FREE	FREE
HALB230-0500-2500-4000		40	3.5	5	4.8	15	6	90	9,280	41.65	FREE	FREE	FREE	FREE
HALB230-0600-3000-1000	3	10	6	6	5.8	15	6	50	5,200	FREE	FREE	FREE	FREE	FREE
HALB230-0600-3000-1500		15	6	6	5.8	15	6	50	5,200	FREE	FREE	FREE	FREE	FREE
HALB230-0600-3000-2000		20	6	6	5.8	15	6	50	5,200	FREE	FREE	FREE	FREE	FREE
HALB230-0600-3000-2500		25	6	6	5.8	15	6	60	5,200	FREE	FREE	FREE	FREE	FREE
HALB230-0600-3000-3000		30	6	6	5.8	15	6	60	5,360	FREE	FREE	FREE	FREE	FREE
HALB230-0600-3000-3500		35	6	6	5.8	15	6	70	5,360	FREE	FREE	FREE	FREE	FREE
HALB230-0600-3000-4000		40	6	6	5.8	15	6	90	5,840	FREE	FREE	FREE	FREE	FREE
HALB230-0600-3000-5000		50	6	6	5.8	15	6	120	6,320	FREE	FREE	FREE	FREE	FREE
HALB230-0600-3000-6000		60	6	6	5.8	15	6	120	6,800	FREE	FREE	FREE	FREE	FREE

HARD STAR Type A Series

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALB230
Model number:HALB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.2	0.003	0.005	120	40,000	0.002	0.005	100	40,000	0.002	0.003	70	40,000
		0.3	0.003	0.005	100	40,000	0.002	0.005	70	40,000	0.002	0.003	50	40,000
		0.5	0.002	0.003	70	40,000	0.001	0.003	50	40,000	0.001	0.002	30	40,000
	0.15	0.3	0.003	0.005	180	40,000	0.002	0.005	150	40,000	0.002	0.003	100	40,000
		0.5	0.003	0.005	150	40,000	0.002	0.005	120	40,000	0.002	0.003	70	40,000
	0.2	0.3	0.01	0.01	350	40,000	0.006	0.005	300	40,000	0.003	0.003	200	40,000
		0.5	0.008	0.01	320	40,000	0.005	0.005	280	40,000	0.003	0.003	180	40,000
		0.75	0.005	0.01	280	40,000	0.003	0.005	200	40,000	0.002	0.003	150	40,000
		1	0.003	0.005	250	40,000	0.002	0.003	160	40,000	0.001	0.002	120	40,000
	0.3	0.5	0.01	0.015	350	40,000	0.007	0.01	300	40,000	0.003	0.005	280	40,000
		0.6	0.007	0.01	350	40,000	0.005	0.007	300	40,000	0.003	0.005	250	40,000
		0.75	0.007	0.01	330	40,000	0.005	0.007	280	40,000	0.003	0.005	230	40,000
		1	0.007	0.01	320	40,000	0.005	0.007	250	40,000	0.003	0.005	200	40,000
		1.25	0.005	0.007	280	40,000	0.003	0.005	200	40,000	0.002	0.003	160	40,000
		1.5	0.005	0.007	230	40,000	0.003	0.005	180	40,000	0.002	0.003	120	40,000
		1.75	0.003	0.005	180	40,000	0.002	0.003	150	40,000	0.002	0.002	100	40,000
		2	0.003	0.005	150	40,000	0.002	0.003	120	40,000	0.002	0.002	90	40,000
		2.25	0.002	0.003	120	40,000	0.001	0.002	100	40,000	0.001	0.001	80	40,000
		2.5	0.002	0.003	100	40,000	0.001	0.002	80	40,000	0.001	0.001	70	40,000
		3	0.001	0.003	80	40,000	0.001	0.002	70	40,000	0.001	0.001	60	40,000
	0.4	0.5	0.03	0.05	800	40,000	0.03	0.03	720	40,000	0.009	0.02	580	40,000
		0.8	0.02	0.05	800	40,000	0.02	0.03	720	40,000	0.008	0.02	580	40,000
		1	0.02	0.05	800	40,000	0.02	0.03	720	40,000	0.008	0.02	580	40,000
		1.5	0.01	0.03	620	40,000	0.01	0.02	500	40,000	0.005	0.01	400	40,000
		2	0.01	0.02	500	40,000	0.01	0.01	380	40,000	0.005	0.007	300	40,000
		2.5	0.007	0.01	420	40,000	0.005	0.007	300	40,000	0.003	0.005	260	40,000
		3	0.007	0.01	300	40,000	0.005	0.007	240	40,000	0.003	0.005	200	40,000
	0.5	1	0.03	0.05	1,000	40,000	0.02	0.03	860	40,000	0.01	0.02	650	40,000
		1.5	0.02	0.05	850	40,000	0.01	0.03	720	40,000	0.007	0.02	520	40,000
		2	0.02	0.03	720	40,000	0.01	0.02	650	40,000	0.007	0.01	400	40,000
		2.5	0.01	0.02	600	40,000	0.007	0.01	530	40,000	0.005	0.007	360	40,000
		3	0.01	0.02	500	40,000	0.007	0.01	420	40,000	0.005	0.007	320	40,000
		3.5	0.007	0.01	420	40,000	0.005	0.007	360	40,000	0.003	0.005	280	40,000
		4	0.007	0.01	350	40,000	0.005	0.007	300	40,000	0.003	0.005	260	40,000
	0.6	1	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
		1.5	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
		2	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
		2.5	0.03	0.05	1,200	40,000	0.02	0.04	840	40,000	0.02	0.03	640	30,000
		3	0.03	0.05	1,200	40,000	0.02	0.04	840	40,000	0.02	0.03	640	30,000
		3.5	0.02	0.03	1,000	40,000	0.01	0.03	620	40,000	0.01	0.02	480	30,000
		4	0.02	0.03	1,000	40,000	0.01	0.03	620	40,000	0.01	0.02	480	30,000

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

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刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.6	4.5	0.02	0.03	900	35,000	0.01	0.02	580	35,000	0.008	0.015	430	30,000
		5	0.01	0.02	720	30,000	0.007	0.015	500	30,000	0.007	0.01	400	30,000
		5.5	0.01	0.015	700	30,000	0.007	0.01	450	30,000	0.005	0.008	360	30,000
		6	0.007	0.01	500	30,000	0.005	0.007	380	30,000	0.004	0.006	320	30,000
	0.7	2	0.07	0.1	1,600	40,000	0.05	0.08	1,300	40,000	0.03	0.07	1,000	30,000
		4	0.04	0.06	1,300	40,000	0.03	0.04	820	40,000	0.015	0.02	600	30,000
		6	0.01	0.03	800	30,000	0.01	0.015	500	30,000	0.006	0.01	420	25,000
	0.8	2	0.1	0.15	2,000	40,000	0.07	0.1	1,600	40,000	0.05	0.1	1,200	30,000
		3	0.1	0.15	2,000	40,000	0.07	0.1	1,600	40,000	0.05	0.05	1,200	30,000
		4	0.05	0.1	1,600	40,000	0.05	0.05	1,200	40,000	0.03	0.05	860	30,000
		5	0.05	0.05	1,600	40,000	0.03	0.05	1,000	40,000	0.02	0.03	620	30,000
		6	0.03	0.05	1,200	30,000	0.02	0.03	760	30,000	0.01	0.02	560	25,000
		7	0.02	0.03	1,000	30,000	0.01	0.02	680	30,000	0.007	0.01	520	25,000
		8	0.01	0.02	820	30,000	0.007	0.01	600	30,000	0.005	0.01	480	25,000
	0.9	2	0.1	0.2	2,200	40,000	0.08	0.15	1,800	30,000	0.06	0.1	1,300	30,000
		4	0.05	0.12	1,800	40,000	0.04	0.08	1,400	30,000	0.03	0.05	900	25,000
		6	0.035	0.05	1,200	30,000	0.025	0.035	800	25,000	0.015	0.025	600	20,000
		8	0.025	0.04	1,000	30,000	0.015	0.025	700	23,000	0.008	0.015	500	20,000
	1	2	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
		2.5	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
		3	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
		4	0.1	0.2	2,500	40,000	0.05	0.15	1,800	30,000	0.05	0.1	1,200	25,000
		5	0.05	0.15	2,000	30,000	0.04	0.1	1,600	25,000	0.03	0.05	920	20,000
		6	0.05	0.1	1,800	30,000	0.04	0.05	1,200	25,000	0.02	0.05	740	20,000
		7	0.04	0.06	1,200	30,000	0.03	0.04	950	25,000	0.02	0.03	680	20,000
		8	0.04	0.06	1,000	30,000	0.03	0.04	860	25,000	0.02	0.03	560	20,000
		9	0.03	0.05	820	25,000	0.02	0.03	750	20,000	0.01	0.02	500	18,000
		10	0.03	0.05	750	25,000	0.02	0.03	620	20,000	0.01	0.02	450	18,000
		12	0.01	0.03	600	20,000	0.007	0.02	520	18,000	0.005	0.01	400	16,000
	1.2	2.4	0.1	0.3	2,500	30,000	0.1	0.2	2,000	30,000	0.05	0.1	1,600	25,000
		4	0.1	0.2	2,500	30,000	0.07	0.2	2,000	30,000	0.05	0.1	1,600	25,000
		6	0.07	0.1	2,000	30,000	0.05	0.1	1,600	25,000	0.03	0.07	1,200	20,000
		8	0.05	0.1	1,600	30,000	0.03	0.07	1,200	25,000	0.02	0.05	920	20,000
		10	0.03	0.07	1,200	20,000	0.02	0.05	860	20,000	0.01	0.03	680	18,000
		12	0.02	0.05	860	20,000	0.01	0.03	620	20,000	0.007	0.02	480	18,000
	1.4	8	0.12	0.2	2,500	30,000	0.08	0.15	1,800	20,000	0.03	0.08	1,000	20,000
		12	0.07	0.12	1,400	20,000	0.04	0.08	1,100	18,000	0.015	0.05	700	18,000
		16	0.02	0.05	700	17,000	0.01	0.03	600	17,000	0.008	0.02	450	16,000
	1.5	3	0.15	0.3	3,000	30,000	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000
		4	0.15	0.3	3,000	30,000	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000
		6	0.15	0.2	3,000	30,000	0.1	0.2	2,000	30,000	0.1	0.1	1,600	25,000

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Recommended Milling Conditions

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Model number:HALB230

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			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1.5	8	0.1	0.2	2,500	25,000	0.05	0.2	1,600	25,000	0.05	0.1	1,200	20,000
		10	0.1	0.1	2,500	25,000	0.05	0.1	1,200	25,000	0.05	0.05	860	20,000
		12	0.05	0.1	1,800	20,000	0.03	0.1	920	20,000	0.02	0.05	780	18,000
		14	0.05	0.07	1,200	20,000	0.03	0.05	820	20,000	0.02	0.03	650	18,000
		16	0.03	0.05	720	18,000	0.02	0.03	650	18,000	0.01	0.02	580	16,000
	1.6	8	0.1	0.2	2,500	25,000	0.07	0.15	2,000	20,000	0.05	0.1	1,600	18,000
		12	0.07	0.1	1,800	20,000	0.05	0.07	1,500	16,000	0.03	0.05	1,200	14,000
		16	0.03	0.05	720	16,000	0.02	0.03	600	14,000	0.015	0.02	480	12,000
	2	3	0.2	0.5	3,000	25,000	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000
		4	0.2	0.5	3,000	25,000	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000
		6	0.2	0.5	2,500	25,000	0.2	0.3	2,000	25,000	0.15	0.3	1,600	20,000
		8	0.2	0.3	2,000	20,000	0.1	0.2	1,600	18,000	0.1	0.2	1,200	16,000
		10	0.1	0.3	2,000	18,000	0.1	0.2	1,600	16,000	0.1	0.1	1,200	14,000
		12	0.1	0.2	1,600	16,000	0.1	0.1	1,200	14,000	0.05	0.1	940	12,000
		13	0.08	0.2	1,600	16,000	0.06	0.1	1,200	14,000	0.04	0.08	940	12,000
		14	0.07	0.15	1,600	16,000	0.05	0.08	1,200	14,000	0.03	0.07	940	12,000
		16	0.07	0.15	1,600	16,000	0.05	0.08	1,200	14,000	0.03	0.07	940	12,000
		18	0.05	0.1	1,400	14,000	0.03	0.05	1,000	12,000	0.02	0.03	850	10,000
		20	0.05	0.1	1,000	14,000	0.03	0.05	820	12,000	0.02	0.03	720	10,000
	2.5	6	0.3	0.4	2,800	20,000	0.2	0.5	2,300	20,000	0.15	0.4	2,000	18,000
		8	0.25	0.3	2,600	20,000	0.15	0.3	2,100	20,000	0.12	0.25	1,800	18,000
		10	0.2	0.3	2,500	20,000	0.15	0.2	2,000	20,000	0.1	0.15	1,600	18,000
		15	0.1	0.2	2,000	18,000	0.07	0.15	1,600	16,000	0.05	0.1	1,200	14,000
		20	0.07	0.15	1,500	16,000	0.05	0.1	1,200	14,000	0.03	0.05	1,000	10,000
	3	6	0.2	0.8	3,000	20,000	0.2	0.6	2,500	18,000	0.2	0.5	2,000	14,000
		8	0.2	0.8	3,000	20,000	0.2	0.6	2,500	18,000	0.2	0.5	2,000	14,000
		10	0.2	0.6	2,500	20,000	0.2	0.4	2,000	18,000	0.1	0.3	1,500	14,000
		12	0.2	0.6	2,500	20,000	0.2	0.4	2,000	18,000	0.1	0.3	1,500	14,000
		14	0.1	0.4	2,000	18,000	0.1	0.3	1,600	16,000	0.1	0.2	1,200	12,000
		16	0.1	0.4	2,000	18,000	0.1	0.3	1,600	16,000	0.1	0.2	1,200	12,000
		20	0.1	0.3	1,600	18,000	0.1	0.2	1,200	16,000	0.1	0.1	960	12,000
		25	0.1	0.2	1,200	16,000	0.07	0.15	920	14,000	0.05	0.07	800	10,000
		30	0.07	0.1	750	14,000	0.05	0.07	640	12,000	0.03	0.05	600	8,600
	3.5	15	0.25	1	3,000	20,000	0.15	0.5	2,300	16,000	0.13	0.4	1,500	14,000
		20	0.18	0.6	2,500	18,000	0.1	0.3	1,800	15,000	0.1	0.2	1,200	12,000
		25	0.12	0.35	1,800	16,000	0.1	0.2	1,600	14,000	0.06	0.12	1,000	10,000
		30	0.1	0.25	1,500	14,000	0.07	0.15	950	11,000	0.05	0.08	800	9,000
		35	0.08	0.2	1,200	13,000	0.07	0.12	800	10,000	0.03	0.06	650	7,500
	4	8	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000
		10	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000
		12	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61（~55HRC）				淬火钢 Hardened Steels SKD11/SKH51（~60HRC）				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	4	14	0.3	1.5	3,000	20,000	0.2	0.8	2,000	16,000	0.2	0.6	1,600	12,000
		15	0.3	1.5	3,000	20,000	0.2	0.8	2,000	16,000	0.2	0.6	1,600	12,000
		20	0.2	1	2,400	16,000	0.1	0.6	1,800	14,000	0.1	0.4	1,400	10,000
		25	0.2	0.8	1,600	16,000	0.1	0.4	1,200	14,000	0.1	0.2	1,000	10,000
		30	0.1	0.3	1,600	14,000	0.07	0.2	1,200	10,000	0.05	0.15	1,000	8,200
		35	0.1	0.2	1,200	14,000	0.07	0.15	1,000	10,000	0.05	0.1	820	8,200
	5	15	0.3	1.5	3,000	18,000	0.2	1.2	2,500	12,000	0.2	0.7	2,000	9,200
		20	0.3	1.5	3,000	18,000	0.2	1.2	2,500	12,000	0.2	0.7	2,000	9,200
		25	0.3	1.2	3,000	15,000	0.2	1	2,000	10,000	0.15	0.5	1,600	8,000
		30	0.2	1	2,500	15,000	0.15	0.8	1,800	8,600	0.1	0.3	1,200	7,200
		40	0.2	0.8	2,000	12,000	0.15	0.5	1,500	7,600	0.1	0.2	860	6,400
	6	10	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
		15	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
		20	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
		25	0.3	1.5	3,000	16,000	0.2	1	2,000	8,000	0.15	0.7	1,500	7,000
		30	0.2	1.5	3,000	14,000	0.2	1	2,000	7,200	0.15	0.7	1,500	6,500
		35	0.2	1.2	2,400	13,000	0.17	0.8	1,600	6,800	0.12	0.5	1,200	5,800
		40	0.2	1	1,800	12,000	0.15	0.6	1,200	6,400	0.1	0.4	1,000	5,200
		50	0.1	0.6	1,200	8,200	0.1	0.3	860	4,800	0.05	0.2	620	4,000
		60	0.07	0.3	600	6,000	0.05	0.15	450	3,200	0.03	0.07	300	2,500

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALB230
Model number:HALB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.2	0.005	0.005	80	50,000	0.005	0.005	80	50,000	0.003	0.005	120	40,000
		0.3	0.005	0.005	80	50,000	0.005	0.005	80	50,000	0.003	0.005	100	40,000
		0.5	0.005	0.005	70	50,000	0.005	0.005	70	50,000	0.002	0.003	70	40,000
	0.15	0.3	0.008	0.01	150	50,000	0.008	0.01	150	50,000	0.003	0.005	180	40,000
		0.5	0.007	0.008	150	50,000	0.007	0.008	150	50,000	0.003	0.005	150	40,000
	0.2	0.3	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.01	0.01	350	40,000
		0.5	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.008	0.01	320	40,000
		0.75	0.01	0.015	250	50,000	0.01	0.015	250	50,000	0.005	0.01	280	40,000
		1	0.008	0.015	250	50,000	0.008	0.015	250	50,000	0.003	0.005	250	40,000
	0.3	0.5	0.012	0.025	250	50,000	0.012	0.025	250	50,000	0.01	0.015	350	40,000
		0.6	0.012	0.025	250	50,000	0.012	0.025	250	50,000	0.007	0.01	350	40,000
		0.75	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.007	0.01	330	40,000
		1	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.007	0.01	320	40,000
		1.25	0.008	0.015	250	50,000	0.008	0.015	250	50,000	0.005	0.007	280	40,000
		1.5	0.008	0.015	200	50,000	0.008	0.015	200	50,000	0.005	0.007	230	40,000
		1.75	0.008	0.015	200	50,000	0.008	0.015	200	50,000	0.003	0.005	180	40,000
		2	0.005	0.012	150	50,000	0.005	0.012	150	50,000	0.003	0.005	150	40,000
		2.25	0.005	0.012	150	50,000	0.005	0.012	150	50,000	0.002	0.003	120	40,000
		2.5	0.005	0.01	150	50,000	0.005	0.01	150	50,000	0.002	0.003	100	40,000
		3	0.005	0.007	150	50,000	0.005	0.007	150	50,000	0.001	0.003	80	40,000
	0.4	0.5	0.03	0.07	800	50,000	0.03	0.07	800	50,000	0.03	0.05	800	40,000
		0.8	0.03	0.07	800	50,000	0.03	0.07	800	50,000	0.02	0.05	800	40,000
		1	0.03	0.07	800	50,000	0.03	0.07	800	50,000	0.02	0.05	800	40,000
		1.5	0.03	0.05	700	50,000	0.03	0.05	700	50,000	0.01	0.03	620	40,000
		2	0.02	0.03	600	50,000	0.02	0.03	600	50,000	0.01	0.02	500	40,000
		2.5	0.02	0.03	450	50,000	0.02	0.03	450	50,000	0.007	0.01	420	40,000
		3	0.015	0.03	400	50,000	0.015	0.03	400	50,000	0.007	0.01	300	40,000
	0.5	1	0.045	0.07	800	50,000	0.045	0.07	800	50,000	0.03	0.05	1,000	40,000
		1.5	0.04	0.07	700	50,000	0.04	0.07	700	50,000	0.02	0.05	850	40,000
		2	0.03	0.06	600	50,000	0.03	0.06	600	50,000	0.02	0.03	720	40,000
		2.5	0.02	0.06	600	50,000	0.02	0.06	600	50,000	0.01	0.02	600	40,000
		3	0.02	0.05	500	50,000	0.02	0.05	500	50,000	0.01	0.02	500	40,000
		3.5	0.02	0.045	400	50,000	0.02	0.045	400	50,000	0.007	0.01	420	40,000
		4	0.018	0.03	400	50,000	0.018	0.03	400	50,000	0.007	0.01	350	40,000
	0.6	1	0.07	0.12	1,200	50,000	0.07	0.12	1,200	50,000	0.05	0.1	1,400	40,000
		1.5	0.07	0.12	1,200	50,000	0.07	0.12	1,200	50,000	0.05	0.1	1,400	40,000
		2	0.07	0.12	1,200	50,000	0.07	0.12	1,200	50,000	0.05	0.1	1,400	40,000
		2.5	0.05	0.12	1,200	50,000	0.05	0.12	1,200	50,000	0.03	0.05	1,200	40,000
		3	0.04	0.1	1,000	50,000	0.04	0.1	1,000	50,000	0.03	0.05	1,200	40,000
		3.5	0.04	0.1	1,000	50,000	0.04	0.1	1,000	50,000	0.02	0.03	1,000	40,000
		4	0.035	0.08	800	50,000	0.035	0.08	800	50,000	0.02	0.03	1,000	40,000

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.6	4.5	0.035	0.08	750	50,000	0.035	0.08	750	50,000	0.02	0.03	900	35,000
		5	0.03	0.06	500	30,000	0.03	0.06	500	30,000	0.01	0.02	720	30,000
		5.5	0.02	0.03	500	30,000	0.02	0.03	500	30,000	0.01	0.015	700	30,000
		6	0.015	0.03	450	30,000	0.015	0.03	450	30,000	0.007	0.01	500	30,000
	0.7	2	0.1	0.15	1,500	30,000	0.1	0.15	1,500	30,000	0.07	0.1	1,600	40,000
		4	0.06	0.12	1,200	30,000	0.06	0.12	1,200	30,000	0.04	0.06	1,300	40,000
		6	0.04	0.07	600	30,000	0.04	0.07	600	30,000	0.01	0.03	800	30,000
	0.8	2	0.15	0.2	2,000	50,000	0.15	0.2	2,000	50,000	0.1	0.15	2,000	40,000
		3	0.12	0.2	1,800	50,000	0.12	0.2	1,800	50,000	0.1	0.15	2,000	40,000
		4	0.1	0.2	1,500	50,000	0.1	0.2	1,500	50,000	0.05	0.1	1,600	40,000
		5	0.08	0.15	1,200	50,000	0.08	0.15	1,200	50,000	0.05	0.05	1,600	40,000
		6	0.07	0.12	900	30,000	0.07	0.12	900	30,000	0.03	0.05	1,200	30,000
		7	0.05	0.08	700	30,000	0.05	0.08	700	30,000	0.02	0.03	1,000	30,000
		8	0.02	0.05	500	24,000	0.02	0.05	500	24,000	0.01	0.02	820	30,000
	0.9	2	0.2	0.3	2,800	50,000	0.2	0.3	2,800	50,000	0.1	0.2	2,200	40,000
		4	0.15	0.25	2,000	50,000	0.15	0.25	2,000	50,000	0.05	0.12	1,800	40,000
		6	0.1	0.2	1,300	30,000	0.1	0.2	1,300	30,000	0.035	0.05	1,200	30,000
		8	0.055	0.08	800	24,000	0.055	0.08	800	24,000	0.025	0.04	1,000	30,000
	1	2	0,25	0.4	3,500	50,000	0,25	0.4	3,500	50,000	0.1	0.3	2,500	40,000
		2.5	0.25	0.4	3,200	50,000	0.25	0.4	3,200	50,000	0.1	0.3	2,500	40,000
		3	0.25	0.4	3,000	50,000	0.25	0.4	3,000	50,000	0.1	0.3	2,500	40,000
		4	0.2	0.4	2,500	50,000	0.2	0.4	2,500	50,000	0.1	0.2	2,500	40,000
		5	0.15	0.35	2,000	50,000	0.15	0.35	2,000	50,000	0.05	0.15	2,000	30,000
		6	0.15	0.3	1,500	50,000	0.15	0.3	1,500	50,000	0.05	0.1	1,800	30,000
		7	0.12	0.3	1,300	30,000	0.12	0.3	1,300	30,000	0.04	0.06	1,200	30,000
		8	0.08	0.15	1,200	30,000	0.08	0.15	1,200	30,000	0.04	0.06	1,000	30,000
		9	0.06	0.1	1,000	30,000	0.06	0.1	1,000	30,000	0.03	0.05	820	25,000
		10	0.05	0.08	800	30,000	0.05	0.08	800	30,000	0.03	0.05	750	25,000
		12	0.02	0.04	600	20,000	0.02	0.04	600	20,000	0.01	0.03	600	20,000
	1.2	2.4	0.3	0.45	3,400	30,000	0.3	0.45	3,400	30,000	0.1	0.3	2,500	30,000
		4	0.28	0.45	3,000	30,000	0.28	0.45	3,000	30,000	0.1	0.2	2,500	30,000
		6	0.15	0.4	2,000	30,000	0.15	0.4	2,000	30,000	0.07	0.1	2,000	30,000
		8	0.12	0.3	1,300	30,000	0.12	0.3	1,300	30,000	0.05	0.1	1,600	30,000
		10	0.08	0.15	1,200	20,000	0.08	0.15	1,200	20,000	0.03	0.07	1,200	20,000
		12	0.05	0.08	800	20,000	0.05	0.08	800	20,000	0.02	0.05	860	20,000
	1.4	8	0.15	0.45	2,500	30,000	0.15	0.45	2,500	30,000	0.12	0.2	2,500	30,000
		12	0.1	0.18	1,200	20,000	0.1	0.18	1,200	20,000	0.07	0.12	1,400	20,000
		16	0.05	0.08	600	20,000	0.05	0.08	600	20,000	0.02	0.05	700	17,000
	1.5	3	0.3	0.5	4,000	30,000	0.3	0.5	4,000	30,000	0.15	0.3	3,000	30,000
		4	0.3	0.45	4,000	30,000	0.3	0.45	4,000	30,000	0.15	0.3	3,000	30,000
		6	0.2	0.45	3,000	30,000	0.2	0.45	3,000	30,000	0.15	0.2	3,000	30,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

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●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A 切削条件参考表
Recommended Milling Conditions

■型号:HALB230
Model number:HALB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1.5	8	0.15	0.4	2,400	30,000	0.15	0.4	2,400	30,000	0.1	0.2	2,500	25,000
		10	0.12	0.3	1,800	30,000	0.12	0.3	1,800	30,000	0.1	0.1	2,500	25,000
		12	0.1	0.2	1,200	24,000	0.1	0.2	1,200	24,000	0.05	0.1	1,800	20,000
		14	0.1	0.15	1,200	24,000	0.1	0.15	1,200	24,000	0.05	0.07	1,200	20,000
		16	0.07	0.12	800	18,000	0.07	0.12	800	18,000	0.03	0.05	720	18,000
	1.6	8	0.15	0.45	3,000	24,000	0.15	0.45	3,000	24,000	0.1	0.2	2,500	25,000
		12	0.1	0.25	1,800	24,000	0.1	0.25	1,800	24,000	0.07	0.1	1,800	20,000
		16	0.08	0.15	650	18,000	0.08	0.15	650	18,000	0.03	0.05	720	16,000
	2	3	0.45	0.7	4,000	30,000	0.45	0.7	4,000	30,000	0.2	0.5	3,000	25,000
		4	0.45	0.7	4,000	30,000	0.45	0.7	4,000	30,000	0.2	0.5	3,000	25,000
		6	0.38	0.7	3,000	30,000	0.38	0.7	3,000	30,000	0.2	0.5	2,500	25,000
		8	0.3	0.45	2,500	20,000	0.3	0.45	2,500	20,000	0.2	0.3	2,000	20,000
		10	0.23	0.45	2,500	20,000	0.23	0.45	2,500	20,000	0.1	0.3	2,000	18,000
		12	0.2	0.3	1,800	16,000	0.2	0.3	1,800	16,000	0.1	0.2	1,600	16,000
		13	0.2	0.3	1,800	16,000	0.2	0.3	1,800	16,000	0.08	0.2	1,600	16,000
		14	0.15	0.3	1,800	16,000	0.15	0.3	1,800	16,000	0.07	0.15	1,600	16,000
		16	0.15	0.25	1,600	14,000	0.15	0.25	1,600	14,000	0.07	0.15	1,600	16,000
		18	0.1	0.2	1,600	14,000	0.1	0.2	1,600	14,000	0.05	0.1	1,400	14,000
		20	0.1	0.15	1,000	12,000	0.1	0.15	1,000	12,000	0.05	0.1	1,000	14,000
	2.5	6	0.5	0.8	4,000	20,000	0.5	0.8	4,000	20,000	0.3	0.4	2,800	20,000
		8	0.3	0.8	3,000	20,000	0.3	0.8	3,000	20,000	0.25	0.3	2,600	20,000
		10	0.3	0.8	3,000	20,000	0.3	0.8	3,000	20,000	0.2	0.3	2,500	20,000
		15	0.25	0.45	2,500	20,000	0.25	0.45	2,500	20,000	0.1	0.2	2,000	18,000
		20	0.15	0.3	1,800	16,000	0.15	0.3	1,800	16,000	0.07	0.15	1,500	16,000
	3	6	0.5	1	4,000	20,000	0.5	1	4,000	20,000	0.2	0.8	3,000	20,000
		8	0.45	0.8	4,000	20,000	0.45	0.8	4,000	20,000	0.2	0.8	3,000	20,000
		10	0.45	0.8	4,000	20,000	0.45	0.8	4,000	20,000	0.2	0.6	2,500	20,000
		12	0.3	0.6	3,000	20,000	0.3	0.6	3,000	20,000	0.2	0.6	2,500	20,000
		14	0.3	0.6	3,000	20,000	0.3	0.6	3,000	20,000	0.1	0.4	2,000	18,000
		16	0.23	0.5	3,000	20,000	0.23	0.5	3,000	20,000	0.1	0.4	2,000	18,000
		20	0.23	0.45	1,800	16,000	0.23	0.45	1,800	16,000	0.1	0.3	1,600	18,000
		25	0.2	0.4	1,200	16,000	0.2	0.4	1,200	16,000	0.1	0.2	1,200	16,000
		30	0.15	0.3	800	12,000	0.15	0.3	800	12,000	0.07	0.1	750	14,000
	3.5	15	0.45	0.6	4,000	20,000	0.45	0.6	4,000	20,000	0.25	1	3,000	20,000
		20	0.3	0.45	2,400	18,000	0.3	0.45	2,400	18,000	0.18	0.6	2,500	18,000
		25	0.25	0.42	2,000	18,000	0.25	0.42	2,000	18,000	0.12	0.35	1,800	16,000
		30	0.23	0.4	1,600	12,000	0.23	0.4	1,600	12,000	0.1	0.25	1,500	14,000
		35	0.15	0.3	1,200	12,000	0.15	0.3	1,200	12,000	0.08	0.2	1,200	13,000
	4	8	0.55	1.2	4,000	20,000	0.55	1.2	4,000	20,000	0.3	1.5	3,000	20,000
		10	0.55	1.2	4,000	20,000	0.55	1.2	4,000	20,000	0.3	1.5	3,000	20,000
		12	0.53	1	4,000	20,000	0.53	1	4,000	20,000	0.3	1.5	3,000	20,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type A Series

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 铁镍钴合金(Kovar)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	4	14	0.45	1	4,000	20,000	0.45	1	4,000	20,000	0.3	1.5	3,000	20,000
		15	0.38	0.8	3,500	20,000	0.38	0.8	3,500	20,000	0.3	1.5	3,000	20,000
		20	0.3	0.5	3,300	20,000	0.3	0.5	3,300	20,000	0.2	1	2,400	16,000
		25	0.23	0.45	2,600	16,000	0.23	0.45	2,600	16,000	0.2	0.8	1,600	16,000
		30	0.2	0.4	2,600	16,000	0.2	0.4	2,600	16,000	0.1	0.3	1,600	14,000
		35	0.18	0.3	1,800	14,000	0.18	0.3	1,800	14,000	0.1	0.2	1,200	14,000
	5	15	0.55	1.5	4,000	20,000	0.55	1.5	4,000	20,000	0.3	1.5	3,000	18,000
		20	0.45	1	4,000	20,000	0.45	1	4,000	20,000	0.3	1.5	3,000	18,000
		25	0.38	0.9	3,000	16,000	0.38	0.9	3,000	16,000	0.3	1.2	3,000	15,000
		30	0.3	0.8	2,400	16,000	0.3	0.8	2,400	16,000	0.2	1	2,500	15,000
		40	0.23	0.45	1,200	12,000	0.23	0.45	1,200	12,000	0.2	0.8	2,000	12,000
	6	10	0.75	2.3	4,000	18,000	0.75	2.3	4,000	18,000	0.3	2	3,000	16,000
		15	0.75	2	4,000	18,000	0.75	2	4,000	18,000	0.3	2	3,000	16,000
		20	0.75	1.8	4,000	18,000	0.75	1.8	4,000	18,000	0.3	2	3,000	16,000
		25	0.6	1.5	4,000	12,000	0.6	1.5	4,000	12,000	0.3	1.5	3,000	16,000
		30	0.53	1	3,000	12,000	0.53	1	3,000	12,000	0.2	1.5	3,000	14,000
		35	0.53	0.8	2,500	12,000	0.53	0.8	2,500	12,000	0.2	1.2	2,400	13,000
		40	0.38	0.6	1,500	8,000	0.38	0.6	1,500	8,000	0.2	1	1,800	12,000
		50	0.3	0.6	1,500	8,000	0.3	0.6	1,500	8,000	0.1	0.6	1,200	8,200
		60	0.3	0.6	1,500	8,000	0.3	0.6	1,500	8,000	0.07	0.3	600	6,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type TI Series

超硬立铣刀 Carbide End Mill

Hard TI | super MG | 刀刃数 4 | 螺旋角 40°/42° | 仰角 15° | 柄径公差 0/-0.005

特　征

- 使用本公司独创的喷射法成膜技术，进行Hard Star Type TI 涂层！
- 纳米级超光滑膜层可抑制溶着，延长使用寿命！
- 具有优异的耐腐蚀性和耐热性，非常适合加工包括铬镍铁合金在内的各种难切削材料！
- 定制产品制作周期短！

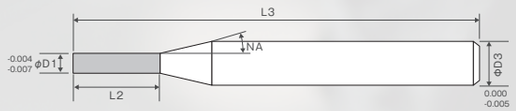
Features

- Hard Star Type TI has original sputtering coating technology.
- Nano-level ultra-smooth coating suppresses welding and achieves a long life.
- Excellent corrosion resistance and heat resistance, ideal for processing a wide range of difficult-to-cut materials including Inconel.
- Non-standard custom-made products available.

超硬平角立铣刀　Carbide Square End Mill

■型号:HTIS499 Model number:HTIS499

Hard TI | super MG | 刀刃数 4 | 螺旋角 40°/42° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HTIS499-0100-00200	1	2	15	4	50	4,000
HTIS499-0100-00300		3	15	4	50	4,160
HTIS499-0150-00300	1.5	3	15	4	50	4,800
HTIS499-0150-00450		4.5	15	4	50	5,120
HTIS499-0200-00400	2	4	15	4	50	5,040
HTIS499-0200-00600		6	15	4	50	5,360
HTIS499-0250-00500	2.5	5	15	4	50	5,040
HTIS499-0250-00750		7.5	15	4	50	5,440
HTIS499-0300-00600	3	6	15	4	50	5,040
HTIS499-0300-00900		9	15	4	50	5,360
HTIS499-0400-00800	4	8	15	6	50	5,280
HTIS499-0400-01200		12	15	6	50	5,600
HTIS499-0500-01000	5	10	15	6	50	5,600
HTIS499-0500-01500		15	15	6	50	6,000
HTIS499-0600-01200	6	12	—	6	50	5,840
HTIS499-0600-01800		18	—	6	60	6,080

HARD STAR Type TI Series

HARD STAR Type TI 切削条件参考表
Recommended Milling Conditions

■型号:HTIS499
Model number:HTIS499

平角立铣刀 Square End Mill

切削材料 Work Material			耐热合金 Heat resistant alloy 铬镍铁合金 Inconel			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min^{-1}
4	1	2	1	0.05	150	12,000
		3	1	0.025	100	11,000
	1.5	3	1.5	0.07	200	9,000
		4.5	1.5	0.035	150	8,000
	2	4	2	0.1	200	6,500
		6	2	0.05	150	6,000
	2.5	5	2.5	0.12	250	5,500
		7.5	2.5	0.6	200	5,000
	3	6	3	0.15	250	3,400
		9	3	0.075	200	3,200
	4	8	4	0.2	250	3,000
		12	4	0.1	200	2,700
	5	10	5	0.25	300	2,500
		15	5	0.12	250	2,200
	6	12	6	0.3	300	2,000
		18	6	0.15	250	1,800

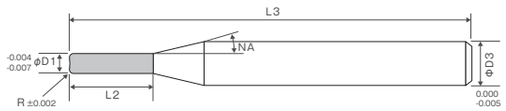
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

CBN Series
Hard Star A Series
Hard Star TI Series 平角 Square
Hard Star TT Series
Ion Depo A Series
Ion Depo U Series
DLC Series
Non-Coat Series
Ion Depo R Series

超硬圆角立铣刀 Carbide Radius End Mill

■型号:HTIR499 Model number:HTIR499

Hard TI | super MG | 刀刃数 4 | 螺旋角 40°/42° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考,如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HTIR499-0300-0300-00800	3	0.3	8	15	4	50	5,520
HTIR499-0300-0500-00800		0.5	8	15	4	50	5,520
HTIR499-0400-0300-01100	4	0.3	11	15	6	50	6,000
HTIR499-0400-0500-01100		0.5	11	15	6	50	6,000
HTIR499-0400-1000-01100		1	11	15	6	50	6,000
HTIR499-0500-0300-01300	5	0.3	13	15	6	50	6,240
HTIR499-0500-0500-01300		0.5	13	15	6	50	6,240
HTIR499-0500-1000-01300		1	13	15	6	50	6,480
HTIR499-0600-0500-01300	6	0.5	13	—	6	50	6,240
HTIR499-0600-1000-01300		1	13	—	6	50	6,480
HTIR499-0800-0500-01900	8	0.5	19	—	8	70	10,800
HTIR499-0800-1000-01900		1	19	—	8	70	10,800
HTIR499-1000-0500-02200	10	0.5	22	—	10	80	12,560
HTIR499-1000-1000-02200		1	22	—	10	80	12,560
HTIR499-1000-2000-02200		2	22	—	10	80	12,560
HTIR499-1000-3000-02200		3	22	—	10	80	12,560
HTIR499-1200-0500-02600	12	0.5	26	—	12	110	16,560
HTIR499-1200-1000-02600		1	26	—	12	110	16,560
HTIR499-1200-2000-02600		2	26	—	12	110	16,560

HARD STAR Type TI 切削条件参考表
Recommended Milling Conditions

■型号:HTIR499
Model number:HTIR499

圆角立铣刀 Radius End Mill

切削材料 Work Material			耐热合金 Heat resistant alloy 镍铁铬合金 Inconel			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹
4	3	8	4.5	0.15	250	3,600
	4	11	6	0.2	250	3,100
	5	13	7.5	0.25	300	2,600
	6	13	9	0.3	300	2,100
	8	19	12	0.4	300	1,700
	10	22	15	0.5	250	1,300
	12	26	18	0.6	200	900

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

HARD STAR Type TT Series

超硬立铣刀 Carbide End Mill

Hard TT | super MG | 刀刃数 4 | 螺旋角 40°/42° | 仰角 15° | 柄径公差 0/-0.005

特　征

- 使用本公司独创的喷射法成膜技术，进行Hard Star Type TT 涂层！
- 纳米级超光滑膜层可抑制溶着，延长使用寿命！
- 具有优异的耐腐蚀性和耐热性，非常适合加工包括钛合金在内的各种难切削材料！
- 定制产品制作周期短！

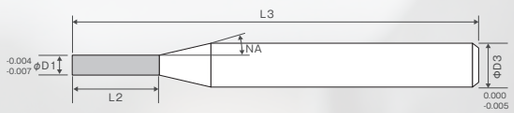
Features

- Hard Star Type TT has original sputtering coating technology.
- Nano-level ultra-smooth coating suppresses welding and achieves a long life.
- Excellent corrosion resistance and heat resistance, ideal for processing a wide range of difficult-to-cut materials including Titanium alloy.
- Non-standard custom-made products available.

超硬平角立铣刀　Carbide Square End Mill

■型号:HTTS499 Model number:HTTS499

Hard TT | super MG | 刀刃数 4 | 螺旋角 40°/42° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HTTS499-0100-00200	1	2	15	4	50	4,000
HTTS499-0100-00300		3	15	4	50	4,160
HTTS499-0150-00300	1.5	3	15	4	50	4,800
HTTS499-0150-00450		4.5	15	4	50	5,120
HTTS499-0200-00400	2	4	15	4	50	5,040
HTTS499-0200-00600		6	15	4	50	5,360
HTTS499-0250-00500	2.5	5	15	4	50	5,040
HTTS499-0250-00750		7.5	15	4	50	5,440
HTTS499-0300-00600	3	6	15	4	50	5,040
HTTS499-0300-00900		9	15	4	50	5,360
HTTS499-0400-00800	4	8	15	6	50	5,280
HTTS499-0400-01200		12	15	6	50	5,600
HTTS499-0500-01000	5	10	15	6	50	5,600
HTTS499-0500-01500		15	15	6	50	6,000
HTTS499-0600-01200	6	12	—	6	50	5,840
HTTS499-0600-01800		18	—	6	60	6,080

HARD STAR Type TT Series

HARD STAR Type TT 切削条件参考表
Recommended Milling Conditions

■型号:HTTS499
Model number:HTTS499

平角立铣刀 Square End Mill

切削材料 Work Material			不锈钢 Stainless Steel SUS304				钛合金 Titanium alloy			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	2	1	0.2	600	18,000	1	0.2	600	16,800
		3	1	0.1	500	16,000	1	0.1	500	14,900
	1.5	3	1.5	0.3	700	12,500	1.5	0.3	700	11,700
		4.5	1.5	0.15	550	11,000	1.5	0.15	550	10,300
	2	4	2	0.4	850	10,000	2	0.4	850	9,300
		6	2	0.2	650	8,500	2	0.2	650	7,900
	2.5	5	2.5	5	1,000	8,200	2.5	5	1,000	7,600
		7.5	2.5	0.25	750	7,100	2.5	0.25	750	6,600
	3	6	3	0.6	1,100	7,200	3	0.6	1,100	6,700
		9	3	0.3	800	6,000	3	0.3	800	5,600
	4	8	4	0.8	1,200	6,400	4	0.8	1,200	6,000
		12	4	0.4	920	5,400	4	0.4	920	5,000
	5	10	5	1	1,200	5,600	5	1	1,200	5,200
		15	5	0.5	1,000	5,000	5	0.5	1,000	4,700
	6	12	6	1.2	1,200	5,000	6	1.2	1,200	4,600
		18	6	0.6	1,000	4,500	6	0.6	1,000	4,200

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.

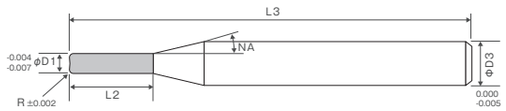
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

CBN Series
Hard Star A Series
Hard Star TT Series
平角 Square
Ion Depo A Series
Ion Depo U Series
DLC Series
Non-Coat Series
Ion Depo R Series

超硬圆角立铣刀 Carbide Radius End Mill

■型号:HTTR499 Model number:HTTR499

Hard TT | super MG | 刀刃数 4 | 螺旋角 40°/42° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考,如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
HTTR499-0300-0300-00800	3	0.3	8	15	4	50	5,520
HTTR499-0300-0500-00800		0.5	8	15	4	50	5,520
HTTR499-0400-0300-01100	4	0.3	11	15	6	50	6,000
HTTR499-0400-0500-01100		0.5	11	15	6	50	6,000
HTTR499-0400-1000-01100		1	11	15	6	50	6,000
HTTR499-0500-0300-01300	5	0.3	13	15	6	50	6,240
HTTR499-0500-0500-01300		0.5	13	15	6	50	6,240
HTTR499-0500-1000-01300		1	13	15	6	50	6,240
HTTR499-0600-0500-01300	6	0.5	13	—	6	50	6,480
HTTR499-0600-1000-01300		1	13	—	6	50	6,480
HTTR499-0800-0500-01900	8	0.5	19	—	8	70	10,800
HTTR499-0800-1000-01900		1	19	—	8	70	10,800
HTTR499-1000-0500-02200	10	0.5	22	—	10	80	12,560
HTTR499-1000-1000-02200		1	22	—	10	80	12,560
HTTR499-1000-2000-02200		2	22	—	10	80	12,560
HTTR499-1000-3000-02200		3	22	—	10	80	12,560
HTTR499-1200-0500-02600	12	0.5	26	—	12	110	16,560
HTTR499-1200-1000-02600		1	26	—	12	110	16,560
HTTR499-1200-2000-02600		2	26	—	12	110	16,560

HARD STAR Type TT 切削条件参考表 Recommended Milling Conditions

■型号:HTTR499 Model number:HTTR499

圆角立铣刀 Radius End Mill

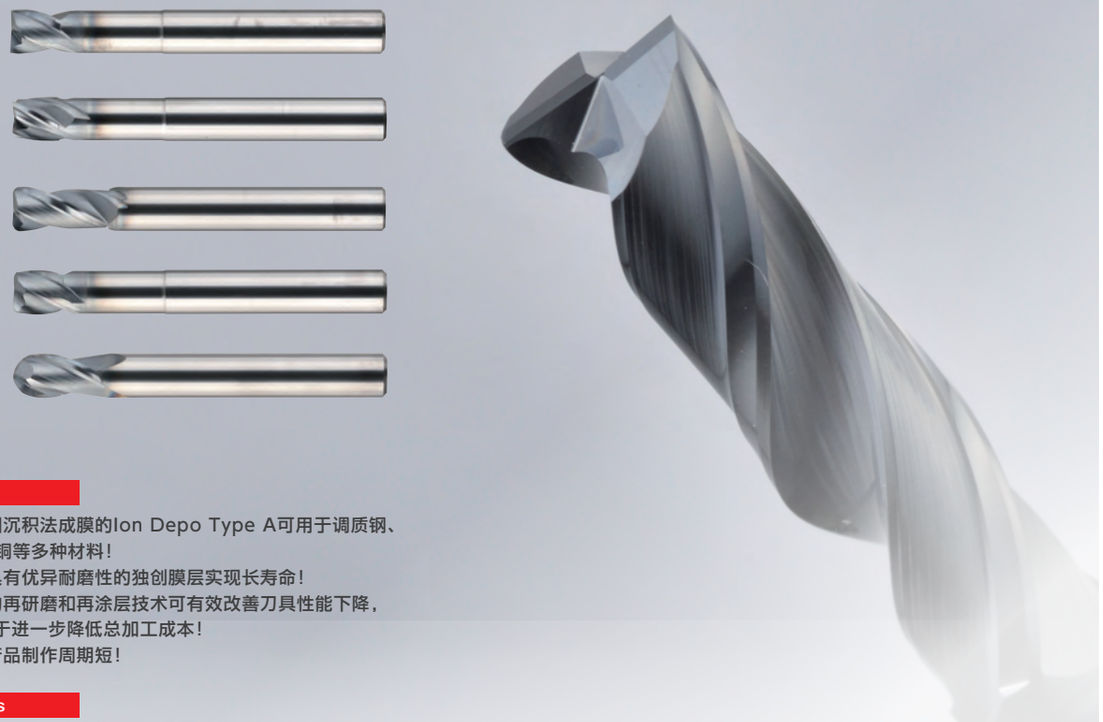
切削材料 Work Material			不锈钢 Stainless Steel SUS304				钛合金 Titanium alloy			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	3	8	4.5	0.6	750	6,000	4.5	0.6	750	5,600
	4	11	6	0.8	800	5,200	6	0.8	800	4,800
	5	13	7.5	1	900	4,600	7.5	1	900	4,200
	6	13	9	1.2	1000	4,200	9	1.2	1000	3,800
	8	19	12	1.6	850	3,600	12	1.6	850	3,200
	10	22	15	2	600	3,000	15	2	600	2,600
	12	26	18	2.4	500	2,500	18	2.4	500	2,100

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

超硬立铣刀 Carbide End Mill

ion A | super MG | 刀刃数 2·4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



特　征

- 由气相沉积法成膜的Ion Depo Type A可用于调质钢、碳钢、铜等多种材料！
- 通过具有优异耐磨性的独创膜层实现长寿命！
- 独创的再研磨和再涂层技术可有效改善刀具性能下降，有助于进一步降低总加工成本！
- 定制产品制作周期短！

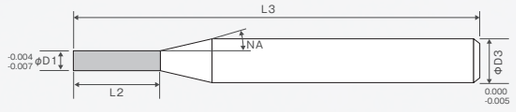
Features

- ion Depo Type A coating for various work materials, heat-treated steel, carbon steel, and copper.
- Achieves long life with excellent wear resistance.
- TOWA re-polishing and re-coating technology enhances cutting tool life and reduces overall tooling cost.
- Non-standard custom-made products available.

超硬平角立铣刀　Carbide Square End Mill

■型号:IAS230　Model number:IAS230

ion A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAS230-0010-00015	0.1	0.15	15	4	50	5,760
IAS230-0015-00020	0.15	0.2	15	4	50	6,000
IAS230-0020-00040	0.2	0.4	15	4	50	3,600
IAS230-0025-00050	0.25	0.5	15	4	50	8,480
IAS230-0030-00030	0.3	0.3	15	4	50	3,120
IAS230-0030-00060		0.6	15	4	50	3,120
IAS230-0035-00070	0.35	0.7	15	4	50	7,360
IAS230-0040-00060	0.4	0.6	15	4	50	3,440
IAS230-0040-00080		0.8	15	4	50	3,440
IAS230-0045-00090	0.45	0.9	15	4	50	7,360
IAS230-0050-00080	0.5	0.8	15	4	50	1,760
IAS230-0050-00125		1.25	15	4	50	1,760
IAS230-0050-00200		2	15	4	50	3,840
IAS230-0055-00130	0.55	1.3	15	4	50	5,760
IAS230-0060-00100	0.6	1	15	4	50	2,720
IAS230-0060-00150		1.5	15	4	50	2,720
IAS230-0060-00240		2.4	15	4	50	3,840
IAS230-0065-00150	0.65	1.5	15	4	50	5,760
IAS230-0070-00180	0.7	1.8	15	4	50	2,960
IAS230-0075-00180	0.75	1.8	15	4	50	5,760
IAS230-0080-00120	0.8	1.2	15	4	50	1,760
IAS230-0080-00200		2	15	4	50	1,760
IAS230-0080-00320		3.2	15	4	50	3,840
IAS230-0085-00200	0.85	2	15	4	50	5,760
IAS230-0090-00200	0.9	2	15	4	50	2,960
IAS230-0095-00200	0.95	2	15	4	50	5,760
IAS230-0100-00150	1	1.5	15	4	50	1,520
IAS230-0100-00250		2.5	15	4	50	1,520
IAS230-0100-00400		4	15	4	50	3,440
IAS230-0105-00250	1.05	2.5	15	4	50	5,760
IAS230-0110-00250	1.1	2.5	15	4	50	4,800
IAS230-0115-00250	1.15	2.5	15	4	50	5,760
IAS230-0120-00300	1.2	3	15	4	50	1,760
IAS230-0125-00300	1.25	3	15	4	50	5,760
IAS230-0130-00300	1.3	3	15	4	50	4,800
IAS230-0135-00300	1.35	3	15	4	50	5,760
IAS230-0140-00350	1.4	3.5	15	4	50	4,800
IAS230-0145-00350	1.45	3.5	15	4	50	5,760
IAS230-0150-00200	1.5	2	15	4	50	1,520
IAS230-0150-00400		4	15	4	50	1,520
IAS230-0150-00600		6	15	4	50	3,440
IAS230-0155-00400	1.55	4	15	4	50	5,760
IAS230-0160-00400	1.6	4	15	4	50	4,800
IAS230-0165-00400	1.65	4	15	4	50	5,760
IAS230-0170-00450	1.7	4.5	15	4	50	4,800

ion Depo Type A Series

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAS230-0175-00450	1.75	4.5	15	4	50	5,760
IAS230-0180-00450	1.8	4.5	15	4	50	1,760
IAS230-0185-00450	1.85	4.5	15	4	50	5,760
IAS230-0190-00500	1.9	5	15	4	50	4,800
IAS230-0195-00500	1.95	5	15	4	50	5,760
IAS230-0200-00300	2	3	15	4	50	1,520
IAS230-0200-00500		5	15	4	50	1,520
IAS230-0200-00800		8	15	4	50	3,440
IAS230-0205-00500	2.05	5	15	4	50	5,760
IAS230-0210-00550	2.1	5.5	15	4	50	4,800
IAS230-0215-00550	2.15	5.5	15	4	50	5,760
IAS230-0220-00550	2.2	5.5	15	4	50	4,800
IAS230-0225-00550	2.25	5.5	15	4	50	5,760
IAS230-0230-00600	2.3	6	15	4	50	4,800
IAS230-0235-00600	2.35	6	15	4	50	5,760
IAS230-0240-00600	2.4	6	15	4	50	4,800
IAS230-0245-00600	2.45	6	15	4	50	5,760
IAS230-0250-00700	2.5	7	15	4	50	1,520
IAS230-0250-01000		10	15	4	50	3,440
IAS230-0255-00700	2.55	7	15	4	50	5,760
IAS230-0260-00700	2.6	7	15	4	50	4,800
IAS230-0265-00700	2.65	7	15	4	50	5,760
IAS230-0270-00700	2.7	7	15	4	50	4,800
IAS230-0275-00700	2.75	7	15	4	50	5,760
IAS230-0280-00700	2.8	7	15	4	50	4,800
IAS230-0285-00800	2.85	8	15	4	50	5,760
IAS230-0290-00800	2.9	8	15	4	50	4,800
IAS230-0295-00800	2.95	8	15	4	50	5,760
IAS230-0300-00500	3	5	15	4	50	2,000
IAS230-0300-00800		8	15	4	50	2,000
IAS230-0300-01200		12	15	4	50	4,400
IAS230-0310-00800	3.1	8	15	6	50	5,600
IAS230-0320-00800	3.2	8	15	6	50	5,600
IAS230-0330-00900	3.3	9	15	6	50	5,600
IAS230-0340-00900	3.4	9	15	6	50	5,600
IAS230-0350-00900	3.5	9	15	6	50	3,600
IAS230-0360-00900	3.6	9	15	6	50	5,600
IAS230-0370-01000	3.7	10	15	6	50	5,600
IAS230-0380-01000	3.8	10	15	6	50	5,600
IAS230-0390-01000	3.9	10	15	6	50	5,600
IAS230-0400-00600	4	6	15	6	50	2,240
IAS230-0400-01000		10	15	6	50	2,240
IAS230-0400-01600		16	15	6	50	4,720
IAS230-0410-01100	4.1	11	15	6	50	6,000
IAS230-0420-01100	4.2	11	15	6	50	6,000

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAS230-0430-01100	4.3	11	15	6	50	6,000
IAS230-0440-01100	4.4	11	15	6	50	6,000
IAS230-0450-01200	4.5	12	15	6	50	4,160
IAS230-0460-01200	4.6	12	15	6	50	6,000
IAS230-0470-01200	4.7	12	15	6	50	6,000
IAS230-0480-01200	4.8	12	15	6	50	6,000
IAS230-0490-01300	4.9	13	15	6	50	6,000
IAS230-0500-00800	5	8	15	6	50	2,400
IAS230-0500-01300		13	15	6	50	2,400
IAS230-0500-02000		20	15	6	60	5,360
IAS230-0510-01300	5.1	13	15	6	50	6,400
IAS230-0520-01300	5.2	13	15	6	50	6,400
IAS230-0530-01400	5.3	14	15	6	50	6,400
IAS230-0540-01400	5.4	14	15	6	50	6,400
IAS230-0550-01400	5.5	14	15	6	50	4,160
IAS230-0560-01400	5.6	14	15	6	50	6,400
IAS230-0570-01500	5.7	15	15	6	50	6,400
IAS230-0580-01500	5.8	15	15	6	50	6,400
IAS230-0590-01500	5.9	15	15	6	50	6,400
IAS230-0600-01000	6	10	—	6	50	2,640
IAS230-0600-01500		15	—	6	50	2,640
IAS230-0600-02400		24	—	6	60	5,440
IAS230-0650-01700	6.5	17	15	8	70	9,200
IAS230-0650-02000		20	15	8	70	9,200
IAS230-0700-01800	7	18	15	8	70	8,560
IAS230-0750-02000	7.5	20	15	8	70	10,240
IAS230-0800-02000	8	20	—	8	70	5,600
IAS230-0800-03200		32	—	8	80	10,800
IAS230-0850-02300	8.5	23	15	10	80	12,320
IAS230-0900-02300	9	23	15	10	80	11,280
IAS230-0950-02500	9.5	25	15	10	80	13,440
IAS230-1000-02500	10	25	—	10	80	6,560
IAS230-1000-04000		40	—	10	90	12,240
IAS230-1050-02800	10.5	28	15	12	110	17,120
IAS230-1100-02800	11	28	15	12	110	17,120
IAS230-1150-03000	11.5	30	15	12	110	10,800
IAS230-1200-03000	12	30	—	12	110	10,800
IAS230-1200-04800		48	—	12	120	20,480
IAS230-1400-02800	14	28	—	14	110	20,560
IAS230-1600-04800	16	48	—	16	140	22,640
IAS230-1800-05400	18	54	—	18	140	35,600
IAS230-2000-06000	20	60	—	20	150	38,560

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAS230
Model number:IAS230

平角立铣刀 Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
	0.1	0.15	0.005	0.005	25	50,000	0.005	0.005	25	50,000	0.005	0.005	20	50,000	0.005	0.005	15	50,000
	0.15	0.2	0.01	0.01	25	50,000	0.008	0.008	25	50,000	0.008	0.008	20	50,000	0.008	0.008	15	50,000
	0.2	0.4	0.01	0.01	40	50,000	0.01	0.01	40	50,000	0.01	0.01	30	50,000	0.01	0.01	25	50,000
	0.25	0.5	0.01	0.01	40	50,000	0.01	0.01	40	50,000	0.01	0.01	30	50,000	0.01	0.01	25	50,000
	0.3	0.3	0.15	0.02	100	50,000	0.15	0.02	100	50,000	0.15	0.02	85	50,000	0.15	0.02	90	50,000
		0.6	0.15	0.02	100	50,000	0.15	0.02	100	50,000	0.15	0.02	85	50,000	0.15	0.02	90	50,000
	0.35	0.7	0.18	0.02	150	50,000	0.18	0.02	150	50,000	0.18	0.02	85	50,000	0.18	0.02	90	50,000
	0.4	0.6	0.20	0.02	150	50,000	0.20	0.02	150	50,000	0.20	0.02	110	40,000	0.20	0.02	130	48,000
		0.8	0.20	0.02	150	50,000	0.20	0.02	150	50,000	0.20	0.02	110	40,000	0.20	0.02	130	48,000
	0.45	0.9	0.23	0.02	150	50,000	0.23	0.02	150	50,000	0.23	0.02	110	40,000	0.23	0.02	130	48,000
	0.5	0.8	0.25	0.03	170	42,000	0.25	0.03	170	42,000	0.25	0.03	110	32,000	0.25	0.03	130	39,000
		1.25	0.50	0.03	170	42,000	0.50	0.03	170	42,000	0.50	0.03	110	32,000	0.50	0.03	130	39,000
		2	0.50	0.03	170	42,000	0.50	0.03	170	42,000	0.50	0.03	110	32,000	0.50	0.03	130	39,000
	0.55	1.3	0.55	0.03	180	42,000	0.55	0.03	180	42,000	0.55	0.03	110	32,000	0.55	0.03	130	39,000
	0.6	1	0.60	0.03	180	42,000	0.60	0.03	180	42,000	0.60	0.03	110	32,000	0.60	0.03	130	39,000
		1.5	0.60	0.03	180	42,000	0.60	0.03	180	42,000	0.60	0.03	110	32,000	0.60	0.03	130	39,000
		2.4	0.60	0.03	180	42,000	0.60	0.03	180	42,000	0.60	0.03	110	32,000	0.60	0.03	130	39,000
	0.65	1.5	0.65	0.03	180	42,000	0.65	0.03	180	42,000	0.65	0.03	110	32,000	0.65	0.03	130	39,000
	0.7	1.8	0.70	0.04	180	42,000	0.70	0.04	180	42,000	0.70	0.04	110	32,000	0.70	0.04	130	39,000
2	0.75	1.8	0.75	0.04	180	42,000	0.75	0.04	180	42,000	0.75	0.04	110	32,000	0.75	0.04	130	39,000
	0.8	1.2	0.80	0.04	210	26,000	0.80	0.04	210	26,000	0.80	0.04	130	20,000	0.80	0.04	150	24,000
		2	0.80	0.04	210	26,000	0.80	0.04	210	26,000	0.80	0.04	130	20,000	0.80	0.04	150	24,000
		3.2	0.80	0.04	210	26,000	0.80	0.04	210	26,000	0.80	0.04	130	20,000	0.80	0.04	150	24,000
	0.85	2	0.85	0.04	210	26,000	0.85	0.04	210	26,000	0.85	0.04	130	20,000	0.85	0.04	150	24,000
	0.9	2	0.90	0.05	210	26,000	0.90	0.05	210	26,000	0.90	0.05	130	20,000	0.90	0.05	150	24,000
	0.95	2	0.95	0.05	210	26,000	0.95	0.05	210	26,000	0.95	0.05	130	20,000	0.95	0.05	150	24,000
	1	1.5	1.00	0.07	210	26,000	1.00	0.07	210	26,000	1.00	0.07	130	16,000	1.00	0.07	150	20,000
		2.5	1.00	0.07	210	26,000	1.00	0.07	210	26,000	1.00	0.07	130	16,000	1.00	0.07	150	20,000
		4	1.00	0.07	210	26,000	1.00	0.07	210	26,000	1.00	0.07	130	16,000	1.00	0.07	150	20,000
	1.05	2.5	1.05	0.07	210	26,000	1.05	0.07	210	26,000	1.05	0.07	130	16,000	1.05	0.07	150	20,000
	1.1	2.5	1.10	0.08	210	26,000	1.10	0.08	210	26,000	1.10	0.08	130	16,000	1.10	0.08	150	20,000
	1.15	2.5	1.15	0.08	210	26,000	1.15	0.08	210	26,000	1.15	0.08	130	16,000	1.15	0.08	150	20,000
	1.2	3	1.20	0.08	210	26,000	1.20	0.08	210	26,000	1.20	0.08	130	16,000	1.20	0.08	150	20,000
	1.25	3	1.25	0.09	210	26,000	1.25	0.09	210	26,000	1.25	0.09	130	16,000	1.25	0.09	150	20,000
	1.3	3	1.30	0.09	210	26,000	1.30	0.09	210	26,000	1.30	0.09	130	16,000	1.30	0.09	150	20,000
	1.35	3	1.35	0.09	210	26,000	1.35	0.09	210	26,000	1.35	0.09	130	16,000	1.35	0.09	150	20,000
	1.4	3.5	1.40	0.10	210	26,000	1.40	0.10	210	26,000	1.40	0.10	130	16,000	1.40	0.10	150	20,000
	1.45	3.5	1.45	0.10	210	26,000	1.45	0.10	210	26,000	1.45	0.10	130	16,000	1.45	0.10	150	20,000
	1.5	2	1.50	0.11	210	14,000	1.50	0.11	210	14,000	1.50	0.11	130	11,000	1.50	0.11	150	13,000
		4	1.50	0.11	210	14,000	1.50	0.11	210	14,000	1.50	0.11	130	11,000	1.50	0.11	150	13,000
		6	1.50	0.11	210	14,000	1.50	0.11	210	14,000	1.50	0.11	130	11,000	1.50	0.11	150	13,000
	1.55	4	1.55	0.11	210	14,000	1.55	0.11	210	14,000	1.55	0.11	130	11,000	1.55	0.11	150	13,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

平角立铣刀 Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
	1.6	4	1.60	0.11	210	14,000	1.60	0.11	210	14,000	1.60	0.11	130	11,000	1.60	0.11	150	13,000
	1.65	4	1.65	0.12	210	14,000	1.65	0.12	210	14,000	1.65	0.12	130	11,000	1.65	0.12	150	13,000
	1.7	4.5	1.70	0.12	210	14,000	1.70	0.12	210	14,000	1.70	0.12	130	11,000	1.70	0.12	150	13,000
	1.75	4.5	1.75	0.12	210	14,000	1.75	0.12	210	14,000	1.75	0.12	130	11,000	1.75	0.12	150	13,000
	1.8	4.5	1.80	0.13	210	14,000	1.80	0.13	210	14,000	1.80	0.13	130	11,000	1.80	0.13	150	13,000
	1.85	4.5	1.85	0.13	210	14,000	1.85	0.13	210	14,000	1.85	0.13	130	11,000	1.85	0.13	150	13,000
	1.9	5	1.90	0.13	210	14,000	1.90	0.13	210	14,000	1.90	0.13	130	11,000	1.90	0.13	150	13,000
	1.95	5	1.95	0.14	210	14,000	1.95	0.14	210	14,000	1.95	0.14	130	11,000	1.95	0.14	150	13,000
	2	3	2.00	0.14	210	11,000	2.00	0.14	210	11,000	2.00	0.14	150	8,000	2.00	0.14	170	9,500
		5	2.00	0.14	210	11,000	2.00	0.14	210	11,000	2.00	0.14	150	8,000	2.00	0.14	170	9,500
		8	2.00	0.14	210	11,000	2.00	0.14	210	11,000	2.00	0.14	150	8,000	2.00	0.14	170	9,500
	2.05	5	2.05	0.14	210	11,000	2.05	0.14	210	11,000	2.05	0.14	150	8,000	2.05	0.14	170	9,500
	2.1	5.5	2.10	0.15	210	11,000	2.10	0.15	210	11,000	2.10	0.15	150	8,000	2.10	0.15	170	9,500
	2.15	5.5	2.15	0.15	210	11,000	2.15	0.15	210	11,000	2.15	0.15	150	8,000	2.15	0.15	170	9,500
	2.2	5.5	2.20	0.15	210	11,000	2.20	0.15	210	11,000	2.20	0.15	150	8,000	2.20	0.15	170	9,500
	2.25	5.5	2.25	0.16	210	11,000	2.25	0.16	210	11,000	2.25	0.16	150	8,000	2.25	0.16	170	9,500
	2.3	6	2.30	0.16	210	11,000	2.30	0.16	210	11,000	2.30	0.16	150	8,000	2.30	0.16	170	9,500
	2.35	6	2.35	0.16	210	11,000	2.35	0.16	210	11,000	2.35	0.16	150	8,000	2.35	0.16	170	9,500
	2.4	6	2.40	0.17	210	11,000	2.40	0.17	210	11,000	2.40	0.17	150	8,000	2.40	0.17	170	9,500
2	2.45	6	2.45	0.17	210	11,000	2.45	0.17	210	11,000	2.45	0.17	150	8,000	2.45	0.17	170	9,500
	2.5	7	2.50	0.18	250	8,300	2.50	0.18	250	8,300	2.50	0.18	160	6,500	2.50	0.18	180	7,600
		10	2.50	0.18	250	8,300	2.50	0.18	250	8,300	2.50	0.18	160	6,500	2.50	0.18	180	7,600
	2.55	7	2.55	0.18	250	8,300	2.55	0.18	250	8,300	2.55	0.18	160	6,500	2.55	0.18	180	7,600
	2.6	7	2.60	0.26	250	8,300	2.60	0.26	250	8,300	2.60	0.26	160	6,500	2.60	0.26	180	7,600
	2.65	7	2.65	0.27	250	8,300	2.65	0.27	250	8,300	2.65	0.27	160	6,500	2.65	0.27	180	7,600
	2.7	7	2.70	0.27	250	8,300	2.70	0.27	250	8,300	2.70	0.27	160	6,500	2.70	0.27	180	7,600
	2.75	7	2.75	0.28	250	8,300	2.75	0.28	250	8,300	2.75	0.28	160	6,500	2.75	0.28	180	7,600
	2.8	7	2.80	0.28	250	8,300	2.80	0.28	250	8,300	2.80	0.28	160	6,500	2.80	0.28	180	7,600
	2.85	8	2.85	0.29	250	8,300	2.85	0.29	250	8,300	2.85	0.29	160	6,500	2.85	0.29	180	7,600
	2.9	8	2.90	0.29	250	8,300	2.90	0.29	250	8,300	2.90	0.29	160	6,500	2.90	0.29	180	7,600
	2.95	8	2.95	0.30	250	8,300	2.95	0.30	250	8,300	2.95	0.30	160	6,500	2.95	0.30	180	7,600
	3	5	3.00	0.30	280	7,000	3.00	0.30	280	7,000	3.00	0.30	170	5,300	3.00	0.30	190	6,500
		8	3.00	0.30	280	7,000	3.00	0.30	280	7,000	3.00	0.30	170	5,300	3.00	0.30	190	6,500
		12	3.00	0.30	280	7,000	3.00	0.30	280	7,000	3.00	0.30	170	5,300	3.00	0.30	190	6,500
	3.1	8	3.10	0.31	280	7,000	3.10	0.31	280	7,000	3.10	0.31	170	5,300	3.10	0.31	190	6,500
	3.2	8	3.20	0.32	280	7,000	3.20	0.32	280	7,000	3.20	0.32	170	5,300	3.20	0.32	190	6,500
	3.3	9	3.30	0.33	280	7,000	3.30	0.33	280	7,000	3.30	0.33	170	5,300	3.30	0.33	190	6,500
	3.4	9	3.40	0.34	280	7,000	3.40	0.34	280	7,000	3.40	0.34	170	5,300	3.40	0.34	190	6,500
	3.5	9	3.50	0.35	280	7,000	3.50	0.35	280	7,000	3.50	0.35	170	5,300	3.50	0.35	190	6,500
	3.6	9	3.60	0.36	280	7,000	3.60	0.36	280	7,000	3.60	0.36	170	5,300	3.60	0.36	190	6,500
	3.7	10	3.70	0.37	280	7,000	3.70	0.37	280	7,000	3.70	0.37	170	5,300	3.70	0.37	190	6,500
	3.8	10	3.80	0.38	280	7,000	3.80	0.38	280	7,000	3.80	0.38	170	5,300	3.80	0.38	190	6,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo A Series 平角 Square
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAS230
Model number:IAS230

平角立铣刀 Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
	3.9	10	3.90	0.39	280	7,000	3.90	0.39	280	7,000	3.90	0.39	170	5,300	3.90	0.39	190	6,500
	4	6	4.00	0.40	310	5,200	4.00	0.40	310	5,200	4.00	0.40	170	4,000	4.00	0.40	190	4,900
		10	4.00	0.40	310	5,200	4.00	0.40	310	5,200	4.00	0.40	170	4,000	4.00	0.40	190	4,900
		16	4.00	0.40	310	5,200	4.00	0.40	310	5,200	4.00	0.40	170	4,000	4.00	0.40	190	4,900
	4.1	11	4.10	0.41	310	5,200	4.10	0.41	310	5,200	4.10	0.41	170	4,000	4.10	0.41	190	4,900
	4.2	11	4.20	0.42	310	5,200	4.20	0.42	310	5,200	4.20	0.42	170	4,000	4.20	0.42	190	4,900
	4.3	11	4.30	0.43	310	5,200	4.30	0.43	310	5,200	4.30	0.43	170	4,000	4.30	0.43	190	4,900
	4.4	11	4.40	0.44	310	5,200	4.40	0.44	310	5,200	4.40	0.44	170	4,000	4.40	0.44	190	4,900
	4.5	12	4.50	0.45	310	5,200	4.50	0.45	310	5,200	4.50	0.45	170	4,000	4.50	0.45	190	4,900
	4.6	12	4.60	0.46	310	5,200	4.60	0.46	310	5,200	4.60	0.46	170	4,000	4.60	0.46	190	4,900
	4.7	12	4.70	0.47	310	5,200	4.70	0.47	310	5,200	4.70	0.47	170	4,000	4.70	0.47	190	4,900
	4.8	12	4.80	0.48	310	5,200	4.80	0.48	310	5,200	4.80	0.48	170	4,000	4.80	0.48	190	4,900
	4.9	13	4.90	0.49	310	5,200	4.90	0.49	310	5,200	4.90	0.49	170	4,000	4.90	0.49	190	4,900
	5	8	5.00	0.50	330	4,100	5.00	0.50	330	4,100	5.00	0.50	210	3,200	5.00	0.50	230	3,800
		13	5.00	0.50	330	4,100	5.00	0.50	330	4,100	5.00	0.50	210	3,200	5.00	0.50	230	3,800
		20	5.00	0.50	330	4,100	5.00	0.50	330	4,100	5.00	0.50	210	3,200	5.00	0.50	230	3,800
	5.1	13	5.10	0.51	330	4,100	5.10	0.51	330	4,100	5.10	0.51	210	3,200	5.10	0.51	230	3,800
	5.2	13	5.20	0.52	330	4,100	5.20	0.52	330	4,100	5.20	0.52	210	3,200	5.20	0.52	230	3,800
	5.3	14	5.30	0.53	330	4,100	5.30	0.53	330	4,100	5.30	0.53	210	3,200	5.30	0.53	230	3,800
2	5.4	14	5.40	0.54	330	4,100	5.40	0.54	330	4,100	5.40	0.54	210	3,200	5.40	0.54	230	3,800
	5.5	14	5.50	0.55	330	4,100	5.50	0.55	330	4,100	5.50	0.55	210	3,200	5.50	0.55	230	3,800
	5.6	14	5.60	0.56	330	4,100	5.60	0.56	330	4,100	5.60	0.56	210	3,200	5.60	0.56	230	3,800
	5.7	15	5.70	0.57	330	4,100	5.70	0.57	330	4,100	5.70	0.57	210	3,200	5.70	0.57	230	3,800
	5.8	15	5.80	0.58	330	4,100	5.80	0.58	330	4,100	5.80	0.58	210	3,200	5.80	0.58	230	3,800
	5.9	15	5.90	0.59	330	4,100	5.90	0.59	330	4,100	5.90	0.59	210	3,200	5.90	0.59	230	3,800
	6	10	6.00	0.60	340	3,400	6.00	0.60	340	3,400	6.00	0.60	240	2,700	6.00	0.60	260	3,200
		15	6.00	0.60	340	3,400	6.00	0.60	340	3,400	6.00	0.60	240	2,700	6.00	0.60	260	3,200
		24	6.00	0.60	300	3,400	6.00	0.60	300	3,400	6.00	0.60	240	2,700	6.00	0.60	260	3,200
	6.5	20	6.50	0.98	340	3,400	6.50	0.98	340	3,400	6.50	0.98	240	2,700	6.50	0.98	260	3,200
		17	6.50	0.98	340	3,400	6.50	0.98	340	3,400	6.50	0.98	240	2,700	6.50	0.98	260	3,200
	7	18	7.00	1.05	340	3,400	7.00	1.05	340	3,400	7.00	1.05	240	2,700	7.00	1.05	260	3,200
	7.5	20	7.50	1.13	340	3,400	7.50	1.13	340	3,400	7.50	1.13	240	2,700	7.50	1.13	260	3,200
	8	20	8.00	1.20	310	2,600	8.00	1.20	310	2,600	8.00	1.20	220	2,000	8.00	1.20	240	2,400
		32	8.00	1.20	300	2,600	8.00	1.20	300	2,600	8.00	1.20	220	2,000	8.00	1.20	240	2,400
	8.5	23	8.50	1.28	310	2,600	8.50	1.28	310	2,600	8.50	1.28	220	2,000	8.50	1.28	240	2,400
	9	23	9.00	1.35	310	2,600	9.00	1.35	310	2,600	9.00	1.35	220	2,000	9.00	1.35	240	2,400
	9.5	25	9.50	1.43	310	2,600	9.50	1.43	310	2,600	9.50	1.43	220	2,000	9.50	1.43	240	2,400
	10	25	10.00	1.50	290	2,100	10.00	1.50	290	2,100	10.00	1.50	210	1,600	10.00	1.50	230	1,900
		40	10.00	1.50	250	1,900	10.00	1.50	250	1,900	10.00	1.50	200	1,400	10.00	1.50	200	1,700
	10.5	28	10.50	1.58	290	2,100	10.50	1.58	290	2,100	10.50	1.58	210	1,600	10.50	1.58	230	1,700
	11	28	16.50	1.65	290	2,100	16.50	1.65	290	2,100	16.50	1.65	210	1,600	16.50	1.65	230	1,700
	11.5	30	17.25	1.73	290	2,100	17.25	1.73	290	2,100	17.25	1.73	210	1,600	17.25	1.73	230	1,700

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

平角立铣刀 Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	12	30	18.00	1.80	270	1,700	18.00	1.80	270	1,700	18.00	1.80	200	1,300	18.00	1.80	250	1,600
		48	18.00	1.80	230	1,600	18.00	1.80	230	1,600	18.00	1.80	180	1,200	18.00	1.80	200	1,400
	14	28	21.00	2.10	270	1,500	21.00	2.10	270	1,500	21.00	2.10	220	1,300	21.00	2.10	250	1,400
	16	48	24.00	2.40	230	1,300	24.00	2.40	230	1,300	24.00	2.40	180	1,100	24.00	2.40	200	1,200
	18	54	27.00	2.70	250	1,200	27.00	2.70	250	1,200	27.00	2.70	200	1,000	27.00	2.70	200	1,100
	20	60	30.00	3.00	200	1,000	30.00	3.00	200	1,000	30.00	3.00	150	800	30.00	3.00	180	900

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAS230
Model number:IAS230

平角立铣刀 Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.1	0.15	0.005	0.005	15	50,000	0.005	0.005	15	50,000	0.005	0.005	20	50,000	0.1	0.02	60	50,000
	0.15	0.2	0.008	0.008	15	50,000	0.008	0.008	15	50,000	0.008	0.008	20	50,000	0.15	0.03	60	50,000
	0.2	0.4	0.01	0.01	20	48,000	0.01	0.01	25	50,000	0.01	0.01	30	50,000	0.2	0.04	90	50,000
	0.25	0.5	0.01	0.01	20	48,000	0.01	0.01	25	50,000	0.01	0.01	30	50,000	0.25	0.05	90	50,000
	0.3	0.3	0.02	0.02	20	32,000	0.15	0.02	90	50,000	0.15	0.02	85	50,000	0.3	0.06	150	50,000
		0.6	0.02	0.02	20	32,000	0.15	0.02	90	50,000	0.15	0.02	85	50,000	0.3	0.06	150	50,000
	0.35	0.7	0.02	0.02	20	32,000	0.18	0.02	90	50,000	0.18	0.02	85	50,000	0.35	0.07	150	50,000
	0.4	0.6	0.40	0.01	50	24,000	0.20	0.02	130	48,000	0.20	0.02	110	40,000	0.4	0.08	200	50,000
		0.8	0.40	0.01	50	24,000	0.20	0.02	130	48,000	0.20	0.02	110	40,000	0.4	0.08	200	50,000
	0.45	0.9	0.45	0.01	50	24,000	0.23	0.02	130	48,000	0.23	0.02	110	40,000	0.45	0.09	200	50,000
	0.5	0.8	0.50	0.01	60	20,000	0.25	0.03	130	39,000	0.25	0.03	110	32,000	0.5	0.1	220	45,000
		1.25	0.50	0.01	60	20,000	0.50	0.03	130	39,000	0.50	0.03	110	32,000	0.5	0.1	220	45,000
		2	0.50	0.01	60	20,000	0.50	0.03	130	39,000	0.50	0.03	110	32,000	0.5	0.1	220	45,000
	0.55	1.3	0.55	0.01	60	20,000	0.55	0.03	130	39,000	0.55	0.03	110	32,000	0.55	0.11	220	45,000
	0.6	1	0.60	0.01	60	20,000	0.60	0.03	130	39,000	0.60	0.03	110	32,000	0.6	0.12	220	45,000
		1.5	0.60	0.01	60	20,000	0.60	0.03	130	39,000	0.60	0.03	110	32,000	0.6	0.12	220	45,000
		2.4	0.60	0.01	60	20,000	0.60	0.03	130	39,000	0.60	0.03	110	32,000	0.6	0.12	220	45,000
	0.65	1.5	0.65	0.01	60	20,000	0.65	0.03	130	39,000	0.65	0.03	110	32,000	0.65	0.13	220	45,000
	0.7	1.8	0.70	0.01	60	20,000	0.70	0.04	130	39,000	0.70	0.04	110	32,000	0.7	0.14	220	45,000
	0.75	1.8	0.75	0.02	60	20,000	0.75	0.04	130	39,000	0.75	0.04	110	32,000	0.75	0.15	220	45,000
	0.8	1.2	0.80	0.02	70	12,000	0.80	0.04	150	24,000	0.80	0.04	130	20,000	0.8	0.16	250	28,000
		2	0.80	0.02	70	12,000	0.80	0.04	150	24,000	0.80	0.04	130	20,000	0.8	0.16	250	28,000
		3.2	0.80	0.02	70	12,000	0.80	0.04	150	24,000	0.80	0.04	130	20,000	0.8	0.16	250	28,000
	0.85	2	0.85	0.02	70	12,000	0.85	0.04	150	24,000	0.85	0.04	130	20,000	0.85	0.17	250	28,000
	0.9	2	0.90	0.02	70	12,000	0.90	0.05	150	24,000	0.90	0.05	130	20,000	0.9	0.18	250	28,000
	0.95	2	0.95	0.02	70	12,000	0.95	0.05	150	24,000	0.95	0.05	130	20,000	0.95	0.19	250	28,000
	1	1.5	1.00	0.02	75	9,500	1.00	0.07	150	20,000	1.00	0.07	130	16,000	1	0.2	270	23,000
		2.5	1.00	0.02	75	9,500	1.00	0.07	150	20,000	1.00	0.07	130	16,000	1	0.2	270	23,000
		4	1.00	0.02	75	9,500	1.00	0.07	150	20,000	1.00	0.07	130	16,000	1	0.2	270	23,000
	1.05	2.5	1.05	0.02	75	9,500	1.05	0.07	150	20,000	1.05	0.07	130	16,000	1.05	0.21	270	23,000
	1.1	2.5	1.10	0.02	75	9,500	1.10	0.08	150	20,000	1.10	0.08	130	16,000	1.1	0.22	270	23,000
	1.15	2.5	1.15	0.02	75	9,500	1.15	0.08	150	20,000	1.15	0.08	130	16,000	1.15	0.23	270	23,000
	1.2	3	1.20	0.02	75	9,500	1.20	0.08	150	20,000	1.20	0.08	130	16,000	1.2	0.24	270	23,000
	1.25	3	1.25	0.03	75	9,500	1.25	0.09	150	20,000	1.25	0.09	130	16,000	1.25	0.25	270	23,000
	1.3	3	1.30	0.03	75	9,500	1.30	0.09	150	20,000	1.30	0.09	130	16,000	1.3	0.26	270	23,000
	1.35	3	1.35	0.03	75	9,500	1.35	0.09	150	20,000	1.35	0.09	130	16,000	1.35	0.27	270	23,000
	1.4	3.5	1.40	0.03	75	9,500	1.40	0.10	150	20,000	1.40	0.10	130	16,000	1.4	0.28	270	23,000
	1.45	3.5	1.45	0.03	75	9,500	1.45	0.10	150	20,000	1.45	0.10	130	16,000	1.45	0.29	270	23,000
	1.5	2	1.50	0.03	75	6,400	1.50	0.11	150	13,000	1.50	0.11	130	11,000	1.5	0.3	300	23,000
		4	1.50	0.03	75	6,400	1.50	0.11	150	13,000	1.50	0.11	130	11,000	1.5	0.3	300	23,000
		6	1.50	0.03	75	6,400	1.50	0.11	150	13,000	1.50	0.11	130	11,000	1.5	0.3	300	23,000
	1.55	4	1.55	0.03	75	6,400	1.55	0.11	150	13,000	1.55	0.11	130	11,000	1.55	0.31	300	23,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

平角立铣刀 Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	1.6	4	1.60	0.03	75	6,400	1.60	0.11	150	13,000	1.60	0.11	130	11,000	1.6	0.32	300	23,000
	1.65	4	1.65	0.03	75	6,400	1.65	0.12	150	13,000	1.65	0.12	130	11,000	1.65	0.33	300	23,000
	1.7	4.5	1.70	0.03	75	6,400	1.70	0.12	150	13,000	1.70	0.12	130	11,000	1.7	0.34	300	23,000
	1.75	4.5	1.75	0.04	75	6,400	1.75	0.12	150	13,000	1.75	0.12	130	11,000	1.75	0.35	300	23,000
	1.8	4.5	1.80	0.04	75	6,400	1.80	0.13	150	13,000	1.80	0.13	130	11,000	1.8	0.36	300	23,000
	1.85	4.5	1.85	0.04	75	6,400	1.85	0.13	150	13,000	1.85	0.13	130	11,000	1.85	0.37	300	23,000
	1.9	5	1.90	0.04	75	6,400	1.90	0.13	150	13,000	1.90	0.13	130	11,000	1.9	0.38	300	23,000
	1.95	5	1.95	0.04	75	6,400	1.95	0.14	150	13,000	1.95	0.14	130	11,000	1.95	0.39	300	23,000
	2	3	2.00	0.04	75	4,800	2.00	0.14	170	9,500	2.00	0.14	150	8,000	2	0.4	330	12,000
		5	2.00	0.04	75	4,800	2.00	0.14	170	9,500	2.00	0.14	150	8,000	2	0.4	330	12,000
		8	2.00	0.04	75	4,800	2.00	0.14	170	9,500	2.00	0.14	150	8,000	2	0.4	330	12,000
	2.05	5	2.05	0.04	75	4,800	2.05	0.14	170	9,500	2.05	0.14	150	8,000	2.05	0.41	330	12,000
	2.1	5.5	2.10	0.04	75	4,800	2.10	0.15	170	9,500	2.10	0.15	150	8,000	2.1	0.42	330	12,000
	2.15	5.5	2.15	0.04	75	4,800	2.15	0.15	170	9,500	2.15	0.15	150	8,000	2.15	0.43	330	12,000
	2.2	5.5	2.20	0.04	75	4,800	2.20	0.15	170	9,500	2.20	0.15	150	8,000	2.2	0.44	330	12,000
	2.25	5.5	2.25	0.05	75	4,800	2.25	0.16	170	9,500	2.25	0.16	150	8,000	2.25	0.45	330	12,000
	2.3	6	2.30	0.05	75	4,800	2.30	0.16	170	9,500	2.30	0.16	150	8,000	2.3	0.46	330	12,000
	2.35	6	2.35	0.05	75	4,800	2.35	0.16	170	9,500	2.35	0.16	150	8,000	2.35	0.47	330	12,000
	2.4	6	2.40	0.05	75	4,800	2.40	0.17	170	9,500	2.40	0.17	150	8,000	2.4	0.48	330	12,000
	2.45	6	2.45	0.05	75	4,800	2.45	0.17	170	9,500	2.45	0.17	150	8,000	2.45	0.49	330	12,000
	2.5	7	2.50	0.05	75	3,800	2.50	0.18	180	7,600	2.50	0.18	160	6,500	2.5	0.5	360	8,900
		10	2.50	0.05	75	3,800	2.50	0.18	180	7,600	2.50	0.18	160	6,500	2.5	0.5	360	8,900
	2.55	7	2.55	0.05	75	3,800	2.55	0.18	180	7,600	2.55	0.18	160	6,500	2.55	0.51	360	8,900
	2.6	7	2.60	0.05	75	3,800	2.60	0.26	180	7,600	2.60	0.26	160	6,500	2.6	0.52	360	8,900
	2.65	7	2.65	0.05	75	3,800	2.65	0.27	180	7,600	2.65	0.27	160	6,500	2.65	0.53	360	8,900
	2.7	7	2.70	0.05	75	3,800	2.70	0.27	180	7,600	2.70	0.27	160	6,500	2.7	0.54	360	8,900
	2.75	7	2.75	0.06	75	3,800	2.75	0.28	180	7,600	2.75	0.28	160	6,500	2.75	0.55	360	8,900
	2.8	7	2.80	0.06	75	3,800	2.80	0.28	180	7,600	2.80	0.28	160	6,500	2.8	0.56	360	8,900
	2.85	8	2.85	0.06	75	3,800	2.85	0.29	180	7,600	2.85	0.29	160	6,500	2.85	0.57	360	8,900
	2.9	8	2.90	0.06	75	3,800	2.90	0.29	180	7,600	2.90	0.29	160	6,500	2.9	0.58	360	8,900
	2.95	8	2.95	0.06	75	3,800	2.95	0.30	180	7,600	2.95	0.30	160	6,500	2.95	0.59	360	8,900
	3	5	3.00	0.06	80	3,200	3.00	0.30	190	6,500	3.00	0.30	170	5,300	3	0.6	370	7,500
		8	3.00	0.06	80	3,200	3.00	0.30	190	6,500	3.00	0.30	170	5,300	3	0.6	370	7,500
		12	3.00	0.06	80	3,200	3.00	0.30	190	6,500	3.00	0.30	170	5,300	3	0.6	370	7,500
	3.1	8	3.10	0.06	80	3,200	3.10	0.31	190	6,500	3.10	0.31	170	5,300	3.1	0.62	370	7,500
	3.2	8	3.20	0.06	80	3,200	3.20	0.32	190	6,500	3.20	0.32	170	5,300	3.2	0.64	370	7,500
	3.3	9	3.30	0.07	80	3,200	3.30	0.33	190	6,500	3.30	0.33	170	5,300	3.3	0.66	370	7,500
	3.4	9	3.40	0.07	80	3,200	3.40	0.34	190	6,500	3.40	0.34	170	5,300	3.4	0.68	370	7,500
	3.5	9	3.50	0.07	80	3,200	3.50	0.35	190	6,500	3.50	0.35	170	5,300	3.5	0.7	370	7,500
	3.6	9	3.60	0.07	80	3,200	3.60	0.36	190	6,500	3.60	0.36	170	5,300	3.6	0.72	370	7,500
	3.7	10	3.70	0.07	80	3,200	3.70	0.37	190	6,500	3.70	0.37	170	5,300	3.7	0.74	370	7,500
	3.8	10	3.80	0.08	80	3,200	3.80	0.38	190	6,500	3.80	0.38	170	5,300	3.8	0.76	370	7,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAS230
Model number:IAS230

平角立铣刀 Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
	3.9	10	3.90	0.08	80	3,200	3.90	0.39	190	6,500	3.90	0.39	170	5,300	3.9	0.78	370	7,500
	4	6	4.00	0.08	95	2,400	4.00	0.40	190	4,900	4.00	0.40	170	4,000	4	0.8	390	5,600
		10	4.00	0.08	95	2,400	4.00	0.40	190	4,900	4.00	0.40	170	4,000	4	0.8	390	5,600
		16	4.00	0.08	95	2,400	4.00	0.40	190	4,900	4.00	0.40	170	4,000	4	0.8	390	5,600
	4.1	11	4.10	0.08	95	2,400	4.10	0.41	190	4,900	4.10	0.41	170	4,000	4.1	0.82	390	5,600
	4.2	11	4.20	0.08	95	2,400	4.20	0.42	190	4,900	4.20	0.42	170	4,000	4.2	0.84	390	5,600
	4.3	11	4.30	0.09	95	2,400	4.30	0.43	190	4,900	4.30	0.43	170	4,000	4.3	0.86	390	5,600
	4.4	11	4.40	0.09	95	2,400	4.40	0.44	190	4,900	4.40	0.44	170	4,000	4.4	0.88	390	5,600
	4.5	12	4.50	0.09	95	2,400	4.50	0.45	190	4,900	4.50	0.45	170	4,000	4.5	0.9	390	5,600
	4.6	12	4.60	0.09	95	2,400	4.60	0.46	190	4,900	4.60	0.46	170	4,000	4.6	0.92	390	5,600
	4.7	12	4.70	0.09	95	2,400	4.70	0.47	190	4,900	4.70	0.47	170	4,000	4.7	0.94	390	5,600
	4.8	12	4.80	0.10	95	2,400	4.80	0.48	190	4,900	4.80	0.48	170	4,000	4.8	0.96	390	5,600
	4.9	13	4.90	0.10	95	2,400	4.90	0.49	190	4,900	4.90	0.49	170	4,000	4.9	0.98	390	5,600
	5	8	5.00	0.10	95	1,900	5.00	0.50	230	3,800	5.00	0.50	210	3,200	5	1	410	4,500
		13	5.00	0.10	95	1,900	5.00	0.50	230	3,800	5.00	0.50	210	3,200	5	1	410	4,500
		20	5.00	0.10	95	1,900	5.00	0.50	230	3,800	5.00	0.50	210	3,200	5	1	410	4,500
	5.1	13	5.10	0.10	95	1,900	5.10	0.51	230	3,800	5.10	0.51	210	3,200	5.1	1.02	410	4,500
	5.2	13	5.20	0.10	95	1,900	5.20	0.52	230	3,800	5.20	0.52	210	3,200	5.2	1.04	410	4,500
	5.3	14	5.30	0.11	95	1,900	5.30	0.53	230	3,800	5.30	0.53	210	3,200	5.3	1.06	410	4,500
2	5.4	14	5.40	0.11	95	1,900	5.40	0.54	230	3,800	5.40	0.54	210	3,200	5.4	1.08	410	4,500
	5.5	14	5.50	0.11	95	1,900	5.50	0.55	230	3,800	5.50	0.55	210	3,200	5.5	1.1	410	4,500
	5.6	14	5.60	0.11	95	1,900	5.60	0.56	230	3,800	5.60	0.56	210	3,200	5.6	1.12	410	4,500
	5.7	15	5.70	0.11	95	1,900	5.70	0.57	230	3,800	5.70	0.57	210	3,200	5.7	1.14	410	4,500
	5.8	15	5.80	0.12	95	1,900	5.80	0.58	230	3,800	5.80	0.58	210	3,200	5.8	1.16	410	4,500
	5.9	15	5.90	0.12	95	1,900	5.90	0.59	230	3,800	5.90	0.59	210	3,200	5.9	1.18	410	4,500
	6	10	6.00	0.12	100	1,600	6.00	0.60	260	3,200	6.00	0.60	240	2,700	6	1.2	410	3,700
		15	6.00	0.12	100	1,600	6.00	0.60	260	3,200	6.00	0.60	240	2,700	6	1.2	410	3,700
		24	6.00	0.12	100	1,600	6.00	0.60	260	3,200	6.00	0.60	240	2,700	6	1.2	410	3,700
	6.5	20	6.50	0.13	100	1,600	6.50	0.98	260	3,200	6.50	0.98	240	2,700	6.5	1.3	410	3,700
		17	6.50	0.13	100	1,600	6.50	0.98	260	3,200	6.50	0.98	240	2,700	6.5	1.3	410	3,700
	7	18	7.00	0.14	100	1,600	7.00	1.05	260	3,200	7.00	1.05	240	2,700	7	1.4	410	3,700
	7.5	20	7.50	0.15	100	1,600	7.50	1.13	260	3,200	7.50	1.13	240	2,700	7.5	1.5	410	3,700
	8	20	8.00	0.16	100	1,200	8.00	1.20	240	2,400	8.00	1.20	220	2,000	12	1.6	360	2,800
		32	8.00	0.16	100	1,200	8.00	1.20	240	2,400	8.00	1.20	220	2,000	12	1.6	360	2,800
	8.5	23	8.50	0.17	100	1,200	8.50	1.28	240	2,400	8.50	1.28	220	2,000	12.75	1.7	360	2,800
	9	23	9.00	0.18	100	1,200	9.00	1.35	240	2,400	9.00	1.35	220	2,000	13.5	1.8	360	2,800
	9.5	25	9.50	0.19	100	1,200	9.50	1.43	240	2,400	9.50	1.43	220	2,000	14.25	1.9	360	2,800
	10	25	10.00	0.20	100	1,000	10.00	1.50	230	1,900	10.00	1.50	210	1,600	15	2	330	2,200
		40	10.00	0.20	100	1,000	10.00	1.50	200	1,700	10.00	1.50	200	1,400	15	2	300	2,000
	10.5	28	10.50	0.21	100	1,000	10.50	1.58	230	1,700	10.50	1.58	210	1,600	15.75	2.1	330	2,200
	11	28	11.00	0.22	100	1,000	16.50	1.65	230	1,700	16.50	1.65	210	1,600	16.5	2.2	330	2,200
	11.5	30	11.50	0.23	100	1,000	17.25	1.73	230	1,700	17.25	1.73	210	1,600	17.25	2.3	330	2,200

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

平角立铣刀 Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	12	30	12.00	0.24	100	800	18.00	1.80	250	1,600	18.00	1.80	200	1,300	18	2.4	320	1,900
		48	12.00	0.24	100	800	18.00	1.80	200	1,400	18.00	1.80	180	1,200	18	2.4	300	1,700
	14	28	14.00	0.28	100	700	21.00	2.10	250	1,400	21.00	2.10	220	1,300	21	2.8	300	1,800
	16	48	16.00	0.32	100	600	24.00	2.40	200	1,200	24.00	2.40	180	1,100	24	3.2	300	1,700
	18	54	18.00	0.36	100	500	27.00	2.70	200	1,100	27.00	2.70	200	1,000	27	3.6	250	1,600
	20	60	20.00	0.40	100	400	30.00	3.00	180	900	30.00	3.00	150	800	30	4	250	1,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAS230
Model number:IAS230

平角立铣刀 Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
	0.1	0.15	0.1	0.02	60	50,000	0.1	0.02	60	50,000	0.005	0.005	15	50,000
	0.15	0.2	0.15	0.03	60	50,000	0.15	0.03	60	50,000	0.008	0.008	15	50,000
	0.2	0.4	0.2	0.04	90	50,000	0.2	0.04	90	50,000	0.01	0.01	20	48,000
	0.25	0.5	0.25	0.05	90	50,000	0.25	0.05	90	50,000	0.01	0.01	20	48,000
	0.3	0.3	0.3	0.06	150	50,000	0.3	0.06	150	50,000	0.02	0.02	20	32,000
		0.6	0.3	0.06	150	50,000	0.3	0.06	150	50,000	0.02	0.02	20	32,000
	0.35	0.7	0.35	0.07	150	50,000	0.35	0.07	150	50,000	0.02	0.02	20	32,000
	0.4	0.6	0.4	0.08	200	50,000	0.4	0.08	200	50,000	0.40	0.01	50	24,000
		0.8	0.4	0.08	200	50,000	0.4	0.08	200	50,000	0.40	0.01	50	24,000
	0.45	0.9	0.45	0.09	200	50,000	0.45	0.09	200	50,000	0.45	0.01	50	24,000
	0.5	0.8	0.5	0.1	220	45,000	0.5	0.1	220	45,000	0.50	0.01	60	20,000
		1.25	0.5	0.1	220	45,000	0.5	0.1	220	45,000	0.50	0.01	60	20,000
		2	0.5	0.1	220	45,000	0.5	0.1	220	45,000	0.50	0.01	60	20,000
	0.55	1.3	0.55	0.11	220	45,000	0.55	0.11	220	45,000	0.55	0.01	60	20,000
	0.6	1	0.6	0.12	220	45,000	0.6	0.12	220	45,000	0.60	0.01	60	20,000
		1.5	0.6	0.12	220	45,000	0.6	0.12	220	45,000	0.60	0.01	60	20,000
		2.4	0.6	0.12	220	45,000	0.6	0.12	220	45,000	0.60	0.01	60	20,000
	0.65	1.5	0.65	0.13	220	45,000	0.65	0.13	220	45,000	0.65	0.01	60	20,000
	0.7	1.8	0.7	0.14	220	45,000	0.7	0.14	220	45,000	0.70	0.01	60	20,000
2	0.75	1.8	0.75	0.15	220	45,000	0.75	0.15	220	45,000	0.75	0.02	60	20,000
	0.8	1.2	0.8	0.16	250	28,000	0.8	0.16	250	28,000	0.80	0.02	70	12,000
		2	0.8	0.16	250	28,000	0.8	0.16	250	28,000	0.80	0.02	70	12,000
		3.2	0.8	0.16	250	28,000	0.8	0.16	250	28,000	0.80	0.02	70	12,000
	0.85	2	0.85	0.17	250	28,000	0.85	0.17	250	28,000	0.85	0.02	70	12,000
	0.9	2	0.9	0.18	250	28,000	0.9	0.18	250	28,000	0.90	0.02	70	12,000
	0.95	2	0.95	0.19	250	28,000	0.95	0.19	250	28,000	0.95	0.02	70	12,000
	1	1.5	1	0.2	270	23,000	1	0.2	270	23,000	1.00	0.02	60	8,500
		2.5	1	0.2	270	23,000	1	0.2	270	23,000	1.00	0.02	60	8,500
		4	1	0.2	270	23,000	1	0.2	270	23,000	1.00	0.02	60	8,500
	1.05	2.5	1.05	0.21	270	23,000	1.05	0.21	270	23,000	1.05	0.02	60	8,500
	1.1	2.5	1.1	0.22	270	23,000	1.1	0.22	270	23,000	1.10	0.02	60	8,500
	1.15	2.5	1.15	0.23	270	23,000	1.15	0.23	270	23,000	1.15	0.02	60	8,500
	1.2	3	1.2	0.24	270	23,000	1.2	0.24	270	23,000	1.20	0.02	60	8,500
	1.25	3	1.25	0.25	270	23,000	1.25	0.25	270	23,000	1.25	0.03	60	8,500
	1.3	3	1.3	0.26	270	23,000	1.3	0.26	270	23,000	1.30	0.03	60	8,500
	1.35	3	1.35	0.27	270	23,000	1.35	0.27	270	23,000	1.35	0.03	60	8,500
	1.4	3.5	1.4	0.28	270	23,000	1.4	0.28	270	23,000	1.40	0.03	60	8,500
	1.45	3.5	1.45	0.29	270	23,000	1.45	0.29	270	23,000	1.45	0.03	60	8,500
	1.5	2	1.5	0.3	300	23,000	1.5	0.3	300	23,000	1.50	0.03	60	6,000
		4	1.5	0.3	300	23,000	1.5	0.3	300	23,000	1.50	0.03	60	6,000
		6	1.5	0.3	300	23,000	1.5	0.3	300	23,000	1.50	0.03	60	6,000
	1.55	4	1.55	0.31	300	23,000	1.55	0.31	300	23,000	1.55	0.03	60	6,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

平角立铣刀 Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
	1.6	4	1.6	0.32	300	23,000	1.6	0.32	300	23,000	1.60	0.03	60	6,000
	1.65	4	1.65	0.33	300	23,000	1.65	0.33	300	23,000	1.65	0.03	60	6,000
	1.7	4.5	1.7	0.34	300	23,000	1.7	0.34	300	23,000	1.70	0.03	60	6,000
	1.75	4.5	1.75	0.35	300	23,000	1.75	0.35	300	23,000	1.75	0.04	60	6,000
	1.8	4.5	1.8	0.36	300	23,000	1.8	0.36	300	23,000	1.80	0.04	60	6,000
	1.85	4.5	1.85	0.37	300	23,000	1.85	0.37	300	23,000	1.85	0.04	60	6,000
	1.9	5	1.9	0.38	300	23,000	1.9	0.38	300	23,000	1.90	0.04	60	6,000
	1.95	5	1.95	0.39	300	23,000	1.95	0.39	300	23,000	1.95	0.04	60	6,000
	2	3	2	0.4	330	12,000	2	0.4	330	12,000	2.00	0.04	60	3,200
		5	2	0.4	330	12,000	2	0.4	330	12,000	2.00	0.04	60	3,200
		8	2	0.4	330	12,000	2	0.4	330	12,000	2.00	0.04	60	3,200
	2.05	5	2.05	0.41	330	12,000	2.05	0.41	330	12,000	2.05	0.04	60	3,200
	2.1	5.5	2.1	0.42	330	12,000	2.1	0.42	330	12,000	2.10	0.04	60	3,200
	2.15	5.5	2.15	0.43	330	12,000	2.15	0.43	330	12,000	2.15	0.04	60	3,200
	2.2	5.5	2.2	0.44	330	12,000	2.2	0.44	330	12,000	2.20	0.04	60	3,200
	2.25	5.5	2.25	0.45	330	12,000	2.25	0.45	330	12,000	2.25	0.05	60	3,200
	2.3	6	2.3	0.46	330	12,000	2.3	0.46	330	12,000	2.30	0.05	60	3,200
	2.35	6	2.35	0.47	330	12,000	2.35	0.47	330	12,000	2.35	0.05	60	3,200
	2.4	6	2.4	0.48	330	12,000	2.4	0.48	330	12,000	2.40	0.05	60	3,200
2	2.45	6	2.45	0.49	330	12,000	2.45	0.49	330	12,000	2.45	0.05	60	3,200
	2.5	7	2.5	0.5	360	8,900	2.5	0.5	360	8,900	2.50	0.05	60	2,500
		10	2.5	0.5	360	8,900	2.5	0.5	360	8,900	2.50	0.05	60	2,500
	2.55	7	2.55	0.51	360	8,900	2.55	0.51	360	8,900	2.55	0.05	60	2,500
	2.6	7	2.6	0.52	360	8,900	2.6	0.52	360	8,900	2.60	0.05	60	2,500
	2.65	7	2.65	0.53	360	8,900	2.65	0.53	360	8,900	2.65	0.05	60	2,500
	2.7	7	2.7	0.54	360	8,900	2.7	0.54	360	8,900	2.70	0.05	60	2,500
	2.75	7	2.75	0.55	360	8,900	2.75	0.55	360	8,900	2.75	0.06	60	2,500
	2.8	7	2.8	0.56	360	8,900	2.8	0.56	360	8,900	2.80	0.06	60	2,500
	2.85	8	2.85	0.57	360	8,900	2.85	0.57	360	8,900	2.85	0.06	60	2,500
	2.9	8	2.9	0.58	360	8,900	2.9	0.58	360	8,900	2.90	0.06	60	2,500
	2.95	8	2.95	0.59	360	8,900	2.95	0.59	360	8,900	2.95	0.06	60	2,500
	3	5	3	0.6	370	7,500	3	0.6	370	7,500	3.00	0.06	70	2,200
		8	3	0.6	370	7,500	3	0.6	370	7,500	3.00	0.06	70	2,200
		12	3	0.6	370	7,500	3	0.6	370	7,500	3.00	0.06	70	2,200
	3.1	8	3.1	0.62	370	7,500	3.1	0.62	370	7,500	3.10	0.06	70	2,200
	3.2	8	3.2	0.64	370	7,500	3.2	0.64	370	7,500	3.20	0.06	70	2,200
	3.3	9	3.3	0.66	370	7,500	3.3	0.66	370	7,500	3.30	0.07	70	2,200
	3.4	9	3.4	0.68	370	7,500	3.4	0.68	370	7,500	3.40	0.07	70	2,200
	3.5	9	3.5	0.7	370	7,500	3.5	0.7	370	7,500	3.50	0.07	70	2,200
	3.6	9	3.6	0.72	370	7,500	3.6	0.72	370	7,500	3.60	0.07	70	2,200
	3.7	10	3.7	0.74	370	7,500	3.7	0.74	370	7,500	3.70	0.07	70	2,200
	3.8	10	3.8	0.76	370	7,500	3.8	0.76	370	7,500	3.80	0.08	70	2,200

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAS230
Model number:IAS230

平角立铣刀 Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
	3.9	10	3.9	0.78	370	7,500	3.9	0.78	370	7,500	3.90	0.08	70	2,200
	4	6	4	0.8	390	5,600	4	0.8	390	5,600	4.00	0.08	80	1,600
		10	4	0.8	390	5,600	4	0.8	390	5,600	4.00	0.08	80	1,600
		16	4	0.8	390	5,600	4	0.8	390	5,600	4.00	0.08	80	1,600
	4.1	11	4.1	0.82	390	5,600	4.1	0.82	390	5,600	4.10	0.08	80	1,600
	4.2	11	4.2	0.84	390	5,600	4.2	0.84	390	5,600	4.20	0.08	80	1,600
	4.3	11	4.3	0.86	390	5,600	4.3	0.86	390	5,600	4.30	0.09	80	1,600
	4.4	11	4.4	0.88	390	5,600	4.4	0.88	390	5,600	4.40	0.09	80	1,600
	4.5	12	4.5	0.9	390	5,600	4.5	0.9	390	5,600	4.50	0.09	80	1,600
	4.6	12	4.6	0.92	390	5,600	4.6	0.92	390	5,600	4.60	0.09	80	1,600
	4.7	12	4.7	0.94	390	5,600	4.7	0.94	390	5,600	4.70	0.09	80	1,600
	4.8	12	4.8	0.96	390	5,600	4.8	0.96	390	5,600	4.80	0.10	80	1,600
	4.9	13	4.9	0.98	390	5,600	4.9	0.98	390	5,600	4.90	0.10	80	1,600
	5	8	5	1	410	4,500	5	1	410	4,500	5.00	0.10	80	1,300
		13	5	1	410	4,500	5	1	410	4,500	5.00	0.10	80	1,300
		20	5	1	410	4,500	5	1	410	4,500	5.00	0.10	80	1,300
	5.1	13	5.1	1.02	410	4,500	5.1	1.02	410	4,500	5.10	0.10	80	1,300
	5.2	13	5.2	1.04	410	4,500	5.2	1.04	410	4,500	5.20	0.10	80	1,300
	5.3	14	5.3	1.06	410	4,500	5.3	1.06	410	4,500	5.30	0.11	80	1,300
2	5.4	14	5.4	1.08	410	4,500	5.4	1.08	410	4,500	5.40	0.11	80	1,300
	5.5	14	5.5	1.1	410	4,500	5.5	1.1	410	4,500	5.50	0.11	80	1,300
	5.6	14	5.6	1.12	410	4,500	5.6	1.12	410	4,500	5.60	0.11	80	1,300
	5.7	15	5.7	1.14	410	4,500	5.7	1.14	410	4,500	5.70	0.11	80	1,300
	5.8	15	5.8	1.16	410	4,500	5.8	1.16	410	4,500	5.80	0.12	80	1,300
	5.9	15	5.9	1.18	410	4,500	5.9	1.18	410	4,500	5.90	0.12	80	1,200
	6	10	6	1.2	410	3,700	6	1.2	410	3,700	6.00	0.12	80	1,200
		15	6	1.2	410	3,700	6	1.2	410	3,700	6.00	0.12	80	1,200
		24	6	1.2	410	3,700	6	1.2	410	3,700	6.00	0.12	80	1,200
	6.5	20	6.5	1.3	410	3,700	6.5	1.3	410	3,700	6.50	0.13	80	1,200
		17	6.5	1.3	410	3,700	6.5	1.3	410	3,700	6.50	0.13	80	1,200
	7	18	7	1.4	410	3,700	7	1.4	410	3,700	7.00	0.14	80	1,200
	7.5	20	7.5	1.5	410	3,700	7.5	1.5	410	3,700	7.50	0.15	80	1,200
	8	20	12	1.6	360	2,800	12	1.6	360	2,800	8.00	0.16	80	1,000
		32	12	1.6	360	2,800	12	1.6	360	2,800	8.00	0.16	80	1,000
	8.5	23	12.75	1.7	360	2,800	12.75	1.7	360	2,800	8.50	0.17	80	1,000
	9	23	13.5	1.8	360	2,800	13.5	1.8	360	2,800	9.00	0.18	80	1,000
	9.5	25	14.25	1.9	360	2,800	14.25	1.9	360	2,800	9.50	0.19	80	1,000
	10	25	15	2	330	2,200	15	2	330	2,200	10.00	0.20	80	900
		40	15	2	300	2,000	15	2	300	2,000	10.00	0.20	80	900
	10.5	28	15.75	2.1	330	2,200	15.75	2.1	330	2,200	10.50	0.21	80	900
	11	28	16.5	2.2	330	2,200	16.5	2.2	330	2,200	11.00	0.22	80	900
	11.5	30	17.25	2.3	330	2,200	17.25	2.3	330	2,200	11.50	0.23	80	900

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

平角立铣刀 Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	12	30	18	2.4	320	1,900	18	2.4	320	1,900	12.00	0.24	80	800
		48	18	2.4	300	1,700	18	2.4	300	1,700	12.00	0.24	80	800
	14	28	21	2.8	300	1,800	21	2.8	300	1,800	14.00	0.28	100	700
	16	48	24	3.2	300	1,700	24	3.2	300	1,700	16.00	0.32	100	600
	18	54	27	3.6	250	1,600	27	3.6	250	1,600	18.00	0.36	100	500
	20	60	30	4	250	1,500	30	4	250	1,500	20.00	0.40	100	400

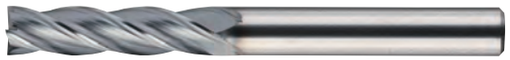
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

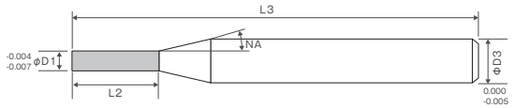
ion Depo Type A Series

超硬平角立铣刀　Carbide Square End Mill

■型号:IAS430　Model number:IAS430

ion A | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005





所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAS430-0100-00250	1	2.5	15	4	50	3,920
IAS430-0100-00400		4	15	4	50	6,800
IAS430-0150-00400	1.5	4	15	4	50	3,920
IAS430-0150-00600		6	15	4	50	6,800
IAS430-0200-00500	2	5	15	4	50	2,400
IAS430-0200-00800		8	15	4	50	4,800
IAS430-0250-00700	2.5	7	15	4	50	2,400
IAS430-0250-01000		10	15	4	50	4,800
IAS430-0300-00800	3	8	15	4	50	2,480
IAS430-0300-01200		12	15	4	50	5,040
IAS430-0350-00900	3.5	9	15	6	50	5,200
IAS430-0400-01000	4	10	15	6	50	2,800
IAS430-0400-01600		16	15	6	50	5,360
IAS430-0450-01200	4.5	12	15	6	50	5,600
IAS430-0500-01300	5	13	15	6	50	2,880
IAS430-0500-02000		20	15	6	60	5,520
IAS430-0550-01400	5.5	14	15	6	50	6,000
IAS430-0600-01500	6	15	—	6	50	3,040
IAS430-0600-02400		24	—	6	60	5,840
IAS430-0650-01700	6.5	17	15	8	70	10,240
IAS430-0700-01800	7	18	15	8	70	8,560
IAS430-0750-01900	7.5	19	15	8	70	10,800
IAS430-0800-02000	8	20	—	8	70	6,160
IAS430-0800-03200		32	—	8	80	11,920
IAS430-0850-02200	8.5	22	15	10	80	13,440
IAS430-0900-02300	9	23	15	10	80	13,440
IAS430-0950-02400	9.5	24	15	10	80	15,520
IAS430-1000-02500	10	25	—	10	80	8,240
IAS430-1000-04000		40	—	10	90	14,640
IAS430-1200-03000	12	30	—	12	110	11,280

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAS430-1200-04800	12	48	—	12	120	22,000
IAS430-1400-02600	14	26	—	14	110	11,760
IAS430-1600-03200	16	32	—	16	120	18,080
IAS430-1800-03200	18	32	—	18	120	21,040
IAS430-2000-03800	20	38	—	20	130	26,400

CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo A Series 平角 Square
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAS430
Model number:IAS430

平角立铣刀 Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	1	2.5	1.50	0.05	330	21,000	1.50	0.05	330	21,000	1.50	0.05	150	15,000	1.50	0.05	210	19,500
		4	1.50	0.05	300	21,000	1.50	0.05	300	21,000	1.50	0.05	150	15,000	1.50	0.05	210	19,500
	1.5	4	2.25	0.08	330	21,000	2.25	0.08	330	21,000	2.25	0.08	150	15,000	2.25	0.08	210	19,500
		6	2.25	0.08	300	21,000	2.25	0.08	300	21,000	2.25	0.08	150	15,000	2.25	0.08	210	19,500
	2	5	3.00	0.10	330	11,000	3.00	0.10	330	11,000	3.00	0.10	160	7,500	3.00	0.10	270	9,600
		8	3.00	0.10	300	11,000	3.00	0.10	300	11,000	3.00	0.10	160	7,500	3.00	0.10	270	9,600
	2.5	7	3.75	0.13	330	11,000	3.75	0.13	330	11,000	3.75	0.13	160	7,500	3.75	0.13	270	9,600
		10	3.75	0.13	300	11,000	3.75	0.13	300	11,000	3.75	0.13	160	7,500	3.75	0.13	270	9,600
	3	8	4.50	0.30	450	7,000	4.50	0.30	450	7,000	4.50	0.30	180	5,000	4.50	0.30	320	6,500
		12	4.50	0.30	400	7,000	4.50	0.30	400	7,000	4.50	0.30	180	5,000	4.50	0.30	320	6,500
	3.5	9	5.25	0.35	450	7,000	5.25	0.35	450	7,000	5.25	0.35	180	5,000	5.25	0.35	320	6,500
	4	10	6.00	0.40	500	5,200	6.00	0.40	500	5,200	6.00	0.40	180	3,600	6.00	0.40	380	5,000
		16	6.00	0.40	500	5,200	6.00	0.40	500	5,200	6.00	0.40	180	3,600	6.00	0.40	380	5,000
	4.5	12	6.75	0.45	500	5,200	6.75	0.45	500	5,200	6.75	0.45	180	3,600	6.75	0.45	380	5,000
	5	13	7.50	0.50	520	4,200	7.50	0.50	520	4,200	7.50	0.50	200	3,000	7.50	0.50	380	4,000
		20	7.50	0.50	520	4,200	7.50	0.50	520	4,200	7.50	0.50	200	3,000	7.50	0.50	380	4,000
	5.5	14	8.25	0.55	520	4,200	8.25	0.55	520	4,200	8.25	0.55	200	3,000	8.25	0.55	380	4,000
	6	15	9.00	0.60	540	3,500	9.00	0.60	540	3,500	9.00	0.60	200	2,500	9.00	0.60	380	3,200
		24	9.00	0.60	540	3,500	9.00	0.60	540	3,500	9.00	0.60	200	2,500	9.00	0.60	380	3,200
	6.5	17	9.75	0.65	540	3,500	9.75	0.65	540	3,500	9.75	0.65	200	2,500	9.75	0.65	380	3,200
	7	18	10.50	1.05	530	3,000	10.50	1.05	530	3,000	10.50	1.05	200	2,000	10.50	1.05	380	2,700
	7.5	19	11.25	1.13	530	3,000	11.25	1.13	530	3,000	11.25	1.13	200	2,000	11.25	1.13	380	2,700
	8	20	12.00	1.20	520	2,700	12.00	1.20	520	2,700	12.00	1.20	200	1,800	12.00	1.20	380	2,400
		32	12.00	1.20	520	2,700	12.00	1.20	520	2,700	12.00	1.20	200	1,800	12.00	1.20	380	2,400
	8.5	22	12.75	1.28	520	2,700	12.75	1.28	520	2,700	12.75	1.28	200	1,800	12.75	1.28	380	2,400
	9	23	13.50	1.35	480	2,300	13.50	1.35	480	2,300	13.50	1.35	200	1,600	13.50	1.35	380	2,100
	9.5	24	14.25	1.43	480	2,300	14.25	1.43	480	2,300	14.25	1.43	200	1,600	14.25	1.43	380	2,100
	10	25	15.00	1.50	470	2,100	15.00	1.50	470	2,100	15.00	1.50	200	1,500	15.00	1.50	380	1,900
		40	15.00	1.50	470	2,000	15.00	1.50	470	2,000	15.00	1.50	200	1,400	15.00	1.50	380	1,800
	12	30	18.00	1.80	440	1,700	18.00	1.80	440	1,700	18.00	1.80	200	1,200	18.00	1.80	380	1,600
		48	18.00	1.80	400	1,600	18.00	1.80	400	1,600	18.00	1.80	180	1,200	18.00	1.80	350	1,500
	14	26	21.00	2.10	430	1,500	21.00	2.10	430	1,500	21.00	2.10	180	1,000	21.00	2.10	350	1,400
	16	32	24.00	2.40	420	1,300	24.00	2.40	420	1,300	24.00	2.40	160	900	24.00	2.40	330	1,200
	18	32	27.00	2.70	400	1,200	27.00	2.70	400	1,200	27.00	2.70	160	800	27.00	2.70	330	1,100
	20	38	30.00	3.00	350	1,000	30.00	3.00	350	1,000	30.00	3.00	150	700	30.00	3.00	300	900

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

平角立铣刀 Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	1	2.5	1.50	0.05	160	9,600	1.50	0.05	210	19,500	1.50	0.05	150	15,000	1.50	0.05	410	22,500
		4	1.50	0.05	160	9,600	1.50	0.05	210	19,500	1.50	0.05	150	15,000	1.50	0.05	410	22,500
	1.5	4	2.25	0.08	160	9,600	2.25	0.08	210	19,500	2.25	0.08	150	15,000	2.25	0.08	450	15,000
		6	2.25	0.08	160	9,600	2.25	0.08	210	19,500	2.25	0.08	150	15,000	2.25	0.08	450	15,000
	2	5	3.00	0.10	180	5,000	3.00	0.10	270	9,600	3.00	0.10	160	7,500	3.00	0.10	500	12,000
		8	3.00	0.10	180	5,000	3.00	0.10	270	9,600	3.00	0.10	160	7,500	3.00	0.10	500	12,000
	2.5	7	3.75	0.13	180	5,000	3.75	0.13	270	9,600	3.75	0.13	160	7,500	3.75	0.13	540	9,000
		10	3.75	0.13	180	5,000	3.75	0.13	270	9,600	3.75	0.13	160	7,500	3.75	0.13	540	9,000
	3	8	4.50	0.30	210	3,200	4.50	0.30	320	6,500	4.50	0.30	180	5,000	4.50	0.30	550	7,500
		12	4.50	0.30	210	3,200	4.50	0.30	320	6,500	4.50	0.30	180	5,000	4.50	0.30	550	7,500
	3.5	9	5.25	0.35	210	3,200	5.25	0.35	320	6,500	5.25	0.35	180	5,000	5.25	0.35	570	6,500
	4	10	6.00	0.40	230	2,400	6.00	0.40	380	5,000	6.00	0.40	180	3,600	6.00	0.40	650	6,500
		16	6.00	0.40	230	2,400	6.00	0.40	380	5,000	6.00	0.40	180	3,600	6.00	0.40	650	5,600
	4.5	12	6.75	0.45	230	2,400	6.75	0.45	380	5,000	6.75	0.45	180	3,600	6.75	0.45	680	5,600
	5	13	7.50	0.50	250	2,000	7.50	0.50	380	4,000	7.50	0.50	200	3,000	7.50	0.50	700	5,000
		20	7.50	0.50	250	2,000	7.50	0.50	380	4,000	7.50	0.50	200	3,000	7.50	0.50	700	5,000
	5.5	14	8.25	0.55	250	2,000	8.25	0.55	380	4,000	8.25	0.55	200	3,000	8.25	0.55	700	4,500
	6	15	9.00	0.60	250	1,600	9.00	0.60	380	3,200	9.00	0.60	200	2,500	9.00	0.60	700	4,100
		24	9.00	0.60	250	1,600	9.00	0.60	380	3,200	9.00	0.60	200	2,500	9.00	0.60	700	4,100
	6.5	17	9.75	0.65	250	1,600	9.75	0.65	380	3,200	9.75	0.65	200	2,500	9.75	0.65	700	4,100
	7	18	10.50	1.05	250	1,500	10.50	1.05	380	2,700	10.50	1.05	200	2,000	10.50	1.05	700	4,100
	7.5	19	11.25	1.13	250	1,500	11.25	1.13	380	2,700	11.25	1.13	200	2,000	11.25	1.13	700	3,700
	8	20	12.00	1.20	250	1,200	12.00	1.20	380	2,400	12.00	1.20	200	1,800	12.00	1.20	700	2,800
		32	12.00	1.20	250	1,200	12.00	1.20	380	2,400	12.00	1.20	200	1,800	12.00	1.20	700	2,800
	8.5	22	12.75	1.28	250	1,200	12.75	1.28	380	2,400	12.75	1.28	200	1,800	12.75	1.28	700	2,800
	9	23	13.50	1.35	250	1,100	13.50	1.35	380	2,100	13.50	1.35	200	1,600	13.50	1.35	700	2,800
	9.5	24	14.25	1.43	250	1,100	14.25	1.43	380	2,100	14.25	1.43	200	1,600	14.25	1.43	700	2,800
	10	25	15.00	1.50	250	1,000	15.00	1.50	380	1,900	15.00	1.50	200	1,500	15.00	1.50	620	2,200
		40	15.00	1.50	210	900	15.00	1.50	300	1,800	15.00	1.50	200	1,500	15.00	1.50	550	2,000
	12	30	18.00	1.80	250	800	18.00	1.80	380	1,600	18.00	1.80	200	1,200	18.00	1.80	540	1,900
		48	18.00	1.80	200	700	18.00	1.80	300	1,500	18.00	1.80	200	1,200	18.00	1.80	500	1,800
	14	26	21.00	2.10	230	700	21.00	2.10	350	1,400	21.00	2.10	180	1,000	21.00	2.10	400	1,800
	16	32	24.00	2.40	210	500	24.00	2.40	330	1,200	24.00	2.40	160	900	24.00	2.40	350	1,600
	18	32	27.00	2.70	200	500	27.00	2.70	330	1,100	27.00	2.70	160	800	27.00	2.70	350	1,400
	20	38	27.00	2.70	180	400	30.00	3.00	300	900	30.00	3.00	150	700	30.00	3.00	300	1,200

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAS430
Model number:IAS430

平角立铣刀 Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	1	2.5	1.50	0.05	410	22,500	1.50	0.05	410	22,500	1.00	0.05	100	6,500
		4	1.50	0.05	410	22,500	1.50	0.05	410	22,500	1.00	0.05	100	6,500
	1.5	4	2.25	0.08	450	15,000	2.25	0.08	450	15,000	1.50	0.08	100	6,500
		6	2.25	0.08	450	15,000	2.25	0.08	450	15,000	1.50	0.08	100	6,500
	2	5	3.00	0.10	500	12,000	3.00	0.10	500	12,000	2.00	0.10	100	3,200
		8	3.00	0.10	500	12,000	3.00	0.10	500	12,000	2.00	0.10	100	3,200
	2.5	7	3.75	0.13	540	9,000	3.75	0.13	540	9,000	3.75	0.13	100	2,500
		10	3.75	0.13	540	9,000	3.75	0.13	540	9,000	3.75	0.13	100	2,500
	3	8	4.50	0.30	550	7,500	4.50	0.30	550	7,500	4.50	0.30	130	2,100
		12	4.50	0.30	550	7,500	4.50	0.30	550	7,500	4.50	0.30	130	2,100
	3.5	9	5.25	0.35	570	6,500	5.25	0.35	570	6,500	5.25	0.35	130	2,100
	4	10	6.00	0.40	650	6,500	6.00	0.40	650	6,500	6.00	0.40	130	1,600
		16	6.00	0.40	650	5,600	6.00	0.40	650	5,600	6.00	0.40	130	1,600
	4.5	12	6.75	0.45	680	5,600	6.75	0.45	680	5,600	6.75	0.45	130	1,600
	5	13	7.50	0.50	700	5,000	7.50	0.50	700	5,000	7.50	0.50	150	1,300
		20	7.50	0.50	700	5,000	7.50	0.50	700	5,000	7.50	0.50	150	1,300
	5.5	14	8.25	0.55	700	4,500	8.25	0.55	700	4,500	8.25	0.55	150	1,300
	6	15	9.00	0.60	700	4,100	9.00	0.60	700	4,100	9.00	0.60	150	1,100
		24	9.00	0.60	700	4,100	9.00	0.60	700	4,100	9.00	0.60	150	1,100
	6.5	17	9.75	0.65	700	4,100	9.75	0.65	700	4,100	9.75	0.65	150	1,100
	7	18	10.50	1.05	700	4,100	10.50	1.05	700	4,100	10.50	1.05	150	1,100
	7.5	19	11.25	1.13	700	3,700	11.25	1.13	700	3,700	11.25	1.13	150	1,100
	8	20	12.00	1.20	700	2,800	12.00	1.20	700	2,800	12.00	1.20	150	800
		32	12.00	1.20	700	2,800	12.00	1.20	700	2,800	12.00	1.20	150	800
	8.5	22	12.75	1.28	700	2,800	12.75	1.28	700	2,800	12.75	1.28	150	800
	9	23	13.50	1.35	700	2,800	13.50	1.35	700	2,800	13.50	1.35	150	800
	9.5	24	14.25	1.43	700	2,800	14.25	1.43	700	2,800	14.25	1.43	150	800
	10	25	15.00	1.50	620	2,200	15.00	1.50	620	2,200	15.00	1.50	150	600
		40	15.00	1.50	550	2,000	15.00	1.50	550	2,000	15.00	1.50	120	500
	12	30	18.00	1.80	540	1,900	18.00	1.80	540	1,900	18.00	1.80	150	500
		48	18.00	1.80	500	1,800	18.00	1.80	500	1,800	18.00	1.80	120	400
	14	26	21.00	2.10	400	1,800	21.00	2.10	400	1,800	21.00	2.10	130	500
	16	32	24.00	2.40	350	1,600	24.00	2.40	350	1,600	24.00	2.40	130	400
	18	32	27.00	2.70	350	1,400	27.00	2.70	350	1,400	27.00	2.70	130	400
	20	38	30.00	3.00	300	1,200	30.00	3.00	300	1,200	30.00	3.00	120	300

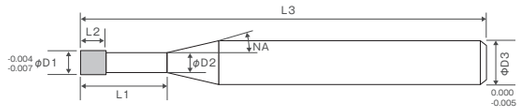
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

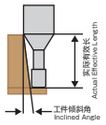
超硬长颈平角立铣刀
Carbide Long Neck Square End Mill

ion A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IALS230 Model number:IALS230



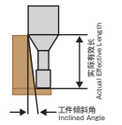
所示的仰角(NA)仅供参考,如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALS230-0010-0030	0.1	0.3	0.15	0.08	15	4	50	7,440	0.35	0.36	0.37	0.39	0.42
IALS230-0010-0050		0.5	0.15	0.08	15	4	50	8,160	0.56	0.57	0.60	0.62	0.67
IALS230-0010-0100		1	0.15	0.08	15	4	50	10,160	1.07	1.11	1.15	1.19	1.29
IALS230-0015-0030	0.15	0.3	0.2	0.13	15	4	50	6,960	0.35	0.36	0.37	0.39	0.42
IALS230-0015-0050		0.5	0.2	0.13	15	4	50	7,600	0.56	0.57	0.60	0.62	0.67
IALS230-0020-0050	0.2	0.5	0.3	0.18	15	4	50	4,880	0.56	0.57	0.60	0.62	0.67
IALS230-0020-0075		0.75	0.3	0.18	15	4	50	4,880	0.81	0.84	0.87	0.91	0.98
IALS230-0020-0100		1	0.3	0.18	15	4	50	5,280	1.07	1.11	1.15	1.19	1.29
IALS230-0030-0080	0.3	0.8	0.3	0.27	15	4	50	4,320	0.88	0.92	0.95	0.98	1.06
IALS230-0030-0100		1	0.4	0.27	15	4	50	4,320	1.09	1.13	1.17	1.21	1.31
IALS230-0030-0150-00030		1.5	0.3	0.27	15	4	50	4,320	1.61	1.66	1.72	1.79	1.93
IALS230-0030-0150-00040		1.5	0.4	0.27	15	4	50	4,320	1.61	1.66	1.72	1.79	1.93
IALS230-0030-0200		2	0.4	0.27	15	4	50	5,280	2.13	2.20	2.28	2.36	2.56
IALS230-0030-0250		2.5	0.4	0.27	15	4	50	5,520	2.64	2.73	2.83	2.94	3.18
IALS230-0030-0300		3	0.4	0.27	15	4	50	5,520	3.16	3.27	3.39	3.51	3.80
IALS230-0040-0100	0.4	1	0.6	0.37	15	4	50	3,120	1.09	1.13	1.17	1.21	1.31
IALS230-0040-0120		1.2	0.4	0.37	15	4	50	3,120	1.30	1.34	1.39	1.44	1.56
IALS230-0040-0150		1.5	0.6	0.37	15	4	50	3,120	1.61	1.66	1.72	1.79	1.93
IALS230-0040-0200		2	0.6	0.37	15	4	50	3,120	2.13	2.20	2.28	2.36	2.56
IALS230-0040-0250-00040		2.5	0.4	0.37	15	4	50	3,120	2.64	2.73	2.83	2.94	3.18
IALS230-0040-0250-00060		2.5	0.6	0.37	15	4	50	3,120	2.64	2.73	2.83	2.94	3.18
IALS230-0040-0300		3	0.6	0.37	15	4	50	3,120	3.16	3.27	3.39	3.51	3.80
IALS230-0050-0100	0.5	1	0.7	0.47	15	4	50	2,240	1.09	1.13	1.17	1.21	1.31
IALS230-0050-0150-00050		1.5	0.5	0.47	15	4	50	2,240	1.61	1.66	1.72	1.79	1.93
IALS230-0050-0150-00070		1.5	0.7	0.47	15	4	50	2,240	1.61	1.66	1.72	1.79	1.93
IALS230-0050-0200		2	0.7	0.47	15	4	50	2,240	2.13	2.20	2.28	2.36	2.56
IALS230-0050-0250		2.5	0.7	0.47	15	4	50	2,240	2.64	2.73	2.83	2.94	3.18
IALS230-0050-0300-00050		3	0.5	0.47	15	4	50	2,240	3.16	3.27	3.39	3.51	3.80
IALS230-0050-0300-00070		3	0.7	0.47	15	4	50	2,240	3.16	3.27	3.39	3.51	3.80
IALS230-0050-0350		3.5	0.7	0.47	15	4	50	2,240	3.68	3.80	3.94	4.09	4.42



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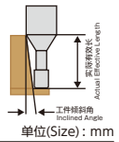
单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALS230-0050-0400	0.5	4	0.7	0.47	15	4	50	2,240	4.19	4.34	4.50	4.66	5.04
IALS230-0060-0150	0.6	1.5	0.9	0.57	15	4	50	2,400	1.61	1.66	1.72	1.79	1.93
IALS230-0060-0180		1.8	0.6	0.57	15	4	50	2,400	1.92	1.99	2.06	2.13	2.31
IALS230-0060-0200		2	0.9	0.57	15	4	50	2,400	2.13	2.20	2.28	2.36	2.56
IALS230-0060-0300		3	0.9	0.57	15	4	50	2,400	3.16	3.27	3.39	3.51	3.80
IALS230-0060-0400		4	0.9	0.57	15	4	50	2,400	4.19	4.34	4.50	4.66	5.04
IALS230-0060-0500		5	0.6	0.57	15	4	50	2,400	5.23	5.41	5.60	5.81	6.29
IALS230-0060-0600		6	0.9	0.57	15	4	50	2,400	6.26	6.48	6.71	6.96	7.53
IALS230-0070-0200	0.7	2	1	0.67	15	4	50	2,720	2.13	2.20	2.28	2.36	2.56
IALS230-0070-0400		4	1	0.67	15	4	50	2,720	4.19	4.34	4.50	4.66	5.04
IALS230-0070-0600		6	1	0.67	15	4	50	2,720	6.26	6.48	6.71	6.96	7.53
IALS230-0080-0220	0.8	2.2	0.8	0.77	15	4	50	2,640	2.33	2.41	2.50	2.59	2.80
IALS230-0080-0300		3	1.2	0.77	15	4	50	2,640	3.16	3.27	3.39	3.51	3.80
IALS230-0080-0400		4	1.2	0.77	15	4	50	2,640	4.19	4.34	4.50	4.66	5.04
IALS230-0080-0500		5	0.8	0.77	15	4	50	2,640	5.23	5.41	5.60	5.81	6.29
IALS230-0080-0600		6	1.2	0.77	15	4	50	2,640	6.26	6.48	6.71	6.96	7.53
IALS230-0080-0800		8	1.2	0.77	15	4	50	2,640	8.33	8.62	8.93	9.26	10.01
IALS230-0090-0400	0.9	4	1.4	0.87	15	4	50	3,040	4.19	4.34	4.50	4.66	5.04
IALS230-0090-0600		6	1.4	0.87	15	4	50	3,040	6.26	6.48	6.71	6.96	7.53
IALS230-0090-0800		8	1.4	0.87	15	4	50	3,040	8.33	8.62	8.93	9.26	10.01
IALS230-0100-0200	1	2	1.5	0.95	15	4	50	2,400	2.16	2.24	2.32	2.41	2.60
IALS230-0100-0300		3	0.8	0.95	15	4	50	2,400	3.20	3.31	3.43	3.56	3.85
IALS230-0100-0400		4	1.5	0.95	15	4	50	2,400	4.23	4.38	4.54	4.71	5.09
IALS230-0100-0600		6	0.8	0.95	15	4	50	2,400	6.30	6.52	6.75	7.01	7.57
IALS230-0100-0700		7	1.5	0.95	15	4	50	2,400	7.33	7.59	7.86	8.16	8.82
IALS230-0100-0800		8	1.5	0.95	15	4	50	2,400	8.37	8.66	8.97	9.31	10.06
IALS230-0100-0900		9	1.5	0.95	15	4	50	2,400	9.40	9.73	10.08	10.46	11.30
IALS230-0100-1000		10	0.8	0.95	15	4	50	2,400	10.43	10.80	11.19	11.61	12.55
IALS230-0100-1200		12	1.5	0.95	15	4	50	2,400	12.50	12.94	13.40	13.91	15.03
IALS230-0120-0400	1.2	4	1.8	1.15	15	4	50	2,560	4.23	4.38	4.54	4.71	5.09
IALS230-0120-0600		6	1.8	1.15	15	4	50	2,560	6.30	6.52	6.75	7.01	7.57
IALS230-0120-0800		8	1.8	1.15	15	4	50	2,560	8.37	8.66	8.97	9.31	10.06
IALS230-0120-1000		10	1.8	1.15	15	4	50	2,560	10.43	10.80	11.19	11.61	12.55
IALS230-0120-1200		12	1.8	1.15	15	4	50	2,560	12.50	12.94	13.40	13.91	15.03
IALS230-0140-0600	1.4	6	2.1	1.35	15	4	50	2,640	6.30	6.52	6.75	7.01	7.57
IALS230-0140-0800		8	2.1	1.35	15	4	50	2,640	8.37	8.66	8.97	9.31	10.06
IALS230-0140-1000		10	2.1	1.35	15	4	50	2,640	10.43	10.80	11.19	11.61	12.55
IALS230-0140-1200		12	2.1	1.35	15	4	50	2,640	12.50	12.94	13.40	13.91	15.03
IALS230-0140-1400		14	2.1	1.35	15	4	50	2,640	14.57	15.08	15.62	16.21	17.52
IALS230-0140-1600		16	2.1	1.35	15	4	50	3,040	16.64	17.21	17.84	18.50	20.01
IALS230-0150-0300	1.5	3	1.1	1.45	15	4	50	2,560	3.20	3.31	3.43	3.56	3.85
IALS230-0150-0400		4	2.3	1.45	15	4	50	2,560	4.23	4.38	4.54	4.71	5.09
IALS230-0150-0600		6	1.1	1.45	15	4	50	2,560	6.30	6.52	6.75	7.01	7.57
IALS230-0150-0800		8	2.3	1.45	15	4	50	2,560	8.37	8.66	8.97	9.31	10.06
IALS230-0150-1000		10	1.1	1.45	15	4	50	2,560	10.43	10.80	11.19	11.61	12.55

ion Depo Type A Series



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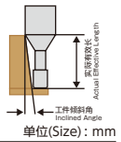
单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALS230-0150-1200	1.5	12	2.3	1.45	15	4	50	2,560	12.50	12.94	13.40	13.91	15.03
IALS230-0150-1400		14	2.3	1.45	15	4	50	2,640	14.57	15.08	15.62	16.21	17.52
IALS230-0150-1600		16	2.3	1.45	15	4	50	2,640	16.64	17.21	17.84	18.50	20.01
IALS230-0160-0600	1.6	6	2.4	1.55	15	4	50	2,640	6.30	6.52	6.75	7.01	7.57
IALS230-0160-0800		8	2.4	1.55	15	4	50	2,640	8.37	8.66	8.97	9.31	10.06
IALS230-0160-1000		10	2.4	1.55	15	4	50	2,640	10.43	10.80	11.19	11.61	12.55
IALS230-0160-1200		12	2.4	1.55	15	4	50	2,640	12.50	12.94	13.40	13.91	15.03
IALS230-0160-1400		14	2.4	1.55	15	4	50	2,640	14.57	15.08	15.62	16.21	17.52
IALS230-0160-1600		16	2.4	1.55	15	4	50	2,640	16.64	17.21	17.84	18.50	20.01
IALS230-0180-0600	1.8	6	2.7	1.75	15	4	50	2,640	6.30	6.52	6.75	7.01	7.57
IALS230-0180-0800		8	2.7	1.75	15	4	50	2,640	8.37	8.66	8.97	9.31	10.06
IALS230-0180-1000		10	2.7	1.75	15	4	50	2,640	10.43	10.80	11.19	11.61	12.55
IALS230-0180-1200		12	2.7	1.75	15	4	50	2,640	12.50	12.94	13.40	13.91	15.03
IALS230-0180-1400		14	2.7	1.75	15	4	50	2,640	14.57	15.08	15.62	16.21	17.52
IALS230-0180-1600		16	2.7	1.75	15	4	50	2,640	16.64	17.21	17.84	18.50	20.01
IALS230-0200-0400	2	4	3	1.94	15	4	50	2,560	4.25	4.40	4.56	4.73	5.11
IALS230-0200-0600		6	1.5	1.94	15	4	50	2,560	6.32	6.54	6.77	7.03	7.60
IALS230-0200-0800		8	3	1.94	15	4	50	2,560	8.39	8.68	8.99	9.33	10.08
IALS230-0200-1000		10	1.5	1.94	15	4	50	2,560	10.45	10.82	11.21	11.63	12.57
IALS230-0200-1200		12	3	1.94	15	4	50	2,560	12.52	12.96	13.42	13.93	15.06
IALS230-0200-1400		14	3	1.94	15	4	50	2,560	14.59	15.10	15.64	16.23	17.54
IALS230-0200-1500		15	1.5	1.94	15	4	50	2,560	15.62	16.17	16.75	17.38	18.79
IALS230-0200-1600		16	3	1.94	15	4	50	2,560	16.65	17.23	17.86	18.53	FREE
IALS230-0200-1800		18	3	1.94	15	4	50	2,560	18.72	19.37	20.07	20.83	FREE
IALS230-0200-2000		20	1.5	1.94	15	4	50	2,560	20.79	21.51	22.29	23.13	FREE
IALS230-0250-0800	2.5	8	3.7	2.44	15	4	50	2,640	8.39	8.68	8.99	9.33	10.08
IALS230-0250-1000		10	3.7	2.44	15	4	50	2,640	10.45	10.82	11.21	11.63	12.57
IALS230-0250-1200		12	3.7	2.44	15	4	50	2,640	12.52	12.96	13.42	13.93	FREE
IALS230-0250-1400		14	3.7	2.44	15	4	50	2,640	14.59	15.10	15.64	16.23	FREE
IALS230-0250-1600		16	3.7	2.44	15	4	50	2,640	16.65	17.23	17.86	18.53	FREE
IALS230-0250-1800		18	3.7	2.44	15	4	50	2,640	18.72	19.37	20.07	20.83	FREE
IALS230-0250-2000		20	3.7	2.44	15	4	50	2,640	20.79	21.51	22.29	FREE	FREE
IALS230-0300-0800	3	8	4.5	2.85	15	4	50	3,440	8.56	8.86	9.18	9.52	FREE
IALS230-0300-1000		10	2.5	2.85	15	4	50	3,440	10.63	11.00	11.39	11.82	FREE
IALS230-0300-1200		12	4.5	2.85	15	4	50	3,440	12.69	13.14	13.61	14.12	FREE
IALS230-0300-1400		14	4.5	2.85	15	4	50	3,440	14.76	15.27	15.83	FREE	FREE
IALS230-0300-1500		15	2.5	2.85	15	4	50	3,440	15.79	16.34	16.93	FREE	FREE
IALS230-0300-1600		16	4.5	2.85	15	4	50	3,440	16.83	17.41	18.04	FREE	FREE
IALS230-0300-1800		18	4.5	2.85	15	4	50	3,440	18.90	19.55	FREE	FREE	FREE
IALS230-0300-2000		20	2.5	2.85	15	4	50	3,440	20.96	21.69	FREE	FREE	FREE
IALS230-0300-2500		25	4.5	2.85	15	4	60	3,440	26.13	27.04	FREE	FREE	FREE
IALS230-0300-3000		30	4.5	2.85	15	4	60	4,080	31.30	FREE	FREE	FREE	FREE
IALS230-0400-1000	4	10	3	3.8	15	6	50	3,920	10.72	11.10	11.50	11.93	12.89
IALS230-0400-1200		12	6	3.8	15	6	50	3,920	12.79	13.24	13.71	14.23	15.38
IALS230-0400-1500		15	3	3.8	15	6	50	3,920	15.89	16.44	17.04	17.68	FREE



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单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALS230-0400-1600	4	16	6	3.8	15	6	50	3,920	16.92	17.51	18.15	18.83	FREE
IALS230-0400-2000		20	3	3.8	15	6	50	3,920	21.06	21.79	22.58	23.43	FREE
IALS230-0400-2500		25	6	3.8	15	6	60	3,920	26.23	27.14	28.12	FREE	FREE
IALS230-0400-3000		30	6	3.8	15	6	60	3,920	31.40	32.49	33.66	FREE	FREE
IALS230-0400-3500		35	6	3.8	15	6	70	3,920	36.56	37.84	FREE	FREE	FREE
IALS230-0500-1500	5	15	3.5	4.8	15	6	50	4,960	15.89	16.44	17.04	FREE	FREE
IALS230-0500-1600		16	7.5	4.8	15	6	50	4,960	16.92	17.51	18.15	FREE	FREE
IALS230-0500-2000		20	3.5	4.8	15	6	50	4,960	21.06	21.79	FREE	FREE	FREE
IALS230-0500-2500		25	7.5	4.8	15	6	60	4,960	26.23	27.14	FREE	FREE	FREE
IALS230-0500-3000		30	7.5	4.8	15	6	60	4,960	31.40	FREE	FREE	FREE	FREE
IALS230-0500-3500		35	7.5	4.8	15	6	70	4,960	36.56	FREE	FREE	FREE	FREE
IALS230-0500-4000		40	7.5	4.8	15	6	70	4,960	41.73	FREE	FREE	FREE	FREE
IALS230-0600-1500	6	15	6	5.8	15	6	50	2,640	FREE	FREE	FREE	FREE	FREE
IALS230-0600-2000		20	6	5.8	15	6	50	2,640	FREE	FREE	FREE	FREE	FREE
IALS230-0600-3000		30	6	5.8	15	6	60	2,640	FREE	FREE	FREE	FREE	FREE
IALS230-0600-4000		40	9	5.8	15	6	70	6,160	FREE	FREE	FREE	FREE	FREE
IALS230-0600-5000		50	9	5.8	15	6	80	7,840	FREE	FREE	FREE	FREE	FREE
IALS230-0600-6000		60	9	5.8	15	6	90	10,000	FREE	FREE	FREE	FREE	FREE

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS230
Model number:IALS230

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.1	0.3	0.005	0.06	150	40,000	0.005	0.06	150	40,000	0.004	0.06	120	40,000	0.005	0.06	150	40,000
		0.5	0.004	0.06	100	40,000	0.004	0.06	100	40,000	0.003	0.06	75	40,000	0.004	0.06	100	40,000
		1	0.002	0.06	40	40,000	0.002	0.06	40	40,000	0.002	0.06	30	40,000	0.002	0.06	40	40,000
	0.15	0.3	0.005	0.09	200	40,000	0.005	0.09	200	40,000	0.004	0.09	150	40,000	0.005	0.09	200	40,000
		0.5	0.005	0.09	150	40,000	0.005	0.09	150	40,000	0.004	0.09	120	40,000	0.005	0.09	150	40,000
	0.2	0.5	0.01	0.12	330	40,000	0.01	0.12	330	40,000	0.007	0.12	250	40,000	0.01	0.12	330	40,000
		0.75	0.008	0.12	280	40,000	0.008	0.12	280	40,000	0.006	0.12	220	40,000	0.008	0.12	280	40,000
		1	0.007	0.12	250	40,000	0.007	0.12	250	40,000	0.005	0.12	180	40,000	0.007	0.12	250	40,000
	0.3	0.8	0.02	0.18	400	40,000	0.02	0.18	400	40,000	0.015	0.18	260	35,000	0.02	0.18	400	40,000
		1	0.02	0.18	400	40,000	0.02	0.18	400	40,000	0.015	0.18	260	35,000	0.02	0.18	400	40,000
		1.5	0.015	0.18	350	40,000	0.015	0.18	350	40,000	0.01	0.18	230	35,000	0.015	0.18	350	40,000
		2	0.01	0.18	300	35,000	0.01	0.18	300	35,000	0.007	0.18	180	30,000	0.01	0.18	300	35,000
		2.5	0.007	0.18	250	30,000	0.007	0.18	250	30,000	0.005	0.18	160	25,000	0.007	0.18	250	30,000
		3	0.005	0.18	200	30,000	0.005	0.18	200	30,000	0.004	0.18	130	25,000	0.005	0.18	200	30,000
	0.4	1	0.025	0.24	500	35,000	0.025	0.24	500	35,000	0.018	0.24	330	30,000	0.025	0.24	500	35,000
		1.2	0.02	0.24	450	35,000	0.02	0.24	450	35,000	0.014	0.24	280	30,000	0.02	0.24	450	35,000
		1.5	0.02	0.24	450	35,000	0.02	0.24	450	35,000	0.014	0.24	280	30,000	0.02	0.24	450	35,000
		2	0.02	0.24	400	35,000	0.02	0.24	400	35,000	0.014	0.24	260	30,000	0.02	0.24	400	35,000
		2.5	0.015	0.24	350	30,000	0.015	0.24	350	30,000	0.01	0.24	230	25,000	0.015	0.24	350	30,000
		3	0.015	0.24	300	30,000	0.015	0.24	300	30,000	0.01	0.24	190	25,000	0.015	0.24	300	30,000
	0.5	1	0.03	0.3	550	30,000	0.03	0.3	550	30,000	0.022	0.3	350	25,000	0.03	0.3	550	30,000
		1.5	0.028	0.3	520	30,000	0.028	0.3	520	30,000	0.02	0.3	330	25,000	0.028	0.3	520	30,000
		2	0.025	0.3	500	30,000	0.025	0.3	500	30,000	0.018	0.3	320	25,000	0.025	0.3	500	30,000
		2.5	0.023	0.3	470	30,000	0.023	0.3	470	30,000	0.016	0.3	290	25,000	0.023	0.3	470	30,000
		3	0.02	0.3	450	30,000	0.02	0.3	450	30,000	0.014	0.3	280	25,000	0.02	0.3	450	30,000
		3.5	0.018	0.3	420	30,000	0.018	0.3	420	30,000	0.012	0.3	250	22,000	0.018	0.3	420	30,000
		4	0.015	0.3	350	25,000	0.015	0.3	350	25,000	0.01	0.3	230	22,000	0.015	0.3	350	25,000
	0.6	1.5	0.035	0.36	600	30,000	0.035	0.36	600	30,000	0.025	0.36	400	25,000	0.035	0.36	600	30,000
		1.8	0.035	0.36	600	30,000	0.035	0.36	600	30,000	0.025	0.36	380	25,000	0.035	0.36	600	30,000
		2	0.035	0.36	600	30,000	0.035	0.36	600	30,000	0.025	0.36	380	25,000	0.035	0.36	600	30,000
		3	0.03	0.36	550	30,000	0.03	0.36	550	30,000	0.02	0.36	350	25,000	0.03	0.36	550	30,000
		4	0.025	0.36	450	25,000	0.025	0.36	450	25,000	0.018	0.36	300	22,000	0.025	0.36	450	25,000
		5	0.02	0.36	400	25,000	0.02	0.36	400	25,000	0.014	0.36	240	20,000	0.02	0.36	400	25,000
		6	0.015	0.36	300	20,000	0.015	0.36	300	20,000	0.01	0.36	200	18,000	0.015	0.36	300	20,000
	0.7	2	0.04	0.42	650	30,000	0.04	0.42	650	30,000	0.03	0.42	400	25,000	0.04	0.42	650	30,000
		4	0.03	0.42	500	25,000	0.03	0.42	500	25,000	0.02	0.42	330	22,000	0.03	0.42	500	25,000
		6	0.02	0.42	350	20,000	0.02	0.42	350	20,000	0.015	0.42	240	18,000	0.02	0.42	350	20,000
	0.8	2.2	0.05	0.48	700	25,000	0.05	0.48	700	25,000	0.03	0.48	500	22,000	0.05	0.48	700	25,000
		3	0.05	0.48	700	25,000	0.05	0.48	700	25,000	0.03	0.48	500	22,000	0.05	0.48	700	25,000
		4	0.045	0.48	600	25,000	0.045	0.48	600	25,000	0.03	0.48	400	22,000	0.045	0.48	600	25,000
		5	0.035	0.48	500	22,000	0.035	0.48	500	22,000	0.025	0.48	350	20,000	0.035	0.48	500	22,000
		6	0.03	0.48	450	20,000	0.03	0.48	450	20,000	0.02	0.48	300	18,000	0.03	0.48	450	20,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.8	8	0.02	0.48	350	18,000	0.02	0.48	350	18,000	0.015	0.48	240	15,000	0.02	0.48	350	18,000
	0.9	4	0.05	0.54	900	25,000	0.05	0.54	900	25,000	0.035	0.54	600	22,000	0.05	0.54	900	25,000
		6	0.04	0.54	600	20,000	0.04	0.54	600	20,000	0.03	0.54	400	18,000	0.04	0.54	600	20,000
		8	0.03	0.54	500	18,000	0.03	0.54	500	18,000	0.02	0.54	330	16,000	0.03	0.54	500	18,000
	1	2	0.07	0.6	1,500	25,000	0.07	0.6	1,500	25,000	0.06	0.6	1,000	22,000	0.07	0.6	1,500	25,000
		3	0.06	0.6	1,200	25,000	0.06	0.6	1,200	25,000	0.05	0.6	800	22,000	0.06	0.6	1,200	25,000
		4	0.055	0.6	1,100	25,000	0.055	0.6	1,100	25,000	0.045	0.6	700	22,000	0.055	0.6	1,100	25,000
		6	0.045	0.6	800	20,000	0.045	0.6	800	20,000	0.035	0.6	500	18,000	0.045	0.6	800	20,000
		7	0.04	0.6	800	20,000	0.04	0.6	800	20,000	0.03	0.6	500	18,000	0.04	0.6	800	20,000
		8	0.035	0.6	700	18,000	0.035	0.6	700	18,000	0.025	0.6	400	15,000	0.035	0.6	700	18,000
		9	0.03	0.6	700	18,000	0.03	0.6	700	18,000	0.02	0.6	400	15,000	0.03	0.6	700	18,000
		10	0.025	0.6	600	16,000	0.025	0.6	600	16,000	0.018	0.6	350	14,000	0.025	0.6	600	16,000
		12	0.02	0.6	500	14,000	0.02	0.6	500	14,000	0.014	0.6	300	12,000	0.02	0.6	500	14,000
	1.2	4	0.06	0.72	1,200	23,000	0.06	0.72	1,200	23,000	0.05	0.72	800	20,000	0.06	0.72	1,200	23,000
		6	0.05	0.72	900	20,000	0.05	0.72	900	20,000	0.04	0.72	600	18,000	0.05	0.72	900	20,000
		8	0.04	0.72	800	18,000	0.04	0.72	800	18,000	0.03	0.72	500	15,000	0.04	0.72	800	18,000
		10	0.03	0.72	700	16,000	0.03	0.72	700	16,000	0.02	0.72	450	14,000	0.03	0.72	700	16,000
		12	0.025	0.72	600	14,000	0.025	0.72	600	14,000	0.018	0.72	350	12,000	0.025	0.72	600	14,000
	1.4	6	0.07	0.84	1,200	20,000	0.07	0.84	1,200	20,000	0.06	0.84	720	16,000	0.07	0.84	1,200	20,000
		8	0.06	0.84	1,000	18,000	0.06	0.84	1,000	18,000	0.05	0.84	580	14,000	0.06	0.84	1,000	18,000
		10	0.05	0.84	850	16,000	0.05	0.84	850	16,000	0.04	0.84	520	13,000	0.05	0.84	850	16,000
		12	0.04	0.84	700	14,000	0.04	0.84	700	14,000	0.03	0.84	450	12,000	0.04	0.84	700	14,000
		14	0.035	0.84	600	13,000	0.035	0.84	600	13,000	0.025	0.84	350	11,000	0.035	0.84	600	13,000
		16	0.025	0.84	500	12,000	0.025	0.84	500	12,000	0.018	0.84	300	10,000	0.025	0.84	500	12,000
	1.5	3	0.09	0.9	1,400	22,000	0.09	0.9	1,400	22,000	0.08	0.9	860	18,000	0.09	0.9	1,400	22,000
		4	0.09	0.9	1,400	22,000	0.09	0.9	1,400	22,000	0.08	0.9	860	18,000	0.09	0.9	1,400	22,000
		6	0.08	0.9	1,200	20,000	0.08	0.9	1,200	20,000	0.07	0.9	720	16,000	0.08	0.9	1,200	20,000
		8	0.07	0.9	1,000	18,000	0.07	0.9	1,000	18,000	0.06	0.9	580	14,000	0.07	0.9	1,000	18,000
		10	0.06	0.9	850	16,000	0.06	0.9	850	16,000	0.05	0.9	520	13,000	0.06	0.9	850	16,000
		12	0.05	0.9	700	14,000	0.05	0.9	700	14,000	0.04	0.9	450	12,000	0.05	0.9	700	14,000
		14	0.04	0.9	600	13,000	0.04	0.9	600	13,000	0.03	0.9	380	11,000	0.04	0.9	600	13,000
		16	0.035	0.9	500	12,000	0.035	0.9	500	12,000	0.025	0.9	320	10,000	0.035	0.9	500	12,000
	1.6	6	0.09	0.96	1,200	20,000	0.09	0.96	1,200	20,000	0.08	0.96	720	16,000	0.09	0.96	1,200	20,000
		8	0.08	0.96	1,000	18,000	0.08	0.96	1,000	18,000	0.07	0.96	580	14,000	0.08	0.96	1,000	18,000
		10	0.07	0.96	850	16,000	0.07	0.96	850	16,000	0.06	0.96	520	13,000	0.07	0.96	850	16,000
		12	0.06	0.96	700	14,000	0.06	0.96	700	14,000	0.05	0.96	450	12,000	0.06	0.96	700	14,000
		14	0.05	0.96	600	13,000	0.05	0.96	600	13,000	0.04	0.96	380	11,000	0.05	0.96	600	13,000
		16	0.04	0.96	500	12,000	0.04	0.96	500	12,000	0.03	0.96	320	10,000	0.04	0.96	500	12,000
	1.8	6	0.1	1.08	1,300	18,000	0.1	1.08	1,300	18,000	0.09	1.08	760	14,000	0.1	1.08	1,300	18,000
		8	0.09	1.08	1,100	18,000	0.09	1.08	1,100	18,000	0.08	1.08	640	14,000	0.09	1.08	1,100	18,000
		10	0.08	1.08	900	16,000	0.08	1.08	900	16,000	0.07	1.08	550	13,000	0.08	1.08	900	16,000
		12	0.07	1.08	750	14,000	0.07	1.08	750	14,000	0.06	1.08	480	12,000	0.07	1.08	750	14,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS230
Model number:IALS230

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	1.8	14	0.06	1.08	650	13,000	0.06	1.08	650	13,000	0.05	1.08	420	11,000	0.06	1.08	650	13,000
		16	0.05	1.08	550	12,000	0.05	1.08	550	12,000	0.04	1.08	350	10,000	0.05	1.08	550	12,000
	2	4	0.13	1.2	1,500	16,000	0.13	1.2	1,500	16,000	0.12	1.2	900	13,000	0.13	1.2	1,500	16,000
		6	0.12	1.2	1,400	16,000	0.12	1.2	1,400	16,000	0.1	1.2	850	13,000	0.12	1.2	1,400	16,000
		8	0.11	1.2	1,300	16,000	0.11	1.2	1,300	16,000	0.09	1.2	800	13,000	0.11	1.2	1,300	16,000
		10	0.1	1.2	1,200	16,000	0.1	1.2	1,200	16,000	0.08	1.2	750	13,000	0.1	1.2	1,200	16,000
		12	0.09	1.2	1,000	14,000	0.09	1.2	1,000	14,000	0.07	1.2	650	12,000	0.09	1.2	1,000	14,000
		14	0.08	1.2	900	13,000	0.08	1.2	900	13,000	0.06	1.2	570	11,000	0.08	1.2	900	13,000
		15	0.07	1.2	800	12,000	0.07	1.2	800	12,000	0.06	1.2	570	11,000	0.07	1.2	800	12,000
		16	0.07	1.2	800	12,000	0.07	1.2	800	12,000	0.05	1.2	500	10,000	0.07	1.2	800	12,000
		18	0.06	1.2	700	11,000	0.06	1.2	700	11,000	0.04	1.2	430	9,000	0.06	1.2	700	11,000
		20	0.05	1.2	600	10,000	0.05	1.2	600	10,000	0.035	1.2	360	8,000	0.05	1.2	600	10,000
	2.5	8	0.15	1.5	1,400	13,000	0.15	1.5	1,400	13,000	0.12	1.5	900	11,000	0.15	1.5	1,400	13,000
		10	0.14	1.5	1,300	13,000	0.14	1.5	1,300	13,000	0.11	1.5	800	11,000	0.14	1.5	1,300	13,000
		12	0.13	1.5	1,200	13,000	0.13	1.5	1,200	13,000	0.1	1.5	750	11,000	0.13	1.5	1,200	13,000
		14	0.12	1.5	1,000	12,000	0.12	1.5	1,000	12,000	0.09	1.5	650	10,000	0.12	1.5	1,000	12,000
		16	0.1	1.5	900	11,000	0.1	1.5	900	11,000	0.07	1.5	550	9,000	0.1	1.5	900	11,000
		18	0.09	1.5	800	10,000	0.09	1.5	800	10,000	0.06	1.5	480	8,000	0.09	1.5	800	10,000
		20	0.08	1.5	700	9,000	0.08	1.5	700	9,000	0.05	1.5	400	7,000	0.08	1.5	700	9,000
	3	8	0.2	1.8	1,500	11,000	0.2	1.8	1,500	11,000	0.16	1.8	1,000	9,000	0.2	1.8	1,500	11,000
		10	0.18	1.8	1,400	11,000	0.18	1.8	1,400	11,000	0.14	1.8	900	9,000	0.18	1.8	1,400	11,000
		12	0.16	1.8	1,300	11,000	0.16	1.8	1,300	11,000	0.12	1.8	800	9,000	0.16	1.8	1,300	11,000
		14	0.14	1.8	1,200	11,000	0.14	1.8	1,200	11,000	0.1	1.8	700	9,000	0.14	1.8	1,200	11,000
		15	0.12	1.8	1,000	10,000	0.12	1.8	1,000	10,000	0.1	1.8	700	9,000	0.12	1.8	1,000	10,000
		16	0.12	1.8	1,000	10,000	0.12	1.8	1,000	10,000	0.09	1.8	600	8,000	0.12	1.8	1,000	10,000
		18	0.11	1.8	900	10,000	0.11	1.8	900	10,000	0.08	1.8	550	8,000	0.11	1.8	900	10,000
		20	0.1	1.8	800	9,000	0.1	1.8	800	9,000	0.07	1.8	450	7,000	0.1	1.8	800	9,000
		25	0.08	1.8	700	8,000	0.08	1.8	700	8,000	0.06	1.8	380	6,000	0.08	1.8	700	8,000
		30	0.06	1.8	600	7,000	0.06	1.8	600	7,000	0.045	1.8	300	5,000	0.06	1.8	600	7,000
	4	10	0.3	2.4	1,500	8,000	0.3	2.4	1,500	8,000	0.25	2.4	850	6,000	0.3	2.4	1,500	8,000
		12	0.3	2.4	1,500	8,000	0.3	2.4	1,500	8,000	0.25	2.4	850	6,000	0.3	2.4	1,500	8,000
		15	0.25	2.4	1,400	8,000	0.25	2.4	1,400	8,000	0.2	2.4	800	6,000	0.25	2.4	1,400	8,000
		16	0.25	2.4	1,400	8,000	0.25	2.4	1,400	8,000	0.2	2.4	800	6,000	0.25	2.4	1,400	8,000
		20	0.2	2.4	1,300	8,000	0.2	2.4	1,300	8,000	0.15	2.4	730	6,000	0.2	2.4	1,300	8,000
		25	0.15	2.4	1,100	7,000	0.15	2.4	1,100	7,000	0.1	2.4	600	5,000	0.15	2.4	1,100	7,000
		30	0.12	2.4	1,000	7,000	0.12	2.4	1,000	7,000	0.08	2.4	540	5,000	0.12	2.4	1,000	7,000
		35	0.1	2.4	800	6,000	0.1	2.4	800	6,000	0.07	2.4	450	4,500	0.1	2.4	800	6,000
	5	15	0.35	3	1,400	6,000	0.35	3	1,400	6,000	0.3	3	800	4,500	0.35	3	1,400	6,000
		16	0.35	3	1,400	6,000	0.35	3	1,400	6,000	0.3	3	800	4,500	0.35	3	1,400	6,000
		20	0.3	3	1,300	6,000	0.3	3	1,300	6,000	0.25	3	730	4,500	0.3	3	1,300	6,000
		25	0.25	3	1,200	6,000	0.25	3	1,200	6,000	0.2	3	680	4,500	0.25	3	1,200	6,000
		30	0.2	3	900	5,000	0.2	3	900	5,000	0.15	3	540	4,000	0.2	3	900	5,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	5	35	0.15	3	800	5,000	0.15	3	800	5,000	0.1	3	420	3,500	0.15	3	800	5,000
		40	0.1	3	600	4,000	0.1	3	600	4,000	0.07	3	340	3,000	0.1	3	600	4,000
	6	15	0.45	3.6	1,500	5,500	0.45	3.6	1,500	5,500	0.38	3.6	700	3,800	0.45	3.6	1,500	5,500
		20	0.4	3.6	1,200	5,000	0.4	3.6	1,200	5,000	0.35	3.6	630	3,500	0.4	3.6	1,200	5,000
		30	0.35	3.6	900	4,000	0.35	3.6	900	4,000	0.3	3.6	500	3,000	0.35	3.6	900	4,000
		40	0.25	3.6	650	3,500	0.25	3.6	650	3,500	0.2	3.6	380	2,700	0.25	3.6	650	3,500
		50	0.15	3.6	500	3,000	0.15	3.6	500	3,000	0.1	3.6	280	2,200	0.15	3.6	500	3,000
		60	0.05	3.6	400	2,700	0.05	3.6	400	2,700	0.04	3.6	220	2,000	0.05	3.6	400	2,700

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS230
Model number:IALS230

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.1	0.3	0.004	0.06	70	40,000	0.005	0.06	150	40,000	0.004	0.06	120	40,000	0.006	0.06	150	40,000
		0.5	0.003	0.06	25	40,000	0.004	0.06	100	40,000	0.003	0.06	75	40,000	0.005	0.06	100	40,000
		1	0.002	0.06	20	40,000	0.002	0.06	40	40,000	0.002	0.06	30	40,000	0.002	0.06	40	40,000
	0.15	0.3	0.004	0.09	100	40,000	0.005	0.09	200	40,000	0.004	0.09	150	40,000	0.008	0.09	200	40,000
		0.5	0.004	0.09	70	40,000	0.005	0.09	150	40,000	0.004	0.09	120	40,000	0.008	0.09	150	40,000
	0.2	0.5	0.007	0.12	200	40,000	0.01	0.12	330	40,000	0.007	0.12	250	40,000	0.012	0.12	330	40,000
		0.75	0.006	0.12	170	40,000	0.008	0.12	280	40,000	0.006	0.12	220	40,000	0.01	0.12	280	40,000
		1	0.005	0.12	130	40,000	0.007	0.12	250	40,000	0.005	0.12	180	40,000	0.008	0.12	250	40,000
	0.3	0.8	0.015	0.18	210	35,000	0.02	0.18	400	40,000	0.015	0.18	260	35,000	0.024	0.18	400	40,000
		1	0.015	0.18	210	35,000	0.02	0.18	400	40,000	0.015	0.18	260	35,000	0.024	0.18	400	40,000
		1.5	0.01	0.18	180	35,000	0.015	0.18	350	40,000	0.01	0.18	230	35,000	0.018	0.18	350	40,000
		2	0.007	0.18	130	30,000	0.01	0.18	300	35,000	0.007	0.18	180	30,000	0.012	0.18	320	40,000
		2.5	0.005	0.18	110	25,000	0.007	0.18	250	30,000	0.005	0.18	160	25,000	0.008	0.18	280	35,000
		3	0.004	0.18	80	25,000	0.005	0.18	200	30,000	0.004	0.18	130	25,000	0.006	0.18	250	35,000
	0.4	1	0.018	0.24	280	30,000	0.025	0.24	500	35,000	0.018	0.24	330	30,000	0.03	0.24	600	40,000
		1.2	0.014	0.24	230	30,000	0.02	0.24	450	35,000	0.014	0.24	280	30,000	0.026	0.24	500	40,000
		1.5	0.014	0.24	230	30,000	0.02	0.24	450	35,000	0.014	0.24	280	30,000	0.026	0.24	500	40,000
		2	0.014	0.24	210	30,000	0.02	0.24	400	35,000	0.014	0.24	260	30,000	0.024	0.24	450	40,000
		2.5	0.01	0.24	180	25,000	0.015	0.24	350	30,000	0.01	0.24	230	25,000	0.02	0.24	400	40,000
		3	0.01	0.24	140	25,000	0.015	0.24	300	30,000	0.01	0.24	190	25,000	0.018	0.24	350	35,000
	0.5	1	0.022	0.3	300	25,000	0.03	0.3	550	30,000	0.022	0.3	350	25,000	0.036	0.3	650	35,000
		1.5	0.02	0.3	280	25,000	0.028	0.3	520	30,000	0.02	0.3	330	25,000	0.033	0.3	630	35,000
		2	0.018	0.3	270	25,000	0.025	0.3	500	30,000	0.018	0.3	320	25,000	0.03	0.3	600	35,000
		2.5	0.016	0.3	240	25,000	0.023	0.3	470	30,000	0.016	0.3	290	25,000	0.027	0.3	580	35,000
		3	0.014	0.3	230	25,000	0.02	0.3	450	30,000	0.014	0.3	280	25,000	0.024	0.3	550	35,000
		3.5	0.012	0.3	200	22,000	0.018	0.3	420	30,000	0.012	0.3	250	22,000	0.021	0.3	500	30,000
		4	0.01	0.3	180	22,000	0.015	0.3	350	25,000	0.01	0.3	230	22,000	0.018	0.3	420	30,000
	0.6	1.5	0.025	0.36	350	25,000	0.035	0.36	600	30,000	0.025	0.36	400	25,000	0.04	0.36	700	35,000
		1.8	0.025	0.36	330	25,000	0.035	0.36	600	30,000	0.025	0.36	380	25,000	0.04	0.36	700	35,000
		2	0.025	0.36	330	25,000	0.035	0.36	600	30,000	0.025	0.36	380	25,000	0.04	0.36	700	35,000
		3	0.02	0.36	300	25,000	0.03	0.36	550	30,000	0.02	0.36	350	25,000	0.035	0.36	650	35,000
		4	0.018	0.36	250	22,000	0.025	0.36	450	25,000	0.018	0.36	300	22,000	0.03	0.36	550	30,000
		5	0.014	0.36	190	20,000	0.02	0.36	400	25,000	0.014	0.36	240	20,000	0.024	0.36	480	30,000
		6	0.01	0.36	150	18,000	0.015	0.36	300	20,000	0.01	0.36	200	18,000	0.018	0.36	380	25,000
	0.7	2	0.03	0.42	350	25,000	0.04	0.42	650	30,000	0.03	0.42	400	25,000	0.05	0.42	750	35,000
		4	0.02	0.42	280	22,000	0.03	0.42	500	25,000	0.02	0.42	330	22,000	0.04	0.42	600	30,000
		6	0.015	0.42	190	18,000	0.02	0.42	350	20,000	0.015	0.42	240	18,000	0.03	0.42	450	25,000
	0.8	2.2	0.03	0.48	450	22,000	0.05	0.48	700	25,000	0.03	0.48	500	22,000	0.06	0.48	850	35,000
		3	0.03	0.48	450	22,000	0.05	0.48	700	25,000	0.03	0.48	500	22,000	0.06	0.48	850	35,000
		4	0.03	0.48	350	22,000	0.045	0.48	600	25,000	0.03	0.48	400	22,000	0.055	0.48	720	30,000
		5	0.025	0.48	300	20,000	0.035	0.48	500	22,000	0.025	0.48	350	20,000	0.05	0.48	650	30,000
		6	0.02	0.48	250	18,000	0.03	0.48	450	20,000	0.02	0.48	300	18,000	0.04	0.48	560	25,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.8	8	0.015	0.48	190	15,000	0.02	0.48	350	18,000	0.015	0.48	240	15,000	0.025	0.48	430	22,000
	0.9	4	0.035	0.54	550	22,000	0.05	0.54	900	25,000	0.035	0.54	600	22,000	0.06	0.54	1,000	30,000
		6	0.03	0.54	350	18,000	0.04	0.54	600	20,000	0.03	0.54	400	18,000	0.05	0.54	750	25,000
		8	0.02	0.54	280	16,000	0.03	0.54	500	18,000	0.02	0.54	330	16,000	0.04	0.54	620	22,000
	1	2	0.06	0.6	950	22,000	0.07	0.6	1,500	25,000	0.06	0.6	1,000	22,000	0.08	0.6	1,800	30,000
		3	0.05	0.6	750	22,000	0.06	0.6	1,200	25,000	0.05	0.6	800	22,000	0.07	0.6	1,500	30,000
		4	0.045	0.6	650	22,000	0.055	0.6	1,100	25,000	0.045	0.6	700	22,000	0.065	0.6	1,300	30,000
		6	0.035	0.6	450	18,000	0.045	0.6	800	20,000	0.035	0.6	500	18,000	0.055	0.6	1,000	25,000
		7	0.03	0.6	450	18,000	0.04	0.6	800	20,000	0.03	0.6	500	18,000	0.05	0.6	1,000	25,000
		8	0.025	0.6	350	15,000	0.035	0.6	700	18,000	0.025	0.6	400	15,000	0.045	0.6	850	22,000
		9	0.02	0.6	350	15,000	0.03	0.6	700	18,000	0.02	0.6	400	15,000	0.04	0.6	850	22,000
		10	0.018	0.6	300	14,000	0.025	0.6	600	16,000	0.018	0.6	350	14,000	0.03	0.6	750	20,000
		12	0.014	0.6	250	12,000	0.02	0.6	500	14,000	0.014	0.6	300	12,000	0.025	0.6	650	18,000
	1.2	4	0.05	0.72	750	20,000	0.06	0.72	1,200	23,000	0.05	0.72	800	20,000	0.07	0.72	1,400	27,000
		6	0.04	0.72	550	18,000	0.05	0.72	900	20,000	0.04	0.72	600	18,000	0.06	0.72	1,200	25,000
		8	0.03	0.72	450	15,000	0.04	0.72	800	18,000	0.03	0.72	500	15,000	0.05	0.72	1,000	22,000
		10	0.02	0.72	400	14,000	0.03	0.72	700	16,000	0.02	0.72	450	14,000	0.04	0.72	850	20,000
		12	0.018	0.72	300	12,000	0.025	0.72	600	14,000	0.018	0.72	350	12,000	0.03	0.72	700	17,000
	1.4	6	0.06	0.84	670	16,000	0.07	0.84	1,200	20,000	0.06	0.84	720	16,000	0.08	0.84	1,500	24,000
		8	0.05	0.84	530	14,000	0.06	0.84	1,000	18,000	0.05	0.84	580	14,000	0.07	0.84	1,300	22,000
		10	0.04	0.84	470	13,000	0.05	0.84	850	16,000	0.04	0.84	520	13,000	0.06	0.84	1,100	20,000
		12	0.03	0.84	400	12,000	0.04	0.84	700	14,000	0.03	0.84	450	12,000	0.05	0.84	850	17,000
		14	0.025	0.84	300	11,000	0.035	0.84	600	13,000	0.025	0.84	350	11,000	0.04	0.84	700	15,000
		16	0.018	0.84	250	10,000	0.025	0.84	500	12,000	0.018	0.84	300	10,000	0.03	0.84	550	13,000
	1.5	3	0.08	0.9	810	18,000	0.09	0.9	1,400	22,000	0.08	0.9	860	18,000	0.1	0.9	1,700	26,000
		4	0.08	0.9	810	18,000	0.09	0.9	1,400	22,000	0.08	0.9	860	18,000	0.1	0.9	1,700	26,000
		6	0.07	0.9	670	16,000	0.08	0.9	1,200	20,000	0.07	0.9	720	16,000	0.09	0.9	1,500	24,000
		8	0.06	0.9	530	14,000	0.07	0.9	1,000	18,000	0.06	0.9	580	14,000	0.08	0.9	1,300	22,000
		10	0.05	0.9	470	13,000	0.06	0.9	850	16,000	0.05	0.9	520	13,000	0.07	0.9	1,100	20,000
		12	0.04	0.9	400	12,000	0.05	0.9	700	14,000	0.04	0.9	450	12,000	0.06	0.9	850	17,000
		14	0.03	0.9	330	11,000	0.04	0.9	600	13,000	0.03	0.9	380	11,000	0.05	0.9	750	16,000
		16	0.025	0.9	270	10,000	0.035	0.9	500	12,000	0.025	0.9	320	10,000	0.04	0.9	650	15,000
	1.6	6	0.08	0.96	670	16,000	0.09	0.96	1,200	20,000	0.08	0.96	720	16,000	0.1	0.96	1,500	24,000
		8	0.07	0.96	530	14,000	0.08	0.96	1,000	18,000	0.07	0.96	580	14,000	0.09	0.96	1,300	22,000
		10	0.06	0.96	470	13,000	0.07	0.96	850	16,000	0.06	0.96	520	13,000	0.08	0.96	1,100	20,000
		12	0.05	0.96	400	12,000	0.06	0.96	700	14,000	0.05	0.96	450	12,000	0.07	0.96	900	18,000
		14	0.04	0.96	330	11,000	0.05	0.96	600	13,000	0.04	0.96	380	11,000	0.06	0.96	750	16,000
		16	0.03	0.96	270	10,000	0.04	0.96	500	12,000	0.03	0.96	320	10,000	0.05	0.96	620	14,000
	1.8	6	0.09	1.08	710	14,000	0.1	1.08	1,300	18,000	0.09	1.08	760	14,000	0.12	1.08	1,600	22,000
		8	0.08	1.08	590	14,000	0.09	1.08	1,100	18,000	0.08	1.08	640	14,000	0.11	1.08	1,400	22,000
		10	0.07	1.08	500	13,000	0.08	1.08	900	16,000	0.07	1.08	550	13,000	0.1	1.08	1,200	20,000
		12	0.06	1.08	430	12,000	0.07	1.08	750	14,000	0.06	1.08	480	12,000	0.085	1.08	900	17,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS230
Model number:IALS230

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	1.8	14	0.05	1.08	370	11,000	0.06	1.08	650	13,000	0.05	1.08	420	11,000	0.07	1.08	800	16,000
		16	0.04	1.08	300	10,000	0.05	1.08	550	12,000	0.04	1.08	350	10,000	0.06	1.08	700	15,000
	2	4	0.12	1.2	850	13,000	0.13	1.2	1,500	16,000	0.12	1.2	900	13,000	0.15	1.2	1,850	20,000
		6	0.1	1.2	800	13,000	0.12	1.2	1,400	16,000	0.1	1.2	850	13,000	0.14	1.2	1,750	20,000
		8	0.09	1.2	750	13,000	0.11	1.2	1,300	16,000	0.09	1.2	800	13,000	0.13	1.2	1,650	20,000
		10	0.08	1.2	700	13,000	0.1	1.2	1,200	16,000	0.08	1.2	750	13,000	0.12	1.2	1,500	20,000
		12	0.07	1.2	600	12,000	0.09	1.2	1,000	14,000	0.07	1.2	650	12,000	0.11	1.2	1,200	17,000
		14	0.06	1.2	520	11,000	0.08	1.2	900	13,000	0.06	1.2	570	11,000	0.1	1.2	1,100	16,000
		15	0.06	1.2	520	11,000	0.07	1.2	800	12,000	0.06	1.2	570	11,000	0.085	1.2	1,000	15,000
		16	0.05	1.2	450	10,000	0.07	1.2	800	12,000	0.05	1.2	500	10,000	0.085	1.2	1,000	15,000
		18	0.04	1.2	380	9,000	0.06	1.2	700	11,000	0.04	1.2	430	9,000	0.07	1.2	800	13,000
		20	0.035	1.2	310	8,000	0.05	1.2	600	10,000	0.035	1.2	360	8,000	0.06	1.2	720	12,000
	2.5	8	0.12	1.5	850	11,000	0.15	1.5	1,400	13,000	0.12	1.5	900	11,000	0.18	1.5	1,700	16,000
		10	0.11	1.5	750	11,000	0.14	1.5	1,300	13,000	0.11	1.5	800	11,000	0.17	1.5	1,600	16,000
		12	0.1	1.5	700	11,000	0.13	1.5	1,200	13,000	0.1	1.5	750	11,000	0.16	1.5	1,500	16,000
		14	0.09	1.5	600	10,000	0.12	1.5	1,000	12,000	0.09	1.5	650	10,000	0.15	1.5	1,200	14,000
		16	0.07	1.5	500	9,000	0.1	1.5	900	11,000	0.07	1.5	550	9,000	0.12	1.5	1,100	13,000
		18	0.06	1.5	430	8,000	0.09	1.5	800	10,000	0.06	1.5	480	8,000	0.11	1.5	950	12,000
		20	0.05	1.5	350	7,000	0.08	1.5	700	9,000	0.05	1.5	400	7,000	0.1	1.5	850	11,000
	3	8	0.16	1.8	950	9,000	0.2	1.8	1,500	11,000	0.16	1.8	1,000	9,000	0.24	1.8	1,800	13,000
		10	0.14	1.8	850	9,000	0.18	1.8	1,400	11,000	0.14	1.8	900	9,000	0.22	1.8	1,700	13,000
		12	0.12	1.8	750	9,000	0.16	1.8	1,300	11,000	0.12	1.8	800	9,000	0.2	1.8	1,600	13,000
		14	0.1	1.8	650	9,000	0.14	1.8	1,200	11,000	0.1	1.8	700	9,000	0.17	1.8	1,400	13,000
		15	0.1	1.8	650	9,000	0.12	1.8	1,000	10,000	0.1	1.8	700	9,000	0.15	1.8	1,200	12,000
		16	0.09	1.8	550	8,000	0.12	1.8	1,000	10,000	0.09	1.8	600	8,000	0.15	1.8	1,200	12,000
		18	0.08	1.8	500	8,000	0.11	1.8	900	10,000	0.08	1.8	550	8,000	0.13	1.8	1,100	12,000
		20	0.07	1.8	400	7,000	0.1	1.8	800	9,000	0.07	1.8	450	7,000	0.12	1.8	1,000	11,000
		25	0.06	1.8	330	6,000	0.08	1.8	700	8,000	0.06	1.8	380	6,000	0.1	1.8	900	10,000
		30	0.045	1.8	250	5,000	0.06	1.8	600	7,000	0.045	1.8	300	5,000	0.07	1.8	730	8,500
	4	10	0.25	2.4	800	6,000	0.3	2.4	1,500	8,000	0.25	2.4	850	6,000	0.36	2.4	1,900	10,000
		12	0.25	2.4	800	6,000	0.3	2.4	1,500	8,000	0.25	2.4	850	6,000	0.36	2.4	1,900	10,000
		15	0.2	2.4	750	6,000	0.25	2.4	1,400	8,000	0.2	2.4	800	6,000	0.3	2.4	1,800	10,000
		16	0.2	2.4	750	6,000	0.25	2.4	1,400	8,000	0.2	2.4	800	6,000	0.3	2.4	1,800	10,000
		20	0.15	2.4	680	6,000	0.2	2.4	1,300	8,000	0.15	2.4	730	6,000	0.24	2.4	1,600	10,000
		25	0.1	2.4	550	5,000	0.15	2.4	1,100	7,000	0.1	2.4	600	5,000	0.18	2.4	1,300	8,500
		30	0.08	2.4	490	5,000	0.12	2.4	1,000	7,000	0.08	2.4	540	5,000	0.15	2.4	1,200	8,500
		35	0.07	2.4	400	4,500	0.1	2.4	800	6,000	0.07	2.4	450	4,500	0.12	2.4	1,000	7,200
	5	15	0.3	3	750	4,500	0.35	3	1,400	6,000	0.3	3	800	4,500	0.42	3	1,700	7,200
		16	0.3	3	750	4,500	0.35	3	1,400	6,000	0.3	3	800	4,500	0.42	3	1,700	7,200
		20	0.25	3	680	4,500	0.3	3	1,300	6,000	0.25	3	730	4,500	0.36	3	1,600	7,200
		25	0.2	3	630	4,500	0.25	3	1,200	6,000	0.2	3	680	4,500	0.3	3	1,500	7,200
		30	0.15	3	490	4,000	0.2	3	900	5,000	0.15	3	540	4,000	0.24	3	1,100	6,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	5	35	0.1	3	370	3,500	0.15	3	800	5,000	0.1	3	420	3,500	0.18	3	1,000	6,000
		40	0.07	3	290	3,000	0.1	3	600	4,000	0.07	3	340	3,000	0.12	3	720	4,800
	6	15	0.38	3.6	650	3,800	0.45	3.6	1,500	5,500	0.38	3.6	700	3,800	0.5	3.6	1,700	6,500
		20	0.35	3.6	580	3,500	0.4	3.6	1,200	5,000	0.35	3.6	630	3,500	0.48	3.6	1,500	6,000
		30	0.3	3.6	450	3,000	0.35	3.6	900	4,000	0.3	3.6	500	3,000	0.42	3.6	1,100	4,800
		40	0.2	3.6	330	2,700	0.25	3.6	650	3,500	0.2	3.6	380	2,700	0.3	3.6	780	4,200
		50	0.1	3.6	230	2,200	0.15	3.6	500	3,000	0.1	3.6	280	2,200	0.18	3.6	600	3,600
		60	0.04	3.6	170	2,000	0.05	3.6	400	2,700	0.04	3.6	220	2,000	0.06	3.6	480	3,200

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS230
Model number:IALS230

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.3	0.006	0.06	150	40,000	0.006	0.06	150	40,000	0.004	0.06	70	40,000
		0.5	0.005	0.06	100	40,000	0.005	0.06	100	40,000	0.003	0.06	25	40,000
		1	0.002	0.06	40	40,000	0.002	0.06	40	40,000	0.002	0.06	20	40,000
	0.15	0.3	0.008	0.09	200	40,000	0.008	0.09	200	40,000	0.004	0.09	100	40,000
		0.5	0.008	0.09	150	40,000	0.008	0.09	150	40,000	0.004	0.09	70	40,000
	0.2	0.5	0.012	0.12	330	40,000	0.012	0.12	330	40,000	0.007	0.12	200	40,000
		0.75	0.01	0.12	280	40,000	0.01	0.12	280	40,000	0.006	0.12	170	40,000
		1	0.008	0.12	250	40,000	0.008	0.12	250	40,000	0.005	0.12	130	40,000
	0.3	0.8	0.024	0.18	400	40,000	0.024	0.18	400	40,000	0.015	0.18	210	35,000
		1	0.024	0.18	400	40,000	0.024	0.18	400	40,000	0.015	0.18	210	35,000
		1.5	0.018	0.18	350	40,000	0.018	0.18	350	40,000	0.01	0.18	180	35,000
		2	0.012	0.18	320	40,000	0.012	0.18	320	40,000	0.007	0.18	130	30,000
		2.5	0.008	0.18	280	35,000	0.008	0.18	280	35,000	0.005	0.18	110	25,000
		3	0.006	0.18	250	35,000	0.006	0.18	250	35,000	0.004	0.18	80	25,000
	0.4	1	0.03	0.24	600	40,000	0.03	0.24	600	40,000	0.018	0.24	280	30,000
		1.2	0.026	0.24	500	40,000	0.026	0.24	500	40,000	0.014	0.24	230	30,000
		1.5	0.026	0.24	500	40,000	0.026	0.24	500	40,000	0.014	0.24	230	30,000
		2	0.024	0.24	450	40,000	0.024	0.24	450	40,000	0.014	0.24	210	30,000
		2.5	0.02	0.24	400	40,000	0.02	0.24	400	40,000	0.01	0.24	180	25,000
		3	0.018	0.24	350	35,000	0.018	0.24	350	35,000	0.01	0.24	140	25,000
	0.5	1	0.036	0.3	650	35,000	0.036	0.3	650	35,000	0.022	0.3	300	25,000
		1.5	0.033	0.3	630	35,000	0.033	0.3	630	35,000	0.02	0.3	280	25,000
		2	0.03	0.3	600	35,000	0.03	0.3	600	35,000	0.018	0.3	270	25,000
		2.5	0.027	0.3	580	35,000	0.027	0.3	580	35,000	0.016	0.3	240	25,000
		3	0.024	0.3	550	35,000	0.024	0.3	550	35,000	0.014	0.3	230	25,000
		3.5	0.021	0.3	500	30,000	0.021	0.3	500	30,000	0.012	0.3	200	22,000
		4	0.018	0.3	420	30,000	0.018	0.3	420	30,000	0.01	0.3	180	22,000
	0.6	1.5	0.04	0.36	700	35,000	0.04	0.36	700	35,000	0.025	0.36	350	25,000
		1.8	0.04	0.36	700	35,000	0.04	0.36	700	35,000	0.025	0.36	330	25,000
		2	0.04	0.36	700	35,000	0.04	0.36	700	35,000	0.025	0.36	330	25,000
		3	0.035	0.36	650	35,000	0.035	0.36	650	35,000	0.02	0.36	300	25,000
		4	0.03	0.36	550	30,000	0.03	0.36	550	30,000	0.018	0.36	250	22,000
		5	0.024	0.36	480	30,000	0.024	0.36	480	30,000	0.014	0.36	190	20,000
		6	0.018	0.36	380	25,000	0.018	0.36	380	25,000	0.01	0.36	150	18,000
	0.7	2	0.05	0.42	750	35,000	0.05	0.42	750	35,000	0.03	0.42	350	25,000
		4	0.04	0.42	600	30,000	0.04	0.42	600	30,000	0.02	0.42	280	22,000
		6	0.03	0.42	450	25,000	0.03	0.42	450	25,000	0.015	0.42	190	18,000
	0.8	2.2	0.06	0.48	850	35,000	0.06	0.48	850	35,000	0.03	0.48	450	22,000
		3	0.06	0.48	850	35,000	0.06	0.48	850	35,000	0.03	0.48	450	22,000
		4	0.055	0.48	720	30,000	0.055	0.48	720	30,000	0.03	0.48	350	22,000
		5	0.05	0.48	650	30,000	0.05	0.48	650	30,000	0.025	0.48	300	20,000
		6	0.04	0.48	560	25,000	0.04	0.48	560	25,000	0.02	0.48	250	18,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.8	8	0.025	0.48	430	22,000	0.025	0.48	430	22,000	0.015	0.48	190	15,000
	0.9	4	0.06	0.54	1,000	30,000	0.06	0.54	1,000	30,000	0.035	0.54	550	22,000
		6	0.05	0.54	750	25,000	0.05	0.54	750	25,000	0.03	0.54	350	18,000
		8	0.04	0.54	620	22,000	0.04	0.54	620	22,000	0.02	0.54	280	16,000
	1	2	0.08	0.6	1,800	30,000	0.08	0.6	1,800	30,000	0.06	0.6	950	22,000
		3	0.07	0.6	1,500	30,000	0.07	0.6	1,500	30,000	0.05	0.6	750	22,000
		4	0.065	0.6	1,300	30,000	0.065	0.6	1,300	30,000	0.045	0.6	650	22,000
		6	0.055	0.6	1,000	25,000	0.055	0.6	1,000	25,000	0.035	0.6	450	18,000
		7	0.05	0.6	1,000	25,000	0.05	0.6	1,000	25,000	0.03	0.6	450	18,000
		8	0.045	0.6	850	22,000	0.045	0.6	850	22,000	0.025	0.6	350	15,000
		9	0.04	0.6	850	22,000	0.04	0.6	850	22,000	0.02	0.6	350	15,000
		10	0.03	0.6	750	20,000	0.03	0.6	750	20,000	0.018	0.6	300	14,000
		12	0.025	0.6	650	18,000	0.025	0.6	650	18,000	0.014	0.6	250	12,000
	1.2	4	0.07	0.72	1,400	27,000	0.07	0.72	1,400	27,000	0.05	0.72	750	20,000
		6	0.06	0.72	1,200	25,000	0.06	0.72	1,200	25,000	0.04	0.72	550	18,000
		8	0.05	0.72	1,000	22,000	0.05	0.72	1,000	22,000	0.03	0.72	450	15,000
		10	0.04	0.72	850	20,000	0.04	0.72	850	20,000	0.02	0.72	400	14,000
		12	0.03	0.72	700	17,000	0.03	0.72	700	17,000	0.018	0.72	300	12,000
	1.4	6	0.08	0.84	1,500	24,000	0.08	0.84	1,500	24,000	0.06	0.84	670	16,000
		8	0.07	0.84	1,300	22,000	0.07	0.84	1,300	22,000	0.05	0.84	530	14,000
		10	0.06	0.84	1,100	20,000	0.06	0.84	1,100	20,000	0.04	0.84	470	13,000
		12	0.05	0.84	850	17,000	0.05	0.84	850	17,000	0.03	0.84	400	12,000
		14	0.04	0.84	700	15,000	0.04	0.84	700	15,000	0.025	0.84	300	11,000
		16	0.03	0.84	550	13,000	0.03	0.84	550	13,000	0.018	0.84	250	10,000
	1.5	3	0.1	0.9	1,700	26,000	0.1	0.9	1,700	26,000	0.08	0.9	810	18,000
		4	0.1	0.9	1,700	26,000	0.1	0.9	1,700	26,000	0.08	0.9	810	18,000
		6	0.09	0.9	1,500	24,000	0.09	0.9	1,500	24,000	0.07	0.9	670	16,000
		8	0.08	0.9	1,300	22,000	0.08	0.9	1,300	22,000	0.06	0.9	530	14,000
		10	0.07	0.9	1,100	20,000	0.07	0.9	1,100	20,000	0.05	0.9	470	13,000
		12	0.06	0.9	850	17,000	0.06	0.9	850	17,000	0.04	0.9	400	12,000
		14	0.05	0.9	750	16,000	0.05	0.9	750	16,000	0.03	0.9	330	11,000
		16	0.04	0.9	650	15,000	0.04	0.9	650	15,000	0.025	0.9	270	10,000
	1.6	6	0.1	0.96	1,500	24,000	0.1	0.96	1,500	24,000	0.08	0.96	670	16,000
		8	0.09	0.96	1,300	22,000	0.09	0.96	1,300	22,000	0.07	0.96	530	14,000
		10	0.08	0.96	1,100	20,000	0.08	0.96	1,100	20,000	0.06	0.96	470	13,000
		12	0.07	0.96	900	18,000	0.07	0.96	900	18,000	0.05	0.96	400	12,000
		14	0.06	0.96	750	16,000	0.06	0.96	750	16,000	0.04	0.96	330	11,000
		16	0.05	0.96	620	14,000	0.05	0.96	620	14,000	0.03	0.96	270	10,000
	1.8	6	0.12	1.08	1,600	22,000	0.12	1.08	1,600	22,000	0.09	1.08	710	14,000
		8	0.11	1.08	1,400	22,000	0.11	1.08	1,400	22,000	0.08	1.08	590	14,000
		10	0.1	1.08	1,200	20,000	0.1	1.08	1,200	20,000	0.07	1.08	500	13,000
		12	0.085	1.08	900	17,000	0.085	1.08	900	17,000	0.06	1.08	430	12,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS230
Model number:IALS230

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1.8	14	0.07	1.08	800	16,000	0.07	1.08	800	16,000	0.05	1.08	370	11,000
		16	0.06	1.08	700	15,000	0.06	1.08	700	15,000	0.04	1.08	300	10,000
	2	4	0.15	1.2	1,850	20,000	0.15	1.2	1,850	20,000	0.12	1.2	850	13,000
		6	0.14	1.2	1,750	20,000	0.14	1.2	1,750	20,000	0.1	1.2	800	13,000
		8	0.13	1.2	1,650	20,000	0.13	1.2	1,650	20,000	0.09	1.2	750	13,000
		10	0.12	1.2	1,500	20,000	0.12	1.2	1,500	20,000	0.08	1.2	700	13,000
		12	0.11	1.2	1,200	17,000	0.11	1.2	1,200	17,000	0.07	1.2	600	12,000
		14	0.1	1.2	1,100	16,000	0.1	1.2	1,100	16,000	0.06	1.2	520	11,000
		15	0.085	1.2	1,000	15,000	0.085	1.2	1,000	15,000	0.06	1.2	520	11,000
		16	0.085	1.2	1,000	15,000	0.085	1.2	1,000	15,000	0.05	1.2	450	10,000
		18	0.07	1.2	800	13,000	0.07	1.2	800	13,000	0.04	1.2	380	9,000
		20	0.06	1.2	720	12,000	0.06	1.2	720	12,000	0.035	1.2	310	8,000
	2.5	8	0.18	1.5	1,700	16,000	0.18	1.5	1,700	16,000	0.12	1.5	850	11,000
		10	0.17	1.5	1,600	16,000	0.17	1.5	1,600	16,000	0.11	1.5	750	11,000
		12	0.16	1.5	1,500	16,000	0.16	1.5	1,500	16,000	0.1	1.5	700	11,000
		14	0.15	1.5	1,200	14,000	0.15	1.5	1,200	14,000	0.09	1.5	600	10,000
		16	0.12	1.5	1,100	13,000	0.12	1.5	1,100	13,000	0.07	1.5	500	9,000
		18	0.11	1.5	950	12,000	0.11	1.5	950	12,000	0.06	1.5	430	8,000
		20	0.1	1.5	850	11,000	0.1	1.5	850	11,000	0.05	1.5	350	7,000
	3	8	0.24	1.8	1,800	13,000	0.24	1.8	1,800	13,000	0.16	1.8	950	9,000
		10	0.22	1.8	1,700	13,000	0.22	1.8	1,700	13,000	0.14	1.8	850	9,000
		12	0.2	1.8	1,600	13,000	0.2	1.8	1,600	13,000	0.12	1.8	750	9,000
		14	0.17	1.8	1,400	13,000	0.17	1.8	1,400	13,000	0.1	1.8	650	9,000
		15	0.15	1.8	1,200	12,000	0.15	1.8	1,200	12,000	0.1	1.8	650	9,000
		16	0.15	1.8	1,200	12,000	0.15	1.8	1,200	12,000	0.09	1.8	550	8,000
		18	0.13	1.8	1,100	12,000	0.13	1.8	1,100	12,000	0.08	1.8	500	8,000
		20	0.12	1.8	1,000	11,000	0.12	1.8	1,000	11,000	0.07	1.8	400	7,000
		25	0.1	1.8	900	10,000	0.1	1.8	900	10,000	0.06	1.8	330	6,000
		30	0.07	1.8	730	8,500	0.07	1.8	730	8,500	0.045	1.8	250	5,000
	4	10	0.36	2.4	1,900	10,000	0.36	2.4	1,900	10,000	0.25	2.4	800	6,000
		12	0.36	2.4	1,900	10,000	0.36	2.4	1,900	10,000	0.25	2.4	800	6,000
		15	0.3	2.4	1,800	10,000	0.3	2.4	1,800	10,000	0.2	2.4	750	6,000
		16	0.3	2.4	1,800	10,000	0.3	2.4	1,800	10,000	0.2	2.4	750	6,000
		20	0.24	2.4	1,600	10,000	0.24	2.4	1,600	10,000	0.15	2.4	680	6,000
		25	0.18	2.4	1,300	8,500	0.18	2.4	1,300	8,500	0.1	2.4	550	5,000
		30	0.15	2.4	1,200	8,500	0.15	2.4	1,200	8,500	0.08	2.4	490	5,000
		35	0.12	2.4	1,000	7,200	0.12	2.4	1,000	7,200	0.07	2.4	400	4,500
	5	15	0.42	3	1,700	7,200	0.42	3	1,700	7,200	0.3	3	750	4,500
		16	0.42	3	1,700	7,200	0.42	3	1,700	7,200	0.3	3	750	4,500
		20	0.36	3	1,600	7,200	0.36	3	1,600	7,200	0.25	3	680	4,500
		25	0.3	3	1,500	7,200	0.3	3	1,500	7,200	0.2	3	630	4,500
		30	0.24	3	1,100	6,000	0.24	3	1,100	6,000	0.15	3	490	4,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
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●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	5	35	0.18	3	1,000	6,000	0.18	3	1,000	6,000	0.1	3	370	3,500
		40	0.12	3	720	4,800	0.12	3	720	4,800	0.07	3	290	3,000
	6	15	0.5	3.6	1,700	6,500	0.5	3.6	1,700	6,500	0.38	3.6	650	3,800
		20	0.48	3.6	1,500	6,000	0.48	3.6	1,500	6,000	0.35	3.6	580	3,500
		30	0.42	3.6	1,100	4,800	0.42	3.6	1,100	4,800	0.3	3.6	450	3,000
		40	0.3	3.6	780	4,200	0.3	3.6	780	4,200	0.2	3.6	330	2,700
		50	0.18	3.6	600	3,600	0.18	3.6	600	3,600	0.1	3.6	230	2,200
		60	0.06	3.6	480	3,200	0.06	3.6	480	3,200	0.04	3.6	170	2,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
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●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
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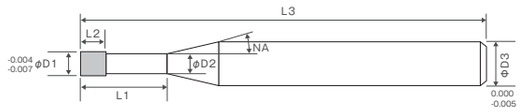
ion Depo Type A Series

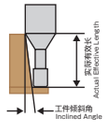
超硬长颈平角立铣刀
Carbide Long Neck Square End Mill

ion A | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IALS430 Model number:IALS430



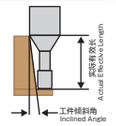
所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

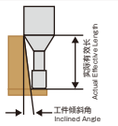
型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALS430-0100-0400	1	4	1.5	0.95	15	4	50	3,200	4.23	4.38	4.54	4.71	5.09
IALS430-0100-0600		6	0.8	0.95	15	4	50	3,200	6.30	6.52	6.75	7.01	7.57
IALS430-0100-0800		8	1.5	0.95	15	4	50	3,200	8.37	8.66	8.97	9.31	10.06
IALS430-0100-1000		10	0.8	0.95	15	4	50	3,200	10.43	10.80	11.19	11.61	12.55
IALS430-0100-1200		12	1.5	0.95	15	4	50	3,200	12.50	12.94	13.40	13.91	15.03
IALS430-0110-0600	1.1	6	1.7	1.05	15	4	50	5,600	6.30	6.52	6.75	7.01	7.57
IALS430-0110-1000		10	1.7	1.05	15	4	50	5,600	10.43	10.80	11.19	11.61	12.55
IALS430-0120-0600	1.2	6	1.8	1.15	15	4	50	3,200	6.30	6.52	6.75	7.01	7.57
IALS430-0120-0800		8	1.8	1.15	15	4	50	3,200	8.37	8.66	8.97	9.31	10.06
IALS430-0120-1000		10	1.8	1.15	15	4	50	3,200	10.43	10.80	11.19	11.61	12.55
IALS430-0120-1200		12	1.8	1.15	15	4	50	3,200	12.50	12.94	13.40	13.91	15.03
IALS430-0130-0600	1.3	6	1.9	1.25	15	4	50	5,600	6.30	6.52	6.75	7.01	7.57
IALS430-0130-1200		12	1.9	1.25	15	4	50	5,600	12.50	12.94	13.40	13.91	15.03
IALS430-0140-0600	1.4	6	2.1	1.35	15	4	50	3,200	6.30	6.52	6.75	7.01	7.57
IALS430-0140-0800		8	2.1	1.35	15	4	50	3,200	8.37	8.66	8.97	9.31	10.06
IALS430-0140-1000		10	2.1	1.35	15	4	50	3,200	10.43	10.80	11.19	11.61	12.55
IALS430-0140-1200		12	2.1	1.35	15	4	50	3,200	12.50	12.94	13.40	13.91	15.03
IALS430-0140-1400		14	2.1	1.35	15	4	50	3,200	14.57	15.08	15.62	16.21	17.52
IALS430-0140-1600		16	2.1	1.35	15	4	50	4,480	16.64	17.21	17.84	18.50	20.01
IALS430-0150-0300	1.5	3	1.1	1.45	15	4	50	3,200	3.20	3.31	3.43	3.56	3.85
IALS430-0150-0600		6	1.1	1.45	15	4	50	3,200	6.30	6.52	6.75	7.01	7.57
IALS430-0150-0800		8	2.3	1.45	15	4	50	3,200	8.37	8.66	8.97	9.31	10.06
IALS430-0150-1000		10	1.1	1.45	15	4	50	3,200	10.43	10.80	11.19	11.61	12.55
IALS430-0150-1200		12	2.3	1.45	15	4	50	3,200	12.50	12.94	13.40	13.91	15.03
IALS430-0150-1400		14	2.3	1.45	15	4	50	3,200	14.57	15.08	15.62	16.21	17.52
IALS430-0150-1600		16	2.3	1.45	15	4	50	3,200	16.64	17.21	17.84	18.50	20.01
IALS430-0160-0600	1.6	6	2.4	1.55	15	4	50	3,200	6.30	6.52	6.75	7.01	7.57
IALS430-0160-0800		8	2.4	1.55	15	4	50	3,200	8.37	8.66	8.97	9.31	10.06
IALS430-0160-1000		10	2.4	1.55	15	4	50	3,200	10.43	10.80	11.19	11.61	12.55
IALS430-0160-1200		12	2.4	1.55	15	4	50	3,200	12.50	12.94	13.40	13.91	15.03



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALS430-0160-1400	1.6	14	2.4	1.55	15	4	50	3,200	14.57	15.08	15.62	16.21	17.52
IALS430-0160-1600		16	2.4	1.55	15	4	50	3,200	16.64	17.21	17.84	18.50	20.01
IALS430-0170-0600	1.7	6	2.5	1.65	15	4	50	4,000	6.30	6.52	6.75	7.01	7.57
IALS430-0170-1400		14	2.5	1.65	15	4	50	4,000	14.57	15.08	15.62	16.21	17.52
IALS430-0180-0600	1.8	6	2.7	1.75	15	4	50	3,200	6.30	6.52	6.75	7.01	7.57
IALS430-0180-0800		8	2.7	1.75	15	4	50	3,200	8.37	8.66	8.97	9.31	10.06
IALS430-0180-1000		10	2.7	1.75	15	4	50	3,200	10.43	10.80	11.19	11.61	12.55
IALS430-0180-1200		12	2.7	1.75	15	4	50	3,200	12.50	12.94	13.40	13.91	15.03
IALS430-0180-1400		14	2.7	1.75	15	4	50	3,200	14.57	15.08	15.62	16.21	17.52
IALS430-0180-1600		16	2.7	1.75	15	4	50	3,200	16.64	17.21	17.84	18.50	20.01
IALS430-0190-0600	1.9	6	2.8	1.85	15	4	50	5,600	6.30	6.52	6.75	7.01	7.57
IALS430-0190-1600		16	2.8	1.85	15	4	50	5,600	16.64	17.21	17.84	18.50	20.01
IALS430-0200-0600	2	6	1.5	1.94	15	4	50	3,200	6.32	6.54	6.77	7.03	7.60
IALS430-0200-0800		8	3	1.94	15	4	50	3,200	8.39	8.68	8.99	9.33	10.08
IALS430-0200-1000		10	1.5	1.94	15	4	50	3,200	10.45	10.82	11.21	11.63	12.57
IALS430-0200-1200		12	3	1.94	15	4	50	3,200	12.52	12.96	13.42	13.93	15.06
IALS430-0200-1400		14	3	1.94	15	4	50	3,200	14.59	15.10	15.64	16.23	17.54
IALS430-0200-1500		15	1.5	1.94	15	4	50	3,200	15.62	16.17	16.75	17.38	18.79
IALS430-0200-1600		16	3	1.94	15	4	50	3,200	16.65	17.23	17.86	18.53	FREE
IALS430-0200-1800		18	3	1.94	15	4	50	3,200	18.72	19.37	20.07	20.83	FREE
IALS430-0200-2000		20	1.5	1.94	15	4	50	3,200	20.79	21.51	22.29	23.13	FREE
IALS430-0250-0800	2.5	8	3.7	2.44	15	4	50	3,200	8.39	8.68	8.99	9.33	10.08
IALS430-0250-1200		12	3.7	2.44	15	4	50	3,200	12.52	12.96	13.42	13.93	FREE
IALS430-0250-1600		16	3.7	2.44	15	4	50	3,200	16.65	17.23	17.86	18.53	FREE
IALS430-0250-2000		20	3.7	2.44	15	4	50	3,200	20.79	21.51	22.29	FREE	FREE
IALS430-0300-0800	3	8	4.5	2.85	15	4	50	4,480	8.56	8.86	9.18	9.52	FREE
IALS430-0300-1000		10	2.5	2.85	15	4	50	4,480	10.63	11.00	11.39	11.82	FREE
IALS430-0300-1200		12	4.5	2.85	15	4	50	4,480	12.69	13.14	13.61	14.12	FREE
IALS430-0300-1500		15	2.5	2.85	15	4	50	4,480	15.79	16.34	16.93	FREE	FREE
IALS430-0300-1600		16	4.5	2.85	15	4	50	4,480	16.83	17.41	18.04	FREE	FREE
IALS430-0300-2000		20	2.5	2.85	15	4	50	4,480	20.96	21.69	FREE	FREE	FREE
IALS430-0300-2500		25	4.5	2.85	15	4	60	4,480	26.13	27.04	FREE	FREE	FREE
IALS430-0300-3000		30	4.5	2.85	15	4	60	5,760	31.30	FREE	FREE	FREE	FREE
IALS430-0350-1500	3.5	15	5.5	3.35	15	6	50	5,040	15.79	16.34	16.93	17.57	18.99
IALS430-0350-2500		25	5.5	3.35	15	6	60	5,040	26.13	27.04	28.02	29.07	FREE
IALS430-0350-3500		35	5.5	3.35	15	6	70	6,400	36.47	37.74	39.10	FREE	FREE
IALS430-0400-1000	4	10	3	3.8	15	6	50	5,040	10.72	11.10	11.50	11.93	12.89
IALS430-0400-1200		12	6	3.8	15	6	50	5,040	12.79	13.24	13.71	14.23	15.38
IALS430-0400-1500		15	3	3.8	15	6	50	5,040	15.89	16.44	17.04	17.68	FREE
IALS430-0400-1600		16	6	3.8	15	6	50	5,040	16.92	17.51	18.15	18.83	FREE
IALS430-0400-2000		20	3	3.8	15	6	50	5,040	21.06	21.79	22.58	23.43	FREE
IALS430-0400-2500		25	6	3.8	15	6	60	5,040	26.23	27.14	28.12	FREE	FREE
IALS430-0400-3000		30	6	3.8	15	6	60	5,040	31.40	32.49	33.66	FREE	FREE
IALS430-0400-3500		35	6	3.8	15	6	70	5,040	36.56	37.84	FREE	FREE	FREE
IALS430-0500-1500	5	15	3.5	4.8	15	6	50	6,400	15.89	16.44	17.04	FREE	FREE



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALS430-0500-1600	5	16	7.5	4.8	15	6	50	6,400	16.92	17.51	18.15	FREE	FREE
IALS430-0500-2000		20	3.5	4.8	15	6	50	6,400	21.06	21.79	FREE	FREE	FREE
IALS430-0500-2500		25	7.5	4.8	15	6	60	6,400	26.23	27.14	FREE	FREE	FREE
IALS430-0500-3500		35	7.5	4.8	15	6	70	6,400	36.56	FREE	FREE	FREE	FREE
IALS430-0600-2000	6	20	6	5.8	15	6	50	6,400	FREE	FREE	FREE	FREE	FREE
IALS430-0600-3000		30	6	5.8	15	6	60	6,400	FREE	FREE	FREE	FREE	FREE
IALS430-0600-4000		40	9	5.8	15	6	70	7,680	FREE	FREE	FREE	FREE	FREE
IALS430-0600-5000		50	9	5.8	15	6	80	9,680	FREE	FREE	FREE	FREE	FREE
IALS430-0800-3000	8	30	12	7.8	15	8	70	11,200	FREE	FREE	FREE	FREE	FREE
IALS430-0800-5000		50	12	7.8	15	8	90	13,920	FREE	FREE	FREE	FREE	FREE
IALS430-0800-6000		60	12	7.8	15	8	100	14,880	FREE	FREE	FREE	FREE	FREE
IALS430-1000-4000	10	40	15	9.8	15	10	90	12,080	FREE	FREE	FREE	FREE	FREE
IALS430-1000-6000		60	15	9.8	15	10	110	16,720	FREE	FREE	FREE	FREE	FREE
IALS430-1000-8000		80	15	9.8	15	10	130	18,640	FREE	FREE	FREE	FREE	FREE

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS430
Model number:IALS430

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	1	4	0.055	0.6	1,700	25,000	0.055	0.6	1,700	25,000	0.045	0.6	1,100	22,000	0.055	0.6	1,700	25,000
		6	0.045	0.6	1,200	20,000	0.045	0.6	1,200	20,000	0.035	0.6	750	18,000	0.045	0.6	1,200	20,000
		8	0.035	0.6	1,050	18,000	0.035	0.6	1,050	18,000	0.025	0.6	600	15,000	0.035	0.6	1,050	18,000
		10	0.025	0.6	900	16,000	0.025	0.6	900	16,000	0.018	0.6	520	14,000	0.025	0.6	900	16,000
		12	0.02	0.6	750	14,000	0.02	0.6	750	14,000	0.014	0.6	450	12,000	0.02	0.6	750	14,000
	1.1	6	0.05	0.66	1,300	20,000	0.05	0.66	1,300	20,000	0.04	0.66	820	18,000	0.05	0.66	1,300	20,000
		10	0.03	0.66	1,000	16,000	0.03	0.66	1,000	16,000	0.02	0.66	600	14,000	0.03	0.66	1,000	16,000
	1.2	6	0.05	0.72	1,400	20,000	0.05	0.72	1,400	20,000	0.04	0.72	900	18,000	0.05	0.72	1,400	20,000
		8	0.04	0.72	1,200	18,000	0.04	0.72	1,200	18,000	0.03	0.72	750	15,000	0.04	0.72	1,200	18,000
		10	0.03	0.72	1,050	16,000	0.03	0.72	1,050	16,000	0.02	0.72	670	14,000	0.03	0.72	1,050	16,000
		12	0.025	0.72	900	14,000	0.025	0.72	900	14,000	0.018	0.72	530	12,000	0.025	0.72	900	14,000
	1.3	6	0.06	0.78	1,500	20,000	0.06	0.78	1,500	20,000	0.05	0.78	1,000	17,000	0.06	0.78	1,500	20,000
		12	0.03	0.78	1,000	14,000	0.03	0.78	1,000	14,000	0.025	0.78	600	12,000	0.03	0.78	1,000	14,000
	1.4	6	0.07	0.84	1,800	20,000	0.07	0.84	1,800	20,000	0.06	0.84	1,100	16,000	0.07	0.84	1,800	20,000
		8	0.06	0.84	1,500	18,000	0.06	0.84	1,500	18,000	0.05	0.84	900	14,000	0.06	0.84	1,500	18,000
		10	0.05	0.84	1,300	16,000	0.05	0.84	1,300	16,000	0.04	0.84	780	13,000	0.05	0.84	1,300	16,000
		12	0.04	0.84	1,050	14,000	0.04	0.84	1,050	14,000	0.03	0.84	670	12,000	0.04	0.84	1,050	14,000
		14	0.035	0.84	900	13,000	0.035	0.84	900	13,000	0.025	0.84	530	11,000	0.035	0.84	900	13,000
		16	0.025	0.84	750	12,000	0.025	0.84	750	12,000	0.018	0.84	450	10,000	0.025	0.84	750	12,000
	1.5	3	0.08	0.9	1,800	20,000	0.08	0.9	1,800	20,000	0.07	0.9	1,100	16,000	0.08	0.9	1,800	20,000
		6	0.08	0.9	1,800	20,000	0.08	0.9	1,800	20,000	0.07	0.9	1,100	16,000	0.08	0.9	1,800	20,000
		8	0.07	0.9	1,500	18,000	0.07	0.9	1,500	18,000	0.06	0.9	900	14,000	0.07	0.9	1,500	18,000
		10	0.06	0.9	1,300	16,000	0.06	0.9	1,300	16,000	0.05	0.9	780	13,000	0.06	0.9	1,300	16,000
		12	0.05	0.9	1,050	14,000	0.05	0.9	1,050	14,000	0.04	0.9	670	12,000	0.05	0.9	1,050	14,000
		14	0.04	0.9	900	13,000	0.04	0.9	900	13,000	0.03	0.9	570	11,000	0.04	0.9	900	13,000
		16	0.035	0.9	750	12,000	0.035	0.9	750	12,000	0.025	0.9	480	10,000	0.035	0.9	750	12,000
	1.6	6	0.09	0.96	1,800	20,000	0.09	0.96	1,800	20,000	0.08	0.96	1,100	16,000	0.09	0.96	1,800	20,000
		8	0.08	0.96	1,500	18,000	0.08	0.96	1,500	18,000	0.07	0.96	900	14,000	0.08	0.96	1,500	18,000
		10	0.07	0.96	1,300	16,000	0.07	0.96	1,300	16,000	0.06	0.96	780	13,000	0.07	0.96	1,300	16,000
		12	0.06	0.96	1,050	14,000	0.06	0.96	1,050	14,000	0.05	0.96	670	12,000	0.06	0.96	1,050	14,000
		14	0.05	0.96	900	13,000	0.05	0.96	900	13,000	0.04	0.96	570	11,000	0.05	0.96	900	13,000
		16	0.04	0.96	750	12,000	0.04	0.96	750	12,000	0.03	0.96	480	10,000	0.04	0.96	750	12,000
	1.7	6	0.095	1.02	1,900	19,000	0.095	1.02	1,900	19,000	0.085	1.02	1,150	15,000	0.095	1.02	1,900	19,000
		14	0.055	1.02	950	13,000	0.055	1.02	950	13,000	0.045	1.02	630	11,000	0.055	1.02	950	13,000
	1.8	6	0.1	1.08	2,000	18,000	0.1	1.08	2,000	18,000	0.09	1.08	1,200	14,000	0.1	1.08	2,000	18,000
		8	0.09	1.08	1,700	18,000	0.09	1.08	1,700	18,000	0.08	1.08	1,000	14,000	0.09	1.08	1,700	18,000
		10	0.08	1.08	1,400	16,000	0.08	1.08	1,400	16,000	0.07	1.08	850	13,000	0.08	1.08	1,400	16,000
		12	0.07	1.08	1,100	14,000	0.07	1.08	1,100	14,000	0.06	1.08	720	12,000	0.07	1.08	1,100	14,000
		14	0.06	1.08	1,000	13,000	0.06	1.08	1,000	13,000	0.05	1.08	630	11,000	0.06	1.08	1,000	13,000
		16	0.05	1.08	850	12,000	0.05	1.08	850	12,000	0.04	1.08	530	10,000	0.05	1.08	850	12,000
	1.9	6	0.11	1.14	2,100	17,000	0.11	1.14	2,100	17,000	0.095	1.14	1,250	14,000	0.11	1.14	2,100	17,000
		16	0.06	1.14	1,000	12,000	0.06	1.14	1,000	12,000	0.045	1.14	630	10,000	0.06	1.14	1,000	12,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS430
Model number:IALS430

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
	2	6	0.12	1.2	2,100	16,000	0.12	1.2	2,100	16,000	0.1	1.2	1,300	13,000	0.12	1.2	2,100	16,000
		8	0.11	1.2	2,000	16,000	0.11	1.2	2,000	16,000	0.09	1.2	1,200	13,000	0.11	1.2	2,000	16,000
		10	0.1	1.2	1,800	16,000	0.1	1.2	1,800	16,000	0.08	1.2	1,100	13,000	0.1	1.2	1,800	16,000
		12	0.09	1.2	1,500	14,000	0.09	1.2	1,500	14,000	0.07	1.2	1,000	12,000	0.09	1.2	1,500	14,000
		14	0.08	1.2	1,350	13,000	0.08	1.2	1,350	13,000	0.06	1.2	850	11,000	0.08	1.2	1,350	13,000
		15	0.07	1.2	1,200	12,000	0.07	1.2	1,200	12,000	0.05	1.2	750	10,000	0.07	1.2	1,200	12,000
		16	0.07	1.2	1,200	12,000	0.07	1.2	1,200	12,000	0.05	1.2	750	10,000	0.07	1.2	1,200	12,000
		18	0.06	1.2	1,000	11,000	0.06	1.2	1,000	11,000	0.04	1.2	650	9,000	0.06	1.2	1,000	11,000
		20	0.05	1.2	900	10,000	0.05	1.2	900	10,000	0.04	1.2	550	8,000	0.05	1.2	900	10,000
	2.5	8	0.15	1.5	2,100	13,000	0.15	1.5	2,100	13,000	0.12	1.5	1,400	11,000	0.15	1.5	2,100	13,000
		12	0.13	1.5	1,800	13,000	0.13	1.5	1,800	13,000	0.1	1.5	1,100	11,000	0.13	1.5	1,800	13,000
		16	0.1	1.5	1,400	11,000	0.1	1.5	1,400	11,000	0.07	1.5	850	9,000	0.1	1.5	1,400	11,000
		20	0.08	1.5	1,100	9,000	0.08	1.5	1,100	9,000	0.05	1.5	600	7,000	0.08	1.5	1,100	9,000
	3	8	0.2	1.8	2,300	11,000	0.2	1.8	2,300	11,000	0.16	1.8	1,500	9,000	0.2	1.8	2,300	11,000
		10	0.16	1.8	2,000	11,000	0.16	1.8	2,000	11,000	0.12	1.8	1,200	9,000	0.16	1.8	2,000	11,000
		12	0.16	1.8	2,000	11,000	0.16	1.8	2,000	11,000	0.12	1.8	1,200	9,000	0.16	1.8	2,000	11,000
		15	0.12	1.8	1,500	10,000	0.12	1.8	1,500	10,000	0.09	1.8	900	8,000	0.12	1.8	1,500	10,000
		16	0.12	1.8	1,500	10,000	0.12	1.8	1,500	10,000	0.09	1.8	900	8,000	0.12	1.8	1,500	10,000
		20	0.1	1.8	1,200	9,000	0.1	1.8	1,200	9,000	0.07	1.8	680	7,000	0.1	1.8	1,200	9,000
4		25	0.08	1.8	1,050	8,000	0.08	1.8	1,050	8,000	0.06	1.8	570	6,000	0.08	1.8	1,050	8,000
		30	0.06	1.8	900	7,000	0.06	1.8	900	7,000	0.5	1.8	450	5,000	0.06	1.8	900	7,000
	3.5	15	0.18	2.1	2,000	9,000	0.18	2.1	2,000	9,000	0.15	2.1	1,200	7,000	0.18	2.1	2,000	9,000
		25	0.12	2.1	1,500	7,500	0.12	2.1	1,500	7,500	0.08	2.1	850	6,000	0.12	2.1	1,500	7,500
		35	0.07	2.1	1,000	6,000	0.07	2.1	1,000	6,000	0.05	2.1	520	4,500	0.07	2.1	1,000	6,000
	4	10	0.3	2.4	2,200	8,000	0.3	2.4	2,200	8,000	0.25	2.4	1,300	6,000	0.3	2.4	2,200	8,000
		12	0.3	2.4	2,200	8,000	0.3	2.4	2,200	8,000	0.25	2.4	1,300	6,000	0.3	2.4	2,200	8,000
		15	0.25	2.4	2,100	8,000	0.25	2.4	2,100	8,000	0.2	2.4	1,200	6,000	0.25	2.4	2,100	8,000
		16	0.25	2.4	2,100	8,000	0.25	2.4	2,100	8,000	0.2	2.4	1,200	6,000	0.25	2.4	2,100	8,000
		20	0.2	2.4	2,000	8,000	0.2	2.4	2,000	8,000	0.15	2.4	1,100	6,000	0.2	2.4	2,000	8,000
		25	0.15	2.4	1,700	7,000	0.15	2.4	1,700	7,000	0.1	2.4	900	5,000	0.15	2.4	1,700	7,000
		30	0.12	2.4	1,500	7,000	0.12	2.4	1,500	7,000	0.08	2.4	800	5,000	0.12	2.4	1,500	7,000
		35	0.1	2.4	1,200	6,000	0.1	2.4	1,200	6,000	0.07	2.4	670	4,500	0.1	2.4	1,200	6,000
	5	15	0.35	3	2,100	6,000	0.35	3	2,100	6,000	0.3	3	1,200	4,500	0.35	3	2,100	6,000
		16	0.35	3	2,100	6,000	0.35	3	2,100	6,000	0.3	3	1,200	4,500	0.35	3	2,100	6,000
		20	0.25	3	1,800	6,000	0.25	3	1,800	6,000	0.2	3	1,000	4,500	0.25	3	1,800	6,000
		25	0.25	3	1,800	6,000	0.25	3	1,800	6,000	0.2	3	1,000	4,500	0.25	3	1,800	6,000
		35	0.15	3	1,200	5,000	0.15	3	1,200	5,000	0.1	3	630	3,500	0.15	3	1,200	5,000
	6	20	0.4	3.6	1,800	5,000	0.4	3.6	1,800	5,000	0.35	3.6	1,000	3,500	0.4	3.6	1,800	5,000
		30	0.35	3.6	1,400	4,000	0.35	3.6	1,400	4,000	0.3	3.6	750	3,000	0.35	3.6	1,400	4,000
		40	0.25	3.6	1,000	3,500	0.25	3.6	1,000	3,500	0.2	3.6	570	2,700	0.25	3.6	1,000	3,500
		50	0.15	3.6	750	3,000	0.15	3.6	750	3,000	0.1	3.6	420	2,200	0.15	3.6	750	3,000
	8	30	0.6	4.8	1,400	3,800	0.6	4.8	1,400	3,800	0.45	4.8	900	2,800	0.6	4.8	1,400	3,800

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	8	50	0.4	4.8	820	2,800	0.4	4.8	820	2,800	0.3	4.8	600	2,100	0.4	4.8	820	2,800
		60	0.3	4.8	680	2,400	0.3	4.8	680	2,400	0.2	4.8	450	1,800	0.3	4.8	680	2,400
	10	40	0.8	6	1,200	3,000	0.8	6	1,200	3,000	0.55	6	750	2,200	0.8	6	1,200	3,000
		60	0.6	6	750	2,200	0.6	6	750	2,200	0.45	6	520	1,600	0.6	6	750	2,200
		80	0.4	6	520	1,800	0.4	6	520	1,800	0.3	6	360	1,300	0.4	6	520	1,800

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS430
Model number:IALS430

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	1	4	0.045	0.6	950	22,000	0.055	0.6	1,700	25,000	0.045	0.6	1,100	22,000	0.055	0.6	1,700	25,000
		6	0.035	0.6	600	18,000	0.045	0.6	1,200	20,000	0.035	0.6	750	18,000	0.045	0.6	1,200	20,000
		8	0.025	0.6	450	15,000	0.035	0.6	1,050	18,000	0.025	0.6	600	15,000	0.035	0.6	1,050	18,000
		10	0.018	0.6	370	14,000	0.025	0.6	900	16,000	0.018	0.6	520	14,000	0.025	0.6	900	16,000
		12	0.014	0.6	300	12,000	0.02	0.6	750	14,000	0.014	0.6	450	12,000	0.02	0.6	750	14,000
	1.1	6	0.04	0.66	670	18,000	0.05	0.66	1,300	20,000	0.04	0.66	820	18,000	0.05	0.66	1,300	20,000
		10	0.02	0.66	450	14,000	0.03	0.66	1,000	16,000	0.02	0.66	600	14,000	0.03	0.66	1,000	16,000
	1.2	6	0.04	0.72	750	18,000	0.05	0.72	1,400	20,000	0.04	0.72	900	18,000	0.05	0.72	1,400	20,000
		8	0.03	0.72	600	15,000	0.04	0.72	1,200	18,000	0.03	0.72	750	15,000	0.04	0.72	1,200	18,000
		10	0.02	0.72	520	14,000	0.03	0.72	1,050	16,000	0.02	0.72	670	14,000	0.03	0.72	1,050	16,000
		12	0.018	0.72	380	12,000	0.025	0.72	900	14,000	0.018	0.72	530	12,000	0.025	0.72	900	14,000
	1.3	6	0.05	0.78	850	17,000	0.06	0.78	1,500	20,000	0.05	0.78	1,000	17,000	0.06	0.78	1,500	20,000
		12	0.025	0.78	450	12,000	0.03	0.78	1,000	14,000	0.025	0.78	600	12,000	0.03	0.78	1,000	14,000
	1.4	6	0.06	0.84	950	16,000	0.07	0.84	1,800	20,000	0.06	0.84	1,100	16,000	0.07	0.84	1,800	20,000
		8	0.05	0.84	750	14,000	0.06	0.84	1,500	18,000	0.05	0.84	900	14,000	0.06	0.84	1,500	18,000
		10	0.04	0.84	630	13,000	0.05	0.84	1,300	16,000	0.04	0.84	780	13,000	0.05	0.84	1,300	16,000
		12	0.03	0.84	520	12,000	0.04	0.84	1,050	14,000	0.03	0.84	670	12,000	0.04	0.84	1,050	14,000
		14	0.025	0.84	380	11,000	0.035	0.84	900	13,000	0.025	0.84	530	11,000	0.035	0.84	900	13,000
		16	0.018	0.84	300	10,000	0.025	0.84	750	12,000	0.018	0.84	450	10,000	0.025	0.84	750	12,000
	1.5	3	0.07	0.9	950	16,000	0.08	0.9	1,800	20,000	0.07	0.9	1,100	16,000	0.08	0.9	1,800	20,000
		6	0.07	0.9	950	16,000	0.08	0.9	1,800	20,000	0.07	0.9	1,100	16,000	0.08	0.9	1,800	20,000
		8	0.06	0.9	750	14,000	0.07	0.9	1,500	18,000	0.06	0.9	900	14,000	0.07	0.9	1,500	18,000
		10	0.05	0.9	630	13,000	0.06	0.9	1,300	16,000	0.05	0.9	780	13,000	0.06	0.9	1,300	16,000
		12	0.04	0.9	520	12,000	0.05	0.9	1,050	14,000	0.04	0.9	670	12,000	0.05	0.9	1,050	14,000
		14	0.03	0.9	420	11,000	0.04	0.9	900	13,000	0.03	0.9	570	11,000	0.04	0.9	900	13,000
		16	0.025	0.9	330	10,000	0.035	0.9	750	12,000	0.025	0.9	480	10,000	0.035	0.9	750	12,000
	1.6	6	0.08	0.96	950	16,000	0.09	0.96	1,800	20,000	0.08	0.96	1,100	16,000	0.09	0.96	1,800	20,000
		8	0.07	0.96	750	14,000	0.08	0.96	1,500	18,000	0.07	0.96	900	14,000	0.08	0.96	1,500	18,000
		10	0.06	0.96	630	13,000	0.07	0.96	1,300	16,000	0.06	0.96	780	13,000	0.07	0.96	1,300	16,000
		12	0.05	0.96	520	12,000	0.06	0.96	1,050	14,000	0.05	0.96	670	12,000	0.06	0.96	1,050	14,000
		14	0.04	0.96	420	11,000	0.05	0.96	900	13,000	0.04	0.96	570	11,000	0.05	0.96	900	13,000
		16	0.03	0.96	330	10,000	0.04	0.96	750	12,000	0.03	0.96	480	10,000	0.04	0.96	750	12,000
	1.7	6	0.085	1.02	1,000	15,000	0.095	1.02	1,900	19,000	0.085	1.02	1,150	15,000	0.095	1.02	1,900	19,000
		14	0.045	1.02	480	11,000	0.055	1.02	950	13,000	0.045	1.02	630	11,000	0.055	1.02	950	13,000
	1.8	6	0.09	1.08	1,050	14,000	0.1	1.08	2,000	18,000	0.09	1.08	1,200	14,000	0.1	1.08	2,000	18,000
		8	0.08	1.08	850	14,000	0.09	1.08	1,700	18,000	0.08	1.08	1,000	14,000	0.09	1.08	1,700	18,000
		10	0.07	1.08	700	13,000	0.08	1.08	1,400	16,000	0.07	1.08	850	13,000	0.08	1.08	1,400	16,000
		12	0.06	1.08	570	12,000	0.07	1.08	1,100	14,000	0.06	1.08	720	12,000	0.07	1.08	1,100	14,000
		14	0.05	1.08	480	11,000	0.06	1.08	1,000	13,000	0.05	1.08	630	11,000	0.06	1.08	1,000	13,000
		16	0.04	1.08	380	10,000	0.05	1.08	850	12,000	0.04	1.08	530	10,000	0.05	1.08	850	12,000
	1.9	6	0.095	1.14	1,100	14,000	0.11	1.14	2,100	17,000	0.095	1.14	1,250	14,000	0.11	1.14	2,100	17,000
		16	0.045	1.14	480	10,000	0.06	1.14	1,000	12,000	0.045	1.14	630	10,000	0.06	1.14	1,000	12,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	2	6	0.1	1.2	1,150	13,000	0.12	1.2	2,100	16,000	0.1	1.2	1,300	13,000	0.12	1.2	2,100	16,000
		8	0.09	1.2	1,050	13,000	0.11	1.2	2,000	16,000	0.09	1.2	1,200	13,000	0.11	1.2	2,000	16,000
		10	0.08	1.2	950	13,000	0.1	1.2	1,800	16,000	0.08	1.2	1,100	13,000	0.1	1.2	1,800	16,000
		12	0.07	1.2	850	12,000	0.09	1.2	1,500	14,000	0.07	1.2	1,000	12,000	0.09	1.2	1,500	14,000
		14	0.06	1.2	700	11,000	0.08	1.2	1,350	13,000	0.06	1.2	850	11,000	0.08	1.2	1,350	13,000
		15	0.05	1.2	600	10,000	0.07	1.2	1,200	12,000	0.05	1.2	750	10,000	0.07	1.2	1,200	12,000
		16	0.05	1.2	600	10,000	0.07	1.2	1,200	12,000	0.05	1.2	750	10,000	0.07	1.2	1,200	12,000
		18	0.04	1.2	500	9,000	0.06	1.2	1,000	11,000	0.04	1.2	650	9,000	0.06	1.2	1,000	11,000
		20	0.035	1.2	400	8,000	0.05	1.2	900	10,000	0.035	1.2	550	8,000	0.05	1.2	900	10,000
	2.5	8	0.12	1.5	1,250	11,000	0.15	1.5	2,100	13,000	0.12	1.5	1,400	11,000	0.15	1.5	2,100	13,000
		12	0.1	1.5	950	11,000	0.13	1.5	1,800	13,000	0.1	1.5	1,100	11,000	0.13	1.5	1,800	13,000
		16	0.07	1.5	700	9,000	0.1	1.5	1,400	11,000	0.07	1.5	850	9,000	0.1	1.5	1,400	11,000
		20	0.05	1.5	450	7,000	0.08	1.5	1,100	9,000	0.05	1.5	600	7,000	0.08	1.5	1,100	9,000
	3	8	0.16	1.8	1,350	9,000	0.2	1.8	2,300	11,000	0.16	1.8	1,500	9,000	0.2	1.8	2,300	11,000
		10	0.12	1.8	1,050	9,000	0.16	1.8	2,000	11,000	0.12	1.8	1,200	9,000	0.16	1.8	2,000	11,000
		12	0.12	1.8	1,050	9,000	0.16	1.8	2,000	11,000	0.12	1.8	1,200	9,000	0.16	1.8	2,000	11,000
		15	0.09	1.8	750	8,000	0.12	1.8	1,500	10,000	0.09	1.8	900	8,000	0.12	1.8	1,500	10,000
		16	0.09	1.8	750	8,000	0.12	1.8	1,500	10,000	0.09	1.8	900	8,000	0.12	1.8	1,500	10,000
		20	0.07	1.8	530	7,000	0.1	1.8	1,200	9,000	0.07	1.8	680	7,000	0.1	1.8	1,200	9,000
		25	0.06	1.8	420	6,000	0.08	1.8	1,050	8,000	0.06	1.8	570	6,000	0.08	1.8	1,050	8,000
		30	0.045	1.8	300	5,000	0.06	1.8	900	7,000	0.045	1.8	450	5,000	0.06	1.8	900	7,000
	3.5	15	0.15	2.1	1,050	7,000	0.18	2.1	2,000	9,000	0.15	2.1	1,200	7,000	0.18	2.1	2,000	9,000
		25	0.08	2.1	700	6,000	0.12	2.1	1,500	7,500	0.08	2.1	850	6,000	0.12	2.1	1,500	7,500
		35	0.05	2.1	370	4,500	0.07	2.1	1,000	6,000	0.05	2.1	520	4,500	0.07	2.1	1,000	6,000
	4	10	0.25	2.4	1,150	6,000	0.3	2.4	2,200	8,000	0.25	2.4	1,300	6,000	0.3	2.4	2,200	8,000
		12	0.25	2.4	1,150	6,000	0.3	2.4	2,200	8,000	0.25	2.4	1,300	6,000	0.3	2.4	2,200	8,000
		15	0.2	2.4	1,050	6,000	0.25	2.4	2,100	8,000	0.2	2.4	1,200	6,000	0.25	2.4	2,100	8,000
		16	0.2	2.4	1,050	6,000	0.25	2.4	2,100	8,000	0.2	2.4	1,200	6,000	0.25	2.4	2,100	8,000
		20	0.15	2.4	950	6,000	0.2	2.4	2,000	8,000	0.15	2.4	1,100	6,000	0.2	2.4	2,000	8,000
		25	0.1	2.4	750	5,000	0.15	2.4	1,700	7,000	0.1	2.4	900	5,000	0.15	2.4	1,700	7,000
		30	0.08	2.4	650	5,000	0.12	2.4	1,500	7,000	0.08	2.4	800	5,000	0.12	2.4	1,500	7,000
		35	0.07	2.4	520	4,500	0.1	2.4	1,200	6,000	0.07	2.4	670	4,500	0.1	2.4	1,200	6,000
	5	15	0.3	3	1,050	4,500	0.35	3	2,100	6,000	0.3	3	1,200	4,500	0.35	3	2,100	6,000
		16	0.3	3	1,050	4,500	0.35	3	2,100	6,000	0.3	3	1,200	4,500	0.35	3	2,100	6,000
		20	0.2	3	850	4,500	0.25	3	1,800	6,000	0.2	3	1,000	4,500	0.25	3	1,800	6,000
		25	0.2	3	850	4,500	0.25	3	1,800	6,000	0.2	3	1,000	4,500	0.25	3	1,800	6,000
		35	0.1	3	480	3,500	0.15	3	1,200	5,000	0.1	3	630	3,500	0.15	3	1,200	5,000
	6	20	0.35	3.6	850	3,500	0.4	3.6	1,800	5,000	0.35	3.6	1,000	3,500	0.4	3.6	1,800	5,000
		30	0.3	3.6	600	3,000	0.35	3.6	1,400	4,000	0.3	3.6	750	3,000	0.35	3.6	1,400	4,000
		40	0.2	3.6	420	2,700	0.25	3.6	1,000	3,500	0.2	3.6	570	2,700	0.25	3.6	1,000	3,500
		50	0.1	3.6	270	2,200	0.15	3.6	750	3,000	0.1	3.6	420	2,200	0.15	3.6	750	3,000
	8	30	0.45	4.8	750	2,800	0.6	4.8	1,400	3,800	0.45	4.8	900	2,800	0.6	4.8	1,400	3,800

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS430
Model number:IALS430

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	8	50	0.3	4.8	450	2,100	0.4	4.8	820	2,800	0.3	4.8	600	2,100	0.4	4.8	820	2,800
		60	0.2	4.8	300	1,800	0.3	4.8	680	2,400	0.2	4.8	450	1,800	0.3	4.8	680	2,400
	10	40	0.55	6	600	2,200	0.8	6	1,200	3,000	0.55	6	750	2,200	0.8	6	1,200	3,000
		60	0.45	6	370	1,600	0.6	6	750	2,200	0.45	6	520	1,600	0.6	6	750	2,200
		80	0.3	6	210	1,300	0.4	6	520	1,800	0.3	6	360	1,300	0.4	6	520	1,800

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	1	4	0.055	0.6	1,700	25,000	0.055	0.6	1,700	25,000	0.045	0.6	950	22,000
		6	0.045	0.6	1,200	20,000	0.045	0.6	1,200	20,000	0.035	0.6	600	18,000
		8	0.035	0.6	1,050	18,000	0.035	0.6	1,050	18,000	0.025	0.6	450	15,000
		10	0.025	0.6	900	16,000	0.025	0.6	900	16,000	0.018	0.6	370	14,000
		12	0.02	0.6	750	14,000	0.02	0.6	750	14,000	0.014	0.6	300	12,000
	1.1	6	0.05	0.66	1,300	20,000	0.05	0.66	1,300	20,000	0.04	0.66	670	18,000
		10	0.03	0.66	1,000	16,000	0.03	0.66	1,000	16,000	0.02	0.66	450	14,000
	1.2	6	0.05	0.72	1,400	20,000	0.05	0.72	1,400	20,000	0.04	0.72	750	18,000
		8	0.04	0.72	1,200	18,000	0.04	0.72	1,200	18,000	0.03	0.72	600	15,000
		10	0.03	0.72	1,050	16,000	0.03	0.72	1,050	16,000	0.02	0.72	520	14,000
		12	0.025	0.72	900	14,000	0.025	0.72	900	14,000	0.018	0.72	380	12,000
	1.3	6	0.06	0.78	1,500	20,000	0.06	0.78	1,500	20,000	0.05	0.78	850	17,000
		12	0.03	0.78	1,000	14,000	0.03	0.78	1,000	14,000	0.025	0.78	450	12,000
	1.4	6	0.07	0.84	1,800	20,000	0.07	0.84	1,800	20,000	0.06	0.84	950	16,000
		8	0.06	0.84	1,500	18,000	0.06	0.84	1,500	18,000	0.05	0.84	750	14,000
		10	0.05	0.84	1,300	16,000	0.05	0.84	1,300	16,000	0.04	0.84	630	13,000
		12	0.04	0.84	1,050	14,000	0.04	0.84	1,050	14,000	0.03	0.84	520	12,000
		14	0.035	0.84	900	13,000	0.035	0.84	900	13,000	0.025	0.84	380	11,000
		16	0.025	0.84	750	12,000	0.025	0.84	750	12,000	0.018	0.84	300	10,000
	1.5	3	0.08	0.9	1,800	20,000	0.08	0.9	1,800	20,000	0.07	0.9	950	16,000
		6	0.08	0.9	1,800	20,000	0.08	0.9	1,800	20,000	0.07	0.9	950	16,000
		8	0.07	0.9	1,500	18,000	0.07	0.9	1,500	18,000	0.06	0.9	750	14,000
		10	0.06	0.9	1,300	16,000	0.06	0.9	1,300	16,000	0.05	0.9	630	13,000
		12	0.05	0.9	1,050	14,000	0.05	0.9	1,050	14,000	0.04	0.9	520	12,000
		14	0.04	0.9	900	13,000	0.04	0.9	900	13,000	0.03	0.9	420	11,000
		16	0.035	0.9	750	12,000	0.035	0.9	750	12,000	0.025	0.9	330	10,000
	1.6	6	0.09	0.96	1,800	20,000	0.09	0.96	1,800	20,000	0.08	0.96	950	16,000
		8	0.08	0.96	1,500	18,000	0.08	0.96	1,500	18,000	0.07	0.96	750	14,000
		10	0.07	0.96	1,300	16,000	0.07	0.96	1,300	16,000	0.06	0.96	630	13,000
		12	0.06	0.96	1,050	14,000	0.06	0.96	1,050	14,000	0.05	0.96	520	12,000
		14	0.05	0.96	900	13,000	0.05	0.96	900	13,000	0.04	0.96	420	11,000
		16	0.04	0.96	750	12,000	0.04	0.96	750	12,000	0.03	0.96	330	10,000
	1.7	6	0.095	1.02	1,900	19,000	0.095	1.02	1,900	19,000	0.085	1.02	1,000	15,000
		14	0.055	1.02	950	13,000	0.055	1.02	950	13,000	0.045	1.02	480	11,000
	1.8	6	0.1	1.08	2,000	18,000	0.1	1.08	2,000	18,000	0.09	1.08	1,050	14,000
		8	0.09	1.08	1,700	18,000	0.09	1.08	1,700	18,000	0.08	1.08	850	14,000
		10	0.08	1.08	1,400	16,000	0.08	1.08	1,400	16,000	0.07	1.08	700	13,000
		12	0.07	1.08	1,100	14,000	0.07	1.08	1,100	14,000	0.06	1.08	570	12,000
		14	0.06	1.08	1,000	13,000	0.06	1.08	1,000	13,000	0.05	1.08	480	11,000
		16	0.05	1.08	850	12,000	0.05	1.08	850	12,000	0.04	1.08	380	10,000
	1.9	6	0.11	1.14	2,100	17,000	0.11	1.14	2,100	17,000	0.095	1.14	1,100	14,000
		16	0.06	1.14	1,000	12,000	0.06	1.14	1,000	12,000	0.045	1.14	480	10,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALS430
Model number:IALS430

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	2	6	0.12	1.2	2,100	16,000	0.12	1.2	2,100	16,000	0.1	1.2	1,150	13,000
		8	0.11	1.2	2,000	16,000	0.11	1.2	2,000	16,000	0.09	1.2	1,050	13,000
		10	0.1	1.2	1,800	16,000	0.1	1.2	1,800	16,000	0.08	1.2	950	13,000
		12	0.09	1.2	1,500	14,000	0.09	1.2	1,500	14,000	0.07	1.2	850	12,000
		14	0.08	1.2	1,350	13,000	0.08	1.2	1,350	13,000	0.06	1.2	700	11,000
		15	0.07	1.2	1,200	12,000	0.07	1.2	1,200	12,000	0.05	1.2	600	10,000
		16	0.07	1.2	1,200	12,000	0.07	1.2	1,200	12,000	0.05	1.2	600	10,000
		18	0.06	1.2	1,000	11,000	0.06	1.2	1,000	11,000	0.04	1.2	500	9,000
		20	0.05	1.2	900	10,000	0.05	1.2	900	10,000	0.035	1.2	400	8,000
	2.5	8	0.15	1.5	2,100	13,000	0.15	1.5	2,100	13,000	0.12	1.5	1,250	11,000
		12	0.13	1.5	1,800	13,000	0.13	1.5	1,800	13,000	0.1	1.5	950	11,000
		16	0.1	1.5	1,400	11,000	0.1	1.5	1,400	11,000	0.07	1.5	700	9,000
		20	0.08	1.5	1,100	9,000	0.08	1.5	1,100	9,000	0.05	1.5	450	7,000
	3	8	0.2	1.8	2,300	11,000	0.2	1.8	2,300	11,000	0.16	1.8	1,350	9,000
		10	0.16	1.8	2,000	11,000	0.16	1.8	2,000	11,000	0.12	1.8	1,050	9,000
		12	0.16	1.8	2,000	11,000	0.16	1.8	2,000	11,000	0.12	1.8	1,050	9,000
		15	0.12	1.8	1,500	10,000	0.12	1.8	1,500	10,000	0.09	1.8	750	8,000
		16	0.12	1.8	1,500	10,000	0.12	1.8	1,500	10,000	0.09	1.8	750	8,000
		20	0.1	1.8	1,200	9,000	0.1	1.8	1,200	9,000	0.07	1.8	530	7,000
		25	0.08	1.8	1,050	8,000	0.08	1.8	1,050	8,000	0.06	1.8	420	6,000
		30	0.06	1.8	900	7,000	0.06	1.8	900	7,000	0.045	1.8	300	5,000
	3.5	15	0.18	2.1	2,000	9,000	0.18	2.1	2,000	9,000	0.15	2.1	1,050	7,000
		25	0.12	2.1	1,500	7,500	0.12	2.1	1,500	7,500	0.08	2.1	700	6,000
		35	0.07	2.1	1,000	6,000	0.07	2.1	1,000	6,000	0.05	2.1	370	4,500
	4	10	0.3	2.4	2,200	8,000	0.3	2.4	2,200	8,000	0.25	2.4	1,150	6,000
		12	0.3	2.4	2,200	8,000	0.3	2.4	2,200	8,000	0.25	2.4	1,150	6,000
		15	0.25	2.4	2,100	8,000	0.25	2.4	2,100	8,000	0.2	2.4	1,050	6,000
		16	0.25	2.4	2,100	8,000	0.25	2.4	2,100	8,000	0.2	2.4	1,050	6,000
		20	0.2	2.4	2,000	8,000	0.2	2.4	2,000	8,000	0.15	2.4	950	6,000
		25	0.15	2.4	1,700	7,000	0.15	2.4	1,700	7,000	0.1	2.4	750	5,000
		30	0.12	2.4	1,500	7,000	0.12	2.4	1,500	7,000	0.08	2.4	650	5,000
		35	0.1	2.4	1,200	6,000	0.1	2.4	1,200	6,000	0.07	2.4	520	4,500
	5	15	0.35	3	2,100	6,000	0.35	3	2,100	6,000	0.3	3	1,050	4,500
		16	0.35	3	2,100	6,000	0.35	3	2,100	6,000	0.3	3	1,050	4,500
		20	0.25	3	1,800	6,000	0.25	3	1,800	6,000	0.2	3	850	4,500
		25	0.25	3	1,800	6,000	0.25	3	1,800	6,000	0.2	3	850	4,500
		35	0.15	3	1,200	5,000	0.15	3	1,200	5,000	0.1	3	480	3,500
	6	20	0.4	3.6	1,800	5,000	0.4	3.6	1,800	5,000	0.35	3.6	850	3,500
		30	0.35	3.6	1,400	4,000	0.35	3.6	1,400	4,000	0.3	3.6	600	3,000
		40	0.25	3.6	1,000	3,500	0.25	3.6	1,000	3,500	0.2	3.6	420	2,700
		50	0.15	3.6	750	3,000	0.15	3.6	750	3,000	0.1	3.6	270	2,200
	8	30	0.6	4.8	1,400	3,800	0.6	4.8	1,400	3,800	0.45	4.8	750	2,800

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	8	50	0.4	4.8	820	2,800	0.4	4.8	820	2,800	0.3	4.8	450	2,100
		60	0.3	4.8	680	2,400	0.3	4.8	680	2,400	0.2	4.8	300	1,800
	10	40	0.8	6	1,200	3,000	0.8	6	1,200	3,000	0.55	6	600	2,200
		60	0.6	6	750	2,200	0.6	6	750	2,200	0.45	6	370	1,600
		80	0.4	6	520	1,800	0.4	6	520	1,800	0.3	6	210	1,300

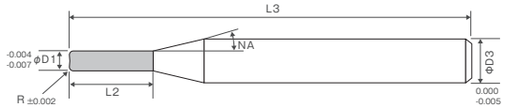
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

超硬圆角立铣刀　Carbide Radius End Mill

■型号:IAR230　Model number:IAR230

ion A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAR230-0100-0100-00200	1	0.1	2	15	4	50	5,600
IAR230-0100-0200-00200		0.2	2	15	4	50	5,600
IAR230-0100-0300-00200		0.3	2	15	4	50	5,600
IAR230-0150-0100-00300	1.5	0.1	3	15	4	50	5,600
IAR230-0150-0200-00300		0.2	3	15	4	50	5,600
IAR230-0150-0300-00300		0.3	3	15	4	50	5,600
IAR230-0200-0100-00400	2	0.1	4	15	4	50	5,600
IAR230-0200-0200-00400		0.2	4	15	4	50	5,600
IAR230-0200-0300-00400		0.3	4	15	4	50	5,600
IAR230-0200-0500-00400		0.5	4	15	4	50	5,600
IAR230-0250-0100-00500	2.5	0.1	5	15	4	50	5,600
IAR230-0250-0200-00500		0.2	5	15	4	50	5,600
IAR230-0250-0300-00500		0.3	5	15	4	50	6,160
IAR230-0250-0500-00500		0.5	5	15	4	50	6,160
IAR230-0300-0100-00600	3	0.1	6	15	4	50	6,880
IAR230-0300-0200-00600		0.2	6	15	4	50	6,880
IAR230-0300-0300-00600		0.3	6	15	4	50	6,880
IAR230-0300-0500-00600		0.5	6	15	4	50	6,880
IAR230-0300-1000-00600		1	6	15	4	50	7,520
IAR230-0400-0100-00800	4	0.1	8	15	6	50	6,960
IAR230-0400-0200-00800		0.2	8	15	6	50	6,960
IAR230-0400-0300-00800		0.3	8	15	6	50	6,960
IAR230-0400-0500-00800		0.5	8	15	6	50	6,960
IAR230-0400-1000-00800		1	8	15	6	50	7,600
IAR230-0500-0100-01000	5	0.1	10	15	6	50	7,040
IAR230-0500-0200-01000		0.2	10	15	6	50	7,040
IAR230-0500-0300-01000		0.3	10	15	6	50	7,040
IAR230-0500-0500-01000		0.5	10	15	6	50	7,040
IAR230-0500-1000-01000		1	10	15	6	50	7,680
IAR230-0500-1500-01000		1.5	10	15	6	50	8,000

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAR230-0600-0100-01200	6	0.1	12	—	6	50	13,920
IAR230-0600-0200-01200		0.2	12	—	6	50	13,920
IAR230-0600-0300-01200		0.3	12	—	6	50	13,920
IAR230-0600-0500-01200		0.5	12	—	6	50	13,920
IAR230-0600-1000-01200		1	12	—	6	50	14,880
IAR230-0600-1500-01200		1.5	12	—	6	50	14,880
IAR230-0600-2000-01200		2	12	—	6	50	14,880

CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo A Series 圆角 Radius
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAR230
Model number:IAR230

圆角立铣刀 Radius End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1	2	1.5	0.1	200	25,500	1.5	0.1	200	25,500	1.5	0.1	80	12,800	1.5	0.1	200	25,500
	1.5	3	2.25	0.15	340	17,100	2.25	0.15	340	17,100	2.25	0.15	90	8,500	2.25	0.15	340	17,100
	2	4	3	0.2	400	12,800	3	0.2	400	12,800	3	0.2	110	6,400	3	0.2	400	12,800
	2.5	5	3.75	0.25	400	10,200	3.75	0.25	400	10,200	3.75	0.25	110	5,100	3.75	0.25	400	10,200
	3	6	4.5	0.3	450	8,500	4.5	0.3	450	8,500	4.5	0.3	120	4,300	4.5	0.3	450	8,500
	4	8	6	0.4	450	6,400	6	0.4	450	6,400	6	0.4	120	3,200	6	0.4	450	6,400
	5	10	7.5	0.5	600	5,100	7.5	0.5	600	5,100	7.5	0.5	150	2,600	7.5	0.5	600	5,100
	6	12	9	0.6	600	4,300	9	0.6	600	4,300	9	0.6	150	2,200	9	0.6	600	4,300

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

圆角立铣刀 Radius End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1	2	1	0.02	60	6,400	1.5	0.1	200	25,500	1.5	0.1	80	12,800	1.5	0.1	200	25,500
	1.5	3	1.5	0.03	70	4,200	2.25	0.15	340	17,100	2.25	0.15	90	8,500	2.25	0.15	340	17,100
	2	4	2	0.04	80	3,200	3	0.2	400	12,800	3	0.2	110	6,400	3	0.2	400	12,800
	2.5	5	2.5	0.05	80	2,500	3.75	0.25	400	10,200	3.75	0.25	110	5,100	3.75	0.25	400	10,200
	3	6	3	0.06	100	2,100	4.5	0.3	450	8,500	4.5	0.3	120	4,300	4.5	0.3	450	8,500
	4	8	4	0.08	100	1,600	6	0.4	450	6,400	6	0.4	120	3,200	6	0.4	450	6,400
	5	10	5	0.1	120	1,300	7.5	0.5	600	5,100	7.5	0.5	150	2,600	7.5	0.5	600	5,100
	6	12	6	0.12	130	1,100	9	0.6	600	4,300	9	0.6	150	2,200	9	0.6	600	4,300

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

圆角立铣刀 Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1	2	1.5	0.1	200	25,500	1.5	0.1	200	25,500	1	0.02	60	6,400
	1.5	3	2.25	0.15	340	17,100	2.25	0.15	340	17,100	1.5	0.03	70	4,200
	2	4	3	0.2	400	12,800	3	0.2	400	12,800	2	0.04	80	3,200
	2.5	5	3.75	0.25	400	10,200	3.75	0.25	400	10,200	2.5	0.05	80	2,500
	3	6	4.5	0.3	450	8,500	4.5	0.3	450	8,500	3	0.06	100	2,100
	4	8	6	0.4	450	6,400	6	0.4	450	6,400	4	0.08	100	1,600
	5	10	7.5	0.5	600	5,100	7.5	0.5	600	5,100	5	0.1	120	1,300
	6	12	9	0.6	600	4,300	9	0.6	600	4,300	6	0.12	130	1,100

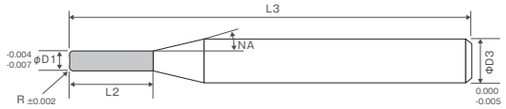
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

超硬圆角立铣刀 Carbide Radius End Mill

■型号:IAR430 Model number:IAR430

ion A | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考,如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAR430-0100-0100-00200	1	0.1	2	15	4	50	9,520
IAR430-0100-0200-00200		0.2	2	15	4	50	9,520
IAR430-0100-0300-00200		0.3	2	15	4	50	9,520
IAR430-0150-0100-00300	1.5	0.1	3	15	4	50	9,520
IAR430-0150-0200-00300		0.2	3	15	4	50	9,520
IAR430-0150-0300-00300		0.3	3	15	4	50	9,520
IAR430-0150-0500-00300		0.5	3	15	4	50	9,520
IAR430-0200-0100-00400	2	0.1	4	15	4	50	9,520
IAR430-0200-0200-00400		0.2	4	15	4	50	9,520
IAR430-0200-0300-00400		0.3	4	15	4	50	9,520
IAR430-0200-0500-00400		0.5	4	15	4	50	9,520
IAR430-0300-0100-00600	3	0.1	6	15	4	50	11,760
IAR430-0300-0200-00600		0.2	6	15	4	50	11,760
IAR430-0300-0300-00600		0.3	6	15	4	50	11,760
IAR430-0300-0500-00600		0.5	6	15	4	50	11,760
IAR430-0300-1000-00600		1	6	15	4	50	12,800
IAR430-0400-0100-00800	4	0.1	8	15	6	50	11,840
IAR430-0400-0200-00800		0.2	8	15	6	50	11,840
IAR430-0400-0300-00800		0.3	8	15	6	50	11,840
IAR430-0400-0500-00800		0.5	8	15	6	50	11,840
IAR430-0400-1000-00800		1	8	15	6	50	12,960
IAR430-0500-0100-01000	5	0.1	10	15	6	50	12,000
IAR430-0500-0200-01000		0.2	10	15	6	50	12,000
IAR430-0500-0300-01000		0.3	10	15	6	50	12,000
IAR430-0500-0500-01000		0.5	10	15	6	50	12,000
IAR430-0500-1000-01000		1	10	15	6	50	13,120
IAR430-0500-1500-01000		1.5	10	15	6	50	13,600
IAR430-0600-0100-01200	6	0.1	12	—	6	50	11,600
IAR430-0600-0200-01200		0.2	12	—	6	50	11,600
IAR430-0600-0300-01200		0.3	12	—	6	50	11,600

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAR430-0600-0500-01200	6	0.5	12	—	6	50	11,600
IAR430-0600-1000-01200		1	12	—	6	50	12,400
IAR430-0600-1500-01200		1.5	12	—	6	50	12,400
IAR430-0800-0100-01600	8	0.1	16	—	8	70	16,720
IAR430-0800-0200-01600		0.2	16	—	8	70	16,720
IAR430-0800-0500-01600		0.5	16	—	8	70	16,720
IAR430-0800-1000-01600		1	16	—	8	70	16,720
IAR430-0800-1500-01600		1.5	16	—	8	70	17,600
IAR430-0800-2000-01600		2	16	—	8	70	17,600
IAR430-0800-2500-01600		2.5	16	—	8	70	18,640
IAR430-0800-3000-01600		3	16	—	8	70	18,640
IAR430-1000-0100-02000	10	0.1	20	—	10	80	17,600
IAR430-1000-0200-02000		0.2	20	—	10	80	17,600
IAR430-1000-0300-02000		0.3	20	—	10	80	17,600
IAR430-1000-0500-02000		0.5	20	—	10	80	17,600
IAR430-1000-1000-02000		1	20	—	10	80	17,600
IAR430-1000-1500-02000		1.5	20	—	10	80	18,640
IAR430-1000-2000-02000		2	20	—	10	80	18,640
IAR430-1000-2500-02000		2.5	20	—	10	80	20,480
IAR430-1000-3000-02000		3	20	—	10	80	20,480
IAR430-1200-0100-02400	12	0.1	24	—	12	110	27,840
IAR430-1200-0200-02400		0.2	24	—	12	110	27,840
IAR430-1200-0300-02400		0.3	24	—	12	110	27,840
IAR430-1200-0500-02400		0.5	24	—	12	110	27,840
IAR430-1200-1000-02400		1	24	—	12	110	27,840
IAR430-1200-1500-02400		1.5	24	—	12	110	28,800
IAR430-1200-2000-02400		2	24	—	12	110	28,800
IAR430-1200-2500-02400		2.5	24	—	12	110	29,680
IAR430-1200-3000-02400		3	24	—	12	110	29,680
IAR430-1600-1000-04000	16	1	40	—	16	130	32,160
IAR430-1600-2000-04000		2	40	—	16	130	32,160
IAR430-1600-3000-04000		3	40	—	16	130	32,160
IAR430-2000-1000-05000	20	1	50	—	20	140	45,920
IAR430-2000-2000-05000		2	50	—	20	140	45,920
IAR430-2000-3000-05000		3	50	—	20	140	45,920

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAR430
Model number:IAR430

圆角立铣刀 Radius End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	2	1.5	0.1	300	25,500	1.5	0.1	300	25,500	1.5	0.1	120	12,800	1.5	0.1	220	19,100
	1.5	3	2.25	0.15	510	17,100	2.25	0.15	510	17,100	2.25	0.15	130	8,500	2.25	0.15	370	12,700
	2	4	3	0.2	600	12,800	3	0.2	600	12,800	3	0.2	160	6,400	3	0.2	430	9,500
	3	6	4.5	0.3	670	8,500	4.5	0.3	670	8,500	4.5	0.3	180	4,300	4.5	0.3	500	6,400
	4	8	6	0.4	760	6,400	6	0.4	760	6,400	6	0.4	200	3,200	6	0.4	570	4,800
	5	10	7.5	0.5	760	5,100	7.5	0.5	760	5,100	7.5	0.5	260	2,600	7.5	0.5	570	3,800
	6	12	9	0.6	760	4,200	9	0.6	760	4,200	9	0.6	260	2,200	9	0.6	570	3,200
	8	16	12	0.8	780	3,200	12	0.8	780	3,200	12	0.8	380	1,600	12	0.8	580	2,400
	10	20	15	1	780	2,600	15	1	780	2,600	15	1	380	1,300	15	1	580	1,900
	12	24	18	1.2	780	2,100	18	1.2	780	2,100	18	1.2	380	1,100	18	1.2	580	1,600
	16	40	24	1.6	600	1,500	24	1.6	600	1,500	24	1.6	300	800	24	1.6	450	1,200
	20	50	30	1.5	500	1,000	30	1.5	500	1,000	30	1.5	300	400	30	1.5	400	700

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

圆角立铣刀 Radius End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	2	1	0.05	60	6,400	1.5	0.1	220	19,100	1.5	0.1	120	12,800	1.5	0.1	300	25,500
	1.5	3	1.5	0.075	65	4,300	2.25	0.15	370	12,700	2.25	0.15	130	8,500	2.25	0.15	510	17,100
	2	4	2	0.1	80	3,200	3	0.2	430	9,500	3	0.2	160	6,400	3	0.2	600	12,800
	3	6	3	0.15	90	2,200	4.5	0.3	500	6,400	4.5	0.3	180	4,300	4.5	0.3	670	8,500
	4	8	4	0.2	90	1,600	6	0.4	570	4,800	6	0.4	200	3,200	6	0.4	760	6,400
	5	10	5	0.25	120	1,300	7.5	0.5	570	3,800	7.5	0.5	260	2,600	7.5	0.5	760	5,100
	6	12	6	0.3	120	1,200	9	0.6	570	3,200	9	0.6	260	2,200	9	0.6	760	4,200
	8	16	8	0.4	160	800	12	0.8	580	2,400	12	0.8	380	1,600	12	0.8	780	3,200
	10	20	10	0.5	160	650	15	1	580	1,900	15	1	380	1,300	15	1	780	2,600
	12	24	12	0.6	160	530	18	1.2	580	1,600	18	1.2	380	1,100	18	1.2	780	2,100
	16	40	16	0.8	150	450	24	1.6	450	1,200	24	1.6	300	800	24	1.6	600	1,500
	20	50	20	0.5	150	350	30	1.5	400	700	30	1.5	300	400	30	1.5	500	1,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

圆角立铣刀 Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	2	1.5	0.1	300	25,500	1.5	0.1	300	25,500	1	0.05	60	6,400
	1.5	3	2.25	0.15	510	17,100	2.25	0.15	510	17,100	1.5	0.075	65	4,300
	2	4	3	0.2	600	12,800	3	0.2	600	12,800	2	0.1	80	3,200
	3	6	4.5	0.3	670	8,500	4.5	0.3	670	8,500	3	0.15	90	2,200
	4	8	6	0.4	760	6,400	6	0.4	760	6,400	4	0.2	90	1,600
	5	10	7.5	0.5	760	5,100	7.5	0.5	760	5,100	5	0.25	120	1,300
	6	12	9	0.6	760	4,200	9	0.6	760	4,200	6	0.3	120	1,200
	8	16	12	0.8	780	3,200	12	0.8	780	3,200	8	0.4	160	800
	10	20	15	1	780	2,600	15	1	780	2,600	10	0.5	160	650
	12	24	18	1.2	780	2,100	18	1.2	780	2,100	12	0.6	160	530
	16	40	24	1.6	600	1,500	24	1.6	600	1,500	16	0.8	150	450
	20	50	30	1.5	500	1,000	30	1.5	500	1,000	20	0.5	150	350

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

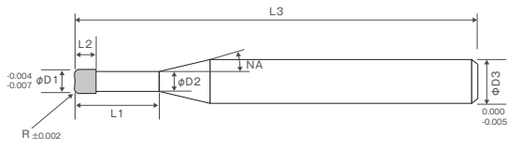
CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo A Series 圆角 Radius
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series

ion Depo Type A Series

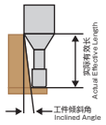
超硬长颈圆角立铣刀
Carbide Long Neck Radius End Mill

ion A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IALR230 Model number:IALR230



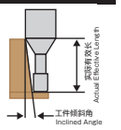
所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR230-0020-0050-0050	0.2	0.05	0.5	0.15	0.18	15	4	50	7,200	0.55	0.57	0.59	0.61	0.66
IALR230-0020-0050-0100		0.05	1	0.15	0.18	15	4	50	7,200	1.07	1.11	1.14	1.19	1.28
IALR230-0020-0050-0200		0.05	2	0.15	0.18	15	4	50	7,200	2.10	2.18	2.25	2.34	2.52
IALR230-0030-0050-0080	0.3	0.05	0.8	0.3	0.27	15	4	50	6,960	0.88	0.91	0.94	0.98	1.05
IALR230-0030-0050-0100		0.05	1	0.25	0.27	15	4	50	6,960	1.09	1.13	1.17	1.21	1.30
IALR230-0030-0050-0150-00025		0.05	1.5	0.25	0.27	15	4	50	6,960	1.61	1.66	1.72	1.78	1.92
IALR230-0030-0050-0150-00030		0.05	1.5	0.3	0.27	15	4	50	6,960	1.61	1.66	1.72	1.78	1.92
IALR230-0030-0050-0200		0.05	2	0.25	0.27	15	4	50	6,960	2.12	2.20	2.27	2.36	2.54
IALR230-0030-0050-0250		0.05	2.5	0.25	0.27	15	4	50	7,680	2.64	2.73	2.83	2.93	3.17
IALR230-0030-0050-0300		0.05	3	0.25	0.27	15	4	50	7,680	3.16	3.27	3.38	3.51	3.79
IALR230-0040-0050-0100	0.4	0.05	1	0.3	0.37	15	4	50	4,640	1.09	1.13	1.17	1.21	1.30
IALR230-0040-0050-0120		0.05	1.2	0.4	0.37	15	4	50	4,640	1.30	1.34	1.39	1.44	1.55
IALR230-0040-0050-0150		0.05	1.5	0.3	0.37	15	4	50	4,640	1.61	1.66	1.72	1.78	1.92
IALR230-0040-0050-0200		0.05	2	0.3	0.37	15	4	50	4,640	2.12	2.20	2.27	2.36	2.54
IALR230-0040-0050-0250		0.05	2.5	0.4	0.37	15	4	50	4,640	2.64	2.73	2.83	2.93	3.17
IALR230-0040-0050-0300		0.05	3	0.3	0.37	15	4	50	4,640	3.16	3.27	3.38	3.51	3.79
IALR230-0040-0100-0100		0.1	1	0.3	0.37	15	4	50	4,640	1.09	1.12	1.16	1.20	1.29
IALR230-0040-0100-0120		0.1	1.2	0.4	0.37	15	4	50	4,640	1.29	1.34	1.38	1.43	1.54
IALR230-0040-0100-0150		0.1	1.5	0.3	0.37	15	4	50	4,640	1.61	1.66	1.71	1.77	1.91
IALR230-0040-0100-0200		0.1	2	0.3	0.37	15	4	50	4,640	2.12	2.19	2.27	2.35	2.53
IALR230-0040-0100-0250		0.1	2.5	0.4	0.37	15	4	50	4,640	2.64	2.73	2.82	2.92	3.15
IALR230-0040-0100-0300		0.1	3	0.3	0.37	15	4	50	4,640	3.16	3.26	3.38	3.50	3.78
IALR230-0050-0050-0100	0.5	0.05	1	0.4	0.47	15	4	50	3,760	1.09	1.13	1.17	1.21	1.30
IALR230-0050-0050-0150		0.05	1.5	0.5	0.47	15	4	50	3,760	1.61	1.66	1.72	1.78	1.92
IALR230-0050-0050-0200		0.05	2	0.4	0.47	15	4	50	3,760	2.12	2.20	2.27	2.36	2.54
IALR230-0050-0050-0300-00040		0.05	3	0.4	0.47	15	4	50	3,760	3.16	3.27	3.38	3.51	3.79
IALR230-0050-0050-0300-00050		0.05	3	0.5	0.47	15	4	50	3,760	3.16	3.27	3.38	3.51	3.79
IALR230-0050-0050-0400		0.05	4	0.4	0.47	15	4	50	3,760	4.19	4.34	4.49	4.66	5.03
IALR230-0050-0100-0100		0.1	1	0.4	0.47	15	4	50	3,760	1.09	1.12	1.16	1.20	1.29
IALR230-0050-0100-0150		0.1	1.5	0.5	0.47	15	4	50	3,760	1.61	1.66	1.71	1.77	1.91



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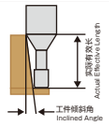
单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR230-0050-0100-0200	0.5	0.1	2	0.4	0.47	15	4	50	3,760	2.12	2.19	2.27	2.35	2.53
IALR230-0050-0100-0300-00040		0.1	3	0.4	0.47	15	4	50	3,760	3.16	3.26	3.38	3.50	3.78
IALR230-0050-0100-0300-00050		0.1	3	0.5	0.47	15	4	50	3,760	3.16	3.26	3.38	3.50	3.78
IALR230-0050-0100-0400		0.1	4	0.4	0.47	15	4	50	3,760	4.19	4.33	4.48	4.65	5.02
IALR230-0060-0050-0180	0.6	0.05	1.8	0.6	0.57	15	4	50	3,760	1.92	1.98	2.05	2.13	2.30
IALR230-0060-0050-0200		0.05	2	0.5	0.57	15	4	50	3,760	2.12	2.20	2.27	2.36	2.54
IALR230-0060-0050-0300		0.05	3	0.5	0.57	15	4	50	3,760	3.16	3.27	3.38	3.51	3.79
IALR230-0060-0050-0400		0.05	4	0.5	0.57	15	4	50	3,760	4.19	4.34	4.49	4.66	5.03
IALR230-0060-0050-0500		0.05	5	0.6	0.57	15	4	50	3,760	5.22	5.40	5.60	5.81	6.27
IALR230-0060-0050-0600		0.05	6	0.5	0.57	15	4	50	3,760	6.26	6.47	6.71	6.96	7.52
IALR230-0060-0100-0180		0.1	1.8	0.6	0.57	15	4	50	3,760	1.92	1.98	2.05	2.12	2.28
IALR230-0060-0100-0200		0.1	2	0.5	0.57	15	4	50	3,760	2.12	2.19	2.27	2.35	2.53
IALR230-0060-0100-0300		0.1	3	0.5	0.57	15	4	50	3,760	3.16	3.26	3.38	3.50	3.78
IALR230-0060-0100-0400		0.1	4	0.5	0.57	15	4	50	3,760	4.19	4.33	4.48	4.65	5.02
IALR230-0060-0100-0500		0.1	5	0.6	0.57	15	4	50	3,760	5.22	5.40	5.59	5.80	6.26
IALR230-0060-0100-0600		0.1	6	0.5	0.57	15	4	50	3,760	6.26	6.47	6.70	6.95	7.51
IALR230-0060-0200-0200		0.2	2	0.5	0.57	15	4	50	3,760	2.12	2.19	2.26	2.33	2.51
IALR230-0060-0200-0300		0.2	3	0.5	0.57	15	4	50	3,760	3.15	3.26	3.37	3.48	3.75
IALR230-0060-0200-0400		0.2	4	0.5	0.57	15	4	50	3,760	4.19	4.32	4.47	4.63	5.00
IALR230-0060-0200-0600		0.2	6	0.5	0.57	15	4	50	3,760	6.25	6.46	6.69	6.93	7.48
IALR230-0070-0050-0400	0.7	0.05	4	0.55	0.67	15	4	50	4,000	4.19	4.34	4.49	4.66	5.03
IALR230-0070-0050-0600		0.05	6	0.55	0.67	15	4	50	4,000	6.26	6.47	6.71	6.96	7.52
IALR230-0070-0100-0400		0.1	4	0.55	0.67	15	4	50	4,000	4.19	4.33	4.48	4.65	5.02
IALR230-0070-0100-0600		0.1	6	0.55	0.67	15	4	50	4,000	6.26	6.47	6.70	6.95	7.51
IALR230-0080-0050-0220	0.8	0.05	2.2	0.8	0.77	15	4	50	4,320	2.33	2.41	2.49	2.59	2.79
IALR230-0080-0050-0400		0.05	4	0.65	0.77	15	4	50	4,320	4.19	4.34	4.49	4.66	5.03
IALR230-0080-0050-0500		0.05	5	0.8	0.77	15	4	50	4,320	5.22	5.40	5.60	5.81	6.27
IALR230-0080-0050-0600		0.05	6	0.65	0.77	15	4	50	4,320	6.26	6.47	6.71	6.96	7.52
IALR230-0080-0050-0800		0.05	8	0.65	0.77	15	4	50	4,320	8.33	8.61	8.92	9.26	10.00
IALR230-0080-0100-0220		0.1	2.2	0.8	0.77	15	4	50	4,320	2.33	2.41	2.49	2.58	2.78
IALR230-0080-0100-0400		0.1	4	0.65	0.77	15	4	50	4,320	4.19	4.33	4.48	4.65	5.02
IALR230-0080-0100-0500		0.1	5	0.8	0.77	15	4	50	4,320	5.22	5.40	5.59	5.80	6.26
IALR230-0080-0100-0600		0.1	6	0.65	0.77	15	4	50	4,320	6.26	6.47	6.70	6.95	7.51
IALR230-0080-0100-0800		0.1	8	0.65	0.77	15	4	50	4,320	8.32	8.61	8.92	9.25	9.99
IALR230-0080-0200-0220		0.2	2.2	0.8	0.77	15	4	50	4,320	2.33	2.40	2.48	2.56	2.76
IALR230-0080-0200-0400		0.2	4	0.65	0.77	15	4	50	4,320	4.19	4.32	4.47	4.63	5.00
IALR230-0080-0200-0500		0.2	5	0.8	0.77	15	4	50	4,320	5.22	5.39	5.58	5.78	6.24
IALR230-0080-0200-0600		0.2	6	0.65	0.77	15	4	50	4,320	6.25	6.46	6.69	6.93	7.48
IALR230-0080-0200-0800		0.2	8	0.65	0.77	15	4	50	4,320	8.32	8.60	8.91	9.23	9.97
IALR230-0090-0100-0400	0.9	0.1	4	0.7	0.87	15	4	50	4,800	4.19	4.33	4.48	4.65	5.02
IALR230-0090-0100-0800		0.1	8	0.7	0.87	15	4	50	4,800	8.32	8.61	8.92	9.25	9.99
IALR230-0100-0050-0200	1	0.05	2	0.8	0.95	15	4	50	3,680	2.16	2.24	2.31	2.40	2.59
IALR230-0100-0050-0300		0.05	3	0.8	0.95	15	4	50	3,680	3.20	3.31	3.42	3.55	3.83
IALR230-0100-0050-0400		0.05	4	0.8	0.95	15	4	50	3,680	4.23	4.38	4.53	4.70	5.08
IALR230-0100-0050-0500		0.05	5	0.8	0.95	15	4	50	3,680	5.26	5.44	5.64	5.85	6.32

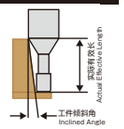
ion Depo Type A Series



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR230-0100-0050-0600	1	0.05	6	0.8	0.95	15	4	50	4,000	6.30	6.51	6.75	7.00	7.56
IALR230-0100-0050-0800		0.05	8	0.8	0.95	15	4	50	4,000	8.36	8.65	8.96	9.30	10.05
IALR230-0100-0050-1000		0.05	10	0.8	0.95	15	4	50	4,000	10.43	10.79	11.18	11.60	12.54
IALR230-0100-0050-1200		0.05	12	0.8	0.95	15	4	50	4,000	12.50	12.93	13.40	13.90	15.02
IALR230-0100-0100-0200		0.1	2	0.8	0.95	15	4	50	3,680	2.16	2.23	2.31	2.39	2.58
IALR230-0100-0100-0300		0.1	3	0.8	0.95	15	4	50	3,680	3.19	3.30	3.42	3.54	3.82
IALR230-0100-0100-0400		0.1	4	0.8	0.95	15	4	50	3,680	4.23	4.37	4.53	4.69	5.07
IALR230-0100-0100-0500		0.1	5	0.8	0.95	15	4	50	3,680	5.26	5.44	5.63	5.84	6.31
IALR230-0100-0100-0600		0.1	6	0.8	0.95	15	4	50	4,000	6.30	6.51	6.74	6.99	7.55
IALR230-0100-0100-0800		0.1	8	0.8	0.95	15	4	50	4,000	8.36	8.65	8.96	9.29	10.04
IALR230-0100-0100-1000		0.1	10	0.8	0.95	15	4	50	4,000	10.43	10.79	11.18	11.59	12.52
IALR230-0100-0100-1200		0.1	12	0.8	0.95	15	4	50	4,000	12.50	12.93	13.39	13.89	15.01
IALR230-0100-0200-0200		0.2	2	0.8	0.95	15	4	50	3,680	2.16	2.23	2.30	2.38	2.56
IALR230-0100-0200-0300		0.2	3	0.8	0.95	15	4	50	3,680	3.19	3.30	3.41	3.53	3.80
IALR230-0100-0200-0400		0.2	4	0.8	0.95	15	4	50	3,680	4.22	4.36	4.52	4.68	5.04
IALR230-0100-0200-0500		0.2	5	0.8	0.95	15	4	50	3,680	5.26	5.43	5.62	5.83	6.29
IALR230-0100-0200-0600		0.2	6	0.8	0.95	15	4	50	4,000	6.29	6.50	6.73	6.98	7.53
IALR230-0100-0200-0800		0.2	8	0.8	0.95	15	4	50	4,000	8.36	8.64	8.95	9.28	10.01
IALR230-0100-0200-1000		0.2	10	0.8	0.95	15	4	50	4,000	10.43	10.78	11.17	11.58	12.50
IALR230-0100-0200-1200		0.2	12	0.8	0.95	15	4	50	4,000	12.49	12.92	13.38	13.88	14.99
IALR230-0100-0300-0200		0.3	2	0.8	0.95	15	4	50	3,680	2.15	2.22	2.29	2.36	2.53
IALR230-0100-0300-0300		0.3	3	0.8	0.95	15	4	50	3,680	3.19	3.29	3.40	3.51	3.78
IALR230-0100-0300-0400		0.3	4	0.8	0.95	15	4	50	3,680	4.22	4.36	4.50	4.66	5.02
IALR230-0100-0300-0500		0.3	5	0.8	0.95	15	4	50	3,680	5.25	5.43	5.61	5.81	6.26
IALR230-0100-0300-0600		0.3	6	0.8	0.95	15	4	50	4,000	6.29	6.50	6.72	6.96	7.51
IALR230-0100-0300-0800		0.3	8	0.8	0.95	15	4	50	4,000	8.36	8.64	8.94	9.26	9.99
IALR230-0100-0300-1000		0.3	10	0.8	0.95	15	4	50	4,000	10.42	10.78	11.15	11.56	12.48
IALR230-0100-0300-1200		0.3	12	0.8	0.95	15	4	50	4,000	12.49	12.92	13.37	13.86	14.96
IALR230-0120-0100-0500	1.2	0.1	5	1	1.15	15	4	50	4,960	5.26	5.44	5.63	5.84	6.31
IALR230-0120-0100-0600		0.1	6	1	1.15	15	4	50	4,080	6.30	6.51	6.74	6.99	7.55
IALR230-0120-0100-0800		0.1	8	1	1.15	15	4	50	4,080	8.36	8.65	8.96	9.29	10.04
IALR230-0120-0100-1000		0.1	10	1	1.15	15	4	50	4,080	10.43	10.79	11.18	11.59	12.52
IALR230-0120-0100-1200		0.1	12	1	1.15	15	4	50	4,080	12.50	12.93	13.39	13.89	15.01
IALR230-0120-0200-0500		0.2	5	1	1.15	15	4	50	4,960	5.26	5.43	5.62	5.83	6.29
IALR230-0120-0200-0600		0.2	6	1	1.15	15	4	50	4,080	6.29	6.50	6.73	6.98	7.53
IALR230-0120-0200-0800		0.2	8	1	1.15	15	4	50	4,080	8.36	8.64	8.95	9.28	10.01
IALR230-0120-0200-1000		0.2	10	1	1.15	15	4	50	4,080	10.43	10.78	11.17	11.58	12.50
IALR230-0120-0200-1200		0.2	12	1	1.15	15	4	50	4,080	12.49	12.92	13.38	13.88	14.99
IALR230-0120-0300-0500		0.3	5	1	1.15	15	4	50	4,960	5.25	5.43	5.61	5.81	6.26
IALR230-0120-0300-0600		0.3	6	1	1.15	15	4	50	4,080	6.29	6.50	6.72	6.96	7.51
IALR230-0120-0300-0800		0.3	8	1	1.15	15	4	50	4,080	8.36	8.64	8.94	9.26	9.99
IALR230-0120-0300-1000		0.3	10	1	1.15	15	4	50	4,080	10.42	10.78	11.15	11.56	12.48
IALR230-0120-0300-1200		0.3	12	1	1.15	15	4	50	4,080	12.49	12.92	13.37	13.86	14.96
IALR230-0150-0100-0400	1.5	0.1	4	1.2	1.45	15	4	50	3,920	4.23	4.37	4.53	4.69	5.07
IALR230-0150-0100-0600		0.1	6	1.2	1.45	15	4	50	3,920	6.30	6.51	6.74	6.99	7.55

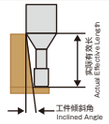


●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR230-0150-0100-0800	1.5	0.1	8	1.2	1.45	15	4	50	4,080	8.36	8.65	8.96	9.29	10.04
IALR230-0150-0100-1000		0.1	10	1.2	1.45	15	4	50	4,080	10.43	10.79	11.18	11.59	12.52
IALR230-0150-0100-1200		0.1	12	1.2	1.45	15	4	50	4,080	12.50	12.93	13.39	13.89	15.01
IALR230-0150-0100-1600		0.1	16	1.2	1.45	15	4	50	4,080	16.63	17.21	17.83	18.49	19.98
IALR230-0150-0200-0400		0.2	4	1.2	1.45	15	4	50	3,920	4.22	4.36	4.52	4.68	5.04
IALR230-0150-0200-0600		0.2	6	1.2	1.45	15	4	50	3,920	6.29	6.50	6.73	6.98	7.53
IALR230-0150-0200-0800		0.2	8	1.2	1.45	15	4	50	4,080	8.36	8.64	8.95	9.28	10.01
IALR230-0150-0200-1000		0.2	10	1.2	1.45	15	4	50	4,080	10.43	10.78	11.17	11.58	12.50
IALR230-0150-0200-1200		0.2	12	1.2	1.45	15	4	50	4,080	12.49	12.92	13.38	13.88	14.99
IALR230-0150-0200-1600		0.2	16	1.2	1.45	15	4	50	4,080	16.63	17.20	17.82	18.48	19.96
IALR230-0150-0300-0400		0.3	4	1.2	1.45	15	4	50	3,920	4.22	4.36	4.50	4.66	5.02
IALR230-0150-0300-0600		0.3	6	1.2	1.45	15	4	50	3,920	6.29	6.50	6.72	6.96	7.51
IALR230-0150-0300-0800		0.3	8	1.2	1.45	15	4	50	4,080	8.36	8.64	8.94	9.26	9.99
IALR230-0150-0300-1000		0.3	10	1.2	1.45	15	4	50	4,080	10.42	10.78	11.15	11.56	12.48
IALR230-0150-0300-1200		0.3	12	1.2	1.45	15	4	50	4,080	12.49	12.92	13.37	13.86	14.96
IALR230-0150-0300-1600		0.3	16	1.2	1.45	15	4	50	4,080	16.63	17.19	17.80	18.46	19.94
IALR230-0150-0500-0400		0.5	4	1.2	1.45	15	4	50	3,920	4.21	4.34	4.48	4.63	4.97
IALR230-0150-0500-0600		0.5	6	1.2	1.45	15	4	50	3,920	6.28	6.48	6.70	6.93	7.46
IALR230-0150-0500-0800		0.5	8	1.2	1.45	15	4	50	4,080	8.35	8.62	8.92	9.23	9.95
IALR230-0150-0500-1000		0.5	10	1.2	1.45	15	4	50	4,080	10.42	10.76	11.13	11.53	12.43
IALR230-0150-0500-1200		0.5	12	1.2	1.45	15	4	50	4,080	12.48	12.90	13.35	13.83	14.92
IALR230-0150-0500-1600		0.5	16	1.2	1.45	15	4	50	4,080	16.62	17.18	17.78	18.43	19.89
IALR230-0200-0100-0400	2	0.1	4	1.6	1.94	15	4	50	3,920	4.25	4.39	4.55	4.71	5.09
IALR230-0200-0100-0600		0.1	6	1.6	1.94	15	4	50	4,080	6.31	6.53	6.76	7.01	7.57
IALR230-0200-0100-0800		0.1	8	1.6	1.94	15	4	50	4,080	8.38	8.67	8.98	9.31	10.06
IALR230-0200-0100-1000		0.1	10	1.6	1.94	15	4	50	4,080	10.45	10.81	11.20	11.61	12.55
IALR230-0200-0100-1200		0.1	12	1.6	1.94	15	4	50	4,080	12.52	12.95	13.41	13.91	15.03
IALR230-0200-0100-1600		0.1	16	1.6	1.94	15	4	50	4,080	16.65	17.23	17.85	18.51	FREE
IALR230-0200-0100-2000		0.1	20	1.6	1.94	15	4	50	4,080	20.79	21.51	22.28	23.11	FREE
IALR230-0200-0200-0400		0.2	4	1.6	1.94	15	4	50	3,920	4.24	4.38	4.54	4.70	5.07
IALR230-0200-0200-0600		0.2	6	1.6	1.94	15	4	50	4,080	6.31	6.52	6.75	7.00	7.55
IALR230-0200-0200-0800		0.2	8	1.6	1.94	15	4	50	4,080	8.38	8.66	8.97	9.30	10.04
IALR230-0200-0200-1000		0.2	10	1.6	1.94	15	4	50	4,080	10.45	10.80	11.19	11.60	12.52
IALR230-0200-0200-1200		0.2	12	1.6	1.94	15	4	50	4,080	12.51	12.94	13.40	13.90	15.01
IALR230-0200-0200-1600		0.2	16	1.6	1.94	15	4	50	4,080	16.65	17.22	17.84	18.50	FREE
IALR230-0200-0200-2000		0.2	20	1.6	1.94	15	4	50	4,080	20.78	21.50	22.27	23.10	FREE
IALR230-0200-0300-0400		0.3	4	1.6	1.94	15	4	50	3,920	4.24	4.38	4.53	4.68	5.04
IALR230-0200-0300-0600		0.3	6	1.6	1.94	15	4	50	4,080	6.31	6.52	6.74	6.98	7.53
IALR230-0200-0300-0800		0.3	8	1.6	1.94	15	4	50	4,080	8.37	8.66	8.96	9.28	10.02
IALR230-0200-0300-1000		0.3	10	1.6	1.94	15	4	50	4,080	10.44	10.80	11.18	11.58	12.50
IALR230-0200-0300-1200		0.3	12	1.6	1.94	15	4	50	4,080	12.51	12.94	13.39	13.88	14.99
IALR230-0200-0300-1600		0.3	16	1.6	1.94	15	4	50	4,080	16.64	17.21	17.83	18.48	FREE
IALR230-0200-0300-2000		0.3	20	1.6	1.94	15	4	50	4,080	20.78	21.49	22.26	23.08	FREE
IALR230-0200-0500-0400		0.5	4	1.6	1.94	15	4	50	3,920	4.23	4.36	4.50	4.65	5.00
IALR230-0200-0500-0600		0.5	6	1.6	1.94	15	4	50	4,080	6.30	6.50	6.72	6.95	7.48

CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo A Series 圆角 Radius
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series



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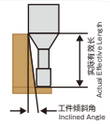
单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR230-0200-0500-0800	2	0.5	8	1.6	1.94	15	4	50	4,080	8.37	8.64	8.94	9.25	9.97
IALR230-0200-0500-1000		0.5	10	1.6	1.94	15	4	50	4,080	10.44	10.78	11.15	11.55	12.46
IALR230-0200-0500-1200		0.5	12	1.6	1.94	15	4	50	4,080	12.50	12.92	13.37	13.85	14.94
IALR230-0200-0500-1600		0.5	16	1.6	1.94	15	4	50	4,080	16.64	17.20	17.80	18.45	FREE
IALR230-0200-0500-2000		0.5	20	1.6	1.94	15	4	50	4,080	20.77	21.48	22.24	23.05	FREE
IALR230-0250-0100-1000	2.5	0.1	10	2	2.44	15	4	50	4,320	10.45	10.81	11.20	11.61	12.55
IALR230-0250-0100-2000		0.1	20	2	2.44	15	4	50	4,400	20.79	21.51	22.28	FREE	FREE
IALR230-0250-0200-1000		0.2	10	2	2.44	15	4	50	4,320	10.45	10.80	11.19	11.60	12.52
IALR230-0250-0200-2000		0.2	20	2	2.44	15	4	50	4,400	20.78	21.50	22.27	FREE	FREE
IALR230-0250-0300-1000		0.3	10	2	2.44	15	4	50	4,320	10.44	10.80	11.18	11.58	12.50
IALR230-0250-0300-2000		0.3	20	2	2.44	15	4	50	4,400	20.78	21.49	22.26	FREE	FREE
IALR230-0250-0500-1000		0.5	10	2	2.44	15	4	50	4,320	10.44	10.78	11.15	11.55	12.46
IALR230-0250-0500-2000		0.5	20	2	2.44	15	4	50	4,400	20.77	21.48	22.24	FREE	FREE
IALR230-0300-0100-1200	3	0.1	12	4.5	2.85	15	4	50	6,880	12.69	13.13	13.60	14.11	FREE
IALR230-0300-0100-1800		0.1	18	4.5	2.85	15	4	50	7,040	18.89	19.55	FREE	FREE	FREE
IALR230-0300-0100-2400		0.1	24	4.5	2.85	15	4	60	7,280	25.09	25.96	FREE	FREE	FREE
IALR230-0300-0100-3000		0.1	30	4.5	2.85	15	4	60	7,600	31.30	FREE	FREE	FREE	FREE
IALR230-0300-0200-1200		0.2	12	4.5	2.85	15	4	50	6,880	12.69	13.12	13.59	14.09	FREE
IALR230-0300-0200-1800		0.2	18	4.5	2.85	15	4	50	7,040	18.89	19.54	FREE	FREE	FREE
IALR230-0300-0200-2400		0.2	24	4.5	2.85	15	4	60	7,280	25.09	25.96	FREE	FREE	FREE
IALR230-0300-0200-3000		0.2	30	4.5	2.85	15	4	60	7,600	31.29	FREE	FREE	FREE	FREE
IALR230-0300-0300-1200		0.3	12	4.5	2.85	15	4	50	6,880	12.68	13.11	13.58	14.08	FREE
IALR230-0300-0300-1800		0.3	18	4.5	2.85	15	4	50	7,040	18.89	19.53	FREE	FREE	FREE
IALR230-0300-0300-2400		0.3	24	4.5	2.85	15	4	60	7,280	25.09	25.95	FREE	FREE	FREE
IALR230-0300-0300-3000		0.3	30	4.5	2.85	15	4	60	7,600	31.29	FREE	FREE	FREE	FREE
IALR230-0300-0500-1200		0.5	12	4.5	2.85	15	4	50	6,880	12.68	13.10	13.56	14.05	FREE
IALR230-0300-0500-1800		0.5	18	4.5	2.85	15	4	50	7,040	18.88	19.52	FREE	FREE	FREE
IALR230-0300-0500-2400		0.5	24	4.5	2.85	15	4	60	7,280	25.08	25.94	FREE	FREE	FREE
IALR230-0300-0500-3000		0.5	30	4.5	2.85	15	4	60	7,600	31.28	FREE	FREE	FREE	FREE
IALR230-0300-1000-1200		1	12	4.5	2.85	15	4	50	6,880	12.66	13.07	13.50	13.97	FREE
IALR230-0300-1000-1800		1	18	4.5	2.85	15	4	50	7,040	18.86	19.48	FREE	FREE	FREE
IALR230-0300-1000-2400		1	24	4.5	2.85	15	4	60	7,280	25.06	25.90	FREE	FREE	FREE
IALR230-0300-1000-3000		1	30	4.5	2.85	15	4	60	7,600	31.27	FREE	FREE	FREE	FREE
IALR230-0400-0100-1600	4	0.1	16	6	3.8	15	6	50	6,880	16.92	17.51	18.14	18.81	FREE
IALR230-0400-0100-2400		0.1	24	6	3.8	15	6	60	6,880	25.19	26.06	27.00	28.01	FREE
IALR230-0400-0100-3200		0.1	32	6	3.8	15	6	70	6,880	33.46	34.62	35.87	FREE	FREE
IALR230-0400-0200-1600		0.2	16	6	3.8	15	6	50	6,880	16.92	17.50	18.13	18.80	FREE
IALR230-0400-0200-2400		0.2	24	6	3.8	15	6	60	6,880	25.19	26.06	26.99	28.00	FREE
IALR230-0400-0200-3200		0.2	32	6	3.8	15	6	70	6,880	33.46	34.62	35.86	FREE	FREE
IALR230-0400-0300-1600		0.3	16	6	3.8	15	6	50	6,880	16.91	17.49	18.11	18.78	FREE
IALR230-0400-0300-2400		0.3	24	6	3.8	15	6	60	6,880	25.18	26.05	26.98	27.98	FREE
IALR230-0400-0300-3200		0.3	32	6	3.8	15	6	70	6,880	33.45	34.61	35.85	FREE	FREE
IALR230-0400-0500-1600		0.5	16	6	3.8	15	6	50	6,880	16.91	17.48	18.09	18.75	FREE
IALR230-0400-0500-2400		0.5	24	6	3.8	15	6	60	6,880	25.18	26.04	26.96	27.95	FREE
IALR230-0400-0500-3200		0.5	32	6	3.8	15	6	70	6,880	33.45	34.59	35.83	FREE	FREE



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR230-0400-1000-1600	4	1	16	6	3.8	15	6	50	6,880	16.89	17.45	18.04	18.68	FREE
IALR230-0400-1000-2400		1	24	6	3.8	15	6	60	6,880	25.16	26.00	26.91	27.88	FREE
IALR230-0400-1000-3200		1	32	6	3.8	15	6	70	6,880	33.43	34.56	35.77	FREE	FREE
IALR230-0500-0100-2000	5	0.1	20	7.5	4.8	15	6	50	8,720	21.06	21.79	FREE	FREE	FREE
IALR230-0500-0100-4000		0.1	40	7.5	4.8	15	6	70	10,960	41.73	FREE	FREE	FREE	FREE
IALR230-0500-0200-1500		0.2	15	3.5	4.8	15	6	50	8,720	15.88	16.43	17.02	FREE	FREE
IALR230-0500-0200-2000-00350		0.2	20	3.5	4.8	15	6	50	8,720	21.05	21.78	FREE	FREE	FREE
IALR230-0500-0200-2000-00750		0.2	20	7.5	4.8	15	6	50	8,720	21.05	21.78	FREE	FREE	FREE
IALR230-0500-0200-4000		0.2	40	7.5	4.8	15	6	70	10,960	41.73	FREE	FREE	FREE	FREE
IALR230-0500-0300-1500		0.3	15	3.5	4.8	15	6	50	8,720	15.88	16.42	17.01	FREE	FREE
IALR230-0500-0300-2000-00350		0.3	20	3.5	4.8	15	6	50	8,720	21.05	21.77	FREE	FREE	FREE
IALR230-0500-0300-2000-00750		0.3	20	7.5	4.8	15	6	50	8,720	21.05	21.77	FREE	FREE	FREE
IALR230-0500-0300-4000		0.3	40	7.5	4.8	15	6	70	10,960	41.72	FREE	FREE	FREE	FREE
IALR230-0500-0500-2000		0.5	20	7.5	4.8	15	6	50	8,720	21.04	21.76	FREE	FREE	FREE
IALR230-0500-0500-4000		0.5	40	7.5	4.8	15	6	70	10,960	41.72	FREE	FREE	FREE	FREE
IALR230-0500-1000-2000		1	20	7.5	4.8	15	6	50	8,720	21.03	21.72	FREE	FREE	FREE
IALR230-0500-1000-4000		1	40	7.5	4.8	15	6	70	10,960	41.70	FREE	FREE	FREE	FREE
IALR230-0600-0100-2400	6	0.1	24	9	5.8	15	6	60	8,720	FREE	FREE	FREE	FREE	FREE
IALR230-0600-0100-4800		0.1	48	9	5.8	15	6	80	13,680	FREE	FREE	FREE	FREE	FREE
IALR230-0600-0200-2400		0.2	24	9	5.8	15	6	60	8,720	FREE	FREE	FREE	FREE	FREE
IALR230-0600-0200-4800		0.2	48	9	5.8	15	6	80	13,680	FREE	FREE	FREE	FREE	FREE
IALR230-0600-0300-2400		0.3	24	9	5.8	15	6	60	8,720	FREE	FREE	FREE	FREE	FREE
IALR230-0600-0300-4800		0.3	48	9	5.8	15	6	80	13,680	FREE	FREE	FREE	FREE	FREE
IALR230-0600-0500-2400		0.5	24	9	5.8	15	6	60	8,720	FREE	FREE	FREE	FREE	FREE
IALR230-0600-0500-4800		0.5	48	9	5.8	15	6	80	13,680	FREE	FREE	FREE	FREE	FREE
IALR230-0600-1000-2400		1	24	9	5.8	15	6	60	8,720	FREE	FREE	FREE	FREE	FREE
IALR230-0600-1000-4800		1	48	9	5.8	15	6	80	13,680	FREE	FREE	FREE	FREE	FREE

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALR230
Model number:IALR230

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.2	0.5	0.01	0.05	200	30,000	0.01	0.05	200	30,000	0.01	0.05	200	30,000	0.003	0.04	150	30,000
		1	0.007	0.05	150	30,000	0.007	0.05	150	30,000	0.007	0.05	150	30,000	0.003	0.04	100	30,000
		2	0.005	0.05	100	30,000	0.005	0.05	100	30,000	0.005	0.05	100	30,000	0.002	0.04	80	30,000
	0.3	0.8	0.02	0.1	200	30,000	0.02	0.1	200	30,000	0.02	0.1	200	30,000	0.003	0.08	180	30,000
		1	0.02	0.1	200	30,000	0.02	0.1	200	30,000	0.02	0.1	200	30,000	0.003	0.08	180	30,000
		1.5	0.015	0.1	180	30,000	0.015	0.1	180	30,000	0.015	0.1	180	30,000	0.003	0.08	130	30,000
		2	0.01	0.1	150	30,000	0.01	0.1	150	30,000	0.01	0.1	150	30,000	0.003	0.08	100	30,000
		2.5	0.007	0.1	120	30,000	0.007	0.1	120	30,000	0.007	0.1	120	30,000	0.002	0.08	80	25,000
		3	0.005	0.1	100	30,000	0.005	0.1	100	30,000	0.005	0.1	100	30,000	0.002	0.08	50	25,000
	0.4	1	0.025	0.12	350	30,000	0.025	0.12	350	30,000	0.025	0.12	350	30,000	0.005	0.1	300	30,000
		1.2	0.025	0.12	350	30,000	0.025	0.12	350	30,000	0.025	0.12	350	30,000	0.005	0.1	300	30,000
		1.5	0.022	0.12	300	30,000	0.022	0.12	300	30,000	0.022	0.12	300	30,000	0.005	0.1	270	30,000
		2	0.02	0.12	250	30,000	0.02	0.12	250	30,000	0.02	0.12	250	30,000	0.005	0.1	180	25,000
		2.5	0.02	0.12	250	30,000	0.02	0.12	250	30,000	0.02	0.12	250	30,000	0.005	0.1	180	25,000
		3	0.015	0.12	220	30,000	0.015	0.12	220	30,000	0.015	0.12	220	30,000	0.004	0.1	150	25,000
	0.5	1	0.03	0.14	500	30,000	0.03	0.14	500	30,000	0.03	0.14	500	30,000	0.01	0.12	400	25,000
		1.5	0.03	0.14	500	30,000	0.03	0.14	500	30,000	0.03	0.14	500	30,000	0.01	0.12	400	25,000
		2	0.025	0.14	400	30,000	0.025	0.14	400	30,000	0.025	0.14	400	30,000	0.01	0.12	300	25,000
		3	0.02	0.14	340	30,000	0.02	0.14	340	30,000	0.02	0.14	340	30,000	0.008	0.12	250	25,000
		4	0.015	0.14	280	25,000	0.015	0.14	280	25,000	0.015	0.14	280	25,000	0.005	0.12	180	20,000
	0.6	1.8	0.035	0.16	600	30,000	0.035	0.16	600	30,000	0.035	0.16	600	30,000	0.02	0.13	400	25,000
		2	0.035	0.16	600	30,000	0.035	0.16	600	30,000	0.035	0.16	600	30,000	0.02	0.13	400	25,000
		3	0.03	0.16	500	30,000	0.03	0.16	500	30,000	0.03	0.16	500	30,000	0.015	0.13	350	25,000
		4	0.025	0.16	400	25,000	0.025	0.16	400	25,000	0.025	0.16	400	25,000	0.015	0.13	250	20,000
		5	0.015	0.16	250	20,000	0.015	0.16	250	20,000	0.015	0.16	250	20,000	0.008	0.13	150	16,000
		6	0.015	0.16	250	20,000	0.015	0.16	250	20,000	0.015	0.16	250	20,000	0.008	0.13	150	16,000
	0.7	4	0.03	0.2	600	25,000	0.03	0.2	600	25,000	0.03	0.2	600	25,000	0.02	0.16	400	20,000
		6	0.02	0.2	450	20,000	0.02	0.2	450	20,000	0.02	0.2	450	20,000	0.01	0.16	250	16,000
	0.8	2.2	0.045	0.25	1,000	25,000	0.045	0.25	1,000	25,000	0.045	0.25	1,000	25,000	0.025	0.2	600	20,000
		4	0.045	0.25	1,000	25,000	0.045	0.25	1,000	25,000	0.045	0.25	1,000	25,000	0.025	0.2	600	20,000
		5	0.03	0.25	700	20,000	0.03	0.25	700	20,000	0.03	0.25	700	20,000	0.02	0.2	400	16,000
		6	0.03	0.25	700	20,000	0.03	0.25	700	20,000	0.03	0.25	700	20,000	0.02	0.2	400	16,000
		8	0.02	0.25	400	18,000	0.02	0.25	400	18,000	0.02	0.25	400	18,000	0.01	0.2	250	14,000
	0.9	4	0.05	0.3	1,100	25,000	0.05	0.3	1,100	25,000	0.05	0.3	1,100	25,000	0.03	0.24	700	20,000
		8	0.03	0.3	500	18,000	0.03	0.3	500	18,000	0.03	0.3	500	18,000	0.01	0.24	350	14,000
	1	2	0.065	0.35	1,600	25,000	0.065	0.35	1,600	25,000	0.065	0.35	1,600	25,000	0.05	0.28	900	20,000
		3	0.06	0.35	1,500	25,000	0.06	0.35	1,500	25,000	0.06	0.35	1,500	25,000	0.05	0.28	850	20,000
		4	0.055	0.35	1,400	25,000	0.055	0.35	1,400	25,000	0.055	0.35	1,400	25,000	0.04	0.28	800	20,000
		5	0.05	0.35	1,200	22,000	0.05	0.35	1,200	22,000	0.05	0.35	1,200	22,000	0.03	0.28	700	18,000
		6	0.045	0.35	1,000	20,000	0.045	0.35	1,000	20,000	0.045	0.35	1,000	20,000	0.02	0.28	600	16,000
		8	0.035	0.35	700	18,000	0.035	0.35	700	18,000	0.035	0.35	700	18,000	0.02	0.28	450	14,000
		10	0.025	0.35	600	16,000	0.025	0.35	600	16,000	0.025	0.35	600	16,000	0.01	0.28	350	13,000

●请将刀具跳实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	1	12	0.02	0.35	350	14,000	0.02	0.35	350	14,000	0.02	0.35	350	14,000	0.008	0.28	250	12,000
	1.2	5	0.055	0.4	1,500	22,000	0.055	0.4	1,500	22,000	0.055	0.4	1,500	22,000	0.03	0.32	850	18,000
		6	0.05	0.4	1,300	20,000	0.05	0.4	1,300	20,000	0.05	0.4	1,300	20,000	0.03	0.32	750	17,000
		8	0.04	0.4	1,100	18,000	0.04	0.4	1,100	18,000	0.04	0.4	1,100	18,000	0.025	0.32	600	15,000
		10	0.03	0.4	900	16,000	0.03	0.4	900	16,000	0.03	0.4	900	16,000	0.02	0.32	500	13,000
		12	0.025	0.4	700	14,000	0.025	0.4	700	14,000	0.025	0.4	700	14,000	0.015	0.32	400	11,000
	1.5	4	0.09	0.45	1,600	22,000	0.09	0.45	1,600	22,000	0.09	0.45	1,600	22,000	0.05	0.36	1,000	18,000
		6	0.08	0.45	1,400	20,000	0.08	0.45	1,400	20,000	0.08	0.45	1,400	20,000	0.045	0.36	850	16,000
		8	0.07	0.45	1,200	18,000	0.07	0.45	1,200	18,000	0.07	0.45	1,200	18,000	0.04	0.36	700	15,000
		10	0.06	0.45	1,000	16,000	0.06	0.45	1,000	16,000	0.06	0.45	1,000	16,000	0.035	0.36	550	13,000
		12	0.05	0.45	800	14,000	0.05	0.45	800	14,000	0.05	0.45	800	14,000	0.03	0.36	450	11,000
		16	0.035	0.45	600	12,000	0.035	0.45	600	12,000	0.035	0.45	600	12,000	0.018	0.36	350	10,000
	2	4	0.13	0.5	2,200	16,000	0.13	0.5	2,200	16,000	0.13	0.5	2,200	16,000	0.06	0.4	1,000	14,000
		6	0.12	0.5	2,100	16,000	0.12	0.5	2,100	16,000	0.12	0.5	2,100	16,000	0.055	0.4	900	14,000
		8	0.11	0.5	2,000	16,000	0.11	0.5	2,000	16,000	0.11	0.5	2,000	16,000	0.05	0.4	800	13,000
		10	0.1	0.5	1,800	16,000	0.1	0.5	1,800	16,000	0.1	0.5	1,800	16,000	0.045	0.4	750	13,000
		12	0.09	0.5	1,500	14,000	0.09	0.5	1,500	14,000	0.09	0.5	1,500	14,000	0.04	0.4	600	11,000
		16	0.07	0.5	1,200	12,000	0.07	0.5	1,200	12,000	0.07	0.5	1,200	12,000	0.03	0.4	500	10,000
		20	0.07	0.5	1,000	12,000	0.07	0.5	1,000	12,000	0.07	0.5	1,000	12,000	0.03	0.4	450	10,000
	2.5	10	0.14	0.8	1,800	13,000	0.14	0.8	1,800	13,000	0.14	0.8	1,800	13,000	0.07	0.65	900	11,000
		20	0.08	0.8	1,000	9,000	0.08	0.8	1,000	9,000	0.08	0.8	1,000	9,000	0.05	0.65	450	7,000
	3	12	0.16	0.9	1,800	11,000	0.16	0.9	1,800	11,000	0.16	0.9	1,800	11,000	0.08	0.75	900	9,000
		18	0.12	0.9	1,400	10,000	0.12	0.9	1,400	10,000	0.12	0.9	1,400	10,000	0.07	0.75	700	8,000
		24	0.08	0.9	1,000	8,000	0.08	0.9	1,000	8,000	0.08	0.9	1,000	8,000	0.05	0.75	500	6,400
		30	0.06	0.9	800	7,000	0.06	0.9	800	7,000	0.06	0.9	800	7,000	0.03	0.75	400	5,600
	4	16	0.2	1.2	2,000	8,000	0.2	1.2	2,000	8,000	0.2	1.2	2,000	8,000	0.1	1	850	6,400
		24	0.12	1.2	1,500	7,000	0.12	1.2	1,500	7,000	0.12	1.2	1,500	7,000	0.08	1	700	5,600
		32	0.08	1.2	800	6,000	0.08	1.2	800	6,000	0.08	1.2	800	6,000	0.04	1	500	4,800
	5	15	0.25	1.6	1,800	6,000	0.25	1.6	1,800	6,000	0.25	1.6	1,800	6,000	0.1	1.3	800	4,800
		20	0.25	1.6	1,800	6,000	0.25	1.6	1,800	6,000	0.25	1.6	1,800	6,000	0.1	1.3	800	4,800
		40	0.07	1.6	700	4,000	0.07	1.6	700	4,000	0.07	1.6	700	4,000	0.05	1.3	400	3,200
	6	24	0.3	2.1	1,500	4,500	0.3	2.1	1,500	4,500	0.3	2.1	1,500	4,500	0.15	1.7	700	3,600
		48	0.1	2.1	600	3,000	0.1	2.1	600	3,000	0.1	2.1	600	3,000	0.05	1.7	350	2,400

●请将刀具跳实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALR230
Model number:IALR230

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.2	0.5	0.003	0.04	150	30,000	0.003	0.04	150	30,000	0.003	0.04	150	30,000	0.012	0.05	250	30,000
		1	0.003	0.04	100	30,000	0.003	0.04	100	30,000	0.003	0.04	100	30,000	0.008	0.05	200	30,000
		2	0.002	0.04	80	30,000	0.002	0.04	80	30,000	0.002	0.04	80	30,000	0.006	0.05	135	30,000
	0.3	0.8	0.003	0.08	180	30,000	0.003	0.08	180	30,000	0.003	0.08	180	30,000	0.024	0.1	300	30,000
		1	0.003	0.08	180	30,000	0.003	0.08	180	30,000	0.003	0.08	180	30,000	0.024	0.1	300	30,000
		1.5	0.003	0.08	130	30,000	0.003	0.08	130	30,000	0.003	0.08	130	30,000	0.018	0.1	260	30,000
		2	0.003	0.08	100	30,000	0.003	0.08	100	30,000	0.003	0.08	100	30,000	0.012	0.1	250	30,000
		2.5	0.002	0.08	80	25,000	0.002	0.08	80	25,000	0.002	0.08	80	25,000	0.008	0.1	240	30,000
		3	0.002	0.08	50	25,000	0.002	0.08	50	25,000	0.002	0.08	50	25,000	0.006	0.1	220	30,000
	0.4	1	0.005	0.1	300	30,000	0.005	0.1	300	30,000	0.005	0.1	300	30,000	0.03	0.12	450	30,000
		1.2	0.005	0.1	300	30,000	0.005	0.1	300	30,000	0.005	0.1	300	30,000	0.03	0.12	450	30,000
		1.5	0.005	0.1	270	30,000	0.005	0.1	270	30,000	0.005	0.1	270	30,000	0.027	0.12	400	30,000
		2	0.005	0.1	180	25,000	0.005	0.1	180	25,000	0.005	0.1	180	25,000	0.024	0.12	360	30,000
		2.5	0.005	0.1	180	25,000	0.005	0.1	180	25,000	0.005	0.1	180	25,000	0.024	0.12	360	30,000
		3	0.004	0.1	150	25,000	0.004	0.1	150	25,000	0.004	0.1	150	25,000	0.018	0.12	300	30,000
	0.5	1	0.01	0.12	400	25,000	0.01	0.12	400	25,000	0.01	0.12	400	25,000	0.036	0.14	650	30,000
		1.5	0.01	0.12	400	25,000	0.01	0.12	400	25,000	0.01	0.12	400	25,000	0.036	0.14	650	30,000
		2	0.01	0.12	300	25,000	0.01	0.12	300	25,000	0.01	0.12	300	25,000	0.03	0.14	600	30,000
		3	0.008	0.12	250	25,000	0.008	0.12	250	25,000	0.008	0.12	250	25,000	0.024	0.14	480	30,000
		4	0.005	0.12	180	20,000	0.005	0.12	180	20,000	0.005	0.12	180	20,000	0.018	0.14	430	30,000
	0.6	1.8	0.02	0.13	400	25,000	0.02	0.13	400	25,000	0.02	0.13	400	25,000	0.04	0.16	800	30,000
		2	0.02	0.13	400	25,000	0.02	0.13	400	25,000	0.02	0.13	400	25,000	0.04	0.16	800	30,000
		3	0.015	0.13	350	25,000	0.015	0.13	350	25,000	0.015	0.13	350	25,000	0.035	0.16	750	30,000
		4	0.015	0.13	250	20,000	0.015	0.13	250	20,000	0.015	0.13	250	20,000	0.03	0.16	650	30,000
		5	0.008	0.13	150	16,000	0.008	0.13	150	16,000	0.008	0.13	150	16,000	0.018	0.16	400	25,000
		6	0.008	0.13	150	16,000	0.008	0.13	150	16,000	0.008	0.13	150	16,000	0.018	0.16	400	25,000
	0.7	4	0.02	0.16	400	20,000	0.02	0.16	400	20,000	0.02	0.16	400	20,000	0.04	0.2	1,000	30,000
		6	0.01	0.16	250	16,000	0.01	0.16	250	16,000	0.01	0.16	250	16,000	0.025	0.2	700	25,000
	0.8	2.2	0.025	0.2	600	20,000	0.025	0.2	600	20,000	0.025	0.2	600	20,000	0.055	0.25	1,400	30,000
		4	0.025	0.2	600	20,000	0.025	0.2	600	20,000	0.025	0.2	600	20,000	0.055	0.25	1,400	30,000
		5	0.02	0.2	400	16,000	0.02	0.2	400	16,000	0.02	0.2	400	16,000	0.04	0.25	1,000	25,000
		6	0.02	0.2	400	16,000	0.02	0.2	400	16,000	0.02	0.2	400	16,000	0.04	0.25	1,000	25,000
		8	0.01	0.2	250	14,000	0.01	0.2	250	14,000	0.01	0.2	250	14,000	0.025	0.25	600	22,000
	0.9	4	0.03	0.24	700	20,000	0.03	0.24	700	20,000	0.03	0.24	700	20,000	0.06	0.3	1,500	30,000
		8	0.01	0.24	350	14,000	0.01	0.24	350	14,000	0.01	0.24	350	14,000	0.04	0.3	800	22,000
	1	2	0.05	0.28	900	20,000	0.05	0.28	900	20,000	0.05	0.28	900	20,000	0.08	0.35	2,200	30,000
		3	0.05	0.28	850	20,000	0.05	0.28	850	20,000	0.05	0.28	850	20,000	0.07	0.35	2,100	30,000
		4	0.04	0.28	800	20,000	0.04	0.28	800	20,000	0.04	0.28	800	20,000	0.065	0.35	2,000	30,000
		5	0.03	0.28	700	18,000	0.03	0.28	700	18,000	0.03	0.28	700	18,000	0.06	0.35	1,700	27,000
		6	0.02	0.28	600	16,000	0.02	0.28	600	16,000	0.02	0.28	600	16,000	0.055	0.35	1,500	25,000
		8	0.02	0.28	450	14,000	0.02	0.28	450	14,000	0.02	0.28	450	14,000	0.045	0.35	1,000	22,000
		10	0.01	0.28	350	13,000	0.01	0.28	350	13,000	0.01	0.28	350	13,000	0.03	0.35	800	20,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	1	12	0.008	0.28	250	12,000	0.008	0.28	250	12,000	0.008	0.28	250	12,000	0.025	0.35	600	18,000
	1.2	5	0.03	0.32	850	18,000	0.03	0.32	850	18,000	0.03	0.32	850	18,000	0.065	0.4	2,200	26,000
		6	0.03	0.32	750	17,000	0.03	0.32	750	17,000	0.03	0.32	750	17,000	0.06	0.4	2,000	25,000
		8	0.025	0.32	600	15,000	0.025	0.32	600	15,000	0.025	0.32	600	15,000	0.05	0.4	1,600	22,000
		10	0.02	0.32	500	13,000	0.02	0.32	500	13,000	0.02	0.32	500	13,000	0.04	0.4	1,400	20,000
		12	0.015	0.32	400	11,000	0.015	0.32	400	11,000	0.015	0.32	400	11,000	0.03	0.4	1,000	17,000
	1.5	4	0.05	0.36	1,000	18,000	0.05	0.36	1,000	18,000	0.05	0.36	1,000	18,000	0.1	0.45	2,300	26,000
		6	0.045	0.36	850	16,000	0.045	0.36	850	16,000	0.045	0.36	850	16,000	0.09	0.45	2,000	24,000
		8	0.04	0.36	700	15,000	0.04	0.36	700	15,000	0.04	0.36	700	15,000	0.08	0.45	1,800	22,000
		10	0.035	0.36	550	13,000	0.035	0.36	550	13,000	0.035	0.36	550	13,000	0.07	0.45	1,500	20,000
		12	0.03	0.36	450	11,000	0.03	0.36	450	11,000	0.03	0.36	450	11,000	0.06	0.45	1,200	17,000
		16	0.018	0.36	350	10,000	0.018	0.36	350	10,000	0.018	0.36	350	10,000	0.04	0.45	900	15,000
	2	4	0.06	0.4	1,000	14,000	0.06	0.4	1,000	14,000	0.06	0.4	1,000	14,000	0.15	0.5	3,000	20,000
		6	0.055	0.4	900	14,000	0.055	0.4	900	14,000	0.055	0.4	900	14,000	0.14	0.5	2,800	20,000
		8	0.05	0.4	800	13,000	0.05	0.4	800	13,000	0.05	0.4	800	13,000	0.13	0.5	2,600	20,000
		10	0.045	0.4	750	13,000	0.045	0.4	750	13,000	0.045	0.4	750	13,000	0.12	0.5	2,300	20,000
		12	0.04	0.4	600	11,000	0.04	0.4	600	11,000	0.04	0.4	600	11,000	0.11	0.5	1,900	17,000
		16	0.03	0.4	500	10,000	0.03	0.4	500	10,000	0.03	0.4	500	10,000	0.085	0.5	1,600	15,000
		20	0.03	0.4	450	10,000	0.03	0.4	450	10,000	0.03	0.4	450	10,000	0.085	0.5	1,400	15,000
	2.5	10	0.07	0.65	900	11,000	0.07	0.65	900	11,000	0.07	0.65	900	11,000	0.17	0.8	3,000	16,000
		20	0.05	0.65	450	7,000	0.05	0.65	450	7,000	0.05	0.65	450	7,000	0.1	0.8	1,600	11,000
	3	12	0.08	0.75	900	9,000	0.08	0.75	900	9,000	0.08	0.75	900	9,000	0.2	0.9	3,000	13,000
		18	0.07	0.75	700	8,000	0.07	0.75	700	8,000	0.07	0.75	700	8,000	0.14	0.9	2,400	12,000
		24	0.05	0.75	500	6,400	0.05	0.75	500	6,400	0.05	0.75	500	6,400	0.1	0.9	1,800	10,000
		30	0.03	0.75	400	5,600	0.03	0.75	400	5,600	0.03	0.75	400	5,600	0.07	0.9	1,300	8,500
	4	16	0.1	1	850	6,400	0.1	1	850	6,400	0.1	1	850	6,400	0.3	1.2	3,200	10,000
		24	0.08	1	700	5,600	0.08	1	700	5,600	0.08	1	700	5,600	0.18	1.2	2,400	8,500
		32	0.04	1	500	4,800	0.04	1	500	4,800	0.04	1	500	4,800	0.14	1.2	1,800	8,000
	5	15	0.1	1.3	800	4,800	0.1	1.3	800	4,800	0.1	1.3	800	4,800	0.36	1.6	3,000	7,200
		20	0.1	1.3	800	4,800	0.1	1.3	800	4,800	0.1	1.3	800	4,800	0.36	1.6	3,000	7,200
		40	0.05	1.3	400	3,200	0.05	1.3	400	3,200	0.05	1.3	400	3,200	0.16	1.6	1,300	4,800
	6	24	0.15	1.7	700	3,600	0.15	1.7	700	3,600	0.15	1.7	700	3,600	0.48	2.1	2,600	5,400
		48	0.05	1.7	350	2,400	0.05	1.7	350	2,400	0.05	1.7	350	2,400	0.18	2.1	1,000	3,600

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALR230
Model number:IALR230

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.2	0.5	0.012	0.05	250	30,000	0.012	0.05	250	30,000	0.003	0.04	150	30,000
		1	0.008	0.05	200	30,000	0.008	0.05	200	30,000	0.003	0.04	100	30,000
		2	0.006	0.05	135	30,000	0.006	0.05	135	30,000	0.002	0.04	80	30,000
	0.3	0.8	0.024	0.1	300	30,000	0.024	0.1	300	30,000	0.003	0.08	180	30,000
		1	0.024	0.1	300	30,000	0.024	0.1	300	30,000	0.003	0.08	180	30,000
		1.5	0.018	0.1	260	30,000	0.018	0.1	260	30,000	0.003	0.08	130	30,000
		2	0.012	0.1	250	30,000	0.012	0.1	250	30,000	0.003	0.08	100	30,000
		2.5	0.008	0.1	240	30,000	0.008	0.1	240	30,000	0.002	0.08	80	25,000
		3	0.006	0.1	220	30,000	0.006	0.1	220	30,000	0.002	0.08	50	25,000
	0.4	1	0.03	0.12	450	30,000	0.03	0.12	450	30,000	0.005	0.1	300	30,000
		1.2	0.03	0.12	450	30,000	0.03	0.12	450	30,000	0.005	0.1	300	30,000
		1.5	0.027	0.12	400	30,000	0.027	0.12	400	30,000	0.005	0.1	270	30,000
		2	0.024	0.12	360	30,000	0.024	0.12	360	30,000	0.005	0.1	180	25,000
		2.5	0.024	0.12	360	30,000	0.024	0.12	360	30,000	0.005	0.1	180	25,000
		3	0.018	0.12	300	30,000	0.018	0.12	300	30,000	0.004	0.1	150	25,000
	0.5	1	0.036	0.14	650	30,000	0.036	0.14	650	30,000	0.01	0.12	400	25,000
		1.5	0.036	0.14	650	30,000	0.036	0.14	650	30,000	0.01	0.12	400	25,000
		2	0.03	0.14	600	30,000	0.03	0.14	600	30,000	0.01	0.12	300	25,000
		3	0.024	0.14	480	30,000	0.024	0.14	480	30,000	0.008	0.12	250	25,000
		4	0.018	0.14	430	30,000	0.018	0.14	430	30,000	0.005	0.12	180	20,000
	0.6	1.8	0.04	0.16	800	30,000	0.04	0.16	800	30,000	0.02	0.13	400	25,000
		2	0.04	0.16	800	30,000	0.04	0.16	800	30,000	0.02	0.13	400	25,000
		3	0.035	0.16	750	30,000	0.035	0.16	750	30,000	0.015	0.13	350	25,000
		4	0.03	0.16	650	30,000	0.03	0.16	650	30,000	0.015	0.13	250	20,000
		5	0.018	0.16	400	25,000	0.018	0.16	400	25,000	0.008	0.13	150	16,000
		6	0.018	0.16	400	25,000	0.018	0.16	400	25,000	0.008	0.13	150	16,000
	0.7	4	0.04	0.2	1,000	30,000	0.04	0.2	1,000	30,000	0.02	0.16	400	20,000
		6	0.025	0.2	700	25,000	0.025	0.2	700	25,000	0.01	0.16	250	16,000
	0.8	2.2	0.055	0.25	1,400	30,000	0.055	0.25	1,400	30,000	0.025	0.2	600	20,000
		4	0.055	0.25	1,400	30,000	0.055	0.25	1,400	30,000	0.025	0.2	600	20,000
		5	0.04	0.25	1,000	25,000	0.04	0.25	1,000	25,000	0.02	0.2	400	16,000
		6	0.04	0.25	1,000	25,000	0.04	0.25	1,000	25,000	0.02	0.2	400	16,000
		8	0.025	0.25	600	22,000	0.025	0.25	600	22,000	0.01	0.2	250	14,000
	0.9	4	0.06	0.3	1,500	30,000	0.06	0.3	1,500	30,000	0.03	0.24	700	20,000
		8	0.04	0.3	800	22,000	0.04	0.3	800	22,000	0.01	0.24	350	14,000
	1	2	0.08	0.35	2,200	30,000	0.08	0.35	2,200	30,000	0.05	0.28	900	20,000
		3	0.07	0.35	2,100	30,000	0.07	0.35	2,100	30,000	0.05	0.28	850	20,000
		4	0.065	0.35	2,000	30,000	0.065	0.35	2,000	30,000	0.04	0.28	800	20,000
		5	0.06	0.35	1,700	27,000	0.06	0.35	1,700	27,000	0.03	0.28	700	18,000
		6	0.055	0.35	1,500	25,000	0.055	0.35	1,500	25,000	0.02	0.28	600	16,000
		8	0.045	0.35	1,000	22,000	0.045	0.35	1,000	22,000	0.02	0.28	450	14,000
		10	0.03	0.35	800	20,000	0.03	0.35	800	20,000	0.01	0.28	350	13,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者禁非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1	12	0.025	0.35	600	18,000	0.025	0.35	600	18,000	0.008	0.28	250	12,000
	1.2	5	0.065	0.4	2,200	26,000	0.065	0.4	2,200	26,000	0.03	0.32	850	18,000
		6	0.06	0.4	2,000	25,000	0.06	0.4	2,000	25,000	0.03	0.32	750	17,000
		8	0.05	0.4	1,600	22,000	0.05	0.4	1,600	22,000	0.025	0.32	600	15,000
		10	0.04	0.4	1,400	20,000	0.04	0.4	1,400	20,000	0.02	0.32	500	13,000
		12	0.03	0.4	1,000	17,000	0.03	0.4	1,000	17,000	0.015	0.32	400	11,000
	1.5	4	0.1	0.45	2,300	26,000	0.1	0.45	2,300	26,000	0.05	0.36	1,000	18,000
		6	0.09	0.45	2,000	24,000	0.09	0.45	2,000	24,000	0.045	0.36	850	16,000
		8	0.08	0.45	1,800	22,000	0.08	0.45	1,800	22,000	0.04	0.36	700	15,000
		10	0.07	0.45	1,500	20,000	0.07	0.45	1,500	20,000	0.035	0.36	550	13,000
		12	0.06	0.45	1,200	17,000	0.06	0.45	1,200	17,000	0.03	0.36	450	11,000
		16	0.04	0.45	900	15,000	0.04	0.45	900	15,000	0.018	0.36	350	10,000
	2	4	0.15	0.5	3,000	20,000	0.15	0.5	3,000	20,000	0.06	0.4	1,000	14,000
		6	0.14	0.5	2,800	20,000	0.14	0.5	2,800	20,000	0.055	0.4	900	14,000
		8	0.13	0.5	2,600	20,000	0.13	0.5	2,600	20,000	0.05	0.4	800	13,000
		10	0.12	0.5	2,300	20,000	0.12	0.5	2,300	20,000	0.045	0.4	750	13,000
		12	0.11	0.5	1,900	17,000	0.11	0.5	1,900	17,000	0.04	0.4	600	11,000
		16	0.085	0.5	1,600	15,000	0.085	0.5	1,600	15,000	0.03	0.4	500	10,000
		20	0.085	0.5	1,400	15,000	0.085	0.5	1,400	15,000	0.03	0.4	450	10,000
	2.5	10	0.17	0.8	3,000	16,000	0.17	0.8	3,000	16,000	0.07	0.65	900	11,000
		20	0.1	0.8	1,600	11,000	0.1	0.8	1,600	11,000	0.05	0.65	450	7,000
	3	12	0.2	0.9	3,000	13,000	0.2	0.9	3,000	13,000	0.08	0.75	900	9,000
		18	0.14	0.9	2,400	12,000	0.14	0.9	2,400	12,000	0.07	0.75	700	8,000
		24	0.1	0.9	1,800	10,000	0.1	0.9	1,800	10,000	0.05	0.75	500	6,400
		30	0.07	0.9	1,300	8,500	0.07	0.9	1,300	8,500	0.03	0.75	400	5,600
	4	16	0.3	1.2	3,200	10,000	0.3	1.2	3,200	10,000	0.1	1	850	6,400
		24	0.18	1.2	2,400	8,500	0.18	1.2	2,400	8,500	0.08	1	700	5,600
		32	0.14	1.2	1,800	8,000	0.14	1.2	1,800	8,000	0.04	1	500	4,800
	5	15	0.36	1.6	3,000	7,200	0.36	1.6	3,000	7,200	0.1	1.3	800	4,800
		20	0.36	1.6	3,000	7,200	0.36	1.6	3,000	7,200	0.1	1.3	800	4,800
		40	0.16	1.6	1,300	4,800	0.16	1.6	1,300	4,800	0.05	1.3	400	3,200
	6	24	0.48	2.1	2,600	5,400	0.48	2.1	2,600	5,400	0.15	1.7	700	3,600
		48	0.18	2.1	1,000	3,600	0.18	2.1	1,000	3,600	0.05	1.7	350	2,400

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者禁非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
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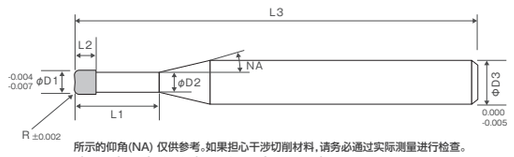
ion Depo Type A Series

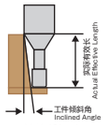
超硬长颈圆角立铣刀
Carbide Long Neck Radius End Mill

ion A | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IALR430 Model number:IALR430



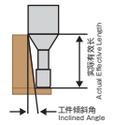
所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR430-0100-0050-0300	1	0.05	3	0.8	0.95	15	4	50	5,760	3.20	3.31	3.42	3.55	3.83
IALR430-0100-0050-0400		0.05	4	0.8	0.95	15	4	50	5,760	4.23	4.38	4.53	4.70	5.08
IALR430-0100-0050-0500		0.05	5	0.8	0.95	15	4	50	5,760	5.26	5.44	5.64	5.85	6.32
IALR430-0100-0050-0600		0.05	6	0.8	0.95	15	4	50	5,760	6.30	6.51	6.75	7.00	7.56
IALR430-0100-0050-0800		0.05	8	0.8	0.95	15	4	50	5,760	8.36	8.65	8.96	9.30	10.05
IALR430-0100-0050-1000		0.05	10	0.8	0.95	15	4	50	5,760	10.43	10.79	11.18	11.60	12.54
IALR430-0100-0050-1200		0.05	12	0.8	0.95	15	4	50	5,760	12.50	12.93	13.40	13.90	15.02
IALR430-0100-0100-0300		0.1	3	0.8	0.95	15	4	50	5,760	3.19	3.30	3.42	3.54	3.82
IALR430-0100-0100-0400		0.1	4	0.8	0.95	15	4	50	5,760	4.23	4.37	4.53	4.69	5.07
IALR430-0100-0100-0500		0.1	5	0.8	0.95	15	4	50	5,760	5.26	5.44	5.63	5.84	6.31
IALR430-0100-0100-0600		0.1	6	0.8	0.95	15	4	50	5,760	6.30	6.51	6.74	6.99	7.55
IALR430-0100-0100-0800		0.1	8	0.8	0.95	15	4	50	5,760	8.36	8.65	8.96	9.29	10.04
IALR430-0100-0100-1000		0.1	10	0.8	0.95	15	4	50	5,760	10.43	10.79	11.18	11.59	12.52
IALR430-0100-0100-1200		0.1	12	0.8	0.95	15	4	50	5,760	12.50	12.93	13.39	13.89	15.01
IALR430-0100-0200-0300		0.2	3	0.8	0.95	15	4	50	5,760	3.19	3.30	3.41	3.53	3.80
IALR430-0100-0200-0400		0.2	4	0.8	0.95	15	4	50	5,760	4.22	4.36	4.52	4.68	5.04
IALR430-0100-0200-0500		0.2	5	0.8	0.95	15	4	50	5,760	5.26	5.43	5.62	5.83	6.29
IALR430-0100-0200-0600		0.2	6	0.8	0.95	15	4	50	5,760	6.29	6.50	6.73	6.98	7.53
IALR430-0100-0200-0800		0.2	8	0.8	0.95	15	4	50	5,760	8.36	8.64	8.95	9.28	10.01
IALR430-0100-0200-1000		0.2	10	0.8	0.95	15	4	50	5,760	10.43	10.78	11.17	11.58	12.50
IALR430-0100-0200-1200		0.2	12	0.8	0.95	15	4	50	5,760	12.49	12.92	13.38	13.88	14.99
IALR430-0100-0300-0300		0.3	3	0.8	0.95	15	4	50	5,760	3.19	3.29	3.40	3.51	3.78
IALR430-0100-0300-0400		0.3	4	0.8	0.95	15	4	50	5,760	4.22	4.36	4.50	4.66	5.02
IALR430-0100-0300-0500		0.3	5	0.8	0.95	15	4	50	5,760	5.25	5.43	5.61	5.81	6.26
IALR430-0100-0300-0600		0.3	6	0.8	0.95	15	4	50	5,760	6.29	6.50	6.72	6.96	7.51
IALR430-0100-0300-0800		0.3	8	0.8	0.95	15	4	50	5,760	8.36	8.64	8.94	9.26	9.99
IALR430-0100-0300-1000		0.3	10	0.8	0.95	15	4	50	5,760	10.42	10.78	11.15	11.56	12.48
IALR430-0100-0300-1200		0.3	12	0.8	0.95	15	4	50	5,760	12.49	12.92	13.37	13.86	14.96
IALR430-0120-0100-0500	1.2	0.1	5	1	1.15	15	4	50	6,080	5.26	5.44	5.63	5.84	6.31
IALR430-0120-0100-1000		0.1	10	1	1.15	15	4	50	6,080	10.43	10.79	11.18	11.59	12.52

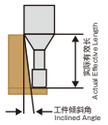


●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR430-0120-0100-1500	1.2	0.1	15	1	1.15	15	4	50	9,120	15.60	16.14	16.72	17.34	18.74
IALR430-0120-0200-0500		0.2	5	1	1.15	15	4	50	6,080	5.26	5.43	5.62	5.83	6.29
IALR430-0120-0200-1000		0.2	10	1	1.15	15	4	50	6,080	10.43	10.78	11.17	11.58	12.50
IALR430-0120-0200-1500		0.2	15	1	1.15	15	4	50	9,120	15.59	16.13	16.71	17.33	18.72
IALR430-0120-0300-0500		0.3	5	1	1.15	15	4	50	6,080	5.25	5.43	5.61	5.81	6.26
IALR430-0120-0300-1000		0.3	10	1	1.15	15	4	50	6,080	10.42	10.78	11.15	11.56	12.48
IALR430-0120-0300-1500		0.3	15	1	1.15	15	4	50	9,120	15.59	16.12	16.70	17.31	18.69
IALR430-0150-0100-0300	1.5	0.1	3	1.1	1.45	15	4	50	6,080	3.19	3.30	3.42	3.54	3.82
IALR430-0150-0100-0600		0.1	6	1.1	1.45	15	4	50	6,080	6.30	6.51	6.74	6.99	7.55
IALR430-0150-0100-1000		0.1	10	1.1	1.45	15	4	50	6,080	10.43	10.79	11.18	11.59	12.52
IALR430-0150-0100-1200		0.1	12	1.2	1.45	15	4	50	6,080	12.50	12.93	13.39	13.89	15.01
IALR430-0150-0100-1800		0.1	18	1.2	1.45	15	4	50	6,080	18.70	19.35	20.04	20.79	22.47
IALR430-0150-0200-0300		0.2	3	1.1	1.45	15	4	50	6,080	3.19	3.30	3.41	3.53	3.80
IALR430-0150-0200-0600		0.2	6	1.1	1.45	15	4	50	6,080	6.29	6.50	6.73	6.98	7.53
IALR430-0150-0200-1000		0.2	10	1.1	1.45	15	4	50	6,080	10.43	10.78	11.17	11.58	12.50
IALR430-0150-0200-1200		0.2	12	1.2	1.45	15	4	50	6,080	12.49	12.92	13.38	13.88	14.99
IALR430-0150-0200-1800		0.2	18	1.2	1.45	15	4	50	6,080	18.70	19.34	20.03	20.78	22.45
IALR430-0150-0300-0300		0.3	3	1.1	1.45	15	4	50	6,080	3.19	3.29	3.40	3.51	3.78
IALR430-0150-0300-0600		0.3	6	1.1	1.45	15	4	50	6,080	6.29	6.50	6.72	6.96	7.51
IALR430-0150-0300-1000		0.3	10	1.1	1.45	15	4	50	6,080	10.42	10.78	11.15	11.56	12.48
IALR430-0150-0300-1200		0.3	12	1.2	1.45	15	4	50	6,080	12.49	12.92	13.37	13.86	14.96
IALR430-0150-0300-1800		0.3	18	1.2	1.45	15	4	50	6,080	18.69	19.33	20.02	20.76	22.42
IALR430-0150-0500-0600		0.5	6	1.2	1.45	15	4	50	6,080	6.28	6.48	6.70	6.93	7.46
IALR430-0150-0500-1200		0.5	12	1.2	1.45	15	4	50	6,080	12.48	12.90	13.35	13.83	14.92
IALR430-0150-0500-1800		0.5	18	1.2	1.45	15	4	50	6,080	18.69	19.32	20.00	20.73	22.38
IALR430-0200-0100-0600	2	0.1	6	1.5	1.94	15	4	50	6,080	6.31	6.53	6.76	7.01	7.57
IALR430-0200-0100-0800		0.1	8	1.6	1.94	15	4	50	6,080	8.38	8.67	8.98	9.31	10.06
IALR430-0200-0100-1000		0.1	10	1.5	1.94	15	4	50	6,080	10.45	10.81	11.20	11.61	12.55
IALR430-0200-0100-1200		0.1	12	1.6	1.94	15	4	50	6,080	12.52	12.95	13.41	13.91	15.03
IALR430-0200-0100-1500		0.1	15	1.5	1.94	15	4	50	6,080	15.62	16.16	16.74	17.36	18.76
IALR430-0200-0100-1600		0.1	16	1.6	1.94	15	4	50	6,080	16.65	17.23	17.85	18.51	FREE
IALR430-0200-0100-2000		0.1	20	1.5	1.94	15	4	50	6,080	20.79	21.51	22.28	23.11	FREE
IALR430-0200-0100-2400		0.1	24	1.6	1.94	15	4	60	6,080	24.92	25.79	26.71	27.71	FREE
IALR430-0200-0200-0600		0.2	6	1.5	1.94	15	4	50	6,080	6.31	6.52	6.75	7.00	7.55
IALR430-0200-0200-0800		0.2	8	1.6	1.94	15	4	50	6,080	8.38	8.66	8.97	9.30	10.04
IALR430-0200-0200-1000		0.2	10	1.5	1.94	15	4	50	6,080	10.45	10.80	11.19	11.60	12.52
IALR430-0200-0200-1200		0.2	12	1.6	1.94	15	4	50	6,080	12.51	12.94	13.40	13.90	15.01
IALR430-0200-0200-1500		0.2	15	1.5	1.94	15	4	50	6,080	15.61	16.15	16.73	17.35	18.74
IALR430-0200-0200-1600		0.2	16	1.6	1.94	15	4	50	6,080	16.65	17.22	17.84	18.50	FREE
IALR430-0200-0200-2000		0.2	20	1.5	1.94	15	4	50	6,080	20.78	21.50	22.27	23.10	FREE
IALR430-0200-0200-2400		0.2	24	1.6	1.94	15	4	60	6,080	24.92	25.78	26.70	27.70	FREE
IALR430-0200-0300-0600		0.3	6	1.5	1.94	15	4	50	6,080	6.31	6.52	6.74	6.98	7.53
IALR430-0200-0300-0800		0.3	8	1.6	1.94	15	4	50	6,080	8.37	8.66	8.96	9.28	10.02
IALR430-0200-0300-1000		0.3	10	1.5	1.94	15	4	50	6,080	10.44	10.80	11.18	11.58	12.50
IALR430-0200-0300-1200		0.3	12	1.6	1.94	15	4	50	6,080	12.51	12.94	13.39	13.88	14.99

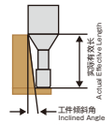
ion Depo Type A Series



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR430-0200-0300-1500	2	0.3	15	1.5	1.94	15	4	50	6,080	15.61	16.14	16.72	17.33	18.72
IALR430-0200-0300-1600		0.3	16	1.6	1.94	15	4	50	6,080	16.64	17.21	17.83	18.48	FREE
IALR430-0200-0300-2000		0.3	20	1.5	1.94	15	4	50	6,080	20.78	21.49	22.26	23.08	FREE
IALR430-0200-0300-2400		0.3	24	1.6	1.94	15	4	60	6,080	24.91	25.77	26.69	27.68	FREE
IALR430-0200-0500-0800		0.5	8	1.6	1.94	15	4	50	6,080	8.37	8.64	8.94	9.25	9.97
IALR430-0200-0500-1200		0.5	12	1.6	1.94	15	4	50	6,080	12.50	12.92	13.37	13.85	14.94
IALR430-0200-0500-1600		0.5	16	1.6	1.94	15	4	50	6,080	16.64	17.20	17.80	18.45	FREE
IALR430-0200-0500-2400		0.5	24	1.6	1.94	15	4	60	6,080	24.91	25.76	26.67	27.65	FREE
IALR430-0250-0100-1000	2.5	0.1	10	2	2.44	15	4	50	6,400	10.45	10.81	11.20	11.61	12.55
IALR430-0250-0100-2000		0.1	20	2	2.44	15	4	50	6,400	20.79	21.51	22.28	FREE	FREE
IALR430-0250-0200-1000		0.2	10	2	2.44	15	4	50	6,400	10.45	10.80	11.19	11.60	12.52
IALR430-0250-0200-2000		0.2	20	2	2.44	15	4	50	6,400	20.78	21.50	22.27	FREE	FREE
IALR430-0250-0300-1000		0.3	10	2	2.44	15	4	50	6,400	10.44	10.80	11.18	11.58	12.50
IALR430-0250-0300-2000		0.3	20	2	2.44	15	4	50	6,400	20.78	21.49	22.26	FREE	FREE
IALR430-0250-0500-1000		0.5	10	2	2.44	15	4	50	6,400	10.44	10.78	11.15	11.55	12.46
IALR430-0250-0500-2000		0.5	20	2	2.44	15	4	50	6,400	20.77	21.48	22.24	FREE	FREE
IALR430-0300-0100-1000	3	0.1	10	2.5	2.85	15	4	50	8,320	10.62	10.99	11.38	11.81	FREE
IALR430-0300-0100-1200		0.1	12	2.5	2.85	15	4	50	8,320	12.69	13.13	13.60	14.11	FREE
IALR430-0300-0100-1500		0.1	15	2.5	2.85	15	4	50	8,320	15.79	16.34	16.92	FREE	FREE
IALR430-0300-0100-1800		0.1	18	2.5	2.85	15	4	50	8,320	18.89	19.55	FREE	FREE	FREE
IALR430-0300-0100-2000		0.1	20	2.5	2.85	15	4	50	8,320	20.96	21.69	FREE	FREE	FREE
IALR430-0300-0100-2400		0.1	24	2.5	2.85	15	4	60	8,800	25.09	25.96	FREE	FREE	FREE
IALR430-0300-0100-3000		0.1	30	2.5	2.85	15	4	60	8,800	31.30	FREE	FREE	FREE	FREE
IALR430-0300-0200-1000		0.2	10	2.5	2.85	15	4	50	8,320	10.62	10.98	11.37	11.79	FREE
IALR430-0300-0200-1200		0.2	12	2.5	2.85	15	4	50	8,320	12.69	13.12	13.59	14.09	FREE
IALR430-0300-0200-1500		0.2	15	2.5	2.85	15	4	50	8,320	15.79	16.33	16.91	FREE	FREE
IALR430-0300-0200-1800		0.2	18	2.5	2.85	15	4	50	8,320	18.89	19.54	FREE	FREE	FREE
IALR430-0300-0200-2000		0.2	20	2.5	2.85	15	4	50	8,320	20.96	21.68	FREE	FREE	FREE
IALR430-0300-0200-2400		0.2	24	2.5	2.85	15	4	60	8,800	25.09	25.96	FREE	FREE	FREE
IALR430-0300-0200-3000		0.2	30	2.5	2.85	15	4	60	8,800	31.29	FREE	FREE	FREE	FREE
IALR430-0300-0300-1000		0.3	10	2.5	2.85	15	4	50	8,320	10.62	10.98	11.36	11.78	FREE
IALR430-0300-0300-1200		0.3	12	2.5	2.85	15	4	50	8,320	12.68	13.11	13.58	14.08	FREE
IALR430-0300-0300-1500		0.3	15	2.5	2.85	15	4	50	8,320	15.78	16.32	16.90	FREE	FREE
IALR430-0300-0300-1800		0.3	18	2.5	2.85	15	4	50	8,320	18.89	19.53	FREE	FREE	FREE
IALR430-0300-0300-2000		0.3	20	2.5	2.85	15	4	50	8,320	20.95	21.67	FREE	FREE	FREE
IALR430-0300-0300-2400		0.3	24	2.5	2.85	15	4	60	8,800	25.09	25.95	FREE	FREE	FREE
IALR430-0300-0300-3000		0.3	30	2.5	2.85	15	4	60	8,800	31.29	FREE	FREE	FREE	FREE
IALR430-0300-0500-1200		0.5	12	2.5	2.85	15	4	50	8,320	12.68	13.10	13.56	14.05	FREE
IALR430-0300-0500-1800		0.5	18	2.5	2.85	15	4	50	8,320	18.88	19.52	FREE	FREE	FREE
IALR430-0300-0500-2400		0.5	24	2.5	2.85	15	4	60	8,800	25.08	25.94	FREE	FREE	FREE
IALR430-0300-0500-3000		0.5	30	2.5	2.85	15	4	60	8,800	31.28	FREE	FREE	FREE	FREE
IALR430-0300-1000-1200		1	12	2.5	2.85	15	4	50	8,320	12.66	13.07	13.50	13.97	FREE
IALR430-0300-1000-1800		1	18	2.5	2.85	15	4	50	8,320	18.86	19.48	FREE	FREE	FREE
IALR430-0300-1000-2400		1	24	2.5	2.85	15	4	60	8,800	25.06	25.90	FREE	FREE	FREE
IALR430-0300-1000-3000		1	30	2.5	2.85	15	4	60	8,800	31.27	FREE	FREE	FREE	FREE



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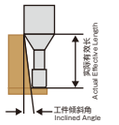
单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR430-0400-0100-1000	4	0.1	10	3	3.8	15	6	50	8,320	10.72	11.09	11.49	11.91	12.87
IALR430-0400-0100-1500		0.1	15	3	3.8	15	6	50	8,320	15.89	16.44	17.03	17.66	19.09
IALR430-0400-0100-1600		0.1	16	3.2	3.8	15	6	50	8,320	16.92	17.51	18.14	18.81	FREE
IALR430-0400-0100-2000		0.1	20	3	3.8	15	6	50	8,320	21.06	21.79	22.57	23.41	FREE
IALR430-0400-0100-2400		0.1	24	3.2	3.8	15	6	60	8,320	25.19	26.06	27.00	28.01	FREE
IALR430-0400-0100-3200		0.1	32	3.2	3.8	15	6	70	8,320	33.46	34.62	35.87	FREE	FREE
IALR430-0400-0200-1000		0.2	10	3	3.8	15	6	50	8,320	10.72	11.08	11.48	11.90	12.85
IALR430-0400-0200-1500		0.2	15	3	3.8	15	6	50	8,320	15.88	16.43	17.02	17.65	19.06
IALR430-0400-0200-1600		0.2	16	3.2	3.8	15	6	50	8,320	16.92	17.50	18.13	18.80	FREE
IALR430-0400-0200-2000		0.2	20	3	3.8	15	6	50	8,320	21.05	21.78	22.56	23.40	FREE
IALR430-0400-0200-2400		0.2	24	3.2	3.8	15	6	60	8,320	25.19	26.06	26.99	28.00	FREE
IALR430-0400-0200-3200		0.2	32	3.2	3.8	15	6	70	8,320	33.46	34.62	35.86	FREE	FREE
IALR430-0400-0300-1000		0.3	10	3	3.8	15	6	50	8,320	10.71	11.08	11.46	11.88	12.83
IALR430-0400-0300-1500		0.3	15	3	3.8	15	6	50	8,320	15.88	16.42	17.01	17.63	19.04
IALR430-0400-0300-1600		0.3	16	3.2	3.8	15	6	50	8,320	16.91	17.49	18.11	18.78	FREE
IALR430-0400-0300-2000		0.3	20	3	3.8	15	6	50	8,320	21.05	21.77	22.55	23.38	FREE
IALR430-0400-0300-2400		0.3	24	3.2	3.8	15	6	60	8,320	25.18	26.05	26.98	27.98	FREE
IALR430-0400-0300-3200		0.3	32	3.2	3.8	15	6	70	8,320	33.45	34.61	35.85	FREE	FREE
IALR430-0400-0500-1600		0.5	16	3.2	3.8	15	6	50	8,320	16.91	17.48	18.09	18.75	FREE
IALR430-0400-0500-2400		0.5	24	3.2	3.8	15	6	60	8,320	25.18	26.04	26.96	27.95	FREE
IALR430-0400-0500-3200		0.5	32	3.2	3.8	15	6	70	8,320	33.45	34.59	35.83	FREE	FREE
IALR430-0400-1000-1600		1	16	3.2	3.8	15	6	50	8,320	16.89	17.45	18.04	18.68	FREE
IALR430-0400-1000-2400		1	24	3.2	3.8	15	6	60	8,320	25.16	26.00	26.91	27.88	FREE
IALR430-0400-1000-3200		1	32	3.2	3.8	15	6	70	8,320	33.43	34.56	35.77	FREE	FREE
IALR430-0500-0100-1500	5	0.1	15	3.5	4.8	15	6	50	10,400	15.89	16.44	17.03	FREE	FREE
IALR430-0500-0100-2000-00350		0.1	20	3.5	4.8	15	6	50	10,400	21.06	21.79	FREE	FREE	FREE
IALR430-0500-0100-2000-00400		0.1	20	4	4.8	15	6	50	10,400	21.06	21.79	FREE	FREE	FREE
IALR430-0500-0100-4000		0.1	40	4	4.8	15	6	70	13,280	41.73	FREE	FREE	FREE	FREE
IALR430-0500-0200-2000		0.2	20	4	4.8	15	6	50	10,400	21.05	21.78	FREE	FREE	FREE
IALR430-0500-0200-4000		0.2	40	4	4.8	15	6	70	13,280	41.73	FREE	FREE	FREE	FREE
IALR430-0500-0300-2000		0.3	20	4	4.8	15	6	50	10,400	21.05	21.77	FREE	FREE	FREE
IALR430-0500-0300-4000		0.3	40	4	4.8	15	6	70	13,280	41.72	FREE	FREE	FREE	FREE
IALR430-0500-0500-2000		0.5	20	4	4.8	15	6	50	10,400	21.04	21.76	FREE	FREE	FREE
IALR430-0500-0500-4000		0.5	40	4	4.8	15	6	70	13,280	41.72	FREE	FREE	FREE	FREE
IALR430-0500-1000-2000		1	20	4	4.8	15	6	50	10,400	21.03	21.72	FREE	FREE	FREE
IALR430-0500-1000-4000		1	40	4	4.8	15	6	70	13,280	41.70	FREE	FREE	FREE	FREE
IALR430-0600-0100-1500	6	0.1	15	6	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0100-2000		0.1	20	6	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0100-2400		0.1	24	5	5.8	15	6	60	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0100-3000		0.1	30	6	5.8	15	6	60	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0100-4800		0.1	48	5	5.8	15	6	80	16,480	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0200-1500		0.2	15	6	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0200-2000		0.2	20	6	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0200-2400		0.2	24	5	5.8	15	6	60	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0200-3000		0.2	30	6	5.8	15	6	60	10,400	FREE	FREE	FREE	FREE	FREE



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单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALR430-0600-0200-4800	6	0.2	48	5	5.8	15	6	80	16,480	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0300-1500		0.3	15	6	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0300-2000		0.3	20	6	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0300-2400		0.3	24	5	5.8	15	6	60	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0300-3000		0.3	30	6	5.8	15	6	60	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0300-4800		0.3	48	5	5.8	15	6	80	16,480	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0500-1500		0.5	15	6	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0500-2000		0.5	20	6	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0500-2400		0.5	24	5	5.8	15	6	60	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0500-3000		0.5	30	6	5.8	15	6	60	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-0500-4800		0.5	48	5	5.8	15	6	80	16,480	FREE	FREE	FREE	FREE	FREE
IALR430-0600-1000-2400		1	24	5	5.8	15	6	60	10,400	FREE	FREE	FREE	FREE	FREE
IALR430-0600-1000-4800		1	48	5	5.8	15	6	80	16,480	FREE	FREE	FREE	FREE	FREE

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALR430
Model number:IALR430

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	1.0	3	0.06	0.35	1,800	16,000	0.06	0.35	1,800	16,000	0.06	0.35	1,800	16,000	0.045	0.3	1,260	12,800
		4	0.05	0.35	1,500	16,000	0.05	0.35	1,500	16,000	0.05	0.35	1,500	16,000	0.04	0.3	1,050	12,800
		5	0.045	0.35	1,410	16,000	0.045	0.35	1,410	16,000	0.045	0.35	1,410	16,000	0.035	0.25	990	12,800
		6	0.04	0.25	1,200	14,500	0.04	0.25	1,200	14,500	0.04	0.25	1,200	14,500	0.03	0.25	840	11,600
		8	0.03	0.25	870	14,500	0.03	0.25	870	14,500	0.03	0.25	870	14,500	0.02	0.2	620	11,600
		10	0.025	0.25	660	11,100	0.025	0.25	660	11,100	0.025	0.25	660	11,100	0.015	0.1	470	8,900
		12	0.02	0.2	300	11,100	0.02	0.2	300	11,100	0.02	0.2	300	11,100	0.01	0.08	210	8,900
	1.2	5	0.06	0.4	1,740	15,500	0.06	0.4	1,740	15,500	0.06	0.4	1,740	15,500	0.045	0.35	1,220	12,400
		10	0.04	0.35	1,290	12,000	0.04	0.35	1,290	12,000	0.04	0.35	1,290	12,000	0.03	0.25	900	9,600
		15	0.02	0.25	480	10,600	0.02	0.25	480	10,600	0.02	0.25	480	10,600	0.01	0.1	330	8,500
	1.5	3	0.08	0.53	1,910	14,000	0.08	0.53	1,910	14,000	0.08	0.53	1,910	14,000	0.05	0.4	1,340	11,200
		6	0.08	0.53	1,910	14,000	0.08	0.53	1,910	14,000	0.08	0.53	1,910	14,000	0.05	0.4	1,340	11,200
		10	0.06	0.42	1,250	11,500	0.06	0.42	1,250	11,500	0.06	0.42	1,250	11,500	0.04	0.3	870	9,000
		12	0.06	0.42	1,250	11,500	0.06	0.42	1,250	11,500	0.06	0.42	1,250	11,500	0.04	0.3	870	9,000
		18	0.02	0.3	560	8,500	0.02	0.3	560	8,500	0.02	0.3	560	8,500	0.01	0.15	390	6,800
	2	6	0.08	0.6	2,150	11,100	0.08	0.6	2,150	11,100	0.08	0.6	2,150	11,100	0.05	0.5	1,500	8,800
		8	0.08	0.6	2,150	11,100	0.08	0.6	2,150	11,100	0.08	0.6	2,150	11,100	0.05	0.5	1,500	8,800
		10	0.065	0.6	1,800	11,100	0.065	0.6	1,800	11,100	0.065	0.6	1,800	11,100	0.045	0.5	1,260	8,800
		12	0.065	0.6	1,800	11,100	0.065	0.6	1,800	11,100	0.065	0.6	1,800	11,100	0.045	0.5	1,260	8,800
		15	0.05	0.5	1,500	9,600	0.05	0.5	1,500	9,600	0.05	0.5	1,500	9,600	0.04	0.35	1,050	7,700
		16	0.05	0.5	1,500	9,600	0.05	0.5	1,500	9,600	0.05	0.5	1,500	9,600	0.04	0.35	1,050	7,700
		20	0.03	0.45	900	9,600	0.03	0.45	900	9,600	0.03	0.45	900	9,600	0.015	0.25	630	7,700
		24	0.02	0.4	740	6,400	0.02	0.4	740	6,400	0.02	0.4	740	6,400	0.01	0.2	510	5,100
	2.5	10	0.1	0.85	2,280	9,200	0.1	0.85	2,280	9,200	0.1	0.85	2,280	9,200	0.07	0.7	1,590	7,400
		20	0.08	0.6	1,580	8,300	0.08	0.6	1,580	8,300	0.08	0.6	1,580	8,300	0.05	0.4	1,110	6,600
	3	10	0.12	0.9	2,400	8,000	0.12	0.9	2,400	8,000	0.12	0.9	2,400	8,000	0.08	0.8	1,680	6,400
		12	0.12	0.9	2,400	8,000	0.12	0.9	2,400	8,000	0.12	0.9	2,400	8,000	0.08	0.8	1,680	6,400
		15	0.11	0.8	2,000	7,800	0.11	0.8	2,000	7,800	0.11	0.8	2,000	7,800	0.07	0.7	1,410	6,200
		18	0.11	0.8	2,000	7,800	0.11	0.8	2,000	7,800	0.11	0.8	2,000	7,800	0.07	0.7	1,410	6,200
		20	0.1	0.8	1,850	7,700	0.1	0.8	1,850	7,700	0.1	0.8	1,850	7,700	0.06	0.6	1,250	6,200
		24	0.1	0.7	1,620	7,500	0.1	0.7	1,620	7,500	0.1	0.7	1,620	7,500	0.06	0.5	1,140	6,000
		30	0.05	0.6	1,050	6,000	0.05	0.6	1,050	6,000	0.05	0.6	1,050	6,000	0.03	0.4	740	4,800
	4	10	0.15	1.2	2,520	6,000	0.15	1.2	2,520	6,000	0.15	1.2	2,520	6,000	0.1	1	1,770	4,800
		15	0.15	1.2	2,520	6,000	0.15	1.2	2,520	6,000	0.15	1.2	2,520	6,000	0.1	1	1,770	4,800
		16	0.15	1.2	2,520	6,000	0.15	1.2	2,520	6,000	0.15	1.2	2,520	6,000	0.1	1	1,770	4,800
		20	0.12	1	2,030	5,400	0.12	1	2,030	5,400	0.12	1	2,030	5,400	0.085	0.8	1,430	4,300
		24	0.12	1	2,030	5,400	0.12	1	2,030	5,400	0.12	1	2,030	5,400	0.085	0.8	1,430	4,300
		32	0.08	0.9	1,350	4,800	0.08	0.9	1,350	4,800	0.08	0.9	1,350	4,800	0.04	0.7	950	3,800
	5	15	0.17	1.6	2,300	5,100	0.17	1.6	2,300	5,100	0.17	1.6	2,300	5,100	0.12	1.2	1,610	4,100
		20	0.17	1.6	2,300	5,100	0.17	1.6	2,300	5,100	0.17	1.6	2,300	5,100	0.12	1.2	1,610	4,100
		40	0.07	1.2	1,020	3,200	0.07	1.2	1,020	3,200	0.07	1.2	1,020	3,200	0.05	0.9	720	2,600
	6	15	0.23	2.1	2,100	3,700	0.23	2.1	2,100	3,700	0.23	2.1	2,100	3,700	0.15	1.5	1,470	3,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALR430
Model number:IALR430

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	6	20	0.22	2.1	2,100	3,700	0.22	2.1	2,100	3,700	0.22	2.1	2,100	3,700	0.13	1.5	1,470	3,000
		24	0.2	2.1	2,100	3,700	0.2	2.1	2,100	3,700	0.2	2.1	2,100	3,700	0.12	1.5	1,470	3,000
		30	0.09	1.5	950	2,600	0.09	1.5	950	2,600	0.09	1.5	950	2,600	0.05	1.2	660	2,100
		48	0.09	1.5	950	2,600	0.09	1.5	950	2,600	0.09	1.5	950	2,600	0.05	1.2	660	2,100

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	1.0	3	0.045	0.3	1,260	12,800	0.045	0.3	1,260	12,800	0.045	0.3	1,260	12,800	0.2	0.23	1,800	16,000
		4	0.04	0.3	1,050	12,800	0.04	0.3	1,050	12,800	0.04	0.3	1,050	12,800	0.15	0.23	1,500	16,000
		5	0.035	0.25	990	12,800	0.035	0.25	990	12,800	0.035	0.25	990	12,800	0.13	0.23	1,410	16,000
		6	0.03	0.25	840	11,600	0.03	0.25	840	11,600	0.03	0.25	840	11,600	0.12	0.2	1,200	14,500
		8	0.02	0.2	620	11,600	0.02	0.2	620	11,600	0.02	0.2	620	11,600	0.09	0.2	870	14,500
		10	0.015	0.1	470	8,900	0.015	0.1	470	8,900	0.015	0.1	470	8,900	0.075	0.15	660	11,100
		12	0.01	0.08	210	8,900	0.01	0.08	210	8,900	0.01	0.08	210	8,900	0.06	0.15	300	11,100
	1.2	5	0.045	0.35	1,220	12,400	0.045	0.35	1,220	12,400	0.045	0.35	1,220	12,400	0.18	0.28	1,740	15,500
		10	0.03	0.25	900	9,600	0.03	0.25	900	9,600	0.03	0.25	900	9,600	0.12	0.28	1,290	12,000
		15	0.01	0.1	330	8,500	0.01	0.1	330	8,500	0.01	0.1	330	8,500	0.07	0.23	480	10,600
	1.5	3	0.05	0.4	1,340	11,200	0.05	0.4	1,340	11,200	0.05	0.4	1,340	11,200	0.24	0.35	1,910	14,000
		6	0.05	0.4	1,340	11,200	0.05	0.4	1,340	11,200	0.05	0.4	1,340	11,200	0.24	0.35	1,910	14,000
		10	0.04	0.3	870	9,000	0.04	0.3	870	9,000	0.04	0.3	870	9,000	0.18	0.3	1,250	11,500
		12	0.04	0.3	870	9,000	0.04	0.3	870	9,000	0.04	0.3	870	9,000	0.18	0.3	1,250	11,500
		18	0.01	0.15	390	6,800	0.01	0.15	390	6,800	0.01	0.15	390	6,800	0.08	0.25	560	8,500
	2	6	0.05	0.5	1,500	8,800	0.05	0.5	1,500	8,800	0.05	0.5	1,500	8,800	0.24	0.45	2,150	11,100
		8	0.05	0.5	1,500	8,800	0.05	0.5	1,500	8,800	0.05	0.5	1,500	8,800	0.24	0.45	2,150	11,100
		10	0.045	0.5	1,260	8,800	0.045	0.5	1,260	8,800	0.045	0.5	1,260	8,800	0.2	0.43	1,800	11,100
		12	0.045	0.5	1,260	8,800	0.045	0.5	1,260	8,800	0.045	0.5	1,260	8,800	0.2	0.43	1,800	11,100
		15	0.04	0.35	1,050	7,700	0.04	0.35	1,050	7,700	0.04	0.35	1,050	7,700	0.15	0.39	1,500	9,600
		16	0.04	0.35	1,050	7,700	0.04	0.35	1,050	7,700	0.04	0.35	1,050	7,700	0.15	0.39	1,500	9,600
		20	0.015	0.25	630	7,700	0.015	0.25	630	7,700	0.015	0.25	630	7,700	0.12	0.35	900	9,600
		24	0.01	0.2	510	5,100	0.01	0.2	510	5,100	0.01	0.2	510	5,100	0.1	0.3	740	6,400
	2.5	10	0.07	0.7	1,590	7,400	0.07	0.7	1,590	7,400	0.07	0.7	1,590	7,400	0.3	0.5	2,280	9,200
		20	0.05	0.4	1,110	6,600	0.05	0.4	1,110	6,600	0.05	0.4	1,110	6,600	0.24	0.43	1,580	8,300
	3	10	0.08	0.8	1,680	6,400	0.08	0.8	1,680	6,400	0.08	0.8	1,680	6,400	0.36	0.55	2,400	8,000
		12	0.08	0.8	1,680	6,400	0.08	0.8	1,680	6,400	0.08	0.8	1,680	6,400	0.36	0.55	2,400	8,000
		15	0.07	0.7	1,410	6,200	0.07	0.7	1,410	6,200	0.07	0.7	1,410	6,200	0.33	0.5	2,010	7,800
		18	0.07	0.7	1,410	6,200	0.07	0.7	1,410	6,200	0.07	0.7	1,410	6,200	0.33	0.5	2,010	7,800
		20	0.06	0.6	1,250	6,200	0.06	0.6	1,250	6,200	0.06	0.6	1,250	6,200	0.3	0.5	1,850	7,700
		24	0.06	0.5	1,140	6,000	0.06	0.5	1,140	6,000	0.06	0.5	1,140	6,000	0.3	0.45	1,620	7,500
		30	0.03	0.4	740	4,800	0.03	0.4	740	4,800	0.03	0.4	740	4,800	0.15	0.4	1,050	6,000
	4	10	0.1	1	1,770	4,800	0.1	1	1,770	4,800	0.1	1	1,770	4,800	0.45	0.75	2,520	6,000
		15	0.1	1	1,770	4,800	0.1	1	1,770	4,800	0.1	1	1,770	4,800	0.45	0.75	2,520	6,000
		16	0.1	1	1,770	4,800	0.1	1	1,770	4,800	0.1	1	1,770	4,800	0.45	0.75	2,520	6,000
		20	0.085	0.8	1,430	4,300	0.085	0.8	1,430	4,300	0.085	0.8	1,430	4,300	0.39	0.7	2,030	5,400
		24	0.085	0.8	1,430	4,300	0.085	0.8	1,430	4,300	0.085	0.8	1,430	4,300	0.39	0.7	2,030	5,400
		32	0.04	0.7	950	3,800	0.04	0.7	950	3,800	0.04	0.7	950	3,800	0.25	0.6	1,350	4,800
	5	15	0.12	1.2	1,610	4,100	0.12	1.2	1,610	4,100	0.12	1.2	1,610	4,100	0.52	1	2,300	5,100
		20	0.12	1.2	1,610	4,100	0.12	1.2	1,610	4,100	0.12	1.2	1,610	4,100	0.52	1	2,300	5,100
		40	0.05	0.9	720	2,600	0.05	0.9	720	2,600	0.05	0.9	720	2,600	0.25	0.8	1,020	3,200
	6	15	0.15	1.5	1,470	3,000	0.15	1.5	1,470	3,000	0.15	1.5	1,470	3,000	0.65	1.2	2,100	3,700

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALR430
Model number:IALR430

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	6	20	0.13	1.5	1,470	3,000	0.13	1.5	1,470	3,000	0.13	1.5	1,470	3,000	0.62	1.2	2,100	3,700
		24	0.12	1.5	1,470	3,000	0.12	1.5	1,470	3,000	0.12	1.5	1,470	3,000	0.6	1.2	2,100	3,700
		30	0.05	1.2	660	2,100	0.05	1.2	660	2,100	0.05	1.2	660	2,100	0.32	0.9	950	2,600
		48	0.05	1.2	660	2,100	0.05	1.2	660	2,100	0.05	1.2	660	2,100	0.32	0.9	950	2,600

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1.0	3	0.2	0.23	1,800	16,000	0.2	0.23	1,800	16,000	0.045	0.3	1,260	12,800
		4	0.15	0.23	1,500	16,000	0.15	0.23	1,500	16,000	0.04	0.3	1,050	12,800
		5	0.13	0.23	1,410	16,000	0.13	0.23	1,410	16,000	0.035	0.25	990	12,800
		6	0.12	0.2	1,200	14,500	0.12	0.2	1,200	14,500	0.03	0.25	840	11,600
		8	0.09	0.2	870	14,500	0.09	0.2	870	14,500	0.02	0.2	620	11,600
		10	0.075	0.15	660	11,100	0.075	0.15	660	11,100	0.015	0.1	470	8,900
		12	0.06	0.15	300	11,100	0.06	0.15	300	11,100	0.01	0.08	210	8,900
	1.2	5	0.18	0.28	1,740	15,500	0.18	0.28	1,740	15,500	0.045	0.35	1,220	12,400
		10	0.12	0.28	1,290	12,000	0.12	0.28	1,290	12,000	0.03	0.25	900	9,600
		15	0.07	0.23	480	10,600	0.07	0.23	480	10,600	0.01	0.1	330	8,500
	1.5	3	0.24	0.35	1,910	14,000	0.24	0.35	1,910	14,000	0.05	0.4	1,340	11,200
		6	0.24	0.35	1,910	14,000	0.24	0.35	1,910	14,000	0.05	0.4	1,340	11,200
		10	0.18	0.3	1,250	11,500	0.18	0.3	1,250	11,500	0.04	0.3	870	9,000
		12	0.18	0.3	1,250	11,500	0.18	0.3	1,250	11,500	0.04	0.3	870	9,000
		18	0.08	0.25	560	8,500	0.08	0.25	560	8,500	0.01	0.15	390	6,800
	2	6	0.24	0.45	2,150	11,100	0.24	0.45	2,150	11,100	0.05	0.5	1,500	8,800
		8	0.24	0.45	2,150	11,100	0.24	0.45	2,150	11,100	0.05	0.5	1,500	8,800
		10	0.2	0.43	1,800	11,100	0.2	0.43	1,800	11,100	0.045	0.5	1,260	8,800
		12	0.2	0.43	1,800	11,100	0.2	0.43	1,800	11,100	0.045	0.5	1,260	8,800
		15	0.15	0.39	1,500	9,600	0.15	0.39	1,500	9,600	0.04	0.35	1,050	7,700
		16	0.15	0.39	1,500	9,600	0.15	0.39	1,500	9,600	0.04	0.35	1,050	7,700
		20	0.12	0.35	900	9,600	0.12	0.35	900	9,600	0.015	0.25	630	7,700
		24	0.1	0.3	740	6,400	0.1	0.3	740	6,400	0.01	0.2	510	5,100
	2.5	10	0.3	0.5	2,280	9,200	0.3	0.5	2,280	9,200	0.07	0.7	1,590	7,400
		20	0.24	0.43	1,580	8,300	0.24	0.43	1,580	8,300	0.05	0.4	1,110	6,600
	3	10	0.36	0.55	2,400	8,000	0.36	0.55	2,400	8,000	0.08	0.8	1,680	6,400
		12	0.36	0.55	2,400	8,000	0.36	0.55	2,400	8,000	0.08	0.8	1,680	6,400
		15	0.33	0.5	2,010	7,800	0.33	0.5	2,010	7,800	0.07	0.7	1,410	6,200
		18	0.33	0.5	2,010	7,800	0.33	0.5	2,010	7,800	0.07	0.7	1,410	6,200
		20	0.3	0.5	1,850	7,700	0.3	0.5	1,850	7,700	0.06	0.6	1,250	6,200
		24	0.3	0.45	1,620	7,500	0.3	0.45	1,620	7,500	0.06	0.5	1,140	6,000
		30	0.15	0.4	1,050	6,000	0.15	0.4	1,050	6,000	0.03	0.4	740	4,800
	4	10	0.45	0.75	2,520	6,000	0.45	0.75	2,520	6,000	0.1	1	1,770	4,800
		15	0.45	0.75	2,520	6,000	0.45	0.75	2,520	6,000	0.1	1	1,770	4,800
		16	0.45	0.75	2,520	6,000	0.45	0.75	2,520	6,000	0.1	1	1,770	4,800
		20	0.39	0.7	2,030	5,400	0.39	0.7	2,030	5,400	0.085	0.8	1,430	4,300
		24	0.39	0.7	2,030	5,400	0.39	0.7	2,030	5,400	0.085	0.8	1,430	4,300
		32	0.25	0.6	1,350	4,800	0.25	0.6	1,350	4,800	0.04	0.7	950	3,800
	5	15	0.52	1	2,300	5,100	0.52	1	2,300	5,100	0.12	1.2	1,610	4,100
		20	0.52	1	2,300	5,100	0.52	1	2,300	5,100	0.12	1.2	1,610	4,100
		40	0.25	0.8	1,020	3,200	0.25	0.8	1,020	3,200	0.05	0.9	720	2,600
	6	15	0.65	1.2	2,100	3,700	0.65	1.2	2,100	3,700	0.15	1.5	1,470	3,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALR430
Model number:IALR430

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	6	20	0.62	1.2	2,100	3,700	0.62	1.2	2,100	3,700	0.13	1.5	1,470	3,000
		24	0.6	1.2	2,100	3,700	0.6	1.2	2,100	3,700	0.12	1.5	1,470	3,000
		30	0.32	0.9	950	2,600	0.32	0.9	950	2,600	0.05	1.2	660	2,100
		48	0.32	0.9	950	2,600	0.32	0.9	950	2,600	0.05	1.2	660	2,100

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

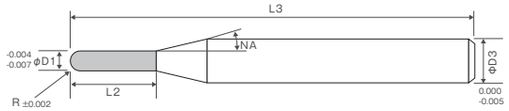
CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo A Series 圆角 Radius
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series

ion Depo Type A Series

超硬球头立铣刀 Carbide Ball End Mill

■型号:IAB230 Model number:IAB230

ion A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	球头R (R) Ball R	刃长 (L2) Length of Cut	刀刃直径 (D1) Outside Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAB230-0010-0050-00010	0.05	0.1	0.1	15	4	50	8,080
IAB230-0015-0075-00015	0.075	0.15	0.15	15	4	50	7,520
IAB230-0020-0100-00020	0.1	0.2	0.2	15	4	50	5,680
IAB230-0030-0150-00030	0.15	0.3	0.3	15	4	50	4,640
IAB230-0040-0200-00060	0.2	0.6	0.4	15	4	50	3,120
IAB230-0050-0250-00080	0.25	0.8	0.5	15	4	50	2,880
IAB230-0060-0300-00090	0.3	0.9	0.6	15	4	50	2,800
IAB230-0060-0300-00100		1	0.6	15	4	50	2,800
IAB230-0070-0350-00110	0.35	1.1	0.7	15	4	50	6,240
IAB230-0080-0400-00120	0.4	1.2	0.8	15	4	50	2,800
IAB230-0090-0450-00140	0.45	1.4	0.9	15	4	50	6,240
IAB230-0100-0500-00150	0.5	1.5	1	15	4	50	2,560
IAB230-0110-0550-00170	0.55	1.7	1.1	15	4	50	6,240
IAB230-0120-0600-00180	0.6	1.8	1.2	15	4	50	3,600
IAB230-0130-0650-00200	0.65	2	1.3	15	4	50	6,240
IAB230-0140-0700-00210	0.7	2.1	1.4	15	4	50	3,600
IAB230-0150-0750-00200	0.75	2	1.5	15	4	50	3,120
IAB230-0150-0750-00230		2.3	1.5	15	4	50	3,120
IAB230-0160-0800-00240	0.8	2.4	1.6	15	4	50	3,600
IAB230-0170-0850-00260	0.85	2.6	1.7	15	4	50	6,240
IAB230-0180-0900-00270	0.9	2.7	1.8	15	4	50	6,240
IAB230-0190-0950-00290	0.95	2.9	1.9	15	4	50	6,240
IAB230-0200-1000-00300	1	3	2	15	4	50	2,320
IAB230-0210-1050-00320	1.05	3.2	2.1	15	4	50	6,240
IAB230-0220-1100-00330	1.1	3.3	2.2	15	4	50	6,240
IAB230-0230-1150-00350	1.15	3.5	2.3	15	4	50	6,240
IAB230-0240-1200-00360	1.2	3.6	2.4	15	4	50	6,240
IAB230-0250-1250-00380	1.25	3.8	2.5	15	4	50	4,000
IAB230-0260-1300-00390	1.3	3.9	2.6	15	4	50	6,240
IAB230-0270-1350-00410	1.35	4.1	2.7	15	4	50	6,240

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	球头R (R) Ball R	刃长 (L2) Length of Cut	刀刃直径 (D1) Outside Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAB230-0280-1400-00420	1.4	4.2	2.8	15	4	50	6,240
IAB230-0290-1450-00440	1.45	4.4	2.9	15	4	50	6,240
IAB230-0300-1500-00500	1.5	5	3	15	4	50	2,800
IAB230-0310-1550-00500	1.55	5	3.1	15	6	50	6,560
IAB230-0320-1600-00500	1.6	5	3.2	15	6	50	6,560
IAB230-0330-1650-00500	1.65	5	3.3	15	6	50	6,560
IAB230-0340-1700-00510	1.7	5.1	3.4	15	6	50	6,560
IAB230-0350-1750-00530	1.75	5.3	3.5	15	6	50	5,200
IAB230-0360-1800-00360	1.8	3.6	3.6	15	6	50	6,560
IAB230-0370-1850-00370	1.85	3.7	3.7	15	6	50	6,560
IAB230-0380-1900-00380	1.9	3.8	3.8	15	6	50	6,560
IAB230-0390-1950-00390	1.95	3.9	3.9	15	6	50	6,560
IAB230-0400-2000-00400	2	4	4	15	6	50	3,200
IAB230-0400-2000-00600		6	4	15	6	50	3,200
IAB230-0410-2050-00410	2.05	4.1	4.1	15	6	50	8,000
IAB230-0420-2100-00420	2.1	4.2	4.2	15	6	50	8,000
IAB230-0430-2150-00430	2.15	4.3	4.3	15	6	50	8,000
IAB230-0440-2200-00440	2.2	4.4	4.4	15	6	50	8,000
IAB230-0450-2250-00450	2.25	4.5	4.5	15	6	50	8,000
IAB230-0460-2300-00460	2.3	4.6	4.6	15	6	50	8,000
IAB230-0470-2350-00470	2.35	4.7	4.7	15	6	50	8,000
IAB230-0480-2400-00480	2.4	4.8	4.8	15	6	50	8,000
IAB230-0490-2450-00490	2.45	4.9	4.9	15	6	50	8,000
IAB230-0500-2500-00500	2.5	5	5	15	6	50	3,840
IAB230-0500-2500-00800		8	5	15	6	50	3,840
IAB230-0510-2550-00510	2.55	5.1	5.1	15	6	50	8,000
IAB230-0520-2600-00520	2.6	5.2	5.2	15	6	50	8,000
IAB230-0530-2650-00530	2.65	5.3	5.3	15	6	50	8,000
IAB230-0540-2700-00540	2.7	5.4	5.4	15	6	50	8,000
IAB230-0550-2750-00550	2.75	5.5	5.5	15	6	50	8,000
IAB230-0560-2800-00560	2.8	5.6	5.6	15	6	50	8,000
IAB230-0570-2850-00570	2.85	5.7	5.7	15	6	50	8,000
IAB230-0580-2900-00580	2.9	5.8	5.8	15	6	50	8,000
IAB230-0590-2950-00590	2.95	5.9	5.9	15	6	50	8,000
IAB230-0600-3000-00600	3	6	6	—	6	50	4,000
IAB230-0600-3000-01000		10	6	—	6	50	4,000
IAB230-0700-3500-00700	3.5	7	7	15	8	70	8,560
IAB230-0800-4000-01200	4	12	8	—	8	70	7,760
IAB230-0800-4000-01600		16	8	—	8	70	7,760
IAB230-0900-4500-01350	4.5	13.5	9	15	10	80	11,920
IAB230-1000-5000-01500	5	15	10	—	10	80	10,160
IAB230-1000-5000-02000		20	10	—	10	80	10,160
IAB230-1100-5500-01650	5.5	16.5	11	15	12	110	19,840
IAB230-1200-6000-02000	6	20	12	—	12	110	17,120
IAB230-1200-6000-02400		24	12	—	12	110	17,120

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单位(Size):mm

型号 Code No.	球头R (R) Ball R	刃长 (L2) Length of Cut	刀刃直径 (D1) Outside Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IAB230-1400-7000-03000	7	30	14	—	14	110	36,160
IAB230-1600-8000-03000	8	30	16	—	16	140	42,720
IAB230-1800-9000-03400	9	34	18	—	18	140	64,400
IAB230-2000-10000-03800	10	38	20	—	20	160	66,320

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAB230
Model number:IAB230

球头立铣刀 Ball End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.1	0.1	0.005	0.008	200	50,000	0.005	0.008	200	50,000	0.005	0.008	200	50,000	0.005	0.008	200	50,000
	0.15	0.15	0.008	0.015	200	50,000	0.008	0.015	200	50,000	0.008	0.015	200	50,000	0.008	0.015	200	50,000
	0.2	0.2	0.010	0.020	400	50,000	0.010	0.020	400	50,000	0.010	0.020	400	50,000	0.010	0.020	400	50,000
	0.3	0.3	0.015	0.030	400	50,000	0.015	0.030	400	50,000	0.015	0.030	400	50,000	0.015	0.030	400	50,000
	0.4	0.6	0.020	0.040	400	50,000	0.020	0.040	400	50,000	0.020	0.040	400	50,000	0.020	0.040	400	50,000
	0.5	0.8	0.025	0.050	400	50,000	0.025	0.050	400	50,000	0.025	0.050	400	50,000	0.025	0.050	400	50,000
	0.6	0.9	0.030	0.060	630	50,000	0.030	0.060	630	50,000	0.030	0.060	630	50,000	0.030	0.060	630	50,000
		1	0.030	0.060	630	50,000	0.030	0.060	630	50,000	0.030	0.060	630	50,000	0.030	0.060	630	50,000
	0.7	1.1	0.035	0.070	630	50,000	0.035	0.070	630	50,000	0.035	0.070	630	50,000	0.035	0.070	630	50,000
	0.8	1.2	0.040	0.080	1200	50,000	0.040	0.080	1200	50,000	0.040	0.080	1200	50,000	0.040	0.080	1200	50,000
	0.9	1.4	0.045	0.090	1200	50,000	0.045	0.090	1200	50,000	0.045	0.090	1200	50,000	0.045	0.090	1200	50,000
	1	1.5	0.050	0.100	1400	48,000	0.050	0.100	1400	48,000	0.050	0.100	1400	48,000	0.050	0.100	1400	48,000
	1.1	1.7	0.055	0.165	1400	48,000	0.055	0.165	1400	48,000	0.055	0.165	1400	48,000	0.055	0.165	1400	48,000
	1.2	1.8	0.060	0.180	1400	40,000	0.060	0.180	1400	40,000	0.060	0.180	1400	40,000	0.060	0.180	1400	40,000
	1.3	2	0.065	0.195	1400	40,000	0.065	0.195	1400	40,000	0.065	0.195	1400	40,000	0.065	0.195	1400	40,000
	1.4	2.1	0.070	0.210	1400	40,000	0.070	0.210	1400	40,000	0.070	0.210	1400	40,000	0.070	0.210	1400	40,000
	1.5	2	0.075	0.225	1400	40,000	0.075	0.225	1400	40,000	0.075	0.225	1400	40,000	0.075	0.225	1400	40,000
		2.3	0.075	0.225	1400	40,000	0.075	0.225	1400	40,000	0.075	0.225	1400	40,000	0.075	0.225	1400	40,000
	1.6	2.4	0.080	0.240	1200	30,000	0.080	0.240	1200	30,000	0.080	0.240	1200	30,000	0.080	0.240	1200	30,000
	1.7	2.6	0.085	0.255	1200	30,000	0.085	0.255	1200	30,000	0.085	0.255	1200	30,000	0.085	0.255	1200	30,000
	1.8	2.7	0.090	0.270	1200	30,000	0.090	0.270	1200	30,000	0.090	0.270	1200	30,000	0.090	0.270	1200	30,000
	1.9	2.9	0.095	0.285	1200	30,000	0.095	0.285	1200	30,000	0.095	0.285	1200	30,000	0.095	0.285	1200	30,000
	2	3	0.100	0.300	1100	24,000	0.100	0.300	1100	24,000	0.100	0.300	1100	24,000	0.100	0.300	1100	24,000
	2.1	3.2	0.105	0.315	1100	24,000	0.105	0.315	1100	24,000	0.105	0.315	1100	24,000	0.105	0.315	1100	24,000
	2.2	3.3	0.110	0.330	1100	24,000	0.110	0.330	1100	24,000	0.110	0.330	1100	24,000	0.110	0.330	1100	24,000
	2.3	3.5	0.115	0.345	1100	24,000	0.115	0.345	1100	24,000	0.115	0.345	1100	24,000	0.115	0.345	1100	24,000
	2.4	3.6	0.120	0.360	1100	24,000	0.120	0.360	1100	24,000	0.120	0.360	1100	24,000	0.120	0.360	1100	24,000
	2.5	3.8	0.125	0.375	1100	24,000	0.125	0.375	1100	24,000	0.125	0.375	1100	24,000	0.125	0.375	1100	24,000
	2.6	3.9	0.130	0.390	1100	24,000	0.130	0.390	1100	24,000	0.130	0.390	1100	24,000	0.130	0.390	1100	24,000
	2.7	4.1	0.135	0.405	1100	24,000	0.135	0.405	1100	24,000	0.135	0.405	1100	24,000	0.135	0.405	1100	24,000
	2.8	4.2	0.140	0.420	1100	24,000	0.140	0.420	1100	24,000	0.140	0.420	1100	24,000	0.140	0.420	1100	24,000
	2.9	4.4	0.145	0.435	1100	24,000	0.145	0.435	1100	24,000	0.145	0.435	1100	24,000	0.145	0.435	1100	24,000
	3	5	0.150	0.450	930	16,000	0.150	0.450	930	16,000	0.150	0.450	930	16,000	0.150	0.450	930	16,000
	3.1	5	0.155	0.465	930	16,000	0.155	0.465	930	16,000	0.155	0.465	930	16,000	0.155	0.465	930	16,000
	3.2	5	0.160	0.480	930	16,000	0.160	0.480	930	16,000	0.160	0.480	930	16,000	0.160	0.480	930	16,000
	3.3	5	0.165	0.495	930	16,000	0.165	0.495	930	16,000	0.165	0.495	930	16,000	0.165	0.495	930	16,000
	3.4	5.1	0.170	0.510	930	16,000	0.170	0.510	930	16,000	0.170	0.510	930	16,000	0.170	0.510	930	16,000
	3.5	5.3	0.175	0.525	930	16,000	0.175	0.525	930	16,000	0.175	0.525	930	16,000	0.175	0.525	930	16,000
	3.6	3.6	0.180	0.540	930	16,000	0.180	0.540	930	16,000	0.180	0.540	930	16,000	0.180	0.540	930	16,000
	3.7	3.7	0.185	0.555	930	16,000	0.185	0.555	930	16,000	0.185	0.555	930	16,000	0.185	0.555	930	16,000
	3.8	3.8	0.190	0.570	930	16,000	0.190	0.570	930	16,000	0.190	0.570	930	16,000	0.190	0.570	930	16,000
	3.9	3.9	0.195	0.585	930	16,000	0.195	0.585	930	16,000	0.195	0.585	930	16,000	0.195	0.585	930	16,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAB230
Model number:IAB230

球头立铣刀 Ball End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	4	4	0.200	0.600	930	12,000	0.200	0.600	930	12,000	0.200	0.600	930	12,000	0.200	0.600	930	12,000
		6	0.200	0.600	930	12,000	0.200	0.600	930	12,000	0.200	0.600	930	12,000	0.200	0.600	930	12,000
	4.1	4.1	0.205	0.615	930	12,000	0.205	0.615	930	12,000	0.205	0.615	930	12,000	0.205	0.615	930	12,000
	4.2	4.2	0.210	0.630	930	12,000	0.210	0.630	930	12,000	0.210	0.630	930	12,000	0.210	0.630	930	12,000
	4.3	4.3	0.215	0.645	930	12,000	0.215	0.645	930	12,000	0.215	0.645	930	12,000	0.215	0.645	930	12,000
	4.4	4.4	0.220	0.660	930	12,000	0.220	0.660	930	12,000	0.220	0.660	930	12,000	0.220	0.660	930	12,000
	4.5	4.5	0.225	0.675	930	12,000	0.225	0.675	930	12,000	0.225	0.675	930	12,000	0.225	0.675	930	12,000
	4.6	4.6	0.230	0.690	930	12,000	0.230	0.690	930	12,000	0.230	0.690	930	12,000	0.230	0.690	930	12,000
	4.7	4.7	0.235	0.705	930	12,000	0.235	0.705	930	12,000	0.235	0.705	930	12,000	0.235	0.705	930	12,000
	4.8	4.8	0.240	0.720	930	12,000	0.240	0.720	930	12,000	0.240	0.720	930	12,000	0.240	0.720	930	12,000
	4.9	4.9	0.245	0.735	930	12,000	0.245	0.735	930	12,000	0.245	0.735	930	12,000	0.245	0.735	930	12,000
	5	5	0.250	0.750	930	9,600	0.250	0.750	930	9,600	0.250	0.750	930	9,600	0.250	0.750	930	9,600
		8	0.250	0.750	930	9,600	0.250	0.750	930	9,600	0.250	0.750	930	9,600	0.250	0.750	930	9,600
	5.1	5.1	0.255	0.765	930	9,600	0.255	0.765	930	9,600	0.255	0.765	930	9,600	0.255	0.765	930	9,600
	5.2	5.2	0.260	0.780	930	9,600	0.260	0.780	930	9,600	0.260	0.780	930	9,600	0.260	0.780	930	9,600
	5.3	5.3	0.265	0.795	930	9,600	0.265	0.795	930	9,600	0.265	0.795	930	9,600	0.265	0.795	930	9,600
	5.4	5.4	0.270	0.810	930	9,600	0.270	0.810	930	9,600	0.270	0.810	930	9,600	0.270	0.810	930	9,600
	5.5	5.5	0.275	0.825	930	9,600	0.275	0.825	930	9,600	0.275	0.825	930	9,600	0.275	0.825	930	9,600
	5.6	5.6	0.280	0.840	930	9,600	0.280	0.840	930	9,600	0.280	0.840	930	9,600	0.280	0.840	930	9,600
	5.7	5.7	0.285	0.855	930	9,600	0.285	0.855	930	9,600	0.285	0.855	930	9,600	0.285	0.855	930	9,600
	5.8	5.8	0.290	0.870	930	9,600	0.290	0.870	930	9,600	0.290	0.870	930	9,600	0.290	0.870	930	9,600
	5.9	5.9	0.295	0.885	930	9,600	0.295	0.885	930	9,600	0.295	0.885	930	9,600	0.295	0.885	930	9,600
	6	6	0.300	0.900	930	8,000	0.300	0.900	930	8,000	0.300	0.900	930	8,000	0.300	0.900	930	8,000
		10	0.300	0.900	930	8,000	0.300	0.900	930	8,000	0.300	0.900	930	8,000	0.300	0.900	930	8,000
	7	7	0.350	1.050	930	8,000	0.350	1.050	930	8,000	0.350	1.050	930	8,000	0.350	1.050	930	8,000
	8	12	0.400	1.200	900	6,000	0.400	1.200	900	6,000	0.400	1.200	900	6,000	0.400	1.200	900	6,000
		16	0.400	1.200	900	6,000	0.400	1.200	900	6,000	0.400	1.200	900	6,000	0.400	1.200	900	6,000
	9	13.5	0.450	1.350	900	6,000	0.450	1.350	900	6,000	0.450	1.350	900	6,000	0.450	1.350	900	6,000
	10	15	0.500	1.500	900	4,800	0.500	1.500	900	4,800	0.500	1.500	900	4,800	0.500	1.500	900	4,800
		20	0.500	1.500	900	4,800	0.500	1.500	900	4,800	0.500	1.500	900	4,800	0.500	1.500	900	4,800
	11	16.5	0.550	1.650	900	4,800	0.550	1.650	900	4,800	0.550	1.650	900	4,800	0.550	1.650	900	4,800
	12	20	0.600	1.800	900	4,000	0.600	1.800	900	4,000	0.600	1.800	900	4,000	0.600	1.800	900	4,000
		24	0.600	1.800	900	4,000	0.600	1.800	900	4,000	0.600	1.800	900	4,000	0.600	1.800	900	4,000
	14	30	0.700	2.100	900	3,400	0.700	2.100	900	3,400	0.700	2.100	900	3,400	0.700	2.100	900	3,400
	16	30	0.800	2.400	900	3,000	0.800	2.400	900	3,000	0.800	2.400	900	3,000	0.800	2.400	900	3,000
	18	34	0.900	2.700	900	2,650	0.900	2.700	900	2,650	0.900	2.700	900	2,650	0.900	2.700	900	2,650
	20	38	1.000	3.000	900	2,400	1.000	3.000	900	2,400	1.000	3.000	900	2,400	1.000	3.000	900	2,400

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●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

球头立铣刀 Ball End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.1	0.003	0.008	100	50,000	0.005	0.008	200	50,000	0.005	0.008	200	50,000	0.005	0.008	250	50,000
	0.15	0.15	0.004	0.015	100	50,000	0.008	0.015	200	50,000	0.008	0.015	200	50,000	0.0075	0.015	250	50,000
	0.2	0.2	0.005	0.020	200	50,000	0.010	0.020	400	50,000	0.010	0.020	400	50,000	0.01	0.020	600	50,000
	0.3	0.3	0.008	0.030	200	50,000	0.015	0.030	400	50,000	0.015	0.030	400	50,000	0.015	0.030	600	50,000
	0.4	0.6	0.010	0.040	500	50,000	0.020	0.040	400	50,000	0.020	0.040	400	50,000	0.02	0.040	600	50,000
	0.5	0.8	0.013	0.050	500	50,000	0.025	0.050	400	50,000	0.025	0.050	400	50,000	0.025	0.050	600	50,000
	0.6	0.9	0.015	0.060	800	48,000	0.030	0.060	630	50,000	0.030	0.060	630	50,000	0.03	0.060	750	50,000
		1	0.015	0.060	800	48,000	0.030	0.060	630	50,000	0.030	0.060	630	50,000	0.03	0.060	750	50,000
	0.7	1.1	0.018	0.070	800	48,000	0.035	0.070	630	50,000	0.035	0.070	630	50,000	0.035	0.070	750	50,000
	0.8	1.2	0.020	0.080	800	36,000	0.040	0.080	1200	50,000	0.040	0.080	1200	50,000	0.04	0.080	1,000	50,000
	0.9	1.4	0.023	0.090	800	36,000	0.045	0.090	1200	50,000	0.045	0.090	1200	50,000	0.045	0.090	1,000	48,000
	1	1.5	0.025	0.100	800	30,000	0.050	0.100	1400	48,000	0.050	0.100	1400	48,000	0.05	0.100	1,000	48,000
	1.1	1.7	0.028	0.165	800	30,000	0.055	0.165	1400	48,000	0.055	0.165	1400	48,000	0.055	0.165	1,000	48,000
	1.2	1.8	0.030	0.180	700	25,000	0.060	0.180	1400	40,000	0.060	0.180	1400	40,000	0.06	0.180	1,100	40,000
	1.3	2	0.033	0.195	700	25,000	0.065	0.195	1400	40,000	0.065	0.195	1400	40,000	0.065	0.195	1,100	40,000
	1.4	2.1	0.035	0.210	700	25,000	0.070	0.210	1400	40,000	0.070	0.210	1400	40,000	0.07	0.210	1,100	40,000
	1.5	2	0.038	0.225	700	25,000	0.075	0.225	1400	40,000	0.075	0.225	1400	40,000	0.075	0.225	1,100	40,000
		2.3	0.038	0.225	700	25,000	0.075	0.225	1400	40,000	0.075	0.225	1400	40,000	0.075	0.225	1,100	40,000
	1.6	2.4	0.040	0.240	600	18,000	0.080	0.240	1200	30,000	0.080	0.240	1200	30,000	0.08	0.240	1,150	30,000
	1.7	2.6	0.043	0.255	600	18,000	0.085	0.255	1200	30,000	0.085	0.255	1200	30,000	0.085	0.255	1,150	30,000
	1.8	2.7	0.045	0.270	600	18,000	0.090	0.270	1200	30,000	0.090	0.270	1200	30,000	0.09	0.270	1,150	30,000
	1.9	2.9	0.048	0.285	600	18,000	0.095	0.285	1200	30,000	0.095	0.285	1200	30,000	0.095	0.285	1,150	30,000
	2	3	0.050	0.300	500	14,500	0.100	0.300	1100	24,000	0.100	0.300	1100	24,000	0.1	0.300	1,200	24,000
	2.1	3.2	0.053	0.315	500	14,500	0.105	0.315	1100	24,000	0.105	0.315	1100	24,000	0.105	0.315	1,200	24,000
	2.2	3.3	0.055	0.330	500	14,500	0.110	0.330	1100	24,000	0.110	0.330	1100	24,000	0.11	0.330	1,200	24,000
	2.3	3.5	0.058	0.345	500	14,500	0.115	0.345	1100	24,000	0.115	0.345	1100	24,000	0.115	0.345	1,200	24,000
	2.4	3.6	0.060	0.360	500	14,500	0.120	0.360	1100	24,000	0.120	0.360	1100	24,000	0.12	0.360	1,200	24,000
	2.5	3.8	0.063	0.375	500	14,500	0.125	0.375	1100	24,000	0.125	0.375	1100	24,000	0.125	0.375	1,200	24,000
	2.6	3.9	0.065	0.390	500	14,500	0.130	0.390	1100	24,000	0.130	0.390	1100	24,000	0.13	0.390	1,200	24,000
	2.7	4.1	0.068	0.405	500	14,500	0.135	0.405	1100	24,000	0.135	0.405	1100	24,000	0.135	0.405	1,200	24,000
	2.8	4.2	0.070	0.420	500	14,500	0.140	0.420	1100	24,000	0.140	0.420	1100	24,000	0.14	0.420	1,200	24,000
	2.9	4.4	0.073	0.435	500	14,500	0.145	0.435	1100	24,000	0.145	0.435	1100	24,000	0.145	0.435	1,200	24,000
	3	5	0.075	0.450	450	9,600	0.150	0.450	930	16,000	0.150	0.450	930	16,000	0.15	0.450	1,200	16,000
	3.1	5	0.078	0.465	450	9,600	0.155	0.465	930	16,000	0.155	0.465	930	16,000	0.155	0.465	1,200	16,000
	3.2	5	0.080	0.480	450	9,600	0.160	0.480	930	16,000	0.160	0.480	930	16,000	0.16	0.480	1,200	16,000
	3.3	5	0.083	0.495	450	9,600	0.165	0.495	930	16,000	0.165	0.495	930	16,000	0.165	0.495	1,200	16,000
	3.4	5.1	0.085	0.510	450	9,600	0.170	0.510	930	16,000	0.170	0.510	930	16,000	0.17	0.510	1,200	16,000
	3.5	5.3	0.088	0.525	450	9,600	0.175	0.525	930	16,000	0.175	0.525	930	16,000	0.175	0.525	1,200	16,000
	3.6	3.6	0.090	0.540	450	9,600	0.180	0.540	930	16,000	0.180	0.540	930	16,000	0.18	0.540	1,200	16,000
	3.7	3.7	0.093	0.555	450	9,600	0.185	0.555	930	16,000	0.185	0.555	930	16,000	0.185	0.555	1,200	16,000
	3.8	3.8	0.095	0.570	450	9,600	0.190	0.570	930	16,000	0.190	0.570	930	16,000	0.19	0.570	1,200	16,000
	3.9	3.9	0.098	0.585	450	9,600	0.195	0.585	930	16,000	0.195	0.585	930	16,000	0.195	0.585	1,200	16,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAB230
Model number:IAB230

球头立铣刀 Ball End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刀刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	4	4	0.100	0.600	450	7,200	0.200	0.600	930	12,000	0.200	0.600	930	12,000	0.2	0.600	1,200	12,000
		6	0.100	0.600	450	7,200	0.200	0.600	930	12,000	0.200	0.600	930	12,000	0.2	0.600	1,200	12,000
	4.1	4.1	0.103	0.615	450	7,200	0.205	0.615	930	12,000	0.205	0.615	930	12,000	0.205	0.615	1,200	12,000
	4.2	4.2	0.105	0.630	450	7,200	0.210	0.630	930	12,000	0.210	0.630	930	12,000	0.21	0.630	1,200	12,000
	4.3	4.3	0.108	0.645	450	7,200	0.215	0.645	930	12,000	0.215	0.645	930	12,000	0.215	0.645	1,200	12,000
	4.4	4.4	0.110	0.660	450	7,200	0.220	0.660	930	12,000	0.220	0.660	930	12,000	0.22	0.660	1,200	12,000
	4.5	4.5	0.113	0.675	450	7,200	0.225	0.675	930	12,000	0.225	0.675	930	12,000	0.225	0.675	1,200	12,000
	4.6	4.6	0.115	0.690	450	7,200	0.230	0.690	930	12,000	0.230	0.690	930	12,000	0.23	0.690	1,200	12,000
	4.7	4.7	0.118	0.705	450	7,200	0.235	0.705	930	12,000	0.235	0.705	930	12,000	0.235	0.705	1,200	12,000
	4.8	4.8	0.120	0.720	450	7,200	0.240	0.720	930	12,000	0.240	0.720	930	12,000	0.24	0.720	1,200	12,000
	4.9	4.9	0.123	0.735	450	7,200	0.245	0.735	930	12,000	0.245	0.735	930	12,000	0.245	0.735	1,200	12,000
	5	5	0.125	0.750	450	5,700	0.250	0.750	930	9,600	0.250	0.750	930	9,600	0.25	0.750	1,150	9,600
		8	0.125	0.750	450	5,700	0.250	0.750	930	9,600	0.250	0.750	930	9,600	0.25	0.750	1,150	9,600
	5.1	5.1	0.128	0.765	450	5,700	0.255	0.765	930	9,600	0.255	0.765	930	9,600	0.255	0.765	1,150	9,600
	5.2	5.2	0.130	0.780	450	5,700	0.260	0.780	930	9,600	0.260	0.780	930	9,600	0.26	0.780	1,150	9,600
	5.3	5.3	0.133	0.795	450	5,700	0.265	0.795	930	9,600	0.265	0.795	930	9,600	0.265	0.795	1,150	9,600
	5.4	5.4	0.135	0.810	450	5,700	0.270	0.810	930	9,600	0.270	0.810	930	9,600	0.27	0.810	1,150	9,600
	5.5	5.5	0.138	0.825	450	5,700	0.275	0.825	930	9,600	0.275	0.825	930	9,600	0.275	0.825	1,150	9,600
	5.6	5.6	0.140	0.840	450	5,700	0.280	0.840	930	9,600	0.280	0.840	930	9,600	0.28	0.840	1,150	9,600
	5.7	5.7	0.143	0.855	450	5,700	0.285	0.855	930	9,600	0.285	0.855	930	9,600	0.285	0.855	1,150	9,600
	5.8	5.8	0.145	0.870	450	5,700	0.290	0.870	930	9,600	0.290	0.870	930	9,600	0.29	0.870	1,150	9,600
	5.9	5.9	0.148	0.885	450	5,700	0.295	0.885	930	9,600	0.295	0.885	930	9,600	0.295	0.885	1,150	9,600
	6	6	0.150	0.900	450	4,800	0.300	0.900	930	8,000	0.300	0.900	930	8,000	0.3	0.900	1,050	8,000
		10	0.150	0.900	450	4,800	0.300	0.900	930	8,000	0.300	0.900	930	8,000	0.3	0.900	1,050	8,000
	7	7	0.175	1.050	450	4,800	0.350	1.050	930	8,000	0.350	1.050	930	8,000	0.35	1.050	1,000	8,000
	8	12	0.200	1.200	450	3,600	0.400	1.200	900	6,000	0.400	1.200	900	6,000	0.4	1.200	1,000	6,000
		16	0.200	1.200	450	3,600	0.400	1.200	900	6,000	0.400	1.200	900	6,000	0.4	1.200	1,000	6,000
	9	13.5	0.225	1.350	450	3,600	0.450	1.350	900	6,000	0.450	1.350	900	6,000	0.45	1.350	1,000	6,000
	10	15	0.250	1.500	450	2,900	0.500	1.500	900	4,800	0.500	1.500	900	4,800	0.5	1.500	1,000	4,800
		20	0.250	1.500	450	2,900	0.500	1.500	900	4,800	0.500	1.500	900	4,800	0.5	1.500	1,000	4,800
	11	16.5	0.275	1.650	450	2,900	0.550	1.650	900	4,800	0.550	1.650	900	4,800	0.55	1.650	1,000	4,800
	12	20	0.300	1.800	450	2,400	0.600	1.800	900	4,000	0.600	1.800	900	4,000	0.6	1.800	1,000	4,000
		24	0.300	1.800	450	2,400	0.600	1.800	900	4,000	0.600	1.800	900	4,000	0.6	1.800	1,000	4,000
	14	30	0.350	2.100	450	2,000	0.700	2.100	900	3,400	0.700	2.100	900	3,400	0.7	2.100	1,000	3,400
	16	30	0.400	2.400	450	1,800	0.800	2.400	900	3,000	0.800	2.400	900	3,000	0.8	2.400	1,000	3,000
	18	34	0.450	2.700	450	1,600	0.900	2.700	900	2,650	0.900	2.700	900	2,650	0.9	2.700	1,000	2,650
	20	38	0.500	3.000	450	1,450	1.000	3.000	900	2,400	1.000	3.000	900	2,400	1	3.000	1,000	2,400

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

球头立铣刀 Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刀刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.1	0.005	0.008	250	50,000	0.005	0.008	250	50,000	0.003	0.008	100	50,000
	0.15	0.15	0.008	0.015	250	50,000	0.008	0.015	250	50,000	0.004	0.015	100	50,000
	0.2	0.2	0.010	0.020	500	50,000	0.010	0.020	500	50,000	0.005	0.020	200	50,000
	0.3	0.3	0.015	0.030	500	50,000	0.015	0.030	500	50,000	0.008	0.030	200	50,000
	0.4	0.6	0.020	0.040	600	50,000	0.020	0.040	600	50,000	0.010	0.040	500	50,000
	0.5	0.8	0.025	0.050	600	50,000	0.025	0.050	600	50,000	0.013	0.050	500	50,000
	0.6	0.9	0.030	0.060	750	50,000	0.030	0.060	750	50,000	0.015	0.060	800	48,000
		1	0.030	0.060	750	50,000	0.030	0.060	750	50,000	0.015	0.060	800	48,000
	0.7	1.1	0.035	0.070	750	50,000	0.035	0.070	750	50,000	0.018	0.070	800	48,000
	0.8	1.2	0.040	0.080	1,000	50,000	0.040	0.080	1,000	50,000	0.020	0.080	800	36,000
	0.9	1.4	0.045	0.090	1,000	50,000	0.045	0.090	1,000	50,000	0.023	0.090	800	36,000
	1	1.5	0.050	0.100	1,250	50,000	0.050	0.100	1,250	50,000	0.025	0.100	800	30,000
	1.1	1.7	0.055	0.165	1,250	50,000	0.055	0.165	1,250	50,000	0.028	0.165	800	30,000
	1.2	1.8	0.060	0.180	1,480	50,000	0.060	0.180	1,480	50,000	0.030	0.180	700	25,000
	1.3	2	0.065	0.195	1,480	50,000	0.065	0.195	1,480	50,000	0.033	0.195	700	25,000
	1.4	2.1	0.070	0.210	1,480	50,000	0.070	0.210	1,480	50,000	0.035	0.210	700	25,000
	1.5	2	0.075	0.225	1,480	50,000	0.075	0.225	1,480	50,000	0.038	0.225	700	25,000
		2.3	0.075	0.225	1,480	50,000	0.075	0.225	1,480	50,000	0.038	0.225	700	25,000
	1.6	2.4	0.080	0.240	1,900	50,000	0.080	0.240	1,900	50,000	0.040	0.240	600	18,000
	1.7	2.6	0.085	0.255	1,900	50,000	0.085	0.255	1,900	50,000	0.043	0.255	600	18,000
	1.8	2.7	0.090	0.270	1,900	50,000	0.090	0.270	1,900	50,000	0.045	0.270	600	18,000
	1.9	2.9	0.095	0.285	1,900	50,000	0.095	0.285	1,900	50,000	0.048	0.285	600	18,000
	2	3	0.100	0.300	2,400	48,000	0.100	0.300	2,400	48,000	0.050	0.300	500	14,500
	2.1	3.2	0.105	0.315	2,400	48,000	0.105	0.315	2,400	48,000	0.053	0.315	500	14,500
	2.2	3.3	0.110	0.330	2,400	48,000	0.110	0.330	2,400	48,000	0.055	0.330	500	14,500
	2.3	3.5	0.115	0.345	2,400	48,000	0.115	0.345	2,400	48,000	0.058	0.345	500	14,500
	2.4	3.6	0.120	0.360	2,400	48,000	0.120	0.360	2,400	48,000	0.060	0.360	500	14,500
	2.5	3.8	0.125	0.375	2,400	48,000	0.125	0.375	2,400	48,000	0.063	0.375	500	14,500
	2.6	3.9	0.130	0.390	2,400	48,000	0.130	0.390	2,400	48,000	0.065	0.390	500	14,500
	2.7	4.1	0.135	0.405	2,400	48,000	0.135	0.405	2,400	48,000	0.068	0.405	500	14,500
	2.8	4.2	0.140	0.420	2,400	48,000	0.140	0.420	2,400	48,000	0.070	0.420	500	14,500
	2.9	4.4	0.145	0.435	2,400	48,000	0.145	0.435	2,400	48,000	0.073	0.435	500	14,500
	3	5	0.150	0.450	2,400	32,000	0.150	0.450	2,400	32,000	0.075	0.450	450	9,600
	3.1	5	0.155	0.465	2,400	32,000	0.155	0.465	2,400	32,000	0.078	0.465	450	9,600
	3.2	5	0.160	0.480	2,400	32,000	0.160	0.480	2,400	32,000	0.080	0.480	450	9,600
	3.3	5	0.165	0.495	2,400	32,000	0.165	0.495	2,400	32,000	0.083	0.495	450	9,600
	3.4	5.1	0.170	0.510	2,400	32,000	0.170	0.510	2,400	32,000	0.085	0.510	450	9,600
	3.5	5.3	0.175	0.525	2,400	32,000	0.175	0.525	2,400	32,000	0.088	0.525	450	9,600
	3.6	3.6	0.180	0.540	2,400	32,000	0.180	0.540	2,400	32,000	0.090	0.540	450	9,600
	3.7	3.7	0.185	0.555	2,400	32,000	0.185	0.555	2,400	32,000	0.093	0.555	450	9,600
	3.8	3.8	0.190	0.570	2,400	32,000	0.190	0.570	2,400	32,000	0.095	0.570	450	9,600
	3.9	3.9	0.195	0.585	2,400	32,000	0.195	0.585	2,400	32,000	0.098	0.585	450	9,600

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IAB230
Model number:IAB230

球头立铣刀 Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	4	4	0.200	0.600	2,400	24,000	0.200	0.600	2,400	24,000	0.100	0.600	450	7,200
		6	0.200	0.600	2,400	24,000	0.200	0.600	2,400	24,000	0.100	0.600	450	7,200
	4.1	4.1	0.205	0.615	2,400	24,000	0.205	0.615	2,400	24,000	0.103	0.615	450	7,200
	4.2	4.2	0.210	0.630	2,400	24,000	0.210	0.630	2,400	24,000	0.105	0.630	450	7,200
	4.3	4.3	0.215	0.645	2,400	24,000	0.215	0.645	2,400	24,000	0.108	0.645	450	7,200
	4.4	4.4	0.220	0.660	2,400	24,000	0.220	0.660	2,400	24,000	0.110	0.660	450	7,200
	4.5	4.5	0.225	0.675	2,400	24,000	0.225	0.675	2,400	24,000	0.113	0.675	450	7,200
	4.6	4.6	0.230	0.690	2,400	24,000	0.230	0.690	2,400	24,000	0.115	0.690	450	7,200
	4.7	4.7	0.235	0.705	2,400	24,000	0.235	0.705	2,400	24,000	0.118	0.705	450	7,200
	4.8	4.8	0.240	0.720	2,400	24,000	0.240	0.720	2,400	24,000	0.120	0.720	450	7,200
	4.9	4.9	0.245	0.735	2,400	24,000	0.245	0.735	2,400	24,000	0.123	0.735	450	7,200
	5	5	0.250	0.750	2,400	19,000	0.250	0.750	2,400	19,000	0.125	0.750	450	5,700
		8	0.250	0.750	2,400	19,000	0.250	0.750	2,400	19,000	0.125	0.750	450	5,700
	5.1	5.1	0.255	0.765	2,400	19,000	0.255	0.765	2,400	19,000	0.128	0.765	450	5,700
	5.2	5.2	0.260	0.780	2,400	19,000	0.260	0.780	2,400	19,000	0.130	0.780	450	5,700
	5.3	5.3	0.265	0.795	2,400	19,000	0.265	0.795	2,400	19,000	0.133	0.795	450	5,700
	5.4	5.4	0.270	0.810	2,400	19,000	0.270	0.810	2,400	19,000	0.135	0.810	450	5,700
	5.5	5.5	0.275	0.825	2,400	19,000	0.275	0.825	2,400	19,000	0.138	0.825	450	5,700
	5.6	5.6	0.280	0.840	2,400	19,000	0.280	0.840	2,400	19,000	0.140	0.840	450	5,700
	5.7	5.7	0.285	0.855	2,400	19,000	0.285	0.855	2,400	19,000	0.143	0.855	450	5,700
	5.8	5.8	0.290	0.870	2,400	19,000	0.290	0.870	2,400	19,000	0.145	0.870	450	5,700
	5.9	5.9	0.295	0.885	2,400	19,000	0.295	0.885	2,400	19,000	0.148	0.885	450	5,700
	6	6	0.300	0.900	2,400	16,000	0.300	0.900	2,400	16,000	0.150	0.900	450	4,800
		10	0.300	0.900	2,400	16,000	0.300	0.900	2,400	16,000	0.150	0.900	450	4,800
	7	7	0.350	1.050	2,400	16,000	0.350	1.050	2,400	16,000	0.175	1.050	450	4,800
	8	12	0.400	1.200	2,400	12,000	0.400	1.200	2,400	12,000	0.200	1.200	450	3,600
		16	0.400	1.200	2,400	12,000	0.400	1.200	2,400	12,000	0.200	1.200	450	3,600
	9	13.5	0.450	1.350	2,400	12,000	0.450	1.350	2,400	12,000	0.225	1.350	450	3,600
	10	15	0.500	1.500	2,300	9,600	0.500	1.500	2,300	9,600	0.250	1.500	450	2,900
		20	0.500	1.500	2,300	9,600	0.500	1.500	2,300	9,600	0.250	1.500	450	2,900
	11	16.5	0.550	1.650	2,300	9,600	0.550	1.650	2,300	9,600	0.275	1.650	450	2,900
	12	20	0.600	1.800	2,100	8,000	0.600	1.800	2,100	8,000	0.300	1.800	450	2,400
		24	0.600	1.800	2,100	8,000	0.600	1.800	2,100	8,000	0.300	1.800	450	2,400
	14	30	0.700	2.100	2,000	6,800	0.700	2.100	2,000	6,800	0.350	2.100	450	2,000
	16	30	0.800	2.400	2,000	6,000	0.800	2.400	2,000	6,000	0.400	2.400	450	1,800
	18	34	0.900	2.700	2,000	5,300	0.900	2.700	2,000	5,300	0.450	2.700	450	1,600
	20	38	1.000	3.000	2,000	4,800	1.000	3.000	2,000	4,800	0.500	3.000	450	1,450

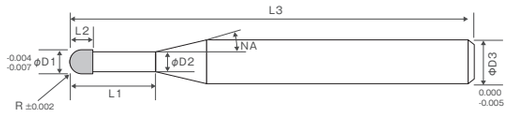
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

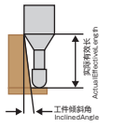
超硬长颈球头立铣刀
Carbide Long Neck Ball End Mill

ion A | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IALB230 Model number:IALB230



所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If you are concerned about interference with the work material, be sure to check by actual measurement.



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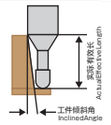
单位(Size):mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Outside Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALB230-0010-0050-0030	0.05	0.3	0.07	0.1	0.08	15	4	50	8,160	0.35	0.36	0.37	0.38	0.41
IALB230-0010-0050-0050		0.5	0.07	0.1	0.08	15	4	50	8,800	0.55	0.57	0.59	0.61	0.66
IALB230-0015-0075-0030	0.075	0.3	0.1	0.15	0.13	15	4	50	9,440	0.35	0.36	0.37	0.38	0.40
IALB230-0015-0075-0050		0.5	0.1	0.15	0.13	15	4	50	10,000	0.55	0.57	0.59	0.61	0.65
IALB230-0015-0075-0100		1	0.1	0.15	0.13	15	4	50	10,400	1.07	1.10	1.14	1.18	1.27
IALB230-0020-0100-0050	0.1	0.5	0.15	0.2	0.18	15	4	50	5,680	0.55	0.57	0.58	0.60	0.64
IALB230-0020-0100-0075		0.75	0.15	0.2	0.18	15	4	50	5,680	0.81	0.84	0.86	0.89	0.96
IALB230-0020-0100-0100		1	0.15	0.2	0.18	15	4	50	5,680	1.07	1.10	1.14	1.18	1.27
IALB230-0030-0150-0050	0.15	0.5	0.2	0.3	0.27	15	4	50	5,600	0.57	0.58	0.60	0.62	0.66
IALB230-0030-0150-0060		0.6	0.2	0.3	0.27	15	4	50	5,600	0.67	0.69	0.71	0.73	0.78
IALB230-0030-0150-0075		0.75	0.2	0.3	0.27	15	4	50	5,600	0.83	0.85	0.88	0.90	0.97
IALB230-0030-0150-0080		0.8	0.3	0.3	0.27	15	4	50	5,600	0.88	0.91	0.93	0.96	1.03
IALB230-0030-0150-0100		1	0.2	0.3	0.27	15	4	50	5,600	1.09	1.12	1.15	1.19	1.28
IALB230-0030-0150-0125		1.25	0.2	0.3	0.27	15	4	50	6,000	1.34	1.39	1.43	1.48	1.59
IALB230-0030-0150-0150-00020		1.5	0.2	0.3	0.27	15	4	50	6,000	1.60	1.65	1.71	1.77	1.90
IALB230-0030-0150-0150-00030		1.5	0.3	0.3	0.27	15	4	50	6,000	1.60	1.65	1.71	1.77	1.90
IALB230-0030-0150-0175		1.75	0.2	0.3	0.27	15	4	50	6,000	1.86	1.92	1.99	2.05	2.21
IALB230-0030-0150-0200		2	0.2	0.3	0.27	15	4	50	6,000	2.12	2.19	2.26	2.34	2.52
IALB230-0030-0150-0225		2.25	0.2	0.3	0.27	15	4	50	6,160	2.38	2.46	2.54	2.63	2.83
IALB230-0030-0150-0250		2.5	0.2	0.3	0.27	15	4	50	6,160	2.64	2.72	2.82	2.92	3.14
IALB230-0030-0150-0275		2.75	0.2	0.3	0.27	15	4	50	6,160	2.90	2.99	3.09	3.20	3.45
IALB230-0030-0150-0300		3	0.2	0.3	0.27	15	4	50	6,160	3.15	3.26	3.37	3.49	3.76
IALB230-0040-0200-0050	0.2	0.5	0.3	0.4	0.37	15	4	50	3,840	0.57	0.58	0.59	0.61	0.64
IALB230-0040-0200-0075		0.75	0.3	0.4	0.37	15	4	50	3,840	0.83	0.85	0.87	0.90	0.96
IALB230-0040-0200-0100		1	0.3	0.4	0.37	15	4	50	3,840	1.08	1.12	1.15	1.18	1.27
IALB230-0040-0200-0120		1.2	0.4	0.4	0.37	15	4	50	3,840	1.29	1.33	1.37	1.41	1.52
IALB230-0040-0200-0150		1.5	0.3	0.4	0.37	15	4	50	3,920	1.60	1.65	1.70	1.76	1.89
IALB230-0040-0200-0200		2	0.3	0.4	0.37	15	4	50	4,000	2.12	2.19	2.26	2.33	2.51
IALB230-0040-0200-0250		2.5	0.4	0.4	0.37	15	4	50	4,160	2.64	2.72	2.81	2.91	3.13
IALB230-0040-0200-0300		3	0.3	0.4	0.37	15	4	50	4,400	3.15	3.26	3.37	3.48	3.75

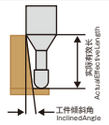


●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Outside Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IALB230-0050-0250-0100	0.25	1	0.35	0.5	0.47	15	4	50	3,840	1.08	1.11	1.14	1.18	1.26
IALB230-0050-0250-0150		1.5	0.5	0.5	0.47	15	4	50	3,840	1.60	1.65	1.70	1.75	1.88
IALB230-0050-0250-0200		2	0.35	0.5	0.47	15	4	50	3,840	2.12	2.18	2.25	2.33	2.50
IALB230-0050-0250-0250		2.5	0.35	0.5	0.47	15	4	50	3,840	2.63	2.72	2.81	2.90	3.12
IALB230-0050-0250-0300		3	0.5	0.5	0.47	15	4	50	3,840	3.15	3.25	3.36	3.48	3.74
IALB230-0050-0250-0350		3.5	0.35	0.5	0.47	15	4	50	3,840	3.67	3.79	3.91	4.05	4.36
IALB230-0050-0250-0400		4	0.35	0.5	0.47	15	4	50	3,840	4.18	4.32	4.47	4.63	4.98
IALB230-0060-0300-0100	0.3	1	0.6	0.6	0.57	15	4	50	3,280	1.08	1.11	1.14	1.17	1.24
IALB230-0060-0300-0150		1.5	0.6	0.6	0.57	15	4	50	2,960	1.60	1.64	1.69	1.74	1.87
IALB230-0060-0300-0200		2	0.6	0.6	0.57	15	4	50	2,960	2.12	2.18	2.25	2.32	2.49
IALB230-0060-0300-0220		2.2	0.8	0.6	0.57	15	4	50	3,040	2.32	2.39	2.47	2.55	2.74
IALB230-0060-0300-0250		2.5	0.6	0.6	0.57	15	4	50	3,040	2.63	2.71	2.80	2.89	3.11
IALB230-0060-0300-0300		3	0.6	0.6	0.57	15	4	50	3,040	3.15	3.25	3.35	3.47	3.73
IALB230-0060-0300-0350		3.5	0.6	0.6	0.57	15	4	50	3,120	3.67	3.78	3.91	4.04	4.35
IALB230-0060-0300-0400		4	0.6	0.6	0.57	15	4	50	3,120	4.18	4.32	4.46	4.62	4.97
IALB230-0060-0300-0450		4.5	0.6	0.6	0.57	15	4	50	3,120	4.70	4.85	5.02	5.19	5.59
IALB230-0060-0300-0500		5	0.6	0.6	0.57	15	4	50	3,120	5.22	5.39	5.57	5.77	6.22
IALB230-0060-0300-0550		5.5	0.6	0.6	0.57	15	4	50	3,120	5.73	5.92	6.13	6.34	6.84
IALB230-0060-0300-0600		6	0.6	0.6	0.57	15	4	50	3,120	6.25	6.46	6.68	6.92	7.46
IALB230-0070-0350-0200	0.35	2	0.7	0.7	0.67	15	4	50	2,960	2.11	2.18	2.24	2.31	2.48
IALB230-0070-0350-0400		4	0.7	0.7	0.67	15	4	50	3,120	4.18	4.31	4.46	4.61	4.96
IALB230-0070-0350-0600		6	0.7	0.7	0.67	15	4	50	3,120	6.25	6.45	6.67	6.91	7.45
IALB230-0080-0400-0200	0.4	2	0.6	0.8	0.77	15	4	50	2,960	2.11	2.17	2.24	2.31	2.46
IALB230-0080-0400-0220		2.2	0.8	0.8	0.77	15	4	50	2,960	2.32	2.39	2.46	2.54	2.71
IALB230-0080-0400-0300		3	0.8	0.8	0.77	15	4	50	3,120	3.15	3.24	3.34	3.46	3.71
IALB230-0080-0400-0400		4	0.6	0.8	0.77	15	4	50	3,120	4.18	4.31	4.45	4.60	4.95
IALB230-0080-0400-0500		5	0.8	0.8	0.77	15	4	50	3,120	5.21	5.38	5.56	5.75	6.19
IALB230-0080-0400-0600		6	0.6	0.8	0.77	15	4	50	3,120	6.25	6.45	6.67	6.90	7.44
IALB230-0080-0400-0700		7	0.6	0.8	0.77	15	4	50	3,120	7.28	7.52	7.78	8.05	8.68
IALB230-0080-0400-0800		8	0.6	0.8	0.77	15	4	50	3,120	8.31	8.59	8.89	9.20	9.92
IALB230-0090-0450-0200	0.45	2	0.65	0.9	0.87	15	4	50	2,960	2.11	2.17	2.23	2.30	2.45
IALB230-0090-0450-0400		4	0.65	0.9	0.87	15	4	50	3,120	4.18	4.31	4.45	4.60	4.94
IALB230-0090-0450-0600		6	0.65	0.9	0.87	15	4	50	3,120	6.24	6.45	6.66	6.90	7.42
IALB230-0090-0450-0800		8	0.65	0.9	0.87	15	4	50	3,120	8.31	8.59	8.88	9.20	9.91
IALB230-0100-0500-0200	0.5	2	0.75	1	0.95	15	4	50	2,480	2.15	2.20	2.27	2.33	2.49
IALB230-0100-0500-0250		2.5	0.75	1	0.95	15	4	50	2,480	2.66	2.74	2.82	2.91	3.11
IALB230-0100-0500-0300		3	0.8	1	0.95	15	4	50	2,480	3.18	3.27	3.37	3.48	3.73
IALB230-0100-0500-0400		4	0.75	1	0.95	15	4	50	2,800	4.21	4.34	4.48	4.63	4.97
IALB230-0100-0500-0600		6	0.8	1	0.95	15	4	50	3,040	6.28	6.48	6.70	6.93	7.46
IALB230-0100-0500-0700		7	0.75	1	0.95	15	4	50	3,040	7.32	7.55	7.81	8.08	8.70
IALB230-0100-0500-0800		8	0.75	1	0.95	15	4	50	3,040	8.35	8.62	8.92	9.23	9.95
IALB230-0100-0500-0900		9	0.75	1	0.95	15	4	50	3,040	9.38	9.69	10.02	10.38	11.19
IALB230-0100-0500-1000		10	0.8	1	0.95	15	4	50	3,040	10.42	10.76	11.13	11.53	12.43
IALB230-0100-0500-1200		12	0.75	1	0.95	15	4	50	3,040	12.48	12.90	13.35	13.83	14.92
IALB230-0120-0600-0240	0.6	2.4	0.9	1.2	1.15	15	4	50	3,760	2.56	2.63	2.70	2.78	2.96

ion Depo Type A Series



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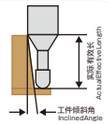
单位(Size):mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Outside Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
										30'	1°	1°30'	2°	3°
IALB230-0120-0600-0400	0.6	4	0.9	1.2	1.15	15	4	50	3,760	4.21	4.34	4.47	4.62	4.95
IALB230-0120-0600-0600		6	0.9	1.2	1.15	15	4	50	4,080	6.28	6.48	6.69	6.92	7.44
IALB230-0120-0600-0800		8	0.9	1.2	1.15	15	4	50	4,080	8.35	8.62	8.91	9.22	9.92
IALB230-0120-0600-1000		10	0.9	1.2	1.15	15	4	50	4,080	10.41	10.76	11.12	11.52	12.41
IALB230-0120-0600-1200		12	0.9	1.2	1.15	15	4	50	4,080	12.48	12.89	13.34	13.82	14.90
IALB230-0140-0700-0800	0.7	8	1	1.4	1.35	15	4	50	3,520	8.34	8.61	8.90	9.20	9.90
IALB230-0140-0700-1200		12	1	1.4	1.35	15	4	50	3,520	12.48	12.89	13.33	13.80	14.87
IALB230-0140-0700-1600		16	1	1.4	1.35	15	4	50	3,520	16.61	17.17	17.76	18.40	19.84
IALB230-0150-0750-0300	0.75	3	1.1	1.5	1.45	15	4	50	2,880	3.17	3.26	3.35	3.45	3.67
IALB230-0150-0750-0400		4	1.1	1.5	1.45	15	4	50	2,880	4.21	4.33	4.46	4.60	4.92
IALB230-0150-0750-0600		6	1.1	1.5	1.45	15	4	50	2,880	6.27	6.47	6.67	6.90	7.40
IALB230-0150-0750-0800		8	1.1	1.5	1.45	15	4	50	3,040	8.34	8.61	8.89	9.20	9.89
IALB230-0150-0750-1000		10	1.1	1.5	1.45	15	4	50	3,280	10.41	10.74	11.11	11.50	12.37
IALB230-0150-0750-1200		12	1.1	1.5	1.45	15	4	50	3,520	12.48	12.88	13.32	13.80	14.86
IALB230-0150-0750-1400		14	1.1	1.5	1.45	15	4	50	3,520	14.54	15.02	15.54	16.09	17.35
IALB230-0150-0750-1600		16	1.1	1.5	1.45	15	4	50	3,520	16.61	17.16	17.76	18.39	19.83
IALB230-0160-0800-0400	0.8	4	1.2	1.6	1.55	15	4	50	4,000	4.20	4.32	4.45	4.59	4.90
IALB230-0160-0800-0800		8	1.2	1.6	1.55	15	4	50	4,080	8.34	8.60	8.88	9.19	9.88
IALB230-0160-0800-1200		12	1.2	1.6	1.55	15	4	50	4,080	12.47	12.88	13.32	13.79	14.85
IALB230-0160-0800-1600		16	1.2	1.6	1.55	15	4	50	4,080	16.61	17.16	17.75	18.39	19.82
IALB230-0180-0900-0800	0.9	8	1.3	1.8	1.75	15	4	50	3,520	8.34	8.60	8.87	9.17	9.85
IALB230-0180-0900-1200		12	1.3	1.8	1.75	15	4	50	3,520	12.47	12.87	13.31	13.77	14.83
IALB230-0180-0900-1600		16	1.3	1.8	1.75	15	4	50	3,520	16.60	17.15	17.74	18.37	19.80
IALB230-0200-1000-0300	1	3	1.5	2	1.94	15	4	50	2,480	3.18	3.26	3.34	3.43	3.64
IALB230-0200-1000-0400		4	1.5	2	1.94	15	4	50	2,480	4.22	4.33	4.45	4.58	4.88
IALB230-0200-1000-0600		6	1.5	2	1.94	15	4	50	2,800	6.28	6.47	6.67	6.88	7.37
IALB230-0200-1000-0800		8	1.5	2	1.94	15	4	50	3,040	8.35	8.61	8.88	9.18	9.85
IALB230-0200-1000-1000		10	1.5	2	1.94	15	4	50	3,040	10.42	10.75	11.10	11.48	12.34
IALB230-0200-1000-1200		12	1.5	2	1.94	15	4	50	3,040	12.49	12.89	13.32	13.78	14.83
IALB230-0200-1000-1300		13	1.5	2	1.94	15	4	50	3,040	13.52	13.96	14.43	14.93	16.07
IALB230-0200-1000-1400		14	1.5	2	1.94	15	4	50	3,040	14.55	15.03	15.53	16.08	17.31
IALB230-0200-1000-1500		15	1.5	2	1.94	15	4	50	3,040	15.59	16.10	16.64	17.23	18.56
IALB230-0200-1000-1600		16	1.5	2	1.94	15	4	50	3,040	16.62	17.17	17.75	18.38	19.80
IALB230-0200-1000-1800		18	1.5	2	1.94	15	4	50	3,040	18.69	19.30	19.97	20.68	FREE
IALB230-0200-1000-2000		20	1.5	2	1.94	15	4	50	3,040	20.76	21.44	22.18	22.98	FREE
IALB230-0250-1250-0600	1.25	6	2.3	2.5	2.44	15	4	50	3,280	6.28	6.45	6.64	6.84	7.31
IALB230-0250-1250-0800		8	2.3	2.5	2.44	15	4	50	3,360	8.34	8.59	8.86	9.14	9.80
IALB230-0250-1250-1000		10	2.3	2.5	2.44	15	4	50	3,440	10.41	10.73	11.07	11.44	12.28
IALB230-0250-1250-1500		15	2.3	2.5	2.44	15	4	50	4,080	15.58	16.08	16.62	17.19	FREE
IALB230-0250-1250-2000		20	2.3	2.5	2.44	15	4	50	4,800	20.75	21.43	22.16	FREE	FREE
IALB230-0300-1500-0600	1.5	6	2.5	3	2.85	15	4	50	2,800	6.44	6.61	6.80	7.00	7.46
IALB230-0300-1500-0800		8	2.5	3	2.85	15	4	50	3,040	8.51	8.75	9.02	9.30	9.95
IALB230-0300-1500-1000		10	2.5	3	2.85	15	4	50	3,520	10.58	10.89	11.23	11.60	FREE
IALB230-0300-1500-1200		12	2.5	3	2.85	15	4	50	3,680	12.64	13.03	13.45	13.90	FREE
IALB230-0300-1500-1400		14	2.5	3	2.85	15	4	50	4,080	14.71	15.17	15.67	FREE	FREE



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Outside Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
										30'	1°	1°30'	2°	3°
IALB230-0300-1500-1500	1.5	15	2.5	3	2.85	15	4	50	4,000	15.74	16.24	16.77	FREE	FREE
IALB230-0300-1500-1600		16	2.5	3	2.85	15	4	50	4,080	16.78	17.31	17.88	FREE	FREE
IALB230-0300-1500-2000		20	2.5	3	2.85	15	4	50	3,920	20.91	21.59	FREE	FREE	FREE
IALB230-0300-1500-2500		25	2.5	3	2.85	15	4	60	3,920	26.08	26.94	FREE	FREE	FREE
IALB230-0300-1500-3000		30	2.5	3	2.85	15	4	60	4,480	31.25	FREE	FREE	FREE	FREE
IALB230-0350-1750-1000	1.75	10	2.8	3.5	3.35	15	6	50	4,480	10.57	10.88	11.21	11.56	12.38
IALB230-0350-1750-1500		15	2.8	3.5	3.35	15	6	50	4,480	15.74	16.22	16.75	17.31	18.59
IALB230-0350-1750-2000		20	2.8	3.5	3.35	15	6	50	4,800	20.90	21.57	22.29	23.06	24.81
IALB230-0350-1750-2500		25	2.8	3.5	3.35	15	6	60	4,800	26.07	26.92	27.83	28.81	FREE
IALB230-0350-1750-3000		30	2.8	3.5	3.35	15	6	60	5,120	31.24	32.27	33.37	34.56	FREE
IALB230-0350-1750-3500		35	2.8	3.5	3.35	15	6	70	6,160	36.41	37.62	38.91	FREE	FREE
IALB230-0400-2000-1000	2	10	3	4	3.8	15	6	50	3,120	10.66	10.96	11.28	11.63	12.43
IALB230-0400-2000-1200		12	3	4	3.8	15	6	50	4,080	12.72	13.10	13.50	13.93	14.92
IALB230-0400-2000-1400		14	3	4	3.8	15	6	50	4,080	14.79	15.24	15.72	16.23	17.41
IALB230-0400-2000-1500		15	3	4	3.8	15	6	50	4,080	15.82	16.31	16.82	17.38	18.65
IALB230-0400-2000-1600		16	3	4	3.8	15	6	50	4,080	16.86	17.38	17.93	18.53	19.89
IALB230-0400-2000-2000		20	3	4	3.8	15	6	50	4,080	20.99	21.65	22.37	23.13	FREE
IALB230-0400-2000-2500		25	3	4	3.8	15	6	60	4,080	26.16	27.00	27.91	28.88	FREE
IALB230-0400-2000-3000		30	3	4	3.8	15	6	60	4,080	31.33	32.35	33.45	FREE	FREE
IALB230-0400-2000-3500		35	3	4	3.8	15	6	70	4,720	36.50	37.70	38.99	FREE	FREE
IALB230-0500-2500-1000	2.5	10	3.5	5	4.8	15	6	50	4,800	10.64	10.92	11.23	11.56	FREE
IALB230-0500-2500-1500		15	3.5	5	4.8	15	6	50	6,800	15.81	16.27	16.77	FREE	FREE
IALB230-0500-2500-2000		20	3.5	5	4.8	15	6	50	6,800	20.98	21.62	FREE	FREE	FREE
IALB230-0500-2500-2500		25	3.5	5	4.8	15	6	60	6,800	26.14	26.97	FREE	FREE	FREE
IALB230-0500-2500-3000		30	3.5	5	4.8	15	6	60	7,280	31.31	FREE	FREE	FREE	FREE
IALB230-0500-2500-3500		35	3.5	5	4.8	15	6	70	7,280	36.48	FREE	FREE	FREE	FREE
IALB230-0500-2500-4000		40	3.5	5	4.8	15	6	70	9,200	41.65	FREE	FREE	FREE	FREE
IALB230-0600-3000-1000	3	10	6	6	5.8	15	6	50	5,120	FREE	FREE	FREE	FREE	FREE
IALB230-0600-3000-1500		15	6	6	5.8	15	6	50	5,120	FREE	FREE	FREE	FREE	FREE
IALB230-0600-3000-2000		20	6	6	5.8	15	6	50	5,120	FREE	FREE	FREE	FREE	FREE
IALB230-0600-3000-2500		25	6	6	5.8	15	6	60	5,120	FREE	FREE	FREE	FREE	FREE
IALB230-0600-3000-3000		30	6	6	5.8	15	6	60	5,280	FREE	FREE	FREE	FREE	FREE
IALB230-0600-3000-3500		35	6	6	5.8	15	6	70	5,440	FREE	FREE	FREE	FREE	FREE
IALB230-0600-3000-4000		40	6	6	5.8	15	6	70	5,760	FREE	FREE	FREE	FREE	FREE
IALB230-0600-3000-4500		45	6	6	5.8	15	6	80	6,160	FREE	FREE	FREE	FREE	FREE
IALB230-0600-3000-5000		50	6	6	5.8	15	6	80	6,240	FREE	FREE	FREE	FREE	FREE

CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo A Series 球头 Ball
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALB230
Model number:IALB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.3	0.005	0.005	80	50,000	0.005	0.005	80	50,000	0.005	0.005	80	50,000	0.003	0.003	60	50,000
		0.5	0.003	0.003	70	50,000	0.003	0.003	70	50,000	0.003	0.003	70	50,000	0.003	0.003	40	50,000
	0.15	0.3	0.005	0.015	150	50,000	0.005	0.015	150	50,000	0.005	0.015	150	50,000	0.003	0.005	120	50,000
		0.5	0.004	0.007	150	50,000	0.004	0.007	150	50,000	0.004	0.007	150	50,000	0.003	0.005	120	50,000
		1	0.003	0.005	100	50,000	0.003	0.005	100	50,000	0.003	0.005	100	50,000	0.002	0.003	70	50,000
	0.2	0.5	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.01	0.01	210	50,000
		0.75	0.007	0.01	250	50,000	0.007	0.01	250	50,000	0.007	0.01	250	50,000	0.005	0.01	210	50,000
		1	0.007	0.01	250	50,000	0.007	0.01	250	50,000	0.007	0.01	250	50,000	0.005	0.01	210	50,000
	0.3	0.5	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.01	0.015	210	50,000
		0.6	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.01	0.015	210	50,000
		0.75	0.008	0.015	250	50,000	0.008	0.015	250	50,000	0.008	0.015	250	50,000	0.007	0.01	210	50,000
		0.8	0.008	0.015	250	50,000	0.008	0.015	250	50,000	0.008	0.015	250	50,000	0.007	0.01	210	50,000
		1	0.007	0.01	250	50,000	0.007	0.01	250	50,000	0.007	0.01	250	50,000	0.005	0.01	210	50,000
		1.25	0.005	0.01	250	50,000	0.005	0.01	250	50,000	0.005	0.01	250	50,000	0.005	0.005	210	50,000
		1.5	0.005	0.01	200	50,000	0.005	0.01	200	50,000	0.005	0.01	200	50,000	0.005	0.005	170	50,000
		1.75	0.005	0.01	200	50,000	0.005	0.01	200	50,000	0.005	0.01	200	50,000	0.005	0.005	170	50,000
		2	0.003	0.01	150	50,000	0.003	0.01	150	50,000	0.003	0.01	150	50,000	0.003	0.005	120	50,000
		2.25	0.003	0.01	150	50,000	0.003	0.01	150	50,000	0.003	0.01	150	50,000	0.003	0.005	120	50,000
		2.5	0.003	0.007	150	50,000	0.003	0.007	150	50,000	0.003	0.007	150	50,000	0.003	0.003	120	50,000
		2.75	0.003	0.007	150	50,000	0.003	0.007	150	50,000	0.003	0.007	150	50,000	0.003	0.003	120	50,000
		3	0.003	0.005	150	50,000	0.003	0.005	150	50,000	0.003	0.005	150	50,000	0.003	0.003	120	50,000
	0.4	0.5	0.02	0.05	800	50,000	0.02	0.05	800	50,000	0.02	0.05	800	50,000	0.02	0.03	650	50,000
		0.75	0.02	0.05	800	50,000	0.02	0.05	800	50,000	0.02	0.05	800	50,000	0.02	0.03	650	50,000
		1	0.02	0.05	800	50,000	0.02	0.05	800	50,000	0.02	0.05	800	50,000	0.02	0.03	650	50,000
		1.2	0.02	0.05	800	50,000	0.02	0.05	800	50,000	0.02	0.05	800	50,000	0.02	0.03	650	50,000
		1.5	0.02	0.03	700	50,000	0.02	0.03	700	50,000	0.02	0.03	700	50,000	0.01	0.02	600	50,000
		2	0.015	0.02	600	50,000	0.015	0.02	600	50,000	0.015	0.02	600	50,000	0.01	0.015	500	50,000
		2.5	0.015	0.02	450	50,000	0.015	0.02	450	50,000	0.015	0.02	450	50,000	0.01	0.015	380	50,000
		3	0.01	0.02	400	30,000	0.01	0.02	400	30,000	0.01	0.02	400	30,000	0.01	0.01	340	30,000
	0.5	1	0.03	0.05	800	50,000	0.03	0.05	800	50,000	0.03	0.05	800	50,000	0.02	0.05	680	50,000
		1.5	0.03	0.05	700	50,000	0.03	0.05	700	50,000	0.03	0.05	700	50,000	0.02	0.04	600	50,000
		2.0	0.02	0.04	600	50,000	0.02	0.04	600	50,000	0.02	0.04	600	50,000	0.02	0.03	510	50,000
		2.5	0.015	0.04	600	50,000	0.015	0.04	600	50,000	0.015	0.04	600	50,000	0.01	0.03	510	50,000
		3	0.015	0.035	500	50,000	0.015	0.035	500	50,000	0.015	0.035	500	50,000	0.01	0.025	420	50,000
		3.5	0.015	0.03	400	50,000	0.015	0.03	400	50,000	0.015	0.03	400	50,000	0.01	0.02	340	50,000
		4	0.012	0.02	400	50,000	0.012	0.02	400	50,000	0.012	0.02	400	50,000	0.005	0.01	340	50,000
	0.6	1.0	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.05	0.07	1,000	50,000
		1.5	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.05	0.07	1,000	50,000
		2	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.04	0.07	1,000	50,000
		2.2	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.04	0.07	1,000	50,000
		2.5	0.035	0.1	1,200	50,000	0.035	0.1	1,200	50,000	0.035	0.1	1,200	50,000	0.03	0.06	1,000	50,000
		3	0.025	0.1	1,000	50,000	0.025	0.1	1,000	50,000	0.025	0.1	1,000	50,000	0.03	0.05	850	50,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.6	3.5	0.025	0.08	1,000	50,000	0.025	0.08	1,000	50,000	0.025	0.08	1,000	50,000	0.02	0.05	850	50,000
		4.0	0.025	0.05	800	50,000	0.025	0.05	800	50,000	0.025	0.05	800	50,000	0.02	0.04	680	50,000
		4.5	0.025	0.05	750	50,000	0.025	0.05	750	50,000	0.025	0.05	750	50,000	0.01	0.03	630	50,000
		5	0.02	0.04	500	30,000	0.02	0.04	500	30,000	0.02	0.04	500	30,000	0.01	0.02	420	30,000
		5.5	0.013	0.02	500	30,000	0.013	0.02	500	30,000	0.013	0.02	500	30,000	0.01	0.01	420	30,000
		6	0.01	0.02	450	30,000	0.01	0.02	450	30,000	0.01	0.02	450	30,000	0.005	0.01	380	30,000
	0.7	2	0.08	0.12	1,800	50,000	0.08	0.12	1,800	50,000	0.08	0.12	1,800	50,000	0.07	0.08	1,300	50,000
		4	0.05	0.11	1,300	50,000	0.05	0.11	1,300	50,000	0.05	0.11	1,300	50,000	0.03	0.06	1,100	50,000
		6	0.03	0.05	700	30,000	0.03	0.05	700	30,000	0.03	0.05	700	30,000	0.01	0.02	600	30,000
	0.8	2.0	0.1	0.15	2,000	50,000	0.1	0.15	2,000	50,000	0.1	0.15	2,000	50,000	0.1	0.12	1,700	50,000
		2.2	0.1	0.15	2,000	50,000	0.1	0.15	2,000	50,000	0.1	0.15	2,000	50,000	0.1	0.12	1,700	50,000
		3.0	0.07	0.15	1,800	50,000	0.07	0.15	1,800	50,000	0.07	0.15	1,800	50,000	0.07	0.1	1,500	50,000
		4	0.05	0.12	1,500	50,000	0.05	0.12	1,500	50,000	0.05	0.12	1,500	50,000	0.05	0.08	1,300	50,000
		5	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.05	0.1	1,200	50,000	0.04	0.07	1,000	50,000
		6	0.05	0.08	900	30,000	0.05	0.08	900	30,000	0.05	0.08	900	30,000	0.03	0.05	750	30,000
		7	0.03	0.05	700	30,000	0.03	0.05	700	30,000	0.03	0.05	700	30,000	0.02	0.03	600	30,000
		8	0.015	0.03	500	24,000	0.015	0.03	500	24,000	0.015	0.03	500	24,000	0.01	0.01	420	24,000
	0.9	2	0.15	0.2	2,500	50,000	0.15	0.2	2,500	50,000	0.15	0.2	2,500	50,000	0.1	0.2	2,000	50,000
		4	0.1	0.2	2,000	50,000	0.1	0.2	2,000	50,000	0.1	0.2	2,000	50,000	0.05	0.12	1,500	50,000
		6	0.07	0.15	1,300	30,000	0.07	0.15	1,300	30,000	0.07	0.15	1,300	30,000	0.035	0.05	1,000	30,000
		8	0.035	0.05	800	30,000	0.035	0.05	800	30,000	0.035	0.05	800	30,000	0.025	0.04	700	30,000
	1	2	0.25	0.35	3,200	50,000	0.25	0.35	3,200	50,000	0.25	0.35	3,200	50,000	0.12	0.3	2,500	50,000
		2.5	0.25	0.3	3,000	50,000	0.25	0.3	3,000	50,000	0.25	0.3	3,000	50,000	0.12	0.3	2,500	50,000
		3	0.2	0.3	3,000	50,000	0.2	0.3	3,000	50,000	0.2	0.3	3,000	50,000	0.12	0.3	2,500	50,000
		4	0.15	0.25	2,500	50,000	0.15	0.25	2,500	50,000	0.15	0.25	2,500	50,000	0.1	0.2	2,100	50,000
		6.0	0.1	0.2	1,500	50,000	0.1	0.2	1,500	50,000	0.1	0.2	1,500	50,000	0.07	0.12	1,200	50,000
		7	0.08	0.2	1,300	30,000	0.08	0.2	1,300	30,000	0.08	0.2	1,300	30,000	0.06	0.1	1,100	30,000
		8	0.05	0.1	1,200	30,000	0.05	0.1	1,200	30,000	0.05	0.1	1,200	30,000	0.05	0.08	1,000	30,000
		9.0	0.04	0.06	1,000	30,000	0.04	0.06	1,000	30,000	0.04	0.06	1,000	30,000	0.05	0.05	850	30,000
		10	0.03	0.05	800	30,000	0.03	0.05	800	30,000	0.03	0.05	800	30,000	0.03	0.05	680	30,000
		12	0.015	0.025	600	20,000	0.015	0.025	600	20,000	0.015	0.025	600	20,000	0.01	0.03	510	20,000
	1.2	2.4	0.25	0.35	3,400	30,000	0.25	0.35	3,400	30,000	0.25	0.35	3,400	30,000	0.12	0.3	2,500	30,000
		4	0.2	0.3	3,000	30,000	0.2	0.3	3,000	30,000	0.2	0.3	3,000	30,000	0.12	0.3	2,500	30,000
		6	0.1	0.25	2,000	30,000	0.1	0.25	2,000	30,000	0.1	0.25	2,000	30,000	0.08	0.17	1,700	30,000
		8	0.08	0.2	1,300	30,000	0.08	0.2	1,300	30,000	0.08	0.2	1,300	30,000	0.06	0.15	1,100	30,000
		10	0.05	0.1	1,200	20,000	0.05	0.1	1,200	20,000	0.05	0.1	1,200	20,000	0.03	0.08	1,000	20,000
		12	0.03	0.05	800	20,000	0.03	0.05	800	20,000	0.03	0.05	800	20,000	0.02	0.04	680	20,000
	1.4	8	0.1	0.3	2,500	30,000	0.1	0.3	2,500	30,000	0.1	0.3	2,500	30,000	0.1	0.2	2,100	30,000
		12	0.07	0.12	1,200	20,000	0.07	0.12	1,200	20,000	0.07	0.12	1,200	20,000	0.05	0.1	1,000	20,000
		16	0.03	0.05	600	20,000	0.03	0.05	600	20,000	0.03	0.05	600	20,000	0.015	0.03	510	20,000
	1.5	3.0	0.2	0.35	4,000	30,000	0.2	0.35	4,000	30,000	0.2	0.35	4,000	30,000	0.15	0.3	3,400	30,000
		4	0.2	0.3	4,000	30,000	0.2	0.3	4,000	30,000	0.2	0.3	4,000	30,000	0.15	0.25	3,400	30,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALB230
Model number:IALB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	1.5	6	0.15	0.3	3,000	30,000	0.15	0.3	3,000	30,000	0.15	0.3	3,000	30,000	0.12	0.2	2,500	30,000
		8.0	0.1	0.25	2,400	30,000	0.1	0.25	2,400	30,000	0.1	0.25	2,400	30,000	0.08	0.18	2,000	30,000
		10.0	0.08	0.2	1,800	30,000	0.08	0.2	1,800	30,000	0.08	0.2	1,800	30,000	0.06	0.12	1,500	30,000
		12	0.07	0.13	1,200	24,000	0.07	0.13	1,200	24,000	0.07	0.13	1,200	24,000	0.05	0.09	1,000	24,000
		14	0.06	0.1	1,200	24,000	0.06	0.1	1,200	24,000	0.06	0.1	1,200	24,000	0.04	0.07	1,000	24,000
		16	0.05	0.08	800	18,000	0.05	0.08	800	18,000	0.05	0.08	800	18,000	0.035	0.06	680	18,000
	1.6	4	0.2	0.3	4,000	24,000	0.2	0.3	4,000	24,000	0.2	0.3	4,000	24,000	0.17	0.25	3,400	24,000
		8	0.1	0.3	3,000	24,000	0.1	0.3	3,000	24,000	0.1	0.3	3,000	24,000	0.09	0.2	2,500	24,000
		12	0.07	0.15	1,800	24,000	0.07	0.15	1,800	24,000	0.07	0.15	1,800	24,000	0.06	0.12	1,500	24,000
		16	0.05	0.1	650	18,000	0.05	0.1	650	18,000	0.05	0.1	650	18,000	0.035	0.07	550	18,000
	1.8	8	0.15	0.3	2,500	20,000	0.15	0.3	2,500	20,000	0.15	0.3	2,500	20,000	0.12	0.2	2,100	20,000
		12.0	0.1	0.2	1,800	16,000	0.1	0.2	1,800	16,000	0.1	0.2	1,800	16,000	0.07	0.15	1,500	16,000
		16	0.08	0.13	1,600	14,000	0.08	0.13	1,600	14,000	0.08	0.13	1,600	14,000	0.06	0.1	1,400	14,000
	2	3.0	0.3	0.5	4,000	30,000	0.3	0.5	4,000	30,000	0.3	0.5	4,000	30,000	0.2	0.5	3,400	30,000
		4	0.3	0.5	4,000	30,000	0.3	0.5	4,000	30,000	0.3	0.5	4,000	30,000	0.2	0.45	3,400	30,000
		6.0	0.25	0.5	3,000	30,000	0.25	0.5	3,000	30,000	0.25	0.5	3,000	30,000	0.2	0.4	2,500	30,000
		8	0.2	0.3	2,500	20,000	0.2	0.3	2,500	20,000	0.2	0.3	2,500	20,000	0.15	0.3	2,100	20,000
		10	0.15	0.3	2,500	20,000	0.15	0.3	2,500	20,000	0.15	0.3	2,500	20,000	0.1	0.2	2,100	20,000
		12.0	0.13	0.2	1,800	16,000	0.13	0.2	1,800	16,000	0.13	0.2	1,800	16,000	0.1	0.15	1,500	16,000
		13	0.12	0.2	1,800	16,000	0.12	0.2	1,800	16,000	0.12	0.2	1,800	16,000	0.08	0.13	1,500	16,000
		14	0.1	0.2	1,800	16,000	0.1	0.2	1,800	16,000	0.1	0.2	1,800	16,000	0.07	0.13	1,500	16,000
		15	0.1	0.2	1,800	16,000	0.1	0.2	1,800	16,000	0.1	0.2	1,800	16,000	0.07	0.13	1,500	16,000
		16	0.1	0.15	1,600	14,000	0.1	0.15	1,600	14,000	0.1	0.15	1,600	14,000	0.06	0.11	1,400	14,000
		18	0.07	0.12	1,600	14,000	0.07	0.12	1,600	14,000	0.07	0.12	1,600	14,000	0.05	0.1	1,400	14,000
		20	0.06	0.1	1,000	12,000	0.06	0.1	1,000	12,000	0.06	0.1	1,000	12,000	0.05	0.07	850	12,000
	2.5	6	0.25	0.5	3,000	20,000	0.25	0.5	3,000	20,000	0.25	0.5	3,000	20,000	0.3	0.35	2,500	20,000
		8	0.2	0.5	3,000	20,000	0.2	0.5	3,000	20,000	0.2	0.5	3,000	20,000	0.25	0.35	2,500	20,000
		10	0.2	0.5	3,000	20,000	0.2	0.5	3,000	20,000	0.2	0.5	3,000	20,000	0.25	0.35	2,500	20,000
		15	0.15	0.3	2,500	20,000	0.15	0.3	2,500	20,000	0.15	0.3	2,500	20,000	0.1	0.2	2,100	20,000
		20	0.1	0.2	1,800	16,000	0.1	0.2	1,800	16,000	0.1	0.2	1,800	16,000	0.08	0.15	1,500	16,000
	3	6	0.35	0.6	4,000	20,000	0.35	0.6	4,000	20,000	0.35	0.6	4,000	20,000	0.25	0.5	3,400	20,000
		8	0.3	0.5	4,000	20,000	0.3	0.5	4,000	20,000	0.3	0.5	4,000	20,000	0.2	0.5	3,400	20,000
		10.0	0.3	0.5	4,000	20,000	0.3	0.5	4,000	20,000	0.3	0.5	4,000	20,000	0.2	0.45	3,400	20,000
		12	0.2	0.4	3,000	20,000	0.2	0.4	3,000	20,000	0.2	0.4	3,000	20,000	0.2	0.4	2,500	20,000
		14	0.2	0.4	3,000	20,000	0.2	0.4	3,000	20,000	0.2	0.4	3,000	20,000	0.15	0.35	2,500	20,000
		15	0.15	0.4	3,000	20,000	0.15	0.4	3,000	20,000	0.15	0.4	3,000	20,000	0.13	0.35	2,500	20,000
		16	0.15	0.35	3,000	20,000	0.15	0.35	3,000	20,000	0.15	0.35	3,000	20,000	0.13	0.35	2,500	20,000
		20.0	0.15	0.3	1,800	16,000	0.15	0.3	1,800	16,000	0.15	0.3	1,800	16,000	0.1	0.2	1,500	16,000
		25	0.13	0.27	1,200	16,000	0.13	0.27	1,200	16,000	0.13	0.27	1,200	16,000	0.1	0.16	1,000	16,000
		30	0.1	0.2	800	12,000	0.1	0.2	800	12,000	0.1	0.2	800	12,000	0.07	0.12	680	12,000
	3.5	10	0.3	0.6	4,000	20,000	0.3	0.6	4,000	20,000	0.3	0.6	4,000	20,000	0.2	0.6	3,600	20,000
		15	0.2	0.5	3,000	20,000	0.2	0.5	3,000	20,000	0.2	0.5	3,000	20,000	0.15	0.5	2,400	20,000

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铸铁 Cast Irons FCD				碳钢 Carbon Steels S50C/SS400				预硬钢 Prehardened Steels PX5/NAK80				合金钢 Die Steels SKD11/SKD61			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	3.5	20	0.2	0.35	3,000	16,000	0.2	0.35	3,000	16,000	0.2	0.35	3,000	16,000	0.1	0.35	2,400	16,000
		25	0.15	0.3	3,000	16,000	0.15	0.3	3,000	16,000	0.15	0.3	3,000	16,000	0.1	0.3	2,400	16,000
		30	0.12	0.25	2,600	12,000	0.12	0.25	2,600	12,000	0.12	0.25	2,600	12,000	0.08	0.25	2,000	12,000
		35	0.12	0.2	1,800	12,000	0.12	0.2	1,800	12,000	0.12	0.2	1,800	12,000	0.05	0.2	1,500	12,000
	4	10	0.35	0.8	4,000	20,000	0.35	0.8	4,000	20,000	0.35	0.8	4,000	20,000	0.25	0.7	3,400	20,000
		12	0.35	0.7	4,000	20,000	0.35	0.7	4,000	20,000	0.35	0.7	4,000	20,000	0.25	0.7	3,400	20,000
		14	0.3	0.6	4,000	20,000	0.3	0.6	4,000	20,000	0.3	0.6	4,000	20,000	0.2	0.5	3,400	20,000
		15	0.25	0.55	3,500	20,000	0.25	0.55	3,500	20,000	0.25	0.55	3,500	20,000	0.2	0.4	3,000	20,000
		16	0.2	0.5	3,500	20,000	0.2	0.5	3,500	20,000	0.2	0.5	3,500	20,000	0.2	0.3	3,000	20,000
		20	0.2	0.35	3,300	20,000	0.2	0.35	3,300	20,000	0.2	0.35	3,300	20,000	0.15	0.3	2,800	20,000
		25	0.15	0.3	2,600	16,000	0.15	0.3	2,600	16,000	0.15	0.3	2,600	16,000	0.12	0.25	2,200	16,000
		30	0.12	0.25	2,600	16,000	0.12	0.25	2,600	16,000	0.12	0.25	2,600	16,000	0.1	0.2	2,200	16,000
		35	0.12	0.2	1,800	14,000	0.12	0.2	1,800	14,000	0.12	0.2	1,800	14,000	0.07	0.15	1,500	14,000
	5	10	0.4	1.2	4,000	20,000	0.4	1.2	4,000	20,000	0.4	1.2	4,000	20,000	0.3	1	3,400	20,000
		15	0.35	1	4,000	20,000	0.35	1	4,000	20,000	0.35	1	4,000	20,000	0.3	0.9	3,400	20,000
		20	0.3	0.7	4,000	20,000	0.3	0.7	4,000	20,000	0.3	0.7	4,000	20,000	0.25	0.7	3,400	20,000
		25	0.25	0.6	3,000	16,000	0.25	0.6	3,000	16,000	0.25	0.6	3,000	16,000	0.2	0.5	2,500	16,000
		30	0.2	0.5	2,400	16,000	0.2	0.5	2,400	16,000	0.2	0.5	2,400	16,000	0.15	0.4	2,000	16,000
		35	0.15	0.4	1,600	14,000	0.15	0.4	1,600	14,000	0.15	0.4	1,600	14,000	0.15	0.3	1,400	14,000
		40	0.15	0.3	1,200	12,000	0.15	0.3	1,200	12,000	0.15	0.3	1,200	12,000	0.12	0.2	1,000	12,000
	6	10.0	0.5	1.5	4,000	18,000	0.5	1.5	4,000	18,000	0.5	1.5	4,000	18,000	0.35	1.2	3,400	18,000
		15	0.5	1.3	4,000	18,000	0.5	1.3	4,000	18,000	0.5	1.3	4,000	18,000	0.35	1.2	3,400	18,000
		20	0.5	1.2	4,000	18,000	0.5	1.2	4,000	18,000	0.5	1.2	4,000	18,000	0.35	1.1	3,400	18,000
		25	0.4	1	4,000	18,000	0.4	1	4,000	18,000	0.4	1	4,000	18,000	0.3	0.8	3,400	18,000
		30.0	0.35	0.7	3,000	12,000	0.35	0.7	3,000	12,000	0.35	0.7	3,000	12,000	0.25	0.6	2,500	12,000
		35	0.35	0.5	2,500	12,000	0.35	0.5	2,500	12,000	0.35	0.5	2,500	12,000	0.2	0.5	2,100	12,000
		40	0.25	0.4	2,300	12,000	0.25	0.4	2,300	12,000	0.25	0.4	2,300	12,000	0.2	0.4	1,900	12,000
		45.0	0.25	0.4	1,500	8,000	0.25	0.4	1,500	8,000	0.25	0.4	1,500	8,000	0.2	0.35	1,200	8,000
		50.0	0.2	0.4	1,500	8,000	0.2	0.4	1,500	8,000	0.2	0.4	1,500	8,000	0.2	0.3	1,200	8,000

●请将刀具确实地固定在刀柄上，以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALB230
Model number:IALB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.1	0.3	0.003	0.003	60	50,000	0.003	0.003	60	50,000	0.003	0.003	60	50,000	0.005	0.005	80	50,000
		0.5	0.003	0.003	40	50,000	0.003	0.003	40	50,000	0.003	0.003	40	50,000	0.005	0.005	70	50,000
	0.15	0.3	0.003	0.005	120	50,000	0.003	0.005	120	50,000	0.003	0.005	120	50,000	0.008	0.01	150	50,000
		0.5	0.003	0.005	120	50,000	0.003	0.005	120	50,000	0.003	0.005	120	50,000	0.007	0.008	150	50,000
		1	0.002	0.003	70	50,000	0.002	0.003	70	50,000	0.002	0.003	70	50,000	0.005	0.007	100	50,000
	0.2	0.5	0.01	0.01	210	50,000	0.01	0.01	210	50,000	0.01	0.01	210	50,000	0.01	0.02	250	50,000
		0.75	0.005	0.01	210	50,000	0.005	0.01	210	50,000	0.005	0.01	210	50,000	0.01	0.015	250	50,000
		1	0.005	0.01	210	50,000	0.005	0.01	210	50,000	0.005	0.01	210	50,000	0.01	0.015	250	50,000
	0.3	0.5	0.01	0.015	210	50,000	0.01	0.015	210	50,000	0.01	0.015	210	50,000	0.012	0.025	250	50,000
		0.6	0.01	0.015	210	50,000	0.01	0.015	210	50,000	0.01	0.015	210	50,000	0.012	0.025	250	50,000
		0.75	0.007	0.01	210	50,000	0.007	0.01	210	50,000	0.007	0.01	210	50,000	0.01	0.02	250	50,000
		0.8	0.007	0.01	210	50,000	0.007	0.01	210	50,000	0.007	0.01	210	50,000	0.01	0.02	250	50,000
		1	0.005	0.01	210	50,000	0.005	0.01	210	50,000	0.005	0.01	210	50,000	0.01	0.02	250	50,000
		1.25	0.005	0.005	210	50,000	0.005	0.005	210	50,000	0.005	0.005	210	50,000	0.008	0.015	250	50,000
		1.5	0.005	0.005	170	50,000	0.005	0.005	170	50,000	0.005	0.005	170	50,000	0.008	0.015	200	50,000
		1.75	0.005	0.005	170	50,000	0.005	0.005	170	50,000	0.005	0.005	170	50,000	0.008	0.015	200	50,000
		2	0.003	0.005	120	50,000	0.003	0.005	120	50,000	0.003	0.005	120	50,000	0.005	0.012	150	50,000
		2.25	0.003	0.005	120	50,000	0.003	0.005	120	50,000	0.003	0.005	120	50,000	0.005	0.012	150	50,000
		2.5	0.003	0.003	120	50,000	0.003	0.003	120	50,000	0.003	0.003	120	50,000	0.005	0.01	150	50,000
		2.75	0.003	0.003	120	50,000	0.003	0.003	120	50,000	0.003	0.003	120	50,000	0.005	0.01	150	50,000
		3	0.003	0.003	120	50,000	0.003	0.003	120	50,000	0.003	0.003	120	50,000	0.005	0.007	150	50,000
	0.4	0.5	0.02	0.03	650	50,000	0.02	0.03	650	50,000	0.02	0.03	650	50,000	0.03	0.07	800	50,000
		0.75	0.02	0.03	650	50,000	0.02	0.03	650	50,000	0.02	0.03	650	50,000	0.03	0.07	800	50,000
		1	0.02	0.03	650	50,000	0.02	0.03	650	50,000	0.02	0.03	650	50,000	0.03	0.07	800	50,000
		1.2	0.02	0.03	650	50,000	0.02	0.03	650	50,000	0.02	0.03	650	50,000	0.03	0.07	800	50,000
		1.5	0.01	0.02	600	50,000	0.01	0.02	600	50,000	0.01	0.02	600	50,000	0.03	0.05	700	50,000
		2	0.01	0.015	500	50,000	0.01	0.015	500	50,000	0.01	0.015	500	50,000	0.02	0.03	600	50,000
		2.5	0.01	0.015	380	50,000	0.01	0.015	380	50,000	0.01	0.015	380	50,000	0.02	0.03	450	50,000
		3	0.01	0.01	340	30,000	0.01	0.01	340	30,000	0.01	0.01	340	30,000	0.015	0.03	400	30,000
	0.5	1	0.02	0.05	680	50,000	0.02	0.05	680	50,000	0.02	0.05	680	50,000	0.045	0.07	800	50,000
		1.5	0.02	0.04	600	50,000	0.02	0.04	600	50,000	0.02	0.04	600	50,000	0.04	0.07	700	50,000
		2.0	0.02	0.03	510	50,000	0.02	0.03	510	50,000	0.02	0.03	510	50,000	0.03	0.06	600	50,000
		2.5	0.01	0.03	510	50,000	0.01	0.03	510	50,000	0.01	0.03	510	50,000	0.02	0.06	600	50,000
		3	0.01	0.025	420	50,000	0.01	0.025	420	50,000	0.01	0.025	420	50,000	0.02	0.05	500	50,000
		3.5	0.01	0.02	340	50,000	0.01	0.02	340	50,000	0.01	0.02	340	50,000	0.02	0.045	400	50,000
		4	0.005	0.01	340	50,000	0.005	0.01	340	50,000	0.005	0.01	340	50,000	0.018	0.03	400	50,000
	0.6	1.0	0.05	0.07	1,000	50,000	0.05	0.07	1,000	50,000	0.05	0.07	1,000	50,000	0.07	0.12	1,200	50,000
		1.5	0.05	0.07	1,000	50,000	0.05	0.07	1,000	50,000	0.05	0.07	1,000	50,000	0.07	0.12	1,200	50,000
		2	0.04	0.07	1,000	50,000	0.04	0.07	1,000	50,000	0.04	0.07	1,000	50,000	0.07	0.12	1,200	50,000
		2.2	0.04	0.07	1,000	50,000	0.04	0.07	1,000	50,000	0.04	0.07	1,000	50,000	0.07	0.12	1,200	50,000
		2.5	0.03	0.06	1,000	50,000	0.03	0.06	1,000	50,000	0.03	0.06	1,000	50,000	0.05	0.12	1,200	50,000
		3	0.03	0.05	850	50,000	0.03	0.05	850	50,000	0.03	0.05	850	50,000	0.04	0.1	1,000	50,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
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●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.6	3.5	0.02	0.05	850	50,000	0.02	0.05	850	50,000	0.02	0.05	850	50,000	0.04	0.1	1,000	50,000
		4.0	0.02	0.04	680	50,000	0.02	0.04	680	50,000	0.02	0.04	680	50,000	0.035	0.08	800	50,000
		4.5	0.01	0.03	630	50,000	0.01	0.03	630	50,000	0.01	0.03	630	50,000	0.035	0.08	750	50,000
		5	0.01	0.02	420	30,000	0.01	0.02	420	30,000	0.01	0.02	420	30,000	0.03	0.06	500	30,000
		5.5	0.01	0.01	420	30,000	0.01	0.01	420	30,000	0.01	0.01	420	30,000	0.02	0.03	500	30,000
		6	0.005	0.01	380	30,000	0.005	0.01	380	30,000	0.005	0.01	380	30,000	0.015	0.03	450	30,000
	0.7	2	0.07	0.08	1,300	50,000	0.07	0.08	1,300	50,000	0.07	0.08	1,300	50,000	0.1	0.15	1,500	50,000
		4	0.03	0.06	1,100	50,000	0.03	0.06	1,100	50,000	0.03	0.06	1,100	50,000	0.06	0.12	1,200	50,000
		6	0.01	0.02	600	30,000	0.01	0.02	600	30,000	0.01	0.02	600	30,000	0.04	0.07	600	30,000
	0.8	2.0	0.1	0.12	1,700	50,000	0.1	0.12	1,700	50,000	0.1	0.12	1,700	50,000	0.15	0.2	2,000	50,000
		2.2	0.1	0.12	1,700	50,000	0.1	0.12	1,700	50,000	0.1	0.12	1,700	50,000	0.15	0.2	2,000	50,000
		3.0	0.07	0.1	1,500	50,000	0.07	0.1	1,500	50,000	0.07	0.1	1,500	50,000	0.12	0.2	1,800	50,000
		4	0.05	0.08	1,300	50,000	0.05	0.08	1,300	50,000	0.05	0.08	1,300	50,000	0.1	0.2	1,500	50,000
		5	0.04	0.07	1,000	50,000	0.04	0.07	1,000	50,000	0.04	0.07	1,000	50,000	0.08	0.15	1,200	50,000
		6	0.03	0.05	750	30,000	0.03	0.05	750	30,000	0.03	0.05	750	30,000	0.07	0.12	900	30,000
		7	0.02	0.03	600	30,000	0.02	0.03	600	30,000	0.02	0.03	600	30,000	0.05	0.08	700	30,000
		8	0.01	0.01	420	24,000	0.01	0.01	420	24,000	0.01	0.01	420	24,000	0.02	0.05	500	24,000
	0.9	2	0.1	0.2	2,000	50,000	0.1	0.2	2,000	50,000	0.1	0.2	2,000	50,000	0.2	0.3	2,800	50,000
		4	0.05	0.12	1,500	50,000	0.05	0.12	1,500	50,000	0.05	0.12	1,500	50,000	0.15	0.25	2,000	50,000
		6	0.035	0.05	1,000	30,000	0.035	0.05	1,000	30,000	0.035	0.05	1,000	30,000	0.1	0.2	1,300	30,000
		8	0.025	0.04	700	30,000	0.025	0.04	700	30,000	0.025	0.04	700	30,000	0.055	0.08	800	30,000
	1	2	0.12	0.3	2,500	50,000	0.12	0.3	2,500	50,000	0.12	0.3	2,500	50,000	0.25	0.4	3,500	50,000
		2.5	0.12	0.3	2,500	50,000	0.12	0.3	2,500	50,000	0.12	0.3	2,500	50,000	0.25	0.4	3,200	50,000
		3	0.12	0.3	2,500	50,000	0.12	0.3	2,500	50,000	0.12	0.3	2,500	50,000	0.25	0.4	3,000	50,000
		4	0.1	0.2	2,100	50,000	0.1	0.2	2,100	50,000	0.1	0.2	2,100	50,000	0.2	0.4	2,500	50,000
		6.0	0.07	0.12	1,200	50,000	0.07	0.12	1,200	50,000	0.07	0.12	1,200	50,000	0.15	0.3	1,500	50,000
		7	0.06	0.1	1,100	30,000	0.06	0.1	1,100	30,000	0.06	0.1	1,100	30,000	0.12	0.3	1,300	30,000
		8	0.05	0.08	1,000	30,000	0.05	0.08	1,000	30,000	0.05	0.08	1,000	30,000	0.08	0.15	1,200	30,000
		9.0	0.05	0.05	850	30,000	0.05	0.05	850	30,000	0.05	0.05	850	30,000	0.06	0.1	1,000	30,000
		10	0.03	0.05	680	30,000	0.03	0.05	680	30,000	0.03	0.05	680	30,000	0.05	0.08	800	30,000
		12	0.01	0.03	510	20,000	0.01	0.03	510	20,000	0.01	0.03	510	20,000	0.02	0.04	600	20,000
	1.2	2.4	0.12	0.3	2,500	30,000	0.12	0.3	2,500	30,000	0.12	0.3	2,500	30,000	0.3	0.45	3,400	30,000
		4	0.12	0.3	2,500	30,000	0.12	0.3	2,500	30,000	0.12	0.3	2,500	30,000	0.28	0.45	3,000	30,000
		6	0.08	0.17	1,700	30,000	0.08	0.17	1,700	30,000	0.08	0.17	1,700	30,000	0.15	0.4	2,000	30,000
		8	0.06	0.15	1,100	30,000	0.06	0.15	1,100	30,000	0.06	0.15	1,100	30,000	0.12	0.3	1,300	30,000
		10	0.03	0.08	1,000	20,000	0.03	0.08	1,000	20,000	0.03	0.08	1,000	20,000	0.08	0.15	1,200	20,000
		12	0.02	0.04	680	20,000	0.02	0.04	680	20,000	0.02	0.04	680	20,000	0.05	0.08	800	20,000
	1.4	8	0.1	0.2	2,100	30,000	0.1	0.2	2,100	30,000	0.1	0.2	2,100	30,000	0.15	0.45	2,500	30,000
		12	0.05	0.1	1,000	20,000	0.05	0.1	1,000	20,000	0.05	0.1	1,000	20,000	0.1	0.18	1,200	20,000
		16	0.015	0.03	510	20,000	0.015	0.03	510	20,000	0.015	0.03	510	20,000	0.05	0.08	600	20,000
	1.5	3.0	0.15	0.3	3,400	30,000	0.15	0.3	3,400	30,000	0.15	0.3	3,400	30,000	0.3	0.5	4,000	30,000
		4	0.15	0.25	3,400	30,000	0.15	0.25	3,400	30,000	0.15	0.25	3,400	30,000	0.3	0.45	4,000	30,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALB230
Model number:IALB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	1.5	6	0.12	0.2	2,500	30,000	0.12	0.2	2,500	30,000	0.12	0.2	2,500	30,000	0.2	0.45	3,000	30,000
		8.0	0.08	0.18	2,000	30,000	0.08	0.18	2,000	30,000	0.08	0.18	2,000	30,000	0.15	0.4	2,400	30,000
		10.0	0.06	0.12	1,500	30,000	0.06	0.12	1,500	30,000	0.06	0.12	1,500	30,000	0.12	0.3	1,800	30,000
		12	0.05	0.09	1,000	24,000	0.05	0.09	1,000	24,000	0.05	0.09	1,000	24,000	0.1	0.2	1,200	24,000
		14	0.04	0.07	1,000	24,000	0.04	0.07	1,000	24,000	0.04	0.07	1,000	24,000	0.1	0.15	1,200	24,000
		16	0.035	0.06	680	18,000	0.035	0.06	680	18,000	0.035	0.06	680	18,000	0.07	0.12	800	18,000
	1.6	4	0.17	0.25	3,400	24,000	0.17	0.25	3,400	24,000	0.17	0.25	3,400	24,000	0.3	0.45	4,000	24,000
		8	0.09	0.2	2,500	24,000	0.09	0.2	2,500	24,000	0.09	0.2	2,500	24,000	0.15	0.45	3,000	24,000
		12	0.06	0.12	1,500	24,000	0.06	0.12	1,500	24,000	0.06	0.12	1,500	24,000	0.1	0.25	1,800	24,000
		16	0.035	0.07	550	18,000	0.035	0.07	550	18,000	0.035	0.07	550	18,000	0.08	0.15	650	18,000
	1.8	8	0.12	0.2	2,100	20,000	0.12	0.2	2,100	20,000	0.12	0.2	2,100	20,000	0.2	0.45	2,500	20,000
		12.0	0.07	0.15	1,500	16,000	0.07	0.15	1,500	16,000	0.07	0.15	1,500	16,000	0.15	0.3	1,800	16,000
		16	0.06	0.1	1,400	14,000	0.06	0.1	1,400	14,000	0.06	0.1	1,400	14,000	0.12	0.2	1,600	14,000
	2	3.0	0.2	0.5	3,400	30,000	0.2	0.5	3,400	30,000	0.2	0.5	3,400	30,000	0.45	0.7	4,000	30,000
		4	0.2	0.45	3,400	30,000	0.2	0.45	3,400	30,000	0.2	0.45	3,400	30,000	0.45	0.7	4,000	30,000
		6.0	0.2	0.4	2,500	30,000	0.2	0.4	2,500	30,000	0.2	0.4	2,500	30,000	0.38	0.7	3,000	30,000
		8	0.15	0.3	2,100	20,000	0.15	0.3	2,100	20,000	0.15	0.3	2,100	20,000	0.3	0.45	2,500	20,000
		10	0.1	0.2	2,100	20,000	0.1	0.2	2,100	20,000	0.1	0.2	2,100	20,000	0.23	0.45	2,500	20,000
		12.0	0.1	0.15	1,500	16,000	0.1	0.15	1,500	16,000	0.1	0.15	1,500	16,000	0.2	0.3	1,800	16,000
		13	0.08	0.13	1,500	16,000	0.08	0.13	1,500	16,000	0.08	0.13	1,500	16,000	0.2	0.3	1,800	16,000
		14	0.07	0.13	1,500	16,000	0.07	0.13	1,500	16,000	0.07	0.13	1,500	16,000	0.15	0.3	1,800	16,000
		15	0.07	0.13	1,500	16,000	0.07	0.13	1,500	16,000	0.07	0.13	1,500	16,000	0.15	0.3	1,800	16,000
		16	0.06	0.11	1,400	14,000	0.06	0.11	1,400	14,000	0.06	0.11	1,400	14,000	0.15	0.25	1,600	14,000
		18	0.05	0.1	1,400	14,000	0.05	0.1	1,400	14,000	0.05	0.1	1,400	14,000	0.1	0.2	1,600	14,000
		20	0.05	0.07	850	12,000	0.05	0.07	850	12,000	0.05	0.07	850	12,000	0.1	0.15	1,000	12,000
	2.5	6	0.27	0.35	2,500	20,000	0.27	0.35	2,500	20,000	0.27	0.35	2,500	20,000	0.35	0.8	3,000	20,000
		8	0.25	0.35	2,500	20,000	0.25	0.35	2,500	20,000	0.25	0.35	2,500	20,000	0.3	0.8	3,000	20,000
		10	0.25	0.35	2,500	20,000	0.25	0.35	2,500	20,000	0.25	0.35	2,500	20,000	0.3	0.8	3,000	20,000
		15	0.1	0.2	2,100	20,000	0.1	0.2	2,100	20,000	0.1	0.2	2,100	20,000	0.25	0.45	2,500	20,000
		20	0.08	0.15	1,500	16,000	0.08	0.15	1,500	16,000	0.08	0.15	1,500	16,000	0.15	0.3	1,800	16,000
	3	6	0.25	0.5	3,400	20,000	0.25	0.5	3,400	20,000	0.25	0.5	3,400	20,000	0.5	1	4,000	20,000
		8	0.2	0.5	3,400	20,000	0.2	0.5	3,400	20,000	0.2	0.5	3,400	20,000	0.45	0.8	4,000	20,000
		10.0	0.2	0.45	3,400	20,000	0.2	0.45	3,400	20,000	0.2	0.45	3,400	20,000	0.45	0.8	4,000	20,000
		12	0.2	0.4	2,500	20,000	0.2	0.4	2,500	20,000	0.2	0.4	2,500	20,000	0.3	0.6	3,000	20,000
		14	0.15	0.35	2,500	20,000	0.15	0.35	2,500	20,000	0.15	0.35	2,500	20,000	0.3	0.6	3,000	20,000
		15	0.13	0.35	2,500	20,000	0.13	0.35	2,500	20,000	0.13	0.35	2,500	20,000	0.23	0.6	3,000	20,000
		16	0.13	0.35	2,500	20,000	0.13	0.35	2,500	20,000	0.13	0.35	2,500	20,000	0.23	0.5	3,000	20,000
		20.0	0.1	0.2	1,500	16,000	0.1	0.2	1,500	16,000	0.1	0.2	1,500	16,000	0.23	0.45	1,800	16,000
		25	0.1	0.16	1,000	16,000	0.1	0.16	1,000	16,000	0.1	0.16	1,000	16,000	0.2	0.4	1,200	16,000
		30	0.07	0.12	680	12,000	0.07	0.12	680	12,000	0.07	0.12	680	12,000	0.15	0.3	800	12,000
	3.5	10	0.2	0.6	3,600	20,000	0.2	0.6	3,600	20,000	0.2	0.6	3,600	20,000	0.45	0.8	4,000	20,000
		15	0.15	0.5	2,400	20,000	0.15	0.5	2,400	20,000	0.15	0.5	2,400	20,000	0.23	0.6	4,000	20,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			高速钢 High Speed Steels HAP5R/HAP72/ASP23				不锈钢 Stainless Steels SUS304				不锈钢 Stainless Steels HPM/STAVAX				铜合金 Copper Alloy 钨铜(Copper Tungsten)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	3.5	20	0.1	0.35	2,400	16,000	0.1	0.35	2,400	16,000	0.1	0.35	2,400	16,000	0.23	0.45	3,000	16,000
		25	0.1	0.3	2,400	16,000	0.1	0.3	2,400	16,000	0.1	0.3	2,400	16,000	0.2	0.4	3,000	16,000
		30	0.08	0.25	2,000	12,000	0.08	0.25	2,000	12,000	0.08	0.25	2,000	12,000	0.15	0.3	2,600	12,000
		35	0.05	0.2	1,500	12,000	0.05	0.2	1,500	12,000	0.05	0.2	1,500	12,000	0.15	0.3	1,800	12,000
	4	10	0.25	0.7	3,400	20,000	0.25	0.7	3,400	20,000	0.25	0.7	3,400	20,000	0.55	1.2	4,000	20,000
		12	0.25	0.7	3,400	20,000	0.25	0.7	3,400	20,000	0.25	0.7	3,400	20,000	0.53	1	4,000	20,000
		14	0.2	0.5	3,400	20,000	0.2	0.5	3,400	20,000	0.2	0.5	3,400	20,000	0.45	1	4,000	20,000
		15	0.2	0.4	3,000	20,000	0.2	0.4	3,000	20,000	0.2	0.4	3,000	20,000	0.38	0.8	3,500	20,000
		16	0.2	0.3	3,000	20,000	0.2	0.3	3,000	20,000	0.2	0.3	3,000	20,000	0.3	0.8	3,500	20,000
		20	0.15	0.3	2,800	20,000	0.15	0.3	2,800	20,000	0.15	0.3	2,800	20,000	0.3	0.5	3,300	20,000
		25	0.12	0.25	2,200	16,000	0.12	0.25	2,200	16,000	0.12	0.25	2,200	16,000	0.23	0.45	2,600	16,000
		30	0.1	0.2	2,200	16,000	0.1	0.2	2,200	16,000	0.1	0.2	2,200	16,000	0.2	0.4	2,600	16,000
	5	35	0.07	0.15	1,500	14,000	0.07	0.15	1,500	14,000	0.07	0.15	1,500	14,000	0.18	0.3	1,800	14,000
		10	0.3	1	3,400	20,000	0.3	1	3,400	20,000	0.3	1	3,400	20,000	0.6	1.8	4,000	20,000
		15	0.3	0.9	3,400	20,000	0.3	0.9	3,400	20,000	0.3	0.9	3,400	20,000	0.55	1.5	4,000	20,000
		20	0.25	0.7	3,400	20,000	0.25	0.7	3,400	20,000	0.25	0.7	3,400	20,000	0.45	1	4,000	20,000
		25	0.2	0.5	2,500	16,000	0.2	0.5	2,500	16,000	0.2	0.5	2,500	16,000	0.38	0.9	3,000	16,000
		30	0.15	0.4	2,000	16,000	0.15	0.4	2,000	16,000	0.15	0.4	2,000	16,000	0.3	0.8	2,400	16,000
		35	0.15	0.3	1,400	14,000	0.15	0.3	1,400	14,000	0.15	0.3	1,400	14,000	0.23	0.6	1,600	14,000
	6	40	0.12	0.2	1,000	12,000	0.12	0.2	1,000	12,000	0.12	0.2	1,000	12,000	0.23	0.45	1,200	12,000
		10.0	0.35	1.2	3,400	18,000	0.35	1.2	3,400	18,000	0.35	1.2	3,400	18,000	0.75	2.3	4,000	18,000
		15	0.35	1.2	3,400	18,000	0.35	1.2	3,400	18,000	0.35	1.2	3,400	18,000	0.75	2	4,000	18,000
		20	0.35	1.1	3,400	18,000	0.35	1.1	3,400	18,000	0.35	1.1	3,400	18,000	0.75	1.8	4,000	18,000
		25	0.3	0.8	3,400	18,000	0.3	0.8	3,400	18,000	0.3	0.8	3,400	18,000	0.6	1.5	4,000	18,000
		30.0	0.25	0.6	2,500	12,000	0.25	0.6	2,500	12,000	0.25	0.6	2,500	12,000	0.53	1	3,000	12,000
		35	0.2	0.5	2,100	12,000	0.2	0.5	2,100	12,000	0.2	0.5	2,100	12,000	0.53	0.8	2,500	12,000
		40	0.2	0.4	1,900	12,000	0.2	0.4	1,900	12,000	0.2	0.4	1,900	12,000	0.38	0.6	2,300	12,000
		45.0	0.2	0.35	1,200	8,000	0.2	0.35	1,200	8,000	0.2	0.35	1,200	8,000	0.38	0.6	1,500	8,000
		50.0	0.2	0.3	1,200	8,000	0.2	0.3	1,200	8,000	0.2	0.3	1,200	8,000	0.3	0.6	1,500	8,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALB230
Model number:IALB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.3	0.005	0.005	80	50,000	0.005	0.005	80	50,000	0.003	0.003	60	50,000
		0.5	0.005	0.005	70	50,000	0.005	0.005	70	50,000	0.003	0.003	40	50,000
	0.15	0.3	0.008	0.01	150	50,000	0.008	0.01	150	50,000	0.003	0.005	120	50,000
		0.5	0.007	0.008	150	50,000	0.007	0.008	150	50,000	0.003	0.005	120	50,000
		1	0.005	0.007	100	50,000	0.005	0.007	100	50,000	0.002	0.003	70	50,000
	0.2	0.5	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.01	0.01	210	50,000
		0.75	0.01	0.015	250	50,000	0.01	0.015	250	50,000	0.005	0.01	210	50,000
		1	0.01	0.015	250	50,000	0.01	0.015	250	50,000	0.005	0.01	210	50,000
	0.3	0.5	0.012	0.025	250	50,000	0.012	0.025	250	50,000	0.01	0.015	210	50,000
		0.6	0.012	0.025	250	50,000	0.012	0.025	250	50,000	0.01	0.015	210	50,000
		0.75	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.007	0.01	210	50,000
		0.8	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.007	0.01	210	50,000
		1	0.01	0.02	250	50,000	0.01	0.02	250	50,000	0.005	0.01	210	50,000
		1.25	0.008	0.015	250	50,000	0.008	0.015	250	50,000	0.005	0.005	210	50,000
		1.5	0.008	0.015	200	50,000	0.008	0.015	200	50,000	0.005	0.005	170	50,000
		1.75	0.008	0.015	200	50,000	0.008	0.015	200	50,000	0.005	0.005	170	50,000
		2	0.005	0.012	150	50,000	0.005	0.012	150	50,000	0.003	0.005	120	50,000
		2.25	0.005	0.012	150	50,000	0.005	0.012	150	50,000	0.003	0.005	120	50,000
		2.5	0.005	0.01	150	50,000	0.005	0.01	150	50,000	0.003	0.003	120	50,000
		2.75	0.005	0.01	150	50,000	0.005	0.01	150	50,000	0.003	0.003	120	50,000
		3	0.005	0.007	150	50,000	0.005	0.007	150	50,000	0.003	0.003	120	50,000
	0.4	0.5	0.03	0.07	800	50,000	0.03	0.07	800	50,000	0.02	0.03	650	50,000
		0.75	0.03	0.07	800	50,000	0.03	0.07	800	50,000	0.02	0.03	650	50,000
		1	0.03	0.07	800	50,000	0.03	0.07	800	50,000	0.02	0.03	650	50,000
		1.2	0.03	0.07	800	50,000	0.03	0.07	800	50,000	0.02	0.03	650	50,000
		1.5	0.03	0.05	700	50,000	0.03	0.05	700	50,000	0.01	0.02	600	50,000
		2	0.02	0.03	600	50,000	0.02	0.03	600	50,000	0.01	0.015	500	50,000
		2.5	0.02	0.03	450	50,000	0.02	0.03	450	50,000	0.01	0.015	380	50,000
		3	0.015	0.03	400	30,000	0.015	0.03	400	30,000	0.01	0.01	340	30,000
	0.5	1	0.045	0.07	800	50,000	0.045	0.07	800	50,000	0.02	0.05	680	50,000
		1.5	0.04	0.07	700	50,000	0.04	0.07	700	50,000	0.02	0.04	600	50,000
		2.0	0.03	0.06	600	50,000	0.03	0.06	600	50,000	0.02	0.03	510	50,000
		2.5	0.02	0.06	600	50,000	0.02	0.06	600	50,000	0.01	0.03	510	50,000
		3	0.02	0.05	500	50,000	0.02	0.05	500	50,000	0.01	0.025	420	50,000
		3.5	0.02	0.045	400	50,000	0.02	0.045	400	50,000	0.01	0.02	340	50,000
		4	0.018	0.03	400	50,000	0.018	0.03	400	50,000	0.005	0.01	340	50,000
	0.6	1.0	0.07	0.12	1,200	50,000	0.07	0.12	1,200	50,000	0.05	0.07	1,000	50,000
		1.5	0.07	0.12	1,200	50,000	0.07	0.12	1,200	50,000	0.05	0.07	1,000	50,000
		2	0.07	0.12	1,200	50,000	0.07	0.12	1,200	50,000	0.04	0.07	1,000	50,000
		2.2	0.07	0.12	1,200	50,000	0.07	0.12	1,200	50,000	0.04	0.07	1,000	50,000
		2.5	0.05	0.12	1,200	50,000	0.05	0.12	1,200	50,000	0.03	0.06	1,000	50,000
		3	0.04	0.1	1,000	50,000	0.04	0.1	1,000	50,000	0.03	0.05	850	50,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.6	3.5	0.04	0.1	1,000	50,000	0.04	0.1	1,000	50,000	0.02	0.05	850	50,000
		4.0	0.035	0.08	800	50,000	0.035	0.08	800	50,000	0.02	0.04	680	50,000
		4.5	0.035	0.08	750	50,000	0.035	0.08	750	50,000	0.01	0.03	630	50,000
		5	0.03	0.06	500	30,000	0.03	0.06	500	30,000	0.01	0.02	420	30,000
		5.5	0.02	0.03	500	30,000	0.02	0.03	500	30,000	0.01	0.01	420	30,000
		6	0.015	0.03	450	30,000	0.015	0.03	450	30,000	0.005	0.01	380	30,000
	0.7	2	0.1	0.15	1,500	50,000	0.1	0.15	1,500	50,000	0.07	0.08	1,300	50,000
		4	0.06	0.12	1,200	50,000	0.06	0.12	1,200	50,000	0.03	0.06	1,100	50,000
		6	0.04	0.07	600	30,000	0.04	0.07	600	30,000	0.01	0.02	600	30,000
	0.8	2.0	0.15	0.2	2,000	50,000	0.15	0.2	2,000	50,000	0.1	0.12	1,700	50,000
		2.2	0.15	0.2	2,000	50,000	0.15	0.2	2,000	50,000	0.1	0.12	1,700	50,000
		3.0	0.12	0.2	1,800	50,000	0.12	0.2	1,800	50,000	0.07	0.1	1,500	50,000
		4	0.1	0.2	1,500	50,000	0.1	0.2	1,500	50,000	0.05	0.08	1,300	50,000
		5	0.08	0.15	1,200	50,000	0.08	0.15	1,200	50,000	0.04	0.07	1,000	50,000
		6	0.07	0.12	900	30,000	0.07	0.12	900	30,000	0.03	0.05	750	30,000
		7	0.05	0.08	700	30,000	0.05	0.08	700	30,000	0.02	0.03	600	30,000
		8	0.02	0.05	500	24,000	0.02	0.05	500	24,000	0.01	0.01	420	24,000
	0.9	2	0.2	0.3	2,800	50,000	0.2	0.3	2,800	50,000	0.1	0.2	2,000	50,000
		4	0.15	0.25	2,000	50,000	0.15	0.25	2,000	50,000	0.05	0.12	1,500	50,000
		6	0.1	0.2	1,300	30,000	0.1	0.2	1,300	30,000	0.035	0.05	1,000	30,000
		8	0.055	0.08	800	30,000	0.055	0.08	800	30,000	0.025	0.04	700	30,000
	1	2	0.25	0.4	3,500	50,000	0.25	0.4	3,500	50,000	0.12	0.3	2,500	50,000
		2.5	0.25	0.4	3,200	50,000	0.25	0.4	3,200	50,000	0.12	0.3	2,500	50,000
		3	0.25	0.4	3,000	50,000	0.25	0.4	3,000	50,000	0.12	0.3	2,500	50,000
		4	0.2	0.4	2,500	50,000	0.2	0.4	2,500	50,000	0.1	0.2	2,100	50,000
		6.0	0.15	0.3	1,500	50,000	0.15	0.3	1,500	50,000	0.07	0.12	1,200	50,000
		7	0.12	0.3	1,300	30,000	0.12	0.3	1,300	30,000	0.06	0.1	1,100	30,000
		8	0.08	0.15	1,200	30,000	0.08	0.15	1,200	30,000	0.05	0.08	1,000	30,000
		9.0	0.06	0.1	1,000	30,000	0.06	0.1	1,000	30,000	0.05	0.05	850	30,000
		10	0.05	0.08	800	30,000	0.05	0.08	800	30,000	0.03	0.05	680	30,000
		12	0.02	0.04	600	20,000	0.02	0.04	600	20,000	0.01	0.03	510	20,000
	1.2	2.4	0.3	0.45	3,400	30,000	0.3	0.45	3,400	30,000	0.12	0.3	2,500	30,000
		4	0.28	0.45	3,000	30,000	0.28	0.45	3,000	30,000	0.12	0.3	2,500	30,000
		6	0.15	0.4	2,000	30,000	0.15	0.4	2,000	30,000	0.08	0.17	1,700	30,000
		8	0.12	0.3	1,300	30,000	0.12	0.3	1,300	30,000	0.06	0.15	1,100	30,000
		10	0.08	0.15	1,200	20,000	0.08	0.15	1,200	20,000	0.03	0.08	1,000	20,000
		12	0.05	0.08	800	20,000	0.05	0.08	800	20,000	0.02	0.04	680	20,000
	1.4	8	0.15	0.45	2,500	30,000	0.15	0.45	2,500	30,000	0.1	0.2	2,100	30,000
		12	0.1	0.18	1,200	20,000	0.1	0.18	1,200	20,000	0.05	0.1	1,000	20,000
		16	0.05	0.08	600	20,000	0.05	0.08	600	20,000	0.015	0.03	510	20,000
	1.5	3.0	0.3	0.5	4,000	30,000	0.3	0.5	4,000	30,000	0.15	0.3	3,400	30,000
		4	0.3	0.45	4,000	30,000	0.3	0.45	4,000	30,000	0.15	0.25	3,400	30,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
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ion Depo Type A Series

ion Depo Type A 切削条件参考表
Recommended Milling Conditions

■型号:IALB230
Model number:IALB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			铝合金 Aluminum Alloy A5000号				铝合金 Aluminum Alloy A7000号				耐热合金 Heat Resistant Alloy 钛合金(Titanium Alloy)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1.5	6	0.2	0.45	3,000	30,000	0.2	0.45	3,000	30,000	0.12	0.2	2,500	30,000
		8.0	0.15	0.4	2,400	30,000	0.15	0.4	2,400	30,000	0.08	0.18	2,000	30,000
		10.0	0.12	0.3	1,800	30,000	0.12	0.3	1,800	30,000	0.06	0.12	1,500	30,000
		12	0.1	0.2	1,200	24,000	0.1	0.2	1,200	24,000	0.05	0.09	1,000	24,000
		14	0.1	0.15	1,200	24,000	0.1	0.15	1,200	24,000	0.04	0.07	1,000	24,000
		16	0.07	0.12	800	18,000	0.07	0.12	800	18,000	0.035	0.06	680	18,000
	1.6	4	0.3	0.45	4,000	24,000	0.3	0.45	4,000	24,000	0.17	0.25	3,400	24,000
		8	0.15	0.45	3,000	24,000	0.15	0.45	3,000	24,000	0.09	0.2	2,500	24,000
		12	0.1	0.25	1,800	24,000	0.1	0.25	1,800	24,000	0.06	0.12	1,500	24,000
		16	0.08	0.15	650	18,000	0.08	0.15	650	18,000	0.035	0.07	550	18,000
	1.8	8	0.2	0.45	2,500	20,000	0.2	0.45	2,500	20,000	0.12	0.2	2,100	20,000
		12.0	0.15	0.3	1,800	16,000	0.15	0.3	1,800	16,000	0.07	0.15	1,500	16,000
		16	0.12	0.2	1,600	14,000	0.12	0.2	1,600	14,000	0.06	0.1	1,400	14,000
	2	3.0	0.45	0.7	4,000	30,000	0.45	0.7	4,000	30,000	0.2	0.5	3,400	30,000
		4	0.45	0.7	4,000	30,000	0.45	0.7	4,000	30,000	0.2	0.45	3,400	30,000
		6.0	0.38	0.7	3,000	30,000	0.38	0.7	3,000	30,000	0.2	0.4	2,500	30,000
		8	0.3	0.45	2,500	20,000	0.3	0.45	2,500	20,000	0.15	0.3	2,100	20,000
		10	0.23	0.45	2,500	20,000	0.23	0.45	2,500	20,000	0.1	0.2	2,100	20,000
		12.0	0.2	0.3	1,800	16,000	0.2	0.3	1,800	16,000	0.1	0.15	1,500	16,000
		13	0.2	0.3	1,800	16,000	0.2	0.3	1,800	16,000	0.08	0.13	1,500	16,000
		14	0.15	0.3	1,800	16,000	0.15	0.3	1,800	16,000	0.07	0.13	1,500	16,000
		15	0.15	0.3	1,800	16,000	0.15	0.3	1,800	16,000	0.07	0.13	1,500	16,000
		16	0.15	0.25	1,600	14,000	0.15	0.25	1,600	14,000	0.06	0.11	1,400	14,000
		18	0.1	0.2	1,600	14,000	0.1	0.2	1,600	14,000	0.05	0.1	1,400	14,000
		20	0.1	0.15	1,000	12,000	0.1	0.15	1,000	12,000	0.05	0.07	850	12,000
	2.5	6	0.35	0.8	3,000	20,000	0.35	0.8	3,000	20,000	0.27	0.35	2,500	20,000
		8	0.3	0.8	3,000	20,000	0.3	0.8	3,000	20,000	0.25	0.35	2,500	20,000
		10	0.3	0.8	3,000	20,000	0.3	0.8	3,000	20,000	0.25	0.35	2,500	20,000
		15	0.25	0.45	2,500	20,000	0.25	0.45	2,500	20,000	0.1	0.2	2,100	20,000
		20	0.15	0.3	1,800	16,000	0.15	0.3	1,800	16,000	0.08	0.15	1,500	16,000
	3	6	0.5	1	4,000	20,000	0.5	1	4,000	20,000	0.25	0.5	3,400	20,000
		8	0.45	0.8	4,000	20,000	0.45	0.8	4,000	20,000	0.2	0.5	3,400	20,000
		10.0	0.45	0.8	4,000	20,000	0.45	0.8	4,000	20,000	0.2	0.45	3,400	20,000
		12	0.3	0.6	3,000	20,000	0.3	0.6	3,000	20,000	0.2	0.4	2,500	20,000
		14	0.3	0.6	3,000	20,000	0.3	0.6	3,000	20,000	0.15	0.35	2,500	20,000
		15	0.23	0.6	3,000	20,000	0.23	0.6	3,000	20,000	0.13	0.35	2,500	20,000
		16	0.23	0.5	3,000	20,000	0.23	0.5	3,000	20,000	0.13	0.35	2,500	20,000
		20.0	0.23	0.45	1,800	16,000	0.23	0.45	1,800	16,000	0.1	0.2	1,500	16,000
		25	0.2	0.4	1,200	16,000	0.2	0.4	1,200	16,000	0.1	0.16	1,000	16,000
		30	0.15	0.3	800	12,000	0.15	0.3	800	12,000	0.07	0.12	680	12,000
	3.5	10	0.45	0.8	4,000	20,000	0.45	0.8	4,000	20,000	0.2	0.45	3,400	20,000
		15	0.23	0.6	4,000	20,000	0.23	0.6	4,000	20,000	0.13	0.35	2,500	20,000

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			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	3.5	20	0.23	0.45	3,000	16,000	0.23	0.45	3,000	16,000	0.1	0.2	2,000	16,000
		25	0.2	0.4	3,000	16,000	0.2	0.4	3,000	16,000	0.1	0.16	1,500	16,000
		30	0.15	0.3	2,600	12,000	0.15	0.3	2,600	12,000	0.07	0.15	1,200	12,000
		35	0.15	0.3	1,800	12,000	0.15	0.3	1,800	12,000	0.05	0.12	1,000	12,000
	4	10	0.55	1.2	4,000	20,000	0.55	1.2	4,000	20,000	0.25	0.7	3,400	20,000
		12	0.53	1	4,000	20,000	0.53	1	4,000	20,000	0.25	0.7	3,400	20,000
		14	0.45	1	4,000	20,000	0.45	1	4,000	20,000	0.2	0.5	3,400	20,000
		15	0.38	0.8	3,500	20,000	0.38	0.8	3,500	20,000	0.2	0.4	3,000	20,000
		16	0.3	0.8	3,500	20,000	0.3	0.8	3,500	20,000	0.2	0.3	3,000	20,000
		20	0.3	0.5	3,300	20,000	0.3	0.5	3,300	20,000	0.15	0.3	2,800	20,000
		25	0.23	0.45	2,600	16,000	0.23	0.45	2,600	16,000	0.12	0.25	2,200	16,000
		30	0.2	0.4	2,600	16,000	0.2	0.4	2,600	16,000	0.1	0.2	2,200	16,000
		35	0.18	0.3	1,800	14,000	0.18	0.3	1,800	14,000	0.07	0.15	1,500	14,000
	5	10	0.6	1.8	4,000	20,000	0.6	1.8	4,000	20,000	0.3	1	3,400	20,000
		15	0.55	1.5	4,000	20,000	0.55	1.5	4,000	20,000	0.3	0.9	3,400	20,000
		20	0.45	1	4,000	20,000	0.45	1	4,000	20,000	0.25	0.7	3,400	20,000
		25	0.38	0.9	3,000	16,000	0.38	0.9	3,000	16,000	0.2	0.5	2,500	16,000
		30	0.3	0.8	2,400	16,000	0.3	0.8	2,400	16,000	0.15	0.4	2,000	16,000
		35	0.23	0.6	1,600	14,000	0.23	0.6	1,600	14,000	0.15	0.3	1,400	14,000
		40	0.23	0.45	1,200	12,000	0.23	0.45	1,200	12,000	0.12	0.2	1,000	12,000
	6	10.0	0.75	2.3	4,000	18,000	0.75	2.3	4,000	18,000	0.35	1.2	3,400	18,000
		15	0.75	2	4,000	18,000	0.75	2	4,000	18,000	0.35	1.2	3,400	18,000
		20	0.75	1.8	4,000	18,000	0.75	1.8	4,000	18,000	0.35	1.1	3,400	18,000
		25	0.6	1.5	4,000	18,000	0.6	1.5	4,000	18,000	0.3	0.8	3,400	18,000
		30.0	0.53	1	3,000	12,000	0.53	1	3,000	12,000	0.25	0.6	2,500	12,000
		35	0.53	0.8	2,500	12,000	0.53	0.8	2,500	12,000	0.2	0.5	2,100	12,000
		40	0.38	0.6	2,300	12,000	0.38	0.6	2,300	12,000	0.2	0.4	1,900	12,000
		45.0	0.38	0.6	1,500	8,000	0.38	0.6	1,500	8,000	0.2	0.35	1,200	8,000
		50.0	0.3	0.6	1,500	8,000	0.3	0.6	1,500	8,000	0.2	0.3	1,200	8,000

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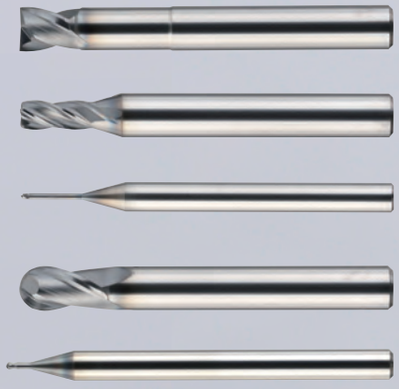
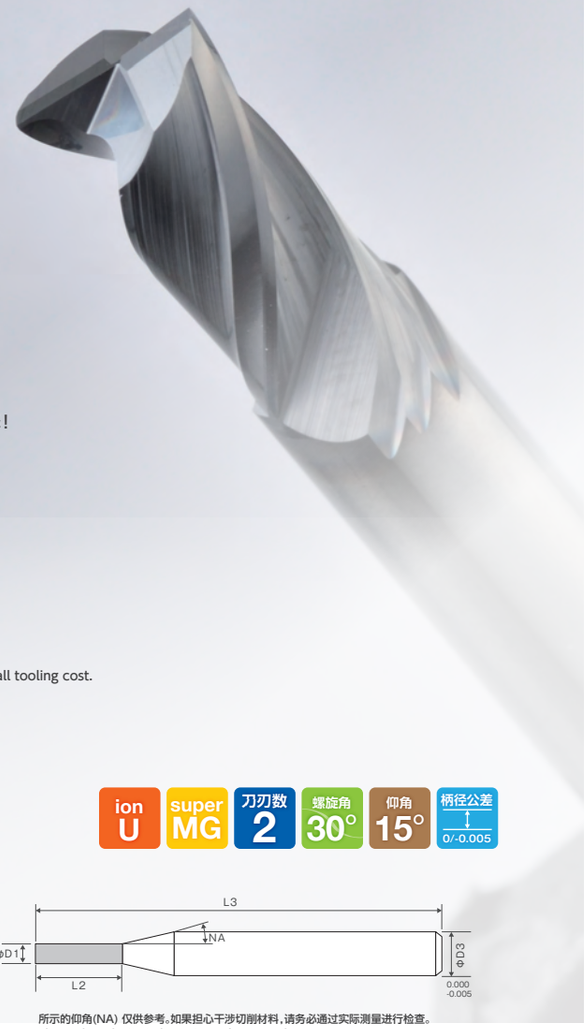
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type U Series

超硬立铣刀　Carbide End Mill

ion U | super MG | 刀刃数 2~6 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005





特　征

- 由气相沉积法成膜的Ion Depo Type U是加工高硬度材料的理想选择！
- 具有优异耐热性的膜层，能对应从粗加工到精加工的所有加工！
- 独创的再研磨和再涂层技术可有效改善刀具性能下降，有助于进一步降低总加工成本！
- 定制产品制作周期短！

Features

- ion Depo Type U plating for high hardness materials.
- Heat resistance coating supports all processing from roughing to finishing.
- TOWA re-polishing and re-coating technology enhances cutting tool life and reduces overall tooling cost.
- Non-standard custom-made products available.

超硬平角立铣刀　Carbide Square End Mill

■型号：IUS230　Model number:IUS230

ion U | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IUS230-0010-00020	0.1	0.2	15	4	50	5,760
IUS230-0020-00040	0.2	0.4	15	4	50	3,680
IUS230-0030-00060	0.3	0.6	15	4	50	2,880
IUS230-0040-00080	0.4	0.8	15	4	50	3,360
IUS230-0050-00100	0.5	1	15	4	50	2,000
IUS230-0060-00120	0.6	1.2	15	4	50	2,800
IUS230-0070-00140	0.7	1.4	15	4	50	3,040
IUS230-0080-00160	0.8	1.6	15	4	50	2,000
IUS230-0090-00180	0.9	1.8	15	4	50	3,040
IUS230-0100-00200	1	2	15	4	50	1,760
IUS230-0110-00220	1.1	2.2	15	4	50	3,120
IUS230-0120-00240	1.2	2.4	15	4	50	2,000
IUS230-0130-00260	1.3	2.6	15	4	50	3,120
IUS230-0140-00280	1.4	2.8	15	4	50	3,120
IUS230-0150-00300	1.5	3	15	4	50	1,840
IUS230-0160-00320	1.6	3.2	15	4	50	3,120
IUS230-0170-00340	1.7	3.4	15	4	50	3,120
IUS230-0180-00360	1.8	3.6	15	4	50	2,000
IUS230-0190-00380	1.9	3.8	15	4	50	3,120
IUS230-0200-00400	2	4	15	4	50	1,840
IUS230-0210-00420	2.1	4.2	15	4	50	3,120
IUS230-0220-00440	2.2	4.4	15	4	50	3,120
IUS230-0230-00460	2.3	4.6	15	4	50	3,120
IUS230-0240-00480	2.4	4.8	15	4	50	3,120
IUS230-0250-00500	2.5	5	15	4	50	1,840
IUS230-0260-00520	2.6	5.2	15	4	50	4,000
IUS230-0270-00540	2.7	5.4	15	4	50	4,000
IUS230-0280-00560	2.8	5.6	15	4	50	4,000
IUS230-0290-00580	2.9	5.8	15	4	50	4,000
IUS230-0300-00600	3	6	15	4	50	2,320
IUS230-0350-00700	3.5	7	15	6	50	3,520
IUS230-0400-00800	4	8	15	6	50	2,560
IUS230-0450-00900	4.5	9	15	6	50	4,000
IUS230-0500-01000	5	10	15	6	50	2,720
IUS230-0550-01100	5.5	11	15	6	50	4,000
IUS230-0600-01200	6	12	—	6	50	2,960

ion Depo Type U Series

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IUS230
Model number:IUS230

平角立铣刀 Square End Mill

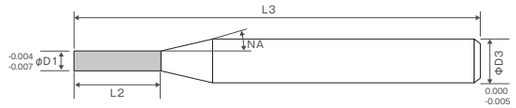
切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
	0.1	0.2	0.003	0.05	130	40,000	0.002	0.04	100	40,000	0.002	0.03	70	40,000
	0.2	0.4	0.003	0.1	200	30,000	0.003	0.08	160	30,000	0.003	0.06	120	30,000
	0.3	0.6	0.003	0.15	300	30,000	0.003	0.12	250	30,000	0.003	0.09	200	30,000
	0.4	0.8	0.005	0.2	370	30,000	0.005	0.16	340	30,000	0.005	0.12	260	25,000
	0.5	1	0.01	0.25	450	25,000	0.007	0.2	400	23,000	0.005	0.15	360	20,000
	0.6	1.2	0.01	0.3	530	25,000	0.007	0.25	430	23,000	0.005	0.18	380	20,000
	0.7	1.4	0.03	0.35	650	25,000	0.02	0.28	500	23,000	0.012	0.21	450	20,000
	0.8	1.6	0.03	0.4	780	25,000	0.02	0.32	650	23,000	0.012	0.24	550	20,000
	0.9	1.8	0.03	0.4	800	25,000	0.02	0.32	700	23,000	0.012	0.24	600	20,000
	1	2	0.05	0.5	1,000	23,000	0.04	0.4	900	18,000	0.03	0.3	600	14,000
	1.1	2.2	0.05	0.5	1,000	23,000	0.04	0.4	900	18,000	0.03	0.3	600	14,000
	1.2	2.4	0.05	0.5	1,000	23,000	0.04	0.4	900	18,000	0.03	0.3	600	14,000
	1.3	2.6	0.05	0.5	1,000	23,000	0.04	0.4	900	18,000	0.03	0.3	600	14,000
	1.4	2.8	0.05	0.5	1,000	23,000	0.04	0.4	900	18,000	0.03	0.3	600	14,000
	1.5	3	0.05	0.75	900	20,000	0.04	0.6	800	18,000	0.03	0.45	600	14,000
	1.6	3.2	0.05	0.75	900	20,000	0.04	0.6	800	18,000	0.03	0.45	600	14,000
	1.7	3.4	0.05	0.75	900	20,000	0.04	0.6	800	18,000	0.03	0.45	600	14,000
	1.8	3.6	0.05	0.75	900	20,000	0.04	0.6	800	18,000	0.03	0.45	600	14,000
	1.9	3.8	0.05	0.75	900	20,000	0.04	0.6	800	18,000	0.03	0.45	600	14,000
2	2	4	0.08	1	900	18,000	0.06	0.8	750	15,000	0.04	0.6	550	12,000
	2.1	4.2	0.08	1	900	18,000	0.06	0.8	750	15,000	0.04	0.6	550	12,000
	2.2	4.4	0.08	1	900	18,000	0.06	0.8	750	15,000	0.04	0.6	550	12,000
	2.3	4.6	0.08	1	900	18,000	0.06	0.8	750	15,000	0.04	0.6	550	12,000
	2.4	4.8	0.08	1	900	18,000	0.06	0.8	750	15,000	0.04	0.6	550	12,000
	2.5	5	0.07	1.25	800	14,000	0.05	1	700	10,000	0.03	0.75	500	8,000
	2.6	5.2	0.07	1.25	800	14,000	0.05	1	700	10,000	0.03	0.75	500	8,000
	2.7	5.4	0.07	1.25	800	14,000	0.05	1	700	10,000	0.03	0.75	500	8,000
	2.8	5.6	0.07	1.25	800	14,000	0.05	1	700	10,000	0.03	0.75	500	8,000
	2.9	5.8	0.07	1.25	800	14,000	0.05	1	700	10,000	0.03	0.75	500	8,000
	3	6	0.1	1.5	850	14,000	0.07	1.2	750	10,000	0.05	0.9	550	8,000
	3.5	7	0.1	1.5	850	14,000	0.07	1.2	750	10,000	0.05	0.9	550	8,000
	4	8	0.1	2	850	10,000	0.07	1.8	750	9,000	0.05	1.5	650	9,000
	4.5	9	0.1	2	850	10,000	0.07	1.8	750	9,000	0.05	1.5	650	9,000
	5	10	0.1	2.5	800	6,000	0.07	2.3	700	5,000	0.06	2	600	4,500
	5.5	11	0.1	2.5	800	6,000	0.07	2.3	700	5,000	0.06	2	600	4,500
	6	12	0.12	3	800	5,000	0.09	2.8	700	4,000	0.08	2.5	700	3,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬平角立铣刀　Carbide Square End Mill

■型号:IUS430　Model number:IUS430

ion U | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IUS430-0100-00200	1	2	15	4	50	5,040
IUS430-0150-00300	1.5	3	15	4	50	5,040
IUS430-0200-00400	2	4	15	4	50	5,040
IUS430-0300-00600	3	6	15	4	50	5,840
IUS430-0400-00800	4	8	15	6	50	6,320
IUS430-0600-01200	6	12	—	6	60	6,640
IUS430-0600-01800		18	—	6	60	7,120
IUS430-0800-01600	8	16	—	8	70	9,920
IUS430-0800-02400		24	—	8	70	11,040
IUS430-1000-02000	10	20	—	10	80	15,520
IUS430-1000-03000		30	—	10	80	16,000
IUS430-1200-02400	12	24	—	12	110	19,600
IUS430-1200-03600		36	—	12	110	20,320
IUS430-1400-03500	14	35	—	14	120	11,760
IUS430-1600-04000	16	40	—	16	130	18,080
IUS430-1800-04500	18	45	—	18	140	21,040
IUS430-2000-05000	20	50	—	20	140	26,400

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IUS430
Model number:IUS430

平角立铣刀　Square End Mill

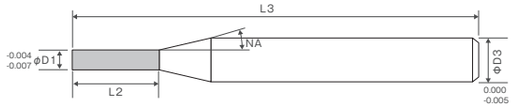
切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
4	1	2	1.5	0.03	800	30,000	1.5	0.02	500	25,000	1.5	0.02	240	20,000
	1.5	3	2.2	0.045	860	20,000	2.2	0.03	560	16,000	2.2	0.03	330	14,000
	2	4	3	0.06	920	15,000	3	0.04	630	12,000	3	0.04	480	10,000
	3	6	4.5	0.09	1,000	10,000	4.5	0.06	700	8,000	4.5	0.06	560	7,000
	4	8	6	0.12	1,200	8,500	6	0.08	800	7,000	6	0.08	600	6,000
	6	12	9	0.18	1,200	6,400	9	0.12	1000	5,300	9	0.12	600	4,600
		18	9	0.12	1,000	5,800	9	0.09	900	4,800	9	0.09	450	4,200
	8	16	12	0.24	1,300	4,800	12	0.16	900	4,000	12	0.16	650	3,400
		24	12	0.2	1,000	4,300	12	0.12	700	3,600	12	0.12	500	3,000
	10	20	15	0.3	1,300	3,800	15	0.2	900	3,200	15	0.2	650	2,600
		30	15	0.25	1,000	3,400	15	0.15	700	2,800	15	0.15	500	2,300
	12	24	18	0.36	1,300	3,200	18	0.24	900	2,600	18	0.24	650	2,200
		36	18	0.3	1,000	2,800	18	0.18	700	2,300	18	0.18	500	2,000
	14	35	21	0.35	700	2,400	21	0.28	550	2,400	21	0.28	500	2,400
	16	40	24	0.4	600	2,100	24	0.32	450	2,100	24	0.32	400	2,100
	18	45	27	0.45	550	1,800	27	0.36	400	1,800	27	0.36	350	1,800
	20	50	30	0.5	500	1,600	30	0.4	350	1,600	30	0.4	300	1,600

●请将刀具确实地固定在刀柄上,以防止刀具振动。　Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。　Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。　∂p=Axial Depth of Cut　∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。　We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。　Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。　Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬平角立铣刀　Carbide Square End Mill

■型号:IUS630　Model number:IUS630

ion U | super MG | 刀刃数 6 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IUS630-0500-01000	5	10	15	6	50	6,720
IUS630-0500-01500		15	15	6	50	7,440
IUS630-0600-01200	6	12	—	6	50	7,280
IUS630-0600-01800		18	—	6	60	8,080
IUS630-0800-01600	8	16	—	8	70	9,920
IUS630-0800-02400		24	—	8	70	11,040
IUS630-1000-02000	10	20	—	10	80	13,200
IUS630-1000-03000		30	—	10	80	14,720
IUS630-1200-02400	12	24	—	12	110	16,880
IUS630-1200-03600		36	—	12	110	18,720
IUS630-1400-03500	14	35	—	14	120	12,800
IUS630-1600-04000	16	40	—	16	130	22,320
IUS630-1800-04500	18	45	—	18	140	25,280
IUS630-2000-05000	20	50	—	20	140	28,000

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IUS630
Model number:IUS630

平角立铣刀　Square End Mill

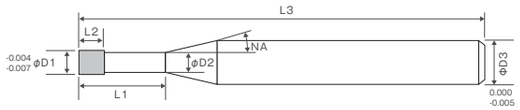
切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
6	5	10	7.5	0.15	1,600	7,600	7.5	0.1	1,200	6,200	7.5	0.1	800	5,300
		15	7.5	0.1	1,400	6,800	7.5	0.07	1,000	5,600	7.5	0.07	600	4,800
	6	12	9	0.18	1,800	6,400	9	0.12	1,200	5,300	9	0.12	800	4,600
		18	9	0.12	1,600	5,800	9	0.09	1,000	4,800	9	0.09	600	4,200
	8	16	12	0.24	2,000	4,800	12	0.16	1,400	4,000	12	0.16	1,000	3,400
		24	12	0.2	1,800	4,300	12	0.12	1,200	3,600	12	0.12	800	3,000
	10	20	15	0.3	2,000	3,800	15	0.2	1,600	3,200	15	0.2	1,000	2,600
		30	15	0.25	1,800	3,400	15	0.15	1,400	2,800	15	0.15	800	2,300
	12	24	18	0.36	2,000	3,200	18	0.24	1,600	2,600	18	0.24	1,000	2,200
		36	18	0.3	1,800	2,800	18	0.18	1,400	2,300	18	0.18	800	2,000
	14	35	21	0.35	1,000	2,400	21	0.28	830	2,400	21	0.28	750	2,400
	16	40	24	0.4	900	2,100	24	0.32	670	2,100	24	0.32	600	2,100
	18	45	27	0.45	820	1,800	27	0.36	600	1,800	27	0.36	530	1,800
	20	50	30	0.5	750	1,600	30	0.4	520	1,600	30	0.4	450	1,600

●请将刀具确实地固定在刀柄上，以防止刀具振动。　Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。　Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。　∂p=Axial Depth of Cut　∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。　We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。　Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。　Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

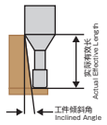
超硬长颈平角立铣刀
Carbide Long Neck Square End Mill

ion U | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IULS230 Model number:IULS230



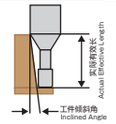
所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
									30'	1°	1°30'	2°	3°
IULS230-0010-0030	0.1	0.3	0.08	0.08	15	4	50	8,400	0.35	0.36	0.37	0.39	0.42
IULS230-0010-0050		0.5	0.08	0.08	15	4	50	9,120	0.56	0.57	0.60	0.62	0.67
IULS230-0015-0030	0.15	0.3	0.12	0.13	15	4	50	11,200	0.35	0.36	0.37	0.39	0.42
IULS230-0015-0050		0.5	0.12	0.13	15	4	50	8,400	0.56	0.57	0.60	0.62	0.67
IULS230-0020-0050	0.2	0.5	0.15	0.18	15	4	50	10,000	0.56	0.57	0.60	0.62	0.67
IULS230-0020-0075		0.75	0.15	0.18	15	4	50	5,760	0.81	0.84	0.87	0.91	0.98
IULS230-0020-0100		1	0.15	0.18	15	4	50	5,920	1.07	1.11	1.15	1.19	1.29
IULS230-0030-0100	0.3	1	0.25	0.27	15	4	50	8,800	1.09	1.13	1.17	1.21	1.31
IULS230-0030-0150		1.5	0.25	0.27	15	4	50	5,040	1.61	1.66	1.72	1.79	1.93
IULS230-0030-0200		2	0.25	0.27	15	4	50	5,040	2.13	2.20	2.28	2.36	2.56
IULS230-0030-0250		2.5	0.25	0.27	15	4	50	6,240	2.64	2.73	2.83	2.94	3.18
IULS230-0030-0300		3	0.25	0.27	15	4	50	6,480	3.16	3.27	3.39	3.51	3.80
IULS230-0040-0100	0.4	1	0.3	0.37	15	4	50	6,480	1.09	1.13	1.17	1.21	1.31
IULS230-0040-0150		1.5	0.3	0.37	15	4	50	3,680	1.61	1.66	1.72	1.79	1.93
IULS230-0040-0200		2	0.3	0.37	15	4	50	3,680	2.13	2.20	2.28	2.36	2.56
IULS230-0040-0250		2.5	0.3	0.37	15	4	50	3,680	2.64	2.73	2.83	2.94	3.18
IULS230-0040-0300		3	0.3	0.37	15	4	50	3,680	3.16	3.27	3.39	3.51	3.80
IULS230-0050-0100	0.5	1	0.4	0.47	15	4	50	2,640	1.09	1.13	1.17	1.21	1.31
IULS230-0050-0150		1.5	0.4	0.47	15	4	50	2,640	1.61	1.66	1.72	1.79	1.93
IULS230-0050-0200		2	0.4	0.47	15	4	50	2,640	2.13	2.20	2.28	2.36	2.56
IULS230-0050-0250		2.5	0.4	0.47	15	4	50	2,640	2.64	2.73	2.83	2.94	3.18
IULS230-0050-0300		3	0.4	0.47	15	4	50	2,640	3.16	3.27	3.39	3.51	3.80
IULS230-0050-0350		3.5	0.4	0.47	15	4	50	2,640	3.68	3.80	3.94	4.09	4.42
IULS230-0050-0400		4	0.4	0.47	15	4	50	2,640	4.19	4.34	4.50	4.66	5.04
IULS230-0060-0150	0.6	1.5	0.5	0.57	15	4	50	2,800	1.61	1.66	1.72	1.79	1.93
IULS230-0060-0200		2	0.5	0.57	15	4	50	2,800	2.13	2.20	2.28	2.36	2.56
IULS230-0060-0300		3	0.5	0.57	15	4	50	2,800	3.16	3.27	3.39	3.51	3.80
IULS230-0060-0400		4	0.5	0.57	15	4	50	2,800	4.19	4.34	4.50	4.66	5.04
IULS230-0060-0500		5	0.5	0.57	15	4	50	2,800	5.23	5.41	5.60	5.81	6.29
IULS230-0060-0600		6	0.5	0.57	15	4	50	2,800	6.26	6.48	6.71	6.96	7.53



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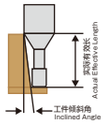
单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
									30'	1°	1°30'	2°	3°
IULS230-0070-0200	0.7	2	0.55	0.67	15	4	50	3,200	2.13	2.20	2.28	2.36	2.56
IULS230-0070-0400		4	0.55	0.67	15	4	50	3,200	4.19	4.34	4.50	4.66	5.04
IULS230-0070-0600		6	0.55	0.67	15	4	50	3,200	6.26	6.48	6.71	6.96	7.53
IULS230-0080-0300	0.8	3	0.65	0.77	15	4	50	3,120	3.16	3.27	3.39	3.51	3.80
IULS230-0080-0400		4	0.65	0.77	15	4	50	3,120	4.19	4.34	4.50	4.66	5.04
IULS230-0080-0500		5	0.65	0.77	15	4	50	3,120	5.23	5.41	5.60	5.81	6.29
IULS230-0080-0600		6	0.65	0.77	15	4	50	3,120	6.26	6.48	6.71	6.96	7.53
IULS230-0080-0800		8	0.65	0.77	15	4	50	3,120	8.33	8.62	8.93	9.26	10.01
IULS230-0100-0200	1	2	0.8	0.95	15	4	50	2,800	2.16	2.24	2.32	2.41	2.60
IULS230-0100-0300		3	0.8	0.95	15	4	50	2,800	3.20	3.31	3.43	3.56	3.85
IULS230-0100-0400		4	0.8	0.95	15	4	50	2,800	4.23	4.38	4.54	4.71	5.09
IULS230-0100-0500		5	0.8	0.95	15	4	50	2,800	5.26	5.45	5.64	5.86	6.33
IULS230-0100-0600		6	0.8	0.95	15	4	50	2,800	6.30	6.52	6.75	7.01	7.57
IULS230-0100-0700		7	0.8	0.95	15	4	50	2,800	7.33	7.59	7.86	8.16	8.82
IULS230-0100-0800		8	0.8	0.95	15	4	50	2,800	8.37	8.66	8.97	9.31	10.06
IULS230-0100-0900		9	0.8	0.95	15	4	50	2,800	9.40	9.73	10.08	10.46	11.30
IULS230-0100-1000		10	0.8	0.95	15	4	50	2,800	10.43	10.80	11.19	11.61	12.55
IULS230-0100-1200		12	0.8	0.95	15	4	50	2,800	12.50	12.94	13.40	13.91	15.03
IULS230-0120-0600	1.2	6	1	1.15	15	4	50	2,960	6.30	6.52	6.75	7.01	7.57
IULS230-0120-0800		8	1	1.15	15	4	50	2,960	8.37	8.66	8.97	9.31	10.06
IULS230-0120-1000		10	1	1.15	15	4	50	2,960	10.43	10.80	11.19	11.61	12.55
IULS230-0120-1200		12	1	1.15	15	4	50	2,960	12.50	12.94	13.40	13.91	15.03
IULS230-0120-1600		16	1	1.15	15	4	50	4,720	16.64	17.21	17.84	18.50	20.01
IULS230-0140-0600	1.4	6	1.1	1.35	15	4	50	3,040	6.30	6.52	6.75	7.01	7.57
IULS230-0140-1200		12	1.1	1.35	15	4	50	3,040	12.50	12.94	13.40	13.91	15.03
IULS230-0150-0400	1.5	4	1.2	1.45	15	4	50	2,960	4.23	4.38	4.54	4.71	5.09
IULS230-0150-0600		6	1.2	1.45	15	4	50	2,960	6.30	6.52	6.75	7.01	7.57
IULS230-0150-0800		8	1.2	1.45	15	4	50	2,960	8.37	8.66	8.97	9.31	10.06
IULS230-0150-1000		10	1.2	1.45	15	4	50	2,960	10.43	10.80	11.19	11.61	12.55
IULS230-0150-1200		12	1.2	1.45	15	4	50	2,960	12.50	12.94	13.40	13.91	15.03
IULS230-0150-1400		14	1.2	1.45	15	4	50	3,040	14.57	15.08	15.62	16.21	17.52
IULS230-0150-1600		16	1.2	1.45	15	4	50	3,040	16.64	17.21	17.84	18.50	20.01
IULS230-0160-0600	1.6	6	1.3	1.55	15	4	50	3,040	6.30	6.52	6.75	7.01	7.57
IULS230-0160-0800		8	1.3	1.55	15	4	50	3,040	8.37	8.66	8.97	9.31	10.06
IULS230-0180-0600	1.8	6	1.4	1.75	15	4	50	3,040	6.30	6.52	6.75	7.01	7.57
IULS230-0180-0800		8	1.4	1.75	15	4	50	3,040	8.37	8.66	8.97	9.31	10.06
IULS230-0180-1000		10	1.4	1.75	15	4	50	3,040	10.43	10.80	11.19	11.61	12.55
IULS230-0180-1200		12	1.4	1.75	15	4	50	3,040	12.50	12.94	13.40	13.91	15.03
IULS230-0180-1400		14	1.4	1.75	15	4	50	3,040	14.57	15.08	15.62	16.21	17.52
IULS230-0180-1600		16	1.4	1.75	15	4	50	3,040	16.64	17.21	17.84	18.50	20.01
IULS230-0200-0400	2	4	1.6	1.94	15	4	50	2,960	4.25	4.40	4.56	4.73	5.11
IULS230-0200-0600		6	1.6	1.94	15	4	50	2,960	6.32	6.54	6.77	7.03	7.60
IULS230-0200-0800		8	1.6	1.94	15	4	50	2,960	8.39	8.68	8.99	9.33	10.08
IULS230-0200-1000		10	1.6	1.94	15	4	50	2,960	10.45	10.82	11.21	11.63	12.57
IULS230-0200-1200		12	1.6	1.94	15	4	50	2,960	12.52	12.96	13.42	13.93	15.06



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单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULS230-0200-1400	2	14	1.6	1.94	15	4	50	2,960	14.59	15.10	15.64	16.23	17.54
IULS230-0200-1600		16	1.6	1.94	15	4	50	2,960	16.65	17.23	17.86	18.53	FREE
IULS230-0200-1800		18	1.6	1.94	15	4	50	2,960	18.72	19.37	20.07	20.83	FREE
IULS230-0200-2000		20	1.6	1.94	15	4	50	2,960	20.79	21.51	22.29	23.13	FREE
IULS230-0250-0800	2.5	8	2	2.44	15	4	50	3,120	8.39	8.68	8.99	9.33	10.08
IULS230-0250-1200		12	2	2.44	15	4	50	3,120	12.52	12.96	13.42	13.93	FREE
IULS230-0250-1600		16	2	2.44	15	4	50	3,120	16.65	17.23	17.86	18.53	FREE
IULS230-0250-2000		20	2	2.44	15	4	50	3,120	20.79	21.51	22.29	FREE	FREE
IULS230-0300-0800	3	8	4.5	2.85	15	4	50	4,000	8.56	8.86	9.18	9.52	FREE
IULS230-0300-1200		12	4.5	2.85	15	4	50	4,000	12.69	13.14	13.61	14.12	FREE
IULS230-0300-1600		16	4.5	2.85	15	4	50	4,000	16.83	17.41	18.04	FREE	FREE
IULS230-0300-2000		20	4.5	2.85	15	4	50	4,000	20.96	21.69	FREE	FREE	FREE
IULS230-0300-2500		25	4.5	2.85	15	4	60	4,000	26.13	27.04	FREE	FREE	FREE
IULS230-0300-3000		30	4.5	2.85	15	4	60	4,800	31.30	FREE	FREE	FREE	FREE
IULS230-0400-1000	4	10	3	3.8	15	6	50	4,180	10.72	11.10	11.50	11.93	12.89
IULS230-0400-1500		15	3	3.8	15	6	50	4,180	15.89	16.44	17.04	17.68	FREE
IULS230-0400-2000		20	3	3.8	15	6	50	4,180	21.06	21.79	22.58	23.43	FREE
IULS230-0500-1500	5	15	3.5	4.8	15	6	50	5,260	15.89	16.44	17.04	FREE	FREE
IULS230-0500-2000		20	3.5	4.8	15	6	50	5,490	21.06	21.79	FREE	FREE	FREE
IULS230-0600-1500	6	15	6	5.8	15	6	50	5,260	FREE	FREE	FREE	FREE	FREE
IULS230-0600-2000		20	6	5.8	15	6	50	5,260	FREE	FREE	FREE	FREE	FREE
IULS230-0600-3000		30	6	5.8	15	6	60	5,490	FREE	FREE	FREE	FREE	FREE

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IULS230
Model number:IULS230

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	0.1	0.3	0.003	0.05	120	40,000	0.002	0.04	100	40,000	0.002	0.03	70	40,000
		0.5	0.003	0.05	80	40,000	0.002	0.04	60	40,000	0.002	0.03	50	40,000
	0.15	0.3	0.003	0.07	150	40,000	0.002	0.06	120	40,000	0.002	0.04	100	40,000
		0.5	0.003	0.07	120	40,000	0.002	0.06	100	40,000	0.002	0.04	80	40,000
	0.2	0.5	0.003	0.1	200	30,000	0.003	0.08	160	30,000	0.003	0.06	120	30,000
		0.75	0.003	0.1	180	30,000	0.003	0.08	140	30,000	0.003	0.06	100	30,000
		1	0.003	0.1	150	30,000	0.003	0.08	120	30,000	0.003	0.06	80	30,000
	0.3	1	0.003	0.15	300	30,000	0.003	0.12	250	30,000	0.003	0.09	200	30,000
		1.5	0.003	0.15	200	30,000	0.003	0.12	160	30,000	0.003	0.09	120	30,000
		2	0.003	0.15	150	30,000	0.003	0.12	120	30,000	0.003	0.09	100	25,000
		2.5	0.002	0.15	100	25,000	0.002	0.12	80	25,000	0.002	0.09	60	20,000
		3	0.002	0.15	50	25,000	0.002	0.12	40	25,000	0.002	0.09	30	20,000
	0.4	1	0.005	0.2	400	30,000	0.005	0.16	350	30,000	0.005	0.12	300	25,000
		1.5	0.005	0.2	360	30,000	0.005	0.16	330	30,000	0.005	0.12	250	25,000
		2	0.005	0.2	320	30,000	0.005	0.16	280	25,000	0.005	0.12	220	25,000
		2.5	0.005	0.2	280	25,000	0.004	0.16	250	25,000	0.004	0.12	200	20,000
		3	0.004	0.2	260	25,000	0.003	0.16	220	20,000	0.003	0.12	180	18,000
	0.5	1	0.01	0.25	500	25,000	0.007	0.2	450	23,000	0.005	0.15	400	20,000
		1.5	0.01	0.25	450	25,000	0.007	0.2	400	23,000	0.005	0.15	360	20,000
		2	0.01	0.25	420	25,000	0.007	0.2	380	23,000	0.005	0.15	320	20,000
		2.5	0.008	0.25	400	25,000	0.006	0.2	360	23,000	0.004	0.15	300	20,000
		3	0.007	0.25	350	25,000	0.005	0.2	320	23,000	0.003	0.15	280	20,000
		3.5	0.006	0.25	320	25,000	0.003	0.2	280	23,000	0.003	0.15	240	20,000
		4	0.005	0.25	280	25,000	0.003	0.2	240	23,000	0.002	0.15	200	20,000
	0.6	1.5	0.01	0.3	550	25,000	0.007	0.25	450	23,000	0.005	0.18	400	20,000
		2	0.01	0.3	500	25,000	0.007	0.25	400	23,000	0.005	0.18	350	20,000
		3	0.007	0.3	450	25,000	0.005	0.25	350	23,000	0.003	0.18	300	20,000
		4	0.005	0.3	400	25,000	0.003	0.25	300	23,000	0.002	0.18	250	20,000
		5	0.003	0.3	350	20,000	0.003	0.25	250	18,000	0.002	0.18	200	16,000
		6	0.002	0.3	300	20,000	0.002	0.25	200	18,000	0.001	0.18	150	16,000
	0.7	2	0.03	0.35	600	25,000	0.02	0.28	450	23,000	0.012	0.21	400	20,000
		4	0.02	0.35	560	25,000	0.015	0.28	400	23,000	0.007	0.21	320	20,000
		6	0.015	0.35	410	20,000	0.012	0.28	300	18,000	0.007	0.21	240	16,000
	0.8	3	0.03	0.4	780	25,000	0.02	0.32	650	23,000	0.012	0.24	550	20,000
		4	0.025	0.4	700	25,000	0.015	0.32	600	23,000	0.007	0.24	500	20,000
		5	0.02	0.4	630	23,000	0.012	0.32	530	20,000	0.006	0.24	450	18,000
		6	0.02	0.4	550	20,000	0.01	0.32	450	18,000	0.005	0.24	350	16,000
		8	0.007	0.4	400	16,000	0.005	0.32	300	14,000	0.003	0.24	200	12,000
	1	2	0.06	0.5	1,000	23,000	0.05	0.4	900	18,000	0.035	0.3	600	14,000
		3	0.05	0.5	1,000	23,000	0.04	0.4	900	18,000	0.03	0.3	600	14,000
		4	0.04	0.5	900	23,000	0.03	0.4	800	18,000	0.02	0.3	500	14,000
		5	0.03	0.5	800	20,000	0.02	0.4	700	16,000	0.012	0.3	450	12,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type U Series

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IULS230
Model number:IULS230

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1	6	0.02	0.5	700	18,000	0.01	0.4	600	14,000	0.007	0.3	400	10,000
		7	0.02	0.5	650	18,000	0.01	0.4	550	14,000	0.006	0.3	370	10,000
		8	0.02	0.5	600	16,000	0.01	0.4	500	12,000	0.005	0.3	340	8,000
		9	0.015	0.5	550	16,000	0.007	0.4	450	12,000	0.005	0.3	300	8,000
		10	0.01	0.5	500	14,000	0.007	0.4	400	10,000	0.005	0.3	250	6,000
		12	0.01	0.5	400	13,000	0.005	0.4	300	10,000	0.004	0.3	180	6,000
	1.2	6	0.03	0.6	700	18,000	0.02	0.5	600	14,000	0.01	0.4	400	10,000
		8	0.02	0.6	600	16,000	0.01	0.5	500	12,000	0.007	0.4	340	8,000
		10	0.02	0.6	500	12,000	0.01	0.5	430	10,000	0.005	0.4	300	8,000
		12	0.01	0.6	500	10,000	0.007	0.5	400	9,000	0.005	0.4	250	7,000
		16	0.01	0.6	300	9,000	0.005	0.5	260	8,000	0.003	0.4	180	6,000
	1.4	6	0.04	0.7	800	20,000	0.03	0.56	700	18,000	0.02	0.42	450	12,000
		12	0.01	0.7	500	13,000	0.007	0.56	400	11,000	0.005	0.42	280	8,000
	1.5	4	0.05	0.75	900	20,000	0.04	0.6	800	18,000	0.03	0.45	600	14,000
		6	0.04	0.75	800	20,000	0.03	0.6	700	18,000	0.02	0.45	500	14,000
		8	0.03	0.75	600	18,000	0.03	0.6	600	14,000	0.01	0.45	380	10,000
		10	0.03	0.75	500	16,000	0.02	0.6	500	14,000	0.01	0.45	350	10,000
		12	0.02	0.75	500	14,000	0.02	0.6	430	12,000	0.007	0.45	310	8,000
		14	0.02	0.75	400	12,000	0.01	0.6	380	10,000	0.007	0.45	250	7,500
		16	0.01	0.75	360	10,000	0.007	0.6	300	9,000	0.005	0.45	200	6,800
	1.6	6	0.04	0.8	850	19,000	0.03	0.64	750	17,000	0.025	0.48	600	13,000
		8	0.03	0.8	750	17,000	0.03	0.64	600	14,000	0.015	0.48	430	10,000
	1.8	6	0.05	0.9	900	18,000	0.04	0.7	750	15,000	0.03	0.5	600	12,000
		8	0.04	0.9	800	16,000	0.03	0.7	600	12,000	0.02	0.5	500	9,500
		10	0.04	0.9	700	14,000	0.03	0.7	500	12,000	0.02	0.5	450	9,500
		12	0.03	0.9	600	12,000	0.02	0.7	500	10,000	0.01	0.5	400	8,200
		14	0.03	0.9	600	12,000	0.02	0.7	430	10,000	0.01	0.5	360	8,200
		16	0.02	0.9	500	10,000	0.01	0.7	400	9,200	0.007	0.5	340	7,500
	2	4	0.08	1	1,000	18,000	0.06	0.8	800	15,000	0.04	0.6	600	12,000
		6	0.06	1	900	18,000	0.05	0.8	750	15,000	0.03	0.6	600	12,000
		8	0.05	1	800	16,000	0.04	0.8	600	12,000	0.02	0.6	500	9,500
		10	0.05	1	700	14,000	0.04	0.8	500	12,000	0.02	0.6	450	9,500
		12	0.04	1	600	12,000	0.03	0.8	500	10,000	0.01	0.6	400	8,200
		14	0.03	1	600	12,000	0.02	0.8	430	10,000	0.007	0.6	360	8,200
		16	0.03	1	500	10,000	0.02	0.8	400	9,200	0.007	0.6	340	7,500
		18	0.02	1	410	9,200	0.01	0.8	370	8,500	0.005	0.6	320	6,000
		20	0.02	1	380	9,200	0.01	0.8	340	8,500	0.005	0.6	260	6,000
	2.5	8	0.07	1.25	800	14,000	0.05	1	700	10,000	0.03	0.75	500	8,000
		12	0.06	1.25	700	12,000	0.04	1	600	9,600	0.02	0.75	480	7,500
		16	0.05	1.25	600	10,000	0.02	1	500	8,500	0.01	0.75	400	7,000
		20	0.05	1.25	500	8,200	0.02	1	500	7,500	0.01	0.75	400	5,000
	3	8	0.1	1.5	900	14,000	0.07	1.2	800	10,000	0.05	0.9	600	8,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	3	12	0.08	1.5	800	12,000	0.06	1.2	700	9,200	0.04	0.9	500	7,200
		16	0.07	1.5	700	10,000	0.05	1.2	600	8,500	0.03	0.9	400	6,500
		20	0.07	1.5	700	9,000	0.04	1.2	600	7,800	0.02	0.9	400	5,800
		25	0.06	1.5	600	8,200	0.03	1.2	500	7,000	0.01	0.9	360	5,000
		30	0.03	1.5	600	7,000	0.02	1.2	500	6,500	0.007	0.9	330	4,500
	4	10	0.1	2	900	10,000	0.07	1.8	800	9,000	0.05	1.5	700	9,000
		15	0.07	2	800	8,000	0.05	1.8	700	7,000	0.04	1.5	600	6,500
		20	0.06	2	750	7,000	0.04	1.8	650	6,000	0.03	1.5	550	5,500
	5	15	0.1	2.5	850	6,000	0.07	2.3	750	5,000	0.06	2	650	4,500
		20	0.08	2.5	800	5,000	0.06	2.3	700	4,000	0.05	2	600	3,500
	6	15	0.12	3	850	5,000	0.09	2.8	750	4,000	0.08	2.5	650	3,500
		20	0.1	3	800	4,000	0.07	2.8	700	3,000	0.06	2.5	600	2,500
		30	0.08	3	700	3,000	0.06	2.8	600	2,000	0.05	2.5	500	1,500

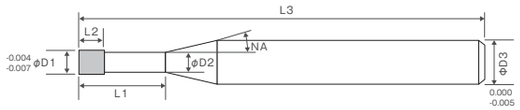
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type U Series

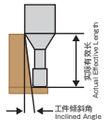
超硬长颈平角立铣刀
Carbide Long Neck Square End Mill

ion U | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IULS430 Model number:IULS430



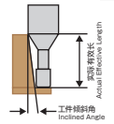
所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULS430-0100-0400	1	4	0.8	0.95	15	4	50	3,960	4.23	4.38	4.54	4.71	5.09
IULS430-0100-0600		6	0.8	0.95	15	4	50	3,960	6.30	6.52	6.75	7.01	7.57
IULS430-0100-0800		8	0.8	0.95	15	4	50	3,960	8.37	8.66	8.97	9.31	10.06
IULS430-0100-1000		10	0.8	0.95	15	4	50	3,960	10.43	10.80	11.19	11.61	12.55
IULS430-0120-0600	1.2	6	1	1.15	15	4	50	3,960	6.30	6.52	6.75	7.01	7.57
IULS430-0120-0800		8	1	1.15	15	4	50	3,960	8.37	8.66	8.97	9.31	10.06
IULS430-0120-1000		10	1	1.15	15	4	50	3,960	10.43	10.80	11.19	11.61	12.55
IULS430-0120-1200		12	1	1.15	15	4	50	3,960	12.50	12.94	13.40	13.91	15.03
IULS430-0150-0600	1.5	6	1.2	1.45	15	4	50	3,960	6.30	6.52	6.75	7.01	7.57
IULS430-0150-0800		8	1.2	1.45	15	4	50	3,960	8.37	8.66	8.97	9.31	10.06
IULS430-0150-1000		10	1.2	1.45	15	4	50	3,960	10.43	10.80	11.19	11.61	12.55
IULS430-0150-1200		12	1.2	1.45	15	4	50	3,960	12.50	12.94	13.40	13.91	15.03
IULS430-0150-1400		14	1.2	1.45	15	4	50	3,960	14.57	15.08	15.62	16.21	17.52
IULS430-0150-1600		16	1.2	1.45	15	4	50	3,960	16.64	17.21	17.84	18.50	20.01
IULS430-0180-0600	1.8	6	1.4	1.75	15	4	50	3,960	6.30	6.52	6.75	7.01	7.57
IULS430-0180-0800		8	1.4	1.75	15	4	50	3,960	8.37	8.66	8.97	9.31	10.06
IULS430-0180-1000		10	1.4	1.75	15	4	50	3,960	10.43	10.80	11.19	11.61	12.55
IULS430-0180-1200		12	1.4	1.75	15	4	50	3,960	12.50	12.94	13.40	13.91	15.03
IULS430-0180-1400		14	1.4	1.75	15	4	50	3,960	14.57	15.08	15.62	16.21	17.52
IULS430-0180-1600		16	1.4	1.75	15	4	50	3,960	16.64	17.21	17.84	18.50	20.01
IULS430-0200-0600	2	6	1.6	1.94	15	4	50	3,960	6.32	6.54	6.77	7.03	7.60
IULS430-0200-0800		8	1.6	1.94	15	4	50	3,960	8.39	8.68	8.99	9.33	10.08
IULS430-0200-1000		10	1.6	1.94	15	4	50	3,960	10.45	10.82	11.21	11.63	12.57
IULS430-0200-1200		12	1.6	1.94	15	4	50	3,960	12.52	12.96	13.42	13.93	15.06
IULS430-0200-1400		14	1.6	1.94	15	4	50	3,960	14.59	15.10	15.64	16.23	17.54
IULS430-0200-1600		16	1.6	1.94	15	4	50	3,960	16.65	17.23	17.86	18.53	FREE
IULS430-0200-1800		18	1.6	1.94	15	4	50	3,960	18.72	19.37	20.07	20.83	FREE
IULS430-0200-2000		20	1.6	1.94	15	4	50	3,960	20.79	21.51	22.29	23.13	FREE
IULS430-0250-0800	2.5	8	2	2.44	15	4	50	3,960	8.39	8.68	8.99	9.33	10.08
IULS430-0250-1200		12	2	2.44	15	4	50	3,960	12.52	12.96	13.42	13.93	FREE



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULS430-0250-1600	2.5	16	2	2.44	15	4	50	3,960	16.65	17.23	17.86	18.53	FREE
IULS430-0250-2000		20	2	2.44	15	4	50	3,960	20.79	21.51	22.29	FREE	FREE
IULS430-0300-0800	3	8	4.5	2.85	15	4	50	5,600	8.56	8.86	9.18	9.52	FREE
IULS430-0300-1200		12	4.5	2.85	15	4	50	5,600	12.69	13.14	13.61	14.12	FREE
IULS430-0300-1600		16	4.5	2.85	15	4	50	5,600	16.83	17.41	18.04	FREE	FREE
IULS430-0300-2000		20	4.5	2.85	15	4	50	5,600	20.96	21.69	FREE	FREE	FREE
IULS430-0300-2500		25	4.5	2.85	15	4	60	5,920	26.13	27.04	FREE	FREE	FREE
IULS430-0300-3000		30	4.5	2.85	15	4	60	6,400	31.30	FREE	FREE	FREE	FREE
IULS430-0400-1200	4	12	6	3.8	15	6	50	5,840	12.79	13.24	13.71	14.23	15.38
IULS430-0400-1600		16	6	3.8	15	6	50	5,840	16.92	17.51	18.15	18.83	FREE
IULS430-0400-2000		20	6	3.8	15	6	50	5,840	21.06	21.79	22.58	23.43	FREE
IULS430-0400-2500		25	6	3.8	15	6	60	6,160	26.23	27.14	28.12	FREE	FREE
IULS430-0400-3000		30	6	3.8	15	6	60	6,800	31.40	32.49	33.66	FREE	FREE
IULS430-0400-3500		35	6	3.8	15	6	70	7,360	36.56	37.84	FREE	FREE	FREE
IULS430-0500-1600	5	16	7.5	4.8	15	6	50	7,360	16.92	17.51	18.15	FREE	FREE
IULS430-0500-2500		25	7.5	4.8	15	6	60	7,680	26.23	27.14	FREE	FREE	FREE
IULS430-0500-3500		35	7.5	4.8	15	6	70	8,000	36.56	FREE	FREE	FREE	FREE
IULS430-0600-2000	6	20	9	5.8	15	6	50	7,360	FREE	FREE	FREE	FREE	FREE
IULS430-0600-3000		30	9	5.8	15	6	60	7,680	FREE	FREE	FREE	FREE	FREE
IULS430-0600-4000		40	9	5.8	15	6	70	8,000	FREE	FREE	FREE	FREE	FREE
IULS430-0600-5000		50	9	5.8	15	6	80	11,200	FREE	FREE	FREE	FREE	FREE

CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
Depo A Series
ion Depo U Series 平角 Square
DLC Series
Non-Coat Series
ion Depo R Series

ion Depo Type U Series

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IULS430
Model number:IULS430

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	1	4	0.04	0.5	1,800	23,000	0.03	0.4	1,600	18,000	0.02	0.3	1,000	14,000
		6	0.02	0.5	1,400	18,000	0.01	0.4	1,200	14,000	0.007	0.3	800	10,000
		8	0.02	0.5	1,200	16,000	0.01	0.4	1,000	12,000	0.005	0.3	680	8,000
		10	0.01	0.5	1,000	14,000	0.007	0.4	800	10,000	0.005	0.3	500	6,000
	1.2	6	0.03	0.6	1,400	18,000	0.02	0.5	1,200	14,000	0.01	0.4	800	10,000
		8	0.02	0.6	1,200	16,000	0.01	0.5	1,000	12,000	0.007	0.4	680	8,000
		10	0.02	0.6	1,000	12,000	0.01	0.5	850	10,000	0.005	0.4	600	8,000
		12	0.01	0.6	1,000	10,000	0.007	0.5	800	9,000	0.005	0.4	500	7,000
	1.5	6	0.04	0.75	1,600	20,000	0.03	0.6	1,400	18,000	0.02	0.45	1,000	14,000
		8	0.03	0.75	1,200	18,000	0.03	0.6	1,200	14,000	0.01	0.45	750	10,000
		10	0.03	0.75	1,000	16,000	0.02	0.6	1,000	14,000	0.01	0.45	700	10,000
		12	0.02	0.75	1,000	14,000	0.02	0.6	850	12,000	0.007	0.45	620	8,000
		14	0.02	0.75	800	12,000	0.01	0.6	750	10,000	0.007	0.45	500	7,500
		16	0.01	0.75	720	10,000	0.007	0.6	600	9,000	0.005	0.45	400	6,800
	1.8	6	0.05	0.9	1,800	18,000	0.04	0.7	1,500	15,000	0.03	0.5	1,200	12,000
		8	0.04	0.9	1,600	16,000	0.03	0.7	1,200	12,000	0.02	0.5	1,000	9,500
		10	0.04	0.9	1,400	14,000	0.03	0.7	1,000	12,000	0.02	0.5	900	9,500
		12	0.03	0.9	1,200	12,000	0.02	0.7	1,000	10,000	0.01	0.5	800	8,200
		14	0.03	0.9	1,200	12,000	0.02	0.7	860	10,000	0.01	0.5	720	8,200
		16	0.02	0.9	1,000	10,000	0.01	0.7	800	9,200	0.007	0.5	680	7,500
	2	6	0.06	1	1,800	18,000	0.05	0.8	1,500	15,000	0.03	0.6	1,200	12,000
		8	0.05	1	1,600	16,000	0.04	0.8	1,200	12,000	0.02	0.6	1,000	9,500
		10	0.05	1	1,400	14,000	0.04	0.8	1,000	12,000	0.02	0.6	900	9,500
		12	0.04	1	1,200	12,000	0.03	0.8	1,000	10,000	0.01	0.6	800	8,200
		14	0.03	1	1,200	12,000	0.02	0.8	860	10,000	0.007	0.6	720	8,200
		16	0.03	1	1,000	10,000	0.02	0.8	800	9,200	0.007	0.6	680	7,500
		18	0.02	1	820	9,200	0.01	0.8	740	8,500	0.005	0.6	640	6,000
		20	0.02	1	760	9,200	0.01	0.8	680	8,500	0.005	0.6	520	6,000
	2.5	8	0.07	1.25	1,600	14,000	0.05	1	1,400	10,000	0.03	0.75	1,000	8,000
		12	0.06	1.25	1,400	12,000	0.04	1	1,200	9,600	0.02	0.75	960	7,500
		16	0.05	1.25	1,200	10,000	0.02	1	1,000	8,500	0.01	0.75	800	7,000
		20	0.05	1.25	1,000	8,200	0.02	1	1,000	7,500	0.01	0.75	800	5,000
	3	8	0.1	1.5	1,800	14,000	0.07	1.2	1,600	10,000	0.05	0.9	1,200	8,000
		12	0.08	1.5	1,600	12,000	0.06	1.2	1,400	9,200	0.04	0.9	1,000	7,200
		16	0.07	1.5	1,400	10,000	0.05	1.2	1,200	8,500	0.03	0.9	800	6,500
		20	0.07	1.5	1,400	9,000	0.04	1.2	1,200	7,800	0.02	0.9	800	5,800
		25	0.06	1.5	1,200	8,200	0.03	1.2	1,000	7,000	0.01	0.9	720	5,000
		30	0.03	1.5	1,200	7,000	0.02	1.2	1,000	6,500	0.007	0.9	650	4,500
	4	12	0.15	2	2,000	9,500	0.08	1.6	1,600	8,000	0.06	1.2	1,000	7,000
		16	0.1	2	1,800	8,000	0.06	1.6	1,400	7,000	0.05	1.2	1,200	6,000
		20	0.08	2	1,600	7,000	0.05	1.6	1,200	6,500	0.04	1.2	1,000	5,500
		25	0.07	2	1,400	6,000	0.04	1.6	1,200	5,200	0.03	1.2	1,000	4,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

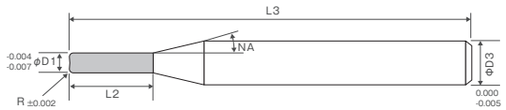
切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	4	30	0.05	2	1,000	4,800	0.03	1.6	850	4,200	0.02	1.2	620	3,500
		35	0.04	2	880	4,200	0.02	1.6	720	3,800	0.01	1.2	550	3,000
	5	16	0.12	2.5	1,800	7,000	0.08	2	1,600	5,500	0.06	1.5	1,000	4,500
		25	0.07	2.5	1,400	5,800	0.05	2	1,200	4,200	0.03	1.5	800	3,000
		35	0.05	2.5	900	4,200	0.03	2	800	3,500	0.02	1.5	600	2,500
	6	20	0.18	3	1,600	6,500	0.08	2.4	1,400	4,500	0.06	1.8	920	3,500
		30	0.12	3	1,200	4,500	0.06	2.4	1,000	3,500	0.04	1.8	660	2,500
		40	0.08	3	1,000	3,000	0.03	2.4	800	2,500	0.02	1.8	550	2,000
		50	0.05	3	700	2,500	0.02	2.4	500	2,000	0.01	1.8	380	1,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬圆角立铣刀　Carbide Radius End Mill

■型号:IUR430　Model number:IUR430

ion U | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IUR430-0300-0200-00600	3	0.2	6	15	4	50	10,000
IUR430-0300-0300-00600		0.3	6	15	4	50	10,000
IUR430-0300-0500-00600		0.5	6	15	4	50	10,000
IUR430-0400-0200-00800	4	0.2	8	15	6	50	10,800
IUR430-0400-0300-00800		0.3	8	15	6	50	10,800
IUR430-0400-0500-00800		0.5	8	15	6	50	10,800
IUR430-0600-0200-01200	6	0.2	12	—	6	60	12,400
IUR430-0600-0300-01200		0.3	12	—	6	60	12,400
IUR430-0600-0500-01200		0.5	12	—	6	60	12,400
IUR430-0600-1000-01200		1	12	—	6	60	12,400
IUR430-0800-0300-01600	8	0.3	16	—	8	70	17,200
IUR430-0800-0500-01600		0.5	16	—	8	70	17,200
IUR430-0800-1000-01600		1	16	—	8	70	17,200
IUR430-1000-0300-02000	10	0.3	20	—	10	80	17,200
IUR430-1000-0500-02000		0.5	20	—	10	80	23,360
IUR430-1000-1000-02000		1	20	—	10	80	23,360
IUR430-1200-0500-02400	12	0.5	24	—	12	110	28,160
IUR430-1200-1000-02400		1	24	—	12	110	28,160
IUR430-1200-2000-02400		2	24	—	12	110	28,160

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IUR430
Model number:IUR430

圆角立铣刀　Radius End Mill

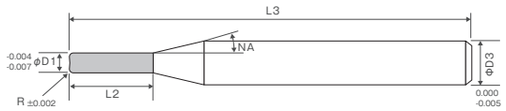
切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min^{-1}	∂p mm	∂e mm	mm/min	min^{-1}	∂p mm	∂e mm	mm/min	min^{-1}
4	3	6	5	0.09	1,000	10,000	5	0.06	700	8,000	5	0.06	560	7,000
	4	8	7	0.12	1,200	8,500	7	0.08	800	7,000	7	0.08	600	6,000
	6	12	9	0.18	1,200	5,600	9	0.12	800	4,700	9	0.12	600	4,000
	8	16	12	0.23	1,400	4,800	12	0.16	800	4,000	12	0.16	500	3,400
	10	20	15	0.30	1,500	3,800	15	0.20	900	3,200	15	0.20	600	2,600
	12	24	18	0.35	1,600	3,200	18	0.24	1,000	2,600	18	0.24	700	2,200

●请将刀具确实地固定在刀柄上，以防止刀具振动。　Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。　Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。　∂p=Axial Depth of Cut　∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。　We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。　Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。　Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬圆角立铣刀　Carbide Radius End Mill

■型号:IUR630　Model number:IUR630

ion U | super MG | 刀刃数 6 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA)仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IUR630-0500-0200-01000	5	0.2	10	15	6	50	11,600
IUR630-0500-0300-01000		0.3	10	15	6	50	11,600
IUR630-0500-0500-01000		0.5	10	15	6	50	11,600
IUR630-0500-1000-01000		1	10	15	6	50	11,600
IUR630-0600-0200-01200	6	0.2	12	—	6	60	12,400
IUR630-0600-0300-01200		0.3	12	—	6	60	12,400
IUR630-0600-0500-01200		0.5	12	—	6	60	12,400
IUR630-0600-1000-01200		1	12	—	6	60	12,400
IUR630-0800-0300-01600	8	0.3	16	—	8	70	17,200
IUR630-0800-0500-01600		0.5	16	—	8	70	17,200
IUR630-0800-1000-01600		1	16	—	8	70	17,200
IUR630-0800-1500-01600		1.5	16	—	8	70	17,200
IUR630-1000-0300-02000	10	0.3	20	—	10	80	23,360
IUR630-1000-0500-02000		0.5	20	—	10	80	23,360
IUR630-1000-1000-02000		1	20	—	10	80	23,360
IUR630-1000-1500-02000		1.5	20	—	10	80	23,360
IUR630-1000-2000-02000		2	20	—	10	80	23,360
IUR630-1200-0500-02400	12	0.5	24	—	12	110	28,160
IUR630-1200-1000-02400		1	24	—	12	110	28,160
IUR630-1200-1500-02400		1.5	24	—	12	110	28,160
IUR630-1200-2000-02400		2	24	—	12	110	28,160

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IUR630
Model number:IUR630

圆角立铣刀　Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
6	5	10	7.5	0.15	1,600	7,600	7.5	0.1	1,200	6,200	7.5	0.1	800	5,300
	6	12	9	0.18	1,800	6,400	9	0.12	1,200	5,300	9	0.12	800	4,600
	8	16	12	0.23	2,000	4,800	12	0.16	1,400	4,000	12	0.16	1,000	3,400
	10	20	15	0.3	2,000	3,800	15	0.2	1,600	3,200	15	0.2	1,000	2,600
	12	24	18	0.35	2,000	3,200	18	0.24	1,600	2,600	18	0.24	1,000	2,200

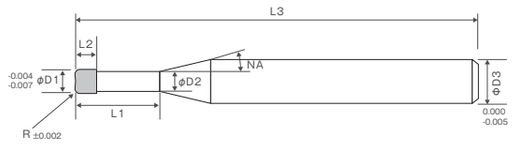
●请将刀具确实地固定在刀柄上,以防止刀具振动。　Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。　Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。　∂p=Axial Depth of Cut　∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。　We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。　Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。　Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type U Series

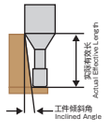
超硬长颈圆角立铣刀
Carbide Long Neck Radius End Mill

ion U | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IULR230 Model number:IULR230



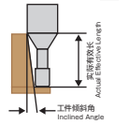
所示的仰角(NA)仅供参考,如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR230-0020-0020-0050	0.2	0.02	0.5	0.15	0.18	15	4	50	8,080	0.55	0.57	0.59	0.61	0.66
IULR230-0020-0020-0100		0.02	1	0.15	0.18	15	4	50	8,080	1.07	1.11	1.15	1.19	1.28
IULR230-0020-0050-0050		0.05	0.5	0.15	0.18	15	4	50	8,080	0.55	0.57	0.59	0.61	0.66
IULR230-0020-0050-0100		0.05	1	0.15	0.18	15	4	50	8,080	1.07	1.11	1.14	1.19	1.28
IULR230-0030-0020-0100	0.3	0.02	1	0.25	0.27	15	4	50	7,840	1.09	1.13	1.17	1.21	1.31
IULR230-0030-0020-0150		0.02	1.5	0.25	0.27	15	4	50	7,840	1.61	1.66	1.72	1.79	1.93
IULR230-0030-0020-0200		0.02	2	0.25	0.27	15	4	50	7,840	2.12	2.20	2.28	2.36	2.55
IULR230-0030-0020-0250		0.02	2.5	0.25	0.27	15	4	50	9,840	2.64	2.73	2.83	2.94	3.17
IULR230-0030-0020-0300		0.02	3	0.25	0.27	15	4	50	9,840	3.16	3.27	3.38	3.51	3.79
IULR230-0030-0050-0100		0.05	1	0.25	0.27	15	4	50	7,840	1.09	1.13	1.17	1.21	1.30
IULR230-0030-0050-0150		0.05	1.5	0.25	0.27	15	4	50	7,840	1.61	1.66	1.72	1.78	1.92
IULR230-0030-0050-0200		0.05	2	0.25	0.27	15	4	50	7,840	2.12	2.20	2.27	2.36	2.54
IULR230-0030-0050-0250		0.05	2.5	0.25	0.27	15	4	50	9,840	2.64	2.73	2.83	2.93	3.17
IULR230-0030-0050-0300		0.05	3	0.25	0.27	15	4	50	9,840	3.16	3.27	3.38	3.51	3.79
IULR230-0040-0020-0100	0.4	0.02	1	0.3	0.37	15	4	50	5,200	1.09	1.13	1.17	1.21	1.31
IULR230-0040-0020-0150		0.02	1.5	0.3	0.37	15	4	50	5,200	1.61	1.66	1.72	1.79	1.93
IULR230-0040-0020-0200		0.02	2	0.3	0.37	15	4	50	5,200	2.12	2.20	2.28	2.36	2.55
IULR230-0040-0020-0250		0.02	2.5	0.3	0.37	15	4	50	5,200	2.64	2.73	2.83	2.94	3.17
IULR230-0040-0020-0300		0.02	3	0.3	0.37	15	4	50	5,200	3.16	3.27	3.38	3.51	3.79
IULR230-0040-0050-0100		0.05	1	0.3	0.37	15	4	50	5,200	1.09	1.13	1.17	1.21	1.30
IULR230-0040-0050-0150		0.05	1.5	0.3	0.37	15	4	50	5,200	1.61	1.66	1.72	1.78	1.92
IULR230-0040-0050-0200		0.05	2	0.3	0.37	15	4	50	5,200	2.12	2.20	2.27	2.36	2.54
IULR230-0040-0050-0250		0.05	2.5	0.3	0.37	15	4	50	5,200	2.64	2.73	2.83	2.93	3.17
IULR230-0040-0050-0300		0.05	3	0.3	0.37	15	4	50	5,200	3.16	3.27	3.38	3.51	3.79
IULR230-0040-0100-0100		0.1	1	0.3	0.37	15	4	50	5,200	1.09	1.12	1.16	1.20	1.29
IULR230-0040-0100-0200		0.1	2	0.3	0.37	15	4	50	5,200	2.12	2.19	2.27	2.35	2.53
IULR230-0040-0100-0300		0.1	3	0.3	0.37	15	4	50	5,200	3.16	3.26	3.38	3.50	3.78
IULR230-0050-0020-0100	0.5	0.02	1	0.4	0.47	15	4	50	4,240	1.09	1.13	1.17	1.21	1.31
IULR230-0050-0020-0200		0.02	2	0.4	0.47	15	4	50	4,240	2.12	2.20	2.28	2.36	2.55
IULR230-0050-0020-0300		0.02	3	0.4	0.47	15	4	50	4,240	3.16	3.27	3.38	3.51	3.79



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR230-0050-0020-0400	0.5	0.02	4	0.4	0.47	15	4	50	4,240	4.19	4.34	4.49	4.66	5.04
IULR230-0050-0050-0100		0.05	1	0.4	0.47	15	4	50	4,240	1.09	1.13	1.17	1.21	1.30
IULR230-0050-0050-0200		0.05	2	0.4	0.47	15	4	50	4,240	2.12	2.20	2.27	2.36	2.54
IULR230-0050-0050-0300		0.05	3	0.4	0.47	15	4	50	4,240	3.16	3.27	3.38	3.51	3.79
IULR230-0050-0050-0400		0.05	4	0.4	0.47	15	4	50	4,240	4.19	4.34	4.49	4.66	5.03
IULR230-0050-0100-0100		0.1	1	0.4	0.47	15	4	50	4,240	1.09	1.12	1.16	1.20	1.29
IULR230-0050-0100-0200		0.1	2	0.4	0.47	15	4	50	4,240	2.12	2.19	2.27	2.35	2.53
IULR230-0050-0100-0300		0.1	3	0.4	0.47	15	4	50	4,240	3.16	3.26	3.38	3.50	3.78
IULR230-0050-0100-0400		0.1	4	0.4	0.47	15	4	50	4,240	4.19	4.33	4.48	4.65	5.02
IULR230-0060-0020-0200	0.6	0.02	2	0.5	0.57	15	4	50	4,560	2.12	2.20	2.28	2.36	2.55
IULR230-0060-0020-0400		0.02	4	0.5	0.57	15	4	50	4,560	4.19	4.34	4.49	4.66	5.04
IULR230-0060-0020-0600		0.02	6	0.5	0.57	15	4	50	4,560	6.26	6.48	6.71	6.96	7.52
IULR230-0060-0050-0200		0.05	2	0.5	0.57	15	4	50	4,560	2.12	2.20	2.27	2.36	2.54
IULR230-0060-0050-0400		0.05	4	0.5	0.57	15	4	50	4,560	4.19	4.34	4.49	4.66	5.03
IULR230-0060-0050-0600		0.05	6	0.5	0.57	15	4	50	4,560	6.26	6.47	6.71	6.96	7.52
IULR230-0060-0100-0200		0.1	2	0.5	0.57	15	4	50	4,240	2.12	2.19	2.27	2.35	2.53
IULR230-0060-0100-0400		0.1	4	0.5	0.57	15	4	50	4,240	4.19	4.33	4.48	4.65	5.02
IULR230-0060-0100-0600		0.1	6	0.5	0.57	15	4	50	4,240	6.26	6.47	6.70	6.95	7.51
IULR230-0070-0020-0200	0.7	0.02	2	0.55	0.67	15	4	50	4,800	2.12	2.20	2.28	2.36	2.55
IULR230-0070-0020-0400		0.02	4	0.55	0.67	15	4	50	4,800	4.19	4.34	4.49	4.66	5.04
IULR230-0070-0020-0600		0.02	6	0.55	0.67	15	4	50	4,800	6.26	6.48	6.71	6.96	7.52
IULR230-0070-0050-0200		0.05	2	0.55	0.67	15	4	50	4,800	2.12	2.20	2.27	2.36	2.54
IULR230-0070-0050-0400		0.05	4	0.55	0.67	15	4	50	4,800	4.19	4.34	4.49	4.66	5.03
IULR230-0070-0050-0600		0.05	6	0.55	0.67	15	4	50	4,800	6.26	6.47	6.71	6.96	7.52
IULR230-0070-0100-0200		0.1	2	0.55	0.67	15	4	50	4,800	2.12	2.19	2.27	2.35	2.53
IULR230-0070-0100-0400		0.1	4	0.55	0.67	15	4	50	4,800	4.19	4.33	4.48	4.65	5.02
IULR230-0070-0100-0600		0.1	6	0.55	0.67	15	4	50	4,800	6.26	6.47	6.70	6.95	7.51
IULR230-0080-0020-0200	0.8	0.02	2	0.65	0.77	15	4	50	4,800	2.12	2.20	2.28	2.36	2.55
IULR230-0080-0020-0400		0.02	4	0.65	0.77	15	4	50	4,800	4.19	4.34	4.49	4.66	5.04
IULR230-0080-0020-0600		0.02	6	0.65	0.77	15	4	50	4,800	6.26	6.48	6.71	6.96	7.52
IULR230-0080-0020-0800		0.02	8	0.65	0.77	15	4	50	4,960	8.33	8.62	8.93	9.26	10.01
IULR230-0080-0050-0200		0.05	2	0.65	0.77	15	4	50	4,800	2.12	2.20	2.27	2.36	2.54
IULR230-0080-0050-0400		0.05	4	0.65	0.77	15	4	50	4,800	4.19	4.34	4.49	4.66	5.03
IULR230-0080-0050-0600		0.05	6	0.65	0.77	15	4	50	4,800	6.26	6.47	6.71	6.96	7.52
IULR230-0080-0050-0800		0.05	8	0.65	0.77	15	4	50	4,960	8.33	8.61	8.92	9.26	10.00
IULR230-0080-0100-0200		0.1	2	0.65	0.77	15	4	50	4,800	2.12	2.19	2.27	2.35	2.53
IULR230-0080-0100-0400		0.1	4	0.65	0.77	15	4	50	4,800	4.19	4.33	4.48	4.65	5.02
IULR230-0080-0100-0600		0.1	6	0.65	0.77	15	4	50	4,800	6.26	6.47	6.70	6.95	7.51
IULR230-0080-0100-0800		0.1	8	0.65	0.77	15	4	50	4,960	8.32	8.61	8.92	9.25	9.99
IULR230-0080-0200-0200		0.2	2	0.65	0.77	15	4	50	4,800	2.12	2.19	2.26	2.33	2.51
IULR230-0080-0200-0400		0.2	4	0.65	0.77	15	4	50	4,800	4.19	4.32	4.47	4.63	5.00
IULR230-0080-0200-0600		0.2	6	0.65	0.77	15	4	50	4,800	6.25	6.46	6.69	6.93	7.48
IULR230-0080-0200-0800		0.2	8	0.65	0.77	15	4	50	4,960	8.32	8.60	8.91	9.23	9.97
IULR230-0090-0100-0400	0.9	0.1	4	0.7	0.87	15	4	50	5,440	4.19	4.33	4.48	4.65	5.02
IULR230-0090-0100-0800		0.1	8	0.7	0.87	15	4	50	5,440	8.32	8.61	8.92	9.25	9.99

ion Depo Type U Series

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IULR230
Model number:IULR230

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.2	0.5	0.003	0.04	200	30,000	0.003	0.02	160	30,000	0.003	0.01	120	30,000
		1	0.003	0.04	150	30,000	0.002	0.02	120	30,000	0.002	0.01	80	30,000
	0.3	1	0.003	0.08	300	30,000	0.003	0.04	250	30,000	0.003	0.03	200	30,000
		1.5	0.003	0.08	200	30,000	0.003	0.04	160	30,000	0.003	0.03	120	30,000
		2	0.003	0.08	150	30,000	0.003	0.04	120	30,000	0.003	0.03	100	25,000
		2.5	0.002	0.08	100	25,000	0.002	0.04	80	25,000	0.002	0.03	60	20,000
		3	0.002	0.08	50	25,000	0.002	0.04	40	25,000	0.002	0.03	30	20,000
	0.4	1	0.005	0.1	400	30,000	0.005	0.05	350	28,000	0.004	0.04	300	25,000
		1.5	0.005	0.1	350	30,000	0.005	0.05	300	28,000	0.004	0.04	260	25,000
		2	0.005	0.1	300	30,000	0.005	0.05	250	25,000	0.003	0.04	220	25,000
		2.5	0.004	0.1	280	28,000	0.004	0.05	240	25,000	0.003	0.04	180	20,000
		3	0.004	0.1	250	25,000	0.003	0.05	220	23,000	0.002	0.04	160	18,000
	0.5	1	0.008	0.15	500	25,000	0.006	0.1	450	23,000	0.004	0.08	400	20,000
		2	0.007	0.15	420	25,000	0.005	0.1	360	23,000	0.003	0.08	300	20,000
		3	0.006	0.15	350	25,000	0.004	0.1	320	23,000	0.003	0.08	280	20,000
		4	0.004	0.15	300	25,000	0.002	0.1	240	23,000	0.002	0.08	180	20,000
	0.6	2	0.012	0.2	500	25,000	0.006	0.15	400	23,000	0.004	0.1	320	20,000
		4	0.007	0.2	400	23,000	0.004	0.15	300	20,000	0.003	0.1	200	18,000
		6	0.005	0.2	200	20,000	0.003	0.15	150	18,000	0.002	0.1	100	12000
	0.7	2	0.012	0.25	700	25,000	0.006	0.15	600	23,000	0.003	0.12	450	20,000
		4	0.008	0.25	600	25,000	0.005	0.15	500	23,000	0.002	0.12	350	20,000
		6	0.005	0.25	350	20,000	0.003	0.15	250	18,000	0.002	0.12	200	16,000
	0.8	2	0.014	0.25	800	25,000	0.006	0.16	700	23,000	0.005	0.14	500	20,000
		4	0.008	0.25	700	25,000	0.005	0.16	600	23,000	0.003	0.14	400	20,000
		6	0.006	0.25	550	20,000	0.004	0.16	450	18,000	0.002	0.14	320	16,000
		8	0.003	0.25	400	16,000	0.002	0.16	300	14,000	0.002	0.14	200	12,000
	0.9	4	0.03	0.3	850	25,000	0.02	0.2	700	20,000	0.01	0.15	600	18,000
		8	0.01	0.3	400	16,000	0.008	0.2	350	14,000	0.005	0.15	250	10,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

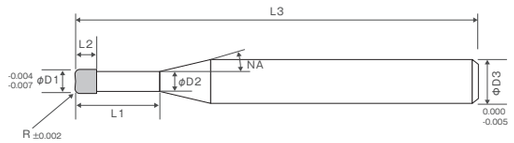
CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo A Series
ion Depo U Series 圆角 Radius
DLC Series
Non-Coat Series
ion Depo R Series

ion Depo Type U Series

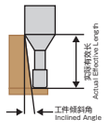
超硬长颈圆角立铣刀
Carbide Long Neck Radius End Mill

ion U | super MG | 刀刃数 3 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IULR330 Model number:IULR330



所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.



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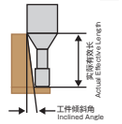
单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR330-0060-0020-0200		0.02	2	0.5	0.57	15	4	50	6,160	2.12	2.20	2.28	2.36	2.55
IULR330-0060-0020-0400		0.02	4	0.5	0.57	15	4	50	6,160	4.19	4.34	4.49	4.66	5.04
IULR330-0060-0020-0600		0.02	6	0.5	0.57	15	4	50	6,160	6.26	6.48	6.71	6.96	7.52
IULR330-0060-0050-0200		0.05	2	0.5	0.57	15	4	50	6,160	2.12	2.20	2.27	2.36	2.54
IULR330-0060-0050-0400	0.6	0.05	4	0.5	0.57	15	4	50	6,160	4.19	4.34	4.49	4.66	5.03
IULR330-0060-0050-0600		0.05	6	0.5	0.57	15	4	50	6,160	6.26	6.47	6.71	6.96	7.52
IULR330-0060-0100-0200		0.1	2	0.5	0.57	15	4	50	5,760	2.12	2.19	2.27	2.35	2.53
IULR330-0060-0100-0400		0.1	4	0.5	0.57	15	4	50	5,760	4.19	4.33	4.48	4.65	5.02
IULR330-0060-0100-0600		0.1	6	0.5	0.57	15	4	50	5,760	6.26	6.47	6.70	6.95	7.51
IULR330-0070-0020-0200		0.02	2	0.55	0.67	15	4	50	6,480	2.12	2.20	2.28	2.36	2.55
IULR330-0070-0020-0400		0.02	4	0.55	0.67	15	4	50	6,480	4.19	4.34	4.49	4.66	5.04
IULR330-0070-0020-0600		0.02	6	0.55	0.67	15	4	50	6,480	6.26	6.48	6.71	6.96	7.52
IULR330-0070-0050-0200		0.05	2	0.55	0.67	15	4	50	6,480	2.12	2.20	2.27	2.36	2.54
IULR330-0070-0050-0400	0.7	0.05	4	0.55	0.67	15	4	50	6,480	4.19	4.34	4.49	4.66	5.03
IULR330-0070-0050-0600		0.05	6	0.55	0.67	15	4	50	6,480	6.26	6.47	6.71	6.96	7.52
IULR330-0070-0100-0200		0.1	2	0.55	0.67	15	4	50	6,480	2.12	2.19	2.27	2.35	2.53
IULR330-0070-0100-0400		0.1	4	0.55	0.67	15	4	50	6,480	4.19	4.33	4.48	4.65	5.02
IULR330-0070-0100-0600		0.1	6	0.55	0.67	15	4	50	6,480	6.26	6.47	6.70	6.95	7.51
IULR330-0080-0020-0200		0.02	2	0.65	0.77	15	4	50	6,480	2.12	2.20	2.28	2.36	2.55
IULR330-0080-0020-0400		0.02	4	0.65	0.77	15	4	50	6,480	4.19	4.34	4.49	4.66	5.04
IULR330-0080-0020-0600		0.02	6	0.65	0.77	15	4	50	6,480	6.26	6.48	6.71	6.96	7.52
IULR330-0080-0020-0800		0.02	8	0.65	0.77	15	4	50	6,720	8.33	8.62	8.93	9.26	10.01
IULR330-0080-0050-0200		0.05	2	0.65	0.77	15	4	50	6,480	2.12	2.20	2.27	2.36	2.54
IULR330-0080-0050-0400		0.05	4	0.65	0.77	15	4	50	6,480	4.19	4.34	4.49	4.66	5.03
IULR330-0080-0050-0600	0.8	0.05	6	0.65	0.77	15	4	50	6,480	6.26	6.47	6.71	6.96	7.52
IULR330-0080-0050-0800		0.05	8	0.65	0.77	15	4	50	6,720	8.33	8.61	8.92	9.26	10.00
IULR330-0080-0100-0200		0.1	2	0.65	0.77	15	4	50	6,480	2.12	2.19	2.27	2.35	2.53
IULR330-0080-0100-0400		0.1	4	0.65	0.77	15	4	50	6,480	4.19	4.33	4.48	4.65	5.02
IULR330-0080-0100-0600		0.1	6	0.65	0.77	15	4	50	6,480	6.26	6.47	6.70	6.95	7.51
IULR330-0080-0100-0800		0.1	8	0.65	0.77	15	4	50	6,720	8.32	8.61	8.92	9.25	9.99



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单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Outside Tool	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR330-0080-0200-0200	0.8	0.2	2	0.65	0.77	15	4	50	6,480	2.12	2.20	2.28	2.36	2.51
IULR330-0080-0200-0400		0.2	4	0.65	0.77	15	4	50	6,480	4.19	4.32	4.47	4.63	5.00
IULR330-0080-0200-0600		0.2	6	0.65	0.77	15	4	50	6,480	6.25	6.46	6.69	6.93	7.48
IULR330-0080-0200-0800		0.2	8	0.65	0.77	15	4	50	6,720	8.32	8.60	8.91	9.23	9.97

ion Depo Type U Series

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IULR330
Model number:IULR330

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
3	0.6	2	0.012	0.20	750	25,000	0.006	0.15	600	23,000	0.004	0.10	480	20,000
		4	0.007	0.20	600	23,000	0.004	0.15	450	20,000	0.003	0.10	300	18,000
		6	0.005	0.20	300	20,000	0.003	0.15	225	18,000	0.002	0.10	150	12,000
	0.7	2	0.012	0.25	1,050	25,000	0.006	0.15	900	23,000	0.003	0.12	675	20,000
		4	0.008	0.25	900	25,000	0.005	0.15	750	23,000	0.002	0.12	525	20,000
		6	0.005	0.25	525	20,000	0.003	0.15	375	18,000	0.002	0.12	300	16,000
	0.8	2	0.014	0.25	1,200	25,000	0.006	0.16	1,050	23,000	0.005	0.14	750	20,000
		4	0.008	0.25	1,050	25,000	0.005	0.16	900	23,000	0.003	0.14	600	20,000
		6	0.006	0.25	825	20,000	0.004	0.16	675	18,000	0.002	0.14	480	16,000
		8	0.003	0.25	600	16,000	0.002	0.16	450	14,000	0.002	0.14	300	12,000

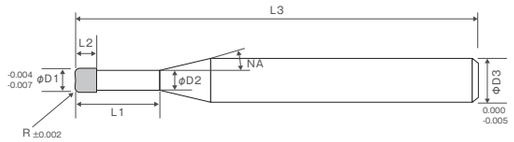
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type U Series

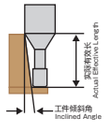
超硬长颈圆角立铣刀
Carbide Long Neck Radius End Mill

ion U | super MG | 刀刃数 4 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IULR430 Model number:IULR430



所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



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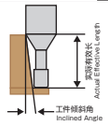
单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR430-0090-0100-0400	0.9	0.1	4	0.7	0.87	15	4	50	7,360	4.19	4.33	4.48	4.65	5.02
IULR430-0090-0100-0800		0.1	8	0.7	0.87	15	4	50	7,360	8.32	8.61	8.92	9.25	9.99
IULR430-0100-0020-0200	1	0.02	2	0.8	0.95	15	4	50	4,960	2.16	2.24	2.32	2.40	2.60
IULR430-0100-0020-0300		0.02	3	0.8	0.95	15	4	50	4,960	3.20	3.31	3.43	3.55	3.84
IULR430-0100-0020-0400		0.02	4	0.8	0.95	15	4	50	4,960	4.23	4.38	4.53	4.70	5.08
IULR430-0100-0020-0500		0.02	5	0.8	0.95	15	4	50	4,960	5.26	5.45	5.64	5.85	6.33
IULR430-0100-0020-0600		0.02	6	0.8	0.95	15	4	50	5,440	6.30	6.52	6.75	7.00	7.57
IULR430-0100-0020-0800		0.02	8	0.8	0.95	15	4	50	5,440	8.37	8.66	8.97	9.30	10.06
IULR430-0100-0020-1000		0.02	10	0.8	0.95	15	4	50	5,440	10.43	10.80	11.18	11.60	12.54
IULR430-0100-0050-0200		0.05	2	0.8	0.95	15	4	50	4,960	2.16	2.24	2.31	2.40	2.59
IULR430-0100-0050-0300		0.05	3	0.8	0.95	15	4	50	4,960	3.20	3.31	3.42	3.55	3.83
IULR430-0100-0050-0400		0.05	4	0.8	0.95	15	4	50	4,960	4.23	4.38	4.53	4.70	5.08
IULR430-0100-0050-0500		0.05	5	0.8	0.95	15	4	50	4,960	5.26	5.44	5.64	5.85	6.32
IULR430-0100-0050-0600		0.05	6	0.8	0.95	15	4	50	5,440	6.30	6.51	6.75	7.00	7.56
IULR430-0100-0050-0800		0.05	8	0.8	0.95	15	4	50	5,440	8.36	8.65	8.96	9.30	10.05
IULR430-0100-0050-1000		0.05	10	0.8	0.95	15	4	50	5,440	10.43	10.79	11.18	11.60	12.54
IULR430-0100-0100-0200		0.1	2	0.8	0.95	15	4	50	4,960	2.16	2.23	2.31	2.39	2.58
IULR430-0100-0100-0300		0.1	3	0.8	0.95	15	4	50	4,960	3.19	3.30	3.42	3.54	3.82
IULR430-0100-0100-0400		0.1	4	0.8	0.95	15	4	50	4,960	4.23	4.37	4.53	4.69	5.07
IULR430-0100-0100-0500		0.1	5	0.8	0.95	15	4	50	4,960	5.26	5.44	5.63	5.84	6.31
IULR430-0100-0100-0600		0.1	6	0.8	0.95	15	4	50	5,440	6.30	6.51	6.74	6.99	7.55
IULR430-0100-0100-0800		0.1	8	0.8	0.95	15	4	50	5,440	8.36	8.65	8.96	9.29	10.04
IULR430-0100-0100-1000		0.1	10	0.8	0.95	15	4	50	4,960	10.43	10.79	11.18	11.59	12.52
IULR430-0100-0200-0200		0.2	2	0.8	0.95	15	4	50	4,960	2.16	2.23	2.30	2.38	2.56
IULR430-0100-0200-0300		0.2	3	0.8	0.95	15	4	50	4,960	3.19	3.30	3.41	3.53	3.80
IULR430-0100-0200-0400		0.2	4	0.8	0.95	15	4	50	4,960	4.22	4.36	4.52	4.68	5.04
IULR430-0100-0200-0500		0.2	5	0.8	0.95	15	4	50	4,960	5.26	5.43	5.62	5.83	6.29
IULR430-0100-0200-0600		0.2	6	0.8	0.95	15	4	50	5,440	6.29	6.50	6.73	6.98	7.53
IULR430-0100-0200-0800		0.2	8	0.8	0.95	15	4	50	5,440	8.36	8.64	8.95	9.28	10.01
IULR430-0100-0200-1000		0.2	10	0.8	0.95	15	4	50	5,440	10.43	10.78	11.17	11.58	12.50



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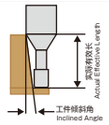
单位(Size) : mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR430-0100-0300-0200	1	0.3	2	0.8	0.95	15	4	50	4,960	2.15	2.22	2.29	2.36	2.53
IULR430-0100-0300-0300		0.3	3	0.8	0.95	15	4	50	4,960	3.19	3.29	3.40	3.51	3.78
IULR430-0100-0300-0400		0.3	4	0.8	0.95	15	4	50	4,960	4.22	4.36	4.50	4.66	5.02
IULR430-0100-0300-0500		0.3	5	0.8	0.95	15	4	50	4,960	5.25	5.43	5.61	5.81	6.26
IULR430-0100-0300-0600		0.3	6	0.8	0.95	15	4	50	5,440	6.29	6.50	6.72	6.96	7.51
IULR430-0100-0300-0800		0.3	8	0.8	0.95	15	4	50	5,440	8.36	8.64	8.94	9.26	9.99
IULR430-0100-0300-1000		0.3	10	0.8	0.95	15	4	50	5,440	10.42	10.78	11.15	11.56	12.48
IULR430-0120-0100-0500	1.2	0.1	5	1	1.15	15	4	50	5,600	5.26	5.44	5.63	5.84	6.31
IULR430-0120-0100-1000		0.1	10	1	1.15	15	4	50	5,600	10.43	10.79	11.18	11.59	12.52
IULR430-0120-0200-0500		0.2	5	1	1.15	15	4	50	5,600	5.26	5.43	5.62	5.83	6.29
IULR430-0120-0200-1000		0.2	10	1	1.15	15	4	50	5,600	10.43	10.78	11.17	11.58	12.50
IULR430-0120-0300-0500		0.3	5	1	1.15	15	4	50	5,600	5.25	5.43	5.61	5.81	6.26
IULR430-0120-0300-1000		0.3	10	1	1.15	15	4	50	5,600	10.42	10.78	11.15	11.56	12.48
IULR430-0150-0020-0300	1.5	0.02	3	1.2	1.45	15	4	50	5,280	3.20	3.31	3.43	3.55	3.84
IULR430-0150-0020-0400		0.02	4	1.2	1.45	15	4	50	5,280	4.23	4.38	4.53	4.70	5.08
IULR430-0150-0020-0600		0.02	6	1.2	1.45	15	4	50	5,280	6.30	6.52	6.75	7.00	7.57
IULR430-0150-0020-0800		0.02	8	1.2	1.45	15	4	50	5,600	8.37	8.66	8.97	9.30	10.06
IULR430-0150-0020-1200		0.02	12	1.2	1.45	15	4	50	5,600	12.50	12.93	13.40	13.90	15.03
IULR430-0150-0020-1500		0.02	15	1.2	1.45	15	4	50	5,600	15.60	16.14	16.73	17.35	18.76
IULR430-0150-0050-0300		0.05	3	1.2	1.45	15	4	50	5,280	3.20	3.31	3.42	3.55	3.83
IULR430-0150-0050-0400		0.05	4	1.2	1.45	15	4	50	5,280	4.23	4.38	4.53	4.70	5.08
IULR430-0150-0050-0600		0.05	6	1.2	1.45	15	4	50	5,280	6.30	6.51	6.75	7.00	7.56
IULR430-0150-0050-0800		0.05	8	1.2	1.45	15	4	50	5,600	8.36	8.65	8.96	9.30	10.05
IULR430-0150-0050-1200		0.05	12	1.2	1.45	15	4	50	5,600	12.50	12.93	13.40	13.90	15.02
IULR430-0150-0050-1500		0.05	15	1.2	1.45	15	4	50	5,600	15.60	16.14	16.72	17.35	18.75
IULR430-0150-0100-0300		0.1	3	1.2	1.45	15	4	50	5,280	3.19	3.30	3.42	3.54	3.82
IULR430-0150-0100-0400		0.1	4	1.2	1.45	15	4	50	5,280	4.23	4.37	4.53	4.69	5.07
IULR430-0150-0100-0600		0.1	6	1.2	1.45	15	4	50	5,280	6.30	6.51	6.74	6.99	7.55
IULR430-0150-0100-0800		0.1	8	1.2	1.45	15	4	50	5,600	8.36	8.65	8.96	9.29	10.04
IULR430-0150-0100-1200		0.1	12	1.2	1.45	15	4	50	5,600	12.50	12.93	13.39	13.89	15.01
IULR430-0150-0100-1500		0.1	15	1.2	1.45	15	4	50	5,600	15.60	16.14	16.72	17.34	18.74
IULR430-0150-0200-0300		0.2	3	1.2	1.45	15	4	50	5,280	3.19	3.30	3.41	3.53	3.80
IULR430-0150-0200-0400		0.2	4	1.2	1.45	15	4	50	5,280	4.22	4.36	4.52	4.68	5.04
IULR430-0150-0200-0600		0.2	6	1.2	1.45	15	4	50	5,280	6.29	6.50	6.73	6.98	7.53
IULR430-0150-0200-0800		0.2	8	1.2	1.45	15	4	50	5,600	8.36	8.64	8.95	9.28	10.01
IULR430-0150-0200-1200		0.2	12	1.2	1.45	15	4	50	5,600	12.49	12.92	13.38	13.88	14.99
IULR430-0150-0200-1500		0.2	15	1.2	1.45	15	4	50	5,600	15.59	16.13	16.71	17.33	18.72
IULR430-0150-0300-0300		0.3	3	1.2	1.45	15	4	50	5,280	3.19	3.29	3.40	3.51	3.78
IULR430-0150-0300-0400		0.3	4	1.2	1.45	15	4	50	5,280	4.22	4.36	4.50	4.66	5.02
IULR430-0150-0300-0600		0.3	6	1.2	1.45	15	4	50	5,280	6.29	6.50	6.72	6.96	7.51
IULR430-0150-0300-0800		0.3	8	1.2	1.45	15	4	50	5,600	8.36	8.64	8.94	9.26	9.99
IULR430-0150-0300-1200		0.3	12	1.2	1.45	15	4	50	5,600	12.49	12.92	13.37	13.86	14.96
IULR430-0150-0300-1500		0.3	15	1.2	1.45	15	4	50	5,600	15.59	16.12	16.70	17.31	18.69
IULR430-0150-0500-0300		0.5	3	1.2	1.45	15	4	50	5,280	3.18	3.27	3.37	3.48	3.73
IULR430-0150-0500-0400		0.5	4	1.2	1.45	15	4	50	5,280	4.21	4.34	4.48	4.63	4.97



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR430-0150-0500-0600	1.5	0.5	6	1.2	1.45	15	4	50	5,280	6.28	6.48	6.70	6.93	7.46
IULR430-0150-0500-0800		0.5	8	1.2	1.45	15	4	50	5,600	8.35	8.62	8.92	9.23	9.95
IULR430-0150-0500-1200		0.5	12	1.2	1.45	15	4	50	5,600	12.48	12.90	13.35	13.83	14.92
IULR430-0150-0500-1500		0.5	15	1.2	1.45	15	4	50	5,600	15.58	16.11	16.67	17.28	18.65
IULR430-0200-0020-0400	2	0.02	4	1.6	1.94	15	4	50	5,280	4.25	4.40	4.56	4.73	5.11
IULR430-0200-0020-0600		0.02	6	1.6	1.94	15	4	50	5,280	6.32	6.54	6.77	7.02	7.59
IULR430-0200-0020-0800		0.02	8	1.6	1.94	15	4	50	5,600	8.38	8.68	8.99	9.32	10.08
IULR430-0200-0020-1200		0.02	12	1.6	1.94	15	4	50	5,600	12.52	12.95	13.42	13.92	15.05
IULR430-0200-0020-1600		0.02	16	1.6	1.94	15	4	50	5,600	16.65	17.23	17.85	18.52	FREE
IULR430-0200-0020-2000		0.02	20	1.6	1.94	15	4	50	5,600	20.79	21.51	22.29	23.12	FREE
IULR430-0200-0050-0400		0.05	4	1.6	1.94	15	4	50	5,280	4.25	4.40	4.55	4.72	5.10
IULR430-0200-0050-0600		0.05	6	1.6	1.94	15	4	50	5,280	6.32	6.53	6.77	7.02	7.59
IULR430-0200-0050-0800		0.05	8	1.6	1.94	15	4	50	5,600	8.38	8.67	8.99	9.32	10.07
IULR430-0200-0050-1200		0.05	12	1.6	1.94	15	4	50	5,600	12.52	12.95	13.42	13.92	15.05
IULR430-0200-0050-1600		0.05	16	1.6	1.94	15	4	50	5,600	16.65	17.23	17.85	18.52	FREE
IULR430-0200-0050-2000		0.05	20	1.6	1.94	15	4	50	5,600	20.79	21.51	22.28	23.12	FREE
IULR430-0200-0100-0400		0.1	4	1.6	1.94	15	4	50	5,280	4.25	4.39	4.55	4.71	5.09
IULR430-0200-0100-0600		0.1	6	1.6	1.94	15	4	50	4,800	6.31	6.53	6.76	7.01	7.57
IULR430-0200-0100-0800		0.1	8	1.6	1.94	15	4	50	5,600	8.38	8.67	8.98	9.31	10.06
IULR430-0200-0100-1200		0.1	12	1.6	1.94	15	4	50	5,600	12.52	12.95	13.41	13.91	15.03
IULR430-0200-0100-1600		0.1	16	1.6	1.94	15	4	50	5,600	16.65	17.23	17.85	18.51	FREE
IULR430-0200-0100-2000		0.1	20	1.6	1.94	15	4	50	5,600	20.79	21.51	22.28	23.11	FREE
IULR430-0200-0200-0400		0.2	4	1.6	1.94	15	4	50	5,280	4.24	4.38	4.54	4.70	5.07
IULR430-0200-0200-0600		0.2	6	1.6	1.94	15	4	50	4,800	6.31	6.52	6.75	7.00	7.55
IULR430-0200-0200-0800		0.2	8	1.6	1.94	15	4	50	5,600	8.38	8.66	8.97	9.30	10.04
IULR430-0200-0200-1200		0.2	12	1.6	1.94	15	4	50	5,600	12.51	12.94	13.40	13.90	15.01
IULR430-0200-0200-1600		0.2	16	1.6	1.94	15	4	50	5,600	16.65	17.22	17.84	18.50	FREE
IULR430-0200-0200-2000		0.2	20	1.6	1.94	15	4	50	5,600	20.78	21.50	22.27	23.10	FREE
IULR430-0200-0300-0400		0.3	4	1.6	1.94	15	4	50	5,280	4.24	4.38	4.53	4.68	5.04
IULR430-0200-0300-0600		0.3	6	1.6	1.94	15	4	50	4,800	6.31	6.52	6.74	6.98	7.53
IULR430-0200-0300-0800		0.3	8	1.6	1.94	15	4	50	5,600	8.37	8.66	8.96	9.28	10.02
IULR430-0200-0300-1200		0.3	12	1.6	1.94	15	4	50	5,600	12.51	12.94	13.39	13.88	14.99
IULR430-0200-0300-1600		0.3	16	1.6	1.94	15	4	50	5,600	16.64	17.21	17.83	18.48	FREE
IULR430-0200-0300-2000		0.3	20	1.6	1.94	15	4	50	5,600	20.78	21.49	22.26	23.08	FREE
IULR430-0200-0500-0400		0.5	4	1.6	1.94	15	4	50	5,280	4.23	4.36	4.50	4.65	5.00
IULR430-0200-0500-0600		0.5	6	1.6	1.94	15	4	50	5,280	6.30	6.50	6.72	6.95	7.48
IULR430-0200-0500-0800		0.5	8	1.6	1.94	15	4	50	5,600	8.37	8.64	8.94	9.25	9.97
IULR430-0200-0500-1200		0.5	12	1.6	1.94	15	4	50	5,600	12.50	12.92	13.37	13.85	14.94
IULR430-0200-0500-1600		0.5	16	1.6	1.94	15	4	50	5,600	16.64	17.20	17.80	18.45	FREE
IULR430-0200-0500-2000		0.5	20	1.6	1.94	15	4	50	5,600	20.77	21.48	22.24	23.05	FREE
IULR430-0250-0100-1000	2.5	0.1	10	2	2.44	15	4	50	5,760	10.45	10.81	11.20	11.61	12.55
IULR430-0250-0100-2000		0.1	20	2	2.44	15	4	50	6,000	20.79	21.51	22.28	FREE	FREE
IULR430-0250-0200-1000		0.2	10	2	2.44	15	4	50	5,760	10.45	10.80	11.19	11.60	12.52
IULR430-0250-0200-2000		0.2	20	2	2.44	15	4	50	6,000	20.78	21.50	22.27	FREE	FREE
IULR430-0250-0300-1000		0.3	10	2	2.44	15	4	50	5,760	10.44	10.80	11.18	11.58	12.50

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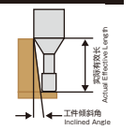

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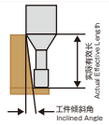
单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR430-0250-0300-2000	2.5	0.3	20	2	2.44	15	4	50	6,000	20.78	21.49	22.26	FREE	FREE
IULR430-0250-0500-1000		0.5	10	2	2.44	15	4	50	5,760	10.44	10.78	11.15	11.55	12.46
IULR430-0250-0500-2000		0.5	20	2	2.44	15	4	50	6,000	20.77	21.48	22.24	FREE	FREE
IULR430-0300-0050-0400	3	0.05	4	2.5	2.85	15	4	50	4,800	4.42	4.57	4.74	4.91	5.31
IULR430-0300-0050-0600		0.05	6	2.5	2.85	15	4	50	4,800	6.49	6.71	6.95	7.21	7.79
IULR430-0300-0050-0800		0.05	8	2.5	2.85	15	4	50	4,800	8.56	8.85	9.17	9.51	FREE
IULR430-0300-0050-1200		0.05	12	2.5	2.85	15	4	50	5,760	12.69	13.13	13.60	14.11	FREE
IULR430-0300-0050-1600		0.05	16	2.5	2.85	15	4	50	7,200	16.83	17.41	18.04	FREE	FREE
IULR430-0300-0050-2000		0.05	20	2.5	2.85	15	4	50	7,200	20.96	21.69	FREE	FREE	FREE
IULR430-0300-0100-0400		0.1	4	2.5	2.85	15	4	50	4,800	4.42	4.57	4.73	4.91	5.30
IULR430-0300-0100-0600		0.1	6	2.5	2.85	15	4	50	4,800	6.49	6.71	6.95	7.21	7.78
IULR430-0300-0100-0800		0.1	8	2.5	2.85	15	4	50	4,800	8.56	8.85	9.17	9.51	FREE
IULR430-0300-0100-1200		0.1	12	2.5	2.85	15	4	50	5,760	12.69	13.13	13.60	14.11	FREE
IULR430-0300-0100-1600		0.1	16	2.5	2.85	15	4	50	7,200	16.82	17.41	18.03	FREE	FREE
IULR430-0300-0100-2000		0.1	20	2.5	2.85	15	4	50	7,200	20.96	21.69	FREE	FREE	FREE
IULR430-0300-0100-2500		0.1	25	2.5	2.85	15	4	60	7,200	26.13	27.03	FREE	FREE	FREE
IULR430-0300-0100-3000		0.1	30	2.5	2.85	15	4	60	8,080	31.30	FREE	FREE	FREE	FREE
IULR430-0300-0200-0400		0.2	4	2.5	2.85	15	4	50	4,800	4.42	4.56	4.72	4.89	5.27
IULR430-0300-0200-0600		0.2	6	2.5	2.85	15	4	50	4,800	6.48	6.70	6.94	7.19	7.76
IULR430-0300-0200-0800		0.2	8	2.5	2.85	15	4	50	4,800	8.55	8.84	9.16	9.49	FREE
IULR430-0300-0200-1200		0.2	12	2.5	2.85	15	4	50	5,760	12.69	13.12	13.59	14.09	FREE
IULR430-0300-0200-1600		0.2	16	2.5	2.85	15	4	50	7,200	16.82	17.40	18.02	FREE	FREE
IULR430-0300-0200-2000		0.2	20	2.5	2.85	15	4	50	7,200	20.96	21.68	FREE	FREE	FREE
IULR430-0300-0200-2500		0.2	25	2.5	2.85	15	4	60	7,200	26.12	27.03	FREE	FREE	FREE
IULR430-0300-0200-3000		0.2	30	2.5	2.85	15	4	60	8,080	31.29	FREE	FREE	FREE	FREE
IULR430-0300-0300-0400		0.3	4	2.5	2.85	15	4	50	4,800	4.41	4.56	4.71	4.88	5.25
IULR430-0300-0300-0600		0.3	6	2.5	2.85	15	4	50	4,800	6.48	6.70	6.93	7.18	7.74
IULR430-0300-0300-0800		0.3	8	2.5	2.85	15	4	50	4,800	8.55	8.84	9.14	9.48	FREE
IULR430-0300-0300-1200		0.3	12	2.5	2.85	15	4	50	5,760	12.68	13.11	13.58	14.08	FREE
IULR430-0300-0300-1600		0.3	16	2.5	2.85	15	4	50	7,200	16.82	17.39	18.01	FREE	FREE
IULR430-0300-0300-2000		0.3	20	2.5	2.85	15	4	50	7,200	20.95	21.67	FREE	FREE	FREE
IULR430-0300-0300-2500		0.3	25	2.5	2.85	15	4	60	7,200	26.12	27.02	FREE	FREE	FREE
IULR430-0300-0300-3000		0.3	30	2.5	2.85	15	4	60	8,080	31.29	FREE	FREE	FREE	FREE
IULR430-0300-0500-0400		0.5	4	2.5	2.85	15	4	50	4,800	4.41	4.54	4.69	4.85	5.20
IULR430-0300-0500-0600		0.5	6	2.5	2.85	15	4	50	4,800	6.47	6.68	6.91	7.15	7.69
IULR430-0300-0500-0800		0.5	8	2.5	2.85	15	4	50	4,800	8.54	8.82	9.12	9.45	FREE
IULR430-0300-0500-1200		0.5	12	2.5	2.85	15	4	50	5,760	12.68	13.10	13.56	14.05	FREE
IULR430-0300-0500-1600		0.5	16	2.5	2.85	15	4	50	7,200	16.81	17.38	17.99	FREE	FREE
IULR430-0300-0500-2000		0.5	20	2.5	2.85	15	4	50	7,200	20.95	21.66	FREE	FREE	FREE
IULR430-0300-0500-2500		0.5	25	2.5	2.85	15	4	60	7,200	26.11	27.01	FREE	FREE	FREE
IULR430-0300-0500-3000		0.5	30	2.5	2.85	15	4	60	8,080	31.28	FREE	FREE	FREE	FREE
IULR430-0300-1000-0800		1	8	2.5	2.85	15	4	50	4,800	8.53	8.79	9.07	9.37	10.06
IULR430-0300-1000-1200		1	12	2.5	2.85	15	4	50	5,760	12.66	13.07	13.50	13.97	FREE
IULR430-0300-1000-1600		1	16	2.5	2.85	15	4	50	7,200	16.79	17.35	17.94	FREE	FREE
IULR430-0300-1000-2000		1	20	2.5	2.85	15	4	50	7,200	20.93	21.62	FREE	FREE	FREE



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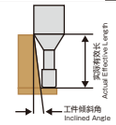
单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR430-0300-1000-2500	3	1	25	2.5	2.85	15	4	60	7,200	26.10	26.97	FREE	FREE	FREE
IULR430-0300-1000-3000		1	30	2.5	2.85	15	4	60	8,080	31.27	FREE	FREE	FREE	FREE
IULR430-0400-0100-0800	4	0.1	8	3.2	3.8	15	6	50	7,200	8.65	8.95	9.27	9.61	10.39
IULR430-0400-0100-1200		0.1	12	3.2	3.8	15	6	50	7,200	12.79	13.23	13.70	14.21	15.36
IULR430-0400-0100-1600		0.1	16	3.2	3.8	15	6	50	7,200	16.92	17.51	18.14	18.81	FREE
IULR430-0400-0100-2400		0.1	24	3.2	3.8	15	6	60	8,000	25.19	26.06	27.00	28.01	FREE
IULR430-0400-0100-3200		0.1	32	3.2	3.8	15	6	70	8,000	33.46	34.62	35.87	FREE	FREE
IULR430-0400-0200-0800		0.2	8	3.2	3.8	15	6	50	7,200	8.65	8.94	9.26	9.60	10.36
IULR430-0400-0200-1200		0.2	12	3.2	3.8	15	6	50	7,200	12.78	13.22	13.69	14.20	15.33
IULR430-0400-0200-1600		0.2	16	3.2	3.8	15	6	50	7,200	16.92	17.50	18.13	18.80	FREE
IULR430-0400-0200-2400		0.2	24	3.2	3.8	15	6	60	8,000	25.19	26.06	26.99	28.00	FREE
IULR430-0400-0200-3200		0.2	32	3.2	3.8	15	6	70	8,000	33.46	34.62	35.86	FREE	FREE
IULR430-0400-0300-0800		0.3	8	3.2	3.8	15	6	50	7,200	8.65	8.94	9.25	9.58	10.34
IULR430-0400-0300-1200		0.3	12	3.2	3.8	15	6	50	7,200	12.78	13.21	13.68	14.18	15.31
IULR430-0400-0300-1600		0.3	16	3.2	3.8	15	6	50	7,200	16.91	17.49	18.11	18.78	FREE
IULR430-0400-0300-2400		0.3	24	3.2	3.8	15	6	60	8,000	25.18	26.05	26.98	27.98	FREE
IULR430-0400-0300-3200		0.3	32	3.2	3.8	15	6	70	8,000	33.45	34.61	35.85	FREE	FREE
IULR430-0400-0500-0800		0.5	8	3.2	3.8	15	6	50	7,200	8.64	8.92	9.23	9.55	10.29
IULR430-0400-0500-1200		0.5	12	3.2	3.8	15	6	50	7,200	12.77	13.20	13.66	14.15	15.27
IULR430-0400-0500-1600		0.5	16	3.2	3.8	15	6	50	7,200	16.91	17.48	18.09	18.75	FREE
IULR430-0400-0500-2400		0.5	24	3.2	3.8	15	6	60	8,000	25.18	26.04	26.96	27.95	FREE
IULR430-0400-0500-3200		0.5	32	3.2	3.8	15	6	70	8,000	33.45	34.59	35.83	FREE	FREE
IULR430-0400-1000-0800		1	8	3.2	3.8	15	6	50	7,200	8.62	8.89	9.17	9.48	10.18
IULR430-0400-1000-1200		1	12	3.2	3.8	15	6	50	7,200	12.76	13.17	13.61	14.08	15.15
IULR430-0400-1000-1600		1	16	3.2	3.8	15	6	50	7,200	16.89	17.45	18.04	18.68	FREE
IULR430-0400-1000-2400		1	24	3.2	3.8	15	6	60	8,000	25.16	26.00	26.91	27.88	FREE
IULR430-0400-1000-3200		1	32	3.2	3.8	15	6	70	8,000	33.43	34.56	35.77	FREE	FREE
IULR430-0500-0100-1500	5	0.1	15	4	4.8	15	6	50	10,240	15.89	16.44	17.03	FREE	FREE
IULR430-0500-0100-2000		0.1	20	4	4.8	15	6	50	10,240	21.06	21.79	FREE	FREE	FREE
IULR430-0500-0100-4000		0.1	40	4	4.8	15	6	70	12,800	41.73	FREE	FREE	FREE	FREE
IULR430-0500-0200-1500		0.2	15	4	4.8	15	6	50	10,240	15.88	16.43	17.02	FREE	FREE
IULR430-0500-0200-2000		0.2	20	4	4.8	15	6	50	10,240	21.05	21.78	FREE	FREE	FREE
IULR430-0500-0200-4000		0.2	40	4	4.8	15	6	70	12,800	41.73	FREE	FREE	FREE	FREE
IULR430-0500-0300-1500		0.3	15	4	4.8	15	6	50	10,240	15.88	16.42	17.01	FREE	FREE
IULR430-0500-0300-2000		0.3	20	4	4.8	15	6	50	10,240	21.05	21.77	FREE	FREE	FREE
IULR430-0500-0300-4000		0.3	40	4	4.8	15	6	70	12,800	41.72	FREE	FREE	FREE	FREE
IULR430-0500-0500-1500		0.5	15	4	4.8	15	6	50	10,240	15.87	16.41	16.98	FREE	FREE
IULR430-0500-0500-2000		0.5	20	4	4.8	15	6	50	10,240	21.04	21.76	FREE	FREE	FREE
IULR430-0500-0500-4000		0.5	40	4	4.8	15	6	70	12,800	41.72	FREE	FREE	FREE	FREE
IULR430-0500-1000-1500		1	15	4	4.8	15	6	50	10,240	15.86	16.38	16.93	FREE	FREE
IULR430-0500-1000-2000		1	20	4	4.8	15	6	50	10,240	21.03	21.72	FREE	FREE	FREE
IULR430-0500-1000-4000		1	40	4	4.8	15	6	70	12,800	41.70	FREE	FREE	FREE	FREE
IULR430-0600-0100-1200	6	0.1	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0100-1800		0.1	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0100-2400		0.1	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	圆角R (R) Corner Radius	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULR430-0600-0100-4800	6	0.1	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0200-1200		0.2	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0200-1800		0.2	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0200-2400		0.2	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0200-4800		0.2	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0300-1200		0.3	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0300-1800		0.3	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0300-2400		0.3	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0300-4800		0.3	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0500-1200		0.5	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0500-1800		0.5	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0500-2400		0.5	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE
IULR430-0600-0500-4800		0.5	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE
IULR430-0600-1000-1200		1	12	5	5.8	15	6	50	10,400	FREE	FREE	FREE	FREE	FREE
IULR430-0600-1000-1800		1	18	5	5.8	15	6	50	13,200	FREE	FREE	FREE	FREE	FREE
IULR430-0600-1000-2400		1	24	5	5.8	15	6	60	13,200	FREE	FREE	FREE	FREE	FREE
IULR430-0600-1000-4800		1	48	5	5.8	15	6	80	16,080	FREE	FREE	FREE	FREE	FREE

ion Depo Type U Series

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IULR430
Model number:IULR430

长颈圆角立铣刀 Long Neck Radius End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	0.9	4	0.03	0.3	1,700	25,000	0.02	0.2	1,400	20,000	0.01	0.15	1,200	18,000
		8	0.01	0.3	800	16,000	0.008	0.2	700	14,000	0.005	0.15	500	10,000
	1.0	2	0.012	0.3	2,300	25,000	0.01	0.25	2,000	21,000	0.008	0.2	1,400	17,000
		3	0.012	0.3	2,100	23,000	0.01	0.25	1,800	20,000	0.008	0.2	1,300	16,000
		4	0.01	0.3	1,800	21,000	0.008	0.25	1,500	18,000	0.005	0.2	1,100	14,000
		5	0.008	0.3	1,600	19,000	0.005	0.25	1,400	16,000	0.003	0.2	1,000	13,000
		6	0.008	0.3	1,400	16,000	0.005	0.25	1,200	14,000	0.003	0.2	850	11,000
		8	0.006	0.3	1,100	15,000	0.005	0.25	900	13,000	0.002	0.2	650	10,000
		10	0.004	0.3	800	13,000	0.003	0.25	700	11,000	0.002	0.2	500	9,000
	1.2	5	0.045	0.4	1,800	20,000	0.03	0.3	1,500	17,000	0.02	0.2	1,100	14,000
		10	0.03	0.4	1,100	13,000	0.01	0.3	950	11,000	0.005	0.2	700	9,000
	1.5	3	0.012	0.5	2,300	23,000	0.01	0.4	2,000	20,000	0.008	0.3	1,400	16,000
		4	0.012	0.5	2,000	21,000	0.01	0.4	1,700	18,000	0.008	0.3	1,200	14,000
		6	0.01	0.5	1,800	19,000	0.008	0.4	1,500	16,000	0.005	0.3	1,100	13,000
		8	0.01	0.5	1,500	16,000	0.008	0.4	1,300	14,000	0.003	0.3	900	11,000
		12	0.008	0.5	1,100	13,000	0.005	0.4	950	11,000	0.002	0.3	650	9,000
		15	0.005	0.5	800	11,000	0.003	0.4	700	9,000	0.002	0.3	500	7,000
	2	4	0.015	0.6	2,300	20,000	0.012	0.5	2,000	17,000	0.008	0.35	1,400	14,000
		6	0.015	0.6	2,100	18,000	0.012	0.5	1,800	15,000	0.008	0.35	1,300	12,000
		8	0.012	0.6	1,800	16,000	0.01	0.5	1,500	14,000	0.005	0.35	1,100	11,000
		12	0.01	0.6	1,400	13,000	0.008	0.5	1,200	11,000	0.003	0.35	850	9,000
		16	0.008	0.6	1,100	11,000	0.005	0.5	950	9,500	0.002	0.35	650	7,500
		20	0.005	0.6	650	8,000	0.003	0.5	550	7,000	0.002	0.35	400	5,500
	2.5	10	0.07	0.7	1,800	13,000	0.05	0.5	1,500	11,000	0.03	0.5	1,100	9,000
		20	0.04	0.7	1,100	9,000	0.02	0.5	950	7,500	0.01	0.5	650	6,000
	3	4	0.1	0.8	2,300	15,000	0.07	0.7	550	13,000	0.05	0.6	1,400	10,000
		6	0.1	0.8	2,100	13,000	0.07	0.7	2,000	11,000	0.05	0.6	1,300	9,000
		8	0.1	0.8	1,800	11,000	0.07	0.7	1,800	9,500	0.05	0.6	1,100	7,500
		12	0.08	0.8	1,600	11,000	0.06	0.7	1,400	9,500	0.04	0.6	1,000	7,500
		16	0.07	0.8	1,500	10,000	0.05	0.7	1,200	8,500	0.03	0.6	900	7,000
		20	0.05	0.8	1,100	8,000	0.04	0.7	950	7,000	0.02	0.6	700	5,500
		25	0.04	0.8	1,000	7,500	0.02	0.7	850	6,500	0.01	0.6	600	5,000
		30	0.03	0.8	650	6,500	0.02	0.7	550	5,500	0.007	0.6	400	4,500
	4	8	0.15	1.2	2,100	10,000	0.08	1	1,800	8,500	0.06	0.8	1,300	7,000
		12	0.15	1.2	2,100	10,000	0.08	1	1,800	8,500	0.06	0.8	1,300	7,000
		16	0.1	1.2	1,800	8,000	0.06	1	1,500	7,000	0.05	0.8	1,100	5,500
		20	0.08	1.2	1,400	7,000	0.05	1	1,200	6,000	0.03	0.8	800	5,000
		24	0.08	1.2	1,300	6,500	0.05	1	1,100	5,500	0.03	0.8	750	4,500
		32	0.04	1.2	1,100	5,500	0.02	1	950	4,500	0.01	0.8	650	3,500
	5	15	0.15	2	2,000	8,000	0.08	1.6	1,700	7,000	0.06	1.2	1,200	5,500
		20	0.1	2	1,600	6,500	0.07	1.6	1,400	5,500	0.05	1.2	1,000	4,500
		40	0.05	2	1,000	4,000	0.02	1.6	850	3,500	0.01	1.2	600	3,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈圆角立铣刀 Long Neck Radius End Mill

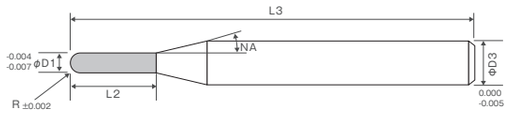
切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
4	6	12	0.18	2.5	2,100	6,500	0.08	2	1,800	5,500	0.06	1.5	1,300	4,500
		18	0.18	2.5	1,800	5,500	0.08	2	1,500	4,500	0.06	1.5	1,100	3,500
		24	0.15	2.5	1,500	5,000	0.07	2	1,300	4,000	0.05	1.5	900	3,000
		48	0.05	2.5	750	2,500	0.03	2	650	2,000	0.02	1.5	450	2,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬球头立铣刀　Carbide Ball End Mill

■型号:IUB230　Model number:IUB230

ion U | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA)仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	球头R (R) Ball R	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IUB230-0010-0050-00010	0.05	0.1	0.1	15	4	50	8,640
IUB230-0015-0075-00015	0.075	0.15	0.15	15	4	50	8,400
IUB230-0020-0100-00020	0.1	0.2	0.2	15	4	50	6,880
IUB230-0030-0150-00030	0.15	0.3	0.3	15	4	50	4,960
IUB230-0040-0200-00060	0.2	0.6	0.4	15	4	50	3,360
IUB230-0050-0250-00080	0.25	0.8	0.5	15	4	50	3,120
IUB230-0060-0300-00090	0.3	0.9	0.6	15	4	50	3,040
IUB230-0080-0400-00120	0.4	1.2	0.8	15	4	50	3,040
IUB230-0100-0500-00150	0.5	1.5	1	15	4	50	2,800
IUB230-0150-0750-00230	0.75	2.3	1.5	15	4	50	3,360
IUB230-0200-1000-00300	1	3	2	15	4	50	3,040
IUB230-0250-1250-00380	1.25	3.8	2.5	15	4	50	4,240
IUB230-0300-1500-00500	1.5	5	3	15	4	50	3,040
IUB230-0400-2000-00600	2	6	4	15	6	50	3,440
IUB230-0500-2500-00800	2.5	8	5	15	6	50	4,160
IUB230-0600-3000-01000	3	10	6	—	6	50	4,320
IUB230-0800-4000-01200	4	12	8	—	8	70	10,960
IUB230-1000-5000-01500	5	15	10	—	10	80	14,080
IUB230-1200-6000-02000	6	20	12	—	12	110	20,240
IUB230-1600-8000-02400	8	24	16	—	16	160	32,000
IUB230-1800-9000-02700	9	27	18	—	18	180	40,080
IUB230-2000-10000-03000	10	30	20	—	20	180	49,920

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IUB230
Model number:IUB230

球头立铣刀 Ball End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of Cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.1	0.003	0.005	120	40,000	0.002	0.005	100	40,000	0.002	0.003	70	40,000
	0.15	0.15	0.003	0.005	180	40,000	0.002	0.005	150	40,000	0.002	0.003	100	40,000
	0.2	0.2	0.01	0.01	350	40,000	0.006	0.005	300	40,000	0.003	0.003	200	40,000
	0.3	0.3	0.01	0.015	350	40,000	0.007	0.01	300	40,000	0.003	0.005	280	40,000
	0.4	0.6	0.03	0.05	800	40,000	0.03	0.03	720	40,000	0.009	0.02	580	40,000
	0.5	0.8	0.03	0.05	1,000	40,000	0.02	0.03	860	40,000	0.01	0.02	650	40,000
	0.6	0.9	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
	0.8	1.2	0.1	0.15	2,000	40,000	0.07	0.1	1,600	40,000	0.05	0.1	1,200	30,000
	1	1.5	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
	1.5	2.3	0.15	0.3	3,000	30,000	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000
	2	3	0.2	0.5	3,000	25,000	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000
	2.5	3.8	0.3	0.4	2,800	20,000	0.2	0.5	2,300	20,000	0.15	0.4	2,000	18,000
	3	5	0.2	0.8	3,000	20,000	0.2	0.6	2,500	18,000	0.2	0.5	2,000	14,000
	4	6	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000
	5	8	0.3	1.5	3,000	18,000	0.2	1.2	2,500	12,000	0.2	0.7	2,000	9,200
	6	10	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
	8	12	0.4	2.4	450	3,600	0.35	1.8	400	2,600	0.35	1.8	350	2,600
	10	15	0.5	2	450	2,900	0.45	1.5	400	1,900	0.45	1.5	350	1,900
	12	20	0.6	2.4	450	2,400	0.55	2	400	1,400	0.55	2	350	1,400
	16	24	0.8	3.2	450	1,800	0.75	2	400	1,000	0.75	2	350	1,000
	18	27	0.9	3.6	450	1,600	0.85	2	400	900	0.85	2	350	900
	20	30	1	4	450	1,450	0.9	2.5	400	800	0.9	2.5	350	800

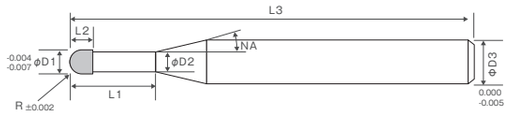
●请将刀具确实地固定在刀柄上,以防止刀具振动。　Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。　Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。　∂p=Axial Depth of Cut　∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。　We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。　Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。　Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type U Series

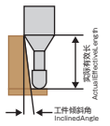
超硬长颈球头立铣刀
Carbide Long Neck Ball End Mill

ion U | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型番:IULB230 Model number:IULB230



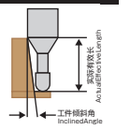
所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

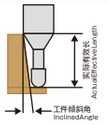
型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULB230-0010-0050-0020	0.05	0.2	0.07	0.1	0.08	15	4	50	8,240	0.24	0.25	0.26	0.27	0.28
IULB230-0010-0050-0030		0.3	0.07	0.1	0.08	15	4	50	8,240	0.35	0.36	0.37	0.38	0.41
IULB230-0010-0050-0050		0.5	0.07	0.1	0.08	15	4	50	8,960	0.55	0.57	0.59	0.61	0.66
IULB230-0015-0075-0030	0.075	0.3	0.1	0.15	0.13	15	4	50	9,600	0.35	0.36	0.37	0.38	0.40
IULB230-0015-0075-0050		0.5	0.1	0.15	0.13	15	4	50	10,160	0.55	0.57	0.59	0.61	0.65
IULB230-0020-0100-0030	0.1	0.3	0.15	0.2	0.18	15	4	50	5,760	0.35	0.35	0.36	0.37	0.40
IULB230-0020-0100-0050		0.5	0.15	0.2	0.18	15	4	50	5,760	0.55	0.57	0.58	0.60	0.64
IULB230-0020-0100-0075		0.75	0.15	0.2	0.18	15	4	50	5,760	0.81	0.84	0.86	0.89	0.96
IULB230-0020-0100-0100		1	0.15	0.2	0.18	15	4	50	5,760	1.07	1.10	1.14	1.18	1.27
IULB230-0030-0150-0050	0.15	0.5	0.2	0.3	0.27	15	4	50	5,680	0.57	0.58	0.60	0.62	0.66
IULB230-0030-0150-0060		0.6	0.2	0.3	0.27	15	4	50	5,680	0.67	0.69	0.71	0.73	0.78
IULB230-0030-0150-0075		0.75	0.2	0.3	0.27	15	4	50	5,680	0.83	0.85	0.88	0.90	0.97
IULB230-0030-0150-0100		1	0.2	0.3	0.27	15	4	50	5,680	1.09	1.12	1.15	1.19	1.28
IULB230-0030-0150-0125		1.25	0.2	0.3	0.27	15	4	50	6,080	1.34	1.39	1.43	1.48	1.59
IULB230-0030-0150-0150		1.5	0.2	0.3	0.27	15	4	50	6,080	1.60	1.65	1.71	1.77	1.90
IULB230-0030-0150-0175		1.75	0.2	0.3	0.27	15	4	50	6,080	1.86	1.92	1.99	2.05	2.21
IULB230-0030-0150-0200		2	0.2	0.3	0.27	15	4	50	6,080	2.12	2.19	2.26	2.34	2.52
IULB230-0030-0150-0225		2.25	0.2	0.3	0.27	15	4	50	6,240	2.38	2.46	2.54	2.63	2.83
IULB230-0030-0150-0250		2.5	0.2	0.3	0.27	15	4	50	6,240	2.64	2.72	2.82	2.92	3.14
IULB230-0030-0150-0300		3	0.2	0.3	0.27	15	4	50	6,240	3.15	3.26	3.37	3.49	3.76
IULB230-0040-0200-0050	0.2	0.5	0.3	0.4	0.37	15	4	50	3,920	0.57	0.58	0.59	0.61	0.64
IULB230-0040-0200-0080		0.8	0.3	0.4	0.37	15	4	50	3,920	0.88	0.90	0.93	0.95	1.02
IULB230-0040-0200-0100		1	0.3	0.4	0.37	15	4	50	3,920	1.08	1.12	1.15	1.18	1.27
IULB230-0040-0200-0150		1.5	0.3	0.4	0.37	15	4	50	4,000	1.60	1.65	1.70	1.76	1.89
IULB230-0040-0200-0200		2	0.3	0.4	0.37	15	4	50	4,080	2.12	2.19	2.26	2.33	2.51
IULB230-0040-0200-0250		2.5	0.3	0.4	0.37	15	4	50	4,240	2.64	2.72	2.81	2.91	3.13
IULB230-0040-0200-0300		3	0.3	0.4	0.37	15	4	50	4,480	3.15	3.26	3.37	3.48	3.75
IULB230-0050-0250-0100	0.25	1	0.35	0.5	0.47	15	4	50	3,920	1.08	1.11	1.14	1.18	1.26
IULB230-0050-0250-0150		1.5	0.5	0.5	0.47	15	4	50	3,920	1.60	1.65	1.70	1.75	1.88
IULB230-0050-0250-0200		2	0.35	0.5	0.47	15	4	50	3,920	2.12	2.18	2.25	2.33	2.50



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IULB230-0050-0250-0250	0.25	2.5	0.35	0.5	0.47	15	4	50	3,920	2.63	2.72	2.81	2.90	3.12
IULB230-0050-0250-0300		3	0.5	0.5	0.47	15	4	50	3,920	3.15	3.25	3.36	3.48	3.74
IULB230-0050-0250-0350		3.5	0.35	0.5	0.47	15	4	50	3,920	3.67	3.79	3.91	4.05	4.36
IULB230-0050-0250-0400		4	0.35	0.5	0.47	15	4	50	3,920	4.18	4.32	4.47	4.63	4.98
IULB230-0060-0300-0100	0.3	1	0.45	0.6	0.57	15	4	50	3,360	1.08	1.11	1.14	1.17	1.24
IULB230-0060-0300-0150		1.5	0.45	0.6	0.57	15	4	50	3,040	1.60	1.64	1.69	1.74	1.87
IULB230-0060-0300-0200		2	0.45	0.6	0.57	15	4	50	3,040	2.12	2.18	2.25	2.32	2.49
IULB230-0060-0300-0250		2.5	0.45	0.6	0.57	15	4	50	3,120	2.63	2.71	2.80	2.89	3.11
IULB230-0060-0300-0300		3	0.45	0.6	0.57	15	4	50	3,120	3.15	3.25	3.35	3.47	3.73
IULB230-0060-0300-0350		3.5	0.45	0.6	0.57	15	4	50	3,200	3.67	3.78	3.91	4.04	4.35
IULB230-0060-0300-0400		4	0.45	0.6	0.57	15	4	50	3,200	4.18	4.32	4.46	4.62	4.97
IULB230-0060-0300-0450		4.5	0.45	0.6	0.57	15	4	50	3,200	4.70	4.85	5.02	5.19	5.59
IULB230-0060-0300-0500		5	0.45	0.6	0.57	15	4	50	3,200	5.22	5.39	5.57	5.77	6.22
IULB230-0060-0300-0550		5.5	0.45	0.6	0.57	15	4	50	3,200	5.73	5.92	6.13	6.34	6.84
IULB230-0060-0300-0600		6	0.45	0.6	0.57	15	4	50	3,200	6.25	6.46	6.68	6.92	7.46
IULB230-0070-0350-0200	0.35	2	0.5	0.7	0.67	15	4	50	3,440	2.11	2.18	2.24	2.31	2.48
IULB230-0070-0350-0400		4	0.5	0.7	0.67	15	4	50	3,680	4.18	4.31	4.46	4.61	4.96
IULB230-0070-0350-0600		6	0.5	0.7	0.67	15	4	50	3,680	6.25	6.45	6.67	6.91	7.45
IULB230-0080-0400-0200	0.4	2	0.6	0.8	0.77	15	4	50	3,040	2.11	2.17	2.24	2.31	2.46
IULB230-0080-0400-0300		3	0.6	0.8	0.77	15	4	50	3,200	3.15	3.24	3.34	3.46	3.71
IULB230-0080-0400-0400		4	0.6	0.8	0.77	15	4	50	3,200	4.18	4.31	4.45	4.60	4.95
IULB230-0080-0400-0500		5	0.6	0.8	0.77	15	4	50	3,200	5.21	5.38	5.56	5.75	6.19
IULB230-0080-0400-0600		6	0.6	0.8	0.77	15	4	50	3,200	6.25	6.45	6.67	6.90	7.44
IULB230-0080-0400-0700		7	0.6	0.8	0.77	15	4	50	3,200	7.28	7.52	7.78	8.05	8.68
IULB230-0080-0400-0800		8	0.6	0.8	0.77	15	4	50	3,200	8.31	8.59	8.89	9.20	9.92
IULB230-0090-0450-0200	0.45	2	0.65	0.9	0.87	15	4	50	3,440	2.11	2.17	2.23	2.30	2.45
IULB230-0090-0450-0400		4	0.65	0.9	0.87	15	4	50	3,680	4.18	4.31	4.45	4.60	4.94
IULB230-0090-0450-0600		6	0.65	0.9	0.87	15	4	50	3,680	6.24	6.45	6.66	6.90	7.42
IULB230-0090-0450-0800		8	0.65	0.9	0.87	15	4	50	3,680	8.31	8.59	8.88	9.20	9.91
IULB230-0100-0500-0200	0.5	2	0.75	1	0.95	15	4	50	2,560	2.15	2.20	2.27	2.33	2.49
IULB230-0100-0500-0250		2.5	0.75	1	0.95	15	4	50	2,560	2.66	2.74	2.82	2.91	3.11
IULB230-0100-0500-0300		3	0.8	1	0.95	15	4	50	2,560	3.18	3.27	3.37	3.48	3.73
IULB230-0100-0500-0400		4	0.75	1	0.95	15	4	50	2,880	4.21	4.34	4.48	4.63	4.97
IULB230-0100-0500-0500		5	0.75	1	0.95	15	4	50	2,880	5.25	5.41	5.59	5.78	6.22
IULB230-0100-0500-0600		6	0.8	1	0.95	15	4	50	3,120	6.28	6.48	6.70	6.93	7.46
IULB230-0100-0500-0700		7	0.75	1	0.95	15	4	50	3,120	7.32	7.55	7.81	8.08	8.70
IULB230-0100-0500-0800		8	0.75	1	0.95	15	4	50	3,120	8.35	8.62	8.92	9.23	9.95
IULB230-0100-0500-0900		9	0.75	1	0.95	15	4	50	3,120	9.38	9.69	10.02	10.38	11.19
IULB230-0100-0500-1000		10	0.8	1	0.95	15	4	50	3,120	10.42	10.76	11.13	11.53	12.43
IULB230-0100-0500-1200		12	0.75	1	0.95	15	4	50	3,120	12.48	12.90	13.35	13.83	14.92
IULB230-0120-0600-0240	0.6	2.4	0.9	1.2	1.15	15	4	50	3,840	2.56	2.63	2.70	2.78	2.96
IULB230-0120-0600-0400		4	0.9	1.2	1.15	15	4	50	3,840	4.21	4.34	4.47	4.62	4.95
IULB230-0120-0600-0600		6	0.9	1.2	1.15	15	4	50	4,160	6.28	6.48	6.69	6.92	7.44
IULB230-0120-0600-0800		8	0.9	1.2	1.15	15	4	50	4,160	8.35	8.62	8.91	9.22	9.92
IULB230-0120-0600-1000		10	0.9	1.2	1.15	15	4	50	4,160	10.41	10.76	11.12	11.52	12.41



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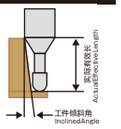
单位(Size) : mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
										30'	1°	1°30'	2°	3°
IULB230-0120-0600-1200	0.6	12	0.9	1.2	1.15	15	4	50	4,160	12.48	12.89	13.34	13.82	14.90
IULB230-0140-0700-0800	0.7	8	1	1.4	1.35	15	4	50	3,600	8.34	8.61	8.90	9.20	9.90
IULB230-0140-0700-1200		12	1	1.4	1.35	15	4	50	3,600	12.48	12.89	13.33	13.80	14.87
IULB230-0140-0700-1600		16	1	1.4	1.35	15	4	50	3,600	16.61	17.17	17.76	18.40	19.84
IULB230-0150-0750-0300	0.75	3	1.1	1.5	1.45	15	4	50	2,960	3.17	3.26	3.35	3.45	3.67
IULB230-0150-0750-0400		4	1.1	1.5	1.45	15	4	50	2,960	4.21	4.33	4.46	4.60	4.92
IULB230-0150-0750-0600		6	1.1	1.5	1.45	15	4	50	2,960	6.27	6.47	6.67	6.90	7.40
IULB230-0150-0750-0800		8	1.1	1.5	1.45	15	4	50	3,120	8.34	8.61	8.89	9.20	9.89
IULB230-0150-0750-1000		10	1.1	1.5	1.45	15	4	50	3,360	10.41	10.74	11.11	11.50	12.37
IULB230-0150-0750-1200		12	1.1	1.5	1.45	15	4	50	3,600	12.48	12.88	13.32	13.80	14.86
IULB230-0150-0750-1400		14	1.1	1.5	1.45	15	4	50	3,600	14.54	15.02	15.54	16.09	17.35
IULB230-0150-0750-1600		16	1.1	1.5	1.45	15	4	50	3,600	16.61	17.16	17.76	18.39	19.83
IULB230-0160-0800-0800	0.8	8	1.2	1.6	1.55	15	4	50	4,160	8.34	8.60	8.88	9.19	9.88
IULB230-0160-0800-1200		12	1.2	1.6	1.55	15	4	50	4,160	12.47	12.88	13.32	13.79	14.85
IULB230-0160-0800-1600		16	1.2	1.6	1.55	15	4	50	4,160	16.61	17.16	17.75	18.39	19.82
IULB230-0200-1000-0300	1	3	1.5	2	1.94	15	4	50	2,560	3.18	3.26	3.34	3.43	3.64
IULB230-0200-1000-0400		4	1.5	2	1.94	15	4	50	2,560	4.22	4.33	4.45	4.58	4.88
IULB230-0200-1000-0600		6	1.5	2	1.94	15	4	50	2,880	6.28	6.47	6.67	6.88	7.37
IULB230-0200-1000-0800		8	1.5	2	1.94	15	4	50	3,120	8.35	8.61	8.88	9.18	9.85
IULB230-0200-1000-1000		10	1.5	2	1.94	15	4	50	3,120	10.42	10.75	11.10	11.48	12.34
IULB230-0200-1000-1200		12	1.5	2	1.94	15	4	50	3,120	12.49	12.89	13.32	13.78	14.83
IULB230-0200-1000-1300		13	1.5	2	1.94	15	4	50	3,120	13.52	13.96	14.43	14.93	16.07
IULB230-0200-1000-1400		14	1.5	2	1.94	15	4	50	3,120	14.55	15.03	15.53	16.08	17.31
IULB230-0200-1000-1600		16	1.5	2	1.94	15	4	50	3,120	16.62	17.17	17.75	18.38	19.80
IULB230-0200-1000-1800		18	1.5	2	1.94	15	4	50	3,120	18.69	19.30	19.97	20.68	FREE
IULB230-0200-1000-2000		20	1.5	2	1.94	15	4	50	3,120	20.76	21.44	22.18	22.98	FREE
IULB230-0250-1250-0600	1.25	6	2.3	2.5	2.44	15	4	50	3,840	6.28	6.45	6.64	6.84	7.31
IULB230-0250-1250-0800		8	2.3	2.5	2.44	15	4	50	3,360	8.34	8.59	8.86	9.14	9.80
IULB230-0250-1250-1000		10	2.3	2.5	2.44	15	4	50	4,080	10.41	10.73	11.07	11.44	12.28
IULB230-0250-1250-1500		15	2.3	2.5	2.44	15	4	50	4,160	15.58	16.08	16.62	17.19	FREE
IULB230-0250-1250-2000		20	2.3	2.5	2.44	15	4	50	4,880	20.75	21.43	22.16	FREE	FREE
IULB230-0300-1500-0600	1.5	6	2.5	3	2.85	15	4	50	3,120	6.44	6.61	6.80	7.00	7.46
IULB230-0300-1500-0800		8	2.5	3	2.85	15	4	50	3,120	8.51	8.75	9.02	9.30	9.95
IULB230-0300-1500-1000		10	2.5	3	2.85	15	4	50	3,600	10.58	10.89	11.23	11.60	FREE
IULB230-0300-1500-1200		12	2.5	3	2.85	15	4	50	3,760	12.64	13.03	13.45	13.90	FREE
IULB230-0300-1500-1400		14	2.5	3	2.85	15	4	50	4,160	14.71	15.17	15.67	FREE	FREE
IULB230-0300-1500-1600		16	2.5	3	2.85	15	4	50	4,160	16.78	17.31	17.88	FREE	FREE
IULB230-0300-1500-2000		20	2.5	3	2.85	15	4	50	4,000	20.91	21.59	FREE	FREE	FREE
IULB230-0300-1500-2500		25	2.5	3	2.85	15	4	60	4,000	26.08	26.94	FREE	FREE	FREE
IULB230-0300-1500-3000		30	2.5	3	2.85	15	4	60	4,560	31.25	FREE	FREE	FREE	FREE
IULB230-0350-1750-1500	1.75	15	2.8	3.5	3.35	15	6	50	5,280	15.74	16.22	16.75	17.31	18.59
IULB230-0350-1750-2000		20	2.8	3.5	3.35	15	6	50	5,280	20.90	21.57	22.29	23.06	24.81
IULB230-0350-1750-2500		25	2.8	3.5	3.35	15	6	60	5,600	26.07	26.92	27.83	28.81	FREE
IULB230-0350-1750-3000		30	2.8	3.5	3.35	15	6	60	5,600	31.24	32.27	33.37	34.56	FREE
IULB230-0350-1750-3500		35	2.8	3.5	3.35	15	6	70	7,200	36.41	37.62	38.91	FREE	FREE

ion Depo Type U Series



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	球头R (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece.				
										30'	1°	1°30'	2°	3°
IULB230-0400-2000-0800	2	8	3	4	3.8	15	6	50	3,200	8.59	8.82	9.07	9.33	9.95
IULB230-0400-2000-1000		10	3	4	3.8	15	6	50	3,200	10.66	10.96	11.28	11.63	12.43
IULB230-0400-2000-1200		12	3	4	3.8	15	6	50	4,160	12.72	13.10	13.50	13.93	14.92
IULB230-0400-2000-1400		14	3	4	3.8	15	6	50	4,160	14.79	15.24	15.72	16.23	17.41
IULB230-0400-2000-1500		15	3	4	3.8	15	6	50	4,160	15.82	16.31	16.82	17.38	18.65
IULB230-0400-2000-2000		20	3	4	3.8	15	6	50	4,160	20.99	21.65	22.37	23.13	FREE
IULB230-0400-2000-2500		25	3	4	3.8	15	6	60	4,160	26.16	27.00	27.91	28.88	FREE
IULB230-0400-2000-3000		30	3	4	3.8	15	6	60	4,160	31.33	32.35	33.45	FREE	FREE
IULB230-0400-2000-3500		35	3	4	3.8	15	6	70	4,800	36.50	37.70	38.99	FREE	FREE
IULB230-0500-2500-1500	2.5	15	3.5	5	4.8	15	6	50	6,880	15.81	16.27	16.77	FREE	FREE
IULB230-0500-2500-2000		20	3.5	5	4.8	15	6	50	6,960	20.98	21.62	FREE	FREE	FREE
IULB230-0500-2500-2500		25	3.5	5	4.8	15	6	60	6,960	26.14	26.97	FREE	FREE	FREE
IULB230-0500-2500-3000		30	3.5	5	4.8	15	6	60	7,440	31.31	FREE	FREE	FREE	FREE
IULB230-0500-2500-4000		40	3.5	5	4.8	15	6	70	9,280	41.65	FREE	FREE	FREE	FREE
IULB230-0600-3000-1000	3	10	6	6	5.8	15	6	50	5,200	FREE	FREE	FREE	FREE	FREE
IULB230-0600-3000-1500		15	6	6	5.8	15	6	50	5,200	FREE	FREE	FREE	FREE	FREE
IULB230-0600-3000-2000		20	6	6	5.8	15	6	50	5,200	FREE	FREE	FREE	FREE	FREE
IULB230-0600-3000-2500		25	6	6	5.8	15	6	60	5,200	FREE	FREE	FREE	FREE	FREE
IULB230-0600-3000-3000		30	6	6	5.8	15	6	60	5,360	FREE	FREE	FREE	FREE	FREE
IULB230-0600-3000-3500		35	6	6	5.8	15	6	70	5,360	FREE	FREE	FREE	FREE	FREE
IULB230-0600-3000-4000		40	6	6	5.8	15	6	70	5,840	FREE	FREE	FREE	FREE	FREE
IULB230-0600-3000-5000		50	6	6	5.8	15	6	80	6,320	FREE	FREE	FREE	FREE	FREE
IULB230-0600-3000-6000		60	6	6	5.8	15	6	90	6,800	FREE	FREE	FREE	FREE	FREE

ion Depo Type U Series

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IULB230
Model number:IULB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.1	0.2	0.003	0.005	120	40,000	0.002	0.005	100	40,000	0.002	0.003	70	40,000
		0.3	0.003	0.005	100	40,000	0.002	0.005	70	40,000	0.002	0.003	50	40,000
		0.5	0.002	0.003	70	40,000	0.001	0.003	50	40,000	0.001	0.002	30	40,000
	0.15	0.3	0.003	0.005	180	40,000	0.002	0.005	150	40,000	0.002	0.003	100	40,000
		0.5	0.003	0.005	150	40,000	0.002	0.005	120	40,000	0.002	0.003	70	40,000
	0.2	0.3	0.01	0.01	350	40,000	0.006	0.005	300	40,000	0.003	0.003	200	40,000
		0.5	0.008	0.01	320	40,000	0.005	0.005	280	40,000	0.003	0.003	180	40,000
		0.75	0.005	0.01	280	40,000	0.003	0.005	200	40,000	0.002	0.003	150	40,000
		1	0.003	0.005	250	40,000	0.002	0.003	160	40,000	0.001	0.002	120	40,000
	0.3	0.5	0.01	0.015	350	40,000	0.007	0.01	300	40,000	0.003	0.005	280	40,000
		0.6	0.007	0.01	350	40,000	0.005	0.007	300	40,000	0.003	0.005	250	40,000
		0.75	0.007	0.01	330	40,000	0.005	0.007	280	40,000	0.003	0.005	230	40,000
		1	0.007	0.01	320	40,000	0.005	0.007	250	40,000	0.003	0.005	200	40,000
		1.25	0.005	0.007	280	40,000	0.003	0.005	200	40,000	0.002	0.003	160	40,000
		1.5	0.005	0.007	230	40,000	0.003	0.005	180	40,000	0.002	0.003	120	40,000
		1.75	0.003	0.005	180	40,000	0.002	0.003	150	40,000	0.002	0.002	100	40,000
		2	0.003	0.005	150	40,000	0.002	0.003	120	40,000	0.002	0.002	90	40,000
		2.25	0.002	0.003	120	40,000	0.001	0.002	100	40,000	0.001	0.001	80	40,000
		2.5	0.002	0.003	100	40,000	0.001	0.002	80	40,000	0.001	0.001	70	40,000
		3	0.001	0.003	80	40,000	0.001	0.002	70	40,000	0.001	0.001	60	40,000
	0.4	0.5	0.03	0.05	800	40,000	0.03	0.03	720	40,000	0.009	0.02	580	40,000
		0.8	0.02	0.05	800	40,000	0.02	0.03	720	40,000	0.008	0.02	580	40,000
		1	0.02	0.05	800	40,000	0.02	0.03	720	40,000	0.008	0.02	580	40,000
		1.5	0.01	0.03	620	40,000	0.01	0.02	500	40,000	0.005	0.01	400	40,000
		2	0.01	0.02	500	40,000	0.01	0.01	380	40,000	0.005	0.007	300	40,000
		2.5	0.007	0.01	420	40,000	0.005	0.007	300	40,000	0.003	0.005	260	40,000
		3	0.007	0.01	300	40,000	0.005	0.007	240	40,000	0.003	0.005	200	40,000
	0.5	1	0.03	0.05	1,000	40,000	0.02	0.03	860	40,000	0.01	0.02	650	40,000
		1.5	0.02	0.05	850	40,000	0.01	0.03	720	40,000	0.007	0.02	520	40,000
		2	0.02	0.03	720	40,000	0.01	0.02	650	40,000	0.007	0.01	400	40,000
		2.5	0.01	0.02	600	40,000	0.007	0.01	530	40,000	0.005	0.007	360	40,000
		3	0.01	0.02	500	40,000	0.007	0.01	420	40,000	0.005	0.007	320	40,000
		3.5	0.007	0.01	420	40,000	0.005	0.007	360	40,000	0.003	0.005	280	40,000
		4	0.007	0.01	350	40,000	0.005	0.007	300	40,000	0.003	0.005	260	40,000
	0.6	1	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
		1.5	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
		2	0.05	0.1	1,400	40,000	0.03	0.06	1,000	40,000	0.02	0.05	720	30,000
		2.5	0.03	0.05	1,200	40,000	0.02	0.04	840	40,000	0.02	0.03	640	30,000
		3	0.03	0.05	1,200	40,000	0.02	0.04	840	40,000	0.02	0.03	640	30,000
		3.5	0.02	0.03	1,000	40,000	0.01	0.03	620	40,000	0.01	0.02	480	30,000
		4	0.02	0.03	1,000	40,000	0.01	0.03	620	40,000	0.01	0.02	480	30,000
		4.5	0.02	0.03	900	35,000	0.01	0.02	580	35,000	0.008	0.015	430	30,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	0.6	5	0.01	0.02	720	30,000	0.007	0.015	500	30,000	0.007	0.01	400	30,000
		5.5	0.01	0.015	700	30,000	0.007	0.01	450	30,000	0.005	0.008	360	30,000
		6	0.007	0.01	500	30,000	0.005	0.007	380	30,000	0.004	0.006	320	30,000
	0.7	2	0.07	0.1	1,600	40,000	0.05	0.08	1,300	40,000	0.03	0.07	1,000	30,000
		4	0.04	0.06	1,300	40,000	0.03	0.04	820	40,000	0.015	0.02	600	30,000
		6	0.01	0.03	800	30,000	0.01	0.015	500	30,000	0.006	0.01	420	25,000
	0.8	2	0.1	0.15	2,000	40,000	0.07	0.1	1,600	40,000	0.05	0.1	1,200	30,000
		3	0.1	0.15	2,000	40,000	0.07	0.1	1,600	40,000	0.05	0.05	1,200	30,000
		4	0.05	0.1	1,600	40,000	0.05	0.05	1,200	40,000	0.03	0.05	860	30,000
		5	0.05	0.05	1,600	40,000	0.03	0.05	1,000	40,000	0.02	0.03	620	30,000
		6	0.03	0.05	1,200	30,000	0.02	0.03	760	30,000	0.01	0.02	560	25,000
		7	0.02	0.03	1,000	30,000	0.01	0.02	680	30,000	0.007	0.01	520	25,000
		8	0.01	0.02	820	30,000	0.007	0.01	600	30,000	0.005	0.01	480	25,000
	0.9	2	0.1	0.2	2,200	40,000	0.08	0.15	1,800	30,000	0.06	0.1	1,300	30,000
		4	0.05	0.12	1,800	40,000	0.04	0.08	1,400	30,000	0.03	0.05	900	25,000
		6	0.035	0.05	1,200	30,000	0.025	0.035	800	25,000	0.015	0.025	600	20,000
		8	0.025	0.04	1,000	30,000	0.015	0.025	700	23,000	0.008	0.015	500	20,000
	1	2	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
		2.5	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
		3	0.1	0.3	2,500	40,000	0.1	0.2	2,000	30,000	0.08	0.1	1,400	25,000
		4	0.1	0.2	2,500	40,000	0.05	0.15	1,800	30,000	0.05	0.1	1,200	25,000
		5	0.05	0.15	2,000	30,000	0.04	0.1	1,600	25,000	0.03	0.05	920	20,000
		6	0.05	0.1	1,800	30,000	0.04	0.05	1,200	25,000	0.02	0.05	740	20,000
		7	0.04	0.06	1,200	30,000	0.03	0.04	950	25,000	0.02	0.03	680	20,000
		8	0.04	0.06	1,000	30,000	0.03	0.04	860	25,000	0.02	0.03	560	20,000
		9	0.03	0.05	820	25,000	0.02	0.03	750	20,000	0.01	0.02	500	18,000
		10	0.03	0.05	750	25,000	0.02	0.03	620	20,000	0.01	0.02	450	18,000
		12	0.01	0.03	600	20,000	0.007	0.02	520	18,000	0.005	0.01	400	16,000
	1.2	2.4	0.1	0.3	2,500	30,000	0.1	0.2	2,000	30,000	0.05	0.1	1,600	25,000
		4	0.1	0.2	2,500	30,000	0.07	0.2	2,000	30,000	0.05	0.1	1,600	25,000
		6	0.07	0.1	2,000	30,000	0.05	0.1	1,600	25,000	0.03	0.07	1,200	20,000
		8	0.05	0.1	1,600	30,000	0.03	0.07	1,200	25,000	0.02	0.05	920	20,000
		10	0.03	0.07	1,200	20,000	0.02	0.05	860	20,000	0.01	0.03	680	18,000
		12	0.02	0.05	860	20,000	0.01	0.03	620	20,000	0.007	0.02	480	18,000
	1.4	8	0.12	0.2	2,500	30,000	0.08	0.15	1,800	20,000	0.03	0.08	1,000	20,000
		12	0.07	0.12	1,400	20,000	0.04	0.08	1,100	18,000	0.015	0.05	700	18,000
		16	0.02	0.05	700	17,000	0.01	0.03	600	17,000	0.008	0.02	450	16,000
	1.5	3	0.15	0.3	3,000	30,000	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000
		4	0.15	0.3	3,000	30,000	0.1	0.3	2,500	30,000	0.1	0.2	2,000	25,000
		6	0.15	0.2	3,000	30,000	0.1	0.2	2,000	30,000	0.1	0.1	1,600	25,000
		8	0.1	0.2	2,500	25,000	0.05	0.2	1,600	25,000	0.05	0.1	1,200	20,000
		10	0.1	0.1	2,500	25,000	0.05	0.1	1,200	25,000	0.05	0.05	860	20,000

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●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IULB230
Model number:IULB230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	1.5	12	0.05	0.1	1,800	20,000	0.03	0.1	920	20,000	0.02	0.05	780	18,000
		14	0.05	0.07	1,200	20,000	0.03	0.05	820	20,000	0.02	0.03	650	18,000
		16	0.03	0.05	720	18,000	0.02	0.03	650	18,000	0.01	0.02	580	16,000
	1.6	8	0.1	0.2	2,500	25,000	0.07	0.15	2,000	20,000	0.05	0.1	1,600	18,000
		12	0.07	0.1	1,800	20,000	0.05	0.07	1,500	16,000	0.03	0.05	1,200	14,000
		16	0.03	0.05	720	16,000	0.02	0.03	600	14,000	0.015	0.02	480	12,000
	2	3	0.2	0.5	3,000	25,000	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000
		4	0.2	0.5	3,000	25,000	0.2	0.5	2,500	25,000	0.15	0.3	2,000	20,000
		6	0.2	0.5	2,500	25,000	0.2	0.3	2,000	25,000	0.15	0.3	1,600	20,000
		8	0.2	0.3	2,000	20,000	0.1	0.2	1,600	18,000	0.1	0.2	1,200	16,000
		10	0.1	0.3	2,000	18,000	0.1	0.2	1,600	16,000	0.1	0.1	1,200	14,000
		12	0.1	0.2	1,600	16,000	0.1	0.1	1,200	14,000	0.05	0.1	940	12,000
		13	0.08	0.2	1,600	16,000	0.06	0.1	1,200	14,000	0.04	0.08	940	12,000
		14	0.07	0.15	1,600	16,000	0.05	0.08	1,200	14,000	0.03	0.07	940	12,000
		16	0.07	0.15	1,600	16,000	0.05	0.08	1,200	14,000	0.03	0.07	940	12,000
		18	0.05	0.1	1,400	14,000	0.03	0.05	1,000	12,000	0.02	0.03	850	10,000
		20	0.05	0.1	1,000	14,000	0.03	0.05	820	12,000	0.02	0.03	720	10,000
	2.5	6	0.3	0.4	2,800	20,000	0.2	0.5	2,300	20,000	0.15	0.4	2,000	18,000
		8	0.25	0.3	2,600	20,000	0.15	0.3	2,100	20,000	0.12	0.25	1,800	18,000
		10	0.2	0.3	2,500	20,000	0.15	0.2	2,000	20,000	0.1	0.15	1,600	18,000
		15	0.1	0.2	2,000	18,000	0.07	0.15	1,600	16,000	0.05	0.1	1,200	14,000
		20	0.07	0.15	1,500	16,000	0.05	0.1	1,200	14,000	0.03	0.05	1,000	10,000
	3	6	0.2	0.8	3,000	20,000	0.2	0.6	2,500	18,000	0.2	0.5	2,000	14,000
		8	0.2	0.8	3,000	20,000	0.2	0.6	2,500	18,000	0.2	0.5	2,000	14,000
		10	0.2	0.6	2,500	20,000	0.2	0.4	2,000	18,000	0.1	0.3	1,500	14,000
		12	0.2	0.6	2,500	20,000	0.2	0.4	2,000	18,000	0.1	0.3	1,500	14,000
		14	0.1	0.4	2,000	18,000	0.1	0.3	1,600	16,000	0.1	0.2	1,200	12,000
		16	0.1	0.4	2,000	18,000	0.1	0.3	1,600	16,000	0.1	0.2	1,200	12,000
		20	0.1	0.3	1,600	18,000	0.1	0.2	1,200	16,000	0.1	0.1	960	12,000
		25	0.1	0.2	1,200	16,000	0.07	0.15	920	14,000	0.05	0.07	800	10,000
		30	0.07	0.1	750	14,000	0.05	0.07	640	12,000	0.03	0.05	600	8,600
	3.5	15	0.25	1	3,000	20,000	0.15	0.5	2,300	16,000	0.13	0.4	1,500	14,000
		20	0.18	0.6	2,500	18,000	0.1	0.3	1,800	15,000	0.1	0.2	1,200	12,000
		25	0.12	0.35	1,800	16,000	0.1	0.2	1,600	14,000	0.06	0.12	1,000	10,000
		30	0.1	0.25	1,500	14,000	0.07	0.15	950	11,000	0.05	0.08	800	9,000
		35	0.08	0.2	1,200	13,000	0.07	0.12	800	10,000	0.03	0.06	650	7,500
	4	8	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000
		10	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000
		12	0.3	1.5	3,000	20,000	0.2	0.8	2,500	16,000	0.2	0.6	2,000	12,000
		14	0.3	1.5	3,000	20,000	0.2	0.8	2,000	16,000	0.2	0.6	1,600	12,000
		15	0.3	1.5	3,000	20,000	0.2	0.8	2,000	16,000	0.2	0.6	1,600	12,000
		20	0.2	1	2,400	16,000	0.1	0.6	1,800	14,000	0.1	0.4	1,400	10,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈球头立铣刀 Long Neck Ball End Mill

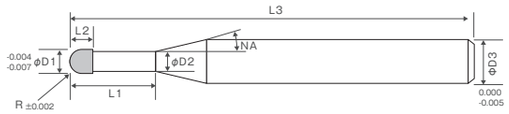
切削材料 Work Material			淬火钢 Hardened Steels STAVAX/HPM/SKD61(~55HRC)				淬火钢 Hardened Steels SKD11/SKH51(~60HRC)				淬火钢 Hardened Steels ASP23/HAP5R/HAP72(60HRC~)			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
2	4	25	0.2	0.8	1,600	16,000	0.1	0.4	1,200	14,000	0.1	0.2	1,000	10,000
		30	0.1	0.3	1,600	14,000	0.07	0.2	1,200	10,000	0.05	0.15	1,000	8,200
		35	0.1	0.2	1,200	14,000	0.07	0.15	1,000	10,000	0.05	0.1	820	8,200
	5	15	0.3	1.5	3,000	18,000	0.2	1.2	2,500	12,000	0.2	0.7	2,000	9,200
		20	0.3	1.5	3,000	18,000	0.2	1.2	2,500	12,000	0.2	0.7	2,000	9,200
		25	0.3	1.2	3,000	15,000	0.2	1	2,000	10,000	0.15	0.5	1,600	8,000
		30	0.2	1	2,500	15,000	0.15	0.8	1,800	8,600	0.1	0.3	1,200	7,200
		40	0.2	0.8	2,000	12,000	0.15	0.5	1,500	7,600	0.1	0.2	860	6,400
	6	10	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
		15	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
		20	0.3	2	3,000	16,000	0.3	1.2	2,500	8,000	0.2	1	2,000	7,000
		25	0.3	1.5	3,000	16,000	0.2	1	2,000	8,000	0.15	0.7	1,500	7,000
		30	0.2	1.5	3,000	14,000	0.2	1	2,000	7,200	0.15	0.7	1,500	6,500
		35	0.2	1.2	2,400	13,000	0.17	0.8	1,600	6,800	0.12	0.5	1,200	5,800
		40	0.2	1	1,800	12,000	0.15	0.6	1,200	6,400	0.1	0.4	1,000	5,200
		50	0.1	0.6	1,200	8,200	0.1	0.3	860	4,800	0.05	0.2	620	4,000
		60	0.07	0.3	600	6,000	0.05	0.15	450	3,200	0.03	0.07	300	2,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬长颈球头立铣刀
Carbide Long Neck Ball End Mill

ion U | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

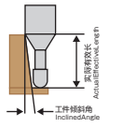
■型号:IUB3D230 Model number:IUB3D230



所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

■ 专属金属3D打印机的颈径规格

■Special (D2) Neck Dia. for Metal 3D printer.



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size) : mm

型号 Code No.	球头 (R) Ball R	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	刀刃直径 (D1) Tool Diameter	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
IUB3D230-0060-0300-0300	0.3	3	0.45	0.6	0.49	15	4	50	3,120	3.30	3.41	3.52	3.64	3.92
IUB3D230-0080-0400-0300	0.4	3	0.6	0.8	0.69	15	4	50	3,200	3.30	3.40	3.51	3.63	3.89
IUB3D230-0100-0500-0300	0.5	3	0.8	1	0.89	15	4	50	2,560	3.30	3.39	3.50	3.61	3.87

ion Depo Type U 切削条件参考表
Recommended Milling Conditions

■型号:IUB3D230
Model number:IUB3D230

长颈球头立铣刀 Long Neck Ball End Mill

切削材料 Work Material	马氏体时效钢(3D打印) Maraging Steels(Metal 3D Printer)					
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut ∂p mm	切削量 Depth of Cut ∂e mm	进给速度 Feed mm/min	转速 Spindle Speed min⁻¹
2	0.6	3	0.03	0.03	800	32,000
	0.8	3	0.045	0.045	1,400	32,000
	1	3	0.05	0.05	1,500	30,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

DLC Series

超硬立铣刀　Carbide End Mill

DLC | super MG | 刀刃数 2 | 螺旋角 45° | 仰角 15° | 柄径公差 0/-0.005

特　征

- 具有低摩擦系数和优异耐磨性的DLC涂层系列产品！
- 优良的耐溶着性，非常适合铝合金等材料的加工！
- 可提供定制产品，制作周期短！

Features

- DLC coatings with a low coefficient of friction and wear resistance.
- Excellent welding resistance, ideal for processing aluminum alloys, etc.
- Non-standard custom-made products available.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

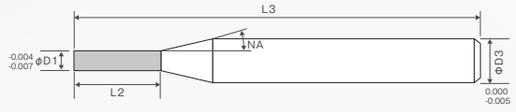
单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
DLCS245-0100-00300	1	3	15	4	50	4,480
DLCS245-0150-00450	1.5	4.5	15	4	50	4,480
DLCS245-0200-00600	2	6	15	4	50	4,480
DLCS245-0250-00750	2.5	7.5	15	4	50	4,480
DLCS245-0300-00900	3	9	15	4	50	5,440
DLCS245-0400-01200	4	12	15	6	50	5,600
DLCS245-0500-01500	5	15	15	6	50	6,000
DLCS245-0600-01800	6	18	—	6	60	6,240
DLCS245-0700-02100	7	21	15	8	70	10,080
DLCS245-0800-02400	8	24	—	8	70	10,080
DLCS245-0900-02700	9	27	15	10	80	12,720
DLCS245-1000-03000	10	30	—	10	80	12,720
DLCS245-1100-03300	11	33	15	12	110	17,440
DLCS245-1200-03600	12	36	—	12	110	17,440

超硬平角立铣刀　Carbide Square End Mill

■型号：DLCS245　Model number:DLCS245

DLC | super MG | 刀刃数 2 | 螺旋角 45° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

DLC Series

DLC切削条件参考表
Recommended Milling Conditions

■型号:DLCS245
Model number:DLCS245

平角立铣刀 Square End Mill

切削材料 Work Material			铝合金 A5000号 Aluminium alloy A5000				铝合金 A7000号 Aluminium alloy A7000				石墨 Graphite			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
2	1	3	1.5	0.2	700	20,000	1.5	0.2	700	20,000	0.2	0.6	2,500	30,000
	1.5	4.5	2	0.3	800	20,000	2	0.3	800	20,000	0.3	1	2,500	25,000
	2	6	3	0.4	1,000	20,000	3	0.4	1,000	20,000	0.5	1.2	3,000	20,000
	2.5	7.5	3.5	0.5	1,200	20,000	3.5	0.5	1,200	20,000	0.5	1.5	3,000	20,000
	3	9	4.5	0.6	1,400	20,000	4.5	0.6	1,500	20,000	0.5	2	3,000	20,000
	4	12	6	0.8	1,600	20,000	6	0.8	1,700	20,000	0.8	2.5	3,000	18,000
	5	15	7.5	1	1,900	20,000	7.5	1	2,000	20,000	1	3	3,000	18,000
	6	18	9	1.2	2,100	20,000	9	1.2	2,200	20,000	1	4	3,000	16,000
	7	21	10	1.4	2,200	17,500	10	1.4	2,300	17,500	1.5	5	3,000	15,000
	8	24	12	1.6	2,300	15,000	12	1.6	2,400	15,000	1.5	6	3,000	13,000
	9	27	13	1.8	2,300	13,500	13	1.8	2,400	13,500	1.5	7	3,000	12,000
	10	30	15	2	2,300	12,000	15	2	2,400	12,000	2	8	3,200	10,000
	11	33	16	2.2	2,400	11,000	16	2.2	2,500	11,000	2	9	3,200	9,000
	12	36	18	2.4	2,400	10,000	18	2.4	2,500	10,000	2	10	3,200	8,000

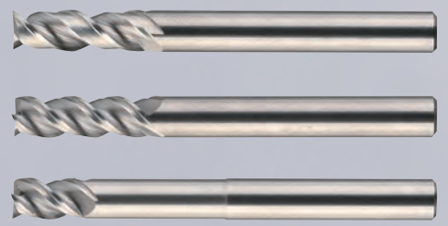
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

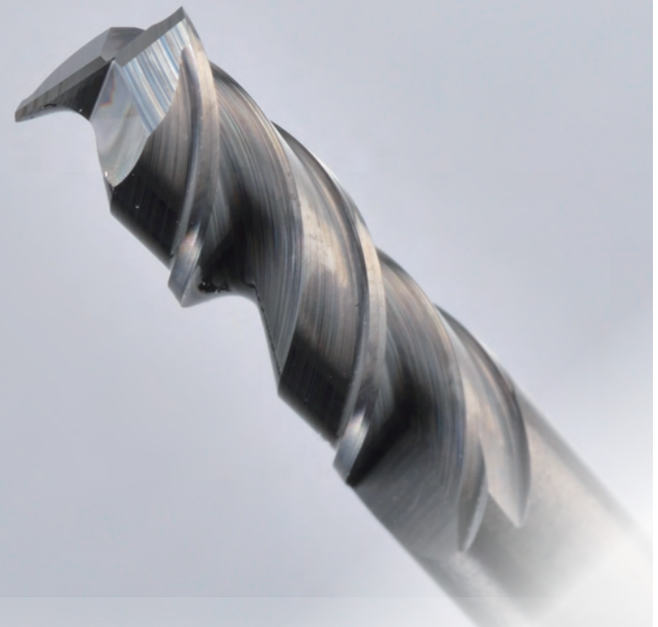
CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
Ion Depo A Series
Ion Depo U Series
DLC Series 平角 Square
Non-Coat Series
Ion Depo R Series

Non-Coat Series

超硬立铣刀　Carbide End Mill

Non | super MG | 刀刃数 2·3 | 螺旋角 45° | 仰角 15° | 柄径公差 0/-0.005





特　征

- 适合铝合金的无涂层工具系列产品！
- 铝加工专用切削刃设计，实现卓越的锋利度！
- 树脂等材料可进行高效切削！
- 采用超超细微粒子合金母材，耐磨性优异，实现刀具长寿命！

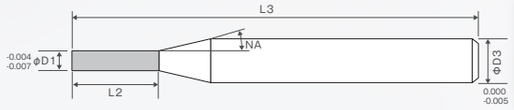
Features

- Non-coated tools for aluminum alloys.
- Cutter geometry designed for exceptional sharpness in aluminum processing .
- Efficient cutting for various materials including resin.
- Ultra-fine particle alloy technology for wear resistance and long life.

超硬平角立铣刀　Carbide Square End Mill

■型号：ALS245　Model number:ALS245

Non | super MG | 刀刃数 2 | 螺旋角 45° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size)：mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
ALS245-0100-00300	1	3	15	4	50	3,680
ALS245-0150-00450	1.5	4.5	15	4	50	3,680
ALS245-0200-00600	2	6	15	4	50	3,680
ALS245-0250-00750	2.5	7.5	15	4	50	3,680
ALS245-0300-00900	3	9	15	4	50	4,480
ALS245-0400-01200	4	12	15	6	50	4,640
ALS245-0500-01500	5	15	15	6	50	4,960
ALS245-0600-01800	6	18	—	6	60	5,200
ALS245-0700-02100	7	21	15	8	70	8,400
ALS245-0800-02400	8	24	—	8	70	8,400
ALS245-0900-02700	9	27	15	10	80	10,560
ALS245-1000-03000	10	30	—	10	80	10,560
ALS245-1100-03300	11	33	15	12	110	14,560
ALS245-1200-03600	12	36	—	12	110	14,560

Non-Coat Series

无涂层 切削条件参考表
Recommended Milling Conditions

■型号:ALS245
Model number:ALS245

平角立铣刀 Square End Mill

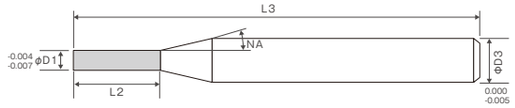
切削材料 Work Material			铝合金 A5000号 Aluminium alloy A5000				铝合金 A7000号 Aluminium alloy A7000			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min^{-1}	∂p mm	∂e mm	mm/min	min^{-1}
2	1	3	1.5	0.2	700	20,000	1.5	0.2	700	20,000
	1.5	4.5	2	0.3	800	20,000	2	0.3	800	20,000
	2	6	3	0.4	1,000	20,000	3	0.4	1,000	20,000
	2.5	7.5	3.5	0.5	1,200	20,000	3.5	0.5	1,200	20,000
	3	9	4.5	0.6	1,400	20,000	4.5	0.6	1,500	20,000
	4	12	6	0.8	1,600	20,000	6	0.8	1,700	20,000
	5	15	7.5	1	1,900	20,000	7.5	1	2,000	20,000
	6	18	9	1.2	2,100	20,000	9	1.2	2,200	20,000
	7	21	10	1.4	2,200	17,500	10	1.4	2,300	17,500
	8	24	12	1.6	2,300	15,000	12	1.6	2,400	15,000
	9	27	13	1.8	2,300	13,500	13	1.8	2,400	13,500
	10	30	15	2	2,300	12,000	15	2	2,400	12,000
	11	33	16	2.2	2,400	11,000	16	2.2	2,500	11,000
	12	36	18	2.4	2,400	10,000	18	2.4	2,500	10,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬平角立铣刀　Carbide　Square End Mill

■型号:ALS345　Model number:ALS345

Non | super MG | 刀刃数 3 | 螺旋角 45° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考。如果担心干涉切削材料，请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material,
please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	刃长 (L2) Length of Cut	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
ALS345-0100-00300	1	3	15	4	50	5,120
ALS345-0200-00600	2	6	15	4	50	5,120
ALS345-0300-00900	3	9	15	4	50	6,160
ALS345-0400-01200	4	12	15	6	50	7,120
ALS345-0500-01500	5	15	15	6	50	7,680
ALS345-0600-00900	6	9	—	6	50	7,680
ALS345-0600-01800		18	—	6	60	8,000
ALS345-0800-01200	8	12	—	8	70	12,240
ALS345-0800-02400		24	—	8	70	12,640
ALS345-1000-01500	10	15	—	10	80	17,840
ALS345-1000-03000		30	—	10	80	17,280
ALS345-1200-01800	12	18	—	12	110	23,840
ALS345-1200-03600		36	—	12	110	20,480

无涂层 切削条件参考表
Recommended Milling Conditions

■型号:ALS345
Model number:ALS345

平角立铣刀　Square End Mill

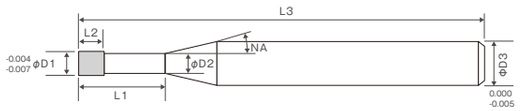
切削材料 Work Material			铝合金　A5000号 Aluminium alloy A5000				铝合金　A7000号 Aluminium alloy A7000			
刃数 Number of Flutes	刀刃直径 Dia.	刃长 Length of cut	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min⁻¹	∂p mm	∂e mm	mm/min	min⁻¹
3	1	3	1	0.3	2,800	20,000	1	0.3	1,100	20,000
	2	6	2	0.6	1,400	20,000	2	0.6	1,500	20,000
	3	9	3	0.9	2,100	20,000	3	0.9	2,200	20,000
	4	12	4	1.2	2,400	20,000	4	1.2	2,500	20,000
	5	15	5	1.5	3,000	20,000	5	1.5	3,100	20,000
	6	9	6	1.8	3,400	18,600	6	1.8	3,500	18,600
		18	6	1.8	3,400	18,600	6	1.8	3,500	18,600
	8	12	8	2.4	3,400	13,900	8	2.4	3,500	13,900
		24	8	2.4	3,400	13,900	8	2.4	3,500	13,900
	10	15	10	3	3,700	11,100	10	3	3,800	11,100
		30	10	3	3,700	11,100	10	3	3,800	11,100
	12	18	12	3.6	4,000	9,300	12	3.6	4,100	9,300
		36	12	3.6	4,000	9,300	12	3.6	4,100	9,300

●请将刀具确实地固定在刀柄上，以防止刀具振动。　Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。　Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。　∂p=Axial Depth of Cut　∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。　We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。　Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。　Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

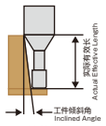
超硬长颈平角立铣刀
Carbide Long Neck Square End Mill

Non | super MG | 刀刃数 3 | 螺旋角 45° | 仰角 15° | 柄径公差 0/-0.005

■型号:ALLS345　Model number:ALLS345

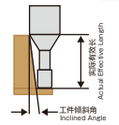


所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.



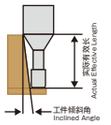
●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)　单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
ALLS345-0100-0300	1	3	1.5	0.95	15	4	50	3,920	3.20	3.31	3.43	3.56	3.85
ALLS345-0100-0500		5	1.5	0.95	15	4	50	4,480	5.26	5.45	5.64	5.86	6.33
ALLS345-0110-0330	1.1	3.3	1.7	1.05	15	4	50	5,360	3.51	3.63	3.76	3.90	4.22
ALLS345-0120-0360	1.2	3.6	1.8	1.15	15	4	50	5,360	3.82	3.95	4.09	4.25	4.59
ALLS345-0130-0390	1.3	3.9	2	1.25	15	4	50	5,360	4.13	4.27	4.43	4.59	4.96
ALLS345-0140-0420	1.4	4.2	2.1	1.35	15	4	50	5,360	4.44	4.59	4.76	4.94	5.34
ALLS345-0150-0450	1.5	4.5	2.3	1.45	15	4	50	3,920	4.75	4.91	5.09	5.28	5.71
ALLS345-0160-0480	1.6	4.8	2.4	1.55	15	4	50	5,360	5.06	5.23	5.42	5.63	6.08
ALLS345-0170-0510	1.7	5.1	2.6	1.65	15	4	50	5,360	5.37	5.56	5.76	5.97	6.46
ALLS345-0180-0540	1.8	5.4	2.7	1.75	15	4	50	5,360	5.68	5.88	6.09	6.32	6.83
ALLS345-0190-0570	1.9	5.7	2.9	1.85	15	4	50	5,360	5.99	6.20	6.42	6.66	7.20
ALLS345-0200-0600	2	6	3	1.94	15	4	50	3,920	6.32	6.54	6.77	7.03	7.60
ALLS345-0200-1000		10	3	1.94	15	4	50	4,480	10.45	10.82	11.21	11.63	12.57
ALLS345-0210-0630	2.1	6.3	3.2	2.04	15	4	50	5,360	6.63	6.86	7.11	7.37	7.97
ALLS345-0220-0660	2.2	6.6	3.3	2.14	15	4	50	5,360	6.94	7.18	7.44	7.72	8.34
ALLS345-0230-0690	2.3	6.9	3.5	2.24	15	4	50	5,360	7.25	7.50	7.77	8.06	8.72
ALLS345-0240-0720	2.4	7.2	3.6	2.34	15	4	50	5,360	7.56	7.82	8.10	8.41	9.09
ALLS345-0250-0750	2.5	7.5	3.8	2.44	15	4	50	3,920	7.87	8.14	8.44	8.75	9.46
ALLS345-0260-0780	2.6	7.8	3.9	2.54	15	4	50	6,560	8.18	8.46	8.77	9.10	9.84
ALLS345-0270-0810	2.7	8.1	4.1	2.64	15	4	50	6,560	8.49	8.78	9.10	9.44	10.21
ALLS345-0280-0840	2.8	8.4	4.2	2.74	15	4	50	6,560	8.80	9.11	9.43	9.79	10.58
ALLS345-0290-0870	2.9	8.7	4.4	2.84	15	4	50	6,560	9.11	9.43	9.77	10.13	FREE
ALLS345-0300-0900	3	9	4.5	2.85	15	4	50	4,720	9.59	9.93	10.29	10.67	FREE
ALLS345-0300-1500		15	4.5	2.85	15	4	50	5,440	15.79	16.34	16.93	FREE	FREE
ALLS345-0310-0930	3.1	9.3	4.7	2.95	15	6	50	6,560	9.90	10.25	10.62	11.02	11.91
ALLS345-0320-0960	3.2	9.6	4.8	3.05	15	6	50	6,560	10.21	10.57	10.95	11.36	12.28
ALLS345-0330-0990	3.3	9.9	5	3.15	15	6	50	6,560	10.52	10.89	11.28	11.71	12.65
ALLS345-0340-1020	3.4	10.2	5.1	3.25	15	6	50	6,560	10.83	11.21	11.62	12.05	13.03
ALLS345-0350-1050	3.5	10.5	5.3	3.35	15	6	50	5,760	11.14	11.53	11.95	12.40	13.40
ALLS345-0360-1080	3.6	10.8	5.4	3.45	15	6	50	6,560	11.45	11.85	12.28	12.74	13.77



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)　单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
ALLS345-0370-1110	3.7	11.1	5.6	3.55	15	6	50	6,560	11.76	12.17	12.61	13.09	14.15
ALLS345-0380-1140	3.8	11.4	5.7	3.65	15	6	50	6,560	12.07	12.49	12.94	13.43	14.52
ALLS345-0390-1170	3.9	11.7	5.9	3.75	15	6	50	6,560	12.38	12.81	13.28	13.78	14.89
ALLS345-0400-1200	4	12	6	3.8	15	6	50	4,880	12.79	13.24	13.71	14.23	15.38
ALLS345-0400-2000		20	6	3.8	15	6	50	6,080	21.06	21.79	22.58	23.43	FREE
ALLS345-0410-1230	4.1	12.3	6.2	3.9	15	6	50	6,880	13.10	13.56	14.05	14.57	15.75
ALLS345-0420-1260	4.2	12.6	6.3	4	15	6	50	6,880	13.41	13.88	14.38	14.92	16.13
ALLS345-0430-1290	4.3	12.9	6.5	4.1	15	6	50	6,880	13.72	14.20	14.71	15.26	FREE
ALLS345-0440-1320	4.4	13.2	6.6	4.2	15	6	50	6,880	14.03	14.52	15.04	15.61	FREE
ALLS345-0450-1350	4.5	13.5	6.8	4.3	15	6	50	6,080	14.34	14.84	15.38	15.95	FREE
ALLS345-0460-1380	4.6	13.8	6.9	4.4	15	6	50	6,880	14.65	15.16	15.71	16.30	FREE
ALLS345-0470-1410	4.7	14.1	7.1	4.5	15	6	50	6,880	14.96	15.48	16.04	16.64	FREE
ALLS345-0480-1440	4.8	14.4	7.2	4.6	15	6	50	6,880	15.27	15.80	16.37	16.99	FREE
ALLS345-0490-1470	4.9	14.7	7.4	4.7	15	6	50	6,880	15.58	16.12	16.71	FREE	FREE
ALLS345-0500-1500	5	15	7.5	4.8	15	6	50	5,280	15.89	16.44	17.04	FREE	FREE
ALLS345-0500-2500		25	7.5	4.8	15	6	60	6,720	26.23	27.14	FREE	FREE	FREE
ALLS345-0510-1530	5.1	15.3	7.7	4.9	15	6	50	7,440	16.20	16.77	FREE	FREE	FREE
ALLS345-0520-1560	5.2	15.6	7.8	5	15	6	50	7,440	16.51	17.09	FREE	FREE	FREE
ALLS345-0530-1590	5.3	15.9	8	5.1	15	6	50	7,440	16.82	17.41	FREE	FREE	FREE
ALLS345-0540-1620	5.4	16.2	8.1	5.2	15	6	50	7,440	17.13	FREE	FREE	FREE	FREE
ALLS345-0550-1650	5.5	16.5	8.3	5.3	15	6	50	6,640	17.44	FREE	FREE	FREE	FREE
ALLS345-0560-1680	5.6	16.8	8.4	5.4	15	6	50	7,440	17.75	FREE	FREE	FREE	FREE
ALLS345-0570-1710	5.7	17.1	8.6	5.5	15	6	50	7,440	FREE	FREE	FREE	FREE	FREE
ALLS345-0580-1740	5.8	17.4	8.7	5.6	15	6	50	7,440	FREE	FREE	FREE	FREE	FREE
ALLS345-0590-1770	5.9	17.7	8.9	5.7	15	6	50	7,440	FREE	FREE	FREE	FREE	FREE
ALLS345-0600-1800	6	18	9	5.8	15	6	50	5,520	FREE	FREE	FREE	FREE	FREE
ALLS345-0600-3000		30	9	5.8	15	6	60	7,040	FREE	FREE	FREE	FREE	FREE
ALLS345-0610-1830	6.1	18.3	9.2	5.9	15	8	70	11,280	19.30	19.97	20.70	21.47	FREE
ALLS345-0620-1860	6.2	18.6	9.3	6	15	8	70	11,280	19.61	20.30	21.03	21.82	FREE
ALLS345-0630-1890	6.3	18.9	9.5	6.1	15	8	70	11,280	19.92	20.62	21.36	22.16	FREE
ALLS345-0640-1920	6.4	19.2	9.6	6.2	15	8	70	11,280	20.23	20.94	21.69	22.51	FREE
ALLS345-0650-1950	6.5	19.5	9.8	6.3	15	8	70	11,280	20.54	21.26	22.03	FREE	FREE
ALLS345-0660-1980	6.6	19.8	9.9	6.4	15	8	70	11,280	20.85	21.58	22.36	FREE	FREE
ALLS345-0670-2010	6.7	20.1	10.1	6.5	15	8	70	11,280	21.16	21.90	22.69	FREE	FREE
ALLS345-0680-2040	6.8	20.4	10.2	6.6	15	8	70	11,280	21.47	22.22	FREE	FREE	FREE
ALLS345-0690-2070	6.9	20.7	10.4	6.7	15	8	70	11,280	21.78	22.54	FREE	FREE	FREE
ALLS345-0700-2100	7	21	10.5	6.8	15	8	70	8,160	22.09	22.86	FREE	FREE	FREE
ALLS345-0710-2130	7.1	21.3	10.7	6.9	15	8	70	11,280	22.40	23.18	FREE	FREE	FREE
ALLS345-0720-2160	7.2	21.6	10.8	7	15	8	70	11,280	22.71	FREE	FREE	FREE	FREE
ALLS345-0730-2190	7.3	21.9	11	7.1	15	8	70	11,280	23.02	FREE	FREE	FREE	FREE
ALLS345-0740-2220	7.4	22.2	11.1	7.2	15	8	70	11,280	23.33	FREE	FREE	FREE	FREE
ALLS345-0750-2250	7.5	22.5	11.3	7.3	15	8	70	11,280	23.64	FREE	FREE	FREE	FREE
ALLS345-0760-2280	7.6	22.8	11.4	7.4	15	8	70	11,280	FREE	FREE	FREE	FREE	FREE
ALLS345-0770-2310	7.7	23.1	11.6	7.5	15	8	70	11,280	FREE	FREE	FREE	FREE	FREE
ALLS345-0780-2340	7.8	23.4	11.7	7.6	15	8	70	11,280	FREE	FREE	FREE	FREE	FREE



●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	有效长 (L1) Effective Length	刃长 (L2) Length of Cut	颈径 (D2) Neck Diameter	仰角 (NA)° Neck Taper Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)	对应倾斜角的实际有效长 Actual effective length by inclined angle of workpiece. 30'	1°	1°30'	2°	3°
ALLS345-0790-2370	7.9	23.7	11.9	7.7	15	8	70	11,280	FREE	FREE	FREE	FREE	FREE
ALLS345-0800-2400	8	24	12	7.8	15	8	70	8,160	FREE	FREE	FREE	FREE	FREE
ALLS345-0800-4000		40	12	7.8	15	8	80	10,560	FREE	FREE	FREE	FREE	FREE
ALLS345-0810-2430	8.1	24.3	12.2	7.9	15	10	80	14,320	25.50	26.39	27.35	FREE	FREE
ALLS345-0820-2460	8.2	24.6	12.3	8	15	10	80	14,320	25.81	26.71	27.68	FREE	FREE
ALLS345-0830-2490	8.3	24.9	12.5	8.1	15	10	80	14,320	26.12	27.03	28.01	FREE	FREE
ALLS345-0840-2520	8.4	25.2	12.6	8.2	15	10	80	14,320	26.43	27.36	28.34	FREE	FREE
ALLS345-0850-2550	8.5	25.5	12.8	8.3	15	10	80	14,320	26.74	27.68	FREE	FREE	FREE
ALLS345-0860-2580	8.6	25.8	12.9	8.4	15	10	80	14,320	27.05	28.00	FREE	FREE	FREE
ALLS345-0870-2610	8.7	26.1	13.1	8.5	15	10	80	14,320	27.36	28.32	FREE	FREE	FREE
ALLS345-0880-2640	8.8	26.4	13.2	8.6	15	10	80	14,320	27.67	28.64	FREE	FREE	FREE
ALLS345-0890-2670	8.9	26.7	13.4	8.7	15	10	80	14,320	27.98	28.96	FREE	FREE	FREE
ALLS345-0900-2700	9	27	13.5	8.8	15	10	80	10,240	28.29	FREE	FREE	FREE	FREE
ALLS345-0910-2730	9.1	27.3	13.7	8.9	15	10	80	14,320	28.60	FREE	FREE	FREE	FREE
ALLS345-0920-2760	9.2	27.6	13.8	9	15	10	80	14,320	28.91	FREE	FREE	FREE	FREE
ALLS345-0930-2790	9.3	27.9	14	9.1	15	10	80	14,320	29.23	FREE	FREE	FREE	FREE
ALLS345-0940-2820	9.4	28.2	14.1	9.2	15	10	80	14,320	29.54	FREE	FREE	FREE	FREE
ALLS345-0950-2850	9.5	28.5	14.3	9.3	15	10	80	14,320	FREE	FREE	FREE	FREE	FREE
ALLS345-0960-2880	9.6	28.8	14.4	9.4	15	10	80	14,320	FREE	FREE	FREE	FREE	FREE
ALLS345-0970-2910	9.7	29.1	14.6	9.5	15	10	80	14,320	FREE	FREE	FREE	FREE	FREE
ALLS345-0980-2940	9.8	29.4	14.7	9.6	15	10	80	14,320	FREE	FREE	FREE	FREE	FREE
ALLS345-0990-2970	9.9	29.7	14.9	9.7	15	10	80	14,320	FREE	FREE	FREE	FREE	FREE
ALLS345-1000-3000	10	30	15	9.8	15	10	80	10,240	FREE	FREE	FREE	FREE	FREE
ALLS345-1000-5000		50	15	9.8	15	10	100	13,360	FREE	FREE	FREE	FREE	FREE
ALLS345-1010-3030	10.1	30.3	15.2	9.9	15	12	110	20,240	31.71	32.81	34.00	FREE	FREE
ALLS345-1020-3060	10.2	30.6	15.3	10	15	12	110	20,240	32.02	33.13	34.33	FREE	FREE
ALLS345-1030-3090	10.3	30.9	15.5	10.1	15	12	110	20,240	32.33	33.45	FREE	FREE	FREE
ALLS345-1040-3120	10.4	31.2	15.6	10.2	15	12	110	20,240	32.64	33.77	FREE	FREE	FREE
ALLS345-1050-3150	10.5	31.5	15.8	10.3	15	12	110	20,240	32.95	34.09	FREE	FREE	FREE
ALLS345-1060-3180	10.6	31.8	15.9	10.4	15	12	110	20,240	33.26	34.42	FREE	FREE	FREE
ALLS345-1070-3210	10.7	32.1	16.1	10.5	15	12	110	20,240	33.57	34.74	FREE	FREE	FREE
ALLS345-1080-3240	10.8	32.4	16.2	10.6	15	12	110	20,240	33.88	FREE	FREE	FREE	FREE
ALLS345-1090-3270	10.9	32.7	16.4	10.7	15	12	110	20,240	34.19	FREE	FREE	FREE	FREE
ALLS345-1100-3300	11	33	16.5	10.8	15	12	110	14,400	34.50	FREE	FREE	FREE	FREE
ALLS345-1110-3330	11.1	33.3	16.7	10.9	15	12	110	20,240	34.81	FREE	FREE	FREE	FREE
ALLS345-1120-3360	11.2	33.6	16.8	11	15	12	110	20,240	35.12	FREE	FREE	FREE	FREE
ALLS345-1130-3390	11.3	33.9	17	11.1	15	12	110	20,240	35.43	FREE	FREE	FREE	FREE
ALLS345-1140-3420	11.4	34.2	17.1	11.2	15	12	110	20,240	FREE	FREE	FREE	FREE	FREE
ALLS345-1150-3450	11.5	34.5	17.3	11.3	15	12	110	20,240	FREE	FREE	FREE	FREE	FREE
ALLS345-1160-3480	11.6	34.8	17.4	11.4	15	12	110	20,240	FREE	FREE	FREE	FREE	FREE
ALLS345-1170-3510	11.7	35.1	17.6	11.5	15	12	110	20,240	FREE	FREE	FREE	FREE	FREE
ALLS345-1180-3540	11.8	35.4	17.7	11.6	15	12	110	20,240	FREE	FREE	FREE	FREE	FREE
ALLS345-1190-3570	11.9	35.7	17.9	11.7	15	12	110	20,240	FREE	FREE	FREE	FREE	FREE
ALLS345-1200-3600	12	36	18	11.8	15	12	110	14,400	FREE	FREE	FREE	FREE	FREE
ALLS345-1200-6000		60	18	11.8	15	12	130	17,920	FREE	FREE	FREE	FREE	FREE

无涂层 切削条件参考表
Recommended Milling Conditions

■型号:ALLS345
Model number:ALLS345

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 A5000号 Aluminium alloy A5000				铝合金 A7000号 Aluminium alloy A7000			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut ∂p mm	切削量 Depth of Cut ∂e mm	进给速度 Feed mm/min	转速 Spindle Speed min⁻¹	切削量 Depth of Cut ∂p mm	切削量 Depth of Cut ∂e mm	进给速度 Feed mm/min	转速 Spindle Speed min⁻¹
3	1	3	1	0.3	1,100	20,000	1	0.3	1,200	20,000
		5	3	0.3	900	20,000	3	0.3	1,000	20,000
	1.1	3.3	1	0.3	1,100	20,000	1	0.3	1,200	20,000
	1.2	3.6	1	0.3	1,100	20,000	1	0.3	1,200	20,000
	1.3	3.9	1	0.3	1,100	20,000	1	0.3	1,200	20,000
	1.4	4.2	1	0.3	1,100	20,000	1	0.3	1,200	20,000
	1.5	4.5	1	0.3	1,100	20,000	1	0.3	1,200	20,000
	1.6	4.8	1	0.6	1,100	20,000	1	0.6	1,200	20,000
	1.7	5.1	1	0.6	1,100	20,000	1	0.6	1,200	20,000
	1.8	5.4	1	0.6	1,100	20,000	1	0.6	1,200	20,000
	1.9	5.7	1	0.6	1,100	20,000	1	0.6	1,200	20,000
	2	6	3	0.6	1,700	20,000	3	0.6	1,800	20,000
		10	6	0.6	1,400	20,000	6	0.6	1,500	20,000
	2.1	6.3	3	0.6	1,700	20,000	3	0.6	1,800	20,000
	2.2	6.6	3	0.6	1,700	20,000	3	0.6	1,800	20,000
	2.3	6.9	3	0.6	1,700	20,000	3	0.6	1,800	20,000
	2.4	7.2	4	0.6	1,700	20,000	4	0.6	1,800	20,000
	2.5	7.5	4	0.6	1,700	20,000	4	0.6	1,800	20,000
	2.6	7.8	4	0.6	1,700	20,000	4	0.6	1,800	20,000
	2.7	8.1	4	0.9	1,700	20,000	4	0.9	1,800	20,000
	2.8	8.4	4	0.9	1,700	20,000	4	0.9	1,800	20,000
	2.9	8.7	4	0.9	1,700	20,000	4	0.9	1,800	20,000
	3	9	4	0.9	1,900	20,000	4	0.9	2,000	20,000
		15	9	0.9	1,600	20,000	9	0.9	1,700	20,000
	3.1	9.3	4	0.9	1,900	20,000	4	0.9	2,000	20,000
	3.2	9.6	4	0.9	1,900	20,000	4	0.9	2,000	20,000
	3.3	9.9	4	0.9	1,900	20,000	4	0.9	2,000	20,000
	3.4	10.2	5	0.9	1,900	20,000	5	0.9	2,000	20,000
	3.5	10.5	5	0.9	1,900	20,000	5	0.9	2,000	20,000
	3.6	10.8	5	1.2	1,900	20,000	5	1.2	2,000	20,000
	3.7	11.1	5	1.2	1,900	20,000	5	1.2	2,000	20,000
	3.8	11.4	5	1.2	1,900	20,000	5	1.2	2,000	20,000
	3.9	11.7	5	1.2	1,900	20,000	5	1.2	2,000	20,000
	4	12	8	1.2	2,100	20,000	8	1.2	2,200	20,000
		20	12	1.2	1,700	20,000	12	1.2	1,800	20,000
	4.1	12.3	8	1.2	2,100	20,000	8	1.2	2,200	20,000
	4.2	12.6	8	1.2	2,100	20,000	8	1.2	2,200	20,000
	4.3	12.9	8	1.2	2,100	20,000	8	1.2	2,200	20,000
	4.4	13.2	8	1.2	2,100	20,000	8	1.2	2,200	20,000
	4.5	13.5	9	1.2	2,100	20,000	9	1.2	2,200	20,000
	4.6	13.8	9	1.2	2,100	20,000	9	1.2	2,200	20,000
	4.7	14.1	9	1.5	2,100	20,000	9	1.5	2,200	20,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者差非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

Non-Coat Series

无涂层 切削条件参考表
Recommended Milling Conditions

■型号:ALLS345
Model number:ALLS345

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 A5000号 Aluminium alloy A5000				铝合金 A7000号 Aluminium alloy A7000			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
3	4.8	14.4	9	1.5	2,100	20,000	9	1.5	2,200	20,000
	4.9	14.7	9	1.5	2,100	20,000	9	1.5	2,200	20,000
	5	15	10	1.5	2,600	20,000	10	1.5	2,700	20,000
		25	15	1.5	1,900	20,000	15	1.5	2,000	20,000
	5.1	15.3	10	1.5	2,600	20,000	10	1.5	2,700	20,000
	5.2	15.6	10	1.5	2,600	20,000	10	1.5	2,700	20,000
	5.3	15.9	10	1.5	2,600	20,000	10	1.5	2,700	20,000
	5.4	16.2	10	1.5	2,600	20,000	10	1.5	2,700	20,000
	5.5	16.5	10	1.5	2,600	20,000	10	1.5	2,700	20,000
	5.6	16.8	10	1.8	2,600	20,000	10	1.8	2,700	20,000
	5.7	17.1	11	1.8	2,600	20,000	11	1.8	2,700	20,000
	5.8	17.4	11	1.8	2,600	20,000	11	1.8	2,700	20,000
	5.9	17.7	11	1.8	2,600	20,000	11	1.8	2,700	20,000
	6	18	12	1.8	2,900	17,500	12	1.8	3,000	17,500
		30	18	1.8	2,400	17,500	18	1.8	2,500	17,500
	6.1	18.3	12	1.8	2,900	17,500	12	1.8	3,000	17,500
	6.2	18.6	12	1.8	2,900	17,500	12	1.8	3,000	17,500
	6.3	18.9	12	1.8	2,900	17,500	12	1.8	3,000	17,500
	6.4	19.2	14	1.8	2,900	17,500	14	1.8	3,000	17,500
	6.5	19.5	14	1.8	2,900	17,500	14	1.8	3,000	17,500
	6.6	19.8	14	1.8	2,900	17,500	14	1.8	3,000	17,500
	6.7	20.1	14	1.8	2,900	17,500	14	1.8	3,000	17,500
	6.8	20.4	14	1.8	2,900	17,500	14	1.8	3,000	17,500
	6.9	20.7	14	1.8	2,900	17,500	14	1.8	3,000	17,500
	7	21	14	2.1	2,900	15,000	14	2.1	3,000	15,000
	7.1	21.3	14	2.1	2,900	15,000	14	2.1	3,000	15,000
	7.2	21.6	14	2.1	2,900	15,000	14	2.1	3,000	15,000
	7.3	21.9	14	2.1	2,900	15,000	14	2.1	3,000	15,000
	7.4	22.2	15	2.1	2,900	15,000	15	2.1	3,000	15,000
	7.5	22.5	14	2.1	2,900	15,000	14	2.1	3,000	15,000
	7.6	22.8	14	2.1	2,900	15,000	14	2.1	3,000	15,000
	7.7	23.1	14	2.1	2,900	15,000	14	2.1	3,000	15,000
	7.8	23.4	14	2.1	2,900	15,000	14	2.1	3,000	15,000
	7.9	23.7	14	2.1	2,900	15,000	14	2.1	3,000	15,000
	8	24	16	2.4	2,900	13,000	16	2.4	3,000	13,000
		40	24	2.4	2,400	13,000	24	2.4	2,500	13,000
	8.1	24.3	16	2.4	2,900	13,000	16	2.4	3,000	13,000
	8.2	24.6	16	2.4	2,900	13,000	16	2.4	3,000	13,000
	8.3	24.9	16	2.4	2,900	13,000	16	2.4	3,000	13,000
	8.4	25.2	18	2.4	2,900	13,000	18	2.4	3,000	13,000
	8.5	25.5	18	2.4	2,900	13,000	18	2.4	3,000	13,000
	8.6	25.8	18	2.4	2,900	13,000	18	2.4	3,000	13,000

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

长颈平角立铣刀 Long Neck Square End Mill

切削材料 Work Material			铝合金 A5000号 Aluminium alloy A5000				铝合金 A7000号 Aluminium alloy A7000			
刃数 Number of Flutes	刀刃直径 Dia.	有效长 Effective Length	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed	切削量 Depth of Cut		进给速度 Feed	转速 Spindle Speed
			∂p mm	∂e mm	mm/min	min-1	∂p mm	∂e mm	mm/min	min-1
3	8.7	26.1	18	2.4	2,900	13,000	18	2.4	3,000	13,000
	8.8	26.4	18	2.4	2,900	13,000	18	2.4	3,000	13,000
	8.9	26.7	18	2.4	2,900	13,000	18	2.4	3,000	13,000
	9	27	18	2.7	2,900	12,000	18	2.7	3,000	12,000
	9.1	27.3	18	2.7	2,900	12,000	18	2.7	3,000	12,000
	9.2	27.6	18	2.7	2,900	12,000	18	2.7	3,000	12,000
	9.3	27.9	18	2.7	2,900	12,000	18	2.7	3,000	12,000
	9.4	28.2	19	2.7	2,900	12,000	19	2.7	3,000	12,000
	9.5	28.5	19	2.7	2,900	12,000	19	2.7	3,000	12,000
	9.6	28.8	19	2.7	2,900	12,000	19	2.7	3,000	12,000
	9.7	29.1	19	2.7	2,900	12,000	19	2.7	3,000	12,000
	9.8	29.4	19	2.7	2,900	12,000	19	2.7	3,000	12,000
	9.9	29.7	19	2.7	2,900	12,000	19	2.7	3,000	12,000
	10	30	19	3	3,150	10,500	19	3	3,250	10,500
		50	30	3	2,700	10,500	30	3	2,800	10,500
	10.1	30.3	20	3	3,150	10,500	20	3	3,250	10,500
	10.2	30.6	20	3	3,150	10,500	20	3	3,250	10,500
	10.3	30.9	20	3	3,150	10,500	20	3	3,250	10,500
	10.4	31.2	20	3	3,150	10,500	20	3	3,250	10,500
	10.5	31.5	20	3	3,150	10,500	20	3	3,250	10,500
	10.6	31.8	20	3	3,150	10,500	20	3	3,250	10,500
	10.7	32.1	20	3	3,150	10,500	20	3	3,250	10,500
	10.8	32.4	20	3	3,150	10,500	20	3	3,250	10,500
	10.9	32.7	20	3	3,150	10,500	20	3	3,250	10,500
	11	33	22	3.3	3,250	9,500	22	3.3	3,350	9,500
	11.1	33.3	22	3.3	3,250	9,500	22	3.3	3,350	9,500
	11.2	33.6	22	3.3	3,250	9,500	22	3.3	3,350	9,500
	11.3	33.9	22	3.3	3,250	9,500	22	3.3	3,350	9,500
	11.4	34.2	22	3.3	3,250	9,500	22	3.3	3,350	9,500
	11.5	34.5	22	3.3	3,250	9,500	22	3.3	3,350	9,500
	11.6	34.8	22	3.3	3,250	9,500	22	3.3	3,350	9,500
	11.7	35.1	23	3.3	3,250	9,500	23	3.3	3,350	9,500
	11.8	35.4	23	3.3	3,250	9,500	23	3.3	3,350	9,500
	11.9	35.7	23	3.3	3,250	9,500	23	3.3	3,350	9,500
	12	36	24	3.6	3,250	9,000	24	3.6	3,350	9,000
		60	36	3.6	2,700	7,500	36	3.6	2,800	7,500

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●∂p=轴向方向切削量,∂e=径向方向切削量。 ∂p=Axial Depth of Cut ∂e=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

ion Depo Type R Series

超硬钻头　Carbide Drill

ion R | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

特　征

- 由气相沉积法成膜的钻头专用Ion Depo Type R系列产品!
- 兼具刚性和锋利性的切削刃,表现出优异的切削性能,支持多种材料的钻孔!
- 提供可减少钻孔工序的双角钻头系列!
- 可提供定制产品,制作周期短!

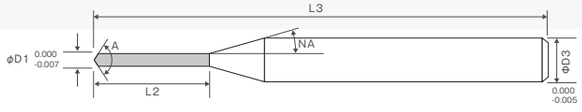
Features

- ion Depo Type R coated drills.
- Outstanding penetration rate with cutting edge design for rigidity and sharpness, supporting drilling a wide range of work materials.
- Double angle drills available for reduced drilling cycle time
- Non-standard custom-made products can be provided at a short delivery time.

超硬钻头　Carbide Drill

ion R | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005

■型号:IRD230　Model number:IRD230



所示的仰角(NA) 仅供参考。如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (NA) shown is a reference value.
If concerned about interference with the work material, please check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	刀刃直径 (D1) Tool Diameter	沟长 (L2) Flute Length	先端角 (A) Point Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IRD230-0100-00800	1	8	130	4	50	1,940
IRD230-0200-01000	2	10	130	4	50	4,360
IRD230-0250-01400	2.5	14	130	4	50	4,360
IRD230-0260-01400	2.6	14	130	4	50	4,360
IRD230-0300-01400	3	14	130	4	50	4,360
IRD230-0340-01600	3.4	16	130	4	50	4,690
IRD230-0350-01600	3.5	16	130	4	50	4,690
IRD230-0400-01600	4	16	130	4	50	4,930
IRD230-0430-02000	4.3	20	130	6	60	5,290
IRD230-0450-02000	4.5	20	130	6	60	5,290
IRD230-0500-02000	5	20	130	6	60	5,660
IRD230-0510-02000	5.1	20	130	6	60	5,970
IRD230-0520-02000	5.2	20	130	6	60	5,970
IRD230-0590-02000	5.9	20	130	6	60	6,260
IRD230-0600-02000	6	20	130	6	60	6,260
IRD230-0650-03000	6.5	30	130	8	70	6,260
IRD230-0660-03000	6.6	30	130	8	70	6,660
IRD230-0680-03000	6.8	30	130	8	70	6,660
IRD230-0690-03000	6.9	30	130	8	70	6,660
IRD230-0700-03000	7	30	130	8	70	6,660
IRD230-0800-03000	8	30	130	8	70	7,420
IRD230-0850-03500	8.5	35	130	10	90	7,820
IRD230-0860-03500	8.6	35	130	10	90	8,240
IRD230-0900-03500	9	35	130	10	90	8,240
IRD230-1000-03500	10	35	130	10	90	9,040
IRD230-1050-03500	10.5	35	130	12	110	9,440
IRD230-1100-04800	11	48	130	12	120	9,760
IRD230-1150-04800	11.5	48	130	12	120	10,240
IRD230-1200-04800	12	48	130	12	120	10,560
★ IRD230-1300-06500	13	65	130	14	150	19,200
★ IRD230-1300-10400		104	130	14	190	22,480
IRD230-1400-07000	14	70	130	14	150	20,160
IRD230-1400-11200		112	130	14	190	23,920
★ IRD230-1500-07500	15	75	130	16	160	21,440
★ IRD230-1500-12000		120	130	16	210	25,280
IRD230-1600-08000	16	80	130	16	200	22,880
IRD230-1600-12800		128	130	16	210	27,040
★ IRD230-1700-08500	17	85	130	18	180	28,320
★ IRD230-1700-13600		136	130	18	230	32,720
IRD230-1800-09000	18	90	130	18	210	33,360
IRD230-1800-14400		144	130	18	230	38,720
★ IRD230-1900-09500	19	95	130	20	190	38,160
★ IRD230-1900-15200		152	130	20	250	43,840
IRD230-2000-10000	20	100	130	20	230	43,280
IRD230-2000-16000		160	130	20	250	46,160

★定制品(Ordered product)

CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series 钻头 Drill

ion Depo Type R Series

ion Depo Type R 切削条件参考表
Recommended Milling Conditions

■型号:IRD230
Model number:IRD230

超硬钻头 Carbide Drills

切削材料 Work Material		铸铁 Cast Iron FCD		碳钢 Carbon Steels S50C/SS400		预硬钢 Prehardened Steels PX5/NAK80		合金钢 Die Steels SKD11/SKD61		高速钢 High Speed Steels HAP5R/HAP72/ASP23		不锈钢 Stainless Steels SUS304		不锈钢 Stainless Steels HPM/STAVAX	
刀刃直径 Drill Dia (mm)	沟长 Flute Length (mm)	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed
		min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev
1	8	13,000	0.04~0.08	13,000	0.04~0.08	7,500	0.04~0.06	7,500	0.04~0.06	7,500	0.04~0.06	10,000	0.04~0.08	7,500	0.04~0.06
2	10	12,700	0.04~0.09	12,700	0.04~0.09	7,200	0.04~0.06	7,200	0.04~0.06	7,200	0.04~0.06	9,500	0.04~0.08	7,200	0.04~0.06
2.5	14	12,700	0.04~0.09	12,700	0.04~0.09	7,200	0.04~0.06	7,200	0.04~0.06	7,200	0.04~0.06	9,500	0.04~0.08	7,200	0.04~0.06
2.6	14	12,700	0.04~0.09	12,700	0.04~0.09	7,200	0.04~0.06	7,200	0.04~0.06	7,200	0.04~0.06	9,500	0.04~0.08	7,200	0.04~0.06
3	14	11,000	0.06~0.12	11,000	0.06~0.12	4,800	0.06~0.09	4,800	0.06~0.09	4,800	0.06~0.09	8,500	0.06~0.12	4,800	0.06~0.09
3.4	16	11,000	0.06~0.12	11,000	0.06~0.12	4,800	0.06~0.09	4,800	0.06~0.09	4,800	0.06~0.09	8,500	0.06~0.12	4,800	0.06~0.09
3.5	16	11,000	0.06~0.12	11,000	0.06~0.12	4,800	0.06~0.09	4,800	0.06~0.09	4,800	0.06~0.09	8,500	0.06~0.12	4,800	0.06~0.09
4	16	8,000	0.08~0.16	8,000	0.08~0.16	3,600	0.08~0.12	3,600	0.08~0.12	3,600	0.08~0.12	6,400	0.08~0.16	3,600	0.08~0.12
3.4	20	8,000	0.08~0.16	8,000	0.08~0.16	3,600	0.08~0.12	3,600	0.08~0.12	3,600	0.08~0.12	6,400	0.08~0.16	3,600	0.08~0.12
3.5	20	8,000	0.08~0.16	8,000	0.08~0.16	3,600	0.08~0.12	3,600	0.08~0.12	3,600	0.08~0.12	6,400	0.08~0.16	3,600	0.08~0.12
5	20	6,400	0.1~0.2	6,400	0.1~0.2	2,900	0.1~0.15	2,900	0.1~0.15	2,900	0.1~0.15	5,100	0.1~0.2	2,900	0.1~0.15
5.1	20	6,400	0.1~0.2	6,400	0.1~0.2	2,900	0.1~0.15	2,900	0.1~0.15	2,900	0.1~0.15	5,100	0.1~0.2	2,900	0.1~0.15
5.2	20	6,400	0.1~0.2	6,400	0.1~0.2	2,900	0.1~0.15	2,900	0.1~0.15	2,900	0.1~0.15	5,100	0.1~0.2	2,900	0.1~0.15
5.9	20	6,400	0.1~0.2	6,400	0.1~0.2	2,900	0.1~0.15	2,900	0.1~0.15	2,900	0.1~0.15	5,100	0.1~0.2	2,900	0.1~0.15
6	20	5,300	0.12~0.24	5,300	0.12~0.24	2,400	0.12~0.18	2,400	0.12~0.18	2,400	0.12~0.18	4,200	0.12~0.24	2,400	0.12~0.18
6.5	30	5,300	0.12~0.24	5,300	0.12~0.24	2,400	0.12~0.18	2,400	0.12~0.18	2,400	0.12~0.18	4,200	0.12~0.24	2,400	0.12~0.18
6.6	30	5,300	0.12~0.24	5,300	0.12~0.24	2,400	0.12~0.18	2,400	0.12~0.18	2,400	0.12~0.18	4,200	0.12~0.24	2,400	0.12~0.18
6.8	30	5,300	0.12~0.24	5,300	0.12~0.24	2,400	0.12~0.18	2,400	0.12~0.18	2,400	0.12~0.18	4,200	0.12~0.24	2,400	0.12~0.18
6.9	30	5,300	0.12~0.24	5,300	0.12~0.24	2,400	0.12~0.18	2,400	0.12~0.18	2,400	0.12~0.18	4,200	0.12~0.24	2,400	0.12~0.18
7	30	4,500	0.14~0.26	4,500	0.14~0.26	2,000	0.14~0.21	2,000	0.14~0.21	2,000	0.14~0.21	3,600	0.14~0.26	2,000	0.14~0.21
8	30	4,000	0.16~0.28	4,000	0.16~0.28	1,800	0.16~0.24	1,800	0.16~0.24	1,800	0.16~0.24	3,200	0.16~0.28	1,800	0.16~0.24
8.5	35	4,000	0.16~0.28	4,000	0.16~0.28	1,800	0.16~0.24	1,800	0.16~0.24	1,800	0.16~0.24	3,200	0.16~0.28	1,800	0.16~0.24
8.6	35	4,000	0.16~0.28	4,000	0.16~0.28	1,800	0.16~0.24	1,800	0.16~0.24	1,800	0.16~0.24	3,200	0.16~0.28	1,800	0.16~0.24
9	35	3,500	0.18~0.3	3,500	0.18~0.3	1,600	0.18~0.27	1,600	0.18~0.27	1,600	0.18~0.27	2,800	0.18~0.3	1,600	0.18~0.27
10	35	3,200	0.2~0.3	3,200	0.2~0.3	1,400	0.2~0.3	1,400	0.2~0.3	1,400	0.2~0.3	2,500	0.2~0.3	1,400	0.2~0.3
10.5	35	3,200	0.2~0.3	3,200	0.2~0.3	1,400	0.2~0.3	1,400	0.2~0.3	1,400	0.2~0.3	2,500	0.2~0.3	1,400	0.2~0.3
11	48	2,900	0.2~0.3	2,900	0.2~0.3	1,300	0.2~0.3	1,300	0.2~0.3	1,300	0.2~0.3	2,300	0.2~0.3	1,300	0.2~0.3
11.5	48	2,900	0.2~0.3	2,900	0.2~0.3	1,300	0.2~0.3	1,300	0.2~0.3	1,300	0.2~0.3	2,300	0.2~0.3	1,300	0.2~0.3
12	48	2,700	0.21~0.3	2,700	0.21~0.3	1,200	0.21~0.3	1,200	0.21~0.3	1,200	0.21~0.3	2,100	0.21~0.3	1,200	0.21~0.3
13	65	2,700	0.21~0.3	2,700	0.21~0.3	1,200	0.21~0.3	1,200	0.21~0.3	1,200	0.21~0.3	2,100	0.21~0.3	1,200	0.21~0.3
	104	2,700	0.21~0.3	2,700	0.21~0.3	1,200	0.21~0.3	1,200	0.21~0.3	1,200	0.21~0.3	2,100	0.21~0.3	1,200	0.21~0.3
14	70	2,300	0.22~0.35	2,300	0.22~0.35	1,000	0.22~0.35	1,000	0.22~0.35	1,000	0.22~0.35	1,800	0.22~0.35	1,000	0.22~0.35
	112	2,300	0.22~0.35	2,300	0.22~0.35	1,000	0.22~0.35	1,000	0.22~0.35	1,000	0.22~0.35	1,800	0.22~0.35	1,000	0.22~0.35
15	75	2,300	0.22~0.35	2,300	0.22~0.35	1,000	0.22~0.35	1,000	0.22~0.35	1,000	0.22~0.35	1,800	0.22~0.35	1,000	0.22~0.35
	120	2,300	0.22~0.35	2,300	0.22~0.35	1,000	0.22~0.35	1,000	0.22~0.35	1,000	0.22~0.35	1,800	0.22~0.35	1,000	0.22~0.35
16	80	2,000	0.25~0.36	2,000	0.25~0.36	900	0.25~0.36	900	0.25~0.36	900	0.25~0.36	1,600	0.25~0.36	900	0.25~0.36
	128	2,000	0.25~0.36	2,000	0.25~0.36	900	0.25~0.36	900	0.25~0.36	900	0.25~0.36	1,600	0.25~0.36	900	0.25~0.36
17	85	2,000	0.25~0.36	2,000	0.25~0.36	900	0.25~0.36	900	0.25~0.36	900	0.25~0.36	1,600	0.25~0.36	900	0.25~0.36
	136	2,000	0.25~0.36	2,000	0.25~0.36	900	0.25~0.36	900	0.25~0.36	900	0.25~0.36	1,600	0.25~0.36	900	0.25~0.36
18	90	1,800	0.28~0.38	1,800	0.28~0.38	800	0.28~0.38	800	0.28~0.38	800	0.28~0.38	1,400	0.28~0.38	800	0.28~0.38
	144	1,800	0.28~0.38	1,800	0.28~0.38	800	0.28~0.38	800	0.28~0.38	800	0.28~0.38	1,400	0.28~0.38	800	0.28~0.38
19	95	1,800	0.28~0.38	1,800	0.28~0.38	800	0.28~0.38	800	0.28~0.38	800	0.28~0.38	1,400	0.28~0.38	800	0.28~0.38

●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●*ap*=轴向方向切削量,*ae*=径向方向切削量。 *ap*=Axial Depth of Cut *ae*=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

超硬钻头 Carbide Drills

切削材料 Work Material		铸铁 Cast Iron FCD		碳钢 Carbon Steels S50C/SS400		预硬钢 Prehardened Steels PX5/NAK80		合金钢 Die Steels SKD11/SKD61		高速钢 High Speed Steels HAP5R/HAP72/ASP23		不锈钢 Stainless Steels SUS304		不锈钢 Stainless Steels HPM/STAVAX	
刀刃直径 Drill Dia (mm)	沟长 Length of cut (mm)	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed
		min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev
19	152	1,800	0.28~0.38	1,800	0.28~0.38	800	0.28~0.38	800	0.28~0.38	800	0.28~0.38	1,400	0.28~0.38	800	0.28~0.38
20	100	1,600	0.3~0.4	1,600	0.3~0.4	700	0.3~0.4	700	0.3~0.4	700	0.3~0.4	1,300	0.3~0.4	700	0.3~0.4
	160	1,600	0.3~0.4	1,600	0.3~0.4	700	0.3~0.4	700	0.3~0.4	700	0.3~0.4	1,300	0.3~0.4	700	0.3~0.4

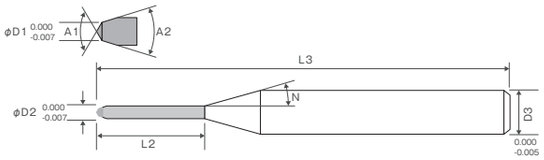
●请将刀具确实地固定在刀柄上,以防止刀具振动。 Reduce tool deflection by mounting the tool securely into the holder.
●请使用油雾或者是非水溶性切削液。 We recommend using oil mist coolant or non-water soluble cutting fluid.
●切削量为精加工的最大值。 Depth of Cut shows the maximum value for finishing.
●刀具悬伸量请尽可能调整到最短。 Length of tool overhang must be as short as possible.
●*ap*=轴向方向切削量,*ae*=径向方向切削量。 *ap*=Axial Depth of Cut *ae*=Radial Depth of Cut.
●请将转速与进给速度调整为同一比例。 Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

CBN Series
Hard Star A Series
Hard Star TI Series
Hard Star TT Series
ion Depo A Series
ion Depo U Series
DLC Series
Non-Coat Series
ion Depo R Series 铣头 Drill

超硬双角钻头　Carbide Double Angle Drill

■型号:IRDAD230　Model number:IRDAD230

ion R | super MG | 刀刃数 2 | 螺旋角 30° | 仰角 15° | 柄径公差 0/-0.005



所示的仰角(NA) 仅供参考,如果担心干涉切削材料,请务必通过实际测量进行检查。
The neck angle (N) shown is a reference value.
If you are concerned about interference with the work material,
be sure to check by actual measurement.

●联系我们了解更多关于可再研磨刀具的资讯(Regrinding is possible. Please contact us for details.)

单位(Size):mm

型号 Code No.	第1刃刃直径 (D1) First Diameter	第2刃刃直径 (D2) Second Diameter	沟长 (L2) Flute Length	先端角 (A1) First Angle	2段角 (A2) Second Angle	刀柄直径 (D3) Shank Diameter	全长 (L3) Overall Length	标准价格 (円) Retail Price (JPY)
IRDAD230-0180-01500	0.5	1.8	15	130	60	4	50	5,230
IRDAD230-0200-01500	0.65	2	15	130	60	4	50	5,230
IRDAD230-0220-01500	1.6	2.2	15	130	60	4	50	5,230
IRDAD230-0250-01500	0.9	2.5	15	130	60	4	50	5,230
IRDAD230-0300-01500	1	3	15	130	60	4	50	5,230
IRDAD230-0340-0100-01500	1	3.4	15	130	60	4	50	5,630
IRDAD230-0340-0150-01500	1.5	3.4	15	130	60	4	50	5,630
IRDAD230-0450-01500	1.5	4.5	15	130	60	6	50	6,350

ion Depo Type R 切削条件参考表
Recommended Milling Conditions

■型号:IRDAD230
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超硬双角钻头 Carbide double angle drills

切削材料 Work Material	铸铁 Cast Iron FCD		碳钢 Carbon Steels S50C/SS400		预硬钢 Prehardened Steels PX5/NAK80		合金钢 Die Steels SKD11/SKD61		高速钢 High Speed Steels HAP5R/HAP72/ASP23		不锈钢 Stainless Steels SUS304		不锈钢 Stainless Steels HPM/STAVAX	
第2刃刃直径 Second Diameter	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed	转速 Speed	切削量 Feed
	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev	min-1	mm/rev
1.8	4,500	0.03	4,500	0.03	4,500	0.03	4,500	0.03	4,500	0.03	4,000	0.03	4,500	0.03
2	4,000	0.03	4,000	0.03	4,000	0.03	4,000	0.03	4,000	0.03	3,600	0.03	4,000	0.03
2.2	3,500	0.05	3,500	0.05	3,500	0.05	3,500	0.05	3,500	0.05	3,200	0.05	3,500	0.05
2.5	3,500	0.05	3,500	0.05	3,500	0.05	3,500	0.05	3,500	0.05	3,200	0.05	3,500	0.05
3	2,600	0.07	2,600	0.07	2,600	0.07	2,600	0.07	2,600	0.07	2,300	0.07	2,600	0.07
3.4	2,500	0.07	2,500	0.07	2,500	0.07	2,500	0.07	2,500	0.07	2,200	0.07	2,500	0.07
4.5	2,000	0.12	2,000	0.12	2,000	0.12	2,000	0.12	2,000	0.12	1,800	0.12	2,000	0.12

●请将刀具确实地固定在刀柄上,以防止刀具振动。　Reduce tool deflection by mounting the tool securely into the holder.
●切削量为精加工的最大值。　Depth of Cut shows the maximum value for finishing.
●ap=轴向方向切削量,ae=径向方向切削量。　ap=Axial Depth of Cut　ae=Radial Depth of Cut.
●请使用油雾或者是非水溶性切削液。　We recommend using oil mist coolant or non-water soluble cutting fluid.
●刀具悬伸量请尽可能调整到最短。　Length of tool overhang must be as short as possible.
●请将转速与进给速度调整为同一比例。　Adjust milling conditions according to the depth of cut and the rigidity of the machine and work holding.

Memo

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安全使用注意事项

●请勿徒手接触切削刃，有受伤风险。

●从盒中取出或装夹于机上时，请使用保护手套。

●使用前请确保刀具没有伤痕或破损。

●如刀具有伤痕或破损，在使用过程中有折损、飞散的风险。

●使用前请详细确认刀具和工件的尺寸。

●切削条件表中的数值仅供参考。需要根据工件和机床性能调整切削条件。

●加工过程中，由于刀具所受冲击负荷或刀具折损等原因，导致刀具有飞散的危险。
请使用安全面罩、护目镜等防护用品。

●如继续使用磨损或已有伤痕的刀具，可能会造成刀具破损或工件损坏。请更换刀具。

●如果加工过程中出现异常振动或噪音，请立即停止加工。

●请根据用途选择切削油。请务必做好防火措施。

Attention on Safety

●Do not directly touch the cutting edge. It could cause injury.

●When removing tools from their packaging, ALWAYS use safety covers.

●Make sure there are no scratches or cracks on the tool before use.

●If the tool has scratches or cracks, there is a risk of damage and scattering during use.

●Verify dimensions of tools and workpiece before starting operation.

●It is necessary to adjust cutting conditions according to part shape, and machine/ work holding rigidity.

●As tools may be scattered due to an impact or damage to the tool during machining.
ALWAYS use safety covers and eye protection.

●Continued use of worn or damaged tools may cause damage, please replace the tool.

●If abnormal vibration, sound, etc. occurs during machining, stop machine immediately.

●Select a cutting fluid appropriate to the particular usage. Ensure that you take proper fire-prevention measures.

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TOWA株式会社

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