

**NS** TOOL

「匠」心创先

日進工具株式会社

# NS TOOL ENDMILL CATALOG



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# 图标的识别方法

Description of Icons

## 材质 Material

表示所使用铣刀的材质

	超微粒子硬质合金 Micro Grain Carbide
	极超微粒硬质合金 Super Micro Grain Carbide
	硬质合金 Regular Grain Carbide
	CBN (立方氮化硼) Cubic Boron Nitride
	PCD Polycrystalline Diamond
	单晶钻石 Monocrystalline Diamond

## 表面处理 Coating

表示刃部的涂层。

	无限白金涂层 MUGEN-COATING PREMIUM
	无限涂层 MUGEN-COATING
	无限微细涂层 MUGEN MICRO COATING
	X涂层 (TiCN类) X-COATING
	DLC涂层 DLC COATING
	钻石涂层 DIAMOND COATING








## 加工用途 Applications

表示要使用的主要加工形状。

	侧面加工 Side milling		钻孔加工 Drilling
	沟槽加工 Slot milling		螺纹加工 Thread milling
	曲面加工 3D milling		斜角加工 C Chamfering
	平面加工 Face milling		R倒角 R Chamfering
	插铣加工 Plunging milling		













## 刃数 Number of Flutes

表示铣刀的刃数。

	1刃 1 Flute		6刃 6 Flute
	2刃 2 Flute		8刃 8 Flute
	3刃 3 Flute		10刃 10 Flute
	4刃 4 Flute		

## 螺旋角 Helix Angle

表示刃部的螺旋角。

	左20° Left 20°		35°
	左11° Left 11°		35° / 38°
	0°		40°
	12°		40° / 42°
	20°		45°
	25°		
	30°		

## 角部形状 Corner Shape

表示刃部角的形状。

	尖角 Sharp Edge		圆鼻 Corner Radius
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## 可加工硬度 Cutting Possibility of Work Material Hardness

表示高硬度材料的可加工硬度。

	可加工的硬度 ~55HRC Possible to cut up to 55HRC
	可加工的硬度 ~62HRC Possible to cut up to 62HRC
	可加工的硬度 ~65HRC Possible to cut up to 65HRC
	可加工的硬度 ~68HRC Possible to cut up to 68HRC

1 各种搜索方法 Search

[根据使用目的查找产品]

按 [形状] 搜索 Search from Type .....	A-002
按 [平底规格] 搜索 Search from Square Dia. ....	A-022
按 [球头规格] 搜索 Search from Ball R .....	A-056
按 [圆鼻规格] 搜索 Search from Radius Dia. & Corner R .....	A-074
按 [产品代码] 搜索 Search from Code No. ....	A-088
按 [产品型号] 搜索 Search from Model .....	A-090

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[旧进工具的全部产品的介绍]

CBN Cubic Boron Nitride .....	B-002
钻石 Diamond .....	C-001
平底 Square .....	D-001
球头 Ball .....	E-001
圆鼻 Radius .....	F-001
锥形 Taper .....	G-001
钻头 Drilling .....	H-001
螺纹 Thread milling .....	I-001
倒角 Chamfering .....	J-001

3 技术资料 Technical Data

[旧进工具产品的技术资料]

产品特点 Features of NS TOOL End Mill .....	K-002
加工案例 Machining Data .....	K-007

4 参考资料 Technical Guidance

[铣刀技术参考资料]

钻石铣刀  
Diamond

平底铣刀  
Square

长颈平底  
铣刀  
Long Neck Square

球头铣刀  
Ball

长颈球头  
铣刀  
Long Neck Ball

圆鼻铣刀  
Radius

长颈圆鼻  
铣刀  
Long Neck Radius

锥形铣刀  
Taper

锥形球头  
铣刀  
Taper Ball

锥形圆鼻  
铣刀  
Taper Radius

钻头  
Drilling

螺纹铣刀  
Thread milling

倒角刀  
Chamfering



### New 铝材专用平底铣刀 (3刃3倍刃长型) 3-Flute Medium End Mill for Aluminum

## AL3D-345



**φ1~φ12 共有9种规格** Total 9 Sizes

- NS TOOL的AL系列在任何条件下都可实现稳定的高效加工。
- 可在多个领域中获得稳定的加工面精度,即使高速加工也可抑制振刀。
- 采用3刃形,实现高效加工。
- AL-series realized a stable and high efficient machining.
- It exhibits stable excellent surface on a wide area and no chattering occurs even during high speed cutting.
- Realized high efficiency machining by adopting 3 flutes.

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### New 铝材用高效平底铣刀 3-Flute Power "Z" End Mill for Aluminum

## ALZ345



**φ1~φ12 共有124种规格** Total 124 Sizes

- NS TOOL的AL系列在任何条件下都可实现稳定的高效加工。
- 插铣性能大幅提高!
- 提高了切屑排放性能的高效型。
- 新增了有效长5D型和长柄型,共有124种规格。
- AL-series realized a stable and high efficient machining.
- Improved drilling capacity!
- High performance with better chip disposal.
- Add new 5D effective length type and long shank type to become 124 sizes.

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### New 铜电极加工用长颈平底铣刀 Long Neck End Mill for Copper Electrode

## DHR237



**φ0.1~φ6 共有54种规格** Total 54 Sizes

- 铜合金加工用的强化型长颈平底铣刀。
- 采用锋利度和精加工表面品质兼具的螺旋角【37.5°】,可抑制加工面产生水平条纹。
- 采用优化的刀刃形状和DLC涂层,可确保长时间持续稳定的进行高品质加工。
- 对钨铜电极的加工也很有效。
- Long neck end mill specialized for processing copper alloy.
- Helix angle 37.5 degrees to achieve both sharpness and finished surface quality that prevents scratches on cutting surface.
- High quality and stable milling performance with long tool life by optimized design and DLC COATING.
- Processing copper tungsten electrodes is also effective.

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New

铜电极加工用长颈球头铣刀 Long Neck Ball End Mill for Copper Electrode

## DRB230



**R0.05~R3 共有57种规格** Total 57 Sizes

- 铜合金加工用的强化型长颈球头铣刀。
- 采用锋利的刀刃形状和DLC涂层，可确保长时间持续稳定的进行高品质加工。
- 对钨铜电极的加工也很有效。
- Long neck ball end mill specialized for processing copper alloy.
- Sharp edge shearing ability and DLC COATING realized high quality and stable a long life processing.
- Processing copper tungsten electrodes is also effective.

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New

CBN超高速加工用 圆鼻铣刀 CBN Super Speed Radius End Mill

## SSR200



**φ0.1~φ2 共有172种规格** Total 172 Sizes

- CBN超群的耐磨性实现了对角部R的高效加工。
- 整个切削刃为连续平滑的刀刃设计！实现超群的加工表面精度。
- 可支持调质钢~68HRC的高硬度材料。
- 规格扩大到从φ0.1起共有172个规格。
- Realized high efficient machining with radius flute along with excellent wear resistance of CBN.
- Realized excellent surface roughness by introducing smooth tangent on all over flute.
- Applicable for work materials from tempered steel to hardened steel (up to 68 HRC).
- Lineup expansion from Dia.0.1mm. 172 sizes in total.

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New

无限白金涂层 高硬度材料用 长颈圆鼻铣刀

MUGEN-COATING PREMIUM Long Neck Radius End Mill for Hardened Steel

## MHRH230R

(2 刃型 2-Flute Type)

**$\phi 0.2 \sim \phi 0.9$**  共有97种规格 Total 97 Sizes



## MHRH430R

(4 刃型 4-Flute Type)

**$\phi 0.2 \sim \phi 6$**  共有326种规格 Total 326 Sizes



- 采用最适合于高硬度材料加工的无限白金涂层。
- 采用增强型外周刃倒锥，可抑制侧部的振刀。
- 角部R精度高达 $\pm 5\mu\text{m}$  (D2.5以下采用)。
- 最小角部R为R0.02，可用于微细的拐角形状的加工。
- 刃径从 $\phi 0.2$ 起，有2刃型和4刃型。

- Adoption of MUGEN-COATING PREMIUM for hardened steels.
- Minimized chattering in side milling by adoption of strong back taper shape on the peripheral cutting edge.
- Corner R accuracy :  $\pm 5\mu\text{m}$  (2.5D and below).
- Smallest size from R0.02 suits minute corner milling.
- Expanded 4-flute lineup from  $\phi 0.2$ .

登载页面 ▶ F-010 (MHRH230R)

登载页面 ▶ F-012 (MHRH430R)

# 日进工具自主研发的涂层介绍 NS TOOL Original Coating



## 无限白金涂层 MUGEN-COATING PREMIUM

对高硬度材料进行直接切削加工时，无限白金涂层可大幅提高刀具的使用寿命。涂膜硬度Hv3,600，耐氧化性高，氧化开始温度高达1,300°C，适用于48~65HRC的高硬度材料加工。

MUGEN-COATING PREMIUM has brought the tool life extension for the machining of high hardened steels. It is suited for hardened steels from 48 to 65 HRC with high coating hardness: 3,600Hv and oxidation onset temperature: 1,300deg. C.



## 无限涂层 MUGEN-COATING

无限涂层是以TiAlN (氮化铝钛) 为基底的涂层，涂膜硬度Hv3,400，耐氧化性高，氧化开始温度高达1,100°C。加工淬火钢、调质钢、生材、铜时，也具有很强的耐磨损性和润滑性。

MUGEN-COATING consists of TiAlN (Titanium Aluminum Nitride) with coating hardness: 3,400Hv and oxidation onset temperature: 1,100deg. C. It covers wide range of work materials such as hardened steels, pre-hardened steels, raw materials and even coppers as being strong tool wear resistance and lubricating ability.



## X涂层 (TiCN类) X-COATING

X涂层是TiCN (氮化钛) 类的涂层。涂膜硬度高达HV3,000，涂层的粘合性极佳。使用湿式冷却来缓解切削热量的切削加工 (切削速度100m/min以下) 时，威力超群。

X-COATING consists of TiCN (Titanium Carbon Nitride) with coating hardness: 3,000Hv and high adhesion. It is recommended for general use of various materials at less than 100m/min cutting speed with coolant fluid.



## DLC涂层 DLC COATING

DLC (类似钻石碳素) 涂层是具有类似钻石性质的碳涂膜，兼具钻石和石墨特性的非晶格结构的涂层。硬度高达HV6,000，摩擦系数仅0.1，涂膜的表面粗糙度Ra0.02μm，非常光滑。而且耐熔融性能优异，加工铝合金时可保持优良的精加工表面。

DLC (Diamond like Carbon) is a carbon coating similar to diamond coating. It is suited for the high accurate surface milling of Aluminum by the features of high coating hardness: 6,000Hv, low friction coefficient: 0.1 and strong welding resistance by smooth surface: Ra0.02 micro meter.



## 钻石涂层 DIAMOND COATING

不含结合剂和杂质的高纯度钻石，具有优异的耐磨损性，采用高粘合性的结合技术，可实现极高的稳定性。

Stable quality brought by strong wear-resistance and stickiness of pure diamond free from bond and impurity.

## 各种涂层的加工材料适用表 Coating application chart by materials

涂层种类 Coating		无限白金 涂层 MUGEN-COATING PREMIUM	无限涂层 MUGEN-COATING	X涂层 X-COATING	DLC涂层 DLC COATING	钻石涂层 DIAMOND COATING
加工材料 Material	淬火钢 56~65HRC Hardened Steels	◎				
	淬火钢 45~55HRC Hardened Steels	◎	○			
	调质钢 Prehardened Steels	◎	◎	○		
	生材 Raw Material	○	◎	○		
	铜合金 Copper		○		◎	
	铝合金 Aluminum Alloy				◎	
	硬脆材 Hard Brittle Materials					◎
	石墨 Graphite					◎