AXIS
Tools for mICRO mACHINING

NexGen

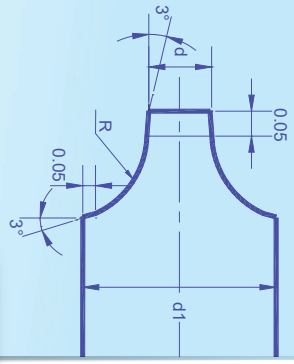
High Precision Milling Tools ≥ ø50 µ

INDMILL

Standard :
R 0.10 - R 1.00 : ±0.010mm
R > 1.00 : ±0.020mm
On Request : ±0.003mm

MMP® TECHNOLOGY
Embedded

Standard :
R 0.10-R 1.50 : ±0.002mm
R 2.00 - 8.00 : ±0.005mm
On Request : ± 0.0015mm

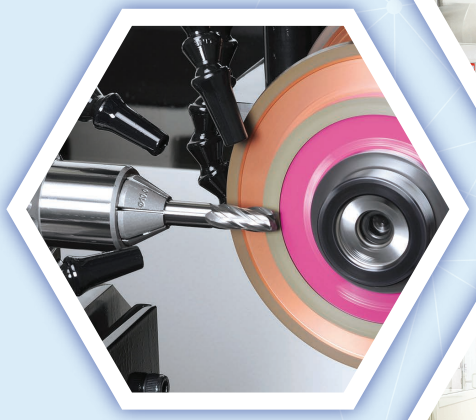


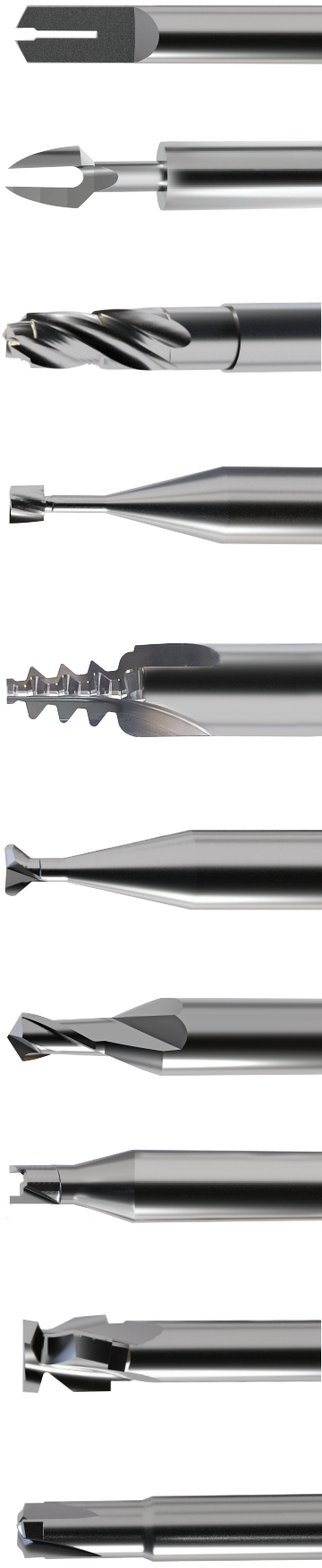
Precision Redefined

End Mills Engineered for Excellence

ISO 9001 ISO 13485 ISO 14001 45001

www.axis-microtools.com





AXIS

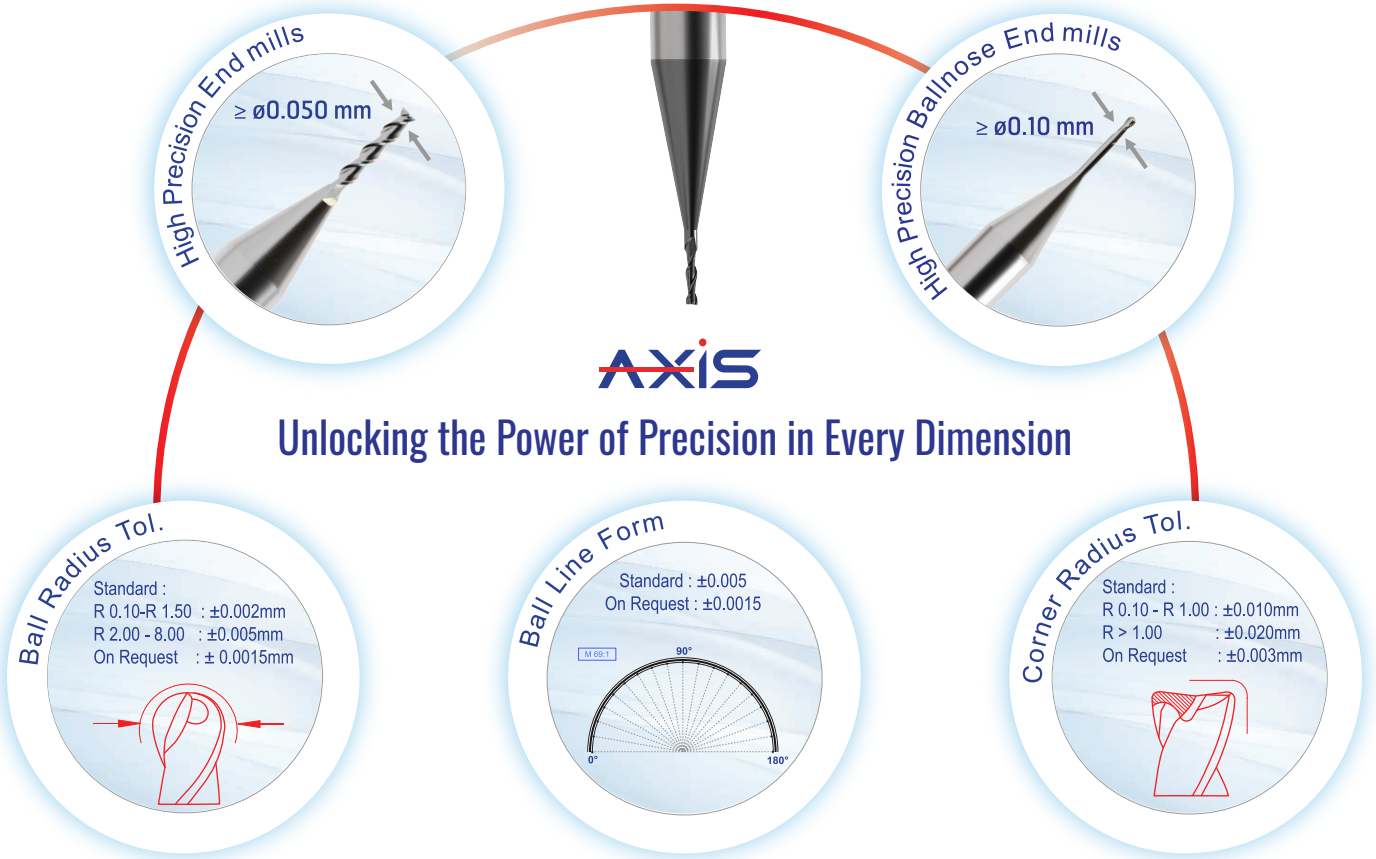
Long-Standing Experience in mICRO Tools

NexGen High Precision Milling Tools

In modern manufacturing, high precision milling tools are crucial for achieving tight tolerances and superior surface finishes. These tools are indispensable in industries where accuracy and quality are paramount, such as Aerospace, Medical, Automotive, and Mold making.

However advancement in tool geometries and thin film coatings, increasingly accurate tool holders, continously evolving machine tools and advancement in crafting precise CAM tool paths have enabled cutting hardened materials with high accuracy and productivity.

With our experience of decades crafting high precision tools aided with technology to stabilize the cutting edge and impart high hardness to the tool bring a basket of niche product offering for mICRO and Macro mACHINING.



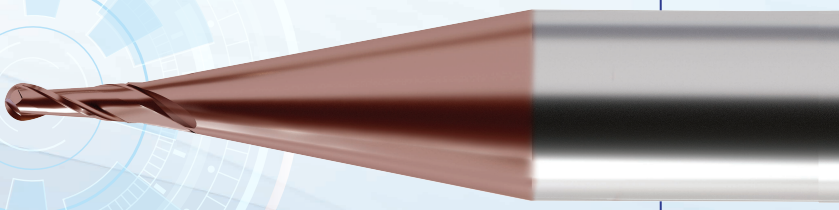
NexGen Coatings

Continuously evolving markets, applications and materials place high demands on precision machining Tools. Our in-house NexGen Coatings (CVD and PVD) facility allows us to offer High-Performance Tools tailored for emerging applications.

With advanced in-house preparation and post-coating processes, we ensure the best foundation for optimal Coating productivity and superior part finishes. Our proprietary engineered mICRO geometries further set our tools apart, making them a class above the rest.

Unleash Superior Performance with HiPIMS Coating

PVD
HiPIMS



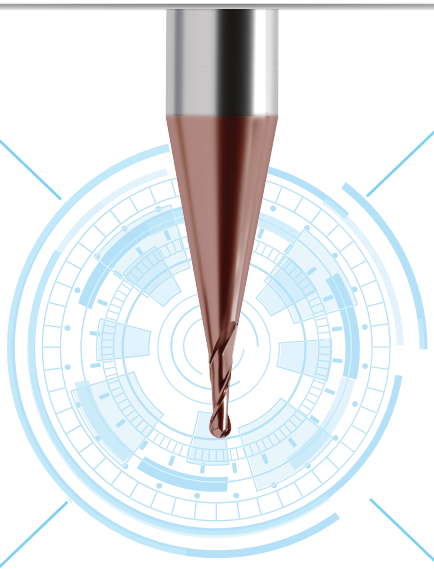
HiPIMS High Power Impulse Magnetron Sputtering

Denser | Smoother | Harder

Coatings for Better Machining Outcomes and Longer Tool Life

HiPIMS is an advanced evolution of DC sputtering technology, offering significantly enhanced performance. The process generates a high-energy plasma that achieves unprecedented levels of material ionization. This results in a high flux of ionized particles, which in turn forms an exceptionally dense and nearly fully amorphous coating structure, providing superior coating quality and durability compared to traditional methods

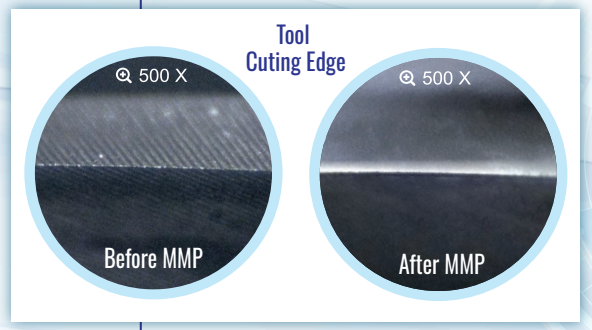
HiPIMS Coatings Benefits



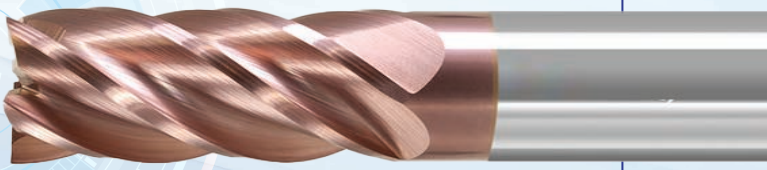
- Emphasize its Excellent Hardness
- Exceptional Adhesion
- Enhanced Wear Resistance
- Extended Tool Life

HiPIMS coating reduces downtime and maintenance costs, contributing to overall cost-efficiency and productivity

Achieve Unmatched Surface Quality and Performance with MMP Superfinishing



MMP TECHNOLOGY
Embedded

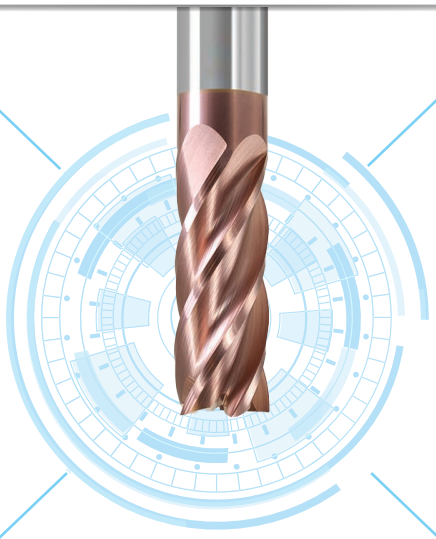


Finely Honed Cutting Edge + Superfinished Flutes

MMP (Micro Machining Process) superfinishing, which achieves an ultra-smooth surface finish

MMP Superfinishing maps and characterises surface roughness into different frequency ranges and filters them to deliver application specific surface objectives, with a degree of precision that is unique and unmatched in the market. Such consistent and high level of surface characterisation and calibration and stabilisation of the cutting edges elevates the tools performance to the next level in high precision and micro machining applications.

MMP Superfinishing Benefits



- Higher MRR (Material Removal Rate)
- Better machined surfaces
- Lesser tool changes and setups
- Higher productivity
- Better cost economics

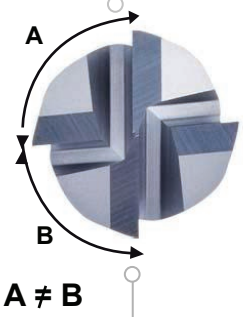
MMP Superfinishing process enhances tool longevity and ensures consistent performance over time, improving the quality of the final product

Design @ AXIS

WHERE INNOVATION MEETS FUNCTION : ELEVATING EVERY DETAIL OF DESIGN

Variable helix and index

Reduce vibration and increase part quality



Precisely controlled diameters

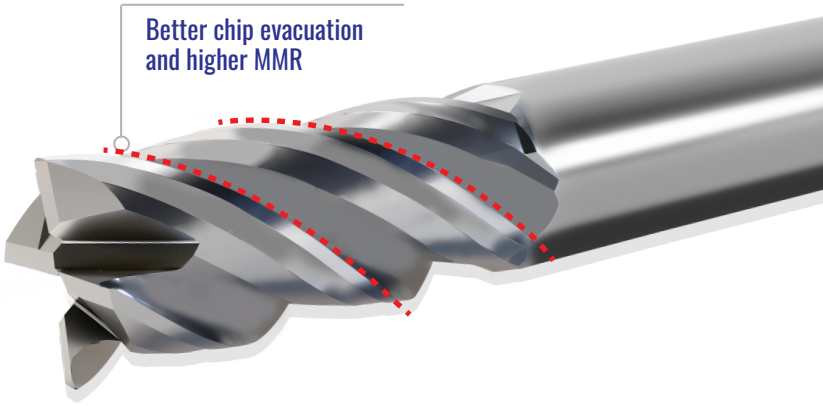
High precision machining
High dimensional accuracy

Stabilized cutting edge

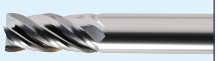
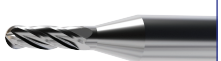
Enhanced performance
Longer tool life

Super finished flutes

Better chip evacuation and higher MMR



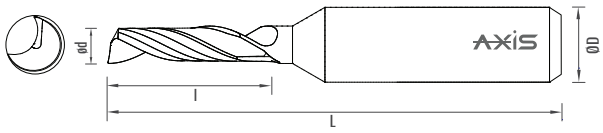
AXIS Portfolio

Series	Dia range (mm)	Description	Application	Tool Image
E923	0.10 -6.00	Single Flute End Mills	Design and geometry tailored for Non ferrous materials such as Aluminium and Plastic	
E305	1.00 -12.00	High Performance End Mills	Geometry designed for milling of Steel, Stainless Steel, Titanium and Nickle Alloys	
E307	1.00 -12.00	High Performance End Mills	Geometry designed for milling of Steel, Stainless Steel, Titanium and Exotic materials	
E310	1.00 -12.00	High Performance Square End Mills	Versatile geometry for side, slot and surface milling of variety of materials such as Steel, Cast Iron and Non Ferrous materials	
E966	0.05 -6.00	2 Flute End Mills	Versatile geometry for side, slot and surface milling of variety of materials such as Cast Iron, steel, Non-ferrous and Titanium	
E967	0.20 -6.00	4 Flute End Mills	Versatile geometry for side, slot and surface milling of variety of materials such as Stainless Steel,Titanium and its Alloys	
E968	1.00 -6.00	3 Flute End Mills	Versatile geometry for side, slot and surface milling of variety of materials such as Cast Iron, Steel , Non-ferrous and Titanium	
B970 B870	0.20 -6.00	2 Flute Ballnose End Mills	Geometry suitable for profile milling of variety of materials like Cast Iron, Steel, Stainless Steel, Non-ferrous,Titanium and Nickle Alloys	
B972	0.20 -6.00	4 Flute Ballnose End Mills	Geometry suitable for profile milling of variety of materials like Cast Iron, Steel, Stainless Steel, Non-ferrous, Titanium and Nickle Alloys	
G847	0.05 -0.20	Engravers	Precisely controlled tip angles and tip diameters for high precision machining requirements	

Single Flute End Mills

E923

Aluminium Alloy | Plastics | Copper Alloy



Z 1 | 30° | AxiH-Hyper | Polished Flute

Design and geometry tailored for Non ferrous materials such as Aluminium and Plastic

High rake angles with sharp cutting edges for better and smooth cutting

Highly polished flutes for better and faster chip evacuation

Design to enable wider flute space for improved chip evacuation

High performance ultra fine carbide substrate developed specifically for mICRO machining applications

ød h10	l	L	ØD h6
0.10	0.30	38.00	3.00
0.20	0.60		
0.30	1.00		
0.40	1.00		
0.50	1.50		
0.60	3.00		
0.70	4.00		
0.80	5.00	38.00	3.00
1.00			
1.00	5.00	40.00	6.00
1.20	5.00	38.00	3.00
1.50			
1.50	5.00	40.00	6.00
2.00	5.00	40.00	3.00
2.00	6.00	38.00	4.00
		50.00	6.00
2.00	10.00	38.00	3.00
	11.00		
3.00	5.00	38.00	3.00
3.00	10.00	38.00	3.00
	11.00		
3.00	11.00	50.00	6.00
	12.00		
	22.00		3.00
4.00	6.00	40.00	4.00
			6.00
4.00	12.00	50.00	6.00
4.00	14.00	50.00	4.00
			6.00
4.00	22.00	50.00	6.00
4.00	22.00	60.00	4.00
	25.00		
4.00	32.00	64.00	4.00
5.00	16.00	60.00	5.00
5.00	22.00	50.00	6.00
6.00	12.00	50.00	6.00
6.00	16.00	60.00	6.00
	20.00		
6.00	22.00	50.00	6.00
6.00	25.00	60.00	6.00
6.00	32.00	64.00	6.00

World of mICRO Tools

ISO 9001 ISO 13485 ISO 14001 45001

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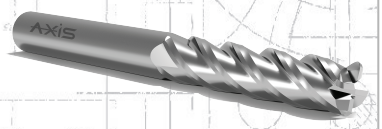
High Performance End Mills

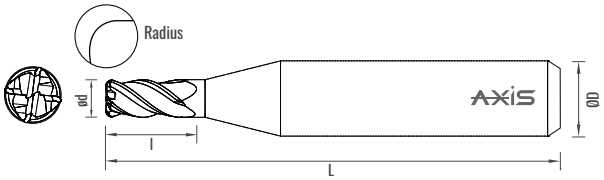
E305



Dia Tolerance

ød ≤ 6.00 - 0.020mm
ød > 6.00 - 0.030mm

SS | Titanium Alloy | Nickel Alloy | Steel High Alloyed | Steel Low/ Unalloyed



Z 2 3,4

3 Flute

4 Flute

AxiH-Inox

AXIS+

Geometry designed for milling of Steel, Stainless Steel, Titanium and Nickle Alloys

Precisely controlled tool features for high precision machining requirements

Variable helix and indexing ensure vibration free machining and smooth surface at higher feed

High performance ultra fine carbide substrate developed specifically for mICRO tooling applications

Finely honed cutting edge and highly polished flutes by MMP Superfinishing process for superior edge strength, chip evacuation, better coating adhesion and longer tool life

ød h10	l	l1	L	ØD h6	Z	R
1.00	3.00	-	45.00	6.00	3	0.20
2.00	5.00					
3.00	8.00	-	50.00	6.00	4	0.20
3.00						0.30
4.00	10.00	-	50.00	6.00	4	0.20
4.00						0.30
5.00	13.00	-	60.00	6.00	4	0.50
5.00						1.00
6.00	15.00	-	60.00	6.00	4	0.50
6.00						1.00
8.00	19.00	22.00	65.00	8.00	4	0.50
8.00						1.00
8.00						2.00
10.00	24.00	27.00	72.00	10.00	4	0.50
10.00						1.00
10.00						2.00
12.00	28.00	33.00	83.00	12.00	4	0.50
12.00						1.00
12.00						2.00

World of mICRO Tools

ISO 9001 ISO 13485 ISO 14001 45001

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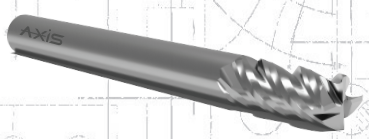
High Performance End Mills

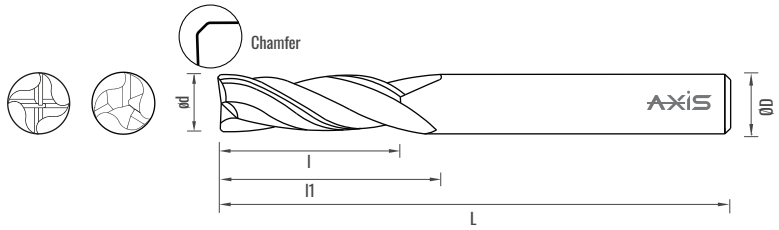
E307



Dia Tolerance

ød ≤ 6.00 - 0.020mm
ød > 6.00 - 0.030mm

SS | Titanium Alloy | Nickel Alloy | Steel High Alloyed | Steel Low/ Unalloyed



Z 3,4 | 42° (3 Flute) | 38° 40° (4 Flute) | AxiH-Inox | AXIS+ | Edge Prep

Geometry designed for milling of Steel, Stainless Steel, Titanium and Exotic materials

Precisely controlled tool features for high precision machining requirements

Variable helix and indexing ensure vibration free machining and smooth surface at higher feed

High performance ultra fine carbide substrate developed specifically for mICRO tooling applications

Finely honed cutting edge and highly polished flutes by MMP Superfinishing process for superior edge strength, chip evacuation, better coating adhesion and longer tool life

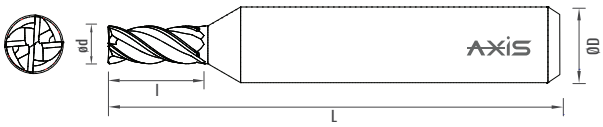
QUALITY
PRECISION
CONSISTENCY
PEOPLE

ød h10	l	l1	L	ØD h5	Z	Chamfer
1.00	3.00	-	45.00	6.00	3	0.02
1.50	4.00					
2.00	5.00					
2.50	7.00					
3.00	8.00	-	50.00	6.00	4	0.03
4.00	10.00					
5.00	13.00	-	60.00	6.00	4	0.05
6.00	15.00					0.10
8.00	19.00	22.00	65.00	8.00	4	0.10
10.00	24.00	27.00	72.00	10.00		
12.00	28.00	33.00	83.00	12.00		

High Performance Square End Mills

E310

Steel High Alloyed | Steel Low/ Unalloyed | Cast Iron | SS | Titanium Alloy | Nickel Alloy | Non-Ferrous



Z 3,4 | 37° (3 Flute) | 35° 38° (4 Flute) | AxiH-Ferro | Edge Prep

Versatile geometry for side, slot and surface milling of variety of materials such as Steel, Cast Iron and Non Ferrous materials

Centre cutting geometry with advanced features for extended tool life, reduced chatter and improved part quality

Variable helix and indexing ensure vibration free machining and smooth surface at higher feed

High performance ultra fine carbide substrate developed specifically for mICRO tooling applications

Finely honed cutting edge and highly polished flutes by MMP Superfinishing process for superior edge strength, chip evacuation, better coating adhesion and longer tool life

ød h10	l	L	ØD h6	Z
1.00	3.00	45.00	6.00	
				3
1.50	4.00	45.00	6.00	3
				3
2.00	5.00	45.00	6.00	
				3
2.50	7.00	45.00	6.00	4
				4
3.00	8.00	50.00	6.00	
				4
4.00	10.00	50.00	6.00	4
6.00	15.00	60.00	6.00	4
				4
8.00	20.00	65.00	8.00	
10.00	24.00	72.00	10.00	
12.00	28.00	80.00	12.00	

World of mICRO Tools

ISO 9001 Q 13485 ISO 14001 45001

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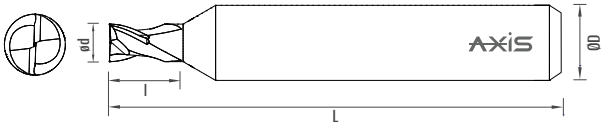
2 Flute End Mills

E966

Steel Low/ Unalloyed | Non-Ferrous | Steel High Alloyed | SS | Cast Iron | Plastics | Titanium Alloy | Nickel Alloy



Z 2 | 30° | AxiH-Ferro | AXIS+ | Edge Prep | FORM HA DIN 6535

Versatile geometry for side, slot and surface milling of variety of materials such as Cast Iron, Steel, Non-ferrous and Titanium

Centre cutting geometry with advanced features for extended tool life, reduced chatter and improved part quality

Broad portfolio starting from Ø0.050mm and available in 2D and 3D cutting lengths

High performance ultra fine carbide substrate developed specifically for mICRO tooling applications

Next Gen coatings suitable for the application material

Proprietary pre and post coating MMP Superfinishing for enhanced coating productivity

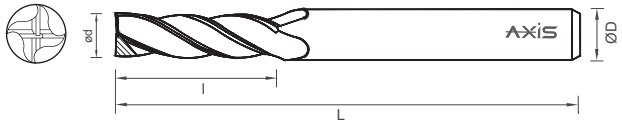
QUALITY
PRECISION
CONSISTENCY
PEOPLE

ød h10	l	L	ØD h6
0.05	0.10	38.00	3.00
	0.15		
0.08	0.15	38.00	3.00
	0.25		
0.10	0.20	38.00	3.00
	0.30		
0.20	0.40	38.00	3.00
	0.60		
0.30	0.60	38.00	3.00
	0.90		
0.40	0.80	38.00	3.00
	1.20		
0.50	1.00	38.00	3.00
	1.50		
0.60	1.20	38.00	3.00
	1.80		
0.70	1.40	38.00	3.00
	2.10		
0.80	1.60	38.00	3.00
	2.40		
0.90	1.80	38.00	3.00
	2.70		
1.00	2.00	38.00	3.00
	3.00		
1.20	2.40	38.00	3.00
	3.60		
1.40	2.80	38.00	3.00
	4.20		
1.50	3.00	38.00	3.00
	4.50		
1.60	3.20	38.00	3.00
	4.80		
1.80	3.60	38.00	3.00
	5.40		
2.00	4.00	38.00	3.00
	6.00		
2.50	5.00	38.00	3.00
	7.50		
3.00	6.00	50.00	6.00
	9.00		
4.00	8.00	50.00	6.00
	12.00		
5.00	10.00	50.00	6.00
	15.00		
6.00	12.00	50.00	6.00
	18.00		

4 Flute End Mills

E967

Steel High Alloyed | Cast Iron | Steel Low/ Unalloyed | SS | Titanium Alloy | Nickel Alloy



Z 4 | 30° | AxiH-Ferro | Edge Prep | FORM HA DIN 6535

- Versatile geometry for side, slot and surface milling of variety of materials such as Cast Iron, Steel, Non-ferrous and Titanium
- Centre cutting geometry with advanced features for extended tool life, reduced chatter and improved part quality
- Broad portfolio starting from Ø0.050mm and available in 2D and 3D cutting lengths
- High performance ultra fine carbide substrate developed specifically for mICRO tooling applications
- Next Gen coatings suitable for the application material
- Proprietary pre and post coating MMP Superfinishing for enhanced coating productivity

World of mICRO Tools

ISO 9001 ISO 13485 ISO 14001 45001

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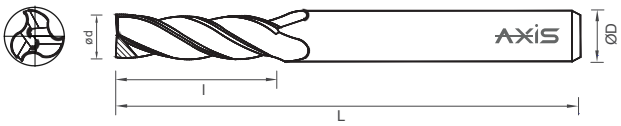
ød h10	l	L	ØD h6
0.20	0.40	38.00	3.00
	0.60		
0.30	0.60	38.00	3.00
	0.90		
0.40	0.80	38.00	3.00
	1.20		
0.50	1.00	38.00	3.00
	1.50		
0.60	1.20	38.00	3.00
	1.80		
0.70	1.40	38.00	3.00
	2.10		
0.80	1.60	38.00	3.00
	2.40		
0.90	1.80	38.00	3.00
	2.70		
1.00	3.00	38.00	3.00
	5.00		
1.20	3.60	38.00	3.00
	6.00		
1.40	4.20	38.00	3.00
	7.00		
1.50	4.50	38.00	3.00
	7.50		
1.60	4.80	38.00	3.00
	8.00		
1.80	5.40	38.00	3.00
	9.00		
2.00	6.00	38.00	3.00
	10.00		
2.50	7.50	38.00	3.00
	10.00		
3.00	9.00	50.00	6.00
	12.00		
4.00	12.00	50.00	6.00
	16.00		
5.00	10.00	50.00	6.00
	15.00		
6.00	12.00	50.00	6.00
	18.00		

3 Flute End Mills

E968

Steel Low/ Unalloyed | Steel High Alloyed | SS | Cast Iron | Non-Ferrous | Titanium Alloy



Z 3 | 30° | AxiH-Ferro | AXIS+ | Edge Prep | FORM HA DIN 6535

Versatile geometry for side, slot and surface milling of variety of materials such as Cast Iron, Steel , Non-ferrous and Titanium

Centre cutting geometry with advanced features for extended tool life, reduced chatter and improved part quality

Broad portfolio starting from Ø1.00mm and available in 2D to 5D cutting lengths

High performance ultra fine carbide substrate developed specifically for mICRO tooling applications

Next Gen coatings suitable for the application material

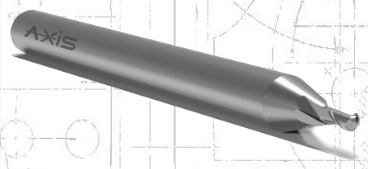
Proprietary pre and post coating MMP Superfinishing for enhanced coating productivity

QUALITY
PRECISION
CONSISTENCY
PEOPLE

ød h10	l	L	ØD h6
1.00	3.00	38.00	3.00
	5.00		
1.20	3.60	38.00	3.00
	6.00		
1.40	4.20	38.00	3.00
	7.00		
1.50	4.50	38.00	3.00
	7.50		
1.60	4.80	38.00	3.00
	8.00		
1.80	5.40	38.00	3.00
	9.00		
2.00	6.00	38.00	3.00
	10.00		
2.50	7.50	38.00	3.00
	10.00		
3.00	9.00	50.00	6.00
	12.00		
4.00	12.00	50.00	6.00
	16.00		
5.00	10.00	50.00	6.00
	15.00		
6.00	12.00	50.00	6.00
	18.00		

2 Flute Ballnose End Mills

B970
B870 On Request

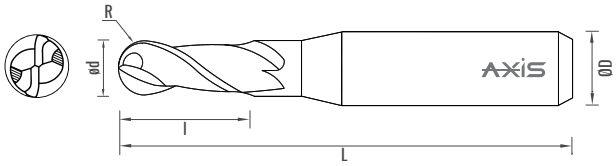


Ball Radius Tolerance

B970 : ± 0.005 (R 0.10 - R 1.50)
± 0.010 (R 2.00 - R 3.00)

B870 : ± 0.003 (R 0.10 - R 1.50)
± 0.005 (R 2.00 - R 3.00)

Steel | Non-Ferrous | SS | Cast Iron | Titanium Alloy | Nickel Alloy



Z 2 | 30° | AxiH-Ferro | Polished Flute | FORM HA DIN 6535

B870

- Geometry suitable for profile milling of variety of materials like Cast Iron, Steel, Stainless Steel, Non-ferrous,Titanium and Nickle Alloys
- Precisely controlled tool features for high precision machining requirements
- Centre cutting geometry with advanced features for extended tool life, reduced chatter and improved part quality
- Precisely controlled ball radii and line form
- High performance ultra fine carbide substrate developed specifically for mICRO tooling applications
- Next Gen coatings suitable for the application material
- Proprietary pre and post coating MMP Superfinishing for enhanced coating productivity

R	ød h10	l	L	ØD h6
0.10	0.20	0.20	38.00	3.00
		0.40		
0.15	0.30	0.30	38.00	3.00
		0.60		
0.20	0.40	0.40	38.00	3.00
		0.80		
0.25	0.50	0.50	38.00	3.00
		1.00		
0.30	0.60	0.60	38.00	3.00
		1.20		
0.35	0.70	0.70	38.00	3.00
		1.40		
0.40	0.80	0.80	38.00	3.00
		1.60		
0.45	0.90	0.90	38.00	3.00
		1.80		
0.50	1.00	1.00	38.00	3.00
		2.00		
0.60	1.20	2.40	38.00	3.00
		3.60		
0.70	1.40	2.80	38.00	3.00
		4.20		
0.75	1.50	3.00	38.00	3.00
		4.50		
0.80	1.60	3.20	38.00	3.00
		4.80		
0.90	1.80	3.60	38.00	3.00
		5.40		
1.00	2.00	4.00	38.00	3.00
		6.00		
1.25	2.50	5.00	38.00	3.00
		7.50		
1.50	3.00	6.00	50.00	6.00
		9.00		
2.00	4.00	8.00	50.00	6.00
		12.00		
2.50	5.00	10.00	50.00	6.00
		15.00		
3.00	6.00	12.00	50.00	6.00
		18.00		

World of mICRO Tools

ISO 9001 ISO 13485 ISO 14001 45001

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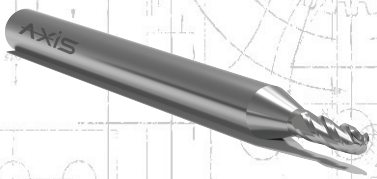
4 Flute Ballnose End Mills

B972



Ball Radius Tolerance

B970 : ± 0.005 (R 0.10 - R 1.50)
± 0.010 (R 2.00 - R 3.00)

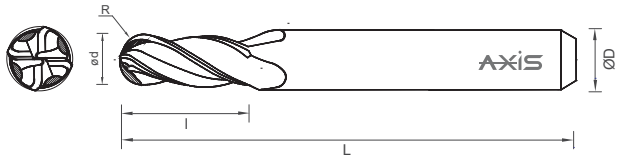
B870 : ± 0.003 (R 0.10 - R 1.50)
± 0.005 (R 2.00 - R 3.00)

Steel High Unalloyed ●

Cast Iron ●

Steel Low Unalloyed ◐

SS ◐



Z 4

30°

AxiH-Hyper

FORM HA
DIN 6535

Geometry suitable for profile milling of variety of materials like Cast Iron, Steel, Stainless Steel, Non-ferrous,Titanium and Nickle Alloys

Precisely controlled tool features for high precision machining requirements

Centre cutting geometry with advanced features for extended tool life, reduced chatter and improved part quality

Precisely controlled ball radii and line form

High performance ultra fine carbide substrate developed specifically for mICRO tooling applications

Next Gen coatings suitable for the application material

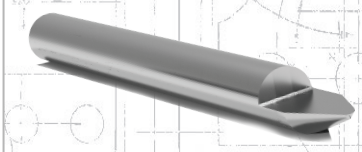
Proprietary pre and post coating MMP Superfinishing for enhanced coating productivity

QUALITY
PRECISION
CONSISTENCY
PEOPLE

R	ød h10	l	L	ØD h6
0.10	0.20	0.20 0.60	38.00	3.00
0.15	0.30	0.30 0.90	38.00	3.00
0.20	0.40	0.80 1.20	38.00	3.00
0.25	0.50	1.00 1.50	38.00	3.00
0.30	0.60	1.20 1.80	38.00	3.00
0.35	0.70	1.40 2.10	38.00	3.00
0.40	0.80	1.60 2.40	38.00	3.00
0.45	0.90	1.80 2.70	38.00	3.00
0.50	1.00	3.00 5.00	38.00	3.00
0.60	1.20	3.60 6.00	38.00	3.00
0.70	1.40	4.20 7.00	38.00	3.00
0.75	1.50	4.50 7.50	38.00	3.00
0.80	1.60	4.80 8.00	38.00	3.00
0.90	1.80	5.40 9.00	38.00	3.00
1.00	2.00	6.00 10.00	38.00	3.00
1.25	2.50	7.50 10.00	38.00	3.00
1.50	3.00	9.00 12.00	50.00	6.00
2.00	4.00	12.00 16.00	50.00	6.00
2.50	5.00	10.00 15.00	50.00	6.00
3.00	6.00	12.00 18.00	50.00	6.00

Engravers

G847

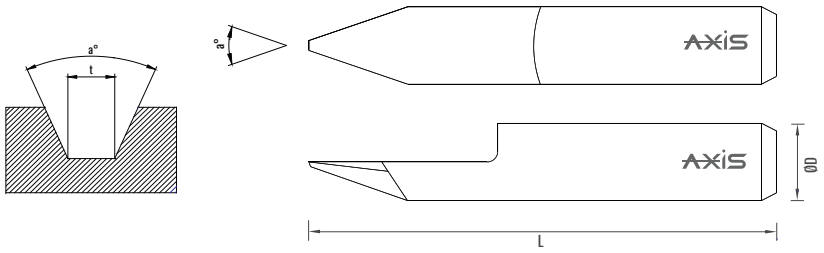


On Request

ultra mICRO tip dia ≥0.020mm

Customised tip radius

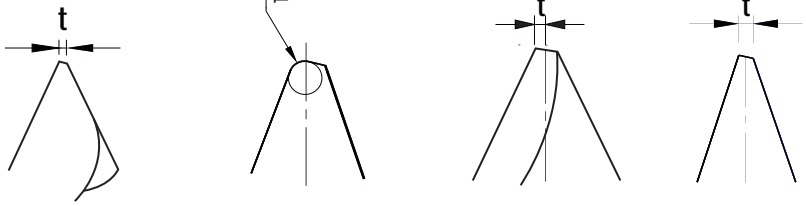
Non-Ferrous | Plastics | Steel | SS | Cast Iron



Z 1 | AxiP-Hyper | FORM HA DIN 6535

- Precisely controlled tip angles and tip diameters for high precision machining requirements
- Sharp cutting edges to ensure burr free engraving
- High performance ultra fine carbide substrate developed specifically for mICRO tooling applications
- Next Gen coatings suitable for the application material

ød	L	ØD h6	Angle a			
0.05	38.00	2.00	30°	45°	60°	90°
0.10						
0.20						
0.05	38.00	3.00	30°	45°	60°	90°
0.10						
0.20						
0.05	38.00	3.175	30°	45°	60°	90°
0.10						
0.20						
0.05	50.00	4.00	30°	45°	60°	90°
0.10						
0.20						
0.05	50.00	5.00	30°	45°	60°	90°
0.10						
0.20						
0.05	50.00	6.00	30°	45°	60°	90°
0.10						
0.20						
0.05	50.00	8.00	30°	45°	60°	90°
0.10						
0.20						



World of mICRO Tools

ISO 9001 ISO 13485 ISO 14001 45001

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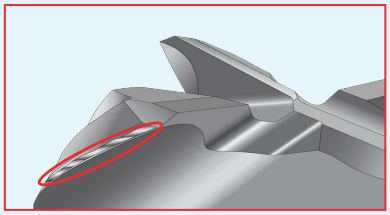
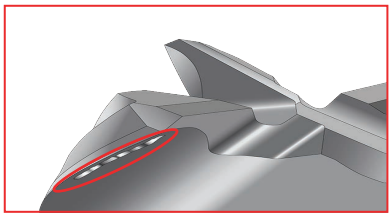
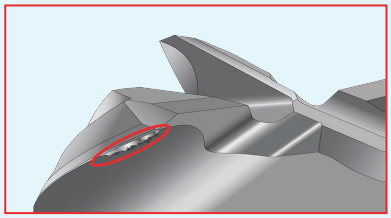
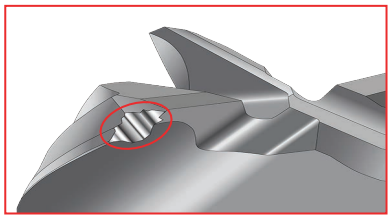
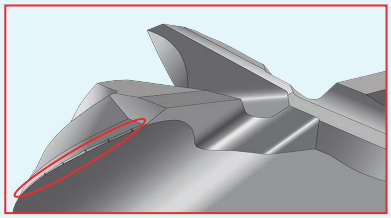
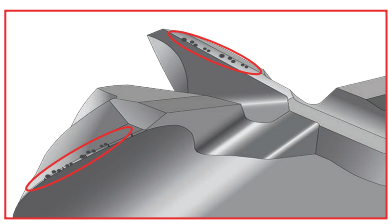
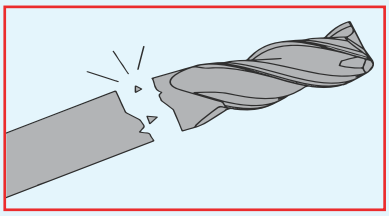
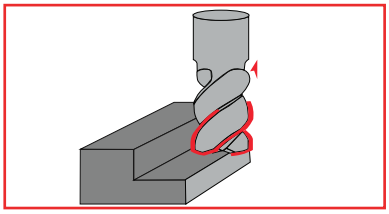
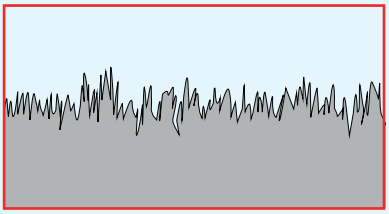
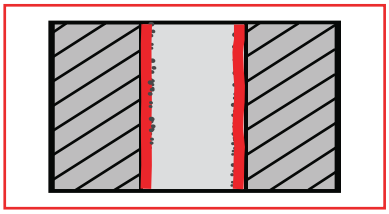
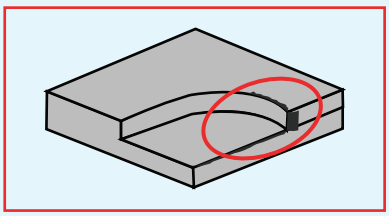
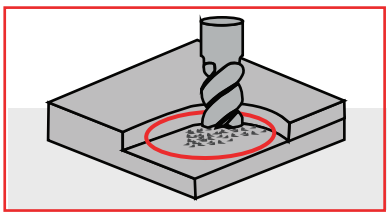
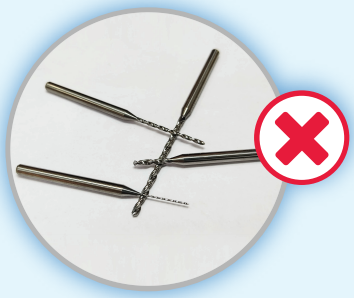
Troubleshooting for End Mills

Problem	Cause	Solution
Flank Wear 	High cutting speed	Reduce the cutting speed
	Carbide grade is too soft	Use harder grade
	Non coated End Mill	Use coated End Mill
	Less number of flutes	Increase the No. of flutes
Crater Wear 	Excessive cutting temperatures	Using appropriate coolant during machining
	Feed too high	Reduce feed
	Cutting speed too high	Reduce cutting speed
	Carbide grade is too soft	Use harder grade
Built Up Edge 	Cutting zone temperature is low	Increase cutting speed
	Negative cutting geometry	Use positive rake geometry
	Caused by chemical reaction between tool and workpiece	Improve lubricant with higher oil content for additives
Corner Fracture 	The grade is too soft	Use tougher grade
	Cutting speed too high	Reduce cutting speed
Thermal Cracking 	Variations in cutting temperature	Increase coolant pressure/volume
	Inconsistent coolant supply	Continuous supply of Coolant
	Less Concentration of coolant	Increase oil concentration percentage
Edge Chipping 	Feed rate is too high	Reduce feed rate
	Larger depth of cut	Decrease axial or radial depth of cut
	High spindle run cut	Check spindle run out and minimize
	Low clamping rigidity	Shorten the tool overhang. Check the spindle and collet run out. Increase chuck clamping power. Increase work clamping rigidity.

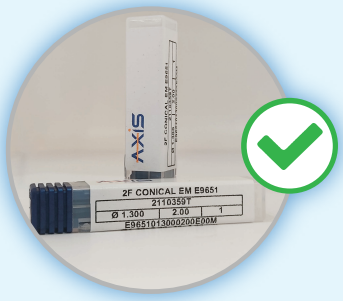
Troubleshooting for End Mills

Problem	Cause	Solution
Tool Breakage 	High depth of cut	Decrease depth of cut
	Low End Mill rigidity	Increase tool diameter. Improve rigidity
	Longer overhang	Shorten the overhang of tool
	Chip jamming	Wider chip pocket
	Chip load per tooth too high	Reduce the chip load
Vibrations During Cutting 	Improper cutting conditions	Decrease cutting speed and feed
	Low End Mill rigidity	Increase the helix angle, No. of flutes and tool diameters
	Low clamping rigidity	Shorten the tool overhang. Check the spindle and collet run out. Increase chuck clamping power. Increase work clamping rigidity
Poor Surface Finish 	Larger cutting edge wear	Use Coated tool
	Improper cutting conditions	Decrease depth of cut and cutting speed
	Chip packing	Use air blow. Increase coolant quantity
Burr or Chipping Occurs 	High depth of cut	Decrease depth of cut and feed
	Large helix angles	Decrease helix angle
Quick Burr Formation 	Notch wear	Use Coated tool
	High cutting parameters	Decrease cutting speed and increase feed
Chip Packing 	Metal removal and feed per tooth high	Decrease depth of cut and feed
	Lack of chip pocket	Decrease No. of flutes

Do's and Don'ts for mICRO Tool Handling



Do not issue
Tools removing box



Always keep the Tool in
original box

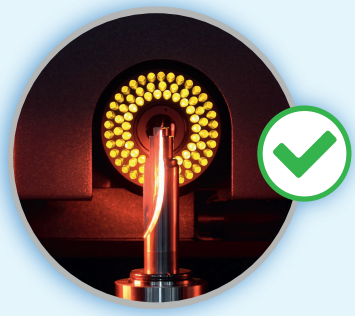
Do not carry
loose Tools

Carry the Tools to the
Presetter along with box

Do not hold Tools
from fluted side

Hold Tools from
the Shank side

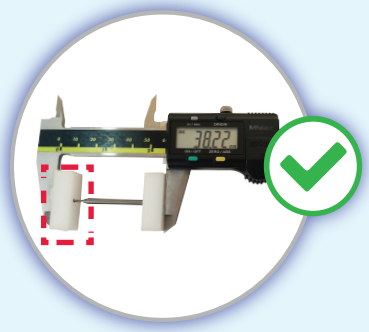
Cautions / Care During Tool Inspection



Use non-contact type equipments for
presetting and measuring T.I.R

Avoid contact type method. By this tool
can be damaged before usage

Use of Vernier Caliper to Measure OAL



Use POM / Acrylic sheet to
avoid damage before measurement

Do not directly load the
Tool in Vernier for measurement

Avoid using flammable cutting oils
during machining

Please ensure tools do not collide
with one another

Apply optimal parameters based on the
material, milling shape, strategy,
machine rigidity, and spindle capacity

INDMILL

NexGen
High Precision Milling Tools

AXIS

Tools for mICRO mACHINING

ISO 9001 Q ISO 13485 ISO 14001 45001

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06-10/2024