

**YE-HPC23 EUROPE**

BEST VALUE IN THE WORLD OF CUTTING TOOLS

**FOR ALUMINUM, ALUMINUM DIE CAST, NON-FERROUS ALLOYS AND PLASTICS**



## **ALU-POWER HPC**

**3-FLUTE, HIGH-PERFORMANCE,  
SOLID CARBIDE END MILLS**

**Keep Your Edge:  
SPEED, STRENGTH &  
SHARPNESS.**

- 3 Flute
- Square End & Corner Radius
- Standard and Extended Length
- Coated and Uncoated
- Chip Breakers **NEW**

Through Special Chip Breaker Design,  
the length of the chip is formed short to  
improve chip evacuation performance.

Chip Breaker Profile Improved on  
Weak-Point of the Cutting Edge



# ALU-POWER HPC

**Built to Handle High-Speed Cutting Without Buildup.**

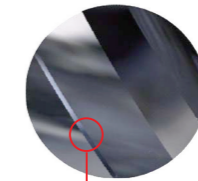
- ▶ Excels in Ultra High-Speed, High HP Applications Up to 35,000 RPM
- ▶ Rigid Design for Excellent Ramping
- ▶ Reduced Vibration in Heavy Cutting

## ALU-POWER HPC 3-FLUTE END MILLS

### ▶▶▶ The Anatomy of Efficiency

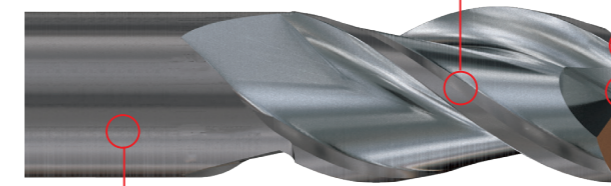
#### Specialized Design of Corner Gash

- ▶ Unique flute design and superior corner protection enhance both tool life and protection against catastrophic failure in high feed applications
- ▶ Polished flutes for excellent chip flow



#### Cylindrical Land

- ▶ Increased performance in a variety of cutting conditions
- ▶ Helps reduce vibration and chatter



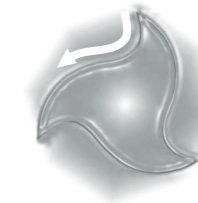
#### Available in a Wide Variety of Sizes and Corner Radii

#### Ideal Symmetrical Shape

- ▶ 3-flute design "to the center" (all 3 flutes come to center)
- ▶ Designed with high spindle speeds in mind
- ▶ Highly effective in vertical ramping up to 20 degrees and step-over plunging applications

#### DLC Diamond-Like Carbon

- ▶ Excels in hard aluminum and high speeds
- ▶ Provides edge strength and unsurpassed tool life



#### Engineered Flute Design

- ▶ Effective chip evacuation at high feed rates with lower cutting forces than competitive products

While other 3-flute End mills can muster up the speed for rough cutting aluminum, few can make it through without melting down the aluminum that surrounds the work itself. That's where the ALU-POWER HPC has a distinct advantage – speed, strength and sharpness.

### Why ALU-POWER HPC Keeps Its Edge Under Tough Conditions

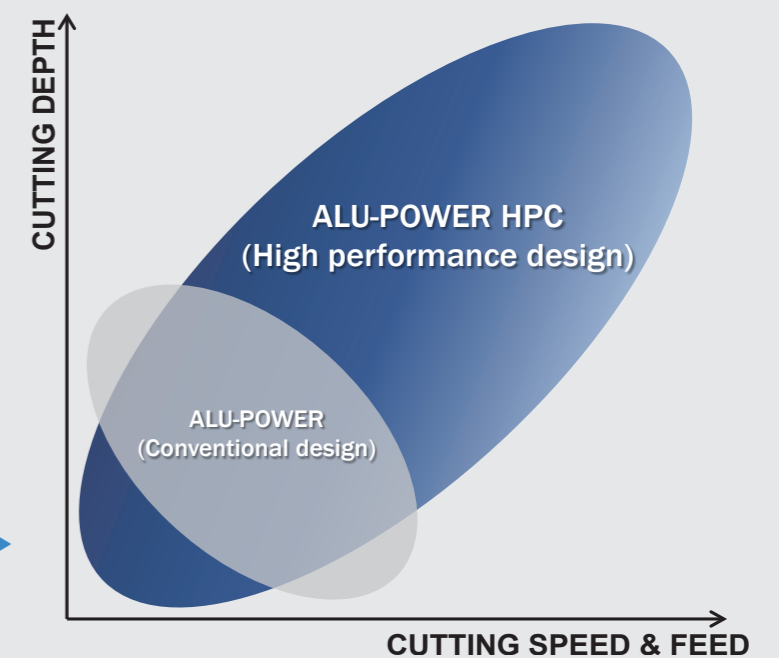
ALU-POWER HPC's highly polished 3-flute design provides more balanced cutting performance – without excessive heat buildup. In fact, while other End mills can gum up at surface speeds of 3,000 or less, ALU-POWER HPC keeps its cool by dissipating heat and providing outstanding chip evacuation. Adding it to its ultra-micrograin carbide design, the results are:

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ More efficient chip evacuation
- ▶ Ability to counteract extreme radial forces
- ▶ DLC Coating provides edge strength and unsurpassed tool life



What do you get when you add 3-flute to the center, polished ultra-micrograin carbide, extra-large chip gullets and a razor-sharp cylindrical land design? In technical terms, it's called the ALU-POWER HPC. In a machinist's term, it's called an extremely sharp, highly durable milling monster that won't back down, cut after cut.

Compared to conventional aluminum-specific End mills, the ALU-POWER HPC provides more versatile performance. Its high-performance design allows you to cut deeper and run at both faster and slower cutting speeds and feeds.



## From Side Cuts to Rough Cuts to Aggressive Ramping, No One Withstands Extreme Radial Forces Better-or Longer.



### ▲ Rough Cutting

Ultra-micrograin carbide supplies the rigidity to keep the chips flying. Highly polished 3-flute design ensures they'll keep flying – cut after cut.



### ▲ Ramping

In steep, aggressive ramping conditions, the ALU-POWER HPC holds its own to resist the torsional stress from extreme helical output.



### ▲ Side cutting

No one offers a cooler-running super high-speed End mill. While others melt down the materials they're cutting, ALU-POWER HPC keeps machining cool in aluminum and soft alloys, to boot.

## The Benefits of Balanced Cutting

When you lock an ALU-POWER HPC into your milling machine, you've unleashed the fastest-running, lowest-heat-producing End mill in the business. And that means you've got the speed and sharpness to take on not only the tough materials but also even more fragile mixed alloy castings with ease. Discover the ALU-POWER HPC and start pushing your productivity higher.



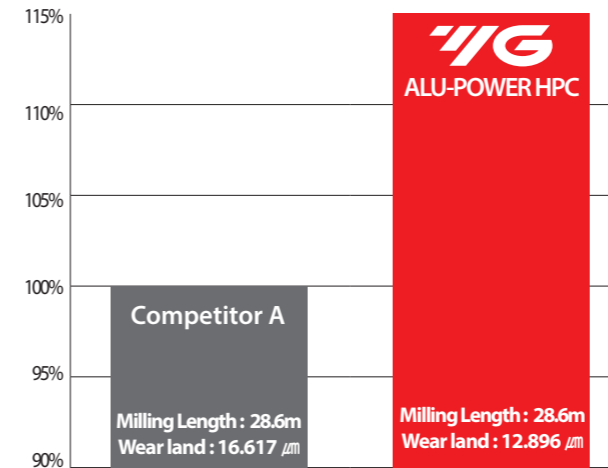
## Another Advantage of YG-1's Perfect Geometry and Superior Coating

Whether you're running parts in today's most advanced 5-axis machining centers on the market today, or in machines built decades ago, ALU-POWER HPC makes the most of your manufacturing assets. That's because its unique 3-flute, 37-degree helix design can operate at lower speeds with higher efficiency.

## CASE STUDY

### TEST I Slotting Application

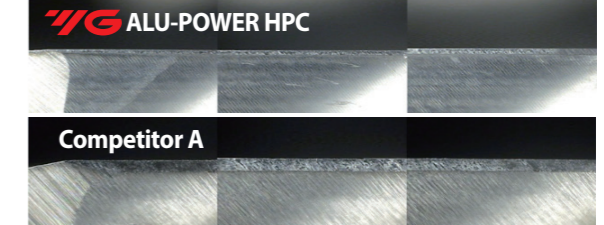
Ø1/2(R.090) 3 Flute Corner radius



### Cutting Condition (Slotting)

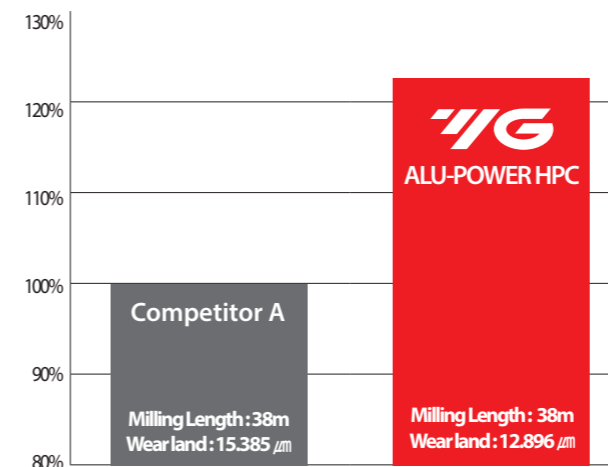
Tool	Ø12.7(R2.28) x Ø12.7 x 31.75 x 88.9
Work Material	AL7075
R.P.M (rev./min.)	12,224
IPM (mm/min.)	5,588
Cutting Depth (mm)	12.7 (Axial)
Coolant	Wet Cut (9% emulsion)
Overhang (mm)	48
Milling Method	Slotting
Machine	Machining Center

Total Milling Length : 38m



### TEST II Pocketing Application

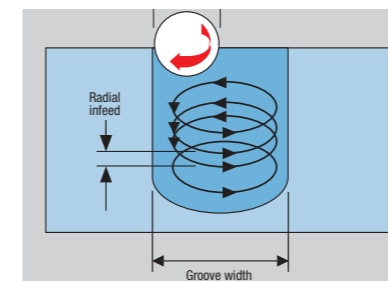
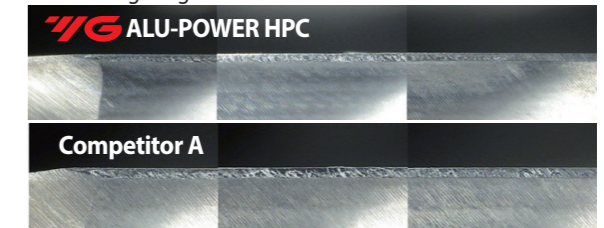
Ø1/2(R.090) 3 Flute Corner radius



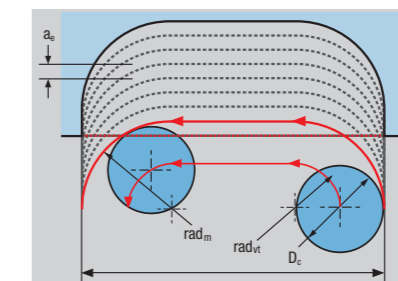
### Cutting Condition (Pocketing)

Tool	Ø12.7(R2.28) x Ø12.7 x 31.75 x 88.9
Work Material	AL7075
R.P.M (rev./min.)	12,224
IPM (mm/min.)	5,588
Cutting Depth (mm)	12.7 (Axial) / 12.2 (Radial)
Coolant	Wet Cut (9% emulsion)
Overhang (mm)	48
Milling Method	Pocketing
Machine	Machining Center

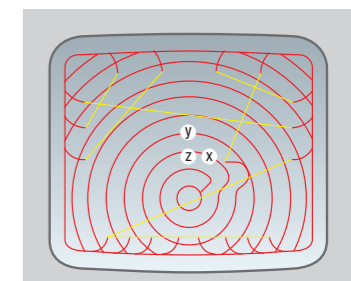
Total Milling Length : 38m



**In trochoidal milling applications,** the cutter follows a spiral path by moving radially as it rotates providing faster machining times, lower tooling costs and reduced loads on machine components.



**Peel milling applications** benefit from ALU-POWER HPC's super sharp high-speed milling ability.



Outstanding chip evacuation through deep gullet design coupled with high speed milling leaves **a well-defined clean cutter path.**



# ALU-POWER HPC CHIP BREAKER 3-FLUTE END MILLS NEW

- Unique Geometry provides the Balance cutting with less vibration during the High Speed Machining.
- Provides long tool life and high productivity on aluminum by Chip breaker releasing stresses on the tool and prevents acceleration rate of wear on the cutting edge.
- Chip Breaker Improves chip evacuation by shortening the chip length during the High Speed Machining.

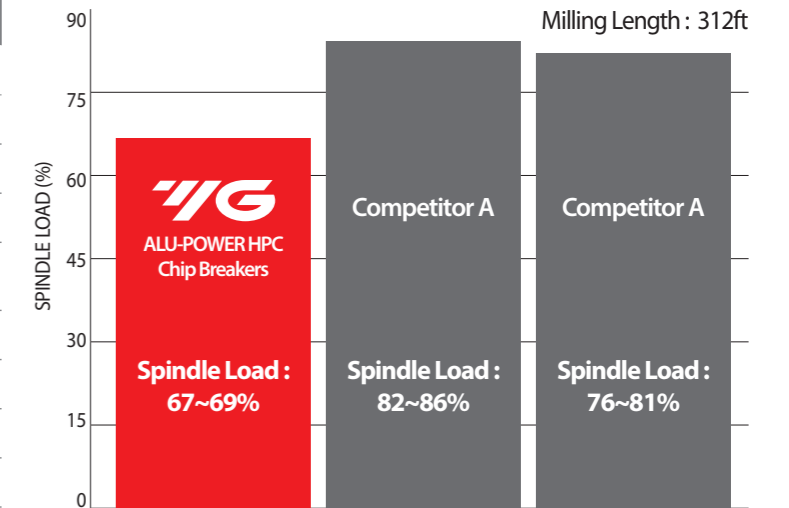
## CASE STUDY

### TEST Chip Breakers - Side Cutting Application

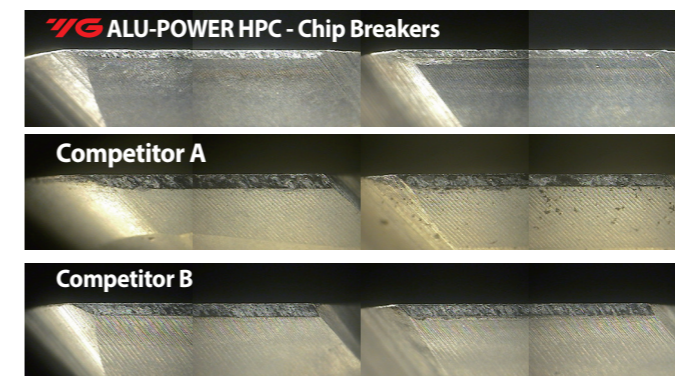
#### Ø1/2(R.03") 3 Flute Chip Breakers

Cutting Conditions	
Tool	Ø12.7(R0.76) x Ø12.7 x 31.75 x 76.2
Work Material	Al7075
R.P.M (rev./min.)	16,800
FEED(mm/min.)	3,835
Cutting Depth (mm)	19.05 (Axial=1.5D) 4,445 (Radial=0.35D)
Coolant	Wet Cut
Holder	BT40 - High Feed Milling Chuck
Milling Method	Profiling
Machine	Machining Center

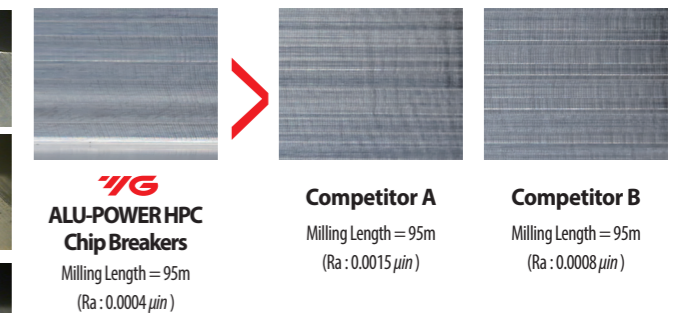
#### Cutting Resistance



#### Cutting Edge (Total Milling Length : 95m)



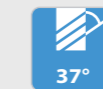
#### Surface Roughness



## GUIDE TO ICONS



The tool is made of micrograin carbide



Helix Angle



Tool Ends:  
Square / Corner Radius



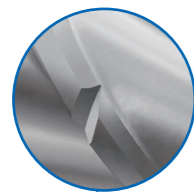
No. of Flutes



Type of Shank

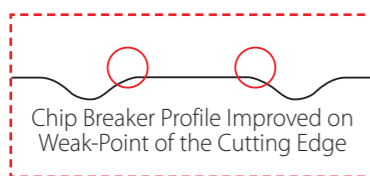


Cutting Conditions



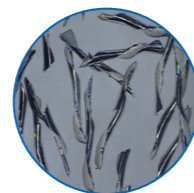
#### Chip Breakers

- ▶ Through Special Chip Breaker Design, the length of the chip is formed short to improve chip evacuation performance.

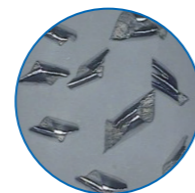


#### Optimized Chip Breaker Profile Design

- ▶ Optimized Chip Breaker Profile design boasts the best performance in Aluminum high-speed processing.



General End mill Chip Geometry



Chip Breaker End mill Chip Geometry

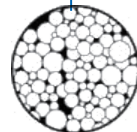
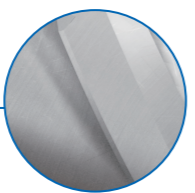
#### Unique Geometries

- ▶ Applied suitable Flute Design for Aluminum high speed machining to have an effective chip evacuation effect.
- ▶ Excellent Corner Protect Design improves tool life.



#### Cylindrical Land

- ▶ Improves tool performance by reducing vibration and chattering in high-speed processing.



#### Premium Tungsten Carbide

- ▶ Excellent wear resistance by using Premium Carbide material.

SERIES	E5H24 JAH24	E5H25 JAH25	E5H22 JAH22	E5H23 JAH23
FLUTE	3	3	3	3
HELIX ANGLE	37°	37°	37°	37°
CUTTING EDGE SHAPE	CORNER RADIUS	CORNER RADIUS	SQUARE	SQUARE
SIZE MIN	D6.0	D6.0	D3.0	D6.0
SIZE MAX	D20.0	D20.0	D25.0	D20.0
PAGE	10	13	16	17

**SOLID CARBIDE**  
**ALU-POWER HPC**  
**END MILLS**

3-Flute, High-Performance,  
For Aluminum, Aluminum Die Cast,  
Non-Ferrous Alloys And Plastics



Please visit  
[globalyg1.com/mat](http://globalyg1.com/mat)  
for material search

◎ : Excellent ○ : Good

Recommended cutting conditions : p.19-21

	-	EXTENDED NECK	-	EXTENDED NECK
	Uncoated	Uncoated	Uncoated	Uncoated
	DLC	DLC	DLC	DLC



ISO	VDI 3323	Material Description	Composition / Structure / Heat Treatment		HB	HRc				
P	1	Non-alloy steel	About 0.15% C	Annealed	125					
	2		About 0.45% C	Annealed	190	13				
	3		About 0.45% C	Quenched & Tempered	250	25				
	4		About 0.75% C	Annealed	270	28				
	5		About 0.75% C	Quenched & Tempered	300	32				
	6	Low alloy steel		Annealed	180	10				
	7		Quenched & Tempered	275	29					
	8		Quenched & Tempered	300	32					
	9		Quenched & Tempered	350	38					
	10		High alloyed steel, and tool steel	Annealed	200	15				
	11	Quenched & Tempered	325	35						
M	12	Stainless steel	Ferritic / Martensitic	Annealed	200	15				
	13		Martensitic	Quenched & Tempered	240	23				
	14		Austenitic	180	10					
K	15	Grey cast iron	Pearlitic / ferritic		180	10				
	16		Pearlitic (Martensitic)	260	26					
	17	Nodular cast iron	Ferritic		160	3				
	18		Pearlitic	250	25					
	19		Ferritic	130						
20	Malleable cast iron	Pearlitic		230	21					
N	21	Aluminum-wrought alloy	Not Curable		60		◎	◎	◎	◎
	22	Curable	Hardened		100		◎	◎	◎	◎
	23	Aluminum-cast, alloyed	≤ 12% Si, Not Curable		75		◎	◎	◎	◎
	24		≤ 12% Si, Curable	Hardened	90		◎	◎	◎	◎
	25		> 12% Si, Not Curable		130		○	○	○	○
	26	Copper and Copper Alloys (Bronze / Brass)	Cutting Alloys, PB>1%		110		○	○	○	○
	27		CuZn, CuSnZn (Brass)		90		○	○	○	○
	28		CuSn, lead-free copper and electrolytic copper		100		○	○	○	○
	29	Non Metallic Materials	Duroplastic, Fiber Reinforced Plastic					○	○	○
30	Rubber, Wood, etc.									
S	31	Heat Resistant Super Alloys	Fe Based	Annealed	200	15				
	32		Cured	280	30					
	33		Annealed	250	25					
	34		Ni or Co Based	Cured	350	38				
	35		Cast	320	34					
	36	Titanium Alloys	Pure Titanium		400 Rm					
37	Alpha + Beta Alloys		Hardened	1050 Rm						
H	38	Hardened steel		Hardened	550	55				
	39		Hardened	630	60					
	40		Chilled Cast Iron	Cast	400	42				
	41		Hardened Cast Iron	Hardened	550	55				

SERIES	E5I86 E5I87
FLUTE	3
HELIX ANGLE	37°
CORNER RADIUS	D6.0
SIZE MAX	D20.0
PAGE	18
	-
	Uncoated
	CHIP BREAKER



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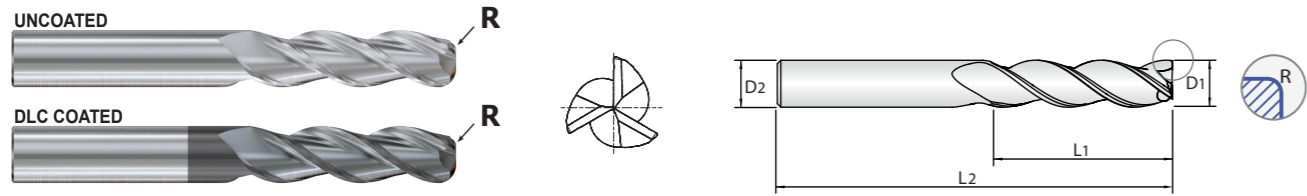
Scan QR Code to See Catalogue  
**AEROSPACE SOLUTIONS &  
COMPOSITE MATERIALS**



HIGH-PERFORMANCE SOLID CARBIDE END MILLS  
CARBIDE, 3 FLUTE 37° HELIX CORNER RADIUS

SERIES  
UNCOATED **E5H24**  
DLC COATED **JAH24**

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ More efficient chip evacuation
- ▶ Ability to counteract extreme radial forces
- ▶ DLC Coating provides edge strength and unsurpassed tool life



Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Uncoated	DLC	R	D1	D2	L1	L2
E5H24060	JAH24060	R0.5	6.0	6	13	57
E5H24901	JAH24901	R1.0	6.0	6	13	57
E5H24902	JAH24902	R1.5	6.0	6	13	57
E5H24903	JAH24903	R0.8	6.0	6	13	72
E5H24904	JAH24904	R1.2	6.0	6	13	72
E5H24905	JAH24905	R0.5	6.0	6	24	75
E5H24906	JAH24906	R1.0	6.0	6	24	75
E5H24080	JAH24080	R0.3	8.0	8	19	63
E5H24907	JAH24907	R0.5	8.0	8	19	63
E5H24908	JAH24908	R1.0	8.0	8	19	63
E5H24909	JAH24909	R1.5	8.0	8	19	63
E5H24910	JAH24910	R0.5	8.0	8	32	75
E5H24911	JAH24911	R1.0	8.0	8	32	75
E5H24912	JAH24912	R1.5	8.0	8	32	75
E5H24913	JAH24913	R2.0	8.0	8	32	75
E5H24100	JAH24100	R0.3	10.0	10	22	72
E5H24914	JAH24914	R0.5	10.0	10	22	72
E5H24915	JAH24915	R1.0	10.0	10	22	72
E5H24916	JAH24916	R1.5	10.0	10	22	72
E5H24917	JAH24917	R0.5	10.0	10	40	100

NEXT PAGE ▶

Mill Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

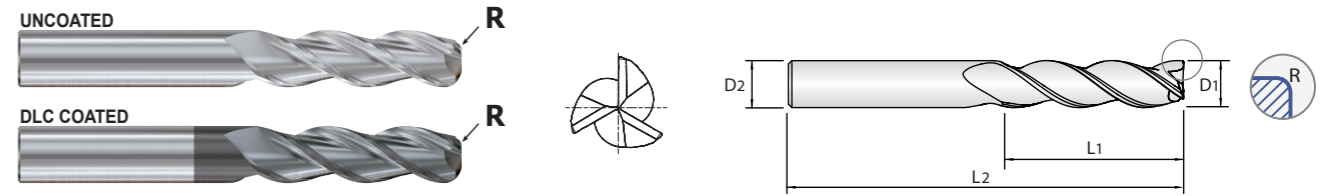
◎ : Excellent ○ : Good

ISO Material Description	P											M				K																									
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron																	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41
HRC	13	25	28	32		10	29	32	38	15	35	15	23	10	10	26	3	25	10	21	15	30	25	38	34	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	41	55				
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100	○	○	○	○	○	○	○	○	○	○	○	○	
Recommend	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

HIGH-PERFORMANCE SOLID CARBIDE END MILLS  
CARBIDE, 3 FLUTE 37° HELIX CORNER RADIUS

SERIES  
UNCOATED **E5H24**  
DLC COATED **JAH24**

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- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ More efficient chip evacuation
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Unit : mm

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Uncoated	DLC	R	D1	D2	L1	L2
E5H24918	JAH24918	R1.0	10.0	10	40	100
E5H24919	JAH24919	R1.5	10.0	10	40	100
E5H24920	JAH24920	R2.0	10.0	10	40	100
E5H24120	JAH24120	R1.5	12.0	12	26	83
E5H24921	JAH24921	R2.0	12.0	12	26	83
E5H24922	JAH24922	R2.5	12.0	12	26	83
E5H24923	JAH24923	R3.0	12.0	12	26	83
E5H24924	JAH24924	R0.5	12.0	12	48	100
E5H24925	JAH24925	R1.0	12.0	12	48	100
E5H24926	JAH24926	R1.5	12.0	12	48	100
E5H24927	JAH24927	R2.0	12.0	12	48	100
E5H24928	JAH24928	R2.5	12.0	12	48	100
E5H24929	JAH24929	R3.0	12.0	12	48	100
E5H24140	JAH24140	R1.0	14.0	14	30	89
E5H24930	JAH24930	R2.0	14.0	14	30	89
E5H24931	JAH24931	R3.0	14.0	14	30	89
E5H24160	JAH24160	R1.5	16.0	16	32	92
E5H24932	JAH24932	R2.0	16.0	16	32	92
E5H24933	JAH24933	R2.5	16.0	16	32	92
E5H24934	JAH24934	R3.0	16.0	16	32	92

NEXT PAGE ▶

Mill Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

◎ : Excellent ○ : Good

ISO Material Description	P											M				K																										
	Non-alloy steel					Low alloy steel						High alloyed steel, and tool steel				Stainless steel				Grey cast iron		Nodular cast iron		Malleable cast iron																		
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22	23	24	25	26	27	28	29	30	31	32	33	34	35	36	37	38	39	40	41	
HRC	13	25	28	32		10	29	32	38	15	35	15	23	10	10	26	3	25	10	21	15	30	25	38	34	200	280	250	350	320	400 Rm	1050 Rm	550	630	400	41	55					
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	60	100	75	90	130	110	90	100	○	○	○	○	○	○	○	○	○	○	○	○		
Recommend	◎	◎	◎	◎	◎	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎	◎

## HIGH-PERFORMANCE SOLID CARBIDE END MILLS CARBIDE, 3 FLUTE 37° HELIX CORNER RADIUS

SERIES

UNCOATED **E5H24**  
DLC COATED **JAH24**

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ More efficient chip evacuation
- ▶ Ability to counteract extreme radial forces
- ▶ DLC Coating provides edge strength and unsurpassed tool life



EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Uncoated	DLC	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>2</sub>
E5H24935	JAH24935	R4.0	16.0	16	32	92
E5H24936	JAH24936	R0.5	16.0	16	64	125
E5H24937	JAH24937	R1.0	16.0	16	64	125
E5H24938	JAH24938	R1.5	16.0	16	64	125
E5H24939	JAH24939	R2.0	16.0	16	64	125
E5H24940	JAH24940	R2.5	16.0	16	64	125
E5H24941	JAH24941	R3.0	16.0	16	64	125
E5H24942	JAH24942	R4.0	16.0	16	64	125
E5H24200	JAH24200	R2.0	20.0	20	38	104
E5H24943	JAH24943	R2.5	20.0	20	38	104
E5H24944	JAH24944	R3.0	20.0	20	38	104
E5H24945	JAH24945	R4.0	20.0	20	38	104
E5H24946	JAH24946	R0.5	20.0	20	80	150
E5H24947	JAH24947	R1.0	20.0	20	80	150
E5H24948	JAH24948	R1.5	20.0	20	80	150
E5H24949	JAH24949	R2.0	20.0	20	80	150
E5H24950	JAH24950	R2.5	20.0	20	80	150
E5H24951	JAH24951	R3.0	20.0	20	80	150
E5H24952	JAH24952	R4.0	20.0	20	80	150

Unit : mm

Mill Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

ISO	P										M					K					
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	35	38	42	45	48	50	52	55	58	60	63	65	68	70	72	74	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

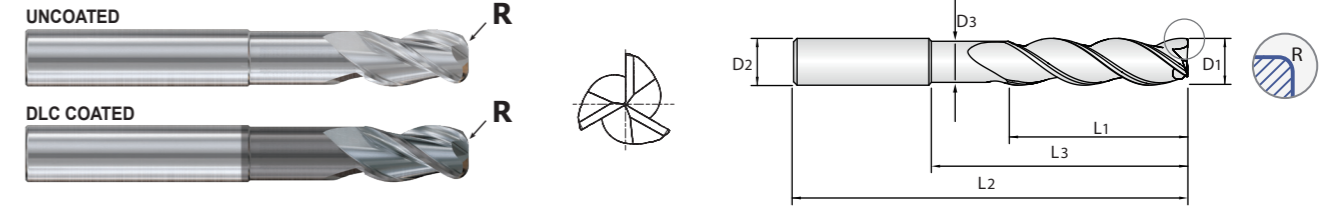
⊙ : Excellent ○ : Good

## HIGH-PERFORMANCE SOLID CARBIDE END MILLS CARBIDE, 3 FLUTE 37° HELIX CORNER RADIUS with EXTENDED NECK

SERIES

UNCOATED **E5H25**  
DLC COATED **JAH25**

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ More efficient chip evacuation
- ▶ Ability to counteract extreme radial forces
- ▶ DLC Coating provides edge strength and unsurpassed tool life



EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
Uncoated	DLC	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
E5H25060	JAH25060	R0.5	6.0	6	10	20	63	5.7
E5H25901	JAH25901	R1.0	6.0	6	10	20	63	5.7
E5H25902	JAH25902	R0.5	6.0	6	13	30	72	5.7
E5H25903	JAH25903	R1.0	6.0	6	13	30	72	5.7
E5H25080	JAH25080	R0.3	8.0	8	12	25	75	7.4
E5H25904	JAH25904	R0.5	8.0	8	12	25	75	7.4
E5H25905	JAH25905	R0.8	8.0	8	12	25	75	7.4
E5H25906	JAH25906	R1.0	8.0	8	12	25	75	7.4
E5H25907	JAH25907	R1.2	8.0	8	12	25	75	7.4
E5H25908	JAH25908	R1.5	8.0	8	12	25	75	7.4
E5H25909	JAH25909	R1.6	8.0	8	12	25	75	7.4
E5H25100	JAH25100	R0.3	10.0	10	14	35	100	9.2
E5H25910	JAH25910	R0.5	10.0	10	14	35	100	9.2
E5H25911	JAH25911	R0.8	10.0	10	14	35	100	9.2
E5H25912	JAH25912	R1.0	10.0	10	14	35	100	9.2
E5H25913	JAH25913	R1.2	10.0	10	14	35	100	9.2
E5H25914	JAH25914	R1.5	10.0	10	14	35	100	9.2
E5H25915	JAH25915	R1.6	10.0	10	14	35	100	9.2

Unit : mm

Mill Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

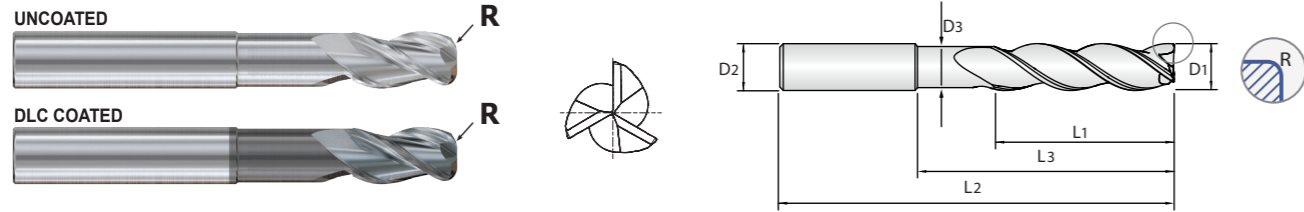
ISO	P										M					K					
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel	Stainless steel			Grey cast iron	Nodular cast iron		Malleable cast iron			
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	
HRC	13	25	28	32	35	38	42	45	48	50	52	55	58	60	63	65	68	70	72	74	
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230	
Recommend																					

⊙ : Excellent ○ : Good

HIGH-PERFORMANCE SOLID CARBIDE END MILLS  
CARBIDE, 3 FLUTE 37° HELIX CORNER RADIUS with EXTENDED NECK

SERIES  
UNCOATED **E5H25**  
DLC COATED **JAH25**

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ More efficient chip evacuation
- ▶ Ability to counteract extreme radial forces
- ▶ DLC Coating provides edge strength and unsurpassed tool life



EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
Uncoated	DLC	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
E5H25916	JAH25916	R2.4	10.0	10	14	35	100	9.2
E5H25120	JAH25120	R0.5	12.0	12	16	40	100	11.0
E5H25917	JAH25917	R0.8	12.0	12	16	40	100	11.0
E5H25918	JAH25918	R1.0	12.0	12	16	40	100	11.0
E5H25919	JAH25919	R1.2	12.0	12	16	40	100	11.0
E5H25920	JAH25920	R1.5	12.0	12	16	40	100	11.0
E5H25921	JAH25921	R1.6	12.0	12	16	40	100	11.0
E5H25922	JAH25922	R2.0	12.0	12	16	40	100	11.0
E5H25923	JAH25923	R2.4	12.0	12	16	40	100	11.0
E5H25924	JAH25924	R2.5	12.0	12	16	40	100	11.0
E5H25925	JAH25925	R3.0	12.0	12	16	40	100	11.0
E5H25926	JAH25926	R4.0	12.0	12	16	40	100	11.0
E5H25140	JAH25140	R1.0	14.0	14	18	45	125	13.0
E5H25927	JAH25927	R2.0	14.0	14	18	45	125	13.0
E5H25928	JAH25928	R3.0	14.0	14	18	45	125	13.0
E5H25929	JAH25929	R4.0	14.0	14	18	45	125	13.0
E5H25160	JAH25160	R0.8	16.0	16	20	50	125	15.0
E5H25930	JAH25930	R1.2	16.0	16	20	50	125	15.0

NEXT PAGE ▶

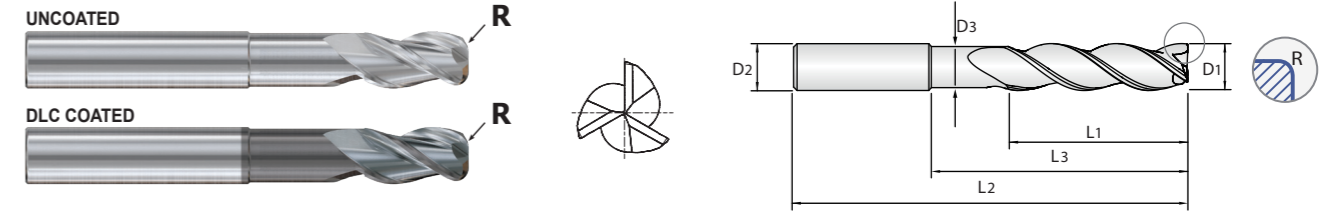
Mill Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRC	13	25	28	32	35	38	42	46	50	55	60	65	70	75	80	85	90	95	100	105	110	115
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○

HIGH-PERFORMANCE SOLID CARBIDE END MILLS  
CARBIDE, 3 FLUTE 37° HELIX CORNER RADIUS with EXTENDED NECK

SERIES  
UNCOATED **E5H25**  
DLC COATED **JAH25**

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ More efficient chip evacuation
- ▶ Ability to counteract extreme radial forces
- ▶ DLC Coating provides edge strength and unsurpassed tool life



EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Overall Length	Neck Diameter
Uncoated	DLC	R	D <sub>1</sub>	D <sub>2</sub>	L <sub>1</sub>	L <sub>3</sub>	L <sub>2</sub>	D <sub>3</sub>
E5H25931	JAH25931	R1.6	16.0	16	20	50	125	15.0
E5H25932	JAH25932	R2.0	16.0	16	20	50	125	15.0
E5H25933	JAH25933	R2.4	16.0	16	20	50	125	15.0
E5H25934	JAH25934	R2.5	16.0	16	20	50	125	15.0
E5H25935	JAH25935	R3.0	16.0	16	20	50	125	15.0
E5H25936	JAH25936	R3.2	16.0	16	20	50	125	15.0
E5H25937	JAH25937	R4.0	16.0	16	20	50	125	15.0
E5H25200	JAH25200	R0.8	20.0	20	25	65	150	19.0
E5H25938	JAH25938	R1.2	20.0	20	25	65	150	19.0
E5H25939	JAH25939	R1.6	20.0	20	25	65	150	19.0
E5H25940	JAH25940	R2.0	20.0	20	25	65	150	19.0
E5H25941	JAH25941	R2.4	20.0	20	25	65	150	19.0
E5H25942	JAH25942	R2.5	20.0	20	25	65	150	19.0
E5H25943	JAH25943	R3.0	20.0	20	25	65	150	19.0
E5H25944	JAH25944	R3.2	20.0	20	25	65	150	19.0
E5H25945	JAH25945	R4.0	20.0	20	25	65	150	19.0

Unit : mm

Mill Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h5
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.011	
Over 18 ~ up to 25	+0/-0.013	

ISO	P										M				K							
Material Description	Non-alloy steel					Low alloy steel					High alloyed steel, and tool steel				Stainless steel		Grey cast iron		Nodular cast iron		Malleable cast iron	
VDI 3323	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21	22
HRC	13	25	28	32	35	38	42	46	50	55	60	65	70	75	80	85	90	95	100	105	110	115
HB	125	190	250	270	300	180	275	300	350	200	325	200	240	180	180	260	160	250	130	230		
Recommend	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○





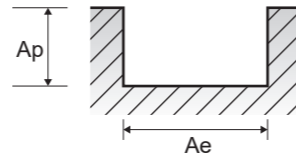


**E5H22, JAH22, E5H23, JAH23** SERIES

**3 FLUTE - SLOTTING**

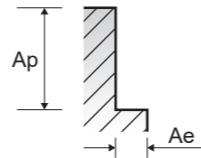
RPM = rev./min. FEED = mm/min.  
Vc = m/min. fz = mm/tooth

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)						
						3.0	6.0	10.0	12.0	16.0	20.0	25.0
N	21~22	Aluminum-wrought alloy	1.0D	1.0D	Vc	488	488	488	488	488	488	488
					fz	0.025	0.076	0.114	0.152	0.168	0.191	0.254
					RPM	51778	25889	15533	12945	9708	7767	6213
					FEED	3946	5918	5326	5918	4883	4439	4735
	23~25	Aluminum-cast, alloyed	1.0D	1.0D	Vc	183	183	183	183	183	183	183
					fz	0.025	0.076	0.114	0.152	0.168	0.191	0.254
					RPM	19417	9708	5825	4854	3641	2913	2330
					FEED	1480	2219	1997	2219	1831	1665	1775
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	Vc	268	268	268	268	268	268	268
					fz	0.020	0.051	0.102	0.127	0.140	0.152	0.178
					RPM	28436	14218	8531	7109	5332	4265	3412
					FEED	1733	2167	2600	2708	2235	1950	1820
29.1	Non Metallic Materials	1.0D	1.0D	Vc	503	503	503	503	503	503	503	
				fz	0.038	0.102	0.191	0.254	0.279	0.305	0.356	
				RPM	53370	26685	16011	13342	10007	8005	6404	
				FEED	6100	8134	9150	10167	8388	7320	6832	



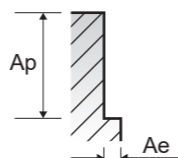
**3 FLUTE - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)						
						3.0	6.0	10.0	12.0	16.0	20.0	25.0
N	21~22	Aluminum-wrought alloy	0.5D	1.5D	Vc	610	610	610	610	610	610	610
					fz	0.025	0.076	0.114	0.152	0.168	0.191	0.254
					RPM	64723	32361	19417	16181	12136	9708	7767
					FEED	4932	7398	6658	7398	6103	5548	5918
	23~25	Aluminum-cast, alloyed	0.5D	1.5D	Vc	244	244	244	244	244	244	244
					fz	0.025	0.076	0.114	0.152	0.168	0.191	0.254
					RPM	25889	12945	7767	6472	4854	3883	3107
					FEED	1973	2959	2663	2959	2441	2219	2367
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	1.5D	Vc	351	351	351	351	351	351	351
					fz	0.020	0.051	0.102	0.127	0.140	0.152	0.178
					RPM	37242	18621	11173	9311	6983	5586	4469
					FEED	2270	2838	3405	3547	2927	2554	2384
29.1	Non Metallic Materials	0.5D	1.5D	Vc	625	625	625	625	625	625	625	
				fz	0.038	0.102	0.191	0.254	0.279	0.305	0.356	
				RPM	66314	33157	19894	16579	12434	9947	7958	
				FEED	7580	10106	11370	12633	10422	9096	8489	



**3 FLUTE - SIDE CUTTING HSM (Light)**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)						
						3.0	6.0	10.0	12.0	16.0	20.0	25.0
N	21~22	Aluminum-wrought alloy	0.05D	2.0D	Vc	1006	1006	1006	1006	1006	1006	1006
					fz	0.053	0.140	0.267	0.356	0.381	0.419	0.495
					RPM	106740	53370	32022	26685	20014	16011	12809
					FEED	17080	22367	25621	28467	22876	20131	19033
	23~25	Aluminum-cast, alloyed	0.05D	2.0D	Vc	366	366	366	366	366	366	366
					fz	0.053	0.140	0.267	0.356	0.381	0.419	0.495
					RPM	38834	19417	11650	9708	7281	5825	4660
					FEED	6214	8138	9321	10357	8323	7324	6924
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.05D	2.0D	Vc	564	564	564	564	564	564	564
					fz	0.043	0.114	0.216	0.292	0.330	0.356	0.406
					RPM	59842	29921	17953	14961	11220	8976	7181
					FEED	7752	10260	11628	13110	11115	9576	8755
29.1	Non Metallic Materials	0.05D	2.0D	Vc	1021	1021	1021	1021	1021	1021	1021	
				fz	0.086	0.229	0.432	0.584	0.635	0.699	0.813	
				RPM	108331	54166	32499	27083	20312	16250	13000	
				FEED	28066	37147	42100	47465	38695	34051	31699	

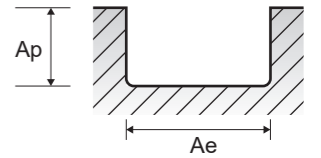


**E5I86, E5I87** SERIES

**3 FLUTE CORNER RADIUS - SLOTTING**

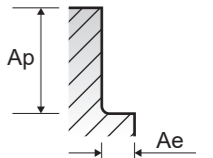
RPM = rev./min. FEED = mm/min.  
Vc = m/min. fz = mm/tooth

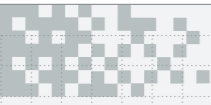
ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)				
						6.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	1.0D	1.0D	Vc	488	488	488	488	488
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	25889	15533	12945	9708	7767
					FEED	5918	5326	5918	4883	4439
	23~25	Aluminum-cast, alloyed	1.0D	1.0D	Vc	183	183	183	183	183
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	9708	5825	4854	3641	2913
					FEED	2219	1997	2219	1831	1665
	26-28	Copper and Copper Alloys (Bronze / Brass)	1.0D	1.0D	Vc	268	268	268	268	268
					fz	0.051	0.102	0.127	0.14	0.152
					RPM	14218	8531	7109	5332	4265
					FEED	2167	2600	2708	2235	1950
29.1	Non Metallic Materials	1.0D	1.0D	Vc	503	503	503	503	503	
				fz	0.102	0.191	0.254	0.279	0.305	
				RPM	26685	16011	13342	10007	8005	
				FEED	8134	9150	10167	8388	7320	



**3 FLUTE CORNER RADIUS - SIDE CUTTING**

ISO	VDI 3323	Material Description	Ae	Ap	Parameter	Mill Diameter (Ø)				
						6.0	10.0	12.0	16.0	20.0
N	21~22	Aluminum-wrought alloy	0.5D	1.5D	Vc	610	610	610	610	610
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	32361	19417	16181	12136	9708
					FEED	7398	6658	7398	6103	5548
	23~25	Aluminum-cast, alloyed	0.5D	1.5D	Vc	244	244	244	244	244
					fz	0.076	0.114	0.152	0.168	0.191
					RPM	12945	7767	6472	4854	3883
					FEED	2959	2663	2959	2441	2219
	26-28	Copper and Copper Alloys (Bronze / Brass)	0.5D	1.5D	Vc	351	351	351	351	351
					fz	0.051	0.102	0.127	0.14	0.152
					RPM	18621	11173	9311	6983	5586
					FEED	2838	3405	3547	2927	2554
29.1	Non Metallic Materials	0.5D	1.5D	Vc	625	625	625	625	625	
				fz	0.102	0.191	0.254	0.279	0.305	
				RPM	33157	19894	16579	12434	9947	
				FEED	10106	11370	12633	10422	9096	





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**YG-1 CO., LTD.**

\* For the more information on sales network, please contact the head office as below;

#### HEAD OFFICE

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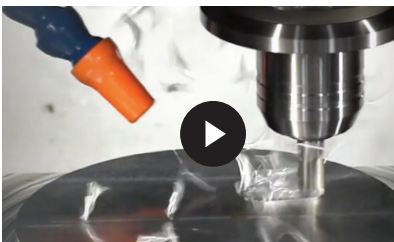
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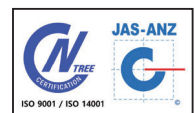
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