

**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

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**Note** The information is provided for reference only. Tool specifications are subject to change without prior notice.  
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**BROTECH**



# 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



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

## 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

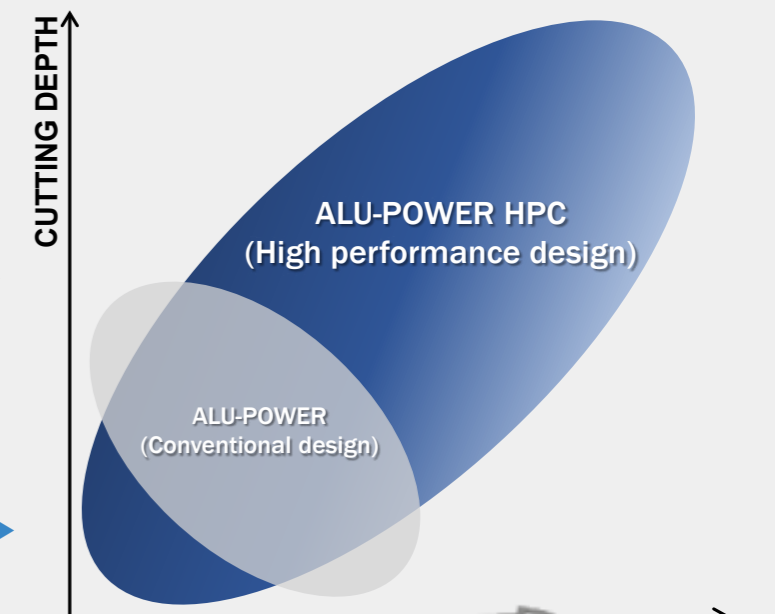


#### Engineered Flute Design

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

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

**■ The Goal:** Reduce cycle time by at least 25%.

### ■ The Test:

The YG-1 3-flute ALU-POWER HPC End mills are pitted against two strong competitors using similar configurations for milling aluminum alloy.

Cutting Conditions		
<b>Material</b>	7075 T-6 (Ribs)	
<b>Machine</b>	5-axis horizontal machining center	
<b>Coolant</b>	High pressure	
<b>Tool Holder</b>	Shrink fit Haimer	
<b>Speed (mm)</b>	RPM	Vc (SMM)
25mm tool	33,000	2,594
20mm tool	30,000	1,886
16mm tool	26,000	1,308
<b>Speed (inch)</b>	RPM	SFM
.9843 inch tool	33,000	8,510
.7874 inch tool	30,000	6,189
.6299 inch tool	26,000	4,291
<b>Feed (mm)</b>	m/min	mm/rev
25mm tool	20	.6071
20mm tool	24.5	.8179
16mm tool	11.4	.4420
<b>Feed (inch)</b>	inch/min	inch/rev
.9843 inch tool	787.4	.0239
.7874 inch tool	964.565	.0322
.6299 inch tool	452.755	.0174
<b>Step (mm)</b>	0.5 – 18	
<b>Step (inch)</b>	.01968 – .7087	
<b>Axial (mm)</b>	13	
<b>Axial (inch)</b>	.5118	
<b>Competitor</b>	U.S. Manufacturer and UK Manufacturer	
<b>YG-1 Tools</b>	3-flute ALU-POWER HPC Tools	
<b>Fixture</b>	Screws & Vacuum	

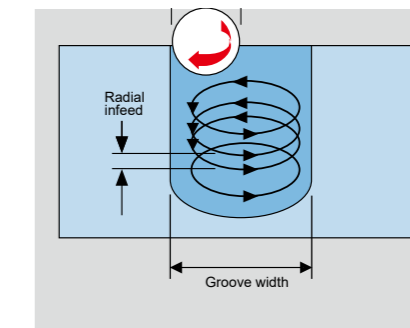
### ■ The Results:

**Saved up to \$2 million by improving the process by 27%.**

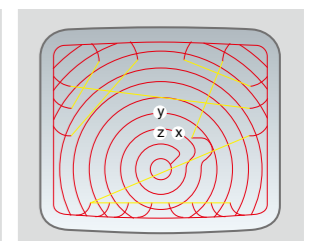
The combination of advanced geometry and the superior coating of the YG-1 3-Flute ALU-POWER HPC End mills beat both competitors in:

- ▶ Trochoidal machining
- ▶ Peel milling
- ▶ Cutter path performance

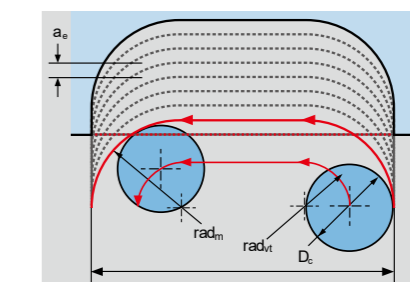
These process improvements resulted in a savings of seven minutes per part. The process was rolled out to all machines in the company.



**▲ 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.







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



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



## SELECTION GUIDE

EDP No.		MODEL	DESCRIPTION	SIZE		PAGE
Uncoated	DLC			MIN	MAX	
<b>E5H24</b>	<b>JAH24</b>		3 FLUTE CORNER RADIUS	6	20	<b>8</b>
<b>E5H25</b>	<b>JAH25</b>		3 FLUTE CORNER RADIUS with EXTENDED NECK	6	20	<b>10</b>
<b>E5H22</b>	<b>JAH22</b>		3 FLUTE SQUARE	3	25	<b>12</b>
<b>E5H23</b>	<b>JAH23</b>		3 FLUTE SQUARE with EXTENDED NECK	6	20	<b>13</b>
RECOMMENDED CUTTING CONDITIONS						<b>14</b>

◎ : Excellent ○ : Good

N			
Aluminum	Aluminum Die Cast	Non-Ferrous Alloys	Plastics
◎	◎	○	○
◎	◎	○	○
◎	◎	○	○
◎	◎	○	○

### Guide to icons

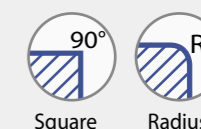
The tool is made of micrograin carbide



Helix Angle



Tool Ends:



No. of Flutes



Type of Shank



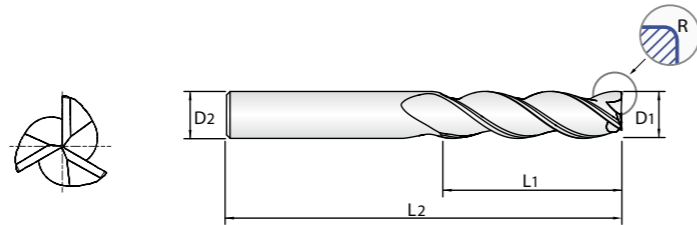
Cutting Conditions



### HIGH-PERFORMANCE SOLID CARBIDE END MILLS 3 FLUTE CORNER RADIUS

UNCOATED **E5H24 Series**  
DLC COATED **JAH24 Series**  
PLAIN SHANK

- ▶ 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



P. 14 - 15

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	6	13	57
E5H24901	JAH24901	R1.0	6	6	13	57
E5H24902	JAH24902	R1.5	6	6	13	57
E5H24903	JAH24903	R0.8	6	6	13	72
E5H24904	JAH24904	R1.2	6	6	13	72
E5H24905	JAH24905	R0.5	6	6	24	75
E5H24906	JAH24906	R1.0	6	6	24	75
E5H24080	JAH24080	R0.3	8	8	19	63
E5H24907	JAH24907	R0.5	8	8	19	63
E5H24908	JAH24908	R1.0	8	8	19	63
E5H24909	JAH24909	R1.5	8	8	19	63
E5H24910	JAH24910	R0.5	8	8	32	75
E5H24911	JAH24911	R1.0	8	8	32	75
E5H24912	JAH24912	R1.5	8	8	32	75
E5H24913	JAH24913	R2.0	8	8	32	75
E5H24100	JAH24100	R0.3	10	10	22	72
E5H24914	JAH24914	R0.5	10	10	22	72
E5H24915	JAH24915	R1.0	10	10	22	72
E5H24916	JAH24916	R1.5	10	10	22	72
E5H24917	JAH24917	R0.5	10	10	40	100
E5H24918	JAH24918	R1.0	10	10	40	100
E5H24919	JAH24919	R1.5	10	10	40	100
E5H24920	JAH24920	R2.0	10	10	40	100
E5H24120	JAH24120	R1.5	12	12	26	83
E5H24921	JAH24921	R2.0	12	12	26	83
E5H24922	JAH24922	R2.5	12	12	26	83
E5H24923	JAH24923	R3.0	12	12	26	83
E5H24924	JAH24924	R0.5	12	12	48	100
E5H24925	JAH24925	R1.0	12	12	48	100
E5H24926	JAH24926	R1.5	12	12	48	100
E5H24927	JAH24927	R2.0	12	12	48	100
E5H24928	JAH24928	R2.5	12	12	48	100

Unit : mm

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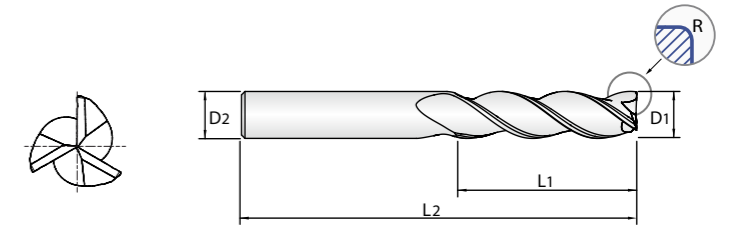
◎ : Excellent ○ : Good

N			
Aluminum	Aluminum Die Cast	Non-Ferrous Alloys	Plastics
◎	◎	○	○

### HIGH-PERFORMANCE SOLID CARBIDE END MILLS 3 FLUTE CORNER RADIUS

UNCOATED **E5H24 Series**  
DLC COATED **JAH24 Series**  
PLAIN SHANK

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



P. 14 - 15

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Uncoated	DLC	R	D1	D2	L1	L2
E5H24929	JAH24929	R3.0	12	12	48	100
E5H24140	JAH24140	R1.0	14	14	30	89
E5H24930	JAH24930	R2.0	14	14	30	89
E5H24931	JAH24931	R3.0	14	14	30	89
E5H24160	JAH24160	R1.5	16	16	32	92
E5H24932	JAH24932	R2.0	16	16	32	92
E5H24933	JAH24933	R2.5	16	16	32	92
E5H24934	JAH24934	R3.0	16	16	32	92
E5H24935	JAH24935	R4.0	16	16	32	92
E5H24936	JAH24936	R0.5	16	16	64	125
E5H24937	JAH24937	R1.0	16	16	64	125
E5H24938	JAH24938	R1.5	16	16	64	125
E5H24939	JAH24939	R2.0	16	16	64	125
E5H24940	JAH24940	R2.5	16	16	64	125
E5H24941	JAH24941	R3.0	16	16	64	125
E5H24942	JAH24942	R4.0	16	16	64	125
E5H24200	JAH24200	R2.0	20	20	38	104
E5H24943	JAH24943	R2.5	20	20	38	104
E5H24944	JAH24944	R3.0	20	20	38	104
E5H24945	JAH24945	R4.0	20	20	38	104
E5H24946	JAH24946	R0.5	20	20	80	150
E5H24947	JAH24947	R1.0	20	20	80	150
E5H24948	JAH24948	R1.5	20	20	80	150
E5H24949	JAH24949	R2.0	20	20	80	150
E5H24950	JAH24950	R2.5	20	20	80	150
E5H24951	JAH24951	R3.0	20	20	80	150
E5H24952	JAH24952	R4.0	20	20	80	150

Unit : mm

Outside Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h6
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.012	
Over 18 ~ up to 25	+0/-0.013	

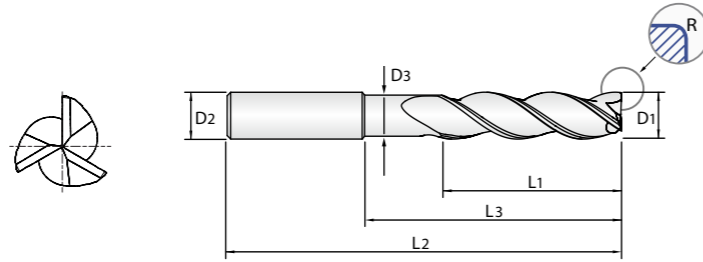
◎ : Excellent ○ : Good

N			
Aluminum	Aluminum Die Cast	Non-Ferrous Alloys	Plastics
◎	◎	○	○

### HIGH-PERFORMANCE SOLID CARBIDE END MILLS 3 FLUTE CORNER RADIUS with EXTENDED NECK

UNCOATED **E5H25 Series**  
DLC COATED **JAH25 Series**  
PLAIN SHANK

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



P. 14 - 15

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Neck Diameter	Overall Length
Uncoated	DLC	R	D1	D2	L1	L3	D3	L2
E5H25060	JAH25060	R0.5	6	6	10	20	5.7	63
E5H25901	JAH25901	R1.0	6	6	10	20	5.7	63
E5H25902	JAH25902	R0.5	6	6	13	30	5.7	72
E5H25903	JAH25903	R1.0	6	6	13	30	5.7	72
E5H25080	JAH25080	R0.3	8	8	12	25	7.4	75
E5H25904	JAH25904	R0.5	8	8	12	25	7.4	75
E5H25905	JAH25905	R0.8	8	8	12	25	7.4	75
E5H25906	JAH25906	R1.0	8	8	12	25	7.4	75
E5H25907	JAH25907	R1.2	8	8	12	25	7.4	75
E5H25908	JAH25908	R1.5	8	8	12	25	7.4	75
E5H25909	JAH25909	R1.6	8	8	12	25	7.4	75
E5H25100	JAH25100	R0.3	10	10	14	35	9.2	100
E5H25910	JAH25910	R0.5	10	10	14	35	9.2	100
E5H25911	JAH25911	R0.8	10	10	14	35	9.2	100
E5H25912	JAH25912	R1.0	10	10	14	35	9.2	100
E5H25913	JAH25913	R1.2	10	10	14	35	9.2	100
E5H25914	JAH25914	R1.5	10	10	14	35	9.2	100
E5H25915	JAH25915	R1.6	10	10	14	35	9.2	100
E5H25916	JAH25916	R2.4	10	10	14	35	9.2	100
E5H25120	JAH25120	R0.5	12	12	16	40	11	100
E5H25917	JAH25917	R0.8	12	12	16	40	11	100
E5H25918	JAH25918	R1.0	12	12	16	40	11	100
E5H25919	JAH25919	R1.2	12	12	16	40	11	100
E5H25920	JAH25920	R1.5	12	12	16	40	11	100
E5H25921	JAH25921	R1.6	12	12	16	40	11	100
E5H25922	JAH25922	R2.0	12	12	16	40	11	100
E5H25923	JAH25923	R2.4	12	12	16	40	11	100
E5H25924	JAH25924	R2.5	12	12	16	40	11	100
E5H25925	JAH25925	R3.0	12	12	16	40	11	100

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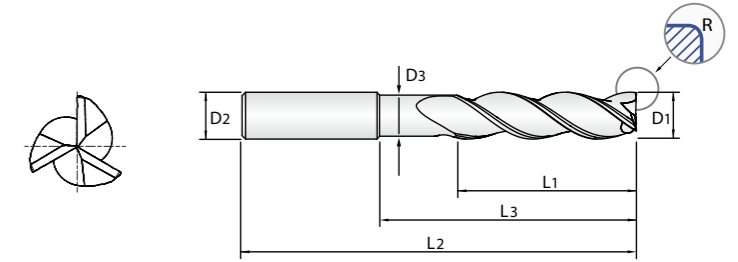
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N			
Aluminum	Aluminum Die Cast	Non-Ferrous Alloys	Plastics
◎	◎	○	○

### HIGH-PERFORMANCE SOLID CARBIDE END MILLS 3 FLUTE CORNER RADIUS with EXTENDED NECK

UNCOATED **E5H25 Series**  
DLC COATED **JAH25 Series**  
PLAIN SHANK

- ▶ Balanced cutting with less vibration
- ▶ Ability to run at higher speeds with less heat in aluminum
- ▶ More efficient chip evacuation
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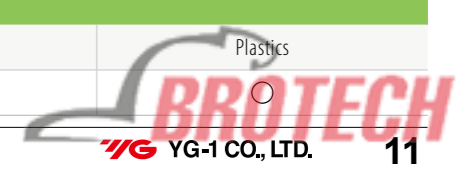
P. 14 - 15

EDP No.		Corner Radius	Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Neck Diameter	Overall Length
Uncoated	DLC	R	D1	D2	L1	L3	D3	L2
E5H25926	JAH25926	R4.0	12	12	16	40	11	100
E5H25140	JAH25140	R1.0	14	14	18	45	13	125
E5H25927	JAH25927	R2.0	14	14	18	45	13	125
E5H25928	JAH25928	R3.0	14	14	18	45	13	125
E5H25929	JAH25929	R4.0	14	14	18	45	13	125
E5H25160	JAH25160	R0.8	16	16	20	50	15	125
E5H25930	JAH25930	R1.2	16	16	20	50	15	125
E5H25931	JAH25931	R1.6	16	16	20	50	15	125
E5H25932	JAH25932	R2.0	16	16	20	50	15	125
E5H25933	JAH25933	R2.4	16	16	20	50	15	125
E5H25934	JAH25934	R2.5	16	16	20	50	15	125
E5H25935	JAH25935	R3.0	16	16	20	50	15	125
E5H25936	JAH25936	R3.2	16	16	20	50	15	125
E5H25937	JAH25937	R4.0	16	16	20	50	15	125
E5H25200	JAH25200	R0.8	20	20	25	65	19	150
E5H25938	JAH25938	R1.2	20	20	25	65	19	150
E5H25939	JAH25939	R1.6	20	20	25	65	19	150
E5H25940	JAH25940	R2.0	20	20	25	65	19	150
E5H25941	JAH25941	R2.4	20	20	25	65	19	150
E5H25942	JAH25942	R2.5	20	20	25	65	19	150
E5H25943	JAH25943	R3.0	20	20	25	65	19	150
E5H25944	JAH25944	R3.2	20	20	25	65	19	150
E5H25945	JAH25945	R4.0	20	20	25	65	19	150

Outside Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h6
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.012	
Over 18 ~ up to 25	+0/-0.013	

◎ : Excellent ○ : Good

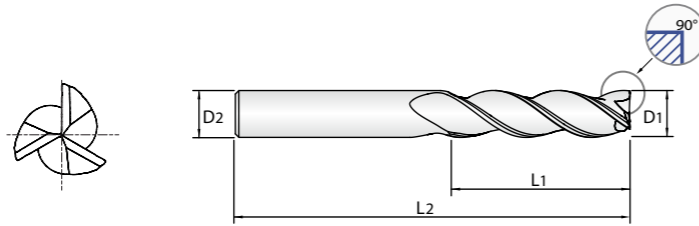
N			
Aluminum	Aluminum Die Cast	Non-Ferrous Alloys	Plastics
◎	◎	○	○



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

UNCOATED **E5H22 Series**  
DLC COATED **JAH22 Series**  
**PLAIN SHANK**

- ▶ 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



P. 14 - 15

Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Overall Length
Uncoated	DLC	D1	D2	L1	L2
E5H22030	JAH22030	3	6	8	52
E5H22040	JAH22040	4	6	11	55
E5H22050	JAH22050	5	6	13	57
E5H22060	JAH22060	6	6	13	57
E5H22901	JAH22901	6	6	13	72
E5H22902	JAH22902	6	6	24	75
E5H22080	JAH22080	8	8	19	63
E5H22903	JAH22903	8	8	32	75
E5H22100	JAH22100	10	10	22	72
E5H22904	JAH22904	10	10	40	100
E5H22120	JAH22120	12	12	26	83
E5H22905	JAH22905	12	12	48	100
E5H22140	JAH22140	14	14	30	89
E5H22160	JAH22160	16	16	32	92
E5H22906	JAH22906	16	16	64	125
E5H22200	JAH22200	20	20	38	104
E5H22907	JAH22907	20	20	80	150
E5H22250	JAH22250	25	25	50	125

Outside Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h6
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.012	
Over 18 ~ up to 25	+0/-0.013	

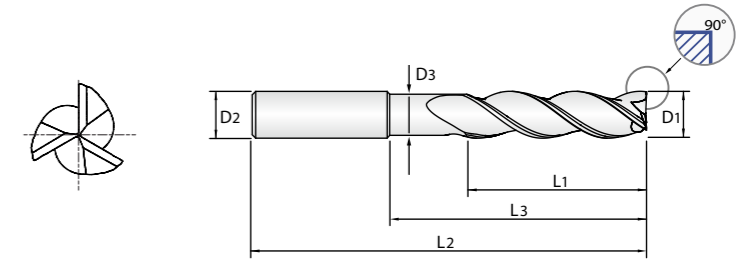
◎ : Excellent ○ : Good

N			
Aluminum	Aluminum Die Cast	Non-Ferrous Alloys	Plastics
◎	◎	○	○

**HIGH-PERFORMANCE SOLID CARBIDE END MILLS**  
**3 FLUTE SQUARE with EXTENDED NECK**

UNCOATED **E5H23 Series**  
DLC COATED **JAH23 Series**  
**PLAIN SHANK**

- ▶ 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



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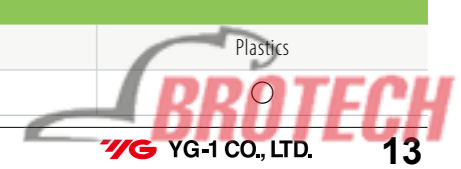
Unit : mm

EDP No.		Mill Diameter	Shank Diameter	Length of Cut	Length Below Shank	Neck Diameter	Overall Length
Uncoated	DLC	D1	D2	L1	L3	D3	L2
E5H23060	JAH23060	6	6	10	20	5.7	75
E5H23080	JAH23080	8	8	12	25	7.4	75
E5H23100	JAH23100	10	10	14	35	9.2	100
E5H23120	JAH23120	12	12	16	40	11	100
E5H23140	JAH23140	14	14	18	45	13	125
E5H23160	JAH23160	16	16	20	50	15	125
E5H23200	JAH23200	20	20	25	65	19	150

Outside Diameter Tolerances (mm)		Shank Diameter Tolerance
Diameter	Tolerance	
Up to 3	+0/-0.006	h6
Over 3 ~ up to 6	+0/-0.008	
Over 6 ~ up to 10	+0/-0.009	
Over 10 ~ up to 18	+0/-0.012	
Over 18 ~ up to 25	+0/-0.013	

◎ : Excellent ○ : Good

N			
Aluminum	Aluminum Die Cast	Non-Ferrous Alloys	Plastics
◎	◎	○	○



RECOMMENDED CUTTING CONDITIONS

JAH24 | JAH25 | JAH22 | JAH23 SERIES (UNCOATED)  
 E5H24 | E5H25 | E5H22 | E5H23 SERIES (DLC COATED)

RPM = rev./min. Feed = mm/min.  
 Vc = m/min. Fz = mm/tooth

Speed and Feed Recommendations							Diameter (D)							
Hardness (Brinell)	Coolant	Work Material	Cutting Method	Ap x D	Ae x D	Vc (SFM)	Parameters	3	6	10	12	16	20	25
< 18% Silicone	Emulsion	Aluminum Alloys: 2024, 5052, 5086, 6061, 6073, 7075	Slotting	1	1	488	RPM	51778	25889	15533	12945	9708	7767	6213
						Vc (m/min)	488	488	488	488	488	488	488	
						Fz (mm/tooth)	0.025	0.076	0.114	0.152	0.168	0.191	0.254	
			Feed (mm/min)	3946	5918	5326	5918	4883	4439	4735				
			Profiling	1.5	0.5	610	RPM	64723	32361	19417	16181	12136	9708	7767
						Vc (m/min)	610	610	610	610	610	610	610	
						Fz (mm/tooth)	0.025	0.076	0.114	0.152	0.168	0.191	0.254	
			Feed (mm/min)	4932	7398	6658	7398	6103	5548	5918				
			HSM (Light)	2	0.05	1006	RPM	106740	53370	32022	26685	20014	16011	12809
Vc (m/min)	1006	1006				1006	1006	1006	1006	1006				
Fz (mm/tooth)	0.053	0.140				0.267	0.356	0.381	0.419	0.495				
Feed (mm/min)	17080	22367	25621	28467	22876	20131	19033							
> 18% Silicone	Emulsion	Aluminum Die Cast Alloys: A-390, A392, B-390	Slotting	1	1	183	RPM	19417	9708	5825	4854	3641	2913	2330
						Vc (m/min)	183	183	183	183	183	183	183	
						Fz (mm/tooth)	0.025	0.076	0.114	0.152	0.168	0.191	0.254	
			Feed (mm/min)	1480	2219	1997	2219	1831	1665	1775				
			Profiling	1.5	0.5	244	RPM	25889	12945	7767	6472	4854	3883	3107
						Vc (m/min)	244	244	244	244	244	244	244	
						Fz (mm/tooth)	0.025	0.076	0.114	0.152	0.168	0.191	0.254	
			Feed (mm/min)	1973	2959	2663	2959	2441	2219	2367				
			HSM (Light)	2	0.05	366	RPM	38834	19417	11650	9708	7281	5825	4660
Vc (m/min)	366	366				366	366	366	366	366				
Fz (mm/tooth)	0.053	0.140				0.267	0.356	0.381	0.419	0.495				
Feed (mm/min)	6214	8138	9321	10357	8323	7324	6924							
N	Emulsion	Copper Alloys: Aluminum Bronze, Brass, Naval Brass, Red Brass	Slotting	1	1	268	RPM	28436	14218	8531	7109	5332	4265	3412
						Vc (m/min)	268	268	268	268	268	268	268	
						Fz (mm/tooth)	0.020	0.051	0.102	0.127	0.140	0.152	0.178	
			Feed (mm/min)	1733	2167	2600	2708	2235	1950	1820				
			Profiling	1.5	0.5	351	RPM	37242	18621	11173	9311	6983	5586	4469
						Vc (m/min)	351	351	351	351	351	351	351	
						Fz (mm/tooth)	0.020	0.051	0.102	0.127	0.140	0.152	0.178	
			Feed (mm/min)	2270	2838	3405	3547	2927	2554	2384				
			HSM (Light)	2	0.05	564	RPM	59842	29921	17953	14961	11220	8976	7181
Vc (m/min)	564	564				564	564	564	564	564				
Fz (mm/tooth)	0.043	0.114				0.216	0.292	0.330	0.356	0.406				
Feed (mm/min)	7752	10260	11628	13110	11115	9576	8755							

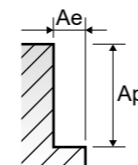
RECOMMENDED CUTTING CONDITIONS

JAH24 | JAH25 | JAH22 | JAH23 SERIES (UNCOATED)  
 E5H24 | E5H25 | E5H22 | E5H23 SERIES (DLC COATED)

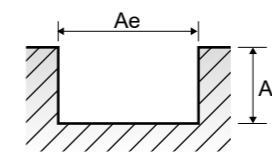
RPM = rev./min. Feed = mm/min.  
 Vc = m/min. Fz = mm/tooth

Speed and Feed Recommendations							Diameter (D)							
Hardness (Brinell)	Coolant	Work Material	Cutting Method	Ap x D	Ae x D	Vc (SFM)	Parameters	3	6	10	12	16	20	25
N	Emulsion	Copper Alloys: Beryllium Copper, C110, Manganese Bronze, Tin Bronze	Slotting	1	1	91	RPM	9655	4828	2897	2414	1810	1448	1159
						Vc (m/min)	91	91	91	91	91	91	91	
						Fz (mm/tooth)	0.020	0.051	0.102	0.127	0.140	0.152	0.178	
			Feed (mm/min)	589	736	883	920	759	662	618				
			Profiling	1.5	0.5	137	RPM	14536	7268	4361	3634	2726	2180	1744
						Vc (m/min)	137	137	137	137	137	137	137	
						Fz (mm/tooth)	0.020	0.051	0.102	0.127	0.140	0.152	0.178	
			Feed (mm/min)	886	1108	1329	1385	1142	997	930				
			HSM (Light)	2	0.05	229	RPM	24298	12149	7289	6074	4556	3645	2916
Vc (m/min)	229	229				229	229	229	229	229				
Fz (mm/tooth)	0.043	0.114				0.216	0.292	0.330	0.356	0.406				
Feed (mm/min)	3148	4166	4721	5323	4513	3888	3555							
N	Air	Plastics: ABS, POLYCARBONATE, PVC, POLYPROPYLENE	Slotting	1	1	503	RPM	53370	26685	16011	13342	10007	8005	6404
						Vc (m/min)	503	503	503	503	503	503	503	
						Fz (mm/tooth)	0.038	0.102	0.191	0.254	0.279	0.305	0.356	
			Feed (mm/min)	6100	8134	9150	10167	8388	7320	6832				
			Profiling	1.5	0.5	625	RPM	66314	33157	19894	16579	12434	9947	7958
						Vc (m/min)	625	625	625	625	625	625	625	
						Fz (mm/tooth)	0.038	0.102	0.191	0.254	0.279	0.305	0.356	
			Feed (mm/min)	7580	10106	11370	12633	10422	9096	8489				
			HSM (Light)	2	0.05	1021	RPM	108331	54166	32499	27083	20312	16250	13000
Vc (m/min)	1021	1021				1021	1021	1021	1021	1021				
Fz (mm/tooth)	0.086	0.229				0.432	0.584	0.635	0.699	0.813				
Feed (mm/min)	28066	37147	42100	47465	38695	34051	31699							

Profiling/HSM



Slotting



- NOTES:**
- ▶ All Cutting Data are Target Values
  - ▶ Maximum recommended depth shown
  - ▶ Finish cuts typically require reduced feed rates and/or higher spindle speed, with radial width of 2% x D1 or less
  - ▶ Reduce speed and feed recommendations for materials harder than listed
  - ▶ Reduce cut depth and feed by 50% for long flute or long reach tools.
  - ▶ Above recommendations are based on ideal conditions. Adjust parameters accordingly for smaller taper machining centers or less rigid conditions
  - ▶ HSM = High speed Machining