YU-HPC18
BEST VALUE IN THE WORLD OF CUTTING TOOLS

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

ALU-POWER HPC
YG-1’S FIRST 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
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. Add that to its ultra-micrograin carbide design and the result is:

- Longer tool life
- 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

The Anatomy of Efficiency

- **Specialized Design of Corner Gash**
  - Unique flute design and superior corner protection adds 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
  - Also 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

**GUIDE TO ICONS**

- **The tool is made of micrograin carbide**

- **Helix Angle**
  - 37°

- **Tool Ends:**
  - No. of Flutes: 3
  - Type of Shank: PLAIN
  - Plain Shank

- **Cutting Conditions**
  - R
  - Radius

800-765-8665 | yg1usa.com
# SELECTION GUIDE

<table>
<thead>
<tr>
<th>ITEM</th>
<th>MODEL</th>
<th>DESCRIPTION</th>
<th>DIAMETER</th>
<th>PAGE</th>
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<td>3-FLUTE STANDARD LENGTH (Plain Shank) COATED</td>
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<td>CORNER RADIUS</td>
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<td>CORNER RADIUS</td>
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<td>3-FLUTE EXTENDED LENGTH (Plain Shank) UNCOATED</td>
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<tr>
<td>ESG98</td>
<td></td>
<td>CORNER RADIUS</td>
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## RECOMMENDED CUTTING CONDITIONS

### INCH

<table>
<thead>
<tr>
<th>Material</th>
<th>Cutting Conditions</th>
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<tbody>
<tr>
<td>Aluminum</td>
<td>Excellent</td>
</tr>
<tr>
<td>Die Cast</td>
<td>Excellent</td>
</tr>
<tr>
<td>Non-Ferrous Alloys</td>
<td>Excellent</td>
</tr>
<tr>
<td>Plastics</td>
<td>Excellent</td>
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</tbody>
</table>

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**Notes:**
- The table above lists various cutting tools with their specifications and recommended cutting conditions.
- The tools are categorized by their model, description, diameter range, and page numbers.
- The cutting conditions are indicated by icons for Excellent and Good performance.
ALU-POWER HPC

Why the Fastest Runners in the Business Bank on ALU-POWER HPC for the Best Returns

What do you get when you add 3 flutes 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 terms, it’s called an extremely sharp, highly durable milling monster that won’t back down, cut after cut after cut.

Work Materials

Aluminum, Non-Ferrous & Non-Metallic Materials

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.

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 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.
There is no comparison to the performance of the ALU-POWER HPC. The chips get out and stay out. Never a need to stop the machine to clean.

COATED AND UNCOATED 3-FLUTE CARBIDE END MILLS

<table>
<thead>
<tr>
<th>Outside Diameter Tolerances (inch)</th>
<th>Shank Diameter Tolerance</th>
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</thead>
<tbody>
<tr>
<td>1/8 – 3/16</td>
<td>H6</td>
</tr>
<tr>
<td>1/4 – 3/8</td>
<td>+0/-0.0032</td>
</tr>
<tr>
<td>1/2 – 5/8</td>
<td>+0/-0.0043</td>
</tr>
<tr>
<td>3/4 – 1</td>
<td>+0/-0.0051</td>
</tr>
</tbody>
</table>

Material Compatibility:
- Aluminum
- Aluminum Die Cast
- Non-Ferrous Alloys
- Plastics

Excellant: ☑️
Good: ☐️
3-FLUTE EXTENDED LENGTH (PLAIN SHANK) - COATED

**JAG96 | JAG98 SERIES**

**Case Study: Field Test Report**

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

**The Test:** Three YG-1 3-flute ALU-POWER HPC end mills are pitted against two strong competitors using similar configurations for milling aluminum alloys.

**Cutting Conditions**

- **Material:** 7075 T-6 (Rbs)
- **Machine:** 5-axis horizontal machining center
- **Coolant:** High pressure
- **Tool Holder:** Shrink fit HaHaer
- **Feed (mm) in/min:** 0.330, 3.94, 6.19
- **Feed (mm) m/min mm/rev:** 3.30, 3.94, 6.19
- **Step (mm) in/min in./rev:** 0.5 – 18
- **Step (in.) in./rev:** 0.0196 – 7.087
- **Axial (mm):** 13
- **Axial (in.):** 0.5118
- **Competitor:** U.S. Manufacturer and UK Manufacturer
- **YG-1 Tools:** 3 ALU-POWER HPC Tools
- **Fixture:** 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.

**Outstanding chip evacuation through deep gullet design coupled with high speed milling increase well-defined clean cutter paths.**

**Peel milling applications benefit from ALU-POWER HPC’s super sharp high-speed milling ability.**
**RECOMMENDED CUTTING CONDITIONS – INCH**

**JAG95 | JAG96 | JAG97 | JAG98 SERIES**

**ESG95 | ESG96 | ESG97 | ESG98 SERIES**

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### Speed and Feed Recommendations

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<tr>
<th>ISO Hardness (BHN)</th>
<th>Cutting Method</th>
<th>Diameter (D)</th>
<th>RPM</th>
<th>Vc (SF)</th>
<th>Parameters</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>1/8</td>
<td>1/4</td>
<td>3/8</td>
<td>1/2</td>
</tr>
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- **Emulsion**
- **HSM**

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### Notation:

- **HSM = high-speed machining**
- **NOTE:** All cutting data are target values.
  - **Maximum recommended depth shown**
  - **Finish cuts may require reduced feed rates and/or higher spindle speeds, with radial width of 2% D 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**

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<th>Non-Ferrous Alloys: Copper Alloys, Beryllium Copper, C110, Manganese Bronze, Tin Bronze</th>
<th>RPM</th>
<th>Vc (SF)</th>
<th>Parameters</th>
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### Cutting Method Parameters

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<th>Parameters</th>
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### Main Tools

- ** profiling**
- ** profiling**

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### Conclusion

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Scan this QR code to see our ALU-POWER HPC tools at work.

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Tool specifications are subject to change without prior notice.