

APPLICATIONS



HIGH PERFORMANCE CUTTING TOOLS

CARBIDE ENDMILLS

CARBIDE DRILLS

POWDER METAL ENDMILLS



Machining Aluminum

luminum's unique characteristics include the following: it is lightweight, durable, corrosion resistant and malleable. These characteristics make Aluminum an ideal material in the Automotive, Aerospace and Medical industries. To machine aluminum efficiently, proper cutting tool geometry and coatings must be utilized.

What you need to know about **Aluminum's** Machinability.

- Its softness and malleability cause material to stick on the cutting tool's edges during machining, reducing overall cutting performance overtime.
- Aluminum oxides cause abrasiveness; to minimize it, the appropriate coatings must be applied.
- Aluminum chemically bonds with cobalt at high temperatures. This results in material build-up on the tool's cutting edge.







What You Need when Machining Aluminum



High Wear Resistance



Reduced Chatter/ Vibration

~

Efficient Chip Evacuation



Sharp & Fine Cutting Edges



Smooth Surface Finish



Increased Productivity

PVD Coatings for Machining Aluminum

Z-Power[®] (ZrN) Zirconium Nitride

What type of coating do you need when machining Aluminum?

hen selecting a PVD coating for Aluminum applications, all of Aluminum's unique properties must be taken into consideration. Aluminum is soft, malleable and abrasive. As a result, during machining it becomes gummy and builds-up on the cutting tool's edges. To minimize these issues, our in-house coating facility developed Z-Power[®] and ZircoPlus[®] coatings.



- High toughness
- Low coefficient of friction
- Excellent wear resistance
- Improved corrosion resistance
- Biocompatible (for medical instruments)

Z-Power®

(ZrN) Zirconium Nitride

Applications

- Aluminum Alloys
- Brass
- Nickel
- Fiberglass
- ...and Non-Ferrous materials

Properties

| d |
|--------------|
| ow, Rose |
|), ZrCN 3100 |
| |
| |
|] |
| er |
| |

*For micro cutting tools, a thickness of < 2 μ m is recommended.

ZircoPlus® (ZrCN) Zirconium-Carbo-Nitride

ZircoPlus®

(ZrCN) Zirconium-Carbo-Nitride

Applications

- Aluminum Alloys ≤8% Si
- Fiberglass
- Nylon
- Polymer Materials
- ...and Non-Ferrous materials







The AXC Series is engineered to provide you with improved accuracy and surface finish. Its design consists of a triple margin, internal coolant holes, 15° helix and 135° point geometry; a design ideal for Aluminum applications.

| Features: | Applicat | ions: | Benefits: | |
|---|-----------------------|--|---|-----------------------------|
| 1. 135° Point Geometry For advanced drilling capabilities | • Aluminu • Copper | m | Superior hole of the second seco | quality cles required |
| 2. Coolant Holes Cools cutting edge and helps evacuate chip | • Gray Cas and th | t Iron leir alloys | Increased proc Longer tool life Long-term cos | luctivity e t savings |
| 3. Triple Margin Increased stability & smooth finish | | | | |
| ZircoPlus[®] Coating Increased corrosion and abrasion resistance | CARBIDE CARBURO | 3xD to 50xD | <u></u> 15° | |
| 5. Available: 3xD – 50xD High penetration capabilities | Zirco Plus® | ZircoPlus [®] provid corrosion and abr for maximized ma | es increased asion resistance, chining. | |

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DRILL DEEP. DRILL FAST. DRILL RIGHT.





3 Flute - Single Margin Carbide Drill **HIGH-PERFORMANCE DRILLING**





Features:

- 1. 130° Point Geometry Self-centering
- 2. Coolant Holes Cools cutting edge and helps evacuate chip
- 3. ZircoPlus® Coating Increased corrosion and abrasion resistance
- 4. Available: 3xD 5xD High penetration capabilities





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The CXC Series is engineered to provide you with improved accuracy and surface finish. Its design consists of a self-centering point, internal coolant holes, 30° helix and 130° point geometry; a design ideal for Aluminum applications.

HIGH-SPEED MILLING ENDMILLS For Aluminum Applications







Our new High-Performance Machining Plus+ Endmills, H235 and H337 Series, are engineered exclusively for high-speed milling centers. The H235 and H337 run at maximum spindle speed and power, achieving RPMs as high as 33,000 (1" Diameters). Furthermore, the H235 & H337 Series allow for increased productivity and reduced machining time, during operations of Aluminum applications.





Increased Productivity





Reduced Machining Time



3 Flute

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2 Flute

VARIABLE ENDMILL

FRIES

Extended Neck



The 360 Series, variable endmill, is engineered for improved chip evacuation and maximum metal removal rates. Its design consists of an eccentric OD, standard chamfer, large gullet and a 1° radial land. The 360 Series is ideal for increased metal removal rates without chatter.



- 1. **Standard Chamfer** Corner radii (Available upon request)
- 2. Eccentric OD For a tougher cutting edge
- 3. Large Gullet Improved chip evacuation
- 4. Variable Flute Left-hand (Available upon request)



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Features: 1. 45° Helix

2. Primary and Secondary

3. Z-Power® Coating

chip & tool 4. E-Cut Form

5. Extended Neck

all ideal properties for improved chip evacuation at high speeds and feeds.

| eatures: | Applications: | Benefits: | |
|--|--|---|--|
| . 45° Helix Improved chip evacuation | Aluminum and its alloys | Increased chip removal Chatter-free machining | |
| Primary and Secondary Provides sharper cutting edge | | Smooth finish on the part Reduced friction between the | |
| Z-Power® Coating Reduces friction between the chip & tool | | • High speeds & feeds | |
| E-Cut Form Provides chatter-free machining | | | |
| Extended Neck Available for deep-pocket applications | Z Power [®] has exc and adhesion res for machining Alu | rellent corrosion istant properties uminum. Scan to View Online > | |

| FINISHING 337 SERIES | 3 Flute - Carbide Finisher, Prima STANDARD FINISHING ENDI | ary & Secondary MILL | |
|--------------------------------|--|---|--|
| | | The 337 Series is the in designed for machinin Series consists of 3 flut coating; all excellent p evacuation and an imp | dustry leading endmill, g Aluminum alloys. The 337 es, a 37° helix and Z-Power® roperties for enhanced chip proved surface finish. |
| | Features: | Applications: | Benefits: |
| | 1. 37º Helix | • Aluminum | High speeds & feeds |
| | Improved chip evacuation | and its alloys | Improved cutting accuracy Efficient chip evacuation |
| | 2. Primary and Secondary Provides sharper cutting edge | | Improved surface finish |
| | 3. Z-Power® Coating Reduced friction between the | | |
| | 4. Extended Neck Available for deep-pocket applications | CARBIDE 3 | |
| | | Z. Power [®] has exc and adhesion resi for machining Alu | ellent corrosion stant properties iminum. |
| | | | Scan to View Online > |
| FINISHING 35 | 3 Flute - Carbide Finisher, Prima HIGH-PERFORMANCE END | ary & Secondary AILL The 345 Series is engir Aluminum application | eered specifically for s. Its design consists of |
| | Features: | primary & secondary a Z-Power [®] coating; a de removal rates and a lo | ngles, a 45° helix and sign ideal for large metal nger tool life. |
| | 1. 45º Helix | • Aluminum | Increased metal removal rates |
| | Improved chip evacuation | and its alloys | Improved accuracy Chatter-free machining |
| | Primary & Secondary Provides sharper cutting edge | | Reduced friction between the |
| | 3. Z-Power[®] Coating Reduces friction between the chip & tool | | chip & tool • High speeds & feeds |
| | 4. E-Cut Form Provides chatter-free machining | CARBIDE 3 | |
| | 5. Extended Neck Available for deep-pocket applications | Z Power [®] has exc and adhesion resi for machining Alu | ellent corrosion stant properties iminum. |
| | | | Scan to View Online > |



| ROUGHING 338 SERIES | 3 Flute - Carbide Coarse Pitch Ro STANDARD ROUGHING ENDI | ougher MILL | |
|------------------------|---|--|---|
| | | The 338 Series is desig removal rates and enh design consists of 3 flu teeth which are ideal f | ned for increased metal anced chip evacuation. Its ites, a 37° helix and coarse or Aluminum applications. |
| E MAR | Features | Applications | Benefits: |
| | 1. Coarse Pitch | • Aluminum | Minimized cutting pressure |
| | Increased chip removal | and its alloys | Reduced machining time |
| | 2. 37° Helix Angle | | Longer tool life Long-term cost savings |
| | 3. Z-Power® Coating Reduces friction between the chip & tool | | |
| | 4. Extended Neck Available for deep-pocket applications | CARBIDE 3 | 37° Goarse Rougher |
| | | Z Power [®] and adhesion resi for machining Alu | ellent corrosion stant properties iminum. |
| | | | |
| ROUGHING 339 SERIES | 3 Flute - Carbide Truncated Rou STANDARD ROUGHING ENDI | igher MILL | |
| | | The 339 Series Truncat for high-volume metal consists of 3 flutes, a 3 a design ideal for heav applications. | ed Rougher is engineered removal rates. Its design 7° helix and truncated teeth; ry feed rates and deep-pocket |
| | Features [.] | Applications: | Benefits: |
| | 1. Truncated Teeth | • Aluminum | Increased metal removal rates |
| | High-volume metal removal | and its alloys | Minimized cutting pressure Reduced machining time |
| 11 5 | 2. 37° Helix Improved chip evacuation | | Longer tool life |
| | Z-Power[®] Coating Reduces friction between the chip & tool | | Long-term cost savings Better finish on roughing applications |
| | Extended Neck Available for deep-pocket applications | CARBIDE 3 | Truncated Rougher |
| | | Z Z-Power [®] has exc Power [®] and adhesion resi for machining Alu | ellent corrosion stant properties iminum. |
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| ROUGHING/ FINISHING PM4 | 4 3 Flute - (PM4) Truncated POWDER METAL ROUG | Rougher HING ENDMILL | |
|-------------------------------|---|--|---|
| | | The Powder Metal (PM Endmills are engineer rates and efficient chi consists of 3 flutes, a 3 a design ideal for hear applications of Alumin | A4) Truncated Roughing red for large metal removal p evacuation. Their design 37° helix and truncated teeth; vy feed rates and deep-pocket num and its alloys. |
| | Features. | Applications | Benefits. |
| | 1. Truncated Teeth High-volume metal removal 2. 37° Helix Teeth with staggered pitch 3. Z-Power [®] Coating Reduces friction between the chip & tool | Aluminum and its alloys | Increased metal removal rates Minimized cutting pressure Reduced machining time Longer tool life Long-term cost savings Better finish on roughing applications |
| | 4. Extended Neck (Available upon request) | PM4 3 Flutes Z Power® Z-Power® has examples and adhesion reform achining A | Truncated Rougher kcellent corrosion esistant properties |
| ROUGHING POWDER N PM | METAL 3 Flute - (PM4) Coarse Pito 4 POWDER METAL ROUG | h Rougher HING ENDMILL | Scan to View Online > |
| | Features: | The Powder Metal Coa machining Aluminum consists of 3 flutes, a 3 ideal properties for m In addition, our Coars Z-Power [®] which minin during machining. | arse Roughers are ideal for alloys. Their unique geometry 37° helix and coarse teeth; aximum metal removal rates. e Roughers are coated with mizes heat and abrasion wear Benefits: |
| | | | Maximum metal removal rates |
| | Aximum metal removal rates 2. 37° Helix Teeth with staggered pitch 3. Z-Power [®] Coating Reduces friction between the chip & tool | and its alloys | Maximum field removal rates Minimized cutting pressure Reduced machining time Longer tool life Long-term cost savings |
| | 4. Extended Neck (Available upon request) | PM43 Flutes37°Z Power*Z-Power* has ex and adhesion re for machining A | xcellent corrosion esistant properties luminum. |
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At PCT customer satisfaction is our number one priority. We understand that we serve different customers with different needs. To better serve our customers, we create custom standards and complete specials per-print.

Customizable Options

- Length & Diameters
- Chamfer
- Radius
- Ball End
- Weldon Flats
- Flat Bottom
- Whistle Notch
- Clearance Angles
- Tolerance









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