



**MORSE**  
**CUTTING TOOLS**



# HIGH SPEED HIGH PERFORMANCE CARBIDE END MILLS for ALUMINUM

- 2-Flute & 3-Flute
- Square End & Ball Nose
- Extended Reach
- Center Cutting
- Micrograin Carbide
- Uncoated & DLC Coated



Spindle Speeds  
up to 30,000 RPM  
when used in  
High Speed  
Machining Centers  
with  
Shrink Fit Tooling Only

For High Speed High Performance Milling of Aluminum Alloys, Copper  
& Copper Alloys in High Speed Machining Centers with Shrink Fit Tooling.

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MADE IN THE  
**USA**

# High Speed High Performance 2-Flute Carbide End Mills for Aluminum

Micrograin Carbide — 35° Helix Angle  
Center Cutting — Extended Reach

High Speed High Performance Milling of Aluminum Alloys,  
Copper & Copper Alloys. Balanced for high spindle speeds  
and reduced chatter. Polished flutes for enhanced chip flow,  
surface finish and accuracy.

DLC - Amorphous Diamond-Like Carbon coating is  
recommended for Aluminum and Non-Ferrous Materials.

**NOTE: For use in High Speed Machining Centers with  
Shrink Fit Tooling Only.**

## TOLERANCES

Diameter +.000 / -.002  
Shank Dia. +.0001 / -.0004

## 2-Flute Square End

List No. 5903 Uncoated - List No. 5903E DLC Coated

| DIA. | SHANK<br>DIA. | LOC   | LENGTH BELOW<br>SHANK | OAL | 5903              | 5903E               |
|------|---------------|-------|-----------------------|-----|-------------------|---------------------|
|      |               |       |                       |     | UNCOATED<br>EDP # | DLC COATED<br>EDP # |
| 3/8  | 3/8           | 1/2   | 1-1/8                 | 3   | 53560             | 93150               |
| 3/8  | 3/8           | 1/2   | 2-1/8                 | 4   | 53561             | 93151               |
| 1/2  | 1/2           | 5/8   | 1-3/8                 | 3   | 53562             | 93152               |
| 1/2  | 1/2           | 5/8   | 2-1/8                 | 4   | 53563             | 93153               |
| 1/2  | 1/2           | 5/8   | 3-3/8                 | 6   | 53564             | 93154               |
| 5/8  | 5/8           | 3/4   | 1-5/8                 | 4   | 53565             | 93155               |
| 5/8  | 5/8           | 3/4   | 2-3/8                 | 5   | 53566             | 93156               |
| 5/8  | 5/8           | 3/4   | 3-3/8                 | 6   | 53567             | 93157               |
| 3/4  | 3/4           | 1     | 2                     | 4   | 53568             | 93158               |
| 3/4  | 3/4           | 1     | 2-1/2                 | 5   | 53569             | 93159               |
| 3/4  | 3/4           | 1     | 3-3/8                 | 6   | 53570             | 93160               |
| 1    | 1             | 1-1/4 | 2-5/8                 | 5   | 53571             | 93161               |
| 1    | 1             | 1-1/4 | 3-3/8                 | 6   | 53572             | 93162               |
| 1    | 1             | 1-1/4 | 4-3/8                 | 7   | 53573             | 93163               |

## 2-Flute Ball Nose

List No. 5926 Uncoated - List No. 5926E DLC Coated

| DIA. | SHANK<br>DIA. | LOC   | LENGTH BELOW<br>SHANK | OAL | 5926              | 5926E               |
|------|---------------|-------|-----------------------|-----|-------------------|---------------------|
|      |               |       |                       |     | UNCOATED<br>EDP # | DLC COATED<br>EDP # |
| 3/8  | 3/8           | 1/2   | 1-1/8                 | 3   | 53574             | 93164               |
| 3/8  | 3/8           | 1/2   | 2-1/8                 | 4   | 53575             | 93165               |
| 1/2  | 1/2           | 5/8   | 1-3/8                 | 3   | 53576             | 93166               |
| 1/2  | 1/2           | 5/8   | 2-1/8                 | 4   | 53577             | 93167               |
| 1/2  | 1/2           | 5/8   | 3-3/8                 | 6   | 53578             | 93168               |
| 5/8  | 5/8           | 3/4   | 1-5/8                 | 4   | 53579             | 93169               |
| 5/8  | 5/8           | 3/4   | 2-3/8                 | 5   | 53580             | 93170               |
| 5/8  | 5/8           | 3/4   | 3-3/8                 | 6   | 53581             | 93171               |
| 3/4  | 3/4           | 1     | 2                     | 4   | 53582             | 93172               |
| 3/4  | 3/4           | 1     | 2-1/2                 | 5   | 53583             | 93173               |
| 3/4  | 3/4           | 1     | 3-3/8                 | 6   | 53584             | 93174               |
| 1    | 1             | 1-1/4 | 2-5/8                 | 5   | 53585             | 93175               |
| 1    | 1             | 1-1/4 | 3-3/8                 | 6   | 53586             | 93176               |
| 1    | 1             | 1-1/4 | 4-3/8                 | 7   | 53587             | 93177               |



List No. 5903 2-Flute Square Uncoated  
List No. 5903E 2-Flute Square DLC Coated



List No. 5926 2-Flute Ball Nose Uncoated  
List No. 5926E 2-Flute Ball Nose DLC Coated

2-Flute end mills provide increased chip capacity  
and are recommended for slotting applications.

**SPEEDS & FEEDS: Page 4**



# High Speed High Performance 3-Flute Carbide End Mills for Aluminum

Micrograin Carbide — 37° Helix Angle  
Center Cutting — Extended Reach

High Speed High Performance Milling of Aluminum Alloys,  
Copper & Copper Alloys. Balanced for high spindle speeds  
and reduced chatter. Polished flutes for enhanced chip flow,  
surface finish and accuracy.

DLC - Amorphous Diamond-Like Carbon coating is  
recommended for Aluminum and Non-Ferrous Materials.

**NOTE: For use in High Speed Machining Centers with  
Shrink Fit Tooling Only.**

## TOLERANCES

Diameter +.000 / -.002  
Shank Dia. +.0001 / -.0004

## 3-Flute Square End

List No. 5904 Uncoated - List No. 5904E DLC Coated

| DIA. | SHANK<br>DIA. | LOC   | LENGTH BELOW<br>SHANK | OAL | 5904              | 5904E               |
|------|---------------|-------|-----------------------|-----|-------------------|---------------------|
|      |               |       |                       |     | UNCOATED<br>EDP # | DLC COATED<br>EDP # |
| 3/8  | 3/8           | 1/2   | 1-1/8                 | 3   | 53590             | 93180               |
| 3/8  | 3/8           | 1/2   | 2-1/8                 | 4   | 53591             | 93181               |
| 1/2  | 1/2           | 5/8   | 1-3/8                 | 3   | 53592             | 93182               |
| 1/2  | 1/2           | 5/8   | 2-1/8                 | 4   | 53593             | 93183               |
| 1/2  | 1/2           | 5/8   | 3-3/8                 | 6   | 53594             | 93184               |
| 5/8  | 5/8           | 3/4   | 1-5/8                 | 4   | 53595             | 93185               |
| 5/8  | 5/8           | 3/4   | 2-3/8                 | 5   | 53596             | 93186               |
| 5/8  | 5/8           | 3/4   | 3-3/8                 | 6   | 53597             | 93187               |
| 3/4  | 3/4           | 1     | 2                     | 4   | 53598             | 93188               |
| 3/4  | 3/4           | 1     | 2-1/2                 | 5   | 53599             | 93189               |
| 3/4  | 3/4           | 1     | 3-3/8                 | 6   | 53600             | 93190               |
| 1    | 1             | 1-1/4 | 2-5/8                 | 5   | 53601             | 93191               |
| 1    | 1             | 1-1/4 | 3-3/8                 | 6   | 53602             | 93192               |
| 1    | 1             | 1-1/4 | 4-3/8                 | 7   | 53603             | 93193               |

## 3-Flute Ball Nose

List No. 5930 Uncoated - List No. 5930E DLC Coated

| DIA. | SHANK<br>DIA. | LOC   | LENGTH BELOW<br>SHANK | OAL | 5930              | 5930E               |
|------|---------------|-------|-----------------------|-----|-------------------|---------------------|
|      |               |       |                       |     | UNCOATED<br>EDP # | DLC COATED<br>EDP # |
| 3/8  | 3/8           | 1/2   | 1-1/8                 | 3   | 53604             | 93194               |
| 3/8  | 3/8           | 1/2   | 2-1/8                 | 4   | 53605             | 93195               |
| 1/2  | 1/2           | 5/8   | 1-3/8                 | 3   | 53606             | 93196               |
| 1/2  | 1/2           | 5/8   | 2-1/8                 | 4   | 53607             | 93197               |
| 1/2  | 1/2           | 5/8   | 3-3/8                 | 6   | 53608             | 93198               |
| 5/8  | 5/8           | 3/4   | 1-5/8                 | 4   | 53609             | 93199               |
| 5/8  | 5/8           | 3/4   | 2-3/8                 | 5   | 53610             | 93200               |
| 5/8  | 5/8           | 3/4   | 3-3/8                 | 6   | 53611             | 93201               |
| 3/4  | 3/4           | 1     | 2                     | 4   | 53612             | 93202               |
| 3/4  | 3/4           | 1     | 2-1/2                 | 5   | 53613             | 93203               |
| 3/4  | 3/4           | 1     | 3-3/8                 | 6   | 53614             | 93204               |
| 1    | 1             | 1-1/4 | 2-5/8                 | 5   | 53615             | 93205               |
| 1    | 1             | 1-1/4 | 3-3/8                 | 6   | 53616             | 93206               |
| 1    | 1             | 1-1/4 | 4-3/8                 | 7   | 53617             | 93207               |



List No. 5904 3-Flute Square Uncoated  
List No. 5904E 3-Flute Square DLC Coated



List No. 5930 3-Flute Ball Nose Uncoated  
List No. 5930E 3-Flute Ball Nose DLC Coated

3-Flute end mills offer higher feed rates than 2-flute  
mills while still offering high chip capacity and are  
recommended for profiling applications.

**SPEEDS & FEEDS: Page 4**



# High Speed High Performance Carbide End Mills for Aluminum Speed and Feed Recommendations

## 2-Flute • List Nos. 5903, 5903E, 5926, 5926E

| Material                           | Type of Cut      | Surface Speed (SFM) | Feed Per Tooth by End Mill Diameter |       |       |       |       | Depth of Cut |        |
|------------------------------------|------------------|---------------------|-------------------------------------|-------|-------|-------|-------|--------------|--------|
|                                    |                  |                     | 3/8"                                | 1/2"  | 5/8"  | 3/4"  | 1"    | Axial        | Radial |
| Wrought Aluminum Alloys            | Slotting         | 1540 - 1760         | .0054                               | .0063 | .0072 | .0081 | .0108 | 1xD          | —      |
|                                    | Heavy Peripheral |                     | .0081                               | .0095 | .0108 | .0117 | .0144 | 1xD          | .5xD   |
|                                    | Light Peripheral |                     | .0036                               | .0045 | .0054 | .0063 | .0090 | 2xD          | .05xD  |
| Low Silicon Aluminum Alloys < 12%  | Slotting         | 1650 - MAX          | .0036                               | .0045 | .0054 | .0063 | .0090 | 1xD          | —      |
|                                    | Heavy Peripheral |                     | .0072                               | .0083 | .0099 | .0108 | .0126 | 1xD          | .5xD   |
|                                    | Light Peripheral |                     | .0027                               | .0036 | .0045 | .0054 | .0071 | 2xD          | .05xD  |
| High Silicon Aluminum Alloys > 12% | Slotting         | 1650 - MAX          | .0023                               | .0025 | .0027 | .0036 | .0059 | 1xD          | —      |
|                                    | Heavy Peripheral |                     | .0050                               | .0063 | .0072 | .0081 | .0099 | 1xD          | .5xD   |
|                                    | Light Peripheral |                     | .0023                               | .0027 | .0036 | .0045 | .0063 | 2xD          | .05xD  |
| Copper & Copper Alloys             | Slotting         | 550 - 935           | .0027                               | .0032 | .0036 | .0045 | .0063 | 1xD          | —      |
|                                    | Heavy Peripheral |                     | .0063                               | .0077 | .0081 | .0090 | .0117 | 1xD          | .5xD   |
|                                    | Light Peripheral |                     | .0032                               | .0041 | .0045 | .0059 | .0076 | 2xD          | .05xD  |

## 3-Flute • List Nos. 5904, 5904E, 5930, 5930E

| Material                           | Type of Cut      | Surface Speed (SFM) | Feed Per Tooth by End Mill Diameter |       |       |       |       | Depth of Cut |        |
|------------------------------------|------------------|---------------------|-------------------------------------|-------|-------|-------|-------|--------------|--------|
|                                    |                  |                     | 3/8"                                | 1/2"  | 5/8"  | 3/4"  | 1"    | Axial        | Radial |
| Wrought Aluminum Alloys            | Slotting         | 1650 - 2000         | .0059                               | .0069 | .0079 | .0089 | .0120 | 1xD          | —      |
|                                    | Heavy Peripheral |                     | .0089                               | .0104 | .0119 | .0129 | .0158 | 1xD          | .5xD   |
|                                    | Light Peripheral |                     | .0040                               | .0049 | .0059 | .0069 | .0100 | 2xD          | .05xD  |
| Low Silicon Aluminum Alloys < 12%  | Slotting         | 2000 - MAX          | .0040                               | .0049 | .0059 | .0069 | .0099 | 1xD          | —      |
|                                    | Heavy Peripheral |                     | .0079                               | .0091 | .0109 | .0119 | .0138 | 1xD          | .5xD   |
|                                    | Light Peripheral |                     | .0030                               | .0040 | .0049 | .0059 | .0079 | 2xD          | .05xD  |
| High Silicon Aluminum Alloys > 12% | Slotting         | 2000 - MAX          | .0025                               | .0028 | .0030 | .0040 | .0064 | 1xD          | —      |
|                                    | Heavy Peripheral |                     | .0054                               | .0069 | .0079 | .0089 | .0109 | 1xD          | .5xD   |
|                                    | Light Peripheral |                     | .0025                               | .0030 | .0040 | .0049 | .0070 | 2xD          | .05xD  |
| Copper & Copper Alloys             | Slotting         | 600 - 1020          | .0030                               | .0035 | .0040 | .0049 | .0069 | 1xD          | —      |
|                                    | Heavy Peripheral |                     | .0069                               | .0084 | .0089 | .0099 | .0129 | 1xD          | .5xD   |
|                                    | Light Peripheral |                     | .0035                               | .0045 | .0049 | .0064 | .0085 | 2xD          | .05xD  |

Speeds and Feeds are suggested starting points and may be increased or decreased depending on actual material and machining conditions.

NOTE: Information in this chart is for reference only. We will not be held liable for any consequential damages or economic loss due to the use of information contained within this chart.

