



3-Flute Standard, Neck Relief and Ball End, 37 Degree Helix, Extra High Performance Endmills for Milling Aluminum and Non-Ferrous Materials.

- RedLine 3 Flute, Standard and Neck Relief Extra High Performance End Mills are designed for Roughing, Finishing or Slotting in Aluminum and Non-Ferrous materials.
- The ZrN coated tools allow for higher speeds, better tool life with a low affinity for Aluminum.
- Use for straight line and helical ramping.
- These Extra High Performance tools can be found on pages 18-22, 24-25.

Aluminum & Non-Ferrous Speeds & Feeds

| Material | Grades | Cut Type | Axial DOC | Radial DOC | # of Flutes | SFM | Feed by Endmill Diameter (IPT) | | | | | | | |
|---------------------------------|------------------|--------------------|-----------|------------|-------------|-------|--------------------------------|---------|---------|---------|---------|---------|---------|---------|
| | | | | | | | 1/8 | 1/4 | 5/16 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| | | | | | | | (.1250) | (.2500) | (.3125) | (.3750) | (.5000) | (.6250) | (.7500) | (1.000) |
| N - Non-Ferrous | | | | | | | | | | | | | | |
| Aluminum Alloys | 6061, 7075, 2024 | Slotting | 1 x D | 1 x D | 3 | 800 | .0015 | .0030 | .0038 | .0045 | .0060 | .0075 | .0090 | .0120 |
| | | Peripheral - Rough | <=2 x D | .5 x D | 3 | 1000 | .0020 | .0040 | .0050 | .0060 | .0080 | .0100 | .0120 | .0160 |
| | | | >2-3 x D | .5 x D | 3 | 1000 | .0019 | .0038 | .0047 | .0056 | .0075 | .0094 | .0113 | .0150 |
| | | | >3-4 x D | .45 x D | 3 | 900 | .0016 | .0033 | .0041 | .0049 | .0065 | .0081 | .0098 | .0130 |
| | | | >4-5 x D | .4 x D | 3 | 800 | .0015 | .0029 | .0036 | .0044 | .0058 | .0073 | .0087 | .0116 |
| | | Finish | 2.5 x D | .015 x D | 3 | 1200 | .0007 | .0014 | .0017 | .0020 | .0027 | .0034 | .0041 | .0054 |
| *Helical Ramp Angle 3.0 deg. | | | | 800 | .0012 | .0024 | .0030 | .0036 | .0048 | .0060 | .0072 | .0096 | | |
| Aluminum High Silicon | A380, A390 | Slotting | .75 x D | 1 x D | 3 | 500 | .0011 | .0023 | .0028 | .0034 | .0045 | .0056 | .0068 | .0090 |
| | | Peripheral - Rough | <=2 x D | .4 x D | 3 | 700 | .0014 | .0029 | .0036 | .0043 | .0057 | .0071 | .0086 | .0114 |
| | | | >2-3 x D | .4 x D | 3 | 700 | .0014 | .0028 | .0034 | .0041 | .0055 | .0069 | .0083 | .0110 |
| | | | >3-4 x D | .375 x D | 3 | 600 | .0012 | .0024 | .0030 | .0036 | .0048 | .0060 | .0072 | .0096 |
| | | | >4-5 x D | .35 x D | 3 | 500 | .0010 | .0020 | .0025 | .0030 | .0040 | .0050 | .0060 | .0080 |
| | | Finish | 2.5 x D | .015 x D | 3 | 900 | .0006 | .0013 | .0016 | .0019 | .0025 | .0031 | .0038 | .0050 |
| *Helical Ramp Angle 2.5 deg. | | | | 500 | .0009 | .0018 | .0023 | .0027 | .0036 | .0045 | .0054 | .0072 | | |
| Magnesium Alloys | | Slotting | 1 x D | 1 x D | 3 | 800 | .0015 | .0030 | .0038 | .0045 | .0060 | .0075 | .0090 | .0120 |
| | | Peripheral - Rough | <=2 x D | .5 x D | 3 | 1000 | .0020 | .0040 | .0050 | .0060 | .0080 | .0100 | .0120 | .0160 |
| | | | >2-3 x D | .5 x D | 3 | 1000 | .0019 | .0038 | .0047 | .0056 | .0075 | .0094 | .0113 | .0150 |
| | | | >3-4 x D | .45 x D | 3 | 900 | .0016 | .0033 | .0041 | .0049 | .0065 | .0081 | .0098 | .0130 |
| | | | >4-5 x D | .4 x D | 3 | 800 | .0015 | .0029 | .0036 | .0044 | .0058 | .0073 | .0087 | .0116 |
| | | Finish | 2.5 x D | .015 x D | 3 | 1200 | .0007 | .0014 | .0017 | .0020 | .0027 | .0034 | .0041 | .0054 |
| *Helical Ramp Angle 3.0 deg. | | | | 800 | .0012 | .0024 | .0030 | .0036 | .0048 | .0060 | .0072 | .0096 | | |
| Copper Alloys, Brass | | Slotting | .75 x D | 1 x D | 3 | 500 | .0009 | .0019 | .0023 | .0028 | .0037 | .0046 | .0056 | .0074 |
| | | Peripheral - Rough | <=2 x D | .4 x D | 3 | 600 | .0012 | .0023 | .0029 | .0035 | .0046 | .0058 | .0069 | .0092 |
| | | | >2-3 x D | .4 x D | 3 | 600 | .0011 | .0023 | .0028 | .0034 | .0045 | .0056 | .0068 | .0090 |
| | | | >3-4 x D | .375 x D | 3 | 500 | .0010 | .0020 | .0024 | .0029 | .0039 | .0049 | .0059 | .0078 |
| | | | >4-5 x D | .35 x D | 3 | 450 | .0008 | .0017 | .0021 | .0025 | .0033 | .0041 | .0050 | .0066 |
| | | Finish | 2.5 x D | .015 x D | 3 | 650 | .0005 | .0011 | .0013 | .0016 | .0021 | .0026 | .0032 | .0042 |
| *Helical Ramp Angle 2.5 deg. | | | | 500 | .0007 | .0015 | .0019 | .0022 | .0030 | .0037 | .0044 | .0059 | | |
| Bronze | | Slotting | .75 x D | 1 x D | 3 | 500 | .0009 | .0018 | .0022 | .0026 | .0035 | .0044 | .0053 | .0070 |
| | | Peripheral - Rough | <=2 x D | .4 x D | 3 | 600 | .0011 | .0022 | .0028 | .0033 | .0044 | .0055 | .0066 | .0088 |
| | | | >2-3 x D | .4 x D | 3 | 600 | .0011 | .0021 | .0026 | .0032 | .0042 | .0053 | .0063 | .0084 |
| | | | >3-4 x D | .375 x D | 3 | 500 | .0009 | .0018 | .0022 | .0026 | .0035 | .0044 | .0053 | .0070 |
| | | | >4-5 x D | .35 x D | 3 | 450 | .0007 | .0015 | .0018 | .0022 | .0029 | .0036 | .0044 | .0058 |
| | | Finish | 2.5 x D | .015 x D | 3 | 650 | .0005 | .0010 | .0012 | .0014 | .0019 | .0024 | .0029 | .0038 |
| *Helical Ramp Angle 2.0 deg. | | | | 500 | .0007 | .0014 | .0018 | .0021 | .0028 | .0035 | .0042 | .0056 | | |
| Composites, Plastic, Fiberglass | | Slotting | .75 x D | 1 x D | 3 | 500 | .0011 | .0023 | .0028 | .0034 | .0045 | .0056 | .0068 | .0090 |
| | | Peripheral - Rough | <=2 x D | .4 x D | 3 | 700 | .0014 | .0029 | .0036 | .0043 | .0057 | .0071 | .0086 | .0114 |
| | | | >2-3 x D | .4 x D | 3 | 700 | .0014 | .0028 | .0034 | .0041 | .0055 | .0069 | .0083 | .0110 |
| | | | >3-4 x D | .375 x D | 3 | 600 | .0012 | .0024 | .0030 | .0036 | .0048 | .0060 | .0072 | .0096 |
| | | | >4-5 x D | .35 x D | 3 | 500 | .0010 | .0020 | .0025 | .0030 | .0040 | .0050 | .0060 | .0080 |
| | | Finish | 2.5 x D | .015 x D | 3 | 900 | .0006 | .0013 | .0016 | .0019 | .0025 | .0031 | .0038 | .0050 |
| *Helical Ramp Angle 3.0 deg. | | | | 500 | .0009 | .0018 | .0023 | .0027 | .0036 | .0045 | .0054 | .0072 | | |

*Straight line Ramp Angle= Helical Ramp Angle x 5 for entry up to 1 x D.