



4-Flute, High Performance Endmills, Square & Ball End, Roughers, Rougher/Finishers, 30 Degree Helix



- RedLine High Performance Roughers are designed to perform in hard to machine materials like stainless steel and titanium.
- Higher feed rates can be attained because of our radius chip breaker, without sacrificing finish.
- These High Performance tools can be found on pages 54-55 & 58.

Solid Carbide Roughers Tools Speeds & Feeds

| Material | Grades | Stub/Reg | | Long | | Feed by Endmill Diameter (IPT) | | | | | |
|----------------------------------|--|----------|---------|----------|---------|--------------------------------|-------------|-------------|-------------|-------------|-------------|
| | | SFM | SFM | SFM | SFM | 1/4 | 3/8 | 1/2 | 5/8 | 3/4 | 1 |
| | | Uncoated | AlTiN | Uncoated | AlTiN | (.2500) | (.3750) | (.5000) | (.6250) | (.7500) | (1.000) |
| S - Steels | | | | | | | | | | | |
| High Strength Tool Steel | A2, D2, P20, H11, H13, S2, O1 | 200-230 | 250-320 | 140-160 | 180-210 | .0003-.0010 | .0010-.0015 | .0015-.0020 | .0020-.0030 | .0030-.0035 | .0035-.0040 |
| High Strength Tool Steel >32 HRC | | 180-220 | 240-280 | 130-150 | 170-190 | .0003-.0010 | .0010-.0015 | .0015-.0020 | .0020-.0030 | .0030-.0035 | .0035-.0040 |
| Low Carbon | A36, 12L14, 12L15, 1005, 1018, 1020, 1108-1119, 1213-1215, 1513-1518, 4012, 5015, 9310 | 210-345 | 350-575 | 165-275 | 280-460 | .0015-.0020 | .0020-.0030 | .0030-.0035 | .0035-.0040 | .0038-.0042 | .0040-.0045 |
| Low Carbon >32HRC | | 125-190 | 210-320 | 100-150 | 165-255 | .0011-.0015 | .0015-.0020 | .0020-.0025 | .0023-.0025 | .0025-.0030 | .0028-.0032 |
| Medium Carbon | 1040-1095, 1140-1151, 1330-1345, 1520-1572, 4023-4063, 4120-4161, 4330-4340, 4620-4640, 8620-8660, 8740-8750, 6150, 51000, 52100 | 210-345 | 350-575 | 165-275 | 280-460 | .0015-.0020 | .0020-.0030 | .0030-.0035 | .0035-.0040 | .0038-.0042 | .0040-.0045 |
| Medium Carbon >32 HRC | | 180-220 | 240-280 | 130-150 | 170-190 | .0003-.0010 | .0010-.0015 | .0015-.0020 | .0020-.0030 | .0030-.0035 | .0035-.0040 |
| M - Stainless Steels | | | | | | | | | | | |
| Austenitic | 301-304L, 310, 316L, 321, 347 | 150-300 | 250-500 | 120-240 | 200-400 | .0010-.0015 | .0015-.0020 | .0020-.0025 | .0025-.0030 | .0030-.0035 | .0035-.0040 |
| Martensitic | 403, 410, 416, 420, 430, 431, 440 | 135-255 | 225-430 | 110-200 | 180-340 | .0015-.0020 | .0020-.0030 | .0030-.0035 | .0035-.0040 | .0038-.0042 | .0040-.0045 |
| Precipitation Hardening | 12/8, 15/5, 17/4, AM-350/355/363, PH13-8MO, PH14-8/MO | 135-255 | 225-430 | 110-200 | 180-340 | .0015-.0020 | .0020-.0030 | .0030-.0035 | .0035-.0040 | .0038-.0042 | .0040-.0045 |
| K - Cast Irons | | | | | | | | | | | |
| Ductile | A536, J434, 60-40-18 | 200-250 | 300-350 | 140-175 | 210-250 | .0005-.0015 | .0015-.0020 | .0020-.0025 | .0025-.0030 | .0030-.0035 | .0035-.0040 |
| Gray | A48, A436, A319, Class 20, G4000 | 250-300 | 450-500 | 175-210 | 315-350 | .0005-.0015 | .0015-.0020 | .0020-.0025 | .0025-.0030 | .0030-.0035 | .0035-.0040 |
| Malleable | A220, A602, J158 | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| N - Non Ferrous | | | | | | | | | | | |
| Aluminum Alloys | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Aluminum High Silicon | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Brass/Bronze | Aluminum Bronze, Low Silicon Bronze | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Composites | G-10, Fiberglass, Graphite, Graphite Epoxy, Plastics | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Copper | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| Magnesium | | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A | N/A |
| S - High Temp Alloys | | | | | | | | | | | |
| Cobalt Base | Stellite, HS-21, Haynes 25/188 | 25-45 | 45-75 | 20-35 | 35-60 | .0009-.0012 | .0012-.0015 | .0015-.0018 | .0018-.0021 | .0021-.0025 | .0025-.0027 |
| Cobalt Base >32HRC | X40, L605 | 25-45 | 45-75 | 20-35 | 35-60 | .0009-.0012 | .0012-.0015 | .0015-.0018 | .0018-.0021 | .0021-.0025 | .0025-.0027 |
| Iron Base | Incoloy 800-802, Multmet N-155 | 25-45 | 45-75 | 20-35 | 35-60 | .0009-.0012 | .0012-.0015 | .0015-.0018 | .0018-.0021 | .0021-.0025 | .0025-.0027 |
| Iron Base >32HRC | Timkin 16-25-6, Carpenter 22-b3 | 25-45 | 45-75 | 20-35 | 35-60 | .0009-.0012 | .0012-.0015 | .0015-.0018 | .0018-.0021 | .0021-.0025 | .0025-.0027 |
| Nickel Base | Inconel 625/718, Inco 700, 713C, 718 | 40-85 | 65-145 | 30-65 | 50-115 | .0009-.0012 | .0012-.0015 | .0015-.0018 | .0018-.0021 | .0021-.0025 | .0025-.0027 |
| Nickel Base >32HRC | Monel 400-401, 404, K401, Rene, Rene 41 & 95 Hastelloy, Waspoly, Udimet 500 & 700 | 30-65 | 55-110 | 25-50 | 45-90 | .0009-.0012 | .0012-.0015 | .0015-.0018 | .0018-.0021 | .0021-.0025 | .0025-.0027 |
| Titanium | Commercially Pure, 6Al-4V, ASTM 1/2/3, 6Al-25N-4Zr-2Mo-Si, Ti-8Al-1Mo, Ti-8Al-4Mo | 75-130 | 125-215 | 60-100 | 100-170 | .0009-.0012 | .0012-.0015 | .0015-.0018 | .0018-.0021 | .0021-.0025 | .0025-.0027 |

NOTE: Speeds and Feeds listed are estimated and will vary by application.

Endmills - Technical Info