

Ultra-Tool® Cutting Tool Information

Ultra-Carb® Rotary Files (Burs)

• Speed Recommendations



Burr Diam	Burr Diam(mm)	# Flutes Std Cut	R.P.M.*	Max. R.P.M.
1/16	1.6mm	8	60000-90000	100000
1/8	3.2mm	12	40000-70000	90000
3/16	4.8mm	14	35000-60000	80000
1/4	6.3mm	18	30000-50000	70000
5/16	7.9mm	20	20000-40000	68000
3/8	9.5mm	22	20000-40000	66000
7/16	11.1mm	22	15000-40000	58000
1/2	12.7mm	24	15000-40000	50000
5/8	15.9mm	30	12000-25000	40000
3/4	19.0mm	34	10000-20000	33000
1"	25.4mm	44	7500-20000	25000

*Speeds are for Standard Cut. Reduce by approximately 25% with addition of DURA-CUT.

Fine-Cut increases flute count approximately 50%. Decrease speed accordingly. Coarse-Cut decreases flute count approximately 25%. Increase speed accordingly. Lower listed speeds when cutting harder ferrous materials. However, increase speeds approximately 50% when cutting stainless steel.

Ultra-Tool® Rotary File products typically include a greater flute count than most competing brands.

Burr heads and solid carbide burs are manufactured from Ultra-Carb®. Shanks are high-speed steel hardened to a rating of 45-48 Rockwell C. Two-piece construction products are induction-brazed (using controlled-frequency amplification) and slow-cooled in our own Factory for maximum strength.

Specifications:

- Standard cylindrical helix angle: 30° ± 2°
- Cutting Diameter: ± .010
- Flute Count: ±1
- Shank Diameter: +0 / - .0005, TIR max .002
- Brazed Burr TIR: max .005
- Taper Angles: ± 1°

Commonly Used Formulas:

- Surface Feet Minute (SFM)=RPM x Diam. x .262
- Revolutions Per Minute (RPM)=3.82 x (SFM / Diam.)
- Feed Rate (IPM)=IPT x #teeth x RPM
- Drilling (IPM)=IPR x RPM
- Feed Per Tooth (IPT)=IPM / (#teeth x RPM)
- Convert Inches to millimeters: Multiply by 25.4
- Convert millimeters to Inches: Multiply by .03937

WARNING: Grinding or other use of this tool may produce hazardous dust and fumes which may endanger health. To avoid adverse health effects, read the material safety data sheet for this product. Utilize adequate ventilation and appropriate protection. Cutting tools may shatter when broken; eye protection in vicinity of use is strongly advised. MSDS available at www.ultra-tool.com.

Ultra-Tool International, Inc. is constantly striving to improve its processes, specifications, and tolerances. As such, products are subject to change without prior notice.

Ultra-Carb® Solid Carbide Reamers

• Recommendations



Material Group	Speed SFM	Feed IPR*
Aluminum/Related Alloys	100-275	.005-.015
Aluminum/High Silicon	70-200	.003-.012
Brass	100-200	.005-.012
Bronze	75-175	.003-.010
Copper/Related Alloys	90-220	.005-.015
Cast Iron (soft)	80-200	.006-.015
Cast Iron (medium)	60-150	.006-.012
Cast Iron (hard)	40-90	.004-.010
Inconel	20-60	.001-.005
Magnesium	100-250	.005-.015
Monel	40-120	.004-.012
Nickel Alloys	40-100	.005-.012
Rene	20-70	.002-.006
Resins/Plastics	100-300	.005-.015
Steel-Cast & Forged	40-100	.003-.010
Steel-Heat Treated (35-40Rc)	40-100	.004-.008
Steel-Heat Treated (40-45Rc)	30-80	.002-.006
Steel-Heat Treated (45+Rc)	25-50	.001-.004
Steel-Medium Carbon	50-125	.004-.010
Steel; Mold	40-120	.004-.006
Steel; Tool	30-100	.003-.007
Stainless-300 Series	20-80	.004-.010
Stainless-400 Series	30-120	.005-.012
Titanium	20-100	.002-.010
Waspoly	20-60	.002-.006

*IPR listing is diameter sensitive. Lower feed rates are for small diameters (1/8" and under) while the high end of the range is for large reamers (1/2" +).

Total Stock Removal:	Up to 1/16	.003-.005
Minimum and Maximum amounts of stock removal should be adhered to for proper reaming action.	1/16 to 1/8	.004-.008
	1/8 to 1/4	.006-.012
	1/4 to 3/8	.008-.014
	3/8 to 1/2	.010-.015
	1/2 to 1"	.012-.020

Spiral flutes generally produce a better surface finish than straight flute. Right-Hand spiral should be used for blind holes, while Left-Hand is excellent for thru-hole applications. Straight flute is appropriate for all general reaming requirements.

All Ultra-Tool® reamer products are manufactured from Ultra-Carb®. Two-piece construction products are induction-brazed (using controlled-frequency amplification) and slow-cooled in our own Factory for maximum strength. All products are manufactured between centers (male, female, or both) for high concentricity characteristics and resharpener capabilities. Also, shanks are ground to the next smallest common fractional diameter for effective tool-holding and practicality. **Note:** Series 411 has oversized shank and no centers.

Specifications:

- Cutting Diameter: +.0002 / -0
- Shank Diameter: ±.0005
- LOC: ±.030
- OAL: ±.060
- Helix (RH & LH): 12°
- Lead Angle: 45°

Ultra-Tool® Services

Ultra-Express: 24-hour (one full business day after order receipt) service on small-lot quantity orders of standard decimal reamers, saw & keyseat cutter thickness sizing, burr cut-styles, standard end mill radius, etc. at no extra charge. Ask the Ultra-Tool Sales Department for more information.

Free Shipping: Maximum two shipment charges on all standard tool orders, regardless of order size or diversity (Standard UPS ground service or Federal Express Express Saver for orders placed directly with Factory; does not include blanket orders or shipments from Manufacturer Representative's warehouse).