



## Speeds & Feeds - Grooving Tools

Speeds & Feeds listed are based on a tool that has a reach 3X the min. bore diameter. These are considered safe starting parameters and will vary by application. To achieve optimal Speeds & Feeds please contact Micro 100 tech support at 800-421-8065.

Quick Change

**QMRR** Retaining Ring - Square - Miniature  
**QRR** Retaining Ring - Square  
**QRRC** Retaining Ring - Corner Radius - Right Hand  
**QMFR** Full Radius - Miniature  
**QFR** Full Radius  
**QUP** Undercutting - Full Radius

Standard

**MRR** Retaining Ring - Square - Right Hand - Miniature  
**RR/RRM** Retaining Ring - Square - Right Hand  
**RRL** Retaining Ring - Square - Left Hand  
**RRC** Retaining Ring - Corner Radius - Right Hand  
**FR** Full Radius  
**UC** Undercutting - Square  
**UP** Undercutting - Full Radius  
**OR** O-Ring Grooving  
**LTR** Thread Relief Tools

Material Guide		Hardness	SFM	FEED RATE IN INCHES PER REVOLUTION BY GROOVE WIDTH						
				.015 - .025	.026 - .035	.036 - .050	.051 - .080	.081 - .150	>.151	
WROUGHT ALUMINUM ALLOY	2014, 5062, 6061, 7050, 7075, 7475	<75 HRB	600							
CAST ALUMINUM ALLOY	319.0, 328.0, 355.0, 360.0, 380.0, 383.0, 390.0, 520.0, 535.0	<75 HRB	400	0.0005	0.0009	0.0013	0.0025	0.003	0.004	
COPPER ALLOY	Cu-ETP, CuBe2, CuZn30, CuZn36Pb3, CuZn10, CuSn5	<75 HRB	450	0.0005	0.0009	0.0013	0.002	0.0025	0.003	
CARBON STEEL	10XX, 11XX, 12XX, 12LXX, ASTM A27, ASTM A36	<75 HRB 75 - 98 HRB 21 - 36 HRC	200	0.0004	0.0008	0.0011	0.0017	0.0021	0.0026	
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC >50 HRC	150 150 100 60	0.0004	0.0008	0.0011	0.0017	0.0021	0.0026	
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC >50 HRC	100 80 65 35	0.0004	0.0008	0.0011	0.0017	0.0021	0.0026	
SPECIALTY STEEL	300M, Invar 36, Kovar, Maraging 200, Maraging 250, Maraging 300, Maraging 350	<75 HRB 75 - 98 HRB 21 - 36 HRC 36 - 50 HRC >50 HRC	75 65 50 40 35	0.0004	0.0008	0.0011	0.0017	0.0021	0.0026	
AUSTENITIC STAINLESS STEEL	Nitronic 50, Nitronic 60, 301, 303, 304, 304L, Incoloy 27-7MO, 316, 316L, 321, 347	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	140 110 50	0.0002	0.0003	0.0008	0.0015	0.0019	0.0023	
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB 21 - 36 HRC	160 115	0.0002	0.0003	0.0007	0.0014	0.0017	0.002	
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC 36 - 50 HRC	100 73	0.0002	0.0003	0.0008	0.0015	0.0019	0.0023	
GRAY CAST IRON	AE J431, ASTM A48	75 - 98 HRB 21 - 36 HRC	205 185	0.0005	0.0009	0.0012	0.0019	0.0024	0.0038	
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB 21 - 36 HRC	173 168	0.0005	0.0009	0.0012	0.0019	0.0024	0.0038	
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	155 130 68	0.0005	0.0009	0.0012	0.0019	0.0024	0.0038	
PURE NICKEL	Nickel 200, Nickel 201	<75 HRB 75 - 98 HRB	143 125	0.0004	0.0007	0.0010	0.0015	0.0019	0.0023	
NICKEL ALLOY	Hastelloy C-22, Inconel 625, Waspaloy, René 41, Inconel 718, Incoloy 20	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	55 38 35	0.0002	0.0005	0.0008	0.0011	0.0015	0.0019	
PURE TITANIUM	Ti Grade 1, Ti Grade 2, Ti Grade 3, Ti Grade 4, Ti Grade 7, Ti Grade 12	<75 HRB 75 - 98 HRB 21 - 36 HRC	150 138 125	0.0004	0.0007	0.0010	0.0015	0.0019	0.0023	
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 28 HRC 29 - 36 HRC	100 75	0.0004	0.0007	0.0010	0.0015	0.0019	0.0023	
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	105 85 33	0.0002	0.0005	0.0008	0.0011	0.0015	0.0019	

### Helpful Hints

- Program in G96 (Constant Surface Footage On) in conjunction with G50 (Maximum Spindle Speed) to achieve best part finish
- Calculate RPM by part diameter being cut
- When using coated tools, increase SFM 5% - 10%
- Peck feed may be required to break chip on some materials and can be achieved by two different methods:
  - » Dwell Method: Programming in a short dwell to allow the chip to break and evacuate
  - » Radial Retract Method: Retracting the tool radially at a distance equal to 1/2 the feed rate, and then resuming the cut. Example: if your feed rate is .006, retract radially by .003 and then resume radial feed to avoid chip pinching