



## Speeds & Feeds - Boring Tools

Speeds & Feeds listed are based on a tool that has a reach 3X the min. bore diameter/rotational 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**  
**QMBB** Right Hand - Sharp - Miniature  
**QBB** Right Hand - Sharp  
**QBB** Right Hand  
**QHBB** Helical Back Rake - Corner Radius  
**QBT** Top Rake Chipbreaker  
**QBM** Boring Head Tools  
**QRB** Reverse Boring

**Standard**  
**MBB/MBBM** Right Hand - Sharp - Miniature  
**BBS/BBM** Right Hand - Sharp  
**BB** Right Hand  
**BBL** Left Hand  
**HBBC** Helical Back Rake - Corner Radius  
**HBB/HBM** Helical Back Rake  
**PBT** Top Rake Chipbreaker

Material Guide		Hardness	SFM	ROUGHING FEED RATE IN INCHES PER REVOLUTION BY MIN BORE DIAMETER					
				.015 - .060	.061 - .130	.131 - .200	.201 - .280	.281 - .374	.375+
WROUGHT ALUMINUM ALLOY	2014, 5062, 6061, 7050, 7075, 7475	<75 HRB	600	0.0005	0.0009	0.0013	0.0025	0.003	0.004
CAST ALUMINUM ALLOY	319.0, 328.0, 355.0, 360.0, 380.0, 383.0, 390.0, 520.0, 535.0	<75 HRB	400						
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	0.0005	0.0009	0.0013	0.002	0.0025	0.003
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC >50 HRC	150 150 100 60	0.0005	0.0009	0.0013	0.002	0.0025	0.003
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC >50 HRC	100 80 65 35	0.0005	0.0009	0.0013	0.002	0.0025	0.003
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	0.0005	0.0009	0.0013	0.002	0.0025	0.003
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	0.00025	0.00045	0.001	0.002	0.0025	0.003
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB 21 - 36 HRC	160 115	0.00022	0.0004	0.0009	0.0018	0.0022	0.0027
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC 36 - 50 HRC	100 73	0.00025	0.00045	0.001	0.002	0.0025	0.003
GRAY CAST IRON	AE J431, ASTM A48	75 - 98 HRB 21 - 36 HRC	205 185	0.00055	0.001	0.0014	0.0022	0.0028	0.0045
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB 21 - 36 HRC	173 168	0.00055	0.001	0.0014	0.0022	0.0028	0.0045
NODULAR (DUCTILE) CAST IRON	ASTM A536, ASTM 897	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	155 130 68	0.00055	0.001	0.0014	0.0022	0.0028	0.0045
PURE NICKEL	Nickel 200, Nickel 201	<75 HRB 75 - 98 HRB	143 125	0.0005	0.0009	0.0013	0.002	0.0025	0.003
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	0.00025	0.0006	0.001	0.0015	0.002	0.0025
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	0.0005	0.0009	0.0013	0.002	0.0025	0.003
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 28 HRC 29 - 36 HRC	100 75	0.0005	0.0009	0.0013	0.002	0.0025	0.003
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	105 85 33	0.00025	0.0006	0.001	0.0015	0.002	0.0025

Calculations - Roughing Depth of Cut	
Min Bores from .010 to .100 Multiply Min Bore Diameter by 3%	Example: Min Bore is .090 (.090 x .03 = .0027 RDOC)
Min bore > .100 Multiply Min Bore Diameter by 5%	Example: Min bore is .180 (.180 X .05 = .009 RDOC)

Calculations - Finishing	
Finishing Depth of Cut Not to exceed 30% of Radius	Example: Nose Radius is .006 (.006 x .3 = .0018 RDOC)
Finishing Feed Rate Multiply radius by 25%	Example: Nose Radius is .006 (.006 x .3 = .0018)

### 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%

RDOC= Radial Depth of Cut



## Speeds & Feeds - Profiling 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

QPR Radial Profiling  
 QPF Axial Profiling  
 QPA Angled Profiling  
 QBT Top Rake Chipbreaker

### Standard

PR Radial Profiling  
 PF Axial Profiling  
 PA Angled Profiling  
 PBT Top Rake Chipbreaker

Material Guide		Hardness	SFM	FEED RATE IN INCHES PER REVOLUTION BY DIAMETER					
				.015 - .060	.061 - .130	.131 - .200	.201 - .280	.281 - .374	.375+
WROUGHT ALUMINUM ALLOY	2014, 5062, 6061, 7050, 7075, 7475	<75 HRB	600	0.0005	0.0009	0.0013	0.0025	0.003	0.004
CAST ALUMINUM ALLOY	319.0, 328.0, 355.0, 360.0, 380.0, 383.0, 390.0, 520.0, 535.0	<75 HRB	400						
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	0.0002	0.0004	0.0005	0.0008	0.0011	0.0013
LOW ALLOY STEEL	13XX, 41XX, 43XX, 51XX, 86XX, 93XX	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC >50 HRC	150 150 100 60	0.0002	0.0004	0.0005	0.0008	0.0011	0.0013
TOOL STEEL	A2, H13, L6, P20, S7	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC >50 HRC	100 80 65 35						
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	0.0002	0.0004	0.0005	0.0008	0.0011	0.0013
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						
MARTENSITIC & FERRITIC STAINLESS STEEL	403, 410, 416, 420, 440, 430, 446	75 - 98 HRB 21 - 36 HRC	160 115	0.0001	0.0001	0.0003	0.0005	0.0007	0.0008
PH STAINLESS STEEL	15-5, 17-4, Carpenter 450, Carpenter 465	21 - 36 HRC 36 - 50 HRC	100 73						
GRAY CAST IRON	AE J431, ASTM A48	75 - 98 HRB 21 - 36 HRC	205 185	0.0002	0.0007	0.0009	0.0014	0.0018	0.0029
MALLEABLE CAST IRON	ASTM A47, ASTM A220, ASTM A602	75 - 98 HRB 21 - 36 HRC	173 168						
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PURE NICKEL	Nickel 200, Nickel 201	<75 HRB 75 - 98 HRB	143 125						
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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						
TITANIUM ALLOY	Ti 3Al-2.5V, Ti 6Al-4V, Ti 10V-2Fe-3Al	21 - 28 HRC 29 - 36 HRC	100 75	0.0002	0.0003	0.0004	0.0006	0.0008	0.0009
COBALT ALLOY	ASTM F562, ASTM F90, ASTM F75, ASTM F799	75 - 98 HRB 21 - 36 HRC 36 - 50 HRC	105 85 33						

Calculations	
Depth of Cut - Not to exceed 30% of Radius	Example: Tool Radius is .006 ( .006 x .30 = .0018)
Finishing Feed Rate - Multiply radius by 25%	Example: Tool Radius is .004 ( .004 x .25 = .001)

RDOC= Radial Depth of Cut

### 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%