



PRODUCT HANDBOOK



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Our Mission

Midwest Industrial Tool Grinding, Inc. (MITGI) is a superior, state of the art, specialty CNC grinding technology partner to leading edge companies seeking strategic value from their tooling supplier.

Our Vision

To manufacture customer-specific tools of the highest quality, providing a lifetime of customer satisfaction.

Our Values

- The most important — Quality
- Creativity
- Always working toward a better solution
- Always Improving
- Responsive service
- Valuable partnerships with our customers
- Openness in communications
- Accountability
- Providing an informal, but disciplined work environment



The success of MITGI is no surprise: our tools are of the highest quality and they have had an immeasurable impact on our customers.

It's that simple.

The success we have had at MITGI is simply undeniable, and can be attributed not only to the superiority of our tools, but also to our extremely qualified employees and the unshakable value we place on our customers.

Our founder, Jim Schaufler, offers the unique ability and insight to manufacture and redesign high quality specialty tools to fit the unique requirements of our customers, undoubtedly creating value for their business and differentiating them from other companies in their industry. It is a regular part of our practice to visit the customer facility and watch their work in action, in order to understand their desired results. This gives us the confidence to design and develop tools to specifically meet their needs. Meeting the specific needs of our customers is our passion. And that's why — along with our cutting-edge technology — we consistently outshine our competition and are one of the fastest growing and most successful companies in the industry.

Yes, we meet our customer's needs, but we also place an incredibly high value on customer confidentiality. We require all management-level personnel to maintain confidentiality agreements. We have



implemented a numbering system to protect the anonymity of our customers and their projects. This numbering system replaces the customer's name and project numbers on all paperwork, including in-house prints, routers, inspection sheets, and schedules. We are extremely proud of the relationships we have with our customers and are exceedingly conscious of maintaining confidentiality while manufacturing their tools.

MITGI is capable of accommodating a diverse number of industries — such as the computer, mold making, medical, and aerospace industries. Our state-of-the-art facility has a diverse group of CNC cutter grinders. These grinders allow us to build both specialty and common tools with accuracy and repeatability. MITGI often provides sample tools for our customers to test against their existing tools, and based on these trial performances the quality of our tools have always spoken for themselves. What's more, we are now diversifying into high-quality customer-specific product lines and we excel in the manufacturing of specialty micro tools, further expanding the industries in which our tools will be employed.

At MITGI, we believe with unwavering conviction in the quality of our products, and we stand behind our tools 100% and the second you begin using our tools, we know you will feel the same way.



MANUFACTURING SERVICES

- SPECIALTY TOOL MANUFACTURING TO CUSTOMER PRINT OR DESIGN
- MICRO-TOOLING, END MILLS AND EXTENDED REACH TOOLING
- END MILLS, BALL, SQUARE AND RADIUS
- EXTENDED REACH END MILLS
- MICRO END MILLS
- DRILLS, MICRO DRILLS, AND EXTENDED REACH DRILLS
- REAMERS AND STEP REAMERS
- MULTI-DIAMETER STEP TOOLING
- SINGLE POINT AND FULL FORM THREADMILLS
- COUNTERSINKS
- COUNTERBORES
- SPADE DRILLS
- DEBURRING KNIVES
- SLITTING SAWS — MOUNTED AND ARBOR STYLE
- MODIFY INSERTS
- SPOT DRILLS
- CORNER ROUNDING END MILLS



PRODUCT LINE

- MICRO END MILLS, SQUARE AND BALL, STANDARD AND STUB
- SPECIALTY MOLD TOOLING
- EXTENDED REACH MOLD TOOLING
- VARIABLE HELIX END MILLS
- SPOT DRILLS
- DEBURRING KNIVES
- THREADMILLS
- TAPERED END MILLS
- CORNER ROUNDING END MILLS
- SPADE DRILLS

RE-NEWING SERVICES

- ENDMILLS
- HIGH PERFORMANCE CARBIDE DRILLS
- THREADMILLS
- STEP TOOLING



CARBIDE MICRO END MILLS - 2007 PRICING

SQUARE STANDARD LENGTH



MADE IN THE USA

Square Standard - Extended Reach and Coating Available

Cutter Diameter (A)	Length of Cut (B)	Shank Diameter (C)	Overall Length (D)	2 Flute		4 Flute	
				Tool#	Price	Tool #	Price
0.001	0.003	1/8"	1-1/2"	N/A	N/A	N/A	N/A
0.002	0.006	1/8"	1-1/2"	N/A	N/A	N/A	N/A
0.003	0.009	1/8"	1-1/2"	S08-003-2-SEM	\$30.00	N/A	N/A
0.004	0.012	1/8"	1-1/2"	S08-004-2-SEM	\$25.50	N/A	N/A
0.005	0.015	1/8"	1-1/2"	S08-005-2-SEM	\$23.50	N/A	N/A
0.006	0.018	1/8"	1-1/2"	S08-006-2-SEM	\$23.50	N/A	N/A
0.007	0.021	1/8"	1-1/2"	S08-007-2-SEM	\$22.75	N/A	N/A
0.008	0.024	1/8"	1-1/2"	S08-008-2-SEM	\$22.75	N/A	N/A
0.009	0.027	1/8"	1-1/2"	S08-009-2-SEM	\$22.75	N/A	N/A
0.010	0.030	1/8"	1-1/2"	S08-010-2-SEM	\$18.75	S08-010-4-SEM	\$18.75
0.011	0.033	1/8"	1-1/2"	S08-011-2-SEM	\$18.75	S08-011-4-SEM	\$18.75
0.012	0.036	1/8"	1-1/2"	S08-012-2-SEM	\$18.75	S08-012-4-SEM	\$18.75
0.013	0.039	1/8"	1-1/2"	S08-013-2-SEM	\$18.75	S08-013-4-SEM	\$18.75
0.014	0.042	1/8"	1-1/2"	S08-014-2-SEM	\$18.75	S08-014-4-SEM	\$18.75
.015 (1/64)	0.045	1/8"	1-1/2"	S08-015-2-SEM	\$16.50	S08-015-4-SEM	\$16.50
0.016	0.048	1/8"	1-1/2"	S08-016-2-SEM	\$16.50	S08-016-4-SEM	\$16.50
0.017	0.051	1/8"	1-1/2"	S08-017-2-SEM	\$16.50	S08-017-4-SEM	\$16.50
0.018	0.054	1/8"	1-1/2"	S08-018-2-SEM	\$16.50	S08-018-4-SEM	\$16.50
0.019	0.057	1/8"	1-1/2"	S08-019-2-SEM	\$16.50	S08-019-4-SEM	\$16.50
0.020	0.060	1/8"	1-1/2"	S08-020-2-SEM	\$15.75	S08-020-4-SEM	\$15.75
0.021	0.063	1/8"	1-1/2"	S08-021-2-SEM	\$15.75	S08-021-4-SEM	\$15.75
0.022	0.066	1/8"	1-1/2"	S08-022-2-SEM	\$15.75	S08-022-4-SEM	\$15.75
0.023	0.069	1/8"	1-1/2"	S08-023-2-SEM	\$15.75	S08-023-4-SEM	\$15.75
0.024	0.072	1/8"	1-1/2"	S08-024-2-SEM	\$15.75	S08-024-4-SEM	\$15.75
0.025	0.075	1/8"	1-1/2"	S08-025-2-SEM	\$14.25	S08-025-4-SEM	\$14.25
0.026	0.078	1/8"	1-1/2"	S08-026-2-SEM	\$14.25	S08-026-4-SEM	\$14.25
0.027	0.081	1/8"	1-1/2"	S08-027-2-SEM	\$14.25	S08-027-4-SEM	\$14.25
0.028	0.084	1/8"	1-1/2"	S08-028-2-SEM	\$14.25	S08-028-4-SEM	\$14.25
0.029	0.087	1/8"	1-1/2"	S08-029-2-SEM	\$14.25	S08-029-4-SEM	\$14.25
0.030	0.090	1/8"	1-1/2"	S08-030-2-SEM	\$14.25	S08-030-4-SEM	\$14.25
.031 (1/32)	0.093	1/8"	1-1/2"	S08-031-2-SEM	\$14.25	S08-031-4-SEM	\$14.25
0.035	0.105	1/8"	1-1/2"	S08-035-2-SEM	\$12.25	S08-035-4-SEM	\$12.25
0.040	0.120	1/8"	1-1/2"	S08-040-2-SEM	\$12.25	S08-040-4-SEM	\$12.25

CARBIDE MICRO END MILLS - 2007 PRICING

SQUARE STANDARD LENGTH



Square Standard - Extended Reach and Coating Available (Continued)

Cutter Diameter (A)	Length of Cut (B)	Shank Diameter (C)	Overall Length (D)	2 Flute		4 Flute	
				Tool#	Price	Tool #	Price
0.045	0.135	1/8"	1-1/2"	S08-045-2-SEM	\$12.25	S08-045-4-SEM	\$12.25
.047 (3/64)	0.141	1/8"	1-1/2"	S08-047-2-SEM	\$12.25	S08-047-4-SEM	\$12.25
0.050	0.150	1/8"	1-1/2"	S08-050-2-SEM	\$12.25	S08-050-4-SEM	\$12.25
0.055	0.165	1/8"	1-1/2"	S08-055-2-SEM	\$12.25	S08-055-4-SEM	\$12.25
0.060	0.180	1/8"	1-1/2"	S08-060-2-SEM	\$10.75	S08-060-4-SEM	\$10.75
.062 (1/16)	0.187	1/8"	1-1/2"	S08-062-2-SEM	\$10.75	S08-062-4-SEM	\$10.75
0.065	0.195	1/8"	1-1/2"	S08-065-2-SEM	\$10.75	S08-065-4-SEM	\$10.75
0.070	0.210	1/8"	1-1/2"	S08-070-2-SEM	\$10.75	S08-070-4-SEM	\$10.75
0.075	0.225	1/8"	1-1/2"	S08-075-2-SEM	\$10.75	S08-075-4-SEM	\$10.75
.078 (5/64)	0.234	1/8"	1-1/2"	S08-078-2-SEM	\$10.75	S08-078-4-SEM	\$10.75
0.080	0.240	1/8"	1-1/2"	S08-080-2-SEM	\$10.75	S08-080-4-SEM	\$10.75
0.085	0.255	1/8"	1-1/2"	S08-085-2-SEM	\$10.75	S08-085-4-SEM	\$10.75
0.090	0.270	1/8"	1-1/2"	S08-090-2-SEM	\$10.75	S08-090-4-SEM	\$10.75
.093 (3/32)	0.279	1/8"	1-1/2"	S08-093-2-SEM	\$10.75	S08-093-4-SEM	\$10.75
0.095	0.285	1/8"	1-1/2"	S08-095-2-SEM	\$10.75	S08-095-4-SEM	\$10.75
0.100	0.300	1/8"	1-1/2"	S08-100-2-SEM	\$10.75	S08-100-4-SEM	\$10.75
0.105	0.315	1/8"	1-1/2"	S08-105-2-SEM	\$10.75	S08-105-4-SEM	\$10.75
0.110	0.330	1/8"	1-1/2"	S08-110-2-SEM	\$10.75	S08-110-4-SEM	\$10.75
0.115	0.345	1/8"	1-1/2"	S08-115-2-SEM	\$10.75	S08-115-4-SEM	\$10.75
0.120	0.360	1/8"	1-1/2"	S08-120-2-SEM	\$10.75	S08-120-4-SEM	\$10.75
.125 (1/8)	0.375	1/8"	1-1/2"	S08-125-2-SEM	\$10.75	S08-125-4-SEM	\$10.75

* Custom Sizes and lengths available upon request

* We stand behind our tool performance with a money back guarantee

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CARBIDE MICRO END MILLS - 2007 PRICING

SQUARE STUB LENGTH



MADE IN THE USA

Square Stub - Extended Reach and Coating Available

Cutter Diameter (A)	Length of Cut (B)	Shank Diameter (C)	Overall Length (D)	2 Flute		4 Flute	
				Tool#	Price	Tool #	Price
0.001	0.0015	1/8"	1-1/2"	N/A	N/A	N/A	N/A
0.002	0.003	1/8"	1-1/2"	N/A	N/A	N/A	N/A
0.003	0.0045	1/8"	1-1/2"	S10-003-2-SST	\$30.00	N/A	N/A
0.004	0.006	1/8"	1-1/2"	S10-004-2-SST	\$25.50	N/A	N/A
0.005	0.0075	1/8"	1-1/2"	S10-005-2-SST	\$23.50	N/A	N/A
0.006	0.009	1/8"	1-1/2"	S10-006-2-SST	\$23.50	N/A	N/A
0.007	0.0105	1/8"	1-1/2"	S10-007-2-SST	\$22.75	N/A	N/A
0.008	0.012	1/8"	1-1/2"	S10-008-2-SST	\$22.75	N/A	N/A
0.009	0.0135	1/8"	1-1/2"	S10-009-2-SST	\$22.75	N/A	N/A
0.010	0.015	1/8"	1-1/2"	S10-010-2-SST	\$18.75	S10-010-4-SST	\$18.75
0.011	0.0165	1/8"	1-1/2"	S10-011-2-SST	\$18.75	S10-011-4-SST	\$18.75
0.012	0.018	1/8"	1-1/2"	S10-012-2-SST	\$18.75	S10-012-4-SST	\$18.75
0.013	0.0195	1/8"	1-1/2"	S10-013-2-SST	\$18.75	S10-013-4-SST	\$18.75
0.014	0.021	1/8"	1-1/2"	S10-014-2-SST	\$18.75	S10-014-4-SST	\$18.75
.015 (1/64)	0.0225	1/8"	1-1/2"	S10-015-2-SST	\$16.50	S10-015-4-SST	\$16.50
0.016	0.024	1/8"	1-1/2"	S10-016-2-SST	\$16.50	S10-016-4-SST	\$16.50
0.017	0.0255	1/8"	1-1/2"	S10-017-2-SST	\$16.50	S10-017-4-SST	\$16.50
0.018	0.027	1/8"	1-1/2"	S10-018-2-SST	\$16.50	S10-018-4-SST	\$16.50
0.019	0.0285	1/8"	1-1/2"	S10-019-2-SST	\$16.50	S10-019-4-SST	\$16.50
0.020	0.03	1/8"	1-1/2"	S10-020-2-SST	\$15.75	S10-020-4-SST	\$15.75
0.021	0.0315	1/8"	1-1/2"	S10-021-2-SST	\$15.75	S10-021-4-SST	\$15.75
0.022	0.033	1/8"	1-1/2"	S10-022-2-SST	\$15.75	S10-022-4-SST	\$15.75
0.023	0.0345	1/8"	1-1/2"	S10-023-2-SST	\$15.75	S10-023-4-SST	\$15.75
0.024	0.036	1/8"	1-1/2"	S10-024-2-SST	\$15.75	S10-024-4-SST	\$15.75
0.025	0.0375	1/8"	1-1/2"	S10-025-2-SST	\$14.25	S10-025-4-SST	\$14.25
0.026	0.039	1/8"	1-1/2"	S10-026-2-SST	\$14.25	S10-026-4-SST	\$14.25
0.027	0.0405	1/8"	1-1/2"	S10-027-2-SST	\$14.25	S10-027-4-SST	\$14.25
0.028	0.042	1/8"	1-1/2"	S10-028-2-SST	\$14.25	S10-028-4-SST	\$14.25
0.029	0.0435	1/8"	1-1/2"	S10-029-2-SST	\$14.25	S10-029-4-SST	\$14.25
0.030	0.045	1/8"	1-1/2"	S10-030-2-SST	\$14.25	S10-030-4-SST	\$14.25
.031 (1/32)	0.0465	1/8"	1-1/2"	S10-031-2-SST	\$14.25	S10-031-4-SST	\$14.25
0.035	0.0525	1/8"	1-1/2"	S10-035-2-SST	\$12.25	S10-035-4-SST	\$12.25
0.040	0.06	1/8"	1-1/2"	S10-040-2-SST	\$12.25	S10-040-4-SST	\$12.25

CARBIDE MICRO END MILLS - 2007 PRICING

SQUARE STUB LENGTH



Square Stub - Extended Reach and Coating Available (Continued)

Cutter Diameter (A)	Length of Cut (B)	Shank Diameter (C)	Overall Length (D)	2 Flute		4 Flute	
				Tool#	Price	Tool #	Price
0.045	0.0675	1/8"	1-1/2"	S10-045-2-SST	\$12.25	S10-045-4-SST	\$12.25
.047 (3/64)	0.0705	1/8"	1-1/2"	S10-047-2-SST	\$12.25	S10-047-4-SST	\$12.25
0.050	0.075	1/8"	1-1/2"	S10-050-2-SST	\$12.25	S10-050-4-SST	\$12.25
0.055	0.0825	1/8"	1-1/2"	S10-055-2-SST	\$12.25	S10-055-4-SST	\$12.25
0.060	0.09	1/8"	1-1/2"	S10-060-2-SST	\$10.75	S10-060-4-SST	\$10.75
.062 (1/16)	0.093	1/8"	1-1/2"	S10-062-2-SST	\$10.75	S10-062-4-SST	\$10.75
0.065	0.0975	1/8"	1-1/2"	S10-065-2-SST	\$10.75	S10-065-4-SST	\$10.75
0.070	0.105	1/8"	1-1/2"	S10-070-2-SST	\$10.75	S10-070-4-SST	\$10.75
0.075	0.1125	1/8"	1-1/2"	S10-075-2-SST	\$10.75	S10-075-4-SST	\$10.75
.078 (5/64)	0.117	1/8"	1-1/2"	S10-078-2-SST	\$10.75	S10-078-4-SST	\$10.75
0.080	0.12	1/8"	1-1/2"	S10-080-2-SST	\$10.75	S10-080-4-SST	\$10.75
0.085	0.1275	1/8"	1-1/2"	S10-085-2-SST	\$10.75	S10-085-4-SST	\$10.75
0.090	0.135	1/8"	1-1/2"	S10-090-2-SST	\$10.75	S10-090-4-SST	\$10.75
.093 (3/32)	0.1395	1/8"	1-1/2"	S10-093-2-SST	\$10.75	S10-093-4-SST	\$10.75
0.095	0.1425	1/8"	1-1/2"	S10-095-2-SST	\$10.75	S10-095-4-SST	\$10.75
0.100	0.15	1/8"	1-1/2"	S10-100-2-SST	\$10.75	S10-100-4-SST	\$10.75
0.105	0.1575	1/8"	1-1/2"	S10-105-2-SST	\$10.75	S10-105-4-SST	\$10.75
0.110	0.165	1/8"	1-1/2"	S10-110-2-SST	\$10.75	S10-110-4-SST	\$10.75
0.115	0.1725	1/8"	1-1/2"	S10-115-2-SST	\$10.75	S10-115-4-SST	\$10.75
0.120	0.18	1/8"	1-1/2"	S10-120-2-SST	\$10.75	S10-120-4-SST	\$10.75
.125 (1/8)	0.1875	1/8"	1-1/2"	S10-125-2-SST	\$10.75	S10-125-4-SST	\$10.75

* Custom Sizes and lengths available upon request

* We stand behind our tool performance with a money back guarantee

* Prices subject to change without notice



CARBIDE MICRO END MILLS - 2007 PRICING

BALL STANDARD LENGTH



MADE IN THE USA

Ball Standard - Extended Reach and Coating Available

Cutter Diameter (A)	Length of Cut (B)	Shank Diameter (C)	Overall Length (D)	2 Flute		4 Flute	
				Tool#	Price	Tool #	Price
0.005	0.015	1/8	1-1/2	S07-005-2-BEM	\$35.10	N/A	N/A
0.010	0.030	1/8	1-1/2	S07-010-2-BEM	\$28.70	S07-010-4-BEM	\$28.70
.015 (1/64)	0.045	1/8	1-1/2	S07-015-2-BEM	\$22.75	S07-015-4-BEM	\$22.75
0.020	0.060	1/8	1-1/2	S07-020-2-BEM	\$21.85	S07-020-4-BEM	\$21.85
0.025	0.075	1/8	1-1/2	S07-025-2-BEM	\$19.90	S07-025-4-BEM	\$19.90
0.030	0.090	1/8	1-1/2	S07-030-2-BEM	\$17.80	S07-030-4-BEM	\$17.80
.031 (1/32)	0.093	1/8	1-1/2	S07-031-2-BEM	\$17.80	S07-031-4-BEM	\$17.80
0.035	0.105	1/8	1-1/2	S07-035-2-BEM	\$16.85	S07-035-4-BEM	\$16.85
0.040	0.120	1/8	1-1/2	S07-040-2-BEM	\$16.85	S07-040-4-BEM	\$16.85
0.045	0.135	1/8	1-1/2	S07-045-2-BEM	\$16.85	S07-045-4-BEM	\$16.85
0.047 (3/64)	0.141	1/8	1-1/2	S07-047-2-BEM	\$16.85	S07-047-4-BEM	\$16.85
0.050	0.150	1/8	1-1/2	S07-050-2-BEM	\$16.85	S07-050-4-BEM	\$16.85
0.055	0.165	1/8	1-1/2	S07-055-2-BEM	\$16.85	S07-055-4-BEM	\$16.85
0.060	0.180	1/8	1-1/2	S07-060-2-BEM	\$16.25	S07-060-4-BEM	\$16.25
.062 (1/16)	0.187	1/8	1-1/2	S07-062-2-BEM	\$16.25	S07-062-4-BEM	\$16.25
0.065	0.195	1/8	1-1/2	S07-065-2-BEM	\$16.25	S07-065-4-BEM	\$16.25
0.070	0.210	1/8	1-1/2	S07-070-2-BEM	\$16.25	S07-070-4-BEM	\$16.25
0.075	0.225	1/8	1-1/2	S07-075-2-BEM	\$16.25	S07-075-4-BEM	\$16.25
.078 (5/64)	0.234	1/8	1-1/2	S07-078-2-BEM	\$16.25	S07-078-4-BEM	\$16.25
0.080	0.240	1/8	1-1/2	S07-080-2-BEM	\$16.25	S07-080-4-BEM	\$16.25
0.085	0.255	1/8	1-1/2	S07-085-2-BEM	\$16.25	S07-085-4-BEM	\$16.25
0.090	0.270	1/8	1-1/2	S07-090-2-BEM	\$16.25	S07-090-4-BEM	\$16.25
.093 (3/32)	0.279	1/8	1-1/2	S07-093-2-BEM	\$16.25	S07-093-4-BEM	\$16.25
0.095	0.285	1/8	1-1/2	S07-095-2-BEM	\$16.25	S07-095-4-BEM	\$16.25
0.100	0.300	1/8	1-1/2	S07-100-2-BEM	\$16.25	S07-100-4-BEM	\$16.25
.125 (1/8)	0.375	1/8	1-1/2	S07-125-2-BEM	\$16.25	S07-125-4-BEM	\$16.25

* Custom Sizes and lengths available upon request

* We stand behind our tool performance with a money back guarantee

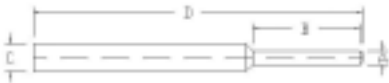
* Prices subject to change without notice

CUSTOM ORDER 3 & 4 FLUTE REAMER - 2007 PRICING

2 FLUTE REAMERS (SEE NOTE BELOW)



Price per 10-24 piece order (10 price per minimum)



MADE IN THE USA

Reamer Size	Tolerance	Tolerance	Tolerance
	.0001	.0002	.0003 and up
.0400" - .1245" X UP TO .300 L.O.C. ON 1/8 x 1-1/2" BLANK	\$36.10	\$34.20	\$32.40
.0400" - .1245" X UP TO .500 L.O.C. ON 1/8 x 1-1/2" BLANK	\$38.80	\$36.10	\$34.20
.0400" - .1245" X UP TO .750 L.O.C. ON 1/8 x 1-1/2" BLANK	\$41.10	\$38.80	\$36.10
.1254" - .1870" X UP TO .300 L.O.C. ON 3/16 x 2" BLANK	\$38.80	\$36.10	\$34.20
.1254" - .1870" X UP TO .500 L.O.C. ON 3/16 x 2" BLANK	\$41.10	\$38.80	\$36.10
.1254" - .1870" X UP TO .750 L.O.C. ON 3/16 x 2" BLANK	\$43.30	\$41.00	\$38.80

*25 - 49 piece orders receive a 5% discount off of the 10 piece price

*50 - 99 piece orders receive a 10 % discount off of the 10 piece price

*100 piece orders receive a 15% discount off of the 10 piece price

*500 piece orders receive a 20% discount off of the 10 piece price

*NOTES:

REAMERS WILL HAVE A 45 DEG CHAMFER LEAD UNLESS OTHERWISE REQUESTED

2 FLUTE REAMERS ARE \$2.00 MORE PER TOOL

PRICES DO NOT INCLUDE MULTI-DIAMETER, MULTI-STEP REAMERS

2 WEEK DELIVERY (10 BUSINESS DAYS)

EXPEDITE CHARGES/DELIVERY AVAILABLE ON A CASE BY CASE BASIS

ALL REAMER PRINTS TO BE APPROVED AT THIS PRICING

SPECIALTY REAMERS, DIFFERENT LENGTHS OR DIAMETERS WILL BE QUOTED

COATING WILL BE AN ADDITIONAL CHARGE



7° DEBURRING KNIVES - 2007 PRICING



MADE IN THE USA

HSS				
Size	MITGI#	Up to 50 lots of 10	50-500 lots of 50	600 and up lots of 100
1/16" x 1-1/4"	S04-007	\$4.80	\$4.00	\$3.80
3/32" x 1-1/4"	S04-011	\$4.80	\$4.00	\$3.80
1/8" x 1-1/4"	S04-005	\$4.80	\$4.00	\$3.80
1mm x 1-1/4"	S04-003	\$5.00	\$4.20	\$4.00

Carbide				
Size	MITGI#	Up to 50 lots of 10	50-500 lots of 50	600 and up lots of 100
1/16" x 1-1/2"	S04-013	\$5.50	\$4.40	\$4.20
3/32" x 1-1/2"	S04-015	\$5.50	\$4.40	\$4.20
1/8" x 1-1/2"	S04-017	\$5.50	\$4.40	\$4.20

10° DEBURRING KNIVES - 2007 PRICING



HSS				
Size	MITGI#	Up to 50 lots of 10	50-500 lots of 50	600 and up lots of 100
1/16" x 1-1/4"	S04-006	\$4.80	\$4.00	\$3.80
3/32" x 1-1/4"	S04-012	\$4.80	\$4.00	\$3.80
1/8" x 1-1/4"	S04-004	\$4.80	\$4.00	\$3.80
1mm x 1-1/4"	S04-002	\$5.00	\$4.20	\$4.00

Carbide				
Size	MITGI#	Up to 50 lots of 10	50-500 lots of 50	600 and up lots of 100
1/16" x 1-1/2"	S04-014	\$5.50	\$4.40	\$4.20
3/32" x 1-1/2"	S04-016	\$5.50	\$4.40	\$4.20
1/8" x 1-1/2"	S04-018	\$5.50	\$4.40	\$4.20

* Custom Sizes and lengths available upon request

* We stand behind our tool performance with a money back guarantee

* Prices subject to change without notice



MADE IN THE USA

Size	MITGI#	Price
1/8" - 2" OAL Ft. Length .375"	S16-001	\$12.70
1/8" - 2" OAL Ft. Length .375" - 4 Facet Point	S16-002	\$12.70
3/16" - 2" OAL Ft. Length .625"	S16-003	\$13.60
3/16" - 2" OAL Ft. Length .625" - 4 Facet Point	S16-004	\$13.60
1/4" - 2" OAL Ft. Length .625"	S16-005	\$20.80
1/4" - 2" OAL Ft. Length .625" - 4 Facet Point	S16-006	\$20.80
5/16" - 2" OAL Ft. Length .750"	S16-007	\$27.60
5/16" - 2" OAL Ft. Length .750" - 4 Facet Point	S16-008	\$27.60
3/8" - 2.5" OAL Ft. Length .750"	S16-009	\$35.45
3/8" - 2.5" OAL Ft. Length .750" - 4 Facet Point	S16-010	\$35.45
1/2" - 3" OAL Ft. Length 1.00	S16-011	\$51.05
1/2" - 3" OAL Ft. Length 1.00 - 4 Facet Point	S16-012	\$51.05
5/8" - 3.5" OAL Ft. Length 1.125"	S16-013	\$100.70
5/8" - 3.5" OAL Ft. Length 1.125" - 4 Facet Point	S16-014	\$100.70
3/4" - 4" OAL Ft. Length 1.250"	S16-015	\$153.10
3/4" - 4" OAL Ft. Length 1.250" - 4 Facet Point	S16-016	\$153.10

* Custom sizes and lengths available upon request

* Prices subject to change without notice

* Our drills have been proven to outperform all drills tested

* We stand behind our drill performance with a money back guarantee

* Drills are made with premium micro-grain carbide and are 100% CNC ground

* Coating is available and quoted upon request

* Standard delivery is 5 business days from order date, please confirm when you place your order

* Standard shipping is UPS ground

* Expedited delivery is available if necessary at an additional charge

* 90° or 120° point angles available

* Will quote quantities above 50 and tool sizes that are not listed

* Pricing reflects standard length tools



5 FT. 30° HELIX SINGLE END END MILLS - 2007 PRICING



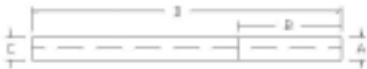
MADE IN THE USA

Mill Dia. (A)	LOC (B) (B)	Shank Dia. (C)	OAL (D)	MITGI#	Stub Price	Standard Price
1/8	0.1875	1/8	2"	S20-001	\$15.50	\$17.90
3/16	0.281	3/16	2"	S20-002	\$17.05	\$19.05
1/4	0.375	1/4	2"	S20-003	\$18.10	\$20.15
5/16	0.469	5/16	2"	S20-004	\$23.90	\$27.20
3/8	0.562	3/8	2-1/2"	S20-005	\$28.80	\$32.60
1/2	0.75	1/2	3"	S20-006	\$45.40	\$49.65

- * Custom sizes and length available upon request
- * Coating is available and quoted upon request
- * Standard delivery is 5 business days from order date, please confirm when you place your order
- * Standard shipping is UPS ground.
- * Expedited delivery is available if necessary at an additional charge

- * Will quote quantities above 50 and tool sizes that are not listed
- * Custom Sizes and lengths available upon request
- * We stand behind our tool performance with a money back guarantee
- * Prices subject to change without notice

VARIABLE HELIX SQUARE END MILLS - 2007 PRICING



MADE IN THE USA

Mill Dia. (A)	LOC (B)	Shank Dia. (C)	OAL (D)	MITGI#	Price
1/8	0.250	1/8	1-1/2"	S21-001	\$17.00
1/4	0.500	1/4	2"	S21-002	\$29.00
3/8	0.750	3/8	2-1/2"	S21-003	\$48.00
1/2	1.000	1/2	3"	S21-004	\$79.00

- * Custom sizes and lengths available upon request
- * Coating is available and quoted upon request
- * Standard delivery is 5 business days from order date, please confirm when you place your order
- * Standard shipping is UPS ground.
- * Expedited delivery is available if necessary at an additional charge

- * Will quote quantities above 50 and tool sizes that are not listed
- * Custom Sizes and lengths available upon request
- * We stand behind our tool performance with a money back guarantee
- * Prices subject to change without notice



MADE IN THE USA

Thread Size	Cutter Dia. (A)	Neck Dia. (B)	Max Depth of Thread (C)	Shank Dia. (D)	OAL (E)	MITGI #	Price
4	0.080	0.035	1/8	1/8	1-1/2	S17-4-TM	\$54.10
6	0.098	0.042	1/4	3/16	2	S17-6-TM	\$54.10
8	0.120	0.064	5/16	1/4	2-1/2	S17-8-TM	\$56.30
10	0.135	0.061	5/16	1/4	2-1/2	S17-10-TM	\$56.30
1/4	0.180	0.091	1/2	1/4	2-1/2	S17-250-TM	\$56.30
5/16	0.240	0.142	1/2	1/4	2-1/2	S17-3125-TM	\$57.05
3/8	0.300	0.190	3/4	3/8	2-1/2	S17-375-TM	\$73.20
1/2	0.388	0.253	3/4	1/2	3	S17-500-TM	\$82.70

- * Extended Reach and Full Form are available upon request
- * Coating is available and quoted upon request
- * All thread mill have a 60° thread
- * All thread mills are 4 ft. solid carbide
- * Can mill any pitch, standard or metric
- * Can mill fine or coarse threads
- * Can mill RH and LH threads
- * Standard delivery is 5 business days from order date, please confirm when you place your order
- * Standard shipping is UPS ground.
- * Expedited delivery is available if necessary at an additional charge
- * Will quote quantities above 50 and tool sizes that are not listed
- * Custom Sizes and lengths available upon request
- * We stand behind our tool performance with a money back guarantee
- * Prices subject to change without notice



SINGLE END CORNER ROUNDING END MILLS - 2007 PRICING



MADE IN THE USA

Radius (A)	Minor Dia. (B)	Shank Dia. (C)	OAL (D)	MITG#	Price
.010	0.105	1/8	1-1/2	S22-001	\$21.10
0.015	0.095	1/8	1-1/2	S22-002	\$21.10
0.02	0.085	1/8	1-1/2	S22-003	\$21.10
0.025	0.075	1/8	1-1/2	S22-004	\$21.10
0.031	0.063	1/8	1-1/2	S22-005	\$21.10
0.035	0.055	1/8	1-1/2	S22-006	\$21.10
0.040	0.045	1/8	1-1/2	S22-007	\$21.10
0.046	0.095	3/16	2	S22-008	\$27.80
0.050	0.087	3/16	2	S22-009	\$27.80
0.055	0.077	3/16	2	S22-010	\$27.80
0.062	0.063	3/16	2	S22-011	\$27.80

* Custom sizes and lengths available upon request

* Coating is available and quoted upon request

* Standard delivery is 5 business days from order date, please confirm when you place your order

* Standard shipping is UPS ground

* Expedited delivery is available if necessary at an additional charge

* Will quote quantities above 50 and tool sizes that are not listed

* 5 piece minimum order

* Custom Sizes and lengths available upon request

* We stand behind our tool performance with a money back guarantee

* Prices subject to change without notice

DECIMAL EQUIVALENT CHART

.0059 - .0980



Decimal Equiv.	Drill Size	mm	Tap Sizes
.0059	97	0.150	
.0063	96	0.160	
.0067	95	0.170	
.0071	94	0.180	
.0075	93	0.191	
.0079	92	0.201	
.0083	91	0.211	
.0087	90	0.221	
.0091	89	0.231	
.0095	88	0.241	
.0100	87	0.254	
.0105	86	0.267	
.0110	85	0.279	
.0115	84	0.292	
.0120	83	0.305	
.0125	82	0.318	
.0130	81	0.330	
.0135	80	0.343	
.0145	79	0.368	
.0156	1/64	0.397	
.0160	78	0.406	
.0180	77	0.457	
.0200	76	0.508	
.0210	75	0.533	
.0225	74	0.572	
.0240	73	0.610	
.0250	72	0.635	
.0260	71	0.660	
.0280	70	0.711	
.0292	69	0.742	
.0310	68	0.787	
.0313	1/32	0.794	

Decimal Equiv.	Drill Size	mm	Tap Sizes
.0320	67	0.813	
.0330	66	0.838	
.0350	65	0.889	
.0360	64	0.914	
.0370	63	0.940	
.0380	62	0.965	
.0390	61	0.991	
.0400	60	1.016	
.0410	59	1.041	
.0420	58	1.067	
.0430	57	1.092	
.0465	56	1.181	
.0469	3/64	1.191	#0-80
.0520	55	1.321	
.0550	54	1.397	
.595	53	1.511	#1-64 • #1-72
.0625	1/16	1.588	
.0635	52	1.613	
.0670	51	1.702	
.0700	50	1.778	#2-56 • #2-64
.0730	49	1.854	
.0760	48	1.930	
.0781	5/64	1.984	
.0785	47	1.994	#3-48
.0810	46	2.057	
.0820	45	2.083	#3-56
.0860	44	2.184	
.0890	43	2.261	#4-40
.0935	42	2.375	#4-48
.0938	3/32	2.381	
.0960	41	2.438	
.0980	40	2.489	



DECIMAL EQUIVALENT CHART

.0995 - .2969

Decimal Equiv.	Drill Size	mm	Tap Sizes
.0995	39	2.527	
.1015	38	2.578	#5-40
.1040	37	2.642	#5-44
.1065	36	2.705	#6-32
.1094	7/64	2.778	
.1100	35	2.794	
.1110	34	2.819	
.1130	33	2.870	#6-40
.1160	32	2.946	
.1200	31	3.048	
.1250	1/8	3.175	
.1285	30	3.264	
.1360	29	3.454	#8-32 • #8-36
.1405	28	3.569	
.1406	9/64	3.572	
.1440	27	3.658	
.1470	26	3.734	
.1495	25	3.797	#10-24
.1520	24	3.861	
.1540	23	3.912	
.1563	5/32	3.969	
.1570	22	3.988	
.1590	21	4.039	#10-32
.1610	20	4.089	
.1660	19	4.216	
.1695	18	4.305	
.1719	11/64	4.366	
.1730	17	4.394	
.1770	16	4.496	#12-24
.1800	15	4.572	
.1820	14	4.623	#12-28
.1850	13	4.699	

Decimal Equiv.	Drill Size	mm	Tap Sizes
.1875	3/16	4.763	#12-32
.1890	12	4.801	
.1910	11	4.851	
.1935	10	4.915	
.1960	9	4.978	
.1990	8	5.055	
.2010	7	5.105	1/4-20
.2031	13/64	5.159	
.2040	6	5.182	
.2055	5	5.220	
.2090	4	5.309	
.2130	3	5.410	1/4-28
.2188	7/32	5.556	1/4-32
.2210	2	5.613	
.2280	1	5.791	
.2340	A	5.944	
.2344	15/64	5.953	
.2380	B	6.045	
.2420	C	6.147	
.2460	D	6.248	
.2500	1/4&E	6.350	
.2570	F	6.528	5/16-18
.2610	G	6.629	
.2656	17/64	6.747	
.2660	H	6.756	
.2720	I	6.909	5/16-24
.2770	J	7.036	
.2810	K	7.137	
.2813	9/32	7.144	5/16-32
.2900	L	7.366	
.2950	M	7.493	
.2969	19/64	7.541	

DECIMAL EQUIVALENT CHART

.3020 - 1.000



Decimal Equiv.	Drill Size	mm	Tap Sizes
.3020	N	7.671	
.3125	5/16	7.938	3/8-16
.3160	O	8.026	
.3230	P	8.204	
.3281	21/64	8.334	
.3320	Q	8.433	3/8-24
.3390	R	8.611	
.3438	11/32	8.731	3/8-32
.3480	S	8.839	
.3580	T	9.093	
.3594	23/64	9.128	
.3680	U	9.347	7/16-14
.3750	3/8	9.525	
.3770	V	9.576	
.3860	W	9.804	
.3906	25/64	9.922	7/16-20
.3970	X	10.084	
.4040	Y	10.262	7/16-28
.4063	13/32	10.319	
.4130	Z	10.490	
.4219	27/64	10.716	1/2-13
.4375	7/16	11.113	
.4531	29/64	11.509	1/2-20
.4688	15/32	11.906	1/2-28
.4844	31/64	12.303	9/16-12
.5000	1/2	12.700	9/16-18
.5156	33/64	13.097	9/16-24
.5313	17/32	13.494	5/8-11
.5469	35/64	13.891	

Decimal Equiv.	Drill Size	mm	Tap Sizes
.5625	9/16	14.288	5/8-18
.5781	37/64	14.684	5/8-24
.5938	19/32	15.081	
.6094	39/64	15.478	11/16-12
.6250	5/8	15.875	
.6406	41/64	16.272	11/16-20 • 11/16-24
.6563	21/32	16.669	3/4-10
.6719	43/64	17.066	
.6875	11/16	17.462	3/4-16
.7031	45/64	17.859	3/4-20
.7188	23/32	18.256	
.7344	47/64	18.653	13/16-12
.7500	3/4	19.050	13/16-16
.7656	49/64	19.447	13/16-20 • 7/8-9
.7813	25/32	19.844	
.7969	51/64	20.241	7/8-14
.8125	13/16	20.637	
.8281	53/64	21.034	7/8-20
.8438	27/32	21.431	
.8594	55/64	21.828	15/16-12
.8750	7/8	22.225	15/16-16 • 1-0-8
.8906	57/64	22.622	15/16-20
.9063	29/32	23.019	
.9219	59/64	23.416	1-0-12
.9375	15/16	23.813	
.9531	61/64	24.209	1-0-20
.9688	31/32	24.606	
.9844	63/64	25.003	
1.000	1	25.400	



MILLIMETER TO INCH CHART

0.01 - 12.5

mm	Inch	mm	Inch	mm	Inch	mm	Inch
0.01	.0004	2.6	.1024	6.0	.2362	9.4	.3701
0.02	.0008	2.7	.1063	6.1	.2402	9.5	.3740
0.03	.0012	2.8	.1102	6.2	.2441	9.6	.3780
0.04	.0016	2.9	.1142	6.3	.2480	9.7	.3819
0.05	.0020	3.0	.1181	6.4	.2520	9.8	.3858
0.06	.0024	3.1	.1220	6.5	.2559	9.9	.3898
0.07	.0028	3.2	.1260	6.6	.2598	10.0	.3937
0.08	.0032	3.3	.1299	6.7	.2638	10.1	.3976
0.09	.0035	3.4	.1339	6.8	.2677	10.2	.4016
0.1	.0039	3.5	.1378	6.9	.2717	10.3	.4055
0.2	.0079	3.6	.1417	7.0	.2756	10.4	.4094
0.3	.0118	3.7	.1457	7.1	.2795	10.5	.4134
0.4	.0157	3.8	.1496	7.2	.2835	10.6	.4173
0.5	.0197	3.9	.1535	7.3	.2874	10.7	.4213
0.6	.0236	4.0	.1575	7.4	.2913	10.8	.4252
0.7	.0276	4.1	.1614	7.5	.2953	10.9	.4291
0.8	.0315	4.2	.1654	7.6	.2992	11.0	.4331
0.9	.0354	4.3	.1693	7.7	.3031	11.1	.4370
1.0	.0394	4.4	.1732	7.8	.3071	11.2	.4409
1.1	.0433	4.5	.1772	7.9	.3110	11.3	.4449
1.2	.0472	4.6	.1811	8.0	.3150	11.4	.4488
1.3	.0512	4.7	.1850	8.1	.3189	11.5	.4528
1.4	.0551	4.8	.1890	8.2	.3228	11.6	.4567
1.5	.0591	4.9	.1929	8.3	.3268	11.7	.4606
1.6	.0630	5.0	.1969	8.4	.3307	11.8	.4646
1.7	.0669	5.1	.2008	8.5	.3346	11.9	.4685
1.8	.0709	5.2	.2047	8.6	.3386	12.0	.4724
1.9	.0748	5.3	.2087	8.7	.3425	12.1	.4764
2.0	.0787	5.4	.2126	8.8	.3465	12.2	.4803
2.1	.0827	5.5	.2165	8.9	.3504	12.3	.4843
2.2	.0866	5.6	.2205	9.0	.3543	12.4	.4882
2.3	.0906	5.7	.2244	9.1	.3583	12.5	.4921
2.4	.0945	5.8	.2283	9.2	.3622		
2.5	.0984	5.9	.2323	9.3	.3661		

MILLIMETER TO INCH CHART

12.6 - 25.4



mm	Inch
12.6	.4961
12.7	.5000
12.8	.5039
12.9	.5079
13.0	.5118
13.1	.5157
13.2	.5197
13.3	.5236
13.4	.5276
13.5	.5315
13.6	.5354
13.7	.5394
13.8	.5433
13.9	.5472
14.0	.5512
14.1	.5551
14.2	.5591
14.3	.5630
14.4	.5669
14.5	.5709
14.6	.5748
14.7	.5787
14.8	.5827
14.9	.5866
15.0	.5906
15.1	.5945
15.2	.5984
15.3	.6024
15.4	.6063
15.5	.6102
15.6	.6142
15.7	.6181
15.8	.6220

mm	Inch
15.9	.6260
16.0	.6299
16.1	.6339
16.2	.6378
16.3	.6417
16.4	.6457
16.5	.6496
16.6	.6535
16.7	.6575
16.8	.6614
16.9	.6654
17.0	.6693
17.1	.6732
17.2	.6772
17.3	.6811
17.4	.6850
17.5	.6890
17.6	.6929
17.7	.6968
17.8	.7008
17.9	.7047
18.0	.7087
18.1	.7126
18.2	.7165
18.3	.7205
18.4	.7244
18.5	.7283
18.6	.7323
18.7	.7362
18.8	.7402
18.9	.7441
19.0	.7480
19.1	.7520

mm	Inch
19.2	.7559
19.3	.7598
19.4	.7638
19.5	.7677
19.6	.7717
19.7	.7756
19.8	.7795
19.9	.7835
20.0	.7874
20.1	.7913
20.2	.7953
20.3	.7992
20.4	.8031
20.5	.8071
20.6	.8110
20.7	.8150
20.8	.8189
20.9	.8228
21.0	.8268
21.1	.8307
21.2	.8346
21.3	.8386
21.4	.8425
21.5	.8465
21.6	.8504
21.7	.8543
21.8	.8583
21.9	.8622
22.0	.8661
22.1	.8701
22.2	.8740
22.3	.8780
22.4	.8819

mm	Inch
22.5	.8858
22.6	.8898
22.7	.8937
22.8	.8976
22.9	.9016
23.0	.9055
23.1	.9094
23.2	.9134
23.3	.9173
23.4	.9213
23.5	.9252
23.6	.9291
23.7	.9331
23.8	.9370
23.9	.9409
24.0	.9449
24.1	.9488
24.2	.9528
24.3	.9567
24.4	.9606
24.5	.9646
24.6	.9685
24.7	.9724
24.8	.9764
24.9	.9803
25.0	.9843
25.1	.9882
25.2	.9921
25.3	.9961
25.4	1.0



Tap Sizes	MM Tap Drill	Drill Dia. in Inches
M1 x 0.25	0.75	.0295
M1.1 x 0.25	0.85	.0335
M1.2 x 0.25	0.95	.0374
M1.4 x 0.3	1.10	.0433
M1.6 x 0.35	1.25	.0492
M1.8 x 0.35	1.45	.0571
M2 x 0.4	1.60	.0630
M2.2 x 0.45	1.75	.0689
M2.5 x 0.45	2.05	.0807
M3 x 0.5	2.50	.0984
M3.5 x 0.6	2.90	.1142
M4 x 0.7	3.30	.1299
M4.5 x 0.75	3.70	.1457
M5 x 0.8	4.20	.1654
M6 x 1	5.00	.1969
M7 x 1	6.00	.2362
M8 x 1.25	6.75	.2657
M8 x 1	7.00	.2756
M10 x 1.5	8.50	.3346
M10 x 1.25	8.75	.3445
M12 x 1.75	10.20	.4016
M12 x 1.25	10.80	.4252

Tap Sizes	MM Tap Drill	Drill Dia. in Inches
M14 x 2	12.00	.4724
M14 x 1.5	12.50	.4921
M16 x 2	14.00	.5512
M16 x 1.5	14.50	.5709
M18 x 2.5	15.50	.6102
M18 x 1.5	16.50	.6496
M20 x 2.5	17.50	.6890
M20 x 1.5	18.50	.7283
M22 x 2.5	19.50	.7677
M22 x 1.5	20.50	.8071
M24 x 3	21.00	.8268
M24 x 2	22.00	.8661
M27 x 3	24.00	.9449
M27 x 2	25.00	.9843
M30 x 3.5	26.50	1.0433
M30 x 2	28.00	1.1024
M33 x 3.5	29.50	1.1614
M33 x 2	31.00	1.2205
M36 x 4	32.00	1.2598
M36 x 3	33.00	1.2992
M39 x 4	35.00	1.3780
M39 x 3	36.00	1.4173



°C	=	Degrees Celsius
DIA	=	Diameter
d	=	Depth of cut
F	=	Feed in Inches Per Minute (F)
°F	=	Degrees Fahrenheit
FPR	=	Feed Per Revolution (F)
FPT	=	Feed Per Tooth
IPM	=	Inches Per Minute
IPR	=	Inches Per Revolution
L	=	Length of Cut
MRR	=	Metal Removal Rate (cubic in./min.)
RPM	=	Revolutions Per Minute
SFM	=	Surface Feed Per Minute
SMPM	=	Surface Meters Per Minute
MMPR	=	Millimeters Per Revolution
T	=	Number of Teeth in a Cutter
TCm	=	Time Cutting in Minutes
TCs	=	Time Cutting in Seconds
TPI	=	Threads Per Inch
W	=	Width of Cut



MILL & LATHE FORMULAS

Cutting Speed (surface feet/min.)

$$\text{SFM} = 0.262 \times \text{DIA} \times \text{RPM}$$

Revolutions Per Minute

$$\text{RPM} = 3.82 \times \text{SFM} \div \text{DIA}$$

Feed Rate (in./min.)

$$\text{IPM} = \text{FPT} \times \text{T} \times \text{RPM}$$

Feed Per Revolution

$$\text{FPR} = \text{IPM} \div \text{RPM}$$

Feed Per Tooth (in)

$$\text{FPT} = \text{IPM} \div (\text{RPM} \times \text{T})$$

Metal Removal Rate

$$\text{MRR} = \text{W} \times \text{d} \times \text{F}$$

Converting IPR to IPM

$$\text{IPM} = \text{IPR} \times \text{RPM}$$

Converting IPM to IPR

$$\text{IPR} = \text{IPM} \div \text{RPM}$$

Converting SFM to SMPM

$$\text{SMPM} = \text{SFM} \times .3048$$

Converting IPR to MMPR

$$\text{MMPR} = \text{IPR} \times 25.40$$

Distance over Time (in minutes)

$$\text{L} = \text{IPM} \times \text{TCm}$$

Time Cutting over Distance (Mill) (Minutes)

$$\text{TCm} = \text{L} \div \text{IPM}$$

Time Cutting over Distance (Mill) (seconds)

$$\text{TCs} = \text{L} \div \text{IPM} \times 60$$

Time Cutting over Distance (Lathe) (seconds)

$$\text{TCs} = \text{L} \div (\text{IPR} \times \text{RPM}) \times 60$$

INCH METRIC CONVERSION

$$\text{mm} \times 0.03937 = \text{in.}$$

$$\text{in.} \times 25.4 = \text{mm}$$

$$\text{m} \times 39.37 = \text{in.}$$

$$\text{in.} \times 0.0254 = \text{m}$$

$$\text{m} \times 3.2808 = \text{ft}$$

$$\text{ft} \times 0.3048 = \text{m}$$

$$\text{m} \times 1.0936 = \text{yd}$$

$$\text{yd} \times 0.9144 = \text{m}$$

$$\text{km} \times 0.621 = \text{mi}$$

$$\text{mi} \times 1.6093 = \text{km}$$

Celsius to Fahrenheit

$$(\text{°C} \times 1.8) + 32 = \text{°F}$$

Fahrenheit to Celsius

$$(\text{°F} - 32) \div 1.8 = \text{°C}$$



INCH TAPS

$$\text{Tap Drill Size (inch)} = \text{Thread Diameter} - \frac{0.01299 \times \% \text{ of Full Thread}}{\text{Number of TPI}}$$

$$\% \text{ of Full Thread (inch)} = \text{number of TPI} \times \frac{\text{Major DIA of Thread} - \text{Drilled DIA}}{0.01299}$$

$$\text{IPM (Mill Tapping Feed Rate)} = \text{RPM} \div \text{TPI}$$

$$\text{IPR (Lathe Threading)} = 1 \div \text{TPI}$$

$$\text{Form Tap Drill Size} = \text{Basic Tap DIA} - \frac{0.0068 \times \% \text{ of Full Thread}}{\text{Number of TPI}}$$

Recommended 65% form thread:

$$\text{Form Tap Drill Size} = \text{Basic Tap DIA} - \frac{0.442}{\text{Number of TPI}}$$

METRIC TAPS

$$\text{Tap Drill Size (metric)} = \text{Thread Diameter (mm)} - \frac{\% \text{ of Full Thread} \times \text{MM Pitch}}{147.06}$$

$$\% \text{ of Full Thread (metric)} = \frac{147.06}{\text{MM Pitch}} \times [\text{Thread DIA (mm)} - \text{Drilled Hole DIA (mm)}]$$

$$\text{SMPM} = \text{RPM} \times \text{Metric Pitch}$$

Recommended 65% form thread:

$$\text{Form Tap Drill Size (metric)} = \text{Basic Tap DIA} - (.75 \times \text{pitch (in metric)} \times .65)$$



FIND TAP DRILL SIZES ON ANY BASIC SIZE THREAD for an Approximate 75% Thread

NC/NF INCH & ISO METRIC

Major dia. less thread pitch = Tap drill size

Note: thread pitch = 1.0 inch divided by threads per inch (TPI)

Inch Example:

$$(1 \div 16 = .0625)$$

$$3/8 - 16 = .375 - .0625 = .3125 \text{ tap drill}$$

Metric Example:

$$M10 - 1.5 = 10 - 1.5 = M8.5 \text{ tap drill}$$

**CONVERT MINUTES OF A DEGREE TO A DECIMAL:****Divide minutes by 60**

degree minutes to convert:	$30^{\circ} 42'$
divide minutes by 60:	$42 \div 60 = 0.7$
bring down degrees:	30.7°

CONVERT MINUTES AND SECONDS TO DECIMAL:**Divide seconds, then minutes by 60**

degree minutes and seconds to convert:	$30^{\circ} 41' 15''$
divide seconds by 60:	$15 \div 60 = 0.25$
divide decimal minutes by 60:	$41.25 \div 60 = 0.6875$
bring down degrees:	30.6875°

CONVERT A DECIMAL DEGREE TO MINUTES:**Multiply decimal by 60**

decimal degree to convert:	30.7°
multiply decimal degree by 60:	$0.7 \times 60 = 42'$
bring down degrees:	$30^{\circ} 42'$

CONVERT DECIMAL TO MINUTES AND SECONDS:**Multiply decimal by 60**

decimal degree to convert:	30.6875°
multiply the degree decimal by 60:	$0.6875 \times 60 = 41.25'$
multiply decimal minutes by 60:	$0.25 \times 60 = 15''$
bring down degrees:	$30^{\circ} 41' 15''$

**January**

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

February

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28			

March

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

April

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

May

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

June

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30

July

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

August

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

September

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

October

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

November

S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	

December

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					



January

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

February

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	

March

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

April

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30			

May

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

June

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30					

July

S	M	T	W	T	F	S
		1	2	3	4	5
6	7	8	9	10	11	12
13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		

August

S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
10	11	12	13	14	15	16
17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

September

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30				

October

S	M	T	W	T	F	S
			1	2	3	4
5	6	7	8	9	10	11
12	13	14	15	16	17	18
19	20	21	22	23	24	25
26	27	28	29	30	31	

November

S	M	T	W	T	F	S
						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30						

December

S	M	T	W	T	F	S
	1	2	3	4	5	6
7	8	9	10	11	12	13
14	15	16	17	18	19	20
21	22	23	24	25	26	27
28	29	30	31			

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S	M	T	W	T	F	S
				1	2	3
4	5	6	7	8	9	10
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18	19	20	21	22	23	24
25	26	27	28	29	30	31

February

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
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March

S	M	T	W	T	F	S
1	2	3	4	5	6	7
8	9	10	11	12	13	14
15	16	17	18	19	20	21
22	23	24	25	26	27	28
29	30	31				

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S	M	T	W	T	F	S	
				1	2	3	4
5	6	7	8	9	10	11	
12	13	14	15	16	17	18	
19	20	21	22	23	24	25	
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S	M	T	W	T	F	S
					1	2
3	4	5	6	7	8	9
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17	18	19	20	21	22	23
24	25	26	27	28	29	30
31						

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S	M	T	W	T	F	S	
		1	2	3	4	5	6
7	8	9	10	11	12	13	
14	15	16	17	18	19	20	
21	22	23	24	25	26	27	
28	29	30					

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S	M	T	W	T	F	S	
				1	2	3	4
5	6	7	8	9	10	11	
12	13	14	15	16	17	18	
19	20	21	22	23	24	25	
26	27	28	29	30	31		

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						1
2	3	4	5	6	7	8
9	10	11	12	13	14	15
16	17	18	19	20	21	22
23	24	25	26	27	28	29
30	31					

September

S	M	T	W	T	F	S	
			1	2	3	4	5
6	7	8	9	10	11	12	
13	14	15	16	17	18	19	
20	21	22	23	24	25	26	
27	28	29	30				

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4	5	6	7	8	9	10
11	12	13	14	15	16	17
18	19	20	21	22	23	24
25	26	27	28	29	30	31

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1	2	3	4	5	6	7
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29	30					

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13	14	15	16	17	18	19
20	21	22	23	24	25	26
27	28	29	30	31		



