

TAPPING SPEED GUIDE

| MATERIALS | | | SPEED FEET PER MINUTE | MATERIALS | | | SPEED FEET PER MINUTE |
|-------------------------|--------------------------------|-----------------|-----------------------|-------------------------------------|-------------------------|-----------|-----------------------|
| Aluminum Alloys | | | 90-100 | (Steel, Cont.) Carbon Steel, Plain | Annealed | 40-80 | |
| Brass | | | 60-100 | | Tempered | 15-40 | |
| Bronze | | | 40-60 | Cast, Carbon | Annealed | 40-50 | |
| Copper | | | 40-60 | | Tempered | 30 | |
| High Temperature Alloys | | | Cobalt Base | Cast, Corrosion Resistant, | Annealed | 20-30 | |
| | | | | | Iron Base | as Cast | 20-25 |
| | | | | | Nickel Base | Low Alloy | Annealed | 30-45 |
| Iron | Ductile | Annealed | 60 | Precipitation Hardening, Stainless | Tempered | 15-25 | |
| | | as Cast | 30 | | Treated | 10-15 | |
| | | Tempered | 15-20 | | Annealed | 15-45 | |
| | Gray, | Annealed | 80 | | Tempered | 15-25 | |
| | | As Cast | 35-60 | | Annealed | 45-75 | |
| | Malleable | | 60 | | Tool Steels, High Speed | Annealed | 15-25 |
| Magnesium Alloys | | Heat Treated | 25-50 | Water Hardening | Annealed | 50 | |
| | | Annealed | 175 | Ultra High Strength Steels | Annealed | 35 | |
| Manganese | | | 20 | | Normalized | 20 | |
| Molybdenum Alloys | | Stress Relieved | 50 | | Tempered | 3-7 | |
| Monel | | Annealed | 20 | Maraging Steels | Annealed | 20-15 | |
| Nickel Alloys | | Annealed | 25 | | Maraged | 5-10 | |
| Plastics, | Reinforced | | 25 | Tantalum Alloys, Stress Relieved | | 3 | |
| | Thermoplastics | | 50 | Titanium Alloys, Commercial Pure, | Annealed | 40-60 | |
| | Thermosetting Plastics | | 50 | Alpha & Alpha Beta Alloys, | Annealed | 10-25 | |
| Steels, | Alloys, Annealed or Cold Drawn | | 40-60 | Tungsten Alloys, Pressed & Sintered | | 50 | |
| | Quenched & Tempered | | 15-35 | Zinc Alloys | Die Cast | 150 | |
| | Armor Plate | | 10 | | | | |

CONVERSION TABLE, SURFACE FEET PER MINUTE TO REVOLUTIONS PER MINUTE

| SPEED FEET PER MINUTE | 20 | 25 | 30 | 40 | 50 | 60 | 70 | 80 | 90 | 100 | 110 | 120 | 130 | 140 | 150 |
|-----------------------|------------------------|------|------|------|------|------|------|------|------|------|------|------|------|------|------|
| TAP SIZE | REVOLUTIONS PER MINUTE | | | | | | | | | | | | | | |
| 0 | 1273 | 1592 | 1910 | 2546 | 3183 | 3820 | 4456 | 5093 | 5730 | 6366 | 7003 | 7639 | 8276 | 8913 | 9549 |
| 1 | 1047 | 1308 | 1570 | 2093 | 2617 | 3140 | 3663 | 4186 | 4710 | 5233 | 5756 | 6279 | 6808 | 7326 | 7849 |
| 2 | 888 | 1110 | 1333 | 1777 | 2221 | 2665 | 3109 | 3554 | 3999 | 4442 | 4886 | 5330 | 5774 | 6218 | 6662 |
| 3 | 772 | 964 | 1157 | 1543 | 1929 | 2315 | 2701 | 3086 | 3472 | 3858 | 4244 | 4629 | 5015 | 5401 | 5787 |
| 4 | 682 | 853 | 1023 | 1364 | 1705 | 2046 | 2387 | 2728 | 3069 | 3411 | 3751 | 4092 | 4434 | 4775 | 5116 |
| 5 | 611 | 764 | 917 | 1222 | 1528 | 1833 | 2139 | 2445 | 2750 | 3056 | 3361 | 3667 | 3973 | 4278 | 4584 |
| 6 | 553 | 691 | 829 | 1106 | 1382 | 1658 | 1934 | 2211 | 2487 | 2764 | 3040 | 3316 | 3592 | 3869 | 4145 |
| 8 | 466 | 583 | 699 | 932 | 1165 | 1398 | 1631 | 1864 | 2097 | 2330 | 2563 | 2796 | 3029 | 3262 | 3495 |
| 10 | 401 | 502 | 603 | 804 | 1005 | 1205 | 1406 | 1607 | 1808 | 2009 | 2210 | 2411 | 2612 | 2813 | 3014 |
| 12 | 354 | 442 | 531 | 707 | 884 | 1061 | 1238 | 1415 | 1592 | 1769 | 1945 | 2122 | 2300 | 2476 | 2653 |
| 1/4 | 306 | 382 | 458 | 611 | 764 | 917 | 1070 | 1222 | 1375 | 1528 | 1681 | 1833 | 1986 | 2139 | 2292 |
| 5/16 | 245 | 306 | 367 | 489 | 611 | 733 | 856 | 978 | 1100 | 1222 | 1345 | 1467 | 1589 | 1711 | 1833 |
| 3/8 | 204 | 255 | 306 | 407 | 509 | 611 | 713 | 815 | 917 | 1019 | 1120 | 1222 | 1324 | 1426 | 1528 |
| 7/16 | 175 | 219 | 262 | 349 | 437 | 524 | 611 | 698 | 786 | 873 | 960 | 1048 | 1135 | 1222 | 1310 |
| 1/2 | 153 | 191 | 229 | 306 | 382 | 458 | 535 | 611 | 688 | 764 | 840 | 917 | 993 | 1070 | 1146 |
| 9/16 | 137 | 172 | 206 | 275 | 344 | 412 | 481 | 550 | 619 | 687 | 756 | 825 | 893 | 963 | 1031 |
| 5/8 | 122 | 153 | 183 | 244 | 306 | 367 | 428 | 489 | 550 | 611 | 672 | 733 | 794 | 856 | 917 |
| 3/4 | 102 | 128 | 153 | 203 | 255 | 306 | 357 | 407 | 458 | 509 | 560 | 611 | 662 | 713 | 764 |
| 7/8 | 87 | 109 | 131 | 175 | 218 | 262 | 306 | 350 | 392 | 437 | 480 | 524 | 568 | 611 | 655 |
| 1 | 76 | 96 | 115 | 153 | 191 | 230 | 268 | 306 | 344 | 382 | 420 | 458 | 497 | 535 | 573 |

STI STRAIGHT FLUTE TAPS

LIST 130

Plug
Bottom



| TAP SIZE | NO. OF FLUTES | PLUG STI EDP NUMBER | | | | BOTTOM STI EDP NUMBER | | | |
|-----------|---------------|---------------------|-------|-------|-------|-----------------------|-------|-------|-------|
| | | H-1 | H-2 | H-3 | H-4 | H-1 | H-2 | H-3 | H-4 |
| 2 - 56 | 3 | 52014 | 52022 | | | 52013 | 52023 | | |
| 4 - 40 | 3 | 54012 | 54022 | | | 54013 | 54023 | | |
| 5 - 40 | 3 | 54112 | 54122 | | | 54113 | 54123 | | |
| 6 - 32 | 3 | | 54222 | 54232 | | | 54223 | 54233 | |
| 6 - 40 | 3 | 54312 | 54322 | | | 54313 | 54323 | | |
| 8 - 32 | 3 | | 54422 | 54432 | | | 54423 | 54433 | |
| 10 - 24 | 3 | | 54522 | 54532 | | | 54523 | 54533 | |
| 10 - 32 | 3 | | 54622 | 54632 | | | 54623 | 54633 | |
| 12 - 24 | 3 | | 54722 | 54732 | | | 54723 | 54733 | |
| | | | | | | | | | |
| 1/4 - 20 | 3 | | 54822 | 54832 | | | 54823 | 54833 | |
| 1/4 - 28 | 3 | | 54922 | 54932 | | | 54923 | 54933 | |
| 5/16 - 18 | 4 | | | 55032 | 55042 | | | 55033 | 55043 |
| 5/16 - 24 | 4 | | 55122 | 55132 | | | 55123 | 55133 | |
| 3/8 - 16 | 4 | | | 55232 | 55242 | | | 55233 | 55243 |
| 3/8 - 24 | 4 | | 55322 | 55332 | | | 55323 | 55333 | |
| 7/16 - 14 | 4 | | | 55432 | 55442 | | | 55433 | 55443 |
| 7/16 - 20 | 4 | | | 55532 | 55542 | | | 55533 | 55543 |
| 1/2 - 13 | 4 | | | 55632 | 55642 | | | 55633 | 55643 |
| 1/2 - 20 | 4 | | | 55732 | 55742 | | | 55733 | 55743 |
| | | | | | | | | | |
| 5/8 - 11 | 4 | | | 55752 | | | | 55753 | |
| 5/8 - 18 | 4 | | | 55762 | | | | 55763 | |
| 3/4 - 10 | 4 | | | 55772 | | | | 55773 | |
| 3/4 - 16 | 4 | | | 55782 | | | | 55783 | |
| 7/8 - 9 | 4 | | | | 55792 | | | | 55793 |
| 7/8 - 14 | 4 | | | | 55802 | | | | 55803 |
| 1 - 8 | 4 | | | | 55812 | | | | 55813 |
| 1 - 14 | 4 | | | | 55822 | | | | 55823 |

SCREW THREAD INSERT (STI) TAP DRILL CHART

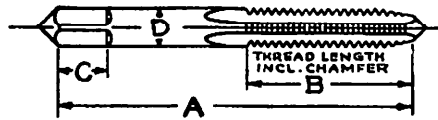
| NOMINAL THREAD SIZE (COARSE SERIES) | SUGGESTED DRILL SIZE (INCH) | | NOMINAL THREAD SIZE | SUGGESTED DRILL SIZE (INCH) | |
|---|-----------------------------|-----------------------------|---------------------------|-----------------------------|-----------------------------|
| | ALUMINUM | STEEL, MAGNESIUM PLASTIC | | ALUMINUM | STEEL, MAGNESIUM PLASTIC |
| M2.2X0.45 | #42 (.0935) | #42 (.0935) | 2 (.086)-56 | 3/32 (.0938) | #41 (.0960) |
| M2.5X0.45 | #37 (.1040) | #37 (.1040) | 3 (.099)-48 | #36 (.1065) | 7/64 (.1094) |
| M3X0.5 | 1/8 (.1250) | 1/8 (.1250) | 4 (.112)-40 | #31 (.1200) | #31 (.1200) |
| M3.5X0.6 | #27 (.1440) | #26 (.1470) | 5 (.125)-40 | 3.4mm (.1339) | #29 (.1360) |
| M4X0.7 | #19 (.1660) | #19 (.1660) | 6 (.138)-32 | #26 (.1470) | #25 (.1495) |
| M5X0.8 | #5 (.2055) | #4 (.2090) | 8 (.164)-32 | #17 (.1730) | #16 (.1770) |
| M6X1 | D (.2460) | 1/4 (.2500) | 10 (.190)-24 | 13/64 (.2031) | #5 (.2055) |
| M7X1 | L (.2900) | L (.2900) | 12 (.216)-24 | #1 (.2280) | #1 (.2280) |
| M8X1.25 | 21/64 (.3281) | Q (.3320) | 1/4 (.2500)-20 | H (.2660) | H (.2660) |
| M10X1.5 | Z (.4130) | Z (.4130) | 5/16 (.3125)-18 | Q (.3320) | Q (.3320) |
| M12X1.75 | 31/64 (.4844) | 1/2 (.5000) | 3/8 (.3750)-16 | X (.3970) | X (.3970) |
| M14X2 | 37/64 (.5781) | 37/64 (.5781) | 7/16 (.4375)-14 | 29/64 (.4531) | 29/64 (.4531) |
| M16X2 | 21/32 (.6562) | 21/32 (.6562) | 1/2 (.5000)-13 | 33/64 (.5156) | 17/32 (.5312) |
| M18X2.5 | 47/64 (.7344) | 47/64 (.7344) | 9/16 (.5625)-12 | 37/64 (.5781) | 19/32 (.5938) |
| M20X2.5 | 13/16 (.8125) | 13/16 (.8125) | 5/8 (.6250)-11 | 21/32 (.6562) | 21/32 (.6562) |
| M22X2.5 | 57/64 (.8906) | 57/64 (.8906) | 3/4 (.7500)-10 | 25/32 (.7812) | 25/32 (.7812) |
| M24X3 | 63/64 (.9844) | 63/64 (.9844) | 7/8 (.8750)-9 | 29/32 (.9062) | 29/32 (.9062) |
| M27X3 | 1-3/32 (1.0938) | 1-3/32 (1.0938) | 1 (1.0000)-8 | 1-1/32 (1.0312) | 1-1/32 (1.0312) |
| M30X3.5 | 1-7/32 (1.1288) | 1-7/32 (1.1288) | 1-1/8 (1.1250)-7 | 1-11/64 (1.1719) | 1-11/64 (1.1719) |
| M33X3.5 | 1-11/32 (1.3438) | 1-11/32 (1.3438) | 1-1/4 (1.2500)-7 | 1-19/64 (1.2969) | 1-19/64 (1.2969) |
| M36X4 | 1-29/64 (1.4531) | 1-15/32 (1.4688) | 1-3/8 (1.3750)-6 | 1-27/64 (1.4219) | 1-27/64 (1.4219) |
| M39X4 | 1-37/64 (1.5781) | 1-37/64 (1.5781) | 1-1/2 (1.5000)-6 | 1-35/64 (1.5469) | 1-35/64 (1.5469) |
| (FINE SERIES) | | | | | |
| M8X1 | 21/64 (.3281) | 21/64 (.3281) | 3 (.099)-56 | #37 (.1040) | #36 (.1065) |
| M10X1 | Y (.4040) | 13/32 (.4062) | 4 (.112)-48 | 3mm (.1181) | #31 (.1200) |
| M10X1.25 | Y (.4040) | 13/32 (.4062) | 6 (.138)-40 | #26 (.1470) | #25 (.1495) |
| M12X1.25 | 31/64 (.4844) | 31/64 (.4844) | 8 (.164)-36 | #17 (.1730) | #16 (.1770) |
| M12X1.5 | 31/64 (.4844) | 1/2 (.5000) | 10 (.190)-32 | #7 (.2010) | 13/64 (.2031) |
| M14X1.5 | 9/16 (.5625) | 37/64 (.5781) | 1/4 (.2500)-28 | G (.2610) | 6.7mm (.2638) |
| M16X1.5 | 41/64 (.6406) | 21/32 (.6562) | 5/16 (.3125)-24 | 21/64 (.3281) | 21/64 (.3281) |
| M18X1.5 | 23/32 (.7188) | 47/64 (.7344) | 3/8 (.3750)-24 | 25/64 (.3906) | 25/64 (.3906) |
| M20X1.5 | 51/64 (.7969) | 13/16 (.8125) | 7/16 (.4375)-20 | 29/64 (.4531) | 29/64 (.4531) |
| M22X1.5 | 7/8 (.8750) | 57/64 (.8906) | 1/2 (.5000)-20 | 33/64 (.5156) | 33/64 (.5156) |
| M18X2 | 47/64 (.7344) | 47/64 (.7344) | 9/16 (.5625)-18 | 37/64 (.5781) | 37/64 (.5781) |
| M20X2 | 13/16 (.8125) | 13/16 (.8125) | 5/8 (.6250)-18 | 41/64 (.6406) | 41/64 (.6406) |
| M22X2 | 57/64 (.8906) | 57/64 (.8906) | 3/4 (.7500)-16 | 49/64 (.7656) | 49/64 (.7656) |
| M24X2 | 31/32 (.9688) | 31/32 (.9688) | 7/8 (.8750)-14 | 57/64 (.8906) | 57/64 (.8906) |
| M27X2 | 1-5/64 (1.0781) | 1-3/32 (1.0938) | 1 (1.0000)-14 | 1-1/64 (1.0156) | 1-1/32 (1.0312) |
| M30X2 | 1-13/64 (1.2031) | 1-13/64 (1.2031) | 1 (1.0000)-12 | 1-1/64 (1.0156) | 1-1/32 (1.0312) |
| M33X2 | 1-5/16 (1.3125) | 1-21/64 (1.3281) | 1-1/8 (1.1250)-12 | 1-9/64 (1.1406) | 1-5/32 (1.1562) |
| M36X2 | 1-7/16 (1.4375) | 1-7/16 (1.4375) | 1-1/4 (1.2500)-12 | 1-17/64 (1.2656) | 1-9/32 (1.2812) |
| M39X2 | 1-35/64 (1.5469) | 1-9/16 (1.5625) | 1-3/8 (1.3750)-12 | 1-25/64 (1.3906) | 1-13/32 (1.4062) |
| M36X3 | 1-29/64 (1.4531) | 1-29/64 (1.4531) | 1-1/2 (1.5000)-12 | 1-33/64 (1.5156) | 1-17/32 (1.5312) |
| M39X3 | 1-9/16 (1.5625) | 1-9/16 (1.5625) | | | |

Table 60

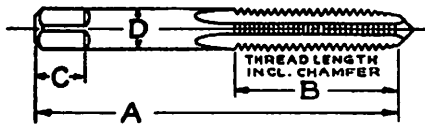
MACHINE SCREW AND HAND TAPS

For Helical Coil Wire Screw Thread Insert (STI)
High Speed Steel, Ground Thread

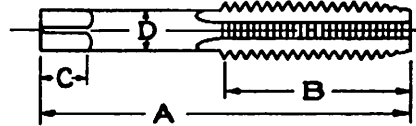
* These taps are oversize to the extent that the internal thread which they produce will accommodate a helical coil wire screw thread insert, which at final assembly will accept a screw thread of the nominal size and pitch.



STYLE 1



STYLE 2



STYLE 3

GENERAL DIMENSIONS

| * Nominal Size (STI) | Style | THREADS PER INCH | | DIMENSIONS — INCHES | | | | |
|----------------------|-------|------------------|--------|-------------------------------|-------------------------------|-------------------------------|------------------|------------------|
| | | NC UNC | NF UNF | Length Overall A | Length of Thread B | Length of Square C | Diam. of Shank D | Size of Square E |
| | | | | | | | | |
| 4 | 1 | 40 | .... | 2 | 1 ¹ / ₆ | 3 ¹ / ₆ | .141 | .110 |
| 5 | 1 | 40 | .... | 2 ¹ / ₈ | 3 ¹ / ₄ | 1 ¹ / ₄ | .168 | .131 |
| 6 | 1 | 32 | .... | 2 ³ / ₈ | 3 ¹ / ₈ | 1 ¹ / ₄ | .194 | .152 |
| 6 | 1 | .... | 40 | 2 ¹ / ₈ | 3 ¹ / ₄ | 1 ¹ / ₄ | .168 | .131 |
| 8 | 1 | 32 | .... | 2 ³ / ₈ | 1 ¹ / ₆ | 3 ¹ / ₂ | .220 | .165 |
| 10 | 2 | 24 | 32 | 2 ¹ / ₂ | 1 | 3 ¹ / ₆ | .255 | .191 |
| 12 | 2 | 24 | .... | 2 ¹ / ₂ | 1 | 3 ¹ / ₆ | .286 | .214 |
| 1/4 | 2 | 20 | 28 | 2 ³ / ₂ | 1 ¹ / ₆ | 3 ¹ / ₆ | .318 | .238 |
| 5/16 | 2 | 18 | 24 | 2 ¹ / ₆ | 1 ¹ / ₄ | 3 ¹ / ₆ | .381 | .286 |
| 3/8 | 3 | 16 | .... | 3 ³ / ₈ | 1 ¹ / ₂ | 3 ¹ / ₆ | .367 | .275 |
| 7/16 | 3 | .... | 24 | 3 ¹ / ₂ | 1 ¹ / ₆ | 1 ¹ / ₂ | .323 | .242 |
| 1/2 | 3 | 14 | .... | 3 ¹ / ₂ | 1 ¹ / ₂ | 1/2 | .429 | .322 |
| 5/8 | 3 | .... | 20 | 3 ³ / ₈ | 1 ¹ / ₂ | 3 ¹ / ₆ | .367 | .275 |
| 3/4 | 3 | 13 | .... | 3 ¹ / ₆ | 1 ¹ / ₆ | 3 ¹ / ₆ | .480 | .360 |
| 7/8 | 3 | .... | 20 | 3 ¹ / ₂ | 1 ¹ / ₂ | 1/2 | .429 | .322 |

(concluded on following page)

Table 60

MACHINE SCREW AND HAND TAPS

**For Helical Coil Wire Screw Thread Insert (STI)
High Speed Steel, Ground Thread (continued)**

GENERAL DIMENSIONS

| * Nominal Size (STI) | Style | THREADS PER INCH | | DIMENSIONS — INCHES | | | | |
|-------------------------------|-------|---------------------|-----------|------------------------|-----------------------------|-----------------------------|---------------------------|---------------------------|
| | | NC UNC | NF UNF | Length Overall A | Length of Thread B | Length of Square C | Diam. of Shank D | Size of Square E |
| | | | | | | | | |
| $\frac{1}{8}$ | 3 | 12 | .... | $4\frac{1}{32}$ | $1\frac{1}{16}$ | $\frac{5}{8}$ | .542 | .406 |
| $\frac{1}{8}$ | 3 | .... | 18 | $3\frac{1}{16}$ | $1\frac{1}{16}$ | $\frac{5}{8}$ | .480 | .360 |
| $\frac{5}{16}$ | 3 | 11 | .... | $4\frac{1}{4}$ | 2 | $\frac{1}{16}$ | .590 | .442 |
| $\frac{5}{16}$ | 3 | .... | 18 | $4\frac{1}{32}$ | $1\frac{1}{16}$ | $\frac{5}{8}$ | .542 | .406 |
| $\frac{3}{4}$ | 3 | 10 | .... | $4\frac{1}{16}$ | $2\frac{1}{32}$ | $\frac{3}{4}$ | .697 | .523 |
| $\frac{3}{4}$ | 3 | .... | 16 | $4\frac{1}{32}$ | 2 | $\frac{1}{16}$ | .652 | .489 |
| $\frac{7}{8}$ | 3 | 9 | .... | $5\frac{1}{8}$ | $2\frac{1}{2}$ | $\frac{1}{16}$ | .800 | .600 |
| $\frac{7}{8}$ | 3 | .... | 14 | $5\frac{1}{8}$ | $2\frac{1}{2}$ | $\frac{1}{16}$ | .800 | .600 |
| 1 | 3 | 8 | .... | $5\frac{1}{4}$ | $2\frac{1}{16}$ | 1 | 1.021 | .766 |
| 1 | 3 | .... | 12 | $5\frac{1}{8}$ | $2\frac{1}{16}$ | $\frac{7}{8}$ | .896 | .672 |
| 1 | 3 | .... | 14† | $5\frac{1}{8}$ | $2\frac{1}{16}$ | $\frac{7}{8}$ | .896 | .672 |
| $1\frac{1}{8}$ | 3 | 7 | .... | $6\frac{1}{8}$ | 3 | $1\frac{1}{8}$ | 1.108 | .831 |
| $1\frac{1}{8}$ | 3 | .... | 12 | $5\frac{1}{4}$ | $2\frac{1}{16}$ | 1 | 1.021 | .766 |
| $1\frac{1}{4}$ | 3 | 7 | .... | $6\frac{3}{8}$ | 3 | $1\frac{1}{8}$ | 1.233 | .925 |
| $1\frac{1}{4}$ | 3 | .... | 12 | $6\frac{1}{8}$ | 3 | $1\frac{1}{8}$ | 1.108 | .831 |
| $1\frac{3}{8}$ | 3 | 6 | .... | $6\frac{1}{16}$ | $3\frac{1}{8}$ | $1\frac{1}{8}$ | 1.305 | .979 |
| $1\frac{3}{8}$ | 3 | .... | 12 | $6\frac{3}{8}$ | 3 | $1\frac{1}{8}$ | 1.233 | .925 |
| $1\frac{1}{2}$ | 3 | 6 | .... | 7 | $3\frac{1}{8}$ | $1\frac{1}{4}$ | 1.430 | 1.072 |
| $1\frac{1}{2}$ | 3 | .... | 12 | $6\frac{1}{16}$ | $3\frac{1}{8}$ | $1\frac{1}{8}$ | 1.305 | .979 |

†NS-UNS