

Heli-Coil® drilling data – inch

The **minimum** drilling depths shown below allow for the following recommended practices:

1. Countersinking the drilled hole to prevent a feather edge at the start of the tapped hole.

2. 3/4 – 1-1/2 pitch of insert “set-down” to allow for maximum production tolerance. Dimensions are shown for both plug and bottoming taps.

Note: Plug taps 5/16" or M8 and smaller have a male center and the drilled hole depth dimensions allow for this length (one half of the diameter of the bolt). Calculation of dimension “F” is as follows:

TABLE V – INCH DRILLED HOLE DIMENSIONS

| Nominal Thread Size | Suggested Drill Size | | “F” MINIMUM DRILLING DEPTH FOR EACH INSERT LENGTH | | | | | | | | | |
|------------------------------------|----------------------|---------------------------|---|------------|--------|------------|--------|----------------|------------|--------|------------|--------|
| | | | Plug Taps | | | | | Bottoming Taps | | | | |
| | Aluminum | Steel, Magnesium, Plastic | 1 Dia. | 1-1/2 Dia. | 2 Dia. | 2-1/2 Dia. | 3 Dia. | 1 Dia. | 1-1/2 Dia. | 2 Dia. | 2-1/2 Dia. | 3 Dia. |
| UNIFIED COARSE THREAD (UNC) | | | | | | | | | | | | |
| 1 (.073)-64 | #47 (.0785) | #46 (.0810) | .203 | .240 | .276 | .313 | .349 | .136 | .172 | .209 | .245 | .282 |
| 2 (.086)-56 | 3/32 (.0938) | #41 (.0960) | .236 | .279 | .322 | .365 | .408 | .157 | .200 | .243 | .286 | .329 |
| 3 (.099)-48 | #36 (.1065) | 7/64 (.1094) | .273 | .323 | .372 | .422 | .471 | .182 | .232 | .281 | .331 | .380 |
| 4 (.112)-40 | #31 (.1200) | #31 (.1200) | .318 | .374 | .430 | .486 | .542 | .212 | .268 | .324 | .380 | .436 |
| 5 (.125)-40 | 3.4mm (.1339) | #29 (.1360) | .338 | .400 | .462 | .525 | .588 | .225 | .288 | .350 | .412 | .475 |
| 6 (.138)-32 | #26 (.1470) | #25 (.1495) | .394 | .464 | .532 | .602 | .670 | .263 | .332 | .401 | .470 | .539 |
| 8 (.164)-32 | #17 (.1730) | #16 (.1770) | .434 | .516 | .598 | .680 | .762 | .289 | .371 | .453 | .535 | .617 |
| 10 (.190)-24 | 13/64 (.2031) | #5 (.2055) | .535 | .630 | .725 | .820 | .915 | .357 | .452 | .547 | .642 | .737 |
| 12 (.216)-24* | #1 (.2280) | #1 (.2280) | .574 | .682 | .790 | .898 | 1.006 | .383 | .491 | .599 | .707 | .815 |
| 1/4 (.2500)-20 | H (.2660) | H (.2660) | .675 | .800 | .925 | 1.050 | 1.175 | .450 | .575 | .700 | .825 | .950 |
| 5/16 (.3125)-18 | Q (.3320) | Q (.3320) | .801 | .957 | 1.113 | 1.269 | 1.425 | .534 | .690 | .846 | 1.002 | 1.158 |
| 3/8 (.3750)-16 | X (.3970) | X (.3970) | .750 | .938 | 1.125 | 1.312 | 1.500 | .625 | .812 | 1.000 | 1.188 | 1.375 |
| 7/16 (.4375)-14 | 29/64 (.4531) | 29/64 (.4531) | .867 | 1.086 | 1.305 | 1.524 | 1.743 | .724 | .943 | 1.162 | 1.381 | 1.600 |
| 1/2 (.5000)-13* | 33/64 (.5156) | 17/32 (.5312) | .962 | 1.212 | 1.462 | 1.712 | 1.962 | .808 | 1.058 | 1.308 | 1.558 | 1.808 |
| 9/16 (.5625)-12* | 37/64 (.5781) | 19/32 (.5938) | 1.062 | 1.343 | 1.624 | 1.905 | 2.186 | .895 | 1.176 | 1.457 | 1.738 | 2.019 |
| 5/8 (.6250)-11 | 21/32 (.6562) | 21/32 (.6562) | 1.170 | 1.483 | 1.795 | 2.108 | 2.420 | .989 | 1.301 | 1.614 | 1.926 | 2.239 |
| 3/4 (.7500)-10 | 25/32 (.7812) | 25/32 (.7812) | 1.350 | 1.725 | 2.100 | 2.475 | 2.850 | 1.150 | 1.525 | 1.900 | 2.275 | 2.650 |
| 7/8 (.8750)-9 | 29/32 (.9062) | 29/32 (.9062) | 1.542 | 1.979 | 2.417 | 2.854 | 3.292 | 1.319 | 1.757 | 2.194 | 2.632 | 3.069 |
| 1 (1.000)-8 | 1-1/32 (1.0312) | 1-1/32 (1.0312) | 1.750 | 2.250 | 2.750 | 3.250 | 3.750 | 1.500 | 2.000 | 2.500 | 3.000 | 3.500 |
| 1-1/8 (1.1250)-7 | 1-11/64 (1.1719) | 1-11/64 (1.1719) | 1.982 | 2.545 | 3.107 | 3.670 | 4.232 | 1.696 | 2.259 | 2.821 | 3.384 | 3.946 |
| 1-1/4 (1.2500)-7 | 1-19/64 (1.2969) | 1-19/64 (1.2969) | 2.107 | 2.732 | 3.357 | 3.982 | 4.607 | 1.821 | 2.446 | 3.071 | 3.696 | 4.321 |
| 1-3/8 (1.3750)-6 | 1-27/64 (1.4219) | 1-27/64 (1.4219) | 2.375 | 3.062 | 3.750 | 4.437 | 5.125 | 2.042 | 2.729 | 3.417 | 4.104 | 4.792 |
| 1-1/2 (1.5000)-6 | 1-35/64 (1.5469) | 1-35/64 (1.5469) | 2.500 | 3.250 | 4.000 | 4.750 | 5.500 | 2.167 | 2.917 | 3.667 | 4.417 | 5.167 |
| UNIFIED FINE THREAD (UNF) | | | | | | | | | | | | |
| 2 (.086)-64 | 2.35mm (.0925) | 2.35mm (.0925) | .223 | .266 | .309 | .352 | .395 | .149 | .192 | .235 | .278 | .321 |
| 3 (.099)-56 | #37 (.1040) | #36 (.1065) | .256 | .305 | .355 | .404 | .454 | .170 | .220 | .269 | .319 | .368 |
| 4 (.112)-48 | 3mm (.1181) | #31 (.1200) | .293 | .349 | .405 | .461 | .517 | .195 | .251 | .307 | .363 | .419 |
| 6 (.138)-40 | #26 (.1470) | #25 (.1495) | .357 | .426 | .495 | .564 | .633 | .238 | .307 | .376 | .445 | .514 |
| 8 (.164)-36 | #17 (.1730) | #16 (.1770) | .413 | .495 | .577 | .659 | .741 | .275 | .357 | .439 | .521 | .603 |
| 10 (.190)-32 | #7 (.2010) | 13/64 (.2031) | .472 | .568 | .662 | .758 | .852 | .315 | .410 | .505 | .600 | .695 |
| 1/4 (.2500)-28 | G (.2610) | 6.7mm (.2638) | .589 | .714 | .839 | .964 | 1.089 | .393 | .518 | .643 | .768 | .893 |
| 5/16 (.3125)-24 | 21/64 (.3281) | 21/64 (.3281) | .718 | .874 | 1.030 | 1.186 | 1.342 | .479 | .635 | .791 | .947 | 1.103 |
| 3/8 (.3750)-24 | 25/64 (.3906) | 25/64 (.3906) | .625 | .812 | 1.000 | 1.187 | 1.375 | .542 | .729 | .917 | 1.104 | 1.292 |
| 7/16 (.4375)-20 | 29/64 (.4531) | 29/64 (.4531) | .738 | .957 | 1.176 | 1.395 | 1.614 | .638 | .857 | 1.076 | 1.295 | 1.514 |
| 1/2 (.5000)-20 | 33/64 (.5156) | 33/64 (.5156) | .800 | 1.050 | 1.300 | 1.550 | 1.800 | .700 | .950 | 1.200 | 1.450 | 1.700 |
| 9/16 (.5625)-18 | 37/64 (.5781) | 37/64 (.5781) | .895 | 1.176 | 1.457 | 1.738 | 2.019 | .784 | 1.065 | 1.346 | 1.627 | 1.908 |
| 5/8 (.6250)-18 | 41/64 (.6406) | 41/64 (.6406) | .958 | 1.271 | 1.583 | 1.896 | 2.208 | .847 | 1.160 | 1.472 | 1.785 | 2.097 |
| 3/4 (.7500)-16 | 49/64 (.7656) | 49/64 (.7656) | 1.125 | 1.500 | 1.875 | 2.250 | 2.625 | 1.000 | 1.375 | 1.750 | 2.125 | 2.500 |
| 7/8 (.8750)-14 | 57/64 (.8906) | 57/64 (.8906) | 1.304 | 1.741 | 2.179 | 2.616 | 3.054 | 1.161 | 1.598 | 2.036 | 2.473 | 2.911 |
| 1 (1.000)-14 | 1-1/64 (1.0156) | 1-1/32 (1.0312) | 1.429 | 1.929 | 2.429 | 2.929 | 3.429 | 1.286 | 1.786 | 2.286 | 2.786 | 3.286 |
| 1 (1.000)-12* | 1-1/64 (1.0156) | 1-1/32 (1.0312) | 1.500 | 2.000 | 2.500 | 3.000 | 3.500 | 1.333 | 1.833 | 2.333 | 2.833 | 3.333 |
| 1-1/8 (1.1250)-12* | 1-9/64 (1.1406) | 1-5/32 (1.1562) | 1.625 | 2.187 | 2.750 | 3.312 | 3.875 | 1.458 | 2.021 | 2.583 | 3.146 | 3.708 |
| 1-1/4 (1.2500)-12* | 1-17/64 (1.2656) | 1-9/32 (1.2812) | 1.750 | 2.375 | 3.000 | 3.625 | 4.250 | 1.583 | 2.208 | 2.833 | 3.458 | 4.083 |
| 1-3/8 (1.3750)-12* | 1-25/64 (1.3906) | 1-13/32 (1.4062) | 1.875 | 2.562 | 3.250 | 3.937 | 4.625 | 1.708 | 2.396 | 3.083 | 3.771 | 4.458 |
| 1-1/2 (1.5000)-12* | 1-33/64 (1.5156) | 1-17/32 (1.5312) | 2.000 | 2.750 | 3.500 | 4.250 | 5.000 | 1.833 | 2.583 | 3.333 | 4.083 | 4.833 |

*Standard size drills are suggested even though in these sizes they vary slightly from minor diameter specifications in NASM33537.

Heli-Coil® insert specifications – metric

| Nominal Thread Size | Type | | Size Designation | "Q" Nominal Length | | | | | Outside Diameter | | Number of Coils Nominal Length | | | | |
|---------------------|---------------------|-----------------------|------------------|--------------------|------------|--------|------------|--------|------------------|-------|--------------------------------|------------|--------|------------|--------|
| | Standard Insert No. | Screw-Lock Insert No. | | 1 Dia. | 1-1/2 Dia. | 2 Dia. | 2-1/2 Dia. | 3 Dia. | Min. | Max. | 1 Dia. | 1-1/2 Dia. | 2 Dia. | 2-1/2 Dia. | 3 Dia. |
| | | | | METRIC COARSE | | | | | | | | | | | |
| M2x0.4 | 1084 | 4184* | 2CN | 2.0 | 3.0 | 4.0 | 5.0 | 6.0 | 2.50 | 2.70 | 3-1/2 | 5-1/2 | 7-3/4 | 10-1/8 | 12-3/8 |
| M2.2x0.45 | 1084 | 4184 | 2.2CN | 2.2 | 3.3 | 4.4 | 5.5 | 6.6 | 2.80 | 3.00 | 3-1/8 | 5-3/8 | 7-5/8 | 9-7/8 | 12-1/8 |
| M2.5x0.45 | 1084 | 4184 | 2.5CN | 2.5 | 3.8 | 5.0 | 6.3 | 7.5 | 3.20 | 3.70 | 3-3/8 | 5-3/4 | 8-1/8 | 10-1/2 | 12-3/4 |
| M3x0.5 | 1084 | 4184 | 3CN | 3.0 | 4.5 | 6.0 | 7.5 | 9.0 | 3.80 | 4.35 | 3-3/4 | 6-3/8 | 8-7/8 | 11-3/8 | 13-7/8 |
| M3.5x0.6 | 1084 | 4184 | 3.5CN | 3.5 | 5.3 | 7.0 | 8.8 | 10.5 | 4.40 | 4.95 | 3-3/4 | 6-3/8 | 8-3/4 | 11-3/8 | 13-3/4 |
| M4x0.7 | 1084 | 4184 | 4CN | 4.0 | 6.0 | 8.0 | 10.0 | 12.0 | 5.05 | 5.60 | 3-5/8 | 6-1/8 | 8-5/8 | 11-1/8 | 13-5/8 |
| M5x0.8 | 1084 | 4184 | 5CN | 5.0 | 7.5 | 10.0 | 12.5 | 15.0 | 6.25 | 6.80 | 4-1/8 | 6-7/8 | 9-5/8 | 12-3/8 | 15-1/8 |
| M6x1 | 1084 | 4184 | 6CN | 6.0 | 9.0 | 12.0 | 15.0 | 18.0 | 7.40 | 7.95 | 4 | 6-3/4 | 9-1/2 | 12-1/8 | 14-7/8 |
| M7x1 | 1084 | 4184 | 7CN | 7.0 | 10.5 | 14.0 | 17.5 | 21.0 | 8.65 | 9.20 | 4-7/8 | 8 | 11-1/8 | 14-1/8 | 17-1/4 |
| M8x1.25 | 1084 | 4184 | 8CN | 8.0 | 12.0 | 16.0 | 20.0 | 24.0 | 9.80 | 10.35 | 4-1/2 | 7-3/8 | 10-1/4 | 13-1/4 | 16-1/8 |
| M10x1.5 | 1084 | 4184 | 10CN | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 11.95 | 12.50 | 4-7/8 | 8 | 11-1/8 | 14-1/4 | 17-3/8 |
| M12x1.75 | 1084 | 4184 | 12CN | 12.0 | 18.0 | 24.0 | 30.0 | 36.0 | 14.30 | 15.00 | 5 | 8-1/4 | 11-1/2 | 14-5/8 | 17-7/8 |
| M14x2 | 1084 | 4184 | 14CN | 14.0 | 21.0 | 28.0 | 35.0 | 42.0 | 16.65 | 17.35 | 5-1/8 | 8-1/2 | 11-3/4 | 15 | 18-3/8 |
| M16x2 | 1084 | 4184 | 16CN | 16.0 | 24.0 | 32.0 | 40.0 | 48.0 | 18.90 | 19.60 | 6-1/8 | 9-3/4 | 13-1/2 | 17-1/4 | 21 |
| M18x2.5 | 1084 | 4184 | 18CN | 18.0 | 27.0 | 36.0 | 45.0 | 54.0 | 21.30 | 22.0 | 5-3/8 | 8-7/8 | 12-1/4 | 15-5/8 | 19 |
| M20x2.5 | 1084 | 4184 | 20CN | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 23.55 | 24.40 | 6-1/8 | 9-7/8 | 13-5/8 | 17-3/8 | 21-1/8 |
| M22x2.5 | 1084 | 4184 | 22CN | 22.0 | 33.0 | 44.0 | 55.0 | 66.0 | 25.90 | 26.90 | 6-3/4 | 10-7/8 | 14-7/8 | 19 | 23-1/8 |
| M24x3 | 1084 | 4184 | 24CN | 24.0 | 36.0 | 48.0 | 60.0 | 72.0 | 28.00 | 29.00 | 6-1/8 | 10 | 13-3/4 | 17-1/2 | 21-3/8 |
| M27x3 | 1084 | 4184 | 27CN | 27.0 | 40.5 | 54.0 | 67.5 | 81.0 | 31.40 | 32.40 | 7 | 11-1/4 | 15-1/2 | 19-3/4 | 24 |
| M30x3.5 | 1084 | 4184 | 30CN | 30.0 | 45.0 | 60.0 | 75.0 | 90.0 | 34.80 | 36.00 | 6-3/4 | 10-3/4 | 14-7/8 | 18-7/8 | 23 |
| M33x3.5 | 1084 | 4184 | 33CN | 33.0 | 49.5 | 66.0 | 82.5 | 99.0 | 37.80 | 39.20 | 7-1/2 | 12 | 16-1/2 | 21 | 25-3/8 |
| M36x4 | 1084 | 4184 | 36CN | 36.0 | 54.0 | 72.0 | 90.0 | 108.0 | 41.50 | 42.90 | 7-1/8 | 11-3/8 | 15-5/8 | 19-7/8 | 24-1/4 |
| M39x4 | 1084 | 4184 | 39CN | 39.0 | 58.5 | 78.0 | 97.5 | 117.0 | 44.60 | 46.00 | 7-7/8 | 12-1/2 | 17-1/8 | 21-3/4 | 26-3/8 |
| METRIC FINE | | | | | | | | | | | | | | | |
| M8x1 | 4255 | 5255 | 8CN | 8.0 | 12.0 | 16.0 | 20.0 | 24.0 | 9.70 | 10.25 | 5-7/8 | 9-3/8 | 13 | 16-1/2 | 20-1/8 |
| M10x1 | 4255 | 5255 | 10CN | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 11.95 | 12.50 | 5-7/8 | 12 | 16-1/2 | 21 | 25-1/2 |
| M10x1.25 | 4649 | 5649 | 10CN | 10.0 | 15.0 | 20.0 | 25.0 | 30.0 | 12.10 | 12.65 | 5-7/8 | 9-1/2 | 13-1/8 | 16-3/4 | 20-3/8 |
| M12x1.25 | 4649 | 5649 | 12CN | 12.0 | 18.0 | 24.0 | 30.0 | 36.0 | 14.30 | 15.00 | 7-1/4 | 11-5/8 | 15-7/8 | 20-1/4 | 24-1/2 |
| M12x1.5 | 3745 | 5145 | 12CN | 12.0 | 18.0 | 24.0 | 30.0 | 36.0 | 14.25 | 14.95 | 6 | 9-5/8 | 13-3/8 | 17 | 20-3/4 |
| M14x1.5 | 3745 | 5145 | 14CN | 14.0 | 21.0 | 28.0 | 35.0 | 42.0 | 16.55 | 17.25 | 7-1/8 | 11-3/8 | 15-5/8 | 20 | 24-1/4 |
| M16x1.5 | 3745 | 5145 | 16CN | 16.0 | 24.0 | 32.0 | 40.0 | 48.0 | 18.90 | 19.60 | 8-1/4 | 13-1/8 | 18 | 22-3/4 | 27-5/8 |
| M18x1.5 | 3745 | 5145 | 18CN | 18.0 | 27.0 | 36.0 | 45.0 | 54.0 | 21.05 | 21.75 | 9-1/2 | 15 | 20-3/8 | 25-7/8 | 31-3/8 |
| M20x1.5 | 3745 | 5145 | 20CN | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 23.15 | 24.00 | 10-3/4 | 16-7/8 | 22-7/8 | 28-7/8 | 35 |
| M22x1.5 | 3745 | 5145 | 22CN | 22.0 | 33.0 | 44.0 | 55.0 | 66.0 | 25.55 | 26.45 | 11-7/8 | 18-1/2 | 25-1/8 | 31-5/8 | 38-1/4 |
| M18x2 | 4266 | 5266 | 18CN | 18.0 | 27.0 | 36.0 | 45.0 | 54.0 | 21.15 | 21.85 | 7 | 11-1/8 | 15-3/8 | 19-1/2 | 23-5/8 |
| M20x2 | 4266 | 5266 | 20CN | 20.0 | 30.0 | 40.0 | 50.0 | 60.0 | 23.20 | 24.05 | 7-7/8 | 12-1/2 | 17-1/4 | 21-7/8 | 26-1/2 |
| M22x2 | 4266 | 5266 | 22CN | 22.0 | 33.0 | 44.0 | 55.0 | 66.0 | 25.60 | 26.50 | 8-3/4 | 13-3/4 | 18-7/8 | 23-7/8 | 29 |
| M24x2 | 4266 | 5266 | 24CN | 24.0 | 36.0 | 48.0 | 60.0 | 72.0 | 28.10 | 29.10 | 9-1/2 | 15 | 20-3/8 | 25-7/8 | 31-1/4 |
| M27x2 | 4266 | 5266 | 27CN | 27.0 | 40.5 | 54.0 | 67.5 | 81.0 | 31.30 | 32.30 | 10-7/8 | 17 | 23-1/4 | 29-3/8 | 35-1/2 |
| M30x2 | 4266 | 5266 | 30CN | 30.0 | 45.0 | 60.0 | 75.0 | 90.0 | 34.50 | 35.70 | 12-1/4 | 19-1/8 | 25-7/8 | 32-3/4 | 39-1/2 |
| M33x2 | 4266 | 5266 | 33CN | 33.0 | 49.5 | 66.0 | 82.5 | 99.0 | 37.80 | 39.20 | 13-5/8 | 21-1/8 | 28-5/8 | 36 | 43-1/2 |
| M36x2 | 4266 | 5266 | 36CN | 36.0 | 54.0 | 72.0 | 90.0 | 108.0 | 41.00 | 42.40 | 15 | 23-1/4 | 31-3/8 | 39-1/2 | 47-3/4 |
| M39x2 | 4266 | 5266 | 39CN | 39.0 | 58.5 | 78.0 | 97.5 | 117.0 | 44.30 | 45.70 | 16-3/8 | 25-1/4 | 34-1/8 | 43 | 51-7/8 |
| M36x3 | 4277 | 5277 | 36CN | 36.0 | 54.0 | 72.0 | 90.0 | 108.0 | 41.30 | 42.70 | 9-3/4 | 15-1/4 | 20-7/8 | 26-1/2 | 32 |
| M39x3 | 4277 | 5277 | 39CN | 39.0 | 58.5 | 78.0 | 97.5 | 117.0 | 44.40 | 45.80 | 10-3/4 | 16-3/4 | 22-3/4 | 28-7/8 | 34-7/8 |

*M2 not available in Screen-Lock 1 diameter length

1084-4CNY060S

Complete Part No. Example: Free Running Insert; M4 x 0.7
Stainless Steel; Cadmium; 1 dia.; On Strip

| | | | | | |
|--|-------------|---|--|---------------|--------------------------------|
| Type | Size | Material | Finish | Length | Packaging |
| 1084 Free Running, Coarse 4255, 4649, 3745, 4266 & 4277 Free Running, Fine 4184 Screw-Lock, Coarse 5255, 5649, 5145, 5266 & 5277 Screw-Lock, Fine | See Chart | CN – Stainless Steel BN – Phosphor Bronze TN – Inconel X EN – Nitronic 60 GN – Titanium | Blank – None Y – Cadmium V – Silver W – Dry Film Lubricant PF – Primer Free II | See Chart | Blank – Bulk S – Strip Feed |

Notes on Insert Specifications:

- Nominal length is a computed value and cannot be measured. It is the actual assembled length + 1/2 pitch.
- The number of coils are counted from the notch.
- Phosphor Bronze Inserts – **Not available** in sizes M2, M2.2, M2.5, M3, M3.5 and M4.
- Inconel X Inserts – 1 diameter long Screw-Lock inserts **not available** in sizes M2, M2.2, M2.5 and M3.