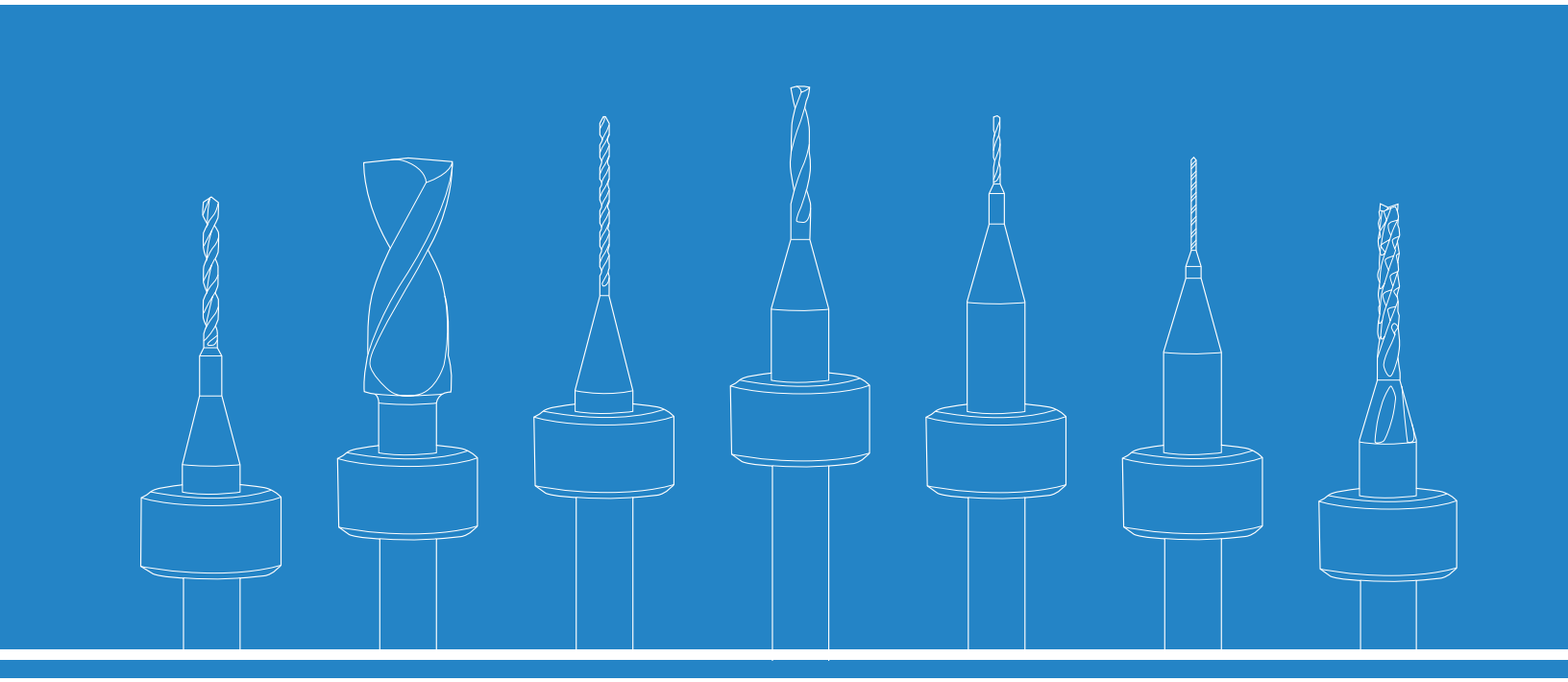
KYOCERA

# PRINTED CIRCUIT BOARD

## RECOMMENDED CUTTING CONDITIONS



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## DRILLING RECOMMENDATIONS

The drilling parameters provided are engineered for Kyocera Precision Tools' designs and are provided as a reference, or starting point, for drilling process development. For additional engineering support, please contact your local Kyocera Precision Tools office.

## ROUTING RECOMMENDATIONS

The routing parameters provided were developed for applications using Kyocera's Series 2300 & 4100 router designs.

# **BT Epoxy** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 10 | 80 | 200 | -0.011 | 300 | 0.13 | 84 |
| 0.13mm | 0.0050 | 10 | 80 | 300 | -0.011 | 300 | 0.13 | 105 |
| 0.15mm | 0.0059 | 13 | 80 | 300 | -0.011 | 300 | 0.16 | 124 |
| #96 | 0.0063 | 15 | 80 | 400 | -0.011 | 300 | 0.19 | 132 |
| #95 | 0.0067 | 16 | 80 | 400 | -0.012 | 300 | 0.20 | 140 |
| #94 | 0.0071 | 19 | 80 | 500 | -0.012 | 300 | 0.24 | 149 |
| #93 | 0.0075 | 21 | 80 | 500 | -0.012 | 300 | 0.26 | 157 |
| #92 | 0.0079 | 23 | 80 | 500 | -0.012 | 300 | 0.29 | 165 |
| #91 | 0.0083 | 27 | 80 | 600 | -0.012 | 300 | 0.34 | 174 |
| #90 | 0.0087 | 30 | 80 | 600 | -0.012 | 300 | 0.38 | 182 |
| #89 | 0.0091 | 32 | 80 | 700 | -0.012 | 300 | 0.40 | 190 |
| #88 | 0.0095 | 33 | 80 | 700 | -0.012 | 300 | 0.41 | 199 |
| 0.25mm | 0.0098 | 37 | 80 | 800 | -0.012 | 500 | 0.46 | 205 |
| #87 | 0.0100 | 37 | 80 | 800 | -0.012 | 500 | 0.46 | 209 |
| #86 | 0.0105 | 40 | 80 | 800 | -0.012 | 500 | 0.50 | 220 |
| #85 | 0.0110 | 43 | 80 | 900 | -0.013 | 500 | 0.54 | 230 |
| #84 | 0.0115 | 45 | 80 | 900 | -0.013 | 500 | 0.56 | 241 |
| 0.30mm | 0.0118 | 47 | 80 | 1000 | -0.013 | 500 | 0.59 | 247 |
| #83 | 0.0120 | 48 | 80 | 1000 | -0.013 | 500 | 0.60 | 251 |
| #82 | 0.0125 | 51 | 80 | 1000 | -0.013 | 500 | 0.64 | 262 |
| #81 | 0.0130 | 57 | 80 | 1000 | -0.013 | 500 | 0.71 | 272 |
| #80 | 0.0135 | 62 | 80 | 1000 | -0.013 | 750 | 0.78 | 283 |
| 0.35mm | 0.0138 | 64 | 80 | 1000 | -0.013 | 750 | 0.80 | 289 |
| #79 | 0.0145 | 70 | 80 | 1000 | -0.013 | 750 | 0.88 | 304 |
| 1/64 | 0.0156 | 77 | 80 | 1000 | -0.014 | 750 | 0.96 | 327 |
| 0.40mm | 0.0158 | 78 | 80 | 1000 | -0.014 | 750 | 0.98 | 331 |
| #78 | 0.0160 | 80 | 80 | 1000 | -0.014 | 750 | 1.00 | 335 |
| 0.45mm | 0.0177 | 91 | 80 | 1000 | -0.014 | 750 | 1.14 | 371 |
| #77 | 0.0180 | 94 | 80 | 1000 | -0.014 | 750 | 1.18 | 375 |
| 0.50mm | 0.0197 | 96 | 73 | 1000 | -0.015 | 750 | 1.32 | 375 |
| #76 | 0.0200 | 96 | 72 | 1000 | -0.015 | 750 | 1.33 | 375 |
| #75 | 0.0210 | 98 | 68 | 1000 | -0.015 | 1000 | 1.44 | 375 |
| 0.55mm | 0.0217 | 100 | 66 | 1000 | -0.015 | 1000 | 1.52 | 375 |
| #74 | 0.0225 | 104 | 64 | 1000 | -0.015 | 1000 | 1.63 | 375 |
| 0.60mm | 0.0236 | 106 | 61 | 1000 | -0.016 | 1000 | 1.74 | 375 |
| #73 | 0.0240 | 108 | 60 | 1000 | -0.016 | 1000 | 1.80 | 375 |
| #72 | 0.0250 | 112 | 57 | 1000 | -0.016 | 1000 | 1.95 | 375 |
| 0.65mm | 0.0256 | 116 | 56 | 1000 | -0.016 | 1000 | 2.07 | 375 |
| #71 | 0.0260 | 118 | 55 | 1000 | -0.016 | 1000 | 2.14 | 375 |
| 0.70mm | 0.0276 | 124 | 52 | 1000 | -0.016 | 1000 | 2.39 | 375 |
| #70 | 0.0280 | 126 | 51 | 1000 | -0.017 | 1000 | 2.46 | 375 |
| #69 | 0.0292 | 123 | 49 | 1000 | -0.017 | 1000 | 2.51 | 375 |
| 0.75mm | 0.0295 | 123 | 49 | 1000 | -0.017 | 1000 | 2.53 | 375 |
| #68 | 0.0310 | 115 | 46 | 1000 | -0.017 | 1000 | 2.49 | 375 |
| 1/32 | 0.0312 | 115 | 46 | 1000 | -0.017 | 1000 | 2.50 | 375 |
| 0.80mm | 0.0315 | 113 | 45 | 1000 | -0.017 | 1000 | 2.48 | 375 |
| #67 | 0.0320 | 113 | 45 | 1000 | -0.017 | 1000 | 2.52 | 375 |
| #66 | 0.0330 | 108 | 43 | 1000 | -0.018 | 1000 | 2.49 | 375 |
| 0.85mm | 0.0335 | 108 | 43 | 1000 | -0.018 | 1000 | 2.52 | 375 |
| #65 | 0.0350 | 103 | 41 | 1000 | -0.018 | 1000 | 2.52 | 375 |
| 0.90mm | 0.0354 | 100 | 40 | 1000 | -0.018 | 1000 | 2.47 | 375 |
| #64 | 0.0360 | 100 | 40 | 1000 | -0.018 | 1000 | 2.51 | 375 |
| #63 | 0.0370 | 98 | 39 | 1000 | -0.019 | 1000 | 2.53 | 375 |
| 0.95mm | 0.0374 | 95 | 38 | 1000 | -0.019 | 1000 | 2.48 | 375 |
| #62 | 0.0380 | 95 | 38 | 1000 | -0.019 | 1000 | 2.52 | 375 |
| #61 | 0.0390 | 93 | 37 | 1000 | -0.019 | 1000 | 2.53 | 375 |
| 1.00mm | 0.0394 | 90 | 36 | 1000 | -0.019 | 1000 | 2.47 | 375 |
| #60 | 0.0400 | 90 | 36 | 1000 | -0.019 | 1000 | 2.51 | 375 |
| #59 | 0.0410 | 88 | 35 | 1000 | -0.020 | 1000 | 2.52 | 375 |
| 1.05mm | 0.0413 | 88 | 35 | 1000 | -0.020 | 1000 | 2.54 | 375 |
| #58 | 0.0420 | 85 | 34 | 1000 | -0.020 | 1000 | 2.49 | 375 |
| #57 | 0.0430 | 83 | 33 | 1000 | -0.020 | 1000 | 2.49 | 375 |
| 1.10mm | 0.0433 | 83 | 33 | 1000 | -0.020 | 1000 | 2.51 | 375 |
| 1.15mm | 0.0453 | 80 | 32 | 1000 | -0.021 | 1000 | 2.53 | 375 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 78 | 31 | 1000 | -0.021 | 1000 | 2.53 | 375 |
| 3/64 | 0.0469 | 78 | 31 | 1000 | -0.021 | 1000 | 2.55 | 375 |
| 1.20mm | 0.0472 | 75 | 30 | 1000 | -0.021 | 1000 | 2.47 | 375 |
| 1.25mm | 0.0492 | 73 | 29 | 1000 | -0.021 | 1000 | 2.51 | 375 |
| 1.30mm | 0.0512 | 70 | 28 | 1000 | -0.022 | 1000 | 2.50 | 375 |
| #55 | 0.0520 | 70 | 28 | 1000 | -0.022 | 1000 | 2.54 | 375 |
| 1.35mm | 0.0531 | 68 | 27 | 1000 | -0.022 | 1000 | 2.52 | 375 |
| #54 | 0.0550 | 65 | 26 | 1000 | -0.023 | 1000 | 2.49 | 375 |
| 1.40mm | 0.0551 | 65 | 26 | 1000 | -0.023 | 1000 | 2.50 | 375 |
| 1.45mm | 0.0571 | 63 | 25 | 1000 | -0.023 | 1000 | 2.51 | 375 |
| 1.50mm | 0.0591 | 60 | 24 | 1000 | -0.024 | 1000 | 2.47 | 375 |
| #53 | 0.0595 | 60 | 24 | 1000 | -0.024 | 1000 | 2.49 | 375 |
| 1.55mm | 0.0610 | 58 | 23 | 1000 | -0.024 | 1000 | 2.47 | 375 |
| 1/16 | 0.0625 | 58 | 23 | 1000 | -0.025 | 1000 | 2.53 | 375 |
| 1.60mm | 0.0630 | 58 | 23 | 1000 | -0.025 | 1000 | 2.55 | 375 |
| #52 | 0.0635 | 58 | 23 | 1000 | -0.025 | 1000 | 2.57 | 375 |
| 1.65mm | 0.0650 | 55 | 22 | 1000 | -0.025 | 1000 | 2.49 | 375 |
| 1.70mm | 0.0669 | 53 | 21 | 1000 | -0.026 | 1000 | 2.47 | 375 |
| #51 | 0.0670 | 53 | 21 | 1000 | -0.026 | 1000 | 2.48 | 375 |
| 1.75mm | 0.0689 | 52 | 21 | 1000 | -0.026 | 1000 | 2.48 | 379 |
| #50 | 0.0700 | 52 | 21 | 1000 | -0.026 | 1000 | 2.48 | 385 |
| 1.80mm | 0.0709 | 52 | 20 | 1000 | -0.027 | 1000 | 2.60 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 45 | 20 | 1000 | -0.018 | 500 | 2.25 | 659 |
| 3.25mm | 0.1280 | 45 | 20 | 1000 | -0.018 | 500 | 2.25 | 670 |
| #30 | 0.1285 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 672 |
| 3.30mm | 0.1299 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 680 |
| 3.35mm | 0.1319 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 690 |
| 3.40mm | 0.1339 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 701 |
| 3.45mm | 0.1358 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 711 |
| #29 | 0.1360 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 712 |
| 3.50mm | 0.1378 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 721 |
| 3.55mm | 0.1398 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 732 |
| #28 | 0.1405 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 735 |
| 9/64 | 0.1406 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 736 |
| 3.60mm | 0.1417 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 742 |
| 3.65mm | 0.1437 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 752 |
| #27 | 0.1440 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 754 |
| 3.70mm | 0.1457 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 762 |
| #26 | 0.1470 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 769 |
| 3.75mm | 0.1476 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 772 |
| #25 | 0.1495 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 782 |
| 3.80mm | 0.1496 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 783 |
| 3.85mm | 0.1516 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 793 |
| #24 | 0.1520 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 795 |
| 3.90mm | 0.1535 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 803 |
| #23 | 0.1540 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 806 |
| 3.95 | 0.1555 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 814 |
| 5/32 | 0.1562 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 817 |
| #22 | 0.1570 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 822 |
| 4.00mm | 0.1575 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 824 |
| #21 | 0.1590 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 832 |
| 4.05mm | 0.1594 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 834 |
| #20 | 0.1610 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 843 |
| 4.10mm | 0.1614 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 845 |
| 4.15mm | 0.1634 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 855 |
| 4.20mm | 0.1654 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 866 |
| #19 | 0.1660 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 869 |
| 4.25mm | 0.1673 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 876 |
| 4.30mm | 0.1693 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 886 |
| #18 | 0.1695 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 887 |
| 4.35mm | 0.1713 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 896 |
| 11/64 | 0.1719 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 900 |
| #17 | 0.1730 | 40 | 20 | 1000 | -0.021 | 200 | 2.00 | 905 |
| 4.40mm | 0.1732 | 40 | 20 | 1000 | -0.021 | 200 | 2.00 | 906 |
| 4.45mm | 0.1752 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 917 |
| #16 | 0.1770 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 926 |
| 4.50mm | 0.1772 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 927 |
| 4.55mm | 0.1792 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 938 |
| #15 | 0.1800 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 942 |
| 4.60mm | 0.1811 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 948 |
| #14 | 0.1820 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 952 |
| 4.65mm | 0.1831 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 958 |
| #13 | 0.1850 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 968 |
| 4.70mm | 0.1850 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 968 |
| 4.75mm | 0.1870 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 979 |
| 3/16 | 0.1875 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 981 |
| 4.80mm | 0.1890 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 989 |
| #12 | 0.1890 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 989 |
| 4.85mm | 0.1909 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 999 |
| #11 | 0.1910 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1000 |
| 4.90mm | 0.1929 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1010 |
| #10 | 0.1935 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1013 |
| 4.95mm | 0.1949 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1020 |
| #9 | 0.1960 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1026 |
| 5.00mm | 0.1968 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1030 |
| 5.05mm | 0.1988 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1040 |
| #8 | 0.1990 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1041 |
| 5.10mm | 0.2008 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1051 |
| #7 | 0.2010 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1052 |
| 5.15mm | 0.2028 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1061 |
| 13/64 | 0.2031 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1063 |
| #6 | 0.2040 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1068 |
| 5.20mm | 0.2047 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1071 |
| #5 | 0.2055 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1075 |

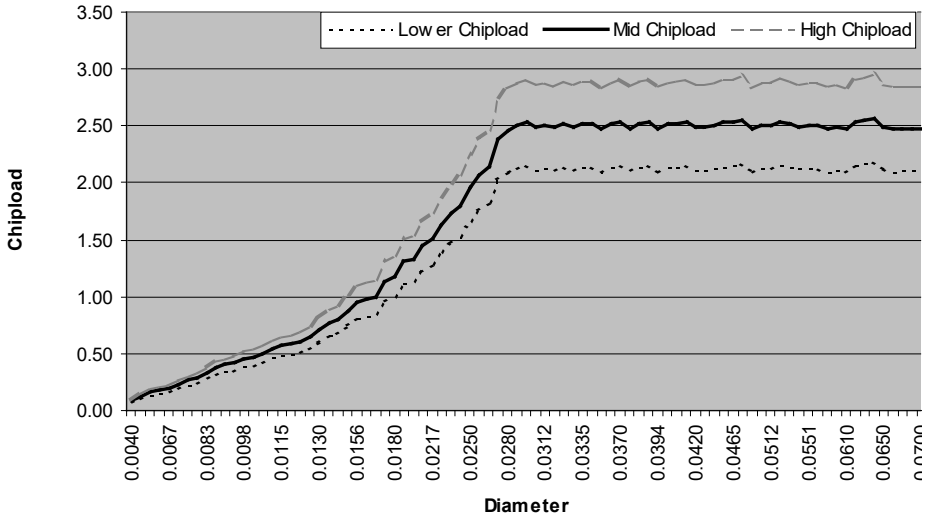
Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1082 |
| 5.30mm | 0.2087 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1092 |
| #4 | 0.2090 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1094 |
| 5.35mm | 0.2106 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1102 |
| 5.40mm | 0.2126 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1113 |
| #3 | 0.2130 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1115 |
| 5.45mm | 0.2146 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1123 |
| 5.50mm | 0.2165 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1133 |
| 5.55mm | 0.2185 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1143 |
| 7/32 | 0.2188 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1145 |
| 5.60mm | 0.2205 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1154 |
| #2 | 0.2210 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1157 |
| 5.65mm | 0.2224 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1164 |
| 5.70mm | 0.2244 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1174 |
| 5.75mm | 0.2264 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1185 |
| #1 | 0.2280 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1193 |
| 5.80mm | 0.2283 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1195 |
| 5.85mm | 0.2302 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1205 |
| 5.90mm | 0.2323 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1216 |
| A | 0.2340 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1225 |
| 5.95mm | 0.2343 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1226 |
| 15/64 | 0.2344 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for BT Epoxy




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Copper-Invar-Copper** PCB Material

(and other metal bonded designs)

**Recommended Drill Series:** 100, 150, 560, 580, 600

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 10 | 80 | 100 | -0.011 | 100 | 0.13 | 84 |
| 0.13mm | 0.0050 | 12 | 80 | 150 | -0.011 | 100 | 0.15 | 105 |
| 0.15mm | 0.0059 | 14 | 80 | 200 | -0.011 | 100 | 0.18 | 124 |
| #96 | 0.0063 | 15 | 80 | 200 | -0.011 | 100 | 0.19 | 132 |
| #95 | 0.0067 | 16 | 80 | 200 | -0.012 | 100 | 0.20 | 140 |
| #94 | 0.0071 | 17 | 80 | 300 | -0.012 | 100 | 0.21 | 149 |
| #93 | 0.0075 | 18 | 80 | 300 | -0.012 | 100 | 0.23 | 157 |
| #92 | 0.0079 | 19 | 80 | 400 | -0.012 | 150 | 0.24 | 165 |
| #91 | 0.0083 | 20 | 80 | 400 | -0.012 | 150 | 0.25 | 174 |
| #90 | 0.0087 | 22 | 80 | 500 | -0.012 | 150 | 0.28 | 182 |
| #89 | 0.0091 | 24 | 80 | 500 | -0.012 | 150 | 0.30 | 190 |
| #88 | 0.0095 | 25 | 80 | 500 | -0.012 | 150 | 0.31 | 199 |
| 0.25mm | 0.0098 | 26 | 80 | 500 | -0.012 | 200 | 0.33 | 205 |
| #87 | 0.0100 | 30 | 80 | 500 | -0.012 | 200 | 0.38 | 209 |
| #86 | 0.0105 | 34 | 80 | 600 | -0.012 | 200 | 0.43 | 220 |
| #85 | 0.0110 | 36 | 80 | 600 | -0.013 | 200 | 0.45 | 230 |
| #84 | 0.0115 | 40 | 80 | 700 | -0.013 | 200 | 0.50 | 241 |
| 0.30mm | 0.0118 | 42 | 80 | 700 | -0.013 | 200 | 0.53 | 247 |
| #83 | 0.0120 | 45 | 80 | 800 | -0.013 | 250 | 0.56 | 251 |
| #82 | 0.0125 | 50 | 80 | 800 | -0.013 | 250 | 0.63 | 262 |
| #81 | 0.0130 | 55 | 80 | 800 | -0.013 | 250 | 0.69 | 272 |
| #80 | 0.0135 | 60 | 80 | 800 | -0.013 | 250 | 0.75 | 283 |
| 0.35mm | 0.0138 | 63 | 80 | 800 | -0.013 | 250 | 0.79 | 289 |
| #79 | 0.0145 | 69 | 80 | 800 | -0.013 | 250 | 0.86 | 304 |
| 1/64 | 0.0156 | 72 | 80 | 800 | -0.014 | 300 | 0.90 | 327 |
| 0.40mm | 0.0158 | 73 | 80 | 800 | -0.014 | 300 | 0.91 | 331 |
| #78 | 0.0160 | 75 | 80 | 800 | -0.014 | 300 | 0.94 | 335 |
| 0.45mm | 0.0177 | 79 | 80 | 900 | -0.014 | 300 | 0.99 | 371 |
| #77 | 0.0180 | 80 | 80 | 900 | -0.014 | 300 | 1.00 | 377 |
| 0.50mm | 0.0197 | 80 | 78 | 900 | -0.015 | 300 | 1.03 | 400 |
| #76 | 0.0200 | 82 | 76 | 900 | -0.015 | 300 | 1.08 | 400 |
| #75 | 0.0210 | 84 | 73 | 1000 | -0.015 | 400 | 1.15 | 400 |
| 0.55mm | 0.0217 | 86 | 70 | 1000 | -0.015 | 400 | 1.23 | 400 |
| #74 | 0.0225 | 85 | 68 | 1000 | -0.015 | 400 | 1.25 | 400 |
| 0.60mm | 0.0236 | 84 | 65 | 1000 | -0.016 | 400 | 1.29 | 400 |
| #73 | 0.0240 | 83 | 64 | 1000 | -0.016 | 400 | 1.30 | 400 |
| #72 | 0.0250 | 83 | 61 | 1000 | -0.016 | 400 | 1.36 | 400 |
| 0.65mm | 0.0256 | 82 | 60 | 1000 | -0.016 | 400 | 1.37 | 400 |
| #71 | 0.0260 | 81 | 59 | 1000 | -0.016 | 400 | 1.37 | 400 |
| 0.70mm | 0.0276 | 78 | 55 | 1000 | -0.016 | 400 | 1.42 | 400 |
| #70 | 0.0280 | 77 | 55 | 1000 | -0.017 | 400 | 1.40 | 400 |
| #69 | 0.0292 | 75 | 52 | 1000 | -0.017 | 400 | 1.44 | 400 |
| 0.75mm | 0.0295 | 74 | 52 | 1000 | -0.017 | 400 | 1.42 | 400 |
| #68 | 0.0310 | 72 | 49 | 1000 | -0.017 | 400 | 1.47 | 400 |
| 1/32 | 0.0312 | 71 | 49 | 1000 | -0.017 | 400 | 1.45 | 400 |
| 0.80mm | 0.0315 | 71 | 49 | 1000 | -0.017 | 400 | 1.45 | 400 |
| #67 | 0.0320 | 70 | 48 | 1000 | -0.017 | 400 | 1.46 | 400 |
| #66 | 0.0330 | 67 | 46 | 1000 | -0.018 | 400 | 1.46 | 400 |
| 0.85mm | 0.0335 | 67 | 46 | 1000 | -0.018 | 400 | 1.46 | 400 |
| #65 | 0.0350 | 65 | 44 | 1000 | -0.018 | 500 | 1.48 | 400 |
| 0.90mm | 0.0354 | 65 | 43 | 1000 | -0.018 | 500 | 1.51 | 400 |
| #64 | 0.0360 | 63 | 42 | 1000 | -0.018 | 500 | 1.50 | 400 |
| #63 | 0.0370 | 62 | 41 | 1000 | -0.019 | 500 | 1.51 | 400 |
| 0.95mm | 0.0374 | 61 | 41 | 1000 | -0.019 | 500 | 1.49 | 400 |
| #62 | 0.0380 | 60 | 40 | 1000 | -0.019 | 500 | 1.50 | 400 |
| #61 | 0.0390 | 60 | 39 | 1000 | -0.019 | 500 | 1.54 | 400 |
| 1.00mm | 0.0394 | 59 | 39 | 1000 | -0.019 | 500 | 1.51 | 400 |
| #60 | 0.0400 | 59 | 38 | 1000 | -0.019 | 500 | 1.55 | 400 |
| #59 | 0.0410 | 58 | 37 | 1000 | -0.020 | 500 | 1.57 | 400 |
| 1.05mm | 0.0413 | 58 | 37 | 1000 | -0.020 | 500 | 1.57 | 400 |
| #58 | 0.0420 | 57 | 36 | 1000 | -0.020 | 500 | 1.58 | 400 |
| #57 | 0.0430 | 57 | 36 | 1000 | -0.020 | 500 | 1.58 | 400 |
| 1.10mm | 0.0433 | 56 | 35 | 1000 | -0.020 | 500 | 1.60 | 400 |
| 1.15mm | 0.0453 | 55 | 34 | 1000 | -0.021 | 500 | 1.62 | 400 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 55 | 33 | 1000 | -0.021 | 500 | 1.67 | 400 |
| 3/64 | 0.0469 | 55 | 33 | 1000 | -0.021 | 500 | 1.67 | 400 |
| 1.20mm | 0.0472 | 55 | 32 | 1000 | -0.021 | 500 | 1.72 | 400 |
| 1.25mm | 0.0492 | 54 | 31 | 1000 | -0.021 | 500 | 1.74 | 400 |
| 1.30mm | 0.0512 | 54 | 30 | 1000 | -0.022 | 500 | 1.80 | 400 |
| #55 | 0.0520 | 54 | 29 | 1000 | -0.022 | 500 | 1.86 | 400 |
| 1.35mm | 0.0531 | 53 | 29 | 1000 | -0.022 | 500 | 1.83 | 400 |
| #54 | 0.0550 | 53 | 28 | 1000 | -0.023 | 500 | 1.89 | 400 |
| 1.40mm | 0.0551 | 53 | 28 | 1000 | -0.023 | 500 | 1.89 | 400 |
| 1.45mm | 0.0571 | 52 | 27 | 1000 | -0.023 | 500 | 1.93 | 400 |
| 1.50mm | 0.0591 | 51 | 26 | 1000 | -0.024 | 500 | 1.96 | 400 |
| #53 | 0.0595 | 51 | 26 | 1000 | -0.024 | 500 | 1.96 | 400 |
| 1.55mm | 0.0610 | 50 | 25 | 1000 | -0.024 | 500 | 2.00 | 400 |
| 1/16 | 0.0625 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.60mm | 0.0630 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| #52 | 0.0635 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.65mm | 0.0650 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.70mm | 0.0669 | 46 | 23 | 1000 | -0.026 | 500 | 2.00 | 400 |
| #51 | 0.0670 | 46 | 23 | 1000 | -0.026 | 500 | 2.00 | 400 |
| 1.75mm | 0.0689 | 44 | 22 | 1000 | -0.026 | 500 | 2.00 | 400 |
| #50 | 0.0700 | 44 | 22 | 1000 | -0.026 | 500 | 2.00 | 400 |
| 1.80mm | 0.0709 | 44 | 22 | 1000 | -0.027 | 500 | 2.00 | 400 |
| 1.85mm | 0.0728 | 42 | 21 | 1000 | -0.027 | 500 | 2.00 | 400 |
| #49 | 0.0730 | 42 | 21 | 1000 | -0.027 | 500 | 2.00 | 400 |
| 1.90mm | 0.0748 | 40 | 20 | 1000 | -0.027 | 500 | 2.00 | 400 |
| #48 | 0.0760 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 400 |
| 1.95mm | 0.0768 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 400 |
| 5/64 | 0.0781 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 409 |
| #47 | 0.0785 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 411 |
| 2.00mm | 0.0787 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 412 |
| 2.05mm | 0.0807 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 422 |
| #46 | 0.0810 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 424 |
| #45 | 0.0820 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 429 |
| 2.10mm | 0.0827 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 433 |
| 2.15mm | 0.0846 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 443 |
| #44 | 0.0860 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 450 |
| 2.20mm | 0.0866 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 453 |
| 2.25mm | 0.0886 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 464 |
| #43 | 0.0890 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 466 |
| 2.30mm | 0.0906 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 474 |
| 2.35mm | 0.0925 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 484 |
| #42 | 0.0935 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 489 |
| 3/32 | 0.0938 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 491 |
| 2.40mm | 0.0945 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 495 |
| #41 | 0.0960 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 502 |
| 2.45mm | 0.0965 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 505 |
| #40 | 0.0980 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 513 |
| 2.50mm | 0.0984 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 515 |
| #39 | 0.0995 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 521 |
| 2.55mm | 0.1004 | 40 | 20 | 1000 | -0.033 | 400 | 2.00 | 525 |
| #38 | 0.1015 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 531 |
| 2.60mm | 0.1024 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 536 |
| #37 | 0.1040 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 544 |
| 2.65mm | 0.1043 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 546 |
| 2.70mm | 0.1063 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 556 |
| #36 | 0.1065 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 557 |
| 2.75mm | 0.1083 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 567 |
| 7/64 | 0.1094 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 573 |
| #35 | 0.1100 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 576 |
| 2.80mm | 0.1102 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 577 |
| #34 | 0.1110 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 581 |
| 2.85mm | 0.1122 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 587 |
| #33 | 0.1130 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 591 |
| 2.90mm | 0.1142 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 598 |
| #32 | 0.1160 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 607 |
| 2.95mm | 0.1161 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 608 |
| 3.00mm | 0.1181 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 618 |
| #31 | 0.1200 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 628 |
| 3.05mm | 0.1201 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 629 |
| 3.10mm | 0.1220 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 638 |
| 3.15mm | 0.1240 | 40 | 20 | 1000 | -0.039 | 400 | 2.00 | 649 |
| 1/8 | 0.1250 | 40 | 20 | 1000 | -0.039 | 400 | 2.00 | 654 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 250 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 250 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 762 |
| #26 | 0.1470 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 769 |
| 3.75mm | 0.1476 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 772 |
| #25 | 0.1495 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 782 |
| 3.80mm | 0.1496 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 783 |
| 3.85mm | 0.1516 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 793 |
| #24 | 0.1520 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 795 |
| 3.90mm | 0.1535 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 803 |
| #23 | 0.1540 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 806 |
| 3.95 | 0.1555 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 814 |
| 5/32 | 0.1562 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 817 |
| #22 | 0.1570 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 822 |
| 4.00mm | 0.1575 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 824 |
| #21 | 0.1590 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 832 |
| 4.05mm | 0.1594 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 834 |
| #20 | 0.1610 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 843 |
| 4.10mm | 0.1614 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 845 |
| 4.15mm | 0.1634 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 855 |
| 4.20mm | 0.1654 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 866 |
| #19 | 0.1660 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 869 |
| 4.25mm | 0.1673 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 876 |
| 4.30mm | 0.1693 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 886 |
| #18 | 0.1695 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 887 |
| 4.35mm | 0.1713 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 896 |
| 11/64 | 0.1719 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 900 |
| #17 | 0.1730 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 905 |
| 4.40mm | 0.1732 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 906 |
| 4.45mm | 0.1752 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 917 |
| #16 | 0.1770 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 926 |
| 4.50mm | 0.1772 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 927 |
| 4.55mm | 0.1792 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 938 |
| #15 | 0.1800 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 942 |
| 4.60mm | 0.1811 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 948 |
| #14 | 0.1820 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 952 |
| 4.65mm | 0.1831 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 958 |
| #13 | 0.1850 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 968 |
| 4.70mm | 0.1850 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 968 |
| 4.75mm | 0.1870 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 979 |
| 3/16 | 0.1875 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 981 |
| 4.80mm | 0.1890 | 24 | 20 | 1000 | -0.023 | 250 | 1.20 | 989 |
| #12 | 0.1890 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 989 |
| 4.85mm | 0.1909 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 999 |
| #11 | 0.1910 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1000 |
| 4.90mm | 0.1929 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1010 |
| #10 | 0.1935 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1013 |
| 4.95mm | 0.1949 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1020 |
| #9 | 0.1960 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1026 |
| 5.00mm | 0.1968 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1030 |
| 5.05mm | 0.1988 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1040 |
| #8 | 0.1990 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1041 |
| 5.10mm | 0.2008 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1051 |
| #7 | 0.2010 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1052 |
| 5.15mm | 0.2028 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1061 |
| 13/64 | 0.2031 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1063 |
| #6 | 0.2040 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1068 |
| 5.20mm | 0.2047 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1071 |
| #5 | 0.2055 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1075 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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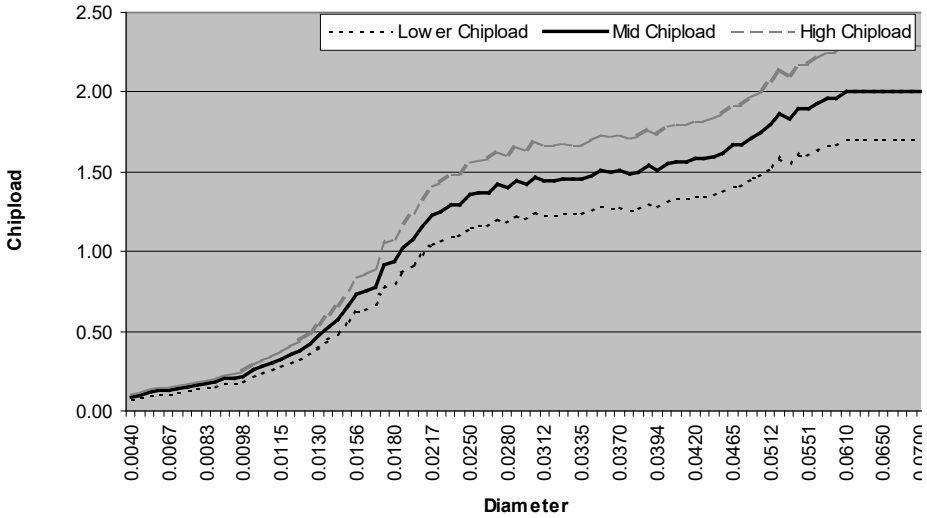
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1082 |
| 5.30mm | 0.2087 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1092 |
| #4 | 0.2090 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1094 |
| 5.35mm | 0.2106 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Copper-Invar-Copper




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Cyanate Ester PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 13 | 80 | 200 | -0.011 | 400 | 0.16 | 84 |
| 0.13mm | 0.0050 | 16 | 80 | 300 | -0.011 | 400 | 0.20 | 105 |
| 0.15mm | 0.0059 | 19 | 80 | 300 | -0.011 | 400 | 0.24 | 124 |
| #96 | 0.0063 | 20 | 80 | 400 | -0.011 | 400 | 0.25 | 132 |
| #95 | 0.0067 | 21 | 80 | 400 | -0.012 | 400 | 0.26 | 140 |
| #94 | 0.0071 | 23 | 80 | 500 | -0.012 | 400 | 0.29 | 149 |
| #93 | 0.0075 | 24 | 80 | 500 | -0.012 | 400 | 0.30 | 157 |
| #92 | 0.0079 | 27 | 80 | 500 | -0.012 | 400 | 0.34 | 165 |
| #91 | 0.0083 | 28 | 80 | 600 | -0.012 | 400 | 0.35 | 174 |
| #90 | 0.0087 | 29 | 80 | 600 | -0.012 | 400 | 0.36 | 182 |
| #89 | 0.0091 | 32 | 80 | 700 | -0.012 | 400 | 0.40 | 190 |
| #88 | 0.0095 | 33 | 80 | 700 | -0.012 | 400 | 0.41 | 199 |
| 0.25mm | 0.0098 | 35 | 80 | 800 | -0.012 | 400 | 0.44 | 205 |
| #87 | 0.0100 | 35 | 80 | 800 | -0.012 | 400 | 0.44 | 209 |
| #86 | 0.0105 | 36 | 80 | 800 | -0.012 | 400 | 0.45 | 220 |
| #85 | 0.0110 | 37 | 80 | 900 | -0.013 | 400 | 0.46 | 230 |
| #84 | 0.0115 | 39 | 80 | 900 | -0.013 | 400 | 0.49 | 241 |
| 0.30mm | 0.0118 | 41 | 80 | 1000 | -0.013 | 400 | 0.51 | 247 |
| #83 | 0.0120 | 42 | 80 | 1000 | -0.013 | 400 | 0.53 | 251 |
| #82 | 0.0125 | 47 | 80 | 1000 | -0.013 | 400 | 0.59 | 262 |
| #81 | 0.0130 | 51 | 80 | 1000 | -0.013 | 400 | 0.64 | 272 |
| #80 | 0.0135 | 55 | 80 | 1000 | -0.013 | 600 | 0.69 | 283 |
| 0.35mm | 0.0138 | 58 | 80 | 1000 | -0.013 | 600 | 0.73 | 289 |
| #79 | 0.0145 | 63 | 80 | 1000 | -0.013 | 600 | 0.79 | 304 |
| 1/64 | 0.0156 | 71 | 80 | 1000 | -0.014 | 600 | 0.89 | 327 |
| 0.40mm | 0.0158 | 72 | 80 | 1000 | -0.014 | 600 | 0.90 | 331 |
| #78 | 0.0160 | 74 | 80 | 1000 | -0.014 | 600 | 0.93 | 335 |
| 0.45mm | 0.0177 | 83 | 78 | 1000 | -0.014 | 600 | 1.07 | 360 |
| #77 | 0.0180 | 84 | 76 | 1000 | -0.014 | 600 | 1.10 | 360 |
| 0.50mm | 0.0197 | 86 | 70 | 1000 | -0.015 | 600 | 1.23 | 360 |
| #76 | 0.0200 | 86 | 69 | 1000 | -0.015 | 600 | 1.25 | 360 |
| #75 | 0.0210 | 88 | 66 | 1000 | -0.015 | 600 | 1.34 | 360 |
| 0.55mm | 0.0217 | 90 | 63 | 1000 | -0.015 | 600 | 1.42 | 360 |
| #74 | 0.0225 | 92 | 61 | 1000 | -0.015 | 600 | 1.50 | 360 |
| 0.60mm | 0.0236 | 93 | 58 | 1000 | -0.016 | 600 | 1.60 | 360 |
| #73 | 0.0240 | 94 | 57 | 1000 | -0.016 | 600 | 1.64 | 360 |
| #72 | 0.0250 | 92 | 55 | 1000 | -0.016 | 600 | 1.67 | 360 |
| 0.65mm | 0.0256 | 91 | 54 | 1000 | -0.016 | 600 | 1.69 | 360 |
| #71 | 0.0260 | 90 | 53 | 1000 | -0.016 | 600 | 1.70 | 360 |
| 0.70mm | 0.0276 | 88 | 50 | 1000 | -0.016 | 600 | 1.76 | 360 |
| #70 | 0.0280 | 87 | 49 | 1000 | -0.017 | 600 | 1.78 | 360 |
| #69 | 0.0292 | 86 | 47 | 1000 | -0.017 | 600 | 1.83 | 360 |
| 0.75mm | 0.0295 | 86 | 47 | 1000 | -0.017 | 600 | 1.83 | 360 |
| #68 | 0.0310 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| 1/32 | 0.0312 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| 0.80mm | 0.0315 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| #67 | 0.0320 | 83 | 43 | 1000 | -0.017 | 800 | 1.93 | 360 |
| #66 | 0.0330 | 82 | 42 | 1000 | -0.018 | 800 | 1.95 | 360 |
| 0.85mm | 0.0335 | 82 | 41 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #65 | 0.0350 | 78 | 39 | 1000 | -0.018 | 800 | 2.00 | 360 |
| 0.90mm | 0.0354 | 78 | 39 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #64 | 0.0360 | 76 | 38 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #63 | 0.0370 | 74 | 37 | 1000 | -0.019 | 800 | 2.00 | 360 |
| 0.95mm | 0.0374 | 74 | 37 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #62 | 0.0380 | 72 | 36 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #61 | 0.0390 | 70 | 35 | 1000 | -0.019 | 800 | 2.00 | 360 |
| 1.00mm | 0.0394 | 70 | 35 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #60 | 0.0400 | 68 | 34 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #59 | 0.0410 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.05mm | 0.0413 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| #58 | 0.0420 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| #57 | 0.0430 | 64 | 32 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.10mm | 0.0433 | 64 | 32 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.15mm | 0.0453 | 60 | 30 | 1000 | -0.021 | 800 | 2.00 | 360 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 60 | 30 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 3/64 | 0.0469 | 58 | 29 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.20mm | 0.0472 | 58 | 29 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.25mm | 0.0492 | 56 | 28 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.30mm | 0.0512 | 54 | 27 | 1000 | -0.022 | 800 | 2.00 | 360 |
| #55 | 0.0520 | 52 | 26 | 1000 | -0.022 | 800 | 2.00 | 360 |
| 1.35mm | 0.0531 | 52 | 26 | 1000 | -0.022 | 800 | 2.00 | 360 |
| #54 | 0.0550 | 50 | 25 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.40mm | 0.0551 | 50 | 25 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.45mm | 0.0571 | 48 | 24 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.50mm | 0.0591 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| #53 | 0.0595 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| 1.55mm | 0.0610 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| 1/16 | 0.0625 | 44 | 22 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.60mm | 0.0630 | 44 | 22 | 1000 | -0.025 | 800 | 2.00 | 360 |
| #52 | 0.0635 | 42 | 21 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.65mm | 0.0650 | 42 | 21 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.70mm | 0.0669 | 42 | 21 | 1000 | -0.026 | 800 | 2.00 | 360 |
| #51 | 0.0670 | 42 | 21 | 1000 | -0.026 | 800 | 2.00 | 360 |
| 1.75mm | 0.0689 | 40 | 20 | 1000 | -0.026 | 800 | 2.00 | 360 |
| #50 | 0.0700 | 40 | 20 | 1000 | -0.026 | 800 | 2.00 | 366 |
| 1.80mm | 0.0709 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 371 |
| 1.85mm | 0.0728 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 381 |
| #49 | 0.0730 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 382 |
| 1.90mm | 0.0748 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 391 |
| #48 | 0.0760 | 40 | 20 | 1000 | -0.028 | 800 | 2.00 | 398 |
| 1.95mm | 0.0768 | 40 | 20 | 1000 | -0.028 | 800 | 2.00 | 402 |
| 5/64 | 0.0781 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 409 |
| #47 | 0.0785 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 411 |
| 2.00mm | 0.0787 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 412 |
| 2.05mm | 0.0807 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 422 |
| #46 | 0.0810 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 424 |
| #45 | 0.0820 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 429 |
| 2.10mm | 0.0827 | 36 | 20 | 1000 | -0.029 | 800 | 1.80 | 433 |
| 2.15mm | 0.0846 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 443 |
| #44 | 0.0860 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 450 |
| 2.20mm | 0.0866 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 453 |
| 2.25mm | 0.0886 | 36 | 20 | 1000 | -0.031 | 800 | 1.80 | 464 |
| #43 | 0.0890 | 36 | 20 | 1000 | -0.031 | 800 | 1.80 | 466 |
| 2.30mm | 0.0906 | 34 | 20 | 1000 | -0.031 | 800 | 1.70 | 474 |
| 2.35mm | 0.0925 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 484 |
| #42 | 0.0935 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 489 |
| 3/32 | 0.0938 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 491 |
| 2.40mm | 0.0945 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 495 |
| #41 | 0.0960 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 502 |
| 2.45mm | 0.0965 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 505 |
| #40 | 0.0980 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 513 |
| 2.50mm | 0.0984 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 515 |
| #39 | 0.0995 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 521 |
| 2.55mm | 0.1004 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 525 |
| #38 | 0.1015 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 531 |
| 2.60mm | 0.1024 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 536 |
| #37 | 0.1040 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 544 |
| 2.65mm | 0.1043 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 546 |
| 2.70mm | 0.1063 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 556 |
| #36 | 0.1065 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 557 |
| 2.75mm | 0.1083 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 567 |
| 7/64 | 0.1094 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 573 |
| #35 | 0.1100 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 576 |
| 2.80mm | 0.1102 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 577 |
| #34 | 0.1110 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 581 |
| 2.85mm | 0.1122 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 587 |
| #33 | 0.1130 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 591 |
| 2.90mm | 0.1142 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 598 |
| #32 | 0.1160 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 607 |
| 2.95mm | 0.1161 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 608 |
| 3.00mm | 0.1181 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 618 |
| #31 | 0.1200 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 628 |
| 3.05mm | 0.1201 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 629 |
| 3.10mm | 0.1220 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 638 |
| 3.15mm | 0.1240 | 32 | 20 | 1000 | -0.039 | 800 | 1.60 | 649 |
| 1/8 | 0.1250 | 32 | 20 | 1000 | -0.039 | 800 | 1.60 | 654 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 500 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 500 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 795 |
| 3.90mm | 0.1535 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 803 |
| #23 | 0.1540 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 806 |
| 3.95 | 0.1555 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 814 |
| 5/32 | 0.1562 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 817 |
| #22 | 0.1570 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 822 |
| 4.00mm | 0.1575 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 824 |
| #21 | 0.1590 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 832 |
| 4.05mm | 0.1594 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 834 |
| #20 | 0.1610 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 843 |
| 4.10mm | 0.1614 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 845 |
| 4.15mm | 0.1634 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 855 |
| 4.20mm | 0.1654 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 866 |
| #19 | 0.1660 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 869 |
| 4.25mm | 0.1673 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 876 |
| 4.30mm | 0.1693 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 886 |
| #18 | 0.1695 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 887 |
| 4.35mm | 0.1713 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 896 |
| 11/64 | 0.1719 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 900 |
| #17 | 0.1730 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 905 |
| 4.40mm | 0.1732 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 906 |
| 4.45mm | 0.1752 | 25 | 20 | 1000 | -0.022 | 500 | 1.25 | 917 |
| #16 | 0.1770 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 926 |
| 4.50mm | 0.1772 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 927 |
| 4.55mm | 0.1792 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 938 |
| #15 | 0.1800 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 942 |
| 4.60mm | 0.1811 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 948 |
| #14 | 0.1820 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 952 |
| 4.65mm | 0.1831 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 958 |
| #13 | 0.1850 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 968 |
| 4.70mm | 0.1850 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 968 |
| 4.75mm | 0.1870 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 979 |
| 3/16 | 0.1875 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

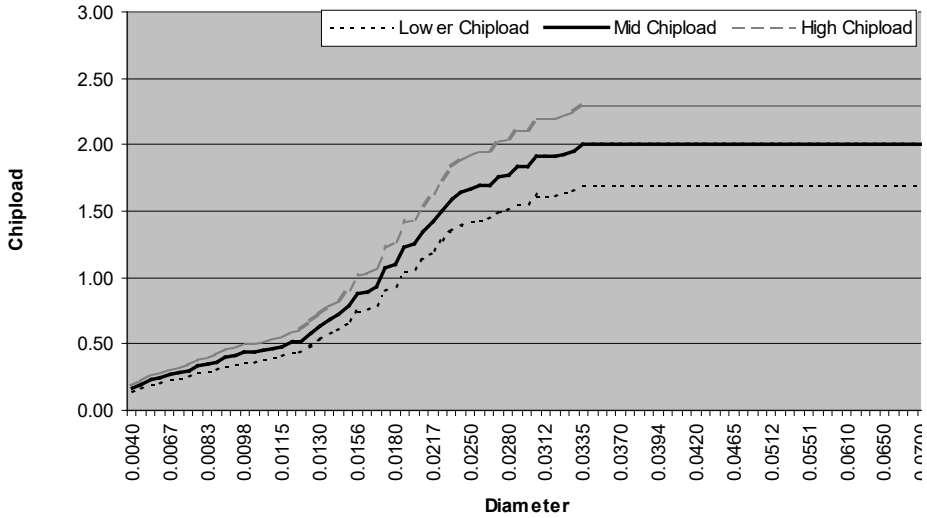
Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 400 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 400 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

### Chiploads for Cyanate Ester




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Double-Sided PCB Material

## Recommended Drill Series: 100, 150, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 20 | 80 | 200 | -0.011 | 500 | 0.25 | 84 |
| 0.13mm | 0.0050 | 23 | 80 | 300 | -0.011 | 600 | 0.29 | 105 |
| 0.15mm | 0.0059 | 27 | 80 | 300 | -0.011 | 800 | 0.34 | 124 |
| #96 | 0.0063 | 30 | 80 | 400 | -0.011 | 800 | 0.38 | 132 |
| #95 | 0.0067 | 33 | 80 | 400 | -0.012 | 800 | 0.41 | 140 |
| #94 | 0.0071 | 37 | 80 | 500 | -0.012 | 1000 | 0.46 | 149 |
| #93 | 0.0075 | 40 | 80 | 500 | -0.012 | 1000 | 0.50 | 157 |
| #92 | 0.0079 | 43 | 80 | 500 | -0.012 | 1200 | 0.54 | 165 |
| #91 | 0.0083 | 47 | 80 | 600 | -0.012 | 1200 | 0.59 | 174 |
| #90 | 0.0087 | 50 | 80 | 600 | -0.012 | 1200 | 0.63 | 182 |
| #89 | 0.0091 | 53 | 80 | 700 | -0.012 | 1500 | 0.66 | 190 |
| #88 | 0.0095 | 57 | 80 | 700 | -0.012 | 1500 | 0.71 | 199 |
| 0.25mm | 0.0098 | 60 | 80 | 800 | -0.012 | 1500 | 0.75 | 205 |
| #87 | 0.0100 | 61 | 80 | 800 | -0.012 | 1500 | 0.76 | 209 |
| #86 | 0.0105 | 65 | 80 | 800 | -0.012 | 1500 | 0.81 | 220 |
| #85 | 0.0110 | 68 | 80 | 900 | -0.013 | 1700 | 0.85 | 230 |
| #84 | 0.0115 | 71 | 80 | 900 | -0.013 | 1700 | 0.89 | 241 |
| 0.30mm | 0.0118 | 73 | 80 | 1000 | -0.013 | 1700 | 0.91 | 247 |
| #83 | 0.0120 | 75 | 80 | 1000 | -0.013 | 1800 | 0.94 | 251 |
| #82 | 0.0125 | 78 | 80 | 1000 | -0.013 | 1800 | 0.98 | 262 |
| #81 | 0.0130 | 81 | 80 | 1000 | -0.013 | 1800 | 1.01 | 272 |
| #80 | 0.0135 | 87 | 80 | 1000 | -0.013 | 2000 | 1.09 | 283 |
| 0.35mm | 0.0138 | 87 | 80 | 1000 | -0.013 | 2000 | 1.09 | 289 |
| #79 | 0.0145 | 90 | 80 | 1000 | -0.013 | 2000 | 1.13 | 304 |
| 1/64 | 0.0156 | 93 | 80 | 1000 | -0.014 | 2000 | 1.16 | 327 |
| 0.40mm | 0.0158 | 95 | 80 | 1000 | -0.014 | 2000 | 1.19 | 331 |
| #78 | 0.0160 | 97 | 80 | 1000 | -0.014 | 2000 | 1.21 | 335 |
| 0.45mm | 0.0177 | 100 | 80 | 1000 | -0.014 | 2000 | 1.25 | 371 |
| #77 | 0.0180 | 102 | 80 | 1000 | -0.014 | 2000 | 1.28 | 377 |
| 0.50mm | 0.0197 | 109 | 80 | 1000 | -0.015 | 2000 | 1.36 | 412 |
| #76 | 0.0200 | 113 | 80 | 1000 | -0.015 | 2000 | 1.41 | 419 |
| #75 | 0.0210 | 121 | 80 | 1000 | -0.015 | 2000 | 1.51 | 440 |
| 0.55mm | 0.0217 | 128 | 80 | 1000 | -0.015 | 2000 | 1.60 | 454 |
| #74 | 0.0225 | 137 | 80 | 1000 | -0.015 | 2000 | 1.71 | 471 |
| 0.60mm | 0.0236 | 148 | 80 | 1000 | -0.016 | 2000 | 1.85 | 494 |
| #73 | 0.0240 | 154 | 80 | 1000 | -0.016 | 2000 | 1.93 | 502 |
| #72 | 0.0250 | 165 | 80 | 1000 | -0.016 | 2000 | 2.06 | 523 |
| 0.65mm | 0.0256 | 173 | 80 | 1000 | -0.016 | 2000 | 2.16 | 536 |
| #71 | 0.0260 | 182 | 80 | 1000 | -0.016 | 2000 | 2.28 | 544 |
| 0.70mm | 0.0276 | 193 | 80 | 1000 | -0.016 | 2000 | 2.41 | 578 |
| #70 | 0.0280 | 197 | 80 | 1000 | -0.017 | 2000 | 2.46 | 586 |
| #69 | 0.0292 | 205 | 79 | 1000 | -0.017 | 2000 | 2.59 | 600 |
| 0.75mm | 0.0295 | 206 | 78 | 1000 | -0.017 | 2000 | 2.64 | 600 |
| #68 | 0.0310 | 210 | 74 | 1000 | -0.017 | 2000 | 2.84 | 600 |
| 1/32 | 0.0312 | 212 | 73 | 1000 | -0.017 | 2000 | 2.90 | 600 |
| 0.80mm | 0.0315 | 215 | 73 | 1000 | -0.017 | 2000 | 2.95 | 600 |
| #67 | 0.0320 | 216 | 72 | 1000 | -0.017 | 2000 | 3.00 | 600 |
| #66 | 0.0330 | 210 | 70 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.85mm | 0.0335 | 204 | 68 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #65 | 0.0350 | 198 | 66 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.90mm | 0.0354 | 195 | 65 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #64 | 0.0360 | 192 | 64 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #63 | 0.0370 | 186 | 62 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 0.95mm | 0.0374 | 183 | 61 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #62 | 0.0380 | 180 | 60 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #61 | 0.0390 | 177 | 59 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 1.00mm | 0.0394 | 174 | 58 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #60 | 0.0400 | 171 | 57 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #59 | 0.0410 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.05mm | 0.0413 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #58 | 0.0420 | 165 | 55 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #57 | 0.0430 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.10mm | 0.0433 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.15mm | 0.0453 | 153 | 51 | 1000 | -0.021 | 2000 | 3.00 | 600 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 3/64 | 0.0469 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.20mm | 0.0472 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.25mm | 0.0492 | 141 | 47 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.30mm | 0.0512 | 135 | 45 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #55 | 0.0520 | 132 | 44 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| 1.35mm | 0.0531 | 129 | 43 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #54 | 0.0550 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.40mm | 0.0551 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.45mm | 0.0571 | 120 | 40 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.50mm | 0.0591 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| #53 | 0.0595 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1.55mm | 0.0610 | 114 | 38 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1/16 | 0.0625 | 111 | 37 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.60mm | 0.0630 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| #52 | 0.0635 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.65mm | 0.0650 | 105 | 35 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.70mm | 0.0669 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #51 | 0.0670 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.75mm | 0.0689 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #50 | 0.0700 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.80mm | 0.0709 | 96 | 32 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.85mm | 0.0728 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #49 | 0.0730 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.90mm | 0.0748 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #48 | 0.0760 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 1.95mm | 0.0768 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 5/64 | 0.0781 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| #47 | 0.0785 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.00mm | 0.0787 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.05mm | 0.0807 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #46 | 0.0810 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #45 | 0.0820 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.10mm | 0.0827 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.15mm | 0.0846 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| #44 | 0.0860 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.20mm | 0.0866 | 78 | 26 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.25mm | 0.0886 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| #43 | 0.0890 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.30mm | 0.0906 | 75 | 25 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.35mm | 0.0925 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #42 | 0.0935 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 3/32 | 0.0938 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.40mm | 0.0945 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #41 | 0.0960 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.45mm | 0.0965 | 72 | 24 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #40 | 0.0980 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| 2.50mm | 0.0984 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #39 | 0.0995 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| 2.55mm | 0.1004 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| #38 | 0.1015 | 69 | 23 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.60mm | 0.1024 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| #37 | 0.1040 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.65mm | 0.1043 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.70mm | 0.1063 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| #36 | 0.1065 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 2.75mm | 0.1083 | 63 | 21 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 7/64 | 0.1094 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #35 | 0.1100 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.80mm | 0.1102 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #34 | 0.1110 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 600 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1500 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 654 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 659 |
| 3.25mm | 0.1280 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 670 |
| #30 | 0.1285 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 672 |
| 3.30mm | 0.1299 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 680 |
| 3.35mm | 0.1319 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 690 |
| 3.40mm | 0.1339 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 701 |
| 3.45mm | 0.1358 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 711 |
| #29 | 0.1360 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 712 |
| 3.50mm | 0.1378 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 721 |
| 3.55mm | 0.1398 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 732 |
| #28 | 0.1405 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 735 |
| 9/64 | 0.1406 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 736 |
| 3.60mm | 0.1417 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 742 |
| 3.65mm | 0.1437 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 752 |
| #27 | 0.1440 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 754 |
| 3.70mm | 0.1457 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 762 |
| #26 | 0.1470 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 769 |
| 3.75mm | 0.1476 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 772 |
| #25 | 0.1495 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 782 |
| 3.80mm | 0.1496 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 783 |
| 3.85mm | 0.1516 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 793 |
| #24 | 0.1520 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 795 |
| 3.90mm | 0.1535 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 803 |
| #23 | 0.1540 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 806 |
| 3.95 | 0.1555 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 814 |
| 5/32 | 0.1562 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 817 |
| #22 | 0.1570 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 822 |
| 4.00mm | 0.1575 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 824 |
| #21 | 0.1590 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 832 |
| 4.05mm | 0.1594 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 834 |
| #20 | 0.1610 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 843 |
| 4.10mm | 0.1614 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 845 |
| 4.15mm | 0.1634 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 855 |
| 4.20mm | 0.1654 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 866 |
| #19 | 0.1660 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 869 |
| 4.25mm | 0.1673 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 876 |
| 4.30mm | 0.1693 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 886 |
| #18 | 0.1695 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 887 |
| 4.35mm | 0.1713 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 896 |
| 11/64 | 0.1719 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 900 |
| #17 | 0.1730 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 905 |
| 4.40mm | 0.1732 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 906 |
| 4.45mm | 0.1752 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 917 |
| #16 | 0.1770 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 926 |
| 4.50mm | 0.1772 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 927 |
| 4.55mm | 0.1792 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 938 |
| #15 | 0.1800 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 942 |
| 4.60mm | 0.1811 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 948 |
| #14 | 0.1820 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 952 |
| 4.65mm | 0.1831 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 958 |
| #13 | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.70mm | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.75mm | 0.1870 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 979 |
| 3/16 | 0.1875 | 45 | 20 | 1000 | -0.022 | 1000 | 2.25 | 981 |
| 4.80mm | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| #12 | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| 4.85mm | 0.1909 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 999 |
| #11 | 0.1910 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1000 |
| 4.90mm | 0.1929 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1010 |
| #10 | 0.1935 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1013 |
| 4.95mm | 0.1949 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1020 |
| #9 | 0.1960 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1026 |
| 5.00mm | 0.1968 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1030 |
| 5.05mm | 0.1988 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1040 |
| #8 | 0.1990 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1041 |
| 5.10mm | 0.2008 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1051 |
| #7 | 0.2010 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1052 |
| 5.15mm | 0.2028 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1061 |
| 13/64 | 0.2031 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1063 |
| #6 | 0.2040 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1068 |
| 5.20mm | 0.2047 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1071 |
| #5 | 0.2055 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1075 |

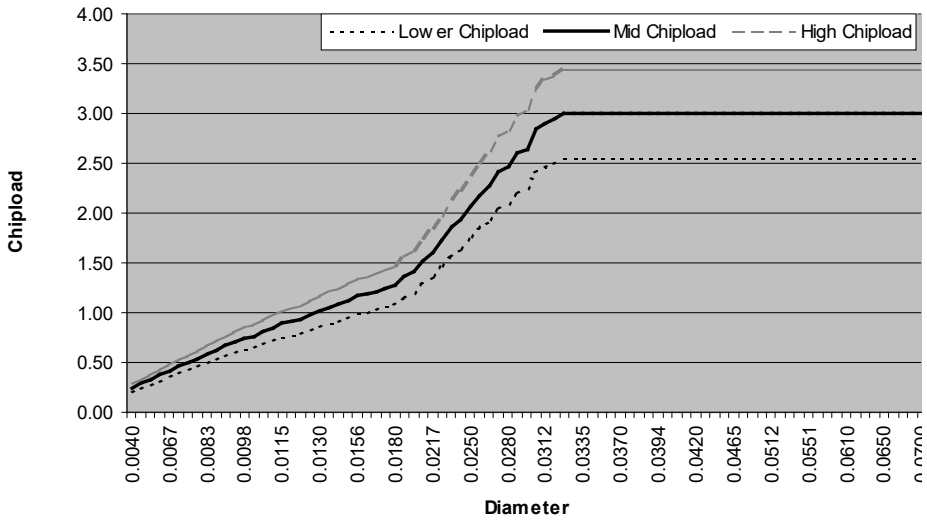
Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1082 |
| 5.30mm | 0.2087 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1092 |
| #4 | 0.2090 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1094 |
| 5.35mm | 0.2106 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1102 |
| 5.40mm | 0.2126 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1113 |
| #3 | 0.2130 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1115 |
| 5.45mm | 0.2146 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1123 |
| 5.50mm | 0.2165 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1133 |
| 5.55mm | 0.2185 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1143 |
| 7/32 | 0.2188 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1145 |
| 5.60mm | 0.2205 | 40 | 20 | 1000 | -0.025 | 600 | 2.00 | 1154 |
| #2 | 0.2210 | 35 | 20 | 1000 | -0.025 | 600 | 1.75 | 1157 |
| 5.65mm | 0.2224 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1164 |
| 5.70mm | 0.2244 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1174 |
| 5.75mm | 0.2264 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1185 |
| #1 | 0.2280 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1193 |
| 5.80mm | 0.2283 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1195 |
| 5.85mm | 0.2302 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1205 |
| 5.90mm | 0.2323 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1216 |
| A | 0.2340 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1225 |
| 5.95mm | 0.2343 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1226 |
| 15/64 | 0.2344 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1227 |
| 6.00mm | 0.2362 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1236 |
| B | 0.2380 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1246 |
| 6.05mm | 0.2382 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Double-Sided




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 High Tg Thick Panel PCB Material

(Panel Thickness > 0.200")

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 40 | 80 | 800 | -0.012 | 750 | 0.50 | 205 |
| #87 | 0.0100 | 40 | 80 | 800 | -0.012 | 750 | 0.50 | 209 |
| #86 | 0.0105 | 43 | 80 | 800 | -0.012 | 750 | 0.54 | 220 |
| #85 | 0.0110 | 47 | 80 | 900 | -0.013 | 750 | 0.59 | 230 |
| #84 | 0.0115 | 50 | 80 | 900 | -0.013 | 750 | 0.63 | 241 |
| 0.30mm | 0.0118 | 52 | 80 | 1000 | -0.013 | 750 | 0.65 | 247 |
| #83 | 0.0120 | 53 | 80 | 1000 | -0.013 | 750 | 0.66 | 251 |
| #82 | 0.0125 | 57 | 80 | 1000 | -0.013 | 750 | 0.71 | 262 |
| #81 | 0.0130 | 60 | 80 | 1000 | -0.013 | 750 | 0.75 | 272 |
| #80 | 0.0135 | 63 | 80 | 1000 | -0.013 | 1000 | 0.79 | 283 |
| 0.35mm | 0.0138 | 65 | 80 | 1000 | -0.013 | 1000 | 0.81 | 289 |
| #79 | 0.0145 | 67 | 80 | 1000 | -0.013 | 1000 | 0.84 | 304 |
| 1/64 | 0.0156 | 73 | 80 | 1000 | -0.014 | 1000 | 0.91 | 327 |
| 0.40mm | 0.0158 | 73 | 80 | 1000 | -0.014 | 1000 | 0.91 | 331 |
| #78 | 0.0160 | 75 | 80 | 1000 | -0.014 | 1000 | 0.94 | 335 |
| 0.45mm | 0.0177 | 84 | 80 | 1000 | -0.014 | 1000 | 1.05 | 371 |
| #77 | 0.0180 | 86 | 80 | 1000 | -0.014 | 1000 | 1.08 | 377 |
| 0.50mm | 0.0197 | 94 | 80 | 1000 | -0.015 | 1000 | 1.18 | 412 |
| #76 | 0.0200 | 95 | 80 | 1000 | -0.015 | 1000 | 1.19 | 419 |
| #75 | 0.0210 | 99 | 80 | 1000 | -0.015 | 1200 | 1.24 | 440 |
| 0.55mm | 0.0217 | 103 | 80 | 1000 | -0.015 | 1200 | 1.29 | 450 |
| #74 | 0.0225 | 103 | 78 | 1000 | -0.015 | 1200 | 1.32 | 450 |
| 0.60mm | 0.0236 | 104 | 74 | 1000 | -0.016 | 1200 | 1.41 | 450 |
| #73 | 0.0240 | 104 | 73 | 1000 | -0.016 | 1200 | 1.42 | 450 |
| #72 | 0.0250 | 104 | 70 | 1000 | -0.016 | 1200 | 1.49 | 450 |
| 0.65mm | 0.0256 | 104 | 68 | 1000 | -0.016 | 1200 | 1.53 | 450 |
| #71 | 0.0260 | 104 | 67 | 1000 | -0.016 | 1200 | 1.55 | 450 |
| 0.70mm | 0.0276 | 103 | 63 | 1000 | -0.016 | 1200 | 1.63 | 450 |
| #70 | 0.0280 | 103 | 62 | 1000 | -0.017 | 1200 | 1.66 | 450 |
| #69 | 0.0292 | 102 | 60 | 1000 | -0.017 | 1200 | 1.70 | 450 |
| 0.75mm | 0.0295 | 102 | 59 | 1000 | -0.017 | 1200 | 1.73 | 450 |
| #68 | 0.0310 | 102 | 57 | 1000 | -0.017 | 1200 | 1.79 | 450 |
| 1/32 | 0.0312 | 101 | 56 | 1000 | -0.017 | 1200 | 1.80 | 450 |
| 0.80mm | 0.0315 | 101 | 55 | 1000 | -0.017 | 1200 | 1.84 | 450 |
| #67 | 0.0320 | 100 | 54 | 1000 | -0.017 | 1200 | 1.85 | 450 |
| #66 | 0.0330 | 100 | 53 | 1000 | -0.018 | 1200 | 1.89 | 450 |
| 0.85mm | 0.0335 | 99 | 52 | 1000 | -0.018 | 1200 | 1.90 | 450 |
| #65 | 0.0350 | 98 | 50 | 1000 | -0.018 | 1200 | 1.96 | 450 |
| 0.90mm | 0.0354 | 98 | 49 | 1000 | -0.018 | 1200 | 2.00 | 450 |
| #64 | 0.0360 | 97 | 48 | 1000 | -0.018 | 1200 | 2.02 | 450 |
| #63 | 0.0370 | 96 | 47 | 1000 | -0.019 | 1200 | 2.04 | 450 |
| 0.95mm | 0.0374 | 95 | 46 | 1000 | -0.019 | 1200 | 2.07 | 450 |
| #62 | 0.0380 | 95 | 46 | 1000 | -0.019 | 1200 | 2.07 | 450 |
| #61 | 0.0390 | 94 | 45 | 1000 | -0.019 | 1200 | 2.09 | 450 |
| 1.00mm | 0.0394 | 94 | 45 | 1000 | -0.019 | 1200 | 2.09 | 450 |
| #60 | 0.0400 | 94 | 44 | 1000 | -0.019 | 1200 | 2.14 | 450 |
| #59 | 0.0410 | 93 | 43 | 1000 | -0.020 | 1200 | 2.16 | 450 |
| 1.05mm | 0.0413 | 93 | 42 | 1000 | -0.020 | 1200 | 2.21 | 450 |
| #58 | 0.0420 | 92 | 41 | 1000 | -0.020 | 1200 | 2.24 | 450 |
| #57 | 0.0430 | 92 | 40 | 1000 | -0.020 | 1200 | 2.30 | 450 |
| 1.10mm | 0.0433 | 92 | 40 | 1000 | -0.020 | 1200 | 2.30 | 450 |
| 1.15mm | 0.0453 | 91 | 39 | 1000 | -0.021 | 1200 | 2.33 | 450 |
| #56 | 0.0465 | 90 | 38 | 1000 | -0.021 | 1200 | 2.37 | 450 |
| 3/64 | 0.0469 | 90 | 37 | 1000 | -0.021 | 1200 | 2.43 | 450 |
| 1.20mm | 0.0472 | 90 | 37 | 1000 | -0.021 | 1200 | 2.43 | 450 |
| 1.25mm | 0.0492 | 89 | 36 | 1000 | -0.021 | 1200 | 2.47 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #55 | 0.0520 | 85 | 34 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| 1.35mm | 0.0531 | 83 | 33 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #54 | 0.0550 | 80 | 32 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.40mm | 0.0551 | 80 | 32 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.45mm | 0.0571 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.50mm | 0.0591 | 75 | 30 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.60mm | 0.0630 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| #52 | 0.0635 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.65mm | 0.0650 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.80mm | 0.0709 | 63 | 25 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.85mm | 0.0728 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #49 | 0.0730 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.90mm | 0.0748 | 58 | 23 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #48 | 0.0760 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 1.95mm | 0.0768 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 5/64 | 0.0781 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| #47 | 0.0785 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.00mm | 0.0787 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.05mm | 0.0807 | 55 | 22 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| #46 | 0.0810 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| #45 | 0.0820 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| 2.10mm | 0.0827 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| 2.15mm | 0.0846 | 53 | 21 | 1000 | -0.030 | 1200 | 2.50 | 450 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1200 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1200 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |
| 3.20mm | 0.1260 | 48 | 20 | 1000 | -0.018 | 600 | 2.40 | 659 |
| 3.25mm | 0.1280 | 48 | 20 | 1000 | -0.018 | 600 | 2.40 | 670 |
| #30 | 0.1285 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 672 |
| 3.30mm | 0.1299 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 680 |
| 3.35mm | 0.1319 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 690 |
| 3.40mm | 0.1339 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 701 |
| 3.45mm | 0.1358 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 711 |
| #29 | 0.1360 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 712 |
| 3.50mm | 0.1378 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 721 |
| 3.55mm | 0.1398 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 732 |
| #28 | 0.1405 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 735 |
| 9/64 | 0.1406 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 736 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

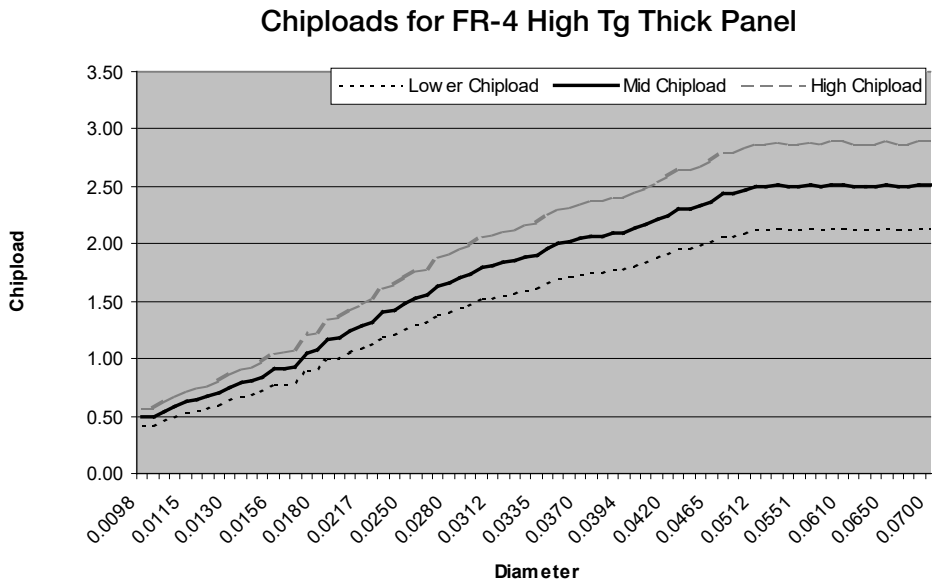
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 742 |
| 3.65mm | 0.1437 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 752 |
| #27 | 0.1440 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 754 |
| 3.70mm | 0.1457 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 814 |
| 5/32 | 0.1562 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 817 |
| #22 | 0.1570 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 822 |
| 4.00mm | 0.1575 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 824 |
| #21 | 0.1590 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 832 |
| 4.05mm | 0.1594 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 834 |
| #20 | 0.1610 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 843 |
| 4.10mm | 0.1614 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 845 |
| 4.15mm | 0.1634 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 855 |
| 4.20mm | 0.1654 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 866 |
| #19 | 0.1660 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 869 |
| 4.25mm | 0.1673 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 876 |
| 4.30mm | 0.1693 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 886 |
| #18 | 0.1695 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 250 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 250 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 250 | 1.50 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1075 |
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1157 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Multilayer High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 17 | 80 | 200 | -0.011 | 500 | 0.21 | 84 |
| 0.13mm | 0.0050 | 20 | 80 | 300 | -0.011 | 600 | 0.25 | 105 |
| 0.15mm | 0.0059 | 24 | 80 | 300 | -0.011 | 600 | 0.30 | 124 |
| #96 | 0.0063 | 26 | 80 | 400 | -0.011 | 600 | 0.33 | 132 |
| #95 | 0.0067 | 30 | 80 | 400 | -0.012 | 600 | 0.38 | 140 |
| #94 | 0.0071 | 32 | 80 | 500 | -0.012 | 600 | 0.40 | 149 |
| #93 | 0.0075 | 34 | 80 | 500 | -0.012 | 600 | 0.43 | 157 |
| #92 | 0.0079 | 38 | 80 | 500 | -0.012 | 800 | 0.48 | 165 |
| #91 | 0.0083 | 40 | 80 | 600 | -0.012 | 800 | 0.50 | 174 |
| #90 | 0.0087 | 42 | 80 | 600 | -0.012 | 800 | 0.53 | 182 |
| #89 | 0.0091 | 46 | 80 | 700 | -0.012 | 800 | 0.58 | 190 |
| #88 | 0.0095 | 48 | 80 | 700 | -0.012 | 800 | 0.60 | 199 |
| 0.25mm | 0.0098 | 50 | 80 | 800 | -0.012 | 1000 | 0.63 | 205 |
| #87 | 0.0100 | 54 | 80 | 800 | -0.012 | 1000 | 0.68 | 209 |
| #86 | 0.0105 | 56 | 80 | 800 | -0.012 | 1000 | 0.70 | 220 |
| #85 | 0.0110 | 58 | 80 | 900 | -0.013 | 1000 | 0.73 | 230 |
| #84 | 0.0115 | 62 | 80 | 900 | -0.013 | 1000 | 0.78 | 241 |
| 0.30mm | 0.0118 | 64 | 80 | 1000 | -0.013 | 1200 | 0.80 | 247 |
| #83 | 0.0120 | 66 | 80 | 1000 | -0.013 | 1200 | 0.83 | 251 |
| #82 | 0.0125 | 70 | 80 | 1000 | -0.013 | 1200 | 0.88 | 262 |
| #81 | 0.0130 | 72 | 80 | 1000 | -0.013 | 1200 | 0.90 | 272 |
| #80 | 0.0135 | 75 | 80 | 1000 | -0.013 | 1500 | 0.94 | 283 |
| 0.35mm | 0.0138 | 77 | 80 | 1000 | -0.013 | 1500 | 0.96 | 289 |
| #79 | 0.0145 | 80 | 80 | 1000 | -0.013 | 1500 | 1.00 | 304 |
| 1/64 | 0.0156 | 87 | 80 | 1000 | -0.014 | 1500 | 1.09 | 327 |
| 0.40mm | 0.0158 | 88 | 80 | 1000 | -0.014 | 1500 | 1.10 | 331 |
| #78 | 0.0160 | 91 | 80 | 1000 | -0.014 | 1500 | 1.14 | 335 |
| 0.45mm | 0.0177 | 102 | 80 | 1000 | -0.014 | 1500 | 1.28 | 371 |
| #77 | 0.0180 | 103 | 80 | 1000 | -0.014 | 1500 | 1.29 | 377 |
| 0.50mm | 0.0197 | 115 | 80 | 1000 | -0.015 | 1500 | 1.44 | 412 |
| #76 | 0.0200 | 118 | 80 | 1000 | -0.015 | 1500 | 1.48 | 419 |
| #75 | 0.0210 | 123 | 80 | 1000 | -0.015 | 1500 | 1.54 | 440 |
| 0.55mm | 0.0217 | 126 | 79 | 1000 | -0.015 | 1500 | 1.59 | 450 |
| #74 | 0.0225 | 125 | 76 | 1000 | -0.015 | 1500 | 1.64 | 450 |
| 0.60mm | 0.0236 | 124 | 73 | 1000 | -0.016 | 1500 | 1.70 | 450 |
| #73 | 0.0240 | 124 | 72 | 1000 | -0.016 | 1500 | 1.72 | 450 |
| #72 | 0.0250 | 123 | 69 | 1000 | -0.016 | 1200 | 1.78 | 450 |
| 0.65mm | 0.0256 | 122 | 67 | 1000 | -0.016 | 1200 | 1.82 | 450 |
| #71 | 0.0260 | 122 | 66 | 1000 | -0.016 | 1200 | 1.85 | 450 |
| 0.70mm | 0.0276 | 120 | 62 | 1000 | -0.016 | 1200 | 1.94 | 450 |
| #70 | 0.0280 | 120 | 61 | 1000 | -0.017 | 1200 | 1.97 | 450 |
| #69 | 0.0292 | 119 | 59 | 1000 | -0.017 | 1200 | 2.02 | 450 |
| 0.75mm | 0.0295 | 119 | 58 | 1000 | -0.017 | 1200 | 2.05 | 450 |
| #68 | 0.0310 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 1/32 | 0.0312 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 0.80mm | 0.0315 | 115 | 55 | 1000 | -0.017 | 1500 | 2.09 | 450 |
| #67 | 0.0320 | 114 | 54 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| #66 | 0.0330 | 113 | 52 | 1000 | -0.018 | 1500 | 2.17 | 450 |
| 0.85mm | 0.0335 | 113 | 51 | 1000 | -0.018 | 1500 | 2.22 | 450 |
| #65 | 0.0350 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| 0.90mm | 0.0354 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| #64 | 0.0360 | 112 | 48 | 1000 | -0.018 | 1500 | 2.33 | 450 |
| #63 | 0.0370 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| 0.95mm | 0.0374 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| #62 | 0.0380 | 110 | 45 | 1000 | -0.019 | 1500 | 2.44 | 450 |
| #61 | 0.0390 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| 1.00mm | 0.0394 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| #60 | 0.0400 | 107 | 43 | 1000 | -0.019 | 1500 | 2.49 | 450 |
| #59 | 0.0410 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.05mm | 0.0413 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #58 | 0.0420 | 103 | 41 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #57 | 0.0430 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.10mm | 0.0433 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.15mm | 0.0453 | 95 | 38 | 1000 | -0.021 | 1500 | 2.50 | 450 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 3/64 | 0.0469 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.20mm | 0.0472 | 90 | 36 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.25mm | 0.0492 | 88 | 35 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| #55 | 0.0520 | 83 | 33 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| 1.35mm | 0.0531 | 80 | 32 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #54 | 0.0550 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.40mm | 0.0551 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.45mm | 0.0571 | 75 | 30 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.50mm | 0.0591 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1.55mm | 0.0610 | 70 | 28 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.60mm | 0.0630 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| #52 | 0.0635 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.65mm | 0.0650 | 65 | 26 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.80mm | 0.0709 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.85mm | 0.0728 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #49 | 0.0730 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.90mm | 0.0748 | 58 | 23 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #48 | 0.0760 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 1.95mm | 0.0768 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 5/64 | 0.0781 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| #47 | 0.0785 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.00mm | 0.0787 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.05mm | 0.0807 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #46 | 0.0810 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #45 | 0.0820 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.10mm | 0.0827 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1075 |

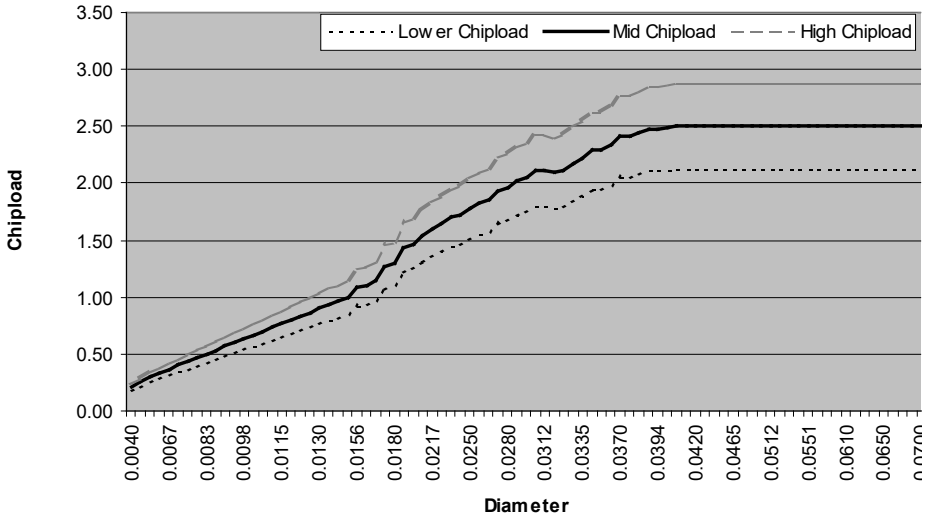
Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Multilayer High Tg




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Multilayer Low Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 24 | 80 | 200 | -0.011 | 500 | 0.30 | 84 |
| 0.13mm | 0.0050 | 28 | 80 | 300 | -0.011 | 600 | 0.35 | 105 |
| 0.15mm | 0.0059 | 30 | 80 | 300 | -0.011 | 600 | 0.38 | 124 |
| #96 | 0.0063 | 34 | 80 | 400 | -0.011 | 600 | 0.43 | 132 |
| #95 | 0.0067 | 34 | 80 | 400 | -0.012 | 600 | 0.43 | 140 |
| #94 | 0.0071 | 38 | 80 | 500 | -0.012 | 600 | 0.48 | 149 |
| #93 | 0.0075 | 40 | 80 | 500 | -0.012 | 600 | 0.50 | 157 |
| #92 | 0.0079 | 42 | 80 | 500 | -0.012 | 800 | 0.53 | 165 |
| #91 | 0.0083 | 46 | 80 | 600 | -0.012 | 800 | 0.58 | 174 |
| #90 | 0.0087 | 48 | 80 | 600 | -0.012 | 800 | 0.60 | 182 |
| #89 | 0.0091 | 50 | 80 | 700 | -0.012 | 800 | 0.63 | 190 |
| #88 | 0.0095 | 54 | 80 | 700 | -0.012 | 800 | 0.68 | 199 |
| 0.25mm | 0.0098 | 56 | 80 | 800 | -0.012 | 1000 | 0.70 | 205 |
| #87 | 0.0100 | 58 | 80 | 800 | -0.012 | 1000 | 0.73 | 209 |
| #86 | 0.0105 | 60 | 80 | 800 | -0.012 | 1000 | 0.75 | 220 |
| #85 | 0.0110 | 63 | 80 | 900 | -0.013 | 1000 | 0.79 | 230 |
| #84 | 0.0115 | 66 | 80 | 900 | -0.013 | 1000 | 0.83 | 241 |
| 0.30mm | 0.0118 | 70 | 80 | 1000 | -0.013 | 1200 | 0.88 | 247 |
| #83 | 0.0120 | 74 | 80 | 1000 | -0.013 | 1200 | 0.93 | 251 |
| #82 | 0.0125 | 77 | 80 | 1000 | -0.013 | 1200 | 0.96 | 262 |
| #81 | 0.0130 | 80 | 80 | 1000 | -0.013 | 1200 | 1.00 | 272 |
| #80 | 0.0135 | 83 | 80 | 1000 | -0.013 | 1500 | 1.04 | 283 |
| 0.35mm | 0.0138 | 86 | 80 | 1000 | -0.013 | 1500 | 1.08 | 289 |
| #79 | 0.0145 | 88 | 80 | 1000 | -0.013 | 1500 | 1.10 | 304 |
| 1/64 | 0.0156 | 92 | 80 | 1000 | -0.014 | 1500 | 1.15 | 327 |
| 0.40mm | 0.0158 | 94 | 80 | 1000 | -0.014 | 1500 | 1.18 | 331 |
| #78 | 0.0160 | 94 | 80 | 1000 | -0.014 | 1500 | 1.18 | 335 |
| 0.45mm | 0.0177 | 100 | 80 | 1000 | -0.014 | 1500 | 1.25 | 371 |
| #77 | 0.0180 | 104 | 80 | 1000 | -0.014 | 1500 | 1.30 | 377 |
| 0.50mm | 0.0197 | 115 | 80 | 1000 | -0.015 | 1500 | 1.44 | 412 |
| #76 | 0.0200 | 118 | 80 | 1000 | -0.015 | 1500 | 1.48 | 419 |
| #75 | 0.0210 | 125 | 80 | 1000 | -0.015 | 1500 | 1.56 | 440 |
| 0.55mm | 0.0217 | 130 | 80 | 1000 | -0.015 | 1500 | 1.63 | 454 |
| #74 | 0.0225 | 138 | 80 | 1000 | -0.015 | 1500 | 1.73 | 471 |
| 0.60mm | 0.0236 | 146 | 80 | 1000 | -0.016 | 1500 | 1.83 | 494 |
| #73 | 0.0240 | 147 | 80 | 1000 | -0.016 | 1500 | 1.84 | 502 |
| #72 | 0.0250 | 155 | 80 | 1000 | -0.016 | 1500 | 1.94 | 523 |
| 0.65mm | 0.0256 | 160 | 80 | 1000 | -0.016 | 1500 | 2.00 | 536 |
| #71 | 0.0260 | 163 | 80 | 1000 | -0.016 | 1500 | 2.04 | 544 |
| 0.70mm | 0.0276 | 166 | 76 | 1000 | -0.016 | 1500 | 2.18 | 550 |
| #70 | 0.0280 | 166 | 75 | 1000 | -0.017 | 1500 | 2.21 | 550 |
| #69 | 0.0292 | 166 | 72 | 1000 | -0.017 | 1500 | 2.31 | 550 |
| 0.75mm | 0.0295 | 166 | 71 | 1000 | -0.017 | 1500 | 2.34 | 550 |
| #68 | 0.0310 | 166 | 68 | 1000 | -0.017 | 1500 | 2.44 | 550 |
| 1/32 | 0.0312 | 166 | 67 | 1000 | -0.017 | 1500 | 2.48 | 550 |
| 0.80mm | 0.0315 | 166 | 67 | 1000 | -0.017 | 1500 | 2.48 | 550 |
| #67 | 0.0320 | 166 | 66 | 1000 | -0.017 | 1500 | 2.52 | 550 |
| #66 | 0.0330 | 164 | 64 | 1000 | -0.018 | 1500 | 2.56 | 550 |
| 0.85mm | 0.0335 | 163 | 63 | 1000 | -0.018 | 1500 | 2.59 | 550 |
| #65 | 0.0350 | 160 | 60 | 1000 | -0.018 | 1500 | 2.67 | 550 |
| 0.90mm | 0.0354 | 160 | 59 | 1000 | -0.018 | 1500 | 2.71 | 550 |
| #64 | 0.0360 | 159 | 58 | 1000 | -0.018 | 1500 | 2.74 | 550 |
| #63 | 0.0370 | 158 | 57 | 1000 | -0.019 | 1500 | 2.77 | 550 |
| 0.95mm | 0.0374 | 158 | 56 | 1000 | -0.019 | 1500 | 2.82 | 550 |
| #62 | 0.0380 | 156 | 55 | 1000 | -0.019 | 1500 | 2.84 | 550 |
| #61 | 0.0390 | 155 | 54 | 1000 | -0.019 | 1500 | 2.87 | 550 |
| 1.00mm | 0.0394 | 155 | 53 | 1000 | -0.019 | 1500 | 2.92 | 550 |
| #60 | 0.0400 | 154 | 53 | 1000 | -0.019 | 1500 | 2.91 | 550 |
| #59 | 0.0410 | 153 | 51 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.05mm | 0.0413 | 153 | 51 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| #58 | 0.0420 | 150 | 50 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| #57 | 0.0430 | 147 | 49 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.10mm | 0.0433 | 147 | 49 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.15mm | 0.0453 | 138 | 46 | 1000 | -0.021 | 1500 | 3.00 | 550 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 3/64 | 0.0469 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.20mm | 0.0472 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.25mm | 0.0492 | 129 | 43 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.30mm | 0.0512 | 123 | 41 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| #55 | 0.0520 | 120 | 40 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| 1.35mm | 0.0531 | 120 | 40 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| #54 | 0.0550 | 114 | 38 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.40mm | 0.0551 | 114 | 38 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.45mm | 0.0571 | 111 | 37 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.50mm | 0.0591 | 108 | 36 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| #53 | 0.0595 | 105 | 35 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| 1.55mm | 0.0610 | 102 | 34 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| 1/16 | 0.0625 | 102 | 34 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.60mm | 0.0630 | 99 | 33 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| #52 | 0.0635 | 99 | 33 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.65mm | 0.0650 | 96 | 32 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.70mm | 0.0669 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| #51 | 0.0670 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| 1.75mm | 0.0689 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| #50 | 0.0700 | 90 | 30 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| 1.80mm | 0.0709 | 90 | 30 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| 1.85mm | 0.0728 | 87 | 29 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| #49 | 0.0730 | 87 | 29 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| 1.90mm | 0.0748 | 84 | 28 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| #48 | 0.0760 | 84 | 28 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 1.95mm | 0.0768 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 5/64 | 0.0781 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| #47 | 0.0785 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 2.00mm | 0.0787 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 2.05mm | 0.0807 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| #46 | 0.0810 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| #45 | 0.0820 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| 2.10mm | 0.0827 | 75 | 25 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| 2.15mm | 0.0846 | 75 | 25 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| #44 | 0.0860 | 72 | 24 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| 2.20mm | 0.0866 | 72 | 24 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| 2.25mm | 0.0886 | 72 | 24 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| #43 | 0.0890 | 72 | 24 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| 2.30mm | 0.0906 | 69 | 23 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| 2.35mm | 0.0925 | 69 | 23 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| #42 | 0.0935 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 3/32 | 0.0938 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 2.40mm | 0.0945 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| #41 | 0.0960 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 2.45mm | 0.0965 | 66 | 22 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #40 | 0.0980 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| 2.50mm | 0.0984 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #39 | 0.0995 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| 2.55mm | 0.1004 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #38 | 0.1015 | 63 | 21 | 1000 | -0.034 | 1500 | 3.00 | 550 |
| 2.60mm | 0.1024 | 63 | 21 | 1000 | -0.034 | 1500 | 3.00 | 550 |
| #37 | 0.1040 | 60 | 20 | 1000 | -0.034 | 1200 | 3.00 | 550 |
| 2.65mm | 0.1043 | 60 | 20 | 1000 | -0.034 | 1200 | 3.00 | 550 |
| 2.70mm | 0.1063 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 550 |
| #36 | 0.1065 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 557 |
| 2.75mm | 0.1083 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 567 |
| 7/64 | 0.1094 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 573 |
| #35 | 0.1100 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 576 |
| 2.80mm | 0.1102 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 577 |
| #34 | 0.1110 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 581 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 587 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 591 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 598 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 654 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 1000 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 1000 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

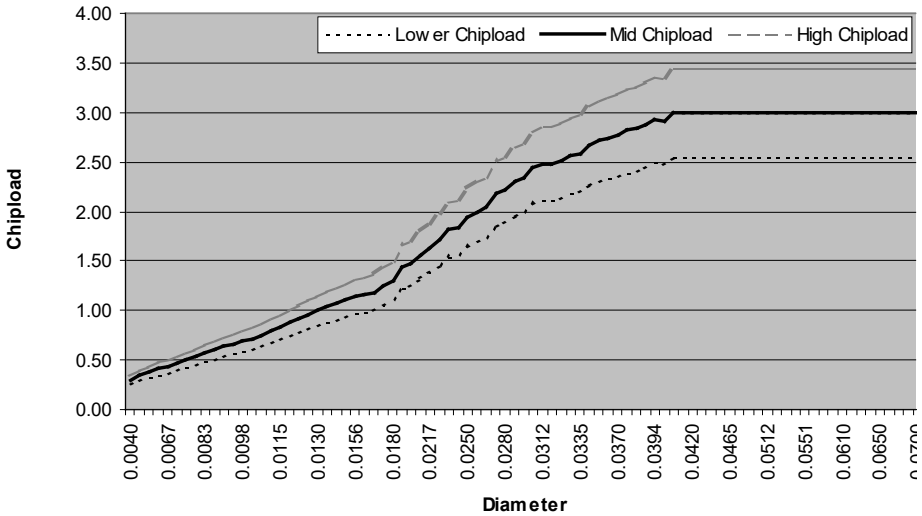
Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Multilayer Low Tg




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

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**Recommended Drill Series:** 100, 150, 240, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 24 | 80 | 200 | -0.011 | 200 | 0.30 | 84 |
| 0.13mm | 0.0050 | 28 | 80 | 300 | -0.011 | 200 | 0.35 | 105 |
| 0.15mm | 0.0059 | 32 | 80 | 300 | -0.011 | 250 | 0.40 | 124 |
| #96 | 0.0063 | 33 | 80 | 400 | -0.011 | 250 | 0.41 | 132 |
| #95 | 0.0067 | 34 | 80 | 400 | -0.012 | 250 | 0.43 | 140 |
| #94 | 0.0071 | 36 | 80 | 500 | -0.012 | 300 | 0.45 | 149 |
| #93 | 0.0075 | 39 | 80 | 500 | -0.012 | 300 | 0.49 | 157 |
| #92 | 0.0079 | 40 | 80 | 500 | -0.012 | 350 | 0.50 | 165 |
| #91 | 0.0083 | 41 | 80 | 600 | -0.012 | 350 | 0.51 | 174 |
| #90 | 0.0087 | 42 | 80 | 600 | -0.012 | 400 | 0.53 | 182 |
| #89 | 0.0091 | 45 | 80 | 700 | -0.012 | 400 | 0.56 | 190 |
| #88 | 0.0095 | 47 | 80 | 700 | -0.012 | 400 | 0.59 | 199 |
| 0.25mm | 0.0098 | 48 | 80 | 800 | -0.012 | 450 | 0.60 | 205 |
| #87 | 0.0100 | 50 | 80 | 800 | -0.012 | 450 | 0.63 | 209 |
| #86 | 0.0105 | 51 | 80 | 800 | -0.012 | 450 | 0.64 | 220 |
| #85 | 0.0110 | 53 | 80 | 900 | -0.013 | 450 | 0.66 | 230 |
| #84 | 0.0115 | 55 | 80 | 900 | -0.013 | 450 | 0.69 | 241 |
| 0.30mm | 0.0118 | 56 | 80 | 1000 | -0.013 | 500 | 0.70 | 247 |
| #83 | 0.0120 | 58 | 80 | 1000 | -0.013 | 500 | 0.73 | 251 |
| #82 | 0.0125 | 60 | 80 | 1000 | -0.013 | 500 | 0.75 | 262 |
| #81 | 0.0130 | 60 | 80 | 1000 | -0.013 | 500 | 0.75 | 272 |
| #80 | 0.0135 | 61 | 79 | 1000 | -0.013 | 500 | 0.77 | 279 |
| 0.35mm | 0.0138 | 61 | 79 | 1000 | -0.013 | 500 | 0.77 | 285 |
| #79 | 0.0145 | 61 | 79 | 1000 | -0.013 | 500 | 0.77 | 300 |
| 1/64 | 0.0156 | 62 | 75 | 1000 | -0.014 | 500 | 0.83 | 306 |
| 0.40mm | 0.0158 | 62 | 74 | 1000 | -0.014 | 500 | 0.84 | 306 |
| #78 | 0.0160 | 62 | 72 | 1000 | -0.014 | 500 | 0.86 | 300 |
| 0.45mm | 0.0177 | 62 | 65 | 1000 | -0.014 | 500 | 0.95 | 300 |
| #77 | 0.0180 | 62 | 64 | 1000 | -0.014 | 500 | 0.97 | 300 |
| 0.50mm | 0.0197 | 62 | 58 | 1000 | -0.015 | 500 | 1.07 | 300 |
| #76 | 0.0200 | 63 | 57 | 1000 | -0.015 | 500 | 1.11 | 300 |
| #75 | 0.0210 | 63 | 55 | 1000 | -0.015 | 750 | 1.15 | 300 |
| 0.55mm | 0.0217 | 64 | 53 | 1000 | -0.015 | 750 | 1.21 | 300 |
| #74 | 0.0225 | 65 | 51 | 1000 | -0.015 | 750 | 1.27 | 300 |
| 0.60mm | 0.0236 | 65 | 49 | 1000 | -0.016 | 750 | 1.33 | 300 |
| #73 | 0.0240 | 66 | 48 | 1000 | -0.016 | 750 | 1.38 | 300 |
| #72 | 0.0250 | 66 | 46 | 1000 | -0.016 | 750 | 1.43 | 300 |
| 0.65mm | 0.0256 | 68 | 45 | 1000 | -0.016 | 750 | 1.51 | 300 |
| #71 | 0.0260 | 69 | 44 | 1000 | -0.016 | 750 | 1.57 | 300 |
| 0.70mm | 0.0276 | 71 | 42 | 1000 | -0.016 | 750 | 1.69 | 300 |
| #70 | 0.0280 | 73 | 41 | 1000 | -0.017 | 750 | 1.78 | 300 |
| #69 | 0.0292 | 74 | 39 | 1000 | -0.017 | 750 | 1.90 | 300 |
| 0.75mm | 0.0295 | 76 | 39 | 1000 | -0.017 | 750 | 1.95 | 300 |
| #68 | 0.0310 | 77 | 37 | 1000 | -0.017 | 1000 | 2.08 | 300 |
| 1/32 | 0.0312 | 78 | 37 | 1000 | -0.017 | 1000 | 2.11 | 300 |
| 0.80mm | 0.0315 | 78 | 36 | 1000 | -0.017 | 1000 | 2.17 | 300 |
| #67 | 0.0320 | 79 | 36 | 1000 | -0.017 | 1000 | 2.19 | 300 |
| #66 | 0.0330 | 81 | 35 | 1000 | -0.018 | 1000 | 2.31 | 300 |
| 0.85mm | 0.0335 | 81 | 34 | 1000 | -0.018 | 1000 | 2.38 | 300 |
| #65 | 0.0350 | 81 | 33 | 1000 | -0.018 | 1000 | 2.45 | 300 |
| 0.90mm | 0.0354 | 80 | 32 | 1000 | -0.018 | 1000 | 2.50 | 300 |
| #64 | 0.0360 | 80 | 32 | 1000 | -0.018 | 1000 | 2.50 | 300 |
| #63 | 0.0370 | 78 | 31 | 1000 | -0.019 | 1000 | 2.52 | 300 |
| 0.95mm | 0.0374 | 78 | 31 | 1000 | -0.019 | 1000 | 2.52 | 300 |
| #62 | 0.0380 | 75 | 30 | 1000 | -0.019 | 1000 | 2.50 | 300 |
| #61 | 0.0390 | 73 | 29 | 1000 | -0.019 | 1000 | 2.52 | 300 |
| 1.00mm | 0.0394 | 73 | 29 | 1000 | -0.019 | 1000 | 2.52 | 300 |
| #60 | 0.0400 | 73 | 29 | 1000 | -0.019 | 1200 | 2.52 | 300 |
| #59 | 0.0410 | 70 | 28 | 1000 | -0.020 | 1200 | 2.50 | 300 |
| 1.05mm | 0.0413 | 70 | 28 | 1000 | -0.020 | 1200 | 2.50 | 300 |
| #58 | 0.0420 | 68 | 27 | 1000 | -0.020 | 1200 | 2.52 | 300 |
| #57 | 0.0430 | 68 | 27 | 1000 | -0.020 | 1200 | 2.52 | 300 |
| 1.10mm | 0.0433 | 65 | 26 | 1000 | -0.020 | 1200 | 2.50 | 300 |
| 1.15mm | 0.0453 | 63 | 25 | 1000 | -0.021 | 1200 | 2.52 | 300 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 63 | 25 | 1000 | -0.021 | 1200 | 2.52 | 300 |
| 3/64 | 0.0469 | 60 | 24 | 1000 | -0.021 | 1200 | 2.50 | 300 |
| 1.20mm | 0.0472 | 60 | 24 | 1000 | -0.021 | 1200 | 2.50 | 300 |
| 1.25mm | 0.0492 | 58 | 23 | 1000 | -0.021 | 1200 | 2.52 | 300 |
| 1.30mm | 0.0512 | 55 | 22 | 1000 | -0.022 | 1200 | 2.50 | 300 |
| #55 | 0.0520 | 55 | 22 | 1000 | -0.022 | 1200 | 2.50 | 300 |
| 1.35mm | 0.0531 | 55 | 22 | 1000 | -0.022 | 1200 | 2.50 | 300 |
| #54 | 0.0550 | 53 | 21 | 1000 | -0.023 | 1200 | 2.52 | 300 |
| 1.40mm | 0.0551 | 53 | 21 | 1000 | -0.023 | 1200 | 2.52 | 300 |
| 1.45mm | 0.0571 | 50 | 20 | 1000 | -0.023 | 1200 | 2.50 | 300 |
| 1.50mm | 0.0591 | 50 | 20 | 1000 | -0.024 | 1200 | 2.50 | 300 |
| #53 | 0.0595 | 50 | 20 | 1000 | -0.024 | 1200 | 2.50 | 311 |
| 1.55mm | 0.0610 | 50 | 20 | 1000 | -0.024 | 1200 | 2.50 | 319 |
| 1/16 | 0.0625 | 50 | 20 | 1000 | -0.025 | 1200 | 2.50 | 327 |
| 1.60mm | 0.0630 | 50 | 20 | 1000 | -0.025 | 1000 | 2.50 | 330 |
| #52 | 0.0635 | 50 | 20 | 1000 | -0.025 | 1000 | 2.50 | 332 |
| 1.65mm | 0.0650 | 50 | 20 | 1000 | -0.025 | 1000 | 2.50 | 340 |
| 1.70mm | 0.0669 | 50 | 20 | 1000 | -0.026 | 1000 | 2.50 | 350 |
| #51 | 0.0670 | 50 | 20 | 1000 | -0.026 | 1000 | 2.50 | 351 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 1000 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 1000 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 800 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 800 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 800 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 800 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 800 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 800 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 800 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 800 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 800 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 800 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 600 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 600 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 600 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 600 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 600 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 600 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 600 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 600 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 600 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 600 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 600 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 600 | 2.50 | 618 |
| #31 | 0.1200 | 43 | 20 | 1000 | -0.038 | 600 | 2.15 | 628 |
| 3.05mm | 0.1201 | 43 | 20 | 1000 | -0.038 | 600 | 2.15 | 629 |
| 3.10mm | 0.1220 | 43 | 20 | 1000 | -0.038 | 600 | 2.15 | 638 |
| 3.15mm | 0.1240 | 43 | 20 | 1000 | -0.039 | 600 | 2.15 | 649 |
| 1/8 | 0.1250 | 43 | 20 | 1000 | -0.039 | 600 | 2.15 | 654 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

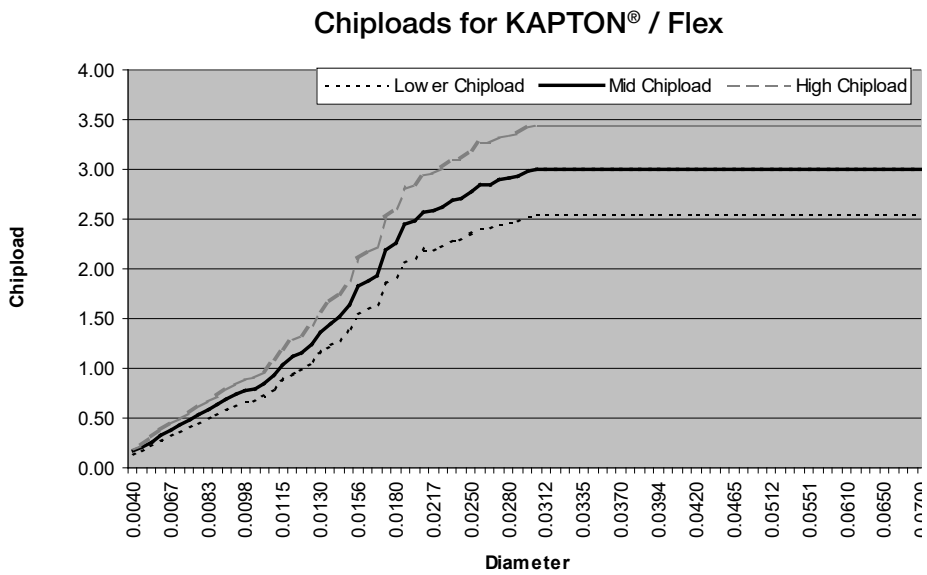
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 43 | 20 | 1000 | -0.018 | 400 | 2.15 | 659 |
| 3.25mm | 0.1280 | 43 | 20 | 1000 | -0.018 | 400 | 2.15 | 670 |
| #30 | 0.1285 | 43 | 20 | 1000 | -0.019 | 400 | 2.15 | 672 |
| 3.30mm | 0.1299 | 43 | 20 | 1000 | -0.019 | 400 | 2.15 | 680 |
| 3.35mm | 0.1319 | 43 | 20 | 1000 | -0.019 | 400 | 2.15 | 690 |
| 3.40mm | 0.1339 | 43 | 20 | 1000 | -0.019 | 400 | 2.15 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 795 |
| 3.90mm | 0.1535 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 803 |
| #23 | 0.1540 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 20 | 20 | 1000 | -0.023 | 300 | 1.00 | 1030 |
| 5.05mm | 0.1988 | 20 | 20 | 1000 | -0.023 | 300 | 1.00 | 1040 |
| #8 | 0.1990 | 20 | 20 | 1000 | -0.023 | 300 | 1.00 | 1041 |
| 5.10mm | 0.2008 | 20 | 20 | 1000 | -0.023 | 200 | 1.00 | 1051 |
| #7 | 0.2010 | 20 | 20 | 1000 | -0.023 | 200 | 1.00 | 1052 |
| 5.15mm | 0.2028 | 20 | 20 | 1000 | -0.023 | 200 | 1.00 | 1061 |
| 13/64 | 0.2031 | 20 | 20 | 1000 | -0.023 | 200 | 1.00 | 1063 |
| #6 | 0.2040 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1068 |
| 5.20mm | 0.2047 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1071 |
| #5 | 0.2055 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1075 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1082 |
| 5.30mm | 0.2087 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1092 |
| #4 | 0.2090 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1094 |
| 5.35mm | 0.2106 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Lexan / Acrylic** PCB Material

## **Recommended Drill Series:** 100, 150

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #80 | 0.0135 | 168 | 42 | 1000 | -0.013 | 2000 | 4.00 | 150 |
| 0.35mm | 0.0138 | 168 | 42 | 1000 | -0.013 | 2000 | 4.00 | 150 |
| #79 | 0.0145 | 168 | 40 | 1000 | -0.013 | 2000 | 4.20 | 150 |
| 1/64 | 0.0156 | 163 | 37 | 1000 | -0.014 | 2000 | 4.40 | 150 |
| 0.40mm | 0.0158 | 162 | 36 | 1000 | -0.014 | 2000 | 4.50 | 150 |
| #78 | 0.0160 | 166 | 36 | 1000 | -0.014 | 2000 | 4.60 | 150 |
| 0.45mm | 0.0177 | 154 | 32 | 1000 | -0.014 | 2000 | 4.80 | 150 |
| #77 | 0.0180 | 160 | 32 | 1000 | -0.014 | 2000 | 5.00 | 150 |
| 0.50mm | 0.0197 | 151 | 29 | 1000 | -0.015 | 2000 | 5.20 | 150 |
| #76 | 0.0200 | 157 | 29 | 1000 | -0.015 | 2000 | 5.40 | 150 |
| #75 | 0.0210 | 151 | 27 | 1000 | -0.015 | 2000 | 5.60 | 150 |
| 0.55mm | 0.0217 | 151 | 26 | 1000 | -0.015 | 2000 | 5.80 | 150 |
| #74 | 0.0225 | 150 | 25 | 1000 | -0.015 | 2000 | 6.00 | 150 |
| 0.60mm | 0.0236 | 149 | 24 | 1000 | -0.016 | 2000 | 6.20 | 150 |
| #73 | 0.0240 | 154 | 24 | 1000 | -0.016 | 2000 | 6.40 | 150 |
| #72 | 0.0250 | 152 | 23 | 1000 | -0.016 | 2000 | 6.60 | 150 |
| 0.65mm | 0.0256 | 150 | 22 | 1000 | -0.016 | 2000 | 6.80 | 150 |
| #71 | 0.0260 | 154 | 22 | 1000 | -0.016 | 2000 | 7.00 | 150 |
| 0.70mm | 0.0276 | 155 | 21 | 1000 | -0.016 | 2000 | 7.40 | 150 |
| #70 | 0.0280 | 152 | 20 | 1000 | -0.017 | 2000 | 7.60 | 150 |
| #69 | 0.0292 | 156 | 20 | 1000 | -0.017 | 2000 | 7.80 | 150 |
| 0.75mm | 0.0295 | 152 | 19 | 1000 | -0.017 | 2000 | 8.00 | 150 |
| #68 | 0.0310 | 148 | 18 | 1000 | -0.017 | 2000 | 8.20 | 150 |
| 1/32 | 0.0312 | 151 | 18 | 1000 | -0.017 | 2000 | 8.40 | 150 |
| 0.80mm | 0.0315 | 155 | 18 | 1000 | -0.017 | 2000 | 8.60 | 150 |
| #67 | 0.0320 | 158 | 18 | 1000 | -0.017 | 2000 | 8.80 | 150 |
| #66 | 0.0330 | 153 | 17 | 1000 | -0.018 | 2000 | 9.00 | 150 |
| 0.85mm | 0.0335 | 156 | 17 | 1000 | -0.018 | 2000 | 9.20 | 150 |
| #65 | 0.0350 | 154 | 16 | 1000 | -0.018 | 2000 | 9.60 | 150 |
| 0.90mm | 0.0354 | 157 | 16 | 1000 | -0.018 | 2000 | 9.80 | 150 |
| #64 | 0.0360 | 160 | 16 | 1000 | -0.018 | 2000 | 10.00 | 150 |
| #63 | 0.0370 | 153 | 15 | 1000 | -0.019 | 2000 | 10.20 | 150 |
| 0.95mm | 0.0374 | 156 | 15 | 1000 | -0.019 | 2000 | 10.40 | 150 |
| #62 | 0.0380 | 159 | 15 | 1000 | -0.019 | 2000 | 10.60 | 150 |
| #61 | 0.0390 | 162 | 15 | 1000 | -0.019 | 2000 | 10.80 | 150 |
| 1.00mm | 0.0394 | 165 | 15 | 1000 | -0.019 | 2000 | 11.00 | 155 |
| #60 | 0.0400 | 168 | 15 | 1000 | -0.019 | 2000 | 11.20 | 157 |
| #59 | 0.0410 | 171 | 15 | 1000 | -0.020 | 2000 | 11.40 | 161 |
| 1.05mm | 0.0413 | 174 | 15 | 1000 | -0.020 | 2000 | 11.60 | 162 |
| #58 | 0.0420 | 177 | 15 | 1000 | -0.020 | 2000 | 11.80 | 165 |
| #57 | 0.0430 | 180 | 15 | 1000 | -0.020 | 2000 | 12.00 | 169 |
| 1.10mm | 0.0433 | 183 | 15 | 1000 | -0.020 | 2000 | 12.20 | 170 |
| 1.15mm | 0.0453 | 189 | 15 | 1000 | -0.021 | 2000 | 12.60 | 178 |
| #56 | 0.0465 | 192 | 15 | 1000 | -0.021 | 2000 | 12.80 | 183 |
| 3/64 | 0.0469 | 195 | 15 | 1000 | -0.021 | 2000 | 13.00 | 184 |
| 1.20mm | 0.0472 | 198 | 15 | 1000 | -0.021 | 2000 | 13.20 | 185 |
| 1.25mm | 0.0492 | 201 | 15 | 1000 | -0.021 | 2000 | 13.40 | 193 |
| 1.30mm | 0.0512 | 207 | 15 | 1000 | -0.022 | 2000 | 13.80 | 201 |
| #55 | 0.0520 | 210 | 15 | 1000 | -0.022 | 2000 | 14.00 | 204 |
| 1.35mm | 0.0531 | 213 | 15 | 1000 | -0.022 | 2000 | 14.20 | 208 |
| #54 | 0.0550 | 219 | 15 | 1000 | -0.023 | 2000 | 14.60 | 216 |
| 1.40mm | 0.0551 | 222 | 15 | 1000 | -0.023 | 2000 | 14.80 | 216 |
| 1.45mm | 0.0571 | 228 | 15 | 1000 | -0.023 | 2000 | 15.20 | 224 |
| 1.50mm | 0.0591 | 234 | 15 | 1000 | -0.024 | 2000 | 15.60 | 232 |
| #53 | 0.0595 | 237 | 15 | 1000 | -0.024 | 2000 | 15.80 | 234 |
| 1.55mm | 0.0610 | 240 | 15 | 1000 | -0.024 | 2000 | 16.00 | 239 |
| 1/16 | 0.0625 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 245 |
| 1.60mm | 0.0630 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 247 |
| #52 | 0.0635 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 249 |
| 1.65mm | 0.0650 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 255 |
| 1.70mm | 0.0669 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 263 |
| #51 | 0.0670 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 263 |
| 1.75mm | 0.0689 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 270 |
| #50 | 0.0700 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 275 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.80mm | 0.0709 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 278 |
| 1.85mm | 0.0728 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 286 |
| #49 | 0.0730 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 287 |
| 1.90mm | 0.0748 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 294 |
| #48 | 0.0760 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 298 |
| 1.95mm | 0.0768 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 301 |
| 5/64 | 0.0781 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 307 |
| #47 | 0.0785 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 308 |
| 2.00mm | 0.0787 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 309 |
| 2.05mm | 0.0807 | 237 | 15 | 1000 | -0.029 | 2000 | 15.80 | 317 |
| #46 | 0.0810 | 234 | 15 | 1000 | -0.029 | 2000 | 15.60 | 318 |
| #45 | 0.0820 | 231 | 15 | 1000 | -0.029 | 2000 | 15.40 | 322 |
| 2.10mm | 0.0827 | 228 | 15 | 1000 | -0.029 | 2000 | 15.20 | 325 |
| 2.15mm | 0.0846 | 222 | 15 | 1000 | -0.030 | 2000 | 14.80 | 332 |
| #44 | 0.0860 | 216 | 15 | 1000 | -0.030 | 2000 | 14.40 | 338 |
| 2.20mm | 0.0866 | 213 | 15 | 1000 | -0.030 | 2000 | 14.20 | 340 |
| 2.25mm | 0.0886 | 207 | 15 | 1000 | -0.031 | 2000 | 13.80 | 348 |
| #43 | 0.0890 | 204 | 15 | 1000 | -0.031 | 2000 | 13.60 | 349 |
| 2.30mm | 0.0906 | 198 | 15 | 1000 | -0.031 | 2000 | 13.20 | 356 |
| 2.35mm | 0.0925 | 192 | 15 | 1000 | -0.032 | 2000 | 12.80 | 363 |
| #42 | 0.0935 | 189 | 15 | 1000 | -0.032 | 2000 | 12.60 | 367 |
| 3/32 | 0.0938 | 183 | 15 | 1000 | -0.032 | 2000 | 12.20 | 368 |
| 2.40mm | 0.0945 | 180 | 15 | 1000 | -0.032 | 2000 | 12.00 | 371 |
| #41 | 0.0960 | 174 | 15 | 1000 | -0.032 | 2000 | 11.60 | 377 |
| 2.45mm | 0.0965 | 171 | 15 | 1000 | -0.033 | 2000 | 11.40 | 379 |
| #40 | 0.0980 | 165 | 15 | 1000 | -0.033 | 2000 | 11.00 | 385 |
| 2.50mm | 0.0984 | 162 | 15 | 1000 | -0.033 | 2000 | 10.80 | 386 |
| #39 | 0.0995 | 159 | 15 | 1000 | -0.033 | 2000 | 10.60 | 391 |
| 2.55mm | 0.1004 | 156 | 15 | 1000 | -0.033 | 2000 | 10.40 | 394 |
| #38 | 0.1015 | 153 | 15 | 1000 | -0.034 | 2000 | 10.20 | 398 |
| 2.60mm | 0.1024 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 402 |
| #37 | 0.1040 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 408 |
| 2.65mm | 0.1043 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 409 |
| 2.70mm | 0.1063 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 417 |
| #36 | 0.1065 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 418 |
| 2.75mm | 0.1083 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 425 |
| 7/64 | 0.1094 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 429 |
| #35 | 0.1100 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 432 |
| 2.80mm | 0.1102 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 433 |
| #34 | 0.1110 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 436 |
| 2.85mm | 0.1122 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 440 |
| #33 | 0.1130 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 444 |
| 2.90mm | 0.1142 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 448 |
| #32 | 0.1160 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 455 |
| 2.95mm | 0.1161 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 456 |
| 3.00mm | 0.1181 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 464 |
| #31 | 0.1200 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 471 |
| 3.05mm | 0.1201 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 471 |
| 3.10mm | 0.1220 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 479 |
| 3.15mm | 0.1240 | 150 | 15 | 1000 | -0.039 | 2000 | 10.00 | 487 |
| 1/8 | 0.1250 | 150 | 15 | 1000 | -0.039 | 2000 | 10.00 | 491 |
| 3.20mm | 0.1260 | 160 | 16 | 1000 | -0.018 | 1500 | 10.00 | 528 |
| 3.25mm | 0.1280 | 160 | 16 | 1000 | -0.018 | 1500 | 10.00 | 536 |
| #30 | 0.1285 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 538 |
| 3.30mm | 0.1299 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 544 |
| 3.35mm | 0.1319 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 552 |
| 3.40mm | 0.1339 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 561 |
| 3.45mm | 0.1358 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 569 |
| #29 | 0.1360 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 569 |
| 3.50mm | 0.1378 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 577 |
| 3.55mm | 0.1398 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 585 |
| #28 | 0.1405 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 625 |
| 9/64 | 0.1406 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 625 |
| 3.60mm | 0.1417 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 630 |
| 3.65mm | 0.1437 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 639 |
| #27 | 0.1440 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 641 |
| 3.70mm | 0.1457 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 648 |
| #26 | 0.1470 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 654 |
| 3.75mm | 0.1476 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 657 |
| #25 | 0.1495 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 665 |
| 3.80mm | 0.1496 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 665 |
| 3.85mm | 0.1516 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 674 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

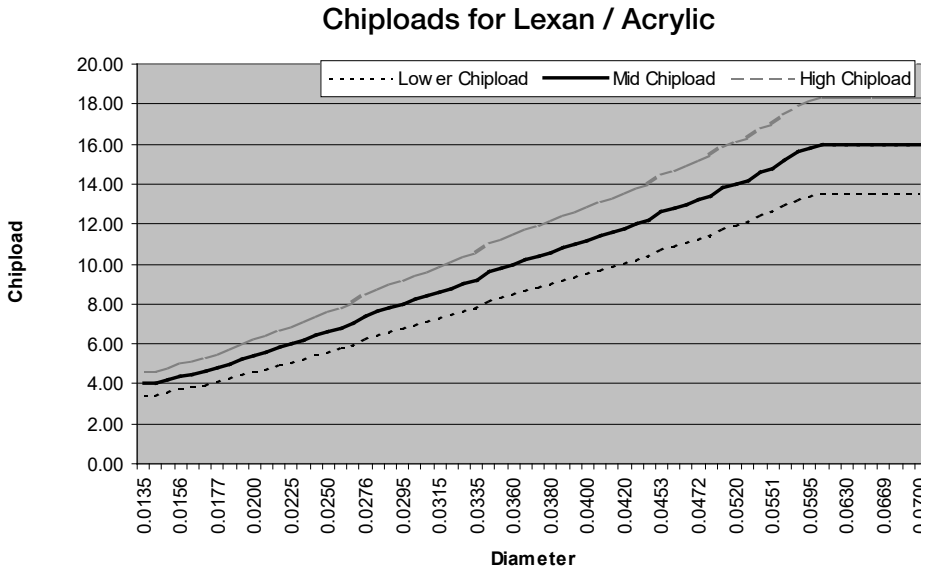
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #24 | 0.1520 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 676 |
| 3.90mm | 0.1535 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 683 |
| #23 | 0.1540 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 685 |
| 3.95 | 0.1555 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 692 |
| 5/32 | 0.1562 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 695 |
| #22 | 0.1570 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 698 |
| 4.00mm | 0.1575 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 701 |
| #21 | 0.1590 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 749 |
| 4.05mm | 0.1594 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 751 |
| #20 | 0.1610 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 758 |
| 4.10mm | 0.1614 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 760 |
| 4.15mm | 0.1634 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 770 |
| 4.20mm | 0.1654 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 779 |
| #19 | 0.1660 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 782 |
| 4.25mm | 0.1673 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 788 |
| 4.30mm | 0.1693 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 797 |
| #18 | 0.1695 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 798 |
| 4.35mm | 0.1713 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 807 |
| 11/64 | 0.1719 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 810 |
| #17 | 0.1730 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 815 |
| 4.40mm | 0.1732 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 816 |
| 4.45mm | 0.1752 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 825 |
| #16 | 0.1770 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 834 |
| 4.50mm | 0.1772 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 835 |
| 4.55mm | 0.1792 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 844 |
| #15 | 0.1800 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 848 |
| 4.60mm | 0.1811 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 853 |
| #14 | 0.1820 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 857 |
| 4.65mm | 0.1831 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 862 |
| #13 | 0.1850 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 871 |
| 4.70mm | 0.1850 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 871 |
| 4.75mm | 0.1870 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 881 |
| 3/16 | 0.1875 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 883 |
| 4.80mm | 0.1890 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 940 |
| #12 | 0.1890 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 940 |
| 4.85mm | 0.1909 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 949 |
| #11 | 0.1910 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 950 |
| 4.90mm | 0.1929 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 959 |
| #10 | 0.1935 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 962 |
| 4.95mm | 0.1949 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 969 |
| #9 | 0.1960 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 974 |
| 5.00mm | 0.1968 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 978 |
| 5.05mm | 0.1988 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 988 |
| #8 | 0.1990 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 989 |
| 5.10mm | 0.2008 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 998 |
| #7 | 0.2010 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 999 |
| 5.15mm | 0.2028 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 1008 |
| 13/64 | 0.2031 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 1010 |
| #6 | 0.2040 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1014 |
| 5.20mm | 0.2047 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1018 |
| #5 | 0.2055 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1022 |
| 5.25mm | 0.2067 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1028 |
| 5.30mm | 0.2087 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1038 |
| #4 | 0.2090 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1039 |
| 5.35mm | 0.2106 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1047 |
| 5.40mm | 0.2126 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1057 |
| #3 | 0.2130 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1059 |
| 5.45mm | 0.2146 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1067 |
| 5.50mm | 0.2165 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1076 |
| 5.55mm | 0.2185 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1086 |
| 7/32 | 0.2188 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1088 |
| 5.60mm | 0.2205 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1096 |
| #2 | 0.2210 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1099 |
| 5.65mm | 0.2224 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1106 |
| 5.70mm | 0.2244 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1116 |
| 5.75mm | 0.2264 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1126 |
| #1 | 0.2280 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1134 |
| 5.80mm | 0.2283 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1135 |
| 5.85mm | 0.2302 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1144 |
| 5.90mm | 0.2323 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1155 |
| A | 0.2340 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1163 |
| 5.95mm | 0.2343 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1165 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 15/64 | 0.2344 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1165 |
| 6.00mm | 0.2362 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1174 |
| B | 0.2380 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1246 |
| 6.05mm | 0.2382 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1247 |
| 6.10mm | 0.2402 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1257 |
| C | 0.2420 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1266 |
| 6.15mm | 0.2421 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1267 |
| 6.20mm | 0.2441 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1277 |
| D | 0.2460 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1287 |
| 6.25mm | 0.2461 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1288 |
| 6.30mm | 0.2480 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1298 |
| 6.35mm | 0.2500 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1308 |
| 6.40mm | 0.2520 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1319 |
| 6.50mm | 0.2559 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1339 |
| F | 0.2570 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1345 |
| 6.60mm | 0.2598 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Polyimide** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 14 | 80 | 200 | -0.011 | 200 | 0.18 | 84 |
| 0.13mm | 0.0050 | 16 | 80 | 300 | -0.011 | 250 | 0.20 | 105 |
| 0.15mm | 0.0059 | 17 | 80 | 300 | -0.011 | 250 | 0.21 | 124 |
| #96 | 0.0063 | 18 | 80 | 400 | -0.011 | 300 | 0.23 | 132 |
| #95 | 0.0067 | 18 | 80 | 400 | -0.012 | 300 | 0.23 | 140 |
| #94 | 0.0071 | 20 | 80 | 500 | -0.012 | 300 | 0.25 | 149 |
| #93 | 0.0075 | 22 | 80 | 500 | -0.012 | 300 | 0.28 | 157 |
| #92 | 0.0079 | 24 | 80 | 500 | -0.012 | 400 | 0.30 | 165 |
| #91 | 0.0083 | 26 | 80 | 600 | -0.012 | 400 | 0.33 | 174 |
| #90 | 0.0087 | 28 | 80 | 600 | -0.012 | 400 | 0.35 | 182 |
| #89 | 0.0091 | 30 | 80 | 700 | -0.012 | 400 | 0.38 | 190 |
| #88 | 0.0095 | 32 | 80 | 700 | -0.012 | 500 | 0.40 | 199 |
| 0.25mm | 0.0098 | 33 | 80 | 800 | -0.012 | 500 | 0.41 | 205 |
| #87 | 0.0100 | 34 | 80 | 800 | -0.012 | 500 | 0.43 | 209 |
| #86 | 0.0105 | 36 | 80 | 800 | -0.012 | 500 | 0.45 | 220 |
| #85 | 0.0110 | 38 | 80 | 900 | -0.013 | 500 | 0.48 | 230 |
| #84 | 0.0115 | 40 | 80 | 900 | -0.013 | 500 | 0.50 | 241 |
| 0.30mm | 0.0118 | 43 | 80 | 1000 | -0.013 | 750 | 0.54 | 247 |
| #83 | 0.0120 | 46 | 80 | 1000 | -0.013 | 750 | 0.58 | 251 |
| #82 | 0.0125 | 49 | 80 | 1000 | -0.013 | 750 | 0.61 | 262 |
| #81 | 0.0130 | 54 | 80 | 1000 | -0.013 | 750 | 0.68 | 272 |
| #80 | 0.0135 | 58 | 80 | 1000 | -0.013 | 750 | 0.73 | 283 |
| 0.35mm | 0.0138 | 59 | 80 | 1000 | -0.013 | 750 | 0.74 | 289 |
| #79 | 0.0145 | 62 | 80 | 1000 | -0.013 | 750 | 0.78 | 304 |
| 1/64 | 0.0156 | 68 | 80 | 1000 | -0.014 | 750 | 0.85 | 327 |
| 0.40mm | 0.0158 | 70 | 80 | 1000 | -0.014 | 750 | 0.88 | 331 |
| #78 | 0.0160 | 72 | 80 | 1000 | -0.014 | 750 | 0.90 | 335 |
| 0.45mm | 0.0177 | 74 | 76 | 1000 | -0.014 | 750 | 0.97 | 350 |
| #77 | 0.0180 | 76 | 74 | 1000 | -0.014 | 750 | 1.03 | 350 |
| 0.50mm | 0.0197 | 80 | 68 | 1000 | -0.015 | 750 | 1.18 | 350 |
| #76 | 0.0200 | 82 | 67 | 1000 | -0.015 | 750 | 1.22 | 350 |
| #75 | 0.0210 | 84 | 64 | 1000 | -0.015 | 750 | 1.31 | 350 |
| 0.55mm | 0.0217 | 86 | 62 | 1000 | -0.015 | 750 | 1.39 | 350 |
| #74 | 0.0225 | 88 | 59 | 1000 | -0.015 | 750 | 1.49 | 350 |
| 0.60mm | 0.0236 | 90 | 57 | 1000 | -0.016 | 750 | 1.58 | 350 |
| #73 | 0.0240 | 92 | 56 | 1000 | -0.016 | 750 | 1.64 | 350 |
| #72 | 0.0250 | 95 | 54 | 1000 | -0.016 | 750 | 1.76 | 350 |
| 0.65mm | 0.0256 | 96 | 52 | 1000 | -0.016 | 750 | 1.85 | 350 |
| #71 | 0.0260 | 98 | 51 | 1000 | -0.016 | 750 | 1.92 | 350 |
| 0.70mm | 0.0276 | 102 | 48 | 1000 | -0.016 | 750 | 2.13 | 350 |
| #70 | 0.0280 | 103 | 48 | 1000 | -0.017 | 750 | 2.15 | 350 |
| #69 | 0.0292 | 104 | 46 | 1000 | -0.017 | 750 | 2.26 | 350 |
| 0.75mm | 0.0295 | 105 | 45 | 1000 | -0.017 | 750 | 2.33 | 350 |
| #68 | 0.0310 | 108 | 43 | 1000 | -0.017 | 750 | 2.50 | 350 |
| 1/32 | 0.0312 | 108 | 43 | 1000 | -0.017 | 750 | 2.50 | 350 |
| 0.80mm | 0.0315 | 105 | 42 | 1000 | -0.017 | 750 | 2.50 | 350 |
| #67 | 0.0320 | 105 | 42 | 1000 | -0.017 | 750 | 2.50 | 350 |
| #66 | 0.0330 | 103 | 41 | 1000 | -0.018 | 750 | 2.50 | 350 |
| 0.85mm | 0.0335 | 100 | 40 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #65 | 0.0350 | 95 | 38 | 1000 | -0.018 | 750 | 2.50 | 350 |
| 0.90mm | 0.0354 | 95 | 38 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #64 | 0.0360 | 93 | 37 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #63 | 0.0370 | 90 | 36 | 1000 | -0.019 | 750 | 2.50 | 350 |
| 0.95mm | 0.0374 | 90 | 36 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #62 | 0.0380 | 88 | 35 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #61 | 0.0390 | 85 | 34 | 1000 | -0.019 | 750 | 2.50 | 350 |
| 1.00mm | 0.0394 | 85 | 34 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #60 | 0.0400 | 83 | 33 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #59 | 0.0410 | 83 | 33 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.05mm | 0.0413 | 80 | 32 | 1000 | -0.020 | 750 | 2.50 | 350 |
| #58 | 0.0420 | 80 | 32 | 1000 | -0.020 | 750 | 2.50 | 350 |
| #57 | 0.0430 | 78 | 31 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.10mm | 0.0433 | 78 | 31 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.15mm | 0.0453 | 75 | 30 | 1000 | -0.021 | 750 | 2.50 | 350 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 73 | 29 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 3/64 | 0.0469 | 70 | 28 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.20mm | 0.0472 | 70 | 28 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.25mm | 0.0492 | 68 | 27 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.30mm | 0.0512 | 65 | 26 | 1000 | -0.022 | 750 | 2.50 | 350 |
| #55 | 0.0520 | 65 | 26 | 1000 | -0.022 | 750 | 2.50 | 350 |
| 1.35mm | 0.0531 | 63 | 25 | 1000 | -0.022 | 750 | 2.50 | 350 |
| #54 | 0.0550 | 60 | 24 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.40mm | 0.0551 | 60 | 24 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.45mm | 0.0571 | 58 | 23 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.50mm | 0.0591 | 58 | 23 | 1000 | -0.024 | 750 | 2.50 | 350 |
| #53 | 0.0595 | 55 | 22 | 1000 | -0.024 | 750 | 2.50 | 350 |
| 1.55mm | 0.0610 | 55 | 22 | 1000 | -0.024 | 750 | 2.50 | 350 |
| 1/16 | 0.0625 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.60mm | 0.0630 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| #52 | 0.0635 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.65mm | 0.0650 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.70mm | 0.0669 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 350 |
| #51 | 0.0670 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 350 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 500 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 500 | 2.50 | 654 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 400 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 400 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 712 |
| 3.50mm | 0.1378 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 721 |
| 3.55mm | 0.1398 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 732 |
| #28 | 0.1405 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 735 |
| 9/64 | 0.1406 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 736 |
| 3.60mm | 0.1417 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 742 |
| 3.65mm | 0.1437 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 752 |
| #27 | 0.1440 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 754 |
| 3.70mm | 0.1457 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 300 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1052 |
| 5.15mm | 0.2028 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1061 |
| 13/64 | 0.2031 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1063 |
| #6 | 0.2040 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1068 |
| 5.20mm | 0.2047 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1071 |
| #5 | 0.2055 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1075 |

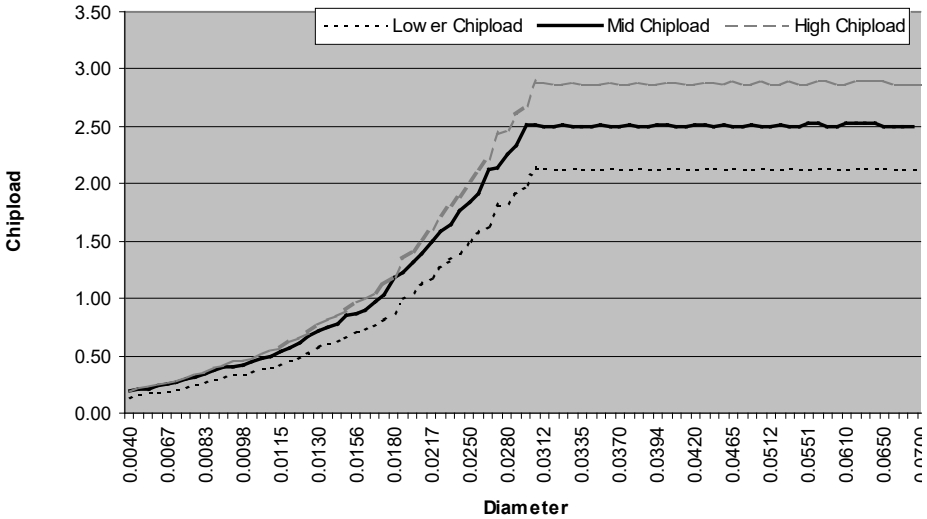
Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1082 |
| 5.30mm | 0.2087 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1092 |
| #4 | 0.2090 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1094 |
| 5.35mm | 0.2106 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1102 |
| 5.40mm | 0.2126 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1113 |
| #3 | 0.2130 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1115 |
| 5.45mm | 0.2146 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1123 |
| 5.50mm | 0.2165 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1133 |
| 5.55mm | 0.2185 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1143 |
| 7/32 | 0.2188 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1145 |
| 5.60mm | 0.2205 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1154 |
| #2 | 0.2210 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1157 |
| 5.65mm | 0.2224 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1164 |
| 5.70mm | 0.2244 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1174 |
| 5.75mm | 0.2264 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1185 |
| #1 | 0.2280 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1193 |
| 5.80mm | 0.2283 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1195 |
| 5.85mm | 0.2302 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1205 |
| 5.90mm | 0.2323 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1216 |
| A | 0.2340 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1225 |
| 5.95mm | 0.2343 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1226 |
| 15/64 | 0.2344 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1227 |
| 6.00mm | 0.2362 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1236 |
| B | 0.2380 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1246 |
| 6.05mm | 0.2382 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1247 |
| 6.10mm | 0.2402 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1257 |
| C | 0.2420 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1266 |
| 6.15mm | 0.2421 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1267 |
| 6.20mm | 0.2441 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1277 |
| D | 0.2460 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1287 |
| 6.25mm | 0.2461 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1288 |
| 6.30mm | 0.2480 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1298 |
| 6.35mm | 0.2500 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1308 |
| 6.40mm | 0.2520 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1319 |
| 6.50mm | 0.2559 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1339 |
| F | 0.2570 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1345 |
| 6.60mm | 0.2598 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Polyimide




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Polyimide Thick Panel** PCB Material

(Panel Thickness > 0.150")

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 26 | 80 | 800 | -0.012 | 350 | 0.33 | 205 |
| #87 | 0.0100 | 29 | 80 | 800 | -0.012 | 350 | 0.36 | 209 |
| #86 | 0.0105 | 30 | 80 | 800 | -0.012 | 350 | 0.38 | 220 |
| #85 | 0.0110 | 33 | 80 | 900 | -0.013 | 350 | 0.41 | 230 |
| #84 | 0.0115 | 34 | 80 | 900 | -0.013 | 350 | 0.43 | 241 |
| 0.30mm | 0.0118 | 37 | 80 | 1000 | -0.013 | 500 | 0.46 | 247 |
| #83 | 0.0120 | 39 | 80 | 1000 | -0.013 | 500 | 0.49 | 251 |
| #82 | 0.0125 | 41 | 80 | 1000 | -0.013 | 500 | 0.51 | 262 |
| #81 | 0.0130 | 46 | 80 | 1000 | -0.013 | 500 | 0.58 | 272 |
| #80 | 0.0135 | 49 | 80 | 1000 | -0.013 | 500 | 0.61 | 283 |
| 0.35mm | 0.0138 | 50 | 80 | 1000 | -0.013 | 500 | 0.63 | 289 |
| #79 | 0.0145 | 53 | 80 | 1000 | -0.013 | 500 | 0.66 | 304 |
| 1/64 | 0.0156 | 58 | 80 | 1000 | -0.014 | 500 | 0.73 | 327 |
| 0.40mm | 0.0158 | 59 | 80 | 1000 | -0.014 | 500 | 0.74 | 331 |
| #78 | 0.0160 | 62 | 80 | 1000 | -0.014 | 500 | 0.78 | 335 |
| 0.45mm | 0.0177 | 63 | 76 | 1000 | -0.014 | 500 | 0.83 | 350 |
| #77 | 0.0180 | 65 | 74 | 1000 | -0.014 | 500 | 0.88 | 350 |
| 0.50mm | 0.0197 | 68 | 68 | 1000 | -0.015 | 500 | 1.00 | 350 |
| #76 | 0.0200 | 70 | 67 | 1000 | -0.015 | 500 | 1.04 | 350 |
| #75 | 0.0210 | 71 | 64 | 1000 | -0.015 | 500 | 1.11 | 350 |
| 0.55mm | 0.0217 | 73 | 62 | 1000 | -0.015 | 500 | 1.18 | 350 |
| #74 | 0.0225 | 75 | 59 | 1000 | -0.015 | 500 | 1.27 | 350 |
| 0.60mm | 0.0236 | 77 | 57 | 1000 | -0.016 | 500 | 1.35 | 350 |
| #73 | 0.0240 | 78 | 56 | 1000 | -0.016 | 500 | 1.39 | 350 |
| #72 | 0.0250 | 81 | 54 | 1000 | -0.016 | 500 | 1.50 | 350 |
| 0.65mm | 0.0256 | 82 | 52 | 1000 | -0.016 | 500 | 1.58 | 350 |
| #71 | 0.0260 | 83 | 51 | 1000 | -0.016 | 500 | 1.63 | 350 |
| 0.70mm | 0.0276 | 87 | 48 | 1000 | -0.016 | 500 | 1.81 | 350 |
| #70 | 0.0280 | 88 | 48 | 1000 | -0.017 | 500 | 1.83 | 350 |
| #69 | 0.0292 | 90 | 46 | 1000 | -0.017 | 500 | 1.96 | 350 |
| 0.75mm | 0.0295 | 91 | 45 | 1000 | -0.017 | 500 | 2.02 | 350 |
| #68 | 0.0310 | 92 | 43 | 1000 | -0.017 | 500 | 2.14 | 350 |
| 1/32 | 0.0312 | 93 | 43 | 1000 | -0.017 | 500 | 2.16 | 350 |
| 0.80mm | 0.0315 | 94 | 42 | 1000 | -0.017 | 500 | 2.24 | 350 |
| #67 | 0.0320 | 95 | 42 | 1000 | -0.017 | 500 | 2.26 | 350 |
| #66 | 0.0330 | 97 | 41 | 1000 | -0.018 | 500 | 2.37 | 350 |
| 0.85mm | 0.0335 | 98 | 40 | 1000 | -0.018 | 500 | 2.45 | 350 |
| #65 | 0.0350 | 95 | 38 | 1000 | -0.018 | 500 | 2.50 | 350 |
| 0.90mm | 0.0354 | 95 | 38 | 1000 | -0.018 | 500 | 2.50 | 350 |
| #64 | 0.0360 | 93 | 37 | 1000 | -0.018 | 500 | 2.51 | 350 |
| #63 | 0.0370 | 90 | 36 | 1000 | -0.019 | 500 | 2.50 | 350 |
| 0.95mm | 0.0374 | 90 | 36 | 1000 | -0.019 | 500 | 2.50 | 350 |
| #62 | 0.0380 | 88 | 35 | 1000 | -0.019 | 500 | 2.51 | 350 |
| #61 | 0.0390 | 85 | 34 | 1000 | -0.019 | 500 | 2.50 | 350 |
| 1.00mm | 0.0394 | 85 | 34 | 1000 | -0.019 | 500 | 2.50 | 350 |
| #60 | 0.0400 | 83 | 33 | 1000 | -0.019 | 500 | 2.52 | 350 |
| #59 | 0.0410 | 83 | 33 | 1000 | -0.020 | 500 | 2.52 | 350 |
| 1.05mm | 0.0413 | 80 | 32 | 1000 | -0.020 | 500 | 2.50 | 350 |
| #58 | 0.0420 | 80 | 32 | 1000 | -0.020 | 500 | 2.50 | 350 |
| #57 | 0.0430 | 78 | 31 | 1000 | -0.020 | 500 | 2.52 | 350 |
| 1.10mm | 0.0433 | 78 | 31 | 1000 | -0.020 | 500 | 2.52 | 350 |
| 1.15mm | 0.0453 | 75 | 30 | 1000 | -0.021 | 500 | 2.50 | 350 |
| #56 | 0.0465 | 73 | 29 | 1000 | -0.021 | 500 | 2.52 | 350 |
| 3/64 | 0.0469 | 70 | 28 | 1000 | -0.021 | 500 | 2.50 | 350 |
| 1.20mm | 0.0472 | 70 | 28 | 1000 | -0.021 | 500 | 2.50 | 350 |
| 1.25mm | 0.0492 | 68 | 27 | 1000 | -0.021 | 500 | 2.52 | 350 |
| 1.30mm | 0.0512 | 65 | 26 | 1000 | -0.022 | 500 | 2.50 | 350 |
| #55 | 0.0520 | 65 | 26 | 1000 | -0.022 | 500 | 2.50 | 350 |
| 1.35mm | 0.0531 | 63 | 25 | 1000 | -0.022 | 500 | 2.52 | 350 |
| #54 | 0.0550 | 60 | 24 | 1000 | -0.023 | 500 | 2.50 | 350 |
| 1.40mm | 0.0551 | 60 | 24 | 1000 | -0.023 | 500 | 2.50 | 350 |
| 1.45mm | 0.0571 | 58 | 23 | 1000 | -0.023 | 500 | 2.52 | 350 |
| 1.50mm | 0.0591 | 58 | 23 | 1000 | -0.024 | 500 | 2.52 | 350 |
| #53 | 0.0595 | 55 | 22 | 1000 | -0.024 | 500 | 2.50 | 350 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 55 | 22 | 1000 | -0.024 | 500 | 2.50 | 350 |
| 1/16 | 0.0625 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| 1.60mm | 0.0630 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| #52 | 0.0635 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| 1.65mm | 0.0650 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| 1.70mm | 0.0669 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 350 |
| #51 | 0.0670 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 350 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 350 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 350 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 350 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 350 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 350 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 350 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 350 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 350 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 350 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 350 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 350 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 350 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 350 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 350 | 2.50 | 654 |
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 250 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 250 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 712 |
| 3.50mm | 0.1378 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 721 |
| 3.55mm | 0.1398 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 732 |
| #28 | 0.1405 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 735 |
| 9/64 | 0.1406 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 736 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

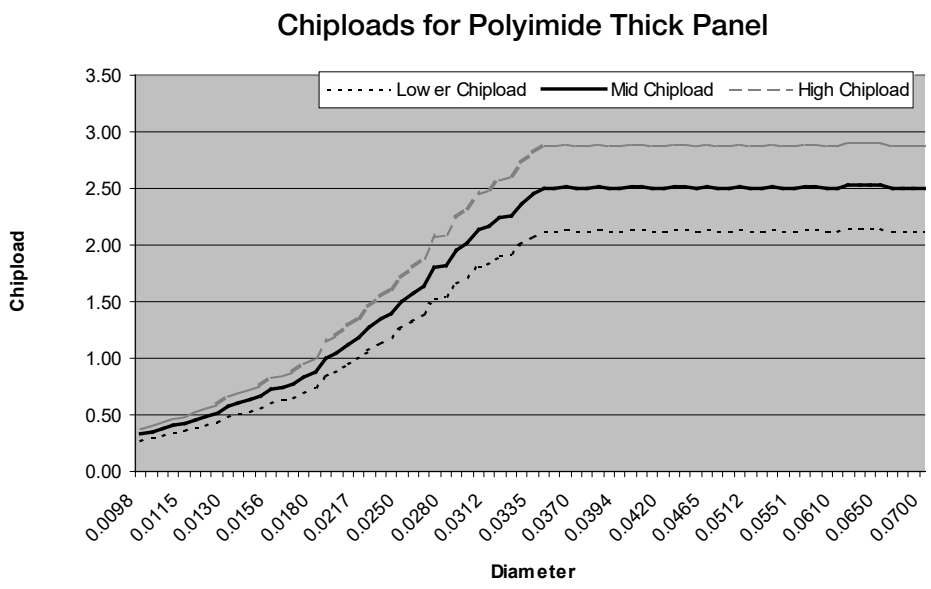
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 742 |
| 3.65mm | 0.1437 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 752 |
| #27 | 0.1440 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 754 |
| 3.70mm | 0.1457 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 200 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1051 |
| #7 | 0.2010 | 23 | 20 | 1000 | -0.023 | 150 | 1.15 | 1052 |
| 5.15mm | 0.2028 | 23 | 20 | 1000 | -0.023 | 150 | 1.15 | 1061 |
| 13/64 | 0.2031 | 23 | 20 | 1000 | -0.023 | 150 | 1.15 | 1063 |
| #6 | 0.2040 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1068 |
| 5.20mm | 0.2047 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1071 |
| #5 | 0.2055 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1075 |
| 5.25mm | 0.2067 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1082 |
| 5.30mm | 0.2087 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1092 |
| #4 | 0.2090 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1094 |
| 5.35mm | 0.2106 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1102 |
| 5.40mm | 0.2126 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1113 |
| #3 | 0.2130 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1115 |
| 5.45mm | 0.2146 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1123 |
| 5.50mm | 0.2165 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1133 |
| 5.55mm | 0.2185 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1143 |
| 7/32 | 0.2188 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1145 |
| 5.60mm | 0.2205 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1154 |
| #2 | 0.2210 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1157 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1164 |
| 5.70mm | 0.2244 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1174 |
| 5.75mm | 0.2264 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1185 |
| #1 | 0.2280 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1193 |
| 5.80mm | 0.2283 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1195 |
| 5.85mm | 0.2302 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1205 |
| 5.90mm | 0.2323 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1216 |
| A | 0.2340 | 23 | 20 | 1000 | -0.025 | 100 | 1.15 | 1225 |
| 5.95mm | 0.2343 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1226 |
| 15/64 | 0.2344 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1227 |
| 6.00mm | 0.2362 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1236 |
| B | 0.2380 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1246 |
| 6.05mm | 0.2382 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1247 |
| 6.10mm | 0.2402 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1257 |
| C | 0.2420 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1266 |
| 6.15mm | 0.2421 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1267 |
| 6.20mm | 0.2441 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1277 |
| D | 0.2460 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1287 |
| 6.25mm | 0.2461 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1288 |
| 6.30mm | 0.2480 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1298 |
| 6.35mm | 0.2500 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1308 |
| 6.40mm | 0.2520 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1319 |
| 6.50mm | 0.2559 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1339 |
| F | 0.2570 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1345 |
| 6.60mm | 0.2598 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Slot Drilling FR-4 PCB Material

## Recommended Drill Series: 100, 150, 700, 750

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #80 | 0.0135 | 40 | 80 | 1000 | -0.013 | 3000 | 0.50 | 283 |
| 0.35mm | 0.0138 | 40 | 80 | 1000 | -0.013 | 3000 | 0.50 | 289 |
| #79 | 0.0145 | 44 | 80 | 1000 | -0.013 | 3000 | 0.55 | 304 |
| 1/64 | 0.0156 | 46 | 80 | 1000 | -0.014 | 3000 | 0.58 | 327 |
| 0.40mm | 0.0158 | 47 | 80 | 1000 | -0.014 | 3000 | 0.59 | 331 |
| #78 | 0.0160 | 48 | 80 | 1000 | -0.014 | 3000 | 0.60 | 335 |
| 0.45mm | 0.0177 | 54 | 80 | 1000 | -0.014 | 3000 | 0.68 | 371 |
| #77 | 0.0180 | 55 | 80 | 1000 | -0.014 | 3000 | 0.69 | 377 |
| 0.50mm | 0.0197 | 62 | 80 | 1000 | -0.015 | 3000 | 0.78 | 412 |
| #76 | 0.0200 | 63 | 80 | 1000 | -0.015 | 3000 | 0.79 | 419 |
| #75 | 0.0210 | 67 | 80 | 1000 | -0.015 | 3000 | 0.84 | 440 |
| 0.55mm | 0.0217 | 70 | 79 | 1000 | -0.015 | 3000 | 0.89 | 450 |
| #74 | 0.0225 | 72 | 76 | 1000 | -0.015 | 3000 | 0.95 | 450 |
| 0.60mm | 0.0236 | 73 | 73 | 1000 | -0.016 | 3000 | 1.00 | 450 |
| #73 | 0.0240 | 72 | 72 | 1000 | -0.016 | 3000 | 1.00 | 450 |
| #72 | 0.0250 | 73 | 69 | 1000 | -0.016 | 3000 | 1.06 | 450 |
| 0.65mm | 0.0256 | 74 | 68 | 1000 | -0.016 | 3000 | 1.09 | 450 |
| #71 | 0.0260 | 74 | 67 | 1000 | -0.016 | 3000 | 1.10 | 450 |
| 0.70mm | 0.0276 | 75 | 63 | 1000 | -0.016 | 3000 | 1.19 | 450 |
| #70 | 0.0280 | 75 | 63 | 1000 | -0.017 | 3000 | 1.19 | 450 |
| #69 | 0.0292 | 76 | 59 | 1000 | -0.017 | 3000 | 1.29 | 450 |
| 0.75mm | 0.0295 | 76 | 58 | 1000 | -0.017 | 3000 | 1.31 | 450 |
| #68 | 0.0310 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| 1/32 | 0.0312 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| 0.80mm | 0.0315 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| #67 | 0.0320 | 75 | 54 | 1000 | -0.017 | 3000 | 1.39 | 450 |
| #66 | 0.0330 | 74 | 52 | 1000 | -0.018 | 3000 | 1.42 | 450 |
| 0.85mm | 0.0335 | 74 | 51 | 1000 | -0.018 | 3000 | 1.45 | 450 |
| #65 | 0.0350 | 73 | 49 | 1000 | -0.018 | 3000 | 1.49 | 450 |
| 0.90mm | 0.0354 | 72 | 48 | 1000 | -0.018 | 3000 | 1.50 | 450 |
| #64 | 0.0360 | 72 | 48 | 1000 | -0.018 | 3000 | 1.50 | 450 |
| #63 | 0.0370 | 71 | 47 | 1000 | -0.019 | 3000 | 1.51 | 450 |
| 0.95mm | 0.0374 | 69 | 46 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #62 | 0.0380 | 68 | 45 | 1000 | -0.019 | 3000 | 1.51 | 450 |
| #61 | 0.0390 | 66 | 44 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| 1.00mm | 0.0394 | 66 | 44 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #60 | 0.0400 | 65 | 43 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #59 | 0.0410 | 63 | 42 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.05mm | 0.0413 | 62 | 41 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| #58 | 0.0420 | 61 | 41 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| #57 | 0.0430 | 60 | 40 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.10mm | 0.0433 | 60 | 40 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.15mm | 0.0453 | 57 | 38 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| #56 | 0.0465 | 56 | 37 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 3/64 | 0.0469 | 54 | 36 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.20mm | 0.0472 | 54 | 36 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.25mm | 0.0492 | 52 | 35 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.30mm | 0.0512 | 51 | 34 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| #55 | 0.0520 | 50 | 33 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| 1.35mm | 0.0531 | 48 | 32 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| #54 | 0.0550 | 47 | 32 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.40mm | 0.0551 | 46 | 31 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.45mm | 0.0571 | 45 | 30 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.50mm | 0.0591 | 44 | 29 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| #53 | 0.0595 | 43 | 29 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| 1.55mm | 0.0610 | 42 | 28 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| 1/16 | 0.0625 | 41 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.60mm | 0.0630 | 41 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| #52 | 0.0635 | 40 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.65mm | 0.0650 | 39 | 26 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.70mm | 0.0669 | 39 | 26 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| #51 | 0.0670 | 38 | 26 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| 1.75mm | 0.0689 | 38 | 25 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| #50 | 0.0700 | 37 | 25 | 1000 | -0.026 | 3000 | 1.50 | 450 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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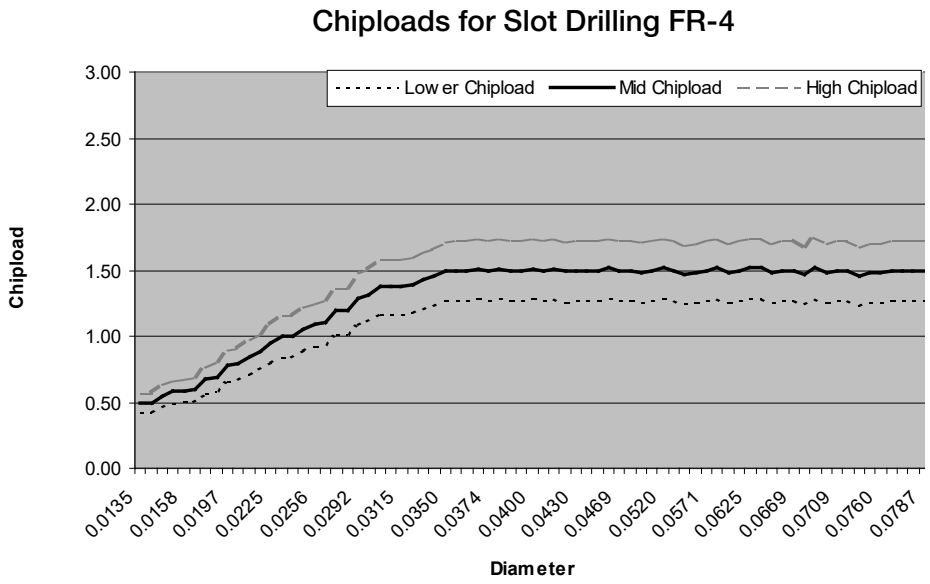
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.80mm | 0.0709 | 36 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| 1.85mm | 0.0728 | 36 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| #49 | 0.0730 | 35 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| 1.90mm | 0.0748 | 34 | 23 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| #48 | 0.0760 | 34 | 23 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 1.95mm | 0.0768 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 5/64 | 0.0781 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| #47 | 0.0785 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 2.00mm | 0.0787 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Aramid** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 26 | 80 | 200 | -0.011 | 1000 | 0.33 | 84 |
| 0.13mm | 0.0050 | 28 | 80 | 300 | -0.011 | 1000 | 0.35 | 105 |
| 0.15mm | 0.0059 | 30 | 80 | 300 | -0.011 | 1000 | 0.38 | 124 |
| #96 | 0.0063 | 30 | 80 | 400 | -0.011 | 1000 | 0.38 | 132 |
| #95 | 0.0067 | 32 | 80 | 400 | -0.012 | 1000 | 0.40 | 140 |
| #94 | 0.0071 | 34 | 80 | 500 | -0.012 | 1000 | 0.43 | 149 |
| #93 | 0.0075 | 37 | 80 | 500 | -0.012 | 1000 | 0.46 | 157 |
| #92 | 0.0079 | 40 | 80 | 500 | -0.012 | 1000 | 0.50 | 165 |
| #91 | 0.0083 | 43 | 80 | 600 | -0.012 | 1200 | 0.54 | 174 |
| #90 | 0.0087 | 46 | 80 | 600 | -0.012 | 1200 | 0.58 | 182 |
| #89 | 0.0091 | 46 | 80 | 700 | -0.012 | 1200 | 0.58 | 190 |
| #88 | 0.0095 | 50 | 80 | 700 | -0.012 | 1200 | 0.63 | 199 |
| 0.25mm | 0.0098 | 52 | 80 | 800 | -0.012 | 1200 | 0.65 | 205 |
| #87 | 0.0100 | 54 | 80 | 800 | -0.012 | 1200 | 0.68 | 209 |
| #86 | 0.0105 | 57 | 80 | 800 | -0.012 | 1500 | 0.71 | 220 |
| #85 | 0.0110 | 61 | 80 | 900 | -0.013 | 1500 | 0.76 | 230 |
| #84 | 0.0115 | 67 | 80 | 900 | -0.013 | 1500 | 0.84 | 241 |
| 0.30mm | 0.0118 | 71 | 80 | 1000 | -0.013 | 1500 | 0.89 | 247 |
| #83 | 0.0120 | 74 | 80 | 1000 | -0.013 | 1500 | 0.93 | 251 |
| #82 | 0.0125 | 78 | 80 | 1000 | -0.013 | 1500 | 0.98 | 262 |
| #81 | 0.0130 | 83 | 80 | 1000 | -0.013 | 1500 | 1.04 | 272 |
| #80 | 0.0135 | 88 | 80 | 1000 | -0.013 | 1500 | 1.10 | 283 |
| 0.35mm | 0.0138 | 92 | 80 | 1000 | -0.013 | 1500 | 1.15 | 289 |
| #79 | 0.0145 | 97 | 80 | 1000 | -0.013 | 1500 | 1.21 | 304 |
| 1/64 | 0.0156 | 103 | 80 | 1000 | -0.014 | 1500 | 1.29 | 327 |
| 0.40mm | 0.0158 | 104 | 80 | 1000 | -0.014 | 1500 | 1.30 | 331 |
| #78 | 0.0160 | 105 | 80 | 1000 | -0.014 | 1500 | 1.31 | 335 |
| 0.45mm | 0.0177 | 105 | 73 | 1000 | -0.014 | 1500 | 1.44 | 340 |
| #77 | 0.0180 | 105 | 72 | 1000 | -0.014 | 1500 | 1.46 | 340 |
| 0.50mm | 0.0197 | 98 | 66 | 1000 | -0.015 | 1500 | 1.48 | 340 |
| #76 | 0.0200 | 96 | 65 | 1000 | -0.015 | 1500 | 1.48 | 340 |
| #75 | 0.0210 | 93 | 62 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| 0.55mm | 0.0217 | 90 | 60 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| #74 | 0.0225 | 87 | 58 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| 0.60mm | 0.0236 | 82 | 55 | 1000 | -0.016 | 1500 | 1.49 | 340 |
| #73 | 0.0240 | 81 | 54 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #72 | 0.0250 | 78 | 52 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| 0.65mm | 0.0256 | 76 | 51 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #71 | 0.0260 | 75 | 50 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| 0.70mm | 0.0276 | 71 | 47 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #70 | 0.0280 | 69 | 46 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #69 | 0.0292 | 66 | 44 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 0.75mm | 0.0295 | 66 | 44 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #68 | 0.0310 | 63 | 42 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 1/32 | 0.0312 | 63 | 42 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 0.80mm | 0.0315 | 61 | 41 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #67 | 0.0320 | 61 | 41 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #66 | 0.0330 | 59 | 39 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| 0.85mm | 0.0335 | 59 | 39 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #65 | 0.0350 | 56 | 37 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| 0.90mm | 0.0354 | 56 | 37 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #64 | 0.0360 | 54 | 36 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #63 | 0.0370 | 53 | 35 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| 0.95mm | 0.0374 | 51 | 34 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #62 | 0.0380 | 51 | 34 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #61 | 0.0390 | 49 | 33 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| 1.00mm | 0.0394 | 49 | 33 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #60 | 0.0400 | 48 | 32 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #59 | 0.0410 | 48 | 32 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.05mm | 0.0413 | 46 | 31 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| #58 | 0.0420 | 46 | 31 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| #57 | 0.0430 | 45 | 30 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.10mm | 0.0433 | 45 | 30 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.15mm | 0.0453 | 43 | 29 | 1000 | -0.021 | 1500 | 1.50 | 340 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 3/64 | 0.0469 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.20mm | 0.0472 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.25mm | 0.0492 | 39 | 26 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.30mm | 0.0512 | 38 | 25 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| #55 | 0.0520 | 38 | 25 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| 1.35mm | 0.0531 | 36 | 24 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| #54 | 0.0550 | 36 | 24 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.40mm | 0.0551 | 36 | 24 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.45mm | 0.0571 | 35 | 23 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.50mm | 0.0591 | 33 | 22 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| #53 | 0.0595 | 33 | 22 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| 1.55mm | 0.0610 | 32 | 21 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| 1/16 | 0.0625 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.60mm | 0.0630 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| #52 | 0.0635 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.65mm | 0.0650 | 30 | 20 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.70mm | 0.0669 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 350 |
| #51 | 0.0670 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 351 |
| 1.75mm | 0.0689 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 361 |
| #50 | 0.0700 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 366 |
| 1.80mm | 0.0709 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 371 |
| 1.85mm | 0.0728 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 381 |
| #49 | 0.0730 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 382 |
| 1.90mm | 0.0748 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 391 |
| #48 | 0.0760 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 398 |
| 1.95mm | 0.0768 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 402 |
| 5/64 | 0.0781 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 409 |
| #47 | 0.0785 | 30 | 20 | 1000 | -0.028 | 1200 | 1.50 | 411 |
| 2.00mm | 0.0787 | 30 | 20 | 1000 | -0.028 | 1200 | 1.50 | 412 |
| 2.05mm | 0.0807 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 422 |
| #46 | 0.0810 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 424 |
| #45 | 0.0820 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 429 |
| 2.10mm | 0.0827 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 433 |
| 2.15mm | 0.0846 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 443 |
| #44 | 0.0860 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 450 |
| 2.20mm | 0.0866 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 453 |
| 2.25mm | 0.0886 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 464 |
| #43 | 0.0890 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 466 |
| 2.30mm | 0.0906 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 474 |
| 2.35mm | 0.0925 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 484 |
| #42 | 0.0935 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 489 |
| 3/32 | 0.0938 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 491 |
| 2.40mm | 0.0945 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 495 |
| #41 | 0.0960 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 502 |
| 2.45mm | 0.0965 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 505 |
| #40 | 0.0980 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 513 |
| 2.50mm | 0.0984 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 515 |
| #39 | 0.0995 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 521 |
| 2.55mm | 0.1004 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 525 |
| #38 | 0.1015 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 531 |
| 2.60mm | 0.1024 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 536 |
| #37 | 0.1040 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 544 |
| 2.65mm | 0.1043 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 546 |
| 2.70mm | 0.1063 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 556 |
| #36 | 0.1065 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 557 |
| 2.75mm | 0.1083 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 567 |
| 7/64 | 0.1094 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 573 |
| #35 | 0.1100 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 576 |
| 2.80mm | 0.1102 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 577 |
| #34 | 0.1110 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 581 |
| 2.85mm | 0.1122 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 587 |
| #33 | 0.1130 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 591 |
| 2.90mm | 0.1142 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 598 |
| #32 | 0.1160 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 607 |
| 2.95mm | 0.1161 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 608 |
| 3.00mm | 0.1181 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 618 |
| #31 | 0.1200 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 628 |
| 3.05mm | 0.1201 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 629 |
| 3.10mm | 0.1220 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 638 |
| 3.15mm | 0.1240 | 30 | 20 | 1000 | -0.039 | 1200 | 1.50 | 649 |
| 1/8 | 0.1250 | 30 | 20 | 1000 | -0.039 | 1200 | 1.50 | 654 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

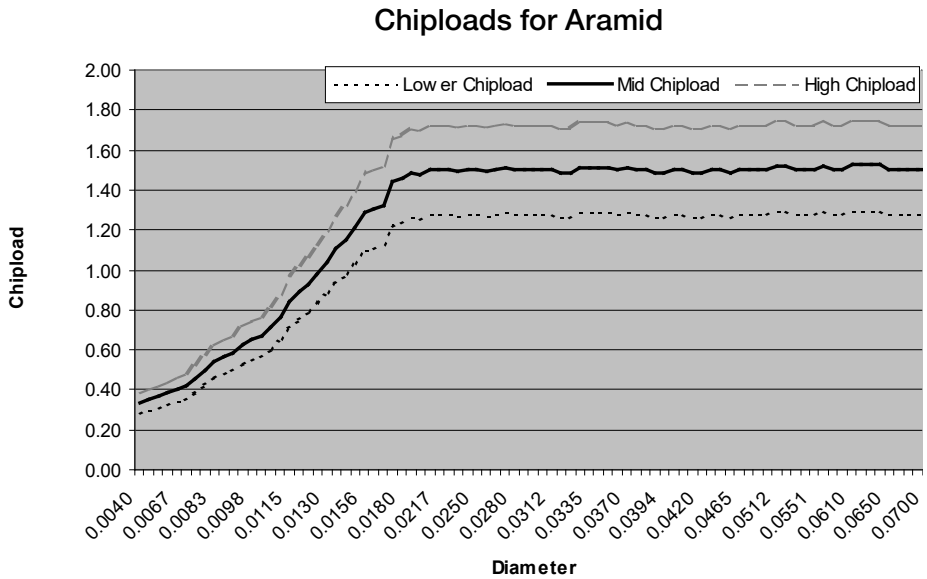
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 1000 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 1000 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 795 |
| 3.90mm | 0.1535 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 803 |
| #23 | 0.1540 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1051 |
| #7 | 0.2010 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1052 |
| 5.15mm | 0.2028 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1061 |
| 13/64 | 0.2031 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1063 |
| #6 | 0.2040 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1068 |
| 5.20mm | 0.2047 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1071 |
| #5 | 0.2055 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1075 |

Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1082 |
| 5.30mm | 0.2087 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1092 |
| #4 | 0.2090 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1094 |
| 5.35mm | 0.2106 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1102 |
| 5.40mm | 0.2126 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1113 |
| #3 | 0.2130 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1115 |
| 5.45mm | 0.2146 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1123 |
| 5.50mm | 0.2165 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1133 |
| 5.55mm | 0.2185 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1143 |
| 7/32 | 0.2188 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1145 |
| 5.60mm | 0.2205 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1154 |
| #2 | 0.2210 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1157 |
| 5.65mm | 0.2224 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1164 |
| 5.70mm | 0.2244 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1174 |
| 5.75mm | 0.2264 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1185 |
| #1 | 0.2280 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1193 |
| 5.80mm | 0.2283 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1195 |
| 5.85mm | 0.2302 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1205 |
| 5.90mm | 0.2323 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1216 |
| A | 0.2340 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1225 |
| 5.95mm | 0.2343 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1226 |
| 15/64 | 0.2344 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **80K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **BT Epoxy** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 10 | 110 | 200 | -0.011 | 300 | 0.09 | 115 |
| 0.13mm | 0.0050 | 14 | 110 | 300 | -0.011 | 300 | 0.13 | 144 |
| 0.15mm | 0.0059 | 19 | 110 | 300 | -0.011 | 300 | 0.17 | 170 |
| #96 | 0.0063 | 20 | 110 | 400 | -0.011 | 300 | 0.18 | 181 |
| #95 | 0.0067 | 22 | 110 | 400 | -0.012 | 300 | 0.20 | 193 |
| #94 | 0.0071 | 25 | 110 | 500 | -0.012 | 300 | 0.23 | 204 |
| #93 | 0.0075 | 30 | 110 | 500 | -0.012 | 300 | 0.27 | 216 |
| #92 | 0.0079 | 32 | 110 | 500 | -0.012 | 300 | 0.29 | 227 |
| #91 | 0.0083 | 36 | 110 | 600 | -0.012 | 300 | 0.33 | 239 |
| #90 | 0.0087 | 42 | 110 | 600 | -0.012 | 300 | 0.38 | 250 |
| #89 | 0.0091 | 44 | 110 | 700 | -0.012 | 300 | 0.40 | 262 |
| #88 | 0.0095 | 46 | 110 | 700 | -0.012 | 300 | 0.42 | 273 |
| 0.25mm | 0.0098 | 51 | 110 | 800 | -0.012 | 500 | 0.46 | 282 |
| #87 | 0.0100 | 52 | 110 | 800 | -0.012 | 500 | 0.47 | 288 |
| #86 | 0.0105 | 55 | 110 | 800 | -0.012 | 500 | 0.50 | 302 |
| #85 | 0.0110 | 59 | 110 | 900 | -0.013 | 500 | 0.54 | 317 |
| #84 | 0.0115 | 63 | 110 | 900 | -0.013 | 500 | 0.57 | 331 |
| 0.30mm | 0.0118 | 64 | 110 | 1000 | -0.013 | 500 | 0.58 | 340 |
| #83 | 0.0120 | 67 | 110 | 1000 | -0.013 | 500 | 0.61 | 345 |
| #82 | 0.0125 | 70 | 110 | 1000 | -0.013 | 500 | 0.64 | 360 |
| #81 | 0.0130 | 78 | 110 | 1000 | -0.013 | 500 | 0.71 | 375 |
| #80 | 0.0135 | 82 | 106 | 1000 | -0.013 | 750 | 0.77 | 375 |
| 0.35mm | 0.0138 | 83 | 104 | 1000 | -0.013 | 750 | 0.80 | 375 |
| #79 | 0.0145 | 87 | 99 | 1000 | -0.013 | 750 | 0.88 | 375 |
| 1/64 | 0.0156 | 88 | 92 | 1000 | -0.014 | 750 | 0.96 | 375 |
| 0.40mm | 0.0158 | 89 | 91 | 1000 | -0.014 | 750 | 0.98 | 375 |
| #78 | 0.0160 | 90 | 90 | 1000 | -0.014 | 750 | 1.00 | 375 |
| 0.45mm | 0.0177 | 92 | 81 | 1000 | -0.014 | 750 | 1.14 | 375 |
| #77 | 0.0180 | 94 | 80 | 1000 | -0.014 | 750 | 1.18 | 375 |
| 0.50mm | 0.0197 | 96 | 73 | 1000 | -0.015 | 750 | 1.32 | 375 |
| #76 | 0.0200 | 96 | 72 | 1000 | -0.015 | 750 | 1.33 | 375 |
| #75 | 0.0210 | 98 | 68 | 1000 | -0.015 | 1000 | 1.44 | 375 |
| 0.55mm | 0.0217 | 100 | 66 | 1000 | -0.015 | 1000 | 1.52 | 375 |
| #74 | 0.0225 | 104 | 64 | 1000 | -0.015 | 1000 | 1.63 | 375 |
| 0.60mm | 0.0236 | 106 | 61 | 1000 | -0.016 | 1000 | 1.74 | 375 |
| #73 | 0.0240 | 108 | 60 | 1000 | -0.016 | 1000 | 1.80 | 375 |
| #72 | 0.0250 | 112 | 57 | 1000 | -0.016 | 1000 | 1.95 | 375 |
| 0.65mm | 0.0256 | 116 | 56 | 1000 | -0.016 | 1000 | 2.07 | 375 |
| #71 | 0.0260 | 118 | 55 | 1000 | -0.016 | 1000 | 2.14 | 375 |
| 0.70mm | 0.0276 | 124 | 52 | 1000 | -0.016 | 1000 | 2.39 | 375 |
| #70 | 0.0280 | 126 | 51 | 1000 | -0.017 | 1000 | 2.46 | 375 |
| #69 | 0.0292 | 123 | 49 | 1000 | -0.017 | 1000 | 2.51 | 375 |
| 0.75mm | 0.0295 | 123 | 49 | 1000 | -0.017 | 1000 | 2.53 | 375 |
| #68 | 0.0310 | 115 | 46 | 1000 | -0.017 | 1000 | 2.49 | 375 |
| 1/32 | 0.0312 | 115 | 46 | 1000 | -0.017 | 1000 | 2.50 | 375 |
| 0.80mm | 0.0315 | 113 | 45 | 1000 | -0.017 | 1000 | 2.48 | 375 |
| #67 | 0.0320 | 113 | 45 | 1000 | -0.017 | 1000 | 2.52 | 375 |
| #66 | 0.0330 | 108 | 43 | 1000 | -0.018 | 1000 | 2.49 | 375 |
| 0.85mm | 0.0335 | 108 | 43 | 1000 | -0.018 | 1000 | 2.52 | 375 |
| #65 | 0.0350 | 103 | 41 | 1000 | -0.018 | 1000 | 2.52 | 375 |
| 0.90mm | 0.0354 | 100 | 40 | 1000 | -0.018 | 1000 | 2.47 | 375 |
| #64 | 0.0360 | 100 | 40 | 1000 | -0.018 | 1000 | 2.51 | 375 |
| #63 | 0.0370 | 98 | 39 | 1000 | -0.019 | 1000 | 2.53 | 375 |
| 0.95mm | 0.0374 | 95 | 38 | 1000 | -0.019 | 1000 | 2.48 | 375 |
| #62 | 0.0380 | 95 | 38 | 1000 | -0.019 | 1000 | 2.52 | 375 |
| #61 | 0.0390 | 93 | 37 | 1000 | -0.019 | 1000 | 2.53 | 375 |
| 1.00mm | 0.0394 | 90 | 36 | 1000 | -0.019 | 1000 | 2.47 | 375 |
| #60 | 0.0400 | 90 | 36 | 1000 | -0.019 | 1000 | 2.51 | 375 |
| #59 | 0.0410 | 88 | 35 | 1000 | -0.020 | 1000 | 2.52 | 375 |
| 1.05mm | 0.0413 | 88 | 35 | 1000 | -0.020 | 1000 | 2.54 | 375 |
| #58 | 0.0420 | 85 | 34 | 1000 | -0.020 | 1000 | 2.49 | 375 |
| #57 | 0.0430 | 83 | 33 | 1000 | -0.020 | 1000 | 2.49 | 375 |
| 1.10mm | 0.0433 | 83 | 33 | 1000 | -0.020 | 1000 | 2.51 | 375 |
| 1.15mm | 0.0453 | 80 | 32 | 1000 | -0.021 | 1000 | 2.53 | 375 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 78 | 31 | 1000 | -0.021 | 1000 | 2.53 | 375 |
| 3/64 | 0.0469 | 78 | 31 | 1000 | -0.021 | 1000 | 2.55 | 375 |
| 1.20mm | 0.0472 | 75 | 30 | 1000 | -0.021 | 1000 | 2.47 | 375 |
| 1.25mm | 0.0492 | 73 | 29 | 1000 | -0.021 | 1000 | 2.51 | 375 |
| 1.30mm | 0.0512 | 70 | 28 | 1000 | -0.022 | 1000 | 2.50 | 375 |
| #55 | 0.0520 | 70 | 28 | 1000 | -0.022 | 1000 | 2.54 | 375 |
| 1.35mm | 0.0531 | 68 | 27 | 1000 | -0.022 | 1000 | 2.52 | 375 |
| #54 | 0.0550 | 65 | 26 | 1000 | -0.023 | 1000 | 2.49 | 375 |
| 1.40mm | 0.0551 | 65 | 26 | 1000 | -0.023 | 1000 | 2.50 | 375 |
| 1.45mm | 0.0571 | 63 | 25 | 1000 | -0.023 | 1000 | 2.51 | 375 |
| 1.50mm | 0.0591 | 60 | 24 | 1000 | -0.024 | 1000 | 2.47 | 375 |
| #53 | 0.0595 | 60 | 24 | 1000 | -0.024 | 1000 | 2.49 | 375 |
| 1.55mm | 0.0610 | 58 | 23 | 1000 | -0.024 | 1000 | 2.47 | 375 |
| 1/16 | 0.0625 | 58 | 23 | 1000 | -0.025 | 1000 | 2.53 | 375 |
| 1.60mm | 0.0630 | 58 | 23 | 1000 | -0.025 | 1000 | 2.55 | 375 |
| #52 | 0.0635 | 58 | 23 | 1000 | -0.025 | 1000 | 2.57 | 375 |
| 1.65mm | 0.0650 | 55 | 22 | 1000 | -0.025 | 1000 | 2.49 | 375 |
| 1.70mm | 0.0669 | 53 | 21 | 1000 | -0.026 | 1000 | 2.47 | 375 |
| #51 | 0.0670 | 53 | 21 | 1000 | -0.026 | 1000 | 2.48 | 375 |
| 1.75mm | 0.0689 | 52 | 21 | 1000 | -0.026 | 1000 | 2.48 | 379 |
| #50 | 0.0700 | 52 | 21 | 1000 | -0.026 | 1000 | 2.48 | 385 |
| 1.80mm | 0.0709 | 52 | 20 | 1000 | -0.027 | 1000 | 2.60 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 45 | 20 | 1000 | -0.018 | 500 | 2.25 | 659 |
| 3.25mm | 0.1280 | 45 | 20 | 1000 | -0.018 | 500 | 2.25 | 670 |
| #30 | 0.1285 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 672 |
| 3.30mm | 0.1299 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 680 |
| 3.35mm | 0.1319 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 690 |
| 3.40mm | 0.1339 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 701 |
| 3.45mm | 0.1358 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 711 |
| #29 | 0.1360 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 712 |
| 3.50mm | 0.1378 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 721 |
| 3.55mm | 0.1398 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 732 |
| #28 | 0.1405 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 735 |
| 9/64 | 0.1406 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 736 |
| 3.60mm | 0.1417 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 742 |
| 3.65mm | 0.1437 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 752 |
| #27 | 0.1440 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 754 |
| 3.70mm | 0.1457 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 762 |
| #26 | 0.1470 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 769 |
| 3.75mm | 0.1476 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 772 |
| #25 | 0.1495 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 782 |
| 3.80mm | 0.1496 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 783 |
| 3.85mm | 0.1516 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 793 |
| #24 | 0.1520 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 795 |
| 3.90mm | 0.1535 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 803 |
| #23 | 0.1540 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 806 |
| 3.95 | 0.1555 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 814 |
| 5/32 | 0.1562 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 817 |
| #22 | 0.1570 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 822 |
| 4.00mm | 0.1575 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 824 |
| #21 | 0.1590 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 832 |
| 4.05mm | 0.1594 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 834 |
| #20 | 0.1610 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 843 |
| 4.10mm | 0.1614 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 845 |
| 4.15mm | 0.1634 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 855 |
| 4.20mm | 0.1654 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 866 |
| #19 | 0.1660 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 869 |
| 4.25mm | 0.1673 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 876 |
| 4.30mm | 0.1693 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 886 |
| #18 | 0.1695 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 887 |
| 4.35mm | 0.1713 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 896 |
| 11/64 | 0.1719 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 900 |
| #17 | 0.1730 | 40 | 20 | 1000 | -0.021 | 200 | 2.00 | 905 |
| 4.40mm | 0.1732 | 40 | 20 | 1000 | -0.021 | 200 | 2.00 | 906 |
| 4.45mm | 0.1752 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 917 |
| #16 | 0.1770 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 926 |
| 4.50mm | 0.1772 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 927 |
| 4.55mm | 0.1792 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 938 |
| #15 | 0.1800 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 942 |
| 4.60mm | 0.1811 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 948 |
| #14 | 0.1820 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 952 |
| 4.65mm | 0.1831 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 958 |
| #13 | 0.1850 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 968 |
| 4.70mm | 0.1850 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 968 |
| 4.75mm | 0.1870 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 979 |
| 3/16 | 0.1875 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 981 |
| 4.80mm | 0.1890 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 989 |
| #12 | 0.1890 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 989 |
| 4.85mm | 0.1909 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 999 |
| #11 | 0.1910 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1000 |
| 4.90mm | 0.1929 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1010 |
| #10 | 0.1935 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1013 |
| 4.95mm | 0.1949 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1020 |
| #9 | 0.1960 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1026 |
| 5.00mm | 0.1968 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1030 |
| 5.05mm | 0.1988 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1040 |
| #8 | 0.1990 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1041 |
| 5.10mm | 0.2008 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1051 |
| #7 | 0.2010 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1052 |
| 5.15mm | 0.2028 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1061 |
| 13/64 | 0.2031 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1063 |
| #6 | 0.2040 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1068 |
| 5.20mm | 0.2047 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1071 |
| #5 | 0.2055 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1075 |

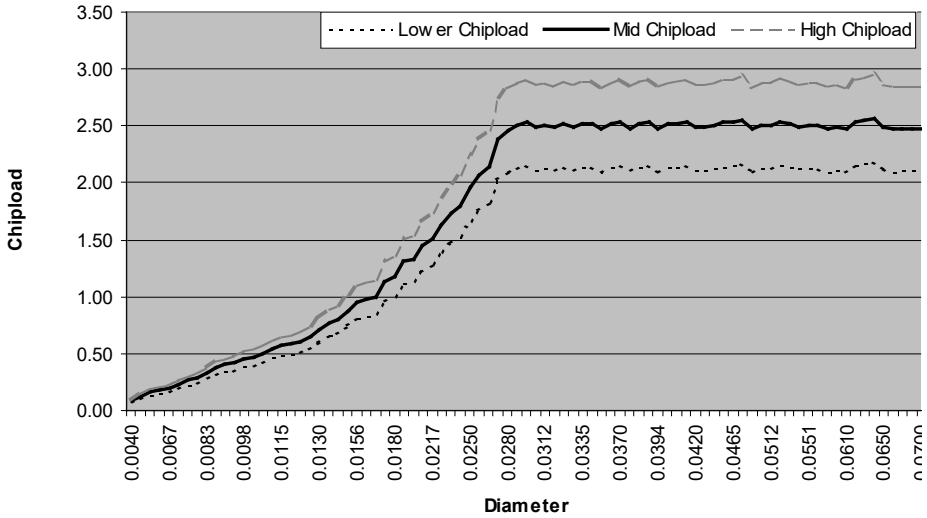
Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1082 |
| 5.30mm | 0.2087 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1092 |
| #4 | 0.2090 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1094 |
| 5.35mm | 0.2106 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1102 |
| 5.40mm | 0.2126 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1113 |
| #3 | 0.2130 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1115 |
| 5.45mm | 0.2146 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1123 |
| 5.50mm | 0.2165 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1133 |
| 5.55mm | 0.2185 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1143 |
| 7/32 | 0.2188 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1145 |
| 5.60mm | 0.2205 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1154 |
| #2 | 0.2210 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1157 |
| 5.65mm | 0.2224 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1164 |
| 5.70mm | 0.2244 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1174 |
| 5.75mm | 0.2264 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1185 |
| #1 | 0.2280 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1193 |
| 5.80mm | 0.2283 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1195 |
| 5.85mm | 0.2302 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1205 |
| 5.90mm | 0.2323 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1216 |
| A | 0.2340 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1225 |
| 5.95mm | 0.2343 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1226 |
| 15/64 | 0.2344 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for BT Epoxy




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Copper-Invar-Copper** PCB Material

(and other metal bonded designs)

**Recommended Drill Series:** 100, 150, 560, 580, 600

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 10 | 110 | 100 | -0.011 | 100 | 0.09 | 115 |
| 0.13mm | 0.0050 | 11 | 110 | 150 | -0.011 | 100 | 0.10 | 144 |
| 0.15mm | 0.0059 | 13 | 110 | 200 | -0.011 | 100 | 0.12 | 170 |
| #96 | 0.0063 | 14 | 110 | 200 | -0.011 | 100 | 0.13 | 181 |
| #95 | 0.0067 | 14 | 110 | 200 | -0.012 | 100 | 0.13 | 193 |
| #94 | 0.0071 | 15 | 110 | 300 | -0.012 | 100 | 0.14 | 204 |
| #93 | 0.0075 | 17 | 110 | 300 | -0.012 | 100 | 0.15 | 216 |
| #92 | 0.0079 | 18 | 110 | 400 | -0.012 | 150 | 0.16 | 227 |
| #91 | 0.0083 | 19 | 110 | 400 | -0.012 | 150 | 0.17 | 239 |
| #90 | 0.0087 | 20 | 110 | 500 | -0.012 | 150 | 0.18 | 250 |
| #89 | 0.0091 | 22 | 110 | 500 | -0.012 | 150 | 0.20 | 262 |
| #88 | 0.0095 | 23 | 110 | 500 | -0.012 | 150 | 0.21 | 273 |
| 0.25mm | 0.0098 | 24 | 110 | 500 | -0.012 | 200 | 0.22 | 282 |
| #87 | 0.0100 | 28 | 110 | 500 | -0.012 | 200 | 0.25 | 288 |
| #86 | 0.0105 | 31 | 110 | 600 | -0.012 | 200 | 0.28 | 302 |
| #85 | 0.0110 | 33 | 110 | 600 | -0.013 | 200 | 0.30 | 317 |
| #84 | 0.0115 | 36 | 110 | 700 | -0.013 | 200 | 0.33 | 331 |
| 0.30mm | 0.0118 | 39 | 110 | 700 | -0.013 | 200 | 0.35 | 340 |
| #83 | 0.0120 | 42 | 110 | 800 | -0.013 | 250 | 0.38 | 345 |
| #82 | 0.0125 | 46 | 110 | 800 | -0.013 | 250 | 0.42 | 360 |
| #81 | 0.0130 | 52 | 110 | 800 | -0.013 | 250 | 0.47 | 374 |
| #80 | 0.0135 | 58 | 110 | 800 | -0.013 | 250 | 0.53 | 389 |
| 0.35mm | 0.0138 | 63 | 110 | 800 | -0.013 | 250 | 0.57 | 397 |
| #79 | 0.0145 | 69 | 105 | 800 | -0.013 | 250 | 0.66 | 400 |
| 1/64 | 0.0156 | 72 | 98 | 800 | -0.014 | 300 | 0.73 | 400 |
| 0.40mm | 0.0158 | 73 | 97 | 800 | -0.014 | 300 | 0.75 | 400 |
| #78 | 0.0160 | 75 | 96 | 800 | -0.014 | 300 | 0.78 | 400 |
| 0.45mm | 0.0177 | 79 | 86 | 900 | -0.014 | 300 | 0.92 | 400 |
| #77 | 0.0180 | 80 | 85 | 900 | -0.014 | 300 | 0.94 | 400 |
| 0.50mm | 0.0197 | 80 | 78 | 900 | -0.015 | 300 | 1.03 | 400 |
| #76 | 0.0200 | 82 | 76 | 900 | -0.015 | 300 | 1.08 | 400 |
| #75 | 0.0210 | 84 | 73 | 1000 | -0.015 | 400 | 1.15 | 400 |
| 0.55mm | 0.0217 | 86 | 70 | 1000 | -0.015 | 400 | 1.23 | 400 |
| #74 | 0.0225 | 85 | 68 | 1000 | -0.015 | 400 | 1.25 | 400 |
| 0.60mm | 0.0236 | 84 | 65 | 1000 | -0.016 | 400 | 1.29 | 400 |
| #73 | 0.0240 | 83 | 64 | 1000 | -0.016 | 400 | 1.30 | 400 |
| #72 | 0.0250 | 83 | 61 | 1000 | -0.016 | 400 | 1.36 | 400 |
| 0.65mm | 0.0256 | 82 | 60 | 1000 | -0.016 | 400 | 1.37 | 400 |
| #71 | 0.0260 | 81 | 59 | 1000 | -0.016 | 400 | 1.37 | 400 |
| 0.70mm | 0.0276 | 78 | 55 | 1000 | -0.016 | 400 | 1.42 | 400 |
| #70 | 0.0280 | 77 | 55 | 1000 | -0.017 | 400 | 1.40 | 400 |
| #69 | 0.0292 | 75 | 52 | 1000 | -0.017 | 400 | 1.44 | 400 |
| 0.75mm | 0.0295 | 74 | 52 | 1000 | -0.017 | 400 | 1.42 | 400 |
| #68 | 0.0310 | 72 | 49 | 1000 | -0.017 | 400 | 1.47 | 400 |
| 1/32 | 0.0312 | 71 | 49 | 1000 | -0.017 | 400 | 1.45 | 400 |
| 0.80mm | 0.0315 | 71 | 49 | 1000 | -0.017 | 400 | 1.45 | 400 |
| #67 | 0.0320 | 70 | 48 | 1000 | -0.017 | 400 | 1.46 | 400 |
| #66 | 0.0330 | 67 | 46 | 1000 | -0.018 | 400 | 1.46 | 400 |
| 0.85mm | 0.0335 | 67 | 46 | 1000 | -0.018 | 400 | 1.46 | 400 |
| #65 | 0.0350 | 65 | 44 | 1000 | -0.018 | 500 | 1.48 | 400 |
| 0.90mm | 0.0354 | 65 | 43 | 1000 | -0.018 | 500 | 1.51 | 400 |
| #64 | 0.0360 | 63 | 42 | 1000 | -0.018 | 500 | 1.50 | 400 |
| #63 | 0.0370 | 62 | 41 | 1000 | -0.019 | 500 | 1.51 | 400 |
| 0.95mm | 0.0374 | 61 | 41 | 1000 | -0.019 | 500 | 1.49 | 400 |
| #62 | 0.0380 | 60 | 40 | 1000 | -0.019 | 500 | 1.50 | 400 |
| #61 | 0.0390 | 60 | 39 | 1000 | -0.019 | 500 | 1.54 | 400 |
| 1.00mm | 0.0394 | 59 | 39 | 1000 | -0.019 | 500 | 1.51 | 400 |
| #60 | 0.0400 | 59 | 38 | 1000 | -0.019 | 500 | 1.55 | 400 |
| #59 | 0.0410 | 58 | 37 | 1000 | -0.020 | 500 | 1.57 | 400 |
| 1.05mm | 0.0413 | 58 | 37 | 1000 | -0.020 | 500 | 1.57 | 400 |
| #58 | 0.0420 | 57 | 36 | 1000 | -0.020 | 500 | 1.58 | 400 |
| #57 | 0.0430 | 57 | 36 | 1000 | -0.020 | 500 | 1.58 | 400 |
| 1.10mm | 0.0433 | 56 | 35 | 1000 | -0.020 | 500 | 1.60 | 400 |
| 1.15mm | 0.0453 | 55 | 34 | 1000 | -0.021 | 500 | 1.62 | 400 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 55 | 33 | 1000 | -0.021 | 500 | 1.67 | 400 |
| 3/64 | 0.0469 | 55 | 33 | 1000 | -0.021 | 500 | 1.67 | 400 |
| 1.20mm | 0.0472 | 55 | 32 | 1000 | -0.021 | 500 | 1.72 | 400 |
| 1.25mm | 0.0492 | 54 | 31 | 1000 | -0.021 | 500 | 1.74 | 400 |
| 1.30mm | 0.0512 | 54 | 30 | 1000 | -0.022 | 500 | 1.80 | 400 |
| #55 | 0.0520 | 54 | 29 | 1000 | -0.022 | 500 | 1.86 | 400 |
| 1.35mm | 0.0531 | 53 | 29 | 1000 | -0.022 | 500 | 1.83 | 400 |
| #54 | 0.0550 | 53 | 28 | 1000 | -0.023 | 500 | 1.89 | 400 |
| 1.40mm | 0.0551 | 53 | 28 | 1000 | -0.023 | 500 | 1.89 | 400 |
| 1.45mm | 0.0571 | 52 | 27 | 1000 | -0.023 | 500 | 1.93 | 400 |
| 1.50mm | 0.0591 | 51 | 26 | 1000 | -0.024 | 500 | 1.96 | 400 |
| #53 | 0.0595 | 51 | 26 | 1000 | -0.024 | 500 | 1.96 | 400 |
| 1.55mm | 0.0610 | 50 | 25 | 1000 | -0.024 | 500 | 2.00 | 400 |
| 1/16 | 0.0625 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.60mm | 0.0630 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| #52 | 0.0635 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.65mm | 0.0650 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.70mm | 0.0669 | 46 | 23 | 1000 | -0.026 | 500 | 2.00 | 400 |
| #51 | 0.0670 | 46 | 23 | 1000 | -0.026 | 500 | 2.00 | 400 |
| 1.75mm | 0.0689 | 44 | 22 | 1000 | -0.026 | 500 | 2.00 | 400 |
| #50 | 0.0700 | 44 | 22 | 1000 | -0.026 | 500 | 2.00 | 400 |
| 1.80mm | 0.0709 | 44 | 22 | 1000 | -0.027 | 500 | 2.00 | 400 |
| 1.85mm | 0.0728 | 42 | 21 | 1000 | -0.027 | 500 | 2.00 | 400 |
| #49 | 0.0730 | 42 | 21 | 1000 | -0.027 | 500 | 2.00 | 400 |
| 1.90mm | 0.0748 | 40 | 20 | 1000 | -0.027 | 500 | 2.00 | 400 |
| #48 | 0.0760 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 400 |
| 1.95mm | 0.0768 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 400 |
| 5/64 | 0.0781 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 409 |
| #47 | 0.0785 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 411 |
| 2.00mm | 0.0787 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 412 |
| 2.05mm | 0.0807 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 422 |
| #46 | 0.0810 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 424 |
| #45 | 0.0820 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 429 |
| 2.10mm | 0.0827 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 433 |
| 2.15mm | 0.0846 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 443 |
| #44 | 0.0860 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 450 |
| 2.20mm | 0.0866 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 453 |
| 2.25mm | 0.0886 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 464 |
| #43 | 0.0890 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 466 |
| 2.30mm | 0.0906 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 474 |
| 2.35mm | 0.0925 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 484 |
| #42 | 0.0935 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 489 |
| 3/32 | 0.0938 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 491 |
| 2.40mm | 0.0945 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 495 |
| #41 | 0.0960 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 502 |
| 2.45mm | 0.0965 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 505 |
| #40 | 0.0980 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 513 |
| 2.50mm | 0.0984 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 515 |
| #39 | 0.0995 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 521 |
| 2.55mm | 0.1004 | 40 | 20 | 1000 | -0.033 | 400 | 2.00 | 525 |
| #38 | 0.1015 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 531 |
| 2.60mm | 0.1024 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 536 |
| #37 | 0.1040 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 544 |
| 2.65mm | 0.1043 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 546 |
| 2.70mm | 0.1063 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 556 |
| #36 | 0.1065 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 557 |
| 2.75mm | 0.1083 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 567 |
| 7/64 | 0.1094 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 573 |
| #35 | 0.1100 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 576 |
| 2.80mm | 0.1102 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 577 |
| #34 | 0.1110 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 581 |
| 2.85mm | 0.1122 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 587 |
| #33 | 0.1130 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 591 |
| 2.90mm | 0.1142 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 598 |
| #32 | 0.1160 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 607 |
| 2.95mm | 0.1161 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 608 |
| 3.00mm | 0.1181 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 618 |
| #31 | 0.1200 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 628 |
| 3.05mm | 0.1201 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 629 |
| 3.10mm | 0.1220 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 638 |
| 3.15mm | 0.1240 | 40 | 20 | 1000 | -0.039 | 400 | 2.00 | 649 |
| 1/8 | 0.1250 | 40 | 20 | 1000 | -0.039 | 400 | 2.00 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 250 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 250 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 762 |
| #26 | 0.1470 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 769 |
| 3.75mm | 0.1476 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 772 |
| #25 | 0.1495 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 782 |
| 3.80mm | 0.1496 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 783 |
| 3.85mm | 0.1516 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 793 |
| #24 | 0.1520 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 795 |
| 3.90mm | 0.1535 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 803 |
| #23 | 0.1540 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 806 |
| 3.95 | 0.1555 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 814 |
| 5/32 | 0.1562 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 817 |
| #22 | 0.1570 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 822 |
| 4.00mm | 0.1575 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 824 |
| #21 | 0.1590 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 832 |
| 4.05mm | 0.1594 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 834 |
| #20 | 0.1610 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 843 |
| 4.10mm | 0.1614 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 845 |
| 4.15mm | 0.1634 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 855 |
| 4.20mm | 0.1654 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 866 |
| #19 | 0.1660 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 869 |
| 4.25mm | 0.1673 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 876 |
| 4.30mm | 0.1693 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 886 |
| #18 | 0.1695 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 887 |
| 4.35mm | 0.1713 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 896 |
| 11/64 | 0.1719 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 900 |
| #17 | 0.1730 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 905 |
| 4.40mm | 0.1732 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 906 |
| 4.45mm | 0.1752 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 917 |
| #16 | 0.1770 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 926 |
| 4.50mm | 0.1772 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 927 |
| 4.55mm | 0.1792 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 938 |
| #15 | 0.1800 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 942 |
| 4.60mm | 0.1811 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 948 |
| #14 | 0.1820 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 952 |
| 4.65mm | 0.1831 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 958 |
| #13 | 0.1850 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 968 |
| 4.70mm | 0.1850 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 968 |
| 4.75mm | 0.1870 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 979 |
| 3/16 | 0.1875 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 981 |
| 4.80mm | 0.1890 | 24 | 20 | 1000 | -0.023 | 250 | 1.20 | 989 |
| #12 | 0.1890 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 989 |
| 4.85mm | 0.1909 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 999 |
| #11 | 0.1910 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1000 |
| 4.90mm | 0.1929 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1010 |
| #10 | 0.1935 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1013 |
| 4.95mm | 0.1949 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1020 |
| #9 | 0.1960 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1026 |
| 5.00mm | 0.1968 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1030 |
| 5.05mm | 0.1988 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1040 |
| #8 | 0.1990 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1041 |
| 5.10mm | 0.2008 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1051 |
| #7 | 0.2010 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1052 |
| 5.15mm | 0.2028 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1061 |
| 13/64 | 0.2031 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1063 |
| #6 | 0.2040 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1068 |
| 5.20mm | 0.2047 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1071 |
| #5 | 0.2055 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1075 |

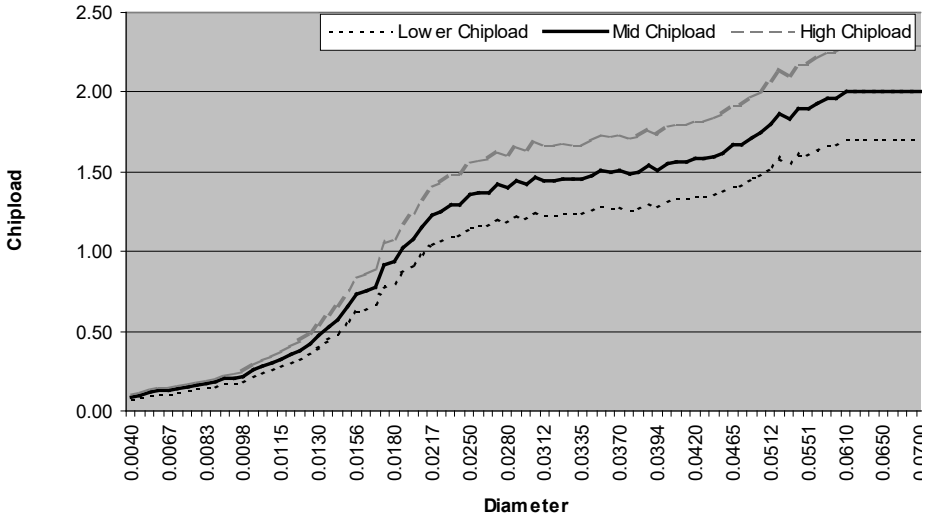
Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1082 |
| 5.30mm | 0.2087 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1092 |
| #4 | 0.2090 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1094 |
| 5.35mm | 0.2106 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Copper-Invar-Copper




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Cyanate Ester PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 19 | 110 | 200 | -0.011 | 400 | 0.17 | 115 |
| 0.13mm | 0.0050 | 22 | 110 | 300 | -0.011 | 400 | 0.20 | 144 |
| 0.15mm | 0.0059 | 25 | 110 | 300 | -0.011 | 400 | 0.23 | 170 |
| #96 | 0.0063 | 28 | 110 | 400 | -0.011 | 400 | 0.25 | 181 |
| #95 | 0.0067 | 30 | 110 | 400 | -0.012 | 400 | 0.27 | 193 |
| #94 | 0.0071 | 31 | 110 | 500 | -0.012 | 400 | 0.28 | 204 |
| #93 | 0.0075 | 33 | 110 | 500 | -0.012 | 400 | 0.30 | 216 |
| #92 | 0.0079 | 36 | 110 | 500 | -0.012 | 400 | 0.33 | 227 |
| #91 | 0.0083 | 39 | 110 | 600 | -0.012 | 400 | 0.35 | 239 |
| #90 | 0.0087 | 41 | 110 | 600 | -0.012 | 400 | 0.37 | 250 |
| #89 | 0.0091 | 44 | 110 | 700 | -0.012 | 400 | 0.40 | 262 |
| #88 | 0.0095 | 46 | 110 | 700 | -0.012 | 400 | 0.42 | 273 |
| 0.25mm | 0.0098 | 47 | 110 | 800 | -0.012 | 400 | 0.43 | 282 |
| #87 | 0.0100 | 47 | 110 | 800 | -0.012 | 400 | 0.43 | 288 |
| #86 | 0.0105 | 50 | 110 | 800 | -0.012 | 400 | 0.45 | 302 |
| #85 | 0.0110 | 52 | 110 | 900 | -0.013 | 400 | 0.47 | 317 |
| #84 | 0.0115 | 53 | 110 | 900 | -0.013 | 400 | 0.48 | 331 |
| 0.30mm | 0.0118 | 56 | 110 | 1000 | -0.013 | 400 | 0.51 | 340 |
| #83 | 0.0120 | 57 | 110 | 1000 | -0.013 | 400 | 0.52 | 345 |
| #82 | 0.0125 | 64 | 110 | 1000 | -0.013 | 400 | 0.58 | 360 |
| #81 | 0.0130 | 67 | 106 | 1000 | -0.013 | 400 | 0.63 | 360 |
| #80 | 0.0135 | 70 | 102 | 1000 | -0.013 | 600 | 0.69 | 360 |
| 0.35mm | 0.0138 | 72 | 100 | 1000 | -0.013 | 600 | 0.72 | 360 |
| #79 | 0.0145 | 75 | 95 | 1000 | -0.013 | 600 | 0.79 | 360 |
| 1/64 | 0.0156 | 78 | 88 | 1000 | -0.014 | 600 | 0.88 | 360 |
| 0.40mm | 0.0158 | 78 | 87 | 1000 | -0.014 | 600 | 0.90 | 360 |
| #78 | 0.0160 | 80 | 86 | 1000 | -0.014 | 600 | 0.93 | 360 |
| 0.45mm | 0.0177 | 83 | 78 | 1000 | -0.014 | 600 | 1.07 | 360 |
| #77 | 0.0180 | 84 | 76 | 1000 | -0.014 | 600 | 1.10 | 360 |
| 0.50mm | 0.0197 | 86 | 70 | 1000 | -0.015 | 600 | 1.23 | 360 |
| #76 | 0.0200 | 86 | 69 | 1000 | -0.015 | 600 | 1.25 | 360 |
| #75 | 0.0210 | 88 | 66 | 1000 | -0.015 | 600 | 1.34 | 360 |
| 0.55mm | 0.0217 | 90 | 63 | 1000 | -0.015 | 600 | 1.42 | 360 |
| #74 | 0.0225 | 92 | 61 | 1000 | -0.015 | 600 | 1.50 | 360 |
| 0.60mm | 0.0236 | 93 | 58 | 1000 | -0.016 | 600 | 1.60 | 360 |
| #73 | 0.0240 | 94 | 57 | 1000 | -0.016 | 600 | 1.64 | 360 |
| #72 | 0.0250 | 92 | 55 | 1000 | -0.016 | 600 | 1.67 | 360 |
| 0.65mm | 0.0256 | 91 | 54 | 1000 | -0.016 | 600 | 1.69 | 360 |
| #71 | 0.0260 | 90 | 53 | 1000 | -0.016 | 600 | 1.70 | 360 |
| 0.70mm | 0.0276 | 88 | 50 | 1000 | -0.016 | 600 | 1.76 | 360 |
| #70 | 0.0280 | 87 | 49 | 1000 | -0.017 | 600 | 1.78 | 360 |
| #69 | 0.0292 | 86 | 47 | 1000 | -0.017 | 600 | 1.83 | 360 |
| 0.75mm | 0.0295 | 86 | 47 | 1000 | -0.017 | 600 | 1.83 | 360 |
| #68 | 0.0310 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| 1/32 | 0.0312 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| 0.80mm | 0.0315 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| #67 | 0.0320 | 83 | 43 | 1000 | -0.017 | 800 | 1.93 | 360 |
| #66 | 0.0330 | 82 | 42 | 1000 | -0.018 | 800 | 1.95 | 360 |
| 0.85mm | 0.0335 | 82 | 41 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #65 | 0.0350 | 78 | 39 | 1000 | -0.018 | 800 | 2.00 | 360 |
| 0.90mm | 0.0354 | 78 | 39 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #64 | 0.0360 | 76 | 38 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #63 | 0.0370 | 74 | 37 | 1000 | -0.019 | 800 | 2.00 | 360 |
| 0.95mm | 0.0374 | 74 | 37 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #62 | 0.0380 | 72 | 36 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #61 | 0.0390 | 70 | 35 | 1000 | -0.019 | 800 | 2.00 | 360 |
| 1.00mm | 0.0394 | 70 | 35 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #60 | 0.0400 | 68 | 34 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #59 | 0.0410 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.05mm | 0.0413 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| #58 | 0.0420 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| #57 | 0.0430 | 64 | 32 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.10mm | 0.0433 | 64 | 32 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.15mm | 0.0453 | 60 | 30 | 1000 | -0.021 | 800 | 2.00 | 360 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 60 | 30 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 3/64 | 0.0469 | 58 | 29 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.20mm | 0.0472 | 58 | 29 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.25mm | 0.0492 | 56 | 28 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.30mm | 0.0512 | 54 | 27 | 1000 | -0.022 | 800 | 2.00 | 360 |
| #55 | 0.0520 | 52 | 26 | 1000 | -0.022 | 800 | 2.00 | 360 |
| 1.35mm | 0.0531 | 52 | 26 | 1000 | -0.022 | 800 | 2.00 | 360 |
| #54 | 0.0550 | 50 | 25 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.40mm | 0.0551 | 50 | 25 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.45mm | 0.0571 | 48 | 24 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.50mm | 0.0591 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| #53 | 0.0595 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| 1.55mm | 0.0610 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| 1/16 | 0.0625 | 44 | 22 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.60mm | 0.0630 | 44 | 22 | 1000 | -0.025 | 800 | 2.00 | 360 |
| #52 | 0.0635 | 42 | 21 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.65mm | 0.0650 | 42 | 21 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.70mm | 0.0669 | 42 | 21 | 1000 | -0.026 | 800 | 2.00 | 360 |
| #51 | 0.0670 | 42 | 21 | 1000 | -0.026 | 800 | 2.00 | 360 |
| 1.75mm | 0.0689 | 40 | 20 | 1000 | -0.026 | 800 | 2.00 | 360 |
| #50 | 0.0700 | 40 | 20 | 1000 | -0.026 | 800 | 2.00 | 366 |
| 1.80mm | 0.0709 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 371 |
| 1.85mm | 0.0728 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 381 |
| #49 | 0.0730 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 382 |
| 1.90mm | 0.0748 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 391 |
| #48 | 0.0760 | 40 | 20 | 1000 | -0.028 | 800 | 2.00 | 398 |
| 1.95mm | 0.0768 | 40 | 20 | 1000 | -0.028 | 800 | 2.00 | 402 |
| 5/64 | 0.0781 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 409 |
| #47 | 0.0785 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 411 |
| 2.00mm | 0.0787 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 412 |
| 2.05mm | 0.0807 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 422 |
| #46 | 0.0810 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 424 |
| #45 | 0.0820 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 429 |
| 2.10mm | 0.0827 | 36 | 20 | 1000 | -0.029 | 800 | 1.80 | 433 |
| 2.15mm | 0.0846 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 443 |
| #44 | 0.0860 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 450 |
| 2.20mm | 0.0866 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 453 |
| 2.25mm | 0.0886 | 36 | 20 | 1000 | -0.031 | 800 | 1.80 | 464 |
| #43 | 0.0890 | 36 | 20 | 1000 | -0.031 | 800 | 1.80 | 466 |
| 2.30mm | 0.0906 | 34 | 20 | 1000 | -0.031 | 800 | 1.70 | 474 |
| 2.35mm | 0.0925 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 484 |
| #42 | 0.0935 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 489 |
| 3/32 | 0.0938 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 491 |
| 2.40mm | 0.0945 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 495 |
| #41 | 0.0960 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 502 |
| 2.45mm | 0.0965 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 505 |
| #40 | 0.0980 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 513 |
| 2.50mm | 0.0984 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 515 |
| #39 | 0.0995 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 521 |
| 2.55mm | 0.1004 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 525 |
| #38 | 0.1015 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 531 |
| 2.60mm | 0.1024 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 536 |
| #37 | 0.1040 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 544 |
| 2.65mm | 0.1043 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 546 |
| 2.70mm | 0.1063 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 556 |
| #36 | 0.1065 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 557 |
| 2.75mm | 0.1083 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 567 |
| 7/64 | 0.1094 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 573 |
| #35 | 0.1100 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 576 |
| 2.80mm | 0.1102 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 577 |
| #34 | 0.1110 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 581 |
| 2.85mm | 0.1122 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 587 |
| #33 | 0.1130 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 591 |
| 2.90mm | 0.1142 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 598 |
| #32 | 0.1160 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 607 |
| 2.95mm | 0.1161 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 608 |
| 3.00mm | 0.1181 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 618 |
| #31 | 0.1200 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 628 |
| 3.05mm | 0.1201 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 629 |
| 3.10mm | 0.1220 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 638 |
| 3.15mm | 0.1240 | 32 | 20 | 1000 | -0.039 | 800 | 1.60 | 649 |
| 1/8 | 0.1250 | 32 | 20 | 1000 | -0.039 | 800 | 1.60 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 500 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 500 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 795 |
| 3.90mm | 0.1535 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 803 |
| #23 | 0.1540 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 806 |
| 3.95 | 0.1555 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 814 |
| 5/32 | 0.1562 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 817 |
| #22 | 0.1570 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 822 |
| 4.00mm | 0.1575 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 824 |
| #21 | 0.1590 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 832 |
| 4.05mm | 0.1594 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 834 |
| #20 | 0.1610 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 843 |
| 4.10mm | 0.1614 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 845 |
| 4.15mm | 0.1634 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 855 |
| 4.20mm | 0.1654 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 866 |
| #19 | 0.1660 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 869 |
| 4.25mm | 0.1673 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 876 |
| 4.30mm | 0.1693 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 886 |
| #18 | 0.1695 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 887 |
| 4.35mm | 0.1713 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 896 |
| 11/64 | 0.1719 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 900 |
| #17 | 0.1730 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 905 |
| 4.40mm | 0.1732 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 906 |
| 4.45mm | 0.1752 | 25 | 20 | 1000 | -0.022 | 500 | 1.25 | 917 |
| #16 | 0.1770 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 926 |
| 4.50mm | 0.1772 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 927 |
| 4.55mm | 0.1792 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 938 |
| #15 | 0.1800 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 942 |
| 4.60mm | 0.1811 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 948 |
| #14 | 0.1820 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 952 |
| 4.65mm | 0.1831 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 958 |
| #13 | 0.1850 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 968 |
| 4.70mm | 0.1850 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 968 |
| 4.75mm | 0.1870 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 979 |
| 3/16 | 0.1875 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

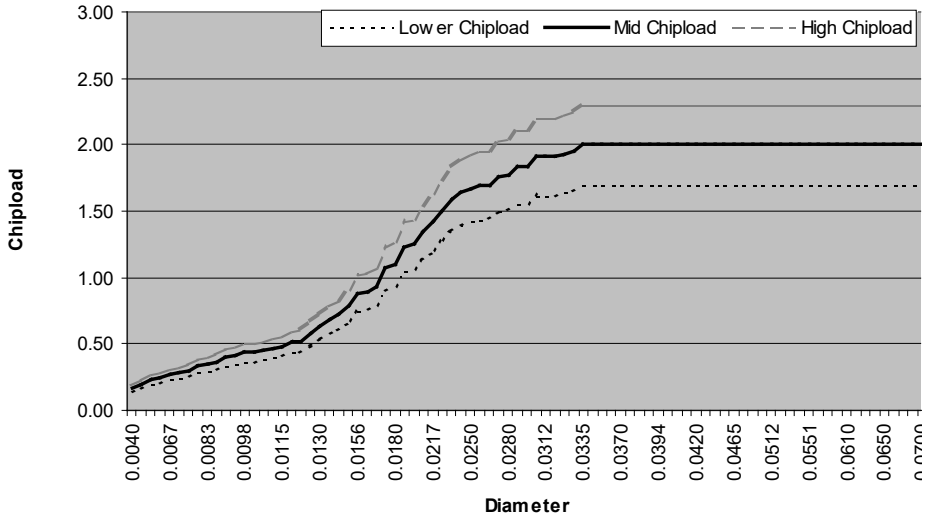
Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 400 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 400 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Cyanate Ester




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# DUROID® / PTFE PCB Material

DUROID® is a registered trademark of Rogers Corporation

**Recommended Drill Series:** 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 36 | 110 | 250 | -0.011 | 250 | 0.33 | 115 |
| 0.13mm | 0.0050 | 42 | 110 | 350 | -0.011 | 250 | 0.38 | 144 |
| 0.15mm | 0.0059 | 48 | 110 | 400 | -0.011 | 250 | 0.44 | 170 |
| #96 | 0.0063 | 55 | 110 | 400 | -0.011 | 250 | 0.50 | 181 |
| #95 | 0.0067 | 62 | 110 | 400 | -0.012 | 250 | 0.56 | 193 |
| #94 | 0.0071 | 67 | 110 | 500 | -0.012 | 250 | 0.61 | 204 |
| #93 | 0.0075 | 72 | 110 | 500 | -0.012 | 250 | 0.65 | 216 |
| #92 | 0.0079 | 77 | 110 | 500 | -0.012 | 300 | 0.70 | 227 |
| #91 | 0.0083 | 83 | 110 | 500 | -0.012 | 300 | 0.75 | 239 |
| #90 | 0.0087 | 88 | 110 | 500 | -0.012 | 300 | 0.80 | 250 |
| #89 | 0.0091 | 94 | 110 | 600 | -0.012 | 300 | 0.85 | 262 |
| #88 | 0.0095 | 96 | 110 | 600 | -0.012 | 300 | 0.87 | 273 |
| 0.25mm | 0.0098 | 97 | 110 | 600 | -0.012 | 400 | 0.88 | 282 |
| #87 | 0.0100 | 99 | 110 | 600 | -0.012 | 400 | 0.90 | 288 |
| #86 | 0.0105 | 101 | 110 | 700 | -0.012 | 400 | 0.92 | 302 |
| #85 | 0.0110 | 102 | 110 | 700 | -0.013 | 400 | 0.93 | 317 |
| #84 | 0.0115 | 107 | 110 | 700 | -0.013 | 400 | 0.97 | 331 |
| 0.30mm | 0.0118 | 110 | 110 | 700 | -0.013 | 400 | 1.00 | 340 |
| #83 | 0.0120 | 114 | 110 | 800 | -0.013 | 400 | 1.04 | 345 |
| #82 | 0.0125 | 116 | 107 | 800 | -0.013 | 400 | 1.08 | 350 |
| #81 | 0.0130 | 117 | 103 | 800 | -0.013 | 400 | 1.14 | 350 |
| #80 | 0.0135 | 119 | 99 | 800 | -0.013 | 500 | 1.20 | 350 |
| 0.35mm | 0.0138 | 119 | 97 | 800 | -0.013 | 500 | 1.23 | 350 |
| #79 | 0.0145 | 120 | 92 | 900 | -0.013 | 500 | 1.30 | 350 |
| 1/64 | 0.0156 | 120 | 86 | 900 | -0.014 | 500 | 1.40 | 350 |
| 0.40mm | 0.0158 | 121 | 85 | 900 | -0.014 | 500 | 1.42 | 350 |
| #78 | 0.0160 | 124 | 84 | 1000 | -0.014 | 500 | 1.48 | 350 |
| 0.45mm | 0.0177 | 126 | 76 | 1000 | -0.014 | 500 | 1.66 | 350 |
| #77 | 0.0180 | 128 | 74 | 1000 | -0.014 | 500 | 1.73 | 350 |
| 0.50mm | 0.0197 | 132 | 68 | 1000 | -0.015 | 500 | 1.94 | 350 |
| #76 | 0.0200 | 134 | 67 | 1000 | -0.015 | 500 | 2.00 | 350 |
| #75 | 0.0210 | 136 | 64 | 1000 | -0.015 | 600 | 2.13 | 350 |
| 0.55mm | 0.0217 | 138 | 62 | 1000 | -0.015 | 600 | 2.23 | 350 |
| #74 | 0.0225 | 140 | 59 | 1000 | -0.015 | 600 | 2.37 | 350 |
| 0.60mm | 0.0236 | 144 | 57 | 1000 | -0.016 | 600 | 2.53 | 350 |
| #73 | 0.0240 | 146 | 56 | 1000 | -0.016 | 600 | 2.61 | 350 |
| #72 | 0.0250 | 148 | 54 | 1000 | -0.016 | 600 | 2.74 | 350 |
| 0.65mm | 0.0256 | 150 | 52 | 1000 | -0.016 | 600 | 2.88 | 350 |
| #71 | 0.0260 | 150 | 51 | 1000 | -0.016 | 600 | 2.94 | 350 |
| 0.70mm | 0.0276 | 150 | 48 | 1000 | -0.016 | 600 | 3.13 | 350 |
| #70 | 0.0280 | 150 | 48 | 1000 | -0.017 | 600 | 3.13 | 350 |
| #69 | 0.0292 | 148 | 46 | 1000 | -0.017 | 700 | 3.22 | 350 |
| 0.75mm | 0.0295 | 146 | 45 | 1000 | -0.017 | 700 | 3.25 | 350 |
| #68 | 0.0310 | 140 | 43 | 1000 | -0.017 | 700 | 3.25 | 350 |
| 1/32 | 0.0312 | 140 | 43 | 1000 | -0.017 | 700 | 3.25 | 350 |
| 0.80mm | 0.0315 | 137 | 42 | 1000 | -0.017 | 700 | 3.25 | 350 |
| #67 | 0.0320 | 137 | 42 | 1000 | -0.017 | 700 | 3.25 | 350 |
| #66 | 0.0330 | 133 | 41 | 1000 | -0.018 | 700 | 3.25 | 350 |
| 0.85mm | 0.0335 | 130 | 40 | 1000 | -0.018 | 700 | 3.25 | 350 |
| #65 | 0.0350 | 124 | 38 | 1000 | -0.018 | 700 | 3.25 | 350 |
| 0.90mm | 0.0354 | 124 | 38 | 1000 | -0.018 | 700 | 3.25 | 350 |
| #64 | 0.0360 | 120 | 37 | 1000 | -0.018 | 700 | 3.25 | 350 |
| #63 | 0.0370 | 117 | 36 | 1000 | -0.019 | 700 | 3.25 | 350 |
| 0.95mm | 0.0374 | 117 | 36 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #62 | 0.0380 | 114 | 35 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #61 | 0.0390 | 111 | 34 | 1000 | -0.019 | 700 | 3.25 | 350 |
| 1.00mm | 0.0394 | 111 | 34 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #60 | 0.0400 | 107 | 33 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #59 | 0.0410 | 107 | 33 | 1000 | -0.020 | 700 | 3.25 | 350 |
| 1.05mm | 0.0413 | 104 | 32 | 1000 | -0.020 | 700 | 3.25 | 350 |
| #58 | 0.0420 | 104 | 32 | 1000 | -0.020 | 700 | 3.25 | 350 |
| #57 | 0.0430 | 101 | 31 | 1000 | -0.020 | 700 | 3.25 | 350 |
| 1.10mm | 0.0433 | 101 | 31 | 1000 | -0.020 | 700 | 3.25 | 350 |
| 1.15mm | 0.0453 | 98 | 30 | 1000 | -0.021 | 700 | 3.25 | 350 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 94 | 29 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 3/64 | 0.0469 | 94 | 29 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 1.20mm | 0.0472 | 91 | 28 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 1.25mm | 0.0492 | 88 | 27 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 1.30mm | 0.0512 | 85 | 26 | 1000 | -0.022 | 700 | 3.25 | 350 |
| #55 | 0.0520 | 85 | 26 | 1000 | -0.022 | 700 | 3.25 | 350 |
| 1.35mm | 0.0531 | 81 | 25 | 1000 | -0.022 | 700 | 3.25 | 350 |
| #54 | 0.0550 | 78 | 24 | 1000 | -0.023 | 700 | 3.25 | 350 |
| 1.40mm | 0.0551 | 78 | 24 | 1000 | -0.023 | 700 | 3.25 | 350 |
| 1.45mm | 0.0571 | 75 | 23 | 1000 | -0.023 | 700 | 3.25 | 350 |
| 1.50mm | 0.0591 | 75 | 23 | 1000 | -0.024 | 700 | 3.25 | 350 |
| #53 | 0.0595 | 72 | 22 | 1000 | -0.024 | 700 | 3.25 | 350 |
| 1.55mm | 0.0610 | 72 | 22 | 1000 | -0.024 | 700 | 3.25 | 350 |
| 1/16 | 0.0625 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| 1.60mm | 0.0630 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| #52 | 0.0635 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| 1.65mm | 0.0650 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| 1.70mm | 0.0669 | 65 | 20 | 1000 | -0.026 | 700 | 3.25 | 350 |
| #51 | 0.0670 | 65 | 20 | 1000 | -0.026 | 700 | 3.25 | 350 |
| 1.75mm | 0.0689 | 65 | 20 | 1000 | -0.026 | 700 | 3.25 | 361 |
| #50 | 0.0700 | 65 | 20 | 1000 | -0.026 | 600 | 3.25 | 366 |
| 1.80mm | 0.0709 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 371 |
| 1.85mm | 0.0728 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 381 |
| #49 | 0.0730 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 382 |
| 1.90mm | 0.0748 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 391 |
| #48 | 0.0760 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 398 |
| 1.95mm | 0.0768 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 402 |
| 5/64 | 0.0781 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 409 |
| #47 | 0.0785 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 411 |
| 2.00mm | 0.0787 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 412 |
| 2.05mm | 0.0807 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 422 |
| #46 | 0.0810 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 424 |
| #45 | 0.0820 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 429 |
| 2.10mm | 0.0827 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 433 |
| 2.15mm | 0.0846 | 65 | 20 | 1000 | -0.030 | 600 | 3.25 | 443 |
| #44 | 0.0860 | 65 | 20 | 1000 | -0.030 | 600 | 3.25 | 450 |
| 2.20mm | 0.0866 | 65 | 20 | 1000 | -0.030 | 600 | 3.25 | 453 |
| 2.25mm | 0.0886 | 65 | 20 | 1000 | -0.031 | 600 | 3.25 | 464 |
| #43 | 0.0890 | 65 | 20 | 1000 | -0.031 | 600 | 3.25 | 466 |
| 2.30mm | 0.0906 | 65 | 20 | 1000 | -0.031 | 600 | 3.25 | 474 |
| 2.35mm | 0.0925 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 484 |
| #42 | 0.0935 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 489 |
| 3/32 | 0.0938 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 491 |
| 2.40mm | 0.0945 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 495 |
| #41 | 0.0960 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 502 |
| 2.45mm | 0.0965 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 505 |
| #40 | 0.0980 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 513 |
| 2.50mm | 0.0984 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 515 |
| #39 | 0.0995 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 521 |
| 2.55mm | 0.1004 | 65 | 20 | 1000 | -0.033 | 500 | 3.25 | 525 |
| #38 | 0.1015 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 531 |
| 2.60mm | 0.1024 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 536 |
| #37 | 0.1040 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 544 |
| 2.65mm | 0.1043 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 546 |
| 2.70mm | 0.1063 | 65 | 20 | 1000 | -0.035 | 500 | 3.25 | 556 |
| #36 | 0.1065 | 65 | 20 | 1000 | -0.035 | 500 | 3.25 | 557 |
| 2.75mm | 0.1083 | 65 | 20 | 1000 | -0.035 | 500 | 3.25 | 567 |
| 7/64 | 0.1094 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 573 |
| #35 | 0.1100 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 576 |
| 2.80mm | 0.1102 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 577 |
| #34 | 0.1110 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 581 |
| 2.85mm | 0.1122 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 587 |
| #33 | 0.1130 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 591 |
| 2.90mm | 0.1142 | 65 | 20 | 1000 | -0.037 | 500 | 3.25 | 598 |
| #32 | 0.1160 | 65 | 20 | 1000 | -0.037 | 500 | 3.25 | 607 |
| 2.95mm | 0.1161 | 65 | 20 | 1000 | -0.037 | 500 | 3.25 | 608 |
| 3.00mm | 0.1181 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 618 |
| #31 | 0.1200 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 628 |
| 3.05mm | 0.1201 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 629 |
| 3.10mm | 0.1220 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 638 |
| 3.15mm | 0.1240 | 65 | 20 | 1000 | -0.039 | 500 | 3.25 | 649 |
| 1/8 | 0.1250 | 65 | 20 | 1000 | -0.039 | 500 | 3.25 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 50 | 20 | 1000 | -0.018 | 400 | 2.50 | 659 |
| 3.25mm | 0.1280 | 50 | 20 | 1000 | -0.018 | 400 | 2.50 | 670 |
| #30 | 0.1285 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 672 |
| 3.30mm | 0.1299 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 680 |
| 3.35mm | 0.1319 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 690 |
| 3.40mm | 0.1339 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 701 |
| 3.45mm | 0.1358 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 711 |
| #29 | 0.1360 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 712 |
| 3.50mm | 0.1378 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 721 |
| 3.55mm | 0.1398 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 732 |
| #28 | 0.1405 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 735 |
| 9/64 | 0.1406 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 736 |
| 3.60mm | 0.1417 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 742 |
| 3.65mm | 0.1437 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 752 |
| #27 | 0.1440 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 754 |
| 3.70mm | 0.1457 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 762 |
| #26 | 0.1470 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 769 |
| 3.75mm | 0.1476 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 772 |
| #25 | 0.1495 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 782 |
| 3.80mm | 0.1496 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 783 |
| 3.85mm | 0.1516 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 793 |
| #24 | 0.1520 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 795 |
| 3.90mm | 0.1535 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 803 |
| #23 | 0.1540 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 806 |
| 3.95 | 0.1555 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 814 |
| 5/32 | 0.1562 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 817 |
| #22 | 0.1570 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 822 |
| 4.00mm | 0.1575 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 824 |
| #21 | 0.1590 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 832 |
| 4.05mm | 0.1594 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 834 |
| #20 | 0.1610 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 843 |
| 4.10mm | 0.1614 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 845 |
| 4.15mm | 0.1634 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 855 |
| 4.20mm | 0.1654 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 866 |
| #19 | 0.1660 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 869 |
| 4.25mm | 0.1673 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 876 |
| 4.30mm | 0.1693 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 886 |
| #18 | 0.1695 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 887 |
| 4.35mm | 0.1713 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 896 |
| 11/64 | 0.1719 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 900 |
| #17 | 0.1730 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 905 |
| 4.40mm | 0.1732 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 906 |
| 4.45mm | 0.1752 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 917 |
| #16 | 0.1770 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 926 |
| 4.50mm | 0.1772 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 927 |
| 4.55mm | 0.1792 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 938 |
| #15 | 0.1800 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 942 |
| 4.60mm | 0.1811 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 948 |
| #14 | 0.1820 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 952 |
| 4.65mm | 0.1831 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 958 |
| #13 | 0.1850 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 968 |
| 4.70mm | 0.1850 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 968 |
| 4.75mm | 0.1870 | 36 | 20 | 1000 | -0.022 | 200 | 1.80 | 979 |
| 3/16 | 0.1875 | 36 | 20 | 1000 | -0.022 | 200 | 1.80 | 981 |
| 4.80mm | 0.1890 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 989 |
| #12 | 0.1890 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 989 |
| 4.85mm | 0.1909 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 999 |
| #11 | 0.1910 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1000 |
| 4.90mm | 0.1929 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1010 |
| #10 | 0.1935 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1013 |
| 4.95mm | 0.1949 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1020 |
| #9 | 0.1960 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1026 |
| 5.00mm | 0.1968 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1030 |
| 5.05mm | 0.1988 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1040 |
| #8 | 0.1990 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1041 |
| 5.10mm | 0.2008 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1051 |
| #7 | 0.2010 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1052 |
| 5.15mm | 0.2028 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1061 |
| 13/64 | 0.2031 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1063 |
| #6 | 0.2040 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1068 |
| 5.20mm | 0.2047 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1071 |
| #5 | 0.2055 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1075 |

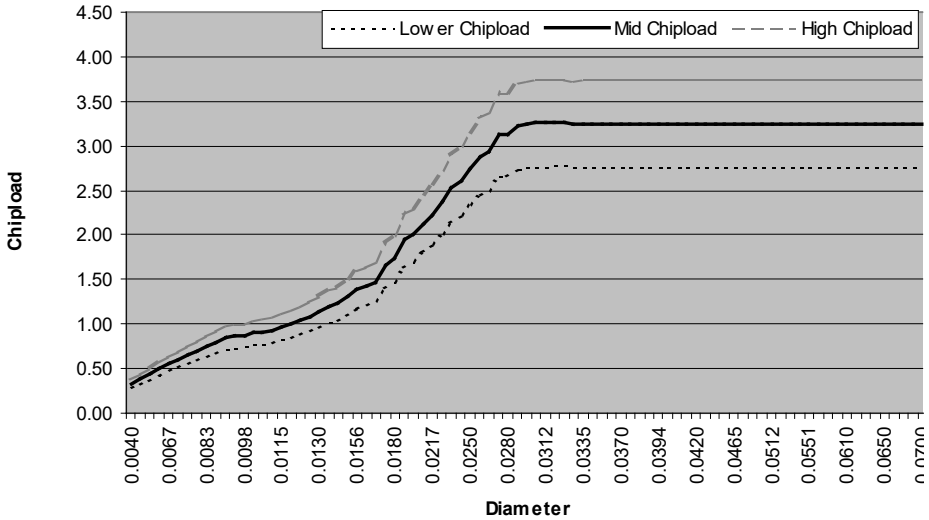
Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1082 |
| 5.30mm | 0.2087 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1092 |
| #4 | 0.2090 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1094 |
| 5.35mm | 0.2106 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1102 |
| 5.40mm | 0.2126 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1113 |
| #3 | 0.2130 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1115 |
| 5.45mm | 0.2146 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1123 |
| 5.50mm | 0.2165 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1133 |
| 5.55mm | 0.2185 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1143 |
| 7/32 | 0.2188 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1145 |
| 5.60mm | 0.2205 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1154 |
| #2 | 0.2210 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1157 |
| 5.65mm | 0.2224 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1164 |
| 5.70mm | 0.2244 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1174 |
| 5.75mm | 0.2264 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1185 |
| #1 | 0.2280 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1193 |
| 5.80mm | 0.2283 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1195 |
| 5.85mm | 0.2302 | 32 | 20 | 1000 | -0.025 | 100 | 1.60 | 1205 |
| 5.90mm | 0.2323 | 32 | 20 | 1000 | -0.025 | 100 | 1.60 | 1216 |
| A | 0.2340 | 32 | 20 | 1000 | -0.025 | 100 | 1.60 | 1225 |
| 5.95mm | 0.2343 | 32 | 20 | 1000 | -0.026 | 100 | 1.60 | 1226 |
| 15/64 | 0.2344 | 32 | 20 | 1000 | -0.026 | 100 | 1.60 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for DUROID® / PTFE




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **DUROID® / PTFE Thick Panel** PCB Material

(Panel Thickness > 0.200")

DUROID® is a registered trademark of Rogers Corporation

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 77 | 110 | 250 | -0.012 | 150 | 0.70 | 282 |
| #87 | 0.0100 | 77 | 110 | 350 | -0.012 | 150 | 0.70 | 288 |
| #86 | 0.0105 | 83 | 110 | 400 | -0.012 | 150 | 0.75 | 302 |
| #85 | 0.0110 | 89 | 110 | 400 | -0.013 | 150 | 0.81 | 317 |
| #84 | 0.0115 | 96 | 110 | 400 | -0.013 | 150 | 0.87 | 331 |
| 0.30mm | 0.0118 | 99 | 110 | 500 | -0.013 | 150 | 0.90 | 340 |
| #83 | 0.0120 | 102 | 110 | 500 | -0.013 | 150 | 0.93 | 345 |
| #82 | 0.0125 | 109 | 107 | 500 | -0.013 | 150 | 1.02 | 350 |
| #81 | 0.0130 | 115 | 103 | 500 | -0.013 | 150 | 1.12 | 350 |
| #80 | 0.0135 | 121 | 99 | 500 | -0.013 | 200 | 1.22 | 350 |
| 0.35mm | 0.0138 | 124 | 97 | 600 | -0.013 | 200 | 1.28 | 350 |
| #79 | 0.0145 | 128 | 92 | 600 | -0.013 | 200 | 1.39 | 350 |
| 1/64 | 0.0156 | 128 | 86 | 600 | -0.014 | 200 | 1.49 | 350 |
| 0.40mm | 0.0158 | 128 | 85 | 600 | -0.014 | 200 | 1.51 | 350 |
| #78 | 0.0160 | 128 | 84 | 700 | -0.014 | 200 | 1.52 | 350 |
| 0.45mm | 0.0177 | 130 | 76 | 700 | -0.014 | 200 | 1.71 | 350 |
| #77 | 0.0180 | 132 | 74 | 700 | -0.014 | 200 | 1.78 | 350 |
| 0.50mm | 0.0197 | 132 | 68 | 700 | -0.015 | 200 | 1.94 | 350 |
| #76 | 0.0200 | 132 | 67 | 800 | -0.015 | 200 | 1.97 | 350 |
| #75 | 0.0210 | 132 | 64 | 800 | -0.015 | 250 | 2.06 | 350 |
| 0.55mm | 0.0217 | 132 | 62 | 800 | -0.015 | 250 | 2.13 | 350 |
| #74 | 0.0225 | 132 | 59 | 800 | -0.015 | 250 | 2.24 | 350 |
| 0.60mm | 0.0236 | 133 | 57 | 800 | -0.016 | 250 | 2.33 | 350 |
| #73 | 0.0240 | 133 | 56 | 900 | -0.016 | 250 | 2.38 | 350 |
| #72 | 0.0250 | 133 | 54 | 900 | -0.016 | 250 | 2.46 | 350 |
| 0.65mm | 0.0256 | 133 | 52 | 900 | -0.016 | 250 | 2.56 | 350 |
| #71 | 0.0260 | 133 | 51 | 1000 | -0.016 | 250 | 2.61 | 350 |
| 0.70mm | 0.0276 | 132 | 48 | 1000 | -0.016 | 250 | 2.75 | 350 |
| #70 | 0.0280 | 132 | 48 | 1000 | -0.017 | 250 | 2.75 | 350 |
| #69 | 0.0292 | 130 | 46 | 1000 | -0.017 | 300 | 2.83 | 350 |
| 0.75mm | 0.0295 | 130 | 45 | 1000 | -0.017 | 300 | 2.89 | 350 |
| #68 | 0.0310 | 130 | 43 | 1000 | -0.017 | 300 | 3.02 | 350 |
| 1/32 | 0.0312 | 129 | 43 | 1000 | -0.017 | 300 | 3.00 | 350 |
| 0.80mm | 0.0315 | 129 | 42 | 1000 | -0.017 | 300 | 3.07 | 350 |
| #67 | 0.0320 | 128 | 42 | 1000 | -0.017 | 300 | 3.05 | 350 |
| #66 | 0.0330 | 128 | 41 | 1000 | -0.018 | 300 | 3.12 | 350 |
| 0.85mm | 0.0335 | 126 | 40 | 1000 | -0.018 | 300 | 3.15 | 350 |
| #65 | 0.0350 | 125 | 38 | 1000 | -0.018 | 300 | 3.29 | 350 |
| 0.90mm | 0.0354 | 125 | 38 | 1000 | -0.018 | 300 | 3.29 | 350 |
| #64 | 0.0360 | 124 | 37 | 1000 | -0.018 | 300 | 3.35 | 350 |
| #63 | 0.0370 | 123 | 36 | 1000 | -0.019 | 300 | 3.42 | 350 |
| 0.95mm | 0.0374 | 121 | 36 | 1000 | -0.019 | 300 | 3.36 | 350 |
| #62 | 0.0380 | 121 | 35 | 1000 | -0.019 | 300 | 3.46 | 350 |
| #61 | 0.0390 | 120 | 34 | 1000 | -0.019 | 300 | 3.53 | 350 |
| 1.00mm | 0.0394 | 120 | 34 | 1000 | -0.019 | 300 | 3.53 | 350 |
| #60 | 0.0400 | 120 | 33 | 1000 | -0.019 | 300 | 3.64 | 350 |
| #59 | 0.0410 | 119 | 33 | 1000 | -0.020 | 300 | 3.61 | 350 |
| 1.05mm | 0.0413 | 119 | 32 | 1000 | -0.020 | 300 | 3.72 | 350 |
| #58 | 0.0420 | 117 | 32 | 1000 | -0.020 | 300 | 3.66 | 350 |
| #57 | 0.0430 | 117 | 31 | 1000 | -0.020 | 300 | 3.77 | 350 |
| 1.10mm | 0.0433 | 117 | 31 | 1000 | -0.020 | 300 | 3.77 | 350 |
| 1.15mm | 0.0453 | 116 | 30 | 1000 | -0.021 | 300 | 3.87 | 350 |
| #56 | 0.0465 | 115 | 29 | 1000 | -0.021 | 300 | 3.97 | 350 |
| 3/64 | 0.0469 | 115 | 29 | 1000 | -0.021 | 300 | 3.97 | 350 |
| 1.20mm | 0.0472 | 115 | 28 | 1000 | -0.021 | 300 | 4.11 | 350 |
| 1.25mm | 0.0492 | 114 | 27 | 1000 | -0.021 | 300 | 4.22 | 350 |
| 1.30mm | 0.0512 | 109 | 26 | 1000 | -0.022 | 300 | 2.50 | 350 |
| #55 | 0.0520 | 109 | 26 | 1000 | -0.022 | 300 | 2.50 | 350 |
| 1.35mm | 0.0531 | 106 | 25 | 1000 | -0.022 | 300 | 2.50 | 350 |
| #54 | 0.0550 | 102 | 24 | 1000 | -0.023 | 300 | 2.50 | 350 |
| 1.40mm | 0.0551 | 102 | 24 | 1000 | -0.023 | 300 | 2.50 | 350 |
| 1.45mm | 0.0571 | 100 | 23 | 1000 | -0.023 | 300 | 4.35 | 350 |
| 1.50mm | 0.0591 | 96 | 23 | 1000 | -0.024 | 300 | 4.17 | 350 |
| #53 | 0.0595 | 93 | 22 | 1000 | -0.024 | 300 | 4.23 | 350 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 93 | 22 | 1000 | -0.024 | 300 | 4.23 | 350 |
| 1/16 | 0.0625 | 89 | 21 | 1000 | -0.025 | 300 | 4.24 | 350 |
| 1.60mm | 0.0630 | 89 | 21 | 1000 | -0.025 | 300 | 4.24 | 350 |
| #52 | 0.0635 | 89 | 21 | 1000 | -0.025 | 300 | 4.24 | 350 |
| 1.65mm | 0.0650 | 87 | 21 | 1000 | -0.025 | 300 | 4.14 | 350 |
| 1.70mm | 0.0669 | 83 | 20 | 1000 | -0.026 | 300 | 4.15 | 350 |
| #51 | 0.0670 | 83 | 20 | 1000 | -0.026 | 300 | 4.15 | 350 |
| 1.75mm | 0.0689 | 80 | 20 | 1000 | -0.026 | 300 | 4.00 | 361 |
| #50 | 0.0700 | 80 | 20 | 1000 | -0.026 | 250 | 4.00 | 366 |
| 1.80mm | 0.0709 | 80 | 20 | 1000 | -0.027 | 250 | 4.00 | 371 |
| 1.85mm | 0.0728 | 77 | 20 | 1000 | -0.027 | 250 | 3.85 | 381 |
| #49 | 0.0730 | 77 | 20 | 1000 | -0.027 | 250 | 3.85 | 382 |
| 1.90mm | 0.0748 | 74 | 20 | 1000 | -0.027 | 250 | 3.70 | 391 |
| #48 | 0.0760 | 74 | 20 | 1000 | -0.028 | 250 | 3.70 | 398 |
| 1.95mm | 0.0768 | 74 | 20 | 1000 | -0.028 | 250 | 3.70 | 402 |
| 5/64 | 0.0781 | 70 | 20 | 1000 | -0.028 | 250 | 3.50 | 409 |
| #47 | 0.0785 | 70 | 20 | 1000 | -0.028 | 250 | 3.50 | 411 |
| 2.00mm | 0.0787 | 70 | 20 | 1000 | -0.028 | 250 | 3.50 | 412 |
| 2.05mm | 0.0807 | 70 | 20 | 1000 | -0.029 | 250 | 3.50 | 422 |
| #46 | 0.0810 | 68 | 20 | 1000 | -0.029 | 250 | 3.40 | 424 |
| #45 | 0.0820 | 68 | 20 | 1000 | -0.029 | 250 | 3.40 | 429 |
| 2.10mm | 0.0827 | 68 | 20 | 1000 | -0.029 | 250 | 3.40 | 433 |
| 2.15mm | 0.0846 | 68 | 20 | 1000 | -0.030 | 250 | 3.40 | 443 |
| #44 | 0.0860 | 64 | 20 | 1000 | -0.030 | 250 | 3.20 | 450 |
| 2.20mm | 0.0866 | 64 | 20 | 1000 | -0.030 | 250 | 3.20 | 453 |
| 2.25mm | 0.0886 | 64 | 20 | 1000 | -0.031 | 250 | 3.20 | 464 |
| #43 | 0.0890 | 64 | 20 | 1000 | -0.031 | 250 | 3.20 | 466 |
| 2.30mm | 0.0906 | 64 | 20 | 1000 | -0.031 | 250 | 3.20 | 474 |
| 2.35mm | 0.0925 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 484 |
| #42 | 0.0935 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 489 |
| 3/32 | 0.0938 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 491 |
| 2.40mm | 0.0945 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 495 |
| #41 | 0.0960 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 502 |
| 2.45mm | 0.0965 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 505 |
| #40 | 0.0980 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 513 |
| 2.50mm | 0.0984 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 515 |
| #39 | 0.0995 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 521 |
| 2.55mm | 0.1004 | 64 | 20 | 1000 | -0.033 | 200 | 3.20 | 525 |
| #38 | 0.1015 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 531 |
| 2.60mm | 0.1024 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 536 |
| #37 | 0.1040 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 544 |
| 2.65mm | 0.1043 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 546 |
| 2.70mm | 0.1063 | 64 | 20 | 1000 | -0.035 | 200 | 3.20 | 556 |
| #36 | 0.1065 | 64 | 20 | 1000 | -0.035 | 200 | 3.20 | 557 |
| 2.75mm | 0.1083 | 64 | 20 | 1000 | -0.035 | 200 | 3.20 | 567 |
| 7/64 | 0.1094 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 573 |
| #35 | 0.1100 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 576 |
| 2.80mm | 0.1102 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 577 |
| #34 | 0.1110 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 581 |
| 2.85mm | 0.1122 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 587 |
| #33 | 0.1130 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 591 |
| 2.90mm | 0.1142 | 64 | 20 | 1000 | -0.037 | 200 | 3.20 | 598 |
| #32 | 0.1160 | 64 | 20 | 1000 | -0.037 | 200 | 3.20 | 607 |
| 2.95mm | 0.1161 | 64 | 20 | 1000 | -0.037 | 200 | 3.20 | 608 |
| 3.00mm | 0.1181 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 618 |
| #31 | 0.1200 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 628 |
| 3.05mm | 0.1201 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 629 |
| 3.10mm | 0.1220 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 638 |
| 3.15mm | 0.1240 | 64 | 20 | 1000 | -0.039 | 200 | 3.20 | 649 |
| 1/8 | 0.1250 | 64 | 20 | 1000 | -0.039 | 200 | 3.20 | 654 |
| 3.20mm | 0.1260 | 61 | 20 | 1000 | -0.018 | 150 | 3.05 | 659 |
| 3.25mm | 0.1280 | 61 | 20 | 1000 | -0.018 | 150 | 3.05 | 670 |
| #30 | 0.1285 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 672 |
| 3.30mm | 0.1299 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 680 |
| 3.35mm | 0.1319 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 690 |
| 3.40mm | 0.1339 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 701 |
| 3.45mm | 0.1358 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 711 |
| #29 | 0.1360 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 712 |
| 3.50mm | 0.1378 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 721 |
| 3.55mm | 0.1398 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 732 |
| #28 | 0.1405 | 57 | 20 | 1000 | -0.019 | 150 | 2.85 | 735 |
| 9/64 | 0.1406 | 57 | 20 | 1000 | -0.019 | 150 | 2.85 | 736 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

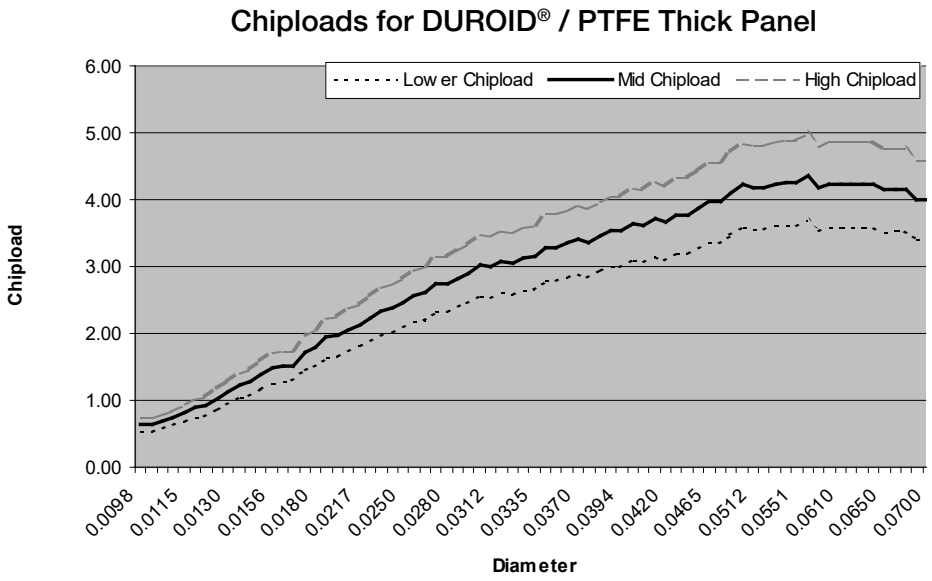
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 57 | 20 | 1000 | -0.019 | 150 | 2.85 | 742 |
| 3.65mm | 0.1437 | 57 | 20 | 1000 | -0.020 | 150 | 2.85 | 752 |
| #27 | 0.1440 | 57 | 20 | 1000 | -0.020 | 150 | 2.85 | 754 |
| 3.70mm | 0.1457 | 57 | 20 | 1000 | -0.020 | 150 | 2.85 | 762 |
| #26 | 0.1470 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 769 |
| 3.75mm | 0.1476 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 772 |
| #25 | 0.1495 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 782 |
| 3.80mm | 0.1496 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 783 |
| 3.85mm | 0.1516 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 793 |
| #24 | 0.1520 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 795 |
| 3.90mm | 0.1535 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 803 |
| #23 | 0.1540 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 806 |
| 3.95 | 0.1555 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 814 |
| 5/32 | 0.1562 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 817 |
| #22 | 0.1570 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 822 |
| 4.00mm | 0.1575 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 824 |
| #21 | 0.1590 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 832 |
| 4.05mm | 0.1594 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 834 |
| #20 | 0.1610 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 843 |
| 4.10mm | 0.1614 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 845 |
| 4.15mm | 0.1634 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 855 |
| 4.20mm | 0.1654 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 866 |
| #19 | 0.1660 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 869 |
| 4.25mm | 0.1673 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 876 |
| 4.30mm | 0.1693 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 886 |
| #18 | 0.1695 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 887 |
| 4.35mm | 0.1713 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 896 |
| 11/64 | 0.1719 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 900 |
| #17 | 0.1730 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 905 |
| 4.40mm | 0.1732 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 906 |
| 4.45mm | 0.1752 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 917 |
| #16 | 0.1770 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 926 |
| 4.50mm | 0.1772 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 927 |
| 4.55mm | 0.1792 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 938 |
| #15 | 0.1800 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 942 |
| 4.60mm | 0.1811 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 948 |
| #14 | 0.1820 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 952 |
| 4.65mm | 0.1831 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 958 |
| #13 | 0.1850 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 968 |
| 4.70mm | 0.1850 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 968 |
| 4.75mm | 0.1870 | 38 | 20 | 1000 | -0.022 | 100 | 1.90 | 979 |
| 3/16 | 0.1875 | 38 | 20 | 1000 | -0.022 | 100 | 1.90 | 981 |
| 4.80mm | 0.1890 | 38 | 20 | 1000 | -0.023 | 100 | 1.90 | 989 |
| #12 | 0.1890 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 989 |
| 4.85mm | 0.1909 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 999 |
| #11 | 0.1910 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1000 |
| 4.90mm | 0.1929 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1010 |
| #10 | 0.1935 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1013 |
| 4.95mm | 0.1949 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1020 |
| #9 | 0.1960 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1026 |
| 5.00mm | 0.1968 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1030 |
| 5.05mm | 0.1988 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1040 |
| #8 | 0.1990 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1041 |
| 5.10mm | 0.2008 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1051 |
| #7 | 0.2010 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1052 |
| 5.15mm | 0.2028 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1061 |
| 13/64 | 0.2031 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1063 |
| #6 | 0.2040 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1068 |
| 5.20mm | 0.2047 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1071 |
| #5 | 0.2055 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1075 |
| 5.25mm | 0.2067 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1082 |
| 5.30mm | 0.2087 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1092 |
| #4 | 0.2090 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1094 |
| 5.35mm | 0.2106 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1102 |
| 5.40mm | 0.2126 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1113 |
| #3 | 0.2130 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1115 |
| 5.45mm | 0.2146 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1123 |
| 5.50mm | 0.2165 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1133 |
| 5.55mm | 0.2185 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1143 |
| 7/32 | 0.2188 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1145 |
| 5.60mm | 0.2205 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1154 |
| #2 | 0.2210 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1157 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1164 |
| 5.70mm | 0.2244 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1174 |
| 5.75mm | 0.2264 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1185 |
| #1 | 0.2280 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1193 |
| 5.80mm | 0.2283 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1195 |
| 5.85mm | 0.2302 | 26 | 20 | 1000 | -0.025 | 50 | 1.30 | 1205 |
| 5.90mm | 0.2323 | 26 | 20 | 1000 | -0.025 | 50 | 1.30 | 1216 |
| A | 0.2340 | 26 | 20 | 1000 | -0.025 | 50 | 1.30 | 1225 |
| 5.95mm | 0.2343 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1226 |
| 15/64 | 0.2344 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1227 |
| 6.00mm | 0.2362 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1236 |
| B | 0.2380 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1246 |
| 6.05mm | 0.2382 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1247 |
| 6.10mm | 0.2402 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1257 |
| C | 0.2420 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1266 |
| 6.15mm | 0.2421 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1267 |
| 6.20mm | 0.2441 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1277 |
| D | 0.2460 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1287 |
| 6.25mm | 0.2461 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1288 |
| 6.30mm | 0.2480 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1298 |
| 6.35mm | 0.2500 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1308 |
| 6.40mm | 0.2520 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1319 |
| 6.50mm | 0.2559 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1339 |
| F | 0.2570 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1345 |
| 6.60mm | 0.2598 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Double-Sided PCB Material

## Recommended Drill Series: 100, 150, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 28 | 110 | 200 | -0.011 | 500 | 0.25 | 115 |
| 0.13mm | 0.0050 | 32 | 110 | 300 | -0.011 | 600 | 0.29 | 144 |
| 0.15mm | 0.0059 | 36 | 110 | 300 | -0.011 | 800 | 0.33 | 170 |
| #96 | 0.0063 | 42 | 110 | 400 | -0.011 | 800 | 0.38 | 181 |
| #95 | 0.0067 | 46 | 110 | 400 | -0.012 | 800 | 0.42 | 193 |
| #94 | 0.0071 | 51 | 110 | 500 | -0.012 | 1000 | 0.46 | 204 |
| #93 | 0.0075 | 55 | 110 | 500 | -0.012 | 1000 | 0.50 | 216 |
| #92 | 0.0079 | 59 | 110 | 500 | -0.012 | 1200 | 0.54 | 227 |
| #91 | 0.0083 | 64 | 110 | 600 | -0.012 | 1200 | 0.58 | 239 |
| #90 | 0.0087 | 69 | 110 | 600 | -0.012 | 1200 | 0.63 | 250 |
| #89 | 0.0091 | 74 | 110 | 700 | -0.012 | 1500 | 0.67 | 262 |
| #88 | 0.0095 | 78 | 110 | 700 | -0.012 | 1500 | 0.71 | 273 |
| 0.25mm | 0.0098 | 83 | 110 | 800 | -0.012 | 1500 | 0.75 | 282 |
| #87 | 0.0100 | 85 | 110 | 800 | -0.012 | 1500 | 0.77 | 288 |
| #86 | 0.0105 | 89 | 110 | 800 | -0.012 | 1500 | 0.81 | 302 |
| #85 | 0.0110 | 94 | 110 | 900 | -0.013 | 1700 | 0.85 | 317 |
| #84 | 0.0115 | 98 | 110 | 900 | -0.013 | 1700 | 0.89 | 331 |
| 0.30mm | 0.0118 | 101 | 110 | 1000 | -0.013 | 1700 | 0.92 | 340 |
| #83 | 0.0120 | 102 | 110 | 1000 | -0.013 | 1800 | 0.93 | 345 |
| #82 | 0.0125 | 108 | 110 | 1000 | -0.013 | 1800 | 0.98 | 360 |
| #81 | 0.0130 | 112 | 110 | 1000 | -0.013 | 1800 | 1.02 | 374 |
| #80 | 0.0135 | 117 | 110 | 1000 | -0.013 | 2000 | 1.06 | 389 |
| 0.35mm | 0.0138 | 119 | 110 | 1000 | -0.013 | 2000 | 1.08 | 397 |
| #79 | 0.0145 | 124 | 110 | 1000 | -0.013 | 2000 | 1.13 | 417 |
| 1/64 | 0.0156 | 129 | 110 | 1000 | -0.014 | 2000 | 1.17 | 449 |
| 0.40mm | 0.0158 | 130 | 110 | 1000 | -0.014 | 2000 | 1.18 | 455 |
| #78 | 0.0160 | 133 | 110 | 1000 | -0.014 | 2000 | 1.21 | 461 |
| 0.45mm | 0.0177 | 138 | 110 | 1000 | -0.014 | 2000 | 1.25 | 509 |
| #77 | 0.0180 | 141 | 110 | 1000 | -0.014 | 2000 | 1.28 | 518 |
| 0.50mm | 0.0197 | 151 | 110 | 1000 | -0.015 | 2000 | 1.37 | 567 |
| #76 | 0.0200 | 155 | 110 | 1000 | -0.015 | 2000 | 1.41 | 576 |
| #75 | 0.0210 | 165 | 109 | 1000 | -0.015 | 2000 | 1.51 | 600 |
| 0.55mm | 0.0217 | 170 | 106 | 1000 | -0.015 | 2000 | 1.60 | 600 |
| #74 | 0.0225 | 175 | 102 | 1000 | -0.015 | 2000 | 1.72 | 600 |
| 0.60mm | 0.0236 | 180 | 97 | 1000 | -0.016 | 2000 | 1.86 | 600 |
| #73 | 0.0240 | 185 | 96 | 1000 | -0.016 | 2000 | 1.93 | 600 |
| #72 | 0.0250 | 190 | 92 | 1000 | -0.016 | 2000 | 2.07 | 600 |
| 0.65mm | 0.0256 | 195 | 90 | 1000 | -0.016 | 2000 | 2.17 | 600 |
| #71 | 0.0260 | 200 | 88 | 1000 | -0.016 | 2000 | 2.27 | 600 |
| 0.70mm | 0.0276 | 200 | 83 | 1000 | -0.016 | 2000 | 2.41 | 600 |
| #70 | 0.0280 | 202 | 82 | 1000 | -0.017 | 2000 | 2.46 | 600 |
| #69 | 0.0292 | 205 | 79 | 1000 | -0.017 | 2000 | 2.59 | 600 |
| 0.75mm | 0.0295 | 206 | 78 | 1000 | -0.017 | 2000 | 2.64 | 600 |
| #68 | 0.0310 | 210 | 74 | 1000 | -0.017 | 2000 | 2.84 | 600 |
| 1/32 | 0.0312 | 212 | 73 | 1000 | -0.017 | 2000 | 2.90 | 600 |
| 0.80mm | 0.0315 | 215 | 73 | 1000 | -0.017 | 2000 | 2.95 | 600 |
| #67 | 0.0320 | 216 | 72 | 1000 | -0.017 | 2000 | 3.00 | 600 |
| #66 | 0.0330 | 210 | 70 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.85mm | 0.0335 | 204 | 68 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #65 | 0.0350 | 198 | 66 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.90mm | 0.0354 | 195 | 65 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #64 | 0.0360 | 192 | 64 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #63 | 0.0370 | 186 | 62 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 0.95mm | 0.0374 | 183 | 61 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #62 | 0.0380 | 180 | 60 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #61 | 0.0390 | 177 | 59 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 1.00mm | 0.0394 | 174 | 58 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #60 | 0.0400 | 171 | 57 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #59 | 0.0410 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.05mm | 0.0413 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #58 | 0.0420 | 165 | 55 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #57 | 0.0430 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.10mm | 0.0433 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.15mm | 0.0453 | 153 | 51 | 1000 | -0.021 | 2000 | 3.00 | 600 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 3/64 | 0.0469 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.20mm | 0.0472 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.25mm | 0.0492 | 141 | 47 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.30mm | 0.0512 | 135 | 45 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #55 | 0.0520 | 132 | 44 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| 1.35mm | 0.0531 | 129 | 43 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #54 | 0.0550 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.40mm | 0.0551 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.45mm | 0.0571 | 120 | 40 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.50mm | 0.0591 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| #53 | 0.0595 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1.55mm | 0.0610 | 114 | 38 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1/16 | 0.0625 | 111 | 37 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.60mm | 0.0630 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| #52 | 0.0635 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.65mm | 0.0650 | 105 | 35 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.70mm | 0.0669 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #51 | 0.0670 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.75mm | 0.0689 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #50 | 0.0700 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.80mm | 0.0709 | 96 | 32 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.85mm | 0.0728 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #49 | 0.0730 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.90mm | 0.0748 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #48 | 0.0760 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 1.95mm | 0.0768 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 5/64 | 0.0781 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| #47 | 0.0785 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.00mm | 0.0787 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.05mm | 0.0807 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #46 | 0.0810 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #45 | 0.0820 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.10mm | 0.0827 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.15mm | 0.0846 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| #44 | 0.0860 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.20mm | 0.0866 | 78 | 26 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.25mm | 0.0886 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| #43 | 0.0890 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.30mm | 0.0906 | 75 | 25 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.35mm | 0.0925 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #42 | 0.0935 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 3/32 | 0.0938 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.40mm | 0.0945 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #41 | 0.0960 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.45mm | 0.0965 | 72 | 24 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #40 | 0.0980 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| 2.50mm | 0.0984 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #39 | 0.0995 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| 2.55mm | 0.1004 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| #38 | 0.1015 | 69 | 23 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.60mm | 0.1024 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| #37 | 0.1040 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.65mm | 0.1043 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.70mm | 0.1063 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| #36 | 0.1065 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 2.75mm | 0.1083 | 63 | 21 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 7/64 | 0.1094 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #35 | 0.1100 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.80mm | 0.1102 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #34 | 0.1110 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 600 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1500 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 659 |
| 3.25mm | 0.1280 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 670 |
| #30 | 0.1285 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 672 |
| 3.30mm | 0.1299 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 680 |
| 3.35mm | 0.1319 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 690 |
| 3.40mm | 0.1339 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 701 |
| 3.45mm | 0.1358 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 711 |
| #29 | 0.1360 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 712 |
| 3.50mm | 0.1378 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 721 |
| 3.55mm | 0.1398 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 732 |
| #28 | 0.1405 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 735 |
| 9/64 | 0.1406 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 736 |
| 3.60mm | 0.1417 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 742 |
| 3.65mm | 0.1437 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 752 |
| #27 | 0.1440 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 754 |
| 3.70mm | 0.1457 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 762 |
| #26 | 0.1470 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 769 |
| 3.75mm | 0.1476 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 772 |
| #25 | 0.1495 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 782 |
| 3.80mm | 0.1496 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 783 |
| 3.85mm | 0.1516 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 793 |
| #24 | 0.1520 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 795 |
| 3.90mm | 0.1535 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 803 |
| #23 | 0.1540 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 806 |
| 3.95 | 0.1555 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 814 |
| 5/32 | 0.1562 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 817 |
| #22 | 0.1570 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 822 |
| 4.00mm | 0.1575 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 824 |
| #21 | 0.1590 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 832 |
| 4.05mm | 0.1594 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 834 |
| #20 | 0.1610 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 843 |
| 4.10mm | 0.1614 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 845 |
| 4.15mm | 0.1634 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 855 |
| 4.20mm | 0.1654 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 866 |
| #19 | 0.1660 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 869 |
| 4.25mm | 0.1673 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 876 |
| 4.30mm | 0.1693 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 886 |
| #18 | 0.1695 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 887 |
| 4.35mm | 0.1713 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 896 |
| 11/64 | 0.1719 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 900 |
| #17 | 0.1730 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 905 |
| 4.40mm | 0.1732 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 906 |
| 4.45mm | 0.1752 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 917 |
| #16 | 0.1770 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 926 |
| 4.50mm | 0.1772 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 927 |
| 4.55mm | 0.1792 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 938 |
| #15 | 0.1800 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 942 |
| 4.60mm | 0.1811 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 948 |
| #14 | 0.1820 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 952 |
| 4.65mm | 0.1831 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 958 |
| #13 | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.70mm | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.75mm | 0.1870 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 979 |
| 3/16 | 0.1875 | 45 | 20 | 1000 | -0.022 | 1000 | 2.25 | 981 |
| 4.80mm | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| #12 | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| 4.85mm | 0.1909 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 999 |
| #11 | 0.1910 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1000 |
| 4.90mm | 0.1929 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1010 |
| #10 | 0.1935 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1013 |
| 4.95mm | 0.1949 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1020 |
| #9 | 0.1960 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1026 |
| 5.00mm | 0.1968 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1030 |
| 5.05mm | 0.1988 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1040 |
| #8 | 0.1990 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1041 |
| 5.10mm | 0.2008 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1051 |
| #7 | 0.2010 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1052 |
| 5.15mm | 0.2028 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1061 |
| 13/64 | 0.2031 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1063 |
| #6 | 0.2040 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1068 |
| 5.20mm | 0.2047 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1071 |
| #5 | 0.2055 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1075 |

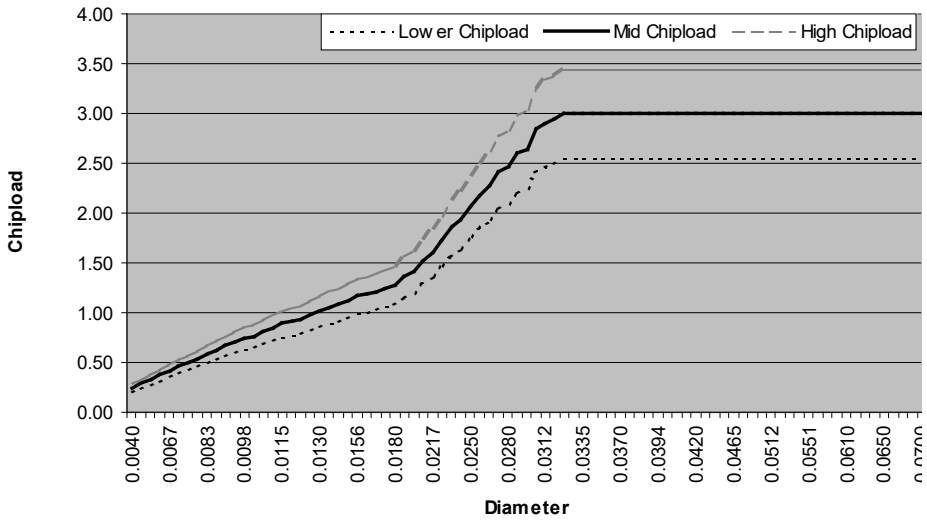
Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1082 |
| 5.30mm | 0.2087 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1092 |
| #4 | 0.2090 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1094 |
| 5.35mm | 0.2106 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1102 |
| 5.40mm | 0.2126 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1113 |
| #3 | 0.2130 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1115 |
| 5.45mm | 0.2146 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1123 |
| 5.50mm | 0.2165 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1133 |
| 5.55mm | 0.2185 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1143 |
| 7/32 | 0.2188 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1145 |
| 5.60mm | 0.2205 | 40 | 20 | 1000 | -0.025 | 600 | 2.00 | 1154 |
| #2 | 0.2210 | 35 | 20 | 1000 | -0.025 | 600 | 1.75 | 1157 |
| 5.65mm | 0.2224 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1164 |
| 5.70mm | 0.2244 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1174 |
| 5.75mm | 0.2264 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1185 |
| #1 | 0.2280 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1193 |
| 5.80mm | 0.2283 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1195 |
| 5.85mm | 0.2302 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1205 |
| 5.90mm | 0.2323 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1216 |
| A | 0.2340 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1225 |
| 5.95mm | 0.2343 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1226 |
| 15/64 | 0.2344 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1227 |
| 6.00mm | 0.2362 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1236 |
| B | 0.2380 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1246 |
| 6.05mm | 0.2382 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Double-Sided




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 High Tg Thick Panel PCB Material

(Panel Thickness > 0.200")

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 55 | 110 | 800 | -0.012 | 750 | 0.50 | 282 |
| #87 | 0.0100 | 55 | 110 | 800 | -0.012 | 750 | 0.50 | 288 |
| #86 | 0.0105 | 59 | 110 | 800 | -0.012 | 750 | 0.54 | 302 |
| #85 | 0.0110 | 64 | 110 | 900 | -0.013 | 750 | 0.58 | 317 |
| #84 | 0.0115 | 69 | 110 | 900 | -0.013 | 750 | 0.63 | 331 |
| 0.30mm | 0.0118 | 72 | 110 | 1000 | -0.013 | 750 | 0.65 | 340 |
| #83 | 0.0120 | 74 | 110 | 1000 | -0.013 | 750 | 0.67 | 345 |
| #82 | 0.0125 | 78 | 110 | 1000 | -0.013 | 750 | 0.71 | 360 |
| #81 | 0.0130 | 83 | 110 | 1000 | -0.013 | 750 | 0.75 | 374 |
| #80 | 0.0135 | 87 | 110 | 1000 | -0.013 | 1000 | 0.79 | 389 |
| 0.35mm | 0.0138 | 89 | 110 | 1000 | -0.013 | 1000 | 0.81 | 397 |
| #79 | 0.0145 | 92 | 110 | 1000 | -0.013 | 1000 | 0.84 | 417 |
| 1/64 | 0.0156 | 100 | 110 | 1000 | -0.014 | 1000 | 0.91 | 449 |
| 0.40mm | 0.0158 | 100 | 109 | 1000 | -0.014 | 1000 | 0.92 | 450 |
| #78 | 0.0160 | 100 | 107 | 1000 | -0.014 | 1000 | 0.93 | 450 |
| 0.45mm | 0.0177 | 102 | 97 | 1000 | -0.014 | 1000 | 1.05 | 450 |
| #77 | 0.0180 | 103 | 96 | 1000 | -0.014 | 1000 | 1.07 | 450 |
| 0.50mm | 0.0197 | 103 | 88 | 1000 | -0.015 | 1000 | 1.17 | 450 |
| #76 | 0.0200 | 103 | 87 | 1000 | -0.015 | 1000 | 1.18 | 450 |
| #75 | 0.0210 | 103 | 83 | 1000 | -0.015 | 1200 | 1.24 | 450 |
| 0.55mm | 0.0217 | 103 | 80 | 1000 | -0.015 | 1200 | 1.29 | 450 |
| #74 | 0.0225 | 103 | 78 | 1000 | -0.015 | 1200 | 1.32 | 450 |
| 0.60mm | 0.0236 | 104 | 74 | 1000 | -0.016 | 1200 | 1.41 | 450 |
| #73 | 0.0240 | 104 | 73 | 1000 | -0.016 | 1200 | 1.42 | 450 |
| #72 | 0.0250 | 104 | 70 | 1000 | -0.016 | 1200 | 1.49 | 450 |
| 0.65mm | 0.0256 | 104 | 68 | 1000 | -0.016 | 1200 | 1.53 | 450 |
| #71 | 0.0260 | 104 | 67 | 1000 | -0.016 | 1200 | 1.55 | 450 |
| 0.70mm | 0.0276 | 103 | 63 | 1000 | -0.016 | 1200 | 1.63 | 450 |
| #70 | 0.0280 | 103 | 62 | 1000 | -0.017 | 1200 | 1.66 | 450 |
| #69 | 0.0292 | 102 | 60 | 1000 | -0.017 | 1200 | 1.70 | 450 |
| 0.75mm | 0.0295 | 102 | 59 | 1000 | -0.017 | 1200 | 1.73 | 450 |
| #68 | 0.0310 | 102 | 57 | 1000 | -0.017 | 1200 | 1.79 | 450 |
| 1/32 | 0.0312 | 101 | 56 | 1000 | -0.017 | 1200 | 1.80 | 450 |
| 0.80mm | 0.0315 | 101 | 55 | 1000 | -0.017 | 1200 | 1.84 | 450 |
| #67 | 0.0320 | 100 | 54 | 1000 | -0.017 | 1200 | 1.85 | 450 |
| #66 | 0.0330 | 100 | 53 | 1000 | -0.018 | 1200 | 1.89 | 450 |
| 0.85mm | 0.0335 | 99 | 52 | 1000 | -0.018 | 1200 | 1.90 | 450 |
| #65 | 0.0350 | 98 | 50 | 1000 | -0.018 | 1200 | 1.96 | 450 |
| 0.90mm | 0.0354 | 98 | 49 | 1000 | -0.018 | 1200 | 2.00 | 450 |
| #64 | 0.0360 | 97 | 48 | 1000 | -0.018 | 1200 | 2.02 | 450 |
| #63 | 0.0370 | 96 | 47 | 1000 | -0.019 | 1200 | 2.04 | 450 |
| 0.95mm | 0.0374 | 95 | 46 | 1000 | -0.019 | 1200 | 2.07 | 450 |
| #62 | 0.0380 | 95 | 46 | 1000 | -0.019 | 1200 | 2.07 | 450 |
| #61 | 0.0390 | 94 | 45 | 1000 | -0.019 | 1200 | 2.09 | 450 |
| 1.00mm | 0.0394 | 94 | 45 | 1000 | -0.019 | 1200 | 2.09 | 450 |
| #60 | 0.0400 | 94 | 44 | 1000 | -0.019 | 1200 | 2.14 | 450 |
| #59 | 0.0410 | 93 | 43 | 1000 | -0.020 | 1200 | 2.16 | 450 |
| 1.05mm | 0.0413 | 93 | 42 | 1000 | -0.020 | 1200 | 2.21 | 450 |
| #58 | 0.0420 | 92 | 41 | 1000 | -0.020 | 1200 | 2.24 | 450 |
| #57 | 0.0430 | 92 | 40 | 1000 | -0.020 | 1200 | 2.30 | 450 |
| 1.10mm | 0.0433 | 92 | 40 | 1000 | -0.020 | 1200 | 2.30 | 450 |
| 1.15mm | 0.0453 | 91 | 39 | 1000 | -0.021 | 1200 | 2.33 | 450 |
| #56 | 0.0465 | 90 | 38 | 1000 | -0.021 | 1200 | 2.37 | 450 |
| 3/64 | 0.0469 | 90 | 37 | 1000 | -0.021 | 1200 | 2.43 | 450 |
| 1.20mm | 0.0472 | 90 | 37 | 1000 | -0.021 | 1200 | 2.43 | 450 |
| 1.25mm | 0.0492 | 89 | 36 | 1000 | -0.021 | 1200 | 2.47 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #55 | 0.0520 | 85 | 34 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| 1.35mm | 0.0531 | 83 | 33 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #54 | 0.0550 | 80 | 32 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.40mm | 0.0551 | 80 | 32 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.45mm | 0.0571 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.50mm | 0.0591 | 75 | 30 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.60mm | 0.0630 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| #52 | 0.0635 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.65mm | 0.0650 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.80mm | 0.0709 | 63 | 25 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.85mm | 0.0728 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #49 | 0.0730 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.90mm | 0.0748 | 58 | 23 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #48 | 0.0760 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 1.95mm | 0.0768 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 5/64 | 0.0781 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| #47 | 0.0785 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.00mm | 0.0787 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.05mm | 0.0807 | 55 | 22 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| #46 | 0.0810 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| #45 | 0.0820 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| 2.10mm | 0.0827 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| 2.15mm | 0.0846 | 53 | 21 | 1000 | -0.030 | 1200 | 2.50 | 450 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1200 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1200 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |
| 3.20mm | 0.1260 | 48 | 20 | 1000 | -0.018 | 600 | 2.40 | 659 |
| 3.25mm | 0.1280 | 48 | 20 | 1000 | -0.018 | 600 | 2.40 | 670 |
| #30 | 0.1285 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 672 |
| 3.30mm | 0.1299 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 680 |
| 3.35mm | 0.1319 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 690 |
| 3.40mm | 0.1339 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 701 |
| 3.45mm | 0.1358 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 711 |
| #29 | 0.1360 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 712 |
| 3.50mm | 0.1378 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 721 |
| 3.55mm | 0.1398 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 732 |
| #28 | 0.1405 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 735 |
| 9/64 | 0.1406 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 736 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

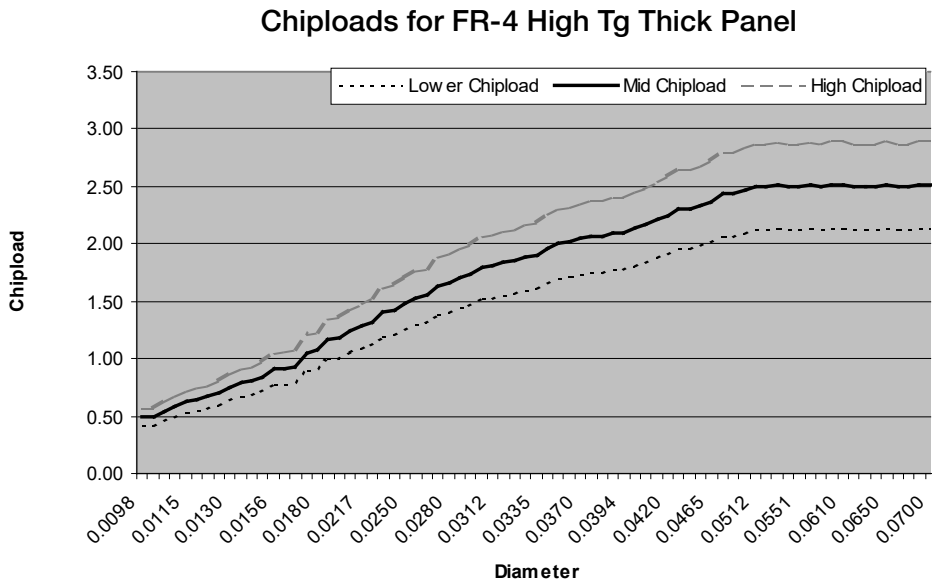
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 742 |
| 3.65mm | 0.1437 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 752 |
| #27 | 0.1440 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 754 |
| 3.70mm | 0.1457 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 814 |
| 5/32 | 0.1562 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 817 |
| #22 | 0.1570 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 822 |
| 4.00mm | 0.1575 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 824 |
| #21 | 0.1590 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 832 |
| 4.05mm | 0.1594 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 834 |
| #20 | 0.1610 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 843 |
| 4.10mm | 0.1614 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 845 |
| 4.15mm | 0.1634 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 855 |
| 4.20mm | 0.1654 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 866 |
| #19 | 0.1660 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 869 |
| 4.25mm | 0.1673 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 876 |
| 4.30mm | 0.1693 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 886 |
| #18 | 0.1695 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 250 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 250 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 250 | 1.50 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1075 |
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1157 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Multilayer High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 23 | 110 | 200 | -0.011 | 500 | 0.21 | 115 |
| 0.13mm | 0.0050 | 28 | 110 | 300 | -0.011 | 600 | 0.25 | 144 |
| 0.15mm | 0.0059 | 33 | 110 | 300 | -0.011 | 600 | 0.30 | 170 |
| #96 | 0.0063 | 36 | 110 | 400 | -0.011 | 600 | 0.33 | 181 |
| #95 | 0.0067 | 41 | 110 | 400 | -0.012 | 600 | 0.37 | 193 |
| #94 | 0.0071 | 44 | 110 | 500 | -0.012 | 600 | 0.40 | 204 |
| #93 | 0.0075 | 47 | 110 | 500 | -0.012 | 600 | 0.43 | 216 |
| #92 | 0.0079 | 52 | 110 | 500 | -0.012 | 800 | 0.47 | 227 |
| #91 | 0.0083 | 55 | 110 | 600 | -0.012 | 800 | 0.50 | 239 |
| #90 | 0.0087 | 58 | 110 | 600 | -0.012 | 800 | 0.53 | 250 |
| #89 | 0.0091 | 63 | 110 | 700 | -0.012 | 800 | 0.57 | 262 |
| #88 | 0.0095 | 66 | 110 | 700 | -0.012 | 800 | 0.60 | 273 |
| 0.25mm | 0.0098 | 69 | 110 | 800 | -0.012 | 1000 | 0.63 | 282 |
| #87 | 0.0100 | 74 | 110 | 800 | -0.012 | 1000 | 0.67 | 288 |
| #86 | 0.0105 | 77 | 110 | 800 | -0.012 | 1000 | 0.70 | 302 |
| #85 | 0.0110 | 80 | 110 | 900 | -0.013 | 1000 | 0.73 | 317 |
| #84 | 0.0115 | 85 | 110 | 900 | -0.013 | 1000 | 0.77 | 331 |
| 0.30mm | 0.0118 | 88 | 110 | 1000 | -0.013 | 1200 | 0.80 | 340 |
| #83 | 0.0120 | 91 | 110 | 1000 | -0.013 | 1200 | 0.83 | 345 |
| #82 | 0.0125 | 96 | 110 | 1000 | -0.013 | 1200 | 0.87 | 360 |
| #81 | 0.0130 | 99 | 110 | 1000 | -0.013 | 1200 | 0.90 | 374 |
| #80 | 0.0135 | 103 | 110 | 1000 | -0.013 | 1500 | 0.94 | 389 |
| 0.35mm | 0.0138 | 106 | 110 | 1000 | -0.013 | 1500 | 0.96 | 397 |
| #79 | 0.0145 | 110 | 110 | 1000 | -0.013 | 1500 | 1.00 | 417 |
| 1/64 | 0.0156 | 120 | 110 | 1000 | -0.014 | 1500 | 1.09 | 450 |
| 0.40mm | 0.0158 | 120 | 109 | 1000 | -0.014 | 1500 | 1.10 | 450 |
| #78 | 0.0160 | 122 | 107 | 1000 | -0.014 | 1500 | 1.14 | 450 |
| 0.45mm | 0.0177 | 123 | 97 | 1000 | -0.014 | 1500 | 1.27 | 450 |
| #77 | 0.0180 | 124 | 96 | 1000 | -0.014 | 1500 | 1.29 | 450 |
| 0.50mm | 0.0197 | 125 | 87 | 1000 | -0.015 | 1500 | 1.44 | 450 |
| #76 | 0.0200 | 126 | 86 | 1000 | -0.015 | 1500 | 1.47 | 450 |
| #75 | 0.0210 | 126 | 82 | 1000 | -0.015 | 1500 | 1.54 | 450 |
| 0.55mm | 0.0217 | 126 | 79 | 1000 | -0.015 | 1500 | 1.59 | 450 |
| #74 | 0.0225 | 125 | 76 | 1000 | -0.015 | 1500 | 1.64 | 450 |
| 0.60mm | 0.0236 | 124 | 73 | 1000 | -0.016 | 1500 | 1.70 | 450 |
| #73 | 0.0240 | 124 | 72 | 1000 | -0.016 | 1500 | 1.72 | 450 |
| #72 | 0.0250 | 123 | 69 | 1000 | -0.016 | 1200 | 1.78 | 450 |
| 0.65mm | 0.0256 | 122 | 67 | 1000 | -0.016 | 1200 | 1.82 | 450 |
| #71 | 0.0260 | 122 | 66 | 1000 | -0.016 | 1200 | 1.85 | 450 |
| 0.70mm | 0.0276 | 120 | 62 | 1000 | -0.016 | 1200 | 1.94 | 450 |
| #70 | 0.0280 | 120 | 61 | 1000 | -0.017 | 1200 | 1.97 | 450 |
| #69 | 0.0292 | 119 | 59 | 1000 | -0.017 | 1200 | 2.02 | 450 |
| 0.75mm | 0.0295 | 119 | 58 | 1000 | -0.017 | 1200 | 2.05 | 450 |
| #68 | 0.0310 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 1/32 | 0.0312 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 0.80mm | 0.0315 | 115 | 55 | 1000 | -0.017 | 1500 | 2.09 | 450 |
| #67 | 0.0320 | 114 | 54 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| #66 | 0.0330 | 113 | 52 | 1000 | -0.018 | 1500 | 2.17 | 450 |
| 0.85mm | 0.0335 | 113 | 51 | 1000 | -0.018 | 1500 | 2.22 | 450 |
| #65 | 0.0350 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| 0.90mm | 0.0354 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| #64 | 0.0360 | 112 | 48 | 1000 | -0.018 | 1500 | 2.33 | 450 |
| #63 | 0.0370 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| 0.95mm | 0.0374 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| #62 | 0.0380 | 110 | 45 | 1000 | -0.019 | 1500 | 2.44 | 450 |
| #61 | 0.0390 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| 1.00mm | 0.0394 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| #60 | 0.0400 | 107 | 43 | 1000 | -0.019 | 1500 | 2.49 | 450 |
| #59 | 0.0410 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.05mm | 0.0413 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #58 | 0.0420 | 103 | 41 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #57 | 0.0430 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.10mm | 0.0433 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.15mm | 0.0453 | 95 | 38 | 1000 | -0.021 | 1500 | 2.50 | 450 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 3/64 | 0.0469 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.20mm | 0.0472 | 90 | 36 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.25mm | 0.0492 | 88 | 35 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| #55 | 0.0520 | 83 | 33 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| 1.35mm | 0.0531 | 80 | 32 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #54 | 0.0550 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.40mm | 0.0551 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.45mm | 0.0571 | 75 | 30 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.50mm | 0.0591 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1.55mm | 0.0610 | 70 | 28 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.60mm | 0.0630 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| #52 | 0.0635 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.65mm | 0.0650 | 65 | 26 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.80mm | 0.0709 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.85mm | 0.0728 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #49 | 0.0730 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.90mm | 0.0748 | 58 | 23 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #48 | 0.0760 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 1.95mm | 0.0768 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 5/64 | 0.0781 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| #47 | 0.0785 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.00mm | 0.0787 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.05mm | 0.0807 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #46 | 0.0810 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #45 | 0.0820 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.10mm | 0.0827 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1075 |

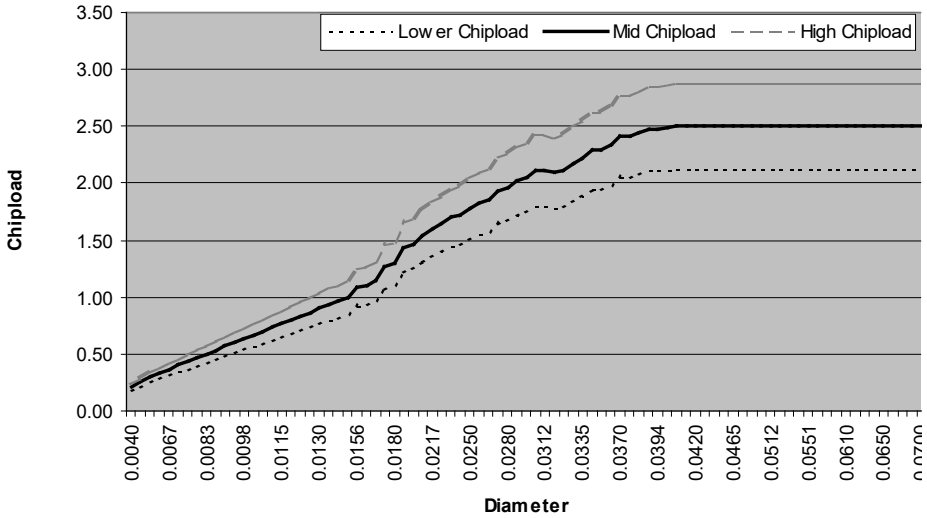
Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Multilayer High Tg




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Multilayer Low Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 33 | 110 | 200 | -0.011 | 500 | 0.30 | 115 |
| 0.13mm | 0.0050 | 39 | 110 | 300 | -0.011 | 600 | 0.35 | 144 |
| 0.15mm | 0.0059 | 42 | 110 | 300 | -0.011 | 600 | 0.38 | 170 |
| #96 | 0.0063 | 46 | 110 | 400 | -0.011 | 600 | 0.42 | 181 |
| #95 | 0.0067 | 47 | 110 | 400 | -0.012 | 600 | 0.43 | 193 |
| #94 | 0.0071 | 52 | 110 | 500 | -0.012 | 600 | 0.47 | 204 |
| #93 | 0.0075 | 55 | 110 | 500 | -0.012 | 600 | 0.50 | 216 |
| #92 | 0.0079 | 58 | 110 | 500 | -0.012 | 800 | 0.53 | 227 |
| #91 | 0.0083 | 63 | 110 | 600 | -0.012 | 800 | 0.57 | 239 |
| #90 | 0.0087 | 66 | 110 | 600 | -0.012 | 800 | 0.60 | 250 |
| #89 | 0.0091 | 69 | 110 | 700 | -0.012 | 800 | 0.63 | 262 |
| #88 | 0.0095 | 74 | 110 | 700 | -0.012 | 800 | 0.67 | 273 |
| 0.25mm | 0.0098 | 77 | 110 | 800 | -0.012 | 1000 | 0.70 | 282 |
| #87 | 0.0100 | 79 | 110 | 800 | -0.012 | 1000 | 0.72 | 288 |
| #86 | 0.0105 | 83 | 110 | 800 | -0.012 | 1000 | 0.75 | 302 |
| #85 | 0.0110 | 87 | 110 | 900 | -0.013 | 1000 | 0.79 | 317 |
| #84 | 0.0115 | 91 | 110 | 900 | -0.013 | 1000 | 0.83 | 331 |
| 0.30mm | 0.0118 | 97 | 110 | 1000 | -0.013 | 1200 | 0.88 | 340 |
| #83 | 0.0120 | 101 | 110 | 1000 | -0.013 | 1200 | 0.92 | 345 |
| #82 | 0.0125 | 106 | 110 | 1000 | -0.013 | 1200 | 0.96 | 360 |
| #81 | 0.0130 | 110 | 110 | 1000 | -0.013 | 1200 | 1.00 | 374 |
| #80 | 0.0135 | 114 | 110 | 1000 | -0.013 | 1500 | 1.04 | 389 |
| 0.35mm | 0.0138 | 118 | 110 | 1000 | -0.013 | 1500 | 1.07 | 397 |
| #79 | 0.0145 | 121 | 110 | 1000 | -0.013 | 1500 | 1.10 | 417 |
| 1/64 | 0.0156 | 127 | 110 | 1000 | -0.014 | 1500 | 1.15 | 449 |
| 0.40mm | 0.0158 | 129 | 110 | 1000 | -0.014 | 1500 | 1.17 | 455 |
| #78 | 0.0160 | 130 | 110 | 1000 | -0.014 | 1500 | 1.18 | 461 |
| 0.45mm | 0.0177 | 138 | 110 | 1000 | -0.014 | 1500 | 1.25 | 509 |
| #77 | 0.0180 | 143 | 110 | 1000 | -0.014 | 1500 | 1.30 | 518 |
| 0.50mm | 0.0197 | 154 | 107 | 1000 | -0.015 | 1500 | 1.44 | 550 |
| #76 | 0.0200 | 155 | 105 | 1000 | -0.015 | 1500 | 1.48 | 550 |
| #75 | 0.0210 | 156 | 100 | 1000 | -0.015 | 1500 | 1.56 | 550 |
| 0.55mm | 0.0217 | 158 | 97 | 1000 | -0.015 | 1500 | 1.63 | 550 |
| #74 | 0.0225 | 160 | 93 | 1000 | -0.015 | 1500 | 1.72 | 550 |
| 0.60mm | 0.0236 | 162 | 89 | 1000 | -0.016 | 1500 | 1.82 | 550 |
| #73 | 0.0240 | 162 | 88 | 1000 | -0.016 | 1500 | 1.84 | 550 |
| #72 | 0.0250 | 163 | 84 | 1000 | -0.016 | 1500 | 1.94 | 550 |
| 0.65mm | 0.0256 | 164 | 82 | 1000 | -0.016 | 1500 | 2.00 | 550 |
| #71 | 0.0260 | 165 | 81 | 1000 | -0.016 | 1500 | 2.04 | 550 |
| 0.70mm | 0.0276 | 166 | 76 | 1000 | -0.016 | 1500 | 2.18 | 550 |
| #70 | 0.0280 | 166 | 75 | 1000 | -0.017 | 1500 | 2.21 | 550 |
| #69 | 0.0292 | 166 | 72 | 1000 | -0.017 | 1500 | 2.31 | 550 |
| 0.75mm | 0.0295 | 166 | 71 | 1000 | -0.017 | 1500 | 2.34 | 550 |
| #68 | 0.0310 | 166 | 68 | 1000 | -0.017 | 1500 | 2.44 | 550 |
| 1/32 | 0.0312 | 166 | 67 | 1000 | -0.017 | 1500 | 2.48 | 550 |
| 0.80mm | 0.0315 | 166 | 67 | 1000 | -0.017 | 1500 | 2.48 | 550 |
| #67 | 0.0320 | 166 | 66 | 1000 | -0.017 | 1500 | 2.52 | 550 |
| #66 | 0.0330 | 164 | 64 | 1000 | -0.018 | 1500 | 2.56 | 550 |
| 0.85mm | 0.0335 | 163 | 63 | 1000 | -0.018 | 1500 | 2.59 | 550 |
| #65 | 0.0350 | 160 | 60 | 1000 | -0.018 | 1500 | 2.67 | 550 |
| 0.90mm | 0.0354 | 160 | 59 | 1000 | -0.018 | 1500 | 2.71 | 550 |
| #64 | 0.0360 | 159 | 58 | 1000 | -0.018 | 1500 | 2.74 | 550 |
| #63 | 0.0370 | 158 | 57 | 1000 | -0.019 | 1500 | 2.77 | 550 |
| 0.95mm | 0.0374 | 158 | 56 | 1000 | -0.019 | 1500 | 2.82 | 550 |
| #62 | 0.0380 | 156 | 55 | 1000 | -0.019 | 1500 | 2.84 | 550 |
| #61 | 0.0390 | 155 | 54 | 1000 | -0.019 | 1500 | 2.87 | 550 |
| 1.00mm | 0.0394 | 155 | 53 | 1000 | -0.019 | 1500 | 2.92 | 550 |
| #60 | 0.0400 | 154 | 53 | 1000 | -0.019 | 1500 | 2.91 | 550 |
| #59 | 0.0410 | 153 | 51 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.05mm | 0.0413 | 153 | 51 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| #58 | 0.0420 | 150 | 50 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| #57 | 0.0430 | 147 | 49 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.10mm | 0.0433 | 147 | 49 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.15mm | 0.0453 | 138 | 46 | 1000 | -0.021 | 1500 | 3.00 | 550 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 3/64 | 0.0469 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.20mm | 0.0472 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.25mm | 0.0492 | 129 | 43 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.30mm | 0.0512 | 123 | 41 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| #55 | 0.0520 | 120 | 40 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| 1.35mm | 0.0531 | 120 | 40 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| #54 | 0.0550 | 114 | 38 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.40mm | 0.0551 | 114 | 38 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.45mm | 0.0571 | 111 | 37 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.50mm | 0.0591 | 108 | 36 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| #53 | 0.0595 | 105 | 35 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| 1.55mm | 0.0610 | 102 | 34 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| 1/16 | 0.0625 | 102 | 34 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.60mm | 0.0630 | 99 | 33 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| #52 | 0.0635 | 99 | 33 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.65mm | 0.0650 | 96 | 32 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.70mm | 0.0669 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| #51 | 0.0670 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| 1.75mm | 0.0689 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| #50 | 0.0700 | 90 | 30 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| 1.80mm | 0.0709 | 90 | 30 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| 1.85mm | 0.0728 | 87 | 29 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| #49 | 0.0730 | 87 | 29 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| 1.90mm | 0.0748 | 84 | 28 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| #48 | 0.0760 | 84 | 28 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 1.95mm | 0.0768 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 5/64 | 0.0781 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| #47 | 0.0785 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 2.00mm | 0.0787 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 2.05mm | 0.0807 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| #46 | 0.0810 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| #45 | 0.0820 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| 2.10mm | 0.0827 | 75 | 25 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| 2.15mm | 0.0846 | 75 | 25 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| #44 | 0.0860 | 72 | 24 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| 2.20mm | 0.0866 | 72 | 24 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| 2.25mm | 0.0886 | 72 | 24 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| #43 | 0.0890 | 72 | 24 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| 2.30mm | 0.0906 | 69 | 23 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| 2.35mm | 0.0925 | 69 | 23 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| #42 | 0.0935 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 3/32 | 0.0938 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 2.40mm | 0.0945 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| #41 | 0.0960 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 2.45mm | 0.0965 | 66 | 22 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #40 | 0.0980 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| 2.50mm | 0.0984 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #39 | 0.0995 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| 2.55mm | 0.1004 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #38 | 0.1015 | 63 | 21 | 1000 | -0.034 | 1500 | 3.00 | 550 |
| 2.60mm | 0.1024 | 63 | 21 | 1000 | -0.034 | 1500 | 3.00 | 550 |
| #37 | 0.1040 | 60 | 20 | 1000 | -0.034 | 1200 | 3.00 | 550 |
| 2.65mm | 0.1043 | 60 | 20 | 1000 | -0.034 | 1200 | 3.00 | 550 |
| 2.70mm | 0.1063 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 550 |
| #36 | 0.1065 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 557 |
| 2.75mm | 0.1083 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 567 |
| 7/64 | 0.1094 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 573 |
| #35 | 0.1100 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 576 |
| 2.80mm | 0.1102 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 577 |
| #34 | 0.1110 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 581 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 587 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 591 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 598 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 1000 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 1000 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

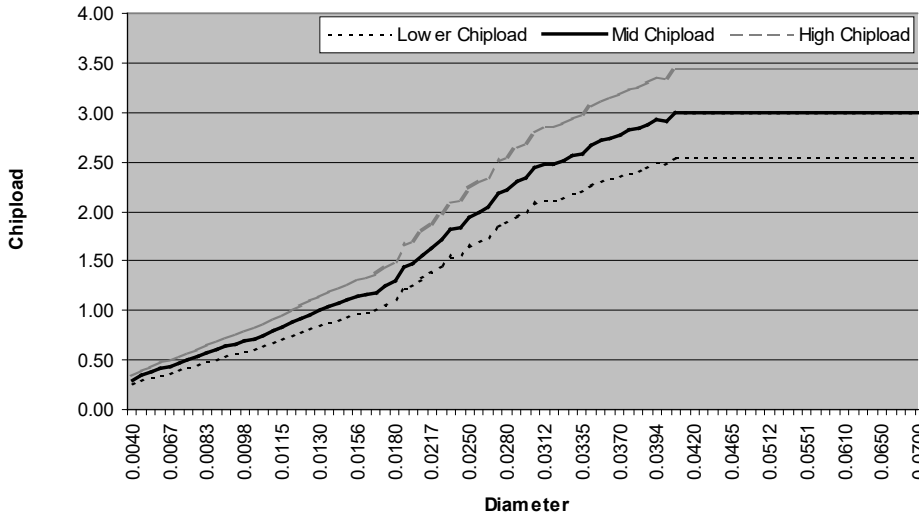
Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Multilayer Low Tg




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **KAPTON® / Flex** PCB Material

KAPTON® is a registered trademark of DuPont

**Recommended Drill Series:** 100, 150, 240, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 28 | 110 | 200 | -0.011 | 200 | 0.25 | 115 |
| 0.13mm | 0.0050 | 35 | 110 | 300 | -0.011 | 200 | 0.32 | 144 |
| 0.15mm | 0.0059 | 40 | 110 | 300 | -0.011 | 250 | 0.36 | 170 |
| #96 | 0.0063 | 44 | 110 | 400 | -0.011 | 250 | 0.40 | 181 |
| #95 | 0.0067 | 47 | 110 | 400 | -0.012 | 250 | 0.43 | 193 |
| #94 | 0.0071 | 50 | 110 | 500 | -0.012 | 300 | 0.45 | 204 |
| #93 | 0.0075 | 54 | 110 | 500 | -0.012 | 300 | 0.49 | 216 |
| #92 | 0.0079 | 55 | 110 | 500 | -0.012 | 350 | 0.50 | 227 |
| #91 | 0.0083 | 56 | 110 | 600 | -0.012 | 350 | 0.51 | 239 |
| #90 | 0.0087 | 56 | 110 | 600 | -0.012 | 400 | 0.51 | 250 |
| #89 | 0.0091 | 57 | 104 | 700 | -0.012 | 400 | 0.55 | 248 |
| #88 | 0.0095 | 57 | 100 | 700 | -0.012 | 400 | 0.57 | 249 |
| 0.25mm | 0.0098 | 58 | 98 | 800 | -0.012 | 450 | 0.59 | 251 |
| #87 | 0.0100 | 58 | 95 | 800 | -0.012 | 450 | 0.61 | 249 |
| #86 | 0.0105 | 59 | 92 | 800 | -0.012 | 450 | 0.64 | 253 |
| #85 | 0.0110 | 59 | 90 | 900 | -0.013 | 450 | 0.66 | 259 |
| #84 | 0.0115 | 59 | 88 | 900 | -0.013 | 450 | 0.67 | 265 |
| 0.30mm | 0.0118 | 60 | 86 | 1000 | -0.013 | 500 | 0.70 | 266 |
| #83 | 0.0120 | 60 | 84 | 1000 | -0.013 | 500 | 0.71 | 264 |
| #82 | 0.0125 | 60 | 82 | 1000 | -0.013 | 500 | 0.73 | 268 |
| #81 | 0.0130 | 60 | 80 | 1000 | -0.013 | 500 | 0.75 | 272 |
| #80 | 0.0135 | 61 | 79 | 1000 | -0.013 | 500 | 0.77 | 279 |
| 0.35mm | 0.0138 | 61 | 79 | 1000 | -0.013 | 500 | 0.77 | 285 |
| #79 | 0.0145 | 61 | 79 | 1000 | -0.013 | 500 | 0.77 | 300 |
| 1/64 | 0.0156 | 62 | 75 | 1000 | -0.014 | 500 | 0.83 | 300 |
| 0.40mm | 0.0158 | 62 | 74 | 1000 | -0.014 | 500 | 0.84 | 300 |
| #78 | 0.0160 | 62 | 72 | 1000 | -0.014 | 500 | 0.86 | 300 |
| 0.45mm | 0.0177 | 62 | 65 | 1000 | -0.014 | 500 | 0.95 | 300 |
| #77 | 0.0180 | 62 | 64 | 1000 | -0.014 | 500 | 0.97 | 300 |
| 0.50mm | 0.0197 | 62 | 58 | 1000 | -0.015 | 500 | 1.07 | 300 |
| #76 | 0.0200 | 63 | 57 | 1000 | -0.015 | 500 | 1.11 | 300 |
| #75 | 0.0210 | 63 | 55 | 1000 | -0.015 | 750 | 1.15 | 300 |
| 0.55mm | 0.0217 | 64 | 53 | 1000 | -0.015 | 750 | 1.21 | 300 |
| #74 | 0.0225 | 65 | 51 | 1000 | -0.015 | 750 | 1.27 | 300 |
| 0.60mm | 0.0236 | 65 | 49 | 1000 | -0.016 | 750 | 1.33 | 300 |
| #73 | 0.0240 | 66 | 48 | 1000 | -0.016 | 750 | 1.38 | 300 |
| #72 | 0.0250 | 66 | 46 | 1000 | -0.016 | 750 | 1.43 | 300 |
| 0.65mm | 0.0256 | 68 | 45 | 1000 | -0.016 | 750 | 1.51 | 300 |
| #71 | 0.0260 | 69 | 44 | 1000 | -0.016 | 750 | 1.57 | 300 |
| 0.70mm | 0.0276 | 71 | 42 | 1000 | -0.016 | 750 | 1.69 | 300 |
| #70 | 0.0280 | 73 | 41 | 1000 | -0.017 | 750 | 1.78 | 300 |
| #69 | 0.0292 | 74 | 39 | 1000 | -0.017 | 750 | 1.90 | 300 |
| 0.75mm | 0.0295 | 76 | 39 | 1000 | -0.017 | 750 | 1.95 | 300 |
| #68 | 0.0310 | 77 | 37 | 1000 | -0.017 | 1000 | 2.08 | 300 |
| 1/32 | 0.0312 | 78 | 37 | 1000 | -0.017 | 1000 | 2.11 | 300 |
| 0.80mm | 0.0315 | 78 | 36 | 1000 | -0.017 | 1000 | 2.17 | 300 |
| #67 | 0.0320 | 79 | 36 | 1000 | -0.017 | 1000 | 2.19 | 300 |
| #66 | 0.0330 | 81 | 35 | 1000 | -0.018 | 1000 | 2.31 | 300 |
| 0.85mm | 0.0335 | 81 | 34 | 1000 | -0.018 | 1000 | 2.38 | 300 |
| #65 | 0.0350 | 81 | 33 | 1000 | -0.018 | 1000 | 2.45 | 300 |
| 0.90mm | 0.0354 | 80 | 32 | 1000 | -0.018 | 1000 | 2.50 | 300 |
| #64 | 0.0360 | 80 | 32 | 1000 | -0.018 | 1000 | 2.50 | 300 |
| #63 | 0.0370 | 78 | 31 | 1000 | -0.019 | 1000 | 2.52 | 300 |
| 0.95mm | 0.0374 | 78 | 31 | 1000 | -0.019 | 1000 | 2.52 | 300 |
| #62 | 0.0380 | 75 | 30 | 1000 | -0.019 | 1000 | 2.50 | 300 |
| #61 | 0.0390 | 73 | 29 | 1000 | -0.019 | 1000 | 2.52 | 300 |
| 1.00mm | 0.0394 | 73 | 29 | 1000 | -0.019 | 1000 | 2.52 | 300 |
| #60 | 0.0400 | 73 | 29 | 1000 | -0.019 | 1200 | 2.52 | 300 |
| #59 | 0.0410 | 70 | 28 | 1000 | -0.020 | 1200 | 2.50 | 300 |
| 1.05mm | 0.0413 | 70 | 28 | 1000 | -0.020 | 1200 | 2.50 | 300 |
| #58 | 0.0420 | 68 | 27 | 1000 | -0.020 | 1200 | 2.52 | 300 |
| #57 | 0.0430 | 68 | 27 | 1000 | -0.020 | 1200 | 2.52 | 300 |
| 1.10mm | 0.0433 | 65 | 26 | 1000 | -0.020 | 1200 | 2.50 | 300 |
| 1.15mm | 0.0453 | 63 | 25 | 1000 | -0.021 | 1200 | 2.52 | 300 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 63 | 25 | 1000 | -0.021 | 1200 | 2.52 | 300 |
| 3/64 | 0.0469 | 60 | 24 | 1000 | -0.021 | 1200 | 2.50 | 300 |
| 1.20mm | 0.0472 | 60 | 24 | 1000 | -0.021 | 1200 | 2.50 | 300 |
| 1.25mm | 0.0492 | 58 | 23 | 1000 | -0.021 | 1200 | 2.52 | 300 |
| 1.30mm | 0.0512 | 55 | 22 | 1000 | -0.022 | 1200 | 2.50 | 300 |
| #55 | 0.0520 | 55 | 22 | 1000 | -0.022 | 1200 | 2.50 | 300 |
| 1.35mm | 0.0531 | 55 | 22 | 1000 | -0.022 | 1200 | 2.50 | 300 |
| #54 | 0.0550 | 53 | 21 | 1000 | -0.023 | 1200 | 2.52 | 300 |
| 1.40mm | 0.0551 | 53 | 21 | 1000 | -0.023 | 1200 | 2.52 | 300 |
| 1.45mm | 0.0571 | 50 | 20 | 1000 | -0.023 | 1200 | 2.50 | 300 |
| 1.50mm | 0.0591 | 50 | 20 | 1000 | -0.024 | 1200 | 2.50 | 309 |
| #53 | 0.0595 | 50 | 20 | 1000 | -0.024 | 1200 | 2.50 | 311 |
| 1.55mm | 0.0610 | 50 | 20 | 1000 | -0.024 | 1200 | 2.50 | 319 |
| 1/16 | 0.0625 | 50 | 20 | 1000 | -0.025 | 1200 | 2.50 | 327 |
| 1.60mm | 0.0630 | 50 | 20 | 1000 | -0.025 | 1000 | 2.50 | 330 |
| #52 | 0.0635 | 50 | 20 | 1000 | -0.025 | 1000 | 2.50 | 332 |
| 1.65mm | 0.0650 | 50 | 20 | 1000 | -0.025 | 1000 | 2.50 | 340 |
| 1.70mm | 0.0669 | 50 | 20 | 1000 | -0.026 | 1000 | 2.50 | 350 |
| #51 | 0.0670 | 50 | 20 | 1000 | -0.026 | 1000 | 2.50 | 351 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 1000 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 1000 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 800 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 800 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 800 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 800 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 800 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 800 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 800 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 800 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 800 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 800 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 800 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 600 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 600 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 600 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 600 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 600 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 600 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 600 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 600 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 600 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 600 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 600 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 600 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 600 | 2.50 | 618 |
| #31 | 0.1200 | 43 | 20 | 1000 | -0.038 | 600 | 2.15 | 628 |
| 3.05mm | 0.1201 | 43 | 20 | 1000 | -0.038 | 600 | 2.15 | 629 |
| 3.10mm | 0.1220 | 43 | 20 | 1000 | -0.038 | 600 | 2.15 | 638 |
| 3.15mm | 0.1240 | 43 | 20 | 1000 | -0.039 | 600 | 2.15 | 649 |
| 1/8 | 0.1250 | 43 | 20 | 1000 | -0.039 | 600 | 2.15 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 43 | 20 | 1000 | -0.018 | 400 | 2.15 | 659 |
| 3.25mm | 0.1280 | 43 | 20 | 1000 | -0.018 | 400 | 2.15 | 670 |
| #30 | 0.1285 | 43 | 20 | 1000 | -0.019 | 400 | 2.15 | 672 |
| 3.30mm | 0.1299 | 43 | 20 | 1000 | -0.019 | 400 | 2.15 | 680 |
| 3.35mm | 0.1319 | 43 | 20 | 1000 | -0.019 | 400 | 2.15 | 690 |
| 3.40mm | 0.1339 | 43 | 20 | 1000 | -0.019 | 400 | 2.15 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 400 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 795 |
| 3.90mm | 0.1535 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 803 |
| #23 | 0.1540 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 20 | 20 | 1000 | -0.023 | 300 | 1.00 | 1030 |
| 5.05mm | 0.1988 | 20 | 20 | 1000 | -0.023 | 300 | 1.00 | 1040 |
| #8 | 0.1990 | 20 | 20 | 1000 | -0.023 | 300 | 1.00 | 1041 |
| 5.10mm | 0.2008 | 20 | 20 | 1000 | -0.023 | 200 | 1.00 | 1051 |
| #7 | 0.2010 | 20 | 20 | 1000 | -0.023 | 200 | 1.00 | 1052 |
| 5.15mm | 0.2028 | 20 | 20 | 1000 | -0.023 | 200 | 1.00 | 1061 |
| 13/64 | 0.2031 | 20 | 20 | 1000 | -0.023 | 200 | 1.00 | 1063 |
| #6 | 0.2040 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1068 |
| 5.20mm | 0.2047 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1071 |
| #5 | 0.2055 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1075 |

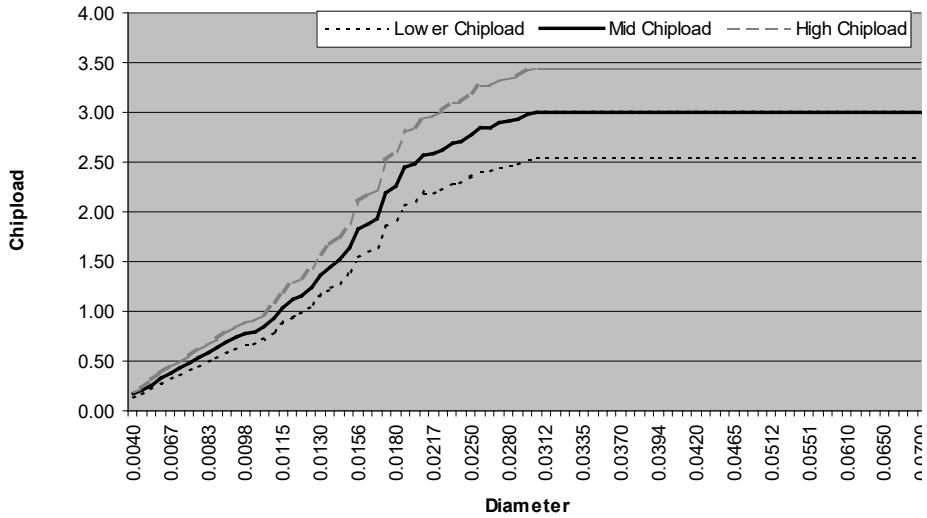
Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1082 |
| 5.30mm | 0.2087 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1092 |
| #4 | 0.2090 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1094 |
| 5.35mm | 0.2106 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 150 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 150 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 150 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for KAPTON® / Flex




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Lexan / Acrylic PCB Material

## Recommended Drill Series: 100, 150

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #80 | 0.0135 | 168 | 42 | 1000 | -0.013 | 2000 | 4.00 | 150 |
| 0.35mm | 0.0138 | 168 | 42 | 1000 | -0.013 | 2000 | 4.00 | 150 |
| #79 | 0.0145 | 168 | 40 | 1000 | -0.013 | 2000 | 4.20 | 150 |
| 1/64 | 0.0156 | 163 | 37 | 1000 | -0.014 | 2000 | 4.40 | 150 |
| 0.40mm | 0.0158 | 162 | 36 | 1000 | -0.014 | 2000 | 4.50 | 150 |
| #78 | 0.0160 | 166 | 36 | 1000 | -0.014 | 2000 | 4.60 | 150 |
| 0.45mm | 0.0177 | 154 | 32 | 1000 | -0.014 | 2000 | 4.80 | 150 |
| #77 | 0.0180 | 160 | 32 | 1000 | -0.014 | 2000 | 5.00 | 150 |
| 0.50mm | 0.0197 | 151 | 29 | 1000 | -0.015 | 2000 | 5.20 | 150 |
| #76 | 0.0200 | 157 | 29 | 1000 | -0.015 | 2000 | 5.40 | 150 |
| #75 | 0.0210 | 151 | 27 | 1000 | -0.015 | 2000 | 5.60 | 150 |
| 0.55mm | 0.0217 | 151 | 26 | 1000 | -0.015 | 2000 | 5.80 | 150 |
| #74 | 0.0225 | 150 | 25 | 1000 | -0.015 | 2000 | 6.00 | 150 |
| 0.60mm | 0.0236 | 149 | 24 | 1000 | -0.016 | 2000 | 6.20 | 150 |
| #73 | 0.0240 | 154 | 24 | 1000 | -0.016 | 2000 | 6.40 | 150 |
| #72 | 0.0250 | 152 | 23 | 1000 | -0.016 | 2000 | 6.60 | 150 |
| 0.65mm | 0.0256 | 150 | 22 | 1000 | -0.016 | 2000 | 6.80 | 150 |
| #71 | 0.0260 | 154 | 22 | 1000 | -0.016 | 2000 | 7.00 | 150 |
| 0.70mm | 0.0276 | 155 | 21 | 1000 | -0.016 | 2000 | 7.40 | 150 |
| #70 | 0.0280 | 152 | 20 | 1000 | -0.017 | 2000 | 7.60 | 150 |
| #69 | 0.0292 | 156 | 20 | 1000 | -0.017 | 2000 | 7.80 | 150 |
| 0.75mm | 0.0295 | 152 | 19 | 1000 | -0.017 | 2000 | 8.00 | 150 |
| #68 | 0.0310 | 148 | 18 | 1000 | -0.017 | 2000 | 8.20 | 150 |
| 1/32 | 0.0312 | 151 | 18 | 1000 | -0.017 | 2000 | 8.40 | 150 |
| 0.80mm | 0.0315 | 155 | 18 | 1000 | -0.017 | 2000 | 8.60 | 150 |
| #67 | 0.0320 | 158 | 18 | 1000 | -0.017 | 2000 | 8.80 | 150 |
| #66 | 0.0330 | 153 | 17 | 1000 | -0.018 | 2000 | 9.00 | 150 |
| 0.85mm | 0.0335 | 156 | 17 | 1000 | -0.018 | 2000 | 9.20 | 150 |
| #65 | 0.0350 | 154 | 16 | 1000 | -0.018 | 2000 | 9.60 | 150 |
| 0.90mm | 0.0354 | 157 | 16 | 1000 | -0.018 | 2000 | 9.80 | 150 |
| #64 | 0.0360 | 160 | 16 | 1000 | -0.018 | 2000 | 10.00 | 150 |
| #63 | 0.0370 | 153 | 15 | 1000 | -0.019 | 2000 | 10.20 | 150 |
| 0.95mm | 0.0374 | 156 | 15 | 1000 | -0.019 | 2000 | 10.40 | 150 |
| #62 | 0.0380 | 159 | 15 | 1000 | -0.019 | 2000 | 10.60 | 150 |
| #61 | 0.0390 | 162 | 15 | 1000 | -0.019 | 2000 | 10.80 | 150 |
| 1.00mm | 0.0394 | 165 | 15 | 1000 | -0.019 | 2000 | 11.00 | 155 |
| #60 | 0.0400 | 168 | 15 | 1000 | -0.019 | 2000 | 11.20 | 157 |
| #59 | 0.0410 | 171 | 15 | 1000 | -0.020 | 2000 | 11.40 | 161 |
| 1.05mm | 0.0413 | 174 | 15 | 1000 | -0.020 | 2000 | 11.60 | 162 |
| #58 | 0.0420 | 177 | 15 | 1000 | -0.020 | 2000 | 11.80 | 165 |
| #57 | 0.0430 | 180 | 15 | 1000 | -0.020 | 2000 | 12.00 | 169 |
| 1.10mm | 0.0433 | 183 | 15 | 1000 | -0.020 | 2000 | 12.20 | 170 |
| 1.15mm | 0.0453 | 189 | 15 | 1000 | -0.021 | 2000 | 12.60 | 178 |
| #56 | 0.0465 | 192 | 15 | 1000 | -0.021 | 2000 | 12.80 | 183 |
| 3/64 | 0.0469 | 195 | 15 | 1000 | -0.021 | 2000 | 13.00 | 184 |
| 1.20mm | 0.0472 | 198 | 15 | 1000 | -0.021 | 2000 | 13.20 | 185 |
| 1.25mm | 0.0492 | 201 | 15 | 1000 | -0.021 | 2000 | 13.40 | 193 |
| 1.30mm | 0.0512 | 207 | 15 | 1000 | -0.022 | 2000 | 13.80 | 201 |
| #55 | 0.0520 | 210 | 15 | 1000 | -0.022 | 2000 | 14.00 | 204 |
| 1.35mm | 0.0531 | 213 | 15 | 1000 | -0.022 | 2000 | 14.20 | 208 |
| #54 | 0.0550 | 219 | 15 | 1000 | -0.023 | 2000 | 14.60 | 216 |
| 1.40mm | 0.0551 | 222 | 15 | 1000 | -0.023 | 2000 | 14.80 | 216 |
| 1.45mm | 0.0571 | 228 | 15 | 1000 | -0.023 | 2000 | 15.20 | 224 |
| 1.50mm | 0.0591 | 234 | 15 | 1000 | -0.024 | 2000 | 15.60 | 232 |
| #53 | 0.0595 | 237 | 15 | 1000 | -0.024 | 2000 | 15.80 | 234 |
| 1.55mm | 0.0610 | 240 | 15 | 1000 | -0.024 | 2000 | 16.00 | 239 |
| 1/16 | 0.0625 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 245 |
| 1.60mm | 0.0630 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 247 |
| #52 | 0.0635 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 249 |
| 1.65mm | 0.0650 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 255 |
| 1.70mm | 0.0669 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 263 |
| #51 | 0.0670 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 263 |
| 1.75mm | 0.0689 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 270 |
| #50 | 0.0700 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 275 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.80mm | 0.0709 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 278 |
| 1.85mm | 0.0728 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 286 |
| #49 | 0.0730 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 287 |
| 1.90mm | 0.0748 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 294 |
| #48 | 0.0760 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 298 |
| 1.95mm | 0.0768 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 301 |
| 5/64 | 0.0781 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 307 |
| #47 | 0.0785 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 308 |
| 2.00mm | 0.0787 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 309 |
| 2.05mm | 0.0807 | 237 | 15 | 1000 | -0.029 | 2000 | 15.80 | 317 |
| #46 | 0.0810 | 234 | 15 | 1000 | -0.029 | 2000 | 15.60 | 318 |
| #45 | 0.0820 | 231 | 15 | 1000 | -0.029 | 2000 | 15.40 | 322 |
| 2.10mm | 0.0827 | 228 | 15 | 1000 | -0.029 | 2000 | 15.20 | 325 |
| 2.15mm | 0.0846 | 222 | 15 | 1000 | -0.030 | 2000 | 14.80 | 332 |
| #44 | 0.0860 | 216 | 15 | 1000 | -0.030 | 2000 | 14.40 | 338 |
| 2.20mm | 0.0866 | 213 | 15 | 1000 | -0.030 | 2000 | 14.20 | 340 |
| 2.25mm | 0.0886 | 207 | 15 | 1000 | -0.031 | 2000 | 13.80 | 348 |
| #43 | 0.0890 | 204 | 15 | 1000 | -0.031 | 2000 | 13.60 | 349 |
| 2.30mm | 0.0906 | 198 | 15 | 1000 | -0.031 | 2000 | 13.20 | 356 |
| 2.35mm | 0.0925 | 192 | 15 | 1000 | -0.032 | 2000 | 12.80 | 363 |
| #42 | 0.0935 | 189 | 15 | 1000 | -0.032 | 2000 | 12.60 | 367 |
| 3/32 | 0.0938 | 183 | 15 | 1000 | -0.032 | 2000 | 12.20 | 368 |
| 2.40mm | 0.0945 | 180 | 15 | 1000 | -0.032 | 2000 | 12.00 | 371 |
| #41 | 0.0960 | 174 | 15 | 1000 | -0.032 | 2000 | 11.60 | 377 |
| 2.45mm | 0.0965 | 171 | 15 | 1000 | -0.033 | 2000 | 11.40 | 379 |
| #40 | 0.0980 | 165 | 15 | 1000 | -0.033 | 2000 | 11.00 | 385 |
| 2.50mm | 0.0984 | 162 | 15 | 1000 | -0.033 | 2000 | 10.80 | 386 |
| #39 | 0.0995 | 159 | 15 | 1000 | -0.033 | 2000 | 10.60 | 391 |
| 2.55mm | 0.1004 | 156 | 15 | 1000 | -0.033 | 2000 | 10.40 | 394 |
| #38 | 0.1015 | 153 | 15 | 1000 | -0.034 | 2000 | 10.20 | 398 |
| 2.60mm | 0.1024 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 402 |
| #37 | 0.1040 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 408 |
| 2.65mm | 0.1043 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 409 |
| 2.70mm | 0.1063 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 417 |
| #36 | 0.1065 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 418 |
| 2.75mm | 0.1083 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 425 |
| 7/64 | 0.1094 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 429 |
| #35 | 0.1100 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 432 |
| 2.80mm | 0.1102 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 433 |
| #34 | 0.1110 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 436 |
| 2.85mm | 0.1122 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 440 |
| #33 | 0.1130 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 444 |
| 2.90mm | 0.1142 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 448 |
| #32 | 0.1160 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 455 |
| 2.95mm | 0.1161 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 456 |
| 3.00mm | 0.1181 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 464 |
| #31 | 0.1200 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 471 |
| 3.05mm | 0.1201 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 471 |
| 3.10mm | 0.1220 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 479 |
| 3.15mm | 0.1240 | 150 | 15 | 1000 | -0.039 | 2000 | 10.00 | 487 |
| 1/8 | 0.1250 | 150 | 15 | 1000 | -0.039 | 2000 | 10.00 | 491 |
| 3.20mm | 0.1260 | 160 | 16 | 1000 | -0.018 | 1500 | 10.00 | 528 |
| 3.25mm | 0.1280 | 160 | 16 | 1000 | -0.018 | 1500 | 10.00 | 536 |
| #30 | 0.1285 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 538 |
| 3.30mm | 0.1299 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 544 |
| 3.35mm | 0.1319 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 552 |
| 3.40mm | 0.1339 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 561 |
| 3.45mm | 0.1358 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 569 |
| #29 | 0.1360 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 569 |
| 3.50mm | 0.1378 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 577 |
| 3.55mm | 0.1398 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 585 |
| #28 | 0.1405 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 625 |
| 9/64 | 0.1406 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 625 |
| 3.60mm | 0.1417 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 630 |
| 3.65mm | 0.1437 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 639 |
| #27 | 0.1440 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 641 |
| 3.70mm | 0.1457 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 648 |
| #26 | 0.1470 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 654 |
| 3.75mm | 0.1476 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 657 |
| #25 | 0.1495 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 665 |
| 3.80mm | 0.1496 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 665 |
| 3.85mm | 0.1516 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 674 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

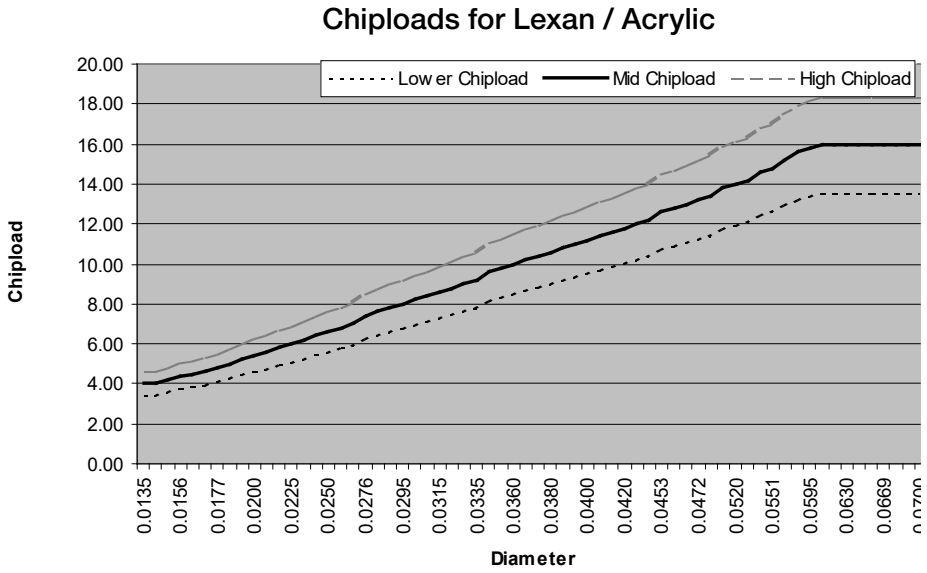
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #24 | 0.1520 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 676 |
| 3.90mm | 0.1535 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 683 |
| #23 | 0.1540 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 685 |
| 3.95 | 0.1555 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 692 |
| 5/32 | 0.1562 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 695 |
| #22 | 0.1570 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 698 |
| 4.00mm | 0.1575 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 701 |
| #21 | 0.1590 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 749 |
| 4.05mm | 0.1594 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 751 |
| #20 | 0.1610 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 758 |
| 4.10mm | 0.1614 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 760 |
| 4.15mm | 0.1634 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 770 |
| 4.20mm | 0.1654 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 779 |
| #19 | 0.1660 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 782 |
| 4.25mm | 0.1673 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 788 |
| 4.30mm | 0.1693 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 797 |
| #18 | 0.1695 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 798 |
| 4.35mm | 0.1713 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 807 |
| 11/64 | 0.1719 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 810 |
| #17 | 0.1730 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 815 |
| 4.40mm | 0.1732 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 816 |
| 4.45mm | 0.1752 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 825 |
| #16 | 0.1770 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 834 |
| 4.50mm | 0.1772 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 835 |
| 4.55mm | 0.1792 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 844 |
| #15 | 0.1800 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 848 |
| 4.60mm | 0.1811 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 853 |
| #14 | 0.1820 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 857 |
| 4.65mm | 0.1831 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 862 |
| #13 | 0.1850 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 871 |
| 4.70mm | 0.1850 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 871 |
| 4.75mm | 0.1870 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 881 |
| 3/16 | 0.1875 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 883 |
| 4.80mm | 0.1890 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 940 |
| #12 | 0.1890 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 940 |
| 4.85mm | 0.1909 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 949 |
| #11 | 0.1910 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 950 |
| 4.90mm | 0.1929 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 959 |
| #10 | 0.1935 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 962 |
| 4.95mm | 0.1949 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 969 |
| #9 | 0.1960 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 974 |
| 5.00mm | 0.1968 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 978 |
| 5.05mm | 0.1988 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 988 |
| #8 | 0.1990 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 989 |
| 5.10mm | 0.2008 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 998 |
| #7 | 0.2010 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 999 |
| 5.15mm | 0.2028 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 1008 |
| 13/64 | 0.2031 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 1010 |
| #6 | 0.2040 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1014 |
| 5.20mm | 0.2047 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1018 |
| #5 | 0.2055 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1022 |
| 5.25mm | 0.2067 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1028 |
| 5.30mm | 0.2087 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1038 |
| #4 | 0.2090 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1039 |
| 5.35mm | 0.2106 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1047 |
| 5.40mm | 0.2126 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1057 |
| #3 | 0.2130 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1059 |
| 5.45mm | 0.2146 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1067 |
| 5.50mm | 0.2165 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1076 |
| 5.55mm | 0.2185 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1086 |
| 7/32 | 0.2188 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1088 |
| 5.60mm | 0.2205 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1096 |
| #2 | 0.2210 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1099 |
| 5.65mm | 0.2224 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1106 |
| 5.70mm | 0.2244 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1116 |
| 5.75mm | 0.2264 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1126 |
| #1 | 0.2280 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1134 |
| 5.80mm | 0.2283 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1135 |
| 5.85mm | 0.2302 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1144 |
| 5.90mm | 0.2323 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1155 |
| A | 0.2340 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1163 |
| 5.95mm | 0.2343 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1165 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 15/64 | 0.2344 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1165 |
| 6.00mm | 0.2362 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1174 |
| B | 0.2380 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1246 |
| 6.05mm | 0.2382 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1247 |
| 6.10mm | 0.2402 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1257 |
| C | 0.2420 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1266 |
| 6.15mm | 0.2421 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1267 |
| 6.20mm | 0.2441 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1277 |
| D | 0.2460 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1287 |
| 6.25mm | 0.2461 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1288 |
| 6.30mm | 0.2480 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1298 |
| 6.35mm | 0.2500 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1308 |
| 6.40mm | 0.2520 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1319 |
| 6.50mm | 0.2559 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1339 |
| F | 0.2570 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1345 |
| 6.60mm | 0.2598 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Polyimide** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 19 | 110 | 200 | -0.011 | 200 | 0.17 | 115 |
| 0.13mm | 0.0050 | 22 | 110 | 300 | -0.011 | 250 | 0.20 | 144 |
| 0.15mm | 0.0059 | 23 | 110 | 300 | -0.011 | 250 | 0.21 | 170 |
| #96 | 0.0063 | 24 | 110 | 400 | -0.011 | 300 | 0.22 | 181 |
| #95 | 0.0067 | 25 | 110 | 400 | -0.012 | 300 | 0.23 | 193 |
| #94 | 0.0071 | 28 | 110 | 500 | -0.012 | 300 | 0.25 | 204 |
| #93 | 0.0075 | 30 | 110 | 500 | -0.012 | 300 | 0.27 | 216 |
| #92 | 0.0079 | 33 | 110 | 500 | -0.012 | 400 | 0.30 | 227 |
| #91 | 0.0083 | 35 | 110 | 600 | -0.012 | 400 | 0.32 | 239 |
| #90 | 0.0087 | 39 | 110 | 600 | -0.012 | 400 | 0.35 | 250 |
| #89 | 0.0091 | 41 | 110 | 700 | -0.012 | 400 | 0.37 | 262 |
| #88 | 0.0095 | 44 | 110 | 700 | -0.012 | 500 | 0.40 | 273 |
| 0.25mm | 0.0098 | 45 | 110 | 800 | -0.012 | 500 | 0.41 | 282 |
| #87 | 0.0100 | 46 | 110 | 800 | -0.012 | 500 | 0.42 | 288 |
| #86 | 0.0105 | 50 | 110 | 800 | -0.012 | 500 | 0.45 | 302 |
| #85 | 0.0110 | 53 | 110 | 900 | -0.013 | 500 | 0.48 | 317 |
| #84 | 0.0115 | 55 | 110 | 900 | -0.013 | 500 | 0.50 | 331 |
| 0.30mm | 0.0118 | 59 | 110 | 1000 | -0.013 | 750 | 0.54 | 340 |
| #83 | 0.0120 | 63 | 110 | 1000 | -0.013 | 750 | 0.57 | 345 |
| #82 | 0.0125 | 65 | 107 | 1000 | -0.013 | 750 | 0.61 | 350 |
| #81 | 0.0130 | 70 | 103 | 1000 | -0.013 | 750 | 0.68 | 350 |
| #80 | 0.0135 | 71 | 99 | 1000 | -0.013 | 750 | 0.72 | 350 |
| 0.35mm | 0.0138 | 72 | 97 | 1000 | -0.013 | 750 | 0.74 | 350 |
| #79 | 0.0145 | 72 | 92 | 1000 | -0.013 | 750 | 0.78 | 350 |
| 1/64 | 0.0156 | 73 | 86 | 1000 | -0.014 | 750 | 0.85 | 350 |
| 0.40mm | 0.0158 | 74 | 85 | 1000 | -0.014 | 750 | 0.87 | 350 |
| #78 | 0.0160 | 76 | 84 | 1000 | -0.014 | 750 | 0.90 | 350 |
| 0.45mm | 0.0177 | 74 | 76 | 1000 | -0.014 | 750 | 0.97 | 350 |
| #77 | 0.0180 | 76 | 74 | 1000 | -0.014 | 750 | 1.03 | 350 |
| 0.50mm | 0.0197 | 80 | 68 | 1000 | -0.015 | 750 | 1.18 | 350 |
| #76 | 0.0200 | 82 | 67 | 1000 | -0.015 | 750 | 1.22 | 350 |
| #75 | 0.0210 | 84 | 64 | 1000 | -0.015 | 750 | 1.31 | 350 |
| 0.55mm | 0.0217 | 86 | 62 | 1000 | -0.015 | 750 | 1.39 | 350 |
| #74 | 0.0225 | 88 | 59 | 1000 | -0.015 | 750 | 1.49 | 350 |
| 0.60mm | 0.0236 | 90 | 57 | 1000 | -0.016 | 750 | 1.58 | 350 |
| #73 | 0.0240 | 92 | 56 | 1000 | -0.016 | 750 | 1.64 | 350 |
| #72 | 0.0250 | 95 | 54 | 1000 | -0.016 | 750 | 1.76 | 350 |
| 0.65mm | 0.0256 | 96 | 52 | 1000 | -0.016 | 750 | 1.85 | 350 |
| #71 | 0.0260 | 98 | 51 | 1000 | -0.016 | 750 | 1.92 | 350 |
| 0.70mm | 0.0276 | 102 | 48 | 1000 | -0.016 | 750 | 2.13 | 350 |
| #70 | 0.0280 | 103 | 48 | 1000 | -0.017 | 750 | 2.15 | 350 |
| #69 | 0.0292 | 104 | 46 | 1000 | -0.017 | 750 | 2.26 | 350 |
| 0.75mm | 0.0295 | 105 | 45 | 1000 | -0.017 | 750 | 2.33 | 350 |
| #68 | 0.0310 | 108 | 43 | 1000 | -0.017 | 750 | 2.50 | 350 |
| 1/32 | 0.0312 | 108 | 43 | 1000 | -0.017 | 750 | 2.50 | 350 |
| 0.80mm | 0.0315 | 105 | 42 | 1000 | -0.017 | 750 | 2.50 | 350 |
| #67 | 0.0320 | 105 | 42 | 1000 | -0.017 | 750 | 2.50 | 350 |
| #66 | 0.0330 | 103 | 41 | 1000 | -0.018 | 750 | 2.50 | 350 |
| 0.85mm | 0.0335 | 100 | 40 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #65 | 0.0350 | 95 | 38 | 1000 | -0.018 | 750 | 2.50 | 350 |
| 0.90mm | 0.0354 | 95 | 38 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #64 | 0.0360 | 93 | 37 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #63 | 0.0370 | 90 | 36 | 1000 | -0.019 | 750 | 2.50 | 350 |
| 0.95mm | 0.0374 | 90 | 36 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #62 | 0.0380 | 88 | 35 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #61 | 0.0390 | 85 | 34 | 1000 | -0.019 | 750 | 2.50 | 350 |
| 1.00mm | 0.0394 | 85 | 34 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #60 | 0.0400 | 83 | 33 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #59 | 0.0410 | 83 | 33 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.05mm | 0.0413 | 80 | 32 | 1000 | -0.020 | 750 | 2.50 | 350 |
| #58 | 0.0420 | 80 | 32 | 1000 | -0.020 | 750 | 2.50 | 350 |
| #57 | 0.0430 | 78 | 31 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.10mm | 0.0433 | 78 | 31 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.15mm | 0.0453 | 75 | 30 | 1000 | -0.021 | 750 | 2.50 | 350 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 73 | 29 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 3/64 | 0.0469 | 70 | 28 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.20mm | 0.0472 | 70 | 28 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.25mm | 0.0492 | 68 | 27 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.30mm | 0.0512 | 65 | 26 | 1000 | -0.022 | 750 | 2.50 | 350 |
| #55 | 0.0520 | 65 | 26 | 1000 | -0.022 | 750 | 2.50 | 350 |
| 1.35mm | 0.0531 | 63 | 25 | 1000 | -0.022 | 750 | 2.50 | 350 |
| #54 | 0.0550 | 60 | 24 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.40mm | 0.0551 | 60 | 24 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.45mm | 0.0571 | 58 | 23 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.50mm | 0.0591 | 58 | 23 | 1000 | -0.024 | 750 | 2.50 | 350 |
| #53 | 0.0595 | 55 | 22 | 1000 | -0.024 | 750 | 2.50 | 350 |
| 1.55mm | 0.0610 | 55 | 22 | 1000 | -0.024 | 750 | 2.50 | 350 |
| 1/16 | 0.0625 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.60mm | 0.0630 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| #52 | 0.0635 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.65mm | 0.0650 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.70mm | 0.0669 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 350 |
| #51 | 0.0670 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 350 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 500 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 500 | 2.50 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 400 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 400 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 712 |
| 3.50mm | 0.1378 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 721 |
| 3.55mm | 0.1398 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 732 |
| #28 | 0.1405 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 735 |
| 9/64 | 0.1406 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 736 |
| 3.60mm | 0.1417 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 742 |
| 3.65mm | 0.1437 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 752 |
| #27 | 0.1440 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 754 |
| 3.70mm | 0.1457 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 300 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1052 |
| 5.15mm | 0.2028 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1061 |
| 13/64 | 0.2031 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1063 |
| #6 | 0.2040 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1068 |
| 5.20mm | 0.2047 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1071 |
| #5 | 0.2055 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1075 |

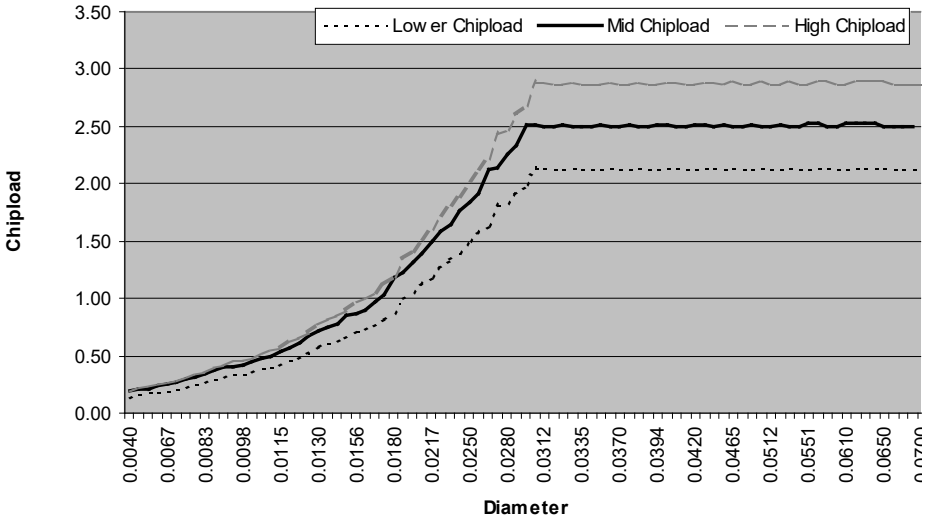
Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1082 |
| 5.30mm | 0.2087 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1092 |
| #4 | 0.2090 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1094 |
| 5.35mm | 0.2106 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1102 |
| 5.40mm | 0.2126 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1113 |
| #3 | 0.2130 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1115 |
| 5.45mm | 0.2146 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1123 |
| 5.50mm | 0.2165 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1133 |
| 5.55mm | 0.2185 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1143 |
| 7/32 | 0.2188 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1145 |
| 5.60mm | 0.2205 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1154 |
| #2 | 0.2210 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1157 |
| 5.65mm | 0.2224 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1164 |
| 5.70mm | 0.2244 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1174 |
| 5.75mm | 0.2264 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1185 |
| #1 | 0.2280 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1193 |
| 5.80mm | 0.2283 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1195 |
| 5.85mm | 0.2302 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1205 |
| 5.90mm | 0.2323 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1216 |
| A | 0.2340 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1225 |
| 5.95mm | 0.2343 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1226 |
| 15/64 | 0.2344 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1227 |
| 6.00mm | 0.2362 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1236 |
| B | 0.2380 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1246 |
| 6.05mm | 0.2382 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1247 |
| 6.10mm | 0.2402 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1257 |
| C | 0.2420 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1266 |
| 6.15mm | 0.2421 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1267 |
| 6.20mm | 0.2441 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1277 |
| D | 0.2460 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1287 |
| 6.25mm | 0.2461 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1288 |
| 6.30mm | 0.2480 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1298 |
| 6.35mm | 0.2500 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1308 |
| 6.40mm | 0.2520 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1319 |
| 6.50mm | 0.2559 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1339 |
| F | 0.2570 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1345 |
| 6.60mm | 0.2598 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Polyimide




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Polyimide Thick Panel** PCB Material

(Panel Thickness > 0.150")

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 36 | 110 | 800 | -0.012 | 350 | 0.33 | 282 |
| #87 | 0.0100 | 40 | 110 | 800 | -0.012 | 350 | 0.36 | 288 |
| #86 | 0.0105 | 42 | 110 | 800 | -0.012 | 350 | 0.38 | 302 |
| #85 | 0.0110 | 45 | 110 | 900 | -0.013 | 350 | 0.41 | 317 |
| #84 | 0.0115 | 46 | 110 | 900 | -0.013 | 350 | 0.42 | 331 |
| 0.30mm | 0.0118 | 51 | 110 | 1000 | -0.013 | 500 | 0.46 | 340 |
| #83 | 0.0120 | 54 | 110 | 1000 | -0.013 | 500 | 0.49 | 345 |
| #82 | 0.0125 | 55 | 107 | 1000 | -0.013 | 500 | 0.51 | 350 |
| #81 | 0.0130 | 60 | 103 | 1000 | -0.013 | 500 | 0.58 | 350 |
| #80 | 0.0135 | 60 | 99 | 1000 | -0.013 | 500 | 0.61 | 350 |
| 0.35mm | 0.0138 | 61 | 97 | 1000 | -0.013 | 500 | 0.63 | 350 |
| #79 | 0.0145 | 61 | 92 | 1000 | -0.013 | 500 | 0.66 | 350 |
| 1/64 | 0.0156 | 62 | 86 | 1000 | -0.014 | 500 | 0.72 | 350 |
| 0.40mm | 0.0158 | 63 | 85 | 1000 | -0.014 | 500 | 0.74 | 350 |
| #78 | 0.0160 | 65 | 84 | 1000 | -0.014 | 500 | 0.77 | 350 |
| 0.45mm | 0.0177 | 63 | 76 | 1000 | -0.014 | 500 | 0.83 | 350 |
| #77 | 0.0180 | 65 | 74 | 1000 | -0.014 | 500 | 0.88 | 350 |
| 0.50mm | 0.0197 | 68 | 68 | 1000 | -0.015 | 500 | 1.00 | 350 |
| #76 | 0.0200 | 70 | 67 | 1000 | -0.015 | 500 | 1.04 | 350 |
| #75 | 0.0210 | 71 | 64 | 1000 | -0.015 | 500 | 1.11 | 350 |
| 0.55mm | 0.0217 | 73 | 62 | 1000 | -0.015 | 500 | 1.18 | 350 |
| #74 | 0.0225 | 75 | 59 | 1000 | -0.015 | 500 | 1.27 | 350 |
| 0.60mm | 0.0236 | 77 | 57 | 1000 | -0.016 | 500 | 1.35 | 350 |
| #73 | 0.0240 | 78 | 56 | 1000 | -0.016 | 500 | 1.39 | 350 |
| #72 | 0.0250 | 81 | 54 | 1000 | -0.016 | 500 | 1.50 | 350 |
| 0.65mm | 0.0256 | 82 | 52 | 1000 | -0.016 | 500 | 1.58 | 350 |
| #71 | 0.0260 | 83 | 51 | 1000 | -0.016 | 500 | 1.63 | 350 |
| 0.70mm | 0.0276 | 87 | 48 | 1000 | -0.016 | 500 | 1.81 | 350 |
| #70 | 0.0280 | 88 | 48 | 1000 | -0.017 | 500 | 1.83 | 350 |
| #69 | 0.0292 | 90 | 46 | 1000 | -0.017 | 500 | 1.96 | 350 |
| 0.75mm | 0.0295 | 91 | 45 | 1000 | -0.017 | 500 | 2.02 | 350 |
| #68 | 0.0310 | 92 | 43 | 1000 | -0.017 | 500 | 2.14 | 350 |
| 1/32 | 0.0312 | 93 | 43 | 1000 | -0.017 | 500 | 2.16 | 350 |
| 0.80mm | 0.0315 | 94 | 42 | 1000 | -0.017 | 500 | 2.24 | 350 |
| #67 | 0.0320 | 95 | 42 | 1000 | -0.017 | 500 | 2.26 | 350 |
| #66 | 0.0330 | 97 | 41 | 1000 | -0.018 | 500 | 2.37 | 350 |
| 0.85mm | 0.0335 | 98 | 40 | 1000 | -0.018 | 500 | 2.45 | 350 |
| #65 | 0.0350 | 95 | 38 | 1000 | -0.018 | 500 | 2.50 | 350 |
| 0.90mm | 0.0354 | 95 | 38 | 1000 | -0.018 | 500 | 2.50 | 350 |
| #64 | 0.0360 | 93 | 37 | 1000 | -0.018 | 500 | 2.51 | 350 |
| #63 | 0.0370 | 90 | 36 | 1000 | -0.019 | 500 | 2.50 | 350 |
| 0.95mm | 0.0374 | 90 | 36 | 1000 | -0.019 | 500 | 2.50 | 350 |
| #62 | 0.0380 | 88 | 35 | 1000 | -0.019 | 500 | 2.51 | 350 |
| #61 | 0.0390 | 85 | 34 | 1000 | -0.019 | 500 | 2.50 | 350 |
| 1.00mm | 0.0394 | 85 | 34 | 1000 | -0.019 | 500 | 2.50 | 350 |
| #60 | 0.0400 | 83 | 33 | 1000 | -0.019 | 500 | 2.52 | 350 |
| #59 | 0.0410 | 83 | 33 | 1000 | -0.020 | 500 | 2.52 | 350 |
| 1.05mm | 0.0413 | 80 | 32 | 1000 | -0.020 | 500 | 2.50 | 350 |
| #58 | 0.0420 | 80 | 32 | 1000 | -0.020 | 500 | 2.50 | 350 |
| #57 | 0.0430 | 78 | 31 | 1000 | -0.020 | 500 | 2.52 | 350 |
| 1.10mm | 0.0433 | 78 | 31 | 1000 | -0.020 | 500 | 2.52 | 350 |
| 1.15mm | 0.0453 | 75 | 30 | 1000 | -0.021 | 500 | 2.50 | 350 |
| #56 | 0.0465 | 73 | 29 | 1000 | -0.021 | 500 | 2.52 | 350 |
| 3/64 | 0.0469 | 70 | 28 | 1000 | -0.021 | 500 | 2.50 | 350 |
| 1.20mm | 0.0472 | 70 | 28 | 1000 | -0.021 | 500 | 2.50 | 350 |
| 1.25mm | 0.0492 | 68 | 27 | 1000 | -0.021 | 500 | 2.52 | 350 |
| 1.30mm | 0.0512 | 65 | 26 | 1000 | -0.022 | 500 | 2.50 | 350 |
| #55 | 0.0520 | 65 | 26 | 1000 | -0.022 | 500 | 2.50 | 350 |
| 1.35mm | 0.0531 | 63 | 25 | 1000 | -0.022 | 500 | 2.52 | 350 |
| #54 | 0.0550 | 60 | 24 | 1000 | -0.023 | 500 | 2.50 | 350 |
| 1.40mm | 0.0551 | 60 | 24 | 1000 | -0.023 | 500 | 2.50 | 350 |
| 1.45mm | 0.0571 | 58 | 23 | 1000 | -0.023 | 500 | 2.52 | 350 |
| 1.50mm | 0.0591 | 58 | 23 | 1000 | -0.024 | 500 | 2.52 | 350 |
| #53 | 0.0595 | 55 | 22 | 1000 | -0.024 | 500 | 2.50 | 350 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 55 | 22 | 1000 | -0.024 | 500 | 2.50 | 350 |
| 1/16 | 0.0625 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| 1.60mm | 0.0630 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| #52 | 0.0635 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| 1.65mm | 0.0650 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| 1.70mm | 0.0669 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 350 |
| #51 | 0.0670 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 350 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 350 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 350 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 350 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 350 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 350 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 350 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 350 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 350 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 350 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 350 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 350 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 350 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 350 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 350 | 2.50 | 654 |
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 250 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 250 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 712 |
| 3.50mm | 0.1378 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 721 |
| 3.55mm | 0.1398 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 732 |
| #28 | 0.1405 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 735 |
| 9/64 | 0.1406 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 736 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

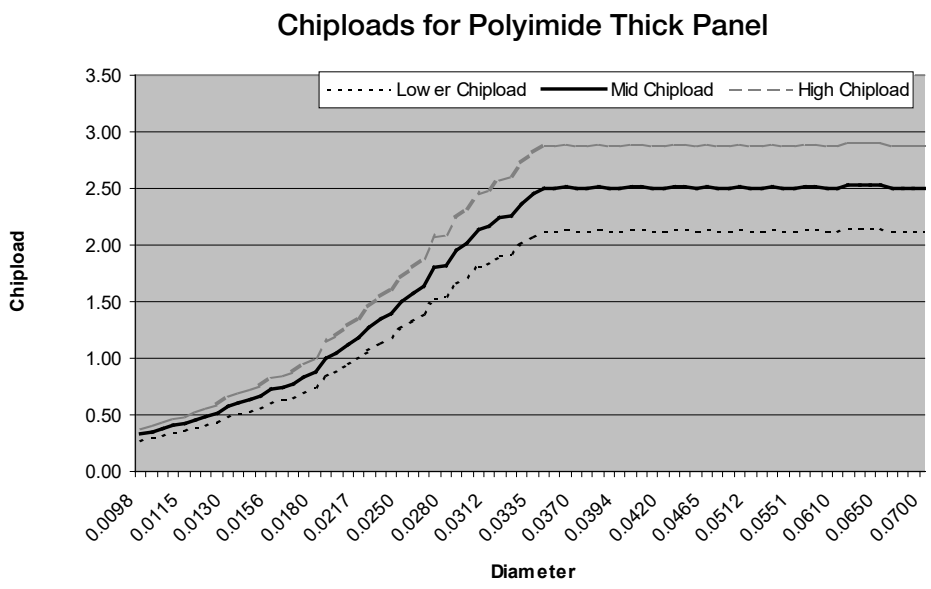
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 742 |
| 3.65mm | 0.1437 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 752 |
| #27 | 0.1440 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 754 |
| 3.70mm | 0.1457 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 200 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1051 |
| #7 | 0.2010 | 23 | 20 | 1000 | -0.023 | 150 | 1.15 | 1052 |
| 5.15mm | 0.2028 | 23 | 20 | 1000 | -0.023 | 150 | 1.15 | 1061 |
| 13/64 | 0.2031 | 23 | 20 | 1000 | -0.023 | 150 | 1.15 | 1063 |
| #6 | 0.2040 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1068 |
| 5.20mm | 0.2047 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1071 |
| #5 | 0.2055 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1075 |
| 5.25mm | 0.2067 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1082 |
| 5.30mm | 0.2087 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1092 |
| #4 | 0.2090 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1094 |
| 5.35mm | 0.2106 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1102 |
| 5.40mm | 0.2126 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1113 |
| #3 | 0.2130 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1115 |
| 5.45mm | 0.2146 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1123 |
| 5.50mm | 0.2165 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1133 |
| 5.55mm | 0.2185 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1143 |
| 7/32 | 0.2188 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1145 |
| 5.60mm | 0.2205 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1154 |
| #2 | 0.2210 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1157 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1164 |
| 5.70mm | 0.2244 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1174 |
| 5.75mm | 0.2264 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1185 |
| #1 | 0.2280 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1193 |
| 5.80mm | 0.2283 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1195 |
| 5.85mm | 0.2302 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1205 |
| 5.90mm | 0.2323 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1216 |
| A | 0.2340 | 23 | 20 | 1000 | -0.025 | 100 | 1.15 | 1225 |
| 5.95mm | 0.2343 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1226 |
| 15/64 | 0.2344 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1227 |
| 6.00mm | 0.2362 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1236 |
| B | 0.2380 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1246 |
| 6.05mm | 0.2382 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1247 |
| 6.10mm | 0.2402 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1257 |
| C | 0.2420 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1266 |
| 6.15mm | 0.2421 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1267 |
| 6.20mm | 0.2441 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1277 |
| D | 0.2460 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1287 |
| 6.25mm | 0.2461 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1288 |
| 6.30mm | 0.2480 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1298 |
| 6.35mm | 0.2500 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1308 |
| 6.40mm | 0.2520 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1319 |
| 6.50mm | 0.2559 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1339 |
| F | 0.2570 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1345 |
| 6.60mm | 0.2598 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Slot Drilling FR-4 PCB Material

## Recommended Drill Series: 100, 150, 700, 750

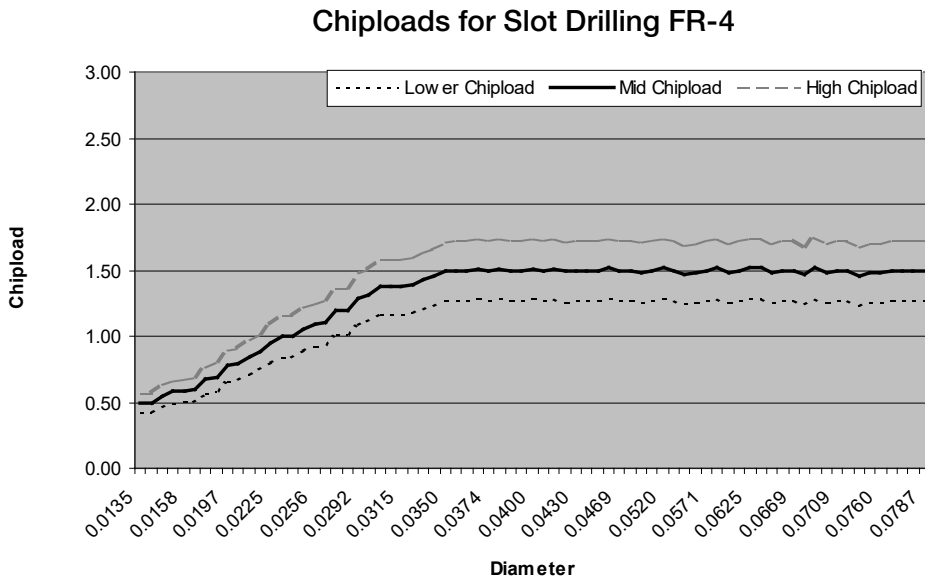
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #80 | 0.0135 | 50 | 100 | 1000 | -0.013 | 3000 | 0.50 | 389 |
| 0.35mm | 0.0138 | 50 | 100 | 1000 | -0.013 | 3000 | 0.50 | 397 |
| #79 | 0.0145 | 55 | 100 | 1000 | -0.013 | 3000 | 0.55 | 417 |
| 1/64 | 0.0156 | 58 | 100 | 1000 | -0.014 | 3000 | 0.58 | 450 |
| 0.40mm | 0.0158 | 59 | 100 | 1000 | -0.014 | 3000 | 0.59 | 450 |
| #78 | 0.0160 | 60 | 100 | 1000 | -0.014 | 3000 | 0.60 | 450 |
| 0.45mm | 0.0177 | 65 | 97 | 1000 | -0.014 | 3000 | 0.67 | 450 |
| #77 | 0.0180 | 66 | 95 | 1000 | -0.014 | 3000 | 0.69 | 450 |
| 0.50mm | 0.0197 | 68 | 87 | 1000 | -0.015 | 3000 | 0.78 | 450 |
| #76 | 0.0200 | 68 | 86 | 1000 | -0.015 | 3000 | 0.79 | 450 |
| #75 | 0.0210 | 69 | 82 | 1000 | -0.015 | 3000 | 0.84 | 450 |
| 0.55mm | 0.0217 | 70 | 79 | 1000 | -0.015 | 3000 | 0.89 | 450 |
| #74 | 0.0225 | 72 | 76 | 1000 | -0.015 | 3000 | 0.95 | 450 |
| 0.60mm | 0.0236 | 73 | 73 | 1000 | -0.016 | 3000 | 1.00 | 450 |
| #73 | 0.0240 | 72 | 72 | 1000 | -0.016 | 3000 | 1.00 | 450 |
| #72 | 0.0250 | 73 | 69 | 1000 | -0.016 | 3000 | 1.06 | 450 |
| 0.65mm | 0.0256 | 74 | 68 | 1000 | -0.016 | 3000 | 1.09 | 450 |
| #71 | 0.0260 | 74 | 67 | 1000 | -0.016 | 3000 | 1.10 | 450 |
| 0.70mm | 0.0276 | 75 | 63 | 1000 | -0.016 | 3000 | 1.19 | 450 |
| #70 | 0.0280 | 75 | 63 | 1000 | -0.017 | 3000 | 1.19 | 450 |
| #69 | 0.0292 | 76 | 59 | 1000 | -0.017 | 3000 | 1.29 | 450 |
| 0.75mm | 0.0295 | 76 | 58 | 1000 | -0.017 | 3000 | 1.31 | 450 |
| #68 | 0.0310 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| 1/32 | 0.0312 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| 0.80mm | 0.0315 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| #67 | 0.0320 | 75 | 54 | 1000 | -0.017 | 3000 | 1.39 | 450 |
| #66 | 0.0330 | 74 | 52 | 1000 | -0.018 | 3000 | 1.42 | 450 |
| 0.85mm | 0.0335 | 74 | 51 | 1000 | -0.018 | 3000 | 1.45 | 450 |
| #65 | 0.0350 | 73 | 49 | 1000 | -0.018 | 3000 | 1.49 | 450 |
| 0.90mm | 0.0354 | 72 | 48 | 1000 | -0.018 | 3000 | 1.50 | 450 |
| #64 | 0.0360 | 72 | 48 | 1000 | -0.018 | 3000 | 1.50 | 450 |
| #63 | 0.0370 | 71 | 47 | 1000 | -0.019 | 3000 | 1.51 | 450 |
| 0.95mm | 0.0374 | 69 | 46 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #62 | 0.0380 | 68 | 45 | 1000 | -0.019 | 3000 | 1.51 | 450 |
| #61 | 0.0390 | 66 | 44 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| 1.00mm | 0.0394 | 66 | 44 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #60 | 0.0400 | 65 | 43 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #59 | 0.0410 | 63 | 42 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.05mm | 0.0413 | 62 | 41 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| #58 | 0.0420 | 61 | 41 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| #57 | 0.0430 | 60 | 40 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.10mm | 0.0433 | 60 | 40 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.15mm | 0.0453 | 57 | 38 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| #56 | 0.0465 | 56 | 37 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 3/64 | 0.0469 | 54 | 36 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.20mm | 0.0472 | 54 | 36 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.25mm | 0.0492 | 52 | 35 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.30mm | 0.0512 | 51 | 34 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| #55 | 0.0520 | 50 | 33 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| 1.35mm | 0.0531 | 48 | 32 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| #54 | 0.0550 | 47 | 32 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.40mm | 0.0551 | 46 | 31 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.45mm | 0.0571 | 45 | 30 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.50mm | 0.0591 | 44 | 29 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| #53 | 0.0595 | 43 | 29 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| 1.55mm | 0.0610 | 42 | 28 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| 1/16 | 0.0625 | 41 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.60mm | 0.0630 | 41 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| #52 | 0.0635 | 40 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.65mm | 0.0650 | 39 | 26 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.70mm | 0.0669 | 39 | 26 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| #51 | 0.0670 | 38 | 26 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| 1.75mm | 0.0689 | 38 | 25 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| #50 | 0.0700 | 37 | 25 | 1000 | -0.026 | 3000 | 1.50 | 450 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.80mm | 0.0709 | 36 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| 1.85mm | 0.0728 | 36 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| #49 | 0.0730 | 35 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| 1.90mm | 0.0748 | 34 | 23 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| #48 | 0.0760 | 34 | 23 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 1.95mm | 0.0768 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 5/64 | 0.0781 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| #47 | 0.0785 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 2.00mm | 0.0787 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Aramid** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 36 | 110 | 200 | -0.011 | 1000 | 0.33 | 115 |
| 0.13mm | 0.0050 | 39 | 110 | 300 | -0.011 | 1000 | 0.35 | 144 |
| 0.15mm | 0.0059 | 41 | 110 | 300 | -0.011 | 1000 | 0.37 | 170 |
| #96 | 0.0063 | 42 | 110 | 400 | -0.011 | 1000 | 0.38 | 181 |
| #95 | 0.0067 | 44 | 110 | 400 | -0.012 | 1000 | 0.40 | 193 |
| #94 | 0.0071 | 46 | 110 | 500 | -0.012 | 1000 | 0.42 | 204 |
| #93 | 0.0075 | 51 | 110 | 500 | -0.012 | 1000 | 0.46 | 216 |
| #92 | 0.0079 | 55 | 110 | 500 | -0.012 | 1000 | 0.50 | 227 |
| #91 | 0.0083 | 59 | 110 | 600 | -0.012 | 1200 | 0.54 | 239 |
| #90 | 0.0087 | 63 | 110 | 600 | -0.012 | 1200 | 0.57 | 250 |
| #89 | 0.0091 | 64 | 110 | 700 | -0.012 | 1200 | 0.58 | 262 |
| #88 | 0.0095 | 69 | 110 | 700 | -0.012 | 1200 | 0.63 | 273 |
| 0.25mm | 0.0098 | 72 | 110 | 800 | -0.012 | 1200 | 0.65 | 282 |
| #87 | 0.0100 | 74 | 110 | 800 | -0.012 | 1200 | 0.67 | 288 |
| #86 | 0.0105 | 78 | 110 | 800 | -0.012 | 1500 | 0.71 | 302 |
| #85 | 0.0110 | 84 | 110 | 900 | -0.013 | 1500 | 0.76 | 317 |
| #84 | 0.0115 | 92 | 110 | 900 | -0.013 | 1500 | 0.84 | 331 |
| 0.30mm | 0.0118 | 98 | 110 | 1000 | -0.013 | 1500 | 0.89 | 340 |
| #83 | 0.0120 | 100 | 108 | 1000 | -0.013 | 1500 | 0.93 | 340 |
| #82 | 0.0125 | 102 | 104 | 1000 | -0.013 | 1500 | 0.98 | 340 |
| #81 | 0.0130 | 104 | 100 | 1000 | -0.013 | 1500 | 1.04 | 340 |
| #80 | 0.0135 | 106 | 96 | 1000 | -0.013 | 1500 | 1.10 | 340 |
| 0.35mm | 0.0138 | 108 | 94 | 1000 | -0.013 | 1500 | 1.15 | 340 |
| #79 | 0.0145 | 109 | 90 | 1000 | -0.013 | 1500 | 1.21 | 340 |
| 1/64 | 0.0156 | 107 | 83 | 1000 | -0.014 | 1500 | 1.29 | 340 |
| 0.40mm | 0.0158 | 107 | 82 | 1000 | -0.014 | 1500 | 1.30 | 340 |
| #78 | 0.0160 | 107 | 81 | 1000 | -0.014 | 1500 | 1.32 | 340 |
| 0.45mm | 0.0177 | 105 | 73 | 1000 | -0.014 | 1500 | 1.44 | 340 |
| #77 | 0.0180 | 105 | 72 | 1000 | -0.014 | 1500 | 1.46 | 340 |
| 0.50mm | 0.0197 | 98 | 66 | 1000 | -0.015 | 1500 | 1.48 | 340 |
| #76 | 0.0200 | 96 | 65 | 1000 | -0.015 | 1500 | 1.48 | 340 |
| #75 | 0.0210 | 93 | 62 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| 0.55mm | 0.0217 | 90 | 60 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| #74 | 0.0225 | 87 | 58 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| 0.60mm | 0.0236 | 82 | 55 | 1000 | -0.016 | 1500 | 1.49 | 340 |
| #73 | 0.0240 | 81 | 54 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #72 | 0.0250 | 78 | 52 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| 0.65mm | 0.0256 | 76 | 51 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #71 | 0.0260 | 75 | 50 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| 0.70mm | 0.0276 | 71 | 47 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #70 | 0.0280 | 69 | 46 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #69 | 0.0292 | 66 | 44 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 0.75mm | 0.0295 | 66 | 44 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #68 | 0.0310 | 63 | 42 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 1/32 | 0.0312 | 63 | 42 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 0.80mm | 0.0315 | 61 | 41 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #67 | 0.0320 | 61 | 41 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #66 | 0.0330 | 59 | 39 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| 0.85mm | 0.0335 | 59 | 39 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #65 | 0.0350 | 56 | 37 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| 0.90mm | 0.0354 | 56 | 37 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #64 | 0.0360 | 54 | 36 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #63 | 0.0370 | 53 | 35 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| 0.95mm | 0.0374 | 51 | 34 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #62 | 0.0380 | 51 | 34 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #61 | 0.0390 | 49 | 33 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| 1.00mm | 0.0394 | 49 | 33 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #60 | 0.0400 | 48 | 32 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #59 | 0.0410 | 48 | 32 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.05mm | 0.0413 | 46 | 31 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| #58 | 0.0420 | 46 | 31 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| #57 | 0.0430 | 45 | 30 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.10mm | 0.0433 | 45 | 30 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.15mm | 0.0453 | 43 | 29 | 1000 | -0.021 | 1500 | 1.50 | 340 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 3/64 | 0.0469 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.20mm | 0.0472 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.25mm | 0.0492 | 39 | 26 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.30mm | 0.0512 | 38 | 25 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| #55 | 0.0520 | 38 | 25 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| 1.35mm | 0.0531 | 36 | 24 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| #54 | 0.0550 | 36 | 24 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.40mm | 0.0551 | 36 | 24 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.45mm | 0.0571 | 35 | 23 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.50mm | 0.0591 | 33 | 22 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| #53 | 0.0595 | 33 | 22 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| 1.55mm | 0.0610 | 32 | 21 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| 1/16 | 0.0625 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.60mm | 0.0630 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| #52 | 0.0635 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.65mm | 0.0650 | 30 | 20 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.70mm | 0.0669 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 350 |
| #51 | 0.0670 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 351 |
| 1.75mm | 0.0689 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 361 |
| #50 | 0.0700 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 366 |
| 1.80mm | 0.0709 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 371 |
| 1.85mm | 0.0728 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 381 |
| #49 | 0.0730 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 382 |
| 1.90mm | 0.0748 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 391 |
| #48 | 0.0760 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 398 |
| 1.95mm | 0.0768 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 402 |
| 5/64 | 0.0781 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 409 |
| #47 | 0.0785 | 30 | 20 | 1000 | -0.028 | 1200 | 1.50 | 411 |
| 2.00mm | 0.0787 | 30 | 20 | 1000 | -0.028 | 1200 | 1.50 | 412 |
| 2.05mm | 0.0807 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 422 |
| #46 | 0.0810 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 424 |
| #45 | 0.0820 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 429 |
| 2.10mm | 0.0827 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 433 |
| 2.15mm | 0.0846 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 443 |
| #44 | 0.0860 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 450 |
| 2.20mm | 0.0866 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 453 |
| 2.25mm | 0.0886 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 464 |
| #43 | 0.0890 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 466 |
| 2.30mm | 0.0906 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 474 |
| 2.35mm | 0.0925 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 484 |
| #42 | 0.0935 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 489 |
| 3/32 | 0.0938 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 491 |
| 2.40mm | 0.0945 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 495 |
| #41 | 0.0960 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 502 |
| 2.45mm | 0.0965 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 505 |
| #40 | 0.0980 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 513 |
| 2.50mm | 0.0984 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 515 |
| #39 | 0.0995 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 521 |
| 2.55mm | 0.1004 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 525 |
| #38 | 0.1015 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 531 |
| 2.60mm | 0.1024 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 536 |
| #37 | 0.1040 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 544 |
| 2.65mm | 0.1043 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 546 |
| 2.70mm | 0.1063 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 556 |
| #36 | 0.1065 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 557 |
| 2.75mm | 0.1083 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 567 |
| 7/64 | 0.1094 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 573 |
| #35 | 0.1100 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 576 |
| 2.80mm | 0.1102 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 577 |
| #34 | 0.1110 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 581 |
| 2.85mm | 0.1122 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 587 |
| #33 | 0.1130 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 591 |
| 2.90mm | 0.1142 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 598 |
| #32 | 0.1160 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 607 |
| 2.95mm | 0.1161 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 608 |
| 3.00mm | 0.1181 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 618 |
| #31 | 0.1200 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 628 |
| 3.05mm | 0.1201 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 629 |
| 3.10mm | 0.1220 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 638 |
| 3.15mm | 0.1240 | 30 | 20 | 1000 | -0.039 | 1200 | 1.50 | 649 |
| 1/8 | 0.1250 | 30 | 20 | 1000 | -0.039 | 1200 | 1.50 | 654 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

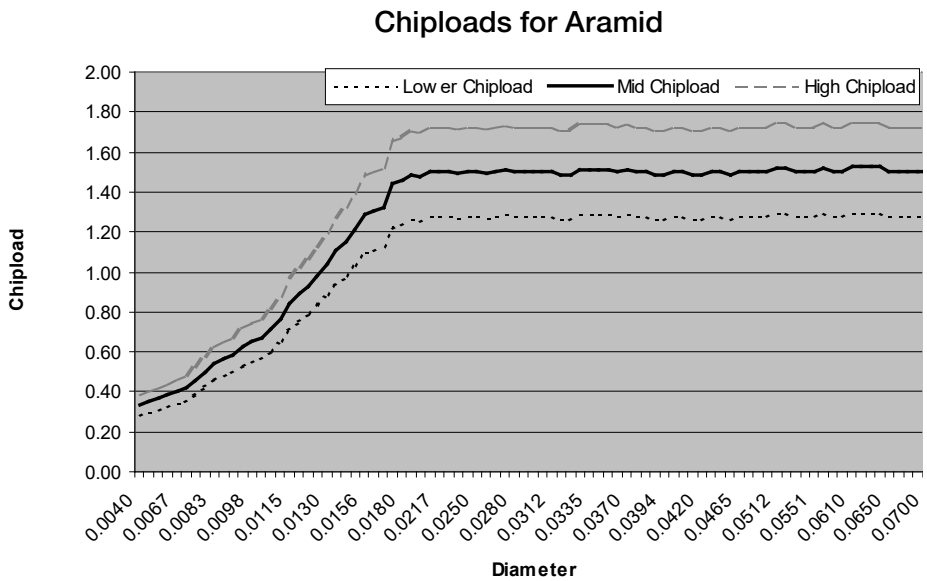
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 1000 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 1000 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 795 |
| 3.90mm | 0.1535 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 803 |
| #23 | 0.1540 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1051 |
| #7 | 0.2010 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1052 |
| 5.15mm | 0.2028 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1061 |
| 13/64 | 0.2031 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1063 |
| #6 | 0.2040 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1068 |
| 5.20mm | 0.2047 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1071 |
| #5 | 0.2055 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1075 |

Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1082 |
| 5.30mm | 0.2087 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1092 |
| #4 | 0.2090 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1094 |
| 5.35mm | 0.2106 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1102 |
| 5.40mm | 0.2126 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1113 |
| #3 | 0.2130 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1115 |
| 5.45mm | 0.2146 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1123 |
| 5.50mm | 0.2165 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1133 |
| 5.55mm | 0.2185 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1143 |
| 7/32 | 0.2188 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1145 |
| 5.60mm | 0.2205 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1154 |
| #2 | 0.2210 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1157 |
| 5.65mm | 0.2224 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1164 |
| 5.70mm | 0.2244 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1174 |
| 5.75mm | 0.2264 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1185 |
| #1 | 0.2280 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1193 |
| 5.80mm | 0.2283 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1195 |
| 5.85mm | 0.2302 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1205 |
| 5.90mm | 0.2323 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1216 |
| A | 0.2340 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1225 |
| 5.95mm | 0.2343 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1226 |
| 15/64 | 0.2344 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **110K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **BT Epoxy** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 10 | 120 | 200 | -0.011 | 300 | 0.08 | 126 |
| 0.13mm | 0.0050 | 15 | 120 | 300 | -0.011 | 300 | 0.13 | 157 |
| 0.15mm | 0.0059 | 20 | 120 | 300 | -0.011 | 300 | 0.17 | 185 |
| #96 | 0.0063 | 22 | 120 | 400 | -0.011 | 300 | 0.18 | 198 |
| #95 | 0.0067 | 24 | 120 | 400 | -0.012 | 300 | 0.20 | 210 |
| #94 | 0.0071 | 28 | 120 | 500 | -0.012 | 300 | 0.23 | 223 |
| #93 | 0.0075 | 32 | 120 | 500 | -0.012 | 300 | 0.27 | 236 |
| #92 | 0.0079 | 35 | 120 | 500 | -0.012 | 300 | 0.29 | 248 |
| #91 | 0.0083 | 40 | 120 | 600 | -0.012 | 300 | 0.33 | 261 |
| #90 | 0.0087 | 45 | 120 | 600 | -0.012 | 300 | 0.38 | 273 |
| #89 | 0.0091 | 48 | 120 | 700 | -0.012 | 300 | 0.40 | 286 |
| #88 | 0.0095 | 50 | 120 | 700 | -0.012 | 300 | 0.42 | 298 |
| 0.25mm | 0.0098 | 55 | 120 | 800 | -0.012 | 500 | 0.46 | 308 |
| #87 | 0.0100 | 56 | 120 | 800 | -0.012 | 500 | 0.47 | 314 |
| #86 | 0.0105 | 60 | 120 | 800 | -0.012 | 500 | 0.50 | 330 |
| #85 | 0.0110 | 65 | 120 | 900 | -0.013 | 500 | 0.54 | 345 |
| #84 | 0.0115 | 68 | 120 | 900 | -0.013 | 500 | 0.57 | 361 |
| 0.30mm | 0.0118 | 70 | 120 | 1000 | -0.013 | 500 | 0.58 | 371 |
| #83 | 0.0120 | 72 | 119 | 1000 | -0.013 | 500 | 0.61 | 375 |
| #82 | 0.0125 | 74 | 115 | 1000 | -0.013 | 500 | 0.64 | 375 |
| #81 | 0.0130 | 78 | 110 | 1000 | -0.013 | 500 | 0.71 | 375 |
| #80 | 0.0135 | 82 | 106 | 1000 | -0.013 | 750 | 0.77 | 375 |
| 0.35mm | 0.0138 | 83 | 104 | 1000 | -0.013 | 750 | 0.80 | 375 |
| #79 | 0.0145 | 87 | 99 | 1000 | -0.013 | 750 | 0.88 | 375 |
| 1/64 | 0.0156 | 88 | 92 | 1000 | -0.014 | 750 | 0.96 | 375 |
| 0.40mm | 0.0158 | 89 | 91 | 1000 | -0.014 | 750 | 0.98 | 375 |
| #78 | 0.0160 | 90 | 90 | 1000 | -0.014 | 750 | 1.00 | 375 |
| 0.45mm | 0.0177 | 92 | 81 | 1000 | -0.014 | 750 | 1.14 | 375 |
| #77 | 0.0180 | 94 | 80 | 1000 | -0.014 | 750 | 1.18 | 375 |
| 0.50mm | 0.0197 | 96 | 73 | 1000 | -0.015 | 750 | 1.32 | 375 |
| #76 | 0.0200 | 96 | 72 | 1000 | -0.015 | 750 | 1.33 | 375 |
| #75 | 0.0210 | 98 | 68 | 1000 | -0.015 | 1000 | 1.44 | 375 |
| 0.55mm | 0.0217 | 100 | 66 | 1000 | -0.015 | 1000 | 1.52 | 375 |
| #74 | 0.0225 | 104 | 64 | 1000 | -0.015 | 1000 | 1.63 | 375 |
| 0.60mm | 0.0236 | 106 | 61 | 1000 | -0.016 | 1000 | 1.74 | 375 |
| #73 | 0.0240 | 108 | 60 | 1000 | -0.016 | 1000 | 1.80 | 375 |
| #72 | 0.0250 | 112 | 57 | 1000 | -0.016 | 1000 | 1.95 | 375 |
| 0.65mm | 0.0256 | 116 | 56 | 1000 | -0.016 | 1000 | 2.07 | 375 |
| #71 | 0.0260 | 118 | 55 | 1000 | -0.016 | 1000 | 2.14 | 375 |
| 0.70mm | 0.0276 | 124 | 52 | 1000 | -0.016 | 1000 | 2.39 | 375 |
| #70 | 0.0280 | 126 | 51 | 1000 | -0.017 | 1000 | 2.46 | 375 |
| #69 | 0.0292 | 123 | 49 | 1000 | -0.017 | 1000 | 2.51 | 375 |
| 0.75mm | 0.0295 | 123 | 49 | 1000 | -0.017 | 1000 | 2.53 | 375 |
| #68 | 0.0310 | 115 | 46 | 1000 | -0.017 | 1000 | 2.49 | 375 |
| 1/32 | 0.0312 | 115 | 46 | 1000 | -0.017 | 1000 | 2.50 | 375 |
| 0.80mm | 0.0315 | 113 | 45 | 1000 | -0.017 | 1000 | 2.48 | 375 |
| #67 | 0.0320 | 113 | 45 | 1000 | -0.017 | 1000 | 2.52 | 375 |
| #66 | 0.0330 | 108 | 43 | 1000 | -0.018 | 1000 | 2.49 | 375 |
| 0.85mm | 0.0335 | 108 | 43 | 1000 | -0.018 | 1000 | 2.52 | 375 |
| #65 | 0.0350 | 103 | 41 | 1000 | -0.018 | 1000 | 2.52 | 375 |
| 0.90mm | 0.0354 | 100 | 40 | 1000 | -0.018 | 1000 | 2.47 | 375 |
| #64 | 0.0360 | 100 | 40 | 1000 | -0.018 | 1000 | 2.51 | 375 |
| #63 | 0.0370 | 98 | 39 | 1000 | -0.019 | 1000 | 2.53 | 375 |
| 0.95mm | 0.0374 | 95 | 38 | 1000 | -0.019 | 1000 | 2.48 | 375 |
| #62 | 0.0380 | 95 | 38 | 1000 | -0.019 | 1000 | 2.52 | 375 |
| #61 | 0.0390 | 93 | 37 | 1000 | -0.019 | 1000 | 2.53 | 375 |
| 1.00mm | 0.0394 | 90 | 36 | 1000 | -0.019 | 1000 | 2.47 | 375 |
| #60 | 0.0400 | 90 | 36 | 1000 | -0.019 | 1000 | 2.51 | 375 |
| #59 | 0.0410 | 88 | 35 | 1000 | -0.020 | 1000 | 2.52 | 375 |
| 1.05mm | 0.0413 | 88 | 35 | 1000 | -0.020 | 1000 | 2.54 | 375 |
| #58 | 0.0420 | 85 | 34 | 1000 | -0.020 | 1000 | 2.49 | 375 |
| #57 | 0.0430 | 83 | 33 | 1000 | -0.020 | 1000 | 2.49 | 375 |
| 1.10mm | 0.0433 | 83 | 33 | 1000 | -0.020 | 1000 | 2.51 | 375 |
| 1.15mm | 0.0453 | 80 | 32 | 1000 | -0.021 | 1000 | 2.53 | 375 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 78 | 31 | 1000 | -0.021 | 1000 | 2.53 | 375 |
| 3/64 | 0.0469 | 78 | 31 | 1000 | -0.021 | 1000 | 2.55 | 375 |
| 1.20mm | 0.0472 | 75 | 30 | 1000 | -0.021 | 1000 | 2.47 | 375 |
| 1.25mm | 0.0492 | 73 | 29 | 1000 | -0.021 | 1000 | 2.51 | 375 |
| 1.30mm | 0.0512 | 70 | 28 | 1000 | -0.022 | 1000 | 2.50 | 375 |
| #55 | 0.0520 | 70 | 28 | 1000 | -0.022 | 1000 | 2.54 | 375 |
| 1.35mm | 0.0531 | 68 | 27 | 1000 | -0.022 | 1000 | 2.52 | 375 |
| #54 | 0.0550 | 65 | 26 | 1000 | -0.023 | 1000 | 2.49 | 375 |
| 1.40mm | 0.0551 | 65 | 26 | 1000 | -0.023 | 1000 | 2.50 | 375 |
| 1.45mm | 0.0571 | 63 | 25 | 1000 | -0.023 | 1000 | 2.51 | 375 |
| 1.50mm | 0.0591 | 60 | 24 | 1000 | -0.024 | 1000 | 2.47 | 375 |
| #53 | 0.0595 | 60 | 24 | 1000 | -0.024 | 1000 | 2.49 | 375 |
| 1.55mm | 0.0610 | 58 | 23 | 1000 | -0.024 | 1000 | 2.47 | 375 |
| 1/16 | 0.0625 | 58 | 23 | 1000 | -0.025 | 1000 | 2.53 | 375 |
| 1.60mm | 0.0630 | 58 | 23 | 1000 | -0.025 | 1000 | 2.55 | 375 |
| #52 | 0.0635 | 58 | 23 | 1000 | -0.025 | 1000 | 2.57 | 375 |
| 1.65mm | 0.0650 | 55 | 22 | 1000 | -0.025 | 1000 | 2.49 | 375 |
| 1.70mm | 0.0669 | 53 | 21 | 1000 | -0.026 | 1000 | 2.47 | 375 |
| #51 | 0.0670 | 53 | 21 | 1000 | -0.026 | 1000 | 2.48 | 375 |
| 1.75mm | 0.0689 | 52 | 21 | 1000 | -0.026 | 1000 | 2.48 | 379 |
| #50 | 0.0700 | 52 | 21 | 1000 | -0.026 | 1000 | 2.48 | 385 |
| 1.80mm | 0.0709 | 52 | 20 | 1000 | -0.027 | 1000 | 2.60 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 45 | 20 | 1000 | -0.018 | 500 | 2.25 | 659 |
| 3.25mm | 0.1280 | 45 | 20 | 1000 | -0.018 | 500 | 2.25 | 670 |
| #30 | 0.1285 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 672 |
| 3.30mm | 0.1299 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 680 |
| 3.35mm | 0.1319 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 690 |
| 3.40mm | 0.1339 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 701 |
| 3.45mm | 0.1358 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 711 |
| #29 | 0.1360 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 712 |
| 3.50mm | 0.1378 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 721 |
| 3.55mm | 0.1398 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 732 |
| #28 | 0.1405 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 735 |
| 9/64 | 0.1406 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 736 |
| 3.60mm | 0.1417 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 742 |
| 3.65mm | 0.1437 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 752 |
| #27 | 0.1440 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 754 |
| 3.70mm | 0.1457 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 762 |
| #26 | 0.1470 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 769 |
| 3.75mm | 0.1476 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 772 |
| #25 | 0.1495 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 782 |
| 3.80mm | 0.1496 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 783 |
| 3.85mm | 0.1516 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 793 |
| #24 | 0.1520 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 795 |
| 3.90mm | 0.1535 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 803 |
| #23 | 0.1540 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 806 |
| 3.95 | 0.1555 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 814 |
| 5/32 | 0.1562 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 817 |
| #22 | 0.1570 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 822 |
| 4.00mm | 0.1575 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 824 |
| #21 | 0.1590 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 832 |
| 4.05mm | 0.1594 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 834 |
| #20 | 0.1610 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 843 |
| 4.10mm | 0.1614 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 845 |
| 4.15mm | 0.1634 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 855 |
| 4.20mm | 0.1654 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 866 |
| #19 | 0.1660 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 869 |
| 4.25mm | 0.1673 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 876 |
| 4.30mm | 0.1693 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 886 |
| #18 | 0.1695 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 887 |
| 4.35mm | 0.1713 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 896 |
| 11/64 | 0.1719 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 900 |
| #17 | 0.1730 | 40 | 20 | 1000 | -0.021 | 200 | 2.00 | 905 |
| 4.40mm | 0.1732 | 40 | 20 | 1000 | -0.021 | 200 | 2.00 | 906 |
| 4.45mm | 0.1752 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 917 |
| #16 | 0.1770 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 926 |
| 4.50mm | 0.1772 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 927 |
| 4.55mm | 0.1792 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 938 |
| #15 | 0.1800 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 942 |
| 4.60mm | 0.1811 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 948 |
| #14 | 0.1820 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 952 |
| 4.65mm | 0.1831 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 958 |
| #13 | 0.1850 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 968 |
| 4.70mm | 0.1850 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 968 |
| 4.75mm | 0.1870 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 979 |
| 3/16 | 0.1875 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 981 |
| 4.80mm | 0.1890 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 989 |
| #12 | 0.1890 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 989 |
| 4.85mm | 0.1909 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 999 |
| #11 | 0.1910 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1000 |
| 4.90mm | 0.1929 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1010 |
| #10 | 0.1935 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1013 |
| 4.95mm | 0.1949 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1020 |
| #9 | 0.1960 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1026 |
| 5.00mm | 0.1968 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1030 |
| 5.05mm | 0.1988 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1040 |
| #8 | 0.1990 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1041 |
| 5.10mm | 0.2008 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1051 |
| #7 | 0.2010 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1052 |
| 5.15mm | 0.2028 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1061 |
| 13/64 | 0.2031 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1063 |
| #6 | 0.2040 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1068 |
| 5.20mm | 0.2047 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1071 |
| #5 | 0.2055 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1075 |

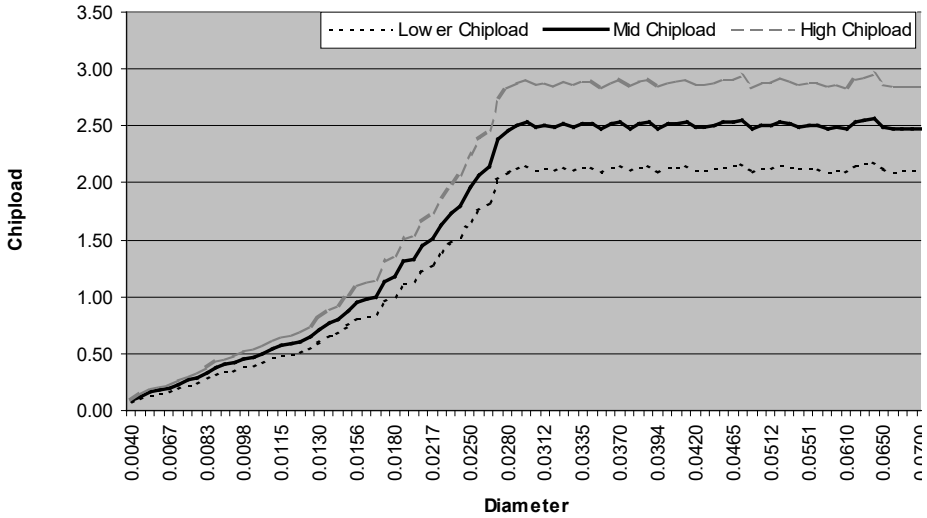
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1082 |
| 5.30mm | 0.2087 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1092 |
| #4 | 0.2090 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1094 |
| 5.35mm | 0.2106 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1102 |
| 5.40mm | 0.2126 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1113 |
| #3 | 0.2130 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1115 |
| 5.45mm | 0.2146 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1123 |
| 5.50mm | 0.2165 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1133 |
| 5.55mm | 0.2185 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1143 |
| 7/32 | 0.2188 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1145 |
| 5.60mm | 0.2205 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1154 |
| #2 | 0.2210 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1157 |
| 5.65mm | 0.2224 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1164 |
| 5.70mm | 0.2244 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1174 |
| 5.75mm | 0.2264 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1185 |
| #1 | 0.2280 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1193 |
| 5.80mm | 0.2283 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1195 |
| 5.85mm | 0.2302 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1205 |
| 5.90mm | 0.2323 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1216 |
| A | 0.2340 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1225 |
| 5.95mm | 0.2343 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1226 |
| 15/64 | 0.2344 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for BT Epoxy




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Copper-Invar-Copper** PCB Material

(and other metal bonded designs)

**Recommended Drill Series:** 100, 150, 560, 580, 600

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 10 | 120 | 100 | -0.011 | 100 | 0.08 | 126 |
| 0.13mm | 0.0050 | 12 | 120 | 150 | -0.011 | 100 | 0.10 | 157 |
| 0.15mm | 0.0059 | 14 | 120 | 200 | -0.011 | 100 | 0.12 | 185 |
| #96 | 0.0063 | 15 | 120 | 200 | -0.011 | 100 | 0.13 | 198 |
| #95 | 0.0067 | 16 | 120 | 200 | -0.012 | 100 | 0.13 | 210 |
| #94 | 0.0071 | 17 | 120 | 300 | -0.012 | 100 | 0.14 | 223 |
| #93 | 0.0075 | 18 | 120 | 300 | -0.012 | 100 | 0.15 | 236 |
| #92 | 0.0079 | 19 | 120 | 400 | -0.012 | 150 | 0.16 | 248 |
| #91 | 0.0083 | 20 | 120 | 400 | -0.012 | 150 | 0.17 | 261 |
| #90 | 0.0087 | 22 | 120 | 500 | -0.012 | 150 | 0.18 | 273 |
| #89 | 0.0091 | 24 | 120 | 500 | -0.012 | 150 | 0.20 | 286 |
| #88 | 0.0095 | 25 | 120 | 500 | -0.012 | 150 | 0.21 | 298 |
| 0.25mm | 0.0098 | 26 | 120 | 500 | -0.012 | 200 | 0.22 | 308 |
| #87 | 0.0100 | 30 | 120 | 500 | -0.012 | 200 | 0.25 | 314 |
| #86 | 0.0105 | 34 | 120 | 600 | -0.012 | 200 | 0.28 | 330 |
| #85 | 0.0110 | 36 | 120 | 600 | -0.013 | 200 | 0.30 | 345 |
| #84 | 0.0115 | 40 | 120 | 700 | -0.013 | 200 | 0.33 | 361 |
| 0.30mm | 0.0118 | 42 | 120 | 700 | -0.013 | 200 | 0.35 | 371 |
| #83 | 0.0120 | 45 | 120 | 800 | -0.013 | 250 | 0.38 | 377 |
| #82 | 0.0125 | 50 | 120 | 800 | -0.013 | 250 | 0.42 | 393 |
| #81 | 0.0130 | 55 | 118 | 800 | -0.013 | 250 | 0.47 | 400 |
| #80 | 0.0135 | 60 | 113 | 800 | -0.013 | 250 | 0.53 | 400 |
| 0.35mm | 0.0138 | 63 | 111 | 800 | -0.013 | 250 | 0.57 | 400 |
| #79 | 0.0145 | 69 | 105 | 800 | -0.013 | 250 | 0.66 | 400 |
| 1/64 | 0.0156 | 72 | 98 | 800 | -0.014 | 300 | 0.73 | 400 |
| 0.40mm | 0.0158 | 73 | 97 | 800 | -0.014 | 300 | 0.75 | 400 |
| #78 | 0.0160 | 75 | 96 | 800 | -0.014 | 300 | 0.78 | 400 |
| 0.45mm | 0.0177 | 79 | 86 | 900 | -0.014 | 300 | 0.92 | 400 |
| #77 | 0.0180 | 80 | 85 | 900 | -0.014 | 300 | 0.94 | 400 |
| 0.50mm | 0.0197 | 80 | 78 | 900 | -0.015 | 300 | 1.03 | 400 |
| #76 | 0.0200 | 82 | 76 | 900 | -0.015 | 300 | 1.08 | 400 |
| #75 | 0.0210 | 84 | 73 | 1000 | -0.015 | 400 | 1.15 | 400 |
| 0.55mm | 0.0217 | 86 | 70 | 1000 | -0.015 | 400 | 1.23 | 400 |
| #74 | 0.0225 | 85 | 68 | 1000 | -0.015 | 400 | 1.25 | 400 |
| 0.60mm | 0.0236 | 84 | 65 | 1000 | -0.016 | 400 | 1.29 | 400 |
| #73 | 0.0240 | 83 | 64 | 1000 | -0.016 | 400 | 1.30 | 400 |
| #72 | 0.0250 | 83 | 61 | 1000 | -0.016 | 400 | 1.36 | 400 |
| 0.65mm | 0.0256 | 82 | 60 | 1000 | -0.016 | 400 | 1.37 | 400 |
| #71 | 0.0260 | 81 | 59 | 1000 | -0.016 | 400 | 1.37 | 400 |
| 0.70mm | 0.0276 | 78 | 55 | 1000 | -0.016 | 400 | 1.42 | 400 |
| #70 | 0.0280 | 77 | 55 | 1000 | -0.017 | 400 | 1.40 | 400 |
| #69 | 0.0292 | 75 | 52 | 1000 | -0.017 | 400 | 1.44 | 400 |
| 0.75mm | 0.0295 | 74 | 52 | 1000 | -0.017 | 400 | 1.42 | 400 |
| #68 | 0.0310 | 72 | 49 | 1000 | -0.017 | 400 | 1.47 | 400 |
| 1/32 | 0.0312 | 71 | 49 | 1000 | -0.017 | 400 | 1.45 | 400 |
| 0.80mm | 0.0315 | 71 | 49 | 1000 | -0.017 | 400 | 1.45 | 400 |
| #67 | 0.0320 | 70 | 48 | 1000 | -0.017 | 400 | 1.46 | 400 |
| #66 | 0.0330 | 67 | 46 | 1000 | -0.018 | 400 | 1.46 | 400 |
| 0.85mm | 0.0335 | 67 | 46 | 1000 | -0.018 | 400 | 1.46 | 400 |
| #65 | 0.0350 | 65 | 44 | 1000 | -0.018 | 500 | 1.48 | 400 |
| 0.90mm | 0.0354 | 65 | 43 | 1000 | -0.018 | 500 | 1.51 | 400 |
| #64 | 0.0360 | 63 | 42 | 1000 | -0.018 | 500 | 1.50 | 400 |
| #63 | 0.0370 | 62 | 41 | 1000 | -0.019 | 500 | 1.51 | 400 |
| 0.95mm | 0.0374 | 61 | 41 | 1000 | -0.019 | 500 | 1.49 | 400 |
| #62 | 0.0380 | 60 | 40 | 1000 | -0.019 | 500 | 1.50 | 400 |
| #61 | 0.0390 | 60 | 39 | 1000 | -0.019 | 500 | 1.54 | 400 |
| 1.00mm | 0.0394 | 59 | 39 | 1000 | -0.019 | 500 | 1.51 | 400 |
| #60 | 0.0400 | 59 | 38 | 1000 | -0.019 | 500 | 1.55 | 400 |
| #59 | 0.0410 | 58 | 37 | 1000 | -0.020 | 500 | 1.57 | 400 |
| 1.05mm | 0.0413 | 58 | 37 | 1000 | -0.020 | 500 | 1.57 | 400 |
| #58 | 0.0420 | 57 | 36 | 1000 | -0.020 | 500 | 1.58 | 400 |
| #57 | 0.0430 | 57 | 36 | 1000 | -0.020 | 500 | 1.58 | 400 |
| 1.10mm | 0.0433 | 56 | 35 | 1000 | -0.020 | 500 | 1.60 | 400 |
| 1.15mm | 0.0453 | 55 | 34 | 1000 | -0.021 | 500 | 1.62 | 400 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 55 | 33 | 1000 | -0.021 | 500 | 1.67 | 400 |
| 3/64 | 0.0469 | 55 | 33 | 1000 | -0.021 | 500 | 1.67 | 400 |
| 1.20mm | 0.0472 | 55 | 32 | 1000 | -0.021 | 500 | 1.72 | 400 |
| 1.25mm | 0.0492 | 54 | 31 | 1000 | -0.021 | 500 | 1.74 | 400 |
| 1.30mm | 0.0512 | 54 | 30 | 1000 | -0.022 | 500 | 1.80 | 400 |
| #55 | 0.0520 | 54 | 29 | 1000 | -0.022 | 500 | 1.86 | 400 |
| 1.35mm | 0.0531 | 53 | 29 | 1000 | -0.022 | 500 | 1.83 | 400 |
| #54 | 0.0550 | 53 | 28 | 1000 | -0.023 | 500 | 1.89 | 400 |
| 1.40mm | 0.0551 | 53 | 28 | 1000 | -0.023 | 500 | 1.89 | 400 |
| 1.45mm | 0.0571 | 52 | 27 | 1000 | -0.023 | 500 | 1.93 | 400 |
| 1.50mm | 0.0591 | 51 | 26 | 1000 | -0.024 | 500 | 1.96 | 400 |
| #53 | 0.0595 | 51 | 26 | 1000 | -0.024 | 500 | 1.96 | 400 |
| 1.55mm | 0.0610 | 50 | 25 | 1000 | -0.024 | 500 | 2.00 | 400 |
| 1/16 | 0.0625 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.60mm | 0.0630 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| #52 | 0.0635 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.65mm | 0.0650 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.70mm | 0.0669 | 46 | 23 | 1000 | -0.026 | 500 | 2.00 | 400 |
| #51 | 0.0670 | 46 | 23 | 1000 | -0.026 | 500 | 2.00 | 400 |
| 1.75mm | 0.0689 | 44 | 22 | 1000 | -0.026 | 500 | 2.00 | 400 |
| #50 | 0.0700 | 44 | 22 | 1000 | -0.026 | 500 | 2.00 | 400 |
| 1.80mm | 0.0709 | 44 | 22 | 1000 | -0.027 | 500 | 2.00 | 400 |
| 1.85mm | 0.0728 | 42 | 21 | 1000 | -0.027 | 500 | 2.00 | 400 |
| #49 | 0.0730 | 42 | 21 | 1000 | -0.027 | 500 | 2.00 | 400 |
| 1.90mm | 0.0748 | 40 | 20 | 1000 | -0.027 | 500 | 2.00 | 400 |
| #48 | 0.0760 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 400 |
| 1.95mm | 0.0768 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 400 |
| 5/64 | 0.0781 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 409 |
| #47 | 0.0785 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 411 |
| 2.00mm | 0.0787 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 412 |
| 2.05mm | 0.0807 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 422 |
| #46 | 0.0810 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 424 |
| #45 | 0.0820 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 429 |
| 2.10mm | 0.0827 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 433 |
| 2.15mm | 0.0846 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 443 |
| #44 | 0.0860 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 450 |
| 2.20mm | 0.0866 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 453 |
| 2.25mm | 0.0886 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 464 |
| #43 | 0.0890 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 466 |
| 2.30mm | 0.0906 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 474 |
| 2.35mm | 0.0925 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 484 |
| #42 | 0.0935 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 489 |
| 3/32 | 0.0938 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 491 |
| 2.40mm | 0.0945 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 495 |
| #41 | 0.0960 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 502 |
| 2.45mm | 0.0965 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 505 |
| #40 | 0.0980 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 513 |
| 2.50mm | 0.0984 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 515 |
| #39 | 0.0995 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 521 |
| 2.55mm | 0.1004 | 40 | 20 | 1000 | -0.033 | 400 | 2.00 | 525 |
| #38 | 0.1015 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 531 |
| 2.60mm | 0.1024 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 536 |
| #37 | 0.1040 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 544 |
| 2.65mm | 0.1043 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 546 |
| 2.70mm | 0.1063 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 556 |
| #36 | 0.1065 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 557 |
| 2.75mm | 0.1083 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 567 |
| 7/64 | 0.1094 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 573 |
| #35 | 0.1100 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 576 |
| 2.80mm | 0.1102 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 577 |
| #34 | 0.1110 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 581 |
| 2.85mm | 0.1122 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 587 |
| #33 | 0.1130 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 591 |
| 2.90mm | 0.1142 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 598 |
| #32 | 0.1160 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 607 |
| 2.95mm | 0.1161 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 608 |
| 3.00mm | 0.1181 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 618 |
| #31 | 0.1200 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 628 |
| 3.05mm | 0.1201 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 629 |
| 3.10mm | 0.1220 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 638 |
| 3.15mm | 0.1240 | 40 | 20 | 1000 | -0.039 | 400 | 2.00 | 649 |
| 1/8 | 0.1250 | 40 | 20 | 1000 | -0.039 | 400 | 2.00 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 250 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 250 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 762 |
| #26 | 0.1470 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 769 |
| 3.75mm | 0.1476 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 772 |
| #25 | 0.1495 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 782 |
| 3.80mm | 0.1496 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 783 |
| 3.85mm | 0.1516 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 793 |
| #24 | 0.1520 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 795 |
| 3.90mm | 0.1535 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 803 |
| #23 | 0.1540 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 806 |
| 3.95 | 0.1555 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 814 |
| 5/32 | 0.1562 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 817 |
| #22 | 0.1570 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 822 |
| 4.00mm | 0.1575 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 824 |
| #21 | 0.1590 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 832 |
| 4.05mm | 0.1594 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 834 |
| #20 | 0.1610 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 843 |
| 4.10mm | 0.1614 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 845 |
| 4.15mm | 0.1634 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 855 |
| 4.20mm | 0.1654 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 866 |
| #19 | 0.1660 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 869 |
| 4.25mm | 0.1673 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 876 |
| 4.30mm | 0.1693 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 886 |
| #18 | 0.1695 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 887 |
| 4.35mm | 0.1713 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 896 |
| 11/64 | 0.1719 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 900 |
| #17 | 0.1730 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 905 |
| 4.40mm | 0.1732 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 906 |
| 4.45mm | 0.1752 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 917 |
| #16 | 0.1770 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 926 |
| 4.50mm | 0.1772 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 927 |
| 4.55mm | 0.1792 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 938 |
| #15 | 0.1800 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 942 |
| 4.60mm | 0.1811 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 948 |
| #14 | 0.1820 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 952 |
| 4.65mm | 0.1831 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 958 |
| #13 | 0.1850 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 968 |
| 4.70mm | 0.1850 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 968 |
| 4.75mm | 0.1870 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 979 |
| 3/16 | 0.1875 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 981 |
| 4.80mm | 0.1890 | 24 | 20 | 1000 | -0.023 | 250 | 1.20 | 989 |
| #12 | 0.1890 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 989 |
| 4.85mm | 0.1909 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 999 |
| #11 | 0.1910 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1000 |
| 4.90mm | 0.1929 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1010 |
| #10 | 0.1935 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1013 |
| 4.95mm | 0.1949 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1020 |
| #9 | 0.1960 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1026 |
| 5.00mm | 0.1968 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1030 |
| 5.05mm | 0.1988 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1040 |
| #8 | 0.1990 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1041 |
| 5.10mm | 0.2008 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1051 |
| #7 | 0.2010 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1052 |
| 5.15mm | 0.2028 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1061 |
| 13/64 | 0.2031 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1063 |
| #6 | 0.2040 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1068 |
| 5.20mm | 0.2047 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1071 |
| #5 | 0.2055 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1075 |

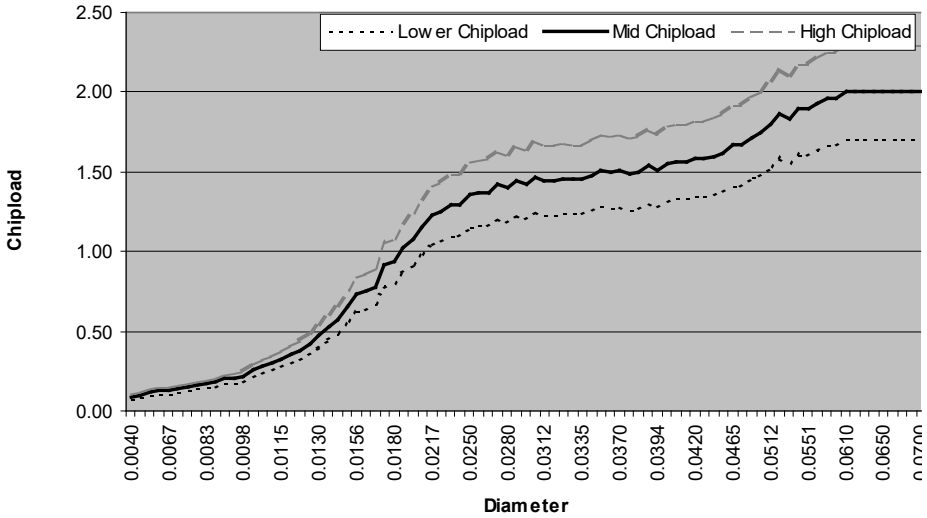
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1082 |
| 5.30mm | 0.2087 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1092 |
| #4 | 0.2090 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1094 |
| 5.35mm | 0.2106 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Copper-Invar-Copper




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Cyanate Ester PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 20 | 120 | 200 | -0.011 | 400 | 0.17 | 126 |
| 0.13mm | 0.0050 | 24 | 120 | 300 | -0.011 | 400 | 0.20 | 157 |
| 0.15mm | 0.0059 | 28 | 120 | 300 | -0.011 | 400 | 0.23 | 185 |
| #96 | 0.0063 | 30 | 120 | 400 | -0.011 | 400 | 0.25 | 198 |
| #95 | 0.0067 | 32 | 120 | 400 | -0.012 | 400 | 0.27 | 210 |
| #94 | 0.0071 | 34 | 120 | 500 | -0.012 | 400 | 0.28 | 223 |
| #93 | 0.0075 | 36 | 120 | 500 | -0.012 | 400 | 0.30 | 236 |
| #92 | 0.0079 | 40 | 120 | 500 | -0.012 | 400 | 0.33 | 248 |
| #91 | 0.0083 | 42 | 120 | 600 | -0.012 | 400 | 0.35 | 261 |
| #90 | 0.0087 | 44 | 120 | 600 | -0.012 | 400 | 0.37 | 273 |
| #89 | 0.0091 | 48 | 120 | 700 | -0.012 | 400 | 0.40 | 286 |
| #88 | 0.0095 | 50 | 120 | 700 | -0.012 | 400 | 0.42 | 298 |
| 0.25mm | 0.0098 | 52 | 120 | 800 | -0.012 | 400 | 0.43 | 308 |
| #87 | 0.0100 | 52 | 120 | 800 | -0.012 | 400 | 0.43 | 314 |
| #86 | 0.0105 | 54 | 120 | 800 | -0.012 | 400 | 0.45 | 330 |
| #85 | 0.0110 | 56 | 120 | 900 | -0.013 | 400 | 0.47 | 345 |
| #84 | 0.0115 | 58 | 120 | 900 | -0.013 | 400 | 0.48 | 361 |
| 0.30mm | 0.0118 | 60 | 117 | 1000 | -0.013 | 400 | 0.51 | 360 |
| #83 | 0.0120 | 60 | 115 | 1000 | -0.013 | 400 | 0.52 | 360 |
| #82 | 0.0125 | 64 | 110 | 1000 | -0.013 | 400 | 0.58 | 360 |
| #81 | 0.0130 | 67 | 106 | 1000 | -0.013 | 400 | 0.63 | 360 |
| #80 | 0.0135 | 70 | 102 | 1000 | -0.013 | 600 | 0.69 | 360 |
| 0.35mm | 0.0138 | 72 | 100 | 1000 | -0.013 | 600 | 0.72 | 360 |
| #79 | 0.0145 | 75 | 95 | 1000 | -0.013 | 600 | 0.79 | 360 |
| 1/64 | 0.0156 | 78 | 88 | 1000 | -0.014 | 600 | 0.88 | 360 |
| 0.40mm | 0.0158 | 78 | 87 | 1000 | -0.014 | 600 | 0.90 | 360 |
| #78 | 0.0160 | 80 | 86 | 1000 | -0.014 | 600 | 0.93 | 360 |
| 0.45mm | 0.0177 | 83 | 78 | 1000 | -0.014 | 600 | 1.07 | 360 |
| #77 | 0.0180 | 84 | 76 | 1000 | -0.014 | 600 | 1.10 | 360 |
| 0.50mm | 0.0197 | 86 | 70 | 1000 | -0.015 | 600 | 1.23 | 360 |
| #76 | 0.0200 | 86 | 69 | 1000 | -0.015 | 600 | 1.25 | 360 |
| #75 | 0.0210 | 88 | 66 | 1000 | -0.015 | 600 | 1.34 | 360 |
| 0.55mm | 0.0217 | 90 | 63 | 1000 | -0.015 | 600 | 1.42 | 360 |
| #74 | 0.0225 | 92 | 61 | 1000 | -0.015 | 600 | 1.50 | 360 |
| 0.60mm | 0.0236 | 93 | 58 | 1000 | -0.016 | 600 | 1.60 | 360 |
| #73 | 0.0240 | 94 | 57 | 1000 | -0.016 | 600 | 1.64 | 360 |
| #72 | 0.0250 | 92 | 55 | 1000 | -0.016 | 600 | 1.67 | 360 |
| 0.65mm | 0.0256 | 91 | 54 | 1000 | -0.016 | 600 | 1.69 | 360 |
| #71 | 0.0260 | 90 | 53 | 1000 | -0.016 | 600 | 1.70 | 360 |
| 0.70mm | 0.0276 | 88 | 50 | 1000 | -0.016 | 600 | 1.76 | 360 |
| #70 | 0.0280 | 87 | 49 | 1000 | -0.017 | 600 | 1.78 | 360 |
| #69 | 0.0292 | 86 | 47 | 1000 | -0.017 | 600 | 1.83 | 360 |
| 0.75mm | 0.0295 | 86 | 47 | 1000 | -0.017 | 600 | 1.83 | 360 |
| #68 | 0.0310 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| 1/32 | 0.0312 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| 0.80mm | 0.0315 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| #67 | 0.0320 | 83 | 43 | 1000 | -0.017 | 800 | 1.93 | 360 |
| #66 | 0.0330 | 82 | 42 | 1000 | -0.018 | 800 | 1.95 | 360 |
| 0.85mm | 0.0335 | 82 | 41 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #65 | 0.0350 | 78 | 39 | 1000 | -0.018 | 800 | 2.00 | 360 |
| 0.90mm | 0.0354 | 78 | 39 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #64 | 0.0360 | 76 | 38 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #63 | 0.0370 | 74 | 37 | 1000 | -0.019 | 800 | 2.00 | 360 |
| 0.95mm | 0.0374 | 74 | 37 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #62 | 0.0380 | 72 | 36 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #61 | 0.0390 | 70 | 35 | 1000 | -0.019 | 800 | 2.00 | 360 |
| 1.00mm | 0.0394 | 70 | 35 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #60 | 0.0400 | 68 | 34 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #59 | 0.0410 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.05mm | 0.0413 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| #58 | 0.0420 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| #57 | 0.0430 | 64 | 32 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.10mm | 0.0433 | 64 | 32 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.15mm | 0.0453 | 60 | 30 | 1000 | -0.021 | 800 | 2.00 | 360 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 60 | 30 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 3/64 | 0.0469 | 58 | 29 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.20mm | 0.0472 | 58 | 29 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.25mm | 0.0492 | 56 | 28 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.30mm | 0.0512 | 54 | 27 | 1000 | -0.022 | 800 | 2.00 | 360 |
| #55 | 0.0520 | 52 | 26 | 1000 | -0.022 | 800 | 2.00 | 360 |
| 1.35mm | 0.0531 | 52 | 26 | 1000 | -0.022 | 800 | 2.00 | 360 |
| #54 | 0.0550 | 50 | 25 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.40mm | 0.0551 | 50 | 25 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.45mm | 0.0571 | 48 | 24 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.50mm | 0.0591 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| #53 | 0.0595 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| 1.55mm | 0.0610 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| 1/16 | 0.0625 | 44 | 22 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.60mm | 0.0630 | 44 | 22 | 1000 | -0.025 | 800 | 2.00 | 360 |
| #52 | 0.0635 | 42 | 21 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.65mm | 0.0650 | 42 | 21 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.70mm | 0.0669 | 42 | 21 | 1000 | -0.026 | 800 | 2.00 | 360 |
| #51 | 0.0670 | 42 | 21 | 1000 | -0.026 | 800 | 2.00 | 360 |
| 1.75mm | 0.0689 | 40 | 20 | 1000 | -0.026 | 800 | 2.00 | 360 |
| #50 | 0.0700 | 40 | 20 | 1000 | -0.026 | 800 | 2.00 | 366 |
| 1.80mm | 0.0709 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 371 |
| 1.85mm | 0.0728 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 381 |
| #49 | 0.0730 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 382 |
| 1.90mm | 0.0748 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 391 |
| #48 | 0.0760 | 40 | 20 | 1000 | -0.028 | 800 | 2.00 | 398 |
| 1.95mm | 0.0768 | 40 | 20 | 1000 | -0.028 | 800 | 2.00 | 402 |
| 5/64 | 0.0781 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 409 |
| #47 | 0.0785 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 411 |
| 2.00mm | 0.0787 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 412 |
| 2.05mm | 0.0807 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 422 |
| #46 | 0.0810 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 424 |
| #45 | 0.0820 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 429 |
| 2.10mm | 0.0827 | 36 | 20 | 1000 | -0.029 | 800 | 1.80 | 433 |
| 2.15mm | 0.0846 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 443 |
| #44 | 0.0860 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 450 |
| 2.20mm | 0.0866 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 453 |
| 2.25mm | 0.0886 | 36 | 20 | 1000 | -0.031 | 800 | 1.80 | 464 |
| #43 | 0.0890 | 36 | 20 | 1000 | -0.031 | 800 | 1.80 | 466 |
| 2.30mm | 0.0906 | 34 | 20 | 1000 | -0.031 | 800 | 1.70 | 474 |
| 2.35mm | 0.0925 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 484 |
| #42 | 0.0935 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 489 |
| 3/32 | 0.0938 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 491 |
| 2.40mm | 0.0945 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 495 |
| #41 | 0.0960 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 502 |
| 2.45mm | 0.0965 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 505 |
| #40 | 0.0980 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 513 |
| 2.50mm | 0.0984 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 515 |
| #39 | 0.0995 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 521 |
| 2.55mm | 0.1004 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 525 |
| #38 | 0.1015 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 531 |
| 2.60mm | 0.1024 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 536 |
| #37 | 0.1040 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 544 |
| 2.65mm | 0.1043 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 546 |
| 2.70mm | 0.1063 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 556 |
| #36 | 0.1065 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 557 |
| 2.75mm | 0.1083 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 567 |
| 7/64 | 0.1094 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 573 |
| #35 | 0.1100 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 576 |
| 2.80mm | 0.1102 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 577 |
| #34 | 0.1110 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 581 |
| 2.85mm | 0.1122 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 587 |
| #33 | 0.1130 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 591 |
| 2.90mm | 0.1142 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 598 |
| #32 | 0.1160 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 607 |
| 2.95mm | 0.1161 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 608 |
| 3.00mm | 0.1181 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 618 |
| #31 | 0.1200 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 628 |
| 3.05mm | 0.1201 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 629 |
| 3.10mm | 0.1220 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 638 |
| 3.15mm | 0.1240 | 32 | 20 | 1000 | -0.039 | 800 | 1.60 | 649 |
| 1/8 | 0.1250 | 32 | 20 | 1000 | -0.039 | 800 | 1.60 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 500 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 500 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 795 |
| 3.90mm | 0.1535 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 803 |
| #23 | 0.1540 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 806 |
| 3.95 | 0.1555 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 814 |
| 5/32 | 0.1562 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 817 |
| #22 | 0.1570 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 822 |
| 4.00mm | 0.1575 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 824 |
| #21 | 0.1590 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 832 |
| 4.05mm | 0.1594 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 834 |
| #20 | 0.1610 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 843 |
| 4.10mm | 0.1614 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 845 |
| 4.15mm | 0.1634 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 855 |
| 4.20mm | 0.1654 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 866 |
| #19 | 0.1660 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 869 |
| 4.25mm | 0.1673 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 876 |
| 4.30mm | 0.1693 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 886 |
| #18 | 0.1695 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 887 |
| 4.35mm | 0.1713 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 896 |
| 11/64 | 0.1719 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 900 |
| #17 | 0.1730 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 905 |
| 4.40mm | 0.1732 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 906 |
| 4.45mm | 0.1752 | 25 | 20 | 1000 | -0.022 | 500 | 1.25 | 917 |
| #16 | 0.1770 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 926 |
| 4.50mm | 0.1772 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 927 |
| 4.55mm | 0.1792 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 938 |
| #15 | 0.1800 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 942 |
| 4.60mm | 0.1811 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 948 |
| #14 | 0.1820 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 952 |
| 4.65mm | 0.1831 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 958 |
| #13 | 0.1850 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 968 |
| 4.70mm | 0.1850 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 968 |
| 4.75mm | 0.1870 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 979 |
| 3/16 | 0.1875 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

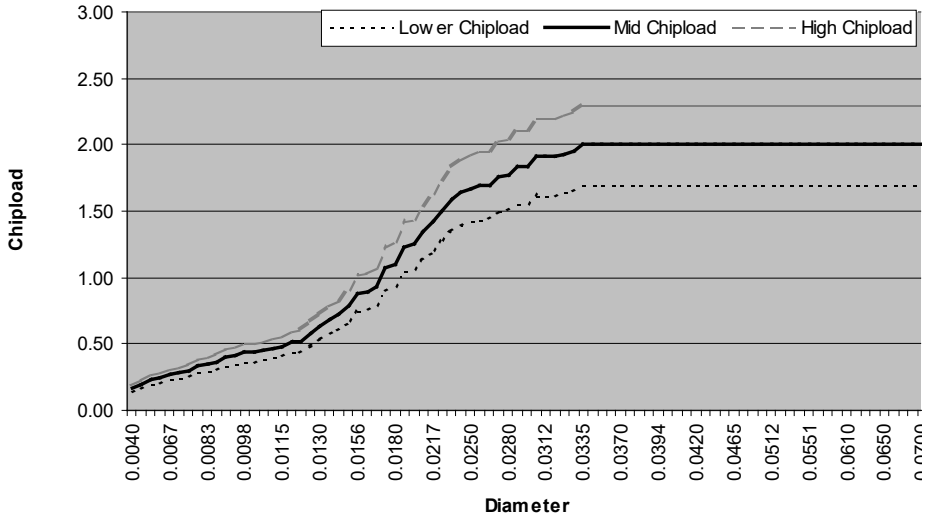
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 400 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 400 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Cyanate Ester




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# DUROID® / PTFE PCB Material

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**Recommended Drill Series:** 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 40 | 120 | 250 | -0.011 | 250 | 0.33 | 126 |
| 0.13mm | 0.0050 | 46 | 120 | 350 | -0.011 | 250 | 0.38 | 157 |
| 0.15mm | 0.0059 | 53 | 120 | 400 | -0.011 | 250 | 0.44 | 185 |
| #96 | 0.0063 | 60 | 120 | 400 | -0.011 | 250 | 0.50 | 198 |
| #95 | 0.0067 | 67 | 120 | 400 | -0.012 | 250 | 0.56 | 210 |
| #94 | 0.0071 | 73 | 120 | 500 | -0.012 | 250 | 0.61 | 223 |
| #93 | 0.0075 | 78 | 120 | 500 | -0.012 | 250 | 0.65 | 236 |
| #92 | 0.0079 | 84 | 120 | 500 | -0.012 | 300 | 0.70 | 248 |
| #91 | 0.0083 | 90 | 120 | 500 | -0.012 | 300 | 0.75 | 261 |
| #90 | 0.0087 | 96 | 120 | 500 | -0.012 | 300 | 0.80 | 273 |
| #89 | 0.0091 | 102 | 120 | 600 | -0.012 | 300 | 0.85 | 286 |
| #88 | 0.0095 | 104 | 120 | 600 | -0.012 | 300 | 0.87 | 298 |
| 0.25mm | 0.0098 | 105 | 120 | 600 | -0.012 | 400 | 0.88 | 308 |
| #87 | 0.0100 | 108 | 120 | 600 | -0.012 | 400 | 0.90 | 314 |
| #86 | 0.0105 | 110 | 120 | 700 | -0.012 | 400 | 0.92 | 330 |
| #85 | 0.0110 | 112 | 120 | 700 | -0.013 | 400 | 0.93 | 345 |
| #84 | 0.0115 | 113 | 116 | 700 | -0.013 | 400 | 0.97 | 350 |
| 0.30mm | 0.0118 | 113 | 113 | 700 | -0.013 | 400 | 1.00 | 350 |
| #83 | 0.0120 | 115 | 111 | 800 | -0.013 | 400 | 1.04 | 350 |
| #82 | 0.0125 | 116 | 107 | 800 | -0.013 | 400 | 1.08 | 350 |
| #81 | 0.0130 | 117 | 103 | 800 | -0.013 | 400 | 1.14 | 350 |
| #80 | 0.0135 | 119 | 99 | 800 | -0.013 | 500 | 1.20 | 350 |
| 0.35mm | 0.0138 | 119 | 97 | 800 | -0.013 | 500 | 1.23 | 350 |
| #79 | 0.0145 | 120 | 92 | 900 | -0.013 | 500 | 1.30 | 350 |
| 1/64 | 0.0156 | 120 | 86 | 900 | -0.014 | 500 | 1.40 | 350 |
| 0.40mm | 0.0158 | 121 | 85 | 900 | -0.014 | 500 | 1.42 | 350 |
| #78 | 0.0160 | 124 | 84 | 1000 | -0.014 | 500 | 1.48 | 350 |
| 0.45mm | 0.0177 | 126 | 76 | 1000 | -0.014 | 500 | 1.66 | 350 |
| #77 | 0.0180 | 128 | 74 | 1000 | -0.014 | 500 | 1.73 | 350 |
| 0.50mm | 0.0197 | 132 | 68 | 1000 | -0.015 | 500 | 1.94 | 350 |
| #76 | 0.0200 | 134 | 67 | 1000 | -0.015 | 500 | 2.00 | 350 |
| #75 | 0.0210 | 136 | 64 | 1000 | -0.015 | 600 | 2.13 | 350 |
| 0.55mm | 0.0217 | 138 | 62 | 1000 | -0.015 | 600 | 2.23 | 350 |
| #74 | 0.0225 | 140 | 59 | 1000 | -0.015 | 600 | 2.37 | 350 |
| 0.60mm | 0.0236 | 144 | 57 | 1000 | -0.016 | 600 | 2.53 | 350 |
| #73 | 0.0240 | 146 | 56 | 1000 | -0.016 | 600 | 2.61 | 350 |
| #72 | 0.0250 | 148 | 54 | 1000 | -0.016 | 600 | 2.74 | 350 |
| 0.65mm | 0.0256 | 150 | 52 | 1000 | -0.016 | 600 | 2.88 | 350 |
| #71 | 0.0260 | 150 | 51 | 1000 | -0.016 | 600 | 2.94 | 350 |
| 0.70mm | 0.0276 | 150 | 48 | 1000 | -0.016 | 600 | 3.13 | 350 |
| #70 | 0.0280 | 150 | 48 | 1000 | -0.017 | 600 | 3.13 | 350 |
| #69 | 0.0292 | 148 | 46 | 1000 | -0.017 | 700 | 3.22 | 350 |
| 0.75mm | 0.0295 | 146 | 45 | 1000 | -0.017 | 700 | 3.25 | 350 |
| #68 | 0.0310 | 140 | 43 | 1000 | -0.017 | 700 | 3.25 | 350 |
| 1/32 | 0.0312 | 140 | 43 | 1000 | -0.017 | 700 | 3.25 | 350 |
| 0.80mm | 0.0315 | 137 | 42 | 1000 | -0.017 | 700 | 3.25 | 350 |
| #67 | 0.0320 | 137 | 42 | 1000 | -0.017 | 700 | 3.25 | 350 |
| #66 | 0.0330 | 133 | 41 | 1000 | -0.018 | 700 | 3.25 | 350 |
| 0.85mm | 0.0335 | 130 | 40 | 1000 | -0.018 | 700 | 3.25 | 350 |
| #65 | 0.0350 | 124 | 38 | 1000 | -0.018 | 700 | 3.25 | 350 |
| 0.90mm | 0.0354 | 124 | 38 | 1000 | -0.018 | 700 | 3.25 | 350 |
| #64 | 0.0360 | 120 | 37 | 1000 | -0.018 | 700 | 3.25 | 350 |
| #63 | 0.0370 | 117 | 36 | 1000 | -0.019 | 700 | 3.25 | 350 |
| 0.95mm | 0.0374 | 117 | 36 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #62 | 0.0380 | 114 | 35 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #61 | 0.0390 | 111 | 34 | 1000 | -0.019 | 700 | 3.25 | 350 |
| 1.00mm | 0.0394 | 111 | 34 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #60 | 0.0400 | 107 | 33 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #59 | 0.0410 | 107 | 33 | 1000 | -0.020 | 700 | 3.25 | 350 |
| 1.05mm | 0.0413 | 104 | 32 | 1000 | -0.020 | 700 | 3.25 | 350 |
| #58 | 0.0420 | 104 | 32 | 1000 | -0.020 | 700 | 3.25 | 350 |
| #57 | 0.0430 | 101 | 31 | 1000 | -0.020 | 700 | 3.25 | 350 |
| 1.10mm | 0.0433 | 101 | 31 | 1000 | -0.020 | 700 | 3.25 | 350 |
| 1.15mm | 0.0453 | 98 | 30 | 1000 | -0.021 | 700 | 3.25 | 350 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 94 | 29 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 3/64 | 0.0469 | 94 | 29 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 1.20mm | 0.0472 | 91 | 28 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 1.25mm | 0.0492 | 88 | 27 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 1.30mm | 0.0512 | 85 | 26 | 1000 | -0.022 | 700 | 3.25 | 350 |
| #55 | 0.0520 | 85 | 26 | 1000 | -0.022 | 700 | 3.25 | 350 |
| 1.35mm | 0.0531 | 81 | 25 | 1000 | -0.022 | 700 | 3.25 | 350 |
| #54 | 0.0550 | 78 | 24 | 1000 | -0.023 | 700 | 3.25 | 350 |
| 1.40mm | 0.0551 | 78 | 24 | 1000 | -0.023 | 700 | 3.25 | 350 |
| 1.45mm | 0.0571 | 75 | 23 | 1000 | -0.023 | 700 | 3.25 | 350 |
| 1.50mm | 0.0591 | 75 | 23 | 1000 | -0.024 | 700 | 3.25 | 350 |
| #53 | 0.0595 | 72 | 22 | 1000 | -0.024 | 700 | 3.25 | 350 |
| 1.55mm | 0.0610 | 72 | 22 | 1000 | -0.024 | 700 | 3.25 | 350 |
| 1/16 | 0.0625 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| 1.60mm | 0.0630 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| #52 | 0.0635 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| 1.65mm | 0.0650 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| 1.70mm | 0.0669 | 65 | 20 | 1000 | -0.026 | 700 | 3.25 | 350 |
| #51 | 0.0670 | 65 | 20 | 1000 | -0.026 | 700 | 3.25 | 350 |
| 1.75mm | 0.0689 | 65 | 20 | 1000 | -0.026 | 700 | 3.25 | 361 |
| #50 | 0.0700 | 65 | 20 | 1000 | -0.026 | 600 | 3.25 | 366 |
| 1.80mm | 0.0709 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 371 |
| 1.85mm | 0.0728 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 381 |
| #49 | 0.0730 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 382 |
| 1.90mm | 0.0748 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 391 |
| #48 | 0.0760 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 398 |
| 1.95mm | 0.0768 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 402 |
| 5/64 | 0.0781 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 409 |
| #47 | 0.0785 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 411 |
| 2.00mm | 0.0787 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 412 |
| 2.05mm | 0.0807 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 422 |
| #46 | 0.0810 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 424 |
| #45 | 0.0820 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 429 |
| 2.10mm | 0.0827 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 433 |
| 2.15mm | 0.0846 | 65 | 20 | 1000 | -0.030 | 600 | 3.25 | 443 |
| #44 | 0.0860 | 65 | 20 | 1000 | -0.030 | 600 | 3.25 | 450 |
| 2.20mm | 0.0866 | 65 | 20 | 1000 | -0.030 | 600 | 3.25 | 453 |
| 2.25mm | 0.0886 | 65 | 20 | 1000 | -0.031 | 600 | 3.25 | 464 |
| #43 | 0.0890 | 65 | 20 | 1000 | -0.031 | 600 | 3.25 | 466 |
| 2.30mm | 0.0906 | 65 | 20 | 1000 | -0.031 | 600 | 3.25 | 474 |
| 2.35mm | 0.0925 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 484 |
| #42 | 0.0935 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 489 |
| 3/32 | 0.0938 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 491 |
| 2.40mm | 0.0945 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 495 |
| #41 | 0.0960 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 502 |
| 2.45mm | 0.0965 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 505 |
| #40 | 0.0980 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 513 |
| 2.50mm | 0.0984 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 515 |
| #39 | 0.0995 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 521 |
| 2.55mm | 0.1004 | 65 | 20 | 1000 | -0.033 | 500 | 3.25 | 525 |
| #38 | 0.1015 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 531 |
| 2.60mm | 0.1024 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 536 |
| #37 | 0.1040 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 544 |
| 2.65mm | 0.1043 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 546 |
| 2.70mm | 0.1063 | 65 | 20 | 1000 | -0.035 | 500 | 3.25 | 556 |
| #36 | 0.1065 | 65 | 20 | 1000 | -0.035 | 500 | 3.25 | 557 |
| 2.75mm | 0.1083 | 65 | 20 | 1000 | -0.035 | 500 | 3.25 | 567 |
| 7/64 | 0.1094 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 573 |
| #35 | 0.1100 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 576 |
| 2.80mm | 0.1102 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 577 |
| #34 | 0.1110 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 581 |
| 2.85mm | 0.1122 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 587 |
| #33 | 0.1130 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 591 |
| 2.90mm | 0.1142 | 65 | 20 | 1000 | -0.037 | 500 | 3.25 | 598 |
| #32 | 0.1160 | 65 | 20 | 1000 | -0.037 | 500 | 3.25 | 607 |
| 2.95mm | 0.1161 | 65 | 20 | 1000 | -0.037 | 500 | 3.25 | 608 |
| 3.00mm | 0.1181 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 618 |
| #31 | 0.1200 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 628 |
| 3.05mm | 0.1201 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 629 |
| 3.10mm | 0.1220 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 638 |
| 3.15mm | 0.1240 | 65 | 20 | 1000 | -0.039 | 500 | 3.25 | 649 |
| 1/8 | 0.1250 | 65 | 20 | 1000 | -0.039 | 500 | 3.25 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 50 | 20 | 1000 | -0.018 | 400 | 2.50 | 659 |
| 3.25mm | 0.1280 | 50 | 20 | 1000 | -0.018 | 400 | 2.50 | 670 |
| #30 | 0.1285 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 672 |
| 3.30mm | 0.1299 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 680 |
| 3.35mm | 0.1319 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 690 |
| 3.40mm | 0.1339 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 701 |
| 3.45mm | 0.1358 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 711 |
| #29 | 0.1360 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 712 |
| 3.50mm | 0.1378 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 721 |
| 3.55mm | 0.1398 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 732 |
| #28 | 0.1405 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 735 |
| 9/64 | 0.1406 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 736 |
| 3.60mm | 0.1417 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 742 |
| 3.65mm | 0.1437 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 752 |
| #27 | 0.1440 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 754 |
| 3.70mm | 0.1457 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 762 |
| #26 | 0.1470 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 769 |
| 3.75mm | 0.1476 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 772 |
| #25 | 0.1495 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 782 |
| 3.80mm | 0.1496 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 783 |
| 3.85mm | 0.1516 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 793 |
| #24 | 0.1520 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 795 |
| 3.90mm | 0.1535 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 803 |
| #23 | 0.1540 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 806 |
| 3.95 | 0.1555 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 814 |
| 5/32 | 0.1562 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 817 |
| #22 | 0.1570 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 822 |
| 4.00mm | 0.1575 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 824 |
| #21 | 0.1590 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 832 |
| 4.05mm | 0.1594 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 834 |
| #20 | 0.1610 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 843 |
| 4.10mm | 0.1614 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 845 |
| 4.15mm | 0.1634 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 855 |
| 4.20mm | 0.1654 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 866 |
| #19 | 0.1660 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 869 |
| 4.25mm | 0.1673 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 876 |
| 4.30mm | 0.1693 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 886 |
| #18 | 0.1695 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 887 |
| 4.35mm | 0.1713 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 896 |
| 11/64 | 0.1719 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 900 |
| #17 | 0.1730 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 905 |
| 4.40mm | 0.1732 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 906 |
| 4.45mm | 0.1752 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 917 |
| #16 | 0.1770 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 926 |
| 4.50mm | 0.1772 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 927 |
| 4.55mm | 0.1792 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 938 |
| #15 | 0.1800 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 942 |
| 4.60mm | 0.1811 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 948 |
| #14 | 0.1820 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 952 |
| 4.65mm | 0.1831 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 958 |
| #13 | 0.1850 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 968 |
| 4.70mm | 0.1850 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 968 |
| 4.75mm | 0.1870 | 36 | 20 | 1000 | -0.022 | 200 | 1.80 | 979 |
| 3/16 | 0.1875 | 36 | 20 | 1000 | -0.022 | 200 | 1.80 | 981 |
| 4.80mm | 0.1890 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 989 |
| #12 | 0.1890 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 989 |
| 4.85mm | 0.1909 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 999 |
| #11 | 0.1910 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1000 |
| 4.90mm | 0.1929 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1010 |
| #10 | 0.1935 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1013 |
| 4.95mm | 0.1949 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1020 |
| #9 | 0.1960 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1026 |
| 5.00mm | 0.1968 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1030 |
| 5.05mm | 0.1988 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1040 |
| #8 | 0.1990 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1041 |
| 5.10mm | 0.2008 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1051 |
| #7 | 0.2010 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1052 |
| 5.15mm | 0.2028 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1061 |
| 13/64 | 0.2031 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1063 |
| #6 | 0.2040 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1068 |
| 5.20mm | 0.2047 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1071 |
| #5 | 0.2055 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1075 |

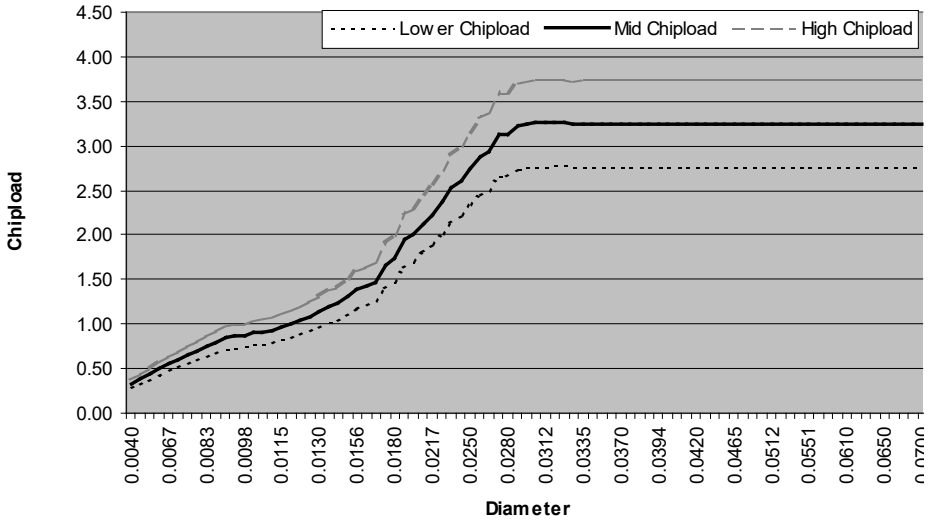
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1082 |
| 5.30mm | 0.2087 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1092 |
| #4 | 0.2090 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1094 |
| 5.35mm | 0.2106 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1102 |
| 5.40mm | 0.2126 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1113 |
| #3 | 0.2130 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1115 |
| 5.45mm | 0.2146 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1123 |
| 5.50mm | 0.2165 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1133 |
| 5.55mm | 0.2185 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1143 |
| 7/32 | 0.2188 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1145 |
| 5.60mm | 0.2205 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1154 |
| #2 | 0.2210 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1157 |
| 5.65mm | 0.2224 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1164 |
| 5.70mm | 0.2244 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1174 |
| 5.75mm | 0.2264 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1185 |
| #1 | 0.2280 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1193 |
| 5.80mm | 0.2283 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1195 |
| 5.85mm | 0.2302 | 32 | 20 | 1000 | -0.025 | 100 | 1.60 | 1205 |
| 5.90mm | 0.2323 | 32 | 20 | 1000 | -0.025 | 100 | 1.60 | 1216 |
| A | 0.2340 | 32 | 20 | 1000 | -0.025 | 100 | 1.60 | 1225 |
| 5.95mm | 0.2343 | 32 | 20 | 1000 | -0.026 | 100 | 1.60 | 1226 |
| 15/64 | 0.2344 | 32 | 20 | 1000 | -0.026 | 100 | 1.60 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for DUROID® / PTFE




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# DUROID® / PTFE Thick Panel PCB Material

(Panel Thickness > 0.200")

DUROID® is a registered trademark of Rogers Corporation

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 77 | 120 | 250 | -0.012 | 150 | 0.64 | 308 |
| #87 | 0.0100 | 77 | 120 | 350 | -0.012 | 150 | 0.64 | 314 |
| #86 | 0.0105 | 83 | 120 | 400 | -0.012 | 150 | 0.69 | 330 |
| #85 | 0.0110 | 89 | 120 | 400 | -0.013 | 150 | 0.74 | 345 |
| #84 | 0.0115 | 96 | 116 | 400 | -0.013 | 150 | 0.83 | 350 |
| 0.30mm | 0.0118 | 100 | 113 | 500 | -0.013 | 150 | 0.88 | 350 |
| #83 | 0.0120 | 102 | 111 | 500 | -0.013 | 150 | 0.92 | 350 |
| #82 | 0.0125 | 109 | 107 | 500 | -0.013 | 150 | 1.02 | 350 |
| #81 | 0.0130 | 115 | 103 | 500 | -0.013 | 150 | 1.12 | 350 |
| #80 | 0.0135 | 121 | 99 | 500 | -0.013 | 200 | 1.22 | 350 |
| 0.35mm | 0.0138 | 124 | 97 | 600 | -0.013 | 200 | 1.28 | 350 |
| #79 | 0.0145 | 128 | 92 | 600 | -0.013 | 200 | 1.39 | 350 |
| 1/64 | 0.0156 | 128 | 86 | 600 | -0.014 | 200 | 1.49 | 350 |
| 0.40mm | 0.0158 | 128 | 85 | 600 | -0.014 | 200 | 1.51 | 350 |
| #78 | 0.0160 | 128 | 84 | 700 | -0.014 | 200 | 1.52 | 350 |
| 0.45mm | 0.0177 | 130 | 76 | 700 | -0.014 | 200 | 1.71 | 350 |
| #77 | 0.0180 | 132 | 74 | 700 | -0.014 | 200 | 1.78 | 350 |
| 0.50mm | 0.0197 | 132 | 68 | 700 | -0.015 | 200 | 1.94 | 350 |
| #76 | 0.0200 | 132 | 67 | 800 | -0.015 | 200 | 1.97 | 350 |
| #75 | 0.0210 | 132 | 64 | 800 | -0.015 | 250 | 2.06 | 350 |
| 0.55mm | 0.0217 | 132 | 62 | 800 | -0.015 | 250 | 2.13 | 350 |
| #74 | 0.0225 | 132 | 59 | 800 | -0.015 | 250 | 2.24 | 350 |
| 0.60mm | 0.0236 | 133 | 57 | 800 | -0.016 | 250 | 2.33 | 350 |
| #73 | 0.0240 | 133 | 56 | 900 | -0.016 | 250 | 2.38 | 350 |
| #72 | 0.0250 | 133 | 54 | 900 | -0.016 | 250 | 2.46 | 350 |
| 0.65mm | 0.0256 | 133 | 52 | 900 | -0.016 | 250 | 2.56 | 350 |
| #71 | 0.0260 | 133 | 51 | 1000 | -0.016 | 250 | 2.61 | 350 |
| 0.70mm | 0.0276 | 132 | 48 | 1000 | -0.016 | 250 | 2.75 | 350 |
| #70 | 0.0280 | 132 | 48 | 1000 | -0.017 | 250 | 2.75 | 350 |
| #69 | 0.0292 | 130 | 46 | 1000 | -0.017 | 300 | 2.83 | 350 |
| 0.75mm | 0.0295 | 130 | 45 | 1000 | -0.017 | 300 | 2.89 | 350 |
| #68 | 0.0310 | 130 | 43 | 1000 | -0.017 | 300 | 3.02 | 350 |
| 1/32 | 0.0312 | 129 | 43 | 1000 | -0.017 | 300 | 3.00 | 350 |
| 0.80mm | 0.0315 | 129 | 42 | 1000 | -0.017 | 300 | 3.07 | 350 |
| #67 | 0.0320 | 128 | 42 | 1000 | -0.017 | 300 | 3.05 | 350 |
| #66 | 0.0330 | 128 | 41 | 1000 | -0.018 | 300 | 3.12 | 350 |
| 0.85mm | 0.0335 | 126 | 40 | 1000 | -0.018 | 300 | 3.15 | 350 |
| #65 | 0.0350 | 125 | 38 | 1000 | -0.018 | 300 | 3.29 | 350 |
| 0.90mm | 0.0354 | 125 | 38 | 1000 | -0.018 | 300 | 3.29 | 350 |
| #64 | 0.0360 | 124 | 37 | 1000 | -0.018 | 300 | 3.35 | 350 |
| #63 | 0.0370 | 123 | 36 | 1000 | -0.019 | 300 | 3.42 | 350 |
| 0.95mm | 0.0374 | 121 | 36 | 1000 | -0.019 | 300 | 3.36 | 350 |
| #62 | 0.0380 | 121 | 35 | 1000 | -0.019 | 300 | 3.46 | 350 |
| #61 | 0.0390 | 120 | 34 | 1000 | -0.019 | 300 | 3.53 | 350 |
| 1.00mm | 0.0394 | 120 | 34 | 1000 | -0.019 | 300 | 3.53 | 350 |
| #60 | 0.0400 | 120 | 33 | 1000 | -0.019 | 300 | 3.64 | 350 |
| #59 | 0.0410 | 119 | 33 | 1000 | -0.020 | 300 | 3.61 | 350 |
| 1.05mm | 0.0413 | 119 | 32 | 1000 | -0.020 | 300 | 3.72 | 350 |
| #58 | 0.0420 | 117 | 32 | 1000 | -0.020 | 300 | 3.66 | 350 |
| #57 | 0.0430 | 117 | 31 | 1000 | -0.020 | 300 | 3.77 | 350 |
| 1.10mm | 0.0433 | 117 | 31 | 1000 | -0.020 | 300 | 3.77 | 350 |
| 1.15mm | 0.0453 | 116 | 30 | 1000 | -0.021 | 300 | 3.87 | 350 |
| #56 | 0.0465 | 115 | 29 | 1000 | -0.021 | 300 | 3.97 | 350 |
| 3/64 | 0.0469 | 115 | 29 | 1000 | -0.021 | 300 | 3.97 | 350 |
| 1.20mm | 0.0472 | 115 | 28 | 1000 | -0.021 | 300 | 4.11 | 350 |
| 1.25mm | 0.0492 | 114 | 27 | 1000 | -0.021 | 300 | 4.22 | 350 |
| 1.30mm | 0.0512 | 109 | 26 | 1000 | -0.022 | 300 | 2.50 | 350 |
| #55 | 0.0520 | 109 | 26 | 1000 | -0.022 | 300 | 2.50 | 350 |
| 1.35mm | 0.0531 | 106 | 25 | 1000 | -0.022 | 300 | 2.50 | 350 |
| #54 | 0.0550 | 102 | 24 | 1000 | -0.023 | 300 | 2.50 | 350 |
| 1.40mm | 0.0551 | 102 | 24 | 1000 | -0.023 | 300 | 2.50 | 350 |
| 1.45mm | 0.0571 | 100 | 23 | 1000 | -0.023 | 300 | 4.35 | 350 |
| 1.50mm | 0.0591 | 96 | 23 | 1000 | -0.024 | 300 | 4.17 | 350 |
| #53 | 0.0595 | 93 | 22 | 1000 | -0.024 | 300 | 4.23 | 350 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 93 | 22 | 1000 | -0.024 | 300 | 4.23 | 350 |
| 1/16 | 0.0625 | 89 | 21 | 1000 | -0.025 | 300 | 4.24 | 350 |
| 1.60mm | 0.0630 | 89 | 21 | 1000 | -0.025 | 300 | 4.24 | 350 |
| #52 | 0.0635 | 89 | 21 | 1000 | -0.025 | 300 | 4.24 | 350 |
| 1.65mm | 0.0650 | 87 | 21 | 1000 | -0.025 | 300 | 4.14 | 350 |
| 1.70mm | 0.0669 | 83 | 20 | 1000 | -0.026 | 300 | 4.15 | 350 |
| #51 | 0.0670 | 83 | 20 | 1000 | -0.026 | 300 | 4.15 | 350 |
| 1.75mm | 0.0689 | 80 | 20 | 1000 | -0.026 | 300 | 4.00 | 361 |
| #50 | 0.0700 | 80 | 20 | 1000 | -0.026 | 250 | 4.00 | 366 |
| 1.80mm | 0.0709 | 80 | 20 | 1000 | -0.027 | 250 | 4.00 | 371 |
| 1.85mm | 0.0728 | 77 | 20 | 1000 | -0.027 | 250 | 3.85 | 381 |
| #49 | 0.0730 | 77 | 20 | 1000 | -0.027 | 250 | 3.85 | 382 |
| 1.90mm | 0.0748 | 74 | 20 | 1000 | -0.027 | 250 | 3.70 | 391 |
| #48 | 0.0760 | 74 | 20 | 1000 | -0.028 | 250 | 3.70 | 398 |
| 1.95mm | 0.0768 | 74 | 20 | 1000 | -0.028 | 250 | 3.70 | 402 |
| 5/64 | 0.0781 | 70 | 20 | 1000 | -0.028 | 250 | 3.50 | 409 |
| #47 | 0.0785 | 70 | 20 | 1000 | -0.028 | 250 | 3.50 | 411 |
| 2.00mm | 0.0787 | 70 | 20 | 1000 | -0.028 | 250 | 3.50 | 412 |
| 2.05mm | 0.0807 | 70 | 20 | 1000 | -0.029 | 250 | 3.50 | 422 |
| #46 | 0.0810 | 68 | 20 | 1000 | -0.029 | 250 | 3.40 | 424 |
| #45 | 0.0820 | 68 | 20 | 1000 | -0.029 | 250 | 3.40 | 429 |
| 2.10mm | 0.0827 | 68 | 20 | 1000 | -0.029 | 250 | 3.40 | 433 |
| 2.15mm | 0.0846 | 68 | 20 | 1000 | -0.030 | 250 | 3.40 | 443 |
| #44 | 0.0860 | 64 | 20 | 1000 | -0.030 | 250 | 3.20 | 450 |
| 2.20mm | 0.0866 | 64 | 20 | 1000 | -0.030 | 250 | 3.20 | 453 |
| 2.25mm | 0.0886 | 64 | 20 | 1000 | -0.031 | 250 | 3.20 | 464 |
| #43 | 0.0890 | 64 | 20 | 1000 | -0.031 | 250 | 3.20 | 466 |
| 2.30mm | 0.0906 | 64 | 20 | 1000 | -0.031 | 250 | 3.20 | 474 |
| 2.35mm | 0.0925 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 484 |
| #42 | 0.0935 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 489 |
| 3/32 | 0.0938 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 491 |
| 2.40mm | 0.0945 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 495 |
| #41 | 0.0960 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 502 |
| 2.45mm | 0.0965 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 505 |
| #40 | 0.0980 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 513 |
| 2.50mm | 0.0984 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 515 |
| #39 | 0.0995 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 521 |
| 2.55mm | 0.1004 | 64 | 20 | 1000 | -0.033 | 200 | 3.20 | 525 |
| #38 | 0.1015 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 531 |
| 2.60mm | 0.1024 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 536 |
| #37 | 0.1040 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 544 |
| 2.65mm | 0.1043 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 546 |
| 2.70mm | 0.1063 | 64 | 20 | 1000 | -0.035 | 200 | 3.20 | 556 |
| #36 | 0.1065 | 64 | 20 | 1000 | -0.035 | 200 | 3.20 | 557 |
| 2.75mm | 0.1083 | 64 | 20 | 1000 | -0.035 | 200 | 3.20 | 567 |
| 7/64 | 0.1094 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 573 |
| #35 | 0.1100 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 576 |
| 2.80mm | 0.1102 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 577 |
| #34 | 0.1110 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 581 |
| 2.85mm | 0.1122 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 587 |
| #33 | 0.1130 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 591 |
| 2.90mm | 0.1142 | 64 | 20 | 1000 | -0.037 | 200 | 3.20 | 598 |
| #32 | 0.1160 | 64 | 20 | 1000 | -0.037 | 200 | 3.20 | 607 |
| 2.95mm | 0.1161 | 64 | 20 | 1000 | -0.037 | 200 | 3.20 | 608 |
| 3.00mm | 0.1181 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 618 |
| #31 | 0.1200 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 628 |
| 3.05mm | 0.1201 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 629 |
| 3.10mm | 0.1220 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 638 |
| 3.15mm | 0.1240 | 64 | 20 | 1000 | -0.039 | 200 | 3.20 | 649 |
| 1/8 | 0.1250 | 64 | 20 | 1000 | -0.039 | 200 | 3.20 | 654 |
| 3.20mm | 0.1260 | 61 | 20 | 1000 | -0.018 | 150 | 3.05 | 659 |
| 3.25mm | 0.1280 | 61 | 20 | 1000 | -0.018 | 150 | 3.05 | 670 |
| #30 | 0.1285 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 672 |
| 3.30mm | 0.1299 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 680 |
| 3.35mm | 0.1319 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 690 |
| 3.40mm | 0.1339 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 701 |
| 3.45mm | 0.1358 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 711 |
| #29 | 0.1360 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 712 |
| 3.50mm | 0.1378 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 721 |
| 3.55mm | 0.1398 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 732 |
| #28 | 0.1405 | 57 | 20 | 1000 | -0.019 | 150 | 2.85 | 735 |
| 9/64 | 0.1406 | 57 | 20 | 1000 | -0.019 | 150 | 2.85 | 736 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

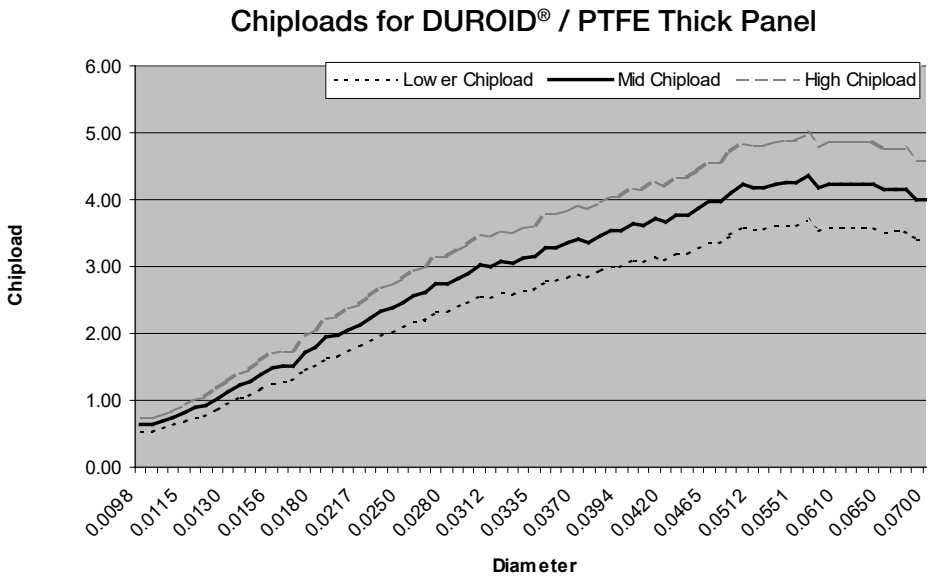
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 57 | 20 | 1000 | -0.019 | 150 | 2.85 | 742 |
| 3.65mm | 0.1437 | 57 | 20 | 1000 | -0.020 | 150 | 2.85 | 752 |
| #27 | 0.1440 | 57 | 20 | 1000 | -0.020 | 150 | 2.85 | 754 |
| 3.70mm | 0.1457 | 57 | 20 | 1000 | -0.020 | 150 | 2.85 | 762 |
| #26 | 0.1470 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 769 |
| 3.75mm | 0.1476 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 772 |
| #25 | 0.1495 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 782 |
| 3.80mm | 0.1496 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 783 |
| 3.85mm | 0.1516 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 793 |
| #24 | 0.1520 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 795 |
| 3.90mm | 0.1535 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 803 |
| #23 | 0.1540 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 806 |
| 3.95 | 0.1555 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 814 |
| 5/32 | 0.1562 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 817 |
| #22 | 0.1570 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 822 |
| 4.00mm | 0.1575 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 824 |
| #21 | 0.1590 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 832 |
| 4.05mm | 0.1594 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 834 |
| #20 | 0.1610 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 843 |
| 4.10mm | 0.1614 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 845 |
| 4.15mm | 0.1634 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 855 |
| 4.20mm | 0.1654 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 866 |
| #19 | 0.1660 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 869 |
| 4.25mm | 0.1673 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 876 |
| 4.30mm | 0.1693 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 886 |
| #18 | 0.1695 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 887 |
| 4.35mm | 0.1713 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 896 |
| 11/64 | 0.1719 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 900 |
| #17 | 0.1730 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 905 |
| 4.40mm | 0.1732 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 906 |
| 4.45mm | 0.1752 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 917 |
| #16 | 0.1770 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 926 |
| 4.50mm | 0.1772 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 927 |
| 4.55mm | 0.1792 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 938 |
| #15 | 0.1800 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 942 |
| 4.60mm | 0.1811 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 948 |
| #14 | 0.1820 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 952 |
| 4.65mm | 0.1831 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 958 |
| #13 | 0.1850 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 968 |
| 4.70mm | 0.1850 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 968 |
| 4.75mm | 0.1870 | 38 | 20 | 1000 | -0.022 | 100 | 1.90 | 979 |
| 3/16 | 0.1875 | 38 | 20 | 1000 | -0.022 | 100 | 1.90 | 981 |
| 4.80mm | 0.1890 | 38 | 20 | 1000 | -0.023 | 100 | 1.90 | 989 |
| #12 | 0.1890 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 989 |
| 4.85mm | 0.1909 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 999 |
| #11 | 0.1910 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1000 |
| 4.90mm | 0.1929 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1010 |
| #10 | 0.1935 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1013 |
| 4.95mm | 0.1949 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1020 |
| #9 | 0.1960 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1026 |
| 5.00mm | 0.1968 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1030 |
| 5.05mm | 0.1988 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1040 |
| #8 | 0.1990 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1041 |
| 5.10mm | 0.2008 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1051 |
| #7 | 0.2010 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1052 |
| 5.15mm | 0.2028 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1061 |
| 13/64 | 0.2031 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1063 |
| #6 | 0.2040 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1068 |
| 5.20mm | 0.2047 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1071 |
| #5 | 0.2055 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1075 |
| 5.25mm | 0.2067 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1082 |
| 5.30mm | 0.2087 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1092 |
| #4 | 0.2090 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1094 |
| 5.35mm | 0.2106 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1102 |
| 5.40mm | 0.2126 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1113 |
| #3 | 0.2130 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1115 |
| 5.45mm | 0.2146 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1123 |
| 5.50mm | 0.2165 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1133 |
| 5.55mm | 0.2185 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1143 |
| 7/32 | 0.2188 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1145 |
| 5.60mm | 0.2205 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1154 |
| #2 | 0.2210 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1157 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1164 |
| 5.70mm | 0.2244 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1174 |
| 5.75mm | 0.2264 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1185 |
| #1 | 0.2280 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1193 |
| 5.80mm | 0.2283 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1195 |
| 5.85mm | 0.2302 | 26 | 20 | 1000 | -0.025 | 50 | 1.30 | 1205 |
| 5.90mm | 0.2323 | 26 | 20 | 1000 | -0.025 | 50 | 1.30 | 1216 |
| A | 0.2340 | 26 | 20 | 1000 | -0.025 | 50 | 1.30 | 1225 |
| 5.95mm | 0.2343 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1226 |
| 15/64 | 0.2344 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1227 |
| 6.00mm | 0.2362 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1236 |
| B | 0.2380 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1246 |
| 6.05mm | 0.2382 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1247 |
| 6.10mm | 0.2402 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1257 |
| C | 0.2420 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1266 |
| 6.15mm | 0.2421 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1267 |
| 6.20mm | 0.2441 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1277 |
| D | 0.2460 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1287 |
| 6.25mm | 0.2461 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1288 |
| 6.30mm | 0.2480 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1298 |
| 6.35mm | 0.2500 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1308 |
| 6.40mm | 0.2520 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1319 |
| 6.50mm | 0.2559 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1339 |
| F | 0.2570 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1345 |
| 6.60mm | 0.2598 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Double-Sided PCB Material

## Recommended Drill Series: 100, 150, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 30 | 120 | 200 | -0.011 | 500 | 0.25 | 126 |
| 0.13mm | 0.0050 | 35 | 120 | 300 | -0.011 | 600 | 0.29 | 157 |
| 0.15mm | 0.0059 | 40 | 120 | 300 | -0.011 | 800 | 0.33 | 185 |
| #96 | 0.0063 | 45 | 120 | 400 | -0.011 | 800 | 0.38 | 198 |
| #95 | 0.0067 | 50 | 120 | 400 | -0.012 | 800 | 0.42 | 210 |
| #94 | 0.0071 | 55 | 120 | 500 | -0.012 | 1000 | 0.46 | 223 |
| #93 | 0.0075 | 60 | 120 | 500 | -0.012 | 1000 | 0.50 | 236 |
| #92 | 0.0079 | 65 | 120 | 500 | -0.012 | 1200 | 0.54 | 248 |
| #91 | 0.0083 | 70 | 120 | 600 | -0.012 | 1200 | 0.58 | 261 |
| #90 | 0.0087 | 75 | 120 | 600 | -0.012 | 1200 | 0.63 | 273 |
| #89 | 0.0091 | 80 | 120 | 700 | -0.012 | 1500 | 0.67 | 286 |
| #88 | 0.0095 | 85 | 120 | 700 | -0.012 | 1500 | 0.71 | 298 |
| 0.25mm | 0.0098 | 90 | 120 | 800 | -0.012 | 1500 | 0.75 | 308 |
| #87 | 0.0100 | 92 | 120 | 800 | -0.012 | 1500 | 0.77 | 314 |
| #86 | 0.0105 | 97 | 120 | 800 | -0.012 | 1500 | 0.81 | 330 |
| #85 | 0.0110 | 102 | 120 | 900 | -0.013 | 1700 | 0.85 | 345 |
| #84 | 0.0115 | 107 | 120 | 900 | -0.013 | 1700 | 0.89 | 361 |
| 0.30mm | 0.0118 | 110 | 120 | 1000 | -0.013 | 1700 | 0.92 | 371 |
| #83 | 0.0120 | 112 | 120 | 1000 | -0.013 | 1800 | 0.93 | 377 |
| #82 | 0.0125 | 117 | 120 | 1000 | -0.013 | 1800 | 0.98 | 393 |
| #81 | 0.0130 | 122 | 120 | 1000 | -0.013 | 1800 | 1.02 | 408 |
| #80 | 0.0135 | 127 | 120 | 1000 | -0.013 | 2000 | 1.06 | 424 |
| 0.35mm | 0.0138 | 130 | 120 | 1000 | -0.013 | 2000 | 1.08 | 433 |
| #79 | 0.0145 | 135 | 120 | 1000 | -0.013 | 2000 | 1.13 | 455 |
| 1/64 | 0.0156 | 140 | 120 | 1000 | -0.014 | 2000 | 1.17 | 490 |
| 0.40mm | 0.0158 | 142 | 120 | 1000 | -0.014 | 2000 | 1.18 | 496 |
| #78 | 0.0160 | 145 | 120 | 1000 | -0.014 | 2000 | 1.21 | 502 |
| 0.45mm | 0.0177 | 150 | 120 | 1000 | -0.014 | 2000 | 1.25 | 556 |
| #77 | 0.0180 | 153 | 120 | 1000 | -0.014 | 2000 | 1.28 | 565 |
| 0.50mm | 0.0197 | 160 | 117 | 1000 | -0.015 | 2000 | 1.37 | 600 |
| #76 | 0.0200 | 162 | 115 | 1000 | -0.015 | 2000 | 1.41 | 600 |
| #75 | 0.0210 | 165 | 109 | 1000 | -0.015 | 2000 | 1.51 | 600 |
| 0.55mm | 0.0217 | 170 | 106 | 1000 | -0.015 | 2000 | 1.60 | 600 |
| #74 | 0.0225 | 175 | 102 | 1000 | -0.015 | 2000 | 1.72 | 600 |
| 0.60mm | 0.0236 | 180 | 97 | 1000 | -0.016 | 2000 | 1.86 | 600 |
| #73 | 0.0240 | 185 | 96 | 1000 | -0.016 | 2000 | 1.93 | 600 |
| #72 | 0.0250 | 190 | 92 | 1000 | -0.016 | 2000 | 2.07 | 600 |
| 0.65mm | 0.0256 | 195 | 90 | 1000 | -0.016 | 2000 | 2.17 | 600 |
| #71 | 0.0260 | 200 | 88 | 1000 | -0.016 | 2000 | 2.27 | 600 |
| 0.70mm | 0.0276 | 200 | 83 | 1000 | -0.016 | 2000 | 2.41 | 600 |
| #70 | 0.0280 | 202 | 82 | 1000 | -0.017 | 2000 | 2.46 | 600 |
| #69 | 0.0292 | 205 | 79 | 1000 | -0.017 | 2000 | 2.59 | 600 |
| 0.75mm | 0.0295 | 206 | 78 | 1000 | -0.017 | 2000 | 2.64 | 600 |
| #68 | 0.0310 | 210 | 74 | 1000 | -0.017 | 2000 | 2.84 | 600 |
| 1/32 | 0.0312 | 212 | 73 | 1000 | -0.017 | 2000 | 2.90 | 600 |
| 0.80mm | 0.0315 | 215 | 73 | 1000 | -0.017 | 2000 | 2.95 | 600 |
| #67 | 0.0320 | 216 | 72 | 1000 | -0.017 | 2000 | 3.00 | 600 |
| #66 | 0.0330 | 210 | 70 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.85mm | 0.0335 | 204 | 68 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #65 | 0.0350 | 198 | 66 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.90mm | 0.0354 | 195 | 65 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #64 | 0.0360 | 192 | 64 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #63 | 0.0370 | 186 | 62 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 0.95mm | 0.0374 | 183 | 61 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #62 | 0.0380 | 180 | 60 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #61 | 0.0390 | 177 | 59 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 1.00mm | 0.0394 | 174 | 58 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #60 | 0.0400 | 171 | 57 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #59 | 0.0410 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.05mm | 0.0413 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #58 | 0.0420 | 165 | 55 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #57 | 0.0430 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.10mm | 0.0433 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.15mm | 0.0453 | 153 | 51 | 1000 | -0.021 | 2000 | 3.00 | 600 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 3/64 | 0.0469 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.20mm | 0.0472 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.25mm | 0.0492 | 141 | 47 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.30mm | 0.0512 | 135 | 45 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #55 | 0.0520 | 132 | 44 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| 1.35mm | 0.0531 | 129 | 43 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #54 | 0.0550 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.40mm | 0.0551 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.45mm | 0.0571 | 120 | 40 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.50mm | 0.0591 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| #53 | 0.0595 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1.55mm | 0.0610 | 114 | 38 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1/16 | 0.0625 | 111 | 37 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.60mm | 0.0630 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| #52 | 0.0635 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.65mm | 0.0650 | 105 | 35 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.70mm | 0.0669 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #51 | 0.0670 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.75mm | 0.0689 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #50 | 0.0700 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.80mm | 0.0709 | 96 | 32 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.85mm | 0.0728 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #49 | 0.0730 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.90mm | 0.0748 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #48 | 0.0760 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 1.95mm | 0.0768 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 5/64 | 0.0781 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| #47 | 0.0785 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.00mm | 0.0787 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.05mm | 0.0807 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #46 | 0.0810 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #45 | 0.0820 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.10mm | 0.0827 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.15mm | 0.0846 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| #44 | 0.0860 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.20mm | 0.0866 | 78 | 26 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.25mm | 0.0886 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| #43 | 0.0890 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.30mm | 0.0906 | 75 | 25 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.35mm | 0.0925 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #42 | 0.0935 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 3/32 | 0.0938 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.40mm | 0.0945 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #41 | 0.0960 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.45mm | 0.0965 | 72 | 24 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #40 | 0.0980 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| 2.50mm | 0.0984 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #39 | 0.0995 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| 2.55mm | 0.1004 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| #38 | 0.1015 | 69 | 23 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.60mm | 0.1024 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| #37 | 0.1040 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.65mm | 0.1043 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.70mm | 0.1063 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| #36 | 0.1065 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 2.75mm | 0.1083 | 63 | 21 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 7/64 | 0.1094 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #35 | 0.1100 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.80mm | 0.1102 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #34 | 0.1110 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 600 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1500 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 659 |
| 3.25mm | 0.1280 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 670 |
| #30 | 0.1285 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 672 |
| 3.30mm | 0.1299 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 680 |
| 3.35mm | 0.1319 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 690 |
| 3.40mm | 0.1339 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 701 |
| 3.45mm | 0.1358 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 711 |
| #29 | 0.1360 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 712 |
| 3.50mm | 0.1378 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 721 |
| 3.55mm | 0.1398 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 732 |
| #28 | 0.1405 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 735 |
| 9/64 | 0.1406 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 736 |
| 3.60mm | 0.1417 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 742 |
| 3.65mm | 0.1437 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 752 |
| #27 | 0.1440 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 754 |
| 3.70mm | 0.1457 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 762 |
| #26 | 0.1470 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 769 |
| 3.75mm | 0.1476 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 772 |
| #25 | 0.1495 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 782 |
| 3.80mm | 0.1496 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 783 |
| 3.85mm | 0.1516 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 793 |
| #24 | 0.1520 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 795 |
| 3.90mm | 0.1535 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 803 |
| #23 | 0.1540 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 806 |
| 3.95 | 0.1555 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 814 |
| 5/32 | 0.1562 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 817 |
| #22 | 0.1570 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 822 |
| 4.00mm | 0.1575 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 824 |
| #21 | 0.1590 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 832 |
| 4.05mm | 0.1594 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 834 |
| #20 | 0.1610 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 843 |
| 4.10mm | 0.1614 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 845 |
| 4.15mm | 0.1634 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 855 |
| 4.20mm | 0.1654 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 866 |
| #19 | 0.1660 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 869 |
| 4.25mm | 0.1673 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 876 |
| 4.30mm | 0.1693 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 886 |
| #18 | 0.1695 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 887 |
| 4.35mm | 0.1713 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 896 |
| 11/64 | 0.1719 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 900 |
| #17 | 0.1730 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 905 |
| 4.40mm | 0.1732 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 906 |
| 4.45mm | 0.1752 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 917 |
| #16 | 0.1770 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 926 |
| 4.50mm | 0.1772 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 927 |
| 4.55mm | 0.1792 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 938 |
| #15 | 0.1800 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 942 |
| 4.60mm | 0.1811 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 948 |
| #14 | 0.1820 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 952 |
| 4.65mm | 0.1831 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 958 |
| #13 | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.70mm | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.75mm | 0.1870 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 979 |
| 3/16 | 0.1875 | 45 | 20 | 1000 | -0.022 | 1000 | 2.25 | 981 |
| 4.80mm | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| #12 | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| 4.85mm | 0.1909 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 999 |
| #11 | 0.1910 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1000 |
| 4.90mm | 0.1929 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1010 |
| #10 | 0.1935 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1013 |
| 4.95mm | 0.1949 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1020 |
| #9 | 0.1960 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1026 |
| 5.00mm | 0.1968 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1030 |
| 5.05mm | 0.1988 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1040 |
| #8 | 0.1990 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1041 |
| 5.10mm | 0.2008 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1051 |
| #7 | 0.2010 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1052 |
| 5.15mm | 0.2028 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1061 |
| 13/64 | 0.2031 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1063 |
| #6 | 0.2040 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1068 |
| 5.20mm | 0.2047 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1071 |
| #5 | 0.2055 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1075 |

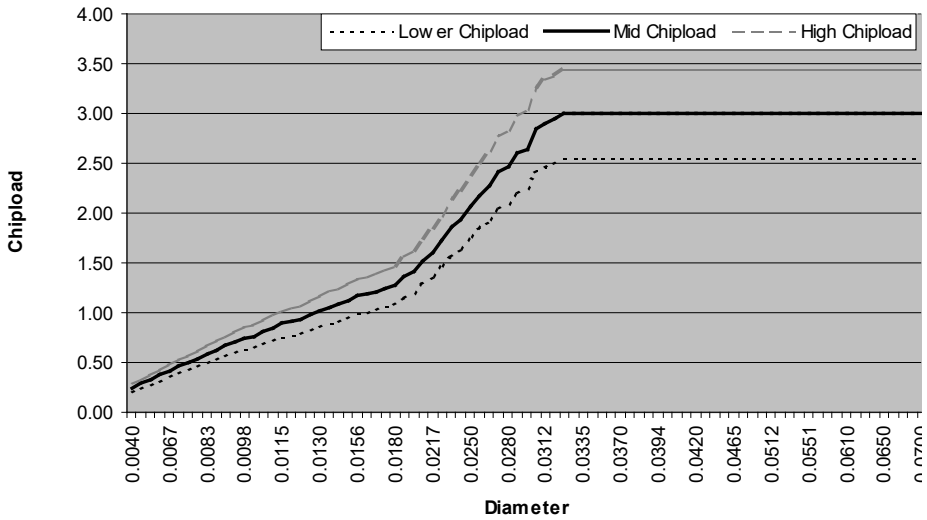
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1082 |
| 5.30mm | 0.2087 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1092 |
| #4 | 0.2090 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1094 |
| 5.35mm | 0.2106 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1102 |
| 5.40mm | 0.2126 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1113 |
| #3 | 0.2130 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1115 |
| 5.45mm | 0.2146 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1123 |
| 5.50mm | 0.2165 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1133 |
| 5.55mm | 0.2185 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1143 |
| 7/32 | 0.2188 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1145 |
| 5.60mm | 0.2205 | 40 | 20 | 1000 | -0.025 | 600 | 2.00 | 1154 |
| #2 | 0.2210 | 35 | 20 | 1000 | -0.025 | 600 | 1.75 | 1157 |
| 5.65mm | 0.2224 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1164 |
| 5.70mm | 0.2244 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1174 |
| 5.75mm | 0.2264 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1185 |
| #1 | 0.2280 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1193 |
| 5.80mm | 0.2283 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1195 |
| 5.85mm | 0.2302 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1205 |
| 5.90mm | 0.2323 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1216 |
| A | 0.2340 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1225 |
| 5.95mm | 0.2343 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1226 |
| 15/64 | 0.2344 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1227 |
| 6.00mm | 0.2362 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1236 |
| B | 0.2380 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1246 |
| 6.05mm | 0.2382 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Double-Sided




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Multilayer High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 25 | 120 | 200 | -0.011 | 400 | 0.21 | 126 |
| 0.13mm | 0.0050 | 30 | 120 | 300 | -0.011 | 400 | 0.25 | 157 |
| 0.15mm | 0.0059 | 36 | 120 | 300 | -0.011 | 400 | 0.30 | 185 |
| #96 | 0.0063 | 40 | 120 | 400 | -0.011 | 400 | 0.33 | 198 |
| #95 | 0.0067 | 44 | 120 | 400 | -0.012 | 400 | 0.37 | 210 |
| #94 | 0.0071 | 48 | 120 | 500 | -0.012 | 400 | 0.40 | 223 |
| #93 | 0.0075 | 52 | 120 | 500 | -0.012 | 400 | 0.43 | 236 |
| #92 | 0.0079 | 56 | 120 | 500 | -0.012 | 600 | 0.47 | 248 |
| #91 | 0.0083 | 60 | 120 | 600 | -0.012 | 600 | 0.50 | 261 |
| #90 | 0.0087 | 64 | 120 | 600 | -0.012 | 600 | 0.53 | 273 |
| #89 | 0.0091 | 68 | 120 | 700 | -0.012 | 600 | 0.57 | 286 |
| #88 | 0.0095 | 72 | 120 | 700 | -0.012 | 600 | 0.60 | 298 |
| 0.25mm | 0.0098 | 76 | 120 | 800 | -0.012 | 800 | 0.63 | 308 |
| #87 | 0.0100 | 80 | 120 | 800 | -0.012 | 800 | 0.67 | 314 |
| #86 | 0.0105 | 84 | 120 | 800 | -0.012 | 800 | 0.70 | 330 |
| #85 | 0.0110 | 88 | 120 | 900 | -0.013 | 800 | 0.73 | 345 |
| #84 | 0.0115 | 92 | 120 | 900 | -0.013 | 800 | 0.77 | 361 |
| 0.30mm | 0.0118 | 96 | 120 | 1000 | -0.013 | 1000 | 0.80 | 371 |
| #83 | 0.0120 | 100 | 120 | 1000 | -0.013 | 1000 | 0.83 | 377 |
| #82 | 0.0125 | 104 | 120 | 1000 | -0.013 | 1000 | 0.87 | 393 |
| #81 | 0.0130 | 108 | 120 | 1000 | -0.013 | 1000 | 0.90 | 408 |
| #80 | 0.0135 | 113 | 120 | 1000 | -0.013 | 1200 | 0.94 | 424 |
| 0.35mm | 0.0138 | 115 | 120 | 1000 | -0.013 | 1200 | 0.96 | 433 |
| #79 | 0.0145 | 119 | 119 | 1000 | -0.013 | 1200 | 1.00 | 450 |
| 1/64 | 0.0156 | 120 | 110 | 1000 | -0.014 | 1200 | 1.09 | 450 |
| 0.40mm | 0.0158 | 120 | 109 | 1000 | -0.014 | 1200 | 1.10 | 450 |
| #78 | 0.0160 | 122 | 107 | 1000 | -0.014 | 1200 | 1.14 | 450 |
| 0.45mm | 0.0177 | 123 | 97 | 1000 | -0.014 | 1200 | 1.27 | 450 |
| #77 | 0.0180 | 124 | 96 | 1000 | -0.014 | 1200 | 1.29 | 450 |
| 0.50mm | 0.0197 | 125 | 87 | 1000 | -0.015 | 1200 | 1.44 | 450 |
| #76 | 0.0200 | 126 | 86 | 1000 | -0.015 | 1200 | 1.47 | 450 |
| #75 | 0.0210 | 126 | 82 | 1000 | -0.015 | 1200 | 1.54 | 450 |
| 0.55mm | 0.0217 | 126 | 79 | 1000 | -0.015 | 1200 | 1.59 | 450 |
| #74 | 0.0225 | 125 | 76 | 1000 | -0.015 | 1200 | 1.64 | 450 |
| 0.60mm | 0.0236 | 124 | 73 | 1000 | -0.016 | 1200 | 1.70 | 450 |
| #73 | 0.0240 | 124 | 72 | 1000 | -0.016 | 1200 | 1.72 | 450 |
| #72 | 0.0250 | 123 | 69 | 1000 | -0.016 | 1200 | 1.78 | 450 |
| 0.65mm | 0.0256 | 122 | 67 | 1000 | -0.016 | 1200 | 1.82 | 450 |
| #71 | 0.0260 | 122 | 66 | 1000 | -0.016 | 1200 | 1.85 | 450 |
| 0.70mm | 0.0276 | 120 | 62 | 1000 | -0.016 | 1200 | 1.94 | 450 |
| #70 | 0.0280 | 120 | 61 | 1000 | -0.017 | 1200 | 1.97 | 450 |
| #69 | 0.0292 | 119 | 59 | 1000 | -0.017 | 1200 | 2.02 | 450 |
| 0.75mm | 0.0295 | 119 | 58 | 1000 | -0.017 | 1200 | 2.05 | 450 |
| #68 | 0.0310 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 1/32 | 0.0312 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 0.80mm | 0.0315 | 115 | 55 | 1000 | -0.017 | 1500 | 2.09 | 450 |
| #67 | 0.0320 | 114 | 54 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| #66 | 0.0330 | 113 | 52 | 1000 | -0.018 | 1500 | 2.17 | 450 |
| 0.85mm | 0.0335 | 113 | 51 | 1000 | -0.018 | 1500 | 2.22 | 450 |
| #65 | 0.0350 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| 0.90mm | 0.0354 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| #64 | 0.0360 | 112 | 48 | 1000 | -0.018 | 1500 | 2.33 | 450 |
| #63 | 0.0370 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| 0.95mm | 0.0374 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| #62 | 0.0380 | 110 | 45 | 1000 | -0.019 | 1500 | 2.44 | 450 |
| #61 | 0.0390 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| 1.00mm | 0.0394 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| #60 | 0.0400 | 107 | 43 | 1000 | -0.019 | 1500 | 2.49 | 450 |
| #59 | 0.0410 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.05mm | 0.0413 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #58 | 0.0420 | 103 | 41 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #57 | 0.0430 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.10mm | 0.0433 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.15mm | 0.0453 | 95 | 38 | 1000 | -0.021 | 1500 | 2.50 | 450 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 3/64 | 0.0469 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.20mm | 0.0472 | 90 | 36 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.25mm | 0.0492 | 88 | 35 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| #55 | 0.0520 | 83 | 33 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| 1.35mm | 0.0531 | 80 | 32 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #54 | 0.0550 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.40mm | 0.0551 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.45mm | 0.0571 | 75 | 30 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.50mm | 0.0591 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1.55mm | 0.0610 | 70 | 28 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.60mm | 0.0630 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| #52 | 0.0635 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.65mm | 0.0650 | 65 | 26 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.80mm | 0.0709 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.85mm | 0.0728 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #49 | 0.0730 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.90mm | 0.0748 | 58 | 23 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #48 | 0.0760 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 1.95mm | 0.0768 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 5/64 | 0.0781 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| #47 | 0.0785 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.00mm | 0.0787 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.05mm | 0.0807 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #46 | 0.0810 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #45 | 0.0820 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.10mm | 0.0827 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1075 |

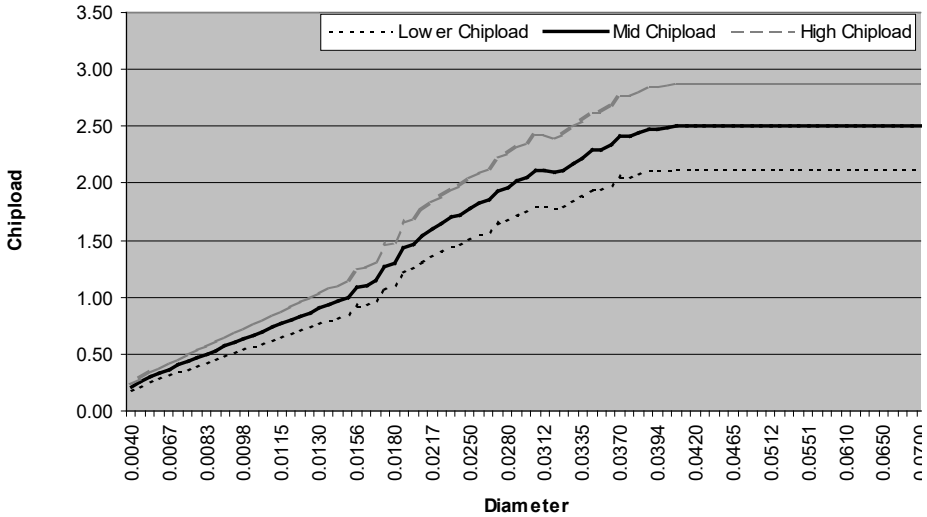
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Multilayer High Tg




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Multilayer Low Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 36 | 120 | 200 | -0.011 | 500 | 0.30 | 126 |
| 0.13mm | 0.0050 | 42 | 120 | 300 | -0.011 | 600 | 0.35 | 157 |
| 0.15mm | 0.0059 | 46 | 120 | 300 | -0.011 | 600 | 0.38 | 185 |
| #96 | 0.0063 | 50 | 120 | 400 | -0.011 | 600 | 0.42 | 198 |
| #95 | 0.0067 | 52 | 120 | 400 | -0.012 | 600 | 0.43 | 210 |
| #94 | 0.0071 | 56 | 120 | 500 | -0.012 | 600 | 0.47 | 223 |
| #93 | 0.0075 | 60 | 120 | 500 | -0.012 | 600 | 0.50 | 236 |
| #92 | 0.0079 | 64 | 120 | 500 | -0.012 | 800 | 0.53 | 248 |
| #91 | 0.0083 | 68 | 120 | 600 | -0.012 | 800 | 0.57 | 261 |
| #90 | 0.0087 | 72 | 120 | 600 | -0.012 | 800 | 0.60 | 273 |
| #89 | 0.0091 | 76 | 120 | 700 | -0.012 | 800 | 0.63 | 286 |
| #88 | 0.0095 | 80 | 120 | 700 | -0.012 | 800 | 0.67 | 298 |
| 0.25mm | 0.0098 | 84 | 120 | 800 | -0.012 | 1000 | 0.70 | 308 |
| #87 | 0.0100 | 86 | 120 | 800 | -0.012 | 1000 | 0.72 | 314 |
| #86 | 0.0105 | 90 | 120 | 800 | -0.012 | 1000 | 0.75 | 330 |
| #85 | 0.0110 | 95 | 120 | 900 | -0.013 | 1000 | 0.79 | 345 |
| #84 | 0.0115 | 100 | 120 | 900 | -0.013 | 1000 | 0.83 | 361 |
| 0.30mm | 0.0118 | 105 | 120 | 1000 | -0.013 | 1200 | 0.88 | 371 |
| #83 | 0.0120 | 110 | 120 | 1000 | -0.013 | 1200 | 0.92 | 377 |
| #82 | 0.0125 | 115 | 120 | 1000 | -0.013 | 1200 | 0.96 | 393 |
| #81 | 0.0130 | 120 | 120 | 1000 | -0.013 | 1200 | 1.00 | 408 |
| #80 | 0.0135 | 125 | 120 | 1000 | -0.013 | 1500 | 1.04 | 424 |
| 0.35mm | 0.0138 | 128 | 120 | 1000 | -0.013 | 1500 | 1.07 | 433 |
| #79 | 0.0145 | 132 | 120 | 1000 | -0.013 | 1500 | 1.10 | 455 |
| 1/64 | 0.0156 | 138 | 120 | 1000 | -0.014 | 1500 | 1.15 | 490 |
| 0.40mm | 0.0158 | 140 | 120 | 1000 | -0.014 | 1500 | 1.17 | 496 |
| #78 | 0.0160 | 142 | 120 | 1000 | -0.014 | 1500 | 1.18 | 502 |
| 0.45mm | 0.0177 | 150 | 120 | 1000 | -0.014 | 1500 | 1.25 | 550 |
| #77 | 0.0180 | 152 | 117 | 1000 | -0.014 | 1500 | 1.30 | 550 |
| 0.50mm | 0.0197 | 154 | 107 | 1000 | -0.015 | 1500 | 1.44 | 550 |
| #76 | 0.0200 | 155 | 105 | 1000 | -0.015 | 1500 | 1.48 | 550 |
| #75 | 0.0210 | 156 | 100 | 1000 | -0.015 | 1500 | 1.56 | 550 |
| 0.55mm | 0.0217 | 158 | 97 | 1000 | -0.015 | 1500 | 1.63 | 550 |
| #74 | 0.0225 | 160 | 93 | 1000 | -0.015 | 1500 | 1.72 | 550 |
| 0.60mm | 0.0236 | 162 | 89 | 1000 | -0.016 | 1500 | 1.82 | 550 |
| #73 | 0.0240 | 162 | 88 | 1000 | -0.016 | 1500 | 1.84 | 550 |
| #72 | 0.0250 | 163 | 84 | 1000 | -0.016 | 1500 | 1.94 | 550 |
| 0.65mm | 0.0256 | 164 | 82 | 1000 | -0.016 | 1500 | 2.00 | 550 |
| #71 | 0.0260 | 165 | 81 | 1000 | -0.016 | 1500 | 2.04 | 550 |
| 0.70mm | 0.0276 | 166 | 76 | 1000 | -0.016 | 1500 | 2.18 | 550 |
| #70 | 0.0280 | 166 | 75 | 1000 | -0.017 | 1500 | 2.21 | 550 |
| #69 | 0.0292 | 166 | 72 | 1000 | -0.017 | 1500 | 2.31 | 550 |
| 0.75mm | 0.0295 | 166 | 71 | 1000 | -0.017 | 1500 | 2.34 | 550 |
| #68 | 0.0310 | 166 | 68 | 1000 | -0.017 | 1500 | 2.44 | 550 |
| 1/32 | 0.0312 | 166 | 67 | 1000 | -0.017 | 1500 | 2.48 | 550 |
| 0.80mm | 0.0315 | 166 | 67 | 1000 | -0.017 | 1500 | 2.48 | 550 |
| #67 | 0.0320 | 166 | 66 | 1000 | -0.017 | 1500 | 2.52 | 550 |
| #66 | 0.0330 | 164 | 64 | 1000 | -0.018 | 1500 | 2.56 | 550 |
| 0.85mm | 0.0335 | 163 | 63 | 1000 | -0.018 | 1500 | 2.59 | 550 |
| #65 | 0.0350 | 160 | 60 | 1000 | -0.018 | 1500 | 2.67 | 550 |
| 0.90mm | 0.0354 | 160 | 59 | 1000 | -0.018 | 1500 | 2.71 | 550 |
| #64 | 0.0360 | 159 | 58 | 1000 | -0.018 | 1500 | 2.74 | 550 |
| #63 | 0.0370 | 158 | 57 | 1000 | -0.019 | 1500 | 2.77 | 550 |
| 0.95mm | 0.0374 | 158 | 56 | 1000 | -0.019 | 1500 | 2.82 | 550 |
| #62 | 0.0380 | 156 | 55 | 1000 | -0.019 | 1500 | 2.84 | 550 |
| #61 | 0.0390 | 155 | 54 | 1000 | -0.019 | 1500 | 2.87 | 550 |
| 1.00mm | 0.0394 | 155 | 53 | 1000 | -0.019 | 1500 | 2.92 | 550 |
| #60 | 0.0400 | 154 | 53 | 1000 | -0.019 | 1500 | 2.91 | 550 |
| #59 | 0.0410 | 153 | 51 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.05mm | 0.0413 | 153 | 51 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| #58 | 0.0420 | 150 | 50 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| #57 | 0.0430 | 147 | 49 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.10mm | 0.0433 | 147 | 49 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.15mm | 0.0453 | 138 | 46 | 1000 | -0.021 | 1500 | 3.00 | 550 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 3/64 | 0.0469 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.20mm | 0.0472 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.25mm | 0.0492 | 129 | 43 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.30mm | 0.0512 | 123 | 41 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| #55 | 0.0520 | 120 | 40 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| 1.35mm | 0.0531 | 120 | 40 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| #54 | 0.0550 | 114 | 38 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.40mm | 0.0551 | 114 | 38 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.45mm | 0.0571 | 111 | 37 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.50mm | 0.0591 | 108 | 36 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| #53 | 0.0595 | 105 | 35 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| 1.55mm | 0.0610 | 102 | 34 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| 1/16 | 0.0625 | 102 | 34 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.60mm | 0.0630 | 99 | 33 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| #52 | 0.0635 | 99 | 33 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.65mm | 0.0650 | 96 | 32 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.70mm | 0.0669 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| #51 | 0.0670 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| 1.75mm | 0.0689 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| #50 | 0.0700 | 90 | 30 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| 1.80mm | 0.0709 | 90 | 30 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| 1.85mm | 0.0728 | 87 | 29 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| #49 | 0.0730 | 87 | 29 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| 1.90mm | 0.0748 | 84 | 28 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| #48 | 0.0760 | 84 | 28 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 1.95mm | 0.0768 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 5/64 | 0.0781 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| #47 | 0.0785 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 2.00mm | 0.0787 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 2.05mm | 0.0807 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| #46 | 0.0810 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| #45 | 0.0820 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| 2.10mm | 0.0827 | 75 | 25 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| 2.15mm | 0.0846 | 75 | 25 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| #44 | 0.0860 | 72 | 24 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| 2.20mm | 0.0866 | 72 | 24 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| 2.25mm | 0.0886 | 72 | 24 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| #43 | 0.0890 | 72 | 24 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| 2.30mm | 0.0906 | 69 | 23 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| 2.35mm | 0.0925 | 69 | 23 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| #42 | 0.0935 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 3/32 | 0.0938 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 2.40mm | 0.0945 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| #41 | 0.0960 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 2.45mm | 0.0965 | 66 | 22 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #40 | 0.0980 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| 2.50mm | 0.0984 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #39 | 0.0995 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| 2.55mm | 0.1004 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #38 | 0.1015 | 63 | 21 | 1000 | -0.034 | 1500 | 3.00 | 550 |
| 2.60mm | 0.1024 | 63 | 21 | 1000 | -0.034 | 1500 | 3.00 | 550 |
| #37 | 0.1040 | 60 | 20 | 1000 | -0.034 | 1200 | 3.00 | 550 |
| 2.65mm | 0.1043 | 60 | 20 | 1000 | -0.034 | 1200 | 3.00 | 550 |
| 2.70mm | 0.1063 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 550 |
| #36 | 0.1065 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 557 |
| 2.75mm | 0.1083 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 567 |
| 7/64 | 0.1094 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 573 |
| #35 | 0.1100 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 576 |
| 2.80mm | 0.1102 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 577 |
| #34 | 0.1110 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 581 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 587 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 591 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 598 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 1000 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 1000 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

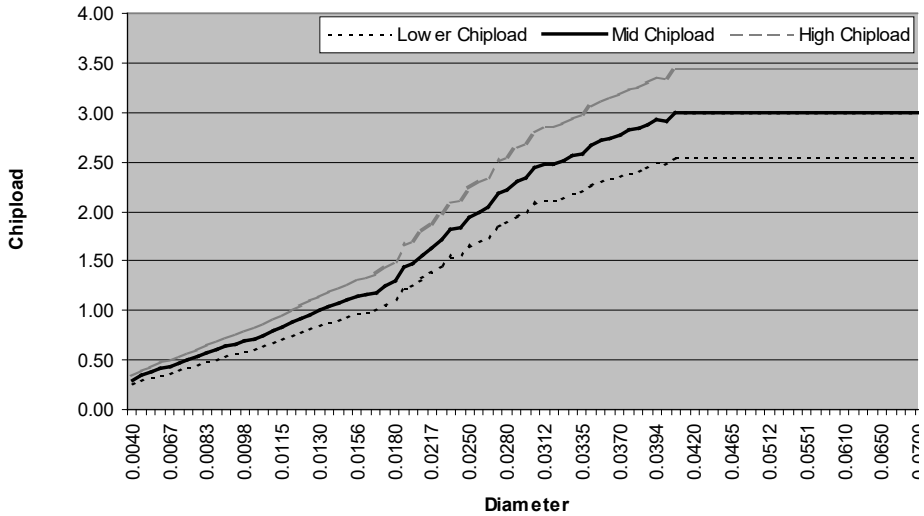
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Multilayer Low Tg




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Thick Panel PCB Material

(Panel Thickness > 0.200")

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 60 | 120 | 800 | -0.012 | 750 | 0.50 | 308 |
| #87 | 0.0100 | 60 | 120 | 800 | -0.012 | 750 | 0.50 | 314 |
| #86 | 0.0105 | 65 | 120 | 800 | -0.012 | 750 | 0.54 | 330 |
| #85 | 0.0110 | 70 | 120 | 900 | -0.013 | 750 | 0.58 | 345 |
| #84 | 0.0115 | 75 | 120 | 900 | -0.013 | 750 | 0.63 | 361 |
| 0.30mm | 0.0118 | 78 | 120 | 1000 | -0.013 | 750 | 0.65 | 371 |
| #83 | 0.0120 | 80 | 120 | 1000 | -0.013 | 750 | 0.67 | 377 |
| #82 | 0.0125 | 85 | 120 | 1000 | -0.013 | 750 | 0.71 | 393 |
| #81 | 0.0130 | 90 | 120 | 1000 | -0.013 | 750 | 0.75 | 408 |
| #80 | 0.0135 | 95 | 120 | 1000 | -0.013 | 1000 | 0.79 | 450 |
| 0.35mm | 0.0138 | 97 | 120 | 1000 | -0.013 | 1000 | 0.81 | 450 |
| #79 | 0.0145 | 100 | 119 | 1000 | -0.013 | 1000 | 0.84 | 450 |
| 1/64 | 0.0156 | 100 | 110 | 1000 | -0.014 | 1000 | 0.91 | 450 |
| 0.40mm | 0.0158 | 100 | 109 | 1000 | -0.014 | 1000 | 0.92 | 450 |
| #78 | 0.0160 | 100 | 107 | 1000 | -0.014 | 1000 | 0.93 | 450 |
| 0.45mm | 0.0177 | 102 | 97 | 1000 | -0.014 | 1000 | 1.05 | 450 |
| #77 | 0.0180 | 103 | 96 | 1000 | -0.014 | 1000 | 1.07 | 450 |
| 0.50mm | 0.0197 | 103 | 88 | 1000 | -0.015 | 1000 | 1.17 | 450 |
| #76 | 0.0200 | 103 | 87 | 1000 | -0.015 | 1000 | 1.18 | 450 |
| #75 | 0.0210 | 103 | 83 | 1000 | -0.015 | 1200 | 1.24 | 450 |
| 0.55mm | 0.0217 | 103 | 80 | 1000 | -0.015 | 1200 | 1.29 | 450 |
| #74 | 0.0225 | 103 | 78 | 1000 | -0.015 | 1200 | 1.32 | 450 |
| 0.60mm | 0.0236 | 104 | 74 | 1000 | -0.016 | 1200 | 1.41 | 450 |
| #73 | 0.0240 | 104 | 73 | 1000 | -0.016 | 1200 | 1.42 | 450 |
| #72 | 0.0250 | 104 | 70 | 1000 | -0.016 | 1200 | 1.49 | 450 |
| 0.65mm | 0.0256 | 104 | 68 | 1000 | -0.016 | 1200 | 1.53 | 450 |
| #71 | 0.0260 | 104 | 67 | 1000 | -0.016 | 1200 | 1.55 | 450 |
| 0.70mm | 0.0276 | 103 | 63 | 1000 | -0.016 | 1200 | 1.63 | 450 |
| #70 | 0.0280 | 103 | 62 | 1000 | -0.017 | 1200 | 1.66 | 450 |
| #69 | 0.0292 | 102 | 60 | 1000 | -0.017 | 1200 | 1.70 | 450 |
| 0.75mm | 0.0295 | 102 | 59 | 1000 | -0.017 | 1200 | 1.73 | 450 |
| #68 | 0.0310 | 102 | 57 | 1000 | -0.017 | 1200 | 1.79 | 450 |
| 1/32 | 0.0312 | 101 | 56 | 1000 | -0.017 | 1200 | 1.80 | 450 |
| 0.80mm | 0.0315 | 101 | 55 | 1000 | -0.017 | 1200 | 1.84 | 450 |
| #67 | 0.0320 | 100 | 54 | 1000 | -0.017 | 1200 | 1.85 | 450 |
| #66 | 0.0330 | 100 | 53 | 1000 | -0.018 | 1200 | 1.89 | 450 |
| 0.85mm | 0.0335 | 99 | 52 | 1000 | -0.018 | 1200 | 1.90 | 450 |
| #65 | 0.0350 | 98 | 50 | 1000 | -0.018 | 1200 | 1.96 | 450 |
| 0.90mm | 0.0354 | 98 | 49 | 1000 | -0.018 | 1200 | 2.00 | 450 |
| #64 | 0.0360 | 97 | 48 | 1000 | -0.018 | 1200 | 2.02 | 450 |
| #63 | 0.0370 | 96 | 47 | 1000 | -0.019 | 1200 | 2.04 | 450 |
| 0.95mm | 0.0374 | 95 | 46 | 1000 | -0.019 | 1200 | 2.07 | 450 |
| #62 | 0.0380 | 95 | 46 | 1000 | -0.019 | 1200 | 2.07 | 450 |
| #61 | 0.0390 | 94 | 45 | 1000 | -0.019 | 1200 | 2.09 | 450 |
| 1.00mm | 0.0394 | 94 | 45 | 1000 | -0.019 | 1200 | 2.09 | 450 |
| #60 | 0.0400 | 94 | 44 | 1000 | -0.019 | 1200 | 2.14 | 450 |
| #59 | 0.0410 | 93 | 43 | 1000 | -0.020 | 1200 | 2.16 | 450 |
| 1.05mm | 0.0413 | 93 | 42 | 1000 | -0.020 | 1200 | 2.21 | 450 |
| #58 | 0.0420 | 92 | 41 | 1000 | -0.020 | 1200 | 2.24 | 450 |
| #57 | 0.0430 | 92 | 40 | 1000 | -0.020 | 1200 | 2.30 | 450 |
| 1.10mm | 0.0433 | 92 | 40 | 1000 | -0.020 | 1200 | 2.30 | 450 |
| 1.15mm | 0.0453 | 91 | 39 | 1000 | -0.021 | 1200 | 2.33 | 450 |
| #56 | 0.0465 | 90 | 38 | 1000 | -0.021 | 1200 | 2.37 | 450 |
| 3/64 | 0.0469 | 90 | 37 | 1000 | -0.021 | 1200 | 2.43 | 450 |
| 1.20mm | 0.0472 | 90 | 37 | 1000 | -0.021 | 1200 | 2.43 | 450 |
| 1.25mm | 0.0492 | 89 | 36 | 1000 | -0.021 | 1200 | 2.47 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #55 | 0.0520 | 85 | 34 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| 1.35mm | 0.0531 | 83 | 33 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #54 | 0.0550 | 80 | 32 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.40mm | 0.0551 | 80 | 32 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.45mm | 0.0571 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.50mm | 0.0591 | 75 | 30 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.60mm | 0.0630 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| #52 | 0.0635 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.65mm | 0.0650 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.80mm | 0.0709 | 63 | 25 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.85mm | 0.0728 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #49 | 0.0730 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.90mm | 0.0748 | 58 | 23 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #48 | 0.0760 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 1.95mm | 0.0768 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 5/64 | 0.0781 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| #47 | 0.0785 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.00mm | 0.0787 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.05mm | 0.0807 | 55 | 22 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| #46 | 0.0810 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| #45 | 0.0820 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| 2.10mm | 0.0827 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| 2.15mm | 0.0846 | 53 | 21 | 1000 | -0.030 | 1200 | 2.50 | 450 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1200 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1200 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |
| 3.20mm | 0.1260 | 48 | 20 | 1000 | -0.018 | 600 | 2.40 | 659 |
| 3.25mm | 0.1280 | 48 | 20 | 1000 | -0.018 | 600 | 2.40 | 670 |
| #30 | 0.1285 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 672 |
| 3.30mm | 0.1299 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 680 |
| 3.35mm | 0.1319 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 690 |
| 3.40mm | 0.1339 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 701 |
| 3.45mm | 0.1358 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 711 |
| #29 | 0.1360 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 712 |
| 3.50mm | 0.1378 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 721 |
| 3.55mm | 0.1398 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 732 |
| #28 | 0.1405 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 735 |
| 9/64 | 0.1406 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 736 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

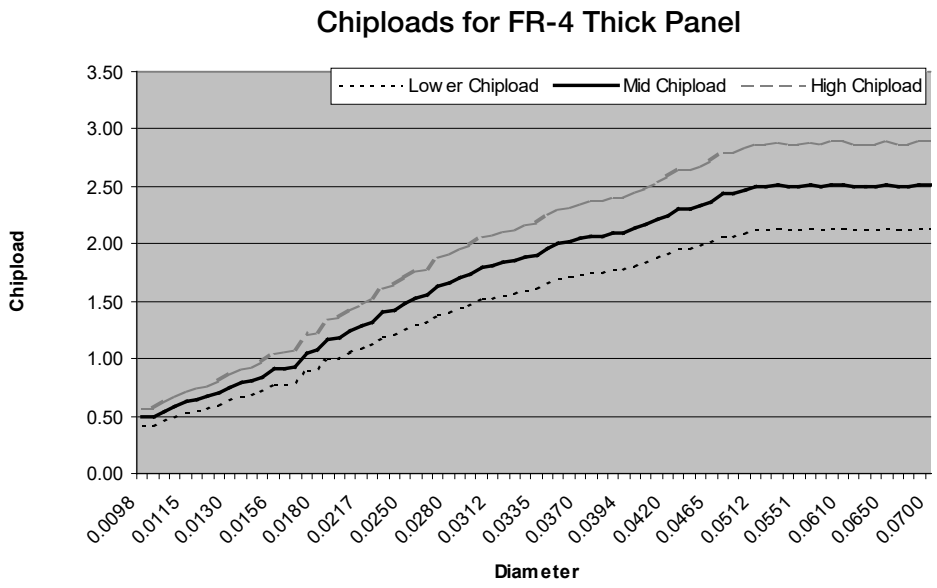
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 742 |
| 3.65mm | 0.1437 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 752 |
| #27 | 0.1440 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 754 |
| 3.70mm | 0.1457 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 814 |
| 5/32 | 0.1562 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 817 |
| #22 | 0.1570 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 822 |
| 4.00mm | 0.1575 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 824 |
| #21 | 0.1590 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 832 |
| 4.05mm | 0.1594 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 834 |
| #20 | 0.1610 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 843 |
| 4.10mm | 0.1614 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 845 |
| 4.15mm | 0.1634 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 855 |
| 4.20mm | 0.1654 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 866 |
| #19 | 0.1660 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 869 |
| 4.25mm | 0.1673 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 876 |
| 4.30mm | 0.1693 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 886 |
| #18 | 0.1695 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 250 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 250 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 250 | 1.50 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1075 |
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1157 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **G10 Unclad** PCB Material

## **Recommended Drill Series:** 100, 150, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 30 | 120 | 200 | -0.011 | 500 | 0.25 | 126 |
| 0.13mm | 0.0050 | 35 | 120 | 300 | -0.011 | 600 | 0.29 | 157 |
| 0.15mm | 0.0059 | 40 | 120 | 300 | -0.011 | 800 | 0.33 | 185 |
| #96 | 0.0063 | 45 | 120 | 400 | -0.011 | 800 | 0.38 | 198 |
| #95 | 0.0067 | 50 | 120 | 400 | -0.012 | 800 | 0.42 | 210 |
| #94 | 0.0071 | 55 | 120 | 500 | -0.012 | 1000 | 0.46 | 223 |
| #93 | 0.0075 | 60 | 120 | 500 | -0.012 | 1000 | 0.50 | 236 |
| #92 | 0.0079 | 65 | 120 | 500 | -0.012 | 1200 | 0.54 | 248 |
| #91 | 0.0083 | 70 | 120 | 600 | -0.012 | 1200 | 0.58 | 261 |
| #90 | 0.0087 | 75 | 120 | 600 | -0.012 | 1200 | 0.63 | 273 |
| #89 | 0.0091 | 80 | 120 | 700 | -0.012 | 1500 | 0.67 | 286 |
| #88 | 0.0095 | 85 | 120 | 700 | -0.012 | 1500 | 0.71 | 298 |
| 0.25mm | 0.0098 | 90 | 120 | 800 | -0.012 | 1500 | 0.75 | 308 |
| #87 | 0.0100 | 92 | 120 | 800 | -0.012 | 1500 | 0.77 | 314 |
| #86 | 0.0105 | 97 | 120 | 800 | -0.012 | 1500 | 0.81 | 330 |
| #85 | 0.0110 | 102 | 120 | 900 | -0.013 | 1700 | 0.85 | 345 |
| #84 | 0.0115 | 107 | 120 | 900 | -0.013 | 1700 | 0.89 | 361 |
| 0.30mm | 0.0118 | 110 | 120 | 1000 | -0.013 | 1700 | 0.92 | 371 |
| #83 | 0.0120 | 112 | 120 | 1000 | -0.013 | 1800 | 0.93 | 377 |
| #82 | 0.0125 | 117 | 120 | 1000 | -0.013 | 1800 | 0.98 | 393 |
| #81 | 0.0130 | 122 | 120 | 1000 | -0.013 | 1800 | 1.02 | 408 |
| #80 | 0.0135 | 127 | 120 | 1000 | -0.013 | 2000 | 1.06 | 424 |
| 0.35mm | 0.0138 | 130 | 120 | 1000 | -0.013 | 2000 | 1.08 | 433 |
| #79 | 0.0145 | 135 | 120 | 1000 | -0.013 | 2000 | 1.13 | 455 |
| 1/64 | 0.0156 | 140 | 120 | 1000 | -0.014 | 2000 | 1.17 | 490 |
| 0.40mm | 0.0158 | 142 | 120 | 1000 | -0.014 | 2000 | 1.18 | 496 |
| #78 | 0.0160 | 145 | 120 | 1000 | -0.014 | 2000 | 1.21 | 502 |
| 0.45mm | 0.0177 | 150 | 120 | 1000 | -0.014 | 2000 | 1.25 | 556 |
| #77 | 0.0180 | 153 | 120 | 1000 | -0.014 | 2000 | 1.28 | 565 |
| 0.50mm | 0.0197 | 160 | 117 | 1000 | -0.015 | 2000 | 1.37 | 600 |
| #76 | 0.0200 | 162 | 115 | 1000 | -0.015 | 2000 | 1.41 | 600 |
| #75 | 0.0210 | 165 | 109 | 1000 | -0.015 | 2000 | 1.51 | 600 |
| 0.55mm | 0.0217 | 170 | 106 | 1000 | -0.015 | 2000 | 1.60 | 600 |
| #74 | 0.0225 | 175 | 102 | 1000 | -0.015 | 2000 | 1.72 | 600 |
| 0.60mm | 0.0236 | 180 | 97 | 1000 | -0.016 | 2000 | 1.86 | 600 |
| #73 | 0.0240 | 185 | 96 | 1000 | -0.016 | 2000 | 1.93 | 600 |
| #72 | 0.0250 | 190 | 92 | 1000 | -0.016 | 2000 | 2.07 | 600 |
| 0.65mm | 0.0256 | 195 | 90 | 1000 | -0.016 | 2000 | 2.17 | 600 |
| #71 | 0.0260 | 200 | 88 | 1000 | -0.016 | 2000 | 2.27 | 600 |
| 0.70mm | 0.0276 | 200 | 83 | 1000 | -0.016 | 2000 | 2.41 | 600 |
| #70 | 0.0280 | 202 | 82 | 1000 | -0.017 | 2000 | 2.46 | 600 |
| #69 | 0.0292 | 205 | 79 | 1000 | -0.017 | 2000 | 2.59 | 600 |
| 0.75mm | 0.0295 | 206 | 78 | 1000 | -0.017 | 2000 | 2.64 | 600 |
| #68 | 0.0310 | 210 | 74 | 1000 | -0.017 | 2000 | 2.84 | 600 |
| 1/32 | 0.0312 | 212 | 73 | 1000 | -0.017 | 2000 | 2.90 | 600 |
| 0.80mm | 0.0315 | 215 | 73 | 1000 | -0.017 | 2000 | 2.95 | 600 |
| #67 | 0.0320 | 216 | 72 | 1000 | -0.017 | 2000 | 3.00 | 600 |
| #66 | 0.0330 | 210 | 70 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.85mm | 0.0335 | 204 | 68 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #65 | 0.0350 | 198 | 66 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.90mm | 0.0354 | 195 | 65 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #64 | 0.0360 | 192 | 64 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #63 | 0.0370 | 186 | 62 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 0.95mm | 0.0374 | 183 | 61 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #62 | 0.0380 | 180 | 60 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #61 | 0.0390 | 177 | 59 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 1.00mm | 0.0394 | 174 | 58 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #60 | 0.0400 | 171 | 57 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #59 | 0.0410 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.05mm | 0.0413 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #58 | 0.0420 | 165 | 55 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #57 | 0.0430 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.10mm | 0.0433 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.15mm | 0.0453 | 153 | 51 | 1000 | -0.021 | 2000 | 3.00 | 600 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 3/64 | 0.0469 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.20mm | 0.0472 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.25mm | 0.0492 | 141 | 47 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.30mm | 0.0512 | 135 | 45 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #55 | 0.0520 | 132 | 44 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| 1.35mm | 0.0531 | 129 | 43 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #54 | 0.0550 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.40mm | 0.0551 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.45mm | 0.0571 | 120 | 40 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.50mm | 0.0591 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| #53 | 0.0595 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1.55mm | 0.0610 | 114 | 38 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1/16 | 0.0625 | 111 | 37 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.60mm | 0.0630 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| #52 | 0.0635 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.65mm | 0.0650 | 105 | 35 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.70mm | 0.0669 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #51 | 0.0670 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.75mm | 0.0689 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #50 | 0.0700 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.80mm | 0.0709 | 96 | 32 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.85mm | 0.0728 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #49 | 0.0730 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.90mm | 0.0748 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #48 | 0.0760 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 1.95mm | 0.0768 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 5/64 | 0.0781 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| #47 | 0.0785 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.00mm | 0.0787 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.05mm | 0.0807 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #46 | 0.0810 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #45 | 0.0820 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.10mm | 0.0827 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.15mm | 0.0846 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| #44 | 0.0860 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.20mm | 0.0866 | 78 | 26 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.25mm | 0.0886 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| #43 | 0.0890 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.30mm | 0.0906 | 75 | 25 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.35mm | 0.0925 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #42 | 0.0935 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 3/32 | 0.0938 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.40mm | 0.0945 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #41 | 0.0960 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.45mm | 0.0965 | 72 | 24 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #40 | 0.0980 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| 2.50mm | 0.0984 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #39 | 0.0995 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| 2.55mm | 0.1004 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| #38 | 0.1015 | 69 | 23 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.60mm | 0.1024 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| #37 | 0.1040 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.65mm | 0.1043 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.70mm | 0.1063 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| #36 | 0.1065 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 2.75mm | 0.1083 | 63 | 21 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 7/64 | 0.1094 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #35 | 0.1100 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.80mm | 0.1102 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #34 | 0.1110 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 600 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1500 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

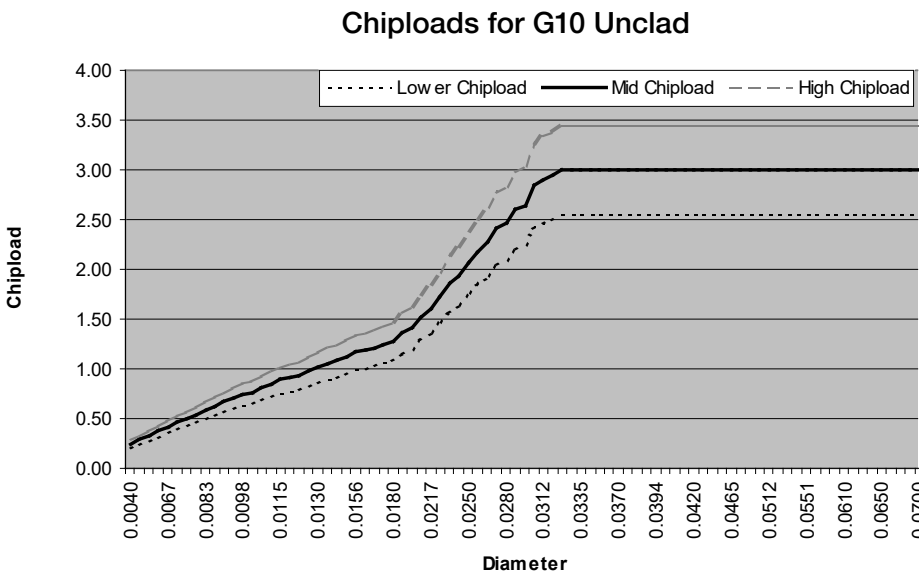
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 659 |
| 3.25mm | 0.1280 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 670 |
| #30 | 0.1285 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 672 |
| 3.30mm | 0.1299 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 680 |
| 3.35mm | 0.1319 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 690 |
| 3.40mm | 0.1339 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 701 |
| 3.45mm | 0.1358 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 711 |
| #29 | 0.1360 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 712 |
| 3.50mm | 0.1378 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 721 |
| 3.55mm | 0.1398 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 732 |
| #28 | 0.1405 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 735 |
| 9/64 | 0.1406 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 736 |
| 3.60mm | 0.1417 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 742 |
| 3.65mm | 0.1437 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 752 |
| #27 | 0.1440 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 754 |
| 3.70mm | 0.1457 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 762 |
| #26 | 0.1470 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 769 |
| 3.75mm | 0.1476 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 772 |
| #25 | 0.1495 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 782 |
| 3.80mm | 0.1496 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 783 |
| 3.85mm | 0.1516 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 793 |
| #24 | 0.1520 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 795 |
| 3.90mm | 0.1535 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 803 |
| #23 | 0.1540 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 806 |
| 3.95 | 0.1555 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 814 |
| 5/32 | 0.1562 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 817 |
| #22 | 0.1570 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 822 |
| 4.00mm | 0.1575 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 824 |
| #21 | 0.1590 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 832 |
| 4.05mm | 0.1594 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 834 |
| #20 | 0.1610 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 843 |
| 4.10mm | 0.1614 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 845 |
| 4.15mm | 0.1634 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 855 |
| 4.20mm | 0.1654 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 866 |
| #19 | 0.1660 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 869 |
| 4.25mm | 0.1673 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 876 |
| 4.30mm | 0.1693 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 886 |
| #18 | 0.1695 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 887 |
| 4.35mm | 0.1713 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 896 |
| 11/64 | 0.1719 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 900 |
| #17 | 0.1730 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 905 |
| 4.40mm | 0.1732 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 906 |
| 4.45mm | 0.1752 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 917 |
| #16 | 0.1770 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 926 |
| 4.50mm | 0.1772 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 927 |
| 4.55mm | 0.1792 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 938 |
| #15 | 0.1800 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 942 |
| 4.60mm | 0.1811 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 948 |
| #14 | 0.1820 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 952 |
| 4.65mm | 0.1831 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 958 |
| #13 | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.70mm | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.75mm | 0.1870 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 979 |
| 3/16 | 0.1875 | 45 | 20 | 1000 | -0.022 | 1000 | 2.25 | 981 |
| 4.80mm | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| #12 | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| 4.85mm | 0.1909 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 999 |
| #11 | 0.1910 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1000 |
| 4.90mm | 0.1929 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1010 |
| #10 | 0.1935 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1013 |
| 4.95mm | 0.1949 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1020 |
| #9 | 0.1960 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1026 |
| 5.00mm | 0.1968 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1030 |
| 5.05mm | 0.1988 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1040 |
| #8 | 0.1990 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1041 |
| 5.10mm | 0.2008 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1051 |
| #7 | 0.2010 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1052 |
| 5.15mm | 0.2028 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1061 |
| 13/64 | 0.2031 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1063 |
| #6 | 0.2040 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1068 |
| 5.20mm | 0.2047 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1071 |
| #5 | 0.2055 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1075 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1082 |
| 5.30mm | 0.2087 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1092 |
| #4 | 0.2090 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1094 |
| 5.35mm | 0.2106 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1102 |
| 5.40mm | 0.2126 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1113 |
| #3 | 0.2130 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1115 |
| 5.45mm | 0.2146 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1123 |
| 5.50mm | 0.2165 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1133 |
| 5.55mm | 0.2185 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1143 |
| 7/32 | 0.2188 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1145 |
| 5.60mm | 0.2205 | 40 | 20 | 1000 | -0.025 | 600 | 2.00 | 1154 |
| #2 | 0.2210 | 35 | 20 | 1000 | -0.025 | 600 | 1.75 | 1157 |
| 5.65mm | 0.2224 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1164 |
| 5.70mm | 0.2244 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1174 |
| 5.75mm | 0.2264 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1185 |
| #1 | 0.2280 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1193 |
| 5.80mm | 0.2283 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1195 |
| 5.85mm | 0.2302 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1205 |
| 5.90mm | 0.2323 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1216 |
| A | 0.2340 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1225 |
| 5.95mm | 0.2343 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1226 |
| 15/64 | 0.2344 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1227 |
| 6.00mm | 0.2362 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1236 |
| B | 0.2380 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1246 |
| 6.05mm | 0.2382 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Isola 370HR High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 24 | 120 | 200 | -0.011 | 300 | 0.20 | 126 |
| 0.13mm | 0.0050 | 27 | 120 | 300 | -0.011 | 300 | 0.23 | 157 |
| 0.15mm | 0.0059 | 30 | 120 | 300 | -0.011 | 400 | 0.25 | 185 |
| #96 | 0.0063 | 33 | 120 | 400 | -0.011 | 400 | 0.28 | 198 |
| #95 | 0.0067 | 36 | 120 | 400 | -0.012 | 400 | 0.30 | 210 |
| #94 | 0.0071 | 39 | 120 | 500 | -0.012 | 500 | 0.33 | 223 |
| #93 | 0.0075 | 42 | 120 | 500 | -0.012 | 500 | 0.35 | 236 |
| #92 | 0.0079 | 45 | 120 | 500 | -0.012 | 500 | 0.38 | 248 |
| #91 | 0.0083 | 48 | 120 | 600 | -0.012 | 500 | 0.40 | 261 |
| #90 | 0.0087 | 51 | 120 | 600 | -0.012 | 500 | 0.43 | 273 |
| #89 | 0.0091 | 54 | 120 | 700 | -0.012 | 700 | 0.45 | 286 |
| #88 | 0.0095 | 57 | 120 | 700 | -0.012 | 700 | 0.48 | 298 |
| 0.25mm | 0.0098 | 60 | 120 | 800 | -0.012 | 700 | 0.50 | 308 |
| #87 | 0.0100 | 64 | 120 | 800 | -0.012 | 700 | 0.53 | 314 |
| #86 | 0.0105 | 70 | 120 | 800 | -0.012 | 700 | 0.58 | 330 |
| #85 | 0.0110 | 76 | 120 | 900 | -0.013 | 800 | 0.63 | 345 |
| #84 | 0.0115 | 81 | 120 | 900 | -0.013 | 800 | 0.68 | 360 |
| 0.30mm | 0.0118 | 82 | 117 | 1000 | -0.013 | 800 | 0.70 | 360 |
| #83 | 0.0120 | 84 | 115 | 1000 | -0.013 | 800 | 0.73 | 360 |
| #82 | 0.0125 | 86 | 110 | 1000 | -0.013 | 800 | 0.78 | 360 |
| #81 | 0.0130 | 88 | 106 | 1000 | -0.013 | 800 | 0.83 | 360 |
| #80 | 0.0135 | 90 | 102 | 1000 | -0.013 | 800 | 0.88 | 360 |
| 0.35mm | 0.0138 | 90 | 100 | 1000 | -0.013 | 1000 | 0.90 | 360 |
| #79 | 0.0145 | 95 | 95 | 1000 | -0.013 | 1000 | 1.00 | 360 |
| 1/64 | 0.0156 | 100 | 88 | 1000 | -0.014 | 1000 | 1.14 | 360 |
| 0.40mm | 0.0158 | 102 | 87 | 1000 | -0.014 | 1000 | 1.17 | 360 |
| #78 | 0.0160 | 104 | 86 | 1000 | -0.014 | 1000 | 1.21 | 360 |
| 0.45mm | 0.0177 | 104 | 78 | 1000 | -0.014 | 1000 | 1.33 | 360 |
| #77 | 0.0180 | 105 | 76 | 1000 | -0.014 | 1000 | 1.38 | 360 |
| 0.50mm | 0.0197 | 106 | 70 | 1000 | -0.015 | 1000 | 1.51 | 360 |
| #76 | 0.0200 | 106 | 69 | 1000 | -0.015 | 1000 | 1.54 | 360 |
| #75 | 0.0210 | 107 | 66 | 1000 | -0.015 | 1200 | 1.62 | 360 |
| 0.55mm | 0.0217 | 108 | 63 | 1000 | -0.015 | 1200 | 1.71 | 360 |
| #74 | 0.0225 | 109 | 61 | 1000 | -0.015 | 1200 | 1.79 | 360 |
| 0.60mm | 0.0236 | 110 | 58 | 1000 | -0.016 | 1200 | 1.90 | 360 |
| #73 | 0.0240 | 110 | 57 | 1000 | -0.016 | 1200 | 1.93 | 360 |
| #72 | 0.0250 | 111 | 55 | 1000 | -0.016 | 1200 | 2.02 | 360 |
| 0.65mm | 0.0256 | 111 | 54 | 1000 | -0.016 | 1200 | 2.06 | 360 |
| #71 | 0.0260 | 112 | 53 | 1000 | -0.016 | 1200 | 2.11 | 360 |
| 0.70mm | 0.0276 | 113 | 50 | 1000 | -0.016 | 1200 | 2.26 | 360 |
| #70 | 0.0280 | 113 | 49 | 1000 | -0.017 | 1200 | 2.31 | 360 |
| #69 | 0.0292 | 114 | 47 | 1000 | -0.017 | 1200 | 2.43 | 360 |
| 0.75mm | 0.0295 | 114 | 47 | 1000 | -0.017 | 1200 | 2.43 | 360 |
| #68 | 0.0310 | 110 | 44 | 1000 | -0.017 | 1200 | 2.50 | 360 |
| 1/32 | 0.0312 | 110 | 44 | 1000 | -0.017 | 1200 | 2.50 | 360 |
| 0.80mm | 0.0315 | 109 | 44 | 1000 | -0.017 | 1200 | 2.50 | 360 |
| #67 | 0.0320 | 108 | 43 | 1000 | -0.017 | 1200 | 2.50 | 360 |
| #66 | 0.0330 | 105 | 42 | 1000 | -0.018 | 1200 | 2.50 | 360 |
| 0.85mm | 0.0335 | 103 | 41 | 1000 | -0.018 | 1200 | 2.50 | 360 |
| #65 | 0.0350 | 98 | 39 | 1000 | -0.018 | 1200 | 2.50 | 360 |
| 0.90mm | 0.0354 | 98 | 39 | 1000 | -0.018 | 1200 | 2.50 | 360 |
| #64 | 0.0360 | 95 | 38 | 1000 | -0.018 | 1200 | 2.50 | 360 |
| #63 | 0.0370 | 95 | 38 | 1000 | -0.019 | 1200 | 2.50 | 360 |
| 0.95mm | 0.0374 | 93 | 37 | 1000 | -0.019 | 1200 | 2.50 | 360 |
| #62 | 0.0380 | 90 | 36 | 1000 | -0.019 | 1200 | 2.50 | 360 |
| #61 | 0.0390 | 88 | 35 | 1000 | -0.019 | 1200 | 2.50 | 360 |
| 1.00mm | 0.0394 | 88 | 35 | 1000 | -0.019 | 1200 | 2.50 | 360 |
| #60 | 0.0400 | 85 | 34 | 1000 | -0.019 | 1200 | 2.50 | 360 |
| #59 | 0.0410 | 85 | 34 | 1000 | -0.020 | 1200 | 2.50 | 360 |
| 1.05mm | 0.0413 | 83 | 33 | 1000 | -0.020 | 1200 | 2.50 | 360 |
| #58 | 0.0420 | 83 | 33 | 1000 | -0.020 | 1200 | 2.50 | 360 |
| #57 | 0.0430 | 80 | 32 | 1000 | -0.020 | 1200 | 2.50 | 360 |
| 1.10mm | 0.0433 | 80 | 32 | 1000 | -0.020 | 1200 | 2.50 | 360 |
| 1.15mm | 0.0453 | 75 | 30 | 1000 | -0.021 | 1200 | 2.50 | 360 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 75 | 30 | 1000 | -0.021 | 1200 | 2.50 | 360 |
| 3/64 | 0.0469 | 73 | 29 | 1000 | -0.021 | 1200 | 2.50 | 360 |
| 1.20mm | 0.0472 | 73 | 29 | 1000 | -0.021 | 1200 | 2.50 | 360 |
| 1.25mm | 0.0492 | 70 | 28 | 1000 | -0.021 | 1200 | 2.50 | 360 |
| 1.30mm | 0.0512 | 68 | 27 | 1000 | -0.022 | 1200 | 2.50 | 360 |
| #55 | 0.0520 | 65 | 26 | 1000 | -0.022 | 1200 | 2.50 | 360 |
| 1.35mm | 0.0531 | 65 | 26 | 1000 | -0.022 | 1200 | 2.50 | 360 |
| #54 | 0.0550 | 63 | 25 | 1000 | -0.023 | 1200 | 2.50 | 360 |
| 1.40mm | 0.0551 | 63 | 25 | 1000 | -0.023 | 1200 | 2.50 | 360 |
| 1.45mm | 0.0571 | 60 | 24 | 1000 | -0.023 | 1200 | 2.50 | 360 |
| 1.50mm | 0.0591 | 58 | 23 | 1000 | -0.024 | 1200 | 2.50 | 360 |
| #53 | 0.0595 | 58 | 23 | 1000 | -0.024 | 1200 | 2.50 | 360 |
| 1.55mm | 0.0610 | 58 | 23 | 1000 | -0.024 | 1200 | 2.50 | 360 |
| 1/16 | 0.0625 | 55 | 22 | 1000 | -0.025 | 1200 | 2.50 | 360 |
| 1.60mm | 0.0630 | 55 | 22 | 1000 | -0.025 | 1200 | 2.50 | 360 |
| #52 | 0.0635 | 55 | 22 | 1000 | -0.025 | 1200 | 2.50 | 360 |
| 1.65mm | 0.0650 | 53 | 21 | 1000 | -0.025 | 1200 | 2.50 | 360 |
| 1.70mm | 0.0669 | 53 | 21 | 1000 | -0.026 | 1200 | 2.50 | 360 |
| #51 | 0.0670 | 53 | 21 | 1000 | -0.026 | 1200 | 2.50 | 360 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 1200 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 1200 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 1000 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 1000 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 1000 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 1000 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 1000 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 1000 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 1000 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 1000 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 1000 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 1000 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 1000 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 1000 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 1000 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 1000 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 1000 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 1000 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 1000 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 1000 | 2.50 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 800 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 800 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

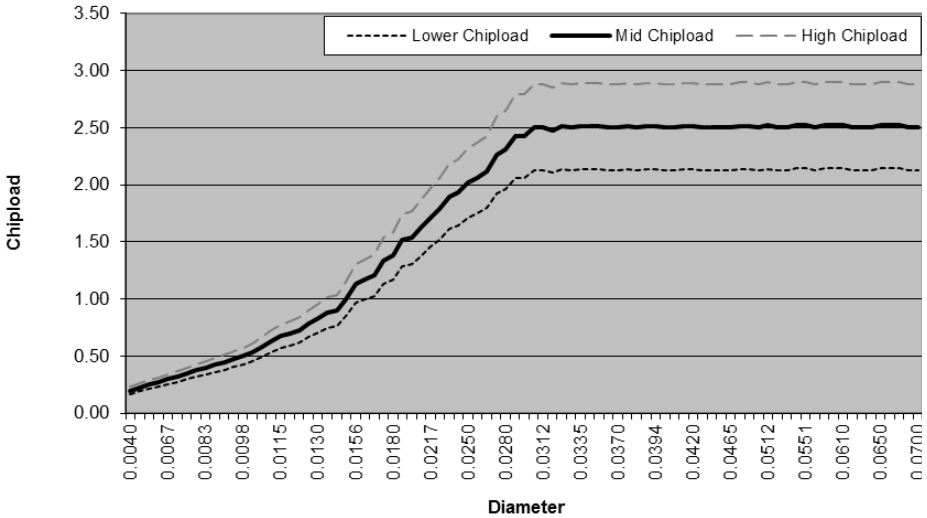
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Isola 370HR High Tg




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Isola 370 TURBO® FR-4 High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 20 | 120 | 200 | -0.011 | 500 | 0.17 | 126 |
| 0.13mm | 0.0050 | 30 | 120 | 300 | -0.011 | 600 | 0.25 | 157 |
| 0.15mm | 0.0059 | 44 | 120 | 300 | -0.011 | 800 | 0.37 | 185 |
| #96 | 0.0063 | 48 | 120 | 400 | -0.011 | 800 | 0.40 | 198 |
| #95 | 0.0067 | 52 | 120 | 400 | -0.012 | 800 | 0.43 | 210 |
| #94 | 0.0071 | 56 | 120 | 500 | -0.012 | 800 | 0.47 | 223 |
| #93 | 0.0075 | 60 | 120 | 500 | -0.012 | 800 | 0.50 | 236 |
| #92 | 0.0079 | 64 | 120 | 500 | -0.012 | 1000 | 0.53 | 248 |
| #91 | 0.0083 | 68 | 120 | 600 | -0.012 | 1000 | 0.57 | 261 |
| #90 | 0.0087 | 72 | 120 | 600 | -0.012 | 1000 | 0.60 | 273 |
| #89 | 0.0091 | 76 | 120 | 700 | -0.012 | 1200 | 0.63 | 286 |
| #88 | 0.0095 | 80 | 120 | 700 | -0.012 | 1200 | 0.67 | 298 |
| 0.25mm | 0.0098 | 84 | 120 | 800 | -0.012 | 1200 | 0.70 | 308 |
| #87 | 0.0100 | 87 | 120 | 800 | -0.012 | 1200 | 0.73 | 314 |
| #86 | 0.0105 | 92 | 120 | 800 | -0.012 | 1200 | 0.77 | 330 |
| #85 | 0.0110 | 98 | 120 | 900 | -0.013 | 1400 | 0.82 | 345 |
| #84 | 0.0115 | 104 | 120 | 900 | -0.013 | 1400 | 0.87 | 361 |
| 0.30mm | 0.0118 | 108 | 120 | 1000 | -0.013 | 1400 | 0.90 | 371 |
| #83 | 0.0120 | 110 | 120 | 1000 | -0.013 | 1400 | 0.92 | 377 |
| #82 | 0.0125 | 114 | 120 | 1000 | -0.013 | 1400 | 0.95 | 393 |
| #81 | 0.0130 | 118 | 120 | 1000 | -0.013 | 1600 | 0.98 | 408 |
| #80 | 0.0135 | 122 | 120 | 1000 | -0.013 | 1600 | 1.02 | 424 |
| 0.35mm | 0.0138 | 125 | 120 | 1000 | -0.013 | 1600 | 1.04 | 433 |
| #79 | 0.0145 | 128 | 119 | 1000 | -0.013 | 1600 | 1.08 | 450 |
| 1/64 | 0.0156 | 130 | 110 | 1000 | -0.014 | 1600 | 1.18 | 450 |
| 0.40mm | 0.0158 | 131 | 109 | 1000 | -0.014 | 1600 | 1.20 | 450 |
| #78 | 0.0160 | 132 | 107 | 1000 | -0.014 | 1600 | 1.23 | 450 |
| 0.45mm | 0.0177 | 132 | 97 | 1000 | -0.014 | 1600 | 1.36 | 450 |
| #77 | 0.0180 | 133 | 96 | 1000 | -0.014 | 1600 | 1.39 | 450 |
| 0.50mm | 0.0197 | 130 | 87 | 1000 | -0.015 | 1600 | 1.49 | 450 |
| #76 | 0.0200 | 128 | 86 | 1000 | -0.015 | 1600 | 1.49 | 450 |
| #75 | 0.0210 | 127 | 82 | 1000 | -0.015 | 1500 | 1.55 | 450 |
| 0.55mm | 0.0217 | 126 | 79 | 1000 | -0.015 | 1500 | 1.59 | 450 |
| #74 | 0.0225 | 125 | 76 | 1000 | -0.015 | 1500 | 1.64 | 450 |
| 0.60mm | 0.0236 | 124 | 73 | 1000 | -0.016 | 1500 | 1.70 | 450 |
| #73 | 0.0240 | 124 | 72 | 1000 | -0.016 | 1500 | 1.72 | 450 |
| #72 | 0.0250 | 123 | 69 | 1000 | -0.016 | 1200 | 1.78 | 450 |
| 0.65mm | 0.0256 | 122 | 67 | 1000 | -0.016 | 1200 | 1.82 | 450 |
| #71 | 0.0260 | 122 | 66 | 1000 | -0.016 | 1200 | 1.85 | 450 |
| 0.70mm | 0.0276 | 120 | 62 | 1000 | -0.016 | 1200 | 1.94 | 450 |
| #70 | 0.0280 | 120 | 61 | 1000 | -0.017 | 1200 | 1.97 | 450 |
| #69 | 0.0292 | 119 | 59 | 1000 | -0.017 | 1200 | 2.02 | 450 |
| 0.75mm | 0.0295 | 119 | 58 | 1000 | -0.017 | 1200 | 2.05 | 450 |
| #68 | 0.0310 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 1/32 | 0.0312 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 0.80mm | 0.0315 | 115 | 55 | 1000 | -0.017 | 1500 | 2.09 | 450 |
| #67 | 0.0320 | 114 | 54 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| #66 | 0.0330 | 113 | 52 | 1000 | -0.018 | 1500 | 2.17 | 450 |
| 0.85mm | 0.0335 | 113 | 51 | 1000 | -0.018 | 1500 | 2.22 | 450 |
| #65 | 0.0350 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| 0.90mm | 0.0354 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| #64 | 0.0360 | 112 | 48 | 1000 | -0.018 | 1500 | 2.33 | 450 |
| #63 | 0.0370 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| 0.95mm | 0.0374 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| #62 | 0.0380 | 110 | 45 | 1000 | -0.019 | 1500 | 2.44 | 450 |
| #61 | 0.0390 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| 1.00mm | 0.0394 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| #60 | 0.0400 | 107 | 43 | 1000 | -0.019 | 1500 | 2.49 | 450 |
| #59 | 0.0410 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.05mm | 0.0413 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #58 | 0.0420 | 103 | 41 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #57 | 0.0430 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.10mm | 0.0433 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.15mm | 0.0453 | 95 | 38 | 1000 | -0.021 | 1500 | 2.50 | 450 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 3/64 | 0.0469 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.20mm | 0.0472 | 90 | 36 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.25mm | 0.0492 | 88 | 35 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| #55 | 0.0520 | 83 | 33 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| 1.35mm | 0.0531 | 80 | 32 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #54 | 0.0550 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.40mm | 0.0551 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.45mm | 0.0571 | 75 | 30 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.50mm | 0.0591 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1.55mm | 0.0610 | 70 | 28 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.60mm | 0.0630 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| #52 | 0.0635 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.65mm | 0.0650 | 65 | 26 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.80mm | 0.0709 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.85mm | 0.0728 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #49 | 0.0730 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.90mm | 0.0748 | 58 | 23 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #48 | 0.0760 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 1.95mm | 0.0768 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 5/64 | 0.0781 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| #47 | 0.0785 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.00mm | 0.0787 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.05mm | 0.0807 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #46 | 0.0810 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #45 | 0.0820 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.10mm | 0.0827 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1075 |

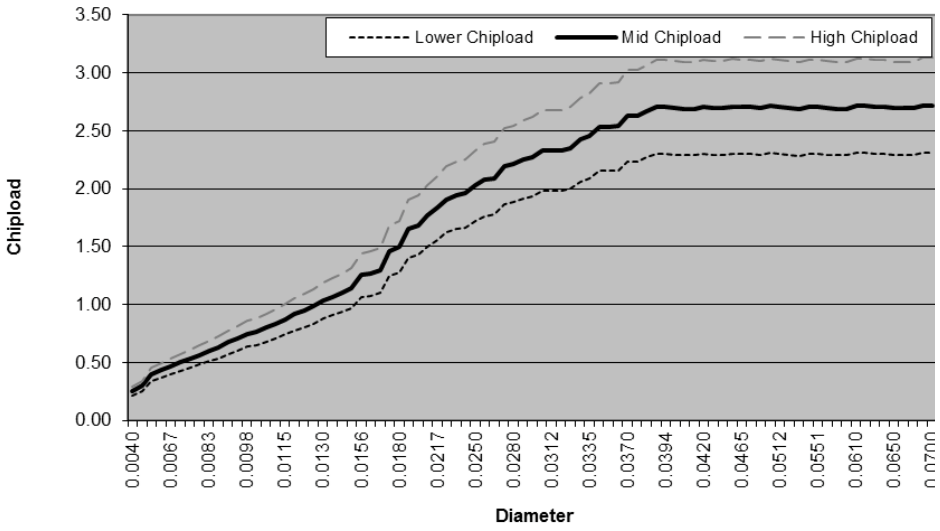
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Isola 370 TURBO® FR-4 High Tg




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Isola IS410 High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 36 | 120 | 200 | -0.011 | 300 | 0.30 | 126 |
| 0.13mm | 0.0050 | 48 | 120 | 300 | -0.011 | 600 | 0.40 | 157 |
| 0.15mm | 0.0059 | 60 | 120 | 300 | -0.011 | 600 | 0.50 | 185 |
| #96 | 0.0063 | 66 | 120 | 400 | -0.011 | 600 | 0.55 | 198 |
| #95 | 0.0067 | 70 | 120 | 400 | -0.012 | 600 | 0.58 | 210 |
| #94 | 0.0071 | 71 | 120 | 500 | -0.012 | 800 | 0.59 | 223 |
| #93 | 0.0075 | 72 | 120 | 500 | -0.012 | 800 | 0.60 | 236 |
| #92 | 0.0079 | 77 | 120 | 500 | -0.012 | 800 | 0.64 | 248 |
| #91 | 0.0083 | 79 | 120 | 600 | -0.012 | 1000 | 0.66 | 261 |
| #90 | 0.0087 | 80 | 120 | 600 | -0.012 | 1000 | 0.67 | 273 |
| #89 | 0.0091 | 81 | 120 | 700 | -0.012 | 1000 | 0.68 | 286 |
| #88 | 0.0095 | 84 | 120 | 700 | -0.012 | 1000 | 0.70 | 298 |
| 0.25mm | 0.0098 | 86 | 120 | 800 | -0.012 | 1200 | 0.72 | 308 |
| #87 | 0.0100 | 90 | 120 | 800 | -0.012 | 1200 | 0.75 | 314 |
| #86 | 0.0105 | 94 | 120 | 800 | -0.012 | 1200 | 0.78 | 330 |
| #85 | 0.0110 | 98 | 120 | 900 | -0.013 | 1200 | 0.82 | 345 |
| #84 | 0.0115 | 103 | 120 | 900 | -0.013 | 1200 | 0.86 | 361 |
| 0.30mm | 0.0118 | 108 | 120 | 1000 | -0.013 | 1500 | 0.90 | 371 |
| #83 | 0.0120 | 114 | 120 | 1000 | -0.013 | 1500 | 0.95 | 377 |
| #82 | 0.0125 | 120 | 120 | 1000 | -0.013 | 1500 | 1.00 | 393 |
| #81 | 0.0130 | 126 | 120 | 1000 | -0.013 | 1500 | 1.05 | 408 |
| #80 | 0.0135 | 132 | 120 | 1000 | -0.013 | 1500 | 1.10 | 424 |
| 0.35mm | 0.0138 | 138 | 120 | 1000 | -0.013 | 1500 | 1.15 | 433 |
| #79 | 0.0145 | 144 | 120 | 1000 | -0.013 | 1500 | 1.20 | 455 |
| 1/64 | 0.0156 | 153 | 118 | 1000 | -0.014 | 1500 | 1.30 | 480 |
| 0.40mm | 0.0158 | 153 | 116 | 1000 | -0.014 | 1500 | 1.32 | 480 |
| #78 | 0.0160 | 154 | 115 | 1000 | -0.014 | 1500 | 1.34 | 480 |
| 0.45mm | 0.0177 | 155 | 104 | 1000 | -0.014 | 1500 | 1.50 | 480 |
| #77 | 0.0180 | 155 | 102 | 1000 | -0.014 | 1500 | 1.52 | 480 |
| 0.50mm | 0.0197 | 156 | 93 | 1000 | -0.015 | 1500 | 1.68 | 480 |
| #76 | 0.0200 | 156 | 92 | 1000 | -0.015 | 1500 | 1.70 | 480 |
| #75 | 0.0210 | 157 | 87 | 1000 | -0.015 | 1500 | 1.80 | 480 |
| 0.55mm | 0.0217 | 157 | 85 | 1000 | -0.015 | 1500 | 1.86 | 480 |
| #74 | 0.0225 | 158 | 82 | 1000 | -0.015 | 1500 | 1.94 | 480 |
| 0.60mm | 0.0236 | 158 | 78 | 1000 | -0.016 | 1500 | 2.03 | 480 |
| #73 | 0.0240 | 159 | 76 | 1000 | -0.016 | 1500 | 2.08 | 480 |
| #72 | 0.0250 | 159 | 73 | 1000 | -0.016 | 1500 | 2.17 | 480 |
| 0.65mm | 0.0256 | 158 | 72 | 1000 | -0.016 | 1500 | 2.20 | 480 |
| #71 | 0.0260 | 158 | 71 | 1000 | -0.016 | 1500 | 2.24 | 480 |
| 0.70mm | 0.0276 | 153 | 66 | 1000 | -0.016 | 1500 | 2.30 | 480 |
| #70 | 0.0280 | 152 | 66 | 1000 | -0.017 | 1500 | 2.32 | 480 |
| #69 | 0.0292 | 151 | 63 | 1000 | -0.017 | 1500 | 2.40 | 480 |
| 0.75mm | 0.0295 | 152 | 62 | 1000 | -0.017 | 1500 | 2.44 | 480 |
| #68 | 0.0310 | 150 | 59 | 1000 | -0.017 | 1500 | 2.53 | 480 |
| 1/32 | 0.0312 | 151 | 59 | 1000 | -0.017 | 1500 | 2.57 | 480 |
| 0.80mm | 0.0315 | 150 | 58 | 1000 | -0.017 | 1500 | 2.58 | 480 |
| #67 | 0.0320 | 150 | 57 | 1000 | -0.017 | 1500 | 2.62 | 480 |
| #66 | 0.0330 | 148 | 56 | 1000 | -0.018 | 1500 | 2.66 | 480 |
| 0.85mm | 0.0335 | 148 | 55 | 1000 | -0.018 | 1500 | 2.70 | 480 |
| #65 | 0.0350 | 145 | 52 | 1000 | -0.018 | 1500 | 2.77 | 480 |
| 0.90mm | 0.0354 | 146 | 52 | 1000 | -0.018 | 1500 | 2.82 | 480 |
| #64 | 0.0360 | 146 | 51 | 1000 | -0.018 | 1500 | 2.87 | 480 |
| #63 | 0.0370 | 144 | 50 | 1000 | -0.019 | 1500 | 2.90 | 480 |
| 0.95mm | 0.0374 | 143 | 49 | 1000 | -0.019 | 1500 | 2.92 | 480 |
| #62 | 0.0380 | 142 | 48 | 1000 | -0.019 | 1500 | 2.94 | 480 |
| #61 | 0.0390 | 140 | 47 | 1000 | -0.019 | 1500 | 2.98 | 480 |
| 1.00mm | 0.0394 | 140 | 47 | 1000 | -0.019 | 1500 | 3.01 | 480 |
| #60 | 0.0400 | 138 | 46 | 1000 | -0.019 | 1500 | 3.01 | 480 |
| #59 | 0.0410 | 134 | 45 | 1000 | -0.020 | 1500 | 2.50 | 480 |
| 1.05mm | 0.0413 | 133 | 44 | 1000 | -0.020 | 1500 | 2.50 | 480 |
| #58 | 0.0420 | 131 | 44 | 1000 | -0.020 | 1500 | 2.50 | 480 |
| #57 | 0.0430 | 128 | 43 | 1000 | -0.020 | 1500 | 2.50 | 480 |
| 1.10mm | 0.0433 | 127 | 42 | 1000 | -0.020 | 1500 | 2.50 | 480 |
| 1.15mm | 0.0453 | 121 | 40 | 1000 | -0.021 | 1500 | 2.50 | 480 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 118 | 39 | 1000 | -0.021 | 1500 | 2.50 | 480 |
| 3/64 | 0.0469 | 117 | 39 | 1000 | -0.021 | 1500 | 2.50 | 480 |
| 1.20mm | 0.0472 | 117 | 39 | 1000 | -0.021 | 1500 | 2.50 | 480 |
| 1.25mm | 0.0492 | 112 | 37 | 1000 | -0.021 | 1500 | 2.50 | 480 |
| 1.30mm | 0.0512 | 107 | 36 | 1000 | -0.022 | 1500 | 2.50 | 480 |
| #55 | 0.0520 | 106 | 35 | 1000 | -0.022 | 1500 | 2.50 | 480 |
| 1.35mm | 0.0531 | 104 | 35 | 1000 | -0.022 | 1500 | 2.50 | 480 |
| #54 | 0.0550 | 100 | 33 | 1000 | -0.023 | 1500 | 2.50 | 480 |
| 1.40mm | 0.0551 | 100 | 33 | 1000 | -0.023 | 1500 | 2.50 | 480 |
| 1.45mm | 0.0571 | 96 | 32 | 1000 | -0.023 | 1500 | 2.50 | 480 |
| 1.50mm | 0.0591 | 93 | 31 | 1000 | -0.024 | 1500 | 2.50 | 480 |
| #53 | 0.0595 | 92 | 31 | 1000 | -0.024 | 1500 | 2.50 | 480 |
| 1.55mm | 0.0610 | 90 | 30 | 1000 | -0.024 | 1500 | 2.50 | 480 |
| 1/16 | 0.0625 | 88 | 29 | 1000 | -0.025 | 1500 | 2.50 | 480 |
| 1.60mm | 0.0630 | 87 | 29 | 1000 | -0.025 | 1500 | 2.50 | 480 |
| #52 | 0.0635 | 87 | 29 | 1000 | -0.025 | 1500 | 2.50 | 480 |
| 1.65mm | 0.0650 | 85 | 28 | 1000 | -0.025 | 1500 | 2.50 | 480 |
| 1.70mm | 0.0669 | 82 | 27 | 1000 | -0.026 | 1500 | 2.50 | 480 |
| #51 | 0.0670 | 82 | 27 | 1000 | -0.026 | 1500 | 2.50 | 480 |
| 1.75mm | 0.0689 | 80 | 27 | 1000 | -0.026 | 1500 | 2.50 | 480 |
| #50 | 0.0700 | 79 | 26 | 1000 | -0.026 | 1500 | 2.50 | 480 |
| 1.80mm | 0.0709 | 78 | 26 | 1000 | -0.027 | 1200 | 2.50 | 480 |
| 1.85mm | 0.0728 | 76 | 25 | 1000 | -0.027 | 1200 | 2.50 | 480 |
| #49 | 0.0730 | 75 | 25 | 1000 | -0.027 | 1200 | 2.50 | 480 |
| 1.90mm | 0.0748 | 74 | 25 | 1000 | -0.027 | 1200 | 2.50 | 480 |
| #48 | 0.0760 | 72 | 24 | 1000 | -0.028 | 1200 | 2.50 | 480 |
| 1.95mm | 0.0768 | 72 | 24 | 1000 | -0.028 | 1200 | 2.50 | 480 |
| 5/64 | 0.0781 | 70 | 23 | 1000 | -0.028 | 1200 | 2.50 | 480 |
| #47 | 0.0785 | 70 | 23 | 1000 | -0.028 | 1200 | 2.50 | 480 |
| 2.00mm | 0.0787 | 70 | 23 | 1000 | -0.028 | 1200 | 2.50 | 480 |
| 2.05mm | 0.0807 | 70 | 23 | 1000 | -0.029 | 1200 | 2.50 | 480 |
| #46 | 0.0810 | 70 | 23 | 1000 | -0.029 | 1200 | 2.50 | 480 |
| #45 | 0.0820 | 66 | 22 | 1000 | -0.029 | 1200 | 2.50 | 480 |
| 2.10mm | 0.0827 | 66 | 22 | 1000 | -0.029 | 1200 | 2.50 | 480 |
| 2.15mm | 0.0846 | 66 | 22 | 1000 | -0.030 | 1200 | 2.50 | 480 |
| #44 | 0.0860 | 63 | 21 | 1000 | -0.030 | 1200 | 2.50 | 480 |
| 2.20mm | 0.0866 | 63 | 21 | 1000 | -0.030 | 1200 | 2.50 | 480 |
| 2.25mm | 0.0886 | 63 | 21 | 1000 | -0.031 | 1200 | 2.50 | 480 |
| #43 | 0.0890 | 63 | 21 | 1000 | -0.031 | 1200 | 2.50 | 480 |
| 2.30mm | 0.0906 | 60 | 20 | 1000 | -0.031 | 1200 | 2.50 | 480 |
| 2.35mm | 0.0925 | 60 | 20 | 1000 | -0.032 | 1200 | 2.50 | 484 |
| #42 | 0.0935 | 60 | 20 | 1000 | -0.032 | 1200 | 2.50 | 489 |
| 3/32 | 0.0938 | 60 | 20 | 1000 | -0.032 | 1200 | 2.50 | 491 |
| 2.40mm | 0.0945 | 60 | 20 | 1000 | -0.032 | 1200 | 2.50 | 495 |
| #41 | 0.0960 | 60 | 20 | 1000 | -0.032 | 1200 | 2.50 | 502 |
| 2.45mm | 0.0965 | 60 | 20 | 1000 | -0.033 | 1200 | 2.50 | 505 |
| #40 | 0.0980 | 60 | 20 | 1000 | -0.033 | 1200 | 2.50 | 513 |
| 2.50mm | 0.0984 | 60 | 20 | 1000 | -0.033 | 1200 | 2.50 | 515 |
| #39 | 0.0995 | 60 | 20 | 1000 | -0.033 | 1200 | 2.50 | 521 |
| 2.55mm | 0.1004 | 60 | 20 | 1000 | -0.033 | 1200 | 2.50 | 525 |
| #38 | 0.1015 | 60 | 20 | 1000 | -0.034 | 1200 | 2.50 | 531 |
| 2.60mm | 0.1024 | 60 | 20 | 1000 | -0.034 | 1200 | 2.50 | 536 |
| #37 | 0.1040 | 60 | 20 | 1000 | -0.034 | 1000 | 2.50 | 544 |
| 2.65mm | 0.1043 | 60 | 20 | 1000 | -0.034 | 1000 | 2.50 | 546 |
| 2.70mm | 0.1063 | 60 | 20 | 1000 | -0.035 | 1000 | 2.50 | 556 |
| #36 | 0.1065 | 60 | 20 | 1000 | -0.035 | 1000 | 2.50 | 557 |
| 2.75mm | 0.1083 | 60 | 20 | 1000 | -0.035 | 1000 | 2.50 | 567 |
| 7/64 | 0.1094 | 60 | 20 | 1000 | -0.036 | 1000 | 2.50 | 573 |
| #35 | 0.1100 | 60 | 20 | 1000 | -0.036 | 1000 | 2.50 | 576 |
| 2.80mm | 0.1102 | 60 | 20 | 1000 | -0.036 | 1000 | 2.50 | 577 |
| #34 | 0.1110 | 60 | 20 | 1000 | -0.036 | 1000 | 2.50 | 581 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1000 | 2.50 | 587 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1000 | 2.50 | 591 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1000 | 2.50 | 598 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1000 | 2.50 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1000 | 2.50 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1000 | 2.50 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1000 | 2.50 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1000 | 2.50 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1000 | 2.50 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1000 | 2.50 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1000 | 2.50 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 50 | 20 | 1000 | -0.018 | 1000 | 2.50 | 659 |
| 3.25mm | 0.1280 | 50 | 20 | 1000 | -0.018 | 1000 | 2.50 | 670 |
| #30 | 0.1285 | 50 | 20 | 1000 | -0.019 | 1000 | 2.50 | 672 |
| 3.30mm | 0.1299 | 50 | 20 | 1000 | -0.019 | 1000 | 2.50 | 680 |
| 3.35mm | 0.1319 | 50 | 20 | 1000 | -0.019 | 1000 | 2.50 | 690 |
| 3.40mm | 0.1339 | 50 | 20 | 1000 | -0.019 | 1000 | 2.50 | 701 |
| 3.45mm | 0.1358 | 50 | 20 | 1000 | -0.019 | 1000 | 2.50 | 711 |
| #29 | 0.1360 | 50 | 20 | 1000 | -0.019 | 1000 | 2.50 | 712 |
| 3.50mm | 0.1378 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 721 |
| 3.55mm | 0.1398 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 732 |
| #28 | 0.1405 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 735 |
| 9/64 | 0.1406 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 736 |
| 3.60mm | 0.1417 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 742 |
| 3.65mm | 0.1437 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 752 |
| #27 | 0.1440 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 754 |
| 3.70mm | 0.1457 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 800 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 800 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 800 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 800 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1075 |

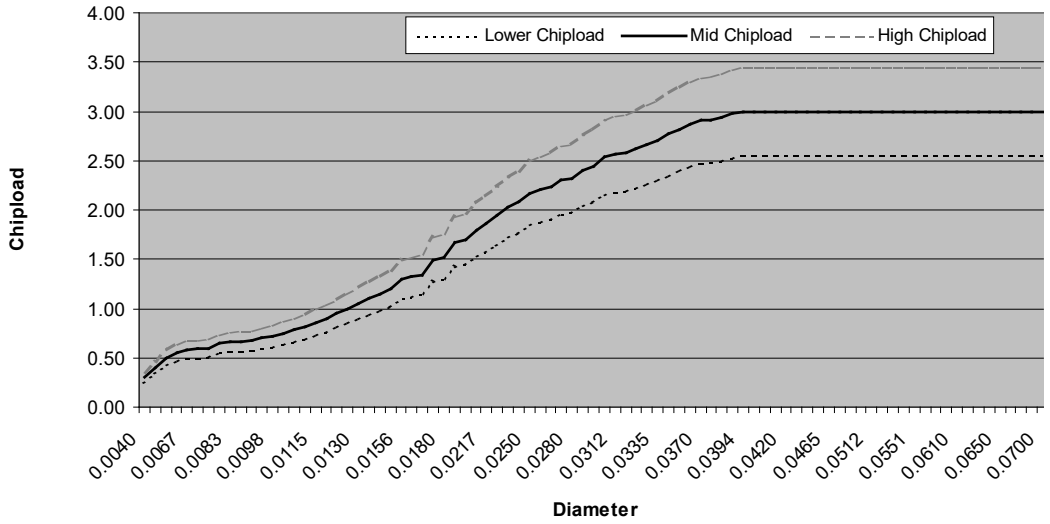
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 250 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 250 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 250 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 250 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 250 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 250 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 250 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 250 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Isola IS410 High Tg




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Isola IS620 High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 36 | 120 | 200 | -0.011 | 300 | 0.30 | 126 |
| 0.13mm | 0.0050 | 48 | 120 | 300 | -0.011 | 500 | 0.40 | 157 |
| 0.15mm | 0.0059 | 60 | 120 | 300 | -0.011 | 500 | 0.50 | 185 |
| #96 | 0.0063 | 66 | 120 | 400 | -0.011 | 500 | 0.55 | 198 |
| #95 | 0.0067 | 70 | 120 | 400 | -0.012 | 500 | 0.58 | 210 |
| #94 | 0.0071 | 71 | 120 | 500 | -0.012 | 500 | 0.59 | 223 |
| #93 | 0.0075 | 72 | 120 | 500 | -0.012 | 500 | 0.60 | 236 |
| #92 | 0.0079 | 77 | 118 | 500 | -0.012 | 700 | 0.65 | 244 |
| #91 | 0.0083 | 79 | 116 | 600 | -0.012 | 700 | 0.68 | 252 |
| #90 | 0.0087 | 80 | 114 | 600 | -0.012 | 700 | 0.70 | 260 |
| #89 | 0.0091 | 81 | 112 | 700 | -0.012 | 700 | 0.72 | 267 |
| #88 | 0.0095 | 84 | 110 | 700 | -0.012 | 700 | 0.76 | 273 |
| 0.25mm | 0.0098 | 87 | 109 | 800 | -0.012 | 1000 | 0.80 | 280 |
| #87 | 0.0100 | 89 | 108 | 800 | -0.012 | 1000 | 0.82 | 283 |
| #86 | 0.0105 | 91 | 106 | 800 | -0.012 | 1000 | 0.86 | 291 |
| #85 | 0.0110 | 94 | 104 | 900 | -0.013 | 1000 | 0.90 | 299 |
| #84 | 0.0115 | 97 | 102 | 900 | -0.013 | 1000 | 0.95 | 307 |
| 0.30mm | 0.0118 | 101 | 101 | 1000 | -0.013 | 1000 | 1.00 | 312 |
| #83 | 0.0120 | 102 | 100 | 1000 | -0.013 | 1000 | 1.02 | 314 |
| #82 | 0.0125 | 105 | 97 | 1000 | -0.013 | 1000 | 1.08 | 317 |
| #81 | 0.0130 | 105 | 94 | 1000 | -0.013 | 1000 | 1.12 | 320 |
| #80 | 0.0135 | 107 | 92 | 1000 | -0.013 | 1000 | 1.16 | 325 |
| 0.35mm | 0.0138 | 109 | 91 | 1000 | -0.013 | 1000 | 1.20 | 329 |
| #79 | 0.0145 | 114 | 88 | 1000 | -0.013 | 1000 | 1.30 | 334 |
| 1/64 | 0.0156 | 119 | 84 | 1000 | -0.014 | 1000 | 1.42 | 343 |
| 0.40mm | 0.0158 | 120 | 83 | 1000 | -0.014 | 1000 | 1.45 | 343 |
| #78 | 0.0160 | 123 | 82 | 1000 | -0.014 | 1000 | 1.50 | 343 |
| 0.45mm | 0.0177 | 128 | 79 | 1000 | -0.014 | 1000 | 1.62 | 366 |
| #77 | 0.0180 | 129 | 78 | 1000 | -0.014 | 1000 | 1.65 | 367 |
| 0.50mm | 0.0197 | 133 | 76 | 1000 | -0.015 | 1000 | 1.75 | 390 |
| #76 | 0.0200 | 137 | 75 | 1000 | -0.015 | 1200 | 1.83 | 390 |
| #75 | 0.0210 | 135 | 71 | 1000 | -0.015 | 1200 | 1.90 | 390 |
| 0.55mm | 0.0217 | 135 | 69 | 1000 | -0.015 | 1200 | 1.96 | 390 |
| #74 | 0.0225 | 134 | 66 | 1000 | -0.015 | 1200 | 2.03 | 390 |
| 0.60mm | 0.0236 | 134 | 63 | 1000 | -0.016 | 1200 | 2.13 | 390 |
| #73 | 0.0240 | 133 | 62 | 1000 | -0.016 | 1200 | 2.15 | 390 |
| #72 | 0.0250 | 133 | 60 | 1000 | -0.016 | 1200 | 2.22 | 390 |
| 0.65mm | 0.0256 | 131 | 58 | 1000 | -0.016 | 1200 | 2.26 | 390 |
| #71 | 0.0260 | 131 | 57 | 1000 | -0.016 | 1200 | 2.30 | 390 |
| 0.70mm | 0.0276 | 129 | 54 | 1000 | -0.016 | 1200 | 2.39 | 390 |
| #70 | 0.0280 | 127 | 53 | 1000 | -0.017 | 1200 | 2.40 | 390 |
| #69 | 0.0292 | 128 | 51 | 1000 | -0.017 | 1200 | 2.51 | 390 |
| 0.75mm | 0.0295 | 128 | 51 | 1000 | -0.017 | 1200 | 2.51 | 390 |
| #68 | 0.0310 | 122 | 48 | 1000 | -0.017 | 1200 | 2.54 | 390 |
| 1/32 | 0.0312 | 122 | 48 | 1000 | -0.017 | 1200 | 2.54 | 390 |
| 0.80mm | 0.0315 | 122 | 47 | 1000 | -0.017 | 1200 | 2.60 | 390 |
| #67 | 0.0320 | 122 | 47 | 1000 | -0.017 | 1200 | 2.60 | 390 |
| #66 | 0.0330 | 121 | 45 | 1000 | -0.018 | 1200 | 2.69 | 390 |
| 0.85mm | 0.0335 | 119 | 44 | 1000 | -0.018 | 1200 | 2.70 | 390 |
| #65 | 0.0350 | 118 | 43 | 1000 | -0.018 | 1200 | 2.74 | 390 |
| 0.90mm | 0.0354 | 117 | 42 | 1000 | -0.018 | 1000 | 2.79 | 390 |
| #64 | 0.0360 | 115 | 41 | 1000 | -0.018 | 1000 | 2.80 | 390 |
| #63 | 0.0370 | 114 | 40 | 1000 | -0.019 | 1000 | 2.85 | 390 |
| 0.95mm | 0.0374 | 114 | 40 | 1000 | -0.019 | 1000 | 2.85 | 390 |
| #62 | 0.0380 | 114 | 39 | 1000 | -0.019 | 1000 | 2.92 | 390 |
| #61 | 0.0390 | 114 | 38 | 1000 | -0.019 | 1000 | 3.00 | 390 |
| 1.00mm | 0.0394 | 113 | 38 | 1000 | -0.019 | 1000 | 2.97 | 390 |
| #60 | 0.0400 | 113 | 37 | 1000 | -0.019 | 1000 | 3.05 | 390 |
| #59 | 0.0410 | 111 | 36 | 1000 | -0.020 | 1000 | 2.50 | 390 |
| 1.05mm | 0.0413 | 112 | 36 | 1000 | -0.020 | 1000 | 2.50 | 390 |
| #58 | 0.0420 | 110 | 35 | 1000 | -0.020 | 1000 | 2.50 | 390 |
| #57 | 0.0430 | 110 | 35 | 1000 | -0.020 | 1000 | 2.50 | 390 |
| 1.10mm | 0.0433 | 109 | 34 | 1000 | -0.020 | 1000 | 2.50 | 390 |
| 1.15mm | 0.0453 | 106 | 33 | 1000 | -0.021 | 1000 | 2.50 | 390 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 102 | 32 | 1000 | -0.021 | 1000 | 2.50 | 390 |
| 3/64 | 0.0469 | 102 | 32 | 1000 | -0.021 | 1000 | 2.50 | 390 |
| 1.20mm | 0.0472 | 102 | 32 | 1000 | -0.021 | 1000 | 2.50 | 390 |
| 1.25mm | 0.0492 | 96 | 30 | 1000 | -0.021 | 1000 | 2.50 | 390 |
| 1.30mm | 0.0512 | 93 | 29 | 1000 | -0.022 | 1000 | 2.50 | 390 |
| #55 | 0.0520 | 93 | 29 | 1000 | -0.022 | 1000 | 2.50 | 390 |
| 1.35mm | 0.0531 | 90 | 28 | 1000 | -0.022 | 1000 | 2.50 | 390 |
| #54 | 0.0550 | 86 | 27 | 1000 | -0.023 | 1000 | 2.50 | 390 |
| 1.40mm | 0.0551 | 86 | 27 | 1000 | -0.023 | 1000 | 2.50 | 390 |
| 1.45mm | 0.0571 | 83 | 26 | 1000 | -0.023 | 1000 | 2.50 | 390 |
| 1.50mm | 0.0591 | 80 | 25 | 1000 | -0.024 | 1000 | 2.50 | 390 |
| #53 | 0.0595 | 80 | 25 | 1000 | -0.024 | 1000 | 2.50 | 390 |
| 1.55mm | 0.0610 | 77 | 24 | 1000 | -0.024 | 1000 | 2.50 | 390 |
| 1/16 | 0.0625 | 77 | 24 | 1000 | -0.025 | 1000 | 2.50 | 390 |
| 1.60mm | 0.0630 | 77 | 24 | 1000 | -0.025 | 1000 | 2.50 | 390 |
| #52 | 0.0635 | 74 | 23 | 1000 | -0.025 | 1000 | 2.50 | 390 |
| 1.65mm | 0.0650 | 74 | 23 | 1000 | -0.025 | 1000 | 2.50 | 390 |
| 1.70mm | 0.0669 | 70 | 22 | 1000 | -0.026 | 1000 | 2.50 | 390 |
| #51 | 0.0670 | 70 | 22 | 1000 | -0.026 | 1000 | 2.50 | 390 |
| 1.75mm | 0.0689 | 70 | 22 | 1000 | -0.026 | 1000 | 2.50 | 390 |
| #50 | 0.0700 | 67 | 21 | 1000 | -0.026 | 1000 | 2.50 | 390 |
| 1.80mm | 0.0709 | 67 | 21 | 1000 | -0.027 | 1000 | 2.50 | 390 |
| 1.85mm | 0.0728 | 64 | 20 | 1000 | -0.027 | 1000 | 2.50 | 390 |
| #49 | 0.0730 | 64 | 20 | 1000 | -0.027 | 1000 | 2.50 | 390 |
| 1.90mm | 0.0748 | 63 | 20 | 1000 | -0.027 | 1000 | 2.50 | 390 |
| #48 | 0.0760 | 62 | 20 | 1000 | -0.028 | 1000 | 2.50 | 390 |
| 1.95mm | 0.0768 | 61 | 20 | 1000 | -0.028 | 1000 | 2.50 | 402 |
| 5/64 | 0.0781 | 59 | 20 | 1000 | -0.028 | 1000 | 2.50 | 409 |
| #47 | 0.0785 | 58 | 20 | 1000 | -0.028 | 1000 | 2.50 | 411 |
| 2.00mm | 0.0787 | 58 | 20 | 1000 | -0.028 | 1000 | 2.50 | 412 |
| 2.05mm | 0.0807 | 56 | 20 | 1000 | -0.029 | 1000 | 2.50 | 422 |
| #46 | 0.0810 | 55 | 20 | 1000 | -0.029 | 1000 | 2.50 | 424 |
| #45 | 0.0820 | 54 | 20 | 1000 | -0.029 | 1000 | 2.50 | 429 |
| 2.10mm | 0.0827 | 52 | 20 | 1000 | -0.029 | 1000 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 800 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 800 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 600 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 600 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1075 |

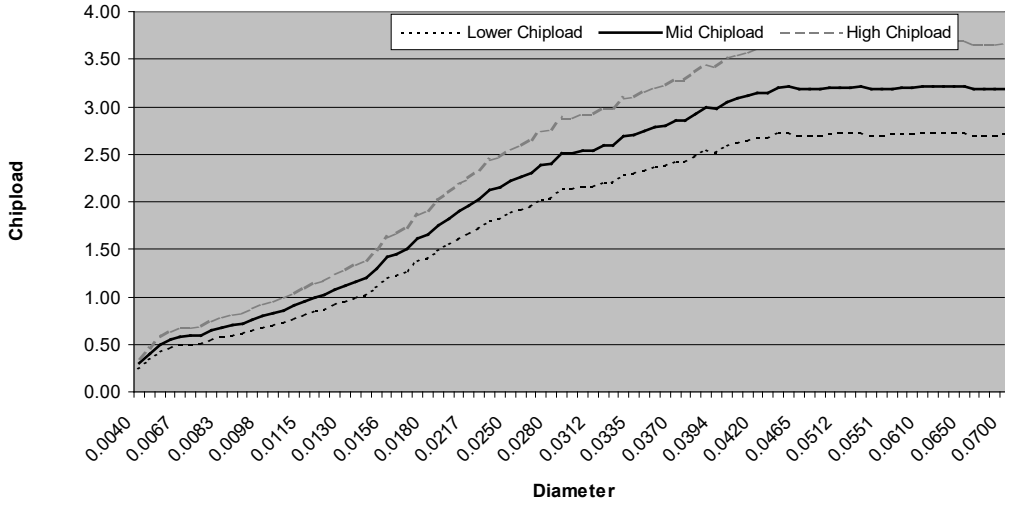
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Isola IS620 High Tg




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# KAPTON® / Flex PCB Material

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**Recommended Drill Series:** 100, 150, 240, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 20 | 120 | 200 | -0.011 | 500 | 0.17 | 126 |
| 0.13mm | 0.0050 | 24 | 120 | 300 | -0.011 | 500 | 0.20 | 157 |
| 0.15mm | 0.0059 | 32 | 120 | 300 | -0.011 | 500 | 0.27 | 185 |
| #96 | 0.0063 | 40 | 120 | 400 | -0.011 | 500 | 0.33 | 198 |
| #95 | 0.0067 | 46 | 120 | 400 | -0.012 | 500 | 0.38 | 210 |
| #94 | 0.0071 | 52 | 120 | 500 | -0.012 | 500 | 0.43 | 223 |
| #93 | 0.0075 | 58 | 120 | 500 | -0.012 | 500 | 0.48 | 236 |
| #92 | 0.0079 | 64 | 120 | 500 | -0.012 | 600 | 0.53 | 248 |
| #91 | 0.0083 | 70 | 120 | 600 | -0.012 | 600 | 0.58 | 261 |
| #90 | 0.0087 | 76 | 120 | 600 | -0.012 | 600 | 0.63 | 273 |
| #89 | 0.0091 | 82 | 120 | 700 | -0.012 | 700 | 0.68 | 286 |
| #88 | 0.0095 | 88 | 120 | 700 | -0.012 | 700 | 0.73 | 298 |
| 0.25mm | 0.0098 | 94 | 120 | 800 | -0.012 | 800 | 0.78 | 308 |
| #87 | 0.0100 | 96 | 120 | 800 | -0.012 | 800 | 0.80 | 314 |
| #86 | 0.0105 | 100 | 118 | 800 | -0.012 | 800 | 0.85 | 325 |
| #85 | 0.0110 | 106 | 113 | 900 | -0.013 | 800 | 0.94 | 325 |
| #84 | 0.0115 | 112 | 108 | 900 | -0.013 | 800 | 1.04 | 325 |
| 0.30mm | 0.0118 | 118 | 105 | 1000 | -0.013 | 1000 | 1.12 | 325 |
| #83 | 0.0120 | 120 | 104 | 1000 | -0.013 | 1000 | 1.16 | 325 |
| #82 | 0.0125 | 124 | 99 | 1000 | -0.013 | 1000 | 1.25 | 325 |
| #81 | 0.0130 | 130 | 96 | 1000 | -0.013 | 1000 | 1.36 | 325 |
| #80 | 0.0135 | 134 | 92 | 1000 | -0.013 | 1000 | 1.46 | 325 |
| 0.35mm | 0.0138 | 136 | 90 | 1000 | -0.013 | 1000 | 1.51 | 325 |
| #79 | 0.0145 | 140 | 86 | 1000 | -0.013 | 1000 | 1.63 | 325 |
| 1/64 | 0.0156 | 146 | 80 | 1000 | -0.014 | 1000 | 1.83 | 325 |
| 0.40mm | 0.0158 | 148 | 79 | 1000 | -0.014 | 1000 | 1.88 | 325 |
| #78 | 0.0160 | 150 | 78 | 1000 | -0.014 | 1000 | 1.93 | 325 |
| 0.45mm | 0.0177 | 154 | 70 | 1000 | -0.014 | 1000 | 2.19 | 325 |
| #77 | 0.0180 | 156 | 69 | 1000 | -0.014 | 1000 | 2.26 | 325 |
| 0.50mm | 0.0197 | 154 | 63 | 1000 | -0.015 | 1000 | 2.44 | 325 |
| #76 | 0.0200 | 154 | 62 | 1000 | -0.015 | 1000 | 2.48 | 325 |
| #75 | 0.0210 | 152 | 59 | 1000 | -0.015 | 1000 | 2.57 | 325 |
| 0.55mm | 0.0217 | 148 | 57 | 1000 | -0.015 | 1000 | 2.59 | 325 |
| #74 | 0.0225 | 145 | 55 | 1000 | -0.015 | 1000 | 2.63 | 325 |
| 0.60mm | 0.0236 | 142 | 53 | 1000 | -0.016 | 1000 | 2.70 | 325 |
| #73 | 0.0240 | 140 | 52 | 1000 | -0.016 | 1000 | 2.71 | 325 |
| #72 | 0.0250 | 138 | 50 | 1000 | -0.016 | 1000 | 2.78 | 325 |
| 0.65mm | 0.0256 | 138 | 49 | 1000 | -0.016 | 1000 | 2.84 | 325 |
| #71 | 0.0260 | 136 | 48 | 1000 | -0.016 | 1000 | 2.85 | 325 |
| 0.70mm | 0.0276 | 130 | 45 | 1000 | -0.016 | 1000 | 2.89 | 325 |
| #70 | 0.0280 | 128 | 44 | 1000 | -0.017 | 1000 | 2.91 | 325 |
| #69 | 0.0292 | 126 | 43 | 1000 | -0.017 | 1000 | 2.93 | 325 |
| 0.75mm | 0.0295 | 125 | 42 | 1000 | -0.017 | 1000 | 2.98 | 325 |
| #68 | 0.0310 | 120 | 40 | 1000 | -0.017 | 1000 | 3.00 | 325 |
| 1/32 | 0.0312 | 120 | 40 | 1000 | -0.017 | 1000 | 3.00 | 325 |
| 0.80mm | 0.0315 | 117 | 39 | 1000 | -0.017 | 1000 | 3.00 | 325 |
| #67 | 0.0320 | 117 | 39 | 1000 | -0.017 | 1000 | 3.00 | 325 |
| #66 | 0.0330 | 114 | 38 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| 0.85mm | 0.0335 | 111 | 37 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| #65 | 0.0350 | 105 | 35 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| 0.90mm | 0.0354 | 105 | 35 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| #64 | 0.0360 | 105 | 35 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| #63 | 0.0370 | 102 | 34 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| 0.95mm | 0.0374 | 99 | 33 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| #62 | 0.0380 | 99 | 33 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| #61 | 0.0390 | 96 | 32 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| 1.00mm | 0.0394 | 96 | 32 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| #60 | 0.0400 | 93 | 31 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| #59 | 0.0410 | 90 | 30 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| 1.05mm | 0.0413 | 90 | 30 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| #58 | 0.0420 | 90 | 30 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| #57 | 0.0430 | 87 | 29 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| 1.10mm | 0.0433 | 87 | 29 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| 1.15mm | 0.0453 | 81 | 27 | 1000 | -0.021 | 1000 | 3.00 | 325 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 81 | 27 | 1000 | -0.021 | 1000 | 3.00 | 325 |
| 3/64 | 0.0469 | 78 | 26 | 1000 | -0.021 | 1000 | 3.00 | 325 |
| 1.20mm | 0.0472 | 78 | 26 | 1000 | -0.021 | 1000 | 3.00 | 325 |
| 1.25mm | 0.0492 | 75 | 25 | 1000 | -0.021 | 1000 | 3.00 | 325 |
| 1.30mm | 0.0512 | 72 | 24 | 1000 | -0.022 | 1000 | 3.00 | 325 |
| #55 | 0.0520 | 72 | 24 | 1000 | -0.022 | 1000 | 3.00 | 325 |
| 1.35mm | 0.0531 | 69 | 23 | 1000 | -0.022 | 1000 | 3.00 | 325 |
| #54 | 0.0550 | 69 | 23 | 1000 | -0.023 | 1000 | 3.00 | 325 |
| 1.40mm | 0.0551 | 69 | 23 | 1000 | -0.023 | 1000 | 3.00 | 325 |
| 1.45mm | 0.0571 | 66 | 22 | 1000 | -0.023 | 1000 | 3.00 | 325 |
| 1.50mm | 0.0591 | 63 | 21 | 1000 | -0.024 | 1000 | 3.00 | 325 |
| #53 | 0.0595 | 63 | 21 | 1000 | -0.024 | 1000 | 3.00 | 325 |
| 1.55mm | 0.0610 | 60 | 20 | 1000 | -0.024 | 1000 | 3.00 | 325 |
| 1/16 | 0.0625 | 60 | 20 | 1000 | -0.025 | 1000 | 3.00 | 325 |
| 1.60mm | 0.0630 | 60 | 20 | 1000 | -0.025 | 800 | 3.00 | 330 |
| #52 | 0.0635 | 60 | 20 | 1000 | -0.025 | 800 | 3.00 | 332 |
| 1.65mm | 0.0650 | 60 | 20 | 1000 | -0.025 | 800 | 3.00 | 340 |
| 1.70mm | 0.0669 | 60 | 20 | 1000 | -0.026 | 800 | 3.00 | 350 |
| #51 | 0.0670 | 60 | 20 | 1000 | -0.026 | 800 | 3.00 | 351 |
| 1.75mm | 0.0689 | 60 | 20 | 1000 | -0.026 | 800 | 3.00 | 361 |
| #50 | 0.0700 | 60 | 20 | 1000 | -0.026 | 700 | 3.00 | 366 |
| 1.80mm | 0.0709 | 60 | 20 | 1000 | -0.027 | 700 | 3.00 | 371 |
| 1.85mm | 0.0728 | 60 | 20 | 1000 | -0.027 | 700 | 3.00 | 381 |
| #49 | 0.0730 | 60 | 20 | 1000 | -0.027 | 700 | 3.00 | 382 |
| 1.90mm | 0.0748 | 60 | 20 | 1000 | -0.027 | 700 | 3.00 | 391 |
| #48 | 0.0760 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 398 |
| 1.95mm | 0.0768 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 402 |
| 5/64 | 0.0781 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 409 |
| #47 | 0.0785 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 411 |
| 2.00mm | 0.0787 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 412 |
| 2.05mm | 0.0807 | 60 | 20 | 1000 | -0.029 | 600 | 3.00 | 422 |
| #46 | 0.0810 | 60 | 20 | 1000 | -0.029 | 600 | 3.00 | 424 |
| #45 | 0.0820 | 60 | 20 | 1000 | -0.029 | 600 | 3.00 | 429 |
| 2.10mm | 0.0827 | 60 | 20 | 1000 | -0.029 | 600 | 3.00 | 433 |
| 2.15mm | 0.0846 | 60 | 20 | 1000 | -0.030 | 600 | 3.00 | 443 |
| #44 | 0.0860 | 60 | 20 | 1000 | -0.030 | 600 | 3.00 | 450 |
| 2.20mm | 0.0866 | 60 | 20 | 1000 | -0.030 | 600 | 3.00 | 453 |
| 2.25mm | 0.0886 | 60 | 20 | 1000 | -0.031 | 600 | 3.00 | 464 |
| #43 | 0.0890 | 60 | 20 | 1000 | -0.031 | 600 | 3.00 | 466 |
| 2.30mm | 0.0906 | 60 | 20 | 1000 | -0.031 | 600 | 3.00 | 474 |
| 2.35mm | 0.0925 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 484 |
| #42 | 0.0935 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 489 |
| 3/32 | 0.0938 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 491 |
| 2.40mm | 0.0945 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 495 |
| #41 | 0.0960 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 502 |
| 2.45mm | 0.0965 | 60 | 20 | 1000 | -0.033 | 600 | 3.00 | 505 |
| #40 | 0.0980 | 60 | 20 | 1000 | -0.033 | 600 | 3.00 | 513 |
| 2.50mm | 0.0984 | 60 | 20 | 1000 | -0.033 | 600 | 3.00 | 515 |
| #39 | 0.0995 | 60 | 20 | 1000 | -0.033 | 600 | 3.00 | 521 |
| 2.55mm | 0.1004 | 60 | 20 | 1000 | -0.033 | 500 | 3.00 | 525 |
| #38 | 0.1015 | 60 | 20 | 1000 | -0.034 | 500 | 3.00 | 531 |
| 2.60mm | 0.1024 | 60 | 20 | 1000 | -0.034 | 500 | 3.00 | 536 |
| #37 | 0.1040 | 60 | 20 | 1000 | -0.034 | 500 | 3.00 | 544 |
| 2.65mm | 0.1043 | 60 | 20 | 1000 | -0.034 | 500 | 3.00 | 546 |
| 2.70mm | 0.1063 | 60 | 20 | 1000 | -0.035 | 500 | 3.00 | 556 |
| #36 | 0.1065 | 60 | 20 | 1000 | -0.035 | 500 | 3.00 | 557 |
| 2.75mm | 0.1083 | 60 | 20 | 1000 | -0.035 | 500 | 3.00 | 567 |
| 7/64 | 0.1094 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 573 |
| #35 | 0.1100 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 576 |
| 2.80mm | 0.1102 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 577 |
| #34 | 0.1110 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 581 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 587 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 591 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 500 | 3.00 | 598 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 500 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 500 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 500 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 500 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 500 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 500 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 500 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 500 | 3.00 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 55 | 20 | 1000 | -0.018 | 400 | 2.75 | 659 |
| 3.25mm | 0.1280 | 55 | 20 | 1000 | -0.018 | 400 | 2.75 | 670 |
| #30 | 0.1285 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 672 |
| 3.30mm | 0.1299 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 680 |
| 3.35mm | 0.1319 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 690 |
| 3.40mm | 0.1339 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 701 |
| 3.45mm | 0.1358 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 711 |
| #29 | 0.1360 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 712 |
| 3.50mm | 0.1378 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 721 |
| 3.55mm | 0.1398 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 732 |
| #28 | 0.1405 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 735 |
| 9/64 | 0.1406 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 736 |
| 3.60mm | 0.1417 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 742 |
| 3.65mm | 0.1437 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 752 |
| #27 | 0.1440 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 754 |
| 3.70mm | 0.1457 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 762 |
| #26 | 0.1470 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 769 |
| 3.75mm | 0.1476 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 772 |
| #25 | 0.1495 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 782 |
| 3.80mm | 0.1496 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 783 |
| 3.85mm | 0.1516 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 793 |
| #24 | 0.1520 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 795 |
| 3.90mm | 0.1535 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 803 |
| #23 | 0.1540 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 806 |
| 3.95 | 0.1555 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 814 |
| 5/32 | 0.1562 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 817 |
| #22 | 0.1570 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 822 |
| 4.00mm | 0.1575 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 824 |
| #21 | 0.1590 | 55 | 20 | 1000 | -0.021 | 400 | 2.75 | 832 |
| 4.05mm | 0.1594 | 55 | 20 | 1000 | -0.021 | 400 | 2.75 | 834 |
| #20 | 0.1610 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 843 |
| 4.10mm | 0.1614 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 845 |
| 4.15mm | 0.1634 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 855 |
| 4.20mm | 0.1654 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 866 |
| #19 | 0.1660 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 869 |
| 4.25mm | 0.1673 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 876 |
| 4.30mm | 0.1693 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 886 |
| #18 | 0.1695 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 887 |
| 4.35mm | 0.1713 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 896 |
| 11/64 | 0.1719 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 900 |
| #17 | 0.1730 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 905 |
| 4.40mm | 0.1732 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 906 |
| 4.45mm | 0.1752 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 917 |
| #16 | 0.1770 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 926 |
| 4.50mm | 0.1772 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 927 |
| 4.55mm | 0.1792 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 938 |
| #15 | 0.1800 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 942 |
| 4.60mm | 0.1811 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 948 |
| #14 | 0.1820 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 952 |
| 4.65mm | 0.1831 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 958 |
| #13 | 0.1850 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 968 |
| 4.70mm | 0.1850 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 968 |
| 4.75mm | 0.1870 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 979 |
| 3/16 | 0.1875 | 50 | 20 | 1000 | -0.022 | 300 | 2.50 | 981 |
| 4.80mm | 0.1890 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 989 |
| #12 | 0.1890 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 989 |
| 4.85mm | 0.1909 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 999 |
| #11 | 0.1910 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1000 |
| 4.90mm | 0.1929 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1010 |
| #10 | 0.1935 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1013 |
| 4.95mm | 0.1949 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1020 |
| #9 | 0.1960 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1026 |
| 5.00mm | 0.1968 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1030 |
| 5.05mm | 0.1988 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1040 |
| #8 | 0.1990 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1041 |
| 5.10mm | 0.2008 | 50 | 20 | 1000 | -0.023 | 200 | 2.50 | 1051 |
| #7 | 0.2010 | 50 | 20 | 1000 | -0.023 | 200 | 2.50 | 1052 |
| 5.15mm | 0.2028 | 50 | 20 | 1000 | -0.023 | 200 | 2.50 | 1061 |
| 13/64 | 0.2031 | 50 | 20 | 1000 | -0.023 | 200 | 2.50 | 1063 |
| #6 | 0.2040 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1068 |
| 5.20mm | 0.2047 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1071 |
| #5 | 0.2055 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1075 |

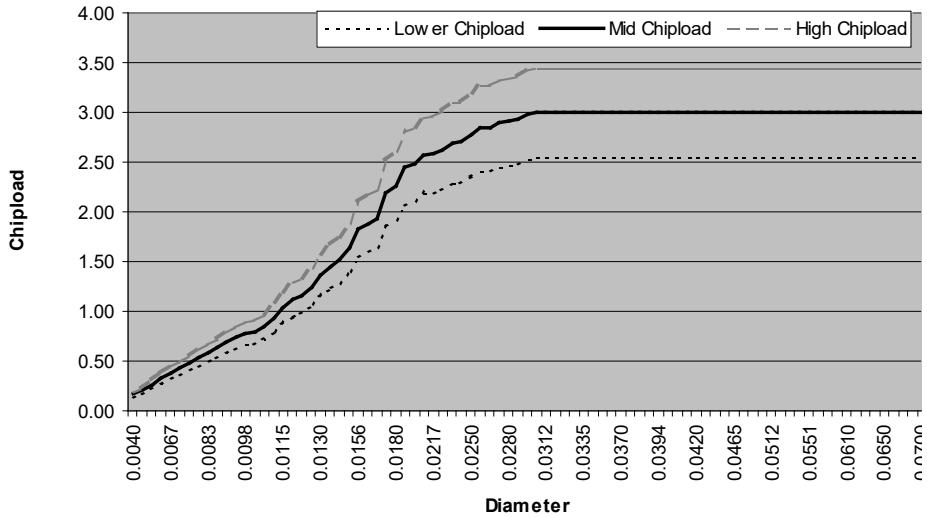
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1082 |
| 5.30mm | 0.2087 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1092 |
| #4 | 0.2090 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1094 |
| 5.35mm | 0.2106 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1102 |
| 5.40mm | 0.2126 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1113 |
| #3 | 0.2130 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1115 |
| 5.45mm | 0.2146 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1123 |
| 5.50mm | 0.2165 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1133 |
| 5.55mm | 0.2185 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1143 |
| 7/32 | 0.2188 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1145 |
| 5.60mm | 0.2205 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1154 |
| #2 | 0.2210 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1157 |
| 5.65mm | 0.2224 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1164 |
| 5.70mm | 0.2244 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1174 |
| 5.75mm | 0.2264 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1185 |
| #1 | 0.2280 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1193 |
| 5.80mm | 0.2283 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1195 |
| 5.85mm | 0.2302 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1205 |
| 5.90mm | 0.2323 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1216 |
| A | 0.2340 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1225 |
| 5.95mm | 0.2343 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1226 |
| 15/64 | 0.2344 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1227 |
| 6.00mm | 0.2362 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1236 |
| B | 0.2380 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1246 |
| 6.05mm | 0.2382 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1247 |
| 6.10mm | 0.2402 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1257 |
| C | 0.2420 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1266 |
| 6.15mm | 0.2421 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1267 |
| 6.20mm | 0.2441 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1277 |
| D | 0.2460 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1287 |
| 6.25mm | 0.2461 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1288 |
| 6.30mm | 0.2480 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1298 |
| 6.35mm | 0.2500 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1308 |
| 6.40mm | 0.2520 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1319 |
| 6.50mm | 0.2559 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1339 |
| F | 0.2570 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1345 |
| 6.60mm | 0.2598 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for KAPTON® / Flex




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Lexan / Acrylic** PCB Material

## **Recommended Drill Series:** 100, 150

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #80 | 0.0135 | 168 | 42 | 1000 | -0.013 | 2000 | 4.00 | 150 |
| 0.35mm | 0.0138 | 168 | 42 | 1000 | -0.013 | 2000 | 4.00 | 150 |
| #79 | 0.0145 | 168 | 40 | 1000 | -0.013 | 2000 | 4.20 | 150 |
| 1/64 | 0.0156 | 163 | 37 | 1000 | -0.014 | 2000 | 4.40 | 150 |
| 0.40mm | 0.0158 | 162 | 36 | 1000 | -0.014 | 2000 | 4.50 | 150 |
| #78 | 0.0160 | 166 | 36 | 1000 | -0.014 | 2000 | 4.60 | 150 |
| 0.45mm | 0.0177 | 154 | 32 | 1000 | -0.014 | 2000 | 4.80 | 150 |
| #77 | 0.0180 | 160 | 32 | 1000 | -0.014 | 2000 | 5.00 | 150 |
| 0.50mm | 0.0197 | 151 | 29 | 1000 | -0.015 | 2000 | 5.20 | 150 |
| #76 | 0.0200 | 157 | 29 | 1000 | -0.015 | 2000 | 5.40 | 150 |
| #75 | 0.0210 | 151 | 27 | 1000 | -0.015 | 2000 | 5.60 | 150 |
| 0.55mm | 0.0217 | 151 | 26 | 1000 | -0.015 | 2000 | 5.80 | 150 |
| #74 | 0.0225 | 150 | 25 | 1000 | -0.015 | 2000 | 6.00 | 150 |
| 0.60mm | 0.0236 | 149 | 24 | 1000 | -0.016 | 2000 | 6.20 | 150 |
| #73 | 0.0240 | 154 | 24 | 1000 | -0.016 | 2000 | 6.40 | 150 |
| #72 | 0.0250 | 152 | 23 | 1000 | -0.016 | 2000 | 6.60 | 150 |
| 0.65mm | 0.0256 | 150 | 22 | 1000 | -0.016 | 2000 | 6.80 | 150 |
| #71 | 0.0260 | 154 | 22 | 1000 | -0.016 | 2000 | 7.00 | 150 |
| 0.70mm | 0.0276 | 155 | 21 | 1000 | -0.016 | 2000 | 7.40 | 150 |
| #70 | 0.0280 | 152 | 20 | 1000 | -0.017 | 2000 | 7.60 | 150 |
| #69 | 0.0292 | 156 | 20 | 1000 | -0.017 | 2000 | 7.80 | 150 |
| 0.75mm | 0.0295 | 152 | 19 | 1000 | -0.017 | 2000 | 8.00 | 150 |
| #68 | 0.0310 | 148 | 18 | 1000 | -0.017 | 2000 | 8.20 | 150 |
| 1/32 | 0.0312 | 151 | 18 | 1000 | -0.017 | 2000 | 8.40 | 150 |
| 0.80mm | 0.0315 | 155 | 18 | 1000 | -0.017 | 2000 | 8.60 | 150 |
| #67 | 0.0320 | 158 | 18 | 1000 | -0.017 | 2000 | 8.80 | 150 |
| #66 | 0.0330 | 153 | 17 | 1000 | -0.018 | 2000 | 9.00 | 150 |
| 0.85mm | 0.0335 | 156 | 17 | 1000 | -0.018 | 2000 | 9.20 | 150 |
| #65 | 0.0350 | 154 | 16 | 1000 | -0.018 | 2000 | 9.60 | 150 |
| 0.90mm | 0.0354 | 157 | 16 | 1000 | -0.018 | 2000 | 9.80 | 150 |
| #64 | 0.0360 | 160 | 16 | 1000 | -0.018 | 2000 | 10.00 | 150 |
| #63 | 0.0370 | 153 | 15 | 1000 | -0.019 | 2000 | 10.20 | 150 |
| 0.95mm | 0.0374 | 156 | 15 | 1000 | -0.019 | 2000 | 10.40 | 150 |
| #62 | 0.0380 | 159 | 15 | 1000 | -0.019 | 2000 | 10.60 | 150 |
| #61 | 0.0390 | 162 | 15 | 1000 | -0.019 | 2000 | 10.80 | 150 |
| 1.00mm | 0.0394 | 165 | 15 | 1000 | -0.019 | 2000 | 11.00 | 155 |
| #60 | 0.0400 | 168 | 15 | 1000 | -0.019 | 2000 | 11.20 | 157 |
| #59 | 0.0410 | 171 | 15 | 1000 | -0.020 | 2000 | 11.40 | 161 |
| 1.05mm | 0.0413 | 174 | 15 | 1000 | -0.020 | 2000 | 11.60 | 162 |
| #58 | 0.0420 | 177 | 15 | 1000 | -0.020 | 2000 | 11.80 | 165 |
| #57 | 0.0430 | 180 | 15 | 1000 | -0.020 | 2000 | 12.00 | 169 |
| 1.10mm | 0.0433 | 183 | 15 | 1000 | -0.020 | 2000 | 12.20 | 170 |
| 1.15mm | 0.0453 | 189 | 15 | 1000 | -0.021 | 2000 | 12.60 | 178 |
| #56 | 0.0465 | 192 | 15 | 1000 | -0.021 | 2000 | 12.80 | 183 |
| 3/64 | 0.0469 | 195 | 15 | 1000 | -0.021 | 2000 | 13.00 | 184 |
| 1.20mm | 0.0472 | 198 | 15 | 1000 | -0.021 | 2000 | 13.20 | 185 |
| 1.25mm | 0.0492 | 201 | 15 | 1000 | -0.021 | 2000 | 13.40 | 193 |
| 1.30mm | 0.0512 | 207 | 15 | 1000 | -0.022 | 2000 | 13.80 | 201 |
| #55 | 0.0520 | 210 | 15 | 1000 | -0.022 | 2000 | 14.00 | 204 |
| 1.35mm | 0.0531 | 213 | 15 | 1000 | -0.022 | 2000 | 14.20 | 208 |
| #54 | 0.0550 | 219 | 15 | 1000 | -0.023 | 2000 | 14.60 | 216 |
| 1.40mm | 0.0551 | 222 | 15 | 1000 | -0.023 | 2000 | 14.80 | 216 |
| 1.45mm | 0.0571 | 228 | 15 | 1000 | -0.023 | 2000 | 15.20 | 224 |
| 1.50mm | 0.0591 | 234 | 15 | 1000 | -0.024 | 2000 | 15.60 | 232 |
| #53 | 0.0595 | 237 | 15 | 1000 | -0.024 | 2000 | 15.80 | 234 |
| 1.55mm | 0.0610 | 240 | 15 | 1000 | -0.024 | 2000 | 16.00 | 239 |
| 1/16 | 0.0625 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 245 |
| 1.60mm | 0.0630 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 247 |
| #52 | 0.0635 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 249 |
| 1.65mm | 0.0650 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 255 |
| 1.70mm | 0.0669 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 263 |
| #51 | 0.0670 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 263 |
| 1.75mm | 0.0689 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 270 |
| #50 | 0.0700 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 275 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.80mm | 0.0709 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 278 |
| 1.85mm | 0.0728 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 286 |
| #49 | 0.0730 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 287 |
| 1.90mm | 0.0748 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 294 |
| #48 | 0.0760 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 298 |
| 1.95mm | 0.0768 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 301 |
| 5/64 | 0.0781 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 307 |
| #47 | 0.0785 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 308 |
| 2.00mm | 0.0787 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 309 |
| 2.05mm | 0.0807 | 237 | 15 | 1000 | -0.029 | 2000 | 15.80 | 317 |
| #46 | 0.0810 | 234 | 15 | 1000 | -0.029 | 2000 | 15.60 | 318 |
| #45 | 0.0820 | 231 | 15 | 1000 | -0.029 | 2000 | 15.40 | 322 |
| 2.10mm | 0.0827 | 228 | 15 | 1000 | -0.029 | 2000 | 15.20 | 325 |
| 2.15mm | 0.0846 | 222 | 15 | 1000 | -0.030 | 2000 | 14.80 | 332 |
| #44 | 0.0860 | 216 | 15 | 1000 | -0.030 | 2000 | 14.40 | 338 |
| 2.20mm | 0.0866 | 213 | 15 | 1000 | -0.030 | 2000 | 14.20 | 340 |
| 2.25mm | 0.0886 | 207 | 15 | 1000 | -0.031 | 2000 | 13.80 | 348 |
| #43 | 0.0890 | 204 | 15 | 1000 | -0.031 | 2000 | 13.60 | 349 |
| 2.30mm | 0.0906 | 198 | 15 | 1000 | -0.031 | 2000 | 13.20 | 356 |
| 2.35mm | 0.0925 | 192 | 15 | 1000 | -0.032 | 2000 | 12.80 | 363 |
| #42 | 0.0935 | 189 | 15 | 1000 | -0.032 | 2000 | 12.60 | 367 |
| 3/32 | 0.0938 | 183 | 15 | 1000 | -0.032 | 2000 | 12.20 | 368 |
| 2.40mm | 0.0945 | 180 | 15 | 1000 | -0.032 | 2000 | 12.00 | 371 |
| #41 | 0.0960 | 174 | 15 | 1000 | -0.032 | 2000 | 11.60 | 377 |
| 2.45mm | 0.0965 | 171 | 15 | 1000 | -0.033 | 2000 | 11.40 | 379 |
| #40 | 0.0980 | 165 | 15 | 1000 | -0.033 | 2000 | 11.00 | 385 |
| 2.50mm | 0.0984 | 162 | 15 | 1000 | -0.033 | 2000 | 10.80 | 386 |
| #39 | 0.0995 | 159 | 15 | 1000 | -0.033 | 2000 | 10.60 | 391 |
| 2.55mm | 0.1004 | 156 | 15 | 1000 | -0.033 | 2000 | 10.40 | 394 |
| #38 | 0.1015 | 153 | 15 | 1000 | -0.034 | 2000 | 10.20 | 398 |
| 2.60mm | 0.1024 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 402 |
| #37 | 0.1040 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 408 |
| 2.65mm | 0.1043 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 409 |
| 2.70mm | 0.1063 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 417 |
| #36 | 0.1065 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 418 |
| 2.75mm | 0.1083 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 425 |
| 7/64 | 0.1094 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 429 |
| #35 | 0.1100 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 432 |
| 2.80mm | 0.1102 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 433 |
| #34 | 0.1110 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 436 |
| 2.85mm | 0.1122 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 440 |
| #33 | 0.1130 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 444 |
| 2.90mm | 0.1142 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 448 |
| #32 | 0.1160 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 455 |
| 2.95mm | 0.1161 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 456 |
| 3.00mm | 0.1181 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 464 |
| #31 | 0.1200 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 471 |
| 3.05mm | 0.1201 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 471 |
| 3.10mm | 0.1220 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 479 |
| 3.15mm | 0.1240 | 150 | 15 | 1000 | -0.039 | 2000 | 10.00 | 487 |
| 1/8 | 0.1250 | 150 | 15 | 1000 | -0.039 | 2000 | 10.00 | 491 |
| 3.20mm | 0.1260 | 160 | 16 | 1000 | -0.018 | 1500 | 10.00 | 528 |
| 3.25mm | 0.1280 | 160 | 16 | 1000 | -0.018 | 1500 | 10.00 | 536 |
| #30 | 0.1285 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 538 |
| 3.30mm | 0.1299 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 544 |
| 3.35mm | 0.1319 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 552 |
| 3.40mm | 0.1339 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 561 |
| 3.45mm | 0.1358 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 569 |
| #29 | 0.1360 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 569 |
| 3.50mm | 0.1378 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 577 |
| 3.55mm | 0.1398 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 585 |
| #28 | 0.1405 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 625 |
| 9/64 | 0.1406 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 625 |
| 3.60mm | 0.1417 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 630 |
| 3.65mm | 0.1437 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 639 |
| #27 | 0.1440 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 641 |
| 3.70mm | 0.1457 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 648 |
| #26 | 0.1470 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 654 |
| 3.75mm | 0.1476 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 657 |
| #25 | 0.1495 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 665 |
| 3.80mm | 0.1496 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 665 |
| 3.85mm | 0.1516 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 674 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #24 | 0.1520 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 676 |
| 3.90mm | 0.1535 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 683 |
| #23 | 0.1540 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 685 |
| 3.95 | 0.1555 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 692 |
| 5/32 | 0.1562 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 695 |
| #22 | 0.1570 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 698 |
| 4.00mm | 0.1575 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 701 |
| #21 | 0.1590 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 749 |
| 4.05mm | 0.1594 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 751 |
| #20 | 0.1610 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 758 |
| 4.10mm | 0.1614 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 760 |
| 4.15mm | 0.1634 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 770 |
| 4.20mm | 0.1654 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 779 |
| #19 | 0.1660 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 782 |
| 4.25mm | 0.1673 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 788 |
| 4.30mm | 0.1693 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 797 |
| #18 | 0.1695 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 798 |
| 4.35mm | 0.1713 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 807 |
| 11/64 | 0.1719 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 810 |
| #17 | 0.1730 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 815 |
| 4.40mm | 0.1732 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 816 |
| 4.45mm | 0.1752 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 825 |
| #16 | 0.1770 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 834 |
| 4.50mm | 0.1772 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 835 |
| 4.55mm | 0.1792 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 844 |
| #15 | 0.1800 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 848 |
| 4.60mm | 0.1811 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 853 |
| #14 | 0.1820 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 857 |
| 4.65mm | 0.1831 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 862 |
| #13 | 0.1850 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 871 |
| 4.70mm | 0.1850 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 871 |
| 4.75mm | 0.1870 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 881 |
| 3/16 | 0.1875 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 883 |
| 4.80mm | 0.1890 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 940 |
| #12 | 0.1890 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 940 |
| 4.85mm | 0.1909 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 949 |
| #11 | 0.1910 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 950 |
| 4.90mm | 0.1929 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 959 |
| #10 | 0.1935 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 962 |
| 4.95mm | 0.1949 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 969 |
| #9 | 0.1960 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 974 |
| 5.00mm | 0.1968 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 978 |
| 5.05mm | 0.1988 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 988 |
| #8 | 0.1990 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 989 |
| 5.10mm | 0.2008 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 998 |
| #7 | 0.2010 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 999 |
| 5.15mm | 0.2028 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 1008 |
| 13/64 | 0.2031 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 1010 |
| #6 | 0.2040 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1014 |
| 5.20mm | 0.2047 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1018 |
| #5 | 0.2055 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1022 |
| 5.25mm | 0.2067 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1028 |
| 5.30mm | 0.2087 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1038 |
| #4 | 0.2090 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1039 |
| 5.35mm | 0.2106 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1047 |
| 5.40mm | 0.2126 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1057 |
| #3 | 0.2130 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1059 |
| 5.45mm | 0.2146 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1067 |
| 5.50mm | 0.2165 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1076 |
| 5.55mm | 0.2185 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1086 |
| 7/32 | 0.2188 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1088 |
| 5.60mm | 0.2205 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1096 |
| #2 | 0.2210 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1099 |
| 5.65mm | 0.2224 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1106 |
| 5.70mm | 0.2244 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1116 |
| 5.75mm | 0.2264 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1126 |
| #1 | 0.2280 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1134 |
| 5.80mm | 0.2283 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1135 |
| 5.85mm | 0.2302 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1144 |
| 5.90mm | 0.2323 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1155 |
| A | 0.2340 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1163 |
| 5.95mm | 0.2343 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1165 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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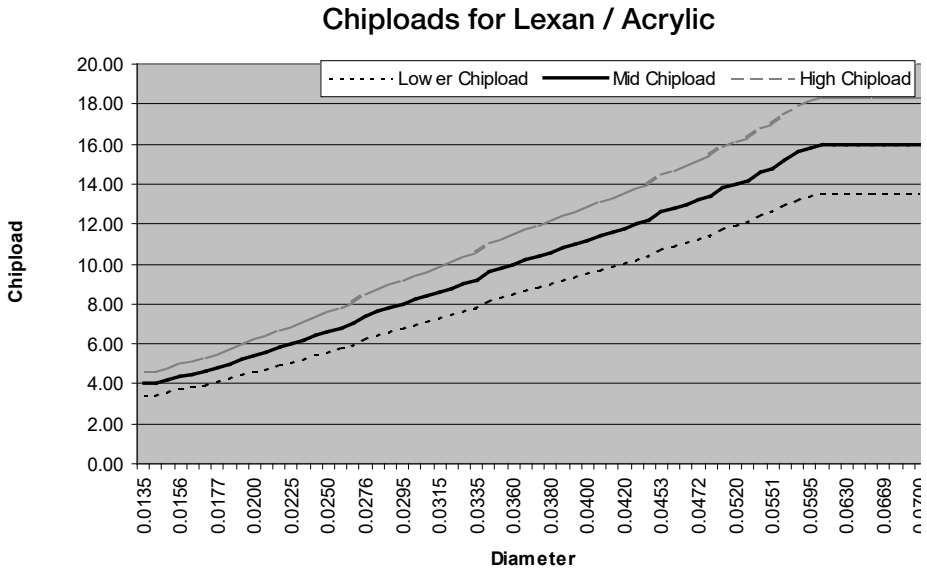
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 15/64 | 0.2344 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1165 |
| 6.00mm | 0.2362 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1174 |
| B | 0.2380 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1246 |
| 6.05mm | 0.2382 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1247 |
| 6.10mm | 0.2402 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1257 |
| C | 0.2420 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1266 |
| 6.15mm | 0.2421 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1267 |
| 6.20mm | 0.2441 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1277 |
| D | 0.2460 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1287 |
| 6.25mm | 0.2461 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1288 |
| 6.30mm | 0.2480 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1298 |
| 6.35mm | 0.2500 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1308 |
| 6.40mm | 0.2520 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1319 |
| 6.50mm | 0.2559 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1339 |
| F | 0.2570 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1345 |
| 6.60mm | 0.2598 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Nelco N4000-6 FR-4 High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 25 | 120 | 200 | -0.011 | 250 | 0.21 | 126 |
| 0.13mm | 0.0050 | 30 | 120 | 300 | -0.011 | 400 | 0.25 | 157 |
| 0.15mm | 0.0059 | 36 | 120 | 300 | -0.011 | 500 | 0.30 | 185 |
| #96 | 0.0063 | 40 | 120 | 400 | -0.011 | 500 | 0.33 | 198 |
| #95 | 0.0067 | 44 | 120 | 400 | -0.012 | 500 | 0.37 | 210 |
| #94 | 0.0071 | 49 | 120 | 500 | -0.012 | 600 | 0.41 | 223 |
| #93 | 0.0075 | 54 | 120 | 500 | -0.012 | 600 | 0.45 | 236 |
| #92 | 0.0079 | 60 | 120 | 500 | -0.012 | 800 | 0.50 | 248 |
| #91 | 0.0083 | 65 | 120 | 600 | -0.012 | 800 | 0.54 | 261 |
| #90 | 0.0087 | 70 | 120 | 600 | -0.012 | 800 | 0.58 | 273 |
| #89 | 0.0091 | 75 | 120 | 700 | -0.012 | 1000 | 0.63 | 286 |
| #88 | 0.0095 | 78 | 120 | 700 | -0.012 | 1000 | 0.65 | 298 |
| 0.25mm | 0.0098 | 80 | 120 | 800 | -0.012 | 1200 | 0.67 | 308 |
| #87 | 0.0100 | 84 | 120 | 800 | -0.012 | 1200 | 0.70 | 314 |
| #86 | 0.0105 | 88 | 120 | 800 | -0.012 | 1200 | 0.73 | 330 |
| #85 | 0.0110 | 92 | 120 | 900 | -0.013 | 1200 | 0.77 | 345 |
| #84 | 0.0115 | 95 | 120 | 900 | -0.013 | 1500 | 0.79 | 361 |
| 0.30mm | 0.0118 | 98 | 120 | 1000 | -0.013 | 1500 | 0.82 | 371 |
| #83 | 0.0120 | 102 | 120 | 1000 | -0.013 | 1500 | 0.85 | 377 |
| #82 | 0.0125 | 106 | 120 | 1000 | -0.013 | 1500 | 0.88 | 393 |
| #81 | 0.0130 | 110 | 120 | 1000 | -0.013 | 1500 | 0.92 | 408 |
| #80 | 0.0135 | 115 | 120 | 1000 | -0.013 | 1500 | 0.96 | 424 |
| 0.35mm | 0.0138 | 116 | 120 | 1000 | -0.013 | 1500 | 0.97 | 433 |
| #79 | 0.0145 | 118 | 119 | 1000 | -0.013 | 1500 | 0.99 | 450 |
| 1/64 | 0.0156 | 119 | 110 | 1000 | -0.014 | 1500 | 1.08 | 450 |
| 0.40mm | 0.0158 | 120 | 109 | 1000 | -0.014 | 1500 | 1.10 | 450 |
| #78 | 0.0160 | 120 | 107 | 1000 | -0.014 | 1500 | 1.12 | 450 |
| 0.45mm | 0.0177 | 121 | 97 | 1000 | -0.014 | 1500 | 1.25 | 450 |
| #77 | 0.0180 | 121 | 96 | 1000 | -0.014 | 1500 | 1.27 | 450 |
| 0.50mm | 0.0197 | 122 | 87 | 1000 | -0.015 | 1500 | 1.40 | 450 |
| #76 | 0.0200 | 122 | 86 | 1000 | -0.015 | 1500 | 1.42 | 450 |
| #75 | 0.0210 | 123 | 82 | 1000 | -0.015 | 1500 | 1.50 | 450 |
| 0.55mm | 0.0217 | 123 | 79 | 1000 | -0.015 | 1500 | 1.55 | 450 |
| #74 | 0.0225 | 124 | 76 | 1000 | -0.015 | 1500 | 1.62 | 450 |
| 0.60mm | 0.0236 | 125 | 73 | 1000 | -0.016 | 1500 | 1.72 | 450 |
| #73 | 0.0240 | 125 | 72 | 1000 | -0.016 | 1500 | 1.74 | 450 |
| #72 | 0.0250 | 125 | 69 | 1000 | -0.016 | 1500 | 1.82 | 450 |
| 0.65mm | 0.0256 | 125 | 67 | 1000 | -0.016 | 1500 | 1.86 | 450 |
| #71 | 0.0260 | 125 | 66 | 1000 | -0.016 | 1500 | 1.89 | 450 |
| 0.70mm | 0.0276 | 124 | 62 | 1000 | -0.016 | 1500 | 1.99 | 450 |
| #70 | 0.0280 | 124 | 61 | 1000 | -0.017 | 1500 | 2.02 | 450 |
| #69 | 0.0292 | 123 | 59 | 1000 | -0.017 | 1500 | 2.09 | 450 |
| 0.75mm | 0.0295 | 123 | 58 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| #68 | 0.0310 | 122 | 55 | 1000 | -0.017 | 1500 | 2.20 | 450 |
| 1/32 | 0.0312 | 122 | 55 | 1000 | -0.017 | 1500 | 2.21 | 450 |
| 0.80mm | 0.0315 | 122 | 55 | 1000 | -0.017 | 1500 | 2.23 | 450 |
| #67 | 0.0320 | 121 | 54 | 1000 | -0.017 | 1500 | 2.25 | 450 |
| #66 | 0.0330 | 120 | 52 | 1000 | -0.018 | 1500 | 2.30 | 450 |
| 0.85mm | 0.0335 | 120 | 51 | 1000 | -0.018 | 1500 | 2.34 | 450 |
| #65 | 0.0350 | 119 | 49 | 1000 | -0.018 | 1500 | 2.42 | 450 |
| 0.90mm | 0.0354 | 119 | 49 | 1000 | -0.018 | 1500 | 2.45 | 450 |
| #64 | 0.0360 | 119 | 48 | 1000 | -0.018 | 1500 | 2.49 | 450 |
| #63 | 0.0370 | 118 | 46 | 1000 | -0.019 | 1500 | 2.54 | 450 |
| 0.95mm | 0.0374 | 118 | 46 | 1000 | -0.019 | 1500 | 2.57 | 450 |
| #62 | 0.0380 | 117 | 45 | 1000 | -0.019 | 1500 | 2.59 | 450 |
| #61 | 0.0390 | 115 | 44 | 1000 | -0.019 | 1500 | 2.60 | 450 |
| 1.00mm | 0.0394 | 113 | 44 | 1000 | -0.019 | 1500 | 2.60 | 450 |
| #60 | 0.0400 | 112 | 43 | 1000 | -0.019 | 1500 | 2.60 | 450 |
| #59 | 0.0410 | 109 | 42 | 1000 | -0.020 | 1500 | 2.60 | 450 |
| 1.05mm | 0.0413 | 108 | 42 | 1000 | -0.020 | 1500 | 2.60 | 450 |
| #58 | 0.0420 | 106 | 41 | 1000 | -0.020 | 1500 | 2.60 | 450 |
| #57 | 0.0430 | 104 | 40 | 1000 | -0.020 | 1500 | 2.60 | 450 |
| 1.10mm | 0.0433 | 103 | 40 | 1000 | -0.020 | 1500 | 2.60 | 450 |
| 1.15mm | 0.0453 | 99 | 38 | 1000 | -0.021 | 1500 | 2.60 | 450 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 96 | 37 | 1000 | -0.021 | 1200 | 2.60 | 450 |
| 3/64 | 0.0469 | 95 | 37 | 1000 | -0.021 | 1200 | 2.60 | 450 |
| 1.20mm | 0.0472 | 95 | 36 | 1000 | -0.021 | 1200 | 2.60 | 450 |
| 1.25mm | 0.0492 | 91 | 35 | 1000 | -0.021 | 1200 | 2.60 | 450 |
| 1.30mm | 0.0512 | 87 | 34 | 1000 | -0.022 | 1200 | 2.60 | 450 |
| #55 | 0.0520 | 86 | 33 | 1000 | -0.022 | 1200 | 2.60 | 450 |
| 1.35mm | 0.0531 | 84 | 32 | 1000 | -0.022 | 1200 | 2.60 | 450 |
| #54 | 0.0550 | 81 | 31 | 1000 | -0.023 | 1200 | 2.60 | 450 |
| 1.40mm | 0.0551 | 81 | 31 | 1000 | -0.023 | 1200 | 2.60 | 450 |
| 1.45mm | 0.0571 | 78 | 30 | 1000 | -0.023 | 1200 | 2.60 | 450 |
| 1.50mm | 0.0591 | 76 | 29 | 1000 | -0.024 | 1200 | 2.60 | 450 |
| #53 | 0.0595 | 75 | 29 | 1000 | -0.024 | 1200 | 2.60 | 450 |
| 1.55mm | 0.0610 | 73 | 28 | 1000 | -0.024 | 1200 | 2.60 | 450 |
| 1/16 | 0.0625 | 72 | 28 | 1000 | -0.025 | 1200 | 2.60 | 450 |
| 1.60mm | 0.0630 | 71 | 27 | 1000 | -0.025 | 1200 | 2.60 | 450 |
| #52 | 0.0635 | 70 | 27 | 1000 | -0.025 | 1200 | 2.60 | 450 |
| 1.65mm | 0.0650 | 69 | 26 | 1000 | -0.025 | 1200 | 2.60 | 450 |
| 1.70mm | 0.0669 | 67 | 26 | 1000 | -0.026 | 1200 | 2.60 | 450 |
| #51 | 0.0670 | 67 | 26 | 1000 | -0.026 | 1200 | 2.60 | 450 |
| 1.75mm | 0.0689 | 65 | 25 | 1000 | -0.026 | 1200 | 2.60 | 450 |
| #50 | 0.0700 | 64 | 25 | 1000 | -0.026 | 1200 | 2.60 | 450 |
| 1.80mm | 0.0709 | 63 | 24 | 1000 | -0.027 | 1200 | 2.60 | 450 |
| 1.85mm | 0.0728 | 61 | 24 | 1000 | -0.027 | 1200 | 2.60 | 450 |
| #49 | 0.0730 | 61 | 24 | 1000 | -0.027 | 1200 | 2.60 | 450 |
| 1.90mm | 0.0748 | 60 | 23 | 1000 | -0.027 | 1200 | 2.60 | 450 |
| #48 | 0.0760 | 59 | 23 | 1000 | -0.028 | 1200 | 2.60 | 450 |
| 1.95mm | 0.0768 | 58 | 22 | 1000 | -0.028 | 1200 | 2.60 | 450 |
| 5/64 | 0.0781 | 57 | 22 | 1000 | -0.028 | 1200 | 2.60 | 450 |
| #47 | 0.0785 | 57 | 22 | 1000 | -0.028 | 1200 | 2.60 | 450 |
| 2.00mm | 0.0787 | 57 | 22 | 1000 | -0.028 | 1200 | 2.60 | 450 |
| 2.05mm | 0.0807 | 55 | 21 | 1000 | -0.029 | 1200 | 2.60 | 450 |
| #46 | 0.0810 | 55 | 21 | 1000 | -0.029 | 1200 | 2.60 | 450 |
| #45 | 0.0820 | 55 | 21 | 1000 | -0.029 | 1200 | 2.60 | 450 |
| 2.10mm | 0.0827 | 54 | 21 | 1000 | -0.029 | 1200 | 2.60 | 450 |
| 2.15mm | 0.0846 | 53 | 20 | 1000 | -0.030 | 1200 | 2.60 | 450 |
| #44 | 0.0860 | 52 | 20 | 1000 | -0.030 | 1200 | 2.60 | 450 |
| 2.20mm | 0.0866 | 52 | 20 | 1000 | -0.030 | 1200 | 2.60 | 453 |
| 2.25mm | 0.0886 | 52 | 20 | 1000 | -0.031 | 1200 | 2.60 | 464 |
| #43 | 0.0890 | 52 | 20 | 1000 | -0.031 | 1200 | 2.60 | 466 |
| 2.30mm | 0.0906 | 52 | 20 | 1000 | -0.031 | 1200 | 2.60 | 474 |
| 2.35mm | 0.0925 | 52 | 20 | 1000 | -0.032 | 1200 | 2.60 | 484 |
| #42 | 0.0935 | 52 | 20 | 1000 | -0.032 | 1200 | 2.60 | 489 |
| 3/32 | 0.0938 | 52 | 20 | 1000 | -0.032 | 1200 | 2.60 | 491 |
| 2.40mm | 0.0945 | 52 | 20 | 1000 | -0.032 | 1200 | 2.60 | 495 |
| #41 | 0.0960 | 52 | 20 | 1000 | -0.032 | 1200 | 2.60 | 502 |
| 2.45mm | 0.0965 | 52 | 20 | 1000 | -0.033 | 1200 | 2.60 | 505 |
| #40 | 0.0980 | 52 | 20 | 1000 | -0.033 | 1200 | 2.60 | 513 |
| 2.50mm | 0.0984 | 52 | 20 | 1000 | -0.033 | 1200 | 2.60 | 515 |
| #39 | 0.0995 | 52 | 20 | 1000 | -0.033 | 1200 | 2.60 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 1200 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 1200 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 1200 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 1200 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 1200 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 1200 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 1200 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 1200 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 1200 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 1200 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 1200 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 1200 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 1200 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 1200 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 1200 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 1200 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 1200 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 1200 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 1200 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 1200 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 1200 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 1200 | 2.50 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 46 | 20 | 1000 | -0.018 | 1000 | 2.30 | 659 |
| 3.25mm | 0.1280 | 46 | 20 | 1000 | -0.018 | 1000 | 2.30 | 670 |
| #30 | 0.1285 | 46 | 20 | 1000 | -0.019 | 1000 | 2.30 | 672 |
| 3.30mm | 0.1299 | 46 | 20 | 1000 | -0.019 | 1000 | 2.30 | 680 |
| 3.35mm | 0.1319 | 46 | 20 | 1000 | -0.019 | 1000 | 2.30 | 690 |
| 3.40mm | 0.1339 | 46 | 20 | 1000 | -0.019 | 1000 | 2.30 | 701 |
| 3.45mm | 0.1358 | 46 | 20 | 1000 | -0.019 | 1000 | 2.30 | 711 |
| #29 | 0.1360 | 46 | 20 | 1000 | -0.019 | 1000 | 2.30 | 712 |
| 3.50mm | 0.1378 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 721 |
| 3.55mm | 0.1398 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 732 |
| #28 | 0.1405 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 735 |
| 9/64 | 0.1406 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 736 |
| 3.60mm | 0.1417 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 742 |
| 3.65mm | 0.1437 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 752 |
| #27 | 0.1440 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 754 |
| 3.70mm | 0.1457 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 800 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 806 |
| 3.95 | 0.1555 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 814 |
| 5/32 | 0.1562 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 817 |
| #22 | 0.1570 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 822 |
| 4.00mm | 0.1575 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 824 |
| #21 | 0.1590 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 832 |
| 4.05mm | 0.1594 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 834 |
| #20 | 0.1610 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 843 |
| 4.10mm | 0.1614 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 845 |
| 4.15mm | 0.1634 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 855 |
| 4.20mm | 0.1654 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 866 |
| #19 | 0.1660 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 869 |
| 4.25mm | 0.1673 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 876 |
| 4.30mm | 0.1693 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 886 |
| #18 | 0.1695 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 887 |
| 4.35mm | 0.1713 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 896 |
| 11/64 | 0.1719 | 35 | 20 | 1000 | -0.021 | 600 | 1.75 | 900 |
| #17 | 0.1730 | 35 | 20 | 1000 | -0.021 | 500 | 1.75 | 905 |
| 4.40mm | 0.1732 | 35 | 20 | 1000 | -0.021 | 500 | 1.75 | 906 |
| 4.45mm | 0.1752 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 917 |
| #16 | 0.1770 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 926 |
| 4.50mm | 0.1772 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 927 |
| 4.55mm | 0.1792 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 938 |
| #15 | 0.1800 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 942 |
| 4.60mm | 0.1811 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 948 |
| #14 | 0.1820 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 952 |
| 4.65mm | 0.1831 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 958 |
| #13 | 0.1850 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 968 |
| 4.70mm | 0.1850 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 968 |
| 4.75mm | 0.1870 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 979 |
| 3/16 | 0.1875 | 35 | 20 | 1000 | -0.022 | 500 | 1.75 | 981 |
| 4.80mm | 0.1890 | 35 | 20 | 1000 | -0.023 | 500 | 1.75 | 989 |
| #12 | 0.1890 | 35 | 20 | 1000 | -0.023 | 500 | 1.75 | 989 |
| 4.85mm | 0.1909 | 35 | 20 | 1000 | -0.023 | 500 | 1.75 | 999 |
| #11 | 0.1910 | 35 | 20 | 1000 | -0.023 | 500 | 1.75 | 1000 |
| 4.90mm | 0.1929 | 35 | 20 | 1000 | -0.023 | 500 | 1.75 | 1010 |
| #10 | 0.1935 | 35 | 20 | 1000 | -0.023 | 500 | 1.75 | 1013 |
| 4.95mm | 0.1949 | 35 | 20 | 1000 | -0.023 | 500 | 1.75 | 1020 |
| #9 | 0.1960 | 35 | 20 | 1000 | -0.023 | 400 | 1.75 | 1026 |
| 5.00mm | 0.1968 | 35 | 20 | 1000 | -0.023 | 400 | 1.75 | 1030 |
| 5.05mm | 0.1988 | 35 | 20 | 1000 | -0.023 | 400 | 1.75 | 1040 |
| #8 | 0.1990 | 35 | 20 | 1000 | -0.023 | 400 | 1.75 | 1041 |
| 5.10mm | 0.2008 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1051 |
| #7 | 0.2010 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1052 |
| 5.15mm | 0.2028 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1061 |
| 13/64 | 0.2031 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1063 |
| #6 | 0.2040 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1068 |
| 5.20mm | 0.2047 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1071 |
| #5 | 0.2055 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1075 |

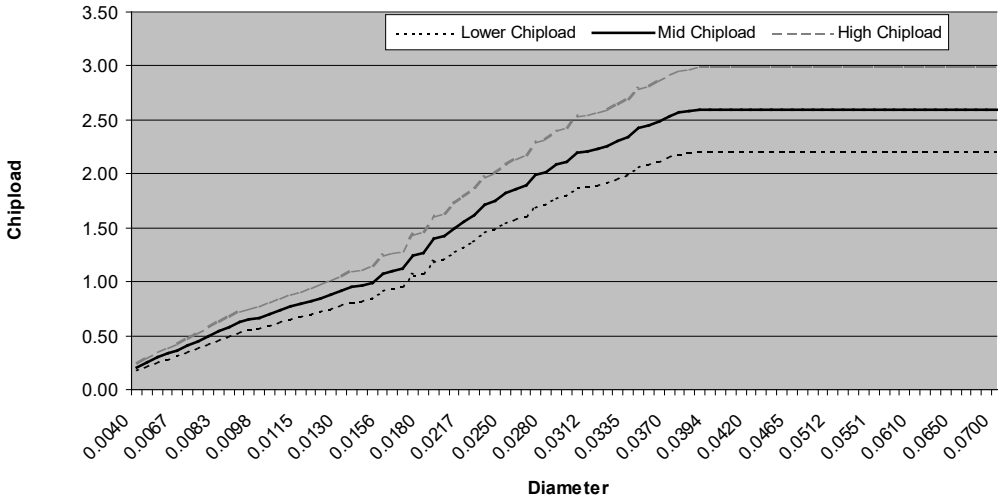
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1082 |
| 5.30mm | 0.2087 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1092 |
| #4 | 0.2090 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1094 |
| 5.35mm | 0.2106 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1102 |
| 5.40mm | 0.2126 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1113 |
| #3 | 0.2130 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1115 |
| 5.45mm | 0.2146 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1123 |
| 5.50mm | 0.2165 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1133 |
| 5.55mm | 0.2185 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1143 |
| 7/32 | 0.2188 | 30 | 20 | 1000 | -0.024 | 400 | 1.50 | 1145 |
| 5.60mm | 0.2205 | 30 | 20 | 1000 | -0.025 | 400 | 1.50 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Nelco N4000-6 FR-4 High Tg




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Nelco N4000-13 FR-4 High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 25 | 120 | 200 | -0.011 | 200 | 0.21 | 126 |
| 0.13mm | 0.0050 | 30 | 120 | 300 | -0.011 | 300 | 0.25 | 157 |
| 0.15mm | 0.0059 | 36 | 120 | 300 | -0.011 | 400 | 0.30 | 185 |
| #96 | 0.0063 | 40 | 120 | 400 | -0.011 | 400 | 0.33 | 198 |
| #95 | 0.0067 | 44 | 120 | 400 | -0.012 | 400 | 0.37 | 210 |
| #94 | 0.0071 | 48 | 120 | 500 | -0.012 | 400 | 0.40 | 223 |
| #93 | 0.0075 | 52 | 120 | 500 | -0.012 | 400 | 0.43 | 236 |
| #92 | 0.0079 | 56 | 120 | 500 | -0.012 | 700 | 0.47 | 248 |
| #91 | 0.0083 | 60 | 120 | 600 | -0.012 | 700 | 0.50 | 261 |
| #90 | 0.0087 | 63 | 120 | 600 | -0.012 | 700 | 0.53 | 273 |
| #89 | 0.0091 | 67 | 120 | 700 | -0.012 | 700 | 0.56 | 286 |
| #88 | 0.0095 | 70 | 120 | 700 | -0.012 | 700 | 0.58 | 298 |
| 0.25mm | 0.0098 | 72 | 120 | 800 | -0.012 | 800 | 0.60 | 308 |
| #87 | 0.0100 | 74 | 120 | 800 | -0.012 | 800 | 0.62 | 314 |
| #86 | 0.0105 | 76 | 120 | 800 | -0.012 | 800 | 0.63 | 330 |
| #85 | 0.0110 | 78 | 120 | 900 | -0.013 | 800 | 0.65 | 345 |
| #84 | 0.0115 | 80 | 120 | 900 | -0.013 | 800 | 0.67 | 361 |
| 0.30mm | 0.0118 | 82 | 120 | 1000 | -0.013 | 1000 | 0.68 | 371 |
| #83 | 0.0120 | 85 | 120 | 1000 | -0.013 | 1000 | 0.71 | 377 |
| #82 | 0.0125 | 88 | 120 | 1000 | -0.013 | 1000 | 0.73 | 393 |
| #81 | 0.0130 | 91 | 120 | 1000 | -0.013 | 1000 | 0.76 | 408 |
| #80 | 0.0135 | 93 | 119 | 1000 | -0.013 | 1200 | 0.78 | 420 |
| 0.35mm | 0.0138 | 95 | 116 | 1000 | -0.013 | 1200 | 0.82 | 420 |
| #79 | 0.0145 | 98 | 111 | 1000 | -0.013 | 1200 | 0.88 | 420 |
| 1/64 | 0.0156 | 104 | 103 | 1000 | -0.014 | 1200 | 1.01 | 420 |
| 0.40mm | 0.0158 | 106 | 102 | 1000 | -0.014 | 1200 | 1.04 | 420 |
| #78 | 0.0160 | 108 | 100 | 1000 | -0.014 | 1200 | 1.08 | 420 |
| 0.45mm | 0.0177 | 110 | 91 | 1000 | -0.014 | 1200 | 1.21 | 420 |
| #77 | 0.0180 | 112 | 89 | 1000 | -0.014 | 1200 | 1.26 | 420 |
| 0.50mm | 0.0197 | 112 | 81 | 1000 | -0.015 | 1200 | 1.38 | 420 |
| #76 | 0.0200 | 112 | 80 | 1000 | -0.015 | 1200 | 1.40 | 420 |
| #75 | 0.0210 | 110 | 76 | 1000 | -0.015 | 1200 | 1.45 | 420 |
| 0.55mm | 0.0217 | 108 | 74 | 1000 | -0.015 | 1200 | 1.46 | 420 |
| #74 | 0.0225 | 106 | 71 | 1000 | -0.015 | 1200 | 1.49 | 420 |
| 0.60mm | 0.0236 | 105 | 68 | 1000 | -0.016 | 1200 | 1.54 | 420 |
| #73 | 0.0240 | 105 | 67 | 1000 | -0.016 | 1200 | 1.57 | 420 |
| #72 | 0.0250 | 103 | 64 | 1000 | -0.016 | 1200 | 1.61 | 420 |
| 0.65mm | 0.0256 | 102 | 63 | 1000 | -0.016 | 1200 | 1.62 | 420 |
| #71 | 0.0260 | 101 | 62 | 1000 | -0.016 | 1200 | 1.63 | 420 |
| 0.70mm | 0.0276 | 100 | 58 | 1000 | -0.016 | 1200 | 1.72 | 420 |
| #70 | 0.0280 | 100 | 57 | 1000 | -0.017 | 1200 | 1.75 | 420 |
| #69 | 0.0292 | 98 | 55 | 1000 | -0.017 | 1200 | 1.78 | 420 |
| 0.75mm | 0.0295 | 97 | 54 | 1000 | -0.017 | 1200 | 1.80 | 420 |
| #68 | 0.0310 | 95 | 52 | 1000 | -0.017 | 1200 | 1.83 | 420 |
| 1/32 | 0.0312 | 95 | 51 | 1000 | -0.017 | 1200 | 1.86 | 420 |
| 0.80mm | 0.0315 | 95 | 51 | 1000 | -0.017 | 1200 | 1.86 | 420 |
| #67 | 0.0320 | 94 | 50 | 1000 | -0.017 | 1200 | 1.88 | 420 |
| #66 | 0.0330 | 93 | 49 | 1000 | -0.018 | 1200 | 1.90 | 420 |
| 0.85mm | 0.0335 | 92 | 48 | 1000 | -0.018 | 1200 | 1.92 | 420 |
| #65 | 0.0350 | 91 | 46 | 1000 | -0.018 | 1200 | 1.98 | 420 |
| 0.90mm | 0.0354 | 91 | 45 | 1000 | -0.018 | 1200 | 2.02 | 420 |
| #64 | 0.0360 | 91 | 45 | 1000 | -0.018 | 1200 | 2.02 | 420 |
| #63 | 0.0370 | 90 | 43 | 1000 | -0.019 | 1200 | 2.09 | 420 |
| 0.95mm | 0.0374 | 90 | 43 | 1000 | -0.019 | 1200 | 2.09 | 420 |
| #62 | 0.0380 | 90 | 42 | 1000 | -0.019 | 1200 | 2.14 | 420 |
| #61 | 0.0390 | 89 | 41 | 1000 | -0.019 | 1200 | 2.17 | 420 |
| 1.00mm | 0.0394 | 89 | 41 | 1000 | -0.019 | 1200 | 2.17 | 420 |
| #60 | 0.0400 | 89 | 40 | 1000 | -0.019 | 1200 | 2.23 | 420 |
| #59 | 0.0410 | 88 | 39 | 1000 | -0.020 | 1200 | 2.26 | 420 |
| 1.05mm | 0.0413 | 88 | 39 | 1000 | -0.020 | 1200 | 2.26 | 420 |
| #58 | 0.0420 | 88 | 38 | 1000 | -0.020 | 1200 | 2.32 | 420 |
| #57 | 0.0430 | 87 | 37 | 1000 | -0.020 | 1200 | 2.35 | 420 |
| 1.10mm | 0.0433 | 87 | 37 | 1000 | -0.020 | 1200 | 2.35 | 420 |
| 1.15mm | 0.0453 | 86 | 35 | 1000 | -0.021 | 1200 | 2.46 | 420 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 86 | 35 | 1000 | -0.021 | 1000 | 2.46 | 420 |
| 3/64 | 0.0469 | 85 | 34 | 1000 | -0.021 | 1000 | 2.50 | 420 |
| 1.20mm | 0.0472 | 85 | 34 | 1000 | -0.021 | 1000 | 2.50 | 420 |
| 1.25mm | 0.0492 | 83 | 33 | 1000 | -0.021 | 1000 | 2.50 | 420 |
| 1.30mm | 0.0512 | 78 | 31 | 1000 | -0.022 | 1000 | 2.50 | 420 |
| #55 | 0.0520 | 78 | 31 | 1000 | -0.022 | 1000 | 2.50 | 420 |
| 1.35mm | 0.0531 | 75 | 30 | 1000 | -0.022 | 1000 | 2.50 | 420 |
| #54 | 0.0550 | 73 | 29 | 1000 | -0.023 | 1000 | 2.50 | 420 |
| 1.40mm | 0.0551 | 73 | 29 | 1000 | -0.023 | 1000 | 2.50 | 420 |
| 1.45mm | 0.0571 | 70 | 28 | 1000 | -0.023 | 1000 | 2.50 | 420 |
| 1.50mm | 0.0591 | 68 | 27 | 1000 | -0.024 | 1000 | 2.50 | 420 |
| #53 | 0.0595 | 68 | 27 | 1000 | -0.024 | 1000 | 2.50 | 420 |
| 1.55mm | 0.0610 | 65 | 26 | 1000 | -0.024 | 1000 | 2.50 | 420 |
| 1/16 | 0.0625 | 65 | 26 | 1000 | -0.025 | 1000 | 2.50 | 420 |
| 1.60mm | 0.0630 | 63 | 25 | 1000 | -0.025 | 1000 | 2.50 | 420 |
| #52 | 0.0635 | 63 | 25 | 1000 | -0.025 | 1000 | 2.50 | 420 |
| 1.65mm | 0.0650 | 63 | 25 | 1000 | -0.025 | 1000 | 2.50 | 420 |
| 1.70mm | 0.0669 | 60 | 24 | 1000 | -0.026 | 1000 | 2.50 | 420 |
| #51 | 0.0670 | 60 | 24 | 1000 | -0.026 | 1000 | 2.50 | 420 |
| 1.75mm | 0.0689 | 58 | 23 | 1000 | -0.026 | 1000 | 2.50 | 420 |
| #50 | 0.0700 | 58 | 23 | 1000 | -0.026 | 1000 | 2.50 | 420 |
| 1.80mm | 0.0709 | 58 | 23 | 1000 | -0.027 | 1000 | 2.50 | 420 |
| 1.85mm | 0.0728 | 55 | 22 | 1000 | -0.027 | 1000 | 2.50 | 420 |
| #49 | 0.0730 | 55 | 22 | 1000 | -0.027 | 1000 | 2.50 | 420 |
| 1.90mm | 0.0748 | 53 | 21 | 1000 | -0.027 | 1000 | 2.50 | 420 |
| #48 | 0.0760 | 53 | 21 | 1000 | -0.028 | 1000 | 2.50 | 420 |
| 1.95mm | 0.0768 | 53 | 21 | 1000 | -0.028 | 1000 | 2.50 | 420 |
| 5/64 | 0.0781 | 53 | 21 | 1000 | -0.028 | 1000 | 2.50 | 420 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 420 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 420 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 420 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 420 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 420 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 46 | 20 | 1000 | -0.033 | 1000 | 2.30 | 525 |
| #38 | 0.1015 | 46 | 20 | 1000 | -0.034 | 1000 | 2.30 | 531 |
| 2.60mm | 0.1024 | 46 | 20 | 1000 | -0.034 | 1000 | 2.30 | 536 |
| #37 | 0.1040 | 46 | 20 | 1000 | -0.034 | 1000 | 2.30 | 544 |
| 2.65mm | 0.1043 | 46 | 20 | 1000 | -0.034 | 1000 | 2.30 | 546 |
| 2.70mm | 0.1063 | 46 | 20 | 1000 | -0.035 | 1000 | 2.30 | 556 |
| #36 | 0.1065 | 46 | 20 | 1000 | -0.035 | 1000 | 2.30 | 557 |
| 2.75mm | 0.1083 | 46 | 20 | 1000 | -0.035 | 1000 | 2.30 | 567 |
| 7/64 | 0.1094 | 46 | 20 | 1000 | -0.036 | 1000 | 2.30 | 573 |
| #35 | 0.1100 | 46 | 20 | 1000 | -0.036 | 1000 | 2.30 | 576 |
| 2.80mm | 0.1102 | 46 | 20 | 1000 | -0.036 | 1000 | 2.30 | 577 |
| #34 | 0.1110 | 46 | 20 | 1000 | -0.036 | 1000 | 2.30 | 581 |
| 2.85mm | 0.1122 | 46 | 20 | 1000 | -0.036 | 1000 | 2.30 | 587 |
| #33 | 0.1130 | 46 | 20 | 1000 | -0.036 | 1000 | 2.30 | 591 |
| 2.90mm | 0.1142 | 46 | 20 | 1000 | -0.037 | 1000 | 2.30 | 598 |
| #32 | 0.1160 | 46 | 20 | 1000 | -0.037 | 1000 | 2.30 | 607 |
| 2.95mm | 0.1161 | 46 | 20 | 1000 | -0.037 | 1000 | 2.30 | 608 |
| 3.00mm | 0.1181 | 46 | 20 | 1000 | -0.038 | 1000 | 2.30 | 618 |
| #31 | 0.1200 | 46 | 20 | 1000 | -0.038 | 1000 | 2.30 | 628 |
| 3.05mm | 0.1201 | 46 | 20 | 1000 | -0.038 | 1000 | 2.30 | 629 |
| 3.10mm | 0.1220 | 46 | 20 | 1000 | -0.038 | 1000 | 2.30 | 638 |
| 3.15mm | 0.1240 | 46 | 20 | 1000 | -0.039 | 1000 | 2.30 | 649 |
| 1/8 | 0.1250 | 46 | 20 | 1000 | -0.039 | 1000 | 2.30 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 800 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 800 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 800 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 700 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 700 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 700 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 700 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 700 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 700 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 700 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 700 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 700 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

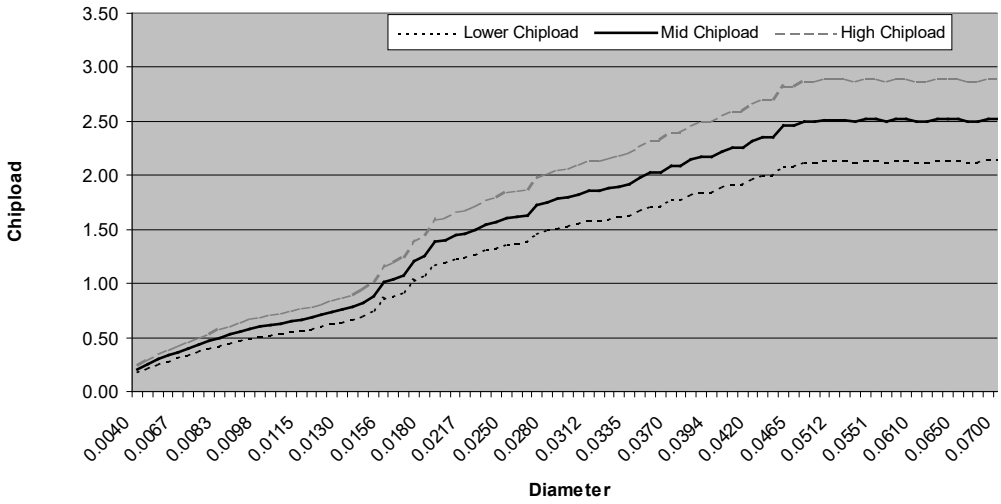
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 300 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 300 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 300 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 300 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 300 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 300 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 300 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Nelco N4000-13 FR-4 High Tg




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Polyimide** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 20 | 120 | 200 | -0.011 | 200 | 0.17 | 126 |
| 0.13mm | 0.0050 | 24 | 120 | 300 | -0.011 | 250 | 0.20 | 157 |
| 0.15mm | 0.0059 | 25 | 120 | 300 | -0.011 | 250 | 0.21 | 185 |
| #96 | 0.0063 | 26 | 120 | 400 | -0.011 | 300 | 0.22 | 198 |
| #95 | 0.0067 | 28 | 120 | 400 | -0.012 | 300 | 0.23 | 210 |
| #94 | 0.0071 | 30 | 120 | 500 | -0.012 | 300 | 0.25 | 223 |
| #93 | 0.0075 | 32 | 120 | 500 | -0.012 | 300 | 0.27 | 236 |
| #92 | 0.0079 | 36 | 120 | 500 | -0.012 | 400 | 0.30 | 244 |
| #91 | 0.0083 | 38 | 120 | 600 | -0.012 | 400 | 0.32 | 252 |
| #90 | 0.0087 | 42 | 120 | 600 | -0.012 | 400 | 0.35 | 255 |
| #89 | 0.0091 | 44 | 120 | 700 | -0.012 | 400 | 0.37 | 257 |
| #88 | 0.0095 | 48 | 120 | 700 | -0.012 | 500 | 0.40 | 263 |
| 0.25mm | 0.0098 | 49 | 120 | 800 | -0.012 | 500 | 0.41 | 269 |
| #87 | 0.0100 | 50 | 120 | 800 | -0.012 | 500 | 0.42 | 272 |
| #86 | 0.0105 | 54 | 120 | 800 | -0.012 | 500 | 0.45 | 280 |
| #85 | 0.0110 | 58 | 120 | 900 | -0.013 | 500 | 0.48 | 288 |
| #84 | 0.0115 | 58 | 116 | 900 | -0.013 | 500 | 0.50 | 295 |
| 0.30mm | 0.0118 | 61 | 113 | 1000 | -0.013 | 750 | 0.54 | 296 |
| #83 | 0.0120 | 63 | 111 | 1000 | -0.013 | 750 | 0.57 | 298 |
| #82 | 0.0125 | 65 | 107 | 1000 | -0.013 | 750 | 0.61 | 301 |
| #81 | 0.0130 | 70 | 103 | 1000 | -0.013 | 750 | 0.68 | 299 |
| #80 | 0.0135 | 71 | 99 | 1000 | -0.013 | 750 | 0.72 | 304 |
| 0.35mm | 0.0138 | 72 | 97 | 1000 | -0.013 | 750 | 0.74 | 307 |
| #79 | 0.0145 | 72 | 92 | 1000 | -0.013 | 750 | 0.78 | 311 |
| 1/64 | 0.0156 | 73 | 86 | 1000 | -0.014 | 750 | 0.85 | 327 |
| 0.40mm | 0.0158 | 74 | 85 | 1000 | -0.014 | 750 | 0.87 | 327 |
| #78 | 0.0160 | 76 | 84 | 1000 | -0.014 | 750 | 0.90 | 327 |
| 0.45mm | 0.0177 | 74 | 76 | 1000 | -0.014 | 750 | 0.97 | 350 |
| #77 | 0.0180 | 76 | 74 | 1000 | -0.014 | 750 | 1.03 | 350 |
| 0.50mm | 0.0197 | 80 | 68 | 1000 | -0.015 | 750 | 1.18 | 350 |
| #76 | 0.0200 | 82 | 67 | 1000 | -0.015 | 750 | 1.22 | 350 |
| #75 | 0.0210 | 84 | 64 | 1000 | -0.015 | 750 | 1.31 | 350 |
| 0.55mm | 0.0217 | 86 | 62 | 1000 | -0.015 | 750 | 1.39 | 350 |
| #74 | 0.0225 | 88 | 59 | 1000 | -0.015 | 750 | 1.49 | 350 |
| 0.60mm | 0.0236 | 90 | 57 | 1000 | -0.016 | 750 | 1.58 | 350 |
| #73 | 0.0240 | 92 | 56 | 1000 | -0.016 | 750 | 1.64 | 350 |
| #72 | 0.0250 | 95 | 54 | 1000 | -0.016 | 750 | 1.76 | 350 |
| 0.65mm | 0.0256 | 96 | 52 | 1000 | -0.016 | 750 | 1.85 | 350 |
| #71 | 0.0260 | 98 | 51 | 1000 | -0.016 | 750 | 1.92 | 350 |
| 0.70mm | 0.0276 | 102 | 48 | 1000 | -0.016 | 750 | 2.13 | 350 |
| #70 | 0.0280 | 103 | 48 | 1000 | -0.017 | 750 | 2.15 | 350 |
| #69 | 0.0292 | 104 | 46 | 1000 | -0.017 | 750 | 2.26 | 350 |
| 0.75mm | 0.0295 | 105 | 45 | 1000 | -0.017 | 750 | 2.33 | 350 |
| #68 | 0.0310 | 108 | 43 | 1000 | -0.017 | 750 | 2.50 | 350 |
| 1/32 | 0.0312 | 108 | 43 | 1000 | -0.017 | 750 | 2.50 | 350 |
| 0.80mm | 0.0315 | 105 | 42 | 1000 | -0.017 | 750 | 2.50 | 350 |
| #67 | 0.0320 | 105 | 42 | 1000 | -0.017 | 750 | 2.50 | 350 |
| #66 | 0.0330 | 103 | 41 | 1000 | -0.018 | 750 | 2.50 | 350 |
| 0.85mm | 0.0335 | 100 | 40 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #65 | 0.0350 | 95 | 38 | 1000 | -0.018 | 750 | 2.50 | 350 |
| 0.90mm | 0.0354 | 95 | 38 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #64 | 0.0360 | 93 | 37 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #63 | 0.0370 | 90 | 36 | 1000 | -0.019 | 750 | 2.50 | 350 |
| 0.95mm | 0.0374 | 90 | 36 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #62 | 0.0380 | 88 | 35 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #61 | 0.0390 | 85 | 34 | 1000 | -0.019 | 750 | 2.50 | 350 |
| 1.00mm | 0.0394 | 85 | 34 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #60 | 0.0400 | 83 | 33 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #59 | 0.0410 | 83 | 33 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.05mm | 0.0413 | 80 | 32 | 1000 | -0.020 | 750 | 2.50 | 350 |
| #58 | 0.0420 | 80 | 32 | 1000 | -0.020 | 750 | 2.50 | 350 |
| #57 | 0.0430 | 78 | 31 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.10mm | 0.0433 | 78 | 31 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.15mm | 0.0453 | 75 | 30 | 1000 | -0.021 | 750 | 2.50 | 350 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 73 | 29 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 3/64 | 0.0469 | 70 | 28 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.20mm | 0.0472 | 70 | 28 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.25mm | 0.0492 | 68 | 27 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.30mm | 0.0512 | 65 | 26 | 1000 | -0.022 | 750 | 2.50 | 350 |
| #55 | 0.0520 | 65 | 26 | 1000 | -0.022 | 750 | 2.50 | 350 |
| 1.35mm | 0.0531 | 63 | 25 | 1000 | -0.022 | 750 | 2.50 | 350 |
| #54 | 0.0550 | 60 | 24 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.40mm | 0.0551 | 60 | 24 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.45mm | 0.0571 | 58 | 23 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.50mm | 0.0591 | 58 | 23 | 1000 | -0.024 | 750 | 2.50 | 350 |
| #53 | 0.0595 | 55 | 22 | 1000 | -0.024 | 750 | 2.50 | 350 |
| 1.55mm | 0.0610 | 55 | 22 | 1000 | -0.024 | 750 | 2.50 | 350 |
| 1/16 | 0.0625 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.60mm | 0.0630 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| #52 | 0.0635 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.65mm | 0.0650 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.70mm | 0.0669 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 350 |
| #51 | 0.0670 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 350 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 500 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 500 | 2.50 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 400 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 400 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 712 |
| 3.50mm | 0.1378 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 721 |
| 3.55mm | 0.1398 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 732 |
| #28 | 0.1405 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 735 |
| 9/64 | 0.1406 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 736 |
| 3.60mm | 0.1417 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 742 |
| 3.65mm | 0.1437 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 752 |
| #27 | 0.1440 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 754 |
| 3.70mm | 0.1457 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 300 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1052 |
| 5.15mm | 0.2028 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1061 |
| 13/64 | 0.2031 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1063 |
| #6 | 0.2040 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1068 |
| 5.20mm | 0.2047 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1071 |
| #5 | 0.2055 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1075 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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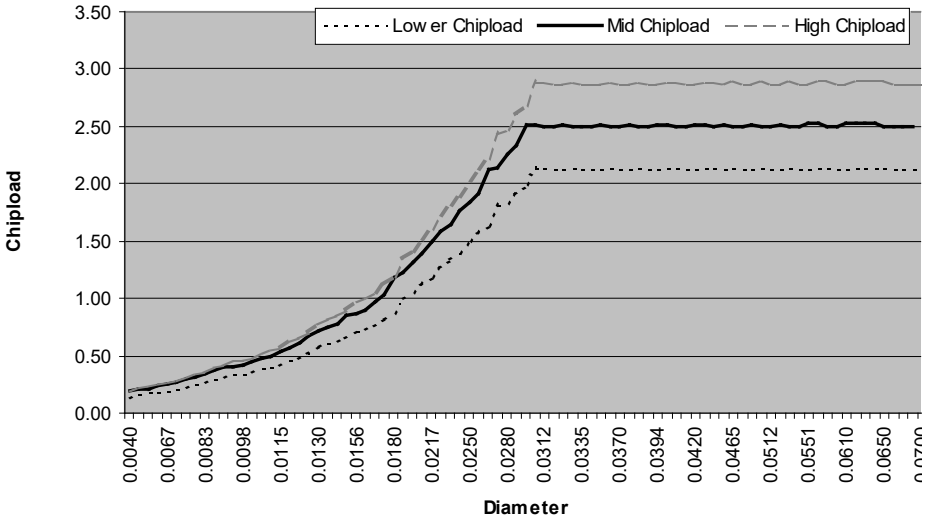
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1082 |
| 5.30mm | 0.2087 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1092 |
| #4 | 0.2090 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1094 |
| 5.35mm | 0.2106 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1102 |
| 5.40mm | 0.2126 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1113 |
| #3 | 0.2130 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1115 |
| 5.45mm | 0.2146 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1123 |
| 5.50mm | 0.2165 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1133 |
| 5.55mm | 0.2185 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1143 |
| 7/32 | 0.2188 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1145 |
| 5.60mm | 0.2205 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1154 |
| #2 | 0.2210 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1157 |
| 5.65mm | 0.2224 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1164 |
| 5.70mm | 0.2244 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1174 |
| 5.75mm | 0.2264 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1185 |
| #1 | 0.2280 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1193 |
| 5.80mm | 0.2283 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1195 |
| 5.85mm | 0.2302 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1205 |
| 5.90mm | 0.2323 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1216 |
| A | 0.2340 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1225 |
| 5.95mm | 0.2343 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1226 |
| 15/64 | 0.2344 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1227 |
| 6.00mm | 0.2362 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1236 |
| B | 0.2380 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1246 |
| 6.05mm | 0.2382 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1247 |
| 6.10mm | 0.2402 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1257 |
| C | 0.2420 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1266 |
| 6.15mm | 0.2421 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1267 |
| 6.20mm | 0.2441 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1277 |
| D | 0.2460 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1287 |
| 6.25mm | 0.2461 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1288 |
| 6.30mm | 0.2480 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1298 |
| 6.35mm | 0.2500 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1308 |
| 6.40mm | 0.2520 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1319 |
| 6.50mm | 0.2559 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1339 |
| F | 0.2570 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1345 |
| 6.60mm | 0.2598 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Polyimide




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Polyimide Thick Panel** PCB Material

(Panel Thickness > 0.150")

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 39 | 120 | 800 | -0.012 | 350 | 0.33 | 308 |
| #87 | 0.0100 | 43 | 120 | 800 | -0.012 | 350 | 0.35 | 314 |
| #86 | 0.0105 | 46 | 120 | 800 | -0.012 | 350 | 0.38 | 330 |
| #85 | 0.0110 | 49 | 120 | 900 | -0.013 | 350 | 0.41 | 345 |
| #84 | 0.0115 | 49 | 116 | 900 | -0.013 | 350 | 0.43 | 350 |
| 0.30mm | 0.0118 | 52 | 113 | 1000 | -0.013 | 500 | 0.46 | 350 |
| #83 | 0.0120 | 54 | 111 | 1000 | -0.013 | 500 | 0.48 | 350 |
| #82 | 0.0125 | 55 | 107 | 1000 | -0.013 | 500 | 0.52 | 350 |
| #81 | 0.0130 | 60 | 103 | 1000 | -0.013 | 500 | 0.58 | 350 |
| #80 | 0.0135 | 60 | 99 | 1000 | -0.013 | 500 | 0.61 | 350 |
| 0.35mm | 0.0138 | 61 | 97 | 1000 | -0.013 | 500 | 0.63 | 350 |
| #79 | 0.0145 | 61 | 92 | 1000 | -0.013 | 500 | 0.67 | 350 |
| 1/64 | 0.0156 | 62 | 86 | 1000 | -0.014 | 500 | 0.72 | 350 |
| 0.40mm | 0.0158 | 63 | 85 | 1000 | -0.014 | 500 | 0.74 | 350 |
| #78 | 0.0160 | 65 | 84 | 1000 | -0.014 | 500 | 0.77 | 350 |
| 0.45mm | 0.0177 | 63 | 76 | 1000 | -0.014 | 500 | 0.83 | 350 |
| #77 | 0.0180 | 65 | 74 | 1000 | -0.014 | 500 | 0.87 | 350 |
| 0.50mm | 0.0197 | 68 | 68 | 1000 | -0.015 | 500 | 1.00 | 350 |
| #76 | 0.0200 | 70 | 67 | 1000 | -0.015 | 500 | 1.04 | 350 |
| #75 | 0.0210 | 71 | 64 | 1000 | -0.015 | 500 | 1.12 | 350 |
| 0.55mm | 0.0217 | 73 | 62 | 1000 | -0.015 | 500 | 1.18 | 350 |
| #74 | 0.0225 | 75 | 59 | 1000 | -0.015 | 500 | 1.27 | 350 |
| 0.60mm | 0.0236 | 77 | 57 | 1000 | -0.016 | 500 | 1.34 | 350 |
| #73 | 0.0240 | 78 | 56 | 1000 | -0.016 | 500 | 1.40 | 350 |
| #72 | 0.0250 | 81 | 54 | 1000 | -0.016 | 500 | 1.50 | 350 |
| 0.65mm | 0.0256 | 82 | 52 | 1000 | -0.016 | 500 | 1.57 | 350 |
| #71 | 0.0260 | 83 | 51 | 1000 | -0.016 | 500 | 1.63 | 350 |
| 0.70mm | 0.0276 | 87 | 48 | 1000 | -0.016 | 500 | 1.81 | 350 |
| #70 | 0.0280 | 88 | 48 | 1000 | -0.017 | 500 | 1.82 | 350 |
| #69 | 0.0292 | 90 | 46 | 1000 | -0.017 | 500 | 1.96 | 350 |
| 0.75mm | 0.0295 | 91 | 45 | 1000 | -0.017 | 500 | 2.02 | 350 |
| #68 | 0.0310 | 92 | 43 | 1000 | -0.017 | 500 | 2.14 | 350 |
| 1/32 | 0.0312 | 93 | 43 | 1000 | -0.017 | 500 | 2.16 | 350 |
| 0.80mm | 0.0315 | 94 | 42 | 1000 | -0.017 | 500 | 2.24 | 350 |
| #67 | 0.0320 | 95 | 42 | 1000 | -0.017 | 500 | 2.26 | 350 |
| #66 | 0.0330 | 97 | 41 | 1000 | -0.018 | 500 | 2.37 | 350 |
| 0.85mm | 0.0335 | 98 | 40 | 1000 | -0.018 | 500 | 2.45 | 350 |
| #65 | 0.0350 | 95 | 38 | 1000 | -0.018 | 500 | 2.50 | 350 |
| 0.90mm | 0.0354 | 95 | 38 | 1000 | -0.018 | 500 | 2.50 | 350 |
| #64 | 0.0360 | 93 | 37 | 1000 | -0.018 | 500 | 2.51 | 350 |
| #63 | 0.0370 | 90 | 36 | 1000 | -0.019 | 500 | 2.50 | 350 |
| 0.95mm | 0.0374 | 90 | 36 | 1000 | -0.019 | 500 | 2.50 | 350 |
| #62 | 0.0380 | 88 | 35 | 1000 | -0.019 | 500 | 2.51 | 350 |
| #61 | 0.0390 | 85 | 34 | 1000 | -0.019 | 500 | 2.50 | 350 |
| 1.00mm | 0.0394 | 85 | 34 | 1000 | -0.019 | 500 | 2.50 | 350 |
| #60 | 0.0400 | 83 | 33 | 1000 | -0.019 | 500 | 2.52 | 350 |
| #59 | 0.0410 | 83 | 33 | 1000 | -0.020 | 500 | 2.52 | 350 |
| 1.05mm | 0.0413 | 80 | 32 | 1000 | -0.020 | 500 | 2.50 | 350 |
| #58 | 0.0420 | 80 | 32 | 1000 | -0.020 | 500 | 2.50 | 350 |
| #57 | 0.0430 | 78 | 31 | 1000 | -0.020 | 500 | 2.52 | 350 |
| 1.10mm | 0.0433 | 78 | 31 | 1000 | -0.020 | 500 | 2.52 | 350 |
| 1.15mm | 0.0453 | 75 | 30 | 1000 | -0.021 | 500 | 2.50 | 350 |
| #56 | 0.0465 | 73 | 29 | 1000 | -0.021 | 500 | 2.52 | 350 |
| 3/64 | 0.0469 | 70 | 28 | 1000 | -0.021 | 500 | 2.50 | 350 |
| 1.20mm | 0.0472 | 70 | 28 | 1000 | -0.021 | 500 | 2.50 | 350 |
| 1.25mm | 0.0492 | 68 | 27 | 1000 | -0.021 | 500 | 2.52 | 350 |
| 1.30mm | 0.0512 | 65 | 26 | 1000 | -0.022 | 500 | 2.50 | 350 |
| #55 | 0.0520 | 65 | 26 | 1000 | -0.022 | 500 | 2.50 | 350 |
| 1.35mm | 0.0531 | 63 | 25 | 1000 | -0.022 | 500 | 2.52 | 350 |
| #54 | 0.0550 | 60 | 24 | 1000 | -0.023 | 500 | 2.50 | 350 |
| 1.40mm | 0.0551 | 60 | 24 | 1000 | -0.023 | 500 | 2.50 | 350 |
| 1.45mm | 0.0571 | 58 | 23 | 1000 | -0.023 | 500 | 2.52 | 350 |
| 1.50mm | 0.0591 | 58 | 23 | 1000 | -0.024 | 500 | 2.52 | 350 |
| #53 | 0.0595 | 55 | 22 | 1000 | -0.024 | 500 | 2.50 | 350 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 55 | 22 | 1000 | -0.024 | 500 | 2.50 | 350 |
| 1/16 | 0.0625 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| 1.60mm | 0.0630 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| #52 | 0.0635 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| 1.65mm | 0.0650 | 53 | 21 | 1000 | -0.025 | 500 | 2.52 | 350 |
| 1.70mm | 0.0669 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 350 |
| #51 | 0.0670 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 350 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 500 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 350 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 350 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 350 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 350 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 350 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 350 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 350 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 350 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 350 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 350 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 350 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 350 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 350 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 350 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 350 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 350 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 350 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 350 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 350 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 350 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 350 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 350 | 2.50 | 654 |
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 250 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 250 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 712 |
| 3.50mm | 0.1378 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 721 |
| 3.55mm | 0.1398 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 732 |
| #28 | 0.1405 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 735 |
| 9/64 | 0.1406 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 736 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 40 | 20 | 1000 | -0.019 | 250 | 2.00 | 742 |
| 3.65mm | 0.1437 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 752 |
| #27 | 0.1440 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 754 |
| 3.70mm | 0.1457 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 250 | 2.00 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 200 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 200 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 200 | 1.50 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1051 |
| #7 | 0.2010 | 23 | 20 | 1000 | -0.023 | 150 | 1.15 | 1052 |
| 5.15mm | 0.2028 | 23 | 20 | 1000 | -0.023 | 150 | 1.15 | 1061 |
| 13/64 | 0.2031 | 23 | 20 | 1000 | -0.023 | 150 | 1.15 | 1063 |
| #6 | 0.2040 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1068 |
| 5.20mm | 0.2047 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1071 |
| #5 | 0.2055 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1075 |
| 5.25mm | 0.2067 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1082 |
| 5.30mm | 0.2087 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1092 |
| #4 | 0.2090 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1094 |
| 5.35mm | 0.2106 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1102 |
| 5.40mm | 0.2126 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1113 |
| #3 | 0.2130 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1115 |
| 5.45mm | 0.2146 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1123 |
| 5.50mm | 0.2165 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1133 |
| 5.55mm | 0.2185 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1143 |
| 7/32 | 0.2188 | 23 | 20 | 1000 | -0.024 | 150 | 1.15 | 1145 |
| 5.60mm | 0.2205 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1154 |
| #2 | 0.2210 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1157 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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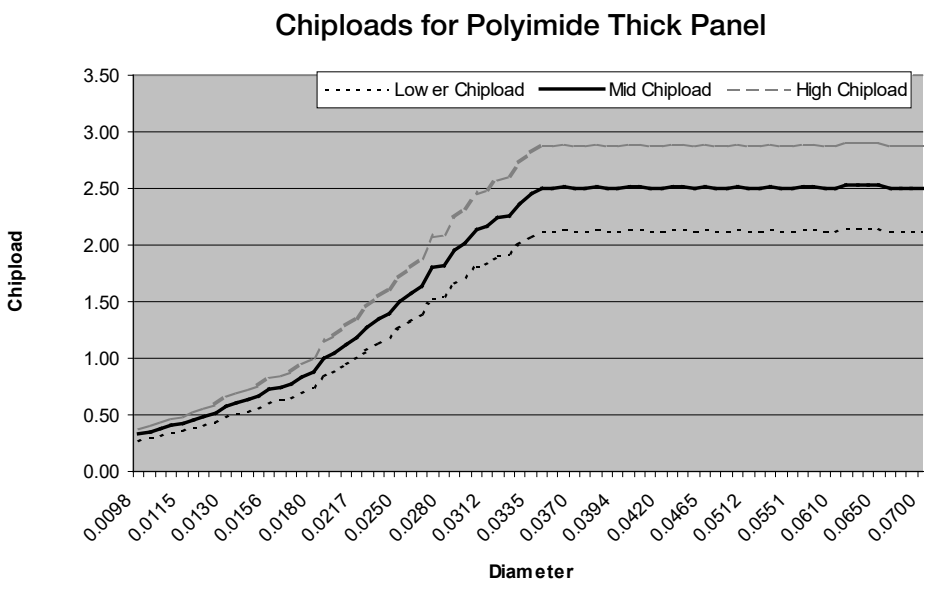
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1164 |
| 5.70mm | 0.2244 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1174 |
| 5.75mm | 0.2264 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1185 |
| #1 | 0.2280 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1193 |
| 5.80mm | 0.2283 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1195 |
| 5.85mm | 0.2302 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1205 |
| 5.90mm | 0.2323 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1216 |
| A | 0.2340 | 23 | 20 | 1000 | -0.025 | 100 | 1.15 | 1225 |
| 5.95mm | 0.2343 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1226 |
| 15/64 | 0.2344 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1227 |
| 6.00mm | 0.2362 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1236 |
| B | 0.2380 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1246 |
| 6.05mm | 0.2382 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1247 |
| 6.10mm | 0.2402 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1257 |
| C | 0.2420 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1266 |
| 6.15mm | 0.2421 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1267 |
| 6.20mm | 0.2441 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1277 |
| D | 0.2460 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1287 |
| 6.25mm | 0.2461 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1288 |
| 6.30mm | 0.2480 | 23 | 20 | 1000 | -0.026 | 100 | 1.15 | 1298 |
| 6.35mm | 0.2500 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1308 |
| 6.40mm | 0.2520 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1319 |
| 6.50mm | 0.2559 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1339 |
| F | 0.2570 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1345 |
| 6.60mm | 0.2598 | 23 | 20 | 1000 | -0.027 | 100 | 1.15 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# RO4003® / Thermoset PCB Material

RO4003® is a registered trademark of Rogers Corporation

**Recommended Drill Series:** 100, 150, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 34 | 120 | 100 | -0.011 | 100 | 0.28 | 126 |
| 0.13mm | 0.0050 | 38 | 120 | 100 | -0.011 | 100 | 0.32 | 157 |
| 0.15mm | 0.0059 | 42 | 120 | 150 | -0.011 | 150 | 0.35 | 185 |
| #96 | 0.0063 | 46 | 120 | 150 | -0.011 | 150 | 0.38 | 198 |
| #95 | 0.0067 | 50 | 120 | 200 | -0.012 | 200 | 0.42 | 210 |
| #94 | 0.0071 | 54 | 120 | 200 | -0.012 | 200 | 0.45 | 223 |
| #93 | 0.0075 | 58 | 120 | 250 | -0.012 | 200 | 0.48 | 236 |
| #92 | 0.0079 | 62 | 120 | 250 | -0.012 | 200 | 0.52 | 248 |
| #91 | 0.0083 | 64 | 120 | 250 | -0.012 | 250 | 0.53 | 261 |
| #90 | 0.0087 | 66 | 120 | 300 | -0.012 | 250 | 0.55 | 273 |
| #89 | 0.0091 | 68 | 118 | 300 | -0.012 | 250 | 0.58 | 281 |
| #88 | 0.0095 | 70 | 116 | 300 | -0.012 | 250 | 0.60 | 288 |
| 0.25mm | 0.0098 | 72 | 114 | 300 | -0.012 | 300 | 0.63 | 292 |
| #87 | 0.0100 | 74 | 112 | 300 | -0.012 | 300 | 0.66 | 293 |
| #86 | 0.0105 | 78 | 110 | 300 | -0.012 | 300 | 0.71 | 302 |
| #85 | 0.0110 | 82 | 108 | 400 | -0.013 | 350 | 0.76 | 311 |
| #84 | 0.0115 | 86 | 106 | 400 | -0.013 | 350 | 0.81 | 350 |
| 0.30mm | 0.0118 | 88 | 105 | 400 | -0.013 | 350 | 0.84 | 350 |
| #83 | 0.0120 | 90 | 104 | 400 | -0.013 | 350 | 0.87 | 350 |
| #82 | 0.0125 | 92 | 102 | 400 | -0.013 | 400 | 0.90 | 350 |
| #81 | 0.0130 | 95 | 100 | 400 | -0.013 | 400 | 0.95 | 350 |
| #80 | 0.0135 | 98 | 99 | 400 | -0.013 | 400 | 0.99 | 350 |
| 0.35mm | 0.0138 | 100 | 97 | 400 | -0.013 | 400 | 1.03 | 350 |
| #79 | 0.0145 | 102 | 92 | 400 | -0.013 | 400 | 1.11 | 350 |
| 1/64 | 0.0156 | 106 | 86 | 400 | -0.014 | 400 | 1.23 | 350 |
| 0.40mm | 0.0158 | 108 | 85 | 400 | -0.014 | 400 | 1.27 | 350 |
| #78 | 0.0160 | 110 | 84 | 400 | -0.014 | 400 | 1.31 | 350 |
| 0.45mm | 0.0177 | 116 | 76 | 500 | -0.014 | 500 | 1.53 | 350 |
| #77 | 0.0180 | 118 | 74 | 500 | -0.014 | 500 | 1.59 | 350 |
| 0.50mm | 0.0197 | 126 | 68 | 500 | -0.015 | 500 | 1.85 | 350 |
| #76 | 0.0200 | 128 | 67 | 500 | -0.015 | 500 | 1.91 | 350 |
| #75 | 0.0210 | 130 | 64 | 500 | -0.015 | 500 | 2.03 | 350 |
| 0.55mm | 0.0217 | 132 | 61 | 500 | -0.015 | 500 | 2.16 | 350 |
| #74 | 0.0225 | 136 | 59 | 500 | -0.015 | 500 | 2.31 | 350 |
| 0.60mm | 0.0236 | 140 | 57 | 500 | -0.016 | 500 | 2.46 | 350 |
| #73 | 0.0240 | 142 | 56 | 500 | -0.016 | 600 | 2.54 | 350 |
| #72 | 0.0250 | 148 | 54 | 500 | -0.016 | 600 | 2.74 | 350 |
| 0.65mm | 0.0256 | 148 | 52 | 500 | -0.016 | 600 | 2.85 | 350 |
| #71 | 0.0260 | 148 | 51 | 500 | -0.016 | 600 | 2.90 | 350 |
| 0.70mm | 0.0276 | 144 | 48 | 500 | -0.016 | 600 | 3.00 | 350 |
| #70 | 0.0280 | 144 | 48 | 500 | -0.017 | 800 | 3.00 | 350 |
| #69 | 0.0292 | 138 | 46 | 500 | -0.017 | 800 | 3.00 | 350 |
| 0.75mm | 0.0295 | 135 | 45 | 500 | -0.017 | 800 | 3.00 | 350 |
| #68 | 0.0310 | 129 | 43 | 500 | -0.017 | 800 | 2.50 | 350 |
| 1/32 | 0.0312 | 129 | 43 | 500 | -0.017 | 800 | 2.50 | 350 |
| 0.80mm | 0.0315 | 126 | 42 | 500 | -0.017 | 800 | 2.50 | 350 |
| #67 | 0.0320 | 126 | 42 | 500 | -0.017 | 800 | 2.50 | 350 |
| #66 | 0.0330 | 123 | 41 | 500 | -0.018 | 1000 | 2.50 | 350 |
| 0.85mm | 0.0335 | 120 | 40 | 500 | -0.018 | 1000 | 2.50 | 350 |
| #65 | 0.0350 | 114 | 38 | 500 | -0.018 | 1000 | 2.50 | 350 |
| 0.90mm | 0.0354 | 114 | 38 | 500 | -0.018 | 1000 | 2.50 | 350 |
| #64 | 0.0360 | 111 | 37 | 500 | -0.018 | 1000 | 2.50 | 350 |
| #63 | 0.0370 | 108 | 36 | 500 | -0.019 | 1000 | 2.50 | 350 |
| 0.95mm | 0.0374 | 108 | 36 | 500 | -0.019 | 1000 | 2.50 | 350 |
| #62 | 0.0380 | 105 | 35 | 500 | -0.019 | 1000 | 2.50 | 350 |
| #61 | 0.0390 | 102 | 34 | 500 | -0.019 | 1000 | 2.50 | 350 |
| 1.00mm | 0.0394 | 102 | 34 | 500 | -0.019 | 1000 | 2.50 | 350 |
| #60 | 0.0400 | 99 | 33 | 500 | -0.019 | 1000 | 2.50 | 350 |
| #59 | 0.0410 | 99 | 33 | 500 | -0.020 | 1000 | 2.50 | 350 |
| 1.05mm | 0.0413 | 96 | 32 | 500 | -0.020 | 1000 | 2.50 | 350 |
| #58 | 0.0420 | 96 | 32 | 500 | -0.020 | 1000 | 2.50 | 350 |
| #57 | 0.0430 | 93 | 31 | 500 | -0.020 | 1000 | 2.50 | 350 |
| 1.10mm | 0.0433 | 93 | 31 | 500 | -0.020 | 1000 | 2.50 | 350 |
| 1.15mm | 0.0453 | 90 | 30 | 500 | -0.021 | 1000 | 2.50 | 350 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 87 | 29 | 500 | -0.021 | 1000 | 2.50 | 350 |
| 3/64 | 0.0469 | 87 | 29 | 500 | -0.021 | 1000 | 2.50 | 350 |
| 1.20mm | 0.0472 | 84 | 28 | 500 | -0.021 | 1000 | 2.50 | 350 |
| 1.25mm | 0.0492 | 81 | 27 | 500 | -0.021 | 1000 | 2.50 | 350 |
| 1.30mm | 0.0512 | 78 | 26 | 500 | -0.022 | 1000 | 2.50 | 350 |
| #55 | 0.0520 | 78 | 26 | 500 | -0.022 | 1000 | 2.50 | 350 |
| 1.35mm | 0.0531 | 75 | 25 | 500 | -0.022 | 1000 | 2.50 | 350 |
| #54 | 0.0550 | 72 | 24 | 500 | -0.023 | 1000 | 2.50 | 350 |
| 1.40mm | 0.0551 | 72 | 24 | 500 | -0.023 | 1000 | 2.50 | 350 |
| 1.45mm | 0.0571 | 69 | 23 | 500 | -0.023 | 1000 | 2.50 | 350 |
| 1.50mm | 0.0591 | 69 | 23 | 500 | -0.024 | 1000 | 2.50 | 350 |
| #53 | 0.0595 | 66 | 22 | 500 | -0.024 | 1000 | 2.50 | 350 |
| 1.55mm | 0.0610 | 66 | 22 | 500 | -0.024 | 1000 | 2.50 | 350 |
| 1/16 | 0.0625 | 63 | 21 | 500 | -0.025 | 1000 | 2.50 | 350 |
| 1.60mm | 0.0630 | 63 | 21 | 500 | -0.025 | 1000 | 2.50 | 350 |
| #52 | 0.0635 | 63 | 21 | 500 | -0.025 | 1000 | 2.50 | 350 |
| 1.65mm | 0.0650 | 60 | 20 | 500 | -0.025 | 1000 | 2.50 | 350 |
| 1.70mm | 0.0669 | 60 | 20 | 500 | -0.026 | 1000 | 2.50 | 350 |
| #51 | 0.0670 | 60 | 20 | 500 | -0.026 | 1000 | 2.50 | 350 |
| 1.75mm | 0.0689 | 60 | 20 | 500 | -0.026 | 1000 | 2.50 | 350 |
| #50 | 0.0700 | 57 | 19 | 500 | -0.026 | 1000 | 2.50 | 350 |
| 1.80mm | 0.0709 | 57 | 19 | 500 | -0.027 | 800 | 2.50 | 350 |
| 1.85mm | 0.0728 | 57 | 19 | 500 | -0.027 | 800 | 2.50 | 362 |
| #49 | 0.0730 | 57 | 19 | 500 | -0.027 | 800 | 2.50 | 363 |
| 1.90mm | 0.0748 | 54 | 18 | 500 | -0.027 | 800 | 2.50 | 352 |
| #48 | 0.0760 | 54 | 18 | 500 | -0.028 | 800 | 2.50 | 358 |
| 1.95mm | 0.0768 | 54 | 18 | 500 | -0.028 | 800 | 2.50 | 362 |
| 5/64 | 0.0781 | 54 | 18 | 500 | -0.028 | 800 | 2.50 | 368 |
| #47 | 0.0785 | 54 | 18 | 500 | -0.028 | 800 | 2.50 | 370 |
| 2.00mm | 0.0787 | 54 | 18 | 500 | -0.028 | 800 | 2.50 | 371 |
| 2.05mm | 0.0807 | 54 | 18 | 500 | -0.029 | 800 | 2.50 | 380 |
| #46 | 0.0810 | 54 | 18 | 500 | -0.029 | 800 | 2.50 | 382 |
| #45 | 0.0820 | 54 | 18 | 500 | -0.029 | 800 | 2.50 | 386 |
| 2.10mm | 0.0827 | 54 | 18 | 500 | -0.029 | 800 | 2.50 | 390 |
| 2.15mm | 0.0846 | 54 | 18 | 500 | -0.030 | 800 | 2.50 | 398 |
| #44 | 0.0860 | 54 | 18 | 500 | -0.030 | 800 | 2.50 | 405 |
| 2.20mm | 0.0866 | 54 | 18 | 500 | -0.030 | 800 | 2.50 | 408 |
| 2.25mm | 0.0886 | 54 | 18 | 500 | -0.031 | 800 | 2.50 | 417 |
| #43 | 0.0890 | 54 | 18 | 500 | -0.031 | 800 | 2.50 | 419 |
| 2.30mm | 0.0906 | 54 | 18 | 500 | -0.031 | 800 | 2.50 | 427 |
| 2.35mm | 0.0925 | 54 | 18 | 500 | -0.032 | 800 | 2.50 | 436 |
| #42 | 0.0935 | 54 | 18 | 500 | -0.032 | 800 | 2.50 | 440 |
| 3/32 | 0.0938 | 54 | 18 | 500 | -0.032 | 800 | 2.50 | 442 |
| 2.40mm | 0.0945 | 54 | 18 | 500 | -0.032 | 800 | 2.50 | 445 |
| #41 | 0.0960 | 54 | 18 | 500 | -0.032 | 800 | 2.50 | 452 |
| 2.45mm | 0.0965 | 54 | 18 | 500 | -0.033 | 800 | 2.50 | 455 |
| #40 | 0.0980 | 54 | 18 | 500 | -0.033 | 800 | 2.50 | 462 |
| 2.50mm | 0.0984 | 54 | 18 | 500 | -0.033 | 800 | 2.50 | 463 |
| #39 | 0.0995 | 54 | 18 | 500 | -0.033 | 800 | 2.50 | 469 |
| 2.55mm | 0.1004 | 54 | 18 | 500 | -0.033 | 800 | 2.50 | 473 |
| #38 | 0.1015 | 54 | 18 | 500 | -0.034 | 800 | 2.50 | 478 |
| 2.60mm | 0.1024 | 54 | 18 | 500 | -0.034 | 800 | 2.50 | 482 |
| #37 | 0.1040 | 54 | 18 | 500 | -0.034 | 800 | 2.50 | 490 |
| 2.65mm | 0.1043 | 54 | 18 | 500 | -0.034 | 800 | 2.50 | 491 |
| 2.70mm | 0.1063 | 54 | 18 | 500 | -0.035 | 800 | 2.50 | 501 |
| #36 | 0.1065 | 54 | 18 | 500 | -0.035 | 800 | 2.50 | 502 |
| 2.75mm | 0.1083 | 54 | 18 | 500 | -0.035 | 800 | 2.50 | 510 |
| 7/64 | 0.1094 | 54 | 18 | 500 | -0.036 | 800 | 2.50 | 515 |
| #35 | 0.1100 | 54 | 18 | 500 | -0.036 | 800 | 2.50 | 518 |
| 2.80mm | 0.1102 | 54 | 18 | 500 | -0.036 | 800 | 2.50 | 519 |
| #34 | 0.1110 | 54 | 18 | 500 | -0.036 | 800 | 2.50 | 523 |
| 2.85mm | 0.1122 | 54 | 18 | 500 | -0.036 | 800 | 2.50 | 528 |
| #33 | 0.1130 | 54 | 18 | 500 | -0.036 | 800 | 2.50 | 532 |
| 2.90mm | 0.1142 | 54 | 18 | 500 | -0.037 | 800 | 2.50 | 538 |
| #32 | 0.1160 | 54 | 18 | 500 | -0.037 | 800 | 2.50 | 546 |
| 2.95mm | 0.1161 | 54 | 18 | 500 | -0.037 | 800 | 2.50 | 547 |
| 3.00mm | 0.1181 | 54 | 18 | 500 | -0.038 | 800 | 2.50 | 556 |
| #31 | 0.1200 | 54 | 18 | 500 | -0.038 | 800 | 2.50 | 565 |
| 3.05mm | 0.1201 | 54 | 18 | 500 | -0.038 | 800 | 2.50 | 566 |
| 3.10mm | 0.1220 | 54 | 18 | 500 | -0.038 | 800 | 2.50 | 575 |
| 3.15mm | 0.1240 | 54 | 18 | 500 | -0.039 | 800 | 2.50 | 584 |
| 1/8 | 0.1250 | 54 | 18 | 500 | -0.039 | 800 | 2.50 | 589 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 50 | 18 | 500 | -0.018 | 600 | 2.78 | 593 |
| 3.25mm | 0.1280 | 50 | 18 | 500 | -0.018 | 600 | 2.78 | 603 |
| #30 | 0.1285 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 605 |
| 3.30mm | 0.1299 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 612 |
| 3.35mm | 0.1319 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 621 |
| 3.40mm | 0.1339 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 631 |
| 3.45mm | 0.1358 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 640 |
| #29 | 0.1360 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 641 |
| 3.50mm | 0.1378 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 649 |
| 3.55mm | 0.1398 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 658 |
| #28 | 0.1405 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 662 |
| 9/64 | 0.1406 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 662 |
| 3.60mm | 0.1417 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 667 |
| 3.65mm | 0.1437 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 677 |
| #27 | 0.1440 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 678 |
| 3.70mm | 0.1457 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 686 |
| #26 | 0.1470 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 692 |
| 3.75mm | 0.1476 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 695 |
| #25 | 0.1495 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 704 |
| 3.80mm | 0.1496 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 705 |
| 3.85mm | 0.1516 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 714 |
| #24 | 0.1520 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 716 |
| 3.90mm | 0.1535 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 723 |
| #23 | 0.1540 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 725 |
| 3.95 | 0.1555 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 732 |
| 5/32 | 0.1562 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 736 |
| #22 | 0.1570 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 739 |
| 4.00mm | 0.1575 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 742 |
| #21 | 0.1590 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 749 |
| 4.05mm | 0.1594 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 751 |
| #20 | 0.1610 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 758 |
| 4.10mm | 0.1614 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 760 |
| 4.15mm | 0.1634 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 770 |
| 4.20mm | 0.1654 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 779 |
| #19 | 0.1660 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 782 |
| 4.25mm | 0.1673 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 788 |
| 4.30mm | 0.1693 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 797 |
| #18 | 0.1695 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 798 |
| 4.35mm | 0.1713 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 807 |
| 11/64 | 0.1719 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 810 |
| #17 | 0.1730 | 40 | 18 | 500 | -0.021 | 300 | 2.22 | 815 |
| 4.40mm | 0.1732 | 40 | 18 | 500 | -0.021 | 300 | 2.22 | 816 |
| 4.45mm | 0.1752 | 40 | 18 | 500 | -0.022 | 300 | 2.22 | 825 |
| #16 | 0.1770 | 40 | 18 | 500 | -0.022 | 300 | 2.22 | 834 |
| 4.50mm | 0.1772 | 40 | 18 | 500 | -0.022 | 300 | 2.22 | 835 |
| 4.55mm | 0.1792 | 40 | 18 | 500 | -0.022 | 300 | 2.22 | 844 |
| #15 | 0.1800 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 848 |
| 4.60mm | 0.1811 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 853 |
| #14 | 0.1820 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 857 |
| 4.65mm | 0.1831 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 862 |
| #13 | 0.1850 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 871 |
| 4.70mm | 0.1850 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 871 |
| 4.75mm | 0.1870 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 881 |
| 3/16 | 0.1875 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 883 |
| 4.80mm | 0.1890 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 890 |
| #12 | 0.1890 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 890 |
| 4.85mm | 0.1909 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 899 |
| #11 | 0.1910 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 900 |
| 4.90mm | 0.1929 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 909 |
| #10 | 0.1935 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 911 |
| 4.95mm | 0.1949 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 918 |
| #9 | 0.1960 | 36 | 18 | 500 | -0.023 | 200 | 2.00 | 923 |
| 5.00mm | 0.1968 | 36 | 18 | 500 | -0.023 | 200 | 2.00 | 927 |
| 5.05mm | 0.1988 | 36 | 18 | 500 | -0.023 | 200 | 2.00 | 936 |
| #8 | 0.1990 | 36 | 18 | 500 | -0.023 | 200 | 2.00 | 937 |
| 5.10mm | 0.2008 | 34 | 18 | 500 | -0.023 | 200 | 1.89 | 946 |
| #7 | 0.2010 | 34 | 18 | 500 | -0.023 | 200 | 1.89 | 947 |
| 5.15mm | 0.2028 | 34 | 18 | 500 | -0.023 | 200 | 1.89 | 955 |
| 13/64 | 0.2031 | 34 | 18 | 500 | -0.023 | 200 | 1.89 | 957 |
| #6 | 0.2040 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 961 |
| 5.20mm | 0.2047 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 964 |
| #5 | 0.2055 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 968 |

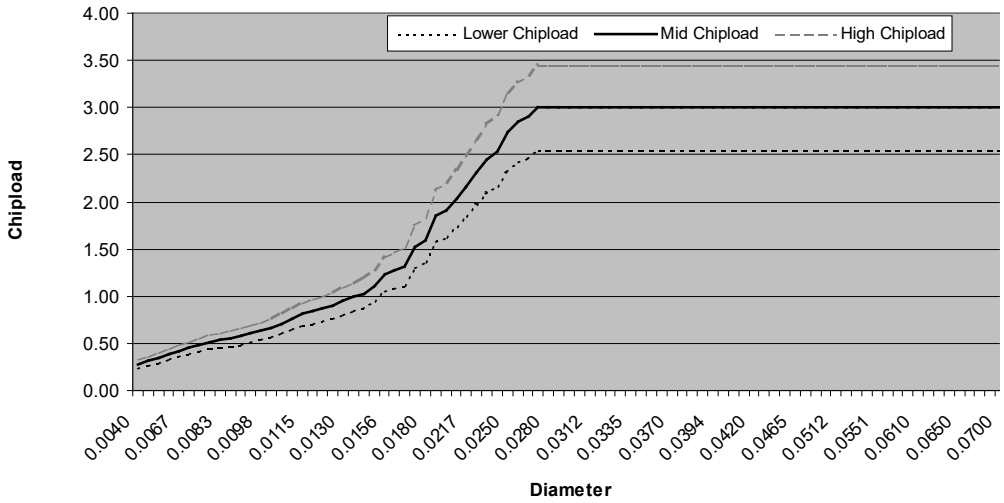
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 974 |
| 5.30mm | 0.2087 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 983 |
| #4 | 0.2090 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 984 |
| 5.35mm | 0.2106 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 992 |
| 5.40mm | 0.2126 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1001 |
| #3 | 0.2130 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1003 |
| 5.45mm | 0.2146 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1011 |
| 5.50mm | 0.2165 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1020 |
| 5.55mm | 0.2185 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1029 |
| 7/32 | 0.2188 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1031 |
| 5.60mm | 0.2205 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1039 |
| #2 | 0.2210 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1041 |
| 5.65mm | 0.2224 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1048 |
| 5.70mm | 0.2244 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1057 |
| 5.75mm | 0.2264 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1066 |
| #1 | 0.2280 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1074 |
| 5.80mm | 0.2283 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1075 |
| 5.85mm | 0.2302 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1084 |
| 5.90mm | 0.2323 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1094 |
| A | 0.2340 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1102 |
| 5.95mm | 0.2343 | 32 | 18 | 500 | -0.026 | 200 | 1.78 | 1104 |
| 15/64 | 0.2344 | 32 | 18 | 500 | -0.026 | 200 | 1.78 | 1104 |
| 6.00mm | 0.2362 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1113 |
| B | 0.2380 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1121 |
| 6.05mm | 0.2382 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1122 |
| 6.10mm | 0.2402 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1131 |
| C | 0.2420 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1140 |
| 6.15mm | 0.2421 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1140 |
| 6.20mm | 0.2441 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1150 |
| D | 0.2460 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1159 |
| 6.25mm | 0.2461 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1159 |
| 6.30mm | 0.2480 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1168 |
| 6.35mm | 0.2500 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1178 |
| 6.40mm | 0.2520 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1187 |
| 6.50mm | 0.2559 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1205 |
| F | 0.2570 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1210 |
| 6.60mm | 0.2598 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1224 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for RO4003® / Thermoset




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# RO4350® / Thermoset PCB Material

RO4350® is a registered trademark of Rogers Corporation

**Recommended Drill Series:** 100, 150, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 40 | 120 | 100 | -0.011 | 100 | 0.33 | 126 |
| 0.13mm | 0.0050 | 46 | 120 | 100 | -0.011 | 100 | 0.38 | 157 |
| 0.15mm | 0.0059 | 53 | 120 | 150 | -0.011 | 150 | 0.44 | 185 |
| #96 | 0.0063 | 60 | 120 | 150 | -0.011 | 150 | 0.50 | 198 |
| #95 | 0.0067 | 67 | 120 | 200 | -0.012 | 200 | 0.56 | 210 |
| #94 | 0.0071 | 73 | 120 | 200 | -0.012 | 200 | 0.61 | 223 |
| #93 | 0.0075 | 78 | 120 | 250 | -0.012 | 200 | 0.65 | 236 |
| #92 | 0.0079 | 84 | 120 | 250 | -0.012 | 200 | 0.70 | 248 |
| #91 | 0.0083 | 90 | 120 | 250 | -0.012 | 250 | 0.75 | 261 |
| #90 | 0.0087 | 96 | 120 | 300 | -0.012 | 250 | 0.80 | 273 |
| #89 | 0.0091 | 102 | 120 | 300 | -0.012 | 250 | 0.85 | 286 |
| #88 | 0.0095 | 104 | 120 | 300 | -0.012 | 250 | 0.87 | 298 |
| 0.25mm | 0.0098 | 105 | 120 | 300 | -0.012 | 300 | 0.88 | 308 |
| #87 | 0.0100 | 108 | 120 | 300 | -0.012 | 300 | 0.90 | 314 |
| #86 | 0.0105 | 110 | 120 | 300 | -0.012 | 300 | 0.92 | 330 |
| #85 | 0.0110 | 112 | 120 | 400 | -0.013 | 350 | 0.93 | 345 |
| #84 | 0.0115 | 113 | 116 | 400 | -0.013 | 350 | 0.97 | 350 |
| 0.30mm | 0.0118 | 113 | 113 | 400 | -0.013 | 350 | 1.00 | 350 |
| #83 | 0.0120 | 115 | 111 | 400 | -0.013 | 350 | 1.04 | 350 |
| #82 | 0.0125 | 116 | 107 | 400 | -0.013 | 400 | 1.08 | 350 |
| #81 | 0.0130 | 117 | 103 | 400 | -0.013 | 400 | 1.14 | 350 |
| #80 | 0.0135 | 119 | 99 | 400 | -0.013 | 400 | 1.20 | 350 |
| 0.35mm | 0.0138 | 119 | 97 | 400 | -0.013 | 400 | 1.23 | 350 |
| #79 | 0.0145 | 120 | 92 | 400 | -0.013 | 400 | 1.30 | 350 |
| 1/64 | 0.0156 | 120 | 86 | 400 | -0.014 | 400 | 1.40 | 350 |
| 0.40mm | 0.0158 | 121 | 85 | 400 | -0.014 | 400 | 1.42 | 350 |
| #78 | 0.0160 | 124 | 84 | 400 | -0.014 | 400 | 1.48 | 350 |
| 0.45mm | 0.0177 | 126 | 76 | 500 | -0.014 | 500 | 1.66 | 350 |
| #77 | 0.0180 | 128 | 74 | 500 | -0.014 | 500 | 1.73 | 350 |
| 0.50mm | 0.0197 | 132 | 68 | 500 | -0.015 | 500 | 1.94 | 350 |
| #76 | 0.0200 | 134 | 67 | 500 | -0.015 | 500 | 2.00 | 350 |
| #75 | 0.0210 | 136 | 64 | 500 | -0.015 | 500 | 2.13 | 350 |
| 0.55mm | 0.0217 | 138 | 61 | 500 | -0.015 | 500 | 2.26 | 350 |
| #74 | 0.0225 | 140 | 59 | 500 | -0.015 | 500 | 2.37 | 350 |
| 0.60mm | 0.0236 | 144 | 57 | 500 | -0.016 | 500 | 2.53 | 350 |
| #73 | 0.0240 | 146 | 56 | 500 | -0.016 | 600 | 2.61 | 350 |
| #72 | 0.0250 | 148 | 54 | 500 | -0.016 | 600 | 2.74 | 350 |
| 0.65mm | 0.0256 | 150 | 52 | 500 | -0.016 | 600 | 2.88 | 350 |
| #71 | 0.0260 | 150 | 51 | 500 | -0.016 | 600 | 2.94 | 350 |
| 0.70mm | 0.0276 | 150 | 48 | 500 | -0.016 | 600 | 3.13 | 350 |
| #70 | 0.0280 | 150 | 48 | 500 | -0.017 | 800 | 3.13 | 350 |
| #69 | 0.0292 | 148 | 46 | 500 | -0.017 | 800 | 3.22 | 350 |
| 0.75mm | 0.0295 | 146 | 45 | 500 | -0.017 | 800 | 3.24 | 350 |
| #68 | 0.0310 | 140 | 43 | 500 | -0.017 | 800 | 2.50 | 350 |
| 1/32 | 0.0312 | 140 | 43 | 500 | -0.017 | 800 | 2.50 | 350 |
| 0.80mm | 0.0315 | 137 | 42 | 500 | -0.017 | 800 | 2.50 | 350 |
| #67 | 0.0320 | 137 | 42 | 500 | -0.017 | 800 | 2.50 | 350 |
| #66 | 0.0330 | 133 | 41 | 500 | -0.018 | 1000 | 2.50 | 350 |
| 0.85mm | 0.0335 | 130 | 40 | 500 | -0.018 | 1000 | 2.50 | 350 |
| #65 | 0.0350 | 124 | 38 | 500 | -0.018 | 1000 | 2.50 | 350 |
| 0.90mm | 0.0354 | 124 | 38 | 500 | -0.018 | 1000 | 2.50 | 350 |
| #64 | 0.0360 | 120 | 37 | 500 | -0.018 | 1000 | 2.50 | 350 |
| #63 | 0.0370 | 117 | 36 | 500 | -0.019 | 1000 | 2.50 | 350 |
| 0.95mm | 0.0374 | 117 | 36 | 500 | -0.019 | 1000 | 2.50 | 350 |
| #62 | 0.0380 | 114 | 35 | 500 | -0.019 | 1000 | 2.50 | 350 |
| #61 | 0.0390 | 111 | 34 | 500 | -0.019 | 1000 | 2.50 | 350 |
| 1.00mm | 0.0394 | 111 | 34 | 500 | -0.019 | 1000 | 2.50 | 350 |
| #60 | 0.0400 | 107 | 33 | 500 | -0.019 | 1000 | 2.50 | 350 |
| #59 | 0.0410 | 107 | 33 | 500 | -0.020 | 1000 | 2.50 | 350 |
| 1.05mm | 0.0413 | 104 | 32 | 500 | -0.020 | 1000 | 2.50 | 350 |
| #58 | 0.0420 | 104 | 32 | 500 | -0.020 | 1000 | 2.50 | 350 |
| #57 | 0.0430 | 101 | 31 | 500 | -0.020 | 1000 | 2.50 | 350 |
| 1.10mm | 0.0433 | 101 | 31 | 500 | -0.020 | 1000 | 2.50 | 350 |
| 1.15mm | 0.0453 | 98 | 30 | 500 | -0.021 | 1000 | 2.50 | 350 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 94 | 29 | 500 | -0.021 | 1000 | 2.50 | 350 |
| 3/64 | 0.0469 | 94 | 29 | 500 | -0.021 | 1000 | 2.50 | 350 |
| 1.20mm | 0.0472 | 91 | 28 | 500 | -0.021 | 1000 | 2.50 | 350 |
| 1.25mm | 0.0492 | 88 | 27 | 500 | -0.021 | 1000 | 2.50 | 350 |
| 1.30mm | 0.0512 | 85 | 26 | 500 | -0.022 | 1000 | 2.50 | 350 |
| #55 | 0.0520 | 85 | 26 | 500 | -0.022 | 1000 | 2.50 | 350 |
| 1.35mm | 0.0531 | 81 | 25 | 500 | -0.022 | 1000 | 2.50 | 350 |
| #54 | 0.0550 | 78 | 24 | 500 | -0.023 | 1000 | 2.50 | 350 |
| 1.40mm | 0.0551 | 78 | 24 | 500 | -0.023 | 1000 | 2.50 | 350 |
| 1.45mm | 0.0571 | 75 | 23 | 500 | -0.023 | 1000 | 2.50 | 350 |
| 1.50mm | 0.0591 | 75 | 23 | 500 | -0.024 | 1000 | 2.50 | 350 |
| #53 | 0.0595 | 72 | 22 | 500 | -0.024 | 1000 | 2.50 | 350 |
| 1.55mm | 0.0610 | 72 | 22 | 500 | -0.024 | 1000 | 2.50 | 350 |
| 1/16 | 0.0625 | 68 | 21 | 500 | -0.025 | 1000 | 2.50 | 350 |
| 1.60mm | 0.0630 | 68 | 21 | 500 | -0.025 | 1000 | 2.50 | 350 |
| #52 | 0.0635 | 68 | 21 | 500 | -0.025 | 1000 | 2.50 | 350 |
| 1.65mm | 0.0650 | 65 | 20 | 500 | -0.025 | 1000 | 2.50 | 350 |
| 1.70mm | 0.0669 | 65 | 20 | 500 | -0.026 | 1000 | 2.50 | 350 |
| #51 | 0.0670 | 65 | 20 | 500 | -0.026 | 1000 | 2.50 | 350 |
| 1.75mm | 0.0689 | 65 | 20 | 500 | -0.026 | 1000 | 2.50 | 350 |
| #50 | 0.0700 | 62 | 19 | 500 | -0.026 | 1000 | 2.50 | 350 |
| 1.80mm | 0.0709 | 62 | 19 | 500 | -0.027 | 800 | 2.50 | 350 |
| 1.85mm | 0.0728 | 62 | 19 | 500 | -0.027 | 800 | 2.50 | 362 |
| #49 | 0.0730 | 62 | 19 | 500 | -0.027 | 800 | 2.50 | 363 |
| 1.90mm | 0.0748 | 59 | 18 | 500 | -0.027 | 800 | 2.50 | 352 |
| #48 | 0.0760 | 59 | 18 | 500 | -0.028 | 800 | 2.50 | 358 |
| 1.95mm | 0.0768 | 59 | 18 | 500 | -0.028 | 800 | 2.50 | 362 |
| 5/64 | 0.0781 | 59 | 18 | 500 | -0.028 | 800 | 2.50 | 368 |
| #47 | 0.0785 | 59 | 18 | 500 | -0.028 | 800 | 2.50 | 370 |
| 2.00mm | 0.0787 | 59 | 18 | 500 | -0.028 | 800 | 2.50 | 371 |
| 2.05mm | 0.0807 | 59 | 18 | 500 | -0.029 | 800 | 2.50 | 380 |
| #46 | 0.0810 | 59 | 18 | 500 | -0.029 | 800 | 2.50 | 382 |
| #45 | 0.0820 | 59 | 18 | 500 | -0.029 | 800 | 2.50 | 386 |
| 2.10mm | 0.0827 | 59 | 18 | 500 | -0.029 | 800 | 2.50 | 390 |
| 2.15mm | 0.0846 | 59 | 18 | 500 | -0.030 | 800 | 2.50 | 398 |
| #44 | 0.0860 | 59 | 18 | 500 | -0.030 | 800 | 2.50 | 405 |
| 2.20mm | 0.0866 | 59 | 18 | 500 | -0.030 | 800 | 2.50 | 408 |
| 2.25mm | 0.0886 | 59 | 18 | 500 | -0.031 | 800 | 2.50 | 417 |
| #43 | 0.0890 | 59 | 18 | 500 | -0.031 | 800 | 2.50 | 419 |
| 2.30mm | 0.0906 | 59 | 18 | 500 | -0.031 | 800 | 2.50 | 427 |
| 2.35mm | 0.0925 | 59 | 18 | 500 | -0.032 | 800 | 2.50 | 436 |
| #42 | 0.0935 | 59 | 18 | 500 | -0.032 | 800 | 2.50 | 440 |
| 3/32 | 0.0938 | 59 | 18 | 500 | -0.032 | 800 | 2.50 | 442 |
| 2.40mm | 0.0945 | 59 | 18 | 500 | -0.032 | 800 | 2.50 | 445 |
| #41 | 0.0960 | 59 | 18 | 500 | -0.032 | 800 | 2.50 | 452 |
| 2.45mm | 0.0965 | 59 | 18 | 500 | -0.033 | 800 | 2.50 | 455 |
| #40 | 0.0980 | 59 | 18 | 500 | -0.033 | 800 | 2.50 | 462 |
| 2.50mm | 0.0984 | 59 | 18 | 500 | -0.033 | 800 | 2.50 | 463 |
| #39 | 0.0995 | 59 | 18 | 500 | -0.033 | 800 | 2.50 | 469 |
| 2.55mm | 0.1004 | 59 | 18 | 500 | -0.033 | 800 | 2.50 | 473 |
| #38 | 0.1015 | 59 | 18 | 500 | -0.034 | 800 | 2.50 | 478 |
| 2.60mm | 0.1024 | 59 | 18 | 500 | -0.034 | 800 | 2.50 | 482 |
| #37 | 0.1040 | 59 | 18 | 500 | -0.034 | 800 | 2.50 | 490 |
| 2.65mm | 0.1043 | 59 | 18 | 500 | -0.034 | 800 | 2.50 | 491 |
| 2.70mm | 0.1063 | 59 | 18 | 500 | -0.035 | 800 | 2.50 | 501 |
| #36 | 0.1065 | 59 | 18 | 500 | -0.035 | 800 | 2.50 | 502 |
| 2.75mm | 0.1083 | 59 | 18 | 500 | -0.035 | 800 | 2.50 | 510 |
| 7/64 | 0.1094 | 59 | 18 | 500 | -0.036 | 800 | 2.50 | 515 |
| #35 | 0.1100 | 59 | 18 | 500 | -0.036 | 800 | 2.50 | 518 |
| 2.80mm | 0.1102 | 59 | 18 | 500 | -0.036 | 800 | 2.50 | 519 |
| #34 | 0.1110 | 59 | 18 | 500 | -0.036 | 800 | 2.50 | 523 |
| 2.85mm | 0.1122 | 59 | 18 | 500 | -0.036 | 800 | 2.50 | 528 |
| #33 | 0.1130 | 59 | 18 | 500 | -0.036 | 800 | 2.50 | 532 |
| 2.90mm | 0.1142 | 59 | 18 | 500 | -0.037 | 800 | 2.50 | 538 |
| #32 | 0.1160 | 59 | 18 | 500 | -0.037 | 800 | 2.50 | 546 |
| 2.95mm | 0.1161 | 59 | 18 | 500 | -0.037 | 800 | 2.50 | 547 |
| 3.00mm | 0.1181 | 59 | 18 | 500 | -0.038 | 800 | 2.50 | 556 |
| #31 | 0.1200 | 59 | 18 | 500 | -0.038 | 800 | 2.50 | 565 |
| 3.05mm | 0.1201 | 59 | 18 | 500 | -0.038 | 800 | 2.50 | 566 |
| 3.10mm | 0.1220 | 59 | 18 | 500 | -0.038 | 800 | 2.50 | 575 |
| 3.15mm | 0.1240 | 59 | 18 | 500 | -0.039 | 800 | 2.50 | 584 |
| 1/8 | 0.1250 | 59 | 18 | 500 | -0.039 | 800 | 2.50 | 589 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 50 | 18 | 500 | -0.018 | 600 | 2.78 | 593 |
| 3.25mm | 0.1280 | 50 | 18 | 500 | -0.018 | 600 | 2.78 | 603 |
| #30 | 0.1285 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 605 |
| 3.30mm | 0.1299 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 612 |
| 3.35mm | 0.1319 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 621 |
| 3.40mm | 0.1339 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 631 |
| 3.45mm | 0.1358 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 640 |
| #29 | 0.1360 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 641 |
| 3.50mm | 0.1378 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 649 |
| 3.55mm | 0.1398 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 658 |
| #28 | 0.1405 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 662 |
| 9/64 | 0.1406 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 662 |
| 3.60mm | 0.1417 | 50 | 18 | 500 | -0.019 | 600 | 2.78 | 667 |
| 3.65mm | 0.1437 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 677 |
| #27 | 0.1440 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 678 |
| 3.70mm | 0.1457 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 686 |
| #26 | 0.1470 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 692 |
| 3.75mm | 0.1476 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 695 |
| #25 | 0.1495 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 704 |
| 3.80mm | 0.1496 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 705 |
| 3.85mm | 0.1516 | 50 | 18 | 500 | -0.020 | 600 | 2.78 | 714 |
| #24 | 0.1520 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 716 |
| 3.90mm | 0.1535 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 723 |
| #23 | 0.1540 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 725 |
| 3.95 | 0.1555 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 732 |
| 5/32 | 0.1562 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 736 |
| #22 | 0.1570 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 739 |
| 4.00mm | 0.1575 | 50 | 18 | 500 | -0.020 | 400 | 2.78 | 742 |
| #21 | 0.1590 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 749 |
| 4.05mm | 0.1594 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 751 |
| #20 | 0.1610 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 758 |
| 4.10mm | 0.1614 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 760 |
| 4.15mm | 0.1634 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 770 |
| 4.20mm | 0.1654 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 779 |
| #19 | 0.1660 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 782 |
| 4.25mm | 0.1673 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 788 |
| 4.30mm | 0.1693 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 797 |
| #18 | 0.1695 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 798 |
| 4.35mm | 0.1713 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 807 |
| 11/64 | 0.1719 | 40 | 18 | 500 | -0.021 | 400 | 2.22 | 810 |
| #17 | 0.1730 | 40 | 18 | 500 | -0.021 | 300 | 2.22 | 815 |
| 4.40mm | 0.1732 | 40 | 18 | 500 | -0.021 | 300 | 2.22 | 816 |
| 4.45mm | 0.1752 | 40 | 18 | 500 | -0.022 | 300 | 2.22 | 825 |
| #16 | 0.1770 | 40 | 18 | 500 | -0.022 | 300 | 2.22 | 834 |
| 4.50mm | 0.1772 | 40 | 18 | 500 | -0.022 | 300 | 2.22 | 835 |
| 4.55mm | 0.1792 | 40 | 18 | 500 | -0.022 | 300 | 2.22 | 844 |
| #15 | 0.1800 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 848 |
| 4.60mm | 0.1811 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 853 |
| #14 | 0.1820 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 857 |
| 4.65mm | 0.1831 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 862 |
| #13 | 0.1850 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 871 |
| 4.70mm | 0.1850 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 871 |
| 4.75mm | 0.1870 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 881 |
| 3/16 | 0.1875 | 36 | 18 | 500 | -0.022 | 300 | 2.00 | 883 |
| 4.80mm | 0.1890 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 890 |
| #12 | 0.1890 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 890 |
| 4.85mm | 0.1909 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 899 |
| #11 | 0.1910 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 900 |
| 4.90mm | 0.1929 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 909 |
| #10 | 0.1935 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 911 |
| 4.95mm | 0.1949 | 36 | 18 | 500 | -0.023 | 300 | 2.00 | 918 |
| #9 | 0.1960 | 36 | 18 | 500 | -0.023 | 200 | 2.00 | 923 |
| 5.00mm | 0.1968 | 36 | 18 | 500 | -0.023 | 200 | 2.00 | 927 |
| 5.05mm | 0.1988 | 36 | 18 | 500 | -0.023 | 200 | 2.00 | 936 |
| #8 | 0.1990 | 36 | 18 | 500 | -0.023 | 200 | 2.00 | 937 |
| 5.10mm | 0.2008 | 34 | 18 | 500 | -0.023 | 200 | 1.89 | 946 |
| #7 | 0.2010 | 34 | 18 | 500 | -0.023 | 200 | 1.89 | 947 |
| 5.15mm | 0.2028 | 34 | 18 | 500 | -0.023 | 200 | 1.89 | 955 |
| 13/64 | 0.2031 | 34 | 18 | 500 | -0.023 | 200 | 1.89 | 957 |
| #6 | 0.2040 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 961 |
| 5.20mm | 0.2047 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 964 |
| #5 | 0.2055 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 968 |

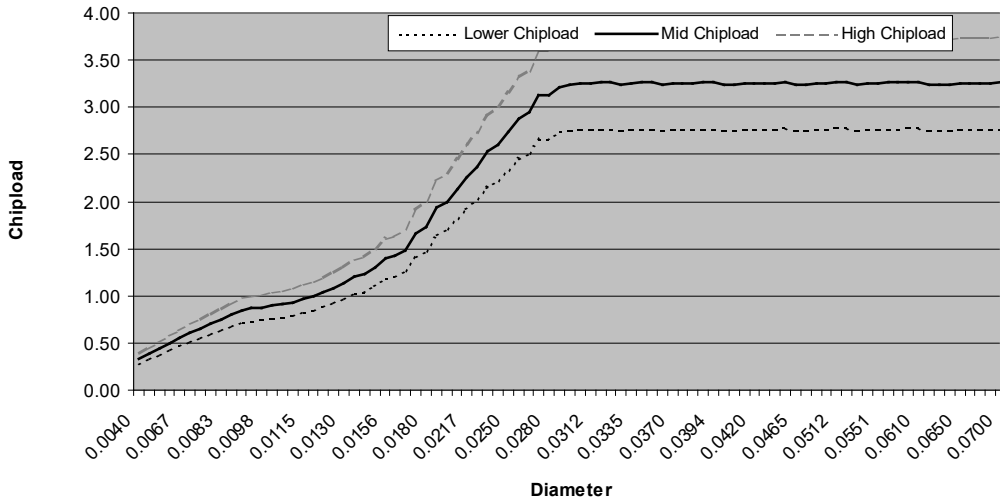
Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 974 |
| 5.30mm | 0.2087 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 983 |
| #4 | 0.2090 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 984 |
| 5.35mm | 0.2106 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 992 |
| 5.40mm | 0.2126 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1001 |
| #3 | 0.2130 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1003 |
| 5.45mm | 0.2146 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1011 |
| 5.50mm | 0.2165 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1020 |
| 5.55mm | 0.2185 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1029 |
| 7/32 | 0.2188 | 34 | 18 | 500 | -0.024 | 200 | 1.89 | 1031 |
| 5.60mm | 0.2205 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1039 |
| #2 | 0.2210 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1041 |
| 5.65mm | 0.2224 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1048 |
| 5.70mm | 0.2244 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1057 |
| 5.75mm | 0.2264 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1066 |
| #1 | 0.2280 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1074 |
| 5.80mm | 0.2283 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1075 |
| 5.85mm | 0.2302 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1084 |
| 5.90mm | 0.2323 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1094 |
| A | 0.2340 | 32 | 18 | 500 | -0.025 | 200 | 1.78 | 1102 |
| 5.95mm | 0.2343 | 32 | 18 | 500 | -0.026 | 200 | 1.78 | 1104 |
| 15/64 | 0.2344 | 32 | 18 | 500 | -0.026 | 200 | 1.78 | 1104 |
| 6.00mm | 0.2362 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1113 |
| B | 0.2380 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1121 |
| 6.05mm | 0.2382 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1122 |
| 6.10mm | 0.2402 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1131 |
| C | 0.2420 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1140 |
| 6.15mm | 0.2421 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1140 |
| 6.20mm | 0.2441 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1150 |
| D | 0.2460 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1159 |
| 6.25mm | 0.2461 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1159 |
| 6.30mm | 0.2480 | 30 | 18 | 500 | -0.026 | 200 | 1.67 | 1168 |
| 6.35mm | 0.2500 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1178 |
| 6.40mm | 0.2520 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1187 |
| 6.50mm | 0.2559 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1205 |
| F | 0.2570 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1210 |
| 6.60mm | 0.2598 | 30 | 18 | 500 | -0.027 | 200 | 1.67 | 1224 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for RO4350® / Thermoset




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Slot Drilling FR-4 PCB Material

## Recommended Drill Series: 100, 150, 700, 750

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #80 | 0.0135 | 50 | 100 | 1000 | -0.013 | 3000 | 0.50 | 353 |
| 0.35mm | 0.0138 | 50 | 100 | 1000 | -0.013 | 3000 | 0.50 | 361 |
| #79 | 0.0145 | 55 | 100 | 1000 | -0.013 | 3000 | 0.55 | 379 |
| 1/64 | 0.0156 | 58 | 100 | 1000 | -0.014 | 3000 | 0.58 | 408 |
| 0.40mm | 0.0158 | 59 | 100 | 1000 | -0.014 | 3000 | 0.59 | 413 |
| #78 | 0.0160 | 60 | 100 | 1000 | -0.014 | 3000 | 0.60 | 419 |
| 0.45mm | 0.0177 | 65 | 97 | 1000 | -0.014 | 3000 | 0.67 | 450 |
| #77 | 0.0180 | 66 | 95 | 1000 | -0.014 | 3000 | 0.69 | 450 |
| 0.50mm | 0.0197 | 68 | 87 | 1000 | -0.015 | 3000 | 0.78 | 450 |
| #76 | 0.0200 | 68 | 86 | 1000 | -0.015 | 3000 | 0.79 | 450 |
| #75 | 0.0210 | 69 | 82 | 1000 | -0.015 | 3000 | 0.84 | 450 |
| 0.55mm | 0.0217 | 70 | 79 | 1000 | -0.015 | 3000 | 0.89 | 450 |
| #74 | 0.0225 | 72 | 76 | 1000 | -0.015 | 3000 | 0.95 | 450 |
| 0.60mm | 0.0236 | 73 | 73 | 1000 | -0.016 | 3000 | 1.00 | 450 |
| #73 | 0.0240 | 72 | 72 | 1000 | -0.016 | 3000 | 1.00 | 450 |
| #72 | 0.0250 | 73 | 69 | 1000 | -0.016 | 3000 | 1.06 | 450 |
| 0.65mm | 0.0256 | 74 | 68 | 1000 | -0.016 | 3000 | 1.09 | 450 |
| #71 | 0.0260 | 74 | 67 | 1000 | -0.016 | 3000 | 1.10 | 450 |
| 0.70mm | 0.0276 | 75 | 63 | 1000 | -0.016 | 3000 | 1.19 | 450 |
| #70 | 0.0280 | 75 | 63 | 1000 | -0.017 | 3000 | 1.19 | 450 |
| #69 | 0.0292 | 76 | 59 | 1000 | -0.017 | 3000 | 1.29 | 450 |
| 0.75mm | 0.0295 | 76 | 58 | 1000 | -0.017 | 3000 | 1.31 | 450 |
| #68 | 0.0310 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| 1/32 | 0.0312 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| 0.80mm | 0.0315 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| #67 | 0.0320 | 75 | 54 | 1000 | -0.017 | 3000 | 1.39 | 450 |
| #66 | 0.0330 | 74 | 52 | 1000 | -0.018 | 3000 | 1.42 | 450 |
| 0.85mm | 0.0335 | 74 | 51 | 1000 | -0.018 | 3000 | 1.45 | 450 |
| #65 | 0.0350 | 73 | 49 | 1000 | -0.018 | 3000 | 1.49 | 450 |
| 0.90mm | 0.0354 | 72 | 48 | 1000 | -0.018 | 3000 | 1.50 | 450 |
| #64 | 0.0360 | 72 | 48 | 1000 | -0.018 | 3000 | 1.50 | 450 |
| #63 | 0.0370 | 71 | 47 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| 0.95mm | 0.0374 | 69 | 46 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #62 | 0.0380 | 68 | 45 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #61 | 0.0390 | 66 | 44 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| 1.00mm | 0.0394 | 66 | 44 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #60 | 0.0400 | 65 | 43 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #59 | 0.0410 | 63 | 42 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.05mm | 0.0413 | 62 | 41 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| #58 | 0.0420 | 61 | 41 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| #57 | 0.0430 | 60 | 40 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.10mm | 0.0433 | 60 | 40 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.15mm | 0.0453 | 57 | 38 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| #56 | 0.0465 | 56 | 37 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 3/64 | 0.0469 | 54 | 36 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.20mm | 0.0472 | 54 | 36 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.25mm | 0.0492 | 52 | 35 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.30mm | 0.0512 | 51 | 34 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| #55 | 0.0520 | 50 | 33 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| 1.35mm | 0.0531 | 48 | 32 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| #54 | 0.0550 | 47 | 32 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.40mm | 0.0551 | 46 | 31 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.45mm | 0.0571 | 45 | 30 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.50mm | 0.0591 | 44 | 29 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| #53 | 0.0595 | 43 | 29 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| 1.55mm | 0.0610 | 42 | 28 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| 1/16 | 0.0625 | 41 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.60mm | 0.0630 | 41 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| #52 | 0.0635 | 40 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.65mm | 0.0650 | 39 | 26 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.70mm | 0.0669 | 39 | 26 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| #51 | 0.0670 | 38 | 26 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| 1.75mm | 0.0689 | 38 | 25 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| #50 | 0.0700 | 37 | 25 | 1000 | -0.026 | 3000 | 1.50 | 450 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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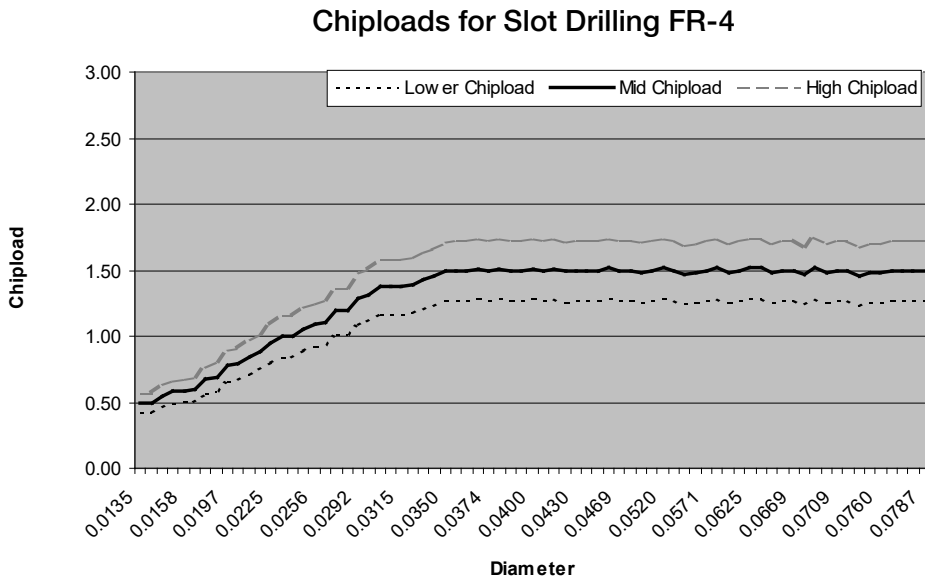
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.80mm | 0.0709 | 36 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| 1.85mm | 0.0728 | 36 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| #49 | 0.0730 | 35 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| 1.90mm | 0.0748 | 34 | 23 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| #48 | 0.0760 | 34 | 23 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 1.95mm | 0.0768 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 5/64 | 0.0781 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| #47 | 0.0785 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 2.00mm | 0.0787 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Aramid** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 40 | 120 | 200 | -0.011 | 1000 | 0.33 | 126 |
| 0.13mm | 0.0050 | 42 | 120 | 300 | -0.011 | 1000 | 0.35 | 157 |
| 0.15mm | 0.0059 | 44 | 120 | 300 | -0.011 | 1000 | 0.37 | 185 |
| #96 | 0.0063 | 46 | 120 | 400 | -0.011 | 1000 | 0.38 | 198 |
| #95 | 0.0067 | 48 | 120 | 400 | -0.012 | 1000 | 0.40 | 210 |
| #94 | 0.0071 | 50 | 120 | 500 | -0.012 | 1000 | 0.42 | 223 |
| #93 | 0.0075 | 55 | 120 | 500 | -0.012 | 1000 | 0.46 | 236 |
| #92 | 0.0079 | 60 | 120 | 500 | -0.012 | 1000 | 0.50 | 248 |
| #91 | 0.0083 | 65 | 120 | 600 | -0.012 | 1200 | 0.54 | 261 |
| #90 | 0.0087 | 68 | 120 | 600 | -0.012 | 1200 | 0.57 | 273 |
| #89 | 0.0091 | 70 | 120 | 700 | -0.012 | 1200 | 0.58 | 286 |
| #88 | 0.0095 | 75 | 120 | 700 | -0.012 | 1200 | 0.63 | 298 |
| 0.25mm | 0.0098 | 78 | 120 | 800 | -0.012 | 1200 | 0.65 | 308 |
| #87 | 0.0100 | 80 | 120 | 800 | -0.012 | 1200 | 0.67 | 314 |
| #86 | 0.0105 | 85 | 120 | 800 | -0.012 | 1500 | 0.71 | 330 |
| #85 | 0.0110 | 90 | 118 | 900 | -0.013 | 1500 | 0.76 | 340 |
| #84 | 0.0115 | 95 | 113 | 900 | -0.013 | 1500 | 0.84 | 340 |
| 0.30mm | 0.0118 | 98 | 110 | 1000 | -0.013 | 1500 | 0.89 | 340 |
| #83 | 0.0120 | 100 | 108 | 1000 | -0.013 | 1500 | 0.93 | 340 |
| #82 | 0.0125 | 102 | 104 | 1000 | -0.013 | 1500 | 0.98 | 340 |
| #81 | 0.0130 | 104 | 100 | 1000 | -0.013 | 1500 | 1.04 | 340 |
| #80 | 0.0135 | 106 | 96 | 1000 | -0.013 | 1500 | 1.10 | 340 |
| 0.35mm | 0.0138 | 108 | 94 | 1000 | -0.013 | 1500 | 1.15 | 340 |
| #79 | 0.0145 | 109 | 90 | 1000 | -0.013 | 1500 | 1.21 | 340 |
| 1/64 | 0.0156 | 107 | 83 | 1000 | -0.014 | 1500 | 1.29 | 340 |
| 0.40mm | 0.0158 | 107 | 82 | 1000 | -0.014 | 1500 | 1.30 | 340 |
| #78 | 0.0160 | 107 | 81 | 1000 | -0.014 | 1500 | 1.32 | 340 |
| 0.45mm | 0.0177 | 105 | 73 | 1000 | -0.014 | 1500 | 1.44 | 340 |
| #77 | 0.0180 | 105 | 72 | 1000 | -0.014 | 1500 | 1.50 | 340 |
| 0.50mm | 0.0197 | 98 | 66 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| #76 | 0.0200 | 96 | 65 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| #75 | 0.0210 | 93 | 62 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| 0.55mm | 0.0217 | 90 | 60 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| #74 | 0.0225 | 87 | 58 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| 0.60mm | 0.0236 | 82 | 55 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #73 | 0.0240 | 81 | 54 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #72 | 0.0250 | 78 | 52 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| 0.65mm | 0.0256 | 76 | 51 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #71 | 0.0260 | 75 | 50 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| 0.70mm | 0.0276 | 71 | 47 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #70 | 0.0280 | 69 | 46 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #69 | 0.0292 | 66 | 44 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 0.75mm | 0.0295 | 66 | 44 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #68 | 0.0310 | 63 | 42 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 1/32 | 0.0312 | 63 | 42 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 0.80mm | 0.0315 | 61 | 41 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #67 | 0.0320 | 61 | 41 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #66 | 0.0330 | 59 | 39 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| 0.85mm | 0.0335 | 59 | 39 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #65 | 0.0350 | 56 | 37 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| 0.90mm | 0.0354 | 56 | 37 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #64 | 0.0360 | 54 | 36 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #63 | 0.0370 | 53 | 35 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| 0.95mm | 0.0374 | 51 | 34 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #62 | 0.0380 | 51 | 34 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #61 | 0.0390 | 49 | 33 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| 1.00mm | 0.0394 | 49 | 33 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #60 | 0.0400 | 48 | 32 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #59 | 0.0410 | 48 | 32 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.05mm | 0.0413 | 46 | 31 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| #58 | 0.0420 | 46 | 31 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| #57 | 0.0430 | 45 | 30 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.10mm | 0.0433 | 45 | 30 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.15mm | 0.0453 | 43 | 29 | 1000 | -0.021 | 1500 | 1.50 | 340 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 3/64 | 0.0469 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.20mm | 0.0472 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.25mm | 0.0492 | 39 | 26 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.30mm | 0.0512 | 38 | 25 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| #55 | 0.0520 | 38 | 25 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| 1.35mm | 0.0531 | 36 | 24 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| #54 | 0.0550 | 36 | 24 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.40mm | 0.0551 | 36 | 24 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.45mm | 0.0571 | 35 | 23 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.50mm | 0.0591 | 33 | 22 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| #53 | 0.0595 | 33 | 22 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| 1.55mm | 0.0610 | 32 | 21 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| 1/16 | 0.0625 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.60mm | 0.0630 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| #52 | 0.0635 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.65mm | 0.0650 | 30 | 20 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.70mm | 0.0669 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 350 |
| #51 | 0.0670 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 351 |
| 1.75mm | 0.0689 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 361 |
| #50 | 0.0700 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 366 |
| 1.80mm | 0.0709 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 371 |
| 1.85mm | 0.0728 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 381 |
| #49 | 0.0730 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 382 |
| 1.90mm | 0.0748 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 391 |
| #48 | 0.0760 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 398 |
| 1.95mm | 0.0768 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 402 |
| 5/64 | 0.0781 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 409 |
| #47 | 0.0785 | 30 | 20 | 1000 | -0.028 | 1200 | 1.50 | 411 |
| 2.00mm | 0.0787 | 30 | 20 | 1000 | -0.028 | 1200 | 1.50 | 412 |
| 2.05mm | 0.0807 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 422 |
| #46 | 0.0810 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 424 |
| #45 | 0.0820 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 429 |
| 2.10mm | 0.0827 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 433 |
| 2.15mm | 0.0846 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 443 |
| #44 | 0.0860 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 450 |
| 2.20mm | 0.0866 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 453 |
| 2.25mm | 0.0886 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 464 |
| #43 | 0.0890 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 466 |
| 2.30mm | 0.0906 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 474 |
| 2.35mm | 0.0925 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 484 |
| #42 | 0.0935 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 489 |
| 3/32 | 0.0938 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 491 |
| 2.40mm | 0.0945 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 495 |
| #41 | 0.0960 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 502 |
| 2.45mm | 0.0965 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 505 |
| #40 | 0.0980 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 513 |
| 2.50mm | 0.0984 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 515 |
| #39 | 0.0995 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 521 |
| 2.55mm | 0.1004 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 525 |
| #38 | 0.1015 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 531 |
| 2.60mm | 0.1024 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 536 |
| #37 | 0.1040 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 544 |
| 2.65mm | 0.1043 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 546 |
| 2.70mm | 0.1063 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 556 |
| #36 | 0.1065 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 557 |
| 2.75mm | 0.1083 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 567 |
| 7/64 | 0.1094 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 573 |
| #35 | 0.1100 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 576 |
| 2.80mm | 0.1102 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 577 |
| #34 | 0.1110 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 581 |
| 2.85mm | 0.1122 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 587 |
| #33 | 0.1130 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 591 |
| 2.90mm | 0.1142 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 598 |
| #32 | 0.1160 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 607 |
| 2.95mm | 0.1161 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 608 |
| 3.00mm | 0.1181 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 618 |
| #31 | 0.1200 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 628 |
| 3.05mm | 0.1201 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 629 |
| 3.10mm | 0.1220 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 638 |
| 3.15mm | 0.1240 | 30 | 20 | 1000 | -0.039 | 1200 | 1.50 | 649 |
| 1/8 | 0.1250 | 30 | 20 | 1000 | -0.039 | 1200 | 1.50 | 654 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

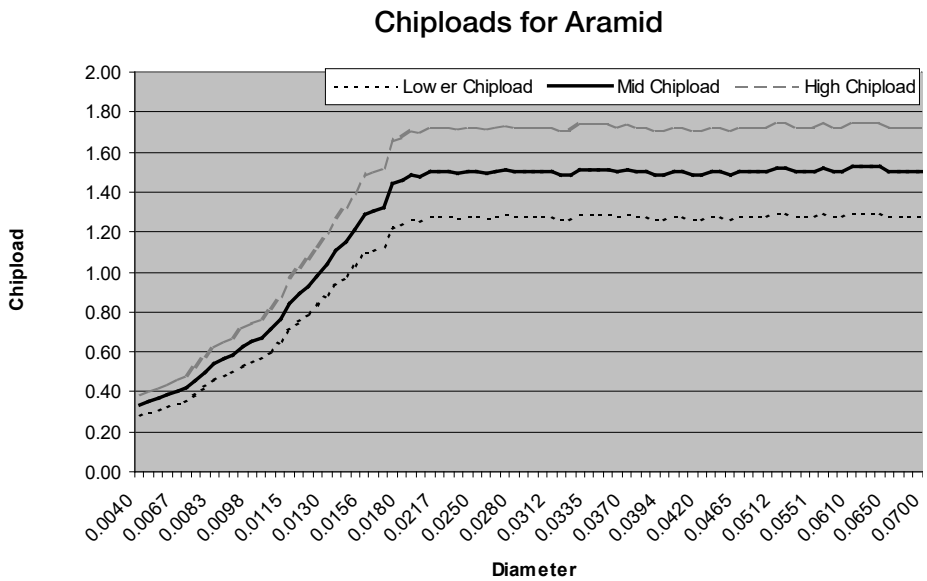
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 1000 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 1000 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 795 |
| 3.90mm | 0.1535 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 803 |
| #23 | 0.1540 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1051 |
| #7 | 0.2010 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1052 |
| 5.15mm | 0.2028 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1061 |
| 13/64 | 0.2031 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1063 |
| #6 | 0.2040 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1068 |
| 5.20mm | 0.2047 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1071 |
| #5 | 0.2055 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1075 |

Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1082 |
| 5.30mm | 0.2087 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1092 |
| #4 | 0.2090 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1094 |
| 5.35mm | 0.2106 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1102 |
| 5.40mm | 0.2126 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1113 |
| #3 | 0.2130 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1115 |
| 5.45mm | 0.2146 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1123 |
| 5.50mm | 0.2165 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1133 |
| 5.55mm | 0.2185 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1143 |
| 7/32 | 0.2188 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1145 |
| 5.60mm | 0.2205 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1154 |
| #2 | 0.2210 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1157 |
| 5.65mm | 0.2224 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1164 |
| 5.70mm | 0.2244 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1174 |
| 5.75mm | 0.2264 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1185 |
| #1 | 0.2280 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1193 |
| 5.80mm | 0.2283 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1195 |
| 5.85mm | 0.2302 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1205 |
| 5.90mm | 0.2323 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1216 |
| A | 0.2340 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1225 |
| 5.95mm | 0.2343 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1226 |
| 15/64 | 0.2344 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **120K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **BT Epoxy** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 14 | 160 | 200 | -0.011 | 300 | 0.09 | 167 |
| 0.13mm | 0.0050 | 21 | 160 | 300 | -0.011 | 300 | 0.13 | 209 |
| 0.15mm | 0.0059 | 27 | 160 | 300 | -0.011 | 300 | 0.17 | 247 |
| #96 | 0.0063 | 29 | 160 | 400 | -0.011 | 300 | 0.18 | 264 |
| #95 | 0.0067 | 32 | 160 | 400 | -0.012 | 300 | 0.20 | 281 |
| #94 | 0.0071 | 37 | 160 | 500 | -0.012 | 300 | 0.23 | 297 |
| #93 | 0.0075 | 43 | 160 | 500 | -0.012 | 300 | 0.27 | 314 |
| #92 | 0.0079 | 46 | 160 | 500 | -0.012 | 300 | 0.29 | 331 |
| #91 | 0.0083 | 53 | 160 | 600 | -0.012 | 300 | 0.33 | 347 |
| #90 | 0.0087 | 61 | 160 | 600 | -0.012 | 300 | 0.38 | 364 |
| #89 | 0.0091 | 63 | 157 | 700 | -0.012 | 300 | 0.40 | 375 |
| #88 | 0.0095 | 63 | 151 | 700 | -0.012 | 300 | 0.42 | 375 |
| 0.25mm | 0.0098 | 67 | 146 | 800 | -0.012 | 500 | 0.46 | 375 |
| #87 | 0.0100 | 67 | 143 | 800 | -0.012 | 500 | 0.47 | 375 |
| #86 | 0.0105 | 68 | 136 | 800 | -0.012 | 500 | 0.50 | 375 |
| #85 | 0.0110 | 70 | 130 | 900 | -0.013 | 500 | 0.54 | 375 |
| #84 | 0.0115 | 71 | 125 | 900 | -0.013 | 500 | 0.57 | 375 |
| 0.30mm | 0.0118 | 70 | 121 | 1000 | -0.013 | 500 | 0.58 | 375 |
| #83 | 0.0120 | 73 | 119 | 1000 | -0.013 | 500 | 0.61 | 375 |
| #82 | 0.0125 | 74 | 115 | 1000 | -0.013 | 500 | 0.64 | 375 |
| #81 | 0.0130 | 78 | 110 | 1000 | -0.013 | 500 | 0.71 | 375 |
| #80 | 0.0135 | 82 | 106 | 1000 | -0.013 | 750 | 0.77 | 375 |
| 0.35mm | 0.0138 | 83 | 104 | 1000 | -0.013 | 750 | 0.80 | 375 |
| #79 | 0.0145 | 87 | 99 | 1000 | -0.013 | 750 | 0.88 | 375 |
| 1/64 | 0.0156 | 88 | 92 | 1000 | -0.014 | 750 | 0.96 | 375 |
| 0.40mm | 0.0158 | 89 | 91 | 1000 | -0.014 | 750 | 0.98 | 375 |
| #78 | 0.0160 | 90 | 90 | 1000 | -0.014 | 750 | 1.00 | 375 |
| 0.45mm | 0.0177 | 92 | 81 | 1000 | -0.014 | 750 | 1.14 | 375 |
| #77 | 0.0180 | 94 | 80 | 1000 | -0.014 | 750 | 1.18 | 375 |
| 0.50mm | 0.0197 | 96 | 73 | 1000 | -0.015 | 750 | 1.32 | 375 |
| #76 | 0.0200 | 96 | 72 | 1000 | -0.015 | 750 | 1.33 | 375 |
| #75 | 0.0210 | 98 | 68 | 1000 | -0.015 | 1000 | 1.44 | 375 |
| 0.55mm | 0.0217 | 100 | 66 | 1000 | -0.015 | 1000 | 1.52 | 375 |
| #74 | 0.0225 | 104 | 64 | 1000 | -0.015 | 1000 | 1.63 | 375 |
| 0.60mm | 0.0236 | 106 | 61 | 1000 | -0.016 | 1000 | 1.74 | 375 |
| #73 | 0.0240 | 108 | 60 | 1000 | -0.016 | 1000 | 1.80 | 375 |
| #72 | 0.0250 | 112 | 57 | 1000 | -0.016 | 1000 | 1.96 | 375 |
| 0.65mm | 0.0256 | 116 | 56 | 1000 | -0.016 | 1000 | 2.07 | 375 |
| #71 | 0.0260 | 118 | 55 | 1000 | -0.016 | 1000 | 2.15 | 375 |
| 0.70mm | 0.0276 | 124 | 52 | 1000 | -0.016 | 1000 | 2.38 | 375 |
| #70 | 0.0280 | 126 | 51 | 1000 | -0.017 | 1000 | 2.47 | 375 |
| #69 | 0.0292 | 123 | 49 | 1000 | -0.017 | 1000 | 2.51 | 375 |
| 0.75mm | 0.0295 | 123 | 49 | 1000 | -0.017 | 1000 | 2.51 | 375 |
| #68 | 0.0310 | 115 | 46 | 1000 | -0.017 | 1000 | 2.50 | 375 |
| 1/32 | 0.0312 | 115 | 46 | 1000 | -0.017 | 1000 | 2.50 | 375 |
| 0.80mm | 0.0315 | 113 | 45 | 1000 | -0.017 | 1000 | 2.51 | 375 |
| #67 | 0.0320 | 113 | 45 | 1000 | -0.017 | 1000 | 2.51 | 375 |
| #66 | 0.0330 | 108 | 43 | 1000 | -0.018 | 1000 | 2.51 | 375 |
| 0.85mm | 0.0335 | 108 | 43 | 1000 | -0.018 | 1000 | 2.51 | 375 |
| #65 | 0.0350 | 103 | 41 | 1000 | -0.018 | 1000 | 2.51 | 375 |
| 0.90mm | 0.0354 | 100 | 40 | 1000 | -0.018 | 1000 | 2.50 | 375 |
| #64 | 0.0360 | 100 | 40 | 1000 | -0.018 | 1000 | 2.50 | 375 |
| #63 | 0.0370 | 98 | 39 | 1000 | -0.019 | 1000 | 2.51 | 375 |
| 0.95mm | 0.0374 | 95 | 38 | 1000 | -0.019 | 1000 | 2.50 | 375 |
| #62 | 0.0380 | 95 | 38 | 1000 | -0.019 | 1000 | 2.50 | 375 |
| #61 | 0.0390 | 93 | 37 | 1000 | -0.019 | 1000 | 2.51 | 375 |
| 1.00mm | 0.0394 | 90 | 36 | 1000 | -0.019 | 1000 | 2.50 | 375 |
| #60 | 0.0400 | 90 | 36 | 1000 | -0.019 | 1000 | 2.50 | 375 |
| #59 | 0.0410 | 88 | 35 | 1000 | -0.020 | 1000 | 2.51 | 375 |
| 1.05mm | 0.0413 | 88 | 35 | 1000 | -0.020 | 1000 | 2.51 | 375 |
| #58 | 0.0420 | 85 | 34 | 1000 | -0.020 | 1000 | 2.50 | 375 |
| #57 | 0.0430 | 83 | 33 | 1000 | -0.020 | 1000 | 2.52 | 375 |
| 1.10mm | 0.0433 | 83 | 33 | 1000 | -0.020 | 1000 | 2.52 | 375 |
| 1.15mm | 0.0453 | 80 | 32 | 1000 | -0.021 | 1000 | 2.50 | 375 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 78 | 31 | 1000 | -0.021 | 1000 | 2.52 | 375 |
| 3/64 | 0.0469 | 78 | 31 | 1000 | -0.021 | 1000 | 2.52 | 375 |
| 1.20mm | 0.0472 | 75 | 30 | 1000 | -0.021 | 1000 | 2.50 | 375 |
| 1.25mm | 0.0492 | 73 | 29 | 1000 | -0.021 | 1000 | 2.52 | 375 |
| 1.30mm | 0.0512 | 70 | 28 | 1000 | -0.022 | 1000 | 2.50 | 375 |
| #55 | 0.0520 | 70 | 28 | 1000 | -0.022 | 1000 | 2.50 | 375 |
| 1.35mm | 0.0531 | 68 | 27 | 1000 | -0.022 | 1000 | 2.52 | 375 |
| #54 | 0.0550 | 65 | 26 | 1000 | -0.023 | 1000 | 2.50 | 375 |
| 1.40mm | 0.0551 | 65 | 26 | 1000 | -0.023 | 1000 | 2.50 | 375 |
| 1.45mm | 0.0571 | 63 | 25 | 1000 | -0.023 | 1000 | 2.52 | 375 |
| 1.50mm | 0.0591 | 60 | 24 | 1000 | -0.024 | 1000 | 2.50 | 375 |
| #53 | 0.0595 | 60 | 24 | 1000 | -0.024 | 1000 | 2.50 | 375 |
| 1.55mm | 0.0610 | 58 | 23 | 1000 | -0.024 | 1000 | 2.52 | 375 |
| 1/16 | 0.0625 | 58 | 23 | 1000 | -0.025 | 1000 | 2.52 | 375 |
| 1.60mm | 0.0630 | 58 | 23 | 1000 | -0.025 | 1000 | 2.52 | 375 |
| #52 | 0.0635 | 58 | 23 | 1000 | -0.025 | 1000 | 2.52 | 375 |
| 1.65mm | 0.0650 | 55 | 22 | 1000 | -0.025 | 1000 | 2.50 | 375 |
| 1.70mm | 0.0669 | 53 | 21 | 1000 | -0.026 | 1000 | 2.52 | 375 |
| #51 | 0.0670 | 53 | 21 | 1000 | -0.026 | 1000 | 2.52 | 375 |
| 1.75mm | 0.0689 | 52 | 21 | 1000 | -0.026 | 1000 | 2.48 | 379 |
| #50 | 0.0700 | 52 | 21 | 1000 | -0.026 | 1000 | 2.48 | 385 |
| 1.80mm | 0.0709 | 52 | 20 | 1000 | -0.027 | 1000 | 2.60 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 1000 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 1000 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 1000 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 45 | 20 | 1000 | -0.018 | 500 | 2.25 | 659 |
| 3.25mm | 0.1280 | 45 | 20 | 1000 | -0.018 | 500 | 2.25 | 670 |
| #30 | 0.1285 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 672 |
| 3.30mm | 0.1299 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 680 |
| 3.35mm | 0.1319 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 690 |
| 3.40mm | 0.1339 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 701 |
| 3.45mm | 0.1358 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 711 |
| #29 | 0.1360 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 712 |
| 3.50mm | 0.1378 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 721 |
| 3.55mm | 0.1398 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 732 |
| #28 | 0.1405 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 735 |
| 9/64 | 0.1406 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 736 |
| 3.60mm | 0.1417 | 45 | 20 | 1000 | -0.019 | 500 | 2.25 | 742 |
| 3.65mm | 0.1437 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 752 |
| #27 | 0.1440 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 754 |
| 3.70mm | 0.1457 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 762 |
| #26 | 0.1470 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 769 |
| 3.75mm | 0.1476 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 772 |
| #25 | 0.1495 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 782 |
| 3.80mm | 0.1496 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 783 |
| 3.85mm | 0.1516 | 45 | 20 | 1000 | -0.020 | 500 | 2.25 | 793 |
| #24 | 0.1520 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 795 |
| 3.90mm | 0.1535 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 803 |
| #23 | 0.1540 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 806 |
| 3.95 | 0.1555 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 814 |
| 5/32 | 0.1562 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 817 |
| #22 | 0.1570 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 822 |
| 4.00mm | 0.1575 | 45 | 20 | 1000 | -0.020 | 250 | 2.25 | 824 |
| #21 | 0.1590 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 832 |
| 4.05mm | 0.1594 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 834 |
| #20 | 0.1610 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 843 |
| 4.10mm | 0.1614 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 845 |
| 4.15mm | 0.1634 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 855 |
| 4.20mm | 0.1654 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 866 |
| #19 | 0.1660 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 869 |
| 4.25mm | 0.1673 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 876 |
| 4.30mm | 0.1693 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 886 |
| #18 | 0.1695 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 887 |
| 4.35mm | 0.1713 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 896 |
| 11/64 | 0.1719 | 40 | 20 | 1000 | -0.021 | 250 | 2.00 | 900 |
| #17 | 0.1730 | 40 | 20 | 1000 | -0.021 | 200 | 2.00 | 905 |
| 4.40mm | 0.1732 | 40 | 20 | 1000 | -0.021 | 200 | 2.00 | 906 |
| 4.45mm | 0.1752 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 917 |
| #16 | 0.1770 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 926 |
| 4.50mm | 0.1772 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 927 |
| 4.55mm | 0.1792 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 938 |
| #15 | 0.1800 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 942 |
| 4.60mm | 0.1811 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 948 |
| #14 | 0.1820 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 952 |
| 4.65mm | 0.1831 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 958 |
| #13 | 0.1850 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 968 |
| 4.70mm | 0.1850 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 968 |
| 4.75mm | 0.1870 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 979 |
| 3/16 | 0.1875 | 40 | 20 | 1000 | -0.022 | 200 | 2.00 | 981 |
| 4.80mm | 0.1890 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 989 |
| #12 | 0.1890 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 989 |
| 4.85mm | 0.1909 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 999 |
| #11 | 0.1910 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1000 |
| 4.90mm | 0.1929 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1010 |
| #10 | 0.1935 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1013 |
| 4.95mm | 0.1949 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1020 |
| #9 | 0.1960 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1026 |
| 5.00mm | 0.1968 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1030 |
| 5.05mm | 0.1988 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1040 |
| #8 | 0.1990 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1041 |
| 5.10mm | 0.2008 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1051 |
| #7 | 0.2010 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1052 |
| 5.15mm | 0.2028 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1061 |
| 13/64 | 0.2031 | 35 | 20 | 1000 | -0.023 | 200 | 1.75 | 1063 |
| #6 | 0.2040 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1068 |
| 5.20mm | 0.2047 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1071 |
| #5 | 0.2055 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1075 |

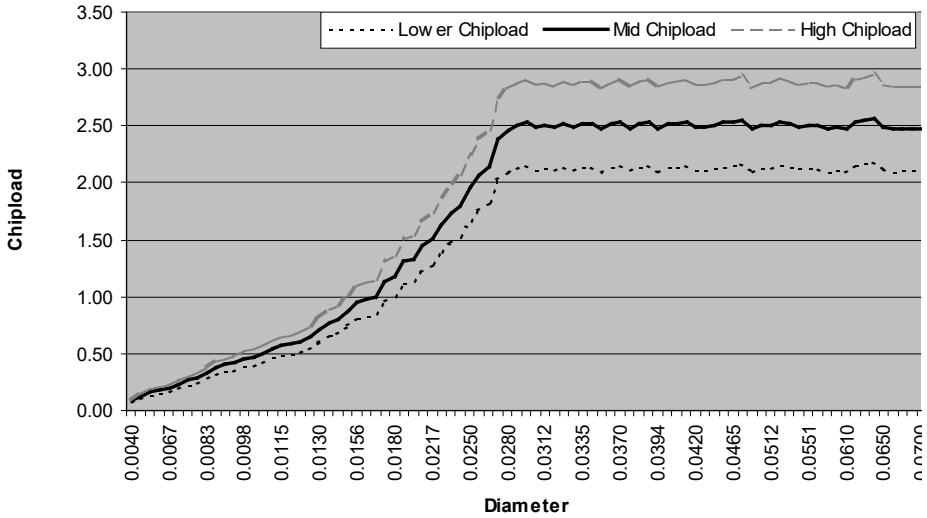
Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 35 | 20 | 1000 | -0.024 | 200 | 1.75 | 1082 |
| 5.30mm | 0.2087 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1092 |
| #4 | 0.2090 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1094 |
| 5.35mm | 0.2106 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1102 |
| 5.40mm | 0.2126 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1113 |
| #3 | 0.2130 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1115 |
| 5.45mm | 0.2146 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1123 |
| 5.50mm | 0.2165 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1133 |
| 5.55mm | 0.2185 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1143 |
| 7/32 | 0.2188 | 30 | 20 | 1000 | -0.024 | 200 | 1.50 | 1145 |
| 5.60mm | 0.2205 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1154 |
| #2 | 0.2210 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1157 |
| 5.65mm | 0.2224 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1164 |
| 5.70mm | 0.2244 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1174 |
| 5.75mm | 0.2264 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1185 |
| #1 | 0.2280 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1193 |
| 5.80mm | 0.2283 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1195 |
| 5.85mm | 0.2302 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1205 |
| 5.90mm | 0.2323 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1216 |
| A | 0.2340 | 30 | 20 | 1000 | -0.025 | 200 | 1.50 | 1225 |
| 5.95mm | 0.2343 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1226 |
| 15/64 | 0.2344 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 200 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 200 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for BT Epoxy




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Copper-Invar-Copper** PCB Material

(and other metal bonded designs)

**Recommended Drill Series:** 100, 150, 560, 580, 600

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 13 | 160 | 100 | -0.011 | 100 | 0.08 | 167 |
| 0.13mm | 0.0050 | 16 | 160 | 150 | -0.011 | 100 | 0.10 | 209 |
| 0.15mm | 0.0059 | 19 | 160 | 200 | -0.011 | 100 | 0.12 | 247 |
| #96 | 0.0063 | 21 | 160 | 200 | -0.011 | 100 | 0.13 | 264 |
| #95 | 0.0067 | 21 | 160 | 200 | -0.012 | 100 | 0.13 | 281 |
| #94 | 0.0071 | 22 | 160 | 300 | -0.012 | 100 | 0.14 | 297 |
| #93 | 0.0075 | 24 | 160 | 300 | -0.012 | 100 | 0.15 | 314 |
| #92 | 0.0079 | 26 | 160 | 400 | -0.012 | 150 | 0.16 | 331 |
| #91 | 0.0083 | 27 | 160 | 400 | -0.012 | 150 | 0.17 | 347 |
| #90 | 0.0087 | 29 | 160 | 500 | -0.012 | 150 | 0.18 | 364 |
| #89 | 0.0091 | 32 | 160 | 500 | -0.012 | 150 | 0.20 | 381 |
| #88 | 0.0095 | 34 | 160 | 500 | -0.012 | 150 | 0.21 | 398 |
| 0.25mm | 0.0098 | 34 | 156 | 500 | -0.012 | 200 | 0.22 | 400 |
| #87 | 0.0100 | 38 | 153 | 500 | -0.012 | 200 | 0.25 | 400 |
| #86 | 0.0105 | 41 | 146 | 600 | -0.012 | 200 | 0.28 | 400 |
| #85 | 0.0110 | 42 | 139 | 600 | -0.013 | 200 | 0.30 | 400 |
| #84 | 0.0115 | 44 | 133 | 700 | -0.013 | 200 | 0.33 | 400 |
| 0.30mm | 0.0118 | 46 | 130 | 700 | -0.013 | 200 | 0.35 | 400 |
| #83 | 0.0120 | 48 | 127 | 800 | -0.013 | 250 | 0.38 | 400 |
| #82 | 0.0125 | 51 | 122 | 800 | -0.013 | 250 | 0.42 | 400 |
| #81 | 0.0130 | 55 | 118 | 800 | -0.013 | 250 | 0.47 | 400 |
| #80 | 0.0135 | 60 | 113 | 800 | -0.013 | 250 | 0.53 | 400 |
| 0.35mm | 0.0138 | 63 | 111 | 800 | -0.013 | 250 | 0.57 | 400 |
| #79 | 0.0145 | 69 | 105 | 800 | -0.013 | 250 | 0.66 | 400 |
| 1/64 | 0.0156 | 72 | 98 | 800 | -0.014 | 300 | 0.73 | 400 |
| 0.40mm | 0.0158 | 73 | 97 | 800 | -0.014 | 300 | 0.75 | 400 |
| #78 | 0.0160 | 75 | 96 | 800 | -0.014 | 300 | 0.78 | 400 |
| 0.45mm | 0.0177 | 79 | 86 | 900 | -0.014 | 300 | 0.92 | 400 |
| #77 | 0.0180 | 80 | 85 | 900 | -0.014 | 300 | 0.94 | 400 |
| 0.50mm | 0.0197 | 80 | 78 | 900 | -0.015 | 300 | 1.03 | 400 |
| #76 | 0.0200 | 82 | 76 | 900 | -0.015 | 300 | 1.08 | 400 |
| #75 | 0.0210 | 84 | 73 | 1000 | -0.015 | 400 | 1.15 | 400 |
| 0.55mm | 0.0217 | 86 | 70 | 1000 | -0.015 | 400 | 1.23 | 400 |
| #74 | 0.0225 | 85 | 68 | 1000 | -0.015 | 400 | 1.25 | 400 |
| 0.60mm | 0.0236 | 84 | 65 | 1000 | -0.016 | 400 | 1.29 | 400 |
| #73 | 0.0240 | 83 | 64 | 1000 | -0.016 | 400 | 1.30 | 400 |
| #72 | 0.0250 | 83 | 61 | 1000 | -0.016 | 400 | 1.36 | 400 |
| 0.65mm | 0.0256 | 82 | 60 | 1000 | -0.016 | 400 | 1.37 | 400 |
| #71 | 0.0260 | 81 | 59 | 1000 | -0.016 | 400 | 1.37 | 400 |
| 0.70mm | 0.0276 | 78 | 55 | 1000 | -0.016 | 400 | 1.42 | 400 |
| #70 | 0.0280 | 77 | 55 | 1000 | -0.017 | 400 | 1.40 | 400 |
| #69 | 0.0292 | 75 | 52 | 1000 | -0.017 | 400 | 1.44 | 400 |
| 0.75mm | 0.0295 | 74 | 52 | 1000 | -0.017 | 400 | 1.42 | 400 |
| #68 | 0.0310 | 72 | 49 | 1000 | -0.017 | 400 | 1.47 | 400 |
| 1/32 | 0.0312 | 71 | 49 | 1000 | -0.017 | 400 | 1.45 | 400 |
| 0.80mm | 0.0315 | 71 | 49 | 1000 | -0.017 | 400 | 1.45 | 400 |
| #67 | 0.0320 | 70 | 48 | 1000 | -0.017 | 400 | 1.46 | 400 |
| #66 | 0.0330 | 67 | 46 | 1000 | -0.018 | 400 | 1.46 | 400 |
| 0.85mm | 0.0335 | 67 | 46 | 1000 | -0.018 | 400 | 1.46 | 400 |
| #65 | 0.0350 | 65 | 44 | 1000 | -0.018 | 500 | 1.48 | 400 |
| 0.90mm | 0.0354 | 65 | 43 | 1000 | -0.018 | 500 | 1.51 | 400 |
| #64 | 0.0360 | 63 | 42 | 1000 | -0.018 | 500 | 1.50 | 400 |
| #63 | 0.0370 | 62 | 41 | 1000 | -0.019 | 500 | 1.51 | 400 |
| 0.95mm | 0.0374 | 61 | 41 | 1000 | -0.019 | 500 | 1.49 | 400 |
| #62 | 0.0380 | 60 | 40 | 1000 | -0.019 | 500 | 1.50 | 400 |
| #61 | 0.0390 | 60 | 39 | 1000 | -0.019 | 500 | 1.54 | 400 |
| 1.00mm | 0.0394 | 59 | 39 | 1000 | -0.019 | 500 | 1.51 | 400 |
| #60 | 0.0400 | 59 | 38 | 1000 | -0.019 | 500 | 1.55 | 400 |
| #59 | 0.0410 | 58 | 37 | 1000 | -0.020 | 500 | 1.57 | 400 |
| 1.05mm | 0.0413 | 58 | 37 | 1000 | -0.020 | 500 | 1.57 | 400 |
| #58 | 0.0420 | 57 | 36 | 1000 | -0.020 | 500 | 1.58 | 400 |
| #57 | 0.0430 | 57 | 36 | 1000 | -0.020 | 500 | 1.58 | 400 |
| 1.10mm | 0.0433 | 56 | 35 | 1000 | -0.020 | 500 | 1.60 | 400 |
| 1.15mm | 0.0453 | 55 | 34 | 1000 | -0.021 | 500 | 1.62 | 400 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 55 | 33 | 1000 | -0.021 | 500 | 1.67 | 400 |
| 3/64 | 0.0469 | 55 | 33 | 1000 | -0.021 | 500 | 1.67 | 400 |
| 1.20mm | 0.0472 | 55 | 32 | 1000 | -0.021 | 500 | 1.72 | 400 |
| 1.25mm | 0.0492 | 54 | 31 | 1000 | -0.021 | 500 | 1.74 | 400 |
| 1.30mm | 0.0512 | 54 | 30 | 1000 | -0.022 | 500 | 1.80 | 400 |
| #55 | 0.0520 | 54 | 29 | 1000 | -0.022 | 500 | 1.86 | 400 |
| 1.35mm | 0.0531 | 53 | 29 | 1000 | -0.022 | 500 | 1.83 | 400 |
| #54 | 0.0550 | 53 | 28 | 1000 | -0.023 | 500 | 1.89 | 400 |
| 1.40mm | 0.0551 | 53 | 28 | 1000 | -0.023 | 500 | 1.89 | 400 |
| 1.45mm | 0.0571 | 52 | 27 | 1000 | -0.023 | 500 | 1.93 | 400 |
| 1.50mm | 0.0591 | 51 | 26 | 1000 | -0.024 | 500 | 1.96 | 400 |
| #53 | 0.0595 | 51 | 26 | 1000 | -0.024 | 500 | 1.96 | 400 |
| 1.55mm | 0.0610 | 50 | 25 | 1000 | -0.024 | 500 | 2.00 | 400 |
| 1/16 | 0.0625 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.60mm | 0.0630 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| #52 | 0.0635 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.65mm | 0.0650 | 48 | 24 | 1000 | -0.025 | 500 | 2.00 | 400 |
| 1.70mm | 0.0669 | 46 | 23 | 1000 | -0.026 | 500 | 2.00 | 400 |
| #51 | 0.0670 | 46 | 23 | 1000 | -0.026 | 500 | 2.00 | 400 |
| 1.75mm | 0.0689 | 44 | 22 | 1000 | -0.026 | 500 | 2.00 | 400 |
| #50 | 0.0700 | 44 | 22 | 1000 | -0.026 | 500 | 2.00 | 400 |
| 1.80mm | 0.0709 | 44 | 22 | 1000 | -0.027 | 500 | 2.00 | 400 |
| 1.85mm | 0.0728 | 42 | 21 | 1000 | -0.027 | 500 | 2.00 | 400 |
| #49 | 0.0730 | 42 | 21 | 1000 | -0.027 | 500 | 2.00 | 400 |
| 1.90mm | 0.0748 | 40 | 20 | 1000 | -0.027 | 500 | 2.00 | 400 |
| #48 | 0.0760 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 400 |
| 1.95mm | 0.0768 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 400 |
| 5/64 | 0.0781 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 409 |
| #47 | 0.0785 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 411 |
| 2.00mm | 0.0787 | 40 | 20 | 1000 | -0.028 | 500 | 2.00 | 412 |
| 2.05mm | 0.0807 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 422 |
| #46 | 0.0810 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 424 |
| #45 | 0.0820 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 429 |
| 2.10mm | 0.0827 | 40 | 20 | 1000 | -0.029 | 500 | 2.00 | 433 |
| 2.15mm | 0.0846 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 443 |
| #44 | 0.0860 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 450 |
| 2.20mm | 0.0866 | 40 | 20 | 1000 | -0.030 | 500 | 2.00 | 453 |
| 2.25mm | 0.0886 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 464 |
| #43 | 0.0890 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 466 |
| 2.30mm | 0.0906 | 40 | 20 | 1000 | -0.031 | 500 | 2.00 | 474 |
| 2.35mm | 0.0925 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 484 |
| #42 | 0.0935 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 489 |
| 3/32 | 0.0938 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 491 |
| 2.40mm | 0.0945 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 495 |
| #41 | 0.0960 | 40 | 20 | 1000 | -0.032 | 500 | 2.00 | 502 |
| 2.45mm | 0.0965 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 505 |
| #40 | 0.0980 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 513 |
| 2.50mm | 0.0984 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 515 |
| #39 | 0.0995 | 40 | 20 | 1000 | -0.033 | 500 | 2.00 | 521 |
| 2.55mm | 0.1004 | 40 | 20 | 1000 | -0.033 | 400 | 2.00 | 525 |
| #38 | 0.1015 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 531 |
| 2.60mm | 0.1024 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 536 |
| #37 | 0.1040 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 544 |
| 2.65mm | 0.1043 | 40 | 20 | 1000 | -0.034 | 400 | 2.00 | 546 |
| 2.70mm | 0.1063 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 556 |
| #36 | 0.1065 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 557 |
| 2.75mm | 0.1083 | 40 | 20 | 1000 | -0.035 | 400 | 2.00 | 567 |
| 7/64 | 0.1094 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 573 |
| #35 | 0.1100 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 576 |
| 2.80mm | 0.1102 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 577 |
| #34 | 0.1110 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 581 |
| 2.85mm | 0.1122 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 587 |
| #33 | 0.1130 | 40 | 20 | 1000 | -0.036 | 400 | 2.00 | 591 |
| 2.90mm | 0.1142 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 598 |
| #32 | 0.1160 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 607 |
| 2.95mm | 0.1161 | 40 | 20 | 1000 | -0.037 | 400 | 2.00 | 608 |
| 3.00mm | 0.1181 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 618 |
| #31 | 0.1200 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 628 |
| 3.05mm | 0.1201 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 629 |
| 3.10mm | 0.1220 | 40 | 20 | 1000 | -0.038 | 400 | 2.00 | 638 |
| 3.15mm | 0.1240 | 40 | 20 | 1000 | -0.039 | 400 | 2.00 | 649 |
| 1/8 | 0.1250 | 40 | 20 | 1000 | -0.039 | 400 | 2.00 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 250 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 250 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 250 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 250 | 1.50 | 762 |
| #26 | 0.1470 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 769 |
| 3.75mm | 0.1476 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 772 |
| #25 | 0.1495 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 782 |
| 3.80mm | 0.1496 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 783 |
| 3.85mm | 0.1516 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 793 |
| #24 | 0.1520 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 795 |
| 3.90mm | 0.1535 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 803 |
| #23 | 0.1540 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 806 |
| 3.95 | 0.1555 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 814 |
| 5/32 | 0.1562 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 817 |
| #22 | 0.1570 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 822 |
| 4.00mm | 0.1575 | 28 | 20 | 1000 | -0.020 | 250 | 1.40 | 824 |
| #21 | 0.1590 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 832 |
| 4.05mm | 0.1594 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 834 |
| #20 | 0.1610 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 843 |
| 4.10mm | 0.1614 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 845 |
| 4.15mm | 0.1634 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 855 |
| 4.20mm | 0.1654 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 866 |
| #19 | 0.1660 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 869 |
| 4.25mm | 0.1673 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 876 |
| 4.30mm | 0.1693 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 886 |
| #18 | 0.1695 | 26 | 20 | 1000 | -0.021 | 250 | 1.30 | 887 |
| 4.35mm | 0.1713 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 896 |
| 11/64 | 0.1719 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 900 |
| #17 | 0.1730 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 905 |
| 4.40mm | 0.1732 | 24 | 20 | 1000 | -0.021 | 250 | 1.20 | 906 |
| 4.45mm | 0.1752 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 917 |
| #16 | 0.1770 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 926 |
| 4.50mm | 0.1772 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 927 |
| 4.55mm | 0.1792 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 938 |
| #15 | 0.1800 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 942 |
| 4.60mm | 0.1811 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 948 |
| #14 | 0.1820 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 952 |
| 4.65mm | 0.1831 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 958 |
| #13 | 0.1850 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 968 |
| 4.70mm | 0.1850 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 968 |
| 4.75mm | 0.1870 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 979 |
| 3/16 | 0.1875 | 24 | 20 | 1000 | -0.022 | 250 | 1.20 | 981 |
| 4.80mm | 0.1890 | 24 | 20 | 1000 | -0.023 | 250 | 1.20 | 989 |
| #12 | 0.1890 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 989 |
| 4.85mm | 0.1909 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 999 |
| #11 | 0.1910 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1000 |
| 4.90mm | 0.1929 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1010 |
| #10 | 0.1935 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1013 |
| 4.95mm | 0.1949 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1020 |
| #9 | 0.1960 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1026 |
| 5.00mm | 0.1968 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1030 |
| 5.05mm | 0.1988 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1040 |
| #8 | 0.1990 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1041 |
| 5.10mm | 0.2008 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1051 |
| #7 | 0.2010 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1052 |
| 5.15mm | 0.2028 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1061 |
| 13/64 | 0.2031 | 22 | 20 | 1000 | -0.023 | 250 | 1.10 | 1063 |
| #6 | 0.2040 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1068 |
| 5.20mm | 0.2047 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1071 |
| #5 | 0.2055 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1075 |

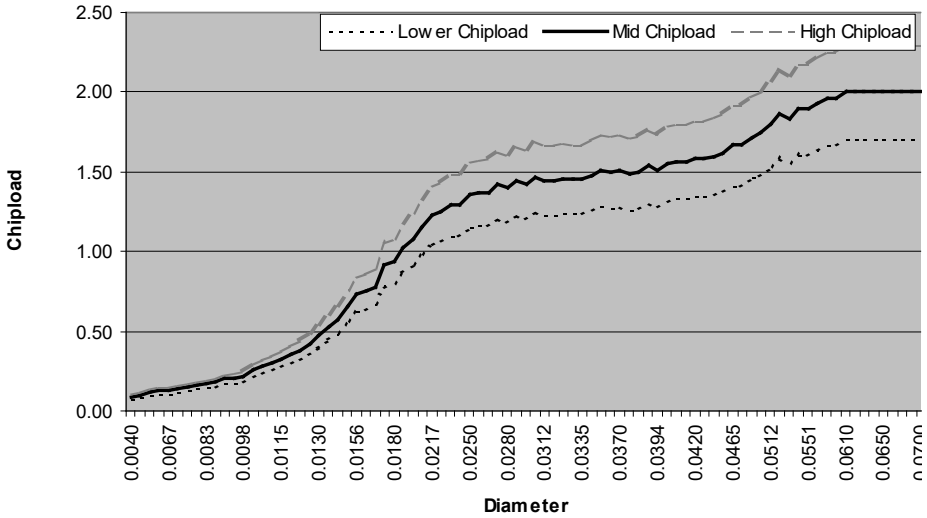
Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1082 |
| 5.30mm | 0.2087 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1092 |
| #4 | 0.2090 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1094 |
| 5.35mm | 0.2106 | 22 | 20 | 1000 | -0.024 | 250 | 1.10 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 250 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 250 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 250 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 250 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Copper-Invar-Copper




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Cyanate Ester PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 27 | 160 | 200 | -0.011 | 400 | 0.17 | 167 |
| 0.13mm | 0.0050 | 32 | 160 | 300 | -0.011 | 400 | 0.20 | 209 |
| 0.15mm | 0.0059 | 37 | 160 | 300 | -0.011 | 400 | 0.23 | 247 |
| #96 | 0.0063 | 40 | 160 | 400 | -0.011 | 400 | 0.25 | 264 |
| #95 | 0.0067 | 42 | 160 | 400 | -0.012 | 400 | 0.26 | 281 |
| #94 | 0.0071 | 44 | 160 | 500 | -0.012 | 400 | 0.28 | 297 |
| #93 | 0.0075 | 46 | 160 | 500 | -0.012 | 400 | 0.29 | 314 |
| #92 | 0.0079 | 48 | 160 | 500 | -0.012 | 400 | 0.30 | 331 |
| #91 | 0.0083 | 49 | 160 | 600 | -0.012 | 400 | 0.31 | 347 |
| #90 | 0.0087 | 50 | 158 | 600 | -0.012 | 400 | 0.32 | 360 |
| #89 | 0.0091 | 51 | 151 | 700 | -0.012 | 400 | 0.34 | 360 |
| #88 | 0.0095 | 52 | 145 | 700 | -0.012 | 400 | 0.36 | 360 |
| 0.25mm | 0.0098 | 53 | 140 | 800 | -0.012 | 400 | 0.38 | 360 |
| #87 | 0.0100 | 54 | 138 | 800 | -0.012 | 400 | 0.39 | 360 |
| #86 | 0.0105 | 56 | 131 | 800 | -0.012 | 400 | 0.43 | 360 |
| #85 | 0.0110 | 58 | 125 | 900 | -0.013 | 400 | 0.46 | 360 |
| #84 | 0.0115 | 59 | 120 | 900 | -0.013 | 400 | 0.49 | 360 |
| 0.30mm | 0.0118 | 60 | 117 | 1000 | -0.013 | 400 | 0.51 | 360 |
| #83 | 0.0120 | 60 | 115 | 1000 | -0.013 | 400 | 0.52 | 360 |
| #82 | 0.0125 | 64 | 110 | 1000 | -0.013 | 400 | 0.58 | 360 |
| #81 | 0.0130 | 67 | 106 | 1000 | -0.013 | 400 | 0.63 | 360 |
| #80 | 0.0135 | 70 | 102 | 1000 | -0.013 | 600 | 0.69 | 360 |
| 0.35mm | 0.0138 | 72 | 100 | 1000 | -0.013 | 600 | 0.72 | 360 |
| #79 | 0.0145 | 75 | 95 | 1000 | -0.013 | 600 | 0.79 | 360 |
| 1/64 | 0.0156 | 78 | 88 | 1000 | -0.014 | 600 | 0.89 | 360 |
| 0.40mm | 0.0158 | 78 | 87 | 1000 | -0.014 | 600 | 0.90 | 360 |
| #78 | 0.0160 | 80 | 86 | 1000 | -0.014 | 600 | 0.93 | 360 |
| 0.45mm | 0.0177 | 83 | 78 | 1000 | -0.014 | 600 | 1.06 | 360 |
| #77 | 0.0180 | 84 | 76 | 1000 | -0.014 | 600 | 1.11 | 360 |
| 0.50mm | 0.0197 | 86 | 70 | 1000 | -0.015 | 600 | 1.23 | 360 |
| #76 | 0.0200 | 86 | 69 | 1000 | -0.015 | 600 | 1.25 | 360 |
| #75 | 0.0210 | 88 | 66 | 1000 | -0.015 | 600 | 1.33 | 360 |
| 0.55mm | 0.0217 | 90 | 63 | 1000 | -0.015 | 600 | 1.43 | 360 |
| #74 | 0.0225 | 92 | 61 | 1000 | -0.015 | 600 | 1.51 | 360 |
| 0.60mm | 0.0236 | 93 | 58 | 1000 | -0.016 | 600 | 1.60 | 360 |
| #73 | 0.0240 | 94 | 57 | 1000 | -0.016 | 600 | 1.65 | 360 |
| #72 | 0.0250 | 92 | 55 | 1000 | -0.016 | 600 | 1.67 | 360 |
| 0.65mm | 0.0256 | 91 | 54 | 1000 | -0.016 | 600 | 1.69 | 360 |
| #71 | 0.0260 | 90 | 53 | 1000 | -0.016 | 600 | 1.70 | 360 |
| 0.70mm | 0.0276 | 88 | 50 | 1000 | -0.016 | 600 | 1.76 | 360 |
| #70 | 0.0280 | 87 | 49 | 1000 | -0.017 | 600 | 1.78 | 360 |
| #69 | 0.0292 | 86 | 47 | 1000 | -0.017 | 600 | 1.83 | 360 |
| 0.75mm | 0.0295 | 86 | 47 | 1000 | -0.017 | 600 | 1.83 | 360 |
| #68 | 0.0310 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| 1/32 | 0.0312 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| 0.80mm | 0.0315 | 84 | 44 | 1000 | -0.017 | 800 | 1.91 | 360 |
| #67 | 0.0320 | 83 | 43 | 1000 | -0.017 | 800 | 1.93 | 360 |
| #66 | 0.0330 | 82 | 42 | 1000 | -0.018 | 800 | 1.95 | 360 |
| 0.85mm | 0.0335 | 82 | 41 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #65 | 0.0350 | 78 | 39 | 1000 | -0.018 | 800 | 2.00 | 360 |
| 0.90mm | 0.0354 | 78 | 39 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #64 | 0.0360 | 76 | 38 | 1000 | -0.018 | 800 | 2.00 | 360 |
| #63 | 0.0370 | 74 | 37 | 1000 | -0.019 | 800 | 2.00 | 360 |
| 0.95mm | 0.0374 | 74 | 37 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #62 | 0.0380 | 72 | 36 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #61 | 0.0390 | 70 | 35 | 1000 | -0.019 | 800 | 2.00 | 360 |
| 1.00mm | 0.0394 | 70 | 35 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #60 | 0.0400 | 68 | 34 | 1000 | -0.019 | 800 | 2.00 | 360 |
| #59 | 0.0410 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.05mm | 0.0413 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| #58 | 0.0420 | 66 | 33 | 1000 | -0.020 | 800 | 2.00 | 360 |
| #57 | 0.0430 | 64 | 32 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.10mm | 0.0433 | 64 | 32 | 1000 | -0.020 | 800 | 2.00 | 360 |
| 1.15mm | 0.0453 | 60 | 30 | 1000 | -0.021 | 800 | 2.00 | 360 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 60 | 30 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 3/64 | 0.0469 | 58 | 29 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.20mm | 0.0472 | 58 | 29 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.25mm | 0.0492 | 56 | 28 | 1000 | -0.021 | 800 | 2.00 | 360 |
| 1.30mm | 0.0512 | 54 | 27 | 1000 | -0.022 | 800 | 2.00 | 360 |
| #55 | 0.0520 | 52 | 26 | 1000 | -0.022 | 800 | 2.00 | 360 |
| 1.35mm | 0.0531 | 52 | 26 | 1000 | -0.022 | 800 | 2.00 | 360 |
| #54 | 0.0550 | 50 | 25 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.40mm | 0.0551 | 50 | 25 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.45mm | 0.0571 | 48 | 24 | 1000 | -0.023 | 800 | 2.00 | 360 |
| 1.50mm | 0.0591 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| #53 | 0.0595 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| 1.55mm | 0.0610 | 46 | 23 | 1000 | -0.024 | 800 | 2.00 | 360 |
| 1/16 | 0.0625 | 44 | 22 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.60mm | 0.0630 | 44 | 22 | 1000 | -0.025 | 800 | 2.00 | 360 |
| #52 | 0.0635 | 42 | 21 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.65mm | 0.0650 | 42 | 21 | 1000 | -0.025 | 800 | 2.00 | 360 |
| 1.70mm | 0.0669 | 42 | 21 | 1000 | -0.026 | 800 | 2.00 | 360 |
| #51 | 0.0670 | 42 | 21 | 1000 | -0.026 | 800 | 2.00 | 360 |
| 1.75mm | 0.0689 | 40 | 20 | 1000 | -0.026 | 800 | 2.00 | 360 |
| #50 | 0.0700 | 40 | 20 | 1000 | -0.026 | 800 | 2.00 | 366 |
| 1.80mm | 0.0709 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 371 |
| 1.85mm | 0.0728 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 381 |
| #49 | 0.0730 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 382 |
| 1.90mm | 0.0748 | 40 | 20 | 1000 | -0.027 | 800 | 2.00 | 391 |
| #48 | 0.0760 | 40 | 20 | 1000 | -0.028 | 800 | 2.00 | 398 |
| 1.95mm | 0.0768 | 40 | 20 | 1000 | -0.028 | 800 | 2.00 | 402 |
| 5/64 | 0.0781 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 409 |
| #47 | 0.0785 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 411 |
| 2.00mm | 0.0787 | 38 | 20 | 1000 | -0.028 | 800 | 1.90 | 412 |
| 2.05mm | 0.0807 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 422 |
| #46 | 0.0810 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 424 |
| #45 | 0.0820 | 38 | 20 | 1000 | -0.029 | 800 | 1.90 | 429 |
| 2.10mm | 0.0827 | 36 | 20 | 1000 | -0.029 | 800 | 1.80 | 433 |
| 2.15mm | 0.0846 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 443 |
| #44 | 0.0860 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 450 |
| 2.20mm | 0.0866 | 36 | 20 | 1000 | -0.030 | 800 | 1.80 | 453 |
| 2.25mm | 0.0886 | 36 | 20 | 1000 | -0.031 | 800 | 1.80 | 464 |
| #43 | 0.0890 | 36 | 20 | 1000 | -0.031 | 800 | 1.80 | 466 |
| 2.30mm | 0.0906 | 34 | 20 | 1000 | -0.031 | 800 | 1.70 | 474 |
| 2.35mm | 0.0925 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 484 |
| #42 | 0.0935 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 489 |
| 3/32 | 0.0938 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 491 |
| 2.40mm | 0.0945 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 495 |
| #41 | 0.0960 | 34 | 20 | 1000 | -0.032 | 800 | 1.70 | 502 |
| 2.45mm | 0.0965 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 505 |
| #40 | 0.0980 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 513 |
| 2.50mm | 0.0984 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 515 |
| #39 | 0.0995 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 521 |
| 2.55mm | 0.1004 | 34 | 20 | 1000 | -0.033 | 800 | 1.70 | 525 |
| #38 | 0.1015 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 531 |
| 2.60mm | 0.1024 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 536 |
| #37 | 0.1040 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 544 |
| 2.65mm | 0.1043 | 34 | 20 | 1000 | -0.034 | 800 | 1.70 | 546 |
| 2.70mm | 0.1063 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 556 |
| #36 | 0.1065 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 557 |
| 2.75mm | 0.1083 | 32 | 20 | 1000 | -0.035 | 800 | 1.60 | 567 |
| 7/64 | 0.1094 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 573 |
| #35 | 0.1100 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 576 |
| 2.80mm | 0.1102 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 577 |
| #34 | 0.1110 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 581 |
| 2.85mm | 0.1122 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 587 |
| #33 | 0.1130 | 32 | 20 | 1000 | -0.036 | 800 | 1.60 | 591 |
| 2.90mm | 0.1142 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 598 |
| #32 | 0.1160 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 607 |
| 2.95mm | 0.1161 | 32 | 20 | 1000 | -0.037 | 800 | 1.60 | 608 |
| 3.00mm | 0.1181 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 618 |
| #31 | 0.1200 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 628 |
| 3.05mm | 0.1201 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 629 |
| 3.10mm | 0.1220 | 32 | 20 | 1000 | -0.038 | 800 | 1.60 | 638 |
| 3.15mm | 0.1240 | 32 | 20 | 1000 | -0.039 | 800 | 1.60 | 649 |
| 1/8 | 0.1250 | 32 | 20 | 1000 | -0.039 | 800 | 1.60 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 500 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 500 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 500 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 500 | 1.50 | 795 |
| 3.90mm | 0.1535 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 803 |
| #23 | 0.1540 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 806 |
| 3.95 | 0.1555 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 814 |
| 5/32 | 0.1562 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 817 |
| #22 | 0.1570 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 822 |
| 4.00mm | 0.1575 | 25 | 20 | 1000 | -0.020 | 500 | 1.25 | 824 |
| #21 | 0.1590 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 832 |
| 4.05mm | 0.1594 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 834 |
| #20 | 0.1610 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 843 |
| 4.10mm | 0.1614 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 845 |
| 4.15mm | 0.1634 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 855 |
| 4.20mm | 0.1654 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 866 |
| #19 | 0.1660 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 869 |
| 4.25mm | 0.1673 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 876 |
| 4.30mm | 0.1693 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 886 |
| #18 | 0.1695 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 887 |
| 4.35mm | 0.1713 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 896 |
| 11/64 | 0.1719 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 900 |
| #17 | 0.1730 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 905 |
| 4.40mm | 0.1732 | 25 | 20 | 1000 | -0.021 | 500 | 1.25 | 906 |
| 4.45mm | 0.1752 | 25 | 20 | 1000 | -0.022 | 500 | 1.25 | 917 |
| #16 | 0.1770 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 926 |
| 4.50mm | 0.1772 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 927 |
| 4.55mm | 0.1792 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 938 |
| #15 | 0.1800 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 942 |
| 4.60mm | 0.1811 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 948 |
| #14 | 0.1820 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 952 |
| 4.65mm | 0.1831 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 958 |
| #13 | 0.1850 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 968 |
| 4.70mm | 0.1850 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 968 |
| 4.75mm | 0.1870 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 979 |
| 3/16 | 0.1875 | 25 | 20 | 1000 | -0.022 | 400 | 1.25 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

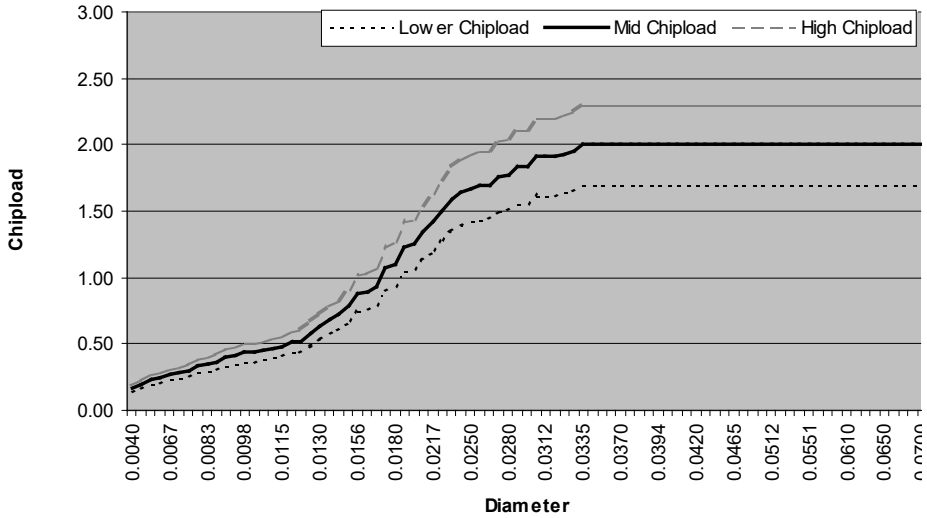
Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 400 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 400 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1157 |
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 400 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 400 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 400 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Cyanate Ester




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# DUROID® / PTFE PCB Material

DUROID® is a registered trademark of Rogers Corporation

**Recommended Drill Series:** 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 60 | 160 | 250 | -0.011 | 250 | 0.38 | 167 |
| 0.13mm | 0.0050 | 66 | 160 | 350 | -0.011 | 250 | 0.41 | 209 |
| 0.15mm | 0.0059 | 70 | 160 | 400 | -0.011 | 250 | 0.44 | 247 |
| #96 | 0.0063 | 74 | 160 | 400 | -0.011 | 250 | 0.46 | 264 |
| #95 | 0.0067 | 78 | 160 | 400 | -0.012 | 250 | 0.49 | 281 |
| #94 | 0.0071 | 82 | 160 | 500 | -0.012 | 250 | 0.51 | 297 |
| #93 | 0.0075 | 86 | 160 | 500 | -0.012 | 250 | 0.54 | 314 |
| #92 | 0.0079 | 90 | 160 | 500 | -0.012 | 300 | 0.56 | 331 |
| #91 | 0.0083 | 94 | 160 | 500 | -0.012 | 300 | 0.59 | 347 |
| #90 | 0.0087 | 98 | 154 | 500 | -0.012 | 300 | 0.64 | 351 |
| #89 | 0.0091 | 102 | 147 | 600 | -0.012 | 300 | 0.69 | 350 |
| #88 | 0.0095 | 106 | 141 | 600 | -0.012 | 300 | 0.75 | 351 |
| 0.25mm | 0.0098 | 110 | 136 | 600 | -0.012 | 400 | 0.81 | 349 |
| #87 | 0.0100 | 112 | 134 | 600 | -0.012 | 400 | 0.84 | 351 |
| #86 | 0.0105 | 112 | 127 | 700 | -0.012 | 400 | 0.88 | 349 |
| #85 | 0.0110 | 113 | 122 | 700 | -0.013 | 400 | 0.93 | 351 |
| #84 | 0.0115 | 113 | 116 | 700 | -0.013 | 400 | 0.97 | 350 |
| 0.30mm | 0.0118 | 113 | 113 | 700 | -0.013 | 400 | 1.00 | 350 |
| #83 | 0.0120 | 115 | 111 | 800 | -0.013 | 400 | 1.04 | 350 |
| #82 | 0.0125 | 116 | 107 | 800 | -0.013 | 400 | 1.08 | 350 |
| #81 | 0.0130 | 117 | 103 | 800 | -0.013 | 400 | 1.14 | 350 |
| #80 | 0.0135 | 119 | 99 | 800 | -0.013 | 500 | 1.20 | 350 |
| 0.35mm | 0.0138 | 119 | 97 | 800 | -0.013 | 500 | 1.23 | 350 |
| #79 | 0.0145 | 120 | 92 | 900 | -0.013 | 500 | 1.30 | 350 |
| 1/64 | 0.0156 | 120 | 86 | 900 | -0.014 | 500 | 1.40 | 350 |
| 0.40mm | 0.0158 | 121 | 85 | 900 | -0.014 | 500 | 1.42 | 350 |
| #78 | 0.0160 | 124 | 84 | 1000 | -0.014 | 500 | 1.48 | 350 |
| 0.45mm | 0.0177 | 126 | 76 | 1000 | -0.014 | 500 | 1.66 | 350 |
| #77 | 0.0180 | 128 | 74 | 1000 | -0.014 | 500 | 1.73 | 350 |
| 0.50mm | 0.0197 | 132 | 68 | 1000 | -0.015 | 500 | 1.94 | 350 |
| #76 | 0.0200 | 134 | 67 | 1000 | -0.015 | 500 | 2.00 | 350 |
| #75 | 0.0210 | 136 | 64 | 1000 | -0.015 | 600 | 2.13 | 350 |
| 0.55mm | 0.0217 | 138 | 62 | 1000 | -0.015 | 600 | 2.23 | 350 |
| #74 | 0.0225 | 140 | 59 | 1000 | -0.015 | 600 | 2.37 | 350 |
| 0.60mm | 0.0236 | 144 | 57 | 1000 | -0.016 | 600 | 2.53 | 350 |
| #73 | 0.0240 | 146 | 56 | 1000 | -0.016 | 600 | 2.61 | 350 |
| #72 | 0.0250 | 148 | 54 | 1000 | -0.016 | 600 | 2.74 | 350 |
| 0.65mm | 0.0256 | 150 | 52 | 1000 | -0.016 | 600 | 2.88 | 350 |
| #71 | 0.0260 | 150 | 51 | 1000 | -0.016 | 600 | 2.94 | 350 |
| 0.70mm | 0.0276 | 150 | 48 | 1000 | -0.016 | 600 | 3.13 | 350 |
| #70 | 0.0280 | 150 | 48 | 1000 | -0.017 | 600 | 3.13 | 350 |
| #69 | 0.0292 | 148 | 46 | 1000 | -0.017 | 700 | 3.22 | 350 |
| 0.75mm | 0.0295 | 146 | 45 | 1000 | -0.017 | 700 | 3.25 | 350 |
| #68 | 0.0310 | 140 | 43 | 1000 | -0.017 | 700 | 3.25 | 350 |
| 1/32 | 0.0312 | 140 | 43 | 1000 | -0.017 | 700 | 3.25 | 350 |
| 0.80mm | 0.0315 | 137 | 42 | 1000 | -0.017 | 700 | 3.25 | 350 |
| #67 | 0.0320 | 137 | 42 | 1000 | -0.017 | 700 | 3.25 | 350 |
| #66 | 0.0330 | 133 | 41 | 1000 | -0.018 | 700 | 3.25 | 350 |
| 0.85mm | 0.0335 | 130 | 40 | 1000 | -0.018 | 700 | 3.25 | 350 |
| #65 | 0.0350 | 124 | 38 | 1000 | -0.018 | 700 | 3.25 | 350 |
| 0.90mm | 0.0354 | 124 | 38 | 1000 | -0.018 | 700 | 3.25 | 350 |
| #64 | 0.0360 | 120 | 37 | 1000 | -0.018 | 700 | 3.25 | 350 |
| #63 | 0.0370 | 117 | 36 | 1000 | -0.019 | 700 | 3.25 | 350 |
| 0.95mm | 0.0374 | 117 | 36 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #62 | 0.0380 | 114 | 35 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #61 | 0.0390 | 111 | 34 | 1000 | -0.019 | 700 | 3.25 | 350 |
| 1.00mm | 0.0394 | 111 | 34 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #60 | 0.0400 | 107 | 33 | 1000 | -0.019 | 700 | 3.25 | 350 |
| #59 | 0.0410 | 107 | 33 | 1000 | -0.020 | 700 | 3.25 | 350 |
| 1.05mm | 0.0413 | 104 | 32 | 1000 | -0.020 | 700 | 3.25 | 350 |
| #58 | 0.0420 | 104 | 32 | 1000 | -0.020 | 700 | 3.25 | 350 |
| #57 | 0.0430 | 101 | 31 | 1000 | -0.020 | 700 | 3.25 | 350 |
| 1.10mm | 0.0433 | 101 | 31 | 1000 | -0.020 | 700 | 3.25 | 350 |
| 1.15mm | 0.0453 | 98 | 30 | 1000 | -0.021 | 700 | 3.25 | 350 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





KYOCERA
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(International) 001.714.428.3655
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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 94 | 29 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 3/64 | 0.0469 | 94 | 29 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 1.20mm | 0.0472 | 91 | 28 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 1.25mm | 0.0492 | 88 | 27 | 1000 | -0.021 | 700 | 3.25 | 350 |
| 1.30mm | 0.0512 | 85 | 26 | 1000 | -0.022 | 700 | 3.25 | 350 |
| #55 | 0.0520 | 85 | 26 | 1000 | -0.022 | 700 | 3.25 | 350 |
| 1.35mm | 0.0531 | 81 | 25 | 1000 | -0.022 | 700 | 3.25 | 350 |
| #54 | 0.0550 | 78 | 24 | 1000 | -0.023 | 700 | 3.25 | 350 |
| 1.40mm | 0.0551 | 78 | 24 | 1000 | -0.023 | 700 | 3.25 | 350 |
| 1.45mm | 0.0571 | 75 | 23 | 1000 | -0.023 | 700 | 3.25 | 350 |
| 1.50mm | 0.0591 | 75 | 23 | 1000 | -0.024 | 700 | 3.25 | 350 |
| #53 | 0.0595 | 72 | 22 | 1000 | -0.024 | 700 | 3.25 | 350 |
| 1.55mm | 0.0610 | 72 | 22 | 1000 | -0.024 | 700 | 3.25 | 350 |
| 1/16 | 0.0625 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| 1.60mm | 0.0630 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| #52 | 0.0635 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| 1.65mm | 0.0650 | 68 | 21 | 1000 | -0.025 | 700 | 3.25 | 350 |
| 1.70mm | 0.0669 | 65 | 20 | 1000 | -0.026 | 700 | 3.25 | 350 |
| #51 | 0.0670 | 65 | 20 | 1000 | -0.026 | 700 | 3.25 | 350 |
| 1.75mm | 0.0689 | 65 | 20 | 1000 | -0.026 | 700 | 3.25 | 361 |
| #50 | 0.0700 | 65 | 20 | 1000 | -0.026 | 600 | 3.25 | 366 |
| 1.80mm | 0.0709 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 371 |
| 1.85mm | 0.0728 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 381 |
| #49 | 0.0730 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 382 |
| 1.90mm | 0.0748 | 65 | 20 | 1000 | -0.027 | 600 | 3.25 | 391 |
| #48 | 0.0760 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 398 |
| 1.95mm | 0.0768 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 402 |
| 5/64 | 0.0781 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 409 |
| #47 | 0.0785 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 411 |
| 2.00mm | 0.0787 | 65 | 20 | 1000 | -0.028 | 600 | 3.25 | 412 |
| 2.05mm | 0.0807 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 422 |
| #46 | 0.0810 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 424 |
| #45 | 0.0820 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 429 |
| 2.10mm | 0.0827 | 65 | 20 | 1000 | -0.029 | 600 | 3.25 | 433 |
| 2.15mm | 0.0846 | 65 | 20 | 1000 | -0.030 | 600 | 3.25 | 443 |
| #44 | 0.0860 | 65 | 20 | 1000 | -0.030 | 600 | 3.25 | 450 |
| 2.20mm | 0.0866 | 65 | 20 | 1000 | -0.030 | 600 | 3.25 | 453 |
| 2.25mm | 0.0886 | 65 | 20 | 1000 | -0.031 | 600 | 3.25 | 464 |
| #43 | 0.0890 | 65 | 20 | 1000 | -0.031 | 600 | 3.25 | 466 |
| 2.30mm | 0.0906 | 65 | 20 | 1000 | -0.031 | 600 | 3.25 | 474 |
| 2.35mm | 0.0925 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 484 |
| #42 | 0.0935 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 489 |
| 3/32 | 0.0938 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 491 |
| 2.40mm | 0.0945 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 495 |
| #41 | 0.0960 | 65 | 20 | 1000 | -0.032 | 600 | 3.25 | 502 |
| 2.45mm | 0.0965 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 505 |
| #40 | 0.0980 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 513 |
| 2.50mm | 0.0984 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 515 |
| #39 | 0.0995 | 65 | 20 | 1000 | -0.033 | 600 | 3.25 | 521 |
| 2.55mm | 0.1004 | 65 | 20 | 1000 | -0.033 | 500 | 3.25 | 525 |
| #38 | 0.1015 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 531 |
| 2.60mm | 0.1024 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 536 |
| #37 | 0.1040 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 544 |
| 2.65mm | 0.1043 | 65 | 20 | 1000 | -0.034 | 500 | 3.25 | 546 |
| 2.70mm | 0.1063 | 65 | 20 | 1000 | -0.035 | 500 | 3.25 | 556 |
| #36 | 0.1065 | 65 | 20 | 1000 | -0.035 | 500 | 3.25 | 557 |
| 2.75mm | 0.1083 | 65 | 20 | 1000 | -0.035 | 500 | 3.25 | 567 |
| 7/64 | 0.1094 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 573 |
| #35 | 0.1100 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 576 |
| 2.80mm | 0.1102 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 577 |
| #34 | 0.1110 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 581 |
| 2.85mm | 0.1122 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 587 |
| #33 | 0.1130 | 65 | 20 | 1000 | -0.036 | 500 | 3.25 | 591 |
| 2.90mm | 0.1142 | 65 | 20 | 1000 | -0.037 | 500 | 3.25 | 598 |
| #32 | 0.1160 | 65 | 20 | 1000 | -0.037 | 500 | 3.25 | 607 |
| 2.95mm | 0.1161 | 65 | 20 | 1000 | -0.037 | 500 | 3.25 | 608 |
| 3.00mm | 0.1181 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 618 |
| #31 | 0.1200 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 628 |
| 3.05mm | 0.1201 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 629 |
| 3.10mm | 0.1220 | 65 | 20 | 1000 | -0.038 | 500 | 3.25 | 638 |
| 3.15mm | 0.1240 | 65 | 20 | 1000 | -0.039 | 500 | 3.25 | 649 |
| 1/8 | 0.1250 | 65 | 20 | 1000 | -0.039 | 500 | 3.25 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 50 | 20 | 1000 | -0.018 | 400 | 2.50 | 659 |
| 3.25mm | 0.1280 | 50 | 20 | 1000 | -0.018 | 400 | 2.50 | 670 |
| #30 | 0.1285 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 672 |
| 3.30mm | 0.1299 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 680 |
| 3.35mm | 0.1319 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 690 |
| 3.40mm | 0.1339 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 701 |
| 3.45mm | 0.1358 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 711 |
| #29 | 0.1360 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 712 |
| 3.50mm | 0.1378 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 721 |
| 3.55mm | 0.1398 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 732 |
| #28 | 0.1405 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 735 |
| 9/64 | 0.1406 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 736 |
| 3.60mm | 0.1417 | 50 | 20 | 1000 | -0.019 | 400 | 2.50 | 742 |
| 3.65mm | 0.1437 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 752 |
| #27 | 0.1440 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 754 |
| 3.70mm | 0.1457 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 762 |
| #26 | 0.1470 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 769 |
| 3.75mm | 0.1476 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 772 |
| #25 | 0.1495 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 782 |
| 3.80mm | 0.1496 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 783 |
| 3.85mm | 0.1516 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 793 |
| #24 | 0.1520 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 795 |
| 3.90mm | 0.1535 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 803 |
| #23 | 0.1540 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 806 |
| 3.95 | 0.1555 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 814 |
| 5/32 | 0.1562 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 817 |
| #22 | 0.1570 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 822 |
| 4.00mm | 0.1575 | 50 | 20 | 1000 | -0.020 | 400 | 2.50 | 824 |
| #21 | 0.1590 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 832 |
| 4.05mm | 0.1594 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 834 |
| #20 | 0.1610 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 843 |
| 4.10mm | 0.1614 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 845 |
| 4.15mm | 0.1634 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 855 |
| 4.20mm | 0.1654 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 866 |
| #19 | 0.1660 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 869 |
| 4.25mm | 0.1673 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 876 |
| 4.30mm | 0.1693 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 886 |
| #18 | 0.1695 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 887 |
| 4.35mm | 0.1713 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 896 |
| 11/64 | 0.1719 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 900 |
| #17 | 0.1730 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 905 |
| 4.40mm | 0.1732 | 40 | 20 | 1000 | -0.021 | 300 | 2.00 | 906 |
| 4.45mm | 0.1752 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 917 |
| #16 | 0.1770 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 926 |
| 4.50mm | 0.1772 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 927 |
| 4.55mm | 0.1792 | 40 | 20 | 1000 | -0.022 | 300 | 2.00 | 938 |
| #15 | 0.1800 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 942 |
| 4.60mm | 0.1811 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 948 |
| #14 | 0.1820 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 952 |
| 4.65mm | 0.1831 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 958 |
| #13 | 0.1850 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 968 |
| 4.70mm | 0.1850 | 36 | 20 | 1000 | -0.022 | 300 | 1.80 | 968 |
| 4.75mm | 0.1870 | 36 | 20 | 1000 | -0.022 | 200 | 1.80 | 979 |
| 3/16 | 0.1875 | 36 | 20 | 1000 | -0.022 | 200 | 1.80 | 981 |
| 4.80mm | 0.1890 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 989 |
| #12 | 0.1890 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 989 |
| 4.85mm | 0.1909 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 999 |
| #11 | 0.1910 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1000 |
| 4.90mm | 0.1929 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1010 |
| #10 | 0.1935 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1013 |
| 4.95mm | 0.1949 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1020 |
| #9 | 0.1960 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1026 |
| 5.00mm | 0.1968 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1030 |
| 5.05mm | 0.1988 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1040 |
| #8 | 0.1990 | 36 | 20 | 1000 | -0.023 | 200 | 1.80 | 1041 |
| 5.10mm | 0.2008 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1051 |
| #7 | 0.2010 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1052 |
| 5.15mm | 0.2028 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1061 |
| 13/64 | 0.2031 | 34 | 20 | 1000 | -0.023 | 150 | 1.70 | 1063 |
| #6 | 0.2040 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1068 |
| 5.20mm | 0.2047 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1071 |
| #5 | 0.2055 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1075 |

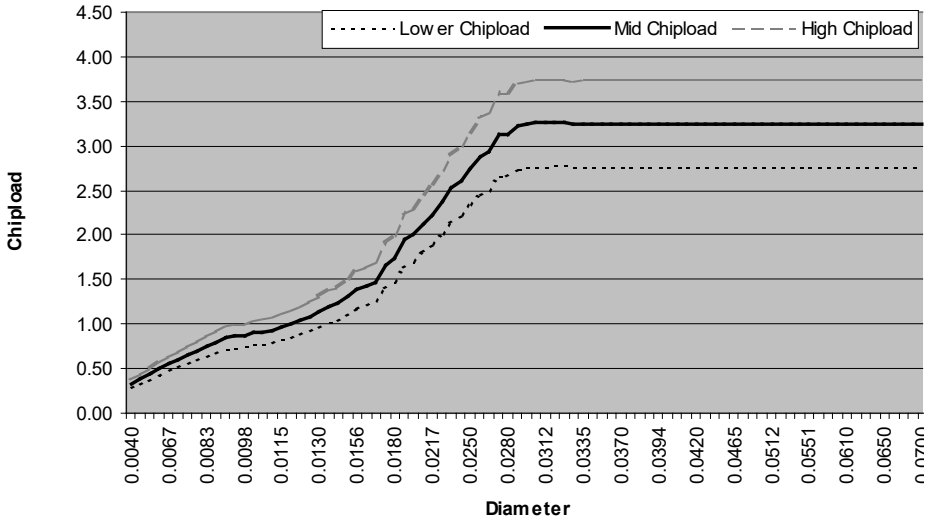
Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1082 |
| 5.30mm | 0.2087 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1092 |
| #4 | 0.2090 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1094 |
| 5.35mm | 0.2106 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1102 |
| 5.40mm | 0.2126 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1113 |
| #3 | 0.2130 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1115 |
| 5.45mm | 0.2146 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1123 |
| 5.50mm | 0.2165 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1133 |
| 5.55mm | 0.2185 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1143 |
| 7/32 | 0.2188 | 34 | 20 | 1000 | -0.024 | 150 | 1.70 | 1145 |
| 5.60mm | 0.2205 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1154 |
| #2 | 0.2210 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1157 |
| 5.65mm | 0.2224 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1164 |
| 5.70mm | 0.2244 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1174 |
| 5.75mm | 0.2264 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1185 |
| #1 | 0.2280 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1193 |
| 5.80mm | 0.2283 | 32 | 20 | 1000 | -0.025 | 150 | 1.60 | 1195 |
| 5.85mm | 0.2302 | 32 | 20 | 1000 | -0.025 | 100 | 1.60 | 1205 |
| 5.90mm | 0.2323 | 32 | 20 | 1000 | -0.025 | 100 | 1.60 | 1216 |
| A | 0.2340 | 32 | 20 | 1000 | -0.025 | 100 | 1.60 | 1225 |
| 5.95mm | 0.2343 | 32 | 20 | 1000 | -0.026 | 100 | 1.60 | 1226 |
| 15/64 | 0.2344 | 32 | 20 | 1000 | -0.026 | 100 | 1.60 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 100 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 100 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for DUROID® / PTFE




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# DUROID® / PTFE Thick Panel PCB Material

(Panel Thickness > 0.200")

DUROID® is a registered trademark of Rogers Corporation

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 87 | 136 | 250 | -0.012 | 150 | 0.64 | 350 |
| #87 | 0.0100 | 86 | 134 | 350 | -0.012 | 150 | 0.64 | 350 |
| #86 | 0.0105 | 88 | 127 | 400 | -0.012 | 150 | 0.69 | 350 |
| #85 | 0.0110 | 90 | 122 | 400 | -0.013 | 150 | 0.74 | 350 |
| #84 | 0.0115 | 96 | 116 | 400 | -0.013 | 150 | 0.83 | 350 |
| 0.30mm | 0.0118 | 100 | 113 | 500 | -0.013 | 150 | 0.88 | 350 |
| #83 | 0.0120 | 102 | 111 | 500 | -0.013 | 150 | 0.92 | 350 |
| #82 | 0.0125 | 109 | 107 | 500 | -0.013 | 150 | 1.02 | 350 |
| #81 | 0.0130 | 115 | 103 | 500 | -0.013 | 150 | 1.12 | 350 |
| #80 | 0.0135 | 121 | 99 | 500 | -0.013 | 200 | 1.22 | 350 |
| 0.35mm | 0.0138 | 124 | 97 | 600 | -0.013 | 200 | 1.28 | 350 |
| #79 | 0.0145 | 128 | 92 | 600 | -0.013 | 200 | 1.39 | 350 |
| 1/64 | 0.0156 | 128 | 86 | 600 | -0.014 | 200 | 1.49 | 350 |
| 0.40mm | 0.0158 | 128 | 85 | 600 | -0.014 | 200 | 1.51 | 350 |
| #78 | 0.0160 | 128 | 84 | 700 | -0.014 | 200 | 1.52 | 350 |
| 0.45mm | 0.0177 | 130 | 76 | 700 | -0.014 | 200 | 1.71 | 350 |
| #77 | 0.0180 | 132 | 74 | 700 | -0.014 | 200 | 1.78 | 350 |
| 0.50mm | 0.0197 | 132 | 68 | 700 | -0.015 | 200 | 1.94 | 350 |
| #76 | 0.0200 | 132 | 67 | 800 | -0.015 | 200 | 1.97 | 350 |
| #75 | 0.0210 | 132 | 64 | 800 | -0.015 | 250 | 2.06 | 350 |
| 0.55mm | 0.0217 | 132 | 62 | 800 | -0.015 | 250 | 2.13 | 350 |
| #74 | 0.0225 | 132 | 59 | 800 | -0.015 | 250 | 2.24 | 350 |
| 0.60mm | 0.0236 | 133 | 57 | 800 | -0.016 | 250 | 2.33 | 350 |
| #73 | 0.0240 | 133 | 56 | 900 | -0.016 | 250 | 2.38 | 350 |
| #72 | 0.0250 | 133 | 54 | 900 | -0.016 | 250 | 2.46 | 350 |
| 0.65mm | 0.0256 | 133 | 52 | 900 | -0.016 | 250 | 2.56 | 350 |
| #71 | 0.0260 | 133 | 51 | 1000 | -0.016 | 250 | 2.61 | 350 |
| 0.70mm | 0.0276 | 132 | 48 | 1000 | -0.016 | 250 | 2.75 | 350 |
| #70 | 0.0280 | 132 | 48 | 1000 | -0.017 | 250 | 2.75 | 350 |
| #69 | 0.0292 | 130 | 46 | 1000 | -0.017 | 300 | 2.83 | 350 |
| 0.75mm | 0.0295 | 130 | 45 | 1000 | -0.017 | 300 | 2.89 | 350 |
| #68 | 0.0310 | 130 | 43 | 1000 | -0.017 | 300 | 3.02 | 350 |
| 1/32 | 0.0312 | 129 | 43 | 1000 | -0.017 | 300 | 3.00 | 350 |
| 0.80mm | 0.0315 | 129 | 42 | 1000 | -0.017 | 300 | 3.07 | 350 |
| #67 | 0.0320 | 128 | 42 | 1000 | -0.017 | 300 | 3.05 | 350 |
| #66 | 0.0330 | 128 | 41 | 1000 | -0.018 | 300 | 3.12 | 350 |
| 0.85mm | 0.0335 | 126 | 40 | 1000 | -0.018 | 300 | 3.15 | 350 |
| #65 | 0.0350 | 125 | 38 | 1000 | -0.018 | 300 | 3.29 | 350 |
| 0.90mm | 0.0354 | 125 | 38 | 1000 | -0.018 | 300 | 3.29 | 350 |
| #64 | 0.0360 | 124 | 37 | 1000 | -0.018 | 300 | 3.35 | 350 |
| #63 | 0.0370 | 123 | 36 | 1000 | -0.019 | 300 | 3.42 | 350 |
| 0.95mm | 0.0374 | 121 | 36 | 1000 | -0.019 | 300 | 3.36 | 350 |
| #62 | 0.0380 | 121 | 35 | 1000 | -0.019 | 300 | 3.46 | 350 |
| #61 | 0.0390 | 120 | 34 | 1000 | -0.019 | 300 | 3.53 | 350 |
| 1.00mm | 0.0394 | 120 | 34 | 1000 | -0.019 | 300 | 3.53 | 350 |
| #60 | 0.0400 | 120 | 33 | 1000 | -0.019 | 300 | 3.64 | 350 |
| #59 | 0.0410 | 119 | 33 | 1000 | -0.020 | 300 | 3.61 | 350 |
| 1.05mm | 0.0413 | 119 | 32 | 1000 | -0.020 | 300 | 3.72 | 350 |
| #58 | 0.0420 | 117 | 32 | 1000 | -0.020 | 300 | 3.66 | 350 |
| #57 | 0.0430 | 117 | 31 | 1000 | -0.020 | 300 | 3.77 | 350 |
| 1.10mm | 0.0433 | 117 | 31 | 1000 | -0.020 | 300 | 3.77 | 350 |
| 1.15mm | 0.0453 | 116 | 30 | 1000 | -0.021 | 300 | 3.87 | 350 |
| #56 | 0.0465 | 115 | 29 | 1000 | -0.021 | 300 | 3.97 | 350 |
| 3/64 | 0.0469 | 115 | 29 | 1000 | -0.021 | 300 | 3.97 | 350 |
| 1.20mm | 0.0472 | 115 | 28 | 1000 | -0.021 | 300 | 4.11 | 350 |
| 1.25mm | 0.0492 | 114 | 27 | 1000 | -0.021 | 300 | 4.22 | 350 |
| 1.30mm | 0.0512 | 109 | 26 | 1000 | -0.022 | 300 | 2.50 | 350 |
| #55 | 0.0520 | 109 | 26 | 1000 | -0.022 | 300 | 2.50 | 350 |
| 1.35mm | 0.0531 | 106 | 25 | 1000 | -0.022 | 300 | 2.50 | 350 |
| #54 | 0.0550 | 102 | 24 | 1000 | -0.023 | 300 | 2.50 | 350 |
| 1.40mm | 0.0551 | 102 | 24 | 1000 | -0.023 | 300 | 2.50 | 350 |
| 1.45mm | 0.0571 | 100 | 23 | 1000 | -0.023 | 300 | 4.35 | 350 |
| 1.50mm | 0.0591 | 96 | 23 | 1000 | -0.024 | 300 | 4.17 | 350 |
| #53 | 0.0595 | 93 | 22 | 1000 | -0.024 | 300 | 4.23 | 350 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 93 | 22 | 1000 | -0.024 | 300 | 4.23 | 350 |
| 1/16 | 0.0625 | 89 | 21 | 1000 | -0.025 | 300 | 4.24 | 350 |
| 1.60mm | 0.0630 | 89 | 21 | 1000 | -0.025 | 300 | 4.24 | 350 |
| #52 | 0.0635 | 89 | 21 | 1000 | -0.025 | 300 | 4.24 | 350 |
| 1.65mm | 0.0650 | 87 | 21 | 1000 | -0.025 | 300 | 4.14 | 350 |
| 1.70mm | 0.0669 | 83 | 20 | 1000 | -0.026 | 300 | 4.15 | 350 |
| #51 | 0.0670 | 83 | 20 | 1000 | -0.026 | 300 | 4.15 | 350 |
| 1.75mm | 0.0689 | 80 | 20 | 1000 | -0.026 | 300 | 4.00 | 361 |
| #50 | 0.0700 | 80 | 20 | 1000 | -0.026 | 250 | 4.00 | 366 |
| 1.80mm | 0.0709 | 80 | 20 | 1000 | -0.027 | 250 | 4.00 | 371 |
| 1.85mm | 0.0728 | 77 | 20 | 1000 | -0.027 | 250 | 3.85 | 381 |
| #49 | 0.0730 | 77 | 20 | 1000 | -0.027 | 250 | 3.85 | 382 |
| 1.90mm | 0.0748 | 74 | 20 | 1000 | -0.027 | 250 | 3.70 | 391 |
| #48 | 0.0760 | 74 | 20 | 1000 | -0.028 | 250 | 3.70 | 398 |
| 1.95mm | 0.0768 | 74 | 20 | 1000 | -0.028 | 250 | 3.70 | 402 |
| 5/64 | 0.0781 | 70 | 20 | 1000 | -0.028 | 250 | 3.50 | 409 |
| #47 | 0.0785 | 70 | 20 | 1000 | -0.028 | 250 | 3.50 | 411 |
| 2.00mm | 0.0787 | 70 | 20 | 1000 | -0.028 | 250 | 3.50 | 412 |
| 2.05mm | 0.0807 | 70 | 20 | 1000 | -0.029 | 250 | 3.50 | 422 |
| #46 | 0.0810 | 68 | 20 | 1000 | -0.029 | 250 | 3.40 | 424 |
| #45 | 0.0820 | 68 | 20 | 1000 | -0.029 | 250 | 3.40 | 429 |
| 2.10mm | 0.0827 | 68 | 20 | 1000 | -0.029 | 250 | 3.40 | 433 |
| 2.15mm | 0.0846 | 68 | 20 | 1000 | -0.030 | 250 | 3.40 | 443 |
| #44 | 0.0860 | 64 | 20 | 1000 | -0.030 | 250 | 3.20 | 450 |
| 2.20mm | 0.0866 | 64 | 20 | 1000 | -0.030 | 250 | 3.20 | 453 |
| 2.25mm | 0.0886 | 64 | 20 | 1000 | -0.031 | 250 | 3.20 | 464 |
| #43 | 0.0890 | 64 | 20 | 1000 | -0.031 | 250 | 3.20 | 466 |
| 2.30mm | 0.0906 | 64 | 20 | 1000 | -0.031 | 250 | 3.20 | 474 |
| 2.35mm | 0.0925 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 484 |
| #42 | 0.0935 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 489 |
| 3/32 | 0.0938 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 491 |
| 2.40mm | 0.0945 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 495 |
| #41 | 0.0960 | 64 | 20 | 1000 | -0.032 | 250 | 3.20 | 502 |
| 2.45mm | 0.0965 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 505 |
| #40 | 0.0980 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 513 |
| 2.50mm | 0.0984 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 515 |
| #39 | 0.0995 | 64 | 20 | 1000 | -0.033 | 250 | 3.20 | 521 |
| 2.55mm | 0.1004 | 64 | 20 | 1000 | -0.033 | 200 | 3.20 | 525 |
| #38 | 0.1015 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 531 |
| 2.60mm | 0.1024 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 536 |
| #37 | 0.1040 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 544 |
| 2.65mm | 0.1043 | 64 | 20 | 1000 | -0.034 | 200 | 3.20 | 546 |
| 2.70mm | 0.1063 | 64 | 20 | 1000 | -0.035 | 200 | 3.20 | 556 |
| #36 | 0.1065 | 64 | 20 | 1000 | -0.035 | 200 | 3.20 | 557 |
| 2.75mm | 0.1083 | 64 | 20 | 1000 | -0.035 | 200 | 3.20 | 567 |
| 7/64 | 0.1094 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 573 |
| #35 | 0.1100 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 576 |
| 2.80mm | 0.1102 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 577 |
| #34 | 0.1110 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 581 |
| 2.85mm | 0.1122 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 587 |
| #33 | 0.1130 | 64 | 20 | 1000 | -0.036 | 200 | 3.20 | 591 |
| 2.90mm | 0.1142 | 64 | 20 | 1000 | -0.037 | 200 | 3.20 | 598 |
| #32 | 0.1160 | 64 | 20 | 1000 | -0.037 | 200 | 3.20 | 607 |
| 2.95mm | 0.1161 | 64 | 20 | 1000 | -0.037 | 200 | 3.20 | 608 |
| 3.00mm | 0.1181 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 618 |
| #31 | 0.1200 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 628 |
| 3.05mm | 0.1201 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 629 |
| 3.10mm | 0.1220 | 64 | 20 | 1000 | -0.038 | 200 | 3.20 | 638 |
| 3.15mm | 0.1240 | 64 | 20 | 1000 | -0.039 | 200 | 3.20 | 649 |
| 1/8 | 0.1250 | 64 | 20 | 1000 | -0.039 | 200 | 3.20 | 654 |
| 3.20mm | 0.1260 | 61 | 20 | 1000 | -0.018 | 150 | 3.05 | 659 |
| 3.25mm | 0.1280 | 61 | 20 | 1000 | -0.018 | 150 | 3.05 | 670 |
| #30 | 0.1285 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 672 |
| 3.30mm | 0.1299 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 680 |
| 3.35mm | 0.1319 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 690 |
| 3.40mm | 0.1339 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 701 |
| 3.45mm | 0.1358 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 711 |
| #29 | 0.1360 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 712 |
| 3.50mm | 0.1378 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 721 |
| 3.55mm | 0.1398 | 61 | 20 | 1000 | -0.019 | 150 | 3.05 | 732 |
| #28 | 0.1405 | 57 | 20 | 1000 | -0.019 | 150 | 2.85 | 735 |
| 9/64 | 0.1406 | 57 | 20 | 1000 | -0.019 | 150 | 2.85 | 736 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

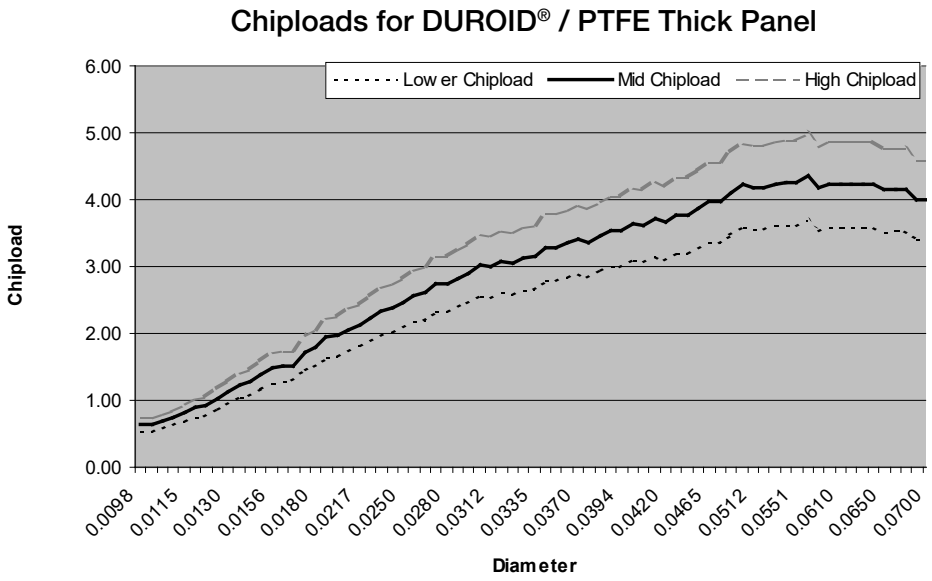
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 57 | 20 | 1000 | -0.019 | 150 | 2.85 | 742 |
| 3.65mm | 0.1437 | 57 | 20 | 1000 | -0.020 | 150 | 2.85 | 752 |
| #27 | 0.1440 | 57 | 20 | 1000 | -0.020 | 150 | 2.85 | 754 |
| 3.70mm | 0.1457 | 57 | 20 | 1000 | -0.020 | 150 | 2.85 | 762 |
| #26 | 0.1470 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 769 |
| 3.75mm | 0.1476 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 772 |
| #25 | 0.1495 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 782 |
| 3.80mm | 0.1496 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 783 |
| 3.85mm | 0.1516 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 793 |
| #24 | 0.1520 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 795 |
| 3.90mm | 0.1535 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 803 |
| #23 | 0.1540 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 806 |
| 3.95 | 0.1555 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 814 |
| 5/32 | 0.1562 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 817 |
| #22 | 0.1570 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 822 |
| 4.00mm | 0.1575 | 51 | 20 | 1000 | -0.020 | 150 | 2.55 | 824 |
| #21 | 0.1590 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 832 |
| 4.05mm | 0.1594 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 834 |
| #20 | 0.1610 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 843 |
| 4.10mm | 0.1614 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 845 |
| 4.15mm | 0.1634 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 855 |
| 4.20mm | 0.1654 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 866 |
| #19 | 0.1660 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 869 |
| 4.25mm | 0.1673 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 876 |
| 4.30mm | 0.1693 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 886 |
| #18 | 0.1695 | 45 | 20 | 1000 | -0.021 | 125 | 2.25 | 887 |
| 4.35mm | 0.1713 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 896 |
| 11/64 | 0.1719 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 900 |
| #17 | 0.1730 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 905 |
| 4.40mm | 0.1732 | 38 | 20 | 1000 | -0.021 | 125 | 1.90 | 906 |
| 4.45mm | 0.1752 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 917 |
| #16 | 0.1770 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 926 |
| 4.50mm | 0.1772 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 927 |
| 4.55mm | 0.1792 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 938 |
| #15 | 0.1800 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 942 |
| 4.60mm | 0.1811 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 948 |
| #14 | 0.1820 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 952 |
| 4.65mm | 0.1831 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 958 |
| #13 | 0.1850 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 968 |
| 4.70mm | 0.1850 | 38 | 20 | 1000 | -0.022 | 125 | 1.90 | 968 |
| 4.75mm | 0.1870 | 38 | 20 | 1000 | -0.022 | 100 | 1.90 | 979 |
| 3/16 | 0.1875 | 38 | 20 | 1000 | -0.022 | 100 | 1.90 | 981 |
| 4.80mm | 0.1890 | 38 | 20 | 1000 | -0.023 | 100 | 1.90 | 989 |
| #12 | 0.1890 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 989 |
| 4.85mm | 0.1909 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 999 |
| #11 | 0.1910 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1000 |
| 4.90mm | 0.1929 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1010 |
| #10 | 0.1935 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1013 |
| 4.95mm | 0.1949 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1020 |
| #9 | 0.1960 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1026 |
| 5.00mm | 0.1968 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1030 |
| 5.05mm | 0.1988 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1040 |
| #8 | 0.1990 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1041 |
| 5.10mm | 0.2008 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1051 |
| #7 | 0.2010 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1052 |
| 5.15mm | 0.2028 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1061 |
| 13/64 | 0.2031 | 32 | 20 | 1000 | -0.023 | 100 | 1.60 | 1063 |
| #6 | 0.2040 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1068 |
| 5.20mm | 0.2047 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1071 |
| #5 | 0.2055 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1075 |
| 5.25mm | 0.2067 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1082 |
| 5.30mm | 0.2087 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1092 |
| #4 | 0.2090 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1094 |
| 5.35mm | 0.2106 | 32 | 20 | 1000 | -0.024 | 100 | 1.60 | 1102 |
| 5.40mm | 0.2126 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1113 |
| #3 | 0.2130 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1115 |
| 5.45mm | 0.2146 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1123 |
| 5.50mm | 0.2165 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1133 |
| 5.55mm | 0.2185 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1143 |
| 7/32 | 0.2188 | 26 | 20 | 1000 | -0.024 | 100 | 1.30 | 1145 |
| 5.60mm | 0.2205 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1154 |
| #2 | 0.2210 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1157 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1164 |
| 5.70mm | 0.2244 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1174 |
| 5.75mm | 0.2264 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1185 |
| #1 | 0.2280 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1193 |
| 5.80mm | 0.2283 | 26 | 20 | 1000 | -0.025 | 100 | 1.30 | 1195 |
| 5.85mm | 0.2302 | 26 | 20 | 1000 | -0.025 | 50 | 1.30 | 1205 |
| 5.90mm | 0.2323 | 26 | 20 | 1000 | -0.025 | 50 | 1.30 | 1216 |
| A | 0.2340 | 26 | 20 | 1000 | -0.025 | 50 | 1.30 | 1225 |
| 5.95mm | 0.2343 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1226 |
| 15/64 | 0.2344 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1227 |
| 6.00mm | 0.2362 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1236 |
| B | 0.2380 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1246 |
| 6.05mm | 0.2382 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1247 |
| 6.10mm | 0.2402 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1257 |
| C | 0.2420 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1266 |
| 6.15mm | 0.2421 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1267 |
| 6.20mm | 0.2441 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1277 |
| D | 0.2460 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1287 |
| 6.25mm | 0.2461 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1288 |
| 6.30mm | 0.2480 | 26 | 20 | 1000 | -0.026 | 50 | 1.30 | 1298 |
| 6.35mm | 0.2500 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1308 |
| 6.40mm | 0.2520 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1319 |
| 6.50mm | 0.2559 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1339 |
| F | 0.2570 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1345 |
| 6.60mm | 0.2598 | 26 | 20 | 1000 | -0.027 | 50 | 1.30 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Double-Sided PCB Material

## Recommended Drill Series: 100, 150, 560, 580

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 32 | 160 | 200 | -0.011 | 500 | 0.20 | 167 |
| 0.13mm | 0.0050 | 40 | 160 | 300 | -0.011 | 600 | 0.25 | 209 |
| 0.15mm | 0.0059 | 45 | 160 | 300 | -0.011 | 800 | 0.28 | 247 |
| #96 | 0.0063 | 51 | 160 | 400 | -0.011 | 800 | 0.32 | 264 |
| #95 | 0.0067 | 58 | 160 | 400 | -0.012 | 800 | 0.36 | 281 |
| #94 | 0.0071 | 64 | 160 | 500 | -0.012 | 1000 | 0.40 | 297 |
| #93 | 0.0075 | 69 | 160 | 500 | -0.012 | 1000 | 0.43 | 314 |
| #92 | 0.0079 | 74 | 160 | 500 | -0.012 | 1200 | 0.46 | 331 |
| #91 | 0.0083 | 80 | 160 | 600 | -0.012 | 1200 | 0.50 | 347 |
| #90 | 0.0087 | 86 | 160 | 600 | -0.012 | 1200 | 0.54 | 364 |
| #89 | 0.0091 | 91 | 160 | 700 | -0.012 | 1500 | 0.57 | 381 |
| #88 | 0.0095 | 96 | 160 | 700 | -0.012 | 1500 | 0.60 | 398 |
| 0.25mm | 0.0098 | 102 | 160 | 800 | -0.012 | 1500 | 0.64 | 410 |
| #87 | 0.0100 | 104 | 160 | 800 | -0.012 | 1500 | 0.65 | 419 |
| #86 | 0.0105 | 110 | 160 | 800 | -0.012 | 1500 | 0.69 | 440 |
| #85 | 0.0110 | 115 | 160 | 900 | -0.013 | 1700 | 0.72 | 461 |
| #84 | 0.0115 | 122 | 160 | 900 | -0.013 | 1700 | 0.76 | 481 |
| 0.30mm | 0.0118 | 125 | 160 | 1000 | -0.013 | 1700 | 0.78 | 494 |
| #83 | 0.0120 | 128 | 160 | 1000 | -0.013 | 1800 | 0.80 | 502 |
| #82 | 0.0125 | 133 | 160 | 1000 | -0.013 | 1800 | 0.83 | 523 |
| #81 | 0.0130 | 139 | 160 | 1000 | -0.013 | 1800 | 0.87 | 544 |
| #80 | 0.0135 | 144 | 160 | 1000 | -0.013 | 2000 | 0.90 | 565 |
| 0.35mm | 0.0138 | 147 | 160 | 1000 | -0.013 | 2000 | 0.92 | 578 |
| #79 | 0.0145 | 150 | 158 | 1000 | -0.013 | 2000 | 0.95 | 600 |
| 1/64 | 0.0156 | 153 | 147 | 1000 | -0.014 | 2000 | 1.04 | 600 |
| 0.40mm | 0.0158 | 154 | 145 | 1000 | -0.014 | 2000 | 1.06 | 600 |
| #78 | 0.0160 | 155 | 143 | 1000 | -0.014 | 2000 | 1.08 | 600 |
| 0.45mm | 0.0177 | 162 | 130 | 1000 | -0.014 | 2000 | 1.25 | 600 |
| #77 | 0.0180 | 163 | 127 | 1000 | -0.014 | 2000 | 1.28 | 600 |
| 0.50mm | 0.0197 | 160 | 117 | 1000 | -0.015 | 2000 | 1.37 | 600 |
| #76 | 0.0200 | 162 | 115 | 1000 | -0.015 | 2000 | 1.41 | 600 |
| #75 | 0.0210 | 165 | 109 | 1000 | -0.015 | 2000 | 1.51 | 600 |
| 0.55mm | 0.0217 | 170 | 106 | 1000 | -0.015 | 2000 | 1.60 | 600 |
| #74 | 0.0225 | 175 | 102 | 1000 | -0.015 | 2000 | 1.72 | 600 |
| 0.60mm | 0.0236 | 180 | 97 | 1000 | -0.016 | 2000 | 1.86 | 600 |
| #73 | 0.0240 | 185 | 96 | 1000 | -0.016 | 2000 | 1.93 | 600 |
| #72 | 0.0250 | 190 | 92 | 1000 | -0.016 | 2000 | 2.07 | 600 |
| 0.65mm | 0.0256 | 195 | 90 | 1000 | -0.016 | 2000 | 2.17 | 600 |
| #71 | 0.0260 | 200 | 88 | 1000 | -0.016 | 2000 | 2.27 | 600 |
| 0.70mm | 0.0276 | 200 | 83 | 1000 | -0.016 | 2000 | 2.41 | 600 |
| #70 | 0.0280 | 202 | 82 | 1000 | -0.017 | 2000 | 2.46 | 600 |
| #69 | 0.0292 | 205 | 79 | 1000 | -0.017 | 2000 | 2.59 | 600 |
| 0.75mm | 0.0295 | 206 | 78 | 1000 | -0.017 | 2000 | 2.64 | 600 |
| #68 | 0.0310 | 210 | 74 | 1000 | -0.017 | 2000 | 2.84 | 600 |
| 1/32 | 0.0312 | 212 | 73 | 1000 | -0.017 | 2000 | 2.90 | 600 |
| 0.80mm | 0.0315 | 215 | 73 | 1000 | -0.017 | 2000 | 2.95 | 600 |
| #67 | 0.0320 | 216 | 72 | 1000 | -0.017 | 2000 | 3.00 | 600 |
| #66 | 0.0330 | 210 | 70 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.85mm | 0.0335 | 204 | 68 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #65 | 0.0350 | 198 | 66 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| 0.90mm | 0.0354 | 195 | 65 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #64 | 0.0360 | 192 | 64 | 1000 | -0.018 | 2000 | 3.00 | 600 |
| #63 | 0.0370 | 186 | 62 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 0.95mm | 0.0374 | 183 | 61 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #62 | 0.0380 | 180 | 60 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #61 | 0.0390 | 177 | 59 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| 1.00mm | 0.0394 | 174 | 58 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #60 | 0.0400 | 171 | 57 | 1000 | -0.019 | 2000 | 3.00 | 600 |
| #59 | 0.0410 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.05mm | 0.0413 | 168 | 56 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #58 | 0.0420 | 165 | 55 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| #57 | 0.0430 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.10mm | 0.0433 | 159 | 53 | 1000 | -0.020 | 2000 | 3.00 | 600 |
| 1.15mm | 0.0453 | 153 | 51 | 1000 | -0.021 | 2000 | 3.00 | 600 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 3/64 | 0.0469 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.20mm | 0.0472 | 147 | 49 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.25mm | 0.0492 | 141 | 47 | 1000 | -0.021 | 2000 | 3.00 | 600 |
| 1.30mm | 0.0512 | 135 | 45 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #55 | 0.0520 | 132 | 44 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| 1.35mm | 0.0531 | 129 | 43 | 1000 | -0.022 | 2000 | 3.00 | 600 |
| #54 | 0.0550 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.40mm | 0.0551 | 126 | 42 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.45mm | 0.0571 | 120 | 40 | 1000 | -0.023 | 2000 | 3.00 | 600 |
| 1.50mm | 0.0591 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| #53 | 0.0595 | 117 | 39 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1.55mm | 0.0610 | 114 | 38 | 1000 | -0.024 | 2000 | 3.00 | 600 |
| 1/16 | 0.0625 | 111 | 37 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.60mm | 0.0630 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| #52 | 0.0635 | 108 | 36 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.65mm | 0.0650 | 105 | 35 | 1000 | -0.025 | 2000 | 3.00 | 600 |
| 1.70mm | 0.0669 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #51 | 0.0670 | 102 | 34 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.75mm | 0.0689 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| #50 | 0.0700 | 99 | 33 | 1000 | -0.026 | 2000 | 3.00 | 600 |
| 1.80mm | 0.0709 | 96 | 32 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.85mm | 0.0728 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #49 | 0.0730 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| 1.90mm | 0.0748 | 93 | 31 | 1000 | -0.027 | 1800 | 3.00 | 600 |
| #48 | 0.0760 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 1.95mm | 0.0768 | 90 | 30 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 5/64 | 0.0781 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| #47 | 0.0785 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.00mm | 0.0787 | 87 | 29 | 1000 | -0.028 | 1800 | 3.00 | 600 |
| 2.05mm | 0.0807 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #46 | 0.0810 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| #45 | 0.0820 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.10mm | 0.0827 | 84 | 28 | 1000 | -0.029 | 1800 | 3.00 | 600 |
| 2.15mm | 0.0846 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| #44 | 0.0860 | 81 | 27 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.20mm | 0.0866 | 78 | 26 | 1000 | -0.030 | 1800 | 3.00 | 600 |
| 2.25mm | 0.0886 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| #43 | 0.0890 | 78 | 26 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.30mm | 0.0906 | 75 | 25 | 1000 | -0.031 | 1800 | 3.00 | 600 |
| 2.35mm | 0.0925 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #42 | 0.0935 | 75 | 25 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 3/32 | 0.0938 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.40mm | 0.0945 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| #41 | 0.0960 | 72 | 24 | 1000 | -0.032 | 1800 | 3.00 | 600 |
| 2.45mm | 0.0965 | 72 | 24 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #40 | 0.0980 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| 2.50mm | 0.0984 | 69 | 23 | 1000 | -0.033 | 1800 | 3.00 | 600 |
| #39 | 0.0995 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| 2.55mm | 0.1004 | 69 | 23 | 1000 | -0.033 | 1500 | 3.00 | 600 |
| #38 | 0.1015 | 69 | 23 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.60mm | 0.1024 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| #37 | 0.1040 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.65mm | 0.1043 | 66 | 22 | 1000 | -0.034 | 1500 | 3.00 | 600 |
| 2.70mm | 0.1063 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| #36 | 0.1065 | 66 | 22 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 2.75mm | 0.1083 | 63 | 21 | 1000 | -0.035 | 1500 | 3.00 | 600 |
| 7/64 | 0.1094 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #35 | 0.1100 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.80mm | 0.1102 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #34 | 0.1110 | 63 | 21 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1500 | 3.00 | 600 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 600 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1500 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1500 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 659 |
| 3.25mm | 0.1280 | 60 | 20 | 1000 | -0.018 | 1200 | 3.00 | 670 |
| #30 | 0.1285 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 672 |
| 3.30mm | 0.1299 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 680 |
| 3.35mm | 0.1319 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 690 |
| 3.40mm | 0.1339 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 701 |
| 3.45mm | 0.1358 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 711 |
| #29 | 0.1360 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 712 |
| 3.50mm | 0.1378 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 721 |
| 3.55mm | 0.1398 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 732 |
| #28 | 0.1405 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 735 |
| 9/64 | 0.1406 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 736 |
| 3.60mm | 0.1417 | 60 | 20 | 1000 | -0.019 | 1200 | 3.00 | 742 |
| 3.65mm | 0.1437 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 752 |
| #27 | 0.1440 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 754 |
| 3.70mm | 0.1457 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 762 |
| #26 | 0.1470 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 769 |
| 3.75mm | 0.1476 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 772 |
| #25 | 0.1495 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 782 |
| 3.80mm | 0.1496 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 783 |
| 3.85mm | 0.1516 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 793 |
| #24 | 0.1520 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 795 |
| 3.90mm | 0.1535 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 803 |
| #23 | 0.1540 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 806 |
| 3.95 | 0.1555 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 814 |
| 5/32 | 0.1562 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 817 |
| #22 | 0.1570 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 822 |
| 4.00mm | 0.1575 | 60 | 20 | 1000 | -0.020 | 1200 | 3.00 | 824 |
| #21 | 0.1590 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 832 |
| 4.05mm | 0.1594 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 834 |
| #20 | 0.1610 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 843 |
| 4.10mm | 0.1614 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 845 |
| 4.15mm | 0.1634 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 855 |
| 4.20mm | 0.1654 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 866 |
| #19 | 0.1660 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 869 |
| 4.25mm | 0.1673 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 876 |
| 4.30mm | 0.1693 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 886 |
| #18 | 0.1695 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 887 |
| 4.35mm | 0.1713 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 896 |
| 11/64 | 0.1719 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 900 |
| #17 | 0.1730 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 905 |
| 4.40mm | 0.1732 | 55 | 20 | 1000 | -0.021 | 1000 | 2.75 | 906 |
| 4.45mm | 0.1752 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 917 |
| #16 | 0.1770 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 926 |
| 4.50mm | 0.1772 | 55 | 20 | 1000 | -0.022 | 1000 | 2.75 | 927 |
| 4.55mm | 0.1792 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 938 |
| #15 | 0.1800 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 942 |
| 4.60mm | 0.1811 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 948 |
| #14 | 0.1820 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 952 |
| 4.65mm | 0.1831 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 958 |
| #13 | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.70mm | 0.1850 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 968 |
| 4.75mm | 0.1870 | 50 | 20 | 1000 | -0.022 | 1000 | 2.50 | 979 |
| 3/16 | 0.1875 | 45 | 20 | 1000 | -0.022 | 1000 | 2.25 | 981 |
| 4.80mm | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| #12 | 0.1890 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 989 |
| 4.85mm | 0.1909 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 999 |
| #11 | 0.1910 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1000 |
| 4.90mm | 0.1929 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1010 |
| #10 | 0.1935 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1013 |
| 4.95mm | 0.1949 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1020 |
| #9 | 0.1960 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1026 |
| 5.00mm | 0.1968 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1030 |
| 5.05mm | 0.1988 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1040 |
| #8 | 0.1990 | 45 | 20 | 1000 | -0.023 | 800 | 2.25 | 1041 |
| 5.10mm | 0.2008 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1051 |
| #7 | 0.2010 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1052 |
| 5.15mm | 0.2028 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1061 |
| 13/64 | 0.2031 | 40 | 20 | 1000 | -0.023 | 600 | 2.00 | 1063 |
| #6 | 0.2040 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1068 |
| 5.20mm | 0.2047 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1071 |
| #5 | 0.2055 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1075 |

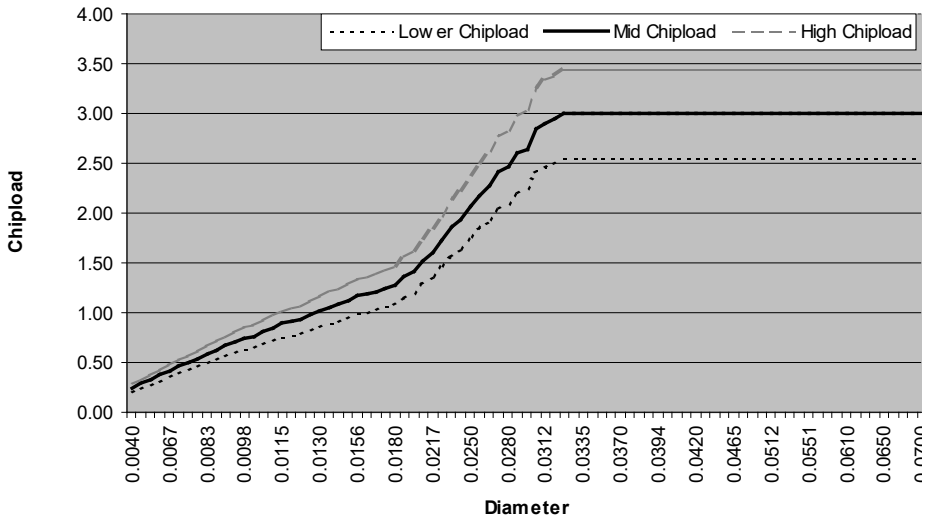
Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1082 |
| 5.30mm | 0.2087 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1092 |
| #4 | 0.2090 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1094 |
| 5.35mm | 0.2106 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1102 |
| 5.40mm | 0.2126 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1113 |
| #3 | 0.2130 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1115 |
| 5.45mm | 0.2146 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1123 |
| 5.50mm | 0.2165 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1133 |
| 5.55mm | 0.2185 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1143 |
| 7/32 | 0.2188 | 40 | 20 | 1000 | -0.024 | 600 | 2.00 | 1145 |
| 5.60mm | 0.2205 | 40 | 20 | 1000 | -0.025 | 600 | 2.00 | 1154 |
| #2 | 0.2210 | 35 | 20 | 1000 | -0.025 | 600 | 1.75 | 1157 |
| 5.65mm | 0.2224 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1164 |
| 5.70mm | 0.2244 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1174 |
| 5.75mm | 0.2264 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1185 |
| #1 | 0.2280 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1193 |
| 5.80mm | 0.2283 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1195 |
| 5.85mm | 0.2302 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1205 |
| 5.90mm | 0.2323 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1216 |
| A | 0.2340 | 35 | 20 | 1000 | -0.025 | 500 | 1.75 | 1225 |
| 5.95mm | 0.2343 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1226 |
| 15/64 | 0.2344 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1227 |
| 6.00mm | 0.2362 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1236 |
| B | 0.2380 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1246 |
| 6.05mm | 0.2382 | 35 | 20 | 1000 | -0.026 | 500 | 1.75 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 500 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 500 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Double-Sided




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 High Tg Thick Panel PCB Material

(Panel Thickness > 0.200")

**Recommended Drill Series:** 100, 150, 430, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.25mm | 0.0098 | 80 | 160 | 800 | -0.012 | 750 | 0.50 | 410 |
| #87 | 0.0100 | 80 | 160 | 800 | -0.012 | 750 | 0.50 | 419 |
| #86 | 0.0105 | 86 | 160 | 800 | -0.012 | 750 | 0.54 | 440 |
| #85 | 0.0110 | 90 | 156 | 900 | -0.013 | 750 | 0.58 | 450 |
| #84 | 0.0115 | 95 | 150 | 900 | -0.013 | 750 | 0.63 | 450 |
| 0.30mm | 0.0118 | 95 | 146 | 1000 | -0.013 | 750 | 0.65 | 450 |
| #83 | 0.0120 | 96 | 143 | 1000 | -0.013 | 750 | 0.67 | 450 |
| #82 | 0.0125 | 98 | 138 | 1000 | -0.013 | 750 | 0.71 | 450 |
| #81 | 0.0130 | 99 | 132 | 1000 | -0.013 | 750 | 0.75 | 450 |
| #80 | 0.0135 | 100 | 127 | 1000 | -0.013 | 1000 | 0.79 | 450 |
| 0.35mm | 0.0138 | 100 | 125 | 1000 | -0.013 | 1000 | 0.80 | 450 |
| #79 | 0.0145 | 100 | 119 | 1000 | -0.013 | 1000 | 0.84 | 450 |
| 1/64 | 0.0156 | 100 | 110 | 1000 | -0.014 | 1000 | 0.91 | 450 |
| 0.40mm | 0.0158 | 100 | 109 | 1000 | -0.014 | 1000 | 0.92 | 450 |
| #78 | 0.0160 | 100 | 107 | 1000 | -0.014 | 1000 | 0.93 | 450 |
| 0.45mm | 0.0177 | 102 | 97 | 1000 | -0.014 | 1000 | 1.05 | 450 |
| #77 | 0.0180 | 103 | 96 | 1000 | -0.014 | 1000 | 1.07 | 450 |
| 0.50mm | 0.0197 | 103 | 88 | 1000 | -0.015 | 1000 | 1.17 | 450 |
| #76 | 0.0200 | 103 | 87 | 1000 | -0.015 | 1000 | 1.18 | 450 |
| #75 | 0.0210 | 103 | 83 | 1000 | -0.015 | 1200 | 1.24 | 450 |
| 0.55mm | 0.0217 | 103 | 80 | 1000 | -0.015 | 1200 | 1.29 | 450 |
| #74 | 0.0225 | 103 | 78 | 1000 | -0.015 | 1200 | 1.32 | 450 |
| 0.60mm | 0.0236 | 104 | 74 | 1000 | -0.016 | 1200 | 1.41 | 450 |
| #73 | 0.0240 | 104 | 73 | 1000 | -0.016 | 1200 | 1.42 | 450 |
| #72 | 0.0250 | 104 | 70 | 1000 | -0.016 | 1200 | 1.49 | 450 |
| 0.65mm | 0.0256 | 104 | 68 | 1000 | -0.016 | 1200 | 1.53 | 450 |
| #71 | 0.0260 | 104 | 67 | 1000 | -0.016 | 1200 | 1.55 | 450 |
| 0.70mm | 0.0276 | 103 | 63 | 1000 | -0.016 | 1200 | 1.63 | 450 |
| #70 | 0.0280 | 103 | 62 | 1000 | -0.017 | 1200 | 1.66 | 450 |
| #69 | 0.0292 | 102 | 60 | 1000 | -0.017 | 1200 | 1.70 | 450 |
| 0.75mm | 0.0295 | 102 | 59 | 1000 | -0.017 | 1200 | 1.73 | 450 |
| #68 | 0.0310 | 102 | 57 | 1000 | -0.017 | 1200 | 1.79 | 450 |
| 1/32 | 0.0312 | 101 | 56 | 1000 | -0.017 | 1200 | 1.80 | 450 |
| 0.80mm | 0.0315 | 101 | 55 | 1000 | -0.017 | 1200 | 1.84 | 450 |
| #67 | 0.0320 | 100 | 54 | 1000 | -0.017 | 1200 | 1.85 | 450 |
| #66 | 0.0330 | 100 | 53 | 1000 | -0.018 | 1200 | 1.89 | 450 |
| 0.85mm | 0.0335 | 99 | 52 | 1000 | -0.018 | 1200 | 1.90 | 450 |
| #65 | 0.0350 | 98 | 50 | 1000 | -0.018 | 1200 | 1.96 | 450 |
| 0.90mm | 0.0354 | 98 | 49 | 1000 | -0.018 | 1200 | 2.00 | 450 |
| #64 | 0.0360 | 97 | 48 | 1000 | -0.018 | 1200 | 2.02 | 450 |
| #63 | 0.0370 | 96 | 47 | 1000 | -0.019 | 1200 | 2.04 | 450 |
| 0.95mm | 0.0374 | 95 | 46 | 1000 | -0.019 | 1200 | 2.07 | 450 |
| #62 | 0.0380 | 95 | 46 | 1000 | -0.019 | 1200 | 2.07 | 450 |
| #61 | 0.0390 | 94 | 45 | 1000 | -0.019 | 1200 | 2.09 | 450 |
| 1.00mm | 0.0394 | 94 | 45 | 1000 | -0.019 | 1200 | 2.09 | 450 |
| #60 | 0.0400 | 94 | 44 | 1000 | -0.019 | 1200 | 2.14 | 450 |
| #59 | 0.0410 | 93 | 43 | 1000 | -0.020 | 1200 | 2.16 | 450 |
| 1.05mm | 0.0413 | 93 | 42 | 1000 | -0.020 | 1200 | 2.21 | 450 |
| #58 | 0.0420 | 92 | 41 | 1000 | -0.020 | 1200 | 2.24 | 450 |
| #57 | 0.0430 | 92 | 40 | 1000 | -0.020 | 1200 | 2.30 | 450 |
| 1.10mm | 0.0433 | 92 | 40 | 1000 | -0.020 | 1200 | 2.30 | 450 |
| 1.15mm | 0.0453 | 91 | 39 | 1000 | -0.021 | 1200 | 2.33 | 450 |
| #56 | 0.0465 | 90 | 38 | 1000 | -0.021 | 1200 | 2.37 | 450 |
| 3/64 | 0.0469 | 90 | 37 | 1000 | -0.021 | 1200 | 2.43 | 450 |
| 1.20mm | 0.0472 | 90 | 37 | 1000 | -0.021 | 1200 | 2.43 | 450 |
| 1.25mm | 0.0492 | 89 | 36 | 1000 | -0.021 | 1200 | 2.47 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #55 | 0.0520 | 85 | 34 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| 1.35mm | 0.0531 | 83 | 33 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #54 | 0.0550 | 80 | 32 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.40mm | 0.0551 | 80 | 32 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.45mm | 0.0571 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.50mm | 0.0591 | 75 | 30 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.55mm | 0.0610 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.60mm | 0.0630 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| #52 | 0.0635 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.65mm | 0.0650 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.80mm | 0.0709 | 63 | 25 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.85mm | 0.0728 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #49 | 0.0730 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.90mm | 0.0748 | 58 | 23 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #48 | 0.0760 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 1.95mm | 0.0768 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 5/64 | 0.0781 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| #47 | 0.0785 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.00mm | 0.0787 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.05mm | 0.0807 | 55 | 22 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| #46 | 0.0810 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| #45 | 0.0820 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| 2.10mm | 0.0827 | 53 | 21 | 1000 | -0.029 | 1200 | 2.50 | 450 |
| 2.15mm | 0.0846 | 53 | 21 | 1000 | -0.030 | 1200 | 2.50 | 450 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1200 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1200 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1200 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1200 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1200 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 800 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |
| 3.20mm | 0.1260 | 48 | 20 | 1000 | -0.018 | 600 | 2.40 | 659 |
| 3.25mm | 0.1280 | 48 | 20 | 1000 | -0.018 | 600 | 2.40 | 670 |
| #30 | 0.1285 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 672 |
| 3.30mm | 0.1299 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 680 |
| 3.35mm | 0.1319 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 690 |
| 3.40mm | 0.1339 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 701 |
| 3.45mm | 0.1358 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 711 |
| #29 | 0.1360 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 712 |
| 3.50mm | 0.1378 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 721 |
| 3.55mm | 0.1398 | 48 | 20 | 1000 | -0.019 | 600 | 2.40 | 732 |
| #28 | 0.1405 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 735 |
| 9/64 | 0.1406 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 736 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

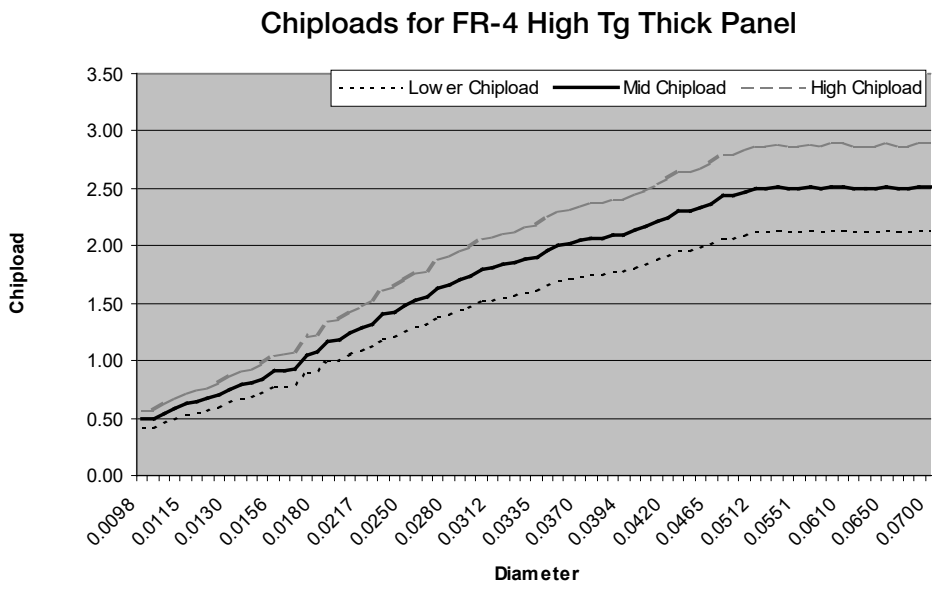
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.60mm | 0.1417 | 45 | 20 | 1000 | -0.019 | 600 | 2.25 | 742 |
| 3.65mm | 0.1437 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 752 |
| #27 | 0.1440 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 754 |
| 3.70mm | 0.1457 | 45 | 20 | 1000 | -0.020 | 600 | 2.25 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 600 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 814 |
| 5/32 | 0.1562 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 817 |
| #22 | 0.1570 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 822 |
| 4.00mm | 0.1575 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 824 |
| #21 | 0.1590 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 832 |
| 4.05mm | 0.1594 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 834 |
| #20 | 0.1610 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 843 |
| 4.10mm | 0.1614 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 845 |
| 4.15mm | 0.1634 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 855 |
| 4.20mm | 0.1654 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 866 |
| #19 | 0.1660 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 869 |
| 4.25mm | 0.1673 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 876 |
| 4.30mm | 0.1693 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 886 |
| #18 | 0.1695 | 35 | 20 | 1000 | -0.021 | 400 | 1.75 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 250 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 250 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 250 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 250 | 1.50 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 250 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 200 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1075 |
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1113 |
| #3 | 0.2130 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1115 |
| 5.45mm | 0.2146 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1123 |
| 5.50mm | 0.2165 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1133 |
| 5.55mm | 0.2185 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1143 |
| 7/32 | 0.2188 | 20 | 20 | 1000 | -0.024 | 200 | 1.00 | 1145 |
| 5.60mm | 0.2205 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1154 |
| #2 | 0.2210 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1157 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.65mm | 0.2224 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1164 |
| 5.70mm | 0.2244 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1174 |
| 5.75mm | 0.2264 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1185 |
| #1 | 0.2280 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1193 |
| 5.80mm | 0.2283 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1195 |
| 5.85mm | 0.2302 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1205 |
| 5.90mm | 0.2323 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1216 |
| A | 0.2340 | 20 | 20 | 1000 | -0.025 | 200 | 1.00 | 1225 |
| 5.95mm | 0.2343 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1226 |
| 15/64 | 0.2344 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1227 |
| 6.00mm | 0.2362 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1236 |
| B | 0.2380 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1246 |
| 6.05mm | 0.2382 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1247 |
| 6.10mm | 0.2402 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1257 |
| C | 0.2420 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1266 |
| 6.15mm | 0.2421 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1267 |
| 6.20mm | 0.2441 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1277 |
| D | 0.2460 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1287 |
| 6.25mm | 0.2461 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1288 |
| 6.30mm | 0.2480 | 20 | 20 | 1000 | -0.026 | 200 | 1.00 | 1298 |
| 6.35mm | 0.2500 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1308 |
| 6.40mm | 0.2520 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1319 |
| 6.50mm | 0.2559 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1339 |
| F | 0.2570 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1345 |
| 6.60mm | 0.2598 | 20 | 20 | 1000 | -0.027 | 200 | 1.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Multilayer High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 34 | 160 | 200 | -0.011 | 500 | 0.21 | 167 |
| 0.13mm | 0.0050 | 40 | 160 | 300 | -0.011 | 600 | 0.25 | 209 |
| 0.15mm | 0.0059 | 48 | 160 | 300 | -0.011 | 600 | 0.30 | 247 |
| #96 | 0.0063 | 52 | 160 | 400 | -0.011 | 600 | 0.33 | 264 |
| #95 | 0.0067 | 58 | 160 | 400 | -0.012 | 600 | 0.36 | 281 |
| #94 | 0.0071 | 62 | 160 | 500 | -0.012 | 600 | 0.39 | 297 |
| #93 | 0.0075 | 68 | 160 | 500 | -0.012 | 600 | 0.43 | 314 |
| #92 | 0.0079 | 75 | 160 | 500 | -0.012 | 800 | 0.47 | 331 |
| #91 | 0.0083 | 80 | 160 | 600 | -0.012 | 800 | 0.50 | 347 |
| #90 | 0.0087 | 84 | 160 | 600 | -0.012 | 800 | 0.53 | 364 |
| #89 | 0.0091 | 88 | 160 | 700 | -0.012 | 800 | 0.55 | 381 |
| #88 | 0.0095 | 92 | 160 | 700 | -0.012 | 800 | 0.58 | 398 |
| 0.25mm | 0.0098 | 94 | 160 | 800 | -0.012 | 1000 | 0.59 | 410 |
| #87 | 0.0100 | 95 | 160 | 800 | -0.012 | 1000 | 0.59 | 419 |
| #86 | 0.0105 | 98 | 160 | 800 | -0.012 | 1000 | 0.61 | 440 |
| #85 | 0.0110 | 100 | 156 | 900 | -0.013 | 1000 | 0.64 | 450 |
| #84 | 0.0115 | 104 | 150 | 900 | -0.013 | 1000 | 0.69 | 450 |
| 0.30mm | 0.0118 | 106 | 146 | 1000 | -0.013 | 1200 | 0.73 | 450 |
| #83 | 0.0120 | 108 | 143 | 1000 | -0.013 | 1200 | 0.76 | 450 |
| #82 | 0.0125 | 112 | 138 | 1000 | -0.013 | 1200 | 0.81 | 450 |
| #81 | 0.0130 | 115 | 132 | 1000 | -0.013 | 1200 | 0.87 | 450 |
| #80 | 0.0135 | 118 | 127 | 1000 | -0.013 | 1500 | 0.93 | 450 |
| 0.35mm | 0.0138 | 118 | 125 | 1000 | -0.013 | 1500 | 0.94 | 450 |
| #79 | 0.0145 | 119 | 119 | 1000 | -0.013 | 1500 | 1.00 | 450 |
| 1/64 | 0.0156 | 120 | 110 | 1000 | -0.014 | 1500 | 1.09 | 450 |
| 0.40mm | 0.0158 | 120 | 109 | 1000 | -0.014 | 1500 | 1.10 | 450 |
| #78 | 0.0160 | 122 | 107 | 1000 | -0.014 | 1500 | 1.14 | 450 |
| 0.45mm | 0.0177 | 123 | 97 | 1000 | -0.014 | 1500 | 1.27 | 450 |
| #77 | 0.0180 | 124 | 96 | 1000 | -0.014 | 1500 | 1.29 | 450 |
| 0.50mm | 0.0197 | 125 | 87 | 1000 | -0.015 | 1500 | 1.44 | 450 |
| #76 | 0.0200 | 126 | 86 | 1000 | -0.015 | 1500 | 1.47 | 450 |
| #75 | 0.0210 | 126 | 82 | 1000 | -0.015 | 1500 | 1.54 | 450 |
| 0.55mm | 0.0217 | 126 | 79 | 1000 | -0.015 | 1500 | 1.59 | 450 |
| #74 | 0.0225 | 125 | 76 | 1000 | -0.015 | 1500 | 1.64 | 450 |
| 0.60mm | 0.0236 | 124 | 73 | 1000 | -0.016 | 1500 | 1.70 | 450 |
| #73 | 0.0240 | 124 | 72 | 1000 | -0.016 | 1500 | 1.72 | 450 |
| #72 | 0.0250 | 123 | 69 | 1000 | -0.016 | 1200 | 1.78 | 450 |
| 0.65mm | 0.0256 | 122 | 67 | 1000 | -0.016 | 1200 | 1.82 | 450 |
| #71 | 0.0260 | 122 | 66 | 1000 | -0.016 | 1200 | 1.85 | 450 |
| 0.70mm | 0.0276 | 120 | 62 | 1000 | -0.016 | 1200 | 1.94 | 450 |
| #70 | 0.0280 | 120 | 61 | 1000 | -0.017 | 1200 | 1.97 | 450 |
| #69 | 0.0292 | 119 | 59 | 1000 | -0.017 | 1200 | 2.02 | 450 |
| 0.75mm | 0.0295 | 119 | 58 | 1000 | -0.017 | 1200 | 2.05 | 450 |
| #68 | 0.0310 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 1/32 | 0.0312 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 0.80mm | 0.0315 | 115 | 55 | 1000 | -0.017 | 1500 | 2.09 | 450 |
| #67 | 0.0320 | 114 | 54 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| #66 | 0.0330 | 113 | 52 | 1000 | -0.018 | 1500 | 2.17 | 450 |
| 0.85mm | 0.0335 | 113 | 51 | 1000 | -0.018 | 1500 | 2.22 | 450 |
| #65 | 0.0350 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| 0.90mm | 0.0354 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| #64 | 0.0360 | 112 | 48 | 1000 | -0.018 | 1500 | 2.33 | 450 |
| #63 | 0.0370 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| 0.95mm | 0.0374 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| #62 | 0.0380 | 110 | 45 | 1000 | -0.019 | 1500 | 2.44 | 450 |
| #61 | 0.0390 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| 1.00mm | 0.0394 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| #60 | 0.0400 | 107 | 43 | 1000 | -0.019 | 1500 | 2.49 | 450 |
| #59 | 0.0410 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.05mm | 0.0413 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #58 | 0.0420 | 103 | 41 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #57 | 0.0430 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.10mm | 0.0433 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.15mm | 0.0453 | 95 | 38 | 1000 | -0.021 | 1500 | 2.50 | 450 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 3/64 | 0.0469 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.20mm | 0.0472 | 90 | 36 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.25mm | 0.0492 | 88 | 35 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| #55 | 0.0520 | 83 | 33 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| 1.35mm | 0.0531 | 80 | 32 | 1000 | -0.022 | 1200 | 2.50 | 450 |
| #54 | 0.0550 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.40mm | 0.0551 | 78 | 31 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.45mm | 0.0571 | 75 | 30 | 1000 | -0.023 | 1200 | 2.50 | 450 |
| 1.50mm | 0.0591 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1.55mm | 0.0610 | 70 | 28 | 1000 | -0.024 | 1200 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.60mm | 0.0630 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| #52 | 0.0635 | 68 | 27 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.65mm | 0.0650 | 65 | 26 | 1000 | -0.025 | 1200 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1200 | 2.50 | 450 |
| 1.80mm | 0.0709 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.85mm | 0.0728 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #49 | 0.0730 | 60 | 24 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| 1.90mm | 0.0748 | 58 | 23 | 1000 | -0.027 | 1200 | 2.50 | 450 |
| #48 | 0.0760 | 58 | 23 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 1.95mm | 0.0768 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 5/64 | 0.0781 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| #47 | 0.0785 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.00mm | 0.0787 | 55 | 22 | 1000 | -0.028 | 1200 | 2.50 | 450 |
| 2.05mm | 0.0807 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #46 | 0.0810 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| #45 | 0.0820 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.10mm | 0.0827 | 53 | 21 | 1000 | -0.029 | 1000 | 2.50 | 450 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 1000 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 1000 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 1000 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 1000 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 1000 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 800 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 800 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 800 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 800 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 800 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 800 | 2.50 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 500 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 500 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 500 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 500 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 400 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 400 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 400 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 300 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1075 |

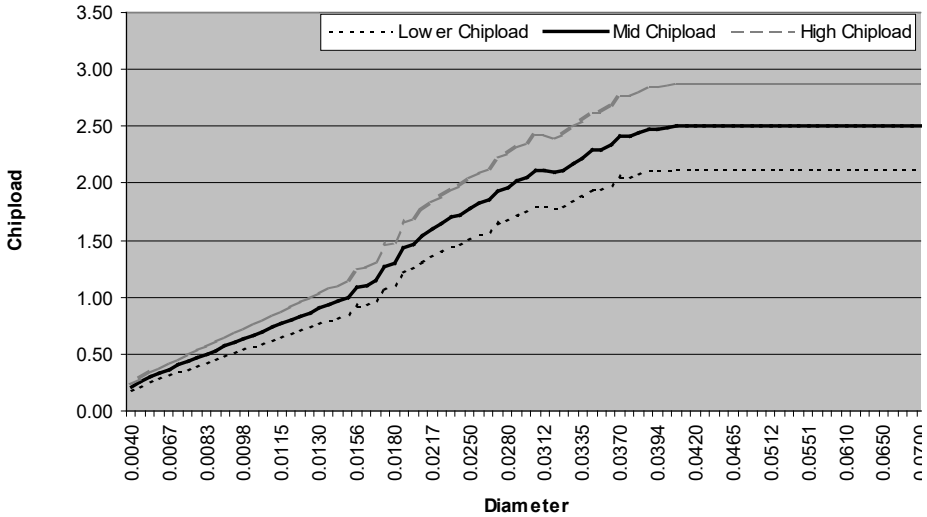
Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 300 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 200 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 200 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 200 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 200 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Multilayer High Tg




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Multilayer Low Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 44 | 160 | 200 | -0.011 | 500 | 0.28 | 167 |
| 0.13mm | 0.0050 | 50 | 160 | 300 | -0.011 | 600 | 0.31 | 209 |
| 0.15mm | 0.0059 | 56 | 160 | 300 | -0.011 | 600 | 0.35 | 247 |
| #96 | 0.0063 | 62 | 160 | 400 | -0.011 | 600 | 0.39 | 264 |
| #95 | 0.0067 | 69 | 160 | 400 | -0.012 | 600 | 0.43 | 281 |
| #94 | 0.0071 | 75 | 160 | 500 | -0.012 | 600 | 0.47 | 297 |
| #93 | 0.0075 | 80 | 160 | 500 | -0.012 | 600 | 0.50 | 314 |
| #92 | 0.0079 | 85 | 160 | 500 | -0.012 | 800 | 0.53 | 331 |
| #91 | 0.0083 | 91 | 160 | 600 | -0.012 | 800 | 0.57 | 347 |
| #90 | 0.0087 | 96 | 160 | 600 | -0.012 | 800 | 0.60 | 364 |
| #89 | 0.0091 | 101 | 160 | 700 | -0.012 | 800 | 0.63 | 381 |
| #88 | 0.0095 | 107 | 160 | 700 | -0.012 | 800 | 0.67 | 398 |
| 0.25mm | 0.0098 | 112 | 160 | 800 | -0.012 | 1000 | 0.70 | 410 |
| #87 | 0.0100 | 115 | 160 | 800 | -0.012 | 1000 | 0.72 | 419 |
| #86 | 0.0105 | 120 | 160 | 800 | -0.012 | 1000 | 0.75 | 440 |
| #85 | 0.0110 | 126 | 160 | 900 | -0.013 | 1000 | 0.79 | 461 |
| #84 | 0.0115 | 130 | 160 | 900 | -0.013 | 1000 | 0.81 | 481 |
| 0.30mm | 0.0118 | 132 | 160 | 1000 | -0.013 | 1200 | 0.83 | 494 |
| #83 | 0.0120 | 134 | 160 | 1000 | -0.013 | 1200 | 0.84 | 502 |
| #82 | 0.0125 | 136 | 160 | 1000 | -0.013 | 1200 | 0.85 | 523 |
| #81 | 0.0130 | 138 | 160 | 1000 | -0.013 | 1200 | 0.86 | 544 |
| #80 | 0.0135 | 140 | 156 | 1000 | -0.013 | 1500 | 0.90 | 550 |
| 0.35mm | 0.0138 | 140 | 152 | 1000 | -0.013 | 1500 | 0.92 | 550 |
| #79 | 0.0145 | 140 | 145 | 1000 | -0.013 | 1500 | 0.97 | 550 |
| 1/64 | 0.0156 | 144 | 135 | 1000 | -0.014 | 1500 | 1.07 | 550 |
| 0.40mm | 0.0158 | 146 | 133 | 1000 | -0.014 | 1500 | 1.10 | 550 |
| #78 | 0.0160 | 148 | 131 | 1000 | -0.014 | 1500 | 1.13 | 550 |
| 0.45mm | 0.0177 | 150 | 119 | 1000 | -0.014 | 1500 | 1.26 | 550 |
| #77 | 0.0180 | 152 | 117 | 1000 | -0.014 | 1500 | 1.30 | 550 |
| 0.50mm | 0.0197 | 154 | 107 | 1000 | -0.015 | 1500 | 1.44 | 550 |
| #76 | 0.0200 | 155 | 105 | 1000 | -0.015 | 1500 | 1.48 | 550 |
| #75 | 0.0210 | 156 | 100 | 1000 | -0.015 | 1500 | 1.56 | 550 |
| 0.55mm | 0.0217 | 158 | 97 | 1000 | -0.015 | 1500 | 1.63 | 550 |
| #74 | 0.0225 | 160 | 93 | 1000 | -0.015 | 1500 | 1.72 | 550 |
| 0.60mm | 0.0236 | 162 | 89 | 1000 | -0.016 | 1500 | 1.82 | 550 |
| #73 | 0.0240 | 162 | 88 | 1000 | -0.016 | 1500 | 1.84 | 550 |
| #72 | 0.0250 | 163 | 84 | 1000 | -0.016 | 1500 | 1.94 | 550 |
| 0.65mm | 0.0256 | 164 | 82 | 1000 | -0.016 | 1500 | 2.00 | 550 |
| #71 | 0.0260 | 165 | 81 | 1000 | -0.016 | 1500 | 2.04 | 550 |
| 0.70mm | 0.0276 | 166 | 76 | 1000 | -0.016 | 1500 | 2.18 | 550 |
| #70 | 0.0280 | 166 | 75 | 1000 | -0.017 | 1500 | 2.21 | 550 |
| #69 | 0.0292 | 166 | 72 | 1000 | -0.017 | 1500 | 2.31 | 550 |
| 0.75mm | 0.0295 | 166 | 71 | 1000 | -0.017 | 1500 | 2.34 | 550 |
| #68 | 0.0310 | 166 | 68 | 1000 | -0.017 | 1500 | 2.44 | 550 |
| 1/32 | 0.0312 | 166 | 67 | 1000 | -0.017 | 1500 | 2.48 | 550 |
| 0.80mm | 0.0315 | 166 | 67 | 1000 | -0.017 | 1500 | 2.48 | 550 |
| #67 | 0.0320 | 166 | 66 | 1000 | -0.017 | 1500 | 2.52 | 550 |
| #66 | 0.0330 | 164 | 64 | 1000 | -0.018 | 1500 | 2.56 | 550 |
| 0.85mm | 0.0335 | 163 | 63 | 1000 | -0.018 | 1500 | 2.59 | 550 |
| #65 | 0.0350 | 160 | 60 | 1000 | -0.018 | 1500 | 2.67 | 550 |
| 0.90mm | 0.0354 | 160 | 59 | 1000 | -0.018 | 1500 | 2.71 | 550 |
| #64 | 0.0360 | 159 | 58 | 1000 | -0.018 | 1500 | 2.74 | 550 |
| #63 | 0.0370 | 158 | 57 | 1000 | -0.019 | 1500 | 2.77 | 550 |
| 0.95mm | 0.0374 | 158 | 56 | 1000 | -0.019 | 1500 | 2.82 | 550 |
| #62 | 0.0380 | 156 | 55 | 1000 | -0.019 | 1500 | 2.84 | 550 |
| #61 | 0.0390 | 155 | 54 | 1000 | -0.019 | 1500 | 2.87 | 550 |
| 1.00mm | 0.0394 | 155 | 53 | 1000 | -0.019 | 1500 | 2.92 | 550 |
| #60 | 0.0400 | 154 | 53 | 1000 | -0.019 | 1500 | 2.91 | 550 |
| #59 | 0.0410 | 153 | 51 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.05mm | 0.0413 | 153 | 51 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| #58 | 0.0420 | 150 | 50 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| #57 | 0.0430 | 147 | 49 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.10mm | 0.0433 | 147 | 49 | 1000 | -0.020 | 1500 | 3.00 | 550 |
| 1.15mm | 0.0453 | 138 | 46 | 1000 | -0.021 | 1500 | 3.00 | 550 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 3/64 | 0.0469 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.20mm | 0.0472 | 135 | 45 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.25mm | 0.0492 | 129 | 43 | 1000 | -0.021 | 1500 | 3.00 | 550 |
| 1.30mm | 0.0512 | 123 | 41 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| #55 | 0.0520 | 120 | 40 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| 1.35mm | 0.0531 | 120 | 40 | 1000 | -0.022 | 1500 | 3.00 | 550 |
| #54 | 0.0550 | 114 | 38 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.40mm | 0.0551 | 114 | 38 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.45mm | 0.0571 | 111 | 37 | 1000 | -0.023 | 1500 | 3.00 | 550 |
| 1.50mm | 0.0591 | 108 | 36 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| #53 | 0.0595 | 105 | 35 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| 1.55mm | 0.0610 | 102 | 34 | 1000 | -0.024 | 1500 | 3.00 | 550 |
| 1/16 | 0.0625 | 102 | 34 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.60mm | 0.0630 | 99 | 33 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| #52 | 0.0635 | 99 | 33 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.65mm | 0.0650 | 96 | 32 | 1000 | -0.025 | 1500 | 3.00 | 550 |
| 1.70mm | 0.0669 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| #51 | 0.0670 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| 1.75mm | 0.0689 | 93 | 31 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| #50 | 0.0700 | 90 | 30 | 1000 | -0.026 | 1500 | 3.00 | 550 |
| 1.80mm | 0.0709 | 90 | 30 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| 1.85mm | 0.0728 | 87 | 29 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| #49 | 0.0730 | 87 | 29 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| 1.90mm | 0.0748 | 84 | 28 | 1000 | -0.027 | 1500 | 3.00 | 550 |
| #48 | 0.0760 | 84 | 28 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 1.95mm | 0.0768 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 5/64 | 0.0781 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| #47 | 0.0785 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 2.00mm | 0.0787 | 81 | 27 | 1000 | -0.028 | 1500 | 3.00 | 550 |
| 2.05mm | 0.0807 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| #46 | 0.0810 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| #45 | 0.0820 | 78 | 26 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| 2.10mm | 0.0827 | 75 | 25 | 1000 | -0.029 | 1500 | 3.00 | 550 |
| 2.15mm | 0.0846 | 75 | 25 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| #44 | 0.0860 | 72 | 24 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| 2.20mm | 0.0866 | 72 | 24 | 1000 | -0.030 | 1500 | 3.00 | 550 |
| 2.25mm | 0.0886 | 72 | 24 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| #43 | 0.0890 | 72 | 24 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| 2.30mm | 0.0906 | 69 | 23 | 1000 | -0.031 | 1500 | 3.00 | 550 |
| 2.35mm | 0.0925 | 69 | 23 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| #42 | 0.0935 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 3/32 | 0.0938 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 2.40mm | 0.0945 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| #41 | 0.0960 | 66 | 22 | 1000 | -0.032 | 1500 | 3.00 | 550 |
| 2.45mm | 0.0965 | 66 | 22 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #40 | 0.0980 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| 2.50mm | 0.0984 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #39 | 0.0995 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| 2.55mm | 0.1004 | 63 | 21 | 1000 | -0.033 | 1500 | 3.00 | 550 |
| #38 | 0.1015 | 63 | 21 | 1000 | -0.034 | 1500 | 3.00 | 550 |
| 2.60mm | 0.1024 | 63 | 21 | 1000 | -0.034 | 1500 | 3.00 | 550 |
| #37 | 0.1040 | 60 | 20 | 1000 | -0.034 | 1200 | 3.00 | 550 |
| 2.65mm | 0.1043 | 60 | 20 | 1000 | -0.034 | 1200 | 3.00 | 550 |
| 2.70mm | 0.1063 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 550 |
| #36 | 0.1065 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 557 |
| 2.75mm | 0.1083 | 60 | 20 | 1000 | -0.035 | 1200 | 3.00 | 567 |
| 7/64 | 0.1094 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 573 |
| #35 | 0.1100 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 576 |
| 2.80mm | 0.1102 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 577 |
| #34 | 0.1110 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 581 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 587 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 1200 | 3.00 | 591 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 598 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 1200 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 1200 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 1200 | 3.00 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 1000 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 1000 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 1000 | 2.00 | 712 |
| 3.50mm | 0.1378 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 721 |
| 3.55mm | 0.1398 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 732 |
| #28 | 0.1405 | 35 | 20 | 1000 | -0.019 | 1000 | 1.75 | 735 |
| 9/64 | 0.1406 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 736 |
| 3.60mm | 0.1417 | 35 | 20 | 1000 | -0.019 | 800 | 1.75 | 742 |
| 3.65mm | 0.1437 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 752 |
| #27 | 0.1440 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 754 |
| 3.70mm | 0.1457 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 762 |
| #26 | 0.1470 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 769 |
| 3.75mm | 0.1476 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 772 |
| #25 | 0.1495 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 782 |
| 3.80mm | 0.1496 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 783 |
| 3.85mm | 0.1516 | 35 | 20 | 1000 | -0.020 | 800 | 1.75 | 793 |
| #24 | 0.1520 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 795 |
| 3.90mm | 0.1535 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 803 |
| #23 | 0.1540 | 35 | 20 | 1000 | -0.020 | 600 | 1.75 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 600 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 600 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 500 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 500 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 500 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 400 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1051 |
| #7 | 0.2010 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1052 |
| 5.15mm | 0.2028 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1061 |
| 13/64 | 0.2031 | 25 | 20 | 1000 | -0.023 | 400 | 1.25 | 1063 |
| #6 | 0.2040 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1068 |
| 5.20mm | 0.2047 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1071 |
| #5 | 0.2055 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1075 |

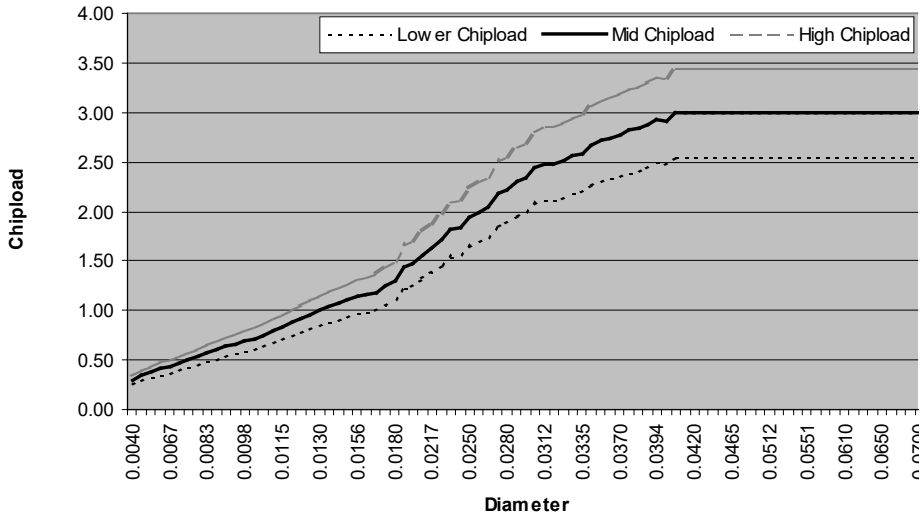
Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1082 |
| 5.30mm | 0.2087 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1092 |
| #4 | 0.2090 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1094 |
| 5.35mm | 0.2106 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1102 |
| 5.40mm | 0.2126 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1113 |
| #3 | 0.2130 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1115 |
| 5.45mm | 0.2146 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1123 |
| 5.50mm | 0.2165 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1133 |
| 5.55mm | 0.2185 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1143 |
| 7/32 | 0.2188 | 25 | 20 | 1000 | -0.024 | 400 | 1.25 | 1145 |
| 5.60mm | 0.2205 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1154 |
| #2 | 0.2210 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1157 |
| 5.65mm | 0.2224 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1164 |
| 5.70mm | 0.2244 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1174 |
| 5.75mm | 0.2264 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1185 |
| #1 | 0.2280 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1193 |
| 5.80mm | 0.2283 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1195 |
| 5.85mm | 0.2302 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1205 |
| 5.90mm | 0.2323 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1216 |
| A | 0.2340 | 25 | 20 | 1000 | -0.025 | 400 | 1.25 | 1225 |
| 5.95mm | 0.2343 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1226 |
| 15/64 | 0.2344 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1227 |
| 6.00mm | 0.2362 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1236 |
| B | 0.2380 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1246 |
| 6.05mm | 0.2382 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1247 |
| 6.10mm | 0.2402 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1257 |
| C | 0.2420 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1266 |
| 6.15mm | 0.2421 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1267 |
| 6.20mm | 0.2441 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1277 |
| D | 0.2460 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1287 |
| 6.25mm | 0.2461 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1288 |
| 6.30mm | 0.2480 | 25 | 20 | 1000 | -0.026 | 400 | 1.25 | 1298 |
| 6.35mm | 0.2500 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1308 |
| 6.40mm | 0.2520 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1319 |
| 6.50mm | 0.2559 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1339 |
| F | 0.2570 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1345 |
| 6.60mm | 0.2598 | 25 | 20 | 1000 | -0.027 | 400 | 1.25 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Multilayer Low Tg




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **KAPTON® / Flex** PCB Material

KAPTON® is a registered trademark of DuPont

**Recommended Drill Series:** 100, 150, 240, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 27 | 160 | 200 | -0.011 | 500 | 0.17 | 167 |
| 0.13mm | 0.0050 | 32 | 160 | 300 | -0.011 | 500 | 0.20 | 209 |
| 0.15mm | 0.0059 | 43 | 160 | 300 | -0.011 | 500 | 0.27 | 247 |
| #96 | 0.0063 | 53 | 160 | 400 | -0.011 | 500 | 0.33 | 264 |
| #95 | 0.0067 | 61 | 160 | 400 | -0.012 | 500 | 0.38 | 281 |
| #94 | 0.0071 | 69 | 160 | 500 | -0.012 | 500 | 0.43 | 297 |
| #93 | 0.0075 | 77 | 160 | 500 | -0.012 | 500 | 0.48 | 314 |
| #92 | 0.0079 | 83 | 157 | 500 | -0.012 | 600 | 0.53 | 325 |
| #91 | 0.0083 | 87 | 150 | 600 | -0.012 | 600 | 0.58 | 325 |
| #90 | 0.0087 | 90 | 143 | 600 | -0.012 | 600 | 0.63 | 325 |
| #89 | 0.0091 | 92 | 136 | 700 | -0.012 | 700 | 0.68 | 325 |
| #88 | 0.0095 | 96 | 131 | 700 | -0.012 | 700 | 0.73 | 325 |
| 0.25mm | 0.0098 | 99 | 127 | 800 | -0.012 | 800 | 0.78 | 325 |
| #87 | 0.0100 | 99 | 124 | 800 | -0.012 | 800 | 0.80 | 325 |
| #86 | 0.0105 | 100 | 118 | 800 | -0.012 | 800 | 0.85 | 325 |
| #85 | 0.0110 | 106 | 113 | 900 | -0.013 | 800 | 0.94 | 325 |
| #84 | 0.0115 | 112 | 108 | 900 | -0.013 | 800 | 1.04 | 325 |
| 0.30mm | 0.0118 | 118 | 105 | 1000 | -0.013 | 1000 | 1.12 | 325 |
| #83 | 0.0120 | 120 | 104 | 1000 | -0.013 | 1000 | 1.15 | 325 |
| #82 | 0.0125 | 124 | 99 | 1000 | -0.013 | 1000 | 1.25 | 325 |
| #81 | 0.0130 | 130 | 96 | 1000 | -0.013 | 1000 | 1.35 | 325 |
| #80 | 0.0135 | 134 | 92 | 1000 | -0.013 | 1000 | 1.46 | 325 |
| 0.35mm | 0.0138 | 136 | 90 | 1000 | -0.013 | 1000 | 1.51 | 325 |
| #79 | 0.0145 | 140 | 86 | 1000 | -0.013 | 1000 | 1.63 | 325 |
| 1/64 | 0.0156 | 146 | 80 | 1000 | -0.014 | 1000 | 1.83 | 325 |
| 0.40mm | 0.0158 | 148 | 79 | 1000 | -0.014 | 1000 | 1.87 | 325 |
| #78 | 0.0160 | 150 | 78 | 1000 | -0.014 | 1000 | 1.92 | 325 |
| 0.45mm | 0.0177 | 154 | 70 | 1000 | -0.014 | 1000 | 2.20 | 325 |
| #77 | 0.0180 | 156 | 69 | 1000 | -0.014 | 1000 | 2.26 | 325 |
| 0.50mm | 0.0197 | 154 | 63 | 1000 | -0.015 | 1000 | 2.44 | 325 |
| #76 | 0.0200 | 154 | 62 | 1000 | -0.015 | 1000 | 2.48 | 325 |
| #75 | 0.0210 | 152 | 59 | 1000 | -0.015 | 1000 | 2.58 | 325 |
| 0.55mm | 0.0217 | 148 | 57 | 1000 | -0.015 | 1000 | 2.60 | 325 |
| #74 | 0.0225 | 145 | 55 | 1000 | -0.015 | 1000 | 2.64 | 325 |
| 0.60mm | 0.0236 | 142 | 53 | 1000 | -0.016 | 1000 | 2.68 | 325 |
| #73 | 0.0240 | 140 | 52 | 1000 | -0.016 | 1000 | 2.69 | 325 |
| #72 | 0.0250 | 138 | 50 | 1000 | -0.016 | 1000 | 2.78 | 325 |
| 0.65mm | 0.0256 | 138 | 49 | 1000 | -0.016 | 1000 | 2.84 | 325 |
| #71 | 0.0260 | 136 | 48 | 1000 | -0.016 | 1000 | 2.85 | 325 |
| 0.70mm | 0.0276 | 130 | 45 | 1000 | -0.016 | 1000 | 2.89 | 325 |
| #70 | 0.0280 | 128 | 44 | 1000 | -0.017 | 1000 | 2.91 | 325 |
| #69 | 0.0292 | 126 | 43 | 1000 | -0.017 | 1000 | 2.93 | 325 |
| 0.75mm | 0.0295 | 125 | 42 | 1000 | -0.017 | 1000 | 2.98 | 325 |
| #68 | 0.0310 | 120 | 40 | 1000 | -0.017 | 1000 | 3.00 | 325 |
| 1/32 | 0.0312 | 120 | 40 | 1000 | -0.017 | 1000 | 3.00 | 325 |
| 0.80mm | 0.0315 | 117 | 39 | 1000 | -0.017 | 1000 | 3.00 | 325 |
| #67 | 0.0320 | 117 | 39 | 1000 | -0.017 | 1000 | 3.00 | 325 |
| #66 | 0.0330 | 114 | 38 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| 0.85mm | 0.0335 | 111 | 37 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| #65 | 0.0350 | 105 | 35 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| 0.90mm | 0.0354 | 105 | 35 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| #64 | 0.0360 | 105 | 35 | 1000 | -0.018 | 1000 | 3.00 | 325 |
| #63 | 0.0370 | 102 | 34 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| 0.95mm | 0.0374 | 99 | 33 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| #62 | 0.0380 | 99 | 33 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| #61 | 0.0390 | 96 | 32 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| 1.00mm | 0.0394 | 96 | 32 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| #60 | 0.0400 | 93 | 31 | 1000 | -0.019 | 1000 | 3.00 | 325 |
| #59 | 0.0410 | 90 | 30 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| 1.05mm | 0.0413 | 90 | 30 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| #58 | 0.0420 | 90 | 30 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| #57 | 0.0430 | 87 | 29 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| 1.10mm | 0.0433 | 87 | 29 | 1000 | -0.020 | 1000 | 3.00 | 325 |
| 1.15mm | 0.0453 | 81 | 27 | 1000 | -0.021 | 1000 | 3.00 | 325 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 81 | 27 | 1000 | -0.021 | 1000 | 3.00 | 325 |
| 3/64 | 0.0469 | 78 | 26 | 1000 | -0.021 | 1000 | 3.00 | 325 |
| 1.20mm | 0.0472 | 78 | 26 | 1000 | -0.021 | 1000 | 3.00 | 325 |
| 1.25mm | 0.0492 | 75 | 25 | 1000 | -0.021 | 1000 | 3.00 | 325 |
| 1.30mm | 0.0512 | 72 | 24 | 1000 | -0.022 | 1000 | 3.00 | 325 |
| #55 | 0.0520 | 72 | 24 | 1000 | -0.022 | 1000 | 3.00 | 325 |
| 1.35mm | 0.0531 | 69 | 23 | 1000 | -0.022 | 1000 | 3.00 | 325 |
| #54 | 0.0550 | 69 | 23 | 1000 | -0.023 | 1000 | 3.00 | 325 |
| 1.40mm | 0.0551 | 69 | 23 | 1000 | -0.023 | 1000 | 3.00 | 325 |
| 1.45mm | 0.0571 | 66 | 22 | 1000 | -0.023 | 1000 | 3.00 | 325 |
| 1.50mm | 0.0591 | 63 | 21 | 1000 | -0.024 | 1000 | 3.00 | 325 |
| #53 | 0.0595 | 63 | 21 | 1000 | -0.024 | 1000 | 3.00 | 325 |
| 1.55mm | 0.0610 | 60 | 20 | 1000 | -0.024 | 1000 | 3.00 | 325 |
| 1/16 | 0.0625 | 60 | 20 | 1000 | -0.025 | 1000 | 3.00 | 325 |
| 1.60mm | 0.0630 | 60 | 20 | 1000 | -0.025 | 800 | 3.00 | 330 |
| #52 | 0.0635 | 60 | 20 | 1000 | -0.025 | 800 | 3.00 | 332 |
| 1.65mm | 0.0650 | 60 | 20 | 1000 | -0.025 | 800 | 3.00 | 340 |
| 1.70mm | 0.0669 | 60 | 20 | 1000 | -0.026 | 800 | 3.00 | 350 |
| #51 | 0.0670 | 60 | 20 | 1000 | -0.026 | 800 | 3.00 | 351 |
| 1.75mm | 0.0689 | 60 | 20 | 1000 | -0.026 | 800 | 3.00 | 361 |
| #50 | 0.0700 | 60 | 20 | 1000 | -0.026 | 700 | 3.00 | 366 |
| 1.80mm | 0.0709 | 60 | 20 | 1000 | -0.027 | 700 | 3.00 | 371 |
| 1.85mm | 0.0728 | 60 | 20 | 1000 | -0.027 | 700 | 3.00 | 381 |
| #49 | 0.0730 | 60 | 20 | 1000 | -0.027 | 700 | 3.00 | 382 |
| 1.90mm | 0.0748 | 60 | 20 | 1000 | -0.027 | 700 | 3.00 | 391 |
| #48 | 0.0760 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 398 |
| 1.95mm | 0.0768 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 402 |
| 5/64 | 0.0781 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 409 |
| #47 | 0.0785 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 411 |
| 2.00mm | 0.0787 | 60 | 20 | 1000 | -0.028 | 700 | 3.00 | 412 |
| 2.05mm | 0.0807 | 60 | 20 | 1000 | -0.029 | 600 | 3.00 | 422 |
| #46 | 0.0810 | 60 | 20 | 1000 | -0.029 | 600 | 3.00 | 424 |
| #45 | 0.0820 | 60 | 20 | 1000 | -0.029 | 600 | 3.00 | 429 |
| 2.10mm | 0.0827 | 60 | 20 | 1000 | -0.029 | 600 | 3.00 | 433 |
| 2.15mm | 0.0846 | 60 | 20 | 1000 | -0.030 | 600 | 3.00 | 443 |
| #44 | 0.0860 | 60 | 20 | 1000 | -0.030 | 600 | 3.00 | 450 |
| 2.20mm | 0.0866 | 60 | 20 | 1000 | -0.030 | 600 | 3.00 | 453 |
| 2.25mm | 0.0886 | 60 | 20 | 1000 | -0.031 | 600 | 3.00 | 464 |
| #43 | 0.0890 | 60 | 20 | 1000 | -0.031 | 600 | 3.00 | 466 |
| 2.30mm | 0.0906 | 60 | 20 | 1000 | -0.031 | 600 | 3.00 | 474 |
| 2.35mm | 0.0925 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 484 |
| #42 | 0.0935 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 489 |
| 3/32 | 0.0938 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 491 |
| 2.40mm | 0.0945 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 495 |
| #41 | 0.0960 | 60 | 20 | 1000 | -0.032 | 600 | 3.00 | 502 |
| 2.45mm | 0.0965 | 60 | 20 | 1000 | -0.033 | 600 | 3.00 | 505 |
| #40 | 0.0980 | 60 | 20 | 1000 | -0.033 | 600 | 3.00 | 513 |
| 2.50mm | 0.0984 | 60 | 20 | 1000 | -0.033 | 600 | 3.00 | 515 |
| #39 | 0.0995 | 60 | 20 | 1000 | -0.033 | 600 | 3.00 | 521 |
| 2.55mm | 0.1004 | 60 | 20 | 1000 | -0.033 | 500 | 3.00 | 525 |
| #38 | 0.1015 | 60 | 20 | 1000 | -0.034 | 500 | 3.00 | 531 |
| 2.60mm | 0.1024 | 60 | 20 | 1000 | -0.034 | 500 | 3.00 | 536 |
| #37 | 0.1040 | 60 | 20 | 1000 | -0.034 | 500 | 3.00 | 544 |
| 2.65mm | 0.1043 | 60 | 20 | 1000 | -0.034 | 500 | 3.00 | 546 |
| 2.70mm | 0.1063 | 60 | 20 | 1000 | -0.035 | 500 | 3.00 | 556 |
| #36 | 0.1065 | 60 | 20 | 1000 | -0.035 | 500 | 3.00 | 557 |
| 2.75mm | 0.1083 | 60 | 20 | 1000 | -0.035 | 500 | 3.00 | 567 |
| 7/64 | 0.1094 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 573 |
| #35 | 0.1100 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 576 |
| 2.80mm | 0.1102 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 577 |
| #34 | 0.1110 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 581 |
| 2.85mm | 0.1122 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 587 |
| #33 | 0.1130 | 60 | 20 | 1000 | -0.036 | 500 | 3.00 | 591 |
| 2.90mm | 0.1142 | 60 | 20 | 1000 | -0.037 | 500 | 3.00 | 598 |
| #32 | 0.1160 | 60 | 20 | 1000 | -0.037 | 500 | 3.00 | 607 |
| 2.95mm | 0.1161 | 60 | 20 | 1000 | -0.037 | 500 | 3.00 | 608 |
| 3.00mm | 0.1181 | 60 | 20 | 1000 | -0.038 | 500 | 3.00 | 618 |
| #31 | 0.1200 | 60 | 20 | 1000 | -0.038 | 500 | 3.00 | 628 |
| 3.05mm | 0.1201 | 60 | 20 | 1000 | -0.038 | 500 | 3.00 | 629 |
| 3.10mm | 0.1220 | 60 | 20 | 1000 | -0.038 | 500 | 3.00 | 638 |
| 3.15mm | 0.1240 | 60 | 20 | 1000 | -0.039 | 500 | 3.00 | 649 |
| 1/8 | 0.1250 | 60 | 20 | 1000 | -0.039 | 500 | 3.00 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

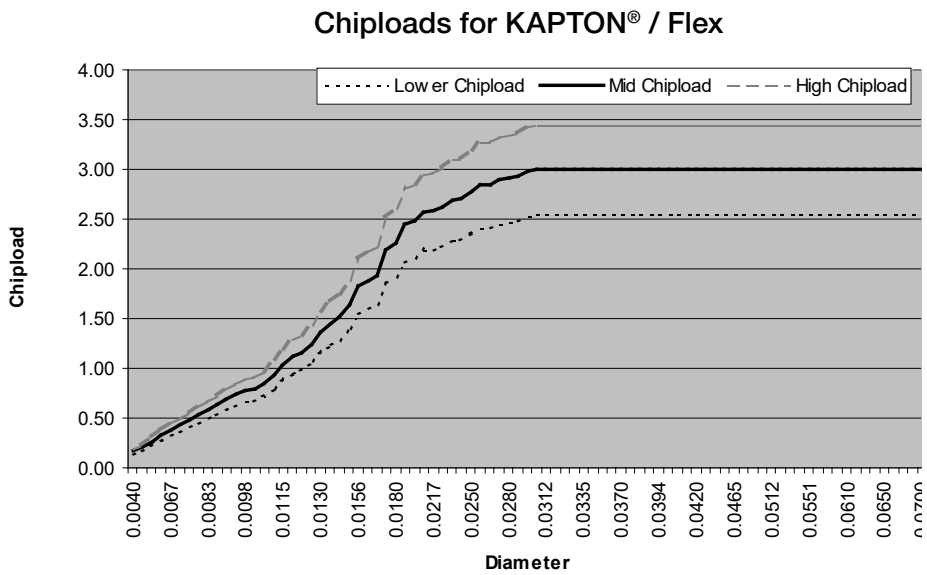
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 55 | 20 | 1000 | -0.018 | 400 | 2.75 | 659 |
| 3.25mm | 0.1280 | 55 | 20 | 1000 | -0.018 | 400 | 2.75 | 670 |
| #30 | 0.1285 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 672 |
| 3.30mm | 0.1299 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 680 |
| 3.35mm | 0.1319 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 690 |
| 3.40mm | 0.1339 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 701 |
| 3.45mm | 0.1358 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 711 |
| #29 | 0.1360 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 712 |
| 3.50mm | 0.1378 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 721 |
| 3.55mm | 0.1398 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 732 |
| #28 | 0.1405 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 735 |
| 9/64 | 0.1406 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 736 |
| 3.60mm | 0.1417 | 55 | 20 | 1000 | -0.019 | 400 | 2.75 | 742 |
| 3.65mm | 0.1437 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 752 |
| #27 | 0.1440 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 754 |
| 3.70mm | 0.1457 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 762 |
| #26 | 0.1470 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 769 |
| 3.75mm | 0.1476 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 772 |
| #25 | 0.1495 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 782 |
| 3.80mm | 0.1496 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 783 |
| 3.85mm | 0.1516 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 793 |
| #24 | 0.1520 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 795 |
| 3.90mm | 0.1535 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 803 |
| #23 | 0.1540 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 806 |
| 3.95 | 0.1555 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 814 |
| 5/32 | 0.1562 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 817 |
| #22 | 0.1570 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 822 |
| 4.00mm | 0.1575 | 55 | 20 | 1000 | -0.020 | 400 | 2.75 | 824 |
| #21 | 0.1590 | 55 | 20 | 1000 | -0.021 | 400 | 2.75 | 832 |
| 4.05mm | 0.1594 | 55 | 20 | 1000 | -0.021 | 400 | 2.75 | 834 |
| #20 | 0.1610 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 843 |
| 4.10mm | 0.1614 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 845 |
| 4.15mm | 0.1634 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 855 |
| 4.20mm | 0.1654 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 866 |
| #19 | 0.1660 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 869 |
| 4.25mm | 0.1673 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 876 |
| 4.30mm | 0.1693 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 886 |
| #18 | 0.1695 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 887 |
| 4.35mm | 0.1713 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 896 |
| 11/64 | 0.1719 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 900 |
| #17 | 0.1730 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 905 |
| 4.40mm | 0.1732 | 55 | 20 | 1000 | -0.021 | 300 | 2.75 | 906 |
| 4.45mm | 0.1752 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 917 |
| #16 | 0.1770 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 926 |
| 4.50mm | 0.1772 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 927 |
| 4.55mm | 0.1792 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 938 |
| #15 | 0.1800 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 942 |
| 4.60mm | 0.1811 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 948 |
| #14 | 0.1820 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 952 |
| 4.65mm | 0.1831 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 958 |
| #13 | 0.1850 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 968 |
| 4.70mm | 0.1850 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 968 |
| 4.75mm | 0.1870 | 55 | 20 | 1000 | -0.022 | 300 | 2.75 | 979 |
| 3/16 | 0.1875 | 50 | 20 | 1000 | -0.022 | 300 | 2.50 | 981 |
| 4.80mm | 0.1890 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 989 |
| #12 | 0.1890 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 989 |
| 4.85mm | 0.1909 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 999 |
| #11 | 0.1910 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1000 |
| 4.90mm | 0.1929 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1010 |
| #10 | 0.1935 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1013 |
| 4.95mm | 0.1949 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1020 |
| #9 | 0.1960 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1026 |
| 5.00mm | 0.1968 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1030 |
| 5.05mm | 0.1988 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1040 |
| #8 | 0.1990 | 50 | 20 | 1000 | -0.023 | 300 | 2.50 | 1041 |
| 5.10mm | 0.2008 | 50 | 20 | 1000 | -0.023 | 200 | 2.50 | 1051 |
| #7 | 0.2010 | 50 | 20 | 1000 | -0.023 | 200 | 2.50 | 1052 |
| 5.15mm | 0.2028 | 50 | 20 | 1000 | -0.023 | 200 | 2.50 | 1061 |
| 13/64 | 0.2031 | 50 | 20 | 1000 | -0.023 | 200 | 2.50 | 1063 |
| #6 | 0.2040 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1068 |
| 5.20mm | 0.2047 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1071 |
| #5 | 0.2055 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1075 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1082 |
| 5.30mm | 0.2087 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1092 |
| #4 | 0.2090 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1094 |
| 5.35mm | 0.2106 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1102 |
| 5.40mm | 0.2126 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1113 |
| #3 | 0.2130 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1115 |
| 5.45mm | 0.2146 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1123 |
| 5.50mm | 0.2165 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1133 |
| 5.55mm | 0.2185 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1143 |
| 7/32 | 0.2188 | 50 | 20 | 1000 | -0.024 | 200 | 2.50 | 1145 |
| 5.60mm | 0.2205 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1154 |
| #2 | 0.2210 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1157 |
| 5.65mm | 0.2224 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1164 |
| 5.70mm | 0.2244 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1174 |
| 5.75mm | 0.2264 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1185 |
| #1 | 0.2280 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1193 |
| 5.80mm | 0.2283 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1195 |
| 5.85mm | 0.2302 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1205 |
| 5.90mm | 0.2323 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1216 |
| A | 0.2340 | 50 | 20 | 1000 | -0.025 | 150 | 2.50 | 1225 |
| 5.95mm | 0.2343 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1226 |
| 15/64 | 0.2344 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1227 |
| 6.00mm | 0.2362 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1236 |
| B | 0.2380 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1246 |
| 6.05mm | 0.2382 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1247 |
| 6.10mm | 0.2402 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1257 |
| C | 0.2420 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1266 |
| 6.15mm | 0.2421 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1267 |
| 6.20mm | 0.2441 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1277 |
| D | 0.2460 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1287 |
| 6.25mm | 0.2461 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1288 |
| 6.30mm | 0.2480 | 50 | 20 | 1000 | -0.026 | 150 | 2.50 | 1298 |
| 6.35mm | 0.2500 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1308 |
| 6.40mm | 0.2520 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1319 |
| 6.50mm | 0.2559 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1339 |
| F | 0.2570 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1345 |
| 6.60mm | 0.2598 | 50 | 20 | 1000 | -0.027 | 150 | 2.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Lexan / Acrylic** PCB Material

## **Recommended Drill Series:** 100, 150

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #80 | 0.0135 | 168 | 42 | 1000 | -0.013 | 2000 | 4.00 | 150 |
| 0.35mm | 0.0138 | 168 | 42 | 1000 | -0.013 | 2000 | 4.00 | 150 |
| #79 | 0.0145 | 168 | 40 | 1000 | -0.013 | 2000 | 4.20 | 150 |
| 1/64 | 0.0156 | 163 | 37 | 1000 | -0.014 | 2000 | 4.40 | 150 |
| 0.40mm | 0.0158 | 162 | 36 | 1000 | -0.014 | 2000 | 4.50 | 150 |
| #78 | 0.0160 | 166 | 36 | 1000 | -0.014 | 2000 | 4.60 | 150 |
| 0.45mm | 0.0177 | 154 | 32 | 1000 | -0.014 | 2000 | 4.80 | 150 |
| #77 | 0.0180 | 160 | 32 | 1000 | -0.014 | 2000 | 5.00 | 150 |
| 0.50mm | 0.0197 | 151 | 29 | 1000 | -0.015 | 2000 | 5.20 | 150 |
| #76 | 0.0200 | 157 | 29 | 1000 | -0.015 | 2000 | 5.40 | 150 |
| #75 | 0.0210 | 151 | 27 | 1000 | -0.015 | 2000 | 5.60 | 150 |
| 0.55mm | 0.0217 | 151 | 26 | 1000 | -0.015 | 2000 | 5.80 | 150 |
| #74 | 0.0225 | 150 | 25 | 1000 | -0.015 | 2000 | 6.00 | 150 |
| 0.60mm | 0.0236 | 149 | 24 | 1000 | -0.016 | 2000 | 6.20 | 150 |
| #73 | 0.0240 | 154 | 24 | 1000 | -0.016 | 2000 | 6.40 | 150 |
| #72 | 0.0250 | 152 | 23 | 1000 | -0.016 | 2000 | 6.60 | 150 |
| 0.65mm | 0.0256 | 150 | 22 | 1000 | -0.016 | 2000 | 6.80 | 150 |
| #71 | 0.0260 | 154 | 22 | 1000 | -0.016 | 2000 | 7.00 | 150 |
| 0.70mm | 0.0276 | 155 | 21 | 1000 | -0.016 | 2000 | 7.40 | 150 |
| #70 | 0.0280 | 152 | 20 | 1000 | -0.017 | 2000 | 7.60 | 150 |
| #69 | 0.0292 | 156 | 20 | 1000 | -0.017 | 2000 | 7.80 | 150 |
| 0.75mm | 0.0295 | 152 | 19 | 1000 | -0.017 | 2000 | 8.00 | 150 |
| #68 | 0.0310 | 148 | 18 | 1000 | -0.017 | 2000 | 8.20 | 150 |
| 1/32 | 0.0312 | 151 | 18 | 1000 | -0.017 | 2000 | 8.40 | 150 |
| 0.80mm | 0.0315 | 155 | 18 | 1000 | -0.017 | 2000 | 8.60 | 150 |
| #67 | 0.0320 | 158 | 18 | 1000 | -0.017 | 2000 | 8.80 | 150 |
| #66 | 0.0330 | 153 | 17 | 1000 | -0.018 | 2000 | 9.00 | 150 |
| 0.85mm | 0.0335 | 156 | 17 | 1000 | -0.018 | 2000 | 9.20 | 150 |
| #65 | 0.0350 | 154 | 16 | 1000 | -0.018 | 2000 | 9.60 | 150 |
| 0.90mm | 0.0354 | 157 | 16 | 1000 | -0.018 | 2000 | 9.80 | 150 |
| #64 | 0.0360 | 160 | 16 | 1000 | -0.018 | 2000 | 10.00 | 150 |
| #63 | 0.0370 | 153 | 15 | 1000 | -0.019 | 2000 | 10.20 | 150 |
| 0.95mm | 0.0374 | 156 | 15 | 1000 | -0.019 | 2000 | 10.40 | 150 |
| #62 | 0.0380 | 159 | 15 | 1000 | -0.019 | 2000 | 10.60 | 150 |
| #61 | 0.0390 | 162 | 15 | 1000 | -0.019 | 2000 | 10.80 | 150 |
| 1.00mm | 0.0394 | 165 | 15 | 1000 | -0.019 | 2000 | 11.00 | 155 |
| #60 | 0.0400 | 168 | 15 | 1000 | -0.019 | 2000 | 11.20 | 157 |
| #59 | 0.0410 | 171 | 15 | 1000 | -0.020 | 2000 | 11.40 | 161 |
| 1.05mm | 0.0413 | 174 | 15 | 1000 | -0.020 | 2000 | 11.60 | 162 |
| #58 | 0.0420 | 177 | 15 | 1000 | -0.020 | 2000 | 11.80 | 165 |
| #57 | 0.0430 | 180 | 15 | 1000 | -0.020 | 2000 | 12.00 | 169 |
| 1.10mm | 0.0433 | 183 | 15 | 1000 | -0.020 | 2000 | 12.20 | 170 |
| 1.15mm | 0.0453 | 189 | 15 | 1000 | -0.021 | 2000 | 12.60 | 178 |
| #56 | 0.0465 | 192 | 15 | 1000 | -0.021 | 2000 | 12.80 | 183 |
| 3/64 | 0.0469 | 195 | 15 | 1000 | -0.021 | 2000 | 13.00 | 184 |
| 1.20mm | 0.0472 | 198 | 15 | 1000 | -0.021 | 2000 | 13.20 | 185 |
| 1.25mm | 0.0492 | 201 | 15 | 1000 | -0.021 | 2000 | 13.40 | 193 |
| 1.30mm | 0.0512 | 207 | 15 | 1000 | -0.022 | 2000 | 13.80 | 201 |
| #55 | 0.0520 | 210 | 15 | 1000 | -0.022 | 2000 | 14.00 | 204 |
| 1.35mm | 0.0531 | 213 | 15 | 1000 | -0.022 | 2000 | 14.20 | 208 |
| #54 | 0.0550 | 219 | 15 | 1000 | -0.023 | 2000 | 14.60 | 216 |
| 1.40mm | 0.0551 | 222 | 15 | 1000 | -0.023 | 2000 | 14.80 | 216 |
| 1.45mm | 0.0571 | 228 | 15 | 1000 | -0.023 | 2000 | 15.20 | 224 |
| 1.50mm | 0.0591 | 234 | 15 | 1000 | -0.024 | 2000 | 15.60 | 232 |
| #53 | 0.0595 | 237 | 15 | 1000 | -0.024 | 2000 | 15.80 | 234 |
| 1.55mm | 0.0610 | 240 | 15 | 1000 | -0.024 | 2000 | 16.00 | 239 |
| 1/16 | 0.0625 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 245 |
| 1.60mm | 0.0630 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 247 |
| #52 | 0.0635 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 249 |
| 1.65mm | 0.0650 | 240 | 15 | 1000 | -0.025 | 2000 | 16.00 | 255 |
| 1.70mm | 0.0669 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 263 |
| #51 | 0.0670 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 263 |
| 1.75mm | 0.0689 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 270 |
| #50 | 0.0700 | 240 | 15 | 1000 | -0.026 | 2000 | 16.00 | 275 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.80mm | 0.0709 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 278 |
| 1.85mm | 0.0728 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 286 |
| #49 | 0.0730 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 287 |
| 1.90mm | 0.0748 | 240 | 15 | 1000 | -0.027 | 2000 | 16.00 | 294 |
| #48 | 0.0760 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 298 |
| 1.95mm | 0.0768 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 301 |
| 5/64 | 0.0781 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 307 |
| #47 | 0.0785 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 308 |
| 2.00mm | 0.0787 | 240 | 15 | 1000 | -0.028 | 2000 | 16.00 | 309 |
| 2.05mm | 0.0807 | 237 | 15 | 1000 | -0.029 | 2000 | 15.80 | 317 |
| #46 | 0.0810 | 234 | 15 | 1000 | -0.029 | 2000 | 15.60 | 318 |
| #45 | 0.0820 | 231 | 15 | 1000 | -0.029 | 2000 | 15.40 | 322 |
| 2.10mm | 0.0827 | 228 | 15 | 1000 | -0.029 | 2000 | 15.20 | 325 |
| 2.15mm | 0.0846 | 222 | 15 | 1000 | -0.030 | 2000 | 14.80 | 332 |
| #44 | 0.0860 | 216 | 15 | 1000 | -0.030 | 2000 | 14.40 | 338 |
| 2.20mm | 0.0866 | 213 | 15 | 1000 | -0.030 | 2000 | 14.20 | 340 |
| 2.25mm | 0.0886 | 207 | 15 | 1000 | -0.031 | 2000 | 13.80 | 348 |
| #43 | 0.0890 | 204 | 15 | 1000 | -0.031 | 2000 | 13.60 | 349 |
| 2.30mm | 0.0906 | 198 | 15 | 1000 | -0.031 | 2000 | 13.20 | 356 |
| 2.35mm | 0.0925 | 192 | 15 | 1000 | -0.032 | 2000 | 12.80 | 363 |
| #42 | 0.0935 | 189 | 15 | 1000 | -0.032 | 2000 | 12.60 | 367 |
| 3/32 | 0.0938 | 183 | 15 | 1000 | -0.032 | 2000 | 12.20 | 368 |
| 2.40mm | 0.0945 | 180 | 15 | 1000 | -0.032 | 2000 | 12.00 | 371 |
| #41 | 0.0960 | 174 | 15 | 1000 | -0.032 | 2000 | 11.60 | 377 |
| 2.45mm | 0.0965 | 171 | 15 | 1000 | -0.033 | 2000 | 11.40 | 379 |
| #40 | 0.0980 | 165 | 15 | 1000 | -0.033 | 2000 | 11.00 | 385 |
| 2.50mm | 0.0984 | 162 | 15 | 1000 | -0.033 | 2000 | 10.80 | 386 |
| #39 | 0.0995 | 159 | 15 | 1000 | -0.033 | 2000 | 10.60 | 391 |
| 2.55mm | 0.1004 | 156 | 15 | 1000 | -0.033 | 2000 | 10.40 | 394 |
| #38 | 0.1015 | 153 | 15 | 1000 | -0.034 | 2000 | 10.20 | 398 |
| 2.60mm | 0.1024 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 402 |
| #37 | 0.1040 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 408 |
| 2.65mm | 0.1043 | 150 | 15 | 1000 | -0.034 | 2000 | 10.00 | 409 |
| 2.70mm | 0.1063 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 417 |
| #36 | 0.1065 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 418 |
| 2.75mm | 0.1083 | 150 | 15 | 1000 | -0.035 | 2000 | 10.00 | 425 |
| 7/64 | 0.1094 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 429 |
| #35 | 0.1100 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 432 |
| 2.80mm | 0.1102 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 433 |
| #34 | 0.1110 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 436 |
| 2.85mm | 0.1122 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 440 |
| #33 | 0.1130 | 150 | 15 | 1000 | -0.036 | 2000 | 10.00 | 444 |
| 2.90mm | 0.1142 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 448 |
| #32 | 0.1160 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 455 |
| 2.95mm | 0.1161 | 150 | 15 | 1000 | -0.037 | 2000 | 10.00 | 456 |
| 3.00mm | 0.1181 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 464 |
| #31 | 0.1200 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 471 |
| 3.05mm | 0.1201 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 471 |
| 3.10mm | 0.1220 | 150 | 15 | 1000 | -0.038 | 2000 | 10.00 | 479 |
| 3.15mm | 0.1240 | 150 | 15 | 1000 | -0.039 | 2000 | 10.00 | 487 |
| 1/8 | 0.1250 | 150 | 15 | 1000 | -0.039 | 2000 | 10.00 | 491 |
| 3.20mm | 0.1260 | 160 | 16 | 1000 | -0.018 | 1500 | 10.00 | 528 |
| 3.25mm | 0.1280 | 160 | 16 | 1000 | -0.018 | 1500 | 10.00 | 536 |
| #30 | 0.1285 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 538 |
| 3.30mm | 0.1299 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 544 |
| 3.35mm | 0.1319 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 552 |
| 3.40mm | 0.1339 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 561 |
| 3.45mm | 0.1358 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 569 |
| #29 | 0.1360 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 569 |
| 3.50mm | 0.1378 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 577 |
| 3.55mm | 0.1398 | 160 | 16 | 1000 | -0.019 | 1500 | 10.00 | 585 |
| #28 | 0.1405 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 625 |
| 9/64 | 0.1406 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 625 |
| 3.60mm | 0.1417 | 170 | 17 | 1000 | -0.019 | 1500 | 10.00 | 630 |
| 3.65mm | 0.1437 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 639 |
| #27 | 0.1440 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 641 |
| 3.70mm | 0.1457 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 648 |
| #26 | 0.1470 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 654 |
| 3.75mm | 0.1476 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 657 |
| #25 | 0.1495 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 665 |
| 3.80mm | 0.1496 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 665 |
| 3.85mm | 0.1516 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 674 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

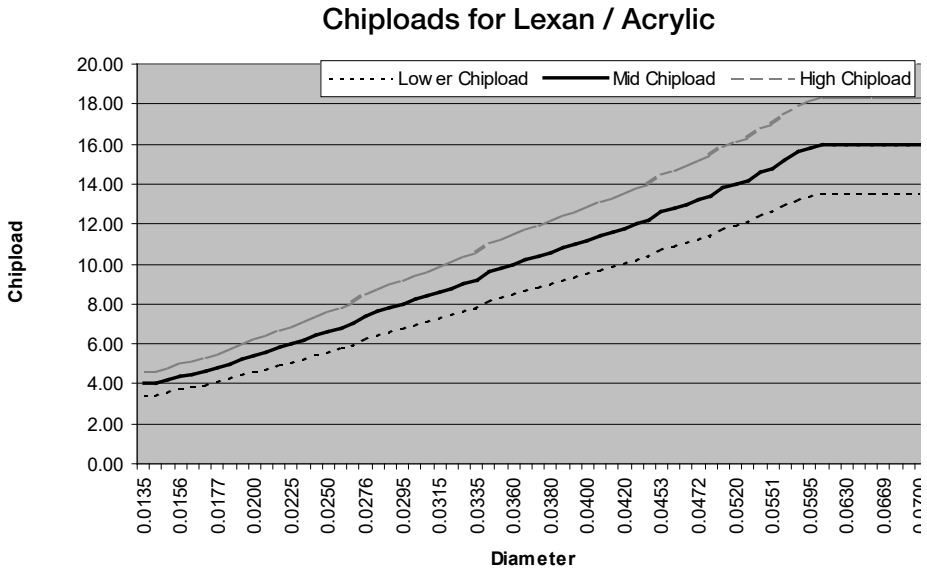
| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #24 | 0.1520 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 676 |
| 3.90mm | 0.1535 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 683 |
| #23 | 0.1540 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 685 |
| 3.95 | 0.1555 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 692 |
| 5/32 | 0.1562 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 695 |
| #22 | 0.1570 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 698 |
| 4.00mm | 0.1575 | 170 | 17 | 1000 | -0.020 | 1500 | 10.00 | 701 |
| #21 | 0.1590 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 749 |
| 4.05mm | 0.1594 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 751 |
| #20 | 0.1610 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 758 |
| 4.10mm | 0.1614 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 760 |
| 4.15mm | 0.1634 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 770 |
| 4.20mm | 0.1654 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 779 |
| #19 | 0.1660 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 782 |
| 4.25mm | 0.1673 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 788 |
| 4.30mm | 0.1693 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 797 |
| #18 | 0.1695 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 798 |
| 4.35mm | 0.1713 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 807 |
| 11/64 | 0.1719 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 810 |
| #17 | 0.1730 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 815 |
| 4.40mm | 0.1732 | 180 | 18 | 1000 | -0.021 | 1500 | 10.00 | 816 |
| 4.45mm | 0.1752 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 825 |
| #16 | 0.1770 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 834 |
| 4.50mm | 0.1772 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 835 |
| 4.55mm | 0.1792 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 844 |
| #15 | 0.1800 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 848 |
| 4.60mm | 0.1811 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 853 |
| #14 | 0.1820 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 857 |
| 4.65mm | 0.1831 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 862 |
| #13 | 0.1850 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 871 |
| 4.70mm | 0.1850 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 871 |
| 4.75mm | 0.1870 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 881 |
| 3/16 | 0.1875 | 180 | 18 | 1000 | -0.022 | 1500 | 10.00 | 883 |
| 4.80mm | 0.1890 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 940 |
| #12 | 0.1890 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 940 |
| 4.85mm | 0.1909 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 949 |
| #11 | 0.1910 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 950 |
| 4.90mm | 0.1929 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 959 |
| #10 | 0.1935 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 962 |
| 4.95mm | 0.1949 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 969 |
| #9 | 0.1960 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 974 |
| 5.00mm | 0.1968 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 978 |
| 5.05mm | 0.1988 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 988 |
| #8 | 0.1990 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 989 |
| 5.10mm | 0.2008 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 998 |
| #7 | 0.2010 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 999 |
| 5.15mm | 0.2028 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 1008 |
| 13/64 | 0.2031 | 190 | 19 | 1000 | -0.023 | 1000 | 10.00 | 1010 |
| #6 | 0.2040 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1014 |
| 5.20mm | 0.2047 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1018 |
| #5 | 0.2055 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1022 |
| 5.25mm | 0.2067 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1028 |
| 5.30mm | 0.2087 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1038 |
| #4 | 0.2090 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1039 |
| 5.35mm | 0.2106 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1047 |
| 5.40mm | 0.2126 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1057 |
| #3 | 0.2130 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1059 |
| 5.45mm | 0.2146 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1067 |
| 5.50mm | 0.2165 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1076 |
| 5.55mm | 0.2185 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1086 |
| 7/32 | 0.2188 | 190 | 19 | 1000 | -0.024 | 1000 | 10.00 | 1088 |
| 5.60mm | 0.2205 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1096 |
| #2 | 0.2210 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1099 |
| 5.65mm | 0.2224 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1106 |
| 5.70mm | 0.2244 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1116 |
| 5.75mm | 0.2264 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1126 |
| #1 | 0.2280 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1134 |
| 5.80mm | 0.2283 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1135 |
| 5.85mm | 0.2302 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1144 |
| 5.90mm | 0.2323 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1155 |
| A | 0.2340 | 190 | 19 | 1000 | -0.025 | 1000 | 10.00 | 1163 |
| 5.95mm | 0.2343 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1165 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 15/64 | 0.2344 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1165 |
| 6.00mm | 0.2362 | 190 | 19 | 1000 | -0.026 | 1000 | 10.00 | 1174 |
| B | 0.2380 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1246 |
| 6.05mm | 0.2382 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1247 |
| 6.10mm | 0.2402 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1257 |
| C | 0.2420 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1266 |
| 6.15mm | 0.2421 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1267 |
| 6.20mm | 0.2441 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1277 |
| D | 0.2460 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1287 |
| 6.25mm | 0.2461 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1288 |
| 6.30mm | 0.2480 | 200 | 20 | 1000 | -0.026 | 1000 | 10.00 | 1298 |
| 6.35mm | 0.2500 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1308 |
| 6.40mm | 0.2520 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1319 |
| 6.50mm | 0.2559 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1339 |
| F | 0.2570 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1345 |
| 6.60mm | 0.2598 | 200 | 20 | 1000 | -0.027 | 1000 | 10.00 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Polyimide** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 27 | 160 | 200 | -0.011 | 200 | 0.17 | 167 |
| 0.13mm | 0.0050 | 32 | 160 | 300 | -0.011 | 250 | 0.20 | 209 |
| 0.15mm | 0.0059 | 34 | 160 | 300 | -0.011 | 250 | 0.21 | 247 |
| #96 | 0.0063 | 35 | 160 | 400 | -0.011 | 300 | 0.22 | 264 |
| #95 | 0.0067 | 37 | 160 | 400 | -0.012 | 300 | 0.23 | 281 |
| #94 | 0.0071 | 40 | 160 | 500 | -0.012 | 300 | 0.25 | 297 |
| #93 | 0.0075 | 42 | 160 | 500 | -0.012 | 300 | 0.26 | 314 |
| #92 | 0.0079 | 45 | 160 | 500 | -0.012 | 400 | 0.28 | 331 |
| #91 | 0.0083 | 46 | 160 | 600 | -0.012 | 400 | 0.29 | 347 |
| #90 | 0.0087 | 47 | 154 | 600 | -0.012 | 400 | 0.31 | 350 |
| #89 | 0.0091 | 48 | 147 | 700 | -0.012 | 400 | 0.33 | 350 |
| #88 | 0.0095 | 50 | 141 | 700 | -0.012 | 500 | 0.35 | 350 |
| 0.25mm | 0.0098 | 52 | 136 | 800 | -0.012 | 500 | 0.38 | 350 |
| #87 | 0.0100 | 54 | 134 | 800 | -0.012 | 500 | 0.40 | 350 |
| #86 | 0.0105 | 55 | 127 | 800 | -0.012 | 500 | 0.43 | 350 |
| #85 | 0.0110 | 57 | 122 | 900 | -0.013 | 500 | 0.47 | 350 |
| #84 | 0.0115 | 58 | 116 | 900 | -0.013 | 500 | 0.50 | 350 |
| 0.30mm | 0.0118 | 61 | 113 | 1000 | -0.013 | 750 | 0.54 | 350 |
| #83 | 0.0120 | 63 | 111 | 1000 | -0.013 | 750 | 0.57 | 350 |
| #82 | 0.0125 | 65 | 107 | 1000 | -0.013 | 750 | 0.61 | 350 |
| #81 | 0.0130 | 70 | 103 | 1000 | -0.013 | 750 | 0.68 | 350 |
| #80 | 0.0135 | 71 | 99 | 1000 | -0.013 | 750 | 0.72 | 350 |
| 0.35mm | 0.0138 | 72 | 97 | 1000 | -0.013 | 750 | 0.74 | 350 |
| #79 | 0.0145 | 72 | 92 | 1000 | -0.013 | 750 | 0.78 | 350 |
| 1/64 | 0.0156 | 73 | 86 | 1000 | -0.014 | 750 | 0.85 | 350 |
| 0.40mm | 0.0158 | 74 | 85 | 1000 | -0.014 | 750 | 0.87 | 350 |
| #78 | 0.0160 | 76 | 84 | 1000 | -0.014 | 750 | 0.90 | 350 |
| 0.45mm | 0.0177 | 74 | 76 | 1000 | -0.014 | 750 | 0.97 | 350 |
| #77 | 0.0180 | 76 | 74 | 1000 | -0.014 | 750 | 1.03 | 350 |
| 0.50mm | 0.0197 | 80 | 68 | 1000 | -0.015 | 750 | 1.18 | 350 |
| #76 | 0.0200 | 82 | 67 | 1000 | -0.015 | 750 | 1.22 | 350 |
| #75 | 0.0210 | 84 | 64 | 1000 | -0.015 | 750 | 1.31 | 350 |
| 0.55mm | 0.0217 | 86 | 62 | 1000 | -0.015 | 750 | 1.39 | 350 |
| #74 | 0.0225 | 88 | 59 | 1000 | -0.015 | 750 | 1.49 | 350 |
| 0.60mm | 0.0236 | 90 | 57 | 1000 | -0.016 | 750 | 1.58 | 350 |
| #73 | 0.0240 | 92 | 56 | 1000 | -0.016 | 750 | 1.64 | 350 |
| #72 | 0.0250 | 95 | 54 | 1000 | -0.016 | 750 | 1.76 | 350 |
| 0.65mm | 0.0256 | 96 | 52 | 1000 | -0.016 | 750 | 1.85 | 350 |
| #71 | 0.0260 | 98 | 51 | 1000 | -0.016 | 750 | 1.92 | 350 |
| 0.70mm | 0.0276 | 102 | 48 | 1000 | -0.016 | 750 | 2.13 | 350 |
| #70 | 0.0280 | 103 | 48 | 1000 | -0.017 | 750 | 2.15 | 350 |
| #69 | 0.0292 | 104 | 46 | 1000 | -0.017 | 750 | 2.26 | 350 |
| 0.75mm | 0.0295 | 105 | 45 | 1000 | -0.017 | 750 | 2.33 | 350 |
| #68 | 0.0310 | 108 | 43 | 1000 | -0.017 | 750 | 2.50 | 350 |
| 1/32 | 0.0312 | 108 | 43 | 1000 | -0.017 | 750 | 2.50 | 350 |
| 0.80mm | 0.0315 | 105 | 42 | 1000 | -0.017 | 750 | 2.50 | 350 |
| #67 | 0.0320 | 105 | 42 | 1000 | -0.017 | 750 | 2.50 | 350 |
| #66 | 0.0330 | 103 | 41 | 1000 | -0.018 | 750 | 2.50 | 350 |
| 0.85mm | 0.0335 | 100 | 40 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #65 | 0.0350 | 95 | 38 | 1000 | -0.018 | 750 | 2.50 | 350 |
| 0.90mm | 0.0354 | 95 | 38 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #64 | 0.0360 | 93 | 37 | 1000 | -0.018 | 750 | 2.50 | 350 |
| #63 | 0.0370 | 90 | 36 | 1000 | -0.019 | 750 | 2.50 | 350 |
| 0.95mm | 0.0374 | 90 | 36 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #62 | 0.0380 | 88 | 35 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #61 | 0.0390 | 85 | 34 | 1000 | -0.019 | 750 | 2.50 | 350 |
| 1.00mm | 0.0394 | 85 | 34 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #60 | 0.0400 | 83 | 33 | 1000 | -0.019 | 750 | 2.50 | 350 |
| #59 | 0.0410 | 83 | 33 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.05mm | 0.0413 | 80 | 32 | 1000 | -0.020 | 750 | 2.50 | 350 |
| #58 | 0.0420 | 80 | 32 | 1000 | -0.020 | 750 | 2.50 | 350 |
| #57 | 0.0430 | 78 | 31 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.10mm | 0.0433 | 78 | 31 | 1000 | -0.020 | 750 | 2.50 | 350 |
| 1.15mm | 0.0453 | 75 | 30 | 1000 | -0.021 | 750 | 2.50 | 350 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 73 | 29 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 3/64 | 0.0469 | 70 | 28 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.20mm | 0.0472 | 70 | 28 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.25mm | 0.0492 | 68 | 27 | 1000 | -0.021 | 750 | 2.50 | 350 |
| 1.30mm | 0.0512 | 65 | 26 | 1000 | -0.022 | 750 | 2.50 | 350 |
| #55 | 0.0520 | 65 | 26 | 1000 | -0.022 | 750 | 2.50 | 350 |
| 1.35mm | 0.0531 | 63 | 25 | 1000 | -0.022 | 750 | 2.50 | 350 |
| #54 | 0.0550 | 60 | 24 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.40mm | 0.0551 | 60 | 24 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.45mm | 0.0571 | 58 | 23 | 1000 | -0.023 | 750 | 2.50 | 350 |
| 1.50mm | 0.0591 | 58 | 23 | 1000 | -0.024 | 750 | 2.50 | 350 |
| #53 | 0.0595 | 55 | 22 | 1000 | -0.024 | 750 | 2.50 | 350 |
| 1.55mm | 0.0610 | 55 | 22 | 1000 | -0.024 | 750 | 2.50 | 350 |
| 1/16 | 0.0625 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.60mm | 0.0630 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| #52 | 0.0635 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.65mm | 0.0650 | 53 | 21 | 1000 | -0.025 | 750 | 2.50 | 350 |
| 1.70mm | 0.0669 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 350 |
| #51 | 0.0670 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 350 |
| 1.75mm | 0.0689 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 361 |
| #50 | 0.0700 | 50 | 20 | 1000 | -0.026 | 750 | 2.50 | 366 |
| 1.80mm | 0.0709 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 371 |
| 1.85mm | 0.0728 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 381 |
| #49 | 0.0730 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 382 |
| 1.90mm | 0.0748 | 50 | 20 | 1000 | -0.027 | 500 | 2.50 | 391 |
| #48 | 0.0760 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 398 |
| 1.95mm | 0.0768 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 402 |
| 5/64 | 0.0781 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 409 |
| #47 | 0.0785 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 411 |
| 2.00mm | 0.0787 | 50 | 20 | 1000 | -0.028 | 500 | 2.50 | 412 |
| 2.05mm | 0.0807 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 422 |
| #46 | 0.0810 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 424 |
| #45 | 0.0820 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 429 |
| 2.10mm | 0.0827 | 50 | 20 | 1000 | -0.029 | 500 | 2.50 | 433 |
| 2.15mm | 0.0846 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 443 |
| #44 | 0.0860 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 450 |
| 2.20mm | 0.0866 | 50 | 20 | 1000 | -0.030 | 500 | 2.50 | 453 |
| 2.25mm | 0.0886 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 464 |
| #43 | 0.0890 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 466 |
| 2.30mm | 0.0906 | 50 | 20 | 1000 | -0.031 | 500 | 2.50 | 474 |
| 2.35mm | 0.0925 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 484 |
| #42 | 0.0935 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 489 |
| 3/32 | 0.0938 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 491 |
| 2.40mm | 0.0945 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 495 |
| #41 | 0.0960 | 50 | 20 | 1000 | -0.032 | 500 | 2.50 | 502 |
| 2.45mm | 0.0965 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 505 |
| #40 | 0.0980 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 513 |
| 2.50mm | 0.0984 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 515 |
| #39 | 0.0995 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 521 |
| 2.55mm | 0.1004 | 50 | 20 | 1000 | -0.033 | 500 | 2.50 | 525 |
| #38 | 0.1015 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 531 |
| 2.60mm | 0.1024 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 536 |
| #37 | 0.1040 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 544 |
| 2.65mm | 0.1043 | 50 | 20 | 1000 | -0.034 | 500 | 2.50 | 546 |
| 2.70mm | 0.1063 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 556 |
| #36 | 0.1065 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 557 |
| 2.75mm | 0.1083 | 50 | 20 | 1000 | -0.035 | 500 | 2.50 | 567 |
| 7/64 | 0.1094 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 573 |
| #35 | 0.1100 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 576 |
| 2.80mm | 0.1102 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 577 |
| #34 | 0.1110 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 581 |
| 2.85mm | 0.1122 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 587 |
| #33 | 0.1130 | 50 | 20 | 1000 | -0.036 | 500 | 2.50 | 591 |
| 2.90mm | 0.1142 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 598 |
| #32 | 0.1160 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 607 |
| 2.95mm | 0.1161 | 50 | 20 | 1000 | -0.037 | 500 | 2.50 | 608 |
| 3.00mm | 0.1181 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 618 |
| #31 | 0.1200 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 628 |
| 3.05mm | 0.1201 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 629 |
| 3.10mm | 0.1220 | 50 | 20 | 1000 | -0.038 | 500 | 2.50 | 638 |
| 3.15mm | 0.1240 | 50 | 20 | 1000 | -0.039 | 500 | 2.50 | 649 |
| 1/8 | 0.1250 | 50 | 20 | 1000 | -0.039 | 500 | 2.50 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 40 | 20 | 1000 | -0.018 | 400 | 2.00 | 659 |
| 3.25mm | 0.1280 | 40 | 20 | 1000 | -0.018 | 400 | 2.00 | 670 |
| #30 | 0.1285 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 672 |
| 3.30mm | 0.1299 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 680 |
| 3.35mm | 0.1319 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 690 |
| 3.40mm | 0.1339 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 701 |
| 3.45mm | 0.1358 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 711 |
| #29 | 0.1360 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 712 |
| 3.50mm | 0.1378 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 721 |
| 3.55mm | 0.1398 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 732 |
| #28 | 0.1405 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 735 |
| 9/64 | 0.1406 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 736 |
| 3.60mm | 0.1417 | 40 | 20 | 1000 | -0.019 | 400 | 2.00 | 742 |
| 3.65mm | 0.1437 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 752 |
| #27 | 0.1440 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 754 |
| 3.70mm | 0.1457 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 762 |
| #26 | 0.1470 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 769 |
| 3.75mm | 0.1476 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 772 |
| #25 | 0.1495 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 782 |
| 3.80mm | 0.1496 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 783 |
| 3.85mm | 0.1516 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 793 |
| #24 | 0.1520 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 795 |
| 3.90mm | 0.1535 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 803 |
| #23 | 0.1540 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 806 |
| 3.95 | 0.1555 | 40 | 20 | 1000 | -0.020 | 400 | 2.00 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 400 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 300 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 300 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 300 | 1.50 | 981 |
| 4.80mm | 0.1890 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 989 |
| #12 | 0.1890 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 989 |
| 4.85mm | 0.1909 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 999 |
| #11 | 0.1910 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1000 |
| 4.90mm | 0.1929 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1010 |
| #10 | 0.1935 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1013 |
| 4.95mm | 0.1949 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1020 |
| #9 | 0.1960 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1026 |
| 5.00mm | 0.1968 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1030 |
| 5.05mm | 0.1988 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1040 |
| #8 | 0.1990 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1041 |
| 5.10mm | 0.2008 | 25 | 20 | 1000 | -0.023 | 300 | 1.25 | 1051 |
| #7 | 0.2010 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1052 |
| 5.15mm | 0.2028 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1061 |
| 13/64 | 0.2031 | 23 | 20 | 1000 | -0.023 | 250 | 1.15 | 1063 |
| #6 | 0.2040 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1068 |
| 5.20mm | 0.2047 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1071 |
| #5 | 0.2055 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1075 |

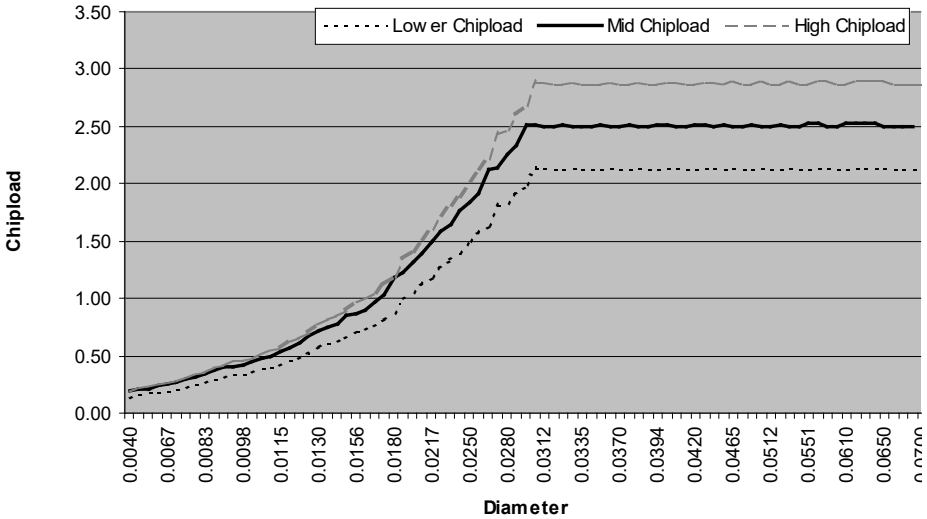
Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1082 |
| 5.30mm | 0.2087 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1092 |
| #4 | 0.2090 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1094 |
| 5.35mm | 0.2106 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1102 |
| 5.40mm | 0.2126 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1113 |
| #3 | 0.2130 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1115 |
| 5.45mm | 0.2146 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1123 |
| 5.50mm | 0.2165 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1133 |
| 5.55mm | 0.2185 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1143 |
| 7/32 | 0.2188 | 23 | 20 | 1000 | -0.024 | 250 | 1.15 | 1145 |
| 5.60mm | 0.2205 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1154 |
| #2 | 0.2210 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1157 |
| 5.65mm | 0.2224 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1164 |
| 5.70mm | 0.2244 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1174 |
| 5.75mm | 0.2264 | 23 | 20 | 1000 | -0.025 | 250 | 1.15 | 1185 |
| #1 | 0.2280 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1193 |
| 5.80mm | 0.2283 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1195 |
| 5.85mm | 0.2302 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1205 |
| 5.90mm | 0.2323 | 23 | 20 | 1000 | -0.025 | 200 | 1.15 | 1216 |
| A | 0.2340 | 23 | 20 | 1000 | -0.025 | 150 | 1.15 | 1225 |
| 5.95mm | 0.2343 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1226 |
| 15/64 | 0.2344 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1227 |
| 6.00mm | 0.2362 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1236 |
| B | 0.2380 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1246 |
| 6.05mm | 0.2382 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1247 |
| 6.10mm | 0.2402 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1257 |
| C | 0.2420 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1266 |
| 6.15mm | 0.2421 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1267 |
| 6.20mm | 0.2441 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1277 |
| D | 0.2460 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1287 |
| 6.25mm | 0.2461 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1288 |
| 6.30mm | 0.2480 | 23 | 20 | 1000 | -0.026 | 150 | 1.15 | 1298 |
| 6.35mm | 0.2500 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1308 |
| 6.40mm | 0.2520 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1319 |
| 6.50mm | 0.2559 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1339 |
| F | 0.2570 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1345 |
| 6.60mm | 0.2598 | 23 | 20 | 1000 | -0.027 | 150 | 1.15 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for Polyimide




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# Slot Drilling FR-4 PCB Material

## Recommended Drill Series: 100, 150, 700, 750

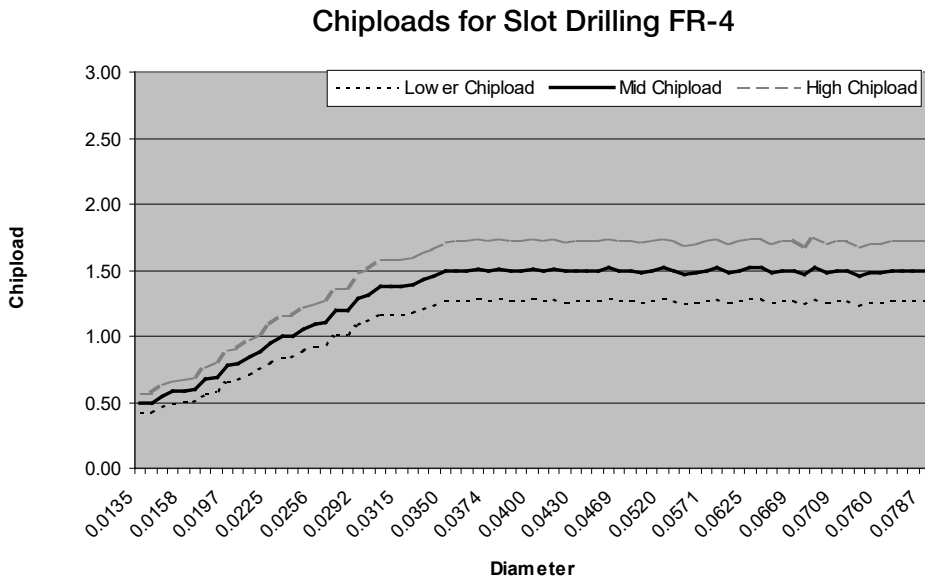
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| #80 | 0.0135 | 50 | 100 | 1000 | -0.013 | 3000 | 0.50 | 353 |
| 0.35mm | 0.0138 | 50 | 100 | 1000 | -0.013 | 3000 | 0.50 | 361 |
| #79 | 0.0145 | 55 | 100 | 1000 | -0.013 | 3000 | 0.55 | 379 |
| 1/64 | 0.0156 | 58 | 100 | 1000 | -0.014 | 3000 | 0.58 | 408 |
| 0.40mm | 0.0158 | 59 | 100 | 1000 | -0.014 | 3000 | 0.59 | 413 |
| #78 | 0.0160 | 60 | 100 | 1000 | -0.014 | 3000 | 0.60 | 419 |
| 0.45mm | 0.0177 | 65 | 97 | 1000 | -0.014 | 3000 | 0.67 | 450 |
| #77 | 0.0180 | 66 | 95 | 1000 | -0.014 | 3000 | 0.69 | 450 |
| 0.50mm | 0.0197 | 68 | 87 | 1000 | -0.015 | 3000 | 0.78 | 450 |
| #76 | 0.0200 | 68 | 86 | 1000 | -0.015 | 3000 | 0.79 | 450 |
| #75 | 0.0210 | 69 | 82 | 1000 | -0.015 | 3000 | 0.84 | 450 |
| 0.55mm | 0.0217 | 70 | 79 | 1000 | -0.015 | 3000 | 0.89 | 450 |
| #74 | 0.0225 | 72 | 76 | 1000 | -0.015 | 3000 | 0.95 | 450 |
| 0.60mm | 0.0236 | 73 | 73 | 1000 | -0.016 | 3000 | 1.00 | 450 |
| #73 | 0.0240 | 72 | 72 | 1000 | -0.016 | 3000 | 1.00 | 450 |
| #72 | 0.0250 | 73 | 69 | 1000 | -0.016 | 3000 | 1.06 | 450 |
| 0.65mm | 0.0256 | 74 | 68 | 1000 | -0.016 | 3000 | 1.09 | 450 |
| #71 | 0.0260 | 74 | 67 | 1000 | -0.016 | 3000 | 1.10 | 450 |
| 0.70mm | 0.0276 | 75 | 63 | 1000 | -0.016 | 3000 | 1.19 | 450 |
| #70 | 0.0280 | 75 | 63 | 1000 | -0.017 | 3000 | 1.19 | 450 |
| #69 | 0.0292 | 76 | 59 | 1000 | -0.017 | 3000 | 1.29 | 450 |
| 0.75mm | 0.0295 | 76 | 58 | 1000 | -0.017 | 3000 | 1.31 | 450 |
| #68 | 0.0310 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| 1/32 | 0.0312 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| 0.80mm | 0.0315 | 76 | 55 | 1000 | -0.017 | 3000 | 1.38 | 450 |
| #67 | 0.0320 | 75 | 54 | 1000 | -0.017 | 3000 | 1.39 | 450 |
| #66 | 0.0330 | 74 | 52 | 1000 | -0.018 | 3000 | 1.42 | 450 |
| 0.85mm | 0.0335 | 74 | 51 | 1000 | -0.018 | 3000 | 1.45 | 450 |
| #65 | 0.0350 | 73 | 49 | 1000 | -0.018 | 3000 | 1.49 | 450 |
| 0.90mm | 0.0354 | 72 | 48 | 1000 | -0.018 | 3000 | 1.50 | 450 |
| #64 | 0.0360 | 72 | 48 | 1000 | -0.018 | 3000 | 1.50 | 450 |
| #63 | 0.0370 | 71 | 47 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| 0.95mm | 0.0374 | 69 | 46 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #62 | 0.0380 | 68 | 45 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #61 | 0.0390 | 66 | 44 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| 1.00mm | 0.0394 | 66 | 44 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #60 | 0.0400 | 65 | 43 | 1000 | -0.019 | 3000 | 1.50 | 450 |
| #59 | 0.0410 | 63 | 42 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.05mm | 0.0413 | 62 | 41 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| #58 | 0.0420 | 61 | 41 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| #57 | 0.0430 | 60 | 40 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.10mm | 0.0433 | 60 | 40 | 1000 | -0.020 | 3000 | 1.50 | 450 |
| 1.15mm | 0.0453 | 57 | 38 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| #56 | 0.0465 | 56 | 37 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 3/64 | 0.0469 | 54 | 36 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.20mm | 0.0472 | 54 | 36 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.25mm | 0.0492 | 52 | 35 | 1000 | -0.021 | 3000 | 1.50 | 450 |
| 1.30mm | 0.0512 | 51 | 34 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| #55 | 0.0520 | 50 | 33 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| 1.35mm | 0.0531 | 48 | 32 | 1000 | -0.022 | 3000 | 1.50 | 450 |
| #54 | 0.0550 | 47 | 32 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.40mm | 0.0551 | 46 | 31 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.45mm | 0.0571 | 45 | 30 | 1000 | -0.023 | 3000 | 1.50 | 450 |
| 1.50mm | 0.0591 | 44 | 29 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| #53 | 0.0595 | 43 | 29 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| 1.55mm | 0.0610 | 42 | 28 | 1000 | -0.024 | 3000 | 1.50 | 450 |
| 1/16 | 0.0625 | 41 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.60mm | 0.0630 | 41 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| #52 | 0.0635 | 40 | 27 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.65mm | 0.0650 | 39 | 26 | 1000 | -0.025 | 3000 | 1.50 | 450 |
| 1.70mm | 0.0669 | 39 | 26 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| #51 | 0.0670 | 38 | 26 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| 1.75mm | 0.0689 | 38 | 25 | 1000 | -0.026 | 3000 | 1.50 | 450 |
| #50 | 0.0700 | 37 | 25 | 1000 | -0.026 | 3000 | 1.50 | 450 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 1.80mm | 0.0709 | 36 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| 1.85mm | 0.0728 | 36 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| #49 | 0.0730 | 35 | 24 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| 1.90mm | 0.0748 | 34 | 23 | 1000 | -0.027 | 3000 | 1.50 | 450 |
| #48 | 0.0760 | 34 | 23 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 1.95mm | 0.0768 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 5/64 | 0.0781 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| #47 | 0.0785 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |
| 2.00mm | 0.0787 | 33 | 22 | 1000 | -0.028 | 3000 | 1.50 | 450 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Aramid** PCB Material

## **Recommended Drill Series:** 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 46 | 160 | 200 | -0.011 | 1000 | 0.29 | 167 |
| 0.13mm | 0.0050 | 50 | 160 | 300 | -0.011 | 1000 | 0.31 | 209 |
| 0.15mm | 0.0059 | 54 | 160 | 300 | -0.011 | 1000 | 0.34 | 247 |
| #96 | 0.0063 | 58 | 160 | 400 | -0.011 | 1000 | 0.36 | 264 |
| #95 | 0.0067 | 62 | 160 | 400 | -0.012 | 1000 | 0.39 | 281 |
| #94 | 0.0071 | 66 | 160 | 500 | -0.012 | 1000 | 0.41 | 297 |
| #93 | 0.0075 | 70 | 160 | 500 | -0.012 | 1000 | 0.44 | 314 |
| #92 | 0.0079 | 74 | 160 | 500 | -0.012 | 1000 | 0.46 | 331 |
| #91 | 0.0083 | 76 | 157 | 600 | -0.012 | 1200 | 0.48 | 340 |
| #90 | 0.0087 | 78 | 149 | 600 | -0.012 | 1200 | 0.52 | 340 |
| #89 | 0.0091 | 80 | 143 | 700 | -0.012 | 1200 | 0.56 | 340 |
| #88 | 0.0095 | 82 | 137 | 700 | -0.012 | 1200 | 0.60 | 340 |
| 0.25mm | 0.0098 | 84 | 133 | 800 | -0.012 | 1200 | 0.63 | 340 |
| #87 | 0.0100 | 86 | 130 | 800 | -0.012 | 1200 | 0.66 | 340 |
| #86 | 0.0105 | 88 | 124 | 800 | -0.012 | 1500 | 0.71 | 340 |
| #85 | 0.0110 | 90 | 118 | 900 | -0.013 | 1500 | 0.76 | 340 |
| #84 | 0.0115 | 95 | 113 | 900 | -0.013 | 1500 | 0.84 | 340 |
| 0.30mm | 0.0118 | 98 | 110 | 1000 | -0.013 | 1500 | 0.89 | 340 |
| #83 | 0.0120 | 100 | 108 | 1000 | -0.013 | 1500 | 0.93 | 340 |
| #82 | 0.0125 | 102 | 104 | 1000 | -0.013 | 1500 | 0.98 | 340 |
| #81 | 0.0130 | 104 | 100 | 1000 | -0.013 | 1500 | 1.04 | 340 |
| #80 | 0.0135 | 106 | 96 | 1000 | -0.013 | 1500 | 1.10 | 340 |
| 0.35mm | 0.0138 | 108 | 94 | 1000 | -0.013 | 1500 | 1.15 | 340 |
| #79 | 0.0145 | 109 | 90 | 1000 | -0.013 | 1500 | 1.21 | 340 |
| 1/64 | 0.0156 | 107 | 83 | 1000 | -0.014 | 1500 | 1.29 | 340 |
| 0.40mm | 0.0158 | 107 | 82 | 1000 | -0.014 | 1500 | 1.30 | 340 |
| #78 | 0.0160 | 107 | 81 | 1000 | -0.014 | 1500 | 1.32 | 340 |
| 0.45mm | 0.0177 | 105 | 73 | 1000 | -0.014 | 1500 | 1.44 | 340 |
| #77 | 0.0180 | 105 | 72 | 1000 | -0.014 | 1500 | 1.46 | 340 |
| 0.50mm | 0.0197 | 98 | 66 | 1000 | -0.015 | 1500 | 1.48 | 340 |
| #76 | 0.0200 | 96 | 65 | 1000 | -0.015 | 1500 | 1.48 | 340 |
| #75 | 0.0210 | 93 | 62 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| 0.55mm | 0.0217 | 90 | 60 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| #74 | 0.0225 | 87 | 58 | 1000 | -0.015 | 1500 | 1.50 | 340 |
| 0.60mm | 0.0236 | 82 | 55 | 1000 | -0.016 | 1500 | 1.49 | 340 |
| #73 | 0.0240 | 81 | 54 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #72 | 0.0250 | 78 | 52 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| 0.65mm | 0.0256 | 76 | 51 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #71 | 0.0260 | 75 | 50 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| 0.70mm | 0.0276 | 71 | 47 | 1000 | -0.016 | 1500 | 1.50 | 340 |
| #70 | 0.0280 | 69 | 46 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #69 | 0.0292 | 66 | 44 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 0.75mm | 0.0295 | 66 | 44 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #68 | 0.0310 | 63 | 42 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 1/32 | 0.0312 | 63 | 42 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| 0.80mm | 0.0315 | 61 | 41 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #67 | 0.0320 | 61 | 41 | 1000 | -0.017 | 1500 | 1.50 | 340 |
| #66 | 0.0330 | 59 | 39 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| 0.85mm | 0.0335 | 59 | 39 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #65 | 0.0350 | 56 | 37 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| 0.90mm | 0.0354 | 56 | 37 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #64 | 0.0360 | 54 | 36 | 1000 | -0.018 | 1500 | 1.50 | 340 |
| #63 | 0.0370 | 53 | 35 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| 0.95mm | 0.0374 | 51 | 34 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #62 | 0.0380 | 51 | 34 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #61 | 0.0390 | 49 | 33 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| 1.00mm | 0.0394 | 49 | 33 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #60 | 0.0400 | 48 | 32 | 1000 | -0.019 | 1500 | 1.50 | 340 |
| #59 | 0.0410 | 48 | 32 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.05mm | 0.0413 | 46 | 31 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| #58 | 0.0420 | 46 | 31 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| #57 | 0.0430 | 45 | 30 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.10mm | 0.0433 | 45 | 30 | 1000 | -0.020 | 1500 | 1.50 | 340 |
| 1.15mm | 0.0453 | 43 | 29 | 1000 | -0.021 | 1500 | 1.50 | 340 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 3/64 | 0.0469 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.20mm | 0.0472 | 42 | 28 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.25mm | 0.0492 | 39 | 26 | 1000 | -0.021 | 1500 | 1.50 | 340 |
| 1.30mm | 0.0512 | 38 | 25 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| #55 | 0.0520 | 38 | 25 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| 1.35mm | 0.0531 | 36 | 24 | 1000 | -0.022 | 1500 | 1.50 | 340 |
| #54 | 0.0550 | 36 | 24 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.40mm | 0.0551 | 36 | 24 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.45mm | 0.0571 | 35 | 23 | 1000 | -0.023 | 1500 | 1.50 | 340 |
| 1.50mm | 0.0591 | 33 | 22 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| #53 | 0.0595 | 33 | 22 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| 1.55mm | 0.0610 | 32 | 21 | 1000 | -0.024 | 1500 | 1.50 | 340 |
| 1/16 | 0.0625 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.60mm | 0.0630 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| #52 | 0.0635 | 32 | 21 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.65mm | 0.0650 | 30 | 20 | 1000 | -0.025 | 1500 | 1.50 | 340 |
| 1.70mm | 0.0669 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 350 |
| #51 | 0.0670 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 351 |
| 1.75mm | 0.0689 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 361 |
| #50 | 0.0700 | 30 | 20 | 1000 | -0.026 | 1500 | 1.50 | 366 |
| 1.80mm | 0.0709 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 371 |
| 1.85mm | 0.0728 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 381 |
| #49 | 0.0730 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 382 |
| 1.90mm | 0.0748 | 30 | 20 | 1000 | -0.027 | 1500 | 1.50 | 391 |
| #48 | 0.0760 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 398 |
| 1.95mm | 0.0768 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 402 |
| 5/64 | 0.0781 | 30 | 20 | 1000 | -0.028 | 1500 | 1.50 | 409 |
| #47 | 0.0785 | 30 | 20 | 1000 | -0.028 | 1200 | 1.50 | 411 |
| 2.00mm | 0.0787 | 30 | 20 | 1000 | -0.028 | 1200 | 1.50 | 412 |
| 2.05mm | 0.0807 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 422 |
| #46 | 0.0810 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 424 |
| #45 | 0.0820 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 429 |
| 2.10mm | 0.0827 | 30 | 20 | 1000 | -0.029 | 1200 | 1.50 | 433 |
| 2.15mm | 0.0846 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 443 |
| #44 | 0.0860 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 450 |
| 2.20mm | 0.0866 | 30 | 20 | 1000 | -0.030 | 1200 | 1.50 | 453 |
| 2.25mm | 0.0886 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 464 |
| #43 | 0.0890 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 466 |
| 2.30mm | 0.0906 | 30 | 20 | 1000 | -0.031 | 1200 | 1.50 | 474 |
| 2.35mm | 0.0925 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 484 |
| #42 | 0.0935 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 489 |
| 3/32 | 0.0938 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 491 |
| 2.40mm | 0.0945 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 495 |
| #41 | 0.0960 | 30 | 20 | 1000 | -0.032 | 1200 | 1.50 | 502 |
| 2.45mm | 0.0965 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 505 |
| #40 | 0.0980 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 513 |
| 2.50mm | 0.0984 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 515 |
| #39 | 0.0995 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 521 |
| 2.55mm | 0.1004 | 30 | 20 | 1000 | -0.033 | 1200 | 1.50 | 525 |
| #38 | 0.1015 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 531 |
| 2.60mm | 0.1024 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 536 |
| #37 | 0.1040 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 544 |
| 2.65mm | 0.1043 | 30 | 20 | 1000 | -0.034 | 1200 | 1.50 | 546 |
| 2.70mm | 0.1063 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 556 |
| #36 | 0.1065 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 557 |
| 2.75mm | 0.1083 | 30 | 20 | 1000 | -0.035 | 1200 | 1.50 | 567 |
| 7/64 | 0.1094 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 573 |
| #35 | 0.1100 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 576 |
| 2.80mm | 0.1102 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 577 |
| #34 | 0.1110 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 581 |
| 2.85mm | 0.1122 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 587 |
| #33 | 0.1130 | 30 | 20 | 1000 | -0.036 | 1200 | 1.50 | 591 |
| 2.90mm | 0.1142 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 598 |
| #32 | 0.1160 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 607 |
| 2.95mm | 0.1161 | 30 | 20 | 1000 | -0.037 | 1200 | 1.50 | 608 |
| 3.00mm | 0.1181 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 618 |
| #31 | 0.1200 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 628 |
| 3.05mm | 0.1201 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 629 |
| 3.10mm | 0.1220 | 30 | 20 | 1000 | -0.038 | 1200 | 1.50 | 638 |
| 3.15mm | 0.1240 | 30 | 20 | 1000 | -0.039 | 1200 | 1.50 | 649 |
| 1/8 | 0.1250 | 30 | 20 | 1000 | -0.039 | 1200 | 1.50 | 654 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

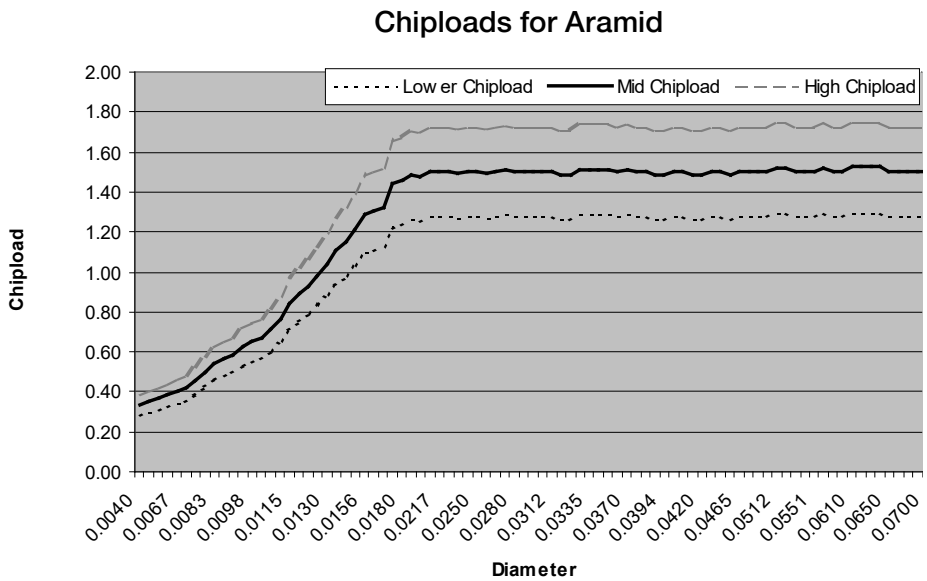
| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 30 | 20 | 1000 | -0.018 | 1000 | 1.50 | 659 |
| 3.25mm | 0.1280 | 30 | 20 | 1000 | -0.018 | 1000 | 1.50 | 670 |
| #30 | 0.1285 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 672 |
| 3.30mm | 0.1299 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 680 |
| 3.35mm | 0.1319 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 690 |
| 3.40mm | 0.1339 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 701 |
| 3.45mm | 0.1358 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 711 |
| #29 | 0.1360 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 712 |
| 3.50mm | 0.1378 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 721 |
| 3.55mm | 0.1398 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 732 |
| #28 | 0.1405 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 735 |
| 9/64 | 0.1406 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 736 |
| 3.60mm | 0.1417 | 30 | 20 | 1000 | -0.019 | 1000 | 1.50 | 742 |
| 3.65mm | 0.1437 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 752 |
| #27 | 0.1440 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 754 |
| 3.70mm | 0.1457 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 762 |
| #26 | 0.1470 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 769 |
| 3.75mm | 0.1476 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 772 |
| #25 | 0.1495 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 782 |
| 3.80mm | 0.1496 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 783 |
| 3.85mm | 0.1516 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 793 |
| #24 | 0.1520 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 795 |
| 3.90mm | 0.1535 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 803 |
| #23 | 0.1540 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 806 |
| 3.95 | 0.1555 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 814 |
| 5/32 | 0.1562 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 817 |
| #22 | 0.1570 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 822 |
| 4.00mm | 0.1575 | 30 | 20 | 1000 | -0.020 | 1000 | 1.50 | 824 |
| #21 | 0.1590 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 832 |
| 4.05mm | 0.1594 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 834 |
| #20 | 0.1610 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 843 |
| 4.10mm | 0.1614 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 845 |
| 4.15mm | 0.1634 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 855 |
| 4.20mm | 0.1654 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 866 |
| #19 | 0.1660 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 869 |
| 4.25mm | 0.1673 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 876 |
| 4.30mm | 0.1693 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 886 |
| #18 | 0.1695 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 887 |
| 4.35mm | 0.1713 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 896 |
| 11/64 | 0.1719 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 900 |
| #17 | 0.1730 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 905 |
| 4.40mm | 0.1732 | 30 | 20 | 1000 | -0.021 | 800 | 1.50 | 906 |
| 4.45mm | 0.1752 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 917 |
| #16 | 0.1770 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 926 |
| 4.50mm | 0.1772 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 927 |
| 4.55mm | 0.1792 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 938 |
| #15 | 0.1800 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 942 |
| 4.60mm | 0.1811 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 948 |
| #14 | 0.1820 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 952 |
| 4.65mm | 0.1831 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 958 |
| #13 | 0.1850 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 968 |
| 4.70mm | 0.1850 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 968 |
| 4.75mm | 0.1870 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 979 |
| 3/16 | 0.1875 | 30 | 20 | 1000 | -0.022 | 800 | 1.50 | 981 |
| 4.80mm | 0.1890 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 989 |
| #12 | 0.1890 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 989 |
| 4.85mm | 0.1909 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 999 |
| #11 | 0.1910 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1000 |
| 4.90mm | 0.1929 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1010 |
| #10 | 0.1935 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1013 |
| 4.95mm | 0.1949 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1020 |
| #9 | 0.1960 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1026 |
| 5.00mm | 0.1968 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1030 |
| 5.05mm | 0.1988 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1040 |
| #8 | 0.1990 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1041 |
| 5.10mm | 0.2008 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1051 |
| #7 | 0.2010 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1052 |
| 5.15mm | 0.2028 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1061 |
| 13/64 | 0.2031 | 30 | 20 | 1000 | -0.023 | 600 | 1.50 | 1063 |
| #6 | 0.2040 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1068 |
| 5.20mm | 0.2047 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1071 |
| #5 | 0.2055 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1075 |

Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1082 |
| 5.30mm | 0.2087 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1092 |
| #4 | 0.2090 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1094 |
| 5.35mm | 0.2106 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1102 |
| 5.40mm | 0.2126 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1113 |
| #3 | 0.2130 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1115 |
| 5.45mm | 0.2146 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1123 |
| 5.50mm | 0.2165 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1133 |
| 5.55mm | 0.2185 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1143 |
| 7/32 | 0.2188 | 30 | 20 | 1000 | -0.024 | 600 | 1.50 | 1145 |
| 5.60mm | 0.2205 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1154 |
| #2 | 0.2210 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1157 |
| 5.65mm | 0.2224 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1164 |
| 5.70mm | 0.2244 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1174 |
| 5.75mm | 0.2264 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1185 |
| #1 | 0.2280 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1193 |
| 5.80mm | 0.2283 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1195 |
| 5.85mm | 0.2302 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1205 |
| 5.90mm | 0.2323 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1216 |
| A | 0.2340 | 30 | 20 | 1000 | -0.025 | 600 | 1.50 | 1225 |
| 5.95mm | 0.2343 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1226 |
| 15/64 | 0.2344 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1227 |
| 6.00mm | 0.2362 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1236 |
| B | 0.2380 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1246 |
| 6.05mm | 0.2382 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1247 |
| 6.10mm | 0.2402 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1257 |
| C | 0.2420 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1266 |
| 6.15mm | 0.2421 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1267 |
| 6.20mm | 0.2441 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1277 |
| D | 0.2460 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1287 |
| 6.25mm | 0.2461 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1288 |
| 6.30mm | 0.2480 | 30 | 20 | 1000 | -0.026 | 600 | 1.50 | 1298 |
| 6.35mm | 0.2500 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1308 |
| 6.40mm | 0.2520 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1319 |
| 6.50mm | 0.2559 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1339 |
| F | 0.2570 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1345 |
| 6.60mm | 0.2598 | 30 | 20 | 1000 | -0.027 | 600 | 1.50 | 1360 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.




Note: This information is based on **160K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# FR-4 Multilayer High Tg PCB Material

## Recommended Drill Series: 100, 150, 430, 460, 480, 560, 580

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 0.10mm | 0.0040 | 43 | 200 | 200 | -0.011 | 500 | 0.22 | 209 |
| 0.13mm | 0.0050 | 50 | 200 | 300 | -0.011 | 600 | 0.25 | 262 |
| 0.15mm | 0.0059 | 60 | 200 | 300 | -0.011 | 600 | 0.30 | 309 |
| #96 | 0.0063 | 65 | 200 | 400 | -0.011 | 600 | 0.33 | 330 |
| #95 | 0.0067 | 73 | 200 | 400 | -0.012 | 600 | 0.37 | 351 |
| #94 | 0.0071 | 78 | 200 | 500 | -0.012 | 600 | 0.39 | 372 |
| #93 | 0.0075 | 85 | 200 | 500 | -0.012 | 600 | 0.43 | 393 |
| #92 | 0.0079 | 94 | 200 | 500 | -0.012 | 800 | 0.47 | 413 |
| #91 | 0.0083 | 100 | 200 | 600 | -0.012 | 800 | 0.50 | 434 |
| #90 | 0.0087 | 104 | 198 | 600 | -0.012 | 800 | 0.53 | 451 |
| #89 | 0.0091 | 104 | 189 | 700 | -0.012 | 800 | 0.55 | 450 |
| #88 | 0.0095 | 104 | 181 | 700 | -0.012 | 800 | 0.57 | 450 |
| 0.25mm | 0.0098 | 104 | 175 | 800 | -0.012 | 1000 | 0.59 | 449 |
| #87 | 0.0100 | 104 | 172 | 800 | -0.012 | 1000 | 0.60 | 450 |
| #86 | 0.0105 | 104 | 164 | 800 | -0.012 | 1000 | 0.63 | 451 |
| #85 | 0.0110 | 104 | 156 | 900 | -0.013 | 1000 | 0.67 | 450 |
| #84 | 0.0115 | 104 | 150 | 900 | -0.013 | 1000 | 0.69 | 450 |
| 0.30mm | 0.0118 | 106 | 146 | 1000 | -0.013 | 1200 | 0.73 | 450 |
| #83 | 0.0120 | 108 | 143 | 1000 | -0.013 | 1200 | 0.76 | 450 |
| #82 | 0.0125 | 112 | 138 | 1000 | -0.013 | 1200 | 0.81 | 450 |
| #81 | 0.0130 | 115 | 132 | 1000 | -0.013 | 1200 | 0.87 | 450 |
| #80 | 0.0135 | 118 | 127 | 1000 | -0.013 | 1500 | 0.93 | 450 |
| 0.35mm | 0.0138 | 118 | 125 | 1000 | -0.013 | 1500 | 0.94 | 450 |
| #79 | 0.0145 | 119 | 119 | 1000 | -0.013 | 1500 | 1.00 | 450 |
| 1/64 | 0.0156 | 120 | 110 | 1000 | -0.014 | 1500 | 1.09 | 450 |
| 0.40mm | 0.0158 | 120 | 109 | 1000 | -0.014 | 1500 | 1.10 | 450 |
| #78 | 0.0160 | 122 | 107 | 1000 | -0.014 | 1500 | 1.14 | 450 |
| 0.45mm | 0.0177 | 123 | 97 | 1000 | -0.014 | 1500 | 1.27 | 450 |
| #77 | 0.0180 | 124 | 96 | 1000 | -0.014 | 1500 | 1.29 | 450 |
| 0.50mm | 0.0197 | 125 | 87 | 1000 | -0.015 | 1500 | 1.44 | 450 |
| #76 | 0.0200 | 126 | 86 | 1000 | -0.015 | 1500 | 1.47 | 450 |
| #75 | 0.0210 | 126 | 82 | 1000 | -0.015 | 1500 | 1.54 | 450 |
| 0.55mm | 0.0217 | 126 | 79 | 1000 | -0.015 | 1500 | 1.59 | 450 |
| #74 | 0.0225 | 125 | 76 | 1000 | -0.015 | 1500 | 1.64 | 450 |
| 0.60mm | 0.0236 | 124 | 73 | 1000 | -0.016 | 1500 | 1.70 | 450 |
| #73 | 0.0240 | 124 | 72 | 1000 | -0.016 | 1500 | 1.72 | 450 |
| #72 | 0.0250 | 123 | 69 | 1000 | -0.016 | 1500 | 1.78 | 450 |
| 0.65mm | 0.0256 | 122 | 67 | 1000 | -0.016 | 1500 | 1.82 | 450 |
| #71 | 0.0260 | 122 | 66 | 1000 | -0.016 | 1500 | 1.85 | 450 |
| 0.70mm | 0.0276 | 120 | 62 | 1000 | -0.016 | 1500 | 1.94 | 450 |
| #70 | 0.0280 | 120 | 61 | 1000 | -0.017 | 1500 | 1.97 | 450 |
| #69 | 0.0292 | 119 | 59 | 1000 | -0.017 | 1500 | 2.02 | 450 |
| 0.75mm | 0.0295 | 119 | 58 | 1000 | -0.017 | 1500 | 2.05 | 450 |
| #68 | 0.0310 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 1/32 | 0.0312 | 116 | 55 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| 0.80mm | 0.0315 | 115 | 55 | 1000 | -0.017 | 1500 | 2.09 | 450 |
| #67 | 0.0320 | 114 | 54 | 1000 | -0.017 | 1500 | 2.11 | 450 |
| #66 | 0.0330 | 113 | 52 | 1000 | -0.018 | 1500 | 2.17 | 450 |
| 0.85mm | 0.0335 | 113 | 51 | 1000 | -0.018 | 1500 | 2.22 | 450 |
| #65 | 0.0350 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| 0.90mm | 0.0354 | 112 | 49 | 1000 | -0.018 | 1500 | 2.29 | 450 |
| #64 | 0.0360 | 112 | 48 | 1000 | -0.018 | 1500 | 2.33 | 450 |
| #63 | 0.0370 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| 0.95mm | 0.0374 | 111 | 46 | 1000 | -0.019 | 1500 | 2.41 | 450 |
| #62 | 0.0380 | 110 | 45 | 1000 | -0.019 | 1500 | 2.44 | 450 |
| #61 | 0.0390 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| 1.00mm | 0.0394 | 109 | 44 | 1000 | -0.019 | 1500 | 2.48 | 450 |
| #60 | 0.0400 | 107 | 43 | 1000 | -0.019 | 1500 | 2.49 | 450 |
| #59 | 0.0410 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.05mm | 0.0413 | 105 | 42 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #58 | 0.0420 | 103 | 41 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| #57 | 0.0430 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.10mm | 0.0433 | 100 | 40 | 1000 | -0.020 | 1500 | 2.50 | 450 |
| 1.15mm | 0.0453 | 95 | 38 | 1000 | -0.021 | 1500 | 2.50 | 450 |

Note: This information is based on **200K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| #56 | 0.0465 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 3/64 | 0.0469 | 93 | 37 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.20mm | 0.0472 | 90 | 36 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.25mm | 0.0492 | 88 | 35 | 1000 | -0.021 | 1500 | 2.50 | 450 |
| 1.30mm | 0.0512 | 85 | 34 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| #55 | 0.0520 | 83 | 33 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| 1.35mm | 0.0531 | 80 | 32 | 1000 | -0.022 | 1500 | 2.50 | 450 |
| #54 | 0.0550 | 78 | 31 | 1000 | -0.023 | 1500 | 2.50 | 450 |
| 1.40mm | 0.0551 | 78 | 31 | 1000 | -0.023 | 1500 | 2.50 | 450 |
| 1.45mm | 0.0571 | 75 | 30 | 1000 | -0.023 | 1500 | 2.50 | 450 |
| 1.50mm | 0.0591 | 73 | 29 | 1000 | -0.024 | 1500 | 2.50 | 450 |
| #53 | 0.0595 | 73 | 29 | 1000 | -0.024 | 1500 | 2.50 | 450 |
| 1.55mm | 0.0610 | 70 | 28 | 1000 | -0.024 | 1500 | 2.50 | 450 |
| 1/16 | 0.0625 | 70 | 28 | 1000 | -0.025 | 1500 | 2.50 | 450 |
| 1.60mm | 0.0630 | 68 | 27 | 1000 | -0.025 | 1500 | 2.50 | 450 |
| #52 | 0.0635 | 68 | 27 | 1000 | -0.025 | 1500 | 2.50 | 450 |
| 1.65mm | 0.0650 | 65 | 26 | 1000 | -0.025 | 1500 | 2.50 | 450 |
| 1.70mm | 0.0669 | 65 | 26 | 1000 | -0.026 | 1500 | 2.50 | 450 |
| #51 | 0.0670 | 65 | 26 | 1000 | -0.026 | 1500 | 2.50 | 450 |
| 1.75mm | 0.0689 | 63 | 25 | 1000 | -0.026 | 1500 | 2.50 | 450 |
| #50 | 0.0700 | 63 | 25 | 1000 | -0.026 | 1500 | 2.50 | 450 |
| 1.80mm | 0.0709 | 63 | 25 | 1000 | -0.027 | 1500 | 2.50 | 464 |
| 1.85mm | 0.0728 | 63 | 25 | 1000 | -0.027 | 1500 | 2.50 | 476 |
| #49 | 0.0730 | 63 | 25 | 1000 | -0.027 | 1500 | 2.50 | 478 |
| 1.90mm | 0.0748 | 63 | 25 | 1000 | -0.027 | 1500 | 2.50 | 489 |
| #48 | 0.0760 | 63 | 25 | 1000 | -0.028 | 1500 | 2.50 | 497 |
| 1.95mm | 0.0768 | 63 | 25 | 1000 | -0.028 | 1500 | 2.50 | 502 |
| 5/64 | 0.0781 | 63 | 25 | 1000 | -0.028 | 1500 | 2.50 | 511 |
| #47 | 0.0785 | 63 | 25 | 1000 | -0.028 | 1500 | 2.50 | 514 |
| 2.00mm | 0.0787 | 63 | 25 | 1000 | -0.028 | 1500 | 2.50 | 515 |
| 2.05mm | 0.0807 | 63 | 25 | 1000 | -0.029 | 1500 | 2.50 | 528 |
| #46 | 0.0810 | 63 | 25 | 1000 | -0.029 | 1500 | 2.50 | 530 |
| #45 | 0.0820 | 63 | 25 | 1000 | -0.029 | 1500 | 2.50 | 536 |
| 2.10mm | 0.0827 | 63 | 25 | 1000 | -0.029 | 1500 | 2.50 | 541 |
| 2.15mm | 0.0846 | 63 | 25 | 1000 | -0.030 | 1500 | 2.50 | 553 |
| #44 | 0.0860 | 63 | 25 | 1000 | -0.030 | 1500 | 2.50 | 563 |
| 2.20mm | 0.0866 | 63 | 25 | 1000 | -0.030 | 1500 | 2.50 | 567 |
| 2.25mm | 0.0886 | 63 | 25 | 1000 | -0.031 | 1500 | 2.50 | 580 |
| #43 | 0.0890 | 63 | 25 | 1000 | -0.031 | 1500 | 2.50 | 582 |
| 2.30mm | 0.0906 | 63 | 25 | 1000 | -0.031 | 1500 | 2.50 | 593 |
| 2.35mm | 0.0925 | 63 | 25 | 1000 | -0.032 | 1500 | 2.50 | 605 |
| #42 | 0.0935 | 63 | 25 | 1000 | -0.032 | 1500 | 2.50 | 612 |
| 3/32 | 0.0938 | 63 | 25 | 1000 | -0.032 | 1500 | 2.50 | 614 |
| 2.40mm | 0.0945 | 63 | 25 | 1000 | -0.032 | 1500 | 2.50 | 618 |
| #41 | 0.0960 | 63 | 25 | 1000 | -0.032 | 1500 | 2.50 | 628 |
| 2.45mm | 0.0965 | 63 | 25 | 1000 | -0.033 | 1500 | 2.50 | 631 |
| #40 | 0.0980 | 63 | 25 | 1000 | -0.033 | 1500 | 2.50 | 641 |
| 2.50mm | 0.0984 | 63 | 25 | 1000 | -0.033 | 1500 | 2.50 | 644 |
| #39 | 0.0995 | 63 | 25 | 1000 | -0.033 | 1500 | 2.50 | 651 |
| 2.55mm | 0.1004 | 63 | 25 | 1000 | -0.033 | 1500 | 2.50 | 657 |
| #38 | 0.1015 | 63 | 25 | 1000 | -0.034 | 1500 | 2.50 | 664 |
| 2.60mm | 0.1024 | 63 | 25 | 1000 | -0.034 | 1500 | 2.50 | 670 |
| #37 | 0.1040 | 63 | 25 | 1000 | -0.034 | 1200 | 2.50 | 680 |
| 2.65mm | 0.1043 | 63 | 25 | 1000 | -0.034 | 1200 | 2.50 | 682 |
| 2.70mm | 0.1063 | 63 | 25 | 1000 | -0.035 | 1200 | 2.50 | 695 |
| #36 | 0.1065 | 63 | 25 | 1000 | -0.035 | 1200 | 2.50 | 697 |
| 2.75mm | 0.1083 | 63 | 25 | 1000 | -0.035 | 1200 | 2.50 | 708 |
| 7/64 | 0.1094 | 63 | 25 | 1000 | -0.036 | 1200 | 2.50 | 716 |
| #35 | 0.1100 | 63 | 25 | 1000 | -0.036 | 1200 | 2.50 | 720 |
| 2.80mm | 0.1102 | 63 | 25 | 1000 | -0.036 | 1200 | 2.50 | 721 |
| #34 | 0.1110 | 63 | 25 | 1000 | -0.036 | 1200 | 2.50 | 726 |
| 2.85mm | 0.1122 | 63 | 25 | 1000 | -0.036 | 1200 | 2.50 | 734 |
| #33 | 0.1130 | 63 | 25 | 1000 | -0.036 | 1200 | 2.50 | 739 |
| 2.90mm | 0.1142 | 63 | 25 | 1000 | -0.037 | 1200 | 2.50 | 747 |
| #32 | 0.1160 | 63 | 25 | 1000 | -0.037 | 1200 | 2.50 | 759 |
| 2.95mm | 0.1161 | 63 | 25 | 1000 | -0.037 | 1200 | 2.50 | 759 |
| 3.00mm | 0.1181 | 63 | 25 | 1000 | -0.038 | 1200 | 2.50 | 773 |
| #31 | 0.1200 | 63 | 25 | 1000 | -0.038 | 1200 | 2.50 | 785 |
| 3.05mm | 0.1201 | 63 | 25 | 1000 | -0.038 | 1200 | 2.50 | 786 |
| 3.10mm | 0.1220 | 63 | 25 | 1000 | -0.038 | 1200 | 2.50 | 798 |
| 3.15mm | 0.1240 | 63 | 25 | 1000 | -0.039 | 1200 | 2.50 | 811 |
| 1/8 | 0.1250 | 63 | 25 | 1000 | -0.039 | 1200 | 2.50 | 818 |

Note: This information is based on **200K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Retract *(inch/min)* | Z-Axis Offset *(inches)* | Max Hits | Chipload *(mm/rev)* | SFM |
|---|---|---|---|---|---|---|---|---|
| 3.20mm | 0.1260 | 50 | 25 | 1000 | -0.018 | 1000 | 2.00 | 824 |
| 3.25mm | 0.1280 | 50 | 25 | 1000 | -0.018 | 1000 | 2.00 | 837 |
| #30 | 0.1285 | 50 | 25 | 1000 | -0.019 | 1000 | 2.00 | 841 |
| 3.30mm | 0.1299 | 50 | 25 | 1000 | -0.019 | 1000 | 2.00 | 850 |
| 3.35mm | 0.1319 | 50 | 25 | 1000 | -0.019 | 1000 | 2.00 | 863 |
| 3.40mm | 0.1339 | 50 | 25 | 1000 | -0.019 | 1000 | 2.00 | 876 |
| 3.45mm | 0.1358 | 50 | 25 | 1000 | -0.019 | 1000 | 2.00 | 888 |
| #29 | 0.1360 | 50 | 25 | 1000 | -0.019 | 1000 | 2.00 | 890 |
| 3.50mm | 0.1378 | 44 | 25 | 1000 | -0.019 | 1000 | 1.76 | 901 |
| 3.55mm | 0.1398 | 44 | 25 | 1000 | -0.019 | 1000 | 1.76 | 915 |
| #28 | 0.1405 | 44 | 25 | 1000 | -0.019 | 1000 | 1.76 | 919 |
| 9/64 | 0.1406 | 44 | 25 | 1000 | -0.019 | 800 | 1.76 | 920 |
| 3.60mm | 0.1417 | 44 | 25 | 1000 | -0.019 | 800 | 1.76 | 927 |
| 3.65mm | 0.1437 | 44 | 25 | 1000 | -0.020 | 800 | 1.76 | 940 |
| #27 | 0.1440 | 44 | 25 | 1000 | -0.020 | 800 | 1.76 | 942 |
| 3.70mm | 0.1457 | 44 | 25 | 1000 | -0.020 | 800 | 1.76 | 953 |
| #26 | 0.1470 | 44 | 25 | 1000 | -0.020 | 800 | 1.76 | 962 |
| 3.75mm | 0.1476 | 44 | 25 | 1000 | -0.020 | 800 | 1.76 | 966 |
| #25 | 0.1495 | 44 | 25 | 1000 | -0.020 | 800 | 1.76 | 978 |
| 3.80mm | 0.1496 | 44 | 25 | 1000 | -0.020 | 800 | 1.76 | 979 |
| 3.85mm | 0.1516 | 44 | 25 | 1000 | -0.020 | 800 | 1.76 | 992 |
| #24 | 0.1520 | 44 | 25 | 1000 | -0.020 | 600 | 1.76 | 994 |
| 3.90mm | 0.1535 | 44 | 25 | 1000 | -0.020 | 600 | 1.76 | 1004 |
| #23 | 0.1540 | 44 | 25 | 1000 | -0.020 | 600 | 1.76 | 1007 |
| 3.95 | 0.1555 | 38 | 25 | 1000 | -0.020 | 600 | 1.52 | 1017 |
| 5/32 | 0.1562 | 38 | 25 | 1000 | -0.020 | 600 | 1.52 | 1022 |
| #22 | 0.1570 | 38 | 25 | 1000 | -0.020 | 600 | 1.52 | 1027 |
| 4.00mm | 0.1575 | 38 | 25 | 1000 | -0.020 | 600 | 1.52 | 1030 |
| #21 | 0.1590 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1040 |
| 4.05mm | 0.1594 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1043 |
| #20 | 0.1610 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1053 |
| 4.10mm | 0.1614 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1056 |
| 4.15mm | 0.1634 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1069 |
| 4.20mm | 0.1654 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1082 |
| #19 | 0.1660 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1086 |
| 4.25mm | 0.1673 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1094 |
| 4.30mm | 0.1693 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1108 |
| #18 | 0.1695 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1109 |
| 4.35mm | 0.1713 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1121 |
| 11/64 | 0.1719 | 38 | 25 | 1000 | -0.021 | 600 | 1.52 | 1125 |
| #17 | 0.1730 | 38 | 25 | 1000 | -0.021 | 500 | 1.52 | 1132 |
| 4.40mm | 0.1732 | 38 | 25 | 1000 | -0.021 | 500 | 1.52 | 1133 |
| 4.45mm | 0.1752 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1146 |
| #16 | 0.1770 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1158 |
| 4.50mm | 0.1772 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1159 |
| 4.55mm | 0.1792 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1172 |
| #15 | 0.1800 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1178 |
| 4.60mm | 0.1811 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1185 |
| #14 | 0.1820 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1191 |
| 4.65mm | 0.1831 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1198 |
| #13 | 0.1850 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1210 |
| 4.70mm | 0.1850 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1210 |
| 4.75mm | 0.1870 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1223 |
| 3/16 | 0.1875 | 38 | 25 | 1000 | -0.022 | 500 | 1.52 | 1227 |
| 4.80mm | 0.1890 | 38 | 25 | 1000 | -0.023 | 500 | 1.52 | 1236 |
| #12 | 0.1890 | 38 | 25 | 1000 | -0.023 | 500 | 1.52 | 1236 |
| 4.85mm | 0.1909 | 38 | 25 | 1000 | -0.023 | 500 | 1.52 | 1249 |
| #11 | 0.1910 | 38 | 25 | 1000 | -0.023 | 500 | 1.52 | 1249 |
| 4.90mm | 0.1929 | 38 | 25 | 1000 | -0.023 | 500 | 1.52 | 1262 |
| #10 | 0.1935 | 38 | 25 | 1000 | -0.023 | 500 | 1.52 | 1266 |
| 4.95mm | 0.1949 | 38 | 25 | 1000 | -0.023 | 500 | 1.52 | 1275 |
| #9 | 0.1960 | 38 | 25 | 1000 | -0.023 | 400 | 1.52 | 1282 |
| 5.00mm | 0.1968 | 38 | 25 | 1000 | -0.023 | 400 | 1.52 | 1287 |
| 5.05mm | 0.1988 | 38 | 25 | 1000 | -0.023 | 400 | 1.52 | 1300 |
| #8 | 0.1990 | 38 | 25 | 1000 | -0.023 | 400 | 1.52 | 1302 |
| 5.10mm | 0.2008 | 31 | 25 | 1000 | -0.023 | 400 | 1.24 | 1314 |
| #7 | 0.2010 | 31 | 25 | 1000 | -0.023 | 400 | 1.24 | 1315 |
| 5.15mm | 0.2028 | 31 | 25 | 1000 | -0.023 | 400 | 1.24 | 1327 |
| 13/64 | 0.2031 | 31 | 25 | 1000 | -0.023 | 400 | 1.24 | 1329 |
| #6 | 0.2040 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1335 |
| 5.20mm | 0.2047 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1339 |
| #5 | 0.2055 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1344 |

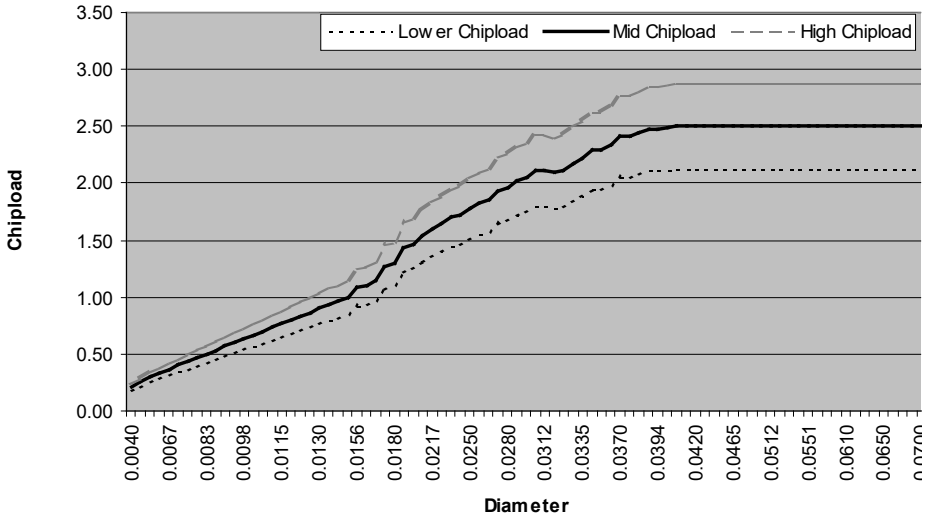
Note: This information is based on **200K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

| Drill Size | Diameter (inch) | Feed (inch/min) | Speed (k-rpm) | Retract (inch/min) | Z-Axis Offset (inches) | Max Hits | Chipload (mm/rev) | SFM |
|---|---|---|---|---|---|---|---|---|
| 5.25mm | 0.2067 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1352 |
| 5.30mm | 0.2087 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1365 |
| #4 | 0.2090 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1367 |
| 5.35mm | 0.2106 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1378 |
| 5.40mm | 0.2126 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1391 |
| #3 | 0.2130 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1393 |
| 5.45mm | 0.2146 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1404 |
| 5.50mm | 0.2165 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1416 |
| 5.55mm | 0.2185 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1429 |
| 7/32 | 0.2188 | 31 | 25 | 1000 | -0.024 | 400 | 1.24 | 1431 |
| 5.60mm | 0.2205 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1442 |
| #2 | 0.2210 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1446 |
| 5.65mm | 0.2224 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1455 |
| 5.70mm | 0.2244 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1468 |
| 5.75mm | 0.2264 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1481 |
| #1 | 0.2280 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1492 |
| 5.80mm | 0.2283 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1493 |
| 5.85mm | 0.2302 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1506 |
| 5.90mm | 0.2323 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1520 |
| A | 0.2340 | 31 | 25 | 1000 | -0.025 | 400 | 1.24 | 1531 |
| 5.95mm | 0.2343 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1533 |
| 15/64 | 0.2344 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1533 |
| 6.00mm | 0.2362 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1545 |
| B | 0.2380 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1557 |
| 6.05mm | 0.2382 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1558 |
| 6.10mm | 0.2402 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1571 |
| C | 0.2420 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1583 |
| 6.15mm | 0.2421 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1584 |
| 6.20mm | 0.2441 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1597 |
| D | 0.2460 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1609 |
| 6.25mm | 0.2461 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1610 |
| 6.30mm | 0.2480 | 31 | 25 | 1000 | -0.026 | 400 | 1.24 | 1622 |
| 6.35mm | 0.2500 | 31 | 25 | 1000 | -0.027 | 400 | 1.24 | 1635 |
| 6.40mm | 0.2520 | 31 | 25 | 1000 | -0.027 | 400 | 1.24 | 1649 |
| 6.50mm | 0.2559 | 31 | 25 | 1000 | -0.027 | 400 | 1.24 | 1674 |
| F | 0.2570 | 31 | 25 | 1000 | -0.027 | 400 | 1.24 | 1681 |
| 6.60mm | 0.2598 | 31 | 25 | 1000 | -0.027 | 400 | 1.24 | 1700 |

In some cases, there may be an opportunity to increase the chipload based on the application's robustness. Variables such as machine technology and condition, stack support materials, and Kyocera design selection may allow the increased throughput with higher chiploads. Multiply the recommended chipload by 1.15 to reach the higher chipload.

If the application is not as robust due to heavy glass, high copper content, tight annular ring requirements, or similar, multiply the recommended chipload by 0.85.

## Chiploads for FR-4 Multilayer High Tg




Note: This information is based on **200K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

# **Series 2300** Chipbreaker Routers

## Standard Flute Length and Extended Flute Length Designs

| Router Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Plunge Feed *(inch/min)* | Z-Axis Offset *(inches)* |
|---|---|---|---|---|---|
| 0.80mm | 0.0315 | 15 | 60 | 20 | -0.020 |
| 0.90mm | 0.0354 | 15 | 55 | 20 | -0.020 |
| 1.00mm | 0.0394 | 20 | 55 | 20 | -0.020 |
| 1.10mm | 0.0433 | 25 | 50 | 25 | -0.020 |
| 1.20mm | 0.0472 | 30 | 47 | 25 | -0.025 |
| 1.27mm | 0.0500 | 35 | 46 | 25 | -0.025 |
| 1.30mm | 0.0512 | 35 | 45 | 25 | -0.025 |
| 1.40mm | 0.0551 | 35 | 40 | 25 | -0.025 |
| 1.50mm | 0.0591 | 35 | 38 | 25 | -0.030 |
| 1/16" | 0.0625 | 40 | 36 | 25 | -0.030 |
| 1.60mm | 0.0630 | 40 | 36 | 25 | -0.030 |
| 1.70mm | 0.0669 | 40 | 34 | 25 | -0.030 |
| 1.80mm | 0.0709 | 40 | 34 | 25 | -0.035 |
| 1.90mm | 0.0748 | 40 | 30 | 25 | -0.035 |
| 2.00mm | 0.0787 | 40 | 27 | 25 | -0.035 |
| 2.10mm | 0.0827 | 40 | 27 | 25 | -0.040 |
| 2.20mm | 0.0866 | 40 | 25 | 25 | -0.040 |
| 2.30mm | 0.0906 | 40 | 25 | 25 | -0.040 |
| 3/32" | 0.0938 | 40 | 24 | 25 | -0.045 |
| 2.40mm | 0.0945 | 40 | 24 | 25 | -0.045 |
| 2.50mm | 0.0984 | 40 | 22 | 25 | -0.050 |
| 2.55mm | 0.1004 | 40 | 22 | 25 | -0.050 |
| 3.00mm | 0.1181 | 40 | 20 | 25 | -0.055 |
| 3.10mm | 0.1220 | 40 | 20 | 25 | -0.060 |
| 3.175mm | 0.1250 | 40 | 20 | 25 | -0.060 |

In some cases, there may be an opportunity to increase Table Feed Rates based on the application's robustness. Variables such as machine technology and condition, stack height, and material type may allow higher throughput. Conversely, if the application is not robust due to critical dimensions, internal cuts, or similar, Table Feed Rate should be reduced. Consult your regional Kyocera Precision Tools Applications Engineer for recommendations.

Note: This information is based on **60K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable





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# **Series 4100** Cross Cut Routers

## Standard Flute Length and Extended Flute Length Designs

| Router Size | Diameter *(inch)* | Feed *(inch/min)* | Speed *(k-rpm)* | Plunge Feed *(inch/min)* | Z-Axis Offset *(inches)* |
|---|---|---|---|---|---|
| 0.80mm | 0.0315 | 20 | 60 | 20 | -0.020 |
| 0.90mm | 0.0354 | 25 | 60 | 20 | -0.020 |
| 1.00mm | 0.0394 | 30 | 58 | 20 | -0.020 |
| 1.10mm | 0.0433 | 30 | 53 | 25 | -0.020 |
| 1.20mm | 0.0472 | 35 | 49 | 25 | -0.025 |
| 1.27mm | 0.0500 | 35 | 46 | 25 | -0.025 |
| 1.30mm | 0.0512 | 40 | 45 | 25 | -0.025 |
| 1.40mm | 0.0551 | 40 | 42 | 25 | -0.025 |
| 1.50mm | 0.0591 | 40 | 39 | 25 | -0.030 |
| 1/16" | 0.0625 | 40 | 37 | 25 | -0.030 |
| 1.60mm | 0.0630 | 40 | 36 | 25 | -0.030 |
| 1.70mm | 0.0669 | 45 | 34 | 25 | -0.030 |
| 1.80mm | 0.0709 | 45 | 32 | 25 | -0.035 |
| 1.90mm | 0.0748 | 45 | 31 | 25 | -0.035 |
| 2.00mm | 0.0787 | 45 | 29 | 25 | -0.035 |
| 2.10mm | 0.0827 | 45 | 28 | 25 | -0.040 |
| 2.20mm | 0.0866 | 45 | 26 | 25 | -0.040 |
| 2.30mm | 0.0906 | 50 | 25 | 25 | -0.040 |
| 3/32" | 0.0938 | 50 | 24 | 25 | -0.045 |
| 2.40mm | 0.0945 | 50 | 24 | 25 | -0.045 |
| 2.50mm | 0.0984 | 50 | 23 | 25 | -0.050 |
| 2.55mm | 0.1004 | 50 | 23 | 25 | -0.050 |
| 3.00mm | 0.1181 | 50 | 19 | 25 | -0.055 |
| 3.10mm | 0.1220 | 50 | 19 | 25 | -0.060 |
| 3.175mm | 0.1250 | 50 | 18 | 25 | -0.060 |

In some cases, there may be an opportunity to increase Table Feed Rates based on the application's robustness. Variables such as machine technology and condition, stack height, and material type may allow higher throughput. Conversely, if the application is not robust due to critical dimensions, internal cuts, or similar, Table Feed Rate should be reduced. Consult your regional Kyocera Precision Tools Applications Engineer for recommendations.



Note: This information is based on **60K RPM** Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable

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