

## 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	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

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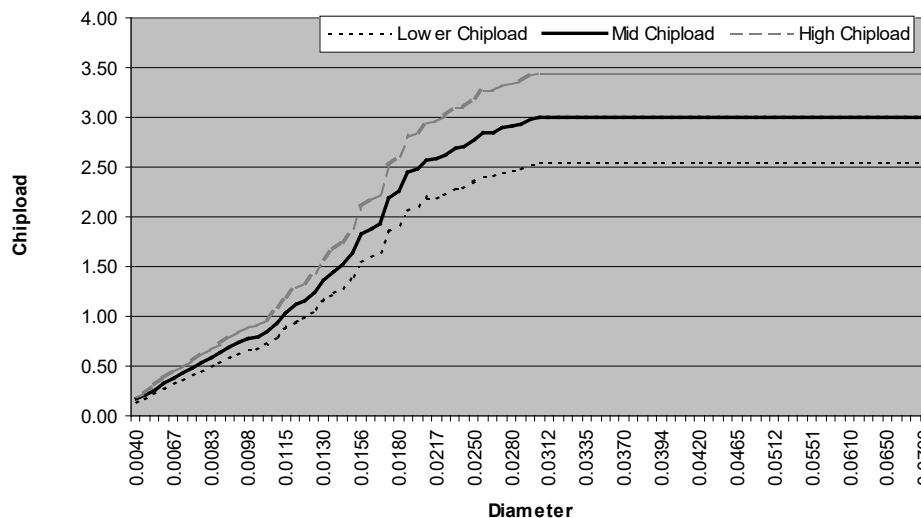
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Drill Size	Diameter (inch)	Feed (inch/min)	Speed (k-rpm)	Retract (inch/min)	Z-Axis Offset (inches)	Max Hits	Chipload (mm/rev)	SFM
5.25mm	0.2067	20	20	1000	-0.024	200	1.00	1082
5.30mm	0.2087	20	20	1000	-0.024	200	1.00	1092
#4	0.2090	20	20	1000	-0.024	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



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