

# 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

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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
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

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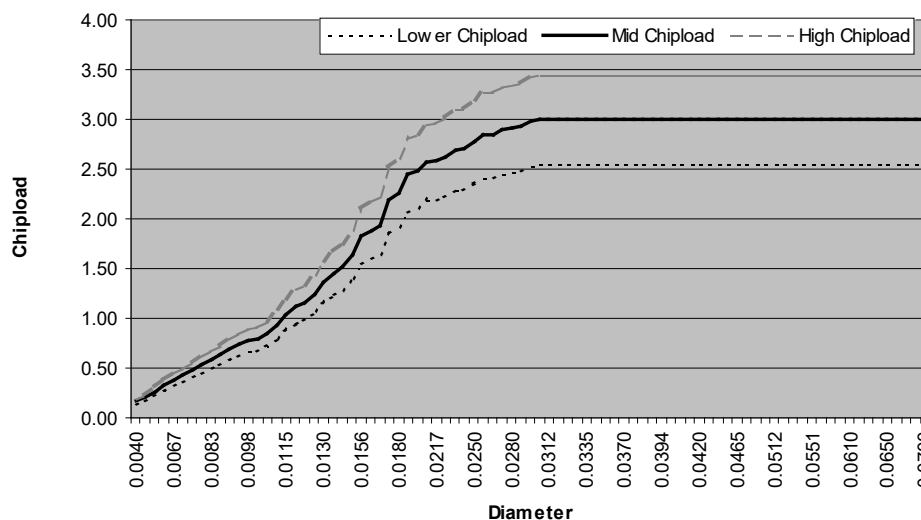
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Drill Size	Diameter (inch)	Feed (inch/min)	Speed (k-rpm)	Retract (inch/min)	Z-Axis Offset (inches)	Max Hits	Chipload (mm/rev)	SFM
5.25mm	0.2067	50	20	1000	-0.024	200	2.50	1082
5.30mm	0.2087	50	20	1000	-0.024	200	2.50	1092
#4	0.2090	50	20	1000	-0.024	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



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