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Drilling Feed & Speed Chart for

Isola IS410 FR-4 High Tg PCB Material

Recommended Tycom Drill Series: Series 100, 150, 450, 460, 480, 560, 580

(Note: Chart is based on 120K RPM Spindle Capability. Please use maximum spindle speed if listed RPM is unattainable)

Size	Diameter	Feed	Speed	Retract	Z-Axis Offset	Max Hits	Chipload	SFM
	(inch)	(Inches/min)	(k-rpm)	(inches/min)	(inches)		(mils/rev)	
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

Size	Diameter	Feed	Speed	Retract	Z-Axis Offset	Hits	Chipload	SFM
	(inch)	(Inches/min)	(k-rpm)	(inches/min)	(inches)		(mils/rev)	
#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
#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

Size	Diameter	Feed	Speed	Retract	Z-Axis Offset	Hits	Chipload	SFM
	(inch)	(Inches/min)	(k-rpm)	(inches/min)	(inches)		(mils/rev)	
#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

Size	Diameter	Feed	Speed	Retract	Z-Axis Offset	Hits	Chipload	SFM
	(inch)	(Inches/min)	(k-rpm)	(inches/min)	(inches)		(mils/rev)	
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
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

Size	Diameter	Feed	Speed	Retract	Z-Axis Offset	Hits	Chipload	SFM
	(inch)	(Inches/min)	(k-rpm)	(inches/min)	(inches)		(mils/rev)	
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
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

Size	Diameter	Feed	Speed	Retract	Z-Axis Offset	Hits	Chipload	SFM
	(inch)	(Inches/min)	(k-rpm)	(inches/min)	(inches)		(mils/rev)	
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 Tycom 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.

