

## Drilling Feed & Speed Chart for

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

Recommended Tycom Drill Series: Series 100, 150, 450, 460, 480, 500, 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	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

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

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

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	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
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

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	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
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

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	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 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.

