Contents

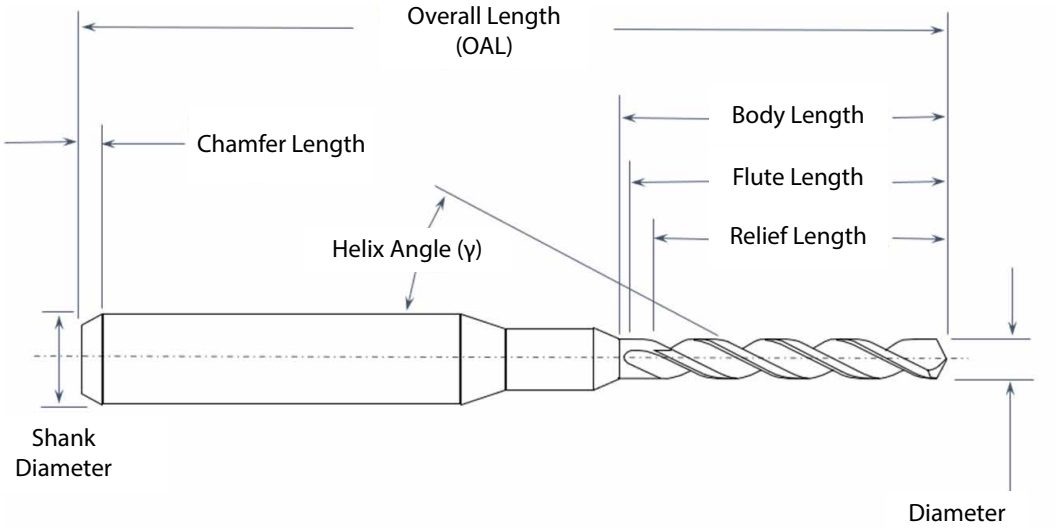
Universal & General Application Drills

High Performance & Special Application Drills

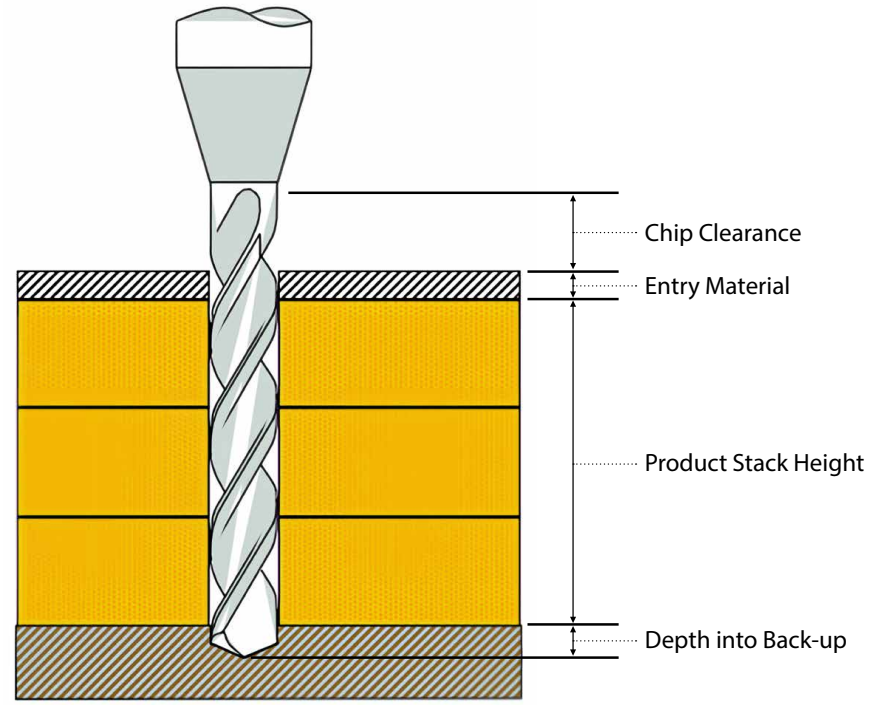
PCB Drills

Technical Overview

PCB Drill Characteristics and Geometry Details



Minimum Length of Cut Requirement



Minimum Chip Clearance
+
Entry Material Thickness
+
Product Stack Height
+
Depth into Back-up
+
Stock Removal (@ Last Use)

=

Minimum Flute Length

1-888-848-9266 | **001-714-428-3611** (Int)
www.kyocera precisiontools.com/pcb

Series 100

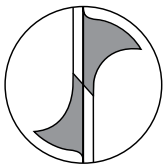
Universal PCB Drills

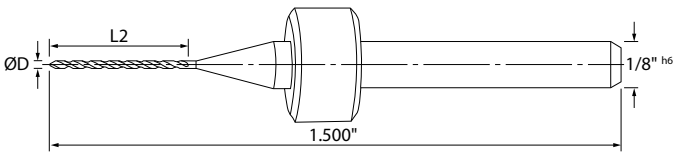
Application and Competitive Advantages of Series 100 PCB Drills

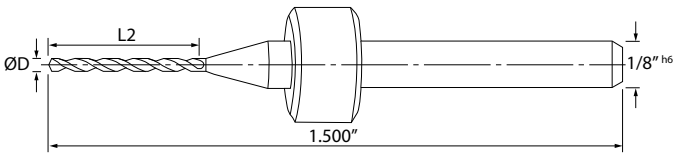
- Ideal for general PCB board drilling in low-, medium- and high-stack panels.
- Wide application range as these drills accommodate successful machining of most common PCB materials.
- Accurate and precise PCB drill point geometry in wire-, fractional and metric sizes (0.020" to 0.125").
- No "bird nest" since these drills reduce debris build-up by offering multiple drill point angles (130° and 165°).
- Standard flute lengths provides enhanced chip evacuation and reduced heat build-up in deeper stacks.
- Precision ground for consistent hole diameter and tight tolerance control across high-volume runs.

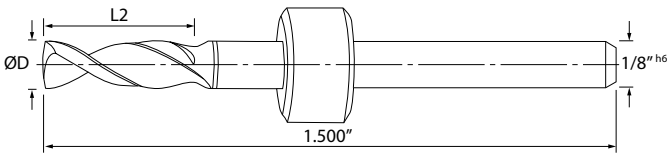
Series 100 Diameter Range
0.0197" ~ 0.1250"
0.50mm ~ 3.15mm

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.





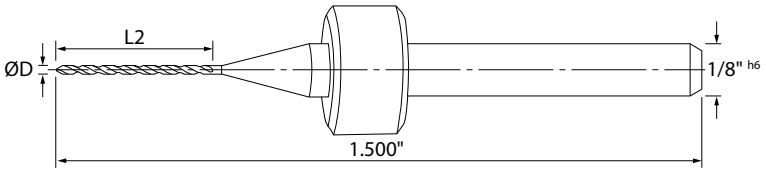


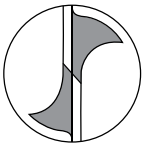


Series 100

Universal PCB Drills

Diameter Range
0.0197" ~ 0.0394" | **0.50mm ~ 1.00mm**





4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
100.0197.360	0.50mm	0.0197	0.360	9.14	130°	+0/-0.0003	+0/-0.008
100.0200.360	#76	0.0200	0.360	9.14	130°	+0/-0.0003	+0/-0.008
100.0210.360	#75	0.0210	0.360	9.14	130°	+0/-0.0003	+0/-0.008
100.0217.360	0.55mm	0.0217	0.360	9.14	130°	+0/-0.0003	+0/-0.008
100.0225.360	#74	0.0225	0.360	9.14	130°	+0/-0.0003	+0/-0.008
100.0236.360	0.60mm	0.0236	0.360	9.14	130°	+0/-0.0003	+0/-0.008
100.0240.400	#73	0.0240	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0250.400	#72	0.0250	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0256.400	0.65mm	0.0256	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0260.400	#71	0.0260	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0276.400	0.70mm	0.0276	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0280.400	#70	0.0280	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0292.400	#69	0.0292	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0295.400	0.75mm	0.0295	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0310.400	#68	0.0310	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0315.400	0.80mm	0.0315	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0320.400	#67	0.0320	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0330.400	#66	0.0330	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0335.400	0.85mm	0.0335	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0350.400	#65	0.0350	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0354.400	0.90mm	0.0354	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0360.400	#64	0.0360	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0370.400	#63	0.0370	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0374.400	0.95mm	0.0374	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0380.400	#62	0.0380	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0390.400	#61	0.0390	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0394.400	1.00mm	0.0394	0.400	10.16	130°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

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Review starting recommendations on **Page 79**

Series 100

Small and medium sized drills with optimized flute lengths capable of drilling medium and high stacks for improved utilization.

Suitable for:

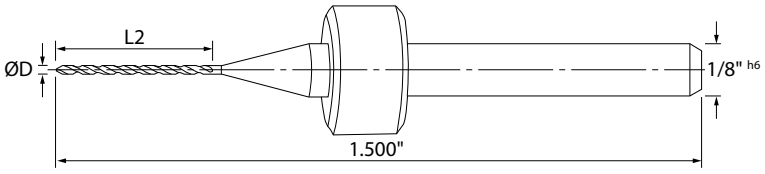
- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates
- Ceramic filled laminates
- Flex Materials

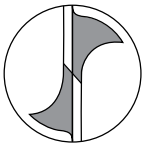
Series 100

Universal PCB Drills

Diameter Range

0.0400" ~ 0.0689" | **1.05mm ~ 1.75mm**





4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
100.0400.400	#60	0.0400	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0410.400	#59	0.0410	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0413.400	1.05mm	0.0413	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0420.400	#58	0.0420	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0430.400	#57	0.0430	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0433.400	1.10mm	0.0433	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0441.400	1.12mm	0.0441	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0453.400	1.15mm	0.0453	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0465.400	#56	0.0465	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0472.400	1.20mm	0.0472	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0492.400	1.25mm	0.0492	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0512.400	1.30mm	0.0512	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0520.400	#55	0.0520	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0531.400	1.35mm	0.0531	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0550.400	#54	0.0550	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0551.400	1.40mm	0.0551	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0571.400	1.45mm	0.0571	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0591.400	1.50mm	0.0591	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0595.400	#53	0.0595	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0610.400	1.55mm	0.0610	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0625.400	1/16"	0.0625	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0630.400	1.60mm	0.0630	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0635.400	#52	0.0635	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0650.400	1.65mm	0.0650	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0669.400	1.70mm	0.0669	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0670.400	#51	0.0670	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0689.400	1.75mm	0.0689	0.400	10.16	130°	+0/-0.0003	+0/-0.008

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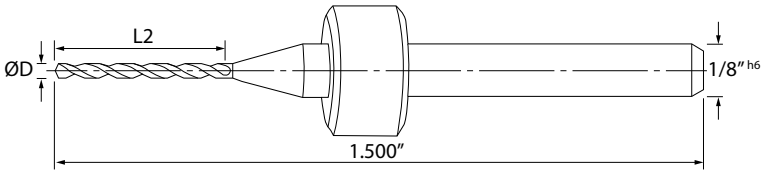
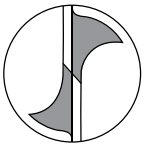
- Flex Materials

Series 100

Universal PCB Drills

Diameter Range
0.0700" ~ 0.0980" | **1.80mm ~ 2.45mm**





4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
100.0700.400	#50	0.0700	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0709.400	1.80mm	0.0709	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0728.400	1.85mm	0.0728	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0730.400	#49	0.0730	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0748.400	1.90mm	0.0748	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0760.400	#48	0.0760	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0768.400	1.95mm	0.0768	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0781.400	5/64"	0.0781	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0785.400	#47	0.0785	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0787.400	2.00mm	0.0787	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0807.400	2.05mm	0.0807	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0810.400	#46	0.0810	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0820.400	#45	0.0820	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0827.400	2.10mm	0.0827	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0846.400	2.15mm	0.0846	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0860.400	#44	0.0860	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0866.400	2.20mm	0.0866	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0886.400	2.25mm	0.0886	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0890.400	#43	0.0890	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0906.400	2.30mm	0.0906	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0925.400	2.35mm	0.0925	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0935.400	#42	0.0935	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0938.400	3/32"	0.0938	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0945.400	2.40mm	0.0945	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0960.400	#41	0.0960	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0965.400	2.45mm	0.0965	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0980.400	#40	0.0980	0.400	10.16	130°	+0/-0.0003	+0/-0.008

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- High copper content laminates
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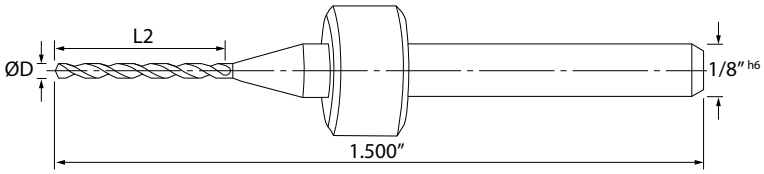
- Flex Materials

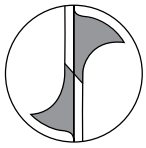
Series 100

Universal PCB Drills

Diameter Range

0.0984" ~ 0.1160" | **2.50mm ~ 2.95mm**





4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
100.0984.400	2.50mm	0.0984	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.0995.400	#39	0.0995	0.400	10.16	130°	+0/-0.0003	+0/-0.008
100.1004.394	2.55mm	0.1004	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1004.400	2.55mm	0.1004	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1015.400	#38	0.1015	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1024.394	2.60mm	0.1024	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1024.400	2.60mm	0.1024	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1040.400	#37	0.1040	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1043.394	2.65mm	0.1043	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1043.400	2.65mm	0.1043	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1063.394	2.70mm	0.1063	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1063.400	2.70mm	0.1063	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1065.400	#36	0.1065	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1083.394	2.75mm	0.1083	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1083.400	2.75mm	0.1083	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1094.400	7/64"	0.1094	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1100.400	#35	0.1100	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1102.394	2.80mm	0.1102	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1102.400	2.80mm	0.1102	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1110.400	#34	0.1110	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1122.394	2.85mm	0.1122	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1122.400	2.85mm	0.1122	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1130.400	#33	0.1130	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1142.394	2.90mm	0.1142	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1142.400	2.90mm	0.1142	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1160.400	#32	0.1160	0.400	10.16	165°	+0/-0.0003	+0/-0.008

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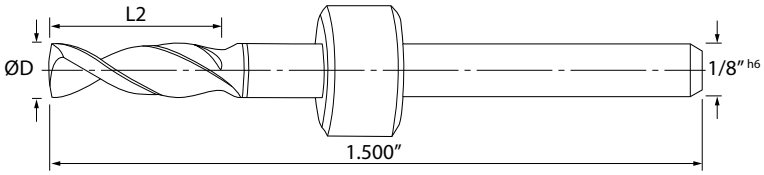
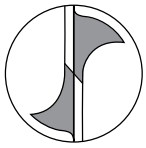
Series 100

Universal PCB Drills

Diameter Range
0.1161" ~ 0.1250" | **2.95mm ~ 3.15mm**





4 Facet Point Geometry

Series 100

Small and medium sized drills with optimized flute lengths capable of drilling medium and high stacks for improved utilization.

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- Flex Materials

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
100.1161.394	2.95mm	0.1161	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1161.400	2.95mm	0.1161	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1181.394	3.00mm	0.1181	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1181.400	3.00mm	0.1181	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1200.400	#31	0.1200	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1201.394	3.05mm	0.1201	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1201.400	3.05mm	0.1201	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1220.394	3.10mm	0.1220	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1220.400	3.10mm	0.1220	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1240.394	3.15mm	0.1240	0.394	10.00	130°	+0/-0.0003	+0/-0.008
100.1240.400	3.15mm	0.1240	0.400	10.16	165°	+0/-0.0003	+0/-0.008
100.1250.394	1/8"	0.1250	0.394	10.01	130°	+0/-0.0003	+0/-0.008
100.1250.400	1/8"	0.1250	0.400	10.16	165°	+0/-0.0003	+0/-0.008

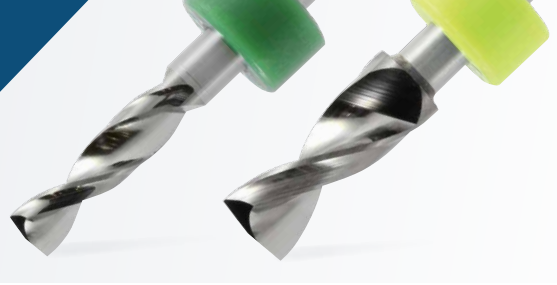
Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

1-888-848-9266 | **001-714-428-3611** (Int)
www.kyoceraprecisiontools.com/pcb

Series 150

Universal Inverse Diameter PCB Drills

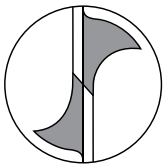


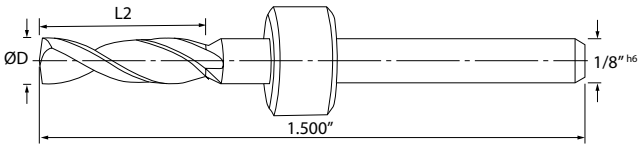
Application and Competitive Advantages of Series 150 PCB Drills

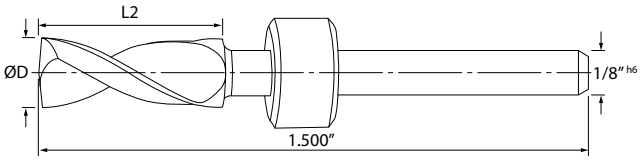
- Engineered for general PCB board drilling when large cutting diameters are required in low-, medium- and high-stack panels.
- Size range from 0.1260″ to 0.2638″ (wire & fractional sizes) and 3.20mm to 6.70mm (metric sizes).
- Accurate and precise PCB drill point geometry with large drill point (165°) produces high quality hole finish.
- Strong and highly accurate brazing supports excellent flute concentricity for improved hole accuracy and longer tool life.
- Large size drills with a reverse shank configuration capable of drilling small to large stacks.
- Precision ground for consistent hole diameter and tight tolerance control across high-volume runs.

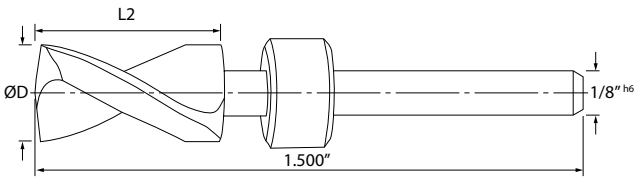
Series 150 Diameter Range
0.1260" ~ 0.2638"
3.20mm ~ 6.70mm

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.









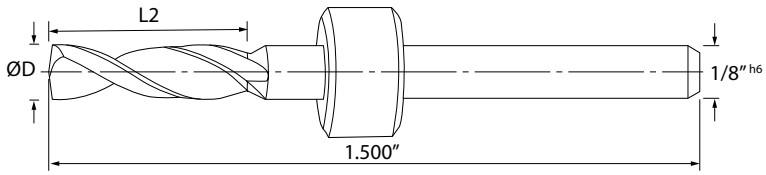
Series 150

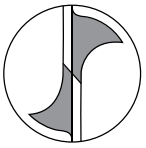
Universal Inverse Diameter PCB Drills

Diameter Range
0.1260" ~ 0.1594" | **3.20mm ~ 4.05mm**

Series 150
Large sized drills with a reverse shank configuration capable of drilling small to large stacks.

Suitable for:
- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates
- Flex Materials




4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
150.1260.500	3.20mm	0.1260	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1270.500	3.23mm	0.1272	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1280.500	3.25mm	0.1280	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1285.500	#30	0.1285	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1299.500	3.30mm	0.1299	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1319.500	3.35mm	0.1319	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1339.500	3.40mm	0.1339	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1358.500	3.45mm	0.1358	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1360.500	#29	0.1360	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1378.500	3.50mm	0.1378	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1398.500	3.55mm	0.1398	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1405.500	#28	0.1405	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1417.500	3.60mm	0.1417	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1437.500	3.65mm	0.1437	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1440.500	#27	0.1440	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1457.500	3.70mm	0.1457	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1476.500	3.75mm	0.1476	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1496.500	3.80mm	0.1496	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1516.500	3.85mm	0.1516	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1520.500	#24	0.1520	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1535.500	3.90mm	0.1535	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1540.500	#23	0.1540	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1555.500	3.95mm	0.1555	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1562.500	5/32"	0.1562	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1570.500	#22	0.1570	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1575.500	4.00mm	0.1575	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1594.500	4.05mm	0.1594	0.500	12.70	165°	+0/-0.0004	+0/-0.010

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

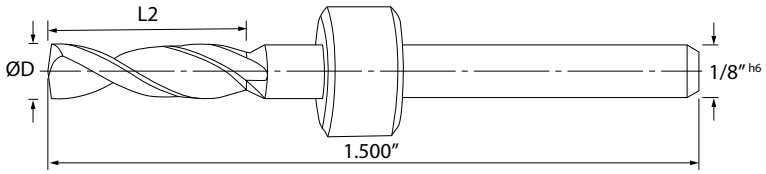
For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

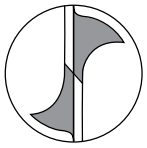
Series 150

Universal Inverse Diameter PCB Drills

Diameter Range

0.1610" ~ 0.1990" | **4.10mm ~ 5.05mm**





4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
150.1610.500	#20	0.1610	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1614.500	4.10mm	0.1614	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1634.500	4.15mm	0.1634	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1654.500	4.20mm	0.1654	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1673.500	4.25mm	0.1673	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1693.500	4.30mm	0.1693	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1713.500	4.35mm	0.1713	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1730.500	#17	0.1730	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1732.500	4.40mm	0.1732	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1752.500	4.45mm	0.1752	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1772.500	4.50mm	0.1772	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1791.500	4.55mm	0.1791	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1800.500	#15	0.1800	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1811.500	4.60mm	0.1811	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1820.500	#14	0.1820	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1831.500	4.65mm	0.1831	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1850.500	#13-4.70mm	0.1850	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1870.500	4.75mm	0.1870	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1875.500	3/16"	0.1875	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1890.500	#12-4.80mm	0.1890	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1909.500	4.85mm	0.1909	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1929.500	4.90mm	0.1929	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1935.500	#10	0.1935	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1949.500	4.95mm	0.1949	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1968.500	5.00mm	0.1969	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1988.500	5.05mm	0.1988	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.1990.500	#8	0.1990	0.500	12.70	165°	+0/-0.0004	+0/-0.010

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

Series 150

Large sized drills with a reverse shank configuration capable of drilling small to large stacks.

Suitable for:

- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates
- Flex Materials

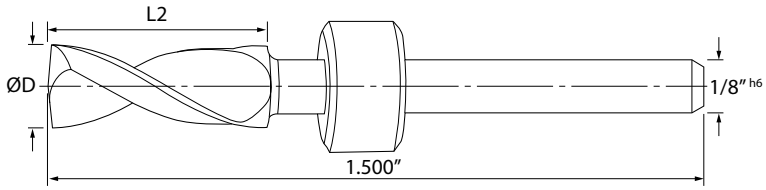
Series 150

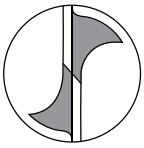
Universal Inverse Diameter PCB Drills

Diameter Range
0.2008" ~ 0.2382" | **5.10mm ~ 6.05mm**

Series 150
Large sized drills with a reverse shank configuration capable of drilling small to large stacks.

Suitable for:
- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates
- Flex Materials





4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
150.2008.500	5.10mm	0.2008	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2010.500	#7	0.2010	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2028.500	5.15mm	0.2028	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2040.500	#6	0.2040	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2047.500	5.20mm	0.2047	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2055.500	#5	0.2055	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2067.500	5.25mm	0.2067	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2087.500	5.30mm	0.2087	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2090.500	#4	0.2090	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2106.500	5.35mm	0.2106	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2126.500	5.40mm	0.2126	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2146.500	5.45mm	0.2146	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2165.500	5.50mm	0.2165	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2185.500	5.55mm	0.2185	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2205.500	5.60mm	0.2205	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2224.500	5.65mm	0.2224	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2244.500	5.70mm	0.2244	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2264.500	5.75mm	0.2264	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2280.500	#1	0.2280	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2283.500	5.80mm	0.2283	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2302.500	5.85mm	0.2303	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2323.500	5.90mm	0.2323	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2340.500	A	0.2340	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2343.500	5.95mm	0.2343	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2362.500	6.00mm	0.2362	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2380.500	B	0.2380	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2382.500	6.05mm	0.2382	0.500	12.70	165°	+0/-0.0004	+0/-0.010

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

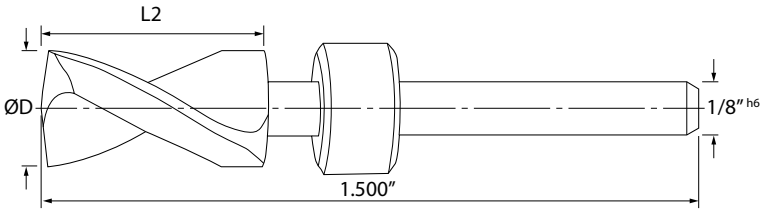
1-888-848-9266 | **001-714-428-3611** (Int)
www.kyoceraprecisiontools.com/pcb

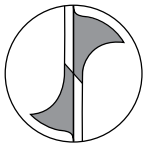
Series 150

Universal Inverse Diameter PCB Drills

Diameter Range

0.2402" ~ 0.2638" | **6.10mm ~ 6.70mm**





4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
150.2402.500	6.10mm	0.2402	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2421.500	6.15mm	0.2421	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2441.500	6.20mm	0.2441	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2461.500	6.25mm	0.2461	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2480.500	6.30mm	0.2480	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2500.500	1/4"-6.35mm	0.2500	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2520.500	6.40mm	0.2520	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2559.500	6.50mm	0.2559	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2570.500	F	0.2570	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2579.500	6.55mm	0.2579	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2598.500	6.60mm	0.2598	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2610.500	G	0.2610	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2618.500	6.65mm	0.2618	0.500	12.70	165°	+0/-0.0004	+0/-0.010
150.2638.500	6.70mm	0.2638	0.500	12.70	165°	+0/-0.0004	+0/-0.010

Series 150

Large sized drills with a reverse shank configuration capable of drilling small to large stacks.

Suitable for:

- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates
- Flex Materials

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

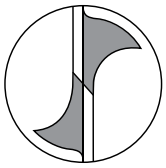
Series 560 / 580

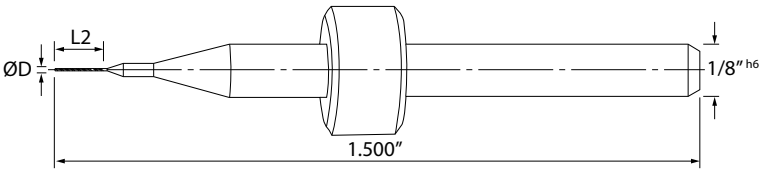
High Helix Universal PCB Drills - Standard & Long Flute

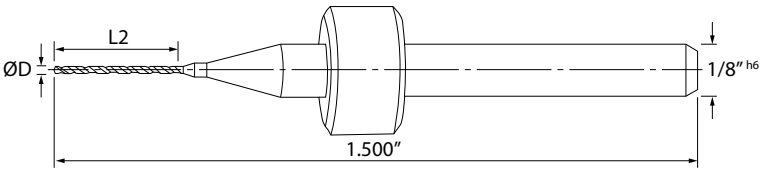
Application and Competitive Advantages of Series 560 / 580 PCB Drills

- Ideal drills for applications in "higher copper content" and "rigid-flex" panels.
- This "non-undercut" drill is perfect for low- to medium stack applications with high accuracy requirements in "rigid-flex" applications.
- Higher helix for maximum material removal (MMR) and debris evacuation.
- **Series 560 - Standard Flute**: inch sizes (0.0039" to 0.0177") and metric sizes (0.10mm to 0.45mm).
- **Series 580 - Extended Flute**: inch sizes (0.0039" to 0.0180") and metric sizes (0.10mm to 0.45mm).

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.







1-888-848-9266 | **001-714-428-3611** (Int)
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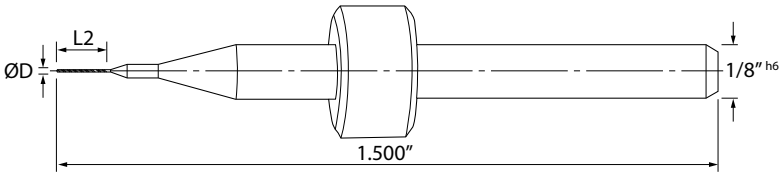
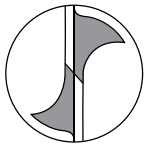
Series 560

High Helix Universal PCB Drills - Standard Flute

Diameter Range
0.0039" ~ 0.0177" | **0.10mm ~ 0.45mm**




4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
560.0040.040	0.10mm	0.0039	0.040	1.02	130°	+0/-0.0003	+0/-0.008
560.0079.118	0.20mm	0.0079	0.118	3.00	130°	+0/-0.0003	+0/-0.008
560.0091.150	#89	0.0091	0.150	3.81	130°	+0/-0.0003	+0/-0.008
560.0098.150	0.25mm	0.0098	0.150	3.81	130°	+0/-0.0003	+0/-0.008
560.0118.220	0.30mm	0.0118	0.220	5.59	130°	+0/-0.0003	+0/-0.008
560.0125.220	#82	0.0125	0.220	5.59	130°	+0/-0.0003	+0/-0.008
560.0130.220	#81	0.0130	0.220	5.59	130°	+0/-0.0003	+0/-0.008
560.0145.220	#79	0.0145	0.220	5.59	130°	+0/-0.0003	+0/-0.008
560.0157.220	0.40mm	0.0157	0.220	5.59	130°	+0/-0.0003	+0/-0.008
560.0177.220	0.45mm	0.0177	0.220	5.59	130°	+0/-0.0003	+0/-0.008

Series 560

Micro and small sized drills with standard flutes capable of drilling small to medium stacks.

Suitable for:

- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates
- Flex Materials

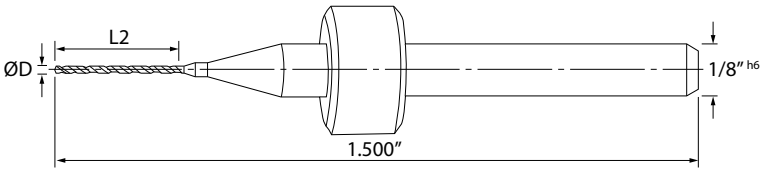
Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

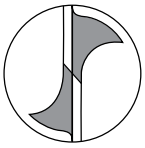
For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

Series 580

High Helix Universal PCB Drills - Extended Flute

Diameter Range
0.0039" ~ 0.0180" | **0.10mm ~ 0.45mm**




4 Facet Point Geometry

Extended Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
580.0040.079	0.10mm	0.0039	0.079	2.01	130°	+0/-0.0003	+0/-0.008
580.0050.087	0.13mm	0.0050	0.087	2.21	130°	+0/-0.0003	+0/-0.008
580.0059.118	0.15mm	0.0059	0.118	3.00	130°	+0/-0.0003	+0/-0.008
580.0071.150	#94	0.0071	0.150	3.81	130°	+0/-0.0003	+0/-0.008
580.0079.157	0.20mm	0.0079	0.157	4.00	130°	+0/-0.0003	+0/-0.008
580.0105.220	#86	0.0105	0.220	5.59	130°	+0/-0.0003	+0/-0.008
580.0135.280	#80	0.0135	0.280	7.11	130°	+0/-0.0003	+0/-0.008
580.0145.280	#79	0.0145	0.280	7.11	130°	+0/-0.0003	+0/-0.008
580.0157.295	0.40mm	0.0157	0.295	7.49	130°	+0/-0.0003	+0/-0.008
580.0160.295	#78	0.0160	0.295	7.49	130°	+0/-0.0003	+0/-0.008
580.0177.295	0.45mm	0.0177	0.295	7.49	130°	+0/-0.0003	+0/-0.008
580.0180.295	#77	0.0180	0.295	7.49	130°	+0/-0.0003	+0/-0.008

Series 580
Micro and small sized drills with extended flutes capable of drilling medium to high stacks.

Suitable for:
- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates
- Flex Materials

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

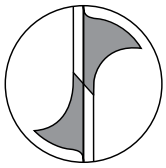
Series 700 / 750

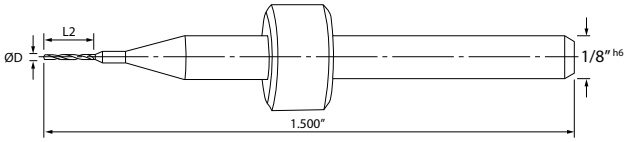
Universal Slot Application PCB Drills - Standard & Long Flute

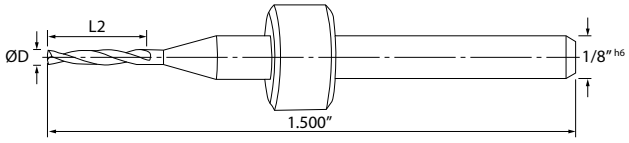
Application and Competitive Advantages of Series 700 / 750 PCB Drills

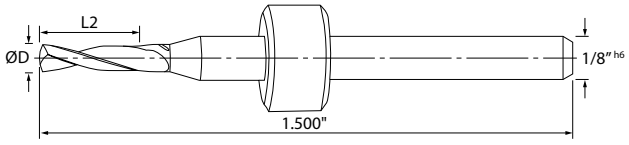
- Ideal drills for reduced deflection in slot drilling applications (low to medium stack).
- Drill point angle of 150° for highest rigidity and minimal deflection.
- Accurate, precise 4-facet drill point optimizes self-centering cutting action with efficient chip formation and reduced cutting forces.
- **Series 700 - Standard Flute**: inch sizes (0.0160" to 0.0520") and metric sizes (0.55mm to 1.15mm).
- **Series 750 - Extended Flute**: inch sizes (0.0374" to 0.0787") and metric sizes (0.95mm to 2.00mm).

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.





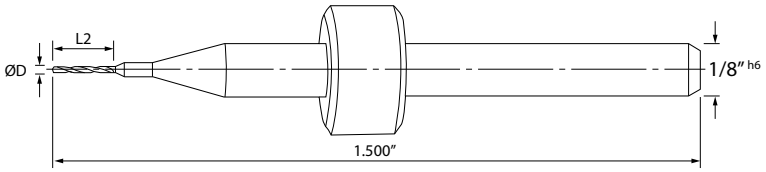


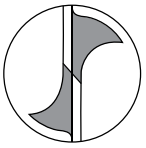


Series 700

Universal Slot Application PCB Drills - Standard Flute

Diameter Range
0.0160" ~ 0.0520" | **0.55mm ~ 1.15mm**




4 Facet Point Geometry

Series 700
Small and medium sized drills with standard flutes capable of slot drilling small to medium stacks.

Suitable for:
- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates
- Flex Materials

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
700.0160.100	#78	0.0160	0.100	2.54	150°	+0/-0.0003	+0/-0.008
700.0180.100	#77	0.0180	0.100	2.54	150°	+0/-0.0003	+0/-0.008
700.0200.150	#76	0.0200	0.150	3.81	150°	+0/-0.0003	+0/-0.008
700.0217.280	0.55mm	0.0217	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0225.280	#74	0.0225	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0236.280	0.60mm	0.0236	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0240.280	#73	0.0240	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0250.280	#72	0.0250	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0256.280	0.65mm	0.0256	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0260.280	#71	0.0260	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0276.280	0.70mm	0.0276	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0280.280	#70	0.0280	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0295.280	0.75mm	0.0295	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0310.280	#68	0.0310	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0315.280	0.80mm	0.0315	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0320.280	#67	0.0320	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0330.280	#66	0.0330	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0335.280	0.85mm	0.0335	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0354.280	0.90mm	0.0354	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0360.280	#64	0.0360	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0370.280	#63	0.0370	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0430.280	#57	0.0430	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0433.280	1.10mm	0.0433	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0453.280	1.15mm	0.0453	0.280	7.11	150°	+0/-0.0003	+0/-0.008
700.0520.280	#55	0.0520	0.280	7.11	150°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

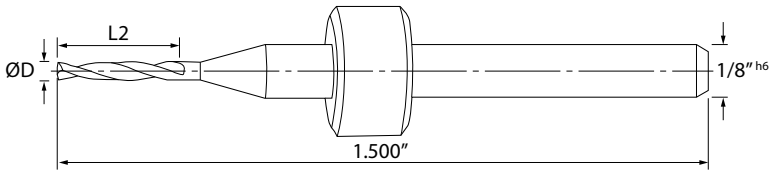
For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

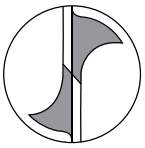
Series 750

Universal Slot Application PCB Drills - Extended Flute

Diameter Range

0.0374" ~ 0.0787" | **0.95mm ~ 2.00mm**





4 Facet Point Geometry

Extended Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
750.0374.340	0.95mm	0.0374	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0394.340	1.00mm	0.0394	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0413.340	1.05mm	0.0413	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0420.340	#58	0.0420	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0433.340	1.10mm	0.0433	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0453.340	1.15mm	0.0453	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0465.340	#56	0.0465	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0472.340	1.20mm	0.0472	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0492.340	1.25mm	0.0492	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0512.340	1.30mm	0.0512	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0531.340	1.35mm	0.0531	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0551.340	1.40mm	0.0551	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0571.340	1.45mm	0.0571	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0591.340	1.50mm	0.0591	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0610.340	1.55mm	0.0610	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0630.340	1.60mm	0.0630	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0650.340	1.65mm	0.0650	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0669.340	1.70mm	0.0669	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0689.340	1.75mm	0.0689	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0709.340	1.80mm	0.0709	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0728.340	1.85mm	0.0728	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0748.340	1.90mm	0.0748	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0768.340	1.95mm	0.0768	0.340	8.64	150°	+0/-0.0003	+0/-0.008
750.0787.340	2.00mm	0.0787	0.340	8.64	150°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

Series 750

Small and medium sized drills with extended flutes capable of slot drilling medium to high stacks.

Suitable for:

- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates
- Flex Materials

Series 405

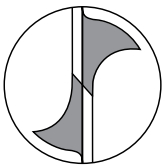
High Performance Short Flute Pilot Drills

Application and Competitive Advantages of Series 405 PCB Drills

- Highly recommended for machining thick- or high-stack panels
- Ideal drills for center- and pilot drilling applications as a pre-stage operation for precise, high aspect ratio (15:1) PCB thru-holes.
- Excellent hole location and fast drilling action for highest productivity.
- Accurate, precise 4-facet drill point optimizes self-centering cutting action with efficient chip formation and reduced cutting forces.

Series 405 Diameter Range
0.0039" ~ 0.0453"
0.10mm ~ 1.15mm

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.



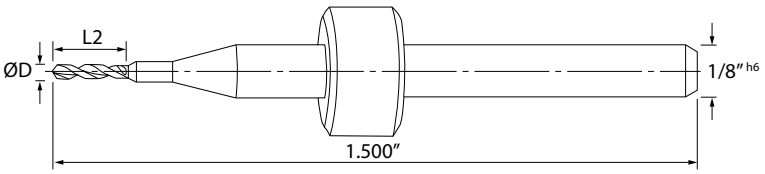
Higher Aspect Ratio

1. Recommend a Pilot Drill / Series 405

- Pilot depth of 1 to 1.5 times x cutting diameter.
- Peck as a last resort.
- Entry material makes a difference.

2. Recommend a Hybrid Drill / Series 430

- Superior drill performance for thick panels (high aspect ratios).
- 2 flutes merge to 1 flute volume and increased accuracy.



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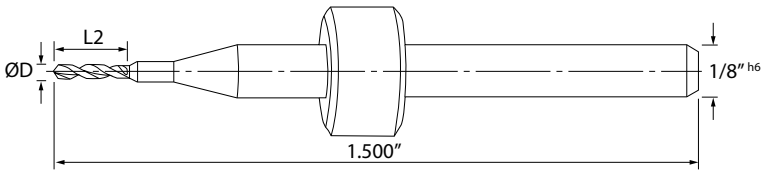
www.kyocera precisiontools.com/pcb

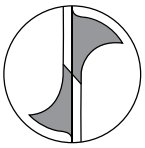
Series 405

High Performance Short Flute Pilot Drills

Diameter Range

0.0039" ~ 0.0453" | **0.10mm ~ 1.15mm**





4 Facet Point Geometry

Short Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
405.0039.025	0.10mm	0.0039	0.025	0.64	130°	+0/-0.0003	+0/-0.008
405.0050.030	0.13mm	0.0050	0.030	0.76	130°	+0/-0.0003	+0/-0.008
405.0059.040	0.15mm	0.0059	0.040	1.02	130°	+0/-0.0003	+0/-0.008
405.0079.050	0.20mm	0.0079	0.050	1.27	130°	+0/-0.0003	+0/-0.008
405.0098.050	0.25mm	0.0098	0.050	1.27	130°	+0/-0.0003	+0/-0.008
405.0118.050	0.30mm	0.0118	0.050	1.27	130°	+0/-0.0003	+0/-0.008
405.0138.075	0.35mm	0.0138	0.075	1.91	130°	+0/-0.0003	+0/-0.008
405.0157.075	0.40mm	0.0157	0.075	1.91	130°	+0/-0.0003	+0/-0.008
405.0165.075	0.42mm	0.0165	0.075	1.91	130°	+0/-0.0003	+0/-0.008
405.0177.075	0.45mm	0.0177	0.075	1.91	130°	+0/-0.0003	+0/-0.008
405.0190.100	0.483mm	0.0190	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0197.100	0.50mm	0.0197	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0217.100	0.55mm	0.0217	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0225.100	#74	0.0225	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0236.100	0.60mm	0.0236	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0256.100	0.65mm	0.0256	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0260.100	#71	0.0260	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0276.100	0.70mm	0.0276	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0280.100	#70	0.0280	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0295.100	0.75mm	0.0295	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0315.100	0.80mm	0.0315	0.100	2.54	130°	+0/-0.0003	+0/-0.008
405.0330.125	#66	0.0330	0.125	3.18	130°	+0/-0.0003	+0/-0.008
405.0335.125	0.85mm	0.0335	0.125	3.18	130°	+0/-0.0003	+0/-0.008
405.0354.125	0.90mm	0.0354	0.125	3.18	130°	+0/-0.0003	+0/-0.008
405.0374.125	0.95mm	0.0374	0.125	3.18	130°	+0/-0.0003	+0/-0.008
405.0394.125	1.00mm	0.0394	0.125	3.18	130°	+0/-0.0003	+0/-0.008
405.0413.125	1.05mm	0.0413	0.125	3.18	130°	+0/-0.0003	+0/-0.008
405.0433.125	1.10mm	0.0433	0.125	3.18	130°	+0/-0.0003	+0/-0.008
405.0453.125	1.15mm	0.0453	0.125	3.18	130°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

Series 405

Micro, small, and medium diameter drills used in piloting holes exceeding 15:1 aspect ratio, promoting hole location precision.

Excellent for:

- Pilot drilling in rigid laminates

Series 422

MicroMax High Performance Drills

Application and Competitive Advantages of Series 422 PCB Drills

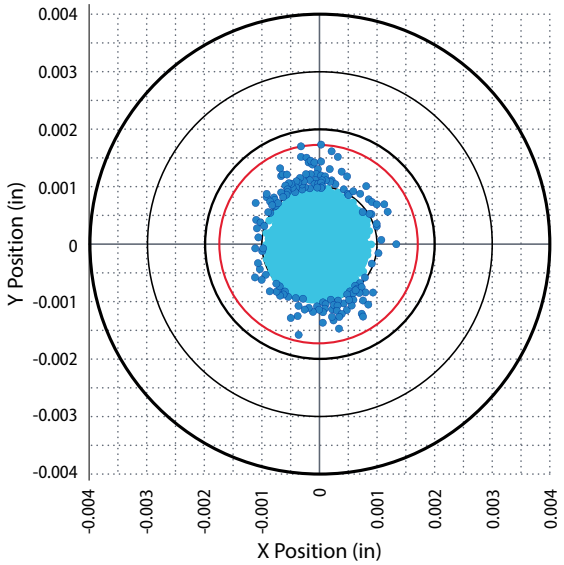
- Optimized for high-stack panels and deep hole applications with aspect ratios greater than 15:1.
- The unique drill point geometry combines the rigidity of a traditional single-flute design with the balanced cutting performance of a two-flute design.
- Delivers excellent hole positioning capability with high CpK performance and reliable hole location accuracy.
- Minimizes the need for pilot, peck, and flip drilling operations, significantly reducing machining time while improving overall hole quality.
- Supports high infeed rates and efficient throughput improves productivity.
- High rigidity, advanced geometry, and specialized carbide grade maximize tool life and stable machining performance.

Series 422 Diameter Range

0.0039" ~ 0.0256"

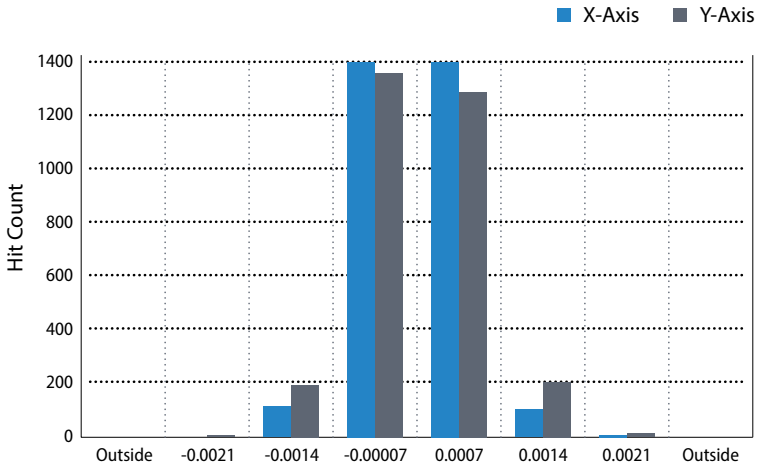
0.10mm ~ 0.65mm

HOLE LOCATION ACCURACY (Internal Evaluation)



True Position = 0.0017"

2.94 CpK



Within RTP of (0.003")			Sample Size 3000 Points	
0.001	0.002	0.003	Outside	Sample
93.2%	6.8%	0.0%	0.0%	3000

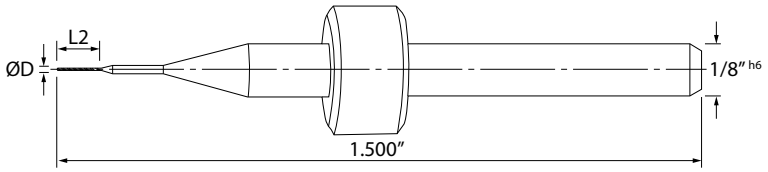
1-888-848-9266 | **001-714-428-3611** (Int)
www.kyocera precisiontools.com/pcb

Series 422

MicroMax HP Drills

Diameter Range

0.0039" ~ 0.0256" | **0.10mm ~ 0.65mm**



Standard & Extended Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
422.0039.079	0.10mm	0.0039	0.079	2.00	130°	+0/-0.0003	+0/-0.008
422.0039.098	0.10mm	0.0039	0.098	2.50	130°	+0/-0.0003	+0/-0.008
422.0051.098	0.13mm	0.0051	0.098	2.50	130°	+0/-0.0003	+0/-0.008
422.0051.118	0.13mm	0.0051	0.118	3.00	130°	+0/-0.0003	+0/-0.008
422.0059.118	0.15mm	0.0059	0.118	3.00	130°	+0/-0.0003	+0/-0.008
422.0059.138	0.15mm	0.0059	0.138	3.50	130°	+0/-0.0003	+0/-0.008
422.0079.118	0.20mm	0.0079	0.118	3.00	130°	+0/-0.0003	+0/-0.008
422.0079.158	0.20mm	0.0079	0.158	4.00	130°	+0/-0.0003	+0/-0.008
422.0098.197	0.25mm	0.0098	0.197	5.00	130°	+0/-0.0003	+0/-0.008
422.0098.217	0.25mm	0.0098	0.217	5.50	130°	+0/-0.0003	+0/-0.008
422.0118.217	0.30mm	0.0118	0.217	5.50	130°	+0/-0.0003	+0/-0.008
422.0118.276	0.30mm	0.0118	0.276	7.00	130°	+0/-0.0003	+0/-0.008
422.0138.197	0.35mm	0.0138	0.197	5.00	130°	+0/-0.0003	+0/-0.008
422.0138.276	0.35mm	0.0138	0.276	7.00	130°	+0/-0.0003	+0/-0.008
422.0157.236	0.40mm	0.0157	0.236	6.00	130°	+0/-0.0003	+0/-0.008
422.0157.295	0.40mm	0.0157	0.295	7.50	130°	+0/-0.0003	+0/-0.008
422.0177.236	0.45mm	0.0177	0.236	6.00	130°	+0/-0.0003	+0/-0.008
422.0177.315	0.45mm	0.0177	0.315	8.00	130°	+0/-0.0003	+0/-0.008
422.0197.276	0.50mm	0.0197	0.276	7.00	130°	+0/-0.0003	+0/-0.008
422.0197.354	0.50mm	0.0197	0.354	9.00	130°	+0/-0.0003	+0/-0.008
422.0217.276	0.55mm	0.0217	0.276	7.00	130°	+0/-0.0003	+0/-0.008
422.0217.354	0.55mm	0.0217	0.354	9.00	130°	+0/-0.0003	+0/-0.008
422.0236.276	0.60mm	0.0236	0.276	7.00	130°	+0/-0.0003	+0/-0.008
422.0236.354	0.60mm	0.0236	0.354	9.00	130°	+0/-0.0003	+0/-0.008
422.0256.394	0.65mm	0.0256	0.394	10.00	130°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

Series 422

Micro and small diameter drills designed with a unique hybrid flute advancing performance through superior strength, hole location precision, and tool life.

Excellent for:

- Polyimides
- High speed laminates

Series 430

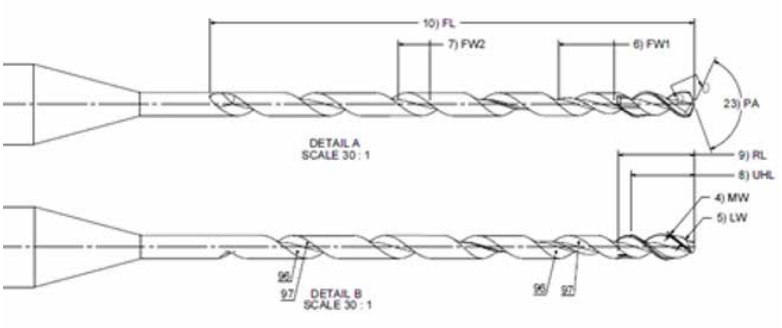
High Performance Hybrid Drills

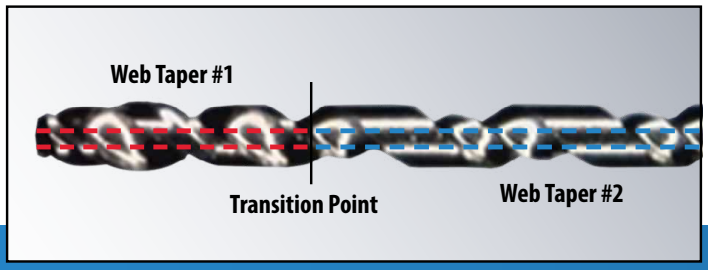
Application and Competitive Advantages of Series 430 PCB Drills

- Innovative specialty undercut drills with a unique two- into one-flute geometry for maximum material removal rates (MRR) & minimal breakage.
- The unique tool geometry offers greater rigidity, precise hole location and increased cutting volume with accelerated chip-evacuation.
- Ideal for applications in high aspect ratio holes (15:1 or larger) especially in combination with the short flute pilot drills (Series 405).
- Unique 2 to 1 flute hybrid geometry advancing performance through superior strength, hole location precision, and tool life.

Series 430 Diameter Range
0.0039" ~ 0.0394"
0.10mm ~ 1.00mm

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.



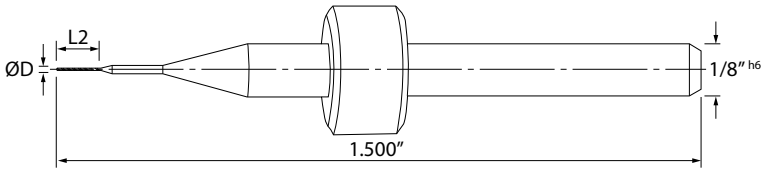


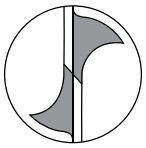
Series 430

High Performance Hybrid Drills

Diameter Range

0.0039" ~ 0.0197" | **0.10mm ~ 0.50mm**





4 Facet Point Geometry

Standard & Extended Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
430.0039.079	0.10mm	0.0039	0.079	2.00	130°	+0/-0.0003	+0/-0.008
430.0039.098	0.10mm	0.0039	0.098	2.50	130°	+0/-0.0003	+0/-0.008
430.0051.098	0.13mm	0.0051	0.098	2.50	130°	+0/-0.0003	+0/-0.008
430.0051.118	0.13mm	0.0051	0.118	3.00	130°	+0/-0.0003	+0/-0.008
430.0059.118	0.15mm	0.0059	0.118	3.00	130°	+0/-0.0003	+0/-0.008
430.0059.138	0.15mm	0.0059	0.138	3.50	130°	+0/-0.0003	+0/-0.008
430.0071.138	#94	0.0071	0.138	3.50	130°	+0/-0.0003	+0/-0.008
430.0079.118	0.20mm	0.0079	0.118	3.00	130°	+0/-0.0003	+0/-0.008
430.0079.158	0.20mm	0.0079	0.158	4.00	130°	+0/-0.0003	+0/-0.008
430.0083.158	#91	0.0083	0.158	4.00	130°	+0/-0.0003	+0/-0.008
430.0091.197	#89	0.0091	0.197	5.00	130°	+0/-0.0003	+0/-0.008
430.0098.197	0.25mm	0.0098	0.197	5.00	130°	+0/-0.0003	+0/-0.008
430.0098.217	0.25mm	0.0098	0.217	5.50	130°	+0/-0.0003	+0/-0.008
430.0098.276	0.25mm	0.0098	0.276	7.00	130°	+0/-0.0003	+0/-0.008
430.0110.197	#85	0.0110	0.197	5.00	130°	+0/-0.0003	+0/-0.008
430.0118.217	0.30mm	0.0118	0.217	5.50	130°	+0/-0.0003	+0/-0.008
430.0118.276	0.30mm	0.0118	0.276	7.00	130°	+0/-0.0003	+0/-0.008
430.0125.236	#82	0.0125	0.236	6.00	130°	+0/-0.0003	+0/-0.008
430.0130.236	#81	0.0130	0.236	6.00	130°	+0/-0.0003	+0/-0.008
430.0138.197	0.35mm	0.0138	0.197	5.00	130°	+0/-0.0003	+0/-0.008
430.0138.276	0.35mm	0.0138	0.276	7.00	130°	+0/-0.0003	+0/-0.008
430.0145.236	#79	0.0145	0.236	6.00	130°	+0/-0.0003	+0/-0.008
430.0157.236	0.40mm	0.0157	0.236	6.00	130°	+0/-0.0003	+0/-0.008
430.0157.295	0.40mm	0.0157	0.295	7.50	130°	+0/-0.0003	+0/-0.008
430.0177.236	0.45mm	0.0177	0.236	6.00	130°	+0/-0.0003	+0/-0.008
430.0177.315	0.45mm	0.0177	0.315	8.00	130°	+0/-0.0003	+0/-0.008
430.0197.276	0.50mm	0.0197	0.276	7.00	130°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

Series 430

Micro and small diameter drills designed with a unique hybrid flute advancing performance through superior strength, hole location precision, and tool life.

Excellent for:

- Polyimides
- High speed laminates

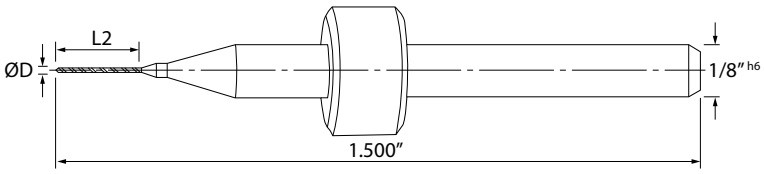
Series 430

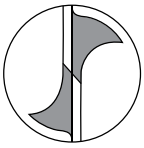
High Performance Hybrid Drills

Diameter Range
0.0217" ~ 0.0394" | **0.55mm ~ 1.00mm**

Series 430
Micro and small diameter drills designed with a unique hybrid flute advancing performance through superior strength, hole location precision, and tool life.

Excellent for:
- Polyimides
- High speed laminates




4 Facet Point Geometry

Standard & Extended Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
430.0197.354	0.50mm	0.0197	0.354	9.00	130°	+0/-0.0003	+0/-0.008
430.0217.276	0.55mm	0.0217	0.276	7.00	130°	+0/-0.0003	+0/-0.008
430.0217.354	0.55mm	0.0217	0.354	9.00	130°	+0/-0.0003	+0/-0.008
430.0236.276	0.60mm	0.0236	0.276	7.00	130°	+0/-0.0003	+0/-0.008
430.0236.354	0.60mm	0.0236	0.354	9.00	130°	+0/-0.0003	+0/-0.008
430.0256.394	0.65mm	0.0256	0.394	10.00	130°	+0/-0.0003	+0/-0.008
430.0276.394	0.70mm	0.0276	0.394	10.00	130°	+0/-0.0003	+0/-0.008
430.0295.394	0.75mm	0.0295	0.394	10.00	130°	+0/-0.0003	+0/-0.008
430.0315.394	0.80mm	0.0315	0.394	10.00	130°	+0/-0.0003	+0/-0.008
430.0335.394	0.85mm	0.0335	0.394	10.00	130°	+0/-0.0003	+0/-0.008
430.0354.394	0.90mm	0.0354	0.394	10.00	130°	+0/-0.0003	+0/-0.008
430.0374.394	0.95mm	0.0374	0.394	10.00	130°	+0/-0.0003	+0/-0.008
430.0394.394	1.00mm	0.0394	0.394	10.00	130°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

Series 460

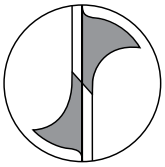
Advanced Undercut Drills - Standard Flute

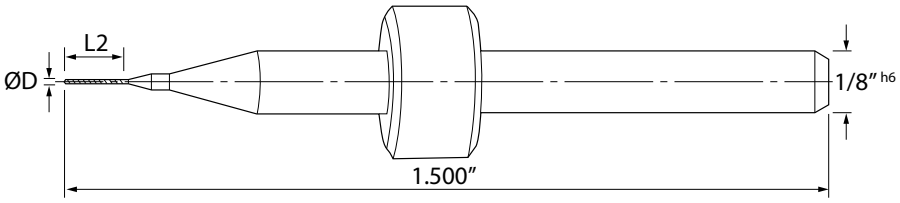
Application and Competitive Advantages of Series 460 PCB Drills

- Ideal high-performance drills for low aspect ratio holes (low-stack panel applications) with high accuracy requirements.
- Geometry advantages are:
  - Variable web taper for maximum rigidity.
  - Thicker web section for higher strength and prolonged tool life.
  - Optimized flute shape to combat chip packing.
  - High helix geometry for faster chip evacuation and improved debris flow.

Series 460 Diameter Range
0.0059" ~ 0.0256"
0.15mm ~ 0.65mm

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.





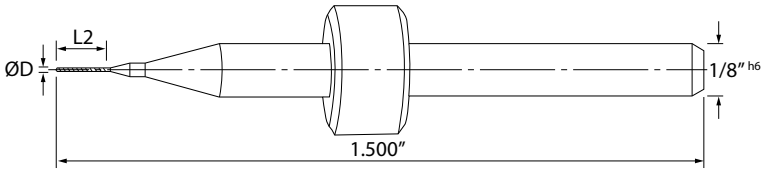
Series 460

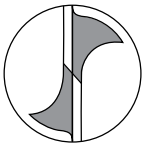
Advanced Undercut Drills - Standard Flute

Diameter Range
0.0059" ~ 0.0256" | **0.15mm ~ 0.65mm**

Series 460
Micro and small sized drills with standard flutes capable of drilling small to medium stacks.

Excellent for:
- Polyimides
- High speed laminates




4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
460.0059.079	0.15mm	0.0059	0.079	2.01	130°	+0/-0.0003	+0/-0.008
460.0079.118	0.20mm	0.0079	0.118	3.00	130°	+0/-0.0003	+0/-0.008
460.0091.158	#89	0.0091	0.158	4.01	130°	+0/-0.0003	+0/-0.008
460.0098.177	0.25mm	0.0098	0.177	4.50	130°	+0/-0.0003	+0/-0.008
460.0110.177	#85	0.0110	0.177	4.50	130°	+0/-0.0003	+0/-0.008
460.0118.217	0.30mm	0.0118	0.217	5.51	130°	+0/-0.0003	+0/-0.008
460.0118.236	0.30mm	0.0118	0.236	5.99	130°	+0/-0.0003	+0/-0.008
460.0130.217	#81	0.0130	0.217	5.51	130°	+0/-0.0003	+0/-0.008
460.0138.217	0.35mm	0.0138	0.217	5.51	130°	+0/-0.0003	+0/-0.008
460.0145.217	#79	0.0145	0.217	5.51	130°	+0/-0.0003	+0/-0.008
460.0157.217	0.40mm	0.0157	0.217	5.51	130°	+0/-0.0003	+0/-0.008
460.0177.220	0.45mm	0.0177	0.220	5.59	130°	+0/-0.0003	+0/-0.008
460.0197.220	0.50mm	0.0197	0.220	5.59	130°	+0/-0.0003	+0/-0.008
460.0217.250	0.55mm	0.0217	0.250	6.35	130°	+0/-0.0003	+0/-0.008
460.0256.250	0.65mm	0.0256	0.250	6.35	130°	+0/-0.0003	+0/-0.008

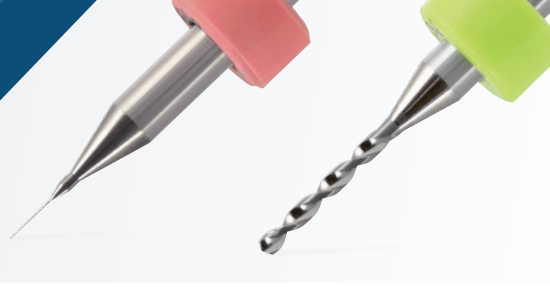
Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

1-888-848-9266 | **001-714-428-3611** (Int)
www.kyoceraprecisiontools.com/pcb

Series 480

Advanced Undercut Drills - Long Flute

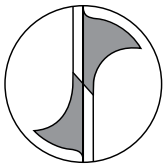


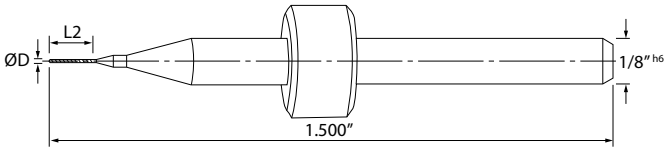
Application and Competitive Advantages of Series 480 PCB Drills

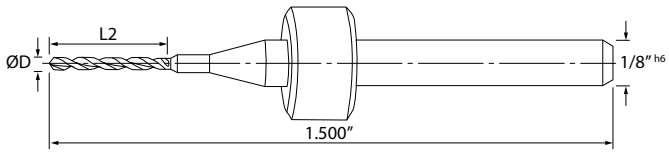
- Similar in engineering concept to series 460 but with extended flute length.
- Ideal high-performance drills to accommodate medium- to high-stack panel applications or higher aspect ratio holes (15:1 or larger).
- Advantage: no "bird nest" since the drills reduce debris build-up by offering multiple drill points (130° and 165°).

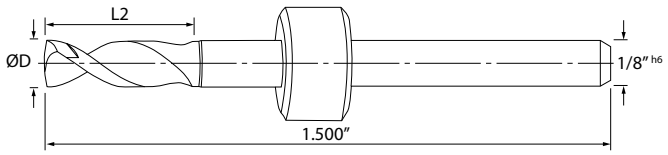
Series 480 Diameter Range
0.0059" ~ 0.1240"
0.15mm ~ 3.15mm

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.









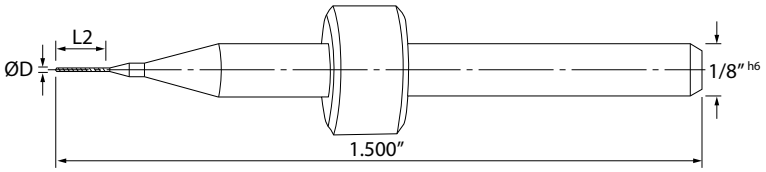
Series 480

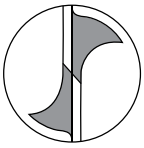
Advanced Undercut Drills - Extended Flute

Diameter Range
0.0059" ~ 0.0354" | **0.15mm ~ 0.90mm**

Series 480
Micro, small, and medium sized undercut drills with extended flutes capable of drilling medium to high stacks.

Excellent for:
- Polyimides
- High speed laminates




4 Facet Point Geometry

Extended Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
480.0059.118	0.15mm	0.0059	0.118	3.00	130°	+0/-0.0003	+0/-0.008
480.0079.158	0.20mm	0.0079	0.158	4.01	130°	+0/-0.0003	+0/-0.008
480.0098.217	0.25mm	0.0098	0.217	5.51	130°	+0/-0.0003	+0/-0.008
480.0110.217	#85	0.0110	0.217	5.51	130°	+0/-0.0003	+0/-0.008
480.0118.256	0.30mm	0.0118	0.256	6.50	130°	+0/-0.0003	+0/-0.008
480.0135.280	#80	0.0135	0.280	7.11	130°	+0/-0.0003	+0/-0.008
480.0138.277	0.35mm	0.0138	0.277	7.04	130°	+0/-0.0003	+0/-0.008
480.0145.280	#79	0.0145	0.280	7.11	130°	+0/-0.0003	+0/-0.008
480.0157.295B1	0.40mm	0.0157	0.295	7.49	130°	+0/-0.0003	+0/-0.008
480.0177.295	0.45mm	0.0177	0.295	7.49	130°	+0/-0.0003	+0/-0.008
480.0197.310	0.50mm	0.0197	0.310	7.87	130°	+0/-0.0003	+0/-0.008
480.0210.310	#75	0.0210	0.310	7.87	130°	+0/-0.0003	+0/-0.008
480.0217.340	0.55mm	0.0217	0.340	8.64	130°	+0/-0.0003	+0/-0.008
480.0225.360	#74	0.0225	0.360	9.14	130°	+0/-0.0003	+0/-0.008
480.0236.340	0.60mm	0.0236	0.340	8.64	130°	+0/-0.0003	+0/-0.008
480.0250.340	#72	0.0250	0.340	8.64	130°	+0/-0.0003	+0/-0.008
480.0256.340	0.65mm	0.0256	0.340	8.64	130°	+0/-0.0003	+0/-0.008
480.0260.400	#71	0.0260	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0276.360	0.70mm	0.0276	0.360	9.14	130°	+0/-0.0003	+0/-0.008
480.0280.400	#70	0.0280	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0295.360	0.75mm	0.0295	0.360	9.14	130°	+0/-0.0003	+0/-0.008
480.0310.394	#68	0.0310	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0315.400	0.80mm	0.0315	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0320.394	#67	0.0320	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0330.315	#66	0.0330	0.315	8.00	130°	+0/-0.0003	+0/-0.008
480.0335.400	0.85mm	0.0335	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0354.400	0.90mm	0.0354	0.400	10.16	130°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

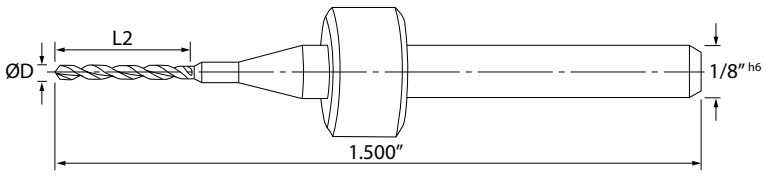
For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

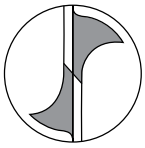
Series 480

Advanced Undercut Drills - Extended Flute

Diameter Range

0.0360" ~ 0.0728" | **0.95mm ~ 1.85mm**





4 Facet Point Geometry

Series 480

Micro, small, and medium sized undercut drills with extended flutes capable of drilling medium to high stacks.

Excellent for:

- Polyimides
- High speed laminates

Extended Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
480.0360.400	#64	0.0360	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0370.394	#63	0.0370	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0374.400	0.95mm	0.0374	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0380.400	#62	0.0380	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0394.400	1.00mm	0.0394	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0400.400	#60	0.0400	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0413.400	1.05mm	0.0413	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0420.400	#58	0.0420	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0433.400	1.10mm	0.0433	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0441.400	1.12mm	0.0441	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0453.400	1.15mm	0.0453	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0465.400	#56	0.0465	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0472.400	1.20mm	0.0472	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0492.400	1.25mm	0.0492	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0512.394	1.30mm	0.0512	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0520.400	#55	0.0520	0.400	10.16	130°	+0/-0.0003	+0/-0.008
480.0531.394	1.35mm	0.0531	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0551.394	1.40mm	0.0551	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0571.394	1.45mm	0.0571	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0591.394	1.50mm	0.0591	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0610.394	1.55mm	0.0610	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0630.394	1.60mm	0.0630	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0650.394	1.65mm	0.0650	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0669.394	1.70mm	0.0669	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0689.394	1.75mm	0.0689	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0709.394	1.80mm	0.0709	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0728.394	1.85mm	0.0728	0.394	10.01	130°	+0/-0.0003	+0/-0.008

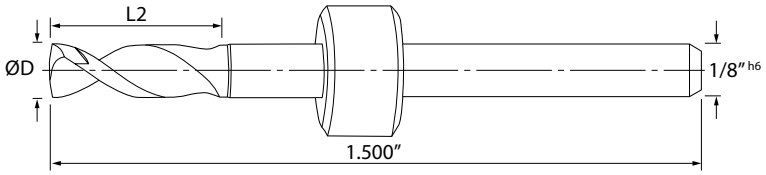
Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

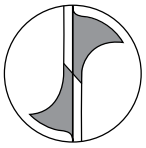
For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

Series 480

Advanced Undercut Drills - Extended Flute

Diameter Range
0.0748" ~ 0.1240" | **1.90mm ~ 3.15mm**





4 Facet Point Geometry

Series 480
Micro, small, and medium sized undercut drills with extended flutes capable of drilling medium to high stacks.

Excellent for:
- Polyimides
- High speed laminates

Extended Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
480.0748.394	1.90mm	0.0748	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0768.394	1.95mm	0.0768	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0787.394	2.00mm	0.0787	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0807.394	2.05mm	0.0807	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0827.394	2.10mm	0.0827	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0846.394	2.15mm	0.0846	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0866.394	2.20mm	0.0866	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0886.394	2.25mm	0.0886	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0906.394	2.30mm	0.0906	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0925.394	2.35mm	0.0925	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0945.394	2.40mm	0.0945	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0965.394	2.45mm	0.0965	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.0984.394	2.50mm	0.0984	0.394	10.01	130°	+0/-0.0003	+0/-0.008
480.1004.394	2.55mm	0.1004	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1024.394	2.60mm	0.1024	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1043.394	2.65mm	0.1043	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1063.394	2.70mm	0.1063	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1083.394	2.75mm	0.1083	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1102.394	2.80mm	0.1102	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1122.394	2.85mm	0.1122	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1142.394	2.90mm	0.1142	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1161.394	2.95mm	0.1161	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1181.394	3.00mm	0.1181	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1201.394	3.05mm	0.1201	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1220.394	3.10mm	0.1220	0.394	10.01	165°	+0/-0.0003	+0/-0.008
480.1240.394	3.15mm	0.1240	0.394	10.01	165°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

1-888-848-9266 | **001-714-428-3611** (Int)
www.kyoceraprecisiontools.com/pcb

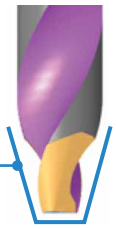
Series 102

Blind Via PCB Drills

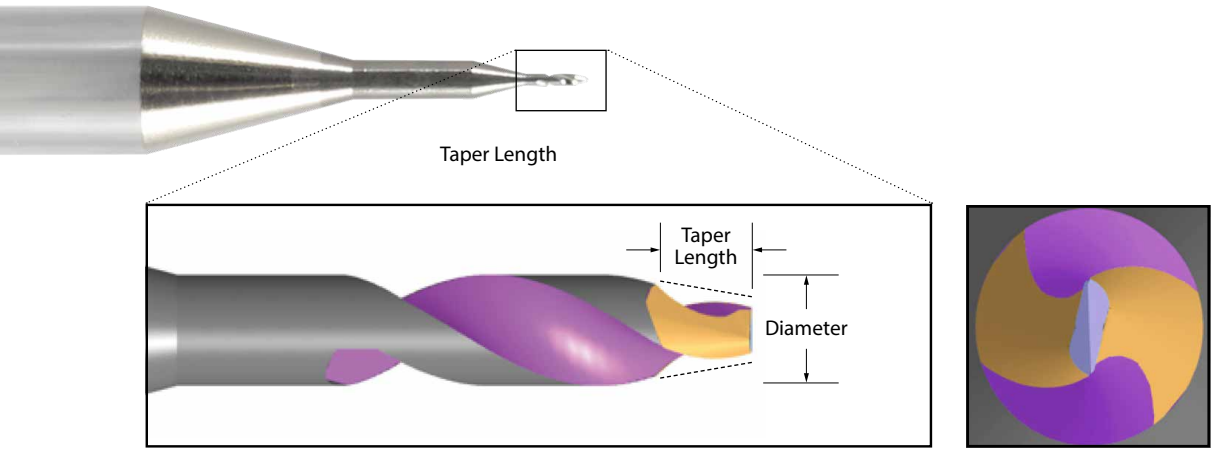
Application and Competitive Advantages of Series 102 PCB Drills

- Ideal drills for blind via applications with fast and efficient cutting action.
- Improved hole wall and top surface quality with minimal debris.
- Accurate and precise tool geometry with side taper promoting superior plating capability.
- Precision ground for consistent hole diameter and tight tolerance control across high-volume runs.

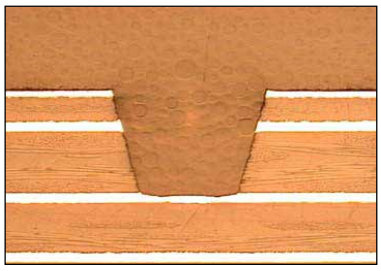
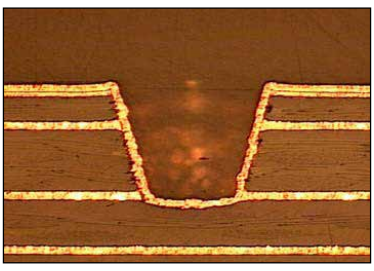
Series 102 Diameter Range
0.0039" ~ 0.0276"
0.10mm ~ 0.70mm



Special V-Shaped Point
promotes blind via shape integrity and clean cuts



Series 102 Performance (Internal Evaluation)

0.25mm Drilled Hole - After Drill	0.25mm Drilled Hole - After Plating
	

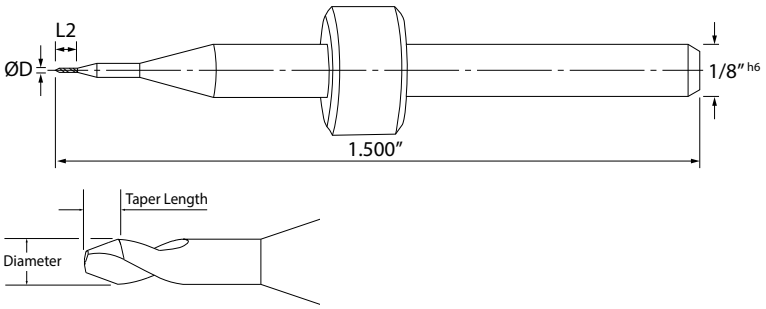
Series 102

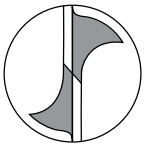
Blind Via PCB Drills

Diameter Range
0.0039" ~ 0.0276" | **0.10mm ~ 0.70mm**

Series 102
Micro and small sized tapered body drills designed for blind via applications promoting superior plating capability.

Suitable for:
- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates





4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions						
			Tip Diameter (mm)	Taper Length (mm)	Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
102.0039.030	0.10mm	0.0039	0.04	0.08	0.016	0.40	175°	+0/-0.0003	+0/-0.008
102.0050.030	0.13mm	0.0051	0.05	0.10	0.020	0.50	175°	+0/-0.0003	+0/-0.008
102.0059.030	0.15mm	0.0059	0.06	0.12	0.024	0.60	175°	+0/-0.0003	+0/-0.008
102.0079.050	0.20mm	0.0079	0.08	0.16	0.031	0.80	175°	+0/-0.0003	+0/-0.008
102.0098.050	0.25mm	0.0098	0.10	0.20	0.039	1.00	175°	+0/-0.0003	+0/-0.008
102.0118.075	0.30mm	0.0118	0.10	0.27	0.047	1.20	175°	+0/-0.0003	+0/-0.008
102.0138.075	0.35mm	0.0138	0.10	0.27	0.055	1.40	175°	+0/-0.0003	+0/-0.008
102.0157.075	0.40mm	0.0157	0.14	0.36	0.063	1.60	175°	+0/-0.0003	+0/-0.008
102.0177.100	0.45mm	0.0177	0.12	0.45	0.053	1.35	175°	+0/-0.0003	+0/-0.008
102.0197.100	0.50mm	0.0197	0.14	0.50	0.059	1.50	175°	+0/-0.0003	+0/-0.008
102.0217.100	0.55mm	0.0217	0.15	0.55	0.065	1.65	175°	+0/-0.0003	+0/-0.008
102.0236.100	0.60mm	0.0236	0.16	0.60	0.071	1.80	175°	+0/-0.0003	+0/-0.008
102.0256.100	0.65mm	0.0256	0.18	0.65	0.077	1.95	175°	+0/-0.0003	+0/-0.008
102.0276.125	0.70mm	0.0276	0.19	0.70	0.083	2.10	175°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

Series 240

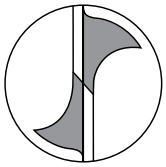
High Performance Flex Drills

Application and Competitive Advantages of Series 240 PCB Drills

- Ideal drills for machining pure flex panels (glass-free PCB layers) without high torque requirements.
- Improved hole wall quality (HWQ) with reduced risk of tearing and chattering in soft / flexible PCB materials.
- Accurate, precise and positive drill point geometry with web-thinning for improved chip formation and reduced cutting forces.
- Open flute design with small tool core allows maximum material removal and high cutting speeds with reduced torque and lower cutting forces.

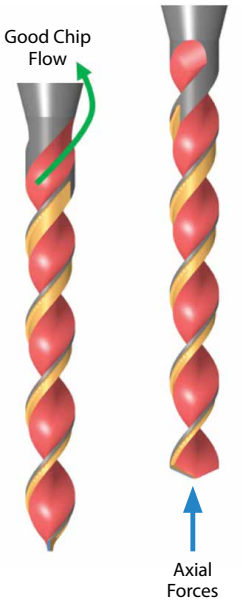
Series 240 Diameter Range
0.0059" ~ 0.0394"
0.15mm ~ 1.00mm

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.

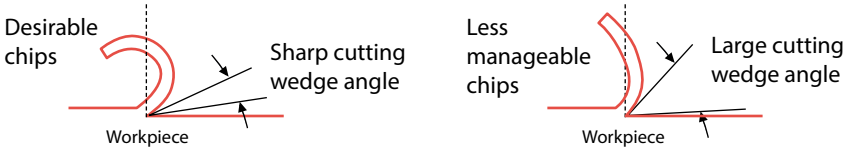


Geometry comparison "High Performance Flex" (Series 240) vs "Conventional PCB drill"

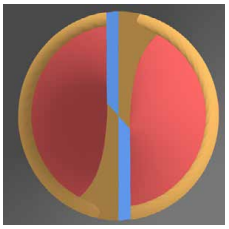
- Tool geometry is designed for excellent shearing action, chip formation and evacuation.
- Series 240 accomplishes faster cutting action with superior part finishes and highest productivity.
- Optimized rake angle for flex and rigid-flex materials results in minimal layer deformation.
- Sharp cutting wedge by rake and primary relief angle results in “no tearing”.
- Higher helix supports fastest debris evacuation allowing drilling with greater feed and speed.



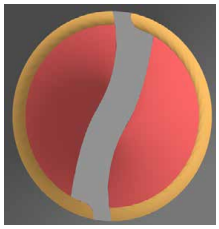
Chip Formation Process

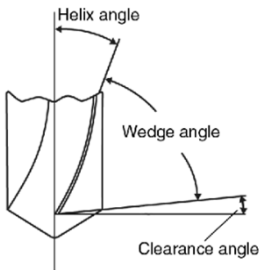


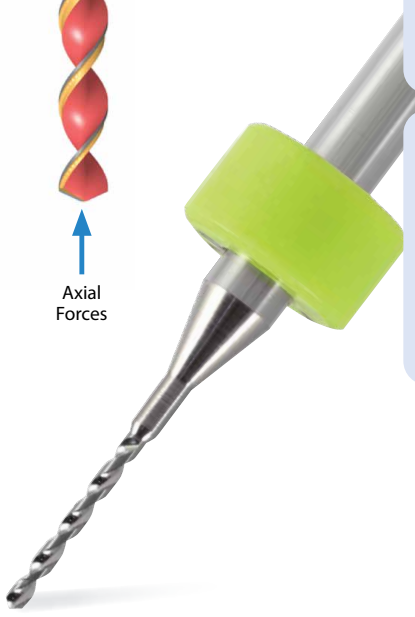
Open Flute



Small Core







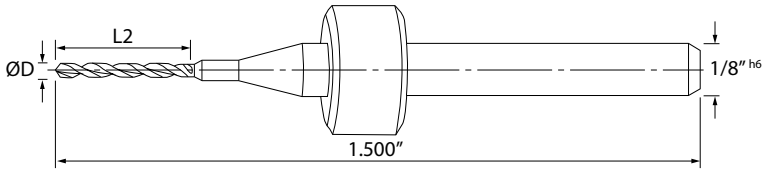
Series 240

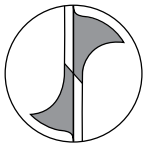
High Performance Flex Drills

Diameter Range
0.0059" ~ 0.0394" | **0.15mm ~ 1.00mm**

Series 240
Small and medium diameter, low thrust, open flute drills designed for drilling flexible printed circuits. Flex drills improve HWQ and reduce tears and debris deposition in soft materials.

Excellent for:
- Flex Materials
- Teflon / PTFE




4 Facet Point Geometry

Standard Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
240.0059.098	0.15mm	0.0059	0.098	2.50	130°	+0/-0.0003	+0/-0.008
240.0079.138	0.20mm	0.0079	0.138	3.50	130°	+0/-0.0003	+0/-0.008
240.0098.138	0.25mm	0.0098	0.138	3.50	130°	+0/-0.0003	+0/-0.008
240.0118.138	0.30mm	0.0118	0.138	3.50	130°	+0/-0.0003	+0/-0.008
240.0138.138	0.35mm	0.0138	0.138	3.50	130°	+0/-0.0003	+0/-0.008
240.0157.158	0.40mm	0.0157	0.158	4.00	130°	+0/-0.0003	+0/-0.008
240.0177.158	0.45mm	0.0177	0.158	4.00	130°	+0/-0.0003	+0/-0.008
240.0197.177	0.50mm	0.0197	0.177	4.50	130°	+0/-0.0003	+0/-0.008
240.0217.177	0.55mm	0.0217	0.177	4.50	130°	+0/-0.0003	+0/-0.008
240.0236.197	0.60mm	0.0236	0.197	5.00	130°	+0/-0.0003	+0/-0.008
240.0256.197	0.65mm	0.0256	0.197	5.00	130°	+0/-0.0003	+0/-0.008
240.0276.197	0.70mm	0.0276	0.197	5.00	130°	+0/-0.0003	+0/-0.008
240.0295.197	0.75mm	0.0295	0.197	5.00	130°	+0/-0.0003	+0/-0.008
240.0315.197	0.80mm	0.0315	0.197	5.00	130°	+0/-0.0003	+0/-0.008
240.0335.197	0.85mm	0.0335	0.197	5.00	130°	+0/-0.0003	+0/-0.008
240.0354.197	0.90mm	0.0354	0.197	5.00	130°	+0/-0.0003	+0/-0.008
240.0374.236	0.95mm	0.0374	0.236	6.00	130°	+0/-0.0003	+0/-0.008
240.0380.197	#62	0.0380	0.197	5.00	130°	+0/-0.0003	+0/-0.008
240.0394.236	1.00mm	0.0394	0.236	6.00	130°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
Additional diameters and special ring colors available upon request.

For recommended cutting conditions please visit: **www.kyoceraprecisiontools.com/pcb/speeds-feeds** or
Review starting recommendations on **Page 79**

1-888-848-9266 | **001-714-428-3611** (Int)
www.kyoceraprecisiontools.com/pcb

Series 260

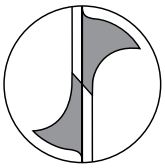
High Performance Back Drills

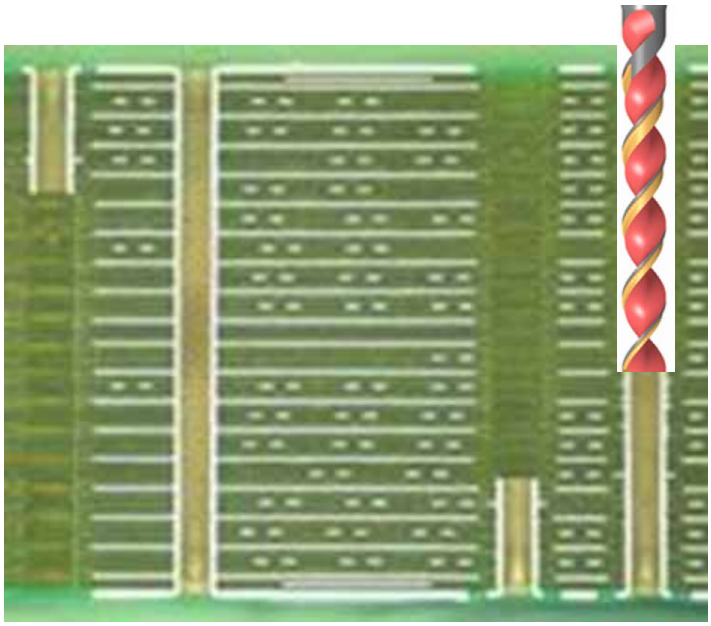
Application and Competitive Advantages of Series 260 PCB Drills

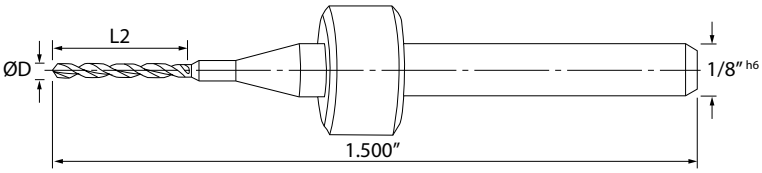
- These drills minimize the stub length in any back-drilled applications by featuring a short drill point at 170°.
- Precise plating removal generates superior and concentric hole quality with excellent wall surface finishes.
- Accurate, precise 4-facet drill point optimizes self-centering cutting action and chip formation with reduced cutting forces.

Series 260 Diameter Range
0.0145" ~ 0.0420"
0.40mm ~ 1.00mm

4-Facet Point Geometry
promotes the self-centering action of the drill, improving hole location.



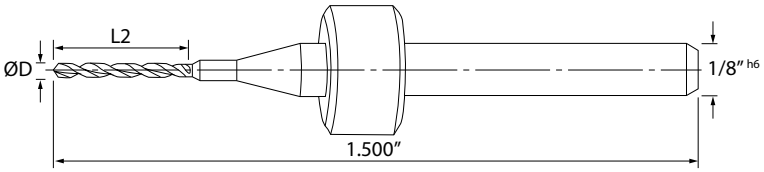


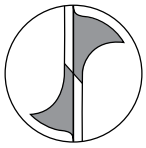


Series 260

High Performance Back Drills

Diameter Range
0.0145" ~ 0.0420" | **0.40mm ~ 1.00mm**




4 Facet Point Geometry

Series 260
Small and medium sized drills designed for reduced cutting forces with exceptional chip flow resulting in superior hole wall quality. Flat point allows for precise Back Drilling processing.

Suitable for:
- FR-4
- Polyimides
- Teflon / PTFE
- High copper content laminates
- High speed laminates

Standard & Extended Flute Length

Part Number	Cutting Diameter ØD	Decimal Inch ØD	Dimensions				
			Flute Length (in) L2	Flute Length (mm) L2	Point Angle	Tolerance ØD (in)	Tolerance ØD (mm)
260.0145.197	#79	0.0145	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0157.197	0.40mm	0.0157	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0177.197	0.45mm	0.0177	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0177.217	0.45mm	0.0177	0.217	5.50	170°	+0/-0.0003	+0/-0.008
260.0177.256	0.45mm	0.0177	0.256	6.50	170°	+0/-0.0003	+0/-0.008
260.0197.197	0.50mm	0.0197	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0197.217	0.50mm	0.0197	0.217	5.50	170°	+0/-0.0003	+0/-0.008
260Q0197.256	0.50mm	0.0197	0.256	6.50	170°	+0/-0.0003	+0/-0.008
260.0217.197	0.55mm	0.0217	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0236.197	0.60mm	0.0236	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0256.197	0.65mm	0.0256	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0276.197	0.70mm	0.0276	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0276.256	0.70mm	0.0276	0.256	6.50	170°	+0/-0.0003	+0/-0.008
260.0295.197	0.75mm	0.0295	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0315.197	0.80mm	0.0315	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0335.197	0.85mm	0.0335	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0354.197	0.90mm	0.0354	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0394.197	1.00mm	0.0394	0.197	5.00	170°	+0/-0.0003	+0/-0.008
260.0420.197	#58	0.0420	0.197	5.00	170°	+0/-0.0003	+0/-0.008

Part Numbers above include rings set at 0.800" - For Ringless Part Number, replace series "." with "-" (XXX-XXXX.XXXX)
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