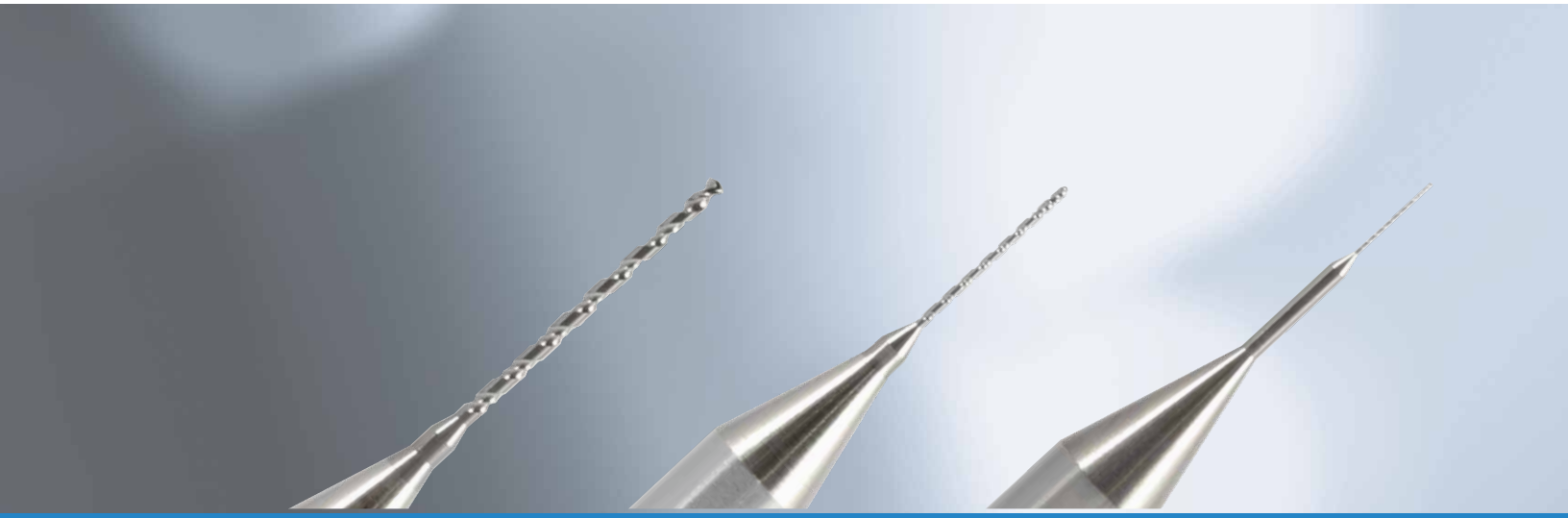
KYOCERA

Series 430

High-Performance Hybrid Drill



Elevated Overall Performance 2 into 1 Hybrid Flute Undercut Drill

- High strength, and long endurance design
- Superior hole wall quality
- Ultra-precise drilled hole location
- Can be used on a broad range of materials
- Reliable, repeatable results

Series 430

High Performance Drill with a Unique Hybrid Flute Design

Kyocera Precision Tools (KPT) is committed to continuous improvement in all of its product offerings, particularly when faced with new PCB applications and materials. In order to meet these new challenges, KPT is pleased to introduce its new hybrid drill design, Series 430. The new design demonstrates high strength, longer endurance, precise drilled hole location, and superior hole wall quality. This document details the results of the work completed in the Kyocera Development Lab in order to demonstrate to the PCB market the new design's high performance.

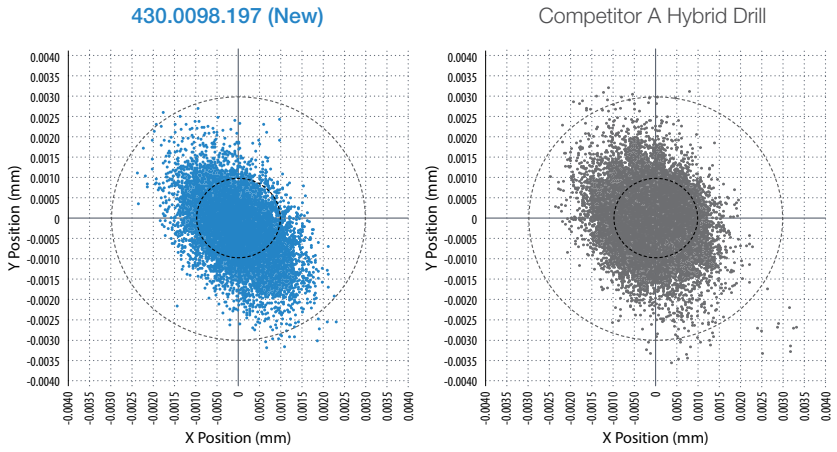
Series 430 Drill Performance Study

Lab tests were conducted to ensure the product performed at a high level that is both reliable and repeatable.

Drill Hole Positional Accuracy / True Position Deviation (Internal Evaluation)

Centered Data	
Material :	High Tg
Thickness :	0.130"
Copper Content :	20 Layers
Hit Count :	1500

True Position Deviation				
	Part Number	Mean	StdDev	Median
New :	430.0098.197	0.00092	0.00051	0.000840
Competitor A :	0.25mm/5mmFL	0.00109	0.00054	0.00104
p-value :	**0.000**			

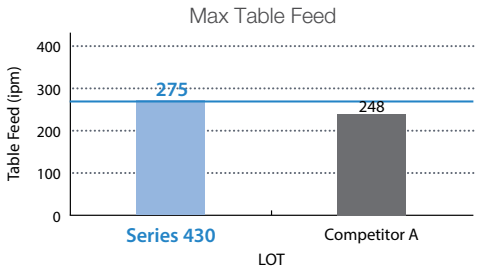


Robustness Tool Performance Comparison (Internal Evaluation)

Constant Variables	
Material :	High Tg
Thickness :	0.130"
Copper Content :	20 Layers

	Max infeed (ipm)
Series 430	275
Competitor A	248

Infeed at Breakage			
	Part Number	Mean	StdDev
New :	430.0098.197	275	26.4
Competitor A :	0.25mm/5mmFL	248	21.9
p-value :	**0.002**		



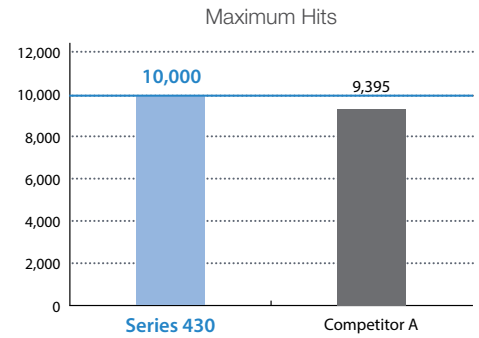
Feed: Start with 100 ipm, increment 20 ipm, stop at 400 ipm

Tool Life Performance Comparison (Internal Evaluation)

Constant Variables	
Material :	High Tg
Thickness :	0.130"
Copper Content :	20 Layers

	Avg Hit/Breakage
Series 430	10,000
Competitor A	9,395

Infeed at Breakage			
	Part Number	Mean	StdDev
New :	430.0098.197	10,000	0
Competitor A :	0.25mm/5mmFL	9,395	1354
p-value :	**0.100**		

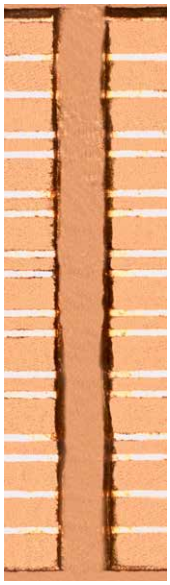
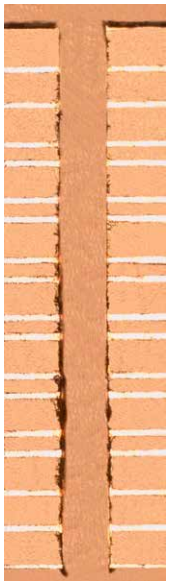


Hole Wall Quality at 1500 Hits (Internal Evaluation)

Constant Variables	
Material :	High Tg
Thickness :	0.140"
Copper Content :	18 Layers
Hit Count :	1500 Hits

Series 430													
Tool	Roughness (mil)					Avg Roughness	Nailheading						Avg Nailheading
	1	2	3	Avg	Max		1	2	3	Nominal	%Avg	%Max	
1	0.14	0.10	0.16	0.13	0.16	0.14	1.92	1.91	1.89	1.32	144%	145%	144%
2	0.16	0.12	0.17	0.15	0.17		1.88	1.92	1.90	1.32	144%	145%	
3	0.15	0.14	0.14	0.14	0.15		1.90	1.92	1.90	1.32	144%	146%	

Competitor A													
Tool	Roughness (mil)					Avg Roughness	Nailheading						Avg Nailheading
	1	2	3	Avg	Max		1	2	3	Nominal	%Avg	%Max	
1	0.22	0.25	0.23	0.23	0.25	0.21	1.95	1.91	1.95	1.32	147%	148%	146%
2	0.20	0.20	0.20	0.20	0.20		1.94	1.92	1.98	1.32	147%	150%	
3	0.18	0.19	0.20	0.19	0.20		1.95	1.90	1.89	1.32	145%	148%	

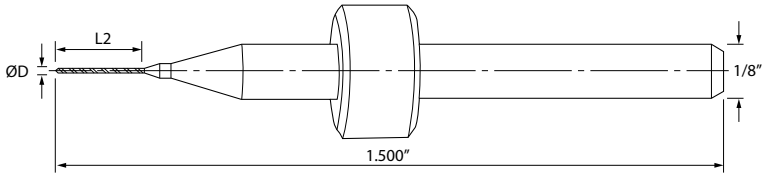
Series 430	Competitor A
	

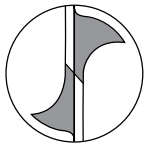
Two into One Flute Hybrid

Undercut Drills

Diameter Range
0.0071" ~ 0.0145"

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





4 Facet Point Geometry

STANDARD Flute Length (Inch)

Part Number	Stock	Drill Size	Dimensions (in)		Point Angle
			Cutting Diameter	Flute Length	
			ØD	L2	
430.0071.138	●	#94	0.0071	0.1378	130°
430.0083.158	●	#91	0.0083	0.1575	130°
430.0091.197	●	#89	0.0091	0.1969	130°
430.0110.197	●	#85	0.0110	0.1969	130°
430.0125.236	●	#82	0.0125	0.2362	130°
430.0130.236	●	#81	0.0130	0.2362	130°
430.0145.236	●	#79	0.0145	0.2362	130°

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

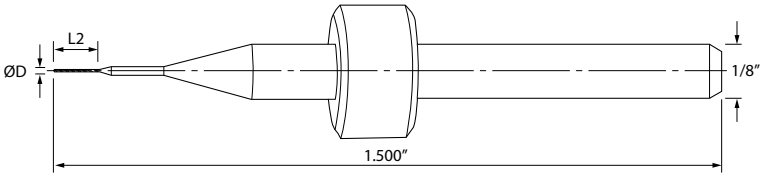
U.S. Standard Item : ●

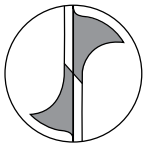
Two into One Flute Hybrid

Undercut Drills

Diameter Range

0.10mm ~ 1.00mm





4 Facet Point Geometry

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

STANDARD Flute Length (Metric)

Part Number	Stock	Drill Size	Dimensions (mm)		Point Angle
			Cutting Diameter	Flute Length	
			ØD	L2	
430.0039.079	●	0.10mm	0.100	2.00	130°
430.0039.098	●	0.10mm	0.100	2.50	130°
430.0051.098	●	0.13mm	0.130	2.50	130°
430.0051.118	●	0.13mm	0.130	3.00	130°
430.0059.118	●	0.15mm	0.150	3.00	130°
430.0059.138	●	0.15mm	0.150	3.50	130°
430.0079.118	●	0.20mm	0.200	3.00	130°
430.0098.217	●	0.25mm	0.250	5.50	130°
430.0118.217	●	0.30mm	0.300	5.50	130°
430.0118.276	●	0.30mm	0.300	7.00	130°
430.0138.197	●	0.35mm	0.350	5.00	130°
430.0138.276	●	0.35mm	0.350	7.00	130°
430.0157.236	●	0.40mm	0.400	6.00	130°
430.0157.295	●	0.40mm	0.400	7.50	130°
430.0177.236	●	0.45mm	0.450	6.00	130°
430.0177.315	●	0.45mm	0.450	8.00	130°
430.0197.276	●	0.50mm	0.500	7.00	130°
430.0197.354	●	0.50mm	0.500	9.00	130°
430.0217.276	●	0.55mm	0.550	7.00	130°
430.0217.354	●	0.55mm	0.550	9.00	130°
430.0236.276	●	0.60mm	0.600	7.00	130°
430.0236.354	●	0.60mm	0.600	9.00	130°
430.0256.394	●	0.65mm	0.650	10.00	130°
430.0276.394	●	0.70mm	0.700	10.00	130°
430.0295.394	●	0.75mm	0.750	10.00	130°
430.0315.394	●	0.80mm	0.800	10.00	130°
430.0335.394	●	0.85mm	0.850	10.00	130°
430.0354.394	●	0.90mm	0.900	10.00	130°
430.0374.394	●	0.95mm	0.950	10.00	130°
430.0394.394	●	1.00mm	1.000	10.00	130°

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