



VALUE AT THE SPINDLE®

Micro Tool Catalog



New Expanded Offering

www.sgsmicrotools.com

ISO 9001:2015 Certified



KYOCERA SGS Precision Tools (KSPT) is an ISO-certified manufacturer of industry leading round solid carbide cutting tools. State of the art manufacturing and warehouse facilities have the capacity and processes to meet the quality and delivery demands of customers in all markets around the world. Complete inspections performed within its metallurgical lab and manufacturing quality departments ensure the use of high quality carbide and reliable manufacturing consistency regardless of when a cutting tool is produced.

KSPT is proud to have pioneered some of the world's most advanced cutting technologies due to rigorous testing of tools, coatings, and materials within its Global Innovation Center. It is this commitment to innovation that has launched patented products and technologies like the Z-Carb with its variable geometry and cutting edge preparation, Series 43 APR® and APF® ultra high performance aluminum cutting tools, and the JetStream coolant technology.

SGS has become an important part of the KYOCERA Precision Tools family, and while the name has changed, one thing has not. Its dedicated people and their relentless commitment to the customer. KSPT Technical Sales Engineers, Application Specialists, and Distribution Partners blanket the globe, delivering reliable service and support to all market segments. It is these people and products that drive innovative application strategies and cutting tool technologies into the end user, continually exceeding expectations and providing the most Value at the Spindle®



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Speed & Feed Recommendations

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Speed & Feed Recommendations

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KSPT MICRO END MILLS

SMALL TOOLS. EPIC PROPORTIONS.

KYOCERA SGS Precision Tools (KSPT) commitment to providing superior quality round solid carbide cutting tools is unwavering, and these efforts are being taken one step further by introducing an impressive micro tool expansion. With a staggering expansion of over 2,500 tools in various lengths of cut, reach variations, end configurations and coating options, the portfolio can satisfy a variety of machining applications tailored for small diameter milling environments. Explore the portfolio below and discover how these small tools can deliver epic VALUE AT THE SPINDLE®!

EXPANSION HIGHLIGHTS:

- 2, 3, and 4 flutes in square, corner radii, and ball nose end configurations options standard
- Lengths of cut ranging from 1.5 times diameter through 12 times diameter
- Expansive reach options ranging from 3 times diameter through 25 times diameter overall reach
- Fractional tools on 1/8" common shank and metric tools on 3MM and 4MM shanks to suit global application demands
- Uncoated options for tools in expanded and legacy portfolio
- Offered in Ti-NAMITE®-A coating for superior chip flow at low spindle speeds in a variety of applications
- All micro tools are manufactured in accordance with KSPT ISO 9001: 2015 quality standards



CASE STUDY M4 8XD MICRO END MILL

INDUSTRY

AEROSPACE

MATERIAL

347 Stainless Steel (28 HRc Hardness)

PRODUCT

M4 8XD Micro End Mills

APPLICATION

Plunging

COMPETITOR

3 Flute Extended Reach Micro End Mill

COOLANT

Soluble Flood

TOOL INFORMATION

0.07" Dia / 0.21" LOC / 2" OAL

GOALS

The goals of this study were to significantly reduce job cost through the implementation of superior tooling and increased manufacturing efficiencies.

STRATEGY

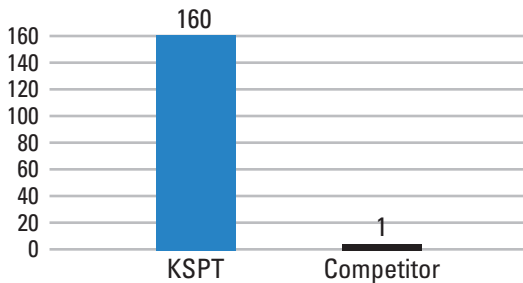
KSPT approached the job with a 4 flute 8XD Micro End Mill. The four flute design allows for higher feed rates and decreased deflection, improving productivity and surface finish.

	KSPT	COMPETITOR
TOOL DIAMETER	.07"	.07
SPEED	6600 RPM	3400 RPM
FEED	4 IPM	2 IPM
RADIAL CUT (AE)	N/A	N/A
AXIAL CUT (AP)	0.38	0.38
CYCLE TIME	6 SECONDS	11.4 SECONDS

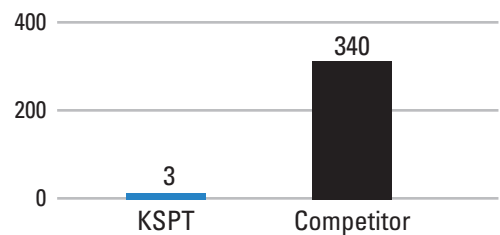
RESULTS

The overall findings of this study indicate **KSPT's 4 flute micro end mill blew away the competitor's 3 flute tool** in efficiency and effectiveness. **KSPT's tool was able to capacitate a 48% higher speed and a 50% greater feed rate.** Those combined efficiencies were able to **cut the cycle time in half!** Because of the higher quality tool, the customer was able to **produce 160 parts per KSPT tool.** The competitor's 3 flute end mill was only able to produce 1 part per tool. Thus, the **tool change cost was reduced by over 99%!** Additionally, since KSPT only used 3 total tools to complete the job, the customer benefited from a **new tool cost reduction by over 99%.** The **M4 8XD 4 flute micro end mill ultimately saved the customer a grand total of \$12,030.34, resulting in a 98.88% cost reduction!** These tools, albeit small, are an epic step forward for micro machining.

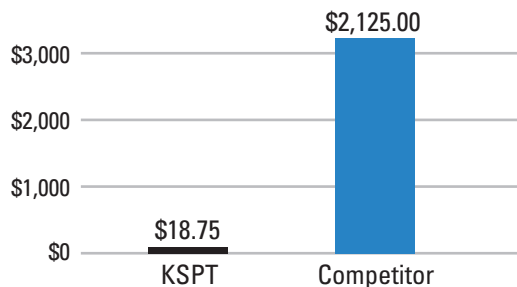
TOTAL PARTS AVAILABLE PER TOOL



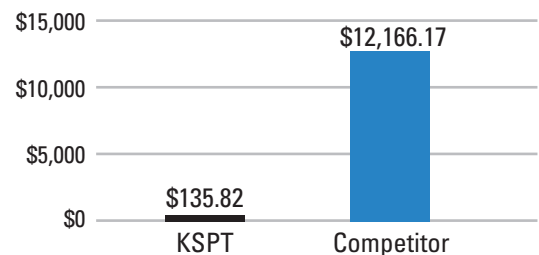
NEW TOOLS REQUIRED TO COMPLETE THE JOB



TOOL CHANGE COST



TOTAL COST



KSPT MICRO DRILLS

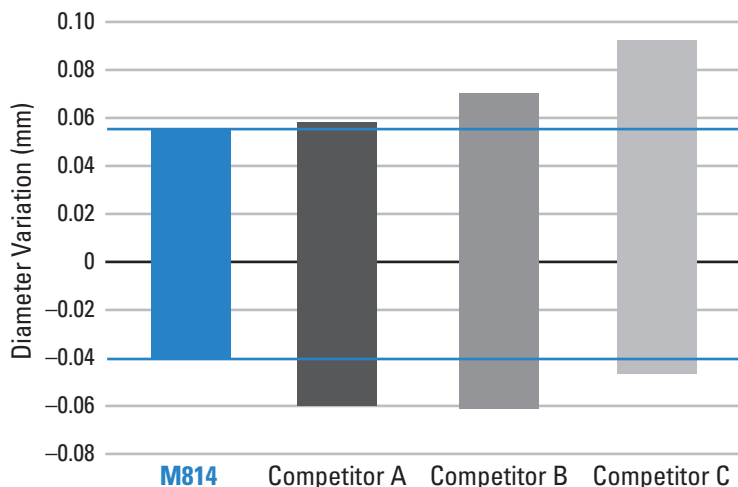
SMALL TOOLS. EPIC PROPORTIONS.

KYOCERA SGS Precision Tools (KSPT) commitment to providing superior quality round solid carbide cutting tools is unwavering, and these efforts are being taken one step further by introducing an impressive micro tool expansion. Within the expansion, KSPT introduces a new lineup of micro drills totaling more than 1,400 tools with a variety of coolant and length options to meet the demands of global hole making applications. Explore the portfolio below and discover how these small tools can deliver epic VALUE AT THE SPINDLE®!

DRILL PORTFOLIO HIGHLIGHTS:

- 2 flutes for optimal chip evacuation and cutting edge strength
- Internal coolant options on select series promotes controlled and consistent operating temperatures
- Lengths of cut ranging from 3 times diameter through 15 times diameter
- Fractional tools on 1/8" common shank and metric tools on 3MM and 4MM shanks to suit global market demands
- Uncoated options standard in select series
- Offered with Ti-NAMITE®-A coating for superior tool life and all-around value across a variety of applications
- Select series offered in new Ti-NAMITE®-Cr (AlCrN) coating for exceptional wear resistance in wet and dry drilling of cast iron and steel materials up to 52 HRC
- All micro tools are manufactured in accordance with KSPT ISO 9001: 2015 quality standards

**HOLE DIAMETER VARIATION
SERIES M814**



	No. of Holes	Dia. Variation (mm)
M814	600	0.0937
Competitor A	600	0.1141
Competitor B	269 (Broken)	0.1281
Competitor C	600	0.1347

Cutting Conditions:

N = 6468 rpm, Vf = 575 mm/min
Drill Diameter 0,3 mm
Drilling Depth 25,4 mm, 17-4PH-900

M814

- Split point and double margin design provide superior hole finish and size control
- Coolant hole feature allows straight through drilling without a peck cycle
- High-performance Ti-NAMITE®-Cr coating and mirror polished fluting increase tool life and productivity in moderate-to-difficult workpiece materials
- Available from stock in a selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures



M105

- 4-facet point design stabilizes on entry for superior hole size control and tool life
- Mirror surface finishes improve chip flow as hole depth increases
- Ti-NAMITE®-A coating and uncoated options for the ultimate performance in a variety of ferrous and non-ferrous workpiece materials
- Available from stock in a selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures



M080 & M081

- 4-facet point design, stub length, and mirror finish provide the highest quality spot
- Ti-NAMITE®-A coating and uncoated options for the ultimate performance and tool life in a variety of ferrous and non-ferrous workpiece materials
- Available from stock in all popular diameters and point configurations
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures



M226 & L226

- 4-facet point design stabilizes on entry for superior hole size control and tool life (>.08mm)
- Mirror surface finishes improve chip flow as hole depth increases
- Ti-NAMITE®-A coating and uncoated options for the ultimate performance in a variety of ferrous and non-ferrous workpiece materials
- Right and left hand cut available from stock in a wide selection of popular lengths and diameters
- Application specific sub-micron grain carbide designed specifically for micro-tool applications
- Manufactured in accordance with KSPT ISO certified quality procedures



KSPT COATINGS

Ti-NAMITE-A

With excellent thermal and chemical resistance, Ti-NAMITE®-A (AlTiN) allows for dry cutting and improvements in performance of carbide. The coating has a high hardness giving ultimate protection against abrasive wear and erosion. Ideal for cast iron, high temperature alloys, steels, and stainless steel applications.

Hardness (HV): 3700

Oxidation Temperature: 1100°C / 2010°F

Coefficient of Friction: 0.30

Thickness: 1 – 4 Microns (based on tool diameter)

KYOCERA SGS PRECISION TOOLS AlTiN COATING PERFORMANCE (LAB RESULTS)

SEM photography shows the KSPT proprietary coating method provides a significant reduction in macro particle deposition on the tool surface, which contributes to increased performance due to smoother chip flow. Another benefit of the KSPT micro-tool coating is a significant reduction in edge rounding due to excessive thickness, typical of most normal coatings.



Ti-NAMITE-CR

With very high wear resistance and excellent hot hardness, Ti-NAMITE®-Cr (AlCrN) allows for wet and dry machining versatility at the highest of cutting speeds for increased machine utilization and productivity. The coating provides optimal thermal shock stability and is ideal for cast iron and steel applications up to 52 HRC.

Hardness (HV): 3200

Oxidation Temperature: 1100°C / 2010°F

Coefficient of Friction: 0.35

Thickness: 1 – 4 Microns (based on tool diameter)

Common Legend

TO ORDER: Please specify quantity and EDP number.

RETURN POLICY: An RMA number must accompany all product returns. Contact your Customer Service Representative for an RMA number.

REGULATION SAFETY GLASSES SHOULD ALWAYS BE WORN WHEN USING HIGH-SPEED CUTTING EQUIPMENT



WARNING: This product can expose you to chemicals including Cobalt, which is known to the State of California to cause cancer. For more information go to www.p65warnings.ca.gov

MATERIALS



Steels



Stainless Steels



Cast Iron



High Temp Alloys



Titanium



Non-Ferrous



Plastics/Composites



Hardened Steels

END MILLS

TOOL LENGTH



Stub



Regular



Long



Long Reach



Extra Long

FLUTES



2 Flutes



3 Flutes



4 Flutes

END CONFIGURATIONS



Ball



Corner



Square

SHANK TYPE



Common

HELIX ANGLE



Right Spiral

PROFILE ANGLE



Profile Angle

RAKE ANGLE



Positive

All tools are in Right Cut Direction unless noted

DRILLS

SHANK TYPE



Common



Straight

HELIX ANGLES



Right Spiral



Left Spiral



None

COOLANT OPTIONS



Internal Coolant



External Coolant

POINT ANGLE



Drill Point

REACH

1.5xD

1.5xD Reach

3xD

3xD Reach

5xD

5xD Reach

8xD

8xD Reach

12xD

12xD Reach

15xD

15xD Reach