

Firearms Machining Solutions



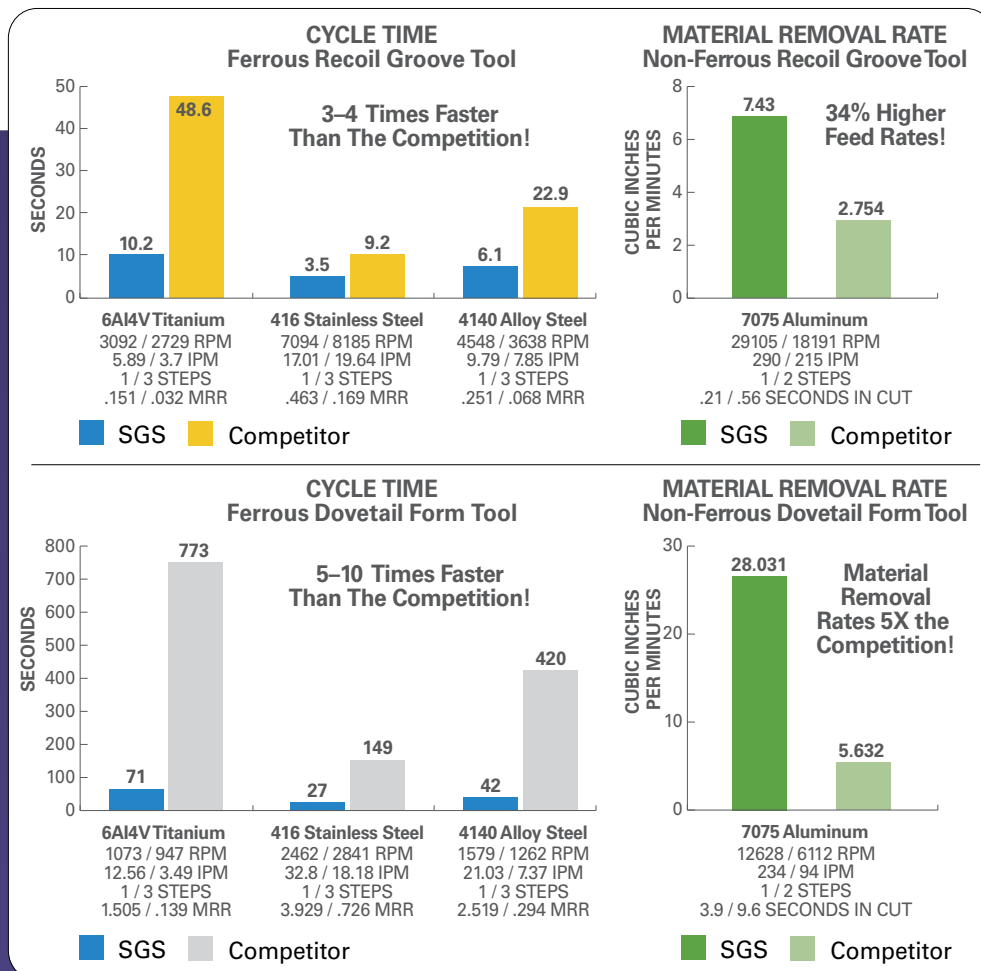


Picatinny Rail

PICATINNY RAIL DOVETAIL FORM AND RECOIL GROOVE TOOLS

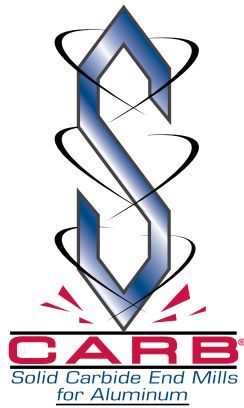
Material group focused Picatinny Rail form tools inspired by widely successful high performance endmills in the current SGS Portfolio. Meets **MIL-STD-1913**

- Recoil groove form tool for slotting operations with a .210" cutting diameter, a .118" length of cut, and a 45° chamfer cut at the top
- Dovetail form tool for side profiling with a .167" cut length below the angle (alternate lengths available on request)
- Optional designs for use in hard metals such as steel, stainless steel, and titanium offered with Ti-NAMITE®-A and Ti-NAMITE®-M coatings or soft materials such as aluminum offered uncoated and with Ti-NAMITE®-B coating



Ferrous Dovetail Form Tool

Non-Ferrous Recoil Groove Tool



AR15 Forend



AR15 Grip



S-CARB® SERIES 43 ENDMILLS

Symmetrical 3 flute endmill designed for a full range of non-ferrous machining requiring a high level of material removal and/or high quality finishes. Available uncoated or with Ti-NAMITE®-B coating.

- Circular land provides chatter and vibration control across a wide range of speeds and feeds
- Specialized flute design maximizes chip evacuation and prevents edge build-up by reducing heat caused from friction
- Ti-NAMITE®-B coating (TB) has a low affinity to edge build up and high hardness leading to longer tool life from reduced wear and better finishes
- Broad offering: square end, ball end, corner radius, extended reach, extended flute length

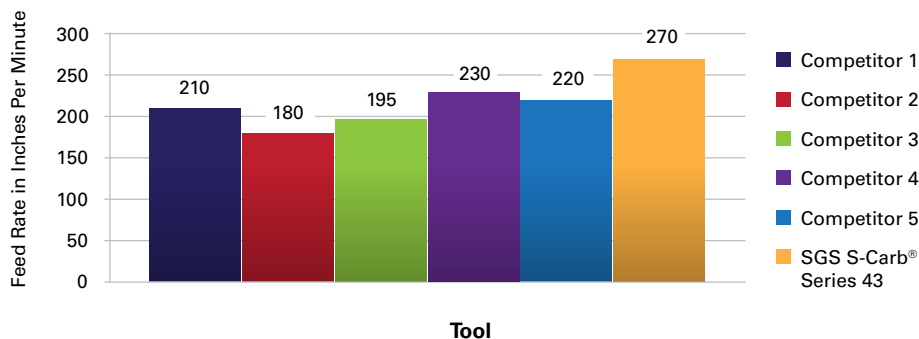


SLOTING CAPABILITY

3-flute end mills maximum feed rate achieved at 100% spindle load on a 30 hp vertical mill in 6061 aluminum @ 10,000 rpm .500" deep slot .500" diameter tool

SLOTING CAPABILITY: 3-FLUTE END MILLS

Maximum Feed Rate Achieved at 100% Spindle Load on a 30 HP Vertical Mill In 6061 Aluminum @ 10,000 RPM .500" Deep Slot .500" Diameter Tool



SHOWN WITH TI-NAMITE®-B COATING (TB)
ALSO AVAILABLE UNCOATED



AR15 Upper Receiver



AR15 Lower Receiver



HI-PERCARB® SERIES 131N DRILLS

High-performance 3 flute drill specifically designed for non-ferrous materials. Available in 3xD & 5xD, both uncoated and Ti-NAMITE®-B coated.

- Self-stabilizing point design stabilizes drill on contact and eliminates center drilling on flat surfaces
- Sculpted gash allows chips to easily flow away from the drill tip, reducing the need for pecking
- Circular land provides a burnishing effect, creating superior surface finishes
- Third flute/margin increases stability in cut, resulting in close tolerance holes
- Open flute structure efficiently evacuates chips while maintaining strength at high feed rates



HI-PERCARB® SERIES 131N VS. COMPETITION 2 FLUTE DRILL IN 2024 ALUMINUM

Independent Lab Results Indicate the HI-PERCARB® Series 131N Drill outperforms the competition in measured hole quality at a variety of speed and feed rates.

DRILL DIA: 0.375"

4847 RPM | 65 INCHES PER MINUTE

- Measured hole size (top to bottom)
- Measured hole circularity (top to bottom)
- Measured hole cylindricity

HI-PERCARB® SERIES 131N

0.00030
0.00030
0.00049

COMPETITOR

0.00034
0.00111
0.00335

DRILL DIA: 0.375"

6786 RPM | 100 INCHES PER MINUTE

- Measured hole size (top to bottom)
- Measured hole circularity (top to bottom)
- Measured hole cylindricity

HI-PERCARB® SERIES 131N

0.00004
0.00008
0.00045

COMPETITOR

0.00018
0.00116
0.00229

DRILL DIA: 0.375"

9530 RPM | 200 INCHES PER MINUTE

- Measured hole size (top to bottom)
- Measured hole circularity (top to bottom)
- Measured hole cylindricity

HI-PERCARB® SERIES 131N

0.00013
0.00003
0.00093

COMPETITOR

0.00036
0.00184
0.00254

SHOWN UNCOATED
ALSO AVAILABLE IN TI-NAMITE®-B (TB) COATING



Suppressor Monocore



Lever Action Rifle Receiver

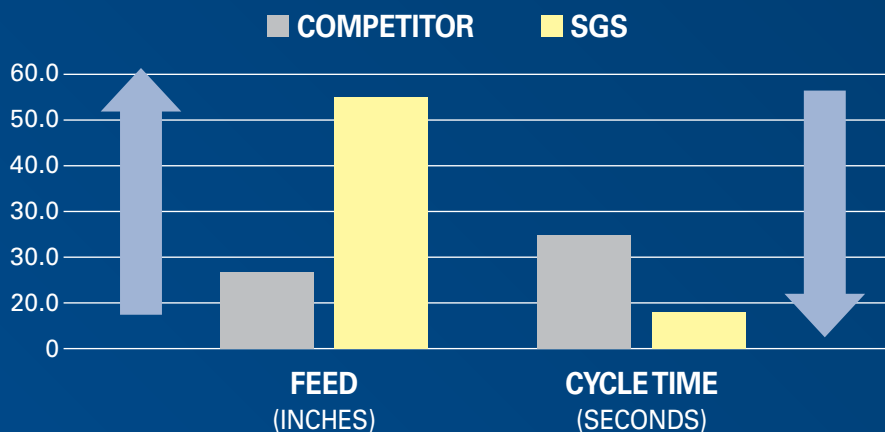
SERIES 33 END MILLS

Series 33 High Performance End Mills are ideal for aggressive ramping, pocketing, and slotting in difficult to machine materials such as Stainless Steel, Titanium, and Inconel.

- Open design accommodates material flow from axial end and aids in load reduction during operations
- Proprietary three-flute design allows for more controlled chip formation and efficient chip evacuation
- Variable end geometry provides superior chatter and vibration suppression during aggressive milling
- Stepped core design provides stability for aggressive ramping and rigidity when flutes are completely engaged

While assisting with an end user application, SGS introduced a 1" Series 33 End Mill. This tool facilitated a 66% increase in spindle speed and a 217% increase in feed rate.

These changes increased the MRR from 0.78 in³ to 2.46 in³ reducing the cycle time by 68%.





AR15 Bolt Carrier Group



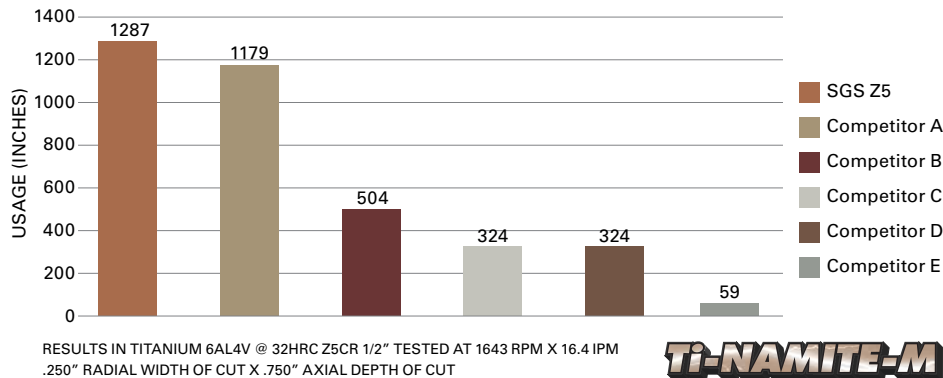
1911/2011 Pistol Slide

Z-CARB-HPR END MILLS

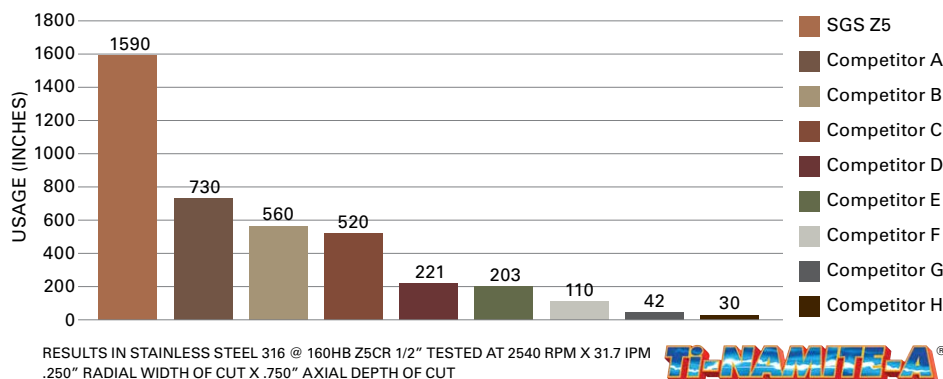
The Z-Carb HPR 5 Flute Roughing End Mills are ideal for achieving high material removal rates (MRR) and superior finishes.

- Variable flute indexing improves chatter suppression over a wide range of spindle speeds
- Specialized flute geometry balances positive cutting action and edge strength allowing for aggressive cuts while reducing contact area to control tool pressure and spindle load
- Ti-NAMITE®-A coating (TA) offers superior protection against erosion from high heat and pressure found in cutting high temperature alloys and stainless-steels
- Ti-NAMITE®-M coating (TM) provides high wear resistance, reduces friction, minimizes edge build up, and provides superior material removal rates and tool life in cast iron, steel, and titanium applications

LAB TESTING RESULTS – HEAVY PROFILING IN TITANIUM



LAB TESTING RESULTS – HEAVY PROFILING IN STAINLESS STEEL



SHOWN WITH Ti-NAMITE®-M COATING
ALSO AVAILABLE IN Ti-NAMITE®-A COATING



Five Flute End Mills

V-CARB® END MILLS

V-Carb® 5 flute endmills feature unequal indexing and an optimized rake and relief combination yielding unmatched finishing capability.

- Features unequal indexing for improved chatter reduction
- High helix improves shearing action which leads to better finishes
- Ti-NAMITE®-A coating has a high hardness and offers great protection against abrasive wear and erosion
- Standard options: Square end, ball end, corner radius



Custom Bolt Action Receiver and Bolt



BDL Bottom Metal

CYCLE TIME REDUCTION

In a recent case study, the V-Carb® ran against a competitor's end mill in 6AL-4V titanium alloy. Our tool geometry facilitated a significantly increased speed and feed rate. The customer achieved a 5 minute reduction in cycle time per part.

**V-CARB
CYCLE TIME**

13:47 36

**COMPETITOR
CYCLE TIME**

18:55 92





Custom Handgun Frame



Stripped Bolt Carrier

HI-PERCARB® SERIES 142P DRILLS

The Hi-PerCarb® Series 142P Drill is an engineered drilling solution addressing issues commonly encountered with ISO **P** Category materials during high production hole-making.

- 4 margin design improves hole perpendicularity and concentricity while providing improved stability in applications such as cross holes or exiting on angle
- High-performance point design stabilizes on entry for exceptional hole size and cylindricity while also allowing for low thrust force and extended tool life
- Internal coolant holes improve tool life and aid in chip evacuation
- Proprietary Ti-NAMITE®-X coating provides exceptional wear resistance and toughness for demanding applications

TESTING PARAMETERS

- 3/8" Diameter
- 8XD Length of Cut
- 4140 Alloy Steel
- 3360 rpm
- 30 ipm
- 3.0" axial depth – blind
- TSC – Water Sol 8.9%

HOLE FINISH TEST RESULTS

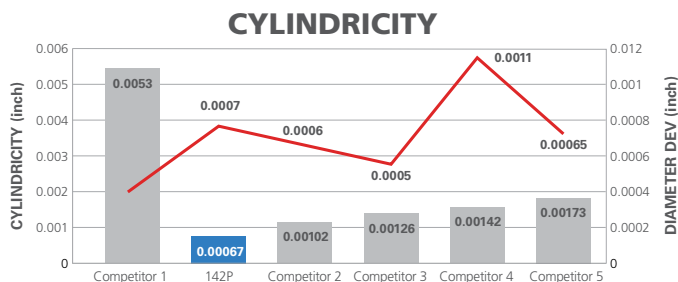
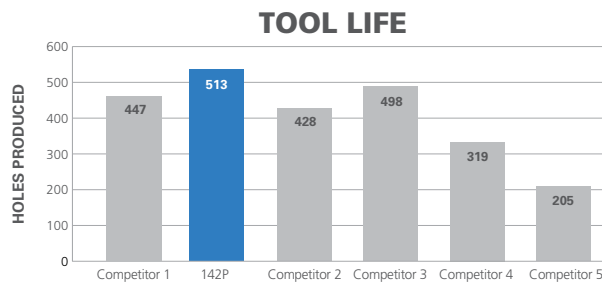
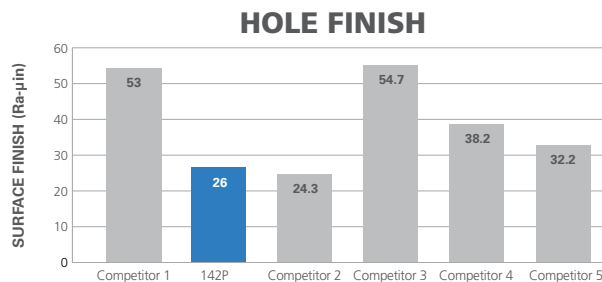
The lower numerical value shown in the chart demonstrates an improved surface finish in alloy steel versus other competitors tested.

TOOL LIFE

All tools were tested until catastrophic failure. Under these conditions, The HI-PERCARB® 142P demonstrated more longevity than all of its competitors.

CYLINDRICITY

CMM measurements of 14 random holes per competitor indicate the 142P cylindricity is the best among those tested.





Muzzle Brake

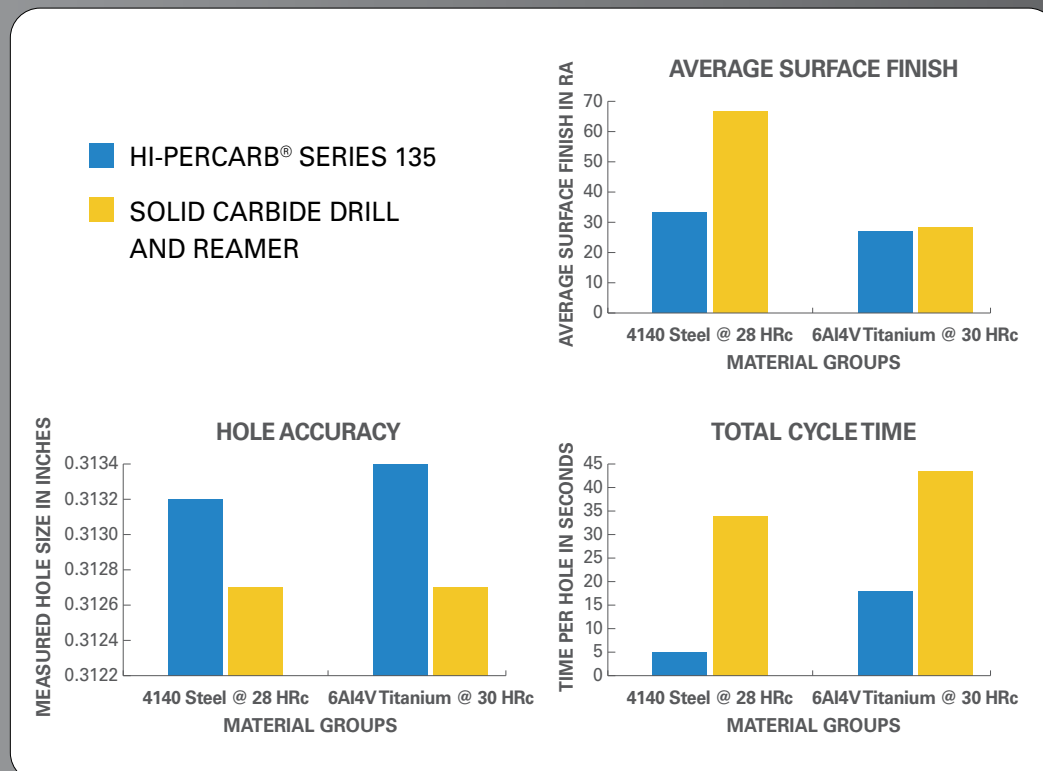
Adjustable Gas Block

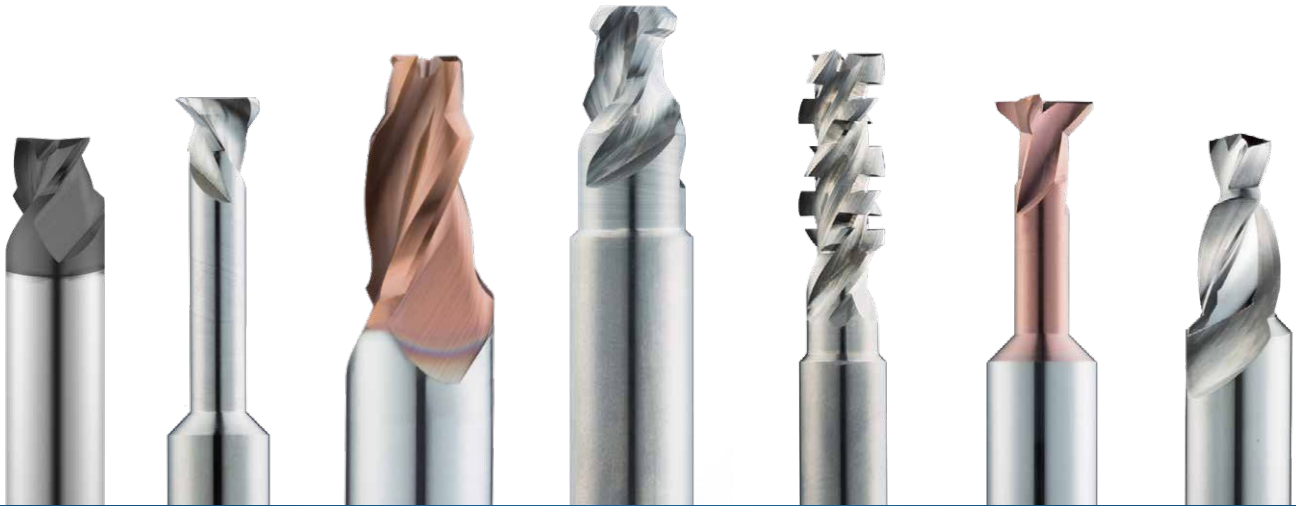


HI-PERCARB® SERIES 135 DRILLS

The Hi-PerCarb® Series 135 Drill's 2 flute/ 4 margin design offers unparalleled performance in a variety of materials and applications.

- Double margin design burnishes to improve accuracy and surface finish while increasing tool stability and rigidity
- Secondary flute improves coolant flow to point
- Cuts cycle time by reducing the need for reaming in high production applications, lowering the total machining cost
- Engineered edge protection improves strength and reduces fatigue allowing for increased feed rates
- Ti-NAMITE®-A coating (TA) has a high hardness and offers great protection against abrasive wear and erosion





Customized Machining Solutions

The KYOCERA SGS Tech Hub (KSTH) is a division of KYOCERA SGS Precision Tools Inc. created to focus on custom high-performance cutting tool solutions, while exploring emerging technologies. The state-of-the-art custom facility is designed with the purpose and resources to provide MORE than a cutting tool. KSTH provides a complete scope of services and works with customers to tailor solutions from conception to application and beyond.

KSTH works closely with manufacturers to provide a complete firearms solution by developing new and innovative milling and drilling solutions, carbide grades, edge preparations, and coatings specifically to overcome the challenges faced by the firearms market.

Our technicians develop special solutions on customer-supplied components and testing requirements using the latest technology in testing applications.

KSTH provides quotation requests within a 24-hour period with aggressive deliveries.

KYOCERA SGS Tech Hub





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Ti-NAMITE® Tool Coatings are specifically engineered for SGS solid carbide rotary tools. The coating lineup includes proprietary processes that result in optimized tool life and increased speed and feed rates in a variety of applications.

	Coating	Identifying Color	Layer Structure	Thickness	Hardness (HV)	Coefficient of Friction (Fretting)	Thermal Stability	General Information
	Aluminum Titanium Nitride (AlTiN)	Dark Grey	Nano Structure	1–5 microns	3700	0.30	1100°C / 2010°F	Excellent thermal and chemical resistance allows for dry cutting and improvements in performance of carbide. The coating has a high hardness giving great protection against abrasive wear and erosion.
	Titanium DiBoride (TiB2)	Light Grey-Silver	Monolayer	1–2 microns	4000	0.10–0.20	850°C / 1562°F	This ceramic based coating ensures a smooth surface and a low affinity to cold welding or edge build up, which makes it optimal for aluminum and copper applications. It has high toughness and high hardness.
	Proprietary (TM)	Copper	Nano Composite	1–5 microns	3600	0.45	1150°C / 2100°F	Features include high wear resistance, reduced friction, and excellent prevention of edge build up. This coating provides superior material removal rates and tool life when used in high performance operations with difficult to machine materials like titanium.
	Proprietary (TX)	Black	Nano Composite	1–5 microns	3600	0.45	1150°C / 2100°F	The structural design of Ti-Namite-X is adapted to meet a diverse range of applications; everything from high- and low-alloy steels to hardened materials (up to 65 HRC core hardness). Ti-Namite-X is suitable for operations which require high cutting speeds, high temperatures at the cutting edge, and high metal removal rates.



SOLUTIONS AROUND THE GLOBE

KYOCERA SGS Precision Tools is an ISO 9001:2015 Certified leader of round solid carbide cutting tool technology for the aerospace, metalworking, and automotive industries with manufacturing sites in the United States and United Kingdom. Our global network of Sales Representatives, Industrial Distributors, and Agents blanket the world selling into more than 60 countries.

LEADERS IN SOLID CARBIDE TOOL TECHNOLOGY

Brand names such as Z-Carb®, S-Carb®, V-Carb, Hi-PerCarb®, Multi-Carb have become synonymous with high performance tooling in the machining and metalworking industry.

We're proud to have pioneered some of the world's most advanced cutting technology right here on our Northeast Ohio manufacturing campus. KSPT high performance end mills, drills and routers are increasing productivity and reducing cost around the world.

EXCEEDING CUSTOMER EXPECTATIONS

As the world's manufacturing needs change, so does KSPT. It's all about the science, starting with our lab inspected substrate materials to our tool designs and coatings. Our exceptional team of researchers, engineers, and machinists are dedicated to developing the absolute best and delivering the ultimate Value at the Spindle®.

- Incredible batch-to-batch consistency
- Metallurgical lab dedicated to testing and rigorous quality control
- ISO 9001:2015 Certified quality procedures
- Patented geometries that extend tool life, reduce chatter, cut cycle times, and improve part quality—even at extreme parameters
- Specialists in extreme and demanding product applications
- Comprehensive tooling services
- Experienced Field Sales Engineers who work to optimize a tool for your particular application
- Dedicated multi-lingual customer service representatives

SGS PRODUCTS ARE DISTRIBUTED BY:



www.kyocera-sgstool.com



VALUE AT THE SPINDLE®

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