

# NACHI

## SG DRILLS

**HIGH PRECISION DRILLING FOR A WIDE  
RANGE OF MATERIALS**



*NACHI SG DRILLS ARE HIGH PERFORMANCE DRILLS THAT ARE A PERFECT FIT FOR APPLICATIONS WHERE CARBIDE IS NOT COST EFFECTIVE AND GENERAL PURPOSE HSS DRILLS DO NOT PROVIDE ENOUGH ACCURACY. THE VERSATILITY OF THE SG DRILLS MAKE IT GREAT FOR CUSTOMERS THAT DRILL EVERYTHING FROM ALUMINUM TO NICKEL ALLOYS. THE SG DRILLS ALSO LEND THEMSELVES TO APPLICATIONS WHERE THE MACHINE MAY NOT HAVE THE SPINDLE SPEEDS TO JUSTIFY USING A CARBIDE TOOL.*

## **SG PRODUCT OFFERING**

- *SG MICRO STUB DRILL  
(0.5mm to 1.9mm)*
- *SG-ESS STUB DRILL  
(1.9mm to 20.0mm)*
- *SG-ESR 5XD DRILL  
(2.0mm to 32.0mm)*
- *SG OIL HOLE 5XD DRILL  
(5.0mm to 20.0mm)*



## **SG DRILL CHARACTERISTICS**

- *SELF CENTERING POINTS FOR STABLE AND PRECISE POSITIONING*
- *PREMIUM POWDERED METAL COBALT SUBSTRATE*
- *COMPOSITE NANO-LAYER SG COATING (TiN+TiCN)*
- *PRECISION GROUND END MILL STYLE SHANK FOR ACCURATE AND PRECISE DRILLING*



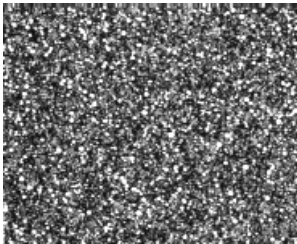
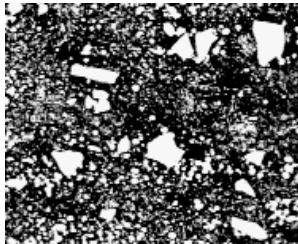
## POWDERED METAL SUBSTRATE

THE SG DRILLS ARE MADE WITH A PROPRIETARY POWDERED METAL (HSS COBALT) SUBSTRATE THAT IS MANUFACTURED AT NACHI'S MATERIAL FACILITY IN JAPAN.

BY USING A POWDERED METAL SUBSTRATE WE ARE ABLE TO ACHIEVE A MORE UNIFORM GRAIN STRUCTURE AS SHOWN IN THE PICTURES TO THE RIGHT.

Conventional HSS

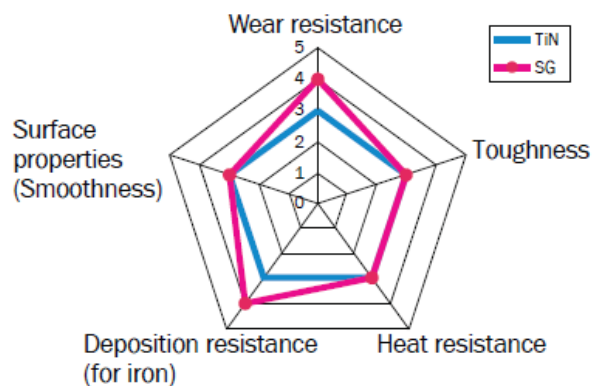
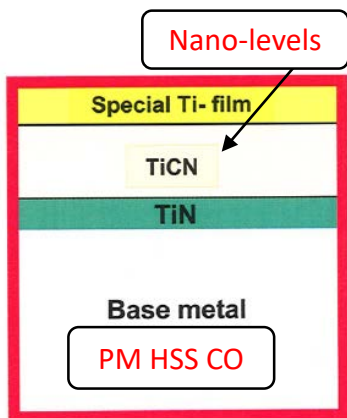
PM HSS CO



A UNIFORM GRAIN STRUCTURE ALLOWS FOR MUCH BETTER HEAT DISSIPATION AND GIVES MUCH BETTER TOOL LIFE THAN THAT OF A CONVENTIONAL HSS CUTTING TOOL.

## SG COATING CHARACTERISTICS

THE SG COATING CONSISTS OF A TiN LAYER ON THE BOTTOM, TiCN LAYERS STACKED AT NANO LEVELS IN THE MIDDLE, AND A SPECIAL Ti FILM ON TOP. THIS CREATES A HIGH OXIDATION (700°C) RESISTANCE AND AN IMPROVED WEAR RESISTANCE AS COMPARED TO TiN.



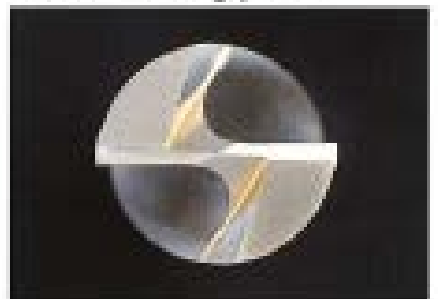
## SG POINT GEOMETRY

NACHI DESIGNED THE SG-ESR WITH A HIGH PERFORMANCE FOUR FACET POINT. THIS DELIVERS INCREASED TOOL LIFE AND MUCH HIGHER ACCURACY THAN A CONVENTIONAL HSS DRILL. THE SG-ESS WAS GIVEN A 3 RAKE POINT GEOMETRY THAT THINS OUT THE CHISEL OF THE TOOL. THIS ALLOWS THE DRILL TO BE SELF CENTERING AND TO HOLD A TIGHTER TRUE POSITIONING TOLERANCE. THE COMBINATION OF A POWDERED METAL SUBSTRATE, SG (TiN+TiCN) NANO-LAYER COATING, HIGH PERFORMANCE POINT GEOMETRY, AND A PRECISION GROUND SHANK GIVES THE SG DRILLS THE TECHNOLOGY NEEDED TO BE THE TOP PERFORMING POWDERED METAL TOOL ON THE MARKET.

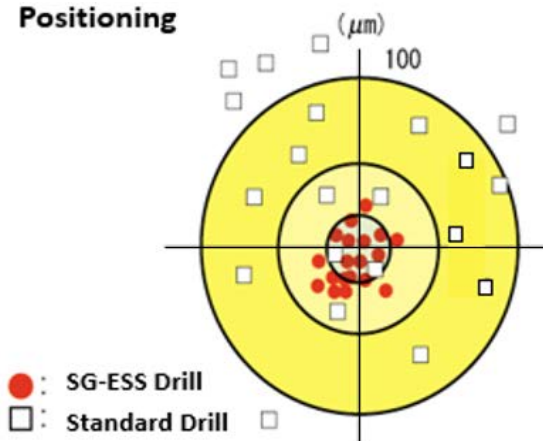
SG-ESR (2 RAKE)



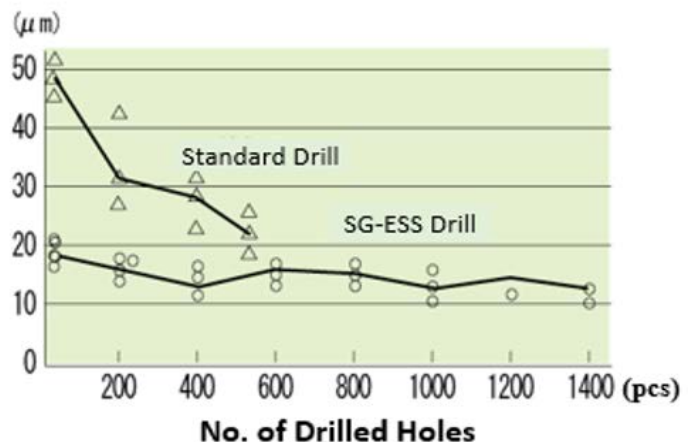
SG-ESS (3 RAKE)



Positioning

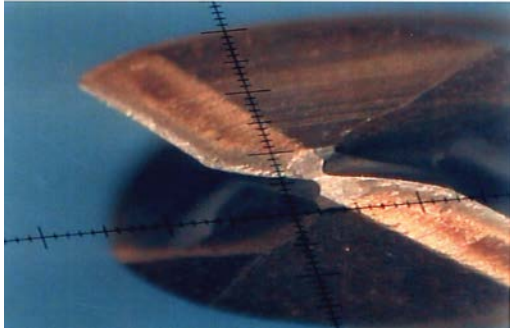


Hole Over Size



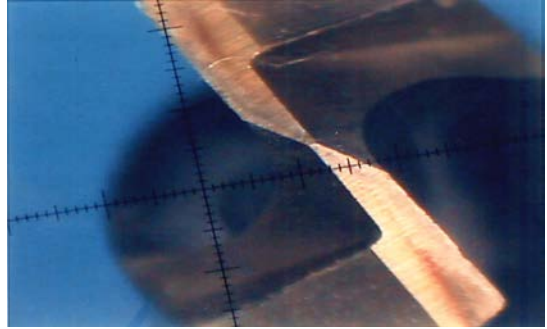
## High Speed Drilling in 304 Stainless

### COMPETITOR



COMPETITOR AFTER 100 HOLES

### NACHI SG-ESS



SG-ESS AFTER 100 HOLES

AFTER 100 HOLES WEAR ON THE COMPETITOR TOOL IS SUBSTANTIAL WHILE THE WEAR ON THE SG-ESS IS MINIMAL.

## SG DRILL HIGHLIGHTS

- 30-50% LOWER COST THAN CARBIDE
- DOUBLE SPEEDS/FEEDS OF CONVENTIONAL HSS-CO DRILLS
- SIMILAR TO CARBIDE SPEEDS/FEEDS IN ALLOY STEEL, CARBON STEEL, AND ALUMINUM
- COMPARABLE PERFORMANCE TO CARBIDE IN ALLOY STEEL, CARBON STEEL, AND ALUMINUM
- FORGIVING POWER OF HSS-CO DRILLS; GREAT FOR USE ON MACHINES WITH RPM RESTRICTIONS
- CONSISTENT TOOL LIFE
- PRECISION GROUND SHANK PROVIDES BETTER HOLE TOLERANCE AND STABLE POSITIONING WITHIN 15 $\mu$ m
- SG-ESS & SG-ESR DRILLS CAN BE USED IN A WIDE VARIETY OF MATERIALS

## ***ENGINEERED SOLUTIONS***

*Nachi designs solutions to help you solve the most difficult cutting tool problems. We pride ourselves in making tools that fit industry needs and save our customers money. If there is problem you are having and our stock item does not fit your needs reach out to our engineering team. We will design custom tools to fit your application.*

*Engineering:*

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