


## Recommended Insert Grade by Work Material

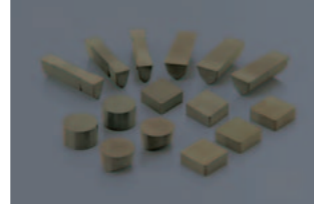
Application	Grade	Inco625	Inco706	Inco713	Inco718	Inco901	Inco903	IN100	Udimet720	Rene41	Waspaloy	718Plus
 Rough Turning Scale	SX5			●	●	●	●	●	●	●	●	●
	SX7	●	●			●	●					
	SX9	●	●	●	●			●	●	●	●	●
 Rough no Scale	SX5					●	●	●	●	●	●	●
	SX7	●	●	●	●	●	●	●	●	●	●	●
	SX9	●	●	●	●							
 Profiling & Semi-Finish	SX5					●	●	●	●	●	●	●
	SX7	●	●	●	●	●	●	●	●	●	●	●
	SX9	●	●	●	●							
 Grooving	WA1	●	●	●	●	●	●	●	●	●	●	●

Application	Grade	Inco625	Inco706	Inco713	Inco718	Inco901	Inco903	IN100	Udimet720	Rene41	Waspaloy	718Plus
 Milling	SX7	●	●	●	●	●	●	●	●	●	●	●
	SX9	●	●	●	●	●	●	●	●	●	●	●

● 1st Choice ● 2nd Choice

Our technical service personnel at each **NTK** sales office are available to answer any technical questions.

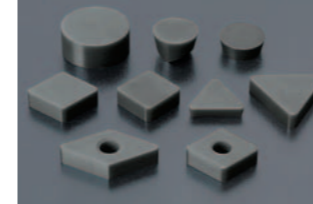
**SX5**



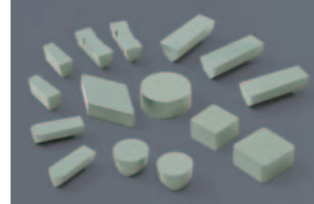
**SX7**



**SX9**



**WA1**



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OC-2178-1109



NTK CUTTING TOOLS

# Solutions for Aerospace Industry

Machining High Temperature Alloys with Ceramics

Introducing New Silicon Nitride **SX7** !

NTK Produces The World's Most Advanced Ceramic Cutting Tool Materials for the Aerospace Industry

## Recommended Cutting Conditions by Application

Application	Grade	Coolant	Cutting Speeds					Feed					Depth of Cut							
			400	600	800	1000	1200	.004	.008	.012	.016	.020	.040	.060	.080	.100	.120			
Rough Turning Scale 	SX5	WET	650 (450-800) sfm 200 (130-240) m/min						.012 (.008-.014) ipr 0.30 (0.20-0.35) mm/rev						.080 (.040-.200)* 2.0 (1.0-5.0) mm					
	SX7		800 (600-1000) sfm 240 (180-300) m/min						.008 (.004-.010) ipr 0.20 (0.10-0.25) mm/rev						.080 (.040-.200)* 2.0 (1.0-5.0) mm					
	SX9		650 (450-800) sfm 200 (130-240) m/min						.012 (.008-.014) ipr 0.30 (0.20-0.35) mm/rev						.080 (.040-.200)* 2.0 (1.0-5.0) mm					
Rough no Scale 	SX5	WET	700 (600-900) sfm 210 (180-270) m/min						.014 (.008-.016) ipr 0.35 (0.20-0.40) mm/rev						.080 (.040-.100)* 2.0 (1.0-2.5) mm					
	SX7		900 (700-1100) sfm 270 (210-330) m/min						.010 (.006-.014) ipr 0.25 (0.15-0.35) mm/rev						.080 (.040-.100)* 2.0 (1.0-2.5) mm					
	SX9		700 (600-900) sfm 210 (180-270) m/min						.014 (.008-.016) ipr 0.35 (0.20-0.40) mm/rev						.080 (.040-.100)* 2.0 (1.0-2.5) mm					
Profiling & Semi-Finish 	SX5	WET	700 (600-900) sfm 210 (180-270) m/min						.008 (.004-.012) ipr 0.20 (0.10-0.30) mm/rev						.060 (.040-.080)* 1.5 (1.0-2.0) mm					
	SX7		900 (700-1100) sfm 270 (210-330) m/min						.006 (.003-.010) ipr 0.15 (0.08-0.25) mm/rev						.060 (.040-.080)* 1.5 (1.0-2.0) mm					
	SX9		700 (600-900) sfm 210 (180-270) m/min						.008 (.004-.012) ipr 0.20 (0.10-0.30) mm/rev						.060 (.040-.080)* 1.5 (1.0-2.0) mm					
Grooving 	WA1	WET	900 (600-1200) sfm 270 (180-360) m/min						.002 (.002-.004) ipr 0.05 (0.05-0.10) mm/rev											

Application	Grade	Coolant	Cutting Speeds					Feed					Depth of Cut							
			2000	2500	3000	3500	4000	.002	.003	.004	.005	.006	.020	.040	.060	.080	.100			
Milling 	SX7	DRY	3500 (2500-4000) sfm 1050 (750-1200) m/min						.004 (.003-.005) ipr 0.10 (0.08-0.12) mm/rev						.060 (.040-.100)* 1.5 (1.0-2.5) mm					
	SX9		3000 (2000-3500) sfm 900 (600-1050) m/min						.006 (.004-.006) ipr 0.15 (0.10-0.15) mm/rev						.060 (.040-.100)* 1.5 (1.0-2.5) mm					

## SX7 SiAlON Ceramic

New

### Features

- Better notching resistance compared to Whisker Ceramics
- No need to program ramping like Whisker Ceramics require
- Better flank wear resistance compared to SiAlON Ceramics
- Best grade for pre-machined Waspaloy
- Best grade for high-speed milling

### Recommended Work Materials

- Inco 718
- Waspaloy

### Recommended Applications

- Semi-Finish
- Milling
- Profiling

### Profiling of Inco 718



Tool Life : 4.5min  
RCGX45, 800sfm .006ipr, .040", Wet  
RCGX120700, 240m/min, 0.15mm/rev, 1.00mm, Wet  
Inco 718 (pre-machined)

## SX5 SiAlON Ceramic

### Features

- Tougher when compared to Whisker Ceramics
- Best grade for machining Waspaloy with scale

### Recommended Work Materials

- Waspaloy
- 718Plus
- Udimet 720
- Rene 41

### Recommended Applications

- Rough Turning with scale and interruptions

### Rough Turning of Waspaloy with Scale



Tool Life : 2.0min  
RNG65, 950sfm .012ipr, .150", Wet  
RNGN190700, 285m/min, 0.30mm/rev, 3.80mm, Wet  
Waspaloy with Scale

## WA1 Whisker-Reinforced Ceramic

### Features

- Versatile grade for machining of high temperature alloys
- Better flank wear resistance compared to SiAlON Ceramics
- Better notching resistance compared to competitors' Whisker Ceramics

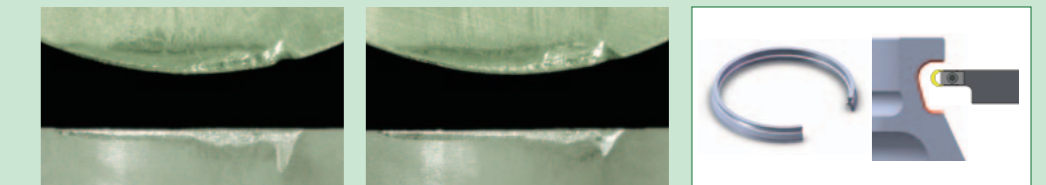
### Recommended Work Materials

- Inco 718
- Inco 625

### Recommended Applications

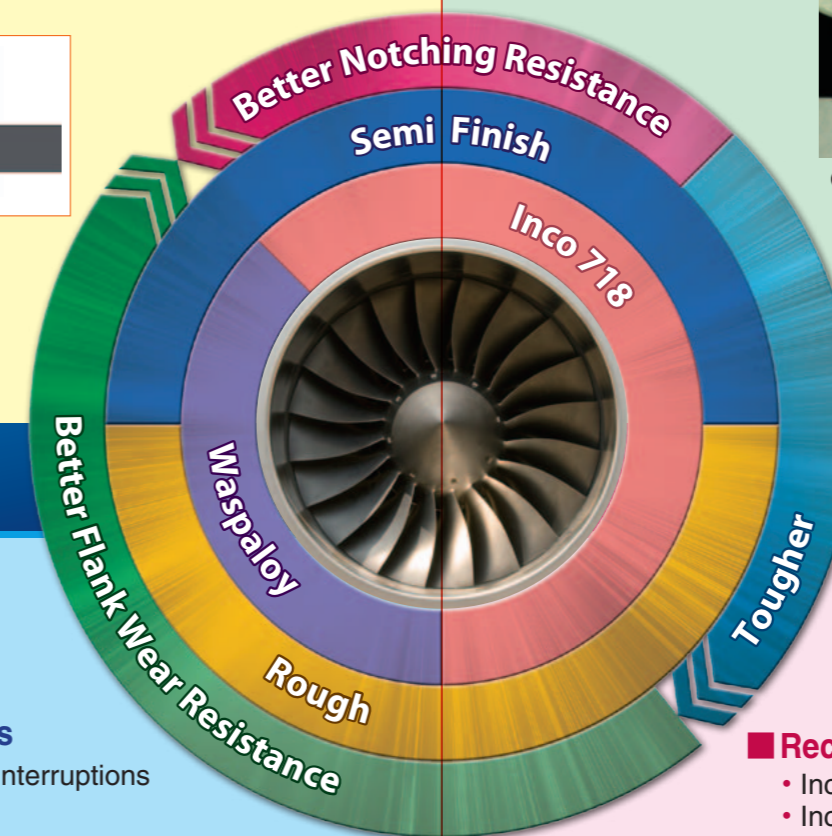
- Semi-Finish
- Profiling
- Grooving

### Profiling of Inco 718



Tool Life : 5.0min  
RPGX45, 800sfm .006ipr, .040", Wet  
RCGX120700, 240m/min, 0.15mm/rev, 1.00mm, Wet  
Inco 718 (pre-machined)

	SX5	SX7	SX9	WA1
Notching	○	◎	◎	
Flank Wear		○		◎
Toughness	○		◎	
Heat Shock		◎	◎	



## SX9 SiAlON Ceramic

### Features

- Tougher when compared to Whisker Ceramics
- Extreme toughness makes higher feed and heavier D.O.C machining possible
- Best grade for machining Inco 718 with scale

### Recommended Work Materials

- Inco 718
- Inco 706
- Inco 713

### Recommended Applications

- Rough turning with scale
- Milling

### Rough Turning of Inco 718 with Scale



Tool Life : 3.0min  
RNG65, 800sfm .010ipr, .150", Wet  
RNGN190700, 240m/min, 0.25mm/rev, 3.80mm, Wet  
Inco 718 with Scale