

New Era in Aerospace Machining

# BIDEMICS Ver.3

Patented

## JX1/JX3 NEW

**Semi-finishing & Finishing**  
**Rough no scale**

1600 SFM Speed Capability  
Longer Tool Life vs. Whisker  
Superior Surface Finishes vs. Whisker  
Able To Cut New Aerospace Materials

## JP2

**Finishing**

1700 SFM Speed Capability  
10 to 15 x Speed vs. Carbide  
Superior Surface Finishes vs. Carbide & CBN  
Coated Multi-tipped Brazed Inserts

**NTK**  
CUTTING TOOLS



## JX1/JX3 <sup>NEW</sup>

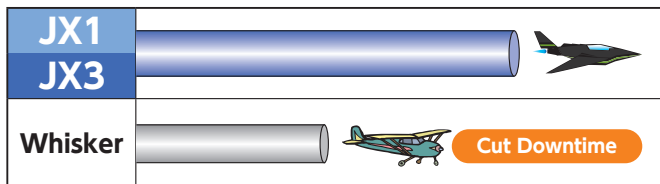
### Features

### Patented

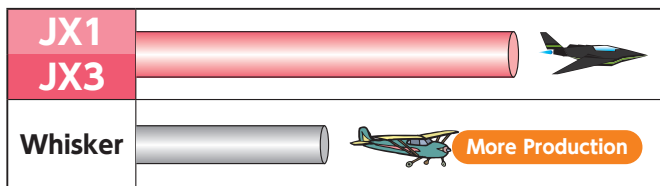
- Significantly extended tool life compared to whisker ceramics
- Double cutting speed potential compared to whisker ceramics
- Superior surface finish compared to whisker ceramics
- Applicable to powder-metallurgical heat resistant alloys
- Newly added JX3 provides toughness to BIDEMICS family

### Increase Productivity vs. Whisker Ceramics

① Significantly extended tool life at same speed



② Double speed capability



## JP2

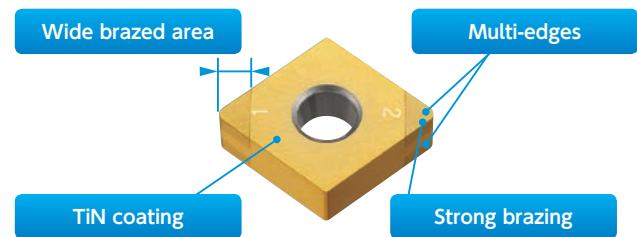
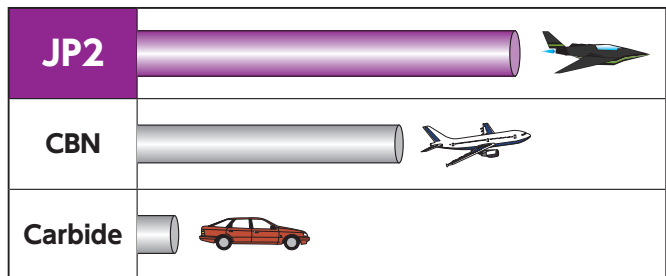
### Features

### Patented

- High speed finish turning can be performed at 800SFM or higher
- Superior wear resistance compared to CBN's
- Superior notching resistance vs CBN or carbides
- Superior surface finishes vs CBNs and coated carbides

### Increase Productivity vs. Carbide

① 10 to 15 times higher speed capability



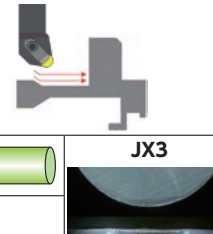
Grade	Work material	Application	Purpose	Cutting speed (SFM)	Feed (IPR)	Depth of cut (inch)	DRY	WET
JX1	Heat Resistant Alloy	Turning	Rough no scale	600- <b>1600</b>	.005-.011	.040-.100		●
			Semi finishing	600- <b>1600</b>	.004-.010	.020-.080		●
JX3	Heat Resistant Alloy	Grooving	Rough no scale	600- <b>1600</b>	.002-.005	—		●
JP2		Turning	Finishing	600- <b>1700</b>	.002-.007	.005-.030		●

## 1 Higher Speeds, More Productivity

JX1/JX3's superior physical properties compared to Whisker ceramic enable you to increase speeds; potentially as much as 2X Whisker ceramic speeds; increasing productivity and potentially offsetting the need for additional equipment to meet increasing demands.

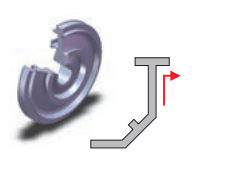
Chips break easily at higher cutting speeds vs the typically continuous chips of HRSA materials. The result is more efficient chip removal.

LPT disc (Inco718)		
	Comp. Whisker	JX3
Shape	RPGX45	←
Cutting speed (SFM)	700	1200
Feed (IPR)	.006	←
Depth of cut (inch)	.070	←
	WET	←
<b>NTK : JX3</b>	100 cc/min	
Competitor's Whisker ceramic	60 cc/min	



• JX3 cut 1.7 times faster than competitor's whisker and kept good edge.

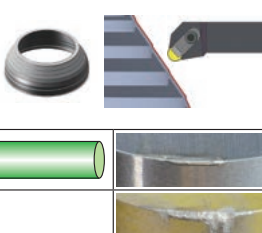
Disk (Inco718 Finishing)		
	Competitor's Coated Carbide	JP2
Shape	CNGG432	CNGA432
Cutting speed (SFM)	70	800
Feed (IPR)	.003	←
Depth of cut (inch)	.010	←
	WET	←
Tool life	1pc	←
<b>NTK : JP2</b>	525 cc/min	
Competitor's Coated Carbide	45 cc/min	



## 2 Longer tool life

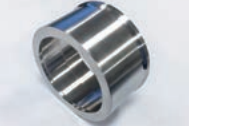
JX1/JX3's combination of High Hardness, Superior Thermal Conductivity and Improved Strength compared to Whisker ceramics results in significantly longer tool life when applied at typical Whisker ceramic speeds, feeds, and depth of cut.

Turbine case (718 Plus semi finish)		
	Comp. coated Whisker	JX1
Shape	RNG45	←
Cutting speed (SFM)	800	←
Feed (IPR)	.010	←
Depth of cut (inch)	.020	←
	WET	←
<b>NTK : JX1</b>	3 pass	
Competitor's Whisker ceramic	1 pass	



• JX1 produced 3 times longer tool life than coated Whisker ceramic on difficult to cut material, 718 Plus.

Ring (Inco625 Finishing)		
	Comp. Whisker	JP2
Shape	CNGA433	←
Cutting speed (SFM)	1100	1400
Feed (IPR)	.008	←
Depth of cut (inch)	.012	←
	WET	←
<b>NTK : JP2</b>	20 pcs/corner with 27% higher productivity	
Competitor's Whisker ceramic	13 pcs/corner	



• JP2 got both better productivity and tool life over Competitor's Whisker.

## 3 Works well on wide range of High Temperature Alloys

BIDEMICS has success on

**Inconel 718**  
**Inconel 625**

- 718 Plus
- Rene41
- Rene88
- Rene104
- Waspaloy

etc.

## 5 Speed up grooving operations



VGW style grooving inserts are now available

## 4 Superior surface finish

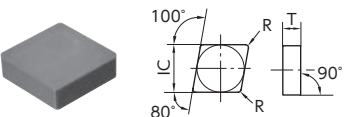
	JP2	CBN	Carbide
Machined surface			
Roughness			
Ra	0.64 $\mu\text{m}$	1.18 $\mu\text{m}$	2.75 $\mu\text{m}$
Rz	3.36 $\mu\text{m}$	5.56 $\mu\text{m}$	9.64 $\mu\text{m}$
Cutting speed	800 SFM	←	120 SFM
Feed rate	.006 IPR	←	←
Cycle time	3.3 min	←	14.7 min
Removed chip	48 cc	←	←

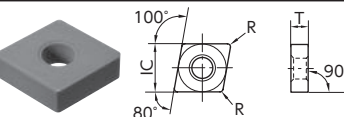
JP2's outstanding Wear Resistance and Notching Resistance results in work piece surface finishes consistently superior to either CBN or Carbide

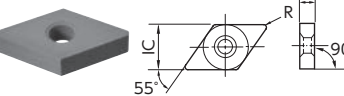
# Insert Item List

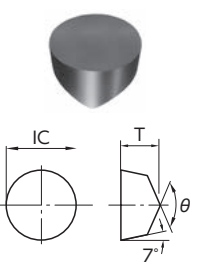
● : 1st Choice   ● : 2nd choice

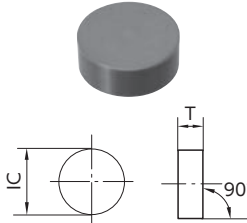
Steel	P														
Stainless Steel	M														
Cast Iron	K														
Non-Ferrous Material	N														
Heat Resistant Alloy	S														
Hardened Material	H														

CNG	Item Number	ISO Item Number	IC	R	T	BIDEMICS			Ceramics							
						Coated			SiALON					Whisker		
						JP2	JX1	JX3	SX7	SX3	SX9	SX5	WA1			
	CNG 433 T0320	CNGN 120412 T01220	1/2	.047	3/16		●									

CNGA	Item Number	ISO Item Number	IC	R	T	BIDEMICS			Ceramics							
						Coated			SiALON					Whisker		
						JP2	JX1	JX3	SX7	SX3	SX9	SX5	WA1			
	CNGA 431 BQ T0220	CNGA 120404 BQ T00520	1/2	.016	3/16											
	CNGA 431 BQ E02	CNGA 120404 BQ ENB	1/2	.016	3/16	●										
	CNGA 432 BQ T0220	CNGA 120408 BQ T00520	1/2	.031	3/16	●										
	CNGA 432 BQ E02	CNGA 120408 BQ ENB	1/2	.031	3/16	●										
	CNGA 433 BQ T0220	CNGA 120412 BQ T00520	1/2	.047	3/16	●										
	CNGA 433 BQ E02	CNGA 120408 BQ ENB	1/2	.047	3/16	●										

DNGA	Item Number	ISO Item Number	IC	R	T	BIDEMICS			Ceramics							
						Coated			SiALON					Whisker		
						JP2	JX1	JX3	SX7	SX3	SX9	SX5	WA1			
	DNGA 431 BQ T0220	DNGA 150404 BQ T00520	1/2	.016	3/16	●										
	DNGA 431 BQ E02	DNGA 150404 BQ ENB	1/2	.016	3/16	●										
	DNGA 432 BQ T0220	DNGA 150408 BQ T00520	1/2	.031	3/16	●										
	DNGA 432 BQ E02	DNGA 150408 BQ ENB	1/2	.031	3/16	●										
	DNGA 433 BQ T0220	DNGA 150412 BQ T00520	1/2	.047	3/16	●										
	DNGA 433 BQ E02	DNGA 150412 BQ ENB	1/2	.047	3/16	●										

RCGX	Item Number	ISO Item Number	IC	R	T	BIDEMICS			Ceramics							
						Coated			SiALON					Whisker		
						JP2	JX1	JX3	SX7	SX3	SX9	SX5	WA1			
	RCGX 23 T0220	RCGX 060400 T00520	1/4		3/16											
	RCGX 23 T0320	RCGX 060400 T00820	1/4		3/16		●	●								
	RCGX 25 T0220	RCGX 060700 T00520	1/4		5/16				●							
	RCGX 25 Z0820	RCGX 060700 Z02020	1/4		5/16											
	RCGX 35 E02	RCGX 090700 E004	3/8		5/16		●	●								
	RCGX 35 T0220	RCGX 090700 T00520	3/8		5/16				●							
	RCGX 35 T0320	RCGX 090700 T00820	3/8		5/16		●	●								
	RCGX 35 T0420	RCGX 090700 T01020	3/8		5/16											
	RCGX 35 Z0420	RCGX 090700 Z01020	3/8		5/16											
	RCGX 35 Z0820	RCGX 090700 Z02020	3/8		5/16											
	RCGX 45 E02	RCGX 120700 E004	1/2		5/16		●	●								
	RCGX 45 T0220	RCGX 120700 T00520	1/2		5/16				●							
	RCGX 45 T0320	RCGX 120700 T00820	1/2		5/16		●	●								
	RCGX 45 T0420	RCGX 120700 T01020	1/2		5/16											
	RCGX 45 Z0620	RCGX 120700 Z01520	1/2		5/16											
	RCGX 45 Z0820	RCGX 120700 Z02020	1/2		5/16											

RNG	Item Number	ISO Item Number	IC	R	T	BIDEMICS			Ceramics							
						Coated			SiALON					Whisker		
						JP2	JX1	JX3	SX7	SX3	SX9	SX5	WA1			
	RNG 45 E01	RNGN 120700 E002	1/2		5/16											
	RNG 45 E02	RNGN 120700 E004	1/2		5/16		●	●								
	RNG 45 E03	RNGN 120700 E007	1/2		5/16											
	RNG 45 T0220	RNGN 120700 T00520	1/2		5/16				●							
	RNG 45 T0225	RNGN 120700 T00525	1/2		5/16					○						
	RNG 45 T0320	RNGN 120700 T00820	1/2		5/16		●	●								
	RNG 45 T0420	RNGN 120700 T01020	1/2		5/16											
	RNG 45 T0525	RNGN 120700 T01225	1/2		5/16											
	RNG 45 Z0620	RNGN 120700 Z01520	1/2		5/16											
	RNG 45 S0825	RNGN 120700 S02025	1/2		5/16											
	RNG 45 T0825	RNGN 120700 T02025	1/2		5/16											
	RNG 45 Z0825	RNGN 120700 Z02025	1/2		5/16											
	RNG 45 P2810	RNGN 120700 P07010	1/2		5/16											

\*Brazed insert

● : 1st Choice   ● : 2nd choice

Steel	P												
Stainless Steel	M												
Cast Iron	K								●	●	●	●	●
Non-Ferrous Material	N												
Heat Resistant Alloy	S	●	●	●	●	●	●	●	●	●	●	●	●
Hardened Material	H												●

RPGX	Item Number	ISO Item Number	IC	R	T	BIDEMICS			Ceramics						
						Coated			SiAlON					Whisker	
						JP2	JX1	JX3	SX7	SX3	SX9	SX5	WA1		
	RPGX 23 T0220	RPGX 060400 T00520	1/4		3/16								●	●	
	RPGX 25 T0220	RPGX 060700 T00520	1/4		5/16				●						
	RPGX 35 E02	RPGX 090700 E004	3/8		5/16		●	●							●
	RPGX 35 T0220	RPGX 090700 T00520	3/8		5/16					●	●	●	●	●	●
	RPGX 35 T0320	RPGX 090700 T00820	3/8		5/16		●	●	●						●
	RPGX 35 T0420	RPGX 090700 T01020	3/8		5/16										●
	RPGX 45 E02	RPGX 120700 E004	1/2		5/16		●	●							●
	RPGX 45 T0220	RPGX 120700 T00520	1/2		5/16					●	●	●	●	●	●
	RPGX 45 T0320	RPGX 120700 T00820	1/2		5/16		●	●	●						●
	RPGX 45 T0420	RPGX 120700 T01020	1/2		5/16							●			●

VGW	Item Number	W	R	T	L	BIDEMICS			Ceramics						
						Coated			SiAlON					Whisker	
						JP2	JX1	JX3	SX7	SX3	SX9	SX5	WA1		
	VGW 41251 E02	.125	.015	.187	.500		●	●							
	VGW 41252 E02	.125	.031	.187	.500		●	●							
	VGW 41561 E02	.156	.015	.187	.500		●	●							
	VGW 41562 E02	.156	.031	.187	.500		●	●							
	VGW 41871 E02	.187	.015	.187	.500		●	●							
	VGW 41872 E02	.187	.031	.187	.500		●	●							
	VGW 62501 E02	.250	.015	.250	.750		●	●							
	VGW 62502 E02	.250	.031	.250	.750		●	●							
	VGW 62503 E02	.250	.046	.250	.750		●	●							
	VGW 83122 E02	.312	.031	.337	1.000		●	●							
	VGW 83124 E02	.312	.062	.337	1.000		●	●							
	VGW 83752 E02	.375	.031	.337	1.000		●	●							
VGW 83754 E02	.375	.062	.337	1.000		●	●								

VGW..R	Item Number	W	R	T	L	BIDEMICS			Ceramics						
						Coated			SiAlON					Whisker	
						JP2	JX1	JX3	SX7	SX3	SX9	SX5	WA1		
	VGW 4125R E02	.125	.063	.187	.500		●	●							
	VGW 4156R E02	.156	.078	.187	.500		●	●							
	VGW 4187R E02	.187	.094	.187	.500		●	●							
	VGW 6218R E02	.218	.109	.250	.750		●	●							
	VGW 6250R E02	.250	.125	.250	.750		●	●							
	VGW 8312R E02	.312	.156	.337	1.000		●	●							
	VGW 8375R E02	.375	.188	.337	1.000		●	●							

VNGA	Item Number	ISO Item Number	IC	R	T	BIDEMICS			Ceramics							
						Coated			SiAlON					Whisker		
						JP2	JX1	JX3	SX7	SX3	SX9	SX5	WA1			
	VNGA 331 BQ T0220	VNGA 160404 BQ T00520	3/8	.016	3/16	●										
	VNGA 331 BQ E02	VNGA 160404 BQ ENB	3/8	.016	3/16	●										
	VNGA 332 BQ T0220	VNGA 160408 BQ T00520	3/8	.031	3/16	●										
	VNGA 332 BQ E02	VNGA 160408 BQ ENB	3/8	.031	3/16	●										
	VNGA 333 BQ T0220	VNGA 160412 BQ T00520	3/8	.047	3/16	●										
	VNGA 333 BQ E02	VNGA 160412 BQ ENB	3/8	.047	3/16	●										

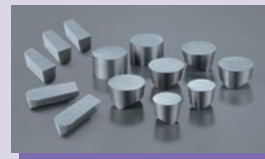
Toolholders- See sections F,G,H of Catalog  
 ● : Stock   ● : Stock (Newly added)   ○ : 1-2 week delivery

## Solutions for the Aerospace & Energy Industries

### BIDE MICS - Game Changer

- 1600SFM Capability
- Double tool life at whisker's speed range

#### JX1



##### ■ Features

- Up to 1600 SFM speed capability
- Much longer tool life at Whisker ceramics' speed range
- Superior surface finish vs. Whisker ceramics

##### ■ Work Materials

- Inco 718 • 718 Plus
- Powdered metal
- Inco 625 • Rene

#### JP2



##### ■ Features

- 10 to 15x speed capability vs. carbide
- Better wear resistance and notching resistance than CBNs
- Superior surface finish to Carbide or CBN

##### ■ Work Materials

- Inco 718 • 718 Plus
- Powdered metal • Inco 625 • Rene

#### SX7

##### ■ Features

- Can run at same cutting condition as whisker ceramics
- Best grade for high-speed milling

##### ■ Work Materials

- Inco 718 • Inco 625
- Waspaloy • Udimet 720



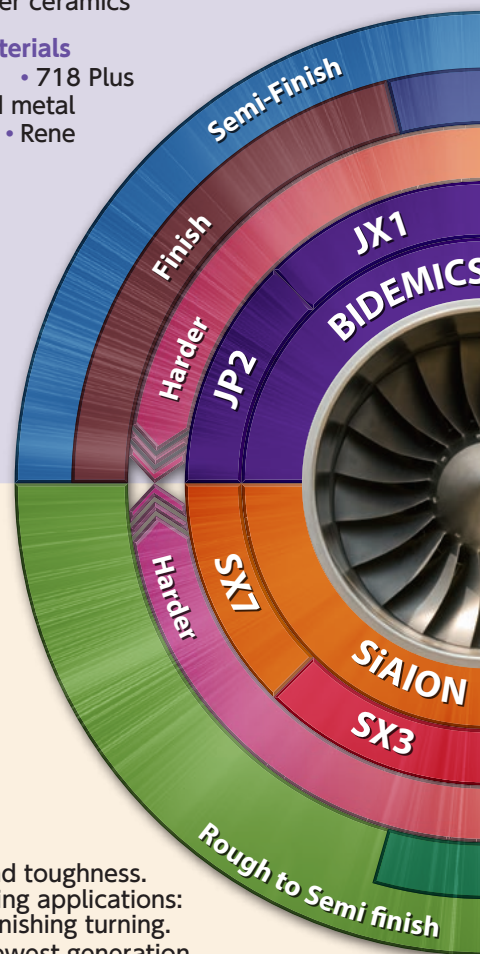
#### SX3

##### ■ Features

- Excellent wear resistance and toughness. Wide range of HRSA machining applications: Roughing with scale - semi finishing turning.
- Able to machine even the newest generation of HRSA work materials (like Rene) as well as most common HRSA materials; such as Inconel 718.

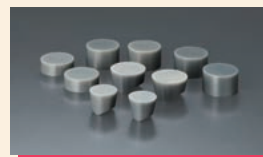
##### ■ Work Materials

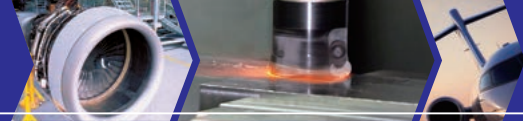
- Inco 718 • 718 Plus
- Powdered metal • Inco 625
- Rene



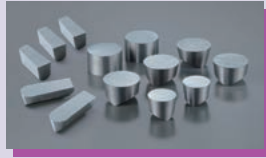
### SiAlON - Workhorse

- Durable for scale to semi-finish machining





## JX3



### ■ Features

- Added toughness in BIDE MICS
- Same speed capability as JX1

### ■ Work Materials

- Inco 718 • 718 Plus • Powdered metal
- Inco 625 • Rene

## WA1

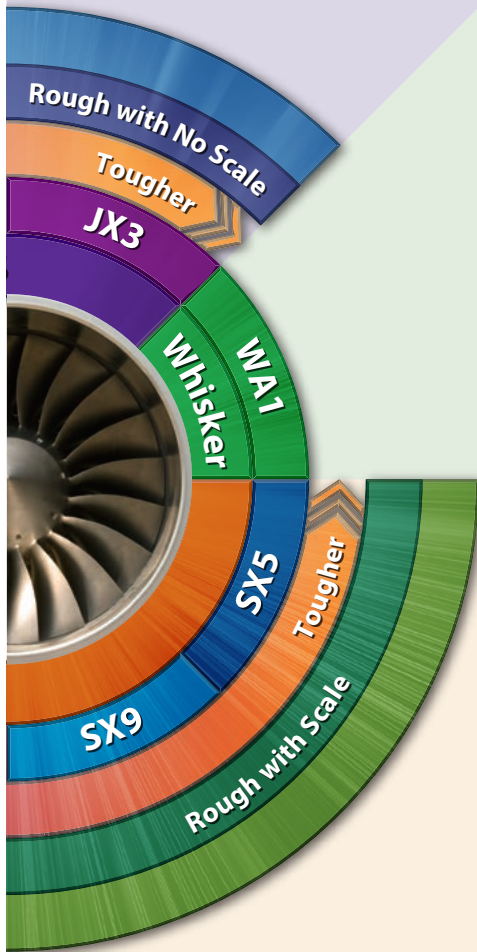


### ■ Features

- Better flank wear resistance compared to SiAlON ceramics
- Better notching resistance compared to competitor's whisker ceramics

### ■ Work Materials

- Inco 718 • Inco 625



## Whisker - Versatile Player

- Productivity and reliability

## SX5



### ■ Features

- Best grade for scale and interruptions
- Best grade for machining high-cobalt alloys

### ■ Work Materials

- Waspaloy • Udimet 720
- 718 Plus • Rene 41

## SX9

### ■ Features

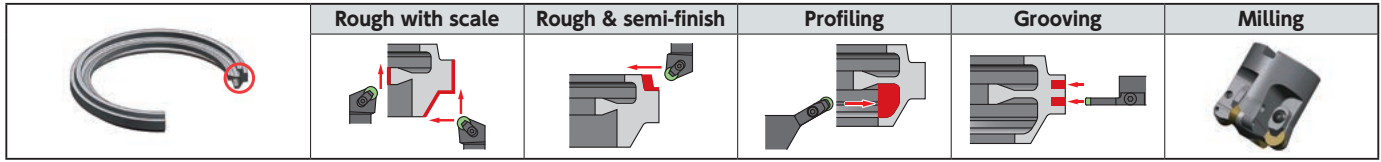
- Extreme toughness makes higher feed and heavier DOC machining possible
- Best grade for machining Inco 718 with scale

### ■ Work Materials

- Inco 718 • Inco 706
- Inco 713 • Rene



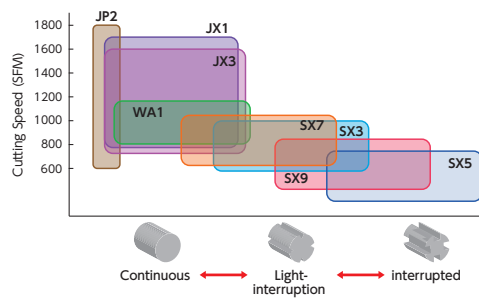
# Applications



# Applications

Application	Grade	Work material	Cutting speed					Feed					Depth of cut					Coolant
			600	800	1000	1200	1400	1600	.004	.008	.012	.016	.020	.020	.040	.060	.080	
Rough with Scale 	<b>SX5</b>	Waspalloy	650 (600-800) SFM					.012 (.008-.014) IPR					.080 (.040-200)*					WET
	<b>SX9</b>	Inco718	650 (600-800) SFM					.012 (.008-.014) IPR					.080 (.040-200)*					WET
	<b>SX3</b>	Overall	800 (600-900) SFM					.008 (.004-.009) IPR					.080 (.040-200)*					WET
Rough no Scale 	<b>JX1 JX3</b>	Overall	700-1300 (600-1600) SFM					.008 (.005-.011) IPR					.070 (.040-100)*					WET
	<b>SX9/SX3 SX7</b>	Overall	700 (600-900) SFM					.009 (.006-.012) IPR					.080 (.040-100)*					WET
	<b>WA1</b>	Overall	800 (600-1000) SFM					.008 (.005-.010) IPR					.070 (.040-100)*					WET
Profiling & Semi-Finish 	<b>JX1 JX3</b>	Overall	700-1500 (600-1600) SFM					.008 (.004-.010) IPR					.060 (.040-080)*					WET
	<b>SX3 SX7</b>	Overall	800 (600-900) SFM					.008 (.005-.010) IPR					.060 (.040-080)*					WET
	<b>WA1</b>	Overall	800 (600-1100) SFM					.008 (.004-.010) IPR					.060 (.040-080)*					WET
Finishing 	<b>JP2</b>	Overall	700-1600 (600-1700) SFM					.004 (.002-.007) IPR					.010 (.005-.030)*					WET
Grooving 	<b>JX1 JX3</b>	Overall	1200 (600-1600) SFM					.003 (.002-.004) IPR					<div style="background-color: orange; padding: 5px; border: 1px solid black;">                     When using SX7/SX3/SX5, increase feed rates 100% vs. Whisker Ceramics                 </div>					WET
	<b>SX5</b>	Waspalloy	700 (600-800) SFM					.006 (.003-.007) IPR										WET
	<b>SX3 SX7</b>	Overall	750 (600-900) SFM					.0045 (.003-.006) IPR										WET
	<b>WA1</b>	Overall	800 (600-1100) SFM					.003 (.002-.004) IPR										WET

# Grade Map



	Grade	Rough with Scale	Rough	Semi-Finishing	Finishing
BIDEMICS	<b>JP2</b>				
	<b>JX1</b>				
	<b>JX3</b>				
Whisker	<b>WA1</b>				
	<b>SX7</b>				
SIALON	<b>SX3</b>				
	<b>SX9</b>				
	<b>SX5</b>				

**NGK NTK**  
 SPARK PLUGS TECHNICAL CERAMICS  
**NGK SPARK PLUGS (USA), INC.**

## NTK Cutting Tools USA

a division of NGK SPARK PLUGS (U.S.A), INC.  
 46929 Magellan Drive, Wixom, MI 48393, U.S.A.  
[www.ntkcuttingtools.com](http://www.ntkcuttingtools.com)

## DISTRIBUTED BY

