

# PR115S/PR120S



Solves various machining issues for heat-resistant alloys and stainless steel

Longer tool life for heat-resistant alloy machining

Unique heat-resistant carbide substrate and newly developed PVD coating technology "MEGACOAT TOUGH"



Specialized chipbreakers for heat-resistant alloys available (SQ/SG/SX)  
Positive inserts for small parts machining also available



PVD coating for heat-resistant alloy

# PR115S/PR120S

Unique carbide substrate with excellent heat-resistant properties and new coating technology "MEGACOAT TOUGH" provides longer tool life for heat-resistant alloy machining. Low cutting force and stable machining with specialized chipbreakers (SQ/SG/SX)

## 1 Longer tool life for heat-resistant alloy machining

### Challenges of machining heat-resistant alloys

When machining heat-resistant alloys that can withstand high temperatures above 1,000 (°C), the workpiece is likely to harden and insert damage is extremely rapid.

#### Crater wear

Worsening chip control, etc.

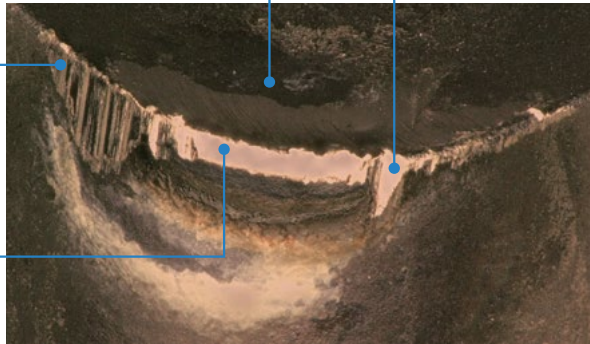
#### Diminishing wear damage from notching

Surface roughness  
Deteriorating dimensional accuracy, etc.

#### Abrasive wear

Cutting force  
Increased cutting heat

< Insert damaged image >



Diminishing damage from notching  
Burr occurs

## SOLUTION

With excellent heat resistance, wear resistance and stability, achieving long tool life and stable machining of heat-resistant alloys

- Excellent heat resistance : **Unique carbide substrate**
- To control wear : **New coating "MEGACOAT TOUGH"**
- Low cutting force and stable machining : **SQ/SG/SX chipbreakers**



**HRSA(Heat Resistant Super Alloy)**

**Exceptional Endurance. Maximum Tool Life.**

**MEGACOAT TOUGH** | HRSA |

Video

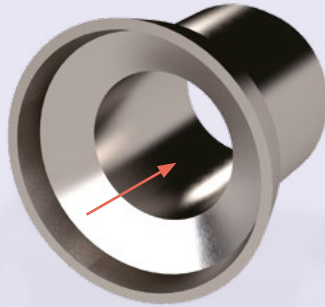


# Case studies

## SOLUTION ①

### Airplane parts Ni-based heat-resistant alloy

Cutting conditions : Vc = 30 m/min, ap = 1.0 mm, f = 0.08 mm/rev, Wet  
CCGT09T304MFP-GQ PR115S



Tool life

**PR115S**

**20 pcs/edge**

Tool life

**1.3x**

Competitor A

**15 pcs/edge**

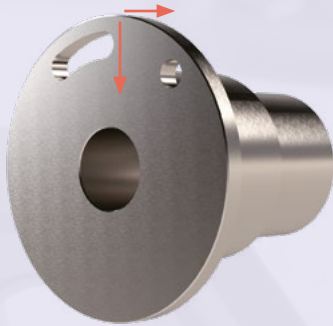
PR115S provides 1.3 times longer tool life in airplane parts machining, which requires high heat resistance

(User evaluation)

## SOLUTION ②

### Agricultural machine engine parts SUH600

Cutting conditions : Vc = 45 m/min, ap = 0.4 mm, f = 0.15 mm/rev, Wet  
WNMG080408MQ PR120S



Tool life

**PR120S**

**140 pcs/edge**

Tool life

**1.5x**

Competitor B

**90 pcs/edge**

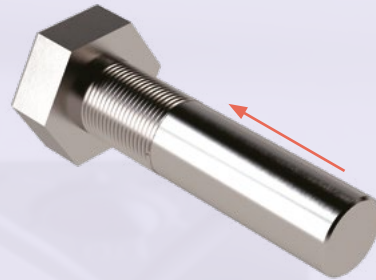
PR120S provides longer tool life in all six edges and ensures stable machining

(User evaluation)

## SOLUTION ③

### Bolt SUS304

Cutting conditions : Vc = 135 m/min, ap = 1.5 mm, f = 0.25 mm/rev, Wet  
TNMG160408MQ PR120S



Tool life

**PR120S**

**22 pcs/edge**

Tool life

**1.5x**

Competitor C

**15 pcs/edge**

Improved tool life of stainless steel

(User evaluation)

## Longer tool life of heat-resistant alloys

### INCONEL718 cutting performance

#### PR115S:

Cutting edge condition after 7.4 min machining  
(Internal evaluation)



Cutting conditions :  
Vc = 60 m/min, ap = 0.5 mm, f = 0.1 mm/rev,  
Wet INCONEL718 CNMG120408 Type

#### PR120S

Cutting edge condition after 15 min machining  
(Internal evaluation)



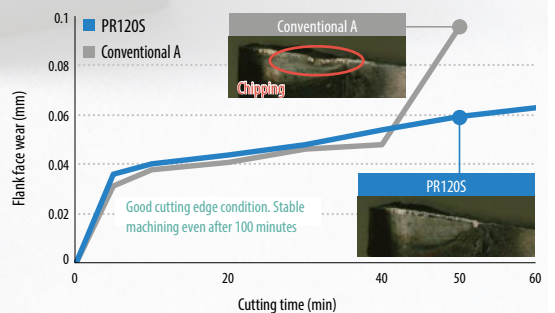
Cutting conditions :  
Vc = 40 m/min, ap = 0.5 mm, f = 0.1 mm/rev,  
Wet INCONEL718 CNMG120408 Type

## Supports small parts machining of stainless steel

### SUS316L cutting performance

#### PR120S

Wear resistance comparison. Cutting edge comparison after 50 min machining  
(Internal evaluation)



Cutting conditions : Vc = 150 m/min, ap = 1.0 mm, f = 0.08 mm/rev,  
Wet, SUS316L, DCGT11T304 type

2

Unique carbide substrate with excellent heat resistance and New coating "MEGACOAT TOUGH"

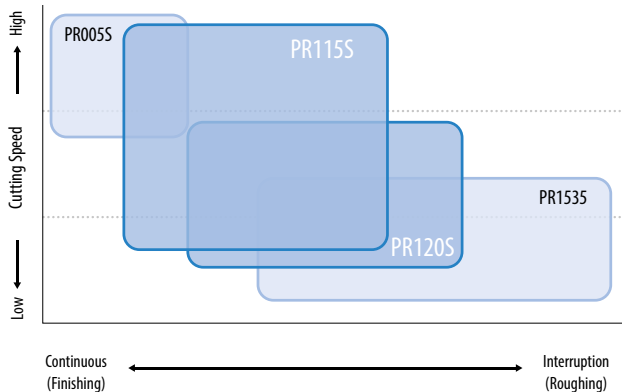
PR115S

Covers a wide range of difficult-to-cut material machining applications  
1st recommendation for continuous finishing of heat-resistant alloys

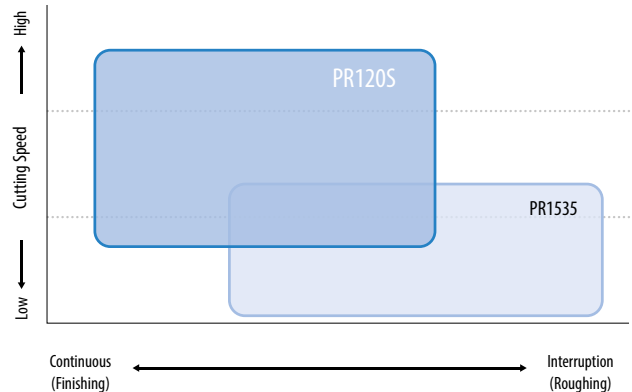
PR120S

Long tool life and stable machining in interrupted machining of heat-resistant alloys  
1st recommendation for continuous finishing to light interrupted machining of stainless steel  
Longer tool life extension possible for stainless steel machining

S Heat-resistant alloys | Application map



M Stainless steel | Application map



Carbide substrate and coating

< Section image >



"MEGACOAT TOUGH" has a special adhesive layer

1. Wear resistant layer

AlTiCrN layer  
Thick-film PVD suppresses abrasive wear

2. Middle layer

TiAlN layer  
Excellent oxidation resistance to suppress crater wear

3. Special adhesive layer

Improved adhesion of the coating  
enhances protection against boundary damage

4. Unique substrate

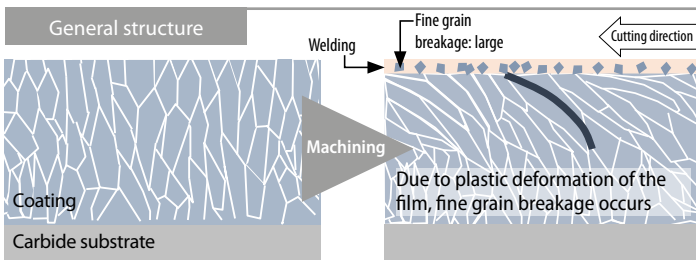
Specializes in heat-resistant alloys



### 1. Wear resistant layer

Thick-film PVD suppresses abrasive wear  
Reduces notch damage with ultra-fine grain structure

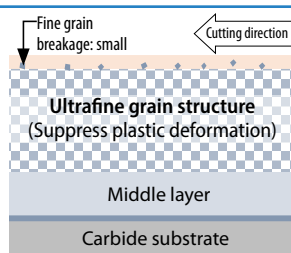
Damage to the coating during machining of heat-resistant alloys



#### PR115S/PR120S

Due to ultrafine structure of the membrane, controls fine grain breakage

Due to grain breakage and dropping of welding, controls wear and tear



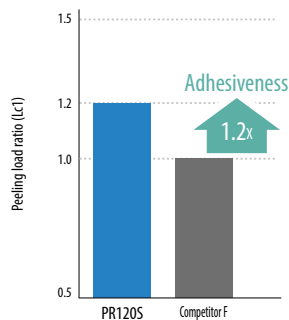
### 3. Special adhesive layer

Adhesion layer at carbide substrate-main layer interface, high affinity and improved adhesion

Scratch test results



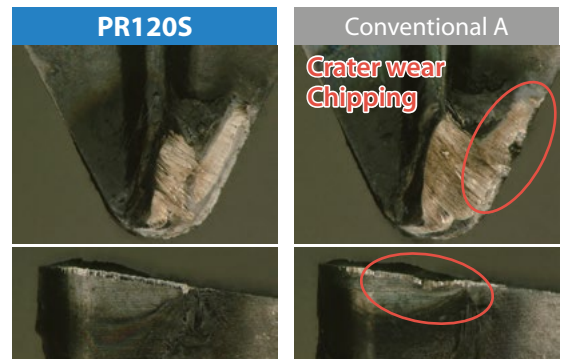
Peeling load (Lc1)  
(Internal evaluation)



### 2. Middle layer

TiAlN layer provides superior oxidation resistance  
Controls crater wear

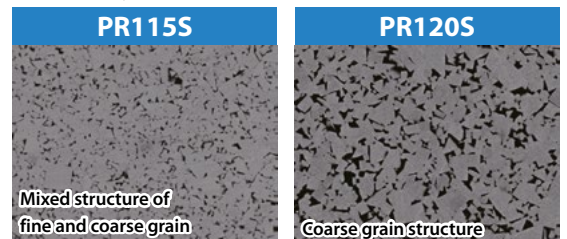
Crater wear comparison (Internal evaluation) After machining for 50 min



Cutting conditions : Vc = 150 m/min, ap = 1.0 mm, f = 0.08 mm/rev, Wet SUS316L DCGT11T304 Type

### 4. Unique carbide substrate

Carbide substrate for heat-resistant alloy machining  
Excellent thermal properties with high thermal conductivity



Excellent heat resistance

Excellent heat resistance and stability

### 3

## New chipbreaker designs (SQ/SG/SX) improve machining stability

### Finishing to medium machining SQ chipbreaker

#### SQ chipbreaker benefits

Reduced temperature at the cutting edge → Extended tool life  
Reduces burring → Extended tool life and efficiency improvements



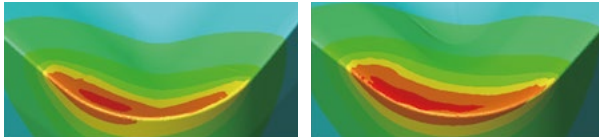
**Special rake face design decreases cutting edge temperature**

Optimal design achieved with simulation technology

**Slant cutting edge**

Inclined in (-) direction  
Effective for burr suppression and reducing notching

#### Edge temperature comparison (Simulation) (Internal evaluation)



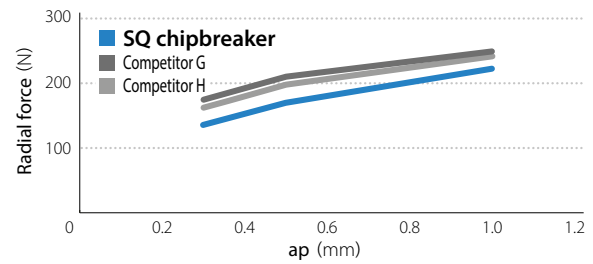
SQ chipbreaker

Conventional B

Cutting conditions:  $V_c = 40$  m/min,  $a_p = 1.0$  mm,  $f = 0.15$  mm/rev,  
Dry CNMG120408 Type  
Workpiece: Ni-based heat-resistant alloy

The newly developed chipbreaker lowers the temperature of the cutting edge. This improves tool life and machining efficiency in semi-finishing applications.

#### Cutting force comparison (Internal evaluation)



Cutting conditions:  
 $V_c = 40$  m/min,  $f = 0.15$  mm/rev, Wet, CNMG120408 Type  
Workpiece: Ni-based heat-resistant alloy

### SG chipbreaker for roughing

#### SG chipbreaker benefits

Well-balanced rake face shape → Extended tool life  
Shallow bottom chipbreaker design → Smooth chip control



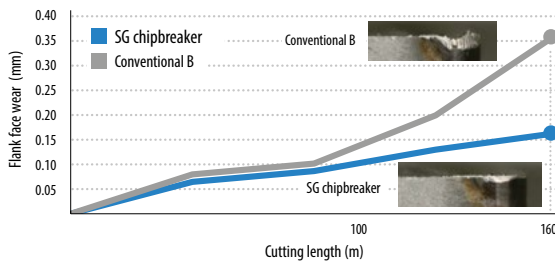
**Standard chipbreaker**

Stable chip control during heavy machining applications

**Well-balanced rake face shape**

High-strength and low cutting force design

#### Wear resistance comparison (Internal evaluation)



Cutting conditions:  
 $V_c = 80$  m/min,  $a_p = 1.0$  mm,  $f = 0.20$  mm/rev, Wet, CNMG120408 Type  
Workpiece: INCONEL718

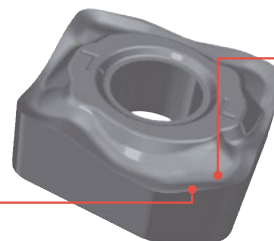
### SX chipbreaker for high efficiency roughing

#### SX chipbreaker benefits

Decreased edge temperature  
→ Extended tool life  
Suppresses burr formation  
→ Greater depths of cut  
Decreased radial forces  
→ Resists edge build-up and improves efficiency

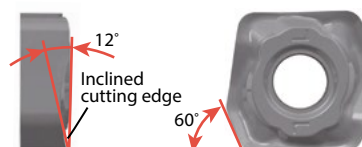
#### Unique cutting edge design (Handed insert)

- 60° lead angle (when installed in the toolholder)
- 12° rake angle



**Rake design decreases temperature at the cutting edge**










Optimal design achieved with CNC simulation technology















- Can be installed in standard Kyocera toolholders (DCLN/PCLN) by changing to corresponding SX shim
- Single-sided handed insert

Please refer to the back cover of this brochure for precautions when using the SX chipbreaker.

## Negative type inserts (M Class)





Shape Handed Insert shows Right-hand	Description	Dimensions (mm)				RE	PR1155	PR1205	PR1535
		I.C.	S	D1	RE				
 Finishing-Medium	CNMG 120404SQ	12.70	4.76	5.16	0.4	●	●		
	120408SQ				0.8	●	●		
	120412SQ				1.2	●	●		
	CNMG 1606125Q	15.875	6.35	6.35	1.2	●	●		
	160616SQ				1.6	●	●		
	CNMG 1906125Q	19.05	6.35	7.94	1.2	●	●		
190616SQ	1.6				●	●			
 Finishing-Medium	CNMG 120404MQ	12.70	4.76	5.16	0.4	●	●	●	
	120408MQ				0.8	●	●	●	
 Medium-Roughing	CNMG 120404MS	12.70	4.76	5.16	0.4	●	●	●	
	120408MS				0.8	●	●	●	
	120412MS				1.2	●	●	●	
	120416MS				1.6	●	●	●	
 Medium-Roughing	CNMG 120404MU	12.70	4.76	5.16	0.4	●	●	●	
	120408MU				0.8	●	●	●	
	120412MU				1.2	●	●	●	
	CNMG 160608MU	15.875	6.35	6.35	0.8	●	●	●	
	160612MU				1.2	●	●	●	
	160616MU				1.6	●	●	●	
CNMG 190612MU	19.05	6.35	7.94	1.2	●	●	●		
190616MU				1.6	●	●	●		
 Medium-Roughing	CNMG 120404TK	12.70	4.76	5.16	0.4	●	●	●	
	120408TK				0.8	●	●	●	
 Roughing	CNMG 120408SG	12.70	4.76	5.16	0.8	●	●	●	
	120412SG				1.2	●	●	●	
	CNMG 1606125G	15.875	6.35	6.35	1.2	●	●	●	
	160616SG				1.6	●	●	●	
	CNMG 1906125G	19.05	6.35	7.94	1.2	●	●	●	
	190616SG				1.6	●	●	●	
 Roughing/ Single-sided	CNMM 1204X <sup>R</sup> / <sub>L</sub> -SX	12.70	4.42	5.16	-	●	●		
	CNMM 1606X <sup>R</sup> / <sub>L</sub> -SX	15.875	5.96	6.35	-	●	●		
	CNMM 1906X <sup>R</sup> / <sub>L</sub> -SX	19.05	5.93	7.94	-	●	●		
 Finishing-Medium	DNMG 150404SQ	12.70	4.76	5.16	0.4	●	●		
	150408SQ				0.8	●	●		
	150412SQ				1.2	●	●		
	DNMG 150604SQ	12.70	6.35	5.16	0.4	●	●		
	150608SQ				0.8	●	●		
	150612SQ				1.2	●	●		
 Finishing-Medium	DNMG 150404MQ	12.70	4.76	5.16	0.4	●	●	●	
	150408MQ				0.8	●	●	●	
	DNMG 150604MQ	12.70	6.35	5.16	0.4	●	●	●	





CNMM...X<sup>R</sup>/<sub>L</sub>-SX inserts are single-sided with 2 cutting edges

Shape	Description	Dimensions (mm)				RE	PR1155	PR1205	PR1535
		I.C.	S	D1	RE				
 Medium-Roughing	DNMG 150404MS	12.70	4.76	5.16	0.4	●	●	●	
	150408MS				0.8	●	●	●	
	150412MS				1.2	●	●	●	
	DNMG 150604MS	12.70	6.35	5.16	0.4	●	●	●	
	150608MS				0.8	●	●	●	
	150612MS				1.2	●	●	●	
 Medium-Roughing	DNMG 150404MU	12.70	4.76	5.16	0.4	●	●	●	
	150408MU				0.8	●	●	●	
 Roughing	DNMG 150408SG	12.70	4.76	5.16	0.8	●	●	●	
	150412SG				1.2	●	●	●	
 Finishing-Medium	DNMG 150608SG	12.70	6.35	5.16	0.8	●	●	●	
	150612SG				1.2	●	●	●	
	150616SG				1.6	●	●	●	
 Medium-Roughing	SNMG 120404MQ	12.70	4.76	5.16	0.4	●	●	●	
	120408MQ				0.8	●	●	●	
 Medium-Roughing	SNMG 120404MS	12.70	4.76	5.16	0.4	●	●	●	
	120408MS				0.8	●	●	●	
	120412MS				1.2	●	●	●	
	120416MS				1.6	●	●	●	
 Roughing	SNMG 190612MU	19.05	6.35	7.94	1.2	●	●	●	
	190616MU				1.6	●	●	●	
 Roughing	SNMG 120408SG	12.70	4.76	5.16	0.8	●	●	●	
	120412SG				1.2	●	●	●	
	SNMG 1506125G	15.875	6.35	6.35	1.2	●	●		
	150616SG				1.6	●	●		
	SNMG 1906125G	19.05	6.35	7.94	1.2	●	●	●	
	190616SG				1.6	●	●	●	
 Finishing-Medium	TNMG 160404MQ	9.525	4.76	3.81	0.4	●	●	●	
	160408MQ				0.8	●	●	●	
 Medium-Roughing	TNMG 160404MS	9.525	4.76	3.81	0.4	●	●	●	
	160408MS				0.8	●	●	●	
	160412MS				1.2	●	●	●	
 Medium-Roughing	TNMG 160404MU	9.525	4.76	3.81	0.4	●	●	●	
	160408MU				0.8	●	●	●	
 Roughing	TNMG 160408SG	9.525	4.76	3.81	0.8	●	●	●	
	160412SG				1.2	●	●	●	
	TNMG 220408SG	12.70	4.76	5.16	0.8	●	●	●	
	220412SG				1.2	●	●	●	

●: Available



## Negative type inserts (M Class)



Shape	Description	Dimensions (mm)				PR1155	PR1205	PR1535
		I.C.	S	D1	RE			
 Finishing-Medium	VNMG 160404MQ	9.525	4.76	3.81	0.4	●	●	●
	160408MQ				0.8	●	●	●
 Medium-Roughing	VNMG 160404MS	9.525	4.76	3.81	0.4	●	●	●
	160408MS				0.8	●	●	●
	160412MS				1.2	●	●	●
 Medium-Roughing	VNMG 160404MU	9.525	4.76	3.81	0.4	●	●	●
	160408MU				0.8	●	●	●
 Roughing	VNMG 160404SG	9.525	4.76	3.81	0.4	●	●	●
	160408SG				0.8	●	●	●

Shape	Description	Dimensions (mm)				PR1155	PR1205	PR1535
		I.C.	S	D1	RE			
 Finishing-Medium	WNMG 080404MQ	12.70	4.76	5.16	0.4	●	●	●
	080408MQ				0.8	●	●	●
 Medium-Roughing	WNMG 080404MS	12.70	4.76	5.16	0.4	●	●	●
	080408MS				0.8	●	●	●
	080412MS				1.2	●	●	●
 Medium-Roughing	WNMG 080404MU	12.70	4.76	5.16	0.4	●	●	●
	080408MU				0.8	●	●	●
 Roughing	WNMG 080408SG	12.70	4.76	5.16	0.8	●	●	●
	080412SG				1.2	●	●	●

● : Available

## Negative type inserts (G Class)

Shape	Description	Dimensions (mm)				PR1155	PR1205	PR1535
		I.C.	S	D1	RE			
 Finishing-Medium / Sharp edge / Polished	CNGG 120402MFP-SK	12.70	4.76	5.16	<0.2	●	●	●
	120404MFP-SK				<0.4	●	●	●
 Finishing-Medium / Sharp edge / Polished	DNGG 150402MFP-SK	12.70	4.76	5.16	<0.2	●	●	●
	150404MFP-SK				<0.4	●	●	●

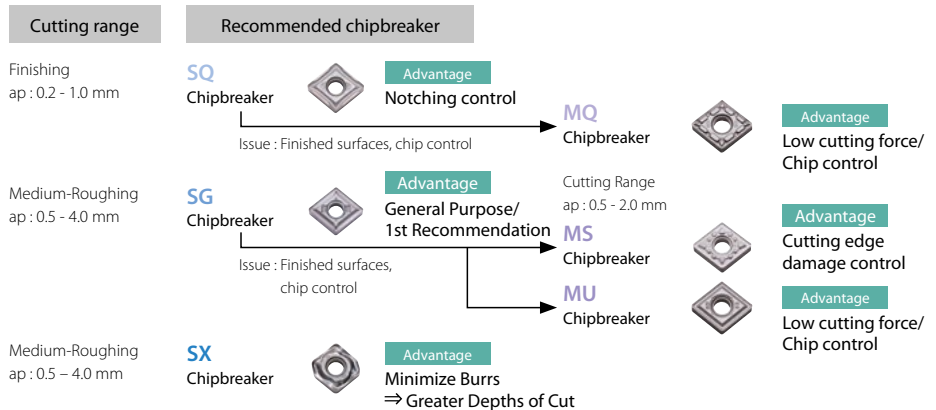
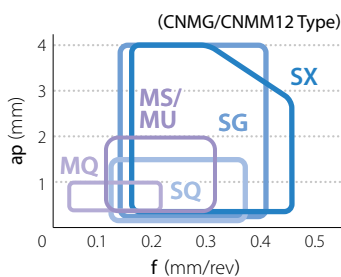
Shape	Description	Dimensions (mm)				PR1155	PR1205	PR1535
		I.C.	S	D1	RE			
 Finishing-Medium / Sharp edge / Polished	TNGG 160401MFP-SK	9.525	4.76	3.81	<0.1	●	●	●
	160402MFP-SK				<0.2	●	●	●
	160404MFP-SK				<0.4	●	●	●
 Finishing-Medium / Sharp edge / Polished	VNGG 160402MFP-SK	9.525	4.76	3.81	<0.2	●	●	●
	160404MFP-SK				<0.4	●	●	●

Insert with corner R (RE) dimension expressed with less than sign (e.g. <0.1, <0.2 etc.) indicates models with minus tolerance for corner R (RE)

● : Available

## Applicable chipbreaker range (ap indicates radial depth of cut per side)

### Heat-resistant alloys



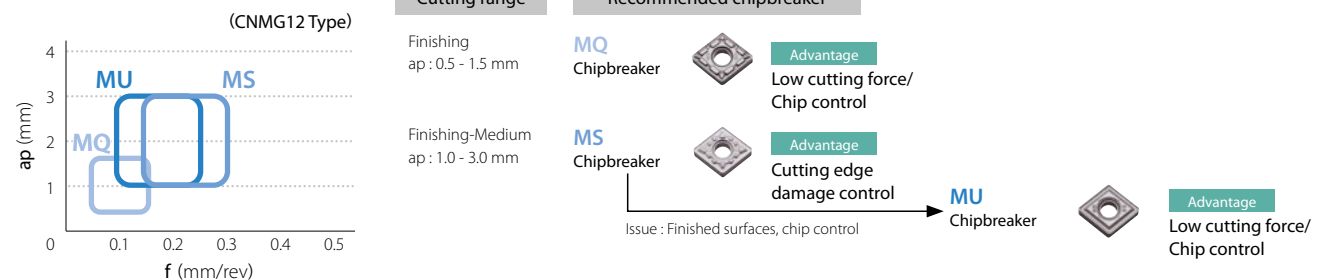


# Recommended cutting conditions






Workpiece	Cutting range	Application	Recommended chipbreaker	Recommended grade	Min. – Recommendation – Max.			
					Vc (m/min)	ap (mm)	f (mm/rev)	
Heat-resistant alloys	Finishing	Continuous	MQ	PR115S	25 – 45 – 70	0.2 – 0.5 – 1.0	0.05 – 0.1 – 0.2	
		Light interruption		PR120S	25 – 40 – 60			
	Finishing-Medium	Continuous	SQ	PR115S	25 – 45 – 70	0.3 – 0.5 – 1.5	0.1 – 0.17 – 0.35	
		Light interruption		PR120S	25 – 40 – 60			
		Continuous	SK	PR115S	25 – 45 – 70	0.5 – 1.0 – 1.5	0.03 – 0.05 – 0.1	
		Light interruption		PR120S	25 – 40 – 60			
	Medium-Roughing	Continuous	MU	PR115S	25 – 45 – 70	0.5 – 1.0 – 2.0	0.1 – 0.15 – 0.3	
		Light interruption		PR120S	25 – 40 – 60			
		Heavy interruption		PR153S	25 – 30 – 45			
		Continuous	MS	PR115S	25 – 45 – 70	0.5 – 1.0 – 2.0	0.1 – 0.15 – 0.3	
		Light interruption		PR120S	25 – 40 – 60			
		Heavy interruption		PR153S	25 – 30 – 45			
	Medium-Roughing	Continuous	TK	PR115S	25 – 45 – 70	1.0 – 2.0 – 3.0	0.12 – 0.2 – 0.3	
		Light interruption		PR120S	25 – 40 – 60			
		Heavy interruption		PR153S	25 – 30 – 45			
	Roughing	Continuous	SG	PR115S	25 – 45 – 70	0.5 – 2.0 – 4.0	0.1 – 0.3 – 0.4	
		Light interruption		PR120S	25 – 40 – 60			
		Heavy interruption		PR153S	25 – 30 – 45			
		Continuous	SX	PR115S	25 – 45 – 70	0.5 – 2.0 – 4.0	0.15 – 0.3 – 0.45	
		Light interruption		PR120S	25 – 40 – 60			
		Heavy interruption		PR153S	25 – 30 – 45			
	Stainless steel (Austenitic related)	Finishing	Continuous	MQ	PR120S	100 – 140 – 180	0.5 – 1.0 – 1.5	0.05 – 0.1 – 0.15
			Interruption		PR153S			
		Finishing-Medium	Continuous	SK	PR120S	80 – 120 – 150	0.5 – 1.5 – 2.0	0.03 – 0.05 – 0.1
Interruption			PR153S					
Medium-Roughing		Continuous	MU	PR120S	80 – 120 – 150	1.0 – 2.0 – 3.0	0.1 – 0.15 – 0.25	
		Interruption		PR153S			0.15 – 0.25 – 0.3	
		Continuous	MS	PR120S	80 – 120 – 150	1.0 – 2.0 – 3.0	0.15 – 0.2 – 0.3	
		Interruption		PR153S			0.2 – 0.3 – 0.4	
		Continuous	TK	PR120S	80 – 120 – 150	1.0 – 2.0 – 4.0	0.1 – 0.2 – 0.3	
		Interruption		PR153S			0.2 – 0.3 – 0.4	
Stainless steel (Precipitation hardened)		Finishing	Continuous	MQ	PR120S	80 – 100 – 120	0.5 – 1.0 – 1.5	0.05 – 0.1 – 0.15
			Interruption		PR153S			
	Medium-Roughing	Continuous	MU	PR120S	80 – 100 – 120	1.0 – 2.0 – 3.0	0.1 – 0.15 – 0.25	
		Interruption		PR153S			0.15 – 0.25 – 0.3	
		Continuous	MS	PR120S	80 – 100 – 120	1.0 – 2.0 – 3.0	0.15 – 0.2 – 0.3	
		Interruption		PR153S			0.2 – 0.3 – 0.4	
		Continuous	TK	PR120S	80 – 100 – 120	1.0 – 2.0 – 4.0	0.1 – 0.2 – 0.3	
		Interruption		PR153S			0.2 – 0.3 – 0.4	


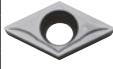



The center value indicates recommended cutting condition

## Stainless steel



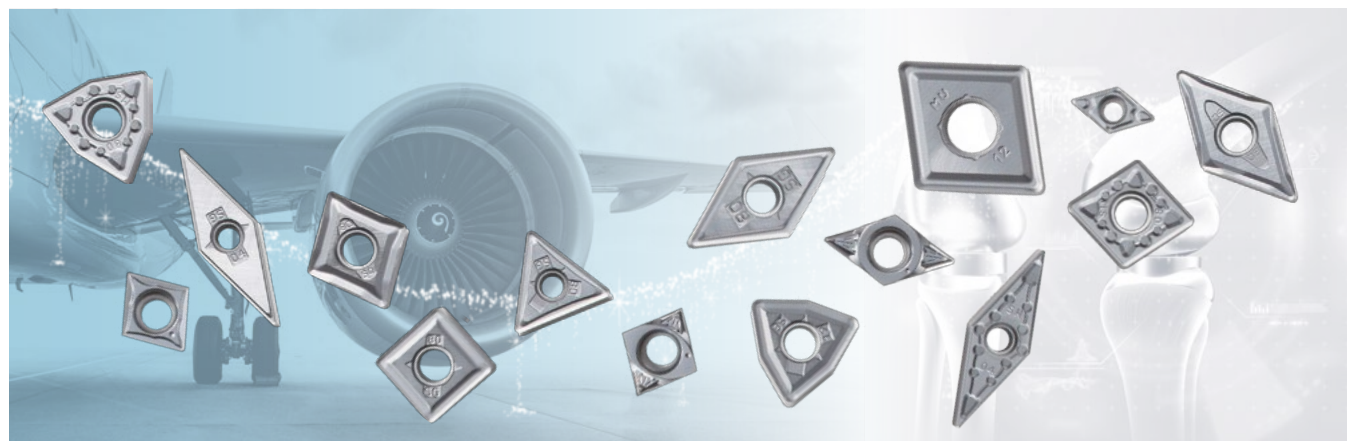
# Positive type inserts

Shape	Description	Dimensions (mm)				PR1155	PR1205	PR1535	PR1535
		I.C.	S	D1	RE				
	CCGT 0602005MFP-SKS	6.35	2.38	3	<0.05	7°	●	●	●
	060201MFP-SKS				<0.1		●	●	●
	060202MFP-SKS				<0.2		●	●	●
	CCGT 09T3005MFP-SKS	9.525	3.97	4.7	<0.05	7°	●	●	●
	09T301MFP-SKS				<0.1		●	●	●
	09T302MFP-SKS				<0.2		●	●	●
09T304MFP-SKS	<0.4				●		●	●	
	CCGT 060201MFP-SK	6.35	2.38	3	<0.1	7°	●	●	●
	060202MFP-SK				<0.2		●	●	●
	060204MFP-SK				<0.4		●	●	●
	CCGT 09T301MFP-SK	9.525	3.97	4.7	<0.1	7°	●	●	●
	09T302MFP-SK				<0.2		●	●	●
	09T304MFP-SK				<0.4		●	●	●
	CCGT 060201MFP-GQ	6.35	2.38	3	<0.1	7°	●	●	●
	060202MFP-GQ				<0.2		●	●	●
	060204MFP-GQ				<0.4		●	●	●
	CCGT 09T301MFP-GQ	9.525	3.97	4.7	<0.1	7°	●	●	●
	09T302MFP-GQ				<0.2		●	●	●
	09T304MFP-GQ				<0.4		●	●	●
	CCMT 09T304MQ	9.525	3.97	4.7	0.4	7°	●	●	●
	09T308MQ				0.8		●	●	●
	DCGT 0702005MFP-SKS	6.35	2.38	3	<0.05	7°	●	●	●
	070201MFP-SKS				<0.1		●	●	●
	070202MFP-SKS				<0.2		●	●	●
	DCGT 11T3005MFP-SKS	9.525	3.97	4.7	<0.05	7°	●	●	●
	11T301MFP-SKS				<0.1		●	●	●
	11T302MFP-SKS				<0.2		●	●	●
11T304MFP-SKS	<0.4	●	●	●					

Shape	Description	Dimensions (mm)				PR1155	PR1205	PR1535	PR1535
		I.C.	S	D1	RE				
	DCGT 070201MFP-SK	6.35	2.38	3	<0.1	7°	●	●	●
	070202MFP-SK				<0.2		●	●	●
	070204MFP-SK				<0.4		●	●	●
	DCGT 11T301MFP-SK	9.525	3.97	4.7	<0.1	7°	●	●	●
	11T302MFP-SK				<0.2		●	●	●
	11T304MFP-SK				<0.4		●	●	●
	DCGT 070201MFP-GQ	6.35	2.38	3	<0.1	7°	●	●	●
	070202MFP-GQ				<0.2		●	●	●
	070204MFP-GQ				<0.4		●	●	●
	DCGT 11T301MFP-GQ	9.525	3.97	4.7	<0.1	7°	●	●	●
	11T302MFP-GQ				<0.2		●	●	●
	11T304MFP-GQ				<0.4		●	●	●
	DCMT 070202MQ	6.35	2.38	3	0.2	7°	●	●	●
	070204MQ				0.4		●	●	●
	DCMT 11T304MQ	9.525	3.97	4.7	0.4	7°	●	●	●
	11T308MQ				0.8		●	●	●
	VCGT 110301MFP-SKS	6.35	3.18	2.8	<0.1	7°	●	●	●
	110302MFP-SKS				<0.2		●	●	●
	110304MFP-SKS				<0.4		●	●	●
	VPGT 110301MFP-SKS	6.35	3.18	3	<0.1	11°	●	●	●
	110302MFP-SKS				<0.2		●	●	●
	110304MFP-SKS				<0.4		●	●	●

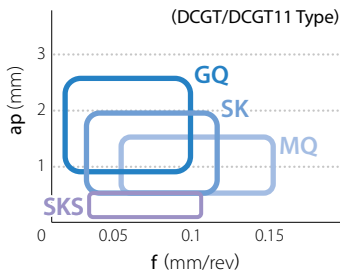
● : Available

Insert with corner R (RE) dimension expressed with less than sign (e.g. <0.1, <0.2 etc.) indicates models with minus tolerance for corner R (RE)



# Applicable chipbreaker range (ap Indicates radial depth of cut per side)

## Heat-resistant alloys



**Cutting range**

Finishing  
ap : 0.5 - 2.0 mm

Finishing-Medium  
ap : 1.0 - 2.5 mm

**Recommended chipbreaker**

**SK** Chipbreaker **Advantage**  
General purpose/  
1st recommendation

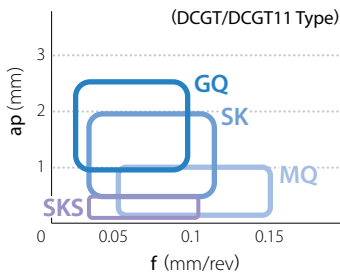
Issue : Chip control during low cutting

**SKS** Chipbreaker **Advantage**  
Chip control

Cutting Range  
ap : 0.1 - 0.5 mm

**GQ** Chipbreaker **Advantage**  
Chipbreaker width according to ap range  
⇒ Can be cut in a wide range of conditions

## Stainless steel



**Cutting range**

Finishing  
ap : 0.5 - 1.5 mm

Finishing-Medium  
ap : 1.0 - 2.5 mm

**Recommended chipbreaker**

**SK** Chipbreaker **Advantage**  
General purpose/  
1st recommendation

Issue : Chip control during low cutting

**SKS** Chipbreaker **Advantage**  
Chip control

Cutting Range  
ap : 0.1 - 0.5 mm

**GQ** Chipbreaker **Advantage**  
Chipbreaker width according to ap range  
⇒ Can be cut in a wide range of conditions

## Recommended cutting conditions

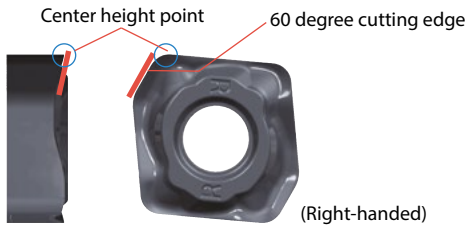
Workpiece	Cutting range	Recommended chipbreaker	Recommended grade	Min. - Recommendation - Max.		
				Vc (m/min)	ap (mm)	f (mm/rev)
Heat-resistant alloys	Finishing	MQ	PR115S	25 - 45 - 70	0.5 - 1.0 - 1.5	0.05 - 0.1 - 0.15
			PR120S	25 - 40 - 60		0.08 - 0.15 - 0.2
			PR153S	25 - 30 - 45		
		SKS	PR115S	25 - 45 - 70	0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1
			PR120S	25 - 40 - 60		
			PR153S	25 - 30 - 45		0.05 - 0.1 - 0.15
	SK	PR115S	25 - 45 - 70	0.5 - 1.0 - 2.0	0.03 - 0.08 - 0.12	
		PR120S	25 - 40 - 60			
		PR153S	25 - 30 - 45		0.05 - 0.1 - 0.15	
	Finishing-Medium	GQ	PR115S	25 - 45 - 70	1.0 - 1.5 - 2.5	0.02 - 0.05 - 0.08
			PR120S	25 - 40 - 60		
			PR153S	25 - 30 - 45		1.0 - 3.0 - 5.0
Stainless steel (Austenitic related)	Finishing	MQ	PR120S	80 - 100 - 120	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.15
			PR153S	60 - 80 - 100	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
		SKS	PR120S	80 - 100 - 120	0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1
			PR153S	60 - 80 - 100	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.15
	SK	PR120S	80 - 100 - 120	0.5 - 1.0 - 2.0	0.03 - 0.08 - 0.12	
		PR153S	60 - 80 - 100	0.5 - 1.5 - 3.0	0.05 - 0.1 - 0.15	
	Finishing-Medium	GQ	PR120S	80 - 100 - 120	1.0 - 1.5 - 2.5	0.02 - 0.05 - 0.08
			PR153S	60 - 80 - 100	1.0 - 3.0 - 5.0	0.04 - 0.07 - 0.1
Stainless steel (Precipitation hardened)	Finishing	MQ	PR120S	40 - 60 - 80	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.15
			PR153S	30 - 50 - 70	0.5 - 1.0 - 1.5	0.08 - 0.15 - 0.2
		SKS	PR120S	40 - 60 - 80	0.1 - 0.3 - 0.5	0.03 - 0.05 - 0.1
			PR153S	30 - 50 - 70	0.3 - 0.5 - 1.0	0.05 - 0.1 - 0.15
	SK	PR120S	40 - 60 - 80	0.5 - 1.0 - 2.0	0.03 - 0.08 - 0.12	
		PR153S	30 - 50 - 70	0.5 - 1.5 - 3.0	0.05 - 0.1 - 0.15	
	Finishing-Medium	GQ	PR120S	40 - 60 - 80	1.0 - 1.5 - 2.5	0.02 - 0.05 - 0.08
			PR153S	30 - 50 - 70	1.0 - 3.0 - 5.0	0.04 - 0.07 - 0.1

The center value indicates recommended cutting condition.

# SX chipbreaker usage precautions

## 1. Cutting edge height

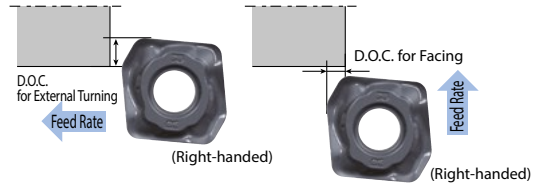
The center of the cutting edge height of the nose is slanted by 60 degrees based on circled portions in image below.



## 2. Recommended D.O.C.

Recommended depth of cut is no greater than the 60° lead angle; however, larger depths of cut are possible.

Description	Recommended D.O.C. External turning (mm)	Max. D.O.C. Facing (mm)
CNMM1204X R/L-SX	0.5 - 2.0 - 4.0	2.0
CNMM1606X R/L-SX	0.5 - 2.5 - 4.5	2.0
CNMM1906X R/L-SX	0.5 - 3.0 - 5.0	2.5



## 3. Applicable toolholder

The SX chipbreaker insert requires a different shim than standard inserts. No additional toolholder modifications are necessary when using the applicable Kyocera holders.

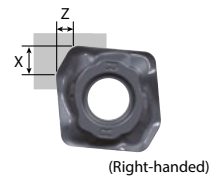
Insert description	Applicable toolholder (Kyocera)	Standard shim	Shim for SX chipbreaker
CNMM1204X R/L-SX	DCLN R/L2020K-12 DCLN R/L2525M-12	DC-44	DC-44-C
	PCLN R/L2020H-12 PCLN R/L2020K-12 PCLN R/L2525M-12 PCLN R/L3225P-12	LC-42N	LC-42N-C
CNMM1606X R/L-SX	PCLN R/L2525M-16 PCLN R/L3232P-16	LC-53N	LC-53N-C
CNMM1906X R/L-SX	PCLN R/L3232P-19	LC-63	LC-63-C

Boring is not recommended

## 4. Unmachined portion varies with insert size

Unmachined portion is reflected below.

Description	Amount uncut (mm)	
	X	Z
CNMM1204X R/L-SX	4.1	2.9
CNMM1606X R/L-SX	4.8	3.3
CNMM1906X R/L-SX	5.4	3.6



## 5. Facing

Facing is possible, but turning is recommended. Cutting edge may drop below center in facing operations. Boss remains at the center of the workpiece.

Description	Run-out amount when facing (mm)
CNMM1204X R/L-SX	0.75
CNMM1606X R/L-SX	0.85
CNMM1906X R/L-SX	1.05

**The SX chipbreaker is uniquely designed for high efficiency roughing. It differs from standard inserts by the following.**

- Handed single-sided 2-corner insert
- Requires a dedicated shim
- Unmachined portion remains at corner (4. Unmachined portion varies with insert size)
- Position of insert is below the center when facing (5. Facing)