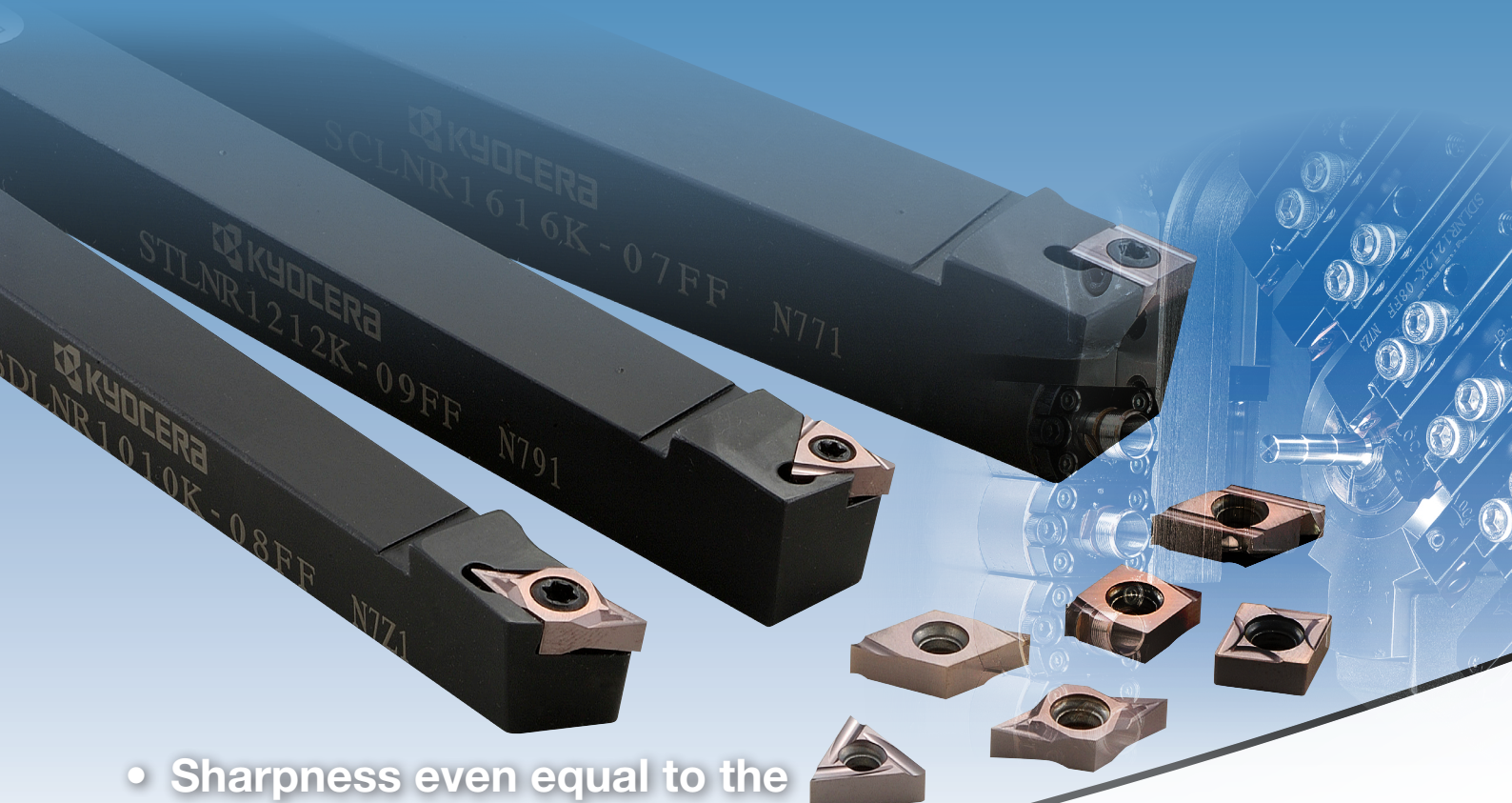




# SMALL DOUBLE SIDED TOOLING

Small negative type insert enables high cost efficiency and stability with double-sided design.



- Sharpness even equal to the conventional positive type insert.

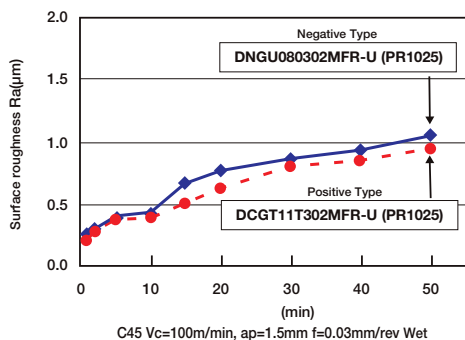
# Small Double Sided Tooling

## Product Lineup Expansion for Small Double Sided Tooling

- New! SK chipbreaker for finishing to middle cutting
- 10mm square type shank available
- Corner R ( $r\epsilon$ ) = 0.2mm type available for GK chipbreaker for middle to rough cutting

**Both edge usable by double-faced Design. Compared to the positive type, the double-faced design is cheaper and more stable.**

■ Surface roughness comparison (sharp edge)



(In house evaluation)

**Smaller double sided tooling for precision machining**

TNGU09

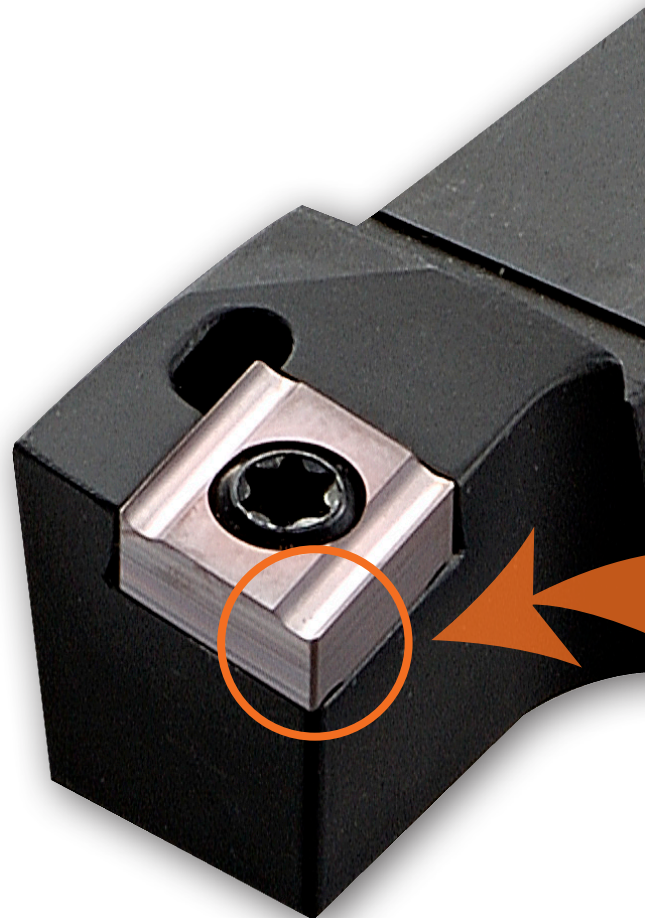


Small Negative Insert

TNGG16



Negative Insert

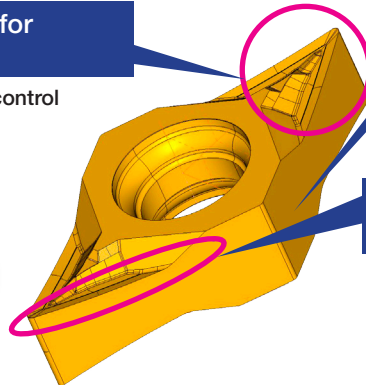
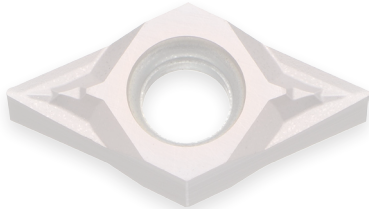


# Small Double Sided Tooling

## Features of SK Chipbreaker

Optimum chipbreaker design for finishing to middle cutting

Suitable geometry for smooth chip control



Periphery ground finish

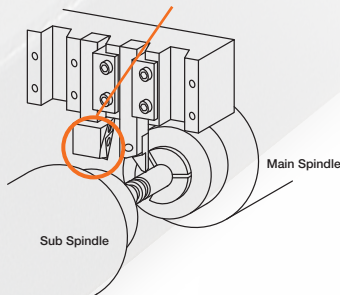
High quality G class periphery grinding.

Sharp Edge

Molded chipbreaker with sharp edge. Lowering cutting force and deformation by sharp edge

**No constraint of tool position against tool post into the newly designed small negative insert.**

The conventional toolholders for negative insert possibly interferes with sub spindle.



No interference with sub spindle

**Minus tolerance for Corner-R( $r\epsilon$ ) of G class (ground) insert**

**M: indicates minus tolerance for corner-R( $r\epsilon$ )**

Corner-R( $r\epsilon$ ) (minus tolerance) = Corner-R on the drawing

**Example**

CNGU070301MFR-U

Sharp edge

Hand

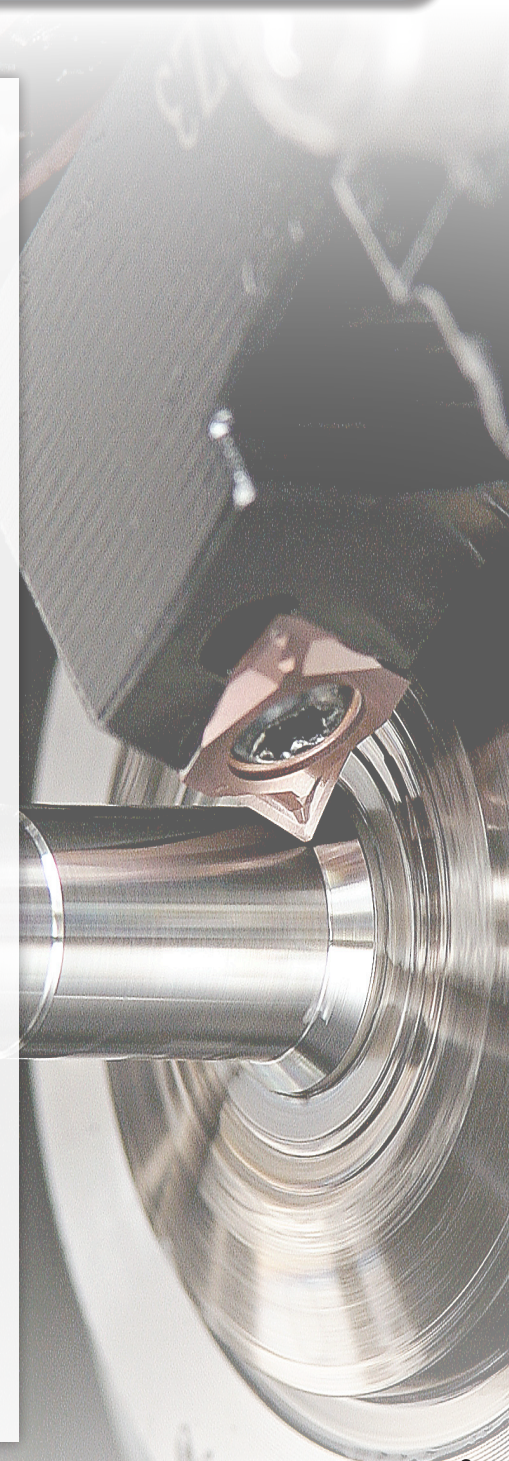
Chipbreaker shape

CNGU070301MER-U

With Honing

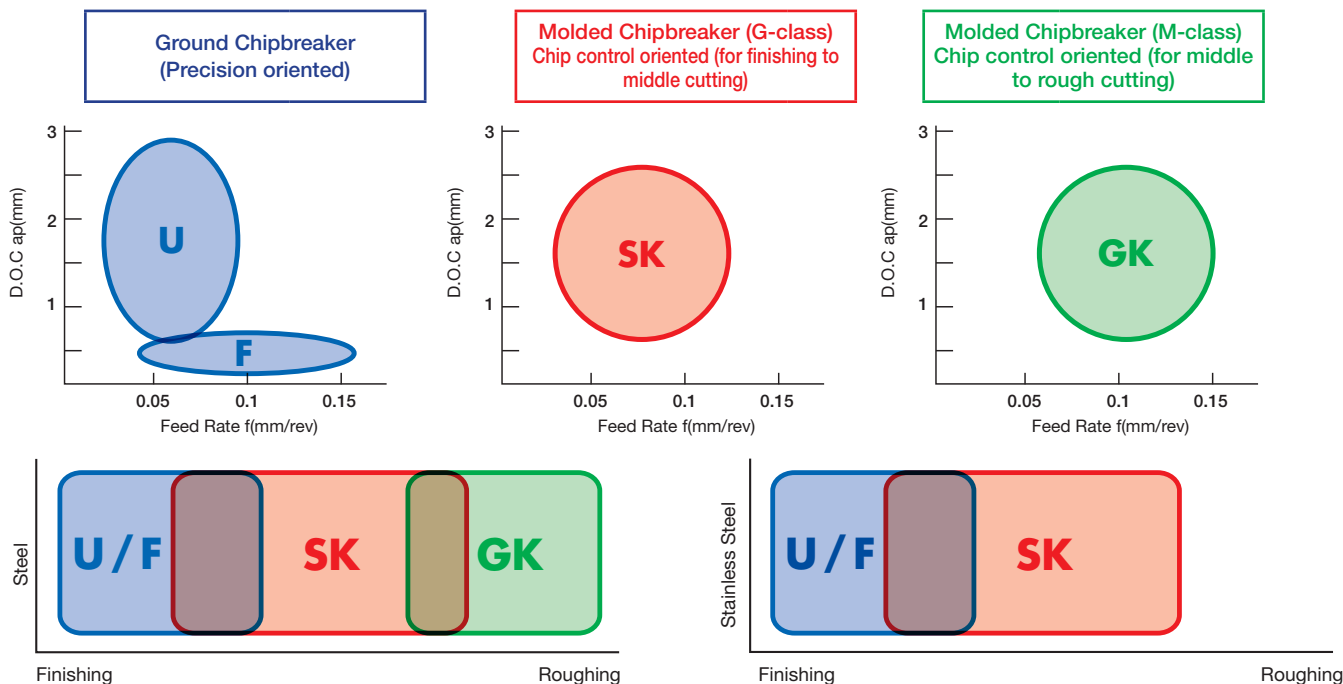
Hand

Chipbreaker shape



# Small Double Sided Tooling

## Chip Control Range



Cutting Range	Name	Design	Advantages
Finishing-Medium	<b>SK</b>		Realizing chip evacuation and low cutting force for machining steel and stainless steel. Equivalent of cutting performance against positive insert.
Medium-Roughing	<b>GK</b>		Good chip evacuation at wide range by breaker dot and wide chip pocket.
Finishing	<b>F</b>		Good chip control for finishing to light cutting with low cutting force.
Low Feed	<b>U</b>		Good chip control at low feed rate and varied ap with low cutting force.

**PR1005:** For free cutting steel  
Better wear resistance due to high hardness substrate

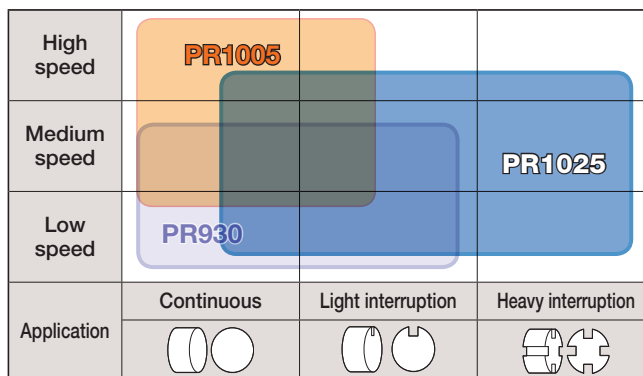
**PR1025:** For steel and stainless steel  
Better fracture resistance due to high toughness substrate

## Recommended Cutting Conditions

Work material	Grade	
	PR1005	PR1025
Free cutting steel	 $V_c=100\text{m/min}$ (60~150)	
Carbon Steel / Alloy Steel	 $V_c=100\text{m/min}$ (60~150)	 $V_c=100\text{m/min}$ (60~150)
Stainless Steel		 $V_c=100\text{m/min}$ (60~150)

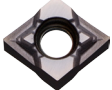
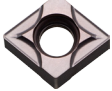











Light interrupted to continuous / 1st recommendation  
 Light interrupted to continuous / 2nd recommendation

## Application range map for PR1025/PR1005



# Small Double Sided Tooling

## Stock Items

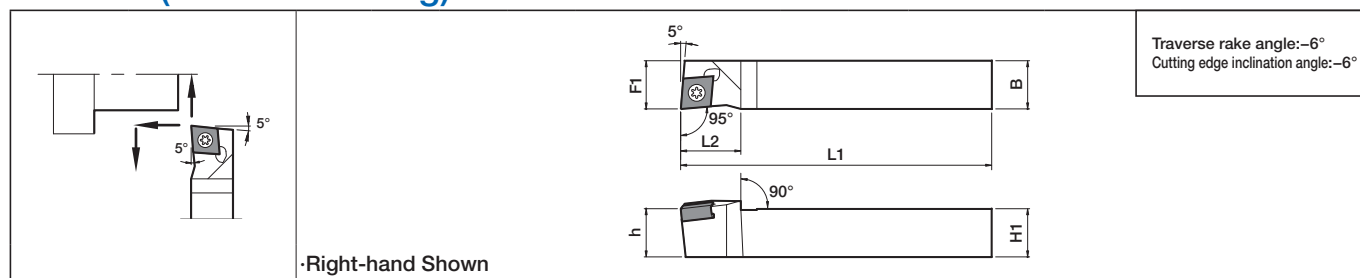
Shape	Description	Dimension(mm)				Stock Grades	
		I.C.	Thickness	Hole	Corner-R(r <sub>e</sub> )	PVD Coated	
						PR1005	PR1025
Right-hand Shown							
 Finishing-Medium / Sharp Edge	<b>CNGU</b> 070301MF-SK 070302MF-SK	7.5	3.18	3.6	< 0.1 < 0.2		● ●
 Medium-Roughing / With Honing	<b>CNMU</b> 070302E-GK 070304E-GK	7.5	3.18	3.6	0.2 0.4	●	● ●
 Finishing / Sharp Edge	<b>CNGU</b> 0703005MFR-F 070301MFR-F 070302MFR-F 070304MFR-F	7.5	3.18	3.6	< 0.05 < 0.1 < 0.2 < 0.4	● ● ● ●	● ● ● ●
 Low Feed / Sharp Edge	<b>CNGU</b> 0703005MFR-U 070301MFR-U 070302MFR-U 070304MFR-U	7.5	3.18	3.6	< 0.05 < 0.1 < 0.2 < 0.4	● ● ● ●	● ● ● ●
 Low Feed / With Honing	<b>CNGU</b> 070301MER-U 070302MER-U 070304MER-U	7.5	3.18	3.6	< 0.1 < 0.2 < 0.4	● ● ●	● ● ●
 Finishing-Medium / Sharp Edge	<b>DNGU</b> 080301MF-SK 080302MF-SK 080304MF-SK	7.0	3.18	3.6	< 0.1 < 0.2 < 0.4		● ● ●
 Medium-Roughing / With Honing	<b>DNMU</b> 080302E-GK 080304E-GK	7.0	3.18	3.6	0.2 0.4	●	● ●
 Finishing / Sharp Edge	<b>DNGU</b> 0803005MFR-F 080301MFR-F 080302MFR-F 080304MFR-F	7.0	3.18	3.6	< 0.05 < 0.1 < 0.2 < 0.4	● ● ● ●	● ● ● ●
 Low Feed / Sharp Edge	<b>DNGU</b> 0803005MFR-U 080301MFR-U 080302MFR-U 080304MFR-U	7.0	3.18	3.6	< 0.05 < 0.1 < 0.2 < 0.4	● ● ● ●	● ● ● ●
 Low Feed / With Honing	<b>DNGU</b> 080301MER-U 080302MER-U 080304MER-U	7.0	3.18	3.6	< 0.1 < 0.2 < 0.4	● ● ●	● ● ●
 Finishing / Sharp Edge	<b>TNGU</b> 0903005MFR-F 090301MFR-F 090302MFR-F 090304MFR-F	5.56	3.18	3.0	< 0.05 < 0.1 < 0.2 < 0.4	● ● ● ●	● ● ● ●
 Low Feed / Sharp Edge	<b>TNGU</b> 0903005MFR-U 090301MFR-U 090302MFR-U 090304MFR-U	5.56	3.18	3.0	< 0.05 < 0.1 < 0.2 < 0.4	● ● ● ●	● ● ● ●
 Low Feed / With Honing	<b>TNGU</b> 090301MER-U 090302MER-U 090304MER-U	5.56	3.18	3.0	< 0.1 < 0.2 < 0.4	● ● ●	● ● ●

\*Inserts whose corner R(r<sub>e</sub>) dimension is expressed with less than sign (e.g.: <0.05, <0.1, <0.2, etc.) indicate models with minus tolerance for corner R(r<sub>e</sub>).

●:Standard Stock

# Small Double Sided Tooling

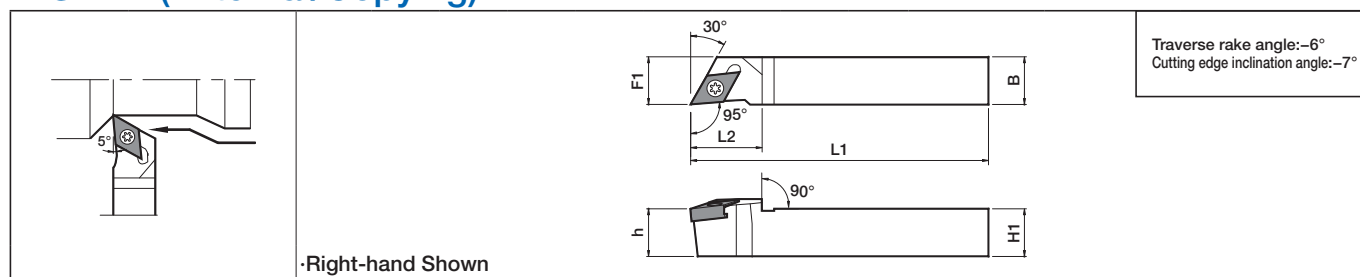
## SCLN (External/Facing)



### Toolholder Dimension

Description	Stock	Dimension (mm)						Std. Corner-R(°)	Spare Parts		Applicable Insert
		H1=h	B	L1	L2	F1	Clamp Screw		Wrench		
SCLNR 1010K-07FF	●	10	10	120	15	10	0.2	SB-3080TR	LTW-10SS	CNGU0703.. CNMU0703..	
1212F-07FF	●	12	12	85		12					
1212K-07FF	●			120		16					
1616K-07FF	●	16	16								

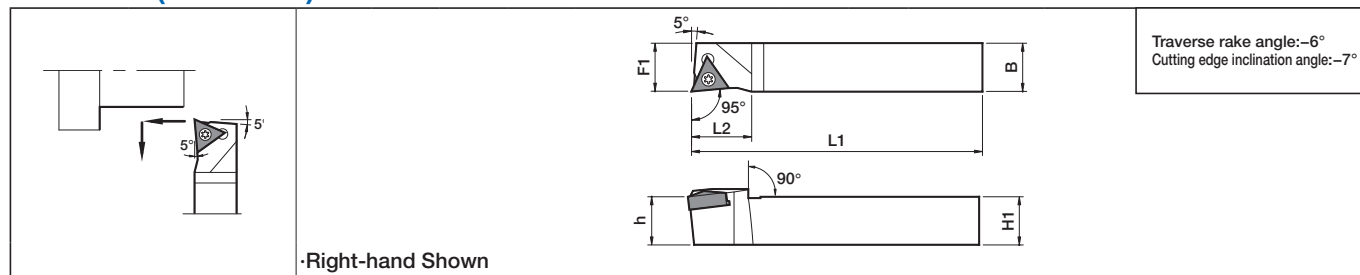
## SDLN (External/Copying)



### Toolholder Dimension

Description	Stock	Dimension (mm)						Std. Corner-R(°)	Spare Parts		Applicable Insert
		H1=h	B	L1	L2	F1	Clamp Screw		Wrench		
SDLNR 1010K-08FF	●	10	10	120	18	10	0.2	SB-3080TR	LTW-10SS	DNGU0803.. DNMU0803..	
1212F-08FF	●	12	12	85		12					
1212K-08FF	●			120		16					
1616K-08FF	●	16	16								

## STLN (External)



### Toolholder Dimension

Description	Stock	Dimension (mm)						Std. Corner-R(°)	Spare Parts		Applicable Insert
		H1=h	B	L1	L2	F1	Clamp Screw		Wrench		
STLNR 1010K-09FF	●	10	10	120	15	10	0.2	SB-2570TR	LTW-8SS	TNGU0903..	
1212F-09FF	●	12	12	85		12					
1212K-09FF	●			120		16					
1616K-09FF	●	16	16								

●:Standard Stock

# Small Double Sided Tooling

## Case Studies

15CrMo5	
<ul style="list-style-type: none"> <li>•Pin</li> <li>•Vc=120m/min</li> <li>•ap=1.5mm</li> <li>•f=0.08mm/rev</li> <li>•Wet</li> </ul>	
<b>CNMU070304E-GK (PR1025)</b>	<b>4,800pcs/insert</b>
Comp. A (DCMT type)	<b>2,400pcs/insert</b>
<p>Against competitor A (DCMT type) performed same machining number per edge. However of negative insert, double machining numbers were achieved per one insert due to negative type of PR1025.</p>	
(Evaluation by the user)	

1.0480	
<ul style="list-style-type: none"> <li>•Nipple</li> <li>•Vc=88m/min</li> <li>•ap=1.0mm</li> <li>•f=0.05~0.08mm/rev</li> <li>•Wet</li> </ul>	
<b>DNGU080302MF-SK (PR1025)</b>	<b>6,000pcs/insert</b>
Comp. B (DCMT type)	<b>2,000pcs/insert</b>
<p>Against competitor B (DCGT type) 1,000 pcs/edge (2,000 pcs/insert), PR1025's tool life is improved 3 times per insert and 1.5 times per edge as 1,500 pcs/edge (6,000 pcs/insert).</p>	
(Evaluation by the user)	

C45	
<ul style="list-style-type: none"> <li>•Shaft</li> <li>•Vc=110m/min</li> <li>•ap=1.0mm</li> <li>•f=0.11mm/rev</li> <li>•Wet</li> </ul>	
<b>DNGU080302MF-SK (PR1025)</b>	<b>800pcs/insert</b>
Comp. C (DCGT type)	<b>300pcs/insert</b>
<p>Competitor C (DCGT type) performs 150pcs per one edge against PR1025 of 200 pcs/edge. Due to negative type insert of PR1025, machining performance is improved about 2.6 times per one insert (1.3 times per edge).</p>	
(Evaluation by the user)	

X12CrNiS18 8	
<ul style="list-style-type: none"> <li>•Spool (Dia 6mm portion)</li> <li>•Vc=66m/min</li> <li>•ap=1.25mm</li> <li>•f=0.025mm/rev</li> <li>•Wet (Dia 8mm portion)</li> <li>•Vc=130m/min</li> <li>•ap=0.25mm</li> <li>•f=0.025mm/rev</li> <li>•Wet</li> </ul>	
<b>DNGU080302MF-SK (PR1025)</b>	<b>60,000pcs/insert</b>
Comp. D (DCGT type)	<b>20,000pcs/insert</b>
<p>Against competitor D (DCGT type) 10,000 pcs/edge, due to improved tool life as 15,000 pcs/edge for PR1025 and being PR1025, tool life is improved 3 times longer per one insert.</p>	
(Evaluation by the user)	

# Small Double Sided Tooling

## ● Case Studies

1.0040	
<ul style="list-style-type: none"> <li>•Hexagonal bar</li> <li>•Vc=120m/min</li> <li>•ap=1.75mm(2 passes)</li> <li>•f=0.1mm/rev</li> <li>•Wet</li> </ul>	
<b>DNMU080304E-GK (PR1025)</b>	<p>5,600pcs/insert</p>
Comp. E (DCGT type)	<p>2,000pcs/insert</p>
<p>Against competitor E (DCGT type) 1,000 pcs/edge (2,000 pcs/insert), PR1025 improved tool life 1,400 pcs/edge(5,600 pcs/insert), about 1.4 time per one edge, and 2.8 times per one insert.</p>	
(Evaluation by the user)	

1.0718	
<ul style="list-style-type: none"> <li>•Shaft</li> <li>•Vc=200m/min</li> <li>•ap=0.1mm</li> <li>•f=0.05mm/rev</li> <li>•Wet</li> </ul>	
<b>CNGU070302MFR-U (PR1025)</b>	<p>8,000pcs/insert</p>
Comp. F (DCGT type)	<p>4,000pcs/insert</p>
<p>Against competitor F (DCGT type) 2,000 pcs/edge, machining number was relatively same as PR1025 per one edge. Due to negative insert, machining number is improved as twice per one insert.</p>	
(Evaluation by the user)	



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