

THE NEW VALUE FRONTIER



CERATIP®

KYOCERA Cutting Tools

CP168-E

WP/WQ Chipbreaker

Wiper Insert



for Finishing **WP**

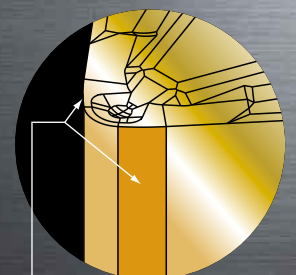


for Middle to Roughing **WQ**

**Improvement of Efficiency and
Surface Roughness**

**Machining
Efficiency UP!**

**Surface
Roughness DOWN!!**



Large Radiused Wiper Edge

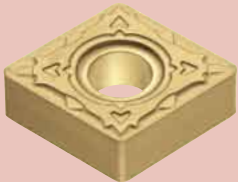
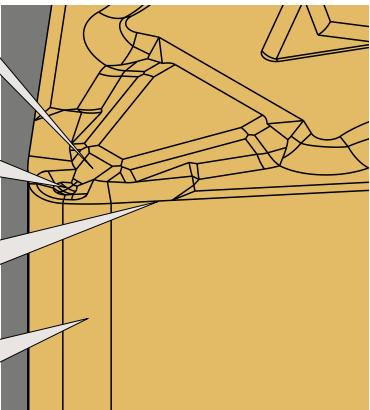
Features

- Surface Finish** ... Excellent Surface Finish due to Wiper Edge Effect
- Chip Control** ... Complete Chip Control Range with WP+WQ Chipbreaker
- Time** ... Machining Time Shortening by High Feed Rate Cutting
- Tool Life** ... Tool Life Extension by Shortened Machining Time

Chipbreaker Design

for Finishing

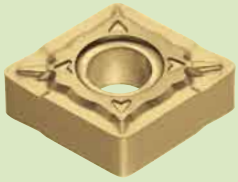
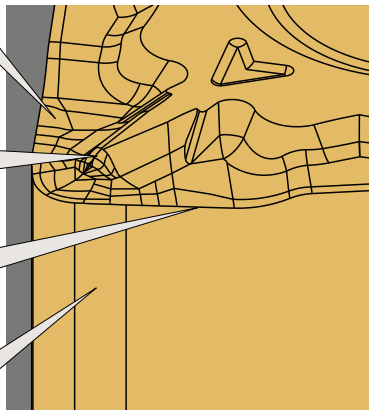
WP Chipbreaker

- Cutting Force Reduction due to Low and Gentle Projection
- Well Curled Chips due to Dimple
- Sharp Cutting Performance
- Surface Roughness Improvement due to Arc Wiper Edge

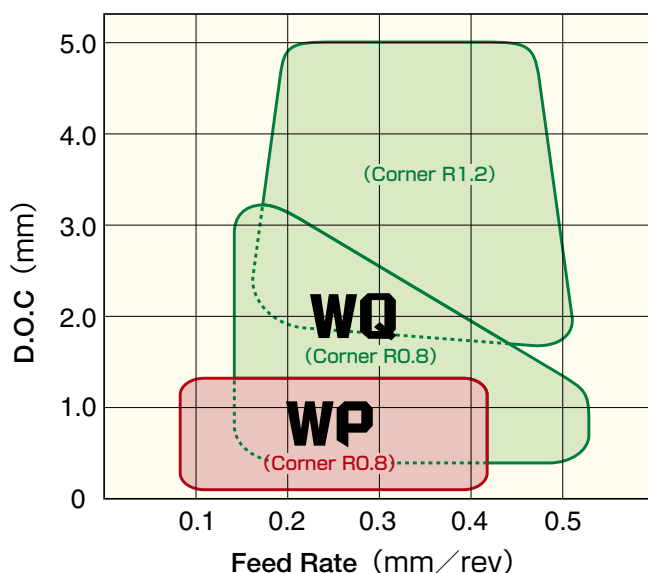
for Middle to Roughing

WQ Chipbreaker

- High Feed Rate Machining due to Wide Chip Pocket
- Optimum Projection for Wide Chip Control Range
- Crack Resistance - Oriented Edge
- Surface Roughness Improvement due to Arc Wiper Edge

Chip Control Range

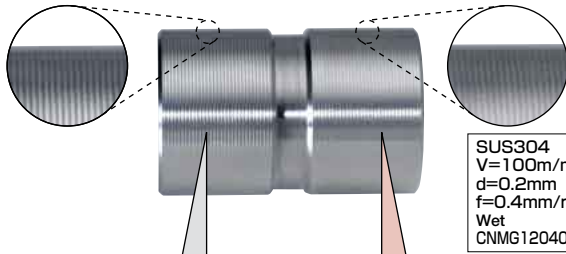


Cutting Conditions
 SCM435 ($\phi 70$)
 V=200m/min
 Wet
 CNMG120408WP
 CNMG120408WQ
 CNMG120412WQ
 PCLNL2525M-12

WP and WQ cover the range from Finishing to Roughing

POINT 1

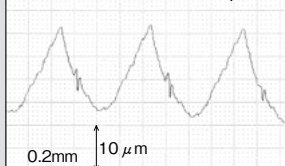
Surface Finish



SUS304
V=100m/min
d=0.2mm
f=0.4mm/rev
Wet
CNMG120408

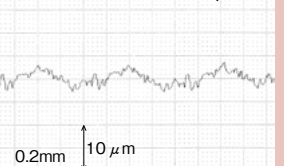
No Wiper Edge

23.2 μ mRz

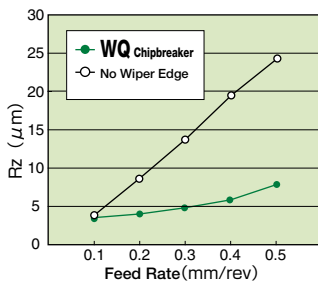


WP Chipbreaker

6.9 μ mRz



• Surface Roughness Comparison



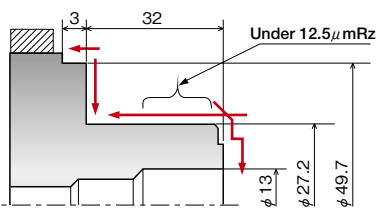
SCM435 V=200m/min d=1.0mm
Wet CNMG120408

Feed Rate (mm/rev)	Corner R					
	0.4		0.8		1.2	
	No Wiper	Wiper	No Wiper	Wiper	No Wiper	Wiper
0.10	3.0	0.4	1.6	0.3	1.0	0.2
0.15	5.7	0.9	3.5	0.6	2.4	0.5
0.20	8.7	1.7	5.9	1.0	4.2	0.8
0.25	11.9	2.6	8.6	1.6	6.4	1.3
0.30	15.2	3.8	11.4	2.3	8.9	1.9
0.35	18.6	5.1	14.4	3.1	11.5	2.6
0.40	22.0	6.7	17.4	4.0	14.3	3.3
0.45	25.5	8.5	20.6	5.1	17.1	4.2
0.50	29.1	10.4	23.8	6.3	20.1	5.2

*The Table shows the theoretical surface roughness

S10C

- Core Stator
- V=200m/min
- d=0.5~1.3mm
- f=0.16mm/rev
- Wet
- CNMG120408WP (PV7020)



WP's surface roughness was stabler than competitor even at double feed rate.
Chip Control was better too.

	Comp. (No Wiper)	WP Chipbreaker
Feed Rate	0.08mm/rev	0.15mm/rev
Roughness	8~10 μ mRz	4~8 μ mRz

For Finishing

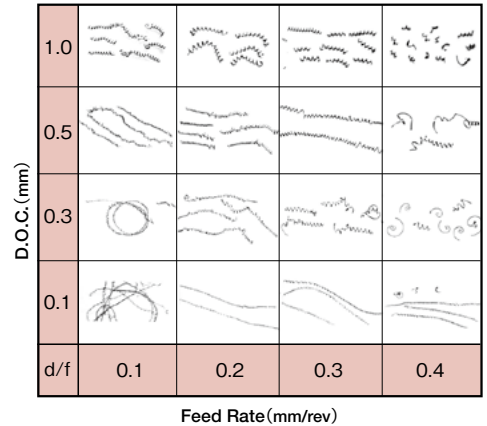
Cermet, PVD Cermet

WP Chipbreaker

POINT 2

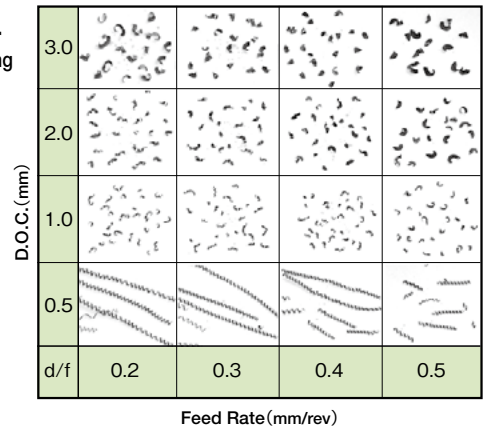
Chip Control

WP Chipbreaker
for Finishing



SCM415
V=200m/min
Wet
CNMG120408WP
CR7015

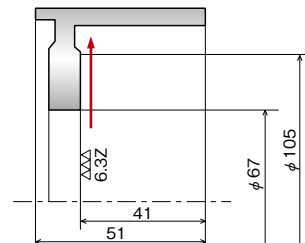
WQ Chipbreaker
for Middle to Roughing



SCM435
V=200m/min
Wet
CNMG120408WQ
CA5025

S45C

- Cover Front
- V=240m/min
- d=0.3mm
- f=0.13mm/rev
- Wet
- WNMG080404WP (PV7020)



WNMG080404WP

150pcs/edge

Competitor

50pcs/edge

WP performed better chip control than competitor and tool life became 3times.

For Chip Control

D.O.C. Under 1mm

D.O.C. 1mm and Over

WP Chipbreaker

WQ Chipbreaker



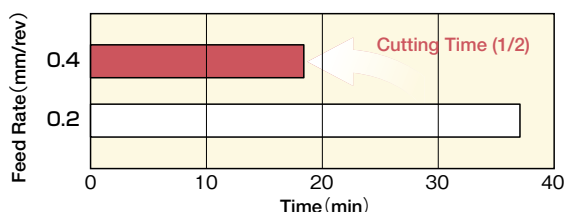
POINT 3

Time

Machining Time Shortening by High Feed Rate Cutting

- Machining Time to Half
- Double Feed Rate Available
- Cutting Process Shortening (One to Finish)

Cutting Time Comparison (Metal Removal Volume 1500cm³)



SCM435 V=200m/min d=1.0mm Wet
CNMG120404WQ(CA5025)

Productivity

Work : (SCr420)

Q'TY : 20,000

加工程序 : Roughing

1 Change to WQ
(CNMG120408WQ(CA5025))

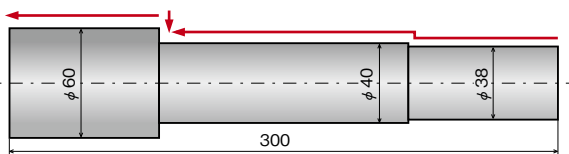
2 Double the Feed Rate
(f=0.25mm/rev? f=0.5mm/rev)

Result

1 Time Shortening 68 sec. → 34 sec./PC
Total 188 Hours Reduction

2 Less Tools
Tool Life Extension
150 pcs/edge → 250 pcs/edge
Inserts Used 34 pcs → 20 pcs

Conventional
Conditions
V=150m/min
d=1~1.5mm
f=0.25mm/rev
Wet



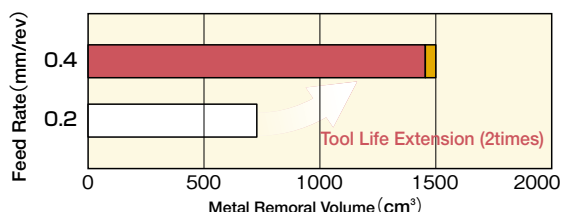
POINT 4

Tool Life

Tool Life Extension

- Tool Life Extension due to Less Cutting Time and Less Wear

Tool Life Comparison (VB=0.125mm)



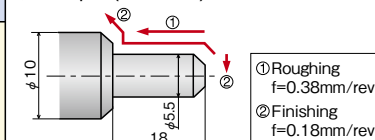
SCM435 V=200m/min d=1.0mm Wet
CNMG120404WQ(CA5025)

S35C

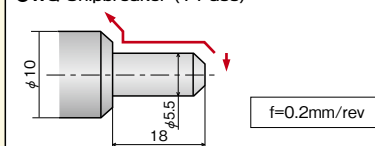
- Piston Rod
- V=150m/min
- d=1~2mm
- f=0.2mm/rev
- Dry

• WNMG080404WQ
(PV90)

● No Wiper (2 Passes)



● WQ Chipbreaker (1 Pass)



WNMG080404WQ

2,000pcs/edge

Comp. (No Wiper)

1,000pcs/edge

Competitor(No Wiper)'s surface roughness was 3 μmRa and no chance to raise feed rate.
WQ finished the process at 1 pass and its surface roughness was 1 μmRa and tool life became double.

Machining Time Shortening Tool Life Extension

WP Chipbreaker

Finishing : Cermet, PVD Cermet

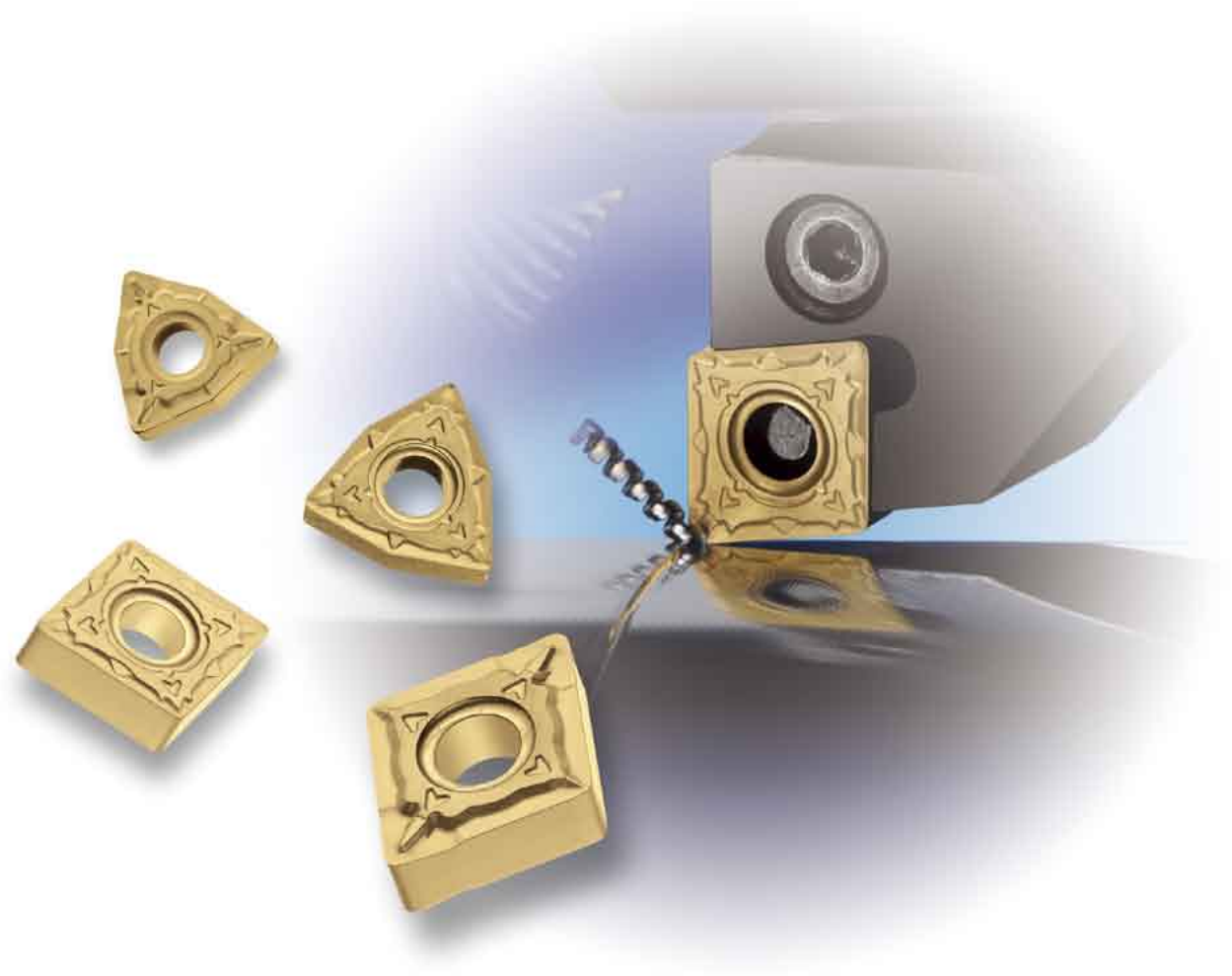
WQ Chipbreaker

Middle to Roughing : CVD Coat

■ Stock Items

Shape	Description	Dimension (mm)				Insert Grade								
						Cermet		PVD Cermet		CVD Coated				
		I.C.	Thickness	Hole	Corner-R	TN6020	TN60	PV7020	PV90	CA5505	CA5515	CA5525	CA5025	CR7015
	CNMG 120404WP 120408WP	12.70	4.76	5.16	0.4 0.8	● ●		● ●		● ●	● ●	● ●	● ●	● ●
	WNMG 080404WP 080408WP	12.70	4.76	5.16	0.4 0.8	● ●		● ●		● ●	● ●	● ●	● ●	● ●
	CNMG 120404WQ 120408WQ 120412WQ	12.70	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● 	● ● ●	● ● 	● ● ●	● ● ●	● ● ●	● ● 	
	WNMG 080404WQ 080408WQ 080412WQ	12.70	4.76	5.16	0.4 0.8 1.2	● ● ●	● ● 	● ● ●	● ● 	● ● ●	● ● ●	● ● ●	● ● 	

● : Standard Stock





Note to Use Wiper Edge Insert

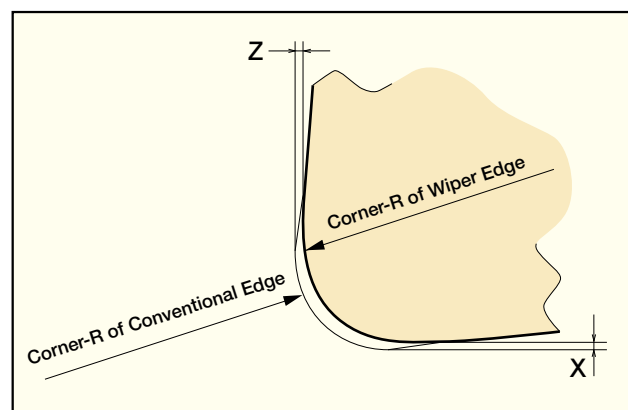
- Use the toolholder of Approach Angle 95° for CNMG...WP/WQ, WNMG...WP/WQ

Applicable Toolholder

CNMG1204○○WP/WQ PCLN[®]/L2525M-12、S32S-PCLN[®]/L12-40
 WNMG0804○○WP/WQ PWLN[®]/L2525M-08、S32S-PWLN[®]/L08-40

- Index position of Wiper Edge Insert differs from that of no wiper insert, and Check the index position when it is replaced

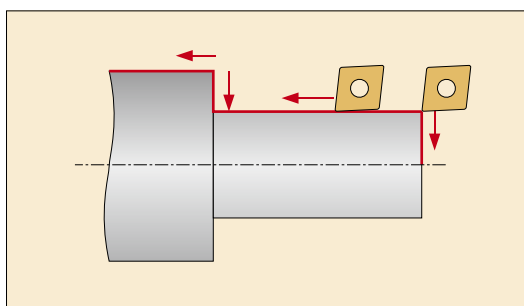
Index Position Difference				
Chipbreaker	Corner-R	Description	X (mm)	Z (mm)
WP	0.4	CNMG120404WP WNMG080404WP	0.03	0.03
	0.8	CNMG120408WP WNMG080408WP	0.04	0.04
WQ	0.4	CNMG120404WQ WNMG080404WQ	0.05	0.05
	0.8	CNMG120408WQ WNMG080408WQ	0.06	0.06
	1.2	CNMG120412WQ WNMG080412WQ	0.05	0.05



- Effective & Ineffective Application for Wiper Edge Insert

○ Effective Application

- Straight cutting in parallel or perpendicular to work's center line



△ Ineffective Application

- Tapered or Curved Face Cutting

