THE NEW VALUE FRONTIER

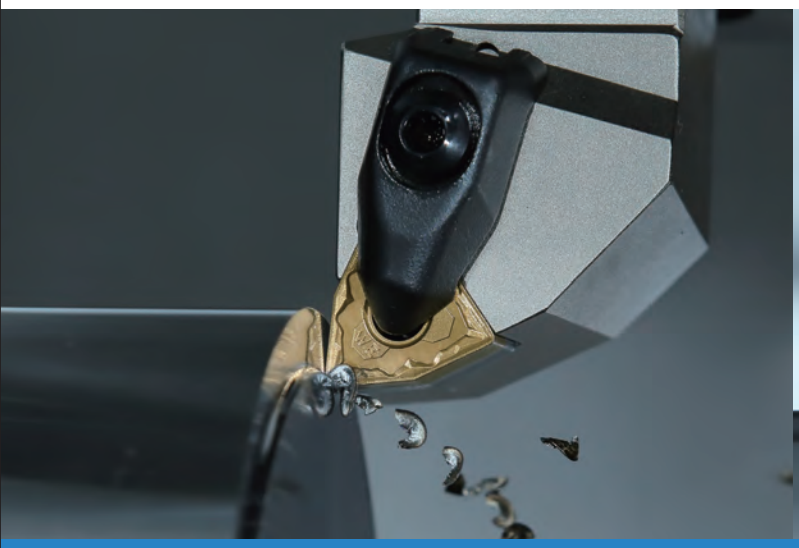
KYOCERA

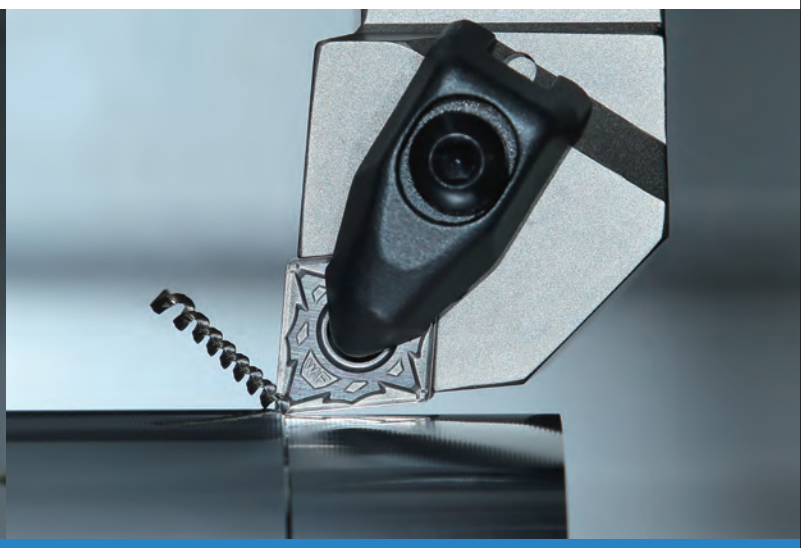
Negative
Wiper Insert

WE Chipbreaker
WF Chipbreaker

Negative Wiper Insert

WE/WF Chipbreaker





High Productivity with Newly Designed Wiper Edge Geometry

Finishing-Medium

WE Chipbreaker (For High Maching Efficiency)

High productivity by reducing cutting time during higher feed machining

Stable chip control in a wide range of applications

Finishing

WF Chipbreaker (For Excellent Surface Roughness)

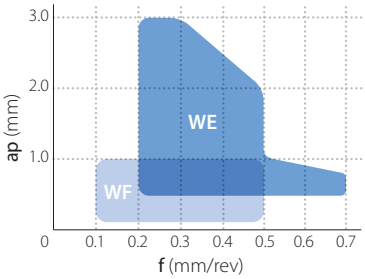
High productivity with smooth chip control in finishing operations

Excellent surface roughness by controlling adhesion

Wiper Insert (Finishing-Medium)

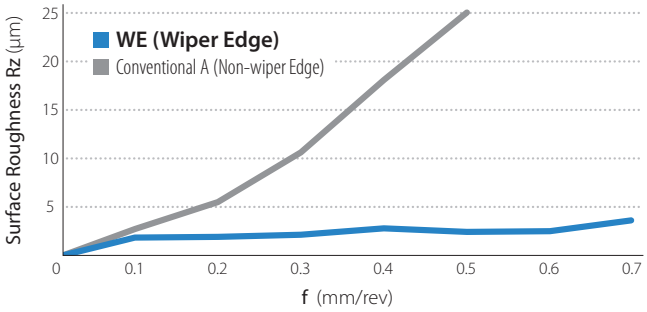
WE Chipbreaker

High productivity by reducing cutting time during higher feed machining
Stable chip control in a wide range of applications



1 3 Times the Feed Rate of Standard Inserts with Excellent Surface Roughness

Surface Finish Comparison (In-house Evaluation)



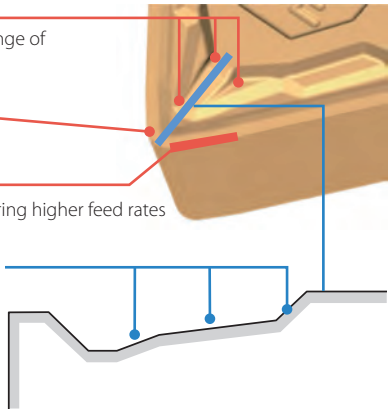
Cutting Conditions: Vc = 250m/min, ap = 0.3 mm, f = 0.1 - 0.7 mm/rev, Wet
CNMG120408 Type Workpiece: SCM435

Chipbreaker Design
Stable chip control in a wide range of applications

Tough edge design
Prevents chip entanglement

Wiper Edge Geometry
Excellent surface roughness during higher feed rates

Chipbreaker Cross Section
Available for a wide range of machining operations utilizing various angled steps



2 Reduce the Number of Machining Passes from 2 Passes to 1 Pass

Conventional Machining Process Cutting Time (2 Passes): 22.1 sec

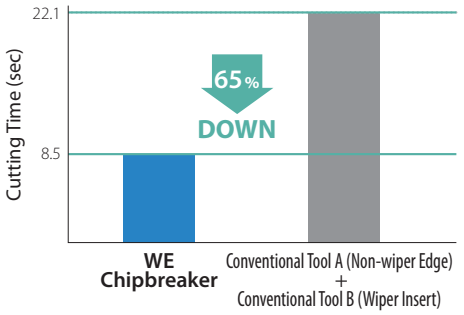
Pass 1 : Conventional Tool (Non-wiper Insert)
Vc = 200 m/min, ap = 1.5 mm, f = 0.25 mm/rev, Wet, CNMG120408 Type

Pass 2 : Conventional Tool (Wiper Insert)
Vc = 200 m/min, ap = 0.5 mm, f = 0.4 mm/rev, Wet, CNMG120408 Type
Workpiece: SCM415 (Diameter of Material ø 40 × 150 L, Cutting Length 100 mm)

Recommended Machining Process Cutting Time (1 Pass): 8.5 sec

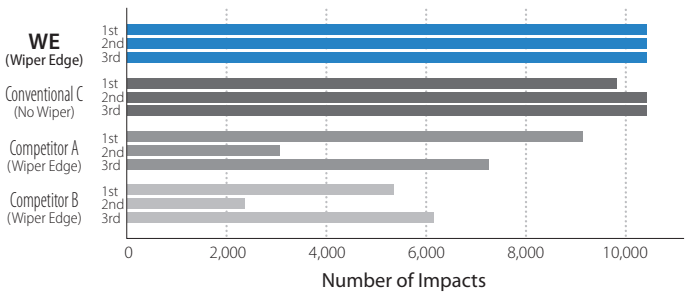
Pass 1 : WE Chipbreaker (Wiper Insert)
Vc = 200 m/min, ap = 2.0 mm, f = 0.4 mm/rev, Wet, CNMG120408 Type
Workpiece: SCM415 (Diameter of Material ø 40 × 150 L, Cutting Length 100 mm)

Cutting Time Comparison (In-house Evaluation)



3 Stable Cutting at 0.7mm/rev Feed Rate

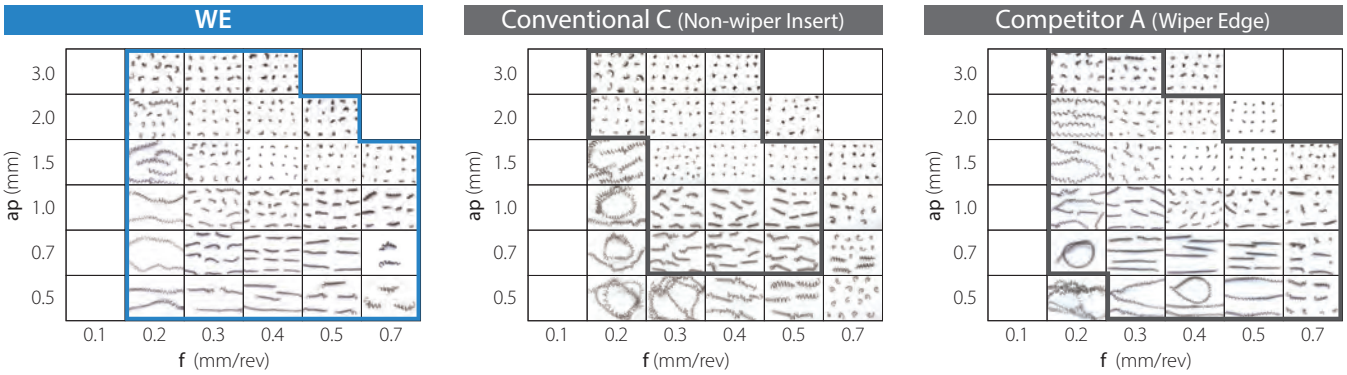
Fracture Resistance Comparison (In-house Evaluation)



Cutting Conditions: Vc = 150 m/min, ap = 1.0 mm, f = 0.7 mm/rev, Wet
CNMG120408 Type (Insert Grade: P25 Grade), Fracture Resistance Comparison (3 Tests)
Workpiece: SCM440(4 Grooves in Workpiece)

4 Stable Chip Control in a Wide Range of Applications

Chip Control Comparison (In-house Evaluation)

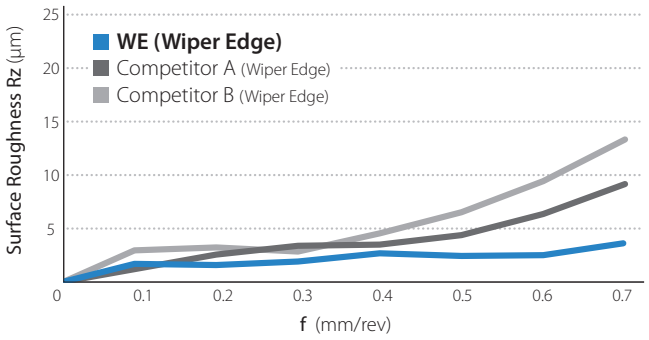


Cutting Conditions: Vc= 200 m/min, ap = 0.5 - 3.0 mm, f = 0.1 - 0.7 mm/rev, Wet, CNMG120408 Type
Workpiece: SCM415

5 Excellent Surface Roughness

Excellent Surface Roughness During High Feed Machining

Surface Finish Comparison (In-house Evaluation)

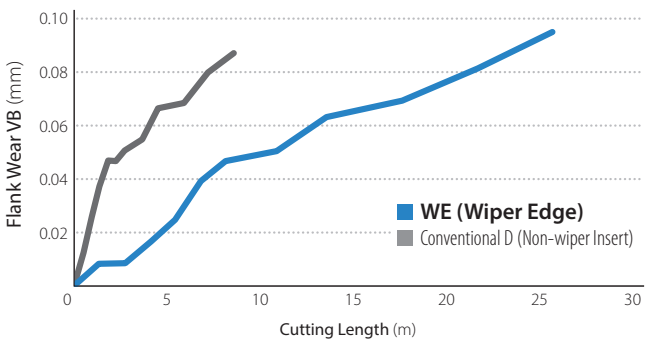


Cutting Conditions: Vc = 250 m/min, ap = 0.3 mm, f = 0.1 - 0.7 mm/rev, Wet
CNMG120408 Type
Workpiece: SCM435

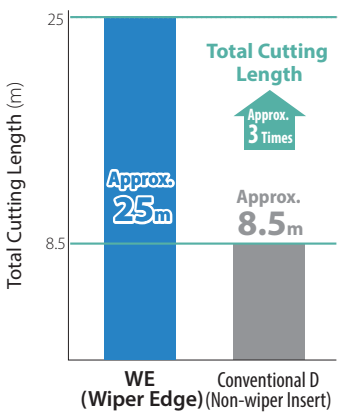
6 Long Tool Life

WE chipbreaker reduces cutting time by increasing feed rate and extending tool life by 3 times

Wear Resistance Comparison (In-house Evaluation)



Total Cutting Length Comparision (In-house Evaluation)



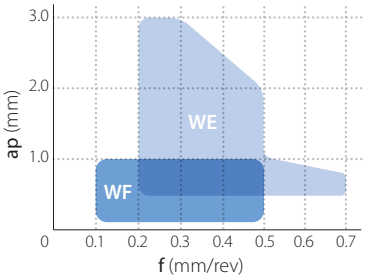
Cutting Conditions:
Vc = 250 m/min
ap = 0.5 mm
f = 0.1 mm/rev (No Wiper)
f = 0.3 mm/rev(Wiper Edge)
Wet, CNMG120408 Type
(Insert Grade: P25 Grade)
Workpiece: SCM435

Wiper Insert (Finishing)

WF Chipbreaker

Smooth chip control improves cutting performance during finishing operations

Excellent surface roughness by controlling adhesion



1 Excellent Chip Control

WF chipbreaker provides excellent chip control during high feed machining

Chip Control Comparison (In-house Evaluation)

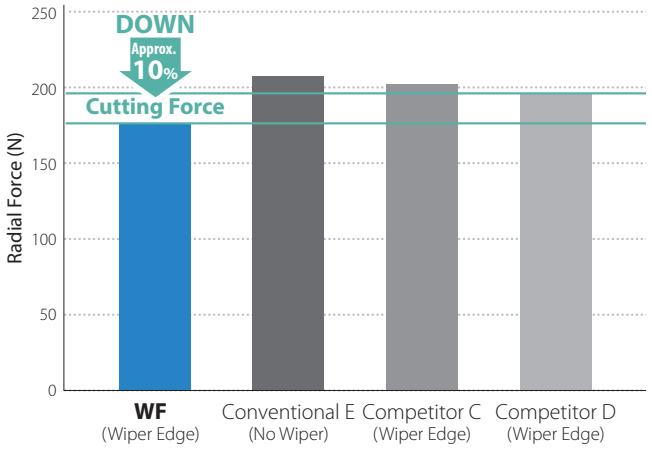
f (mm/rev)	0.1	0.2	0.3	0.4	0.5
WF Chipbreaker (Wiper Edge)					
Conventional E (No Wiper)					
Competitor C (Wiper Edge)					
Competitor D (Wiper Edge)					

Cutting Conditions:Vc = 200 m/min, ap = 0.5 mm, f = 0.1 - 0.5 mm/rev, Wet
CNMG120408 Type
Workpiece: SCM415

2 Excellent Surface Roughness

Prevents tool Deflection by Reducing Radial Forces

Cutting Force Comparison (In-house Evaluation)



Cutting Conditions: Vc = 200 m/min, ap = 0.5 mm, f = 0.3 mm/rev, Wet
CNMG120408 Type
Workpiece: SCM415

WF chipbreaker reduces tearing of the finished surface by controlling adhesion with the newly designed wiper edge

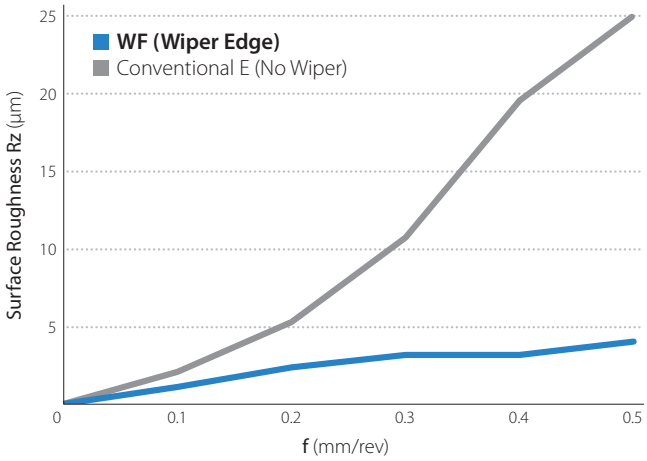
Surface Finish Comparison (In-house Evaluation)

f (mm/rev)	0.1	0.2
WF (Wiper Edge)		
Competitor C (Wiper Edge)		
Competitor D (Wiper Edge)		

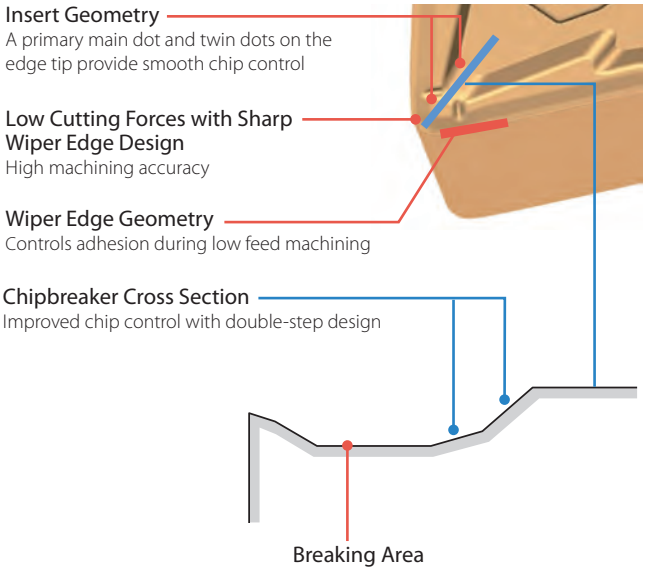
Cutting Conditions: Vc = 200 m/min, ap = 0.3 mm, f = 0.1 - 0.2 mm/rev, Wet
CNMG120408 Type
Workpiece: SCM415

3 Excellent Surface Roughness During 2 Times Higher Feed Rate Machining (Cutting Time 1/2)

Surface Finish Comparison (In-house Evaluation)



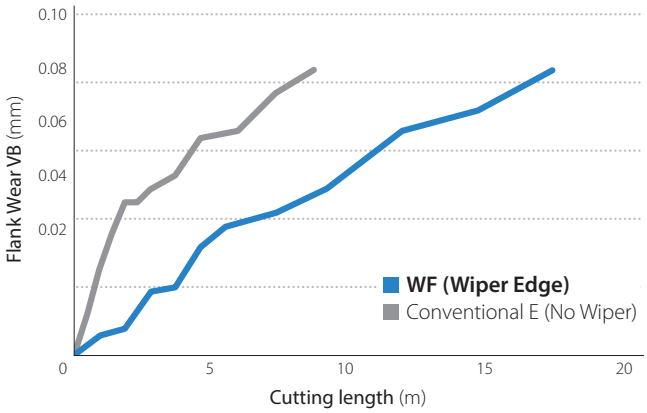
Cutting Conditions: Vc = 250 m/min, ap = 0.3 mm, f = 0.1 - 0.5 mm/rev, Wet
CNMG120408 Type
Workpiece: SCM435



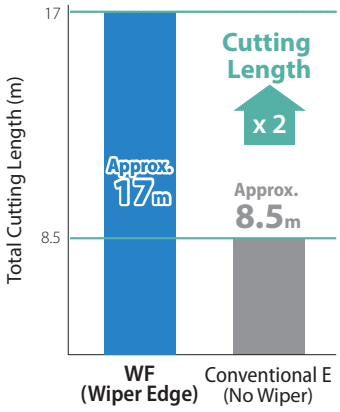
4 Long Tool Life

WF chipbreaker reduces cutting time by increasing feed fate and extends tool life by 2 times

Wear Resistance Comparison (In-house Evaluation)



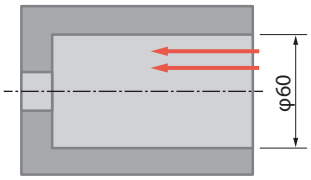
Total Cutting Length Comparision (In-house Evaluation)



Cutting Conditions:
Vc = 250 m/min
ap = 0.5 mm
f = 0.1 mm/rev (No Wiper)
f = 0.2 mm/rev (WF Chipbreaker)
Wet, CNMG120408 Type
Insert Grade: P25 Grade
Workpiece: SCM435

Case Studies

Housing S10C



Vc = 260 m/min, ap = 1.0 - 1.5 mm
f = 0.35 mm/rev, Wet (Water Soluble)
CNMG120408WE CA525

Chip Control

WE Chipbreaker (CA525) Competitor E

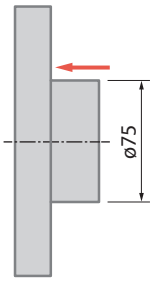
ap = 1.5mm

WE chipbreaker (CA525) improved chip control during high feed machining compared to Competitor E

(User evaluation)

Pulley Sintered Metal

Vc = 250 m/min
ap = 0.2 mm
f = 0.13 mm/rev
Wet (Water Soluble)
CNMG120408WE
PV720



Cutting Time

WEChipbreaker (PV720) **3.2 sec.**

Cutting Efficiency x 1.4

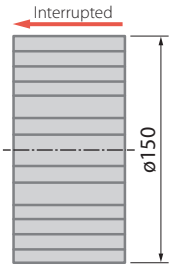
Competitor F **4.5 sec.**

WE chipbreaker (PV720) reduced cutting time by chaning cutting conditions with superior surface finish and excellent surface roughness compared to Competitor E

(User evaluation)

Drum Cold-rolled Steel Sheet

Vc = 135 m/min
ap = 0.25 mm
f = 0.6 mm/rev
Wet (Water Soluble)
CNMG120408WE
CA530



Surface Roughness

WE Chipbreaker (CA530) **9.5μmRz** (100pcs/corner)

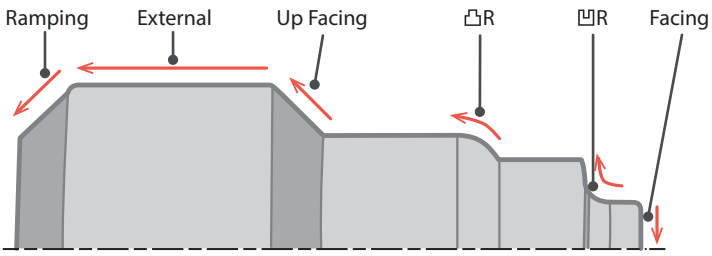
Less than 1/4 Surface Roughness

Competitor G **Rz 40~60μm (After Machining 100pcs)**

WE chipbreaker (CA530) improved surface roughness without any chip entanglement

(User evaluation)

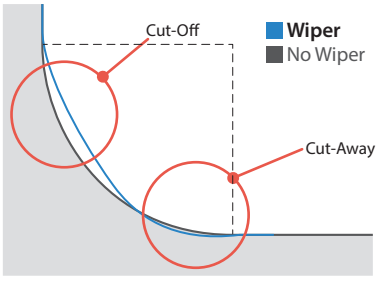
Caution (Finished Edge Line)



Application	Caution
External• Facing	For D type and T type inserts, expected performance may vary depending on toolholders Please check the applicable toolholder
Up Facing Ramping	For D type and T type inserts, Z-direction program corrections are required
凹R • 凸R	Do not use wiper insert if a precise R shape is needed

Radius Cutting (Differences from Non-wiper Insert)

Cut-off and cut-away will occur between radius machining and straight machining
There is a limit to the use of a wiper insert when there is an R parameter symbol
Please refer to the list on the right for finished dimensions



D Type Insert Unit: mm

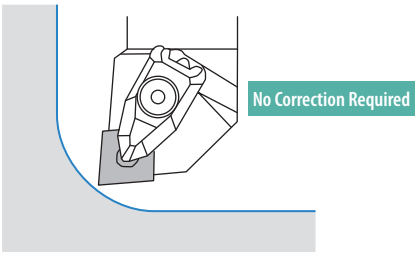
Nominal Corner R	Finished Dimension
0.4	R0.4 $^{+0.4}_{-0}$
0.8	R0.8 ±0.2
1.2	R1.2 $^{+0.3}_{-0.4}$

T Type Insert Unit: mm

Nominal Corner R	Finished Dimension
0.4	R0.4 $^{+0.4}_{-0}$
0.8	R0.8 ±0.2
1.2	R1.2 $^{+0}_{-0.4}$

There is no limit for using CNMG/WNMG type inserts

CNMG/WNMG type inserts meet ISO standard

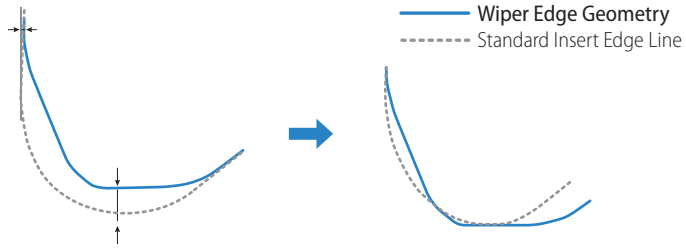


Cutting Edge Offsets of Negative Wiper Insert

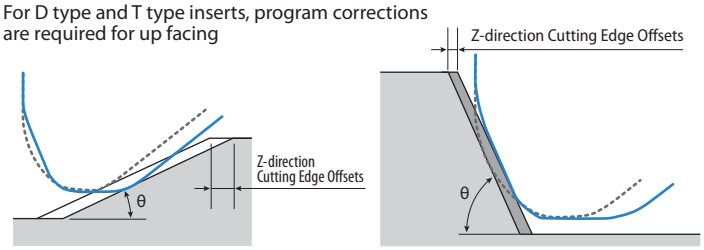
Cutting Edge Offsets (mm)					
DNMX150404WF DNMX150604WF		DNMX150408WF DNMX150608WF		DNMX150412WF DNMX150612WF	
X-direction	Z-direction	X-direction	Z-direction	X-direction	Z-direction
0.24	0.02	0.14	0.01	0.11	0.01

Cutting Edge Offsets (mm)					
TNMX160404WF		TNMX160408WF		TNMX160412WF	
X-direction	Z-direction	X-direction	Z-direction	X-direction	Z-direction
0.24	0.01	0.16	0.00	0.11	0.00

For D type and T type inserts, cutting edge offsets are required



For D type and T type inserts, program corrections are required for up facing



DNMX1504 Type
DNMX1506 Type

Z-direction Cutting Edge Offsets (mm)

Corner-R(rε) (mm)	Ramping Angle θ					
	0°	5°	10°	15°	20°	25°
0.4	0.00	– 0.34	– 0.35	– 0.36	– 0.36	– 0.36
0.8	0.00	– 0.26	– 0.26	– 0.25	– 0.24	– 0.22
1.2	0.00	– 0.15	– 0.17	– 0.16	– 0.15	– 0.15

Z-direction Cutting Edge Offsets (mm)

Corner-R(rε) (mm)	Up Facing Angle θ																		
	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
0.4	0.00	– 0.02	– 0.03	– 0.03	– 0.04	– 0.05	– 0.06	– 0.07	– 0.08	– 0.09	– 0.10	– 0.11	– 0.12	– 0.10	– 0.08	– 0.06	– 0.04	– 0.02	0.00
0.8	0.00	0.13	0.12	0.11	0.09	0.07	0.05	0.04	0.02	0.00	– 0.02	– 0.05	– 0.07	– 0.06	– 0.04	– 0.02	– 0.01	– 0.01	0.00
1.2	0.00	0.36	0.34	0.31	0.27	0.24	0.20	0.16	0.13	0.09	0.05	0.00	– 0.04	– 0.04	– 0.03	– 0.02	– 0.01	– 0.01	0.00

TNMX1604 Type

Z-direction Cutting Edge Offsets (mm)

Corner-R(rε) (mm)	Ramping Angle θ					
	0°	5°	10°	15°	20°	25°
0.4	0.00					
0.8	0.00					
1.2	0.00					

Do not use TNMX1604 type insert for ramping

Z-direction Cutting Edge Offsets (mm)

Corner-R(rε) (mm)	Up Facing Angle θ																		
	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
0.4	0.00	– 0.06	– 0.05	– 0.05	– 0.06	– 0.07	– 0.08	– 0.08	– 0.09	– 0.10	– 0.11	– 0.12	– 0.13	– 0.12	– 0.10	– 0.07	– 0.05	– 0.02	0.00
0.8	0.00	0.11	0.11	0.10	0.08	0.06	0.04	0.02	0.00	– 0.02	– 0.04	– 0.06	– 0.08	– 0.08	– 0.06	– 0.04	– 0.02	– 0.01	0.00
1.2	0.00	0.34	0.32	0.29	0.25	0.22	0.19	0.15	0.14	0.08	0.04	0.00	– 0.05	– 0.05	– 0.03	– 0.01	0.00	0.00	0.00

Applicable Toolholders for Negative Wiper Inserts

Insert Installation

Insert	Cutting Edge Angle
CNMG1204 Type	95°
WNMG0804 Type	95°
DNMX1504/1506 Type	93°
TNMX1604 Type	91°

List of Applicable Toolholders

Insert	Application	Description	Applicable
CNMG1204 Type	External Turning	PCLN	Yes
		DCLN	
	Boring	S–PCLN	
		A–DCLN	
		HA–PCLN12	
WNMG0804 Type	External Turning	PWLN	Yes
		DWLN	
		WWLN	
	Boring	S–PWLN	
		A–DWLN	
		S–WWLN08-E	

List of Applicable Toolholders

Insert	Application	Description	Applicable
DNMX1504/1506 Type	External Turning	PDJN	Yes
		DDJN	
		PDHN	No
		DDHN	
	Boring	S–PDUN15	Yes
		A–DDUN	
		HA–PDUN15	
		S–PDZN15	
		S–PDQN15	No
TNMX1604 Type	External Turning	PTGN	Yes
		DTGN	
		PTFN	
		WTJN–N	See Caution
		WTKN–N	No
		WTEN–N	
	Boring	A–DTFN	Yes
		S–PTUN	See Caution
		HA–PTFN16	

Wiper Effect is Limited

Stock Items (Negative)

WE Chipbreaker

Shape	Description	Dimensions (mm)	CERMET		MEGACOAT NANO CERMET		CVD Coated Carbide			
		Corner-R(rε)	TN610	TN620	PV710	PV720	CA510	CA515	CA525	CA530
	CNMG 120404WE	0.4	●	●	●	●	●	●	●	●
	CNMG 120408WE	0.8	●	●	●	●	●	●	●	●
	CNMG 120412WE	1.2	●	●	●	●	●	●	●	●
	WNMG 080404WE	0.4	●	●	●	●	●	●	●	●
	WNMG 080408WE	0.8	●	●	●	●	●	●	●	●
	WNMG 080412WE	1.2	●	●	●	●	●	●	●	●

●: Standard Stock

Dimensions

(mm)

Description	I.C.	Thickness	Hole
CNMG1204…	12.70	4.76	5.16
DNMX1504…	12.70	4.76	5.16
DNMX1506…		6.35	
TNMX1604…	9.525	4.76	3.81
WNMG0804…	12.70	4.76	5.16

WF Chipbreaker

Shape	Description	Dimensions (mm)	CERMET		MEGACOAT NANO CERMET		CVD Coated Carbide			
		Corner-R(rε)	TN610	TN620	PV710	PV720	CA510	CA515	CA525	CA530
	CNMG 120404WF	0.4	●	●	●	●	●	●	●	●
	CNMG 120408WF	0.8	●	●	●	●	●	●	●	●
	DNMX 150404WF	0.4	●	●	●	●	●	●	●	●
	DNMX 150408WF	0.8	●	●	●	●	●	●	●	●
	DNMX 150412WF	1.2	●	●	●	●	●	●	●	●
	DNMX 150604WF	0.4	●	●	●	●	●	●	●	●
	DNMX 150608WF	0.8	●	●	●	●	●	●	●	●
	DNMX 150612WF	1.2	●	●	●	●	●	●	●	●
	TNMX 160404WF	0.4	●	●	●	●	●	●	●	●
	TNMX 160408WF	0.8	●	●	●	●	●	●	●	●
	TNMX 160412WF	1.2	●	●	●	●	●	●	●	●
	WNMG 080404WF	0.4	●	●	●	●	●	●	●	●
	WNMG 080408WF	0.8	●	●	●	●	●	●	●	●

●: Standard Stock

Recommended Cutting Conditions

WE Chipbreaker

Workpiece	Insert Grade	Min. - Recommendation - Max.		
		Cutting Speed Vc (m/min)	ap (mm)	f (mm/rev)
Carbon Steel Alloy Steel	TN610	120 - **220** - 340	0.5 - **0.7** - 3.0	0.2 - **0.45** - 0.7
	TN620	100 - **200** - 300		
	PV710	130 - **280** - 360		
	PV720	130 - **250** - 340		
	CA510	190 - **280** - 360		
	CA515	160 - **260** - 340		
	CA525	150 - **240** - 320		
	CA530	130 - **200** - 270		

WF Chipbreaker

Workpiece	Insert Grade	Min. - Recommendation - Max.		
		Cutting Speed Vc (m/min)	ap (mm)	f (mm/rev)
Carbon Steel Alloy Steel	TN610	120 - **220** - 340	0.1 - **0.5** - 1.0	0.1 - **0.3** - 0.5
	TN620	100 - **200** - 300		
	PV710	130 - **280** - 360		
	PV720	130 - **250** - 340		
	CA510	190 - **280** - 360		
	CA515	160 - **260** - 340		
	CA525	150 - **240** - 320		
	CA530	130 - **200** - 270		

Positive Wiper Insert

WP Chipbreaker

Excellent surface roughness and smooth chip control during high feed machining
High quality surface finish with no galling
High machining accuracy with low cutting forces