



WE/WF Chipbreaker

Negative Wiper Inserts for Steel Turning



Increased Productivity with Newly Designed Wiper Edge Geometries

WE Chipbreaker for Finishing-Medium (for Improved Machining Efficiency)

Faster Feed Rates Yield Productivity Gains Through Reduced Cycle Times

Stable Chip Control in a Wide Range of Applications

WF Chipbreaker for Finishing (for Excellent Surface Roughness)

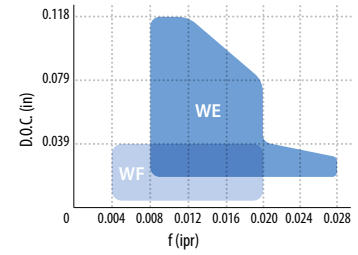
Smooth Chip Control in Finishing Operations

Excellent Surface Roughness by Reducing Edge Build-up



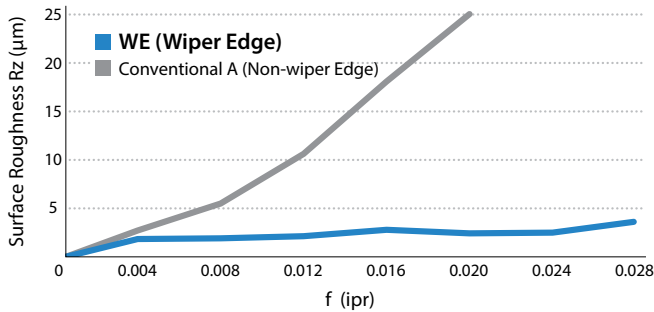
WE Chipbreaker (Finishing-Medium)

Faster Feed Rates Yield Productivity Gains Through Reduced Cycle Times
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 (Internal Evaluation)



Cutting Conditions: $V_c = 820$ sfm, D.O.C. = 0.012", $f = 0.004 - 0.028$ ipr, Wet
CNMG432 Insert Workpiece: 4137

Chipbreaker Design

Stable chip control in a wide range of applications

Tough Edge Design

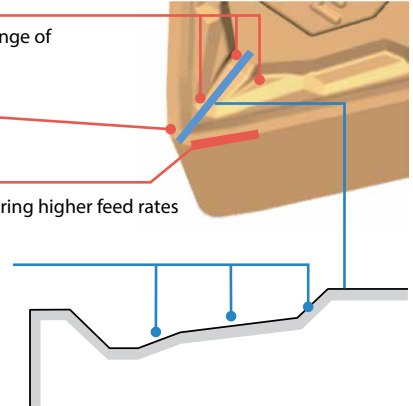
Prevents chip entanglement

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 Reduces the Number of Machining Passes from 2 to 1

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

Pass 1 : Conventional Tool (Non-wiper Insert)

$V_c = 660$ sfm, D.O.C. = 0.059", $f = 0.010$ ipr, Wet, CNMG432 Insert

Pass 2 : Conventional Tool (Wiper Insert)

$V_c = 660$ sfm, D.O.C. = 0.020", $f = 0.016$ ipr, Wet, CNMG432 Insert

Workpiece : Chromium Steel (Diameter of Material $\varnothing 1.575"$ x 5.906" L, Cutting Length 3.937")



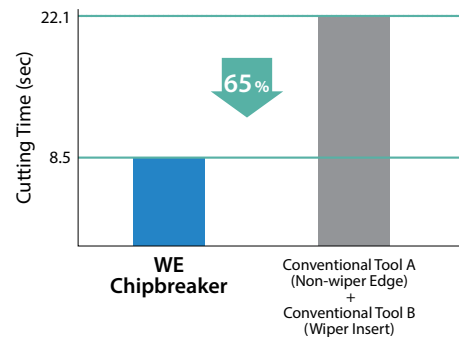
Recommended Machining Process Cutting Time (1 Pass) : 8.5 Sec

Pass 1 : WE Chipbreaker (Wiper Insert)

$V_c = 660$ sfm, D.O.C. = 0.079", $f = 0.016$ ipr, Wet, CNMG432 Insert

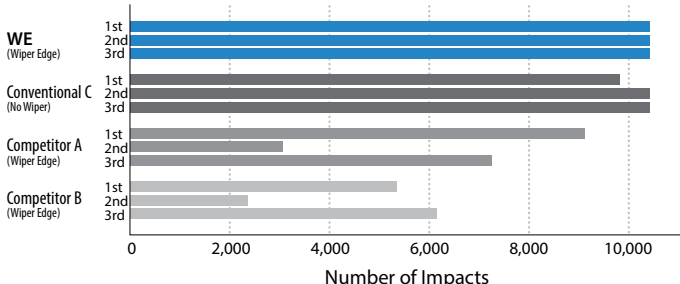
Workpiece : Chromium Steel (Diameter of Material $\varnothing 1.575"$ x 5.906" L, Cutting Length 3.937")

Cutting Time Comparison (Internal Evaluation)



3 Stable Cutting at 0.028 ipr Feed Rate

Fracture Resistance Comparison (Internal Evaluation)

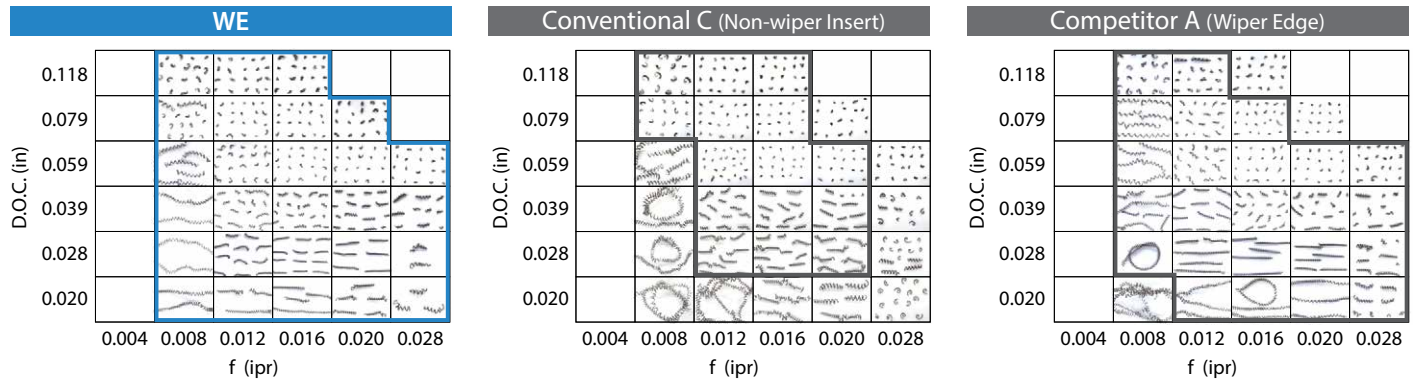


Cutting Conditions: $V_c = 490$ sfm, D.O.C. = 0.039", $f = 0.028$ ipr, Wet
CNMG432 Insert (Insert Grade: P25 Grade), Fracture Resistance Comparison (3 Tests)
Workpiece: 4140 (4 Grooves in Workpiece)

4

Stable Chip Control in a Wide Range of Applications

Chip Control Comparison (Internal Evaluation)



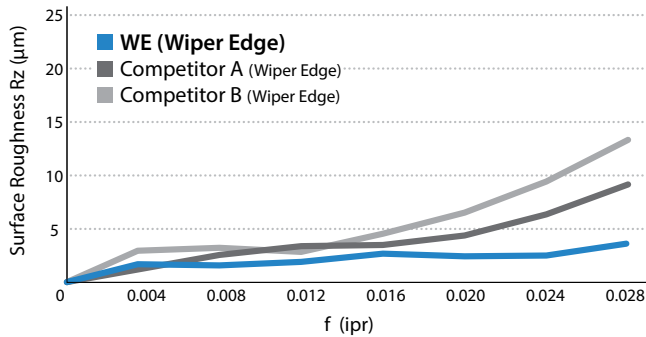
Cutting Conditions: $V_c = 660$ sfm, D.O.C. = 0.020" - 0.118", $f = 0.004 - 0.028$ ipr, Wet, CNMG432 Insert
Workpiece: Chromium Steel

5

Stable Chip Control in a Wide Range of Applications

Excellent Surface Roughness During High Feed Machining

Surface Finish Comparison (Internal Evaluation)



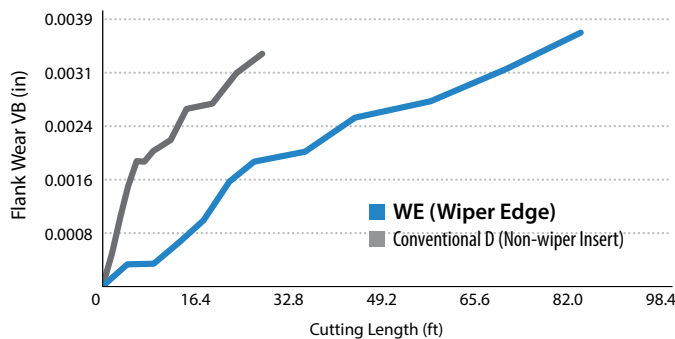
Cutting Conditions: $V_c = 820$ sfm, D.O.C. = 0.012", $f = 0.004 - 0.028$ ipr, Wet, CNMG432 Insert
Workpiece: 4137

6

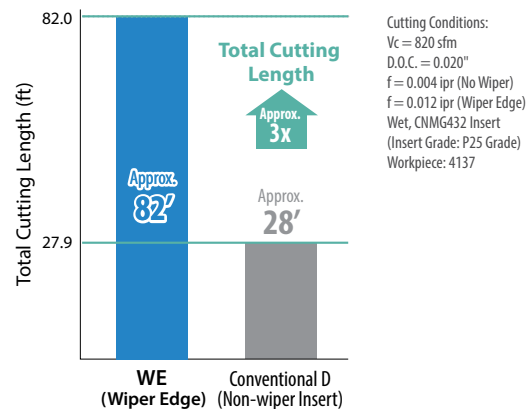
Long Tool Life

WE Chipbreaker Reduces Cutting Time with Increased Feed Rate and Extended Tool Life

Wear Resistance Comparison (Internal Evaluation)



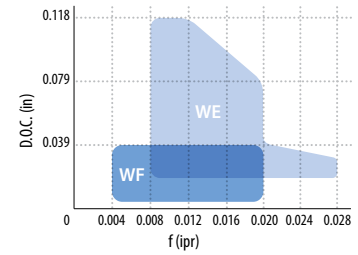
Total Cutting Length Comparison (Internal Evaluation)



Cutting Conditions:
 $V_c = 820$ sfm
D.O.C. = 0.020"
 $f = 0.004$ (No Wiper)
 $f = 0.012$ ipr (Wiper Edge)
Wet, CNMG432 Insert
(Insert Grade: P25 Grade)
Workpiece: 4137

WF Chipbreaker (Finishing)

Smooth Chip Control Improves Cutting Performance in Finishing Operations
Excellent Surface Roughness by Reducing Edge Build-up



1 Excellent Chip Control

WF Chipbreaker Provides Excellent Chip Control During High Feed Machining

Chip Control Comparison (Internal Evaluation)

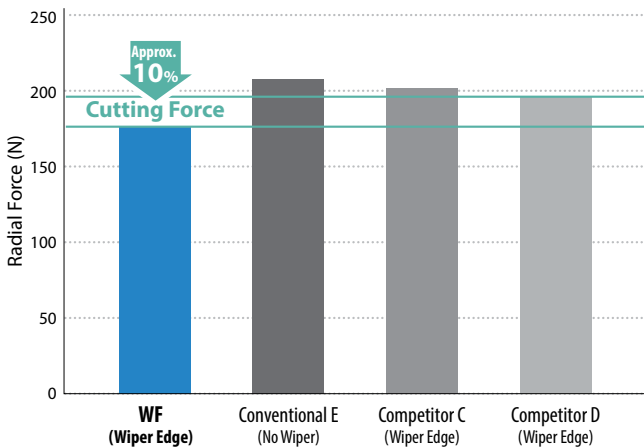
f (ipr)	0.004	0.008	0.012	0.016	0.020
WF Chipbreaker (Wiper Edge)					
Conventional E (No Wiper)					
Competitor C (Wiper Edge)					
Competitor D (Wiper Edge)					

Cutting Conditions: $V_c = 660$ sfm, $D.O.C. = 0.020"$, $f = 0.004 - 0.020$ ipr, Wet
CNMG432 Insert
Workpiece: Chromium Steel

2 Excellent Surface Roughness

Prevents Tool Deflection by Reducing Radial Forces

Cutting Force Comparison (Internal Evaluation)



Cutting Conditions: $V_c = 660$ sfm, $D.O.C. = 0.020"$, $f = 0.012$ ipr, Wet
CNMG432 Insert
Workpiece: Chromium Steel

WF Chipbreaker Reduces Tearing of the Finished Surface by Controlling Adhesion with the Newly Designed Wiper Edge

Surface Finish Comparison (Internal Evaluation)

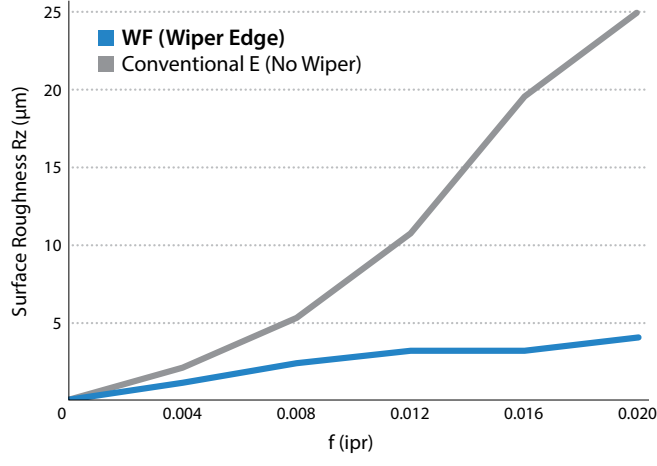
f (ipr)	0.004	0.008
WF (Wiper Edge)		
Competitor C (Wiper Edge)		
Competitor D (Wiper Edge)		

Cutting Conditions: $V_c = 660$ sfm, $D.O.C. = 0.012"$, $f = 0.004 - 0.008$ ipr, Wet
CNMG432 Insert
Workpiece: Chromium Steel

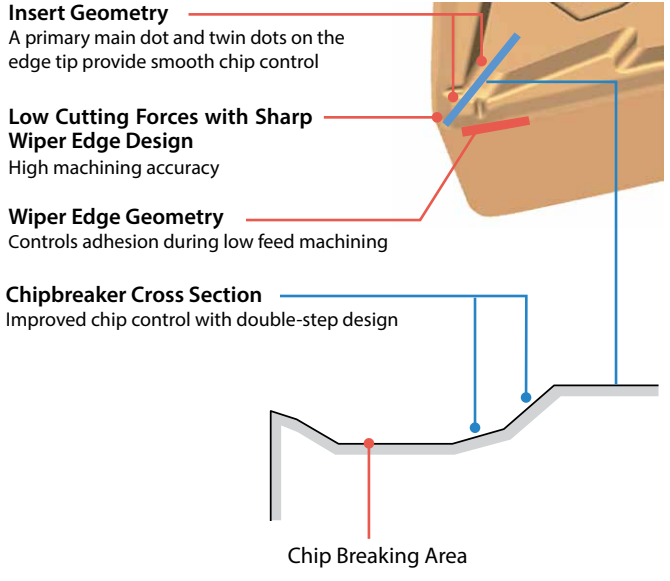
3

Excellent Surface Roughness with Twice the Feed Rate and Half the Cutting Time

Surface Finish Comparison (Internal Evaluation)



Cutting Conditions: Vc = 820 sfm, D.O.C. = 0.012", f = 0.004 - 0.020 ipr, Wet
 CNMG432 Insert
 Workpiece: 4137

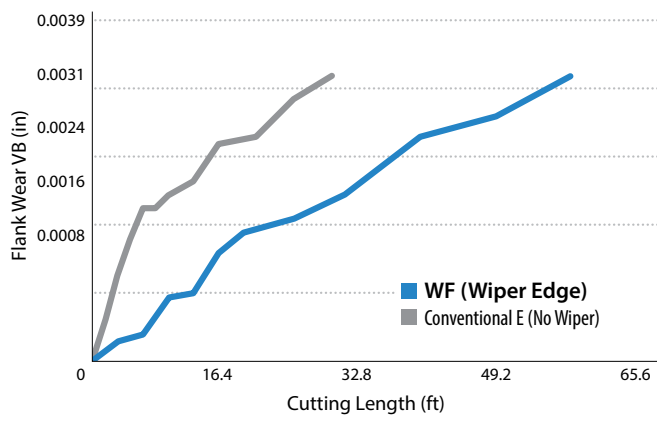


4

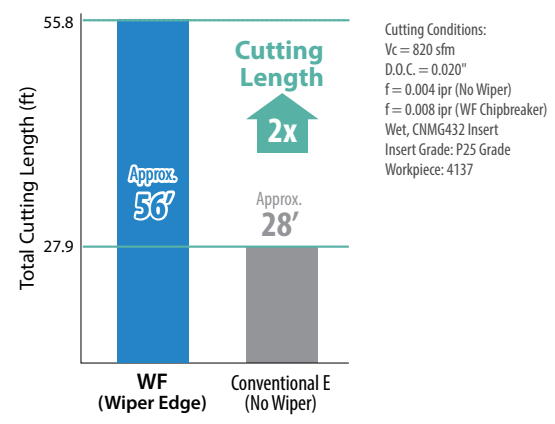
Long Tool Life

WF Chipbreaker Reduces Cutting Time with Increased Feed Rate and Extended Tool Life

Wear Resistance Comparison (Internal Evaluation)

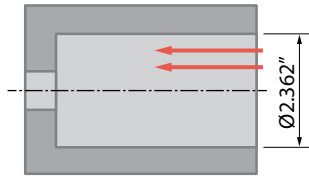


Total Cutting Length Comparison (Internal Evaluation)



Case Studies

Housing, 1010



Vc = 850 sfm, D.O.C. = 0.039" - 0.059"
f = 0.014" ipr, Wet (Water Soluble)
CNMG432WE CA525

Chip Control

WE Chipbreaker (CA525)



Competitor E



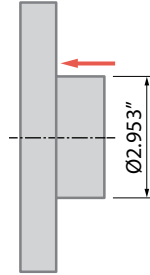
D.O.C. = 0.059"

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

(Customer Evaluation)

Pulley, Sintered Metal

Vc = 820 sfm
D.O.C. = 0.008"
f = 0.005 ipr
Wet (Water Soluble)
CNMG432WE
PV720



Cutting Time

WE Chipbreaker (PV720)

3.2 sec.

Competitor F

4.5 sec.

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

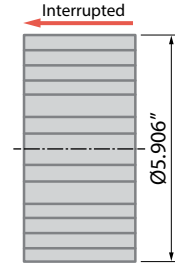
(Customer Evaluation)

Cutting Efficiency

1.4x

Drum, Cold-rolled Steel Sheet

Vc = 440 sfm
ap = 0.010"
f = 0.024 ipr
Wet (Water Soluble)
CNMG432WE
CA530



Surface Roughness

WE Chipbreaker (CA530)

9.5 μm Rz
(100pcs/corner)

Less than 1/4
Surface Roughness

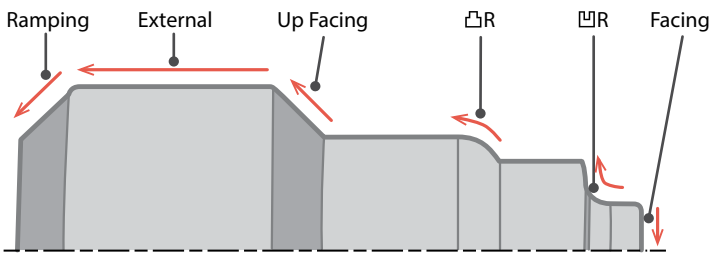
Competitor G

Rz 40~60 μm (After Machining 100pcs)

WE chipbreaker (CA530) improved surface roughness with no chip entanglement

(Customer Evaluation)

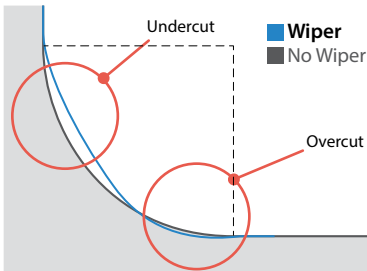
Caution (Finished Edge Line)



Application	Caution
External / Facing	Please check the applicable toolholder to confirm the lead angle matches the angle of the wiper.
Up Facing Ramping	For D type and T type inserts, Z-axis program corrections are required.
R (convex) • R (concave)	Do not use wiper inserts if a precise radial shape is needed.

Radius Cutting (Differences from Non-wiper Insert)

When machining a profile or radius on a workpiece, please note that DNMX and TNMX wiper inserts have some limitations. Please refer to the list on the right for finished dimensions.



DNMX Inserts

Unit: in

Nominal Corner R	Finished Dimension
0.016 (1/64)	R0.016 $^{+0.016}_{-0}$
0.032 (1/32)	R0.032 ± 0.008
0.047 (3/64)	R0.047 $^{+0.012}_{-0.016}$

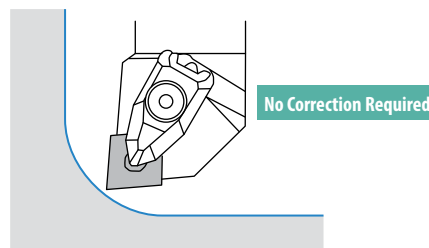
TNMX Inserts

Unit: in

Nominal Corner R	Finished Dimension
0.016 (1/64)	R0.016 $^{+0.016}_{-0}$
0.032 (1/32)	R0.032 ± 0.008
0.047 (3/64)	R0.047 $^{+0}_{-0.016}$

There is No Limit When Using CNMG/WNMG inserts

CNMG/WNMG inserts meet ISO standard

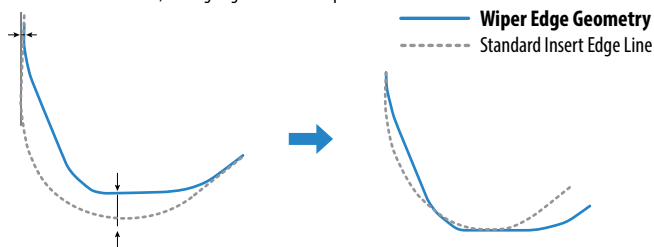


Cutting Edge Offsets of Negative Wiper Inserts

Cutting Edge Offsets (in)					
DNMX431WF DNMX441WF		DNMX432WF DNMX442WF		DNMX433WF DNMX443WF	
X-axis	Z-axis	X-axis	Z-axis	X-axis	Z-axis
0.0094	0.0008	0.0055	0.0004	0.0043	0.0004

Cutting Edge Offsets (in)					
TNMX331WF		TNMX332WF		TNMX333WF	
X-axis	Z-axis	X-axis	Z-axis	X-axis	Z-axis
0.0094	0.0004	0.0063	0.0000	0.0043	0.0000

For DNMX and TNMX inserts, cutting edge offsets are required



For DNMX and TNMX inserts, program corrections are required for up facing



DNMX43 Insert DNMX44 Insert

Z-axis Cutting Edge Offsets (in)

Corner-R (re) (in)	Ramping Angle θ					
	0°	5°	10°	15°	20°	25°
1/64	0.0000	-0.0134	-0.0138	-0.0142	-0.0142	-0.0142
1/32	0.0000	-0.0102	-0.0102	-0.0098	-0.0094	-0.0087
3/64	0.0000	-0.0059	-0.0067	-0.0063	-0.0059	-0.0059

Z-axis Cutting Edge Offsets (in)

Corner-R (re) (in)	Up Facing Angle θ																		
	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
1/64	0.0000	-0.0008	-0.0012	-0.0012	-0.0016	-0.0020	-0.0024	-0.0028	-0.0031	-0.0035	-0.0039	-0.0043	-0.0047	-0.0039	-0.0031	-0.0024	-0.0016	-0.0008	0.0000
1/32	0.0000	0.0051	0.0047	0.0043	0.0035	0.0028	0.0020	0.0016	0.0008	0.0000	-0.0008	-0.0020	-0.0028	-0.0016	-0.0008	-0.0004	-0.0004	0.0000	0.0000
3/64	0.0000	0.0142	0.0134	0.0122	0.0106	0.0094	0.0079	0.0063	0.0051	0.0035	0.0020	0.0000	-0.0016	-0.0016	-0.0012	-0.0008	-0.0004	-0.0004	0.0000

TNMX33 Insert

Z-axis Cutting Edge Offsets (in)

Corner-R (re) (in)	Ramping Angle θ					
	0°	5°	10°	15°	20°	25°
1/64	0.0000					
1/32	0.0000					
3/64	0.0000					

Do not use TNMX33 insert for ramping

Z-axis Cutting Edge Offsets (in)

Corner-R (re) (in)	Up Facing Angle θ																		
	0°	5°	10°	15°	20°	25°	30°	35°	40°	45°	50°	55°	60°	65°	70°	75°	80°	85°	90°
1/64	0.0000	-0.0024	-0.0020	-0.0020	-0.0024	-0.0028	-0.0031	-0.0031	-0.0035	-0.0039	-0.0043	-0.0047	-0.0051	-0.0047	-0.0039	-0.0028	-0.0020	-0.0008	0.0000
1/32	0.0000	0.0043	0.0043	0.0039	0.0031	0.0024	0.0016	0.0008	0.0000	-0.0008	-0.0016	-0.0024	-0.0031	-0.0031	-0.0024	-0.0016	-0.0008	-0.0004	0.0000
3/64	0.0000	0.0134	0.0126	0.0114	0.0098	0.0087	0.0075	0.0059	0.0055	0.0031	0.0016	0.0000	-0.0020	-0.0020	-0.0012	-0.0004	0.0000	0.0000	0.0000

Applicable Toolholders for Negative Wiper Inserts

Insert Installation

Insert	Cutting Edge Angle
CNMG43 Type	95°
WNMG43 Type	95°
DNMX43/44 Type	93°
TNMX33 Type	91°

List of Applicable Toolholders



Insert	Application	Part Number	Applicable
CNMG43 Type	External Turning	PCLN	Yes
		DCLN	
	Boring	S-PCLN	
		HA-PCLN12	
WNMG43 Type	External Turning	PWLN	Yes
		DWLN	
		WWLN	
	Boring	S-PWLN	
		S-WWLN08-E	

List of Applicable Toolholders

Insert	Application	Part Number	Applicable
DNMX43/44 Type	External Turning	PDJN	Yes
		DDJN	
		PDHN	
		DDHN	
	Boring	S-PDUN15	Yes
A-DDUN			
HA-PDUN15			
S-PDZN15			
		S-PDQN15	No
TNMX33 Type	External Turning	PTGN	Yes
		DTGN	
		PTFN	
	Boring	WTJN-N	Limited Wiper Effect
		WTKN-N	No
		WTEN-N	No
		A-DTFN	Yes
		S-PTUN	Limited Wiper Effect
		HA-PTFN16	Limited Wiper Effect

Negative Inserts





WE Chipbreaker

Shape	Part Number	Corner-R (re)	Material								
			Cermet		MEGACOAT NANO Cermet		CVD Coated Carbide				
			TN610	TN620	PV710	PV720	CA510	CA515	CA525	CA530	
✱ Interruption / 1st Choice ● Light Interruption / 1st Choice ● Continuous / 1st Choice ○ Continuous / 2nd Choice			P	●	●	●	●	○	●	●	✱
	CNMG 431WE	1/64	○	○	●	●	○	●	●	○	
	432WE	1/32	○	○	●	●	○	●	●	○	
	433WE	3/64	○	○	●	●	○	●	●	○	
	WNMG 431WE	1/64	○	○	●	●	○	●	●	○	
	432WE	1/32	○	○	●	●	○	●	●	○	
	433WE	3/64	○	○	●	●	○	●	●	○	

Dimensions

Part Number	I.C.	Thickness	Hole
CNMG43...	1/2	3/16	0.203
DNMX43...	1/2	3/16	0.203
DNMX44...		1/4	
TNMX33...	3/8	3/16	0.150
WNMG43...	1/2	3/16	0.203

WF Chipbreaker

Shape	Part Number	Corner-R (re)	Material								
			Cermet		MEGACOAT NANO Cermet		CVD Coated Carbide				
			TN610	TN620	PV710	PV720	CA510	CA515	CA525	CA530	
✱ Interruption / 1st Choice ● Light Interruption / 1st Choice ● Continuous / 1st Choice ○ Continuous / 2nd Choice			P	●	●	●	●	○	●	●	✱
	CNMG 431WF	1/64	○	○	●	●	●	●	●	○	
	432WF	1/32	○	○	●	●	●	●	●	○	
	DNMX 431WF	1/64	○	○	●	●	●	●	●	○	
	432WF	1/32	○	○	●	●	●	●	●	○	
	433WF	3/64	○	○	●	●	●	●	●	○	
	DNMX 441WF	1/64	○	○	●	●	●	●	●	○	
	442WF	1/32	○	○	●	●	●	●	●	○	
	TNMX 331WF	1/64	○	○	●	●	●	●	●	○	
	332WF	1/32	○	○	●	●	●	●	●	○	
	333WF	3/64	○	○	●	●	●	●	●	○	
	WNMG 431WF	1/64	○	○	●	●	●	●	●	○	
	432WF	1/32	○	○	●	●	●	●	●	○	

● : U.S. Stock ○ : World Express (Shipping: 7-10 Business Days)

Inserts sold in 10 piece boxes

Recommended Cutting Conditions

WE Chipbreaker

Workpiece	Insert Grade	Min. - Recommendation - Max.		
		Cutting Speed Vc (sfm)	D.O.C. (in)	f (ipr)
Carbon Steel Alloy Steel	TN610	390 - 720 - 1120	0.020 - 0.028 - 0.118	0.008 - 0.018 - 0.028
	TN620	330 - 660 - 980		
	PV710	430 - 920 - 1180		
	PV720	430 - 820 - 1120		
	CA510	620 - 920 - 1180		
	CA515	520 - 850 - 1120		
	CA525	490 - 790 - 1050		
	CA530	430 - 660 - 890		

WF Chipbreaker

Workpiece	Insert Grade	Min. - Recommendation - Max.		
		Cutting Speed Vc (sfm)	D.O.C. (in)	f (ipr)
Carbon Steel Alloy Steel	TN610	390 - 720 - 1120	0.004 - 0.020 - 0.039	0.004 - 0.012 - 0.020
	TN620	330 - 660 - 980		
	PV710	430 - 920 - 1180		
	PV720	430 - 820 - 1120		
	CA510	620 - 920 - 1180		
	CA515	520 - 850 - 1120		
	CA525	490 - 790 - 1050		
	CA530	430 - 660 - 890		

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



See our WP Positive Wiper Insert brochure at www.kyoceraprecisiontools.com/indexable/brochures/turning



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 Hendersonville, NC 28792
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 Technical Support | 800.823.7284 - Option 2



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