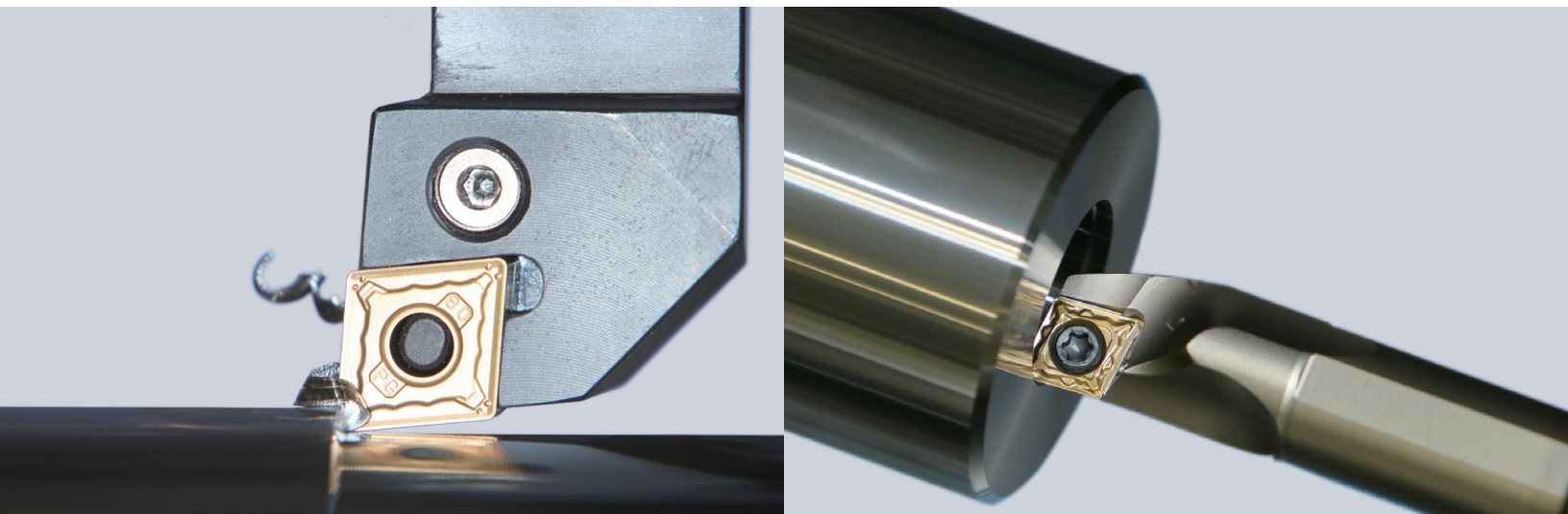




# CA5 Series

CVD Coated Carbide for Steel



Long Tool Life and Stable Machining of Steel

New Coated Carbide Grade for Longer Tool Life and Stable Machining

Various Chipbreakers Available for Steel Machining



(Image to scale)

**NEW** Large I.C. Roughing Inserts  
SNMG PH 1" I.C.



**NEW** WF Wiper Insert  
(Finishing)



**NEW** WE Wiper Insert  
(Finishing - Medium)

# CA5 Series

New Coated Carbide Grade CA5 Series for Longer Tool Life and Stable Machining  
Various Chipbreakers Available for Steel Machining Applications

## 1 New Coated Carbide Grade for Longer Tool Life and Stable Machining

### Longer tool life

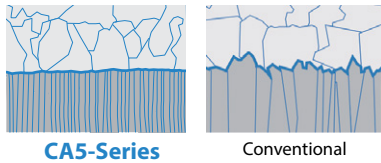
High-Performance  $\alpha$ -Al<sub>2</sub>O<sub>3</sub> Layer  
Excellent Wear and Fracture Resistance

### Prevents Layer Peeling

Strong Intra-coating Adhesion  
Higher Adhesion Between Each Layer with Improved Crystal Structure

### Control chipping

Micro TiCN Layer  
Higher Layer Strength and Fracture Resistance

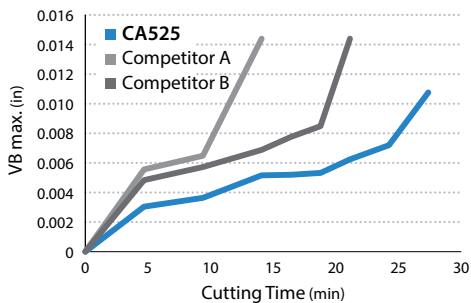


### 1st Recommendation

## CA525 General Use

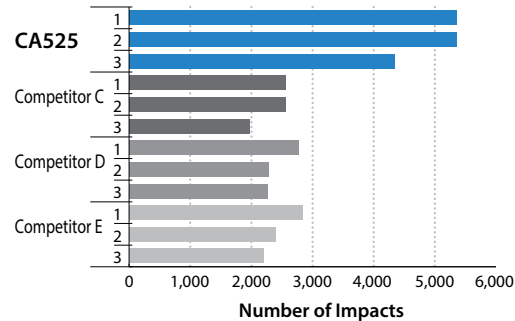
Special substrate and tough coating layer provides high wear and fracture resistance

Wear Resistance Comparison  
(In-house Evaluation)

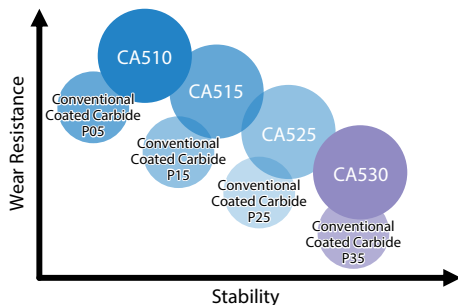


Cutting Conditions: Vc = 980 sfm, D.O.C. = 0.079", f = 0.012 ipr, Wet  
Workpiece: 4137

Fracture Resistance Comparison  
(In-house Evaluation)



Cutting Conditions: Vc = 980 sfm, D.O.C. = 0.059", f = 0.012 ipr, Wet  
Workpiece: 4140 (with 4 Slots)



**CA510** High Speed and High Efficiency Steel Machining  
Wear Resistance Oriented

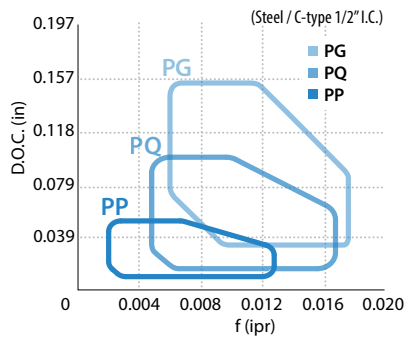
**CA515** Continuous to Light Interrupted Steel Machining

**CA530** General to Heavy Interrupted Machining  
Stability Oriented

## 2

# Various Chipbreakers Available for Steel Machining

### Negative



### PG Chipbreaker (Medium - Roughing)

Provides stable machining with wide chip control range

#### Step Wall

Prevents chip compacting at high feed rate

#### Hybrid Land

Good balance of sharpness and strength due to double structure of flat and positive land design

#### Twin Dots

Improve chip control at low feed rate  
Control crater wear

### PP Chipbreaker (Finishing)

For a wide range of feed rates in steel finishing

#### Smooth Taper Cutting Edge

Reduces the Cutting Force

#### 3-step Smart Dot Structure

The 3 different dots provide smooth chip evacuation in a wide range of feed rate

### PQ Chipbreaker (Finishing - Medium)

Stable chip control in a wide range of applications

#### 2-step Smart Wall (2-step Rising Smooth Surface)

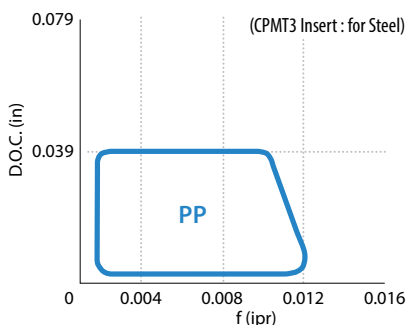
Excellent chip control in a wide range of applications, preventing the dots from being damaged during high feed machining

#### Flat Zone (Braking Area)

#### Continuously Variable Land

Specially designed positive land has well-balanced combination of sharpness and toughness

### Positive



### PP Chipbreaker (Finishing)

Stable chip control when finishing steel

#### High-Stability Cutting Edge Design

Shape designed to control the edge stress and heat generation

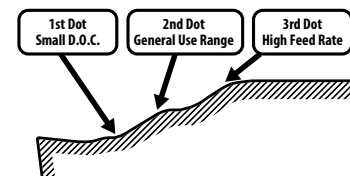
Stable Performance with Superior Edge Strength

### Composite-Dot Chipbreaker

Multi-dot design with different functions

Controls chip's curling condition and flow direction that varies depending on the cutting conditions and work materials

Stable Chip Control Regardless of Feed Rate and Work Materials



## 3

# New Wiper Inserts Added to the Lineup (Negative)

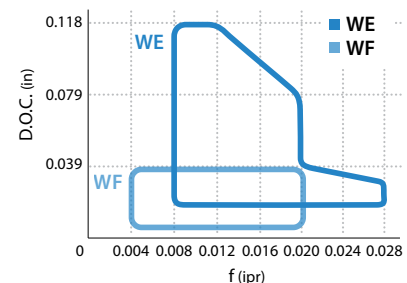
### High Productivity with Newly Designed Wiper Edge Geometry

#### WE Chipbreaker (Finishing - Medium)











Stable Chip Control in a Wide Range of Feed Rates










#### WF Chipbreaker (Finishing)

Good Surface Finish due to Stable Chip Control in Steel Finishing



# Negative Inserts


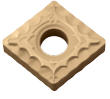






Shape Right-hand Shown	Part Number	Dimensions (in)							
		I.C.	Thickness	Hole	Corner-R (r <sub>e</sub> )	CA510	CA515	CA525	CA530
	CNMG 431WF	1/2	3/16	0.203	1/64	●	●	●	○
	432WF				1/32	●	●	●	○
	CNMG 431WP	1/2	3/16	0.203	1/64	●	○	○	○
	432WP				1/32	●	●	●	●
	CNMG 431WE	1/2	3/16	0.203	1/64	○	●	●	○
	432WE				1/32	○	●	●	○
	433WE				3/64	○	●	●	○
	CNMG 431WQ	1/2	3/16	0.203	1/64	○	●	○	○
	432WQ				1/32	●	●	●	○
	433WQ				3/64	○	●	●	○
	CNMG 4305PP	1/2	3/16	0.203	0.008	●	●	●	●
	431PP				1/64	●	●	●	○
	432PP				1/32	●	●	●	○
	433PP				3/64	●	●	○	○
	CNMG 4305GP	1/2	3/16	0.203	0.008	○	○	○	○
	431GP				1/64	○	○	○	○
	432GP				1/32	○	○	○	○
	CNMG 431PQ	1/2	3/16	0.203	1/64	●	●	●	○
	432PQ				1/32	●	●	●	●
	433PQ				3/64	●	●	●	●
	CNMG 331HQ	3/8	3/16	0.150	1/64	○	●	●	○
	332HQ				1/32	●	●	○	○
	CNMG 431HQ	1/2	3/16	0.203	1/64	○	●	●	○
	432HQ				1/32	●	●	●	●
433HQ	3/64	○	●	○	○				
	CNMG 431CQ	1/2	3/16	0.203	1/64	○	●	●	○
	432CQ				1/32	○	●	●	●
	433CQ				3/64	○	●	○	○
	CNMG 542CQ	5/8	1/4	1/4	1/32	●	●	●	○
543CQ	3/64				●	○	●	●	
	CNMG 432CJ	1/2	3/16	0.203	1/32	●	○	○	○
	433CJ				3/64	○	○	○	○
	CNMG 543CJ	5/8	1/4	1/4	3/64	○	○	○	○
544CJ	1/16				○	○	○	○	
	CNMG 331GS	3/8	3/16	0.150	1/64	○	○	○	○
	332GS				1/32	○	●	●	○
	CNMG 431GS	1/2	3/16	0.203	1/64	○	○	○	○
	432GS				1/32	○	○	●	○
433GS	3/64	○	○	●	○				

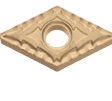








Shape Right-hand Shown	Part Number	Dimensions (in)							
		I.C.	Thickness	Hole	Corner-R (r <sub>e</sub> )	CA510	CA515	CA525	CA530
	CNMG 431PG	1/2	3/16	0.203	1/64	●	●	●	○
	432PG				1/32	●	●	●	●
	433PG				3/64	●	●	●	●
	434PG				1/16	○	○	●	●
	CNMG 431PS	1/2	3/16	0.203	1/64	○	●	●	○
	432PS				1/32	●	●	●	○
	433PS				3/64	○	●	●	●
	434PS				1/16	○	○	●	○
	CNMG 543PS	5/8	1/4	1/4	3/64	●	●	●	●
	544PS				1/16	○	○	●	○
	CNMG 432PT	1/2	3/16	0.203	1/32	●	●	●	●
	433PT				3/64	●	●	●	●
	CNMG 542PT				5/8	1/4	1/4	1/32	○
543PT	3/64	○	●	●				●	
544PT	1/16	●	○	●	○				
	CNMG 432GT	1/2	3/16	0.203	1/32	●	●	●	○
	433GT				3/64	○	○	○	○
	CNMG 431	1/2	3/16	0.203	1/64	○	○	●	●
	432				1/32	●	●	●	●
	433				3/64	●	●	●	●
	CNMG 542	5/8	1/4	1/4	1/32		○	○	
	543				3/64		●	○	
	CNMG 643				3/4	1/4	5/16	3/64	○
644	1/16	○	○	○				○	
	CNMG 432PH	1/2	3/16	0.203	1/32	●	●	●	●
	433PH				3/64	●	●	●	●
	434PH				1/16	●	●	○	●
	CNMG 542PH	5/8	1/4	1/4	1/32	●	●	●	○
	543PH				3/64	●	●	●	●
	544PH				1/16	●	●	●	●
	CNMG 642PH				3/4	1/4	5/16	1/32	●
643PH	3/64	●	●	●				●	
644PH	1/16	●	○	●				●	
646PH	3/32	●	●	●	●				
	CNMM 432PX	1/2	3/16	0.203	1/32	○	○	○	○
	433PX				3/64	○	○	○	○
	434PX				1/16		○	○	
	CNMM 542PX	5/8	1/4	1/4	1/32	○	○	○	○
	543PX				3/64	○	○	○	○
	544PX				1/16	○	○	○	○
CNMM 642PX	3/4	1/4	5/16	1/32			○	○	
643PX				3/64	○	○	○	○	
644PX				1/16	○	○	○	○	
646PX	3/32			○	○				

Inserts sold in 10 piece boxes

● : U.S. Stock ▲ : Call for Availability - 1-800-823-7284 ○ : World Express (Shipping: 7-10 Business Days)

# Negative Inserts











Shape Right-hand Shown	Part Number	Dimensions (in)				CA510	CA515	CA525	CA530	
		I.C.	Thickness	Hole	Corner-R (r <sub>e</sub> )					
 Finishing / Low Carbon Steel	CNMG 431XP	1/2	3/16	0.203	1/64	●	●	●	○	
	432XP				1/32	○	○	○	●	
 Medium / Low Carbon Steel	CNMG 431XQ	1/2	3/16	0.203	1/64	○	●	●	○	
	432XQ				1/32	●	○	●	○	
 Roughing / Low Carbon Steel	CNMG 432XS	1/2	3/16	0.203	1/32	●	●	●	●	
 Finishing with Wiper Edge	DNMX 431WF	1/2	3/16	0.203	1/64	●	●	●	○	
	432WF				1/32	●	●	●	○	
	433WF				3/64	●	●	●	○	
	DNMX 441WF	1/2	1/4	0.203	1/64	●	●	●	○	
	442WF				1/32	●	●	●	○	
	443WF				3/64	●	●	●	○	
 Finishing	DNMG 4305PP	1/2	3/16	0.203	0.008	○	●	●	●	
	431PP				1/64	●	●	●	●	
	432PP				1/32	●	●	●	●	
	433PP				3/64	●	○	○	○	
	DNMG 4405PP	1/2	1/4	0.203	0.008	○	○	○	○	
	441PP				1/64	○	●	○	○	
	442PP				1/32	○	○	○	○	
	443PP				3/64	○	○	○	○	
	 Finishing	DNMG 331GP	3/8	3/16	0.150	1/64	○	○	●	○
		332GP				1/32	○	○	○	○
DNMG 4305GP		1/2	3/16	0.203	0.008	○	○	○	○	
431GP					1/64	○	○	○	○	
 Finishing-Medium	432GP	1/2	3/16	0.203	1/32	○	○	○	○	
	433GP				3/64	○	○	○	○	
	DNMG 431PQ	1/2	3/16	0.203	1/64	●	●	●	●	
	432PQ				1/32	●	●	●	●	
	433PQ				3/64	●	●	●	●	
	DNMG 441PQ	1/2	1/4	0.203	1/64	●	○	○	○	
442PQ	1/32				●	○	○	○		
443PQ	3/64				○	○	○	○		
 Finishing-Medium	DNMG 3305HQ	3/8	3/16	0.150	0.008	○	○	○	○	
	331HQ				1/64	○	●	●	○	
	DNMG 431HQ	1/2	3/16	0.203	1/64	●	●	●	●	
	432HQ				1/32	●	●	●	●	
	433HQ				3/64	●	●	○	○	
	DNMG 441HQ	1/2	1/4	0.203	1/64	○	○	○	○	
	442HQ				1/32	○	○	○	○	
	443HQ				3/64	○	○	○	○	












Shape Right-hand Shown	Part Number	Dimensions (in)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (r <sub>e</sub> )				
 Finishing-Medium / Up Facing	DNMG 431CQ	1/2	3/16	0.203	1/64	●	●	●	○
	432CQ				1/32	●	●	●	●
	433CQ				3/64	●	●	●	○
 Finishing-Medium / Up Facing	DNMG 441CQ	1/2	1/4	0.203	1/64	○	○	○	○
	442CQ				1/32	○	○	○	○
	443CQ				3/64	○	○	○	○
 Finishing-Medium / Up Facing	DNMG 432CJ	1/2	3/16	0.203	1/32	●	●	●	●
	433CJ				3/64	●	○	●	○
	443CJ	1/2	1/4	0.203	1/32	○	○	○	○
 Medium-Roughing	DNMG 331GS	3/8	3/16	0.150	1/64	○	○	●	○
	332GS				1/32	○	●	●	○
	DNMG 431GS	1/2	3/16	0.203	1/64	○	○	●	○
	432GS				1/32	○	●	○	○
	433GS				3/64	○	○	○	○
	DNMG 441GS	1/2	1/4	0.203	1/64	○	○	○	○
442GS	1/32				○	○	○	○	
 Medium-Roughing	DNMG 431PG	1/2	3/16	0.203	1/64	●	●	●	●
	432PG				1/32	●	●	●	●
	433PG				3/64	●	●	●	●
	434PG	1/16	●	○	●	●			
DNMG 441PG	1/2	1/4	0.203	1/64	○	○	○	○	
442PG				1/32	○	○	●	○	
443PG				3/64	○	○	○	○	
444PG				1/16	○	○	○	○	
 Medium-Roughing	DNMG 431PS	1/2	3/16	0.203	1/64	●	●	●	○
	432PS				1/32	●	●	●	●
	433PS				3/64	○	●	●	○
 Medium-Roughing / High Feed	DNMG 441PS	1/2	1/4	0.203	1/64	○	○	○	○
	442PS				1/32	○	○	○	○
	443PS				3/64	○	○	○	○
	444PS				1/16	○	○	○	○
 Medium-Roughing / High Feed	DNMG 432PT	1/2	3/16	0.203	1/32	●	●	●	●
	433PT				3/64	○	○	○	●
	DNMG 442PT	1/2	1/4	0.203	1/32	●	○	○	○
443PT	3/64				○	○	○	○	
 Medium-Roughing / High Feed	DNMG 432GT	1/2	3/16	0.203	1/32	○	●	●	○
	433GT				3/64	○	○	○	○
	DNMG 442GT	1/2	1/4	0.203	1/32	○	○	○	○
443GT	3/64				○	○	○	○	

Inserts sold in 10 piece boxes

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

# Negative Inserts

Shape Right-hand Shown	Part Number	Dimensions (in)							
		I.C.	Thickness	Hole	Corner-R (r <sub>z</sub> )	CA510	CA515	CA525	CA530
 Roughing	DNMG 431	1/2	3/16	0.203	1/64	●	●	●	●
	432				1/32	●	●	●	●
	DNMG 442	1/2	1/4	0.203	1/32	○	○	○	○
	443				3/64	○	○	○	○
 Roughing	DNMG 432PH	1/2	3/16	0.203	1/32	●	●	●	●
	433PH				3/64	○	●	●	●
	434PH				1/16		●	●	
	DNMG 442PH	1/2	1/4	0.203	1/32	○	○	○	○
	443PH				3/64	○	○	○	○
	444PH				1/16	○	○	○	○
 Single Sided Roughing / High Feed	DNMM 432PX	1/2	3/16	0.203	1/32			○	○
	433PX				3/64			○	○
	434PX				1/16			○	○
	DNMM 442PX	1/2	1/4	0.203	1/32	○	○	○	○
	443PX				3/64	○	○	○	○
	444PX				1/16			○	○
 Finishing / Low Carbon Steel	DNMG 431XP	1/2	3/16	0.203	1/64	●	●	●	●
	432XP				1/32	●	●	●	●
 Medium / Low Carbon Steel	DNMG 431XQ	1/2	3/16	0.203	1/64	●	●	●	●
	432XQ				1/32	●	●	●	●
 Roughing / Low Carbon Steel	DNMG 432XS	1/2	3/16	0.203	1/32	●	●	●	●
 Medium-Roughing	RNMG 32	3/8	1/8	0.150	-	●	●	●	○
	RNMG 43	1/2	3/16	0.203	-	●	●	○	○
	RNMG 54	5/8	1/4	1/4	-			●	○
 Finishing-Medium	SNMG 431PQ	1/2	3/16	0.203	1/64	●	●	●	●
	432PQ				1/32	●	●	○	●
	433PQ				3/64	●	○	○	●
 Finishing-Medium	SNMG 431HQ	1/2	3/16	0.203	1/64	●	●	●	●
	432HQ				1/32	●	●	●	●
	433HQ				3/64	●	○	○	●
 Medium-Roughing	SNMG 432PG	1/2	3/16	0.203	1/32	●	○	●	●
	433PG				3/64	●	●	●	●
	434PG				1/16	●	●	●	●












Shape Right-hand Shown	Part Number	Dimensions (in)							
		I.C.	Thickness	Hole	Corner-R (r <sub>z</sub> )	CA510	CA515	CA525	CA530
 Medium-Roughing	SNMG 432PS	1/2	3/16	0.203	1/32	○	●	●	○
	433PS				3/64	○	●	○	○
	434PS				1/16	○	○	○	○
 Medium-Roughing / High Feed	SNMG 432PT	1/2	3/16	0.203	1/32	○	●	●	●
	433PT				3/64	○	●	●	●
 Roughing	SNMG 321	3/8	1/8	0.150	1/64			●	○
	322				1/32			●	○
	SNMG 432	1/2	3/16	0.203	1/32	●	●	●	●
	433				3/64	●	●	●	●
	434				1/16			●	●
 Roughing	SNMG 432PH	1/2	3/16	0.203	1/32	●	○	●	●
	433PH				3/64	●	●	●	●
	434PH				1/16	●	●	●	●
	SNMG 543PH	5/8	1/4	1/4	3/64	●	●	●	●
	544PH				1/16	●	●	●	●
	SNMG 643PH	3/4	1/4	5/16	3/64			●	●
644PH	1/16						●	●	
 Roughing <b>NEW</b>	SNMG 866PH	1	3/8	0.359	3/32			●	●
 Single Sided Roughing / High Feed	SNMM 432PX	1/2	3/16	0.203	1/32	○	○	○	●
	433PX				3/64	○	○	○	○
	434PX				1/16			○	○
	SNMM 543PX	5/8	1/4	1/4	3/64			○	○
	544PX				1/16			○	○
	SNMM 643PX	3/4	1/4	5/16	3/64	○	○	○	○
644PX	1/16				○	○	○	○	
646PX	3/32			○	○				
 Finishing / Low Carbon Steel	SNMG 432XP	1/2	3/16	0.203	1/32	●	●	○	●
 Medium / Low Carbon Steel	SNMG 432XQ	1/2	3/16	0.203	1/32	●	○	○	●
 Roughing / Low Carbon Steel	SNMG 432XS	1/2	3/16	0.203	1/32	●	●	●	●
 Finishing with Wiper Edge	TNMX 331WF	3/8	3/16	0.150	1/64	●	●	●	○
332WF	1/32				●	●	●	○	
333WF	3/64				●	●	●	○	
 Finishing <b>NEW</b>	TNMG 3305PP	3/8	3/16	0.150	0.008	●	●	●	●
	331PP				1/64	●	●	○	●
	332PP				1/32	●	●	●	○
	333PP				3/64	●	●	○	●












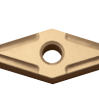

Inserts sold in 10 piece boxes

SNMG866PH inserts solid in 5 piece boxes

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

# Negative Inserts





















Shape Right-hand Shown	Part Number	Dimensions (in)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (r <sub>e</sub> )				
 Finishing	TNMG 3305GP	3/8	3/16	0.150	0.008	○	●	○	○
	331GP				1/64	○	○	○	○
	332GP				1/32	○	○	●	○
 Finishing-Medium	TNMG 331PQ	3/8	3/16	0.150	1/64	●	●	●	●
	332PQ				1/32	●	●	●	●
	333PQ				3/64	●	○	○	●
 Finishing-Medium	TNMG 231HQ	1/4	3/16	0.089	1/64	○	○	●	○
	232HQ				1/32	○	○	○	○
	TNMG 331HQ	3/8	3/16	0.150	1/64	○	●	●	●
	332HQ				1/32	○	●	●	○
	333HQ				3/64	○	○	○	●
 Finishing-Medium / Up Facing	TNMG 331CQ	3/8	3/16	0.150	1/64	●	○	●	○
	332CQ				1/32	●	○	●	○
	333CQ				3/64	●	●	●	○
 Finishing-Medium / Up Facing	TNMG 432CQ	1/2	3/16	0.203	1/32	○	●	○	○
	433CQ				3/64	○	●	○	○
 Medium-Roughing	TNMG 231GS	1/4	3/16	0.089	1/64			○	○
	232GS				1/32			○	○
	TNMG 331GS	3/8	3/16	0.150	1/64	○	○	○	○
332GS	1/32				○	○	○	○	
 Medium-Roughing	TNMG 331PG	3/8	3/16	0.150	1/64	●	○	○	●
	332PG				1/32	●	●	●	●
	333PG				3/64	●	○	●	●
 Medium-Roughing	TNMG 331PS	3/8	3/16	0.150	1/64	○	○	●	○
	332PS				1/32	○	●	●	○
	333PS				3/64	○	○	○	○
	TNMG 431PS	1/2	3/16	0.203	1/64	○	●	●	○
	432PS				1/32	○	●	●	○
	433PS				3/64	○	●	●	○
	434PS				1/16	○	○	○	○
 Medium-Roughing / High Feed	TNMG 332PT	3/8	3/16	0.150	1/32	○	●	●	○
	333PT				3/64	○	○	○	●
 Medium-Roughing / High Feed	TNMG 332GT	3/8	3/16	0.150	1/32	○	○	●	○
	333GT				3/64	○	○	○	○
 Roughing	TNMG 331	3/8	3/16	0.150	1/64	●	●	●	●
	332				1/32	●	○	●	●
	333				3/64	●	●	●	●
	TNMG 432	1/2	3/16	0.203	1/32	○	●	●	○
	433				3/64	○	○	○	○

Shape Right-hand Shown	Part Number	Dimensions (in)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (r <sub>e</sub> )				
 Roughing	TNMG 332PH	3/8	3/16	0.150	1/32	○	●	●	○
	333PH				3/64	●	○	○	●
	TNMG 432PH	1/2	3/16	0.203	1/32	○	●	●	○
	433PH				3/64	○	●	○	○
	434PH				1/16	○	●	○	
 Roughing	TNMM 332PX	3/8	3/16	0.150	1/32			○	○
	333PX				3/64			○	○
	TNMM 432PX	1/2	3/16	0.203	1/32			○	○
	433PX				3/64			○	○
	434PX				1/16		○	○	
 Single Sided Roughing / High Feed	TNMG 331XP	3/8	3/16	0.150	1/64	●	○	●	●
	332XP				1/32	●	○	○	●
 Medium / Low Carbon Steel	TNMG 331XQ	3/8	3/16	0.150	1/64	●	○	●	●
	332XQ				1/32	●	●	●	●
 Medium / Low Carbon Steel	TNMG 332XS	3/8	3/16	0.150	1/32	●	●	●	●
 Roughing / Low Carbon Steel	TNMG 331 <sup>R/L</sup> -ST	3/8	3/16	0.150	1/64	○	○	○	○
	332 <sup>R/L</sup> -ST				1/32	○	○	○	○
 Medium-Roughing	VNMG 3305PP	3/8	3/16	0.150	0.008	●	●	●	○
	331PP				1/64	●	●	●	●
	332PP				1/32	●	●	●	●
	333PP				3/64	●	●	●	●
 Finishing	VNMG 3305GP	3/8	3/16	0.150	0.008	○	○	○	○
	331GP				1/64	○	○	○	○
	332GP				1/32	○	○	○	
 Medium-Roughing	VNMG 331 <sup>R/L</sup> -VC	3/8	3/16	0.150	1/64	○	●	○	○
	332 <sup>R/L</sup> -VC				1/32	○	○	Ⓜ	○
	333 <sup>R/L</sup> -VC				3/64	○	○	○	○
 Finishing-Medium	VNMG 331VF	3/8	3/16	0.150	1/64	●	●	●	●
	332VF				1/32	●	●	●	●
	333VF				3/64	●	●	●	●
 Finishing-Medium	VNMG 331PQ	3/8	3/16	0.150	1/64	●	●	●	●
	332PQ				1/32	●	●	●	●
	333PQ				3/64	●	●	●	●
 Finishing-Medium	VNMG 331HQ	3/8	3/16	0.150	1/64	●	●	●	●
	332HQ				1/32	●	●	●	●
	333HQ				3/64	●	○	○	●
 Roughing	VNMG 331	3/8	3/16	0.150	1/64	●	●	●	●
	332				1/32	●	●	●	●

Inserts sold in 10 piece boxes

● : U.S. Stock Ⓜ : U.S. Stock (R-hand Only)  
▲ : Call for Availability - 1-800-823-7284 ○ : World Express (Shipping: 7-10 Business Days)

# Negative Inserts




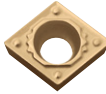
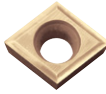

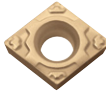







Shape Right-hand Shown	Part Number	Dimensions (in)										
		I.C.	Thickness	Hole	Corner-R (r <sub>e</sub> )	CA510	CA515	CA525	CA530			
 Finishing with Wiper Edge	WNUMG 431WF	1/2	3/16	0.203	1/64	●	●	●	○			
	432WF				1/32	●	●	●	○			
	WNUMG 431WP				1/64	●	●	●	●			
 Finishing with Wiper Edge	432WP	1/2	3/16	0.203	1/32	●	●	●	○			
	WNUMG 431WE				1/64	○	●	●	○			
 Finishing-Medium with Wiper Edge	432WE	1/2	3/16	0.203	1/32	○	●	●	○			
	433WE				3/64	○	●	●	○			
	WNUMG 431WQ				1/64	●	●	○	●			
 Finishing-Medium with Wiper Edge	432WQ	1/2	3/16	0.203	1/32	●	●	●	○			
	433WQ				3/64	●	○	●	●			
	WNUMG 4305PP				1/2	3/16	0.203	0.008	●	○	●	●
431PP	1/64	●	●	●				○				
432PP	1/32	●	●	●				○				
433PP	3/64	○	○	○				○				
 Finishing	WNUMG 431PQ	1/2	3/16	0.203	1/64	●	●	●	●			
	432PQ				1/32	●	●	●	●			
	433PQ				3/64	●	●	●	●			
 Finishing-Medium	WNUMG 3251HQ	3/8	5/32	0.150	1/64			●	○			
	3252HQ				1/32			●	○			
	WNUMG 331HQ	3/8	3/16	0.150	1/64	●	●	●	○			
332HQ	1/32				●	○	●	○				
 Finishing-Medium	WNUMG 431HQ	1/2	3/16	0.203	1/64	●	●	●	○			
	432HQ				1/32	●	●	●	○			
	433HQ				3/64	○	●	●	○			
 Finishing-Medium / Up Facing	WNUMG 431CQ	1/2	3/16	0.203	1/64	○	●	●	○			
	432CQ				1/32	●	●	●	○			
	433CQ				3/64	○	○	●	●			
 Finishing-Medium / Up Facing	WNUMG 432CJ	1/2	3/16	0.203	1/32	○	●	●	○			
	433CJ				3/64	○	●	●	○			
 Medium-Roughing	WNUMG 331GS	3/8	3/16	0.150	1/64	○	○	●	○			
	332GS				1/32	○	●	●	○			
 Medium-Roughing	WNUMG 431GS	1/2	3/16	0.203	1/64	○	○	○	○			
	432GS				1/32	○	●	●	○			
	433GS				3/64	○	○	○	○			
 Medium-Roughing	WNUMG 431PG	1/2	3/16	0.203	1/64	○	●	●	●			
	432PG				1/32	●	●	●	●			
	433PG				3/64	●	●	●	●			
 Medium-Roughing	434PG	1/2	3/16	0.203	1/16	●	○	●	●			
	WNUMG 431PS				1/2	3/16	0.203	1/64	○	○	●	●
	432PS							1/32	●	●	●	○
433PS	3/64	○	●	●				○				
 Medium-Roughing	434PS	1/2	3/16	0.203	1/16	○	○	●	○			
	WNUMG 432PT				1/2	3/16	0.203	1/32	●	●	●	●
	433PT							3/64	○	○	●	●
 Medium-Roughing / High Feed	WNUMG 432GT	1/2	3/16	0.203	1/32	○	●	●	○			
	433GT				3/64	○	○	●	○			
 Medium-Roughing / High Feed	WNUMG 431	1/2	3/16	0.203	1/64	○	●	●	●			
	432				1/32	○	●	●	●			
	433				3/64	○	●	○	●			
 Roughing	WNUMG 432PH	1/2	3/16	0.203	1/32	○	●	●	●			
	433PH				3/64	●	●	●	○			
 Roughing	WNUMG 431XP	1/2	3/16	0.203	1/64	●	●	○	●			
	432XP				1/32	●	●	●	○			
 Medium / Low Carbon Steel	WNUMG 431XQ	1/2	3/16	0.203	1/64	●	●	○	●			
	432XQ				1/32	●	●	●	○			
 Roughing / Low Carbon Steel	WNUMG 432XS	1/2	3/16	0.203	1/32	●	●	●	●			

Inserts sold in 10 piece boxes

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















# Positive Inserts











Shape Right-hand Shown	Part Number	Dimensions (in)					CA510	CA515	CA525	CA530	
		I.C.	Thickness	Hole	Corner-R (r <sub>e</sub> )	Relief Angle					
	CCMT 21505WP	1/4	3/32	0.110	0.008	●	●	●	●		
	2151WP				1/64	7°	●	●	●	●	
	2152WP				1/32	▲	▲	▲	▲		
	CCMT 32505WP	3/8	5/32	0.173	0.008	▲	▲	▲	▲		
	3251WP				1/64	7°	●	●	●	●	
	3252WP				1/32	●	●	●	●		
	CCMT 21505PP	1/4	3/32	0.110	0.008	●	●	●	●		
	2151PP				1/64	7°	●	●	●	●	
	CCMT 32505PP	3/8	5/32	0.173	0.008	●	●	●	●		
	3251PP				1/64	7°	●	●	●	●	
	3252PP				1/32	●	●	●	●		
		CCMT 21505GK	1/4	3/32	0.110	0.008	●	●	●	●	
2151GK		1/64				7°	●	●	●	●	
CCMT 32505GK		3/8	5/32	0.173	0.008	●	●	●	●		
3251GK					1/64	7°	●	●	●	●	
CCMT 431GK		1/2	3/16	0.217	1/64	●	●	●	●		
432GK					1/32	7°	●	●	●	●	
433GK	3/64				○	○	●	●			
	CCMT 21505HQ	1/4	3/32	0.110	0.008	●	●	●	●		
	2151HQ				1/64	7°	●	●	●	●	
	CCMT 32505HQ	3/8	5/32	0.173	0.008	●	●	●	●		
	3251HQ				1/64	7°	●	●	●	●	
	3252HQ				1/32	●	●	●	●		
		CCMT 3252	3/8	5/32	0.173	1/32	7°	○	●	●	○
		CPMT 251505PP	5/16	3/32	0.130	0.008	●	●	●	●	
	25151PP	1/64				11°	●	●	●	●	
	CPMT 3205PP	3/8	1/8	0.173	0.008	●	●	●	●		
	321PP				1/64	11°	●	●	●	●	
	322PP				1/32	●	●	●	●		
		CPMT 25151GP	5/16	3/32	0.130	1/64	11°	○	○	○	○
CPMT 321GP		3/8	1/8	0.173	1/64	11°	○	○	○	○	
322GP					1/32	○	○	○	○		
	CPMH 25151HQ	5/16	3/32	0.138	1/64	11°	●	○	○	●	
	25152HQ				1/32	●	○	●	●		
	CPMH 321HQ	3/8	1/8	0.177	1/64	11°	●	○	●	●	
	322HQ				1/32	●	○	●	●		
	CPMH 25151	5/16	3/32	0.138	1/64	11°	○	○	●	○	
	25152				1/32	○	○	●	●		
	CPMH 321	3/8	1/8	0.177	1/64	11°	○	○	●	○	
	322				1/32	○	○	●	●		
	CPMT 25151XP	5/16	3/32	0.130	1/64	11°	●	○	●	●	
	CPMT 321XP				1/64	11°	●	○	●	●	
	322XP	3/8	1/8	0.173	1/32	11°	●	○	○	●	
	322XP				1/32	●	○	○	●		
	CPMT 321XQ	3/8	1/8	0.173	1/64	11°	●	●	●	●	
	322XQ				1/32	●	○	○	●		
		RCMX 1003M0	0.394	1/8	0.142	-	7°	○	○	○	○
		RCMX 1204M0	0.472	3/16	0.165	-	7°	○	○	○	○
		SCMT 3251HQ	3/8	5/32	0.173	1/64	7°	○	●	●	●
		3252HQ				1/32	○	●	●	●	
	SPMR 321	3/8	1/8	-	1/64	11°	○	○	○	○	
	322				1/32	○	○	○	○		
SPMR 421	1/2	1/8	-	1/64	11°	○	○	○	○		
422				1/32	○	○	○	○			
	TBMT 12105DP	5/32	1/16	0.091	0.008	5°	○	○	○	○	
	1211DP				1/64	○	○	○	○		

Inserts sold in 10 piece boxes

● : U.S. Stock ▲ : Call for Availability - 1-800-823-7284 ○ : World Express (Shipping: 7-10 Business Days)

# Positive Inserts

Shape Right-hand Shown	Part Number	Dimensions (in)					CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (re)	Relief Angle				
 Finishing with Wiper Edge	TCMX 18151WP	7/32	3/32	0.098	1/64	7°	●	●	●	●
	TCMX 2151WP	1/4	3/32	0.110	1/64	7°	●	●	●	●
 Finishing-Medium	TCMT 2151HQ	1/4	3/32	0.110	1/64	7°	○	●	●	●
	2152HQ				1/32		○	●	●	●
 Finishing with Wiper Edge	TPMX 181505WP	7/32	3/32	0.118	0.008	11°	▲	▲	▲	▲
	18151WP				1/64		●	●	●	●
	18152WP				1/32		▲	▲	▲	▲
	TPMX 2205WP	1/4	1/8	0.130	0.008	11°	▲	▲	▲	▲
	221WP				1/64		●	●	●	●
	222WP				1/32		▲	▲	▲	▲
 Finishing	TPMT 181505PP	7/32	3/32	0.110	0.008	11°	●	●	●	●
	18151PP				1/64		●	●	●	●
	TPMT 2205PP	1/4	1/8	0.130	0.008	11°	●	●	●	●
	221PP				1/64		●	●	●	●
222PP	1/32	●	●	●	●					
 Finishing	TPMT 18151GP	7/32	3/32	0.110	1/64	11°	○	○	○	○
	TPMT 221GP	1/4	1/8	0.130	1/64	11°	○	○	○	○
	222GP				1/32		○	●	●	○
TPMT 321GP	3/8	1/8	0.173	1/64	11°	○	○	○	○	
 Finishing-Medium	TPMT 181505HQ	7/32	3/32	0.110	0.008	11°	○	○	○	●
	18151HQ				1/64		○	●	○	●
	TPMT 2205HQ	1/4	1/8	0.130	0.008	11°	○	○	●	●
	221HQ				1/64		○	●	●	●
	222HQ				1/32		○	○	●	●
	TPMT 321HQ	3/8	1/8	0.173	1/64	11°	○	●	●	●
322HQ	1/32				○		●	●	○	
 Finishing / Low Carbon Steel	TPMT 18151XP	7/32	3/32	0.110	1/64	11°	●	●	●	●
	TPMT 221XP	1/4	1/8	0.130	1/64	11°	●	●	●	●
	222XP				1/32		●	●	○	●
	TPMT 321XP	3/8	1/8	0.173	1/64	11°	●	○	○	●
322XP	1/32				●		●	●	●	
 Finishing-Medium / Low Carbon Steel	TPMT 221XQ	1/4	1/8	0.130	1/64	11°	●	○	●	●
	222XQ				1/32		●	○	●	●
 Finishing-Medium / Low Carbon Steel	TPMT 321XQ	3/8	1/8	0.173	1/64	11°	●	○	○	●
	322XQ				1/32		●	○	●	●
 Finishing	TPMR 321GP	3/8	1/8	-	1/64	11°	○	○	○	○
 Finishing-Medium	TPMR 221HQ	1/4	1/8	-	1/64	11°	○	○	○	●
	222HQ				1/32		○	○	○	●
	TPMR 321HQ	3/8	1/8	-	1/64	11°	○	●	●	●
	322HQ				1/32		○	○	●	●
 Medium	TPMR 221	1/4	1/8	-	1/64	11°	○	○	●	●
	222				1/32		○	○	●	●
TPMR 321	TPMR 321	3/8	1/8	-	1/64	11°	○	○	●	●
	322				1/32		○	○	●	●

Shape Right-hand Shown	Part Number	Dimensions (in)					CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (re)	Relief Angle				
 Finishing	VBMT 2205PP	1/4	1/8	0.110	0.008	5°	●	●	●	●
	221PP				1/64		●	●	●	●
	222PP				1/32		●	●	●	●
VBMT 331PP	VBMT 331PP	3/8	3/16	0.173	1/64	5°	●	●	●	●
	332PP				1/32		●	●	●	●
	333PP				3/64		●	●	●	●
 Finishing	VBMT 221GP	1/4	1/8	0.110	1/64	5°	○	○	●	○
	VBMT 331GP	3/8	3/16	0.173	1/64	5°	○	○	○	○
	332GP				1/32		○	○	●	○
 Finishing	VBMT 2205VF	1/4	1/8	0.110	0.008	5°	●	●	●	●
	221VF				1/64		●	●	●	●
	222VF				1/32		●	○	●	●
	VBMT 3305VF	3/8	3/16	0.173	0.008	5°	●	●	●	●
331VF	1/64				●		●	●	●	
332VF	1/32				●		●	●	●	
333VF	3/64	●	●	●	●					
 Finishing-Medium	VBMT 221HQ	1/4	1/8	0.110	1/64	5°	○	○	●	○
	222HQ				1/32		●	●	●	○
	VBMT 331HQ				3/8		3/16	0.173	1/64	5°
332HQ	1/32	●	●	●		●				
333HQ	3/64	●	○	●		●				
 Finishing	VCMT 151505PP	3/16	3/32	0.091	0.008	7°	●	●	●	●
	15151PP				1/64		●	●	●	●
	VCMT 331PP	3/8	3/16	0.173	1/64	7°	●	●	●	●
332PP	1/32				●		●	●	●	
 Finishing	VCMT 151505VF	3/16	3/32	0.091	0.008	7°	●	●	●	●
	15151VF				1/64		●	●	●	●
 Finishing-Medium	VCMT 151505HQ	3/16	3/32	0.091	0.008	7°	○	●	●	●
	15151HQ				1/64		○	○	●	●
 Finishing	WBMT 12105L-DP	5/32	1/16	0.091	0.008	5°	○	○	○	○
	1211L-DP				1/64		○	○	○	○
	WBMT 151505L-DP	3/16	3/32	0.091	0.008	5°	○	○	○	○
15151L-DP	1/64				○		○	○	○	
 Finishing	WPMT 2151GP	1/4	3/32	0.110	1/64	11°	○	○	●	○
	WPMT 321GP	3/8	1/8	0.173	1/64	11°	○	○	○	○
 Finishing	WPMT 21505HQ	1/4	3/32	0.110	0.008	11°	○	●	○	●
	2151HQ				1/64		●	●	●	●
	WPMT 321HQ	3/8	1/8	0.173	1/64	11°	●	●	●	●
322HQ	1/32				●		○	●	●	

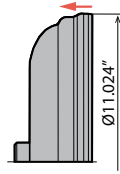
Inserts sold in 10 piece boxes

● : U.S. Stock ▲ : Call for Availability - 1-800-823-7284 ○ : World Express (Shipping: 7-10 Business Days)

## Case Studies

### Hot Rolled Steel

Automotive Parts  
 Vc = 1640 sfm  
 D.O.C. = 0.028"  
 f = 0.012 ipr  
 Wet  
 CNMG432PG



**CA510**

**100 pcs/edge**

**Tool Life**  
 x1.3

Competitor F  
 (CVD Coated Carbide)

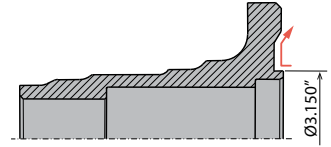
**75 pcs/edge**

CA510 produces 33% longer tool life compared to Competitor F's CVD.

(User Evaluation)

### Carbon Steel

Automotive Parts  
 Vc = 980 sfm  
 D.O.C. = 0.039"  
 f = 0.012 ipr  
 Wet  
 DNMG432PQ



**CA510**

**200 pcs/edge**

**Tool Life**  
 x1.3

Competitor G  
 (CVD Coated Carbide)

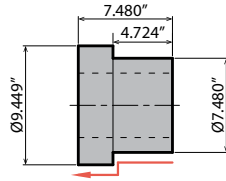
**150 pcs/edge**

CA510 produces 33% longer tool life compared to Competitor G's CVD.

(User Evaluation)

### 4140

Cover  
 Vc = 460~490 sfm  
 D.O.C. = 0.118"~0.138"  
 f = 0.014~0.016 ipr  
 Wet  
 CNMG432PT



**CA515**

**10 pcs/edge**

**Tool Life**  
 x1.4

Competitor H  
 (CVD Coated Carbide)

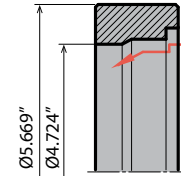
**7 pcs/edge**

CA515 produces 43% longer tool life compared to Competitor H's CVD.

(User Evaluation)

### Structural Steel

Gear  
 Vc = 1250 sfm  
 D.O.C. = 0.059"~0.079"  
 f = 0.012~0.016 ipr  
 Wet  
 WNMG432PQ



**CA515**

**430 pcs/edge**

**Tool Life**  
 x1.1

Competitor I  
 (CVD Coated Carbide)

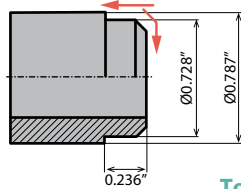
**380 pcs/edge**

CA515 produces 13% longer tool life compared to Competitor I's CVD.

(User Evaluation)

### Structural Steel

Machine Part  
 Vc = 560 sfm  
 D.O.C. = 0.031"  
 f = 0.008 ipr  
 Wet  
 CNMG432PQ



**CA525**

**1,400 pcs/edge and more**

**Tool Life**  
 x1.4

Competitor J  
 (CVD Coated Carbide)

**800-1,000 pcs/edge**

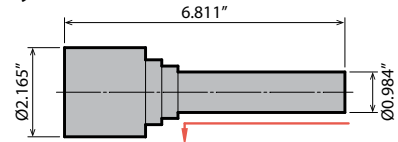
CA525 produces 43% longer tool life compared to Competitor J's CVD.

Chip control was smooth.

(User Evaluation)

### Chromium Molybdenum Steel

Shaft  
 Vc = 390 sfm  
 D.O.C. = 0.079"  
 f = 0.010 ipr  
 Dry  
 TNMG332R-ST



**CA525**

**10 pcs/edge**

**Tool Life**  
 x5

Competitor K  
 (CVD Coated Carbide)

**2 pcs/edge**

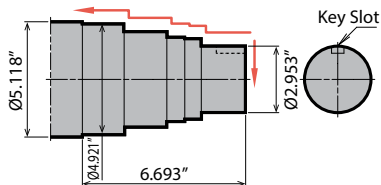
CA525 shows 5 times longer tool life compared to Competitor K's CVD.

(User Evaluation)

## Case Studies

### 1045

Shaft  
 Vc = 820 sfm  
 D.O.C. = 0.118"  
 f = 0.012 ipr  
 Wet  
 CNMG432PS



**Tool Life**  
 ↑  
 x1.6

### CA525

**10 pcs/edge**

Competitor L  
 (CVD Coated Carbide)  
 Competitor M  
 (PVD Coated Carbide)

L  
**6 pcs/edge**

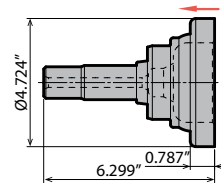
M  
**Instant Breakage**

CA525 produces 66% longer tool life compared to Competitor L's CVD.  
 Competitor M's PVD carbide could not complete 1pc before breakage.

(User Evaluation)

### Chromium Molybdenum Steel

Flange Shaft  
 Vc = 850~920 sfm  
 D.O.C. = 0.024"  
 f = 0.012~0.020 ipr  
 Wet  
 CNMG432PQ



**Tool Life**  
 ↑  
 x1.2

### CA525

**180 pcs/edge**

Competitor N  
 (CVD Coated Carbide)

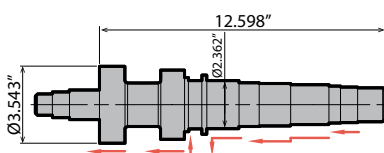
**150 pcs/edge**

CA525 produces 20% longer tool life compared to Competitor N's CVD.

(User Evaluation)

### 1045

Shaft  
 Vc = 330 sfm  
 D.O.C. = 0.079"~0.157"  
 f = 0.016 ipr  
 Wet  
 WNMG432PS



**Tool Life**  
 ↑  
 x1.7

### CA525

**70 pcs/edge**

Competitor O  
 (CVD Coated Carbide)

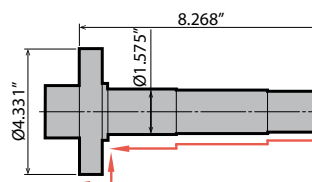
**40 pcs/edge**

CA525 produces 70% longer tool life compared to Competitor O's CVD.

(User Evaluation)

### 5120

Shaft  
 Vc = 300 sfm  
 D.O.C. = 0.079"~0.118"  
 f = 0.013 ipr  
 Wet  
 WNMG432PS



**Tool Life**  
 ↑  
 x1.3

### CA525

**260 pcs/edge**

Competitor P  
 (CVD Coated Carbide)

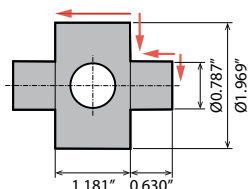
**190 pcs/edge**

CA525 produces 30% longer tool life compared to Competitor P's CVD.

(User Evaluation)

### 5120H

Gear  
 Vc = 590 sfm  
 D.O.C. = 0.079"  
 f = 0.008 ipr  
 Wet  
 DNMG431CQ



**Tool Life**  
 ↑  
 x1.25

### CA530

**10 pcs/edge**

Competitor Q  
 (CVD Coated Carbide)

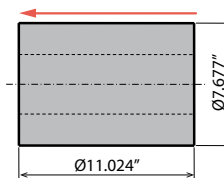
**3-8 pcs/edge**

CA530 averages 25% longer tool life compared to Competitor Q's CVD.

(User Evaluation)

### 13Cr

Machine Parts  
 Vc = 330 sfm  
 D.O.C. = 0.079"  
 f = 0.016 ipr  
 Wet  
 SNMG433PH



**Tool Life**  
 ↑  
 x1.8

**Efficiency**  
 ↑  
 11%

### CA530

**9 pcs/edge**

Competitor R  
 (CVD Coated Carbide)

**5 pcs/edge**

CA530 produces 80% longer tool life compared to Competitor R's CVD.  
 Improved machining efficiency by 1.1 times.

(User Evaluation)



## KYOCERA Precision Tools, Inc.

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 Hendersonville, NC 28792  
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