

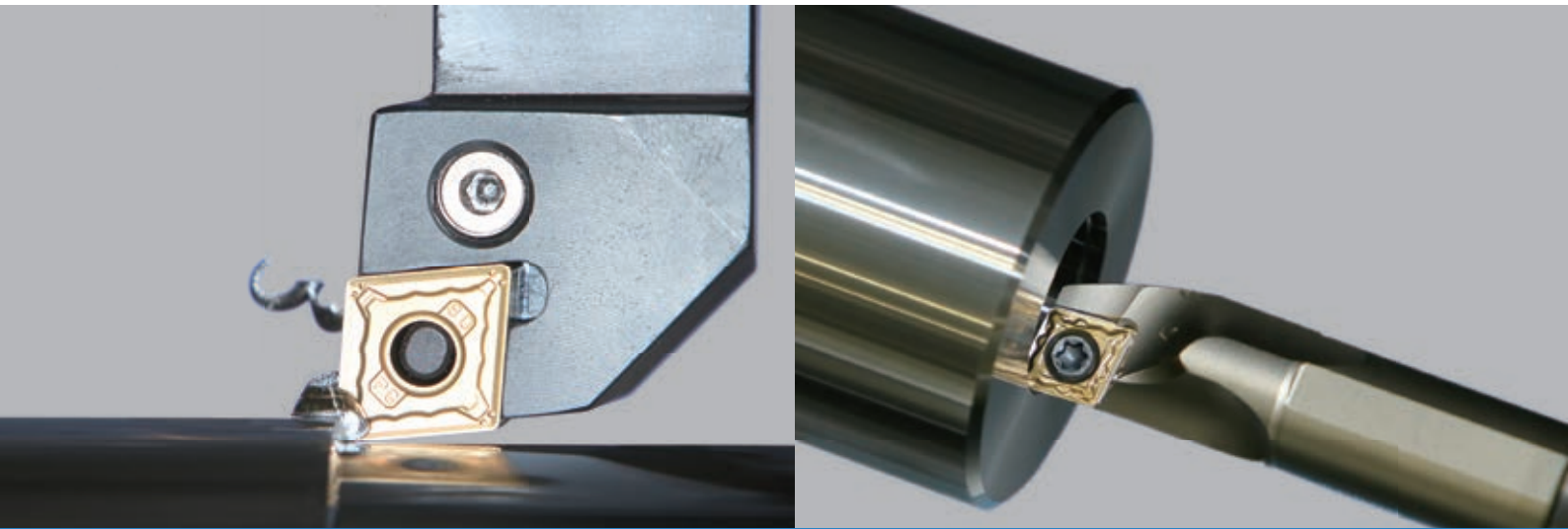
THE NEW VALUE FRONTIER



New CVD coated carbide grade
for steel

CA5 Series

CA5 Series



Long tool life and stable machining of steel

New CA5 series for longer tool life and stable machining

Various chipbreakers available for steel machining



NEW

WF chipbreaker
(finishing)



WE chipbreaker
(finishing - medium)



New CVD coated carbide grade for steel

CA5 Series

Longer tool life and stable machining
Various chipbreakers available

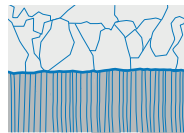
1 New coated carbide grade for longer tool life and stable machining

Longer tool life

- High-performance α -Al₂O₃ layer
- Excellent wear and fracture resistance

Prevents layer peeling

- Strong Intra-coating adhesion
- Higher adhesion between each layer with improved crystal structure



CRIOS technology



Conventional

Suppresses chipping

- Micro TiCN layer
- Higher layer strength and fracture resistance



CRIOS technology is Kyocera's original CVD coating technology

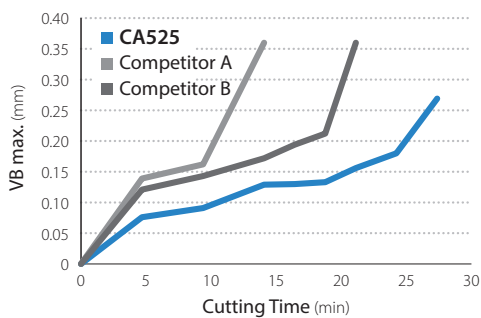
1st recommendation

General use CA525

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

Wear resistance comparison

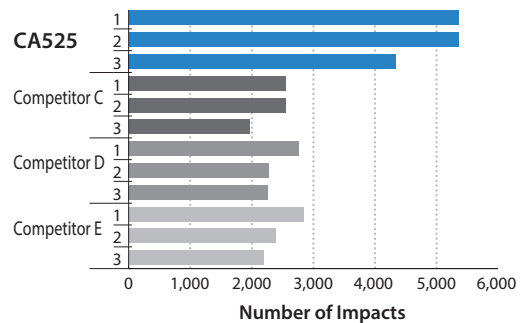
(In-house evaluation)



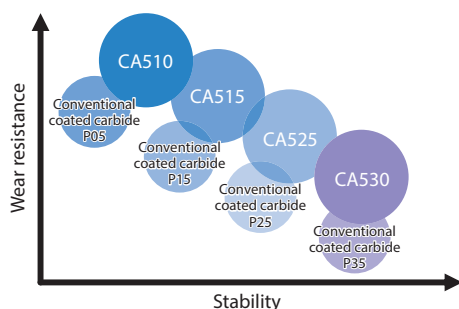
Cutting conditions: Vc = 300 m/min, ap = 2.0 mm, f = 0.3 mm/rev, wet
Workpiece: 34CrMo4

Fracture resistance comparison

(In-house evaluation)



Cutting conditions: Vc = 300 m/min, ap = 1.5 mm, f = 0.3 mm/rev, wet
Workpiece: 42CrMo4 (with 4 slots)



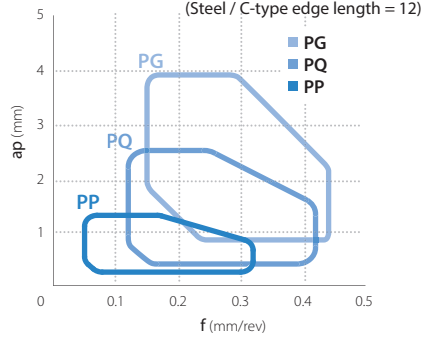
CA510 High speed and high efficiency steel machining
Wear resistance oriented

CA515 Continuous to light interrupted steel machining

CA530 General to heavy interrupted machining
Stability oriented

2 Various chipbreakers available for steel machining

Negative type



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 cutting force

3-step smart dot structure
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

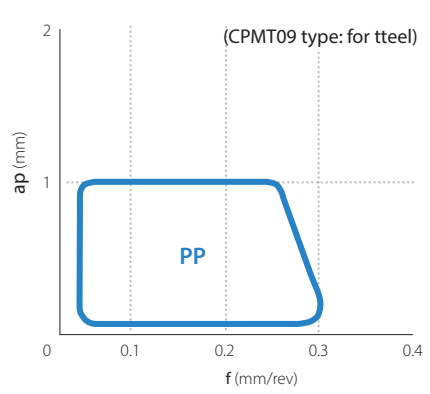
2-step smart wall (2-step rising smooth surface)
Excellent chip control in a wide range of applications, preventing the dots from being damaged at high feed cuttings

Twin dots

Flat zone (breaking area)

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

Positive type



PP chipbreaker (finishing)

Stable chip control when finishing steel

High-stability cutting edge design
Suitable shape for controlling the edge stress and heat generation

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

- 1st dot: Small D.O.C.
- 2nd dot: General use
- 3rd dot: High feed rate

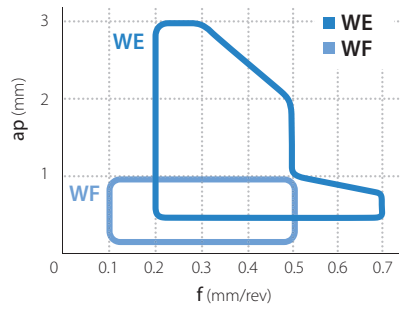
Stable performance with superior edge strength

3 New negative wiper inserts

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 type inserts









Shape	Description	Dimensions (mm)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (rε)				
	CNMG 120404WF	12.70	4.76	5.16	0.4	●	●	●	●
	120408WF				0.8	●	●	●	●
	Finishing with wiper edge								
	CNMG 120404WP	12.70	4.76	5.16	0.4	●	●	●	●
	120408WP				0.8	●	●	●	●
	Finishing with wiper edge								
	CNMG 120404WE	12.70	4.76	5.16	0.4	●	●	●	●
	120408WE				0.8	●	●	●	●
	120412WE				1.2	●	●	●	●
	CNMG 120404WQ	12.70	4.76	5.16	0.4	●	●	●	●
	120408WQ				0.8	●	●	●	●
	120412WQ				1.2	●	●	●	●
	CNMG 120402PP	12.70	4.76	5.16	0.2	●	●	●	●
	120404PP				0.4	●	●	●	●
	120408PP				0.8	●	●	●	●
	120412PP				1.2	●	●	●	●
Finishing									
	CNMG 120402GP	12.70	4.76	5.16	0.2	●	●	●	●
	120404GP				0.4	●	●	●	●
	120408GP				0.8	●	●	●	●
Finishing									
	CNMG 120404PQ	12.70	4.76	5.16	0.4	●	●	●	●
	120408PQ				0.8	●	●	●	●
	120412PQ				1.2	●	●	●	●
Finishing-Medium									
	CNMG 090404HQ	9.525	4.76	3.81	0.4	●	●	●	●
	090408HQ				0.8	●	●	●	●
	CNMG 120404HQ	12.70	4.76	5.16	0.4	●	●	●	●
	120408HQ				0.8	●	●	●	●
	120412HQ				1.2	●	●	●	●
Finishing-Medium									
	CNMG 120404CQ	12.70	4.76	5.16	0.4	●	●	●	●
	120408CQ				0.8	●	●	●	●
	120412CQ				1.2	●	●	●	●
	CNMG 160608CQ	15.875	6.35	6.35	0.8	●	●	●	●
	160612CQ				1.2	●	●	●	●
Finishing-Medium / Up facing									
	CNMG 120408CJ	12.70	4.76	5.16	0.8	●	●	●	●
	120412CJ				1.2	●	●	●	●
	160612CJ				1.2	●	●	●	●
	CNMG 160616CJ	15.875	6.35	6.35	1.6	●	●	●	●
	160616CJ				1.6	●	●	●	●
Finishing-Medium / Up facing									
	CNMG 090404GS	9.525	4.76	3.81	0.4	●	●	●	●
	090408GS				0.8	●	●	●	●
	CNMG 120404GS	12.70	4.76	5.16	0.4	●	●	●	●
	120408GS				0.8	●	●	●	●
	120412GS				1.2	●	●	●	●
Medium-Roughing									

● : Available












Shape	Description	Dimensions (mm)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (rε)				
	CNMG 120404PG	12.70	4.76	5.16	0.4	●	●	●	●
	120408PG				0.8	●	●	●	●
	120412PG				1.2	●	●	●	●
	120416PG				1.6	●	●	●	●
Medium-Roughing									
	CNMG 120404PS	12.70	4.76	5.16	0.4	●	●	●	●
	120408PS				0.8	●	●	●	●
	120412PS				1.2	●	●	●	●
	120416PS				1.6	●	●	●	●
	CNMG 160612PS	15.875	6.35	6.35	1.2	●	●	●	●
	160616PS				1.6	●	●	●	●
Medium-Roughing									
	CNMG 120408PT	12.70	4.76	5.16	0.8	●	●	●	●
	120412PT				1.2	●	●	●	●
	CNMG 160608PT	15.875	6.35	6.35	0.8	●	●	●	●
	160612PT				1.2	●	●	●	●
	160616PT				1.6	●	●	●	●
Medium-Roughing / High feed									
	CNMG 120408GT	12.70	4.76	5.16	0.8	●	●	●	●
	120412GT				1.2	●	●	●	●
Medium-Roughing / High feed									
	CNMG 120404	12.70	4.76	5.16	0.4	●	●	●	●
	120408				0.8	●	●	●	●
	120412				1.2	●	●	●	●
	CNMG 160608	15.875	6.35	6.35	0.8	●	●	●	●
	160612				1.2	●	●	●	●
	CNMG 190612	19.05	6.35	7.94	1.2	●	●	●	●
	190616				1.6	●	●	●	●
	Roughing								
	CNMG 120408PH	12.70	4.76	5.16	0.8	●	●	●	●
	120412PH				1.2	●	●	●	●
	120416PH				1.6	●	●	●	●
	CNMG 160608PH	15.875	6.35	6.35	0.8	●	●	●	●
	160612PH				1.2	●	●	●	●
	160616PH				1.6	●	●	●	●
	Roughing								
	CNMG 190608PH	19.05	6.35	7.94	0.8	●	●	●	●
	190612PH				1.2	●	●	●	●
	190616PH				1.6	●	●	●	●
	190624PH				2.4	●	●	●	●
	CNMM 120408PX	12.70	4.76	5.16	0.8	●	●	●	●
	120412PX				1.2	●	●	●	●
	120416PX				1.6	●	●	●	●
	CNMM 160608PX	15.875	6.35	6.35	0.8	●	●	●	●
	160612PX				1.2	●	●	●	●
	160616PX				1.6	●	●	●	●
	CNMM 190608PX	19.05	6.35	7.94	0.8	●	●	●	●
	190612PX				1.2	●	●	●	●
	190616PX				1.6	●	●	●	●
	190624PX				2.4	●	●	●	●
Single sided / Roughing / High feed									

● : Available

Negative type inserts











Shape	Description	Dimensions (mm)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (rε)				
 Low carbon steel / Finishing	CNMG 120404XP	12.70	4.76	5.16	0.4	●	●	●	●
	120408XP				0.8	●	●	●	●
 Low carbon steel / Medium	CNMG 120404XQ	12.70	4.76	5.16	0.4	●	●	●	●
	120408XQ				0.8	●	●	●	●
 Low carbon steel / Roughing	CNMG 120408XS	12.70	4.76	5.16	0.8	●	●	●	●
 Finishing with wiper edge	DNMX 150404WF	12.70	4.76	5.16	0.4	●	●	●	●
	150408WF				0.8	●	●	●	●
	150412WF				1.2	●	●	●	●
	DNMX 150604WF	12.70	6.35	5.16	0.4	●	●	●	●
	150608WF				0.8	●	●	●	●
	150612WF				1.2	●	●	●	●
 Finishing	DNMG 150402PP	12.70	4.76	5.16	0.2	●	●	●	●
	150404PP				0.4	●	●	●	●
	150408PP				0.8	●	●	●	●
	150412PP				1.2	●	●	●	●
	DNMG 150602PP	12.70	6.35	5.16	0.2	●	●	●	●
	150604PP				0.4	●	●	●	●
	150608PP				0.8	●	●	●	●
150612PP	1.2	●	●	●	●				
 Finishing	DNMG 110404GP	9.525	4.76	3.81	0.4	●	●	●	●
	110408GP				0.8	●	●	●	●
	DNMG 150402GP	12.70	4.76	5.16	0.2	●	●	●	●
	150408GP				0.8	●	●	●	●
 Finishing-Medium	DNMG 150404PQ	12.70	4.76	5.16	0.4	●	●	●	●
	150408PQ				0.8	●	●	●	●
	150412PQ				1.2	●	●	●	●
	DNMG 150604PQ	12.70	6.35	5.16	0.4	●	●	●	●
	150608PQ				0.8	●	●	●	●
	150612PQ				1.2	●	●	●	●
 Finishing-Medium	DNMG 110402HQ	9.525	4.76	3.81	0.2	●	●	●	●
	110404HQ				0.4	●	●	●	●
	DNMG 150404HQ	12.70	4.76	5.16	0.4	●	●	●	●
	150408HQ				0.8	●	●	●	●
	150412HQ				1.2	●	●	●	●
	DNMG 150604HQ	12.70	6.35	5.16	0.4	●	●	●	●
	150608HQ				0.8	●	●	●	●
	150612HQ				1.2	●	●	●	●

● : Available









Shape	Description	Dimensions (mm)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (rε)				
 Finishing-Medium / Up facing	DNMG 150404CQ	12.70	4.76	5.16	0.4	●	●	●	●
	150408CQ				0.8	●	●	●	●
	150412CQ				1.2	●	●	●	●
 Finishing-Medium / Up facing	DNMG 150604CQ	12.70	6.35	5.16	0.4	●	●	●	●
	150608CQ				0.8	●	●	●	●
	150612CQ				1.2	●	●	●	●
 Finishing-Medium / Up facing	DNMG 150408CJ	12.70	4.76	5.16	0.8	●	●	●	●
	150412CJ				1.2	●	●	●	●
	DNMG 150608CJ	12.70	6.35	5.16	0.8	●	●	●	●
 Medium-Roughing	DNMG 110404GS	9.525	4.76	3.81	0.4	●	●	●	●
	110408GS				0.8	●	●	●	●
	DNMG 150404GS	12.70	4.76	5.16	0.4	●	●	●	●
150408GS	0.8				●	●	●	●	
150412GS	1.2				●	●	●	●	
 Medium-Roughing	DNMG 150604GS	12.70	6.35	5.16	0.4	●	●	●	●
	150608GS				0.8	●	●	●	●
	DNMG 150404PG	12.70	4.76	5.16	0.4	●	●	●	●
150408PG	0.8				●	●	●	●	
150412PG	1.2				●	●	●	●	
150416PG	1.6				●	●	●	●	
 Medium-Roughing	DNMG 150604PG	12.70	6.35	5.16	0.4	●	●	●	●
	150608PG				0.8	●	●	●	●
	150612PG				1.2	●	●	●	●
	150616PG				1.6	●	●	●	●
 Medium-Roughing	DNMG 150404PS	12.70	4.76	5.16	0.4	●	●	●	●
	150408PS				0.8	●	●	●	●
	150412PS	1.2	●	●	●	●			
 Medium-Roughing	DNMG 150604PS	12.70	6.35	5.16	0.4	●	●	●	●
	150608PS				0.8	●	●	●	●
	150612PS				1.2	●	●	●	●
	150616PS				1.6	●	●	●	●
 Medium-Roughing / High feed	DNMG 150408PT	12.70	4.76	5.16	0.8	●	●	●	●
	150412PT				1.2	●	●	●	●
 Medium-Roughing / High feed	DNMG 150608PT	12.70	6.35	5.16	0.8	●	●	●	●
	150612PT				1.2	●	●	●	●
 Medium-Roughing / High feed	DNMG 150408GT	12.70	4.76	5.16	0.8	●	●	●	●
	150412GT				1.2	●	●	●	●
	DNMG 150608GT	12.70	6.35	5.16	0.8	●	●	●	●
150612GT	1.2	●	●	●	●	●	●	●	

● : Available

Negative type inserts





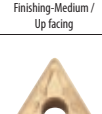





Shape	Description	Dimensions (mm)				Corner-R (rε)	CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole						
 Roughing	DNMG 150404	12.70	4.76	5.16	0.4	●	●	●	●	
	150408				0.8	●	●	●	●	
	DNMG 150608	12.70	6.35	5.16	0.8	●	●	●	●	
	150612				1.2	●	●	●	●	
 Roughing	DNMG 150408PH	12.70	4.76	5.16	0.8	●	●	●	●	
	150412PH				1.2	●	●	●	●	
	150416PH				1.6	●	●	●	●	
	DNMG 150608PH	12.70	6.35	5.16	0.8	●	●	●	●	
	150612PH				1.2	●	●	●	●	
	150616PH				1.6	●	●	●	●	
 Single Sided / Roughing / High feed	DNMM 150408PX	12.70	4.76	5.16	0.8			●	●	
	150412PX				1.2			●	●	
	150416PX				1.6			●	●	
	DNMM 150608PX	12.70	6.35	5.16	0.8	●	●	●	●	
150612PX	1.2				●	●	●	●		
150616PX	1.6			●	●					
 Low carbon steel / Finishing	DNMG 150404XP	12.70	4.76	5.16	0.4	●	●	●	●	
	150408XP				0.8	●	●	●	●	
 Low carbon steel / Medium	DNMG 150404XQ	12.70	4.76	5.16	0.4	●	●	●	●	
	150408XQ				0.8	●	●	●	●	
 Low carbon steel / Roughing	DNMG 150408XS	12.70	4.76	5.16	0.8	●	●	●	●	
 Medium-Roughing	RNMG 090300	9.525	3.18	3.81	—	●	●	●	●	
	RNMG 120400	12.70	4.76	5.16	—	●	●	●	●	
	RNMG 150600	15.875	6.35	6.35	—			●	●	
 Finishing-Medium	SNMG 120404PQ	12.70	4.76	5.16	0.4	●	●	●	●	
	120408PQ				0.8	●	●	●	●	
	120412PQ				1.2	●	●	●	●	
 Finishing-Medium	SNMG 120404HQ	12.70	4.76	5.16	0.4	●	●	●	●	
	120408HQ				0.8	●	●	●	●	
	120412HQ				1.2	●	●	●	●	
 Medium-Roughing	SNMG 120408PG	12.70	4.76	5.16	0.8	●	●	●	●	
	120412PG				1.2	●	●	●	●	
	120416PG				1.6	●	●	●	●	

● : Available




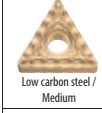
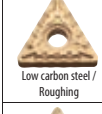







Shape	Description	Dimensions (mm)				Corner-R (rε)	CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole						
 Medium-Roughing	SNMG 120408PS	12.70	4.76	5.16	0.8	●	●	●	●	
	120412PS				1.2	●	●	●	●	
	120416PS				1.6	●	●	●	●	
 Medium-Roughing High feed	SNMG 120408PT	12.70	4.76	5.16	0.8	●	●	●	●	
	120412PT				1.2	●	●	●	●	
 Roughing	SNMG 090304	9.525	3.18	3.81	0.4			●	●	
	090308				0.8			●	●	
	SNMG 120408	12.70	4.76	5.16	0.8	●	●	●	●	
	120412				1.2	●	●	●	●	
120416	1.6			●	●					
 Roughing	SNMG 120408PH	12.70	4.76	5.16	0.8	●	●	●	●	
	120412PH				1.2	●	●	●	●	
	120416PH				1.6	●	●	●	●	
	SNMG 150612PH	15.875	6.35	6.35	1.2	●	●	●	●	
	150616PH				1.6	●	●	●	●	
	SNMG 190612PH				19.05	6.35	7.94	1.2		
190616PH	1.6			●				●		
 Single Sided / Roughing / High feed	SNMM 120408PX	12.70	4.76	5.16	0.8	●	●	●	●	
	120412PX				1.2	●	●	●	●	
	120416PX				1.6			●	●	
	SNMM 150612PX	15.875	6.35	6.35	1.2			●	●	
	150616PX				1.6			●	●	
	SNMM 190612PX				19.05	6.35	7.94	1.2	●	●
190616PX	1.6	●	●	●				●		
190624PX	2.4			●	●					
 Low carbon steel / Finishing	SNMG 120408XP	12.70	4.76	5.16	0.8	●	●	●	●	
	SNMG 120408XQ	12.70	4.76	5.16	0.8	●	●	●	●	
 Low carbon steel / Roughing	SNMG 120408XS	12.70	4.76	5.16	0.8	●	●	●	●	
	TNMX 160404WF	9.525	4.76	3.81	0.4	●	●	●	●	
160408WF	0.8				●	●	●	●		
160412WF	1.2				●	●	●	●		
 Finishing	TNMG 160402PP	9.525	4.76	3.81	0.2	●	●	●	●	
	160404PP				0.4	●	●	●	●	
	160408PP				0.8	●	●	●	●	
	160412PP				1.2	●	●	●	●	

● : Available

Negative type inserts














Shape	Description	Dimensions (mm)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (rε)				
 Finishing	TNMG 160402GP	9.525	4.76	3.81	0.2	●	●	●	●
	160404GP				0.4	●	●	●	●
	160408GP				0.8	●	●	●	●
 Finishing-Medium	TNMG 160404PQ	9.525	4.76	3.81	0.4	●	●	●	●
	160408PQ				0.8	●	●	●	●
	160412PQ				1.2	●	●	●	●
 Finishing-Medium	TNMG 110404HQ	6.35	4.76	2.26	0.4	●	●	●	●
	110408HQ				0.8	●	●	●	●
	TNMG 160404HQ	9.525	4.76	3.81	0.4	●	●	●	●
	160408HQ				0.8	●	●	●	●
 Finishing-Medium / Up facing	TNMG 160404CQ	9.525	4.76	3.81	0.4	●	●	●	●
	160408CQ				0.8	●	●	●	●
	160412CQ				1.2	●	●	●	●
 Finishing-Medium / Up facing	TNMG 220408CQ	12.70	4.76	5.16	0.8	●	●	●	●
	220412CQ				1.2	●	●	●	●
	TNMG 110404GS				6.35	4.76	2.26	0.4	●
110408GS	0.8	●	●	●				●	
 Medium-Roughing	TNMG 160404GS	9.525	4.76	3.81	0.4	●	●	●	●
	160408GS				0.8	●	●	●	●
	TNMG 160404PG				9.525	4.76	3.81	0.4	●
160408PG	0.8	●	●	●				●	
160412PG	1.2	●	●	●				●	
 Medium-Roughing	TNMG 160404PS	9.525	4.76	3.81	0.4	●	●	●	●
	160408PS				0.8	●	●	●	●
	160412PS				1.2	●	●	●	●
	TNMG 220404PS	12.70	4.76	5.16	0.4	●	●	●	●
220408PS	0.8				●	●	●	●	
220412PS	1.2				●	●	●	●	
220416PS	1.6				●	●	●	●	
 Medium-Roughing / High feed	TNMG 160408PT	9.525	4.76	3.81	0.8	●	●	●	●
	160412PT				1.2	●	●	●	●
 Medium-Roughing / High feed	TNMG 160408GT	9.525	4.76	3.81	0.8	●	●	●	●
	160412GT				1.2	●	●	●	●
 Roughing	TNMG 160404	9.525	4.76	3.81	0.4	●	●	●	●
	160408				0.8	●	●	●	●
	160412				1.2	●	●	●	●
	TNMG 220408	12.70	4.76	5.16	0.8	●	●	●	●
	220412				1.2	●	●	●	●

● : Available









Shape Handed Insert shows Right-hand	Description	Dimensions (mm)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (rε)				
 Roughing	TNMG 160408PH	9.525	4.76	3.81	0.8	●	●	●	●
	160412PH				1.2	●	●	●	●
	TNMG 220408PH				12.70	4.76	5.16	0.8	●
220412PH	1.2	●	●	●				●	
220416PH	1.6	●	●	●				●	
 Single Sided / Roughing / High feed	TNMM 160408PX	9.525	4.76	3.81	0.8	●	●	●	●
	160412PX				1.2	●	●	●	●
	TNMM 220408PX	12.70	4.76	5.16	0.8	●	●	●	●
220412PX	1.2				●	●	●	●	
220416PX	1.6				●	●	●	●	
 Low carbon steel / Finishing	TNMG 160404XP	9.525	4.76	3.81	0.4	●	●	●	●
	160408XP				0.8	●	●	●	●
 Low carbon steel / Medium	TNMG 160404XQ	9.525	4.76	3.81	0.4	●	●	●	●
	160408XQ				0.8	●	●	●	●
 Low carbon steel / Roughing	TNMG 160408XS	9.525	4.76	3.81	0.8	●	●	●	●
	TNMG 160404 ^R / _L -ST				9.525	4.76	3.81	0.4	●
160408 ^R / _L -ST	0.8	●	●	●				●	
 Finishing	VNMG 160402PP	9.525	4.76	3.81	0.2	●	●	●	●
	160404PP				0.4	●	●	●	●
	160408PP				0.8	●	●	●	●
	160412PP				1.2	●	●	●	●
 Finishing	VNMG 160402GP	9.525	4.76	3.81	0.2	●	●	●	●
	160404GP				0.4	●	●	●	●
	160408GP				0.8	●	●	●	●
 Finishing-Medium	VNMG 160404 ^R / _L -VC	9.525	4.76	3.81	0.4	●	●	●	●
	160408 ^R / _L -VC				0.8	●	●	●	●
	160412 ^R / _L -VC				1.2	●	●	●	●
 Finishing-Medium	VNMG 160404VF	9.525	4.76	3.81	0.4	●	●	●	●
	160408VF				0.8	●	●	●	●
	160412VF				1.2	●	●	●	●
 Finishing-Medium	VNMG 160404PQ	9.525	4.76	3.81	0.4	●	●	●	●
	160408PQ				0.8	●	●	●	●
	160412PQ				1.2	●	●	●	●
 Finishing-Medium	VNMG 160404HQ	9.525	4.76	3.81	0.4	●	●	●	●
	160408HQ				0.8	●	●	●	●
	160412HQ				1.2	●	●	●	●
 Roughing	VNMG 160404	9.525	4.76	3.81	0.4	●	●	●	●
	160408				0.8	●	●	●	●

● : Available

Negative type inserts












Shape	Description	Dimensions (mm)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (rε)				
 Finishing with wiper edge	WNMG 080404WF	12.70	4.76	5.16	0.4	●	●	●	●
	080408WF				0.8	●	●	●	●
 Finishing with wiper edge	WNMG 080404WP	12.70	4.76	5.16	0.4	●	●	●	●
	080408WP				0.8	●	●	●	●
 Finishing-Medium with wiper edge	WNMG 080404WE	12.70	4.76	5.16	0.4	●	●	●	●
	080408WE				0.8	●	●	●	●
	080412WE				1.2	●	●	●	●
 Finishing-Medium with wiper edge	WNMG 080404WQ	12.70	4.76	5.16	0.4	●	●	●	●
	080408WQ				0.8	●	●	●	●
	080412WQ				1.2	●	●	●	●
 Finishing	WNMG 080402PP	12.70	4.76	5.16	0.2	●	●	●	●
	080404PP				0.4	●	●	●	●
	080408PP				0.8	●	●	●	●
	080412PP				1.2	●	●	●	●
 Finishing-Medium	WNMG 080404PQ	12.70	4.76	5.16	0.4	●	●	●	●
	080408PQ				0.8	●	●	●	●
	080412PQ				1.2	●	●	●	●
 Finishing-Medium	WNMG 06T304HQ	9.525	3.97	3.81	0.4			●	●
	06T308HQ				0.8			●	●
 Finishing-Medium	WNMG 060404HQ	9.525	4.76	3.81	0.4	●	●	●	●
	060408HQ				0.8	●	●	●	●
 Finishing-Medium	WNMG 080404HQ	12.70	4.76	5.16	0.4	●	●	●	●
	080408HQ				0.8	●	●	●	●
	080412HQ				1.2	●	●	●	●
 Finishing-Medium / Up facing	WNMG 080404CQ	12.70	4.76	5.16	0.4	●	●	●	●
	080408CQ				0.8	●	●	●	●
	080412CQ				1.2	●	●	●	●
 Finishing-Medium / Up facing	WNMG 080408CJ	12.70	4.76	5.16	0.8	●	●	●	●
	080412CJ				1.2	●	●	●	●
 Medium-Roughing	WNMG 060404GS	9.525	4.76	3.81	0.4	●	●	●	●
	060408GS				0.8	●	●	●	●
	080404GS	12.70	4.76	5.16	0.4	●	●	●	●
080408GS	0.8				●	●	●	●	
 Medium-Roughing	080412GS	12.70	4.76	5.16	1.2	●	●	●	●
	080404PG				0.4	●	●	●	●
	080408PG				0.8	●	●	●	●
	080412PG				1.2	●	●	●	●
080416PG	1.6	●	●	●	●				









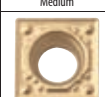


● : Available

Shape	Description	Dimensions (mm)				CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (rε)				
 Medium-Roughing	WNMG 080404PS	12.70	4.76	5.16	0.4	●	●	●	●
	080408PS				0.8	●	●	●	●
	080412PS				1.2	●	●	●	●
	080416PS				1.6	●	●	●	●
 Medium-Roughing / High feed	WNMG 080408PT	12.70	4.76	5.16	0.8	●	●	●	●
	080412PT				1.2	●	●	●	●
 Medium-Roughing / High feed	WNMG 080408GT	12.70	4.76	5.16	0.8	●	●	●	●
	080412GT				1.2	●	●	●	●
 Roughing	WNMG 080404	12.70	4.76	5.16	0.4	●	●	●	●
	080408				0.8	●	●	●	●
	080412				1.2	●	●	●	●
 Roughing	WNMG 080408PH	12.70	4.76	5.16	0.8	●	●	●	●
	080412PH				1.2	●	●	●	●
 Low carbon steel / Finishing	WNMG 080404XP	12.70	4.76	5.16	0.4	●	●	●	●
	080408XP				0.8	●	●	●	●
 Low carbon steel / Medium	WNMG 080404XQ	12.70	4.76	5.16	0.4	●	●	●	●
	080408XQ				0.8	●	●	●	●
 Low carbon steel / Roughing	WNMG 080408XS	12.70	4.76	5.16	0.8	●	●	●	●

● : Available

Positive type inserts















Shape	Description	Dimensions (mm)				Relief Angle	CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (r _e)					
	CCMT 060202WP	6.35	2.38	2.8	0.2	7°	●	●	●	●
	060204WP				0.4		●	●	●	●
	060208WP				0.8		●	●	●	●
	CCMT 09T302WP	9.525	3.97	4.4	0.2	7°	●	●	●	●
	09T304WP				0.4		●	●	●	●
	09T308WP				0.8		●	●	●	●
	CCMT 060202PP	6.35	2.38	2.8	0.2	7°	●	●	●	●
	060204PP				0.4		●	●	●	●
	CCMT 09T302PP	9.525	3.97	4.4	0.2	7°	●	●	●	●
09T304PP	0.4				●		●	●	●	
09T308PP	0.8				●		●	●	●	
	CCMT 060202GK	6.35	2.38	2.8	0.2	7°	●	●	●	●
	060204GK				0.4		●	●	●	●
	CCMT 09T302GK	9.525	3.97	4.4	0.2	7°	●	●	●	●
	09T304GK				0.4		●	●	●	●
	CCMT 120404GK	12.70	4.76	5.5	0.4	7°	●	●	●	●
	120408GK				0.8		●	●	●	●
120412GK	1.2				●		●	●	●	
	CCMT 060202HQ	6.35	2.38	2.8	0.2	7°	●	●	●	●
	060204HQ				0.4		●	●	●	●
	CCMT 09T302HQ	9.525	3.97	4.4	0.2	7°	●	●	●	●
	09T304HQ				0.4		●	●	●	●
	09T308HQ				0.8		●	●	●	●
		CCMT 09T308	9.525	3.97	4.4	0.8	7°	●	●	●
	CPMT 080202PP	7.94	2.38	3.3	0.2	11°	●	●	●	●
	080204PP				0.4		●	●	●	●
	CPMT 090302PP	9.525	3.18	4.4	0.2	11°	●	●	●	●
	090304PP				0.4		●	●	●	●
	090308PP				0.8		●	●	●	●
		CPMT 080204GP	7.94	2.38	3.3	0.4	11°	●	●	●
090304GP		0.4				●		●	●	●
CPMT 090308GP		9.525	3.18	4.4	0.8	11°	●	●	●	●
	CPMH 080204HQ	7.94	2.38	3.5	0.4	11°	●	●	●	●
	080208HQ				0.8		●	●	●	●
	CPMH 090304HQ	9.525	3.18	4.5	0.4	11°	●	●	●	●
	090308HQ				0.8		●	●	●	●
	CPMH 080204	7.94	2.38	3.5	0.4	11°	●	●	●	●
	080208				0.8		●	●	●	●
	CPMH 090304	9.525	3.18	4.5	0.4	11°	●	●	●	●
	090308				0.8		●	●	●	●
	CPMT 080204XP	7.94	2.38	3.3	0.4	11°	●	●	●	●
	090304XP				0.4		●	●	●	●
	CPMT 090308XP	9.525	3.18	4.4	0.8	11°	●	●	●	●
	090308XP				0.8		●	●	●	●
	CPMT 090304XQ	9.525	3.18	4.4	0.4	11°	●	●	●	●
	090308XQ				0.8		●	●	●	●

Shape	Description	Dimensions (mm)				Relief Angle	CA510	CA515	CA525	CA530
		I.C.	Thickness	Hole	Corner-R (r _e)					
	DCMX 070202WP	6.35	2.38	2.8	0.2	7°	●	●	●	●
	070204WP				0.4		●	●	●	●
	070208WP				0.8		●	●	●	●
	DCMX 11T302WP	9.525	3.97	4.4	0.2	7°	●	●	●	●
	11T304WP				0.4		●	●	●	●
	11T308WP				0.8		●	●	●	●
	DCMT 070202PP	6.35	2.38	2.8	0.2	7°	●	●	●	●
	070204PP				0.4		●	●	●	●
	DCMT 11T302PP	9.525	3.97	4.4	0.2	7°	●	●	●	●
	11T304PP				0.4		●	●	●	●
11T308PP	0.8				●		●	●	●	
	DCMT 070202GP	6.35	2.38	2.8	0.2	7°	●	●	●	●
	070204GP				0.4		●	●	●	●
	DCMT 11T304GP	9.525	3.97	4.4	0.4	7°	●	●	●	●
	11T308GP				0.8		●	●	●	●
	DCMT 070202GK	6.35	2.38	2.8	0.2	7°	●	●	●	●
	070204GK				0.4		●	●	●	●
	DCMT 070208GK	9.525	3.97	4.4	0.8	7°	●	●	●	●
	070208GK				0.8		●	●	●	●
	DCMT 11T302GK	9.525	3.97	4.4	0.2	7°	●	●	●	●
	11T304GK				0.4		●	●	●	●
	11T308GK				0.8		●	●	●	●
	DCMT 070202HQ	6.35	2.38	2.8	0.2	7°	●	●	●	●
	070204HQ				0.4		●	●	●	●
	DCMT 070208HQ	9.525	3.97	4.4	0.8	7°	●	●	●	●
070208HQ	0.8				●		●	●	●	
	DCMT 11T302HQ	9.525	3.97	4.4	0.2	7°	●	●	●	●
	11T304HQ				0.4		●	●	●	●
	11T308HQ				0.8		●	●	●	●
	DCMT 070204XP	6.35	2.38	2.8	0.4	7°	●	●	●	●
	DCMT 11T302XP	9.525	3.97	4.4	0.2	7°	●	●	●	●
	11T304XP				0.4		●	●	●	●
	11T308XP				0.8		●	●	●	●
	DCMT 11T304XQ	9.525	3.97	4.4	0.4	7°	●	●	●	●
11T308XQ	0.8				●		●	●	●	
	RCMX 1003M0	10.0	3.18	3.6	—	7°	●	●	●	●
	RCMX 1204M0	12.0	4.76	4.2	—		●	●	●	●
	SCMT 09T304HQ	9.525	3.97	4.4	0.4	7°	●	●	●	●
	09T308HQ				0.8		●	●	●	●
	SPMR 090304	9.525	3.18	—	0.4	11°	●	●	●	●
	090308				0.8		●	●	●	●
	SPMR 120304	12.70	3.18	—	0.4	11°	●	●	●	●
	120308				0.8		●	●	●	●
	TBMT 060102DP	3.97	1.59	2.3	0.2	5°	●	●	●	●
	060104DP				0.4		●	●	●	●














● : Available

● : Available

Positive type inserts

Shape	Description	Dimensions (mm)				Relief Angle	CA510	CA515	CA525	CA530	
		I.C.	Thickness	Hole	Corner-R (r)						
 Finishing with wiper edge	TCMX 090204WP	5.56	2.38	2.5	0.4	7°	●	●	●	●	
	TCMX 110204WP	6.35	2.38	2.8	0.4	7°	●	●	●	●	
 Finishing-Medium	TCMT 110204HQ	6.35	2.38	2.8	0.4	7°	●	●	●	●	
	TCMT 110208HQ				0.8		●	●	●	●	
 Finishing with wiper edge	TPMX 090202WP	5.56	2.38	3.0	0.2	11°	●	●	●	●	
					090204WP		0.4	●	●	●	●
					090208WP		0.8	●	●	●	●
	TPMX 110302WP	6.35	3.18	3.3	0.2	11°	●	●	●	●	
					110304WP		0.4	●	●	●	●
					110308WP		0.8	●	●	●	●
 Finishing	TPMT 090202PP	5.56	2.38	2.8	0.2	11°	●	●	●	●	
					090204PP		0.4	●	●	●	●
	TPMT 110302PP	6.35	3.18	3.3	0.2	11°	●	●	●	●	
					110304PP		0.4	●	●	●	●
 Finishing	TPMT 110308PP	6.35	3.18	3.3	0.4	11°	●	●	●	●	
					0.8		●	●	●	●	
	TPMT 160304GP	9.525	3.18	4.4	0.4	11°	●	●	●	●	
					0.8		●	●	●	●	
 Finishing	TPMT 090204GP	5.56	2.38	2.8	0.4	11°	●	●	●	●	
					0.8		●	●	●	●	
	TPMT 110304GP	6.35	3.18	3.3	0.4	11°	●	●	●	●	
					0.8		●	●	●	●	
 Finishing	TPMT 160304GP	9.525	3.18	4.4	0.4	11°	●	●	●	●	
					0.8		●	●	●	●	
	TPMT 090202HQ	5.56	2.38	2.8	0.2	11°	●	●	●	●	
					090204HQ		0.4	●	●	●	●
					0.8		●	●	●	●	
	 Finishing-Medium	TPMT 110302HQ	6.35	3.18	3.3	0.2	11°	●	●	●	●
110304HQ						0.4		●	●	●	●
110308HQ		6.35	3.18	3.3	0.4	11°	●	●	●	●	
					0.8		●	●	●	●	
 Finishing-Medium	TPMT 160304HQ	9.525	3.18	4.4	0.4	11°	●	●	●	●	
					160308HQ		0.8	●	●	●	●
	TPMT 090204XP	5.56	2.38	2.8	0.4	11°	●	●	●	●	
					0.8		●	●	●	●	
 Low carbon steel / Finishing	TPMT 110304XP	6.35	3.18	3.3	0.4	11°	●	●	●	●	
					110308XP		0.8	●	●	●	●
	TPMT 160304XP	9.525	3.18	4.4	0.4	11°	●	●	●	●	
 Low carbon steel / Finishing-Medium	TPMT 160308XP	9.525	3.18	4.4	0.8	11°	●	●	●	●	
					0.4		●	●	●	●	
	TPMT 110304XQ	6.35	3.18	3.3	0.4	11°	●	●	●	●	
					110308XQ		0.8	●	●	●	●
 Low carbon steel / Finishing-Medium	TPMT 160304XQ	9.525	3.18	4.4	0.4	11°	●	●	●	●	
					160308XQ		0.8	●	●	●	●
	TPMR 160304GP	9.525	3.18	—	0.4	11°	●	●	●	●	
					0.8		●	●	●	●	
 Finishing	TPMR 110304HQ	6.35	3.18	—	0.4	11°	●	●	●	●	
					110308HQ		0.8	●	●	●	●
	TPMR 160304HQ	9.525	3.18	—	0.4	11°	●	●	●	●	
					160308HQ		0.8	●	●	●	●
 Finishing-Medium	TPMR 110304	6.35	3.18	—	0.4	11°	●	●	●	●	
					110308		0.8	●	●	●	●
	TPMR 160304	9.525	3.18	—	0.4	11°	●	●	●	●	
					160308		0.8	●	●	●	●

● : Available

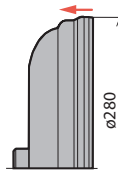
Shape Handed Insert shows Left-hand	Description	Dimensions (mm)				Relief Angle	CA510	CA515	CA525	CA530	
		I.C.	Thickness	Hole	Corner-R (r)						
 Finishing	VBMT 110302PP	6.35	3.18	2.8	0.2	5°	●	●	●	●	
	110304PP				0.4		●	●	●	●	
	110308PP				0.8		●	●	●	●	
 Finishing	VBMT 160404PP	9.525	4.76	4.4	0.4	5°	●	●	●	●	
	160408PP				0.8		●	●	●	●	
	160412PP				1.2		●	●	●	●	
 Finishing	VBMT 110304GP	6.35	3.18	2.8	0.4	5°	●	●	●	●	
	VBMT 160404GP	9.525	4.76	4.4	0.4	5°	●	●	●	●	
					0.8		●	●	●	●	
 Finishing	VBMT 110302VF	6.35	3.18	2.8	0.2	5°	●	●	●	●	
					110304VF		0.4	●	●	●	●
					110308VF		0.8	●	●	●	●
	VBMT 160402VF	9.525	4.76	4.4	0.2	5°	●	●	●	●	
					160404VF		0.4	●	●	●	●
					160408VF		0.8	●	●	●	●
160412VF	1.2	●	●	●	●						
 Finishing-Medium	VBMT 110304HQ	6.35	3.18	2.8	0.4	5°	●	●	●	●	
					110308HQ		0.8	●	●	●	●
	VBMT 160404HQ	9.525	4.76	4.4	0.4	5°	●	●	●	●	
					160408HQ		0.8	●	●	●	●
160412HQ	1.2	●	●	●	●						
 Finishing	VCMT 080202PP	4.76	2.38	2.3	0.2	7°	●	●	●	●	
	080204PP				0.4		●	●	●	●	
	VCMT 160404PP	9.525	4.76	4.4	0.4	7°	●	●	●	●	
 Finishing	VCMT 160408PP	9.525	4.76	4.4	0.8	7°	●	●	●	●	
					0.4		●	●	●	●	
 Finishing	VCMT 080202VF	4.76	2.38	2.3	0.2	7°	●	●	●	●	
					080204VF		0.4	●	●	●	●
 Finishing-Medium	VCMT 080202HQ	4.76	2.38	2.3	0.2	7°	●	●	●	●	
					080204HQ		0.4	●	●	●	●
 Finishing	WBMT 060102L-DP	3.97	1.59	2.3	0.2	5°	L	L	L	L	
	060104L-DP				0.4		L	L	L	L	
 Finishing	WBMT 080202L-DP	4.76	2.38	2.3	0.2	5°	L	L	L	L	
					080204L-DP		0.4	L	L	L	L
 Finishing	WPMT 110204GP	6.35	2.38	2.8	0.4	11°	●	●	●	●	
	WPMT 160304GP	9.525	3.18	4.4	0.4	11°	●	●	●	●	
 Finishing	WPMT 110202HQ	6.35	2.38	2.8	0.2	11°	●	●	●	●	
					110204HQ		0.4	●	●	●	●
	WPMT 160304HQ	9.525	3.18	4.4	0.4	11°	●	●	●	●	
					160308HQ		0.8	●	●	●	●

● : Available
L : L-hand Only

Case studies

Hot rolled steel

Automotive parts
 $V_c = 500$ m/min
 $a_p = 0.7$ mm
 $f = 0.3$ mm/rev
 Wet
 CNMG120408PG



CA510

100 pcs/edge

x1.3

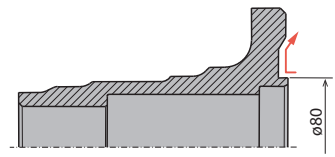
Competitor F*

75 pcs/edge

CA510 produces 33% longer tool life compared to competitor F's CVD. (User evaluation)

Carbon steel

Automotive parts
 $V_c = 300$ m/min
 $a_p = 1.0$ mm
 $f = 0.3$ mm/rev
 Wet
 DNMG150408PQ



CA510

200 pcs/edge

x1.3

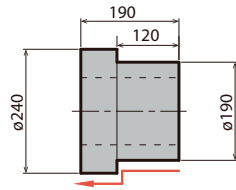
Competitor G*

150 pcs/edge

CA510 produces 33% longer tool life compared to competitor G's CVD. (User evaluation)

42CrMo4

Cover
 $V_c = 140\text{--}150$ m/min
 $a_p = 3.0\text{--}3.5$ mm
 $f = 0.35\text{--}0.4$ mm/rev
 Wet
 CNMG120408PT



CA515

10 pcs/edge

x1.4

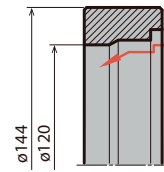
Competitor H*

7 pcs/edge

CA515 produces 43% longer tool life compared to competitor H's CVD. (User evaluation)

17Cr3

Gear
 $V_c = 380$ m/min
 $a_p = 1.5\text{--}2.0$ mm
 $f = 0.3\text{--}0.4$ mm/rev
 Wet
 WNMG080408PQ



CA515

430 pcs/edge

x1.1

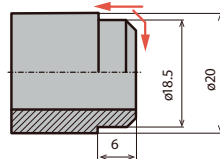
Competitor I*

380 pcs/edge

CA515 produces 13% longer tool life compared to competitor I's CVD. (User evaluation)

Ust42-2

Machine Part
 $V_c = 170$ m/min
 $a_p = 0.8$ mm
 $f = 0.2$ mm/rev
 Wet
 CNMG120408PQ



CA525

1,400 pcs/edge and more

x1.4

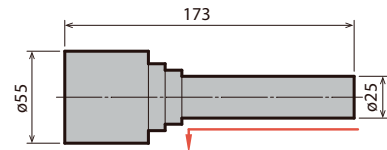
Competitor J*

800-1,000 pcs/edge

CA525 produces 43% longer tool life compared to competitor J's CVD. Chip control was smooth. (User evaluation)

20CrMo5

Shaft
 $V_c = 120$ m/min
 $a_p = 2.0$ mm
 $f = 0.25$ mm/rev
 Dry
 TNMG160408R-ST



CA525

10 pcs/edge

x5

Competitor K*

2 pcs/edge

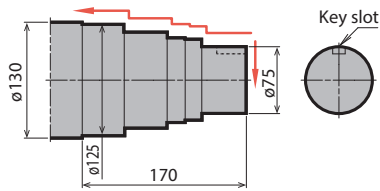
CA525 shows 5 times longer tool life compared to competitor K's CVD. (User evaluation)

* CVD coated carbide

Case studies

C45

Shaft
 Vc = 250 m/min
 ap = 3.0 mm
 f = 0.3 mm/rev
 Wet
 CNMG120408PS



CA525

10 pcs/edge

x1.6

Competitor L*
 Competitor M**

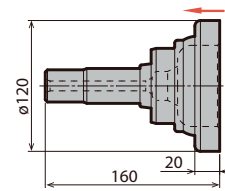
6 pcs/edge

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)

20CrMo5

Flange shaft
 Vc = 260~280 m/min
 ap = 0.6 mm
 f = 0.3~0.5 mm/rev
 Wet
 CNMG120408PQ



CA525

180 pcs/edge

x1.2

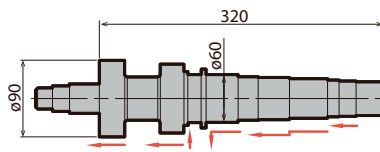
Competitor N*

150 pcs/edge

CA525 produces 20% longer tool life compared to competitor N's CVD. (User evaluation)

C45

Shaft
 Vc = 100 m/min
 ap = 2.0~4.0 mm
 f = 0.4 mm/rev
 Wet
 WNMG080408PS



CA525

70 pcs/edge

x1.7

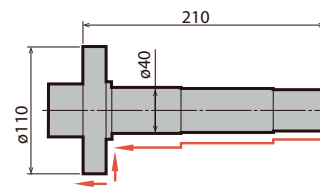
Competitor O*

40 pcs/edge

CA525 produces 70% longer tool life compared to competitor O's CVD. (User evaluation)

20Cr4

Shaft
 Vc = 90 m/min
 ap = 2.0~3.0 mm
 f = 0.32 mm/rev
 Wet
 WNMG080408PS



CA525

260 pcs/edge

x1.3

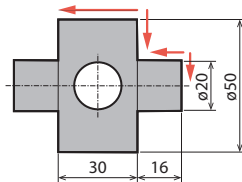
Competitor P*

190 pcs/edge

CA525 produces 30% longer tool life compared to competitor P's CVD. (User evaluation)

17Cr3

Gear
 Vc = 180 m/min
 ap = 2.0 mm
 f = 0.2 mm/rev
 Wet
 DNMG150404CQ



CA530

10 pcs/edge

x1.25

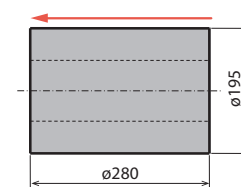
Competitor Q*

3-8 pcs/edge

CA530 averages 25% longer tool life compared to competitor Q's CVD. (User evaluation)

X6Cr13

Machine Parts
 Vc = 100 m/min
 ap = 2.0 mm
 f = 0.4 mm/rev
 Wet
 SNMG120412PH



CA530

9 pcs/edge

x1.8

Efficiency
11%

Competitor R*

5 pcs/edge

CA530 produces 80% longer tool life compared to competitor R's CVD. Improved machining efficiency by 1.1 times. (User evaluation)

* CVD coated carbide

** PVD coated carbide