

Tungaloy

Member IMC Group

Keeping the Customer First

Tungaloy Report No. 359-E

TURNLINE CVD Coated Grade for Grey and Ductile Cast Iron Turning

T5100 SERIES

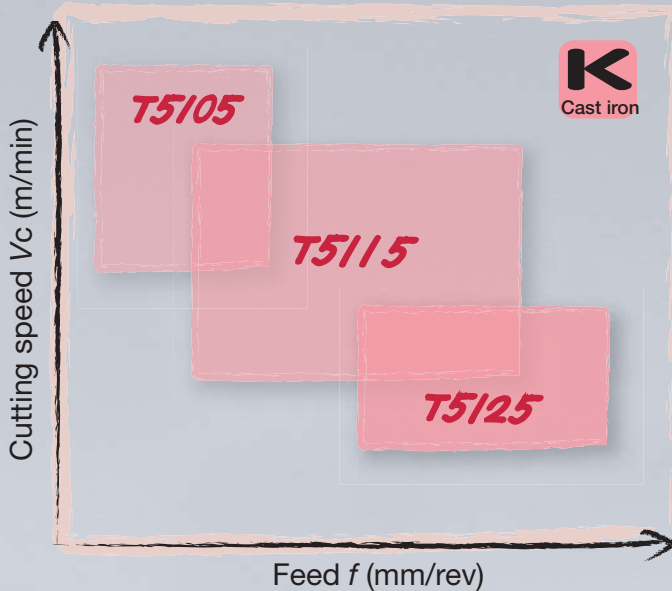
PREMIUMTEC
TUNGALOY

For a wide range of cast iron turning applications



Drastically improved wear and chipping resistance by newly developed coating and exclusive substrate

Application Range



Grades

T5105 High wear resistance grade
The T5105 grade is suitable for high speed continuous machining.

T5115 **First Choice !!**
Multi purpose machining grade
All-round grade for a wide range of applications from continuous to interrupted turning.

T5125 Extremely tough grade
The T5125 is suitable for heavy interrupted cutting with remarkably high impact resistance.

Features

Special Surface Technology

PREMIUMTEC

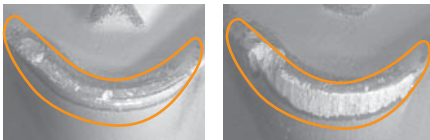
TUNGALOY

Smooth insert surface prevents chip adhesion and improves chip flow.

Comparison of welding on the edge

Smooth surface prevents chips from welding on to the cutting edge. This also improves the quality of the machined surface.

Edge condition after 40min machining

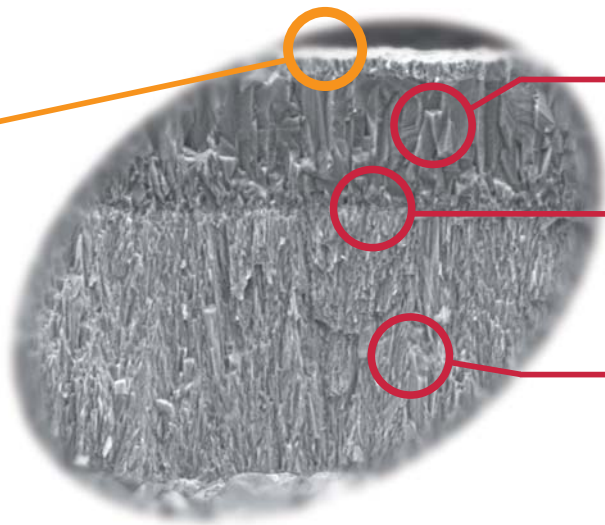


T5115 Conventional Insert

Insert : **CNMG120412-CM T5115**
Work material : FCD600 (GGG60)
Cutting speed : $V_c = 150$ m/min
Feed : $f = 0.35$ mm/rev
Depth of cut : $a_p = 2.0$ mm
Machining : Continuous and interrupted cutting
Coolant : Water soluble cutting fluid

Application	Grade		Substrate			Coating layer		Features
	Application code		Specific gravity	Hardness (HRA)	T.R.S. (GPa)	Main Composition	Thickness (μ m)	
K Cast iron	T5105		15.0	92.5	2.4	Fine columnar TiCN + Al ₂ O ₃	16	For grey & ductile cast iron turning The T5100 series has the well balanced combination of a coating with fine and hard crystals and a fine substrate with extremely high toughness levels.
	K05 - K15							
	T5115		14.8	91.5	2.7			
	K10 - K20							
	T5125		14.0	90.5	2.8			
K15 - K30								

are provided



Improved chipping resistance

Fine-grained particles in the alumina layer

Strong adhesion

Fine interlayer with high density

Improved wear resistance

Fine-grained Ti(C,N) crystallization with high carbon content

▼ **Comparison of wear resistance**
The fine-grained Ti(C,N) coating layer has excellent wear resistance.

Insert : **CNMG120412-CM**
Work material : Ductile iron (FCD600)
Cutting speed : $V_c = 200$ m/min
Feed : $f = 0.35$ mm/rev
Depth of cut : $a_p = 2.0$ mm
Machining : Facing (continuous)
Coolant : Water soluble

■ Comparison in K05 - K10 class grade

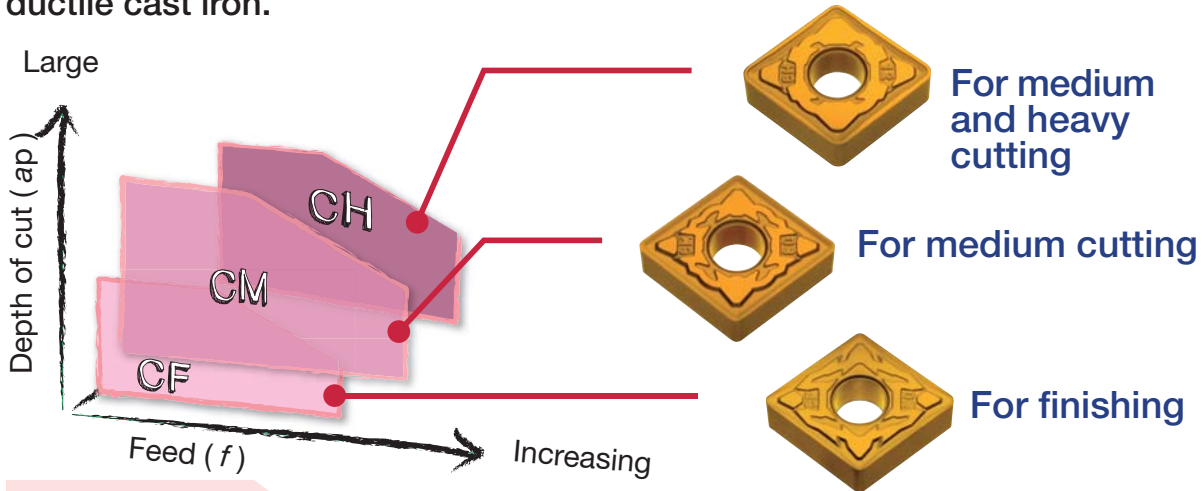
	T5105	Competitor A	Competitor B
10 min			
30 min			

■ Comparison in K10 - K20 class grade

	T5115	Competitor A	Competitor B
10 min			
30 min			

Chipbreaker (For negative inserts)

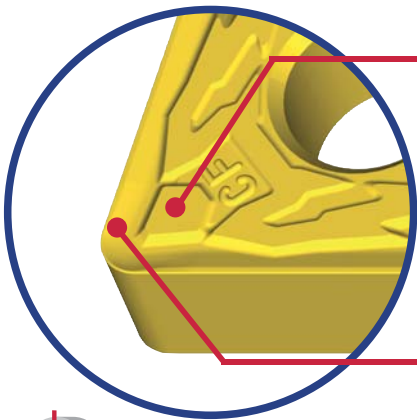
Three types of grade and chipbreaker provide excellent performance on grey and ductile cast iron.



CF type

Low cutting force

Suitable for burr reduction and low rigidity machining



Stable insert seating

Seating stability is improved with a new bottom face design

→ This stabilizes the tool life by reducing the vibration when cutting

Arc-shaped rake face

The cutting force is reduced with a large rake angle

→ Prevents chattering and deformation in low rigidity machining

→ Improves wear resistance in finishing



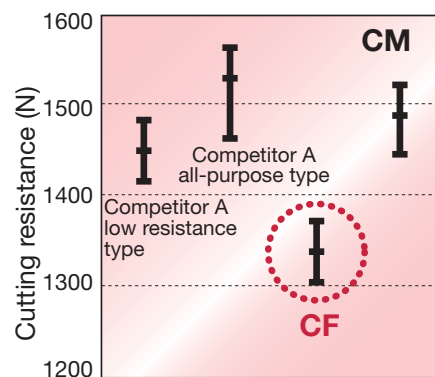
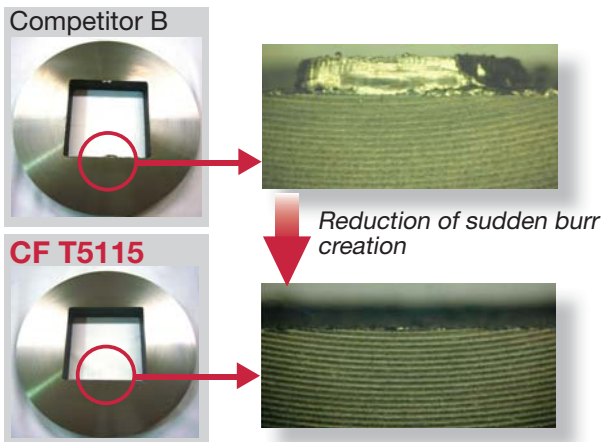
Reducing burr

The sharp edge prevents burr and edge breakout.



Low cutting force

10% reduction when compared to competitors.

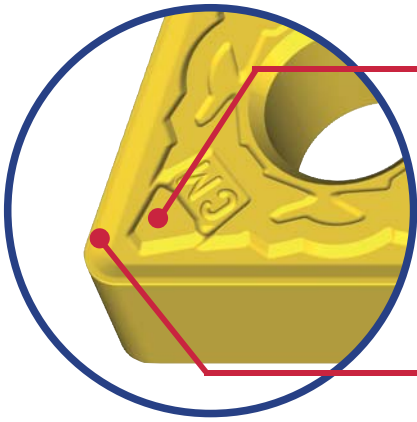


Insert	: CNMG120412-CF T5115
Toolholder	: ACLNR2525M12-A
Work material	: FCD600 (GGG60)
Cutting speed	: $V_c = 150$ m/min
Feed	: $f = 0.35$ mm/rev
Depth of cut	: $a_p = 2.0$ mm
Machining	: Continuous and interrupted face turning
Coolant	: Water soluble

Insert	: CNMG120412-CF T5115
Toolholder	: ACLNR2525M12-A
Work material	: FCD600 (GGG60)
Cutting speed	: $V_c = 200$ m/min
Feed	: $f = 0.3$ mm/rev
Depth of cut	: $a_p = 0.5$ mm
Machining	: Continuous face turning
Coolant	: Water soluble

CMtype

1st choice
All-round chipbreaker



Stable insert seating on the toolholder

Seating stability is improved with a new bottom face design

→ This stabilizes the tool life by reducing the vibration when cutting

Positive land

The new cutting edge designed offers the balance of low cutting forces and chipping resistance

→ Suitable for wide application range



Stable tool life in continuous-interrupted cutting

Excellent performance in continuous-interrupted cutting



Reducing burr

Optimal edge shape reduces burrs and stabilises tool life.

	CM type with T5115	Conventional (K20 class)	Competitor (K20 class)
40 min	Small wear	Wear	Fracture
60 min	Still available Withstands interrupted cutting		

After 20 minutes machining



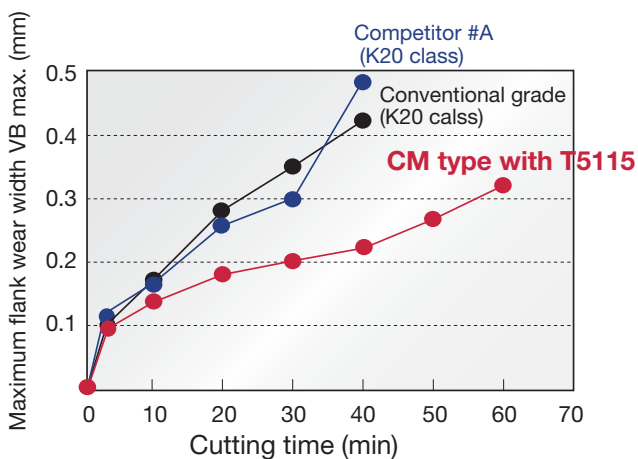
60% reduction of burr



Competitor B (general type)

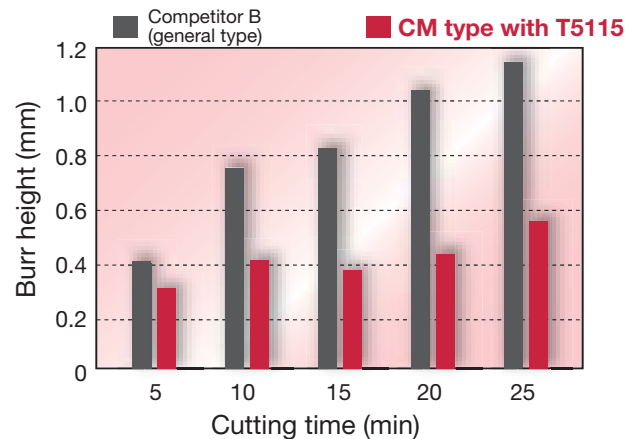
CM type with T5115

Comparison of flank wear



Insert used : **CNMG120412-CM T5115**
 Toolholder used : ACLNR2525M12-A
 Work material : FCD600 (GGG60)
 Cutting speed : $V_c = 150$ m/min
 Feed : $f = 0.35$ mm/rev
 Depth of cut : $a_p = 2.0$ mm
 Machining : Facing, continuous and interrupted
 Coolant : Water soluble

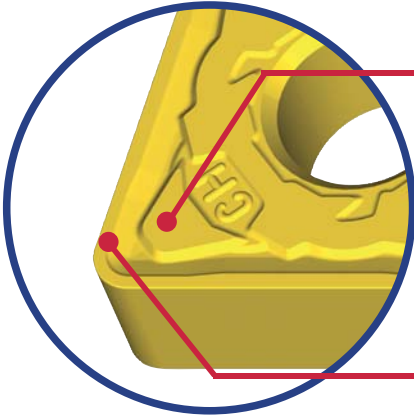
Difference of burr height



Insert : **CNMG120412-CM T5115**
 Toolholder : ACLNR2525M12-A
 Work material : FCD600 (GGG60)
 Cutting speed : $V_c = 150$ m/min
 Feed : $f = 0.35$ mm/rev
 Depth of cut : $a_p = 2.0$ mm
 Machining : Continuous and interrupted face turning
 Coolant : Water soluble

CH type

With strengthened edge
For heavy machining



Stable insert seating on the toolholder
Seating stability is improved with a new bottom face design

→ This stabilizes the tool life by reducing the vibration when cutting

Wide negative land and land support
Wide negative land

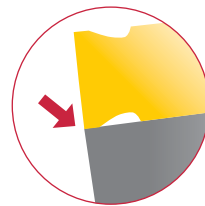
→ Very strong cutting edge even when heavy turning

Land support

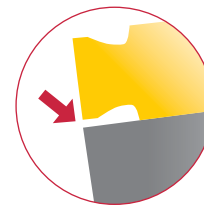
→ Reduces chatter and increases the tool life

Land support

Large contact area stabilises machining when heavy turning.



CH type breaker

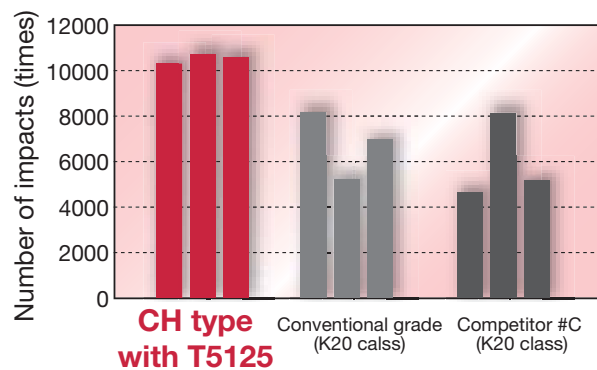


Conventional 3-D chipbreaker



Long tool life in heavy interrupted turning

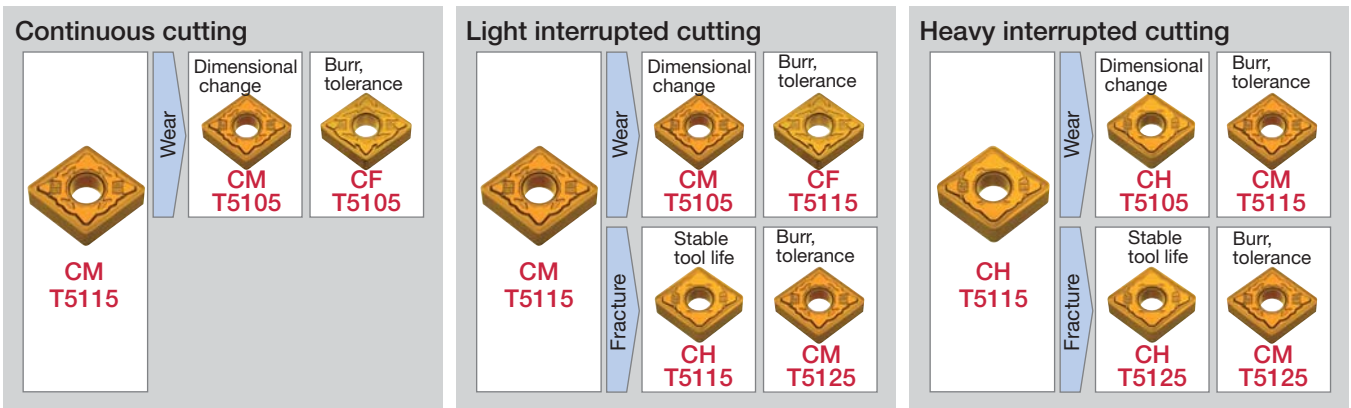
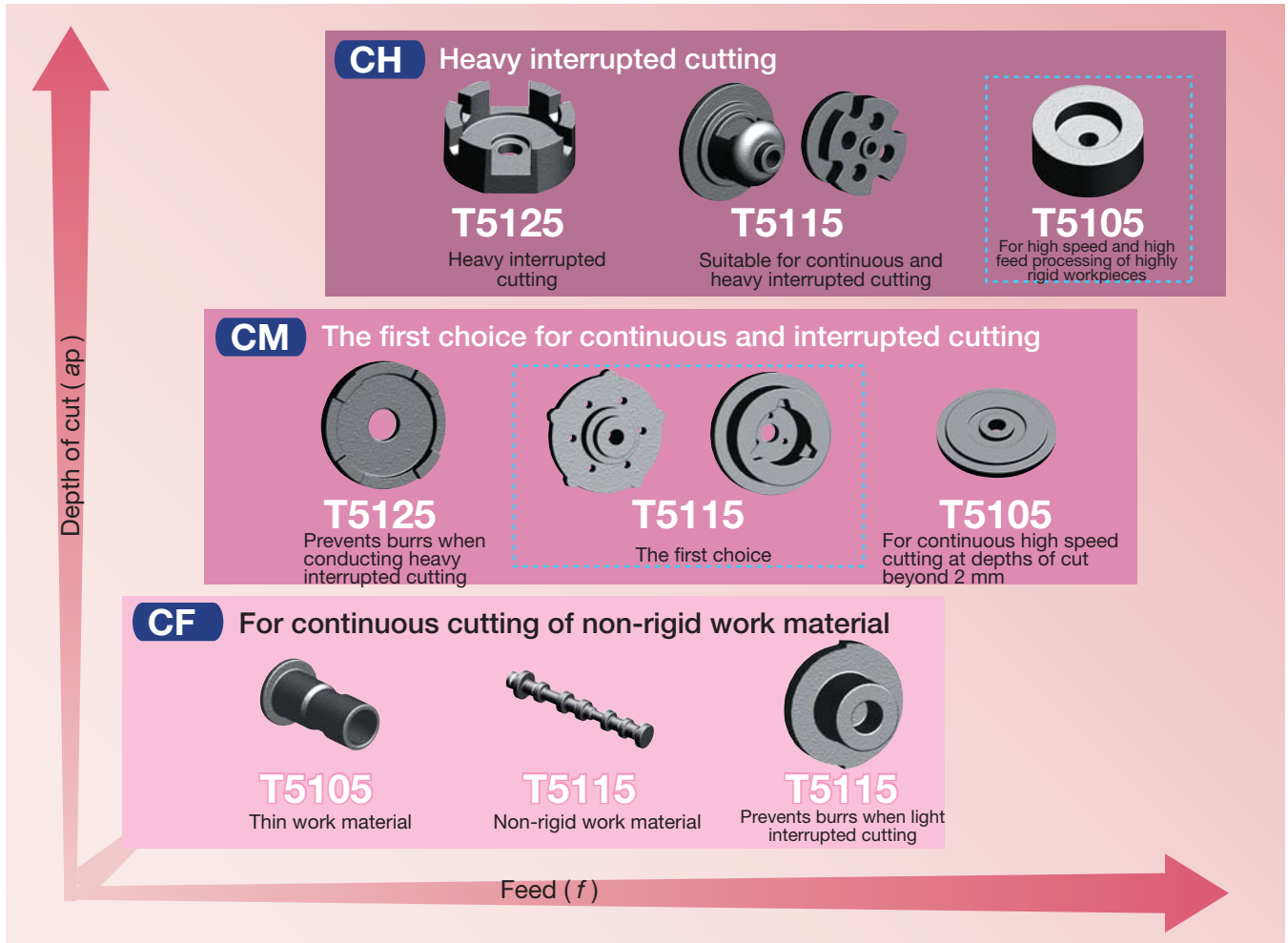
150% tool life improvement in heavy interrupted turning credit to the strong cutting edge.



	CH T5125	Conventional (K20 class)	Competitor #C (K20 class)
5 min	Normal wear	Chipping	
15 min	Small welding	Large welding	Large welding
Final	Normal wear 30 min	20 min	23 min

Insert : **CNMG120412-CH T5125**
 Toolholder : ACLNR2525M12-A
 Work material : FCD600 (GGG60)
 Cutting speed : $V_c = 150$ m/min
 Depth of cut : $a_p = 2.0$ mm
 Feed : $f = 0.35$ mm/rev
 Machining : Interrupted face turning
 Coolant : Water soluble

Selection guide



Standard cutting conditions For negative insert

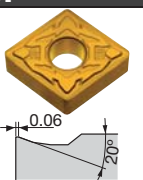
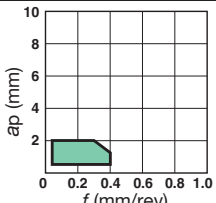
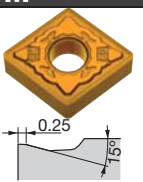
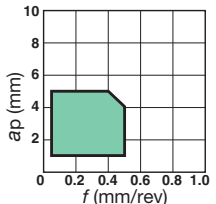
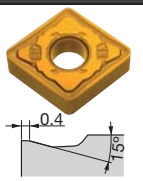
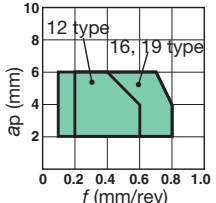
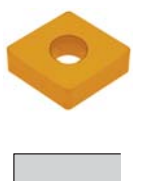
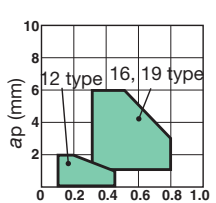
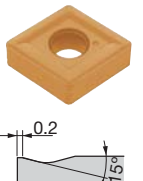
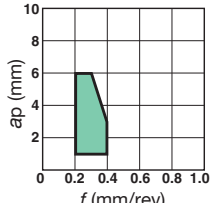
Chipbreaker	Corner radius (mm)	Depth of cut a_p (mm)	Feed f (mm/rev)
CF	0.4	1.0 (0.5- 2.0)	0.15 (0.05 - 0.2)
	0.8		0.25 (0.1 - 0.35)
	1.2		0.3 (0.1 - 0.4)
	1.6		0.35 (0.15 - 0.5)
CM	0.4	2.0 (1.0- 5.0)	0.15 (0.05 - 0.2)
	0.8		0.3 (0.15 - 0.4)
	1.2		0.35 (0.15 - 0.5)
	1.6		0.45 (0.2 - 0.8)
CH	0.4	3.0 (2.0 - 6.0)	0.2 (0.1 - 0.3)
	0.8		0.35 (0.2 - 0.45)
	1.2		0.4 (0.2 - 0.6)
	1.6		0.45 (0.3 - 0.8)

Chipbreaker	Corner radius (mm)	Depth of cut a_p (mm)	Feed f (mm/rev)
without chipbreaker	0.4	1.0 (0.05- 2.0)	0.2 (0.1 - 0.3)
	0.8		0.35 (0.2 - 0.45)
	1.2		0.45 (0.3 - 0.8)
	1.6		0.45 (0.3 - 0.8)
All-round	0.4	3.0 (1.0 - 6.0)	0.25 (0.2 - 0.3)
	0.8		0.3 (0.2 - 0.5)
	1.2		0.3 (0.2 - 0.5)

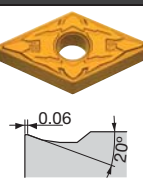
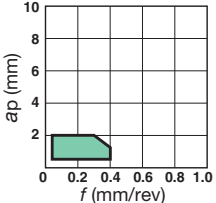
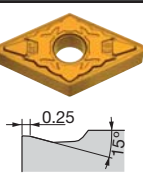
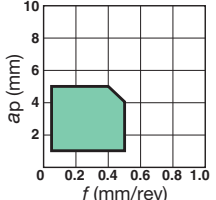
Grades	Cutting Speed V_c (m/min)	
	Grey cast iron	Ductile cast iron
T5105	330 (180 - 480)	290 (180 - 400)
T5115	270 (140 - 400)	255 (140 - 370)
T5125	210 (120 - 300)	180 (120 - 250)

Inserts Negative type

Rhombic, 80° negative

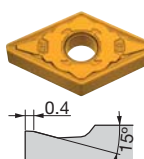
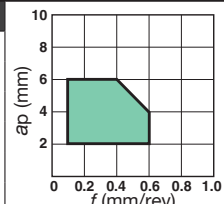
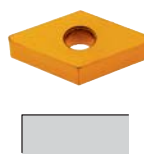
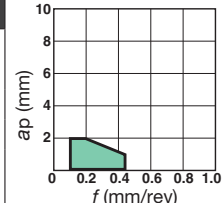
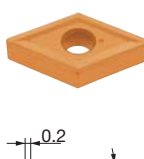
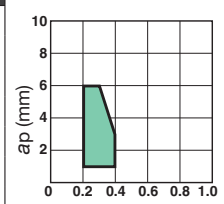
Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade		
				I.C. dia ϕd	Thick- ness s	Hole dia ϕd_1	Corner R $r \epsilon$	Coated		
								T5105	T5115	T5125
Finishing	CF 		CNMG120404-CF	12.70	4.76	5.16	0.4	●	●	
			CNMG120408-CF				0.8	●	●	
			* CNMG120412-CF				1.2	●	●	
Medium cutting	CM 		CNMG120404-CM	12.70	4.76	5.16	0.4	●	●	●
			CNMG120408-CM				0.8	●	●	●
			* CNMG120412-CM				1.2	●	●	●
			CNMG160608-CM	15.875	6.35	6.35	0.8	●	●	●
			CNMG160612-CM				1.2	●	●	●
Medium to heavy cutting	CH 		CNMG120404-CH	12.70	4.76	5.16	0.4	●	●	●
			CNMG120408-CH				0.8	●	●	●
			* CNMG120412-CH				1.2	●	●	●
			CNMG160612-CH	15.875	6.35	6.35	1.2	●	●	●
			CNMG160616-CH				1.6	●	●	●
			CNMG190612-CH	19.05	6.35	7.93	1.2	●	●	●
CNMG190616-CH	1.6	●	●				●			
Finishing to medium cutting	Without Chipbreaker 		CNMA120404	12.70	4.76	5.16	0.4	●	●	●
			CNMA120408				0.8	●	●	●
			CNMA120412				1.2	●	●	●
			CNMA120416				1.6	●	●	●
			CNMA160608	15.875	6.35	6.35	0.8	●	●	●
			CNMA160612				1.2	●	●	●
			CNMA160616				1.6	●	●	●
			CNMA190612	19.05	6.35	7.93	1.2	●	●	●
			CNMA190616				1.6	●	●	●
Medium cutting	All-round 		CNMG120404	12.70	4.76	5.16	0.4	●	●	●
			* CNMG120408				0.8	●	●	●
			CNMG120412				1.2	●	●	●
			CNMG120416				1.6	●	●	●
			CNMG160608	15.875	6.35	6.35	0.8	●	●	●
			CNMG160612				1.2	●	●	●
			CNMG160616				1.6	●	●	●
			CNMG190612	19.05	6.35	7.93	1.2	●	●	●
			CNMG190616				1.6	●	●	●

Rhombic, 55° negative


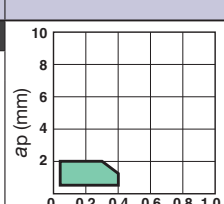
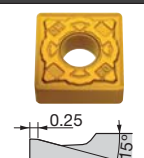
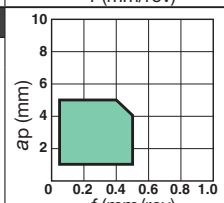
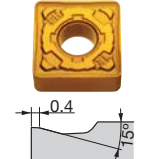
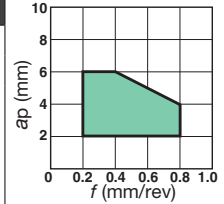
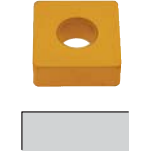
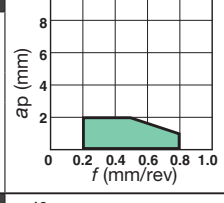
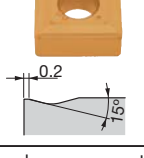
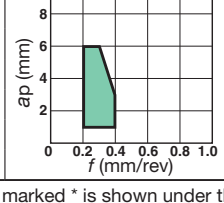
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				I.C. dia ϕd	Thick- ness s	Hole dia ϕd_1	Corner R $r \epsilon$	Coated		
								T5105	T5115	T5125
Finishing	CF 		DNMG150404-CF	12.70	4.76	5.16	0.4	●	●	
			DNMG150408-CF				0.8	●	●	
			* DNMG150412-CF				1.2	●	●	
			DNMG150604-CF	12.70	6.35	5.16	0.4	●	●	
			DNMG150608-CF				0.8	●	●	
DNMG150612-CF	1.2	●	●							
Medium cutting	CM 		DNMG150404-CM	12.70	4.76	5.16	0.4	●	●	●
			DNMG150408-CM				0.8	●	●	●
			* DNMG150412-CM				1.2	●	●	●
			DNMG150604-CM	12.70	6.35	5.16	0.4	●	●	●
			DNMG150608-CM				0.8	●	●	●
			DNMG150612-CM				1.2	●	●	●

Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade		
				I.C. dia ϕd	Thick- ness s	Hole dia ϕd_1	Corner R $r \epsilon$	Coated		
								T5105	T5115	T5125
Medium to heavy cutting	CH 		DNMG150404-CH	12.70	4.76	5.16	0.4	●	●	●
			DNMG150408-CH				0.8	●	●	●
			* DNMG150412-CH	12.70	6.35	5.16	1.2	●	●	●
			DNMG150604-CH				0.4	●	●	●
			DNMG150608-CH				0.8	●	●	●
			DNMG150612-CH				1.2	●	●	●
Finishing to medium cutting	Without Chipbreaker 		DNMA150404	12.70	4.76	5.16	0.4	●	●	●
			DNMA150408				0.8	●	●	●
			DNMA150412	12.70	6.35	5.16	1.2	●	●	●
			DNMA150604				0.4	●	●	●
			DNMA150608				0.8	●	●	●
			DNMA150612				1.2	●	●	●
Medium cutting	All-round 		DNMG110404	9.525	4.76	3.81	0.4	●	●	●
			DNMG110408				0.8	●	●	●
			DNMG150404	12.70	4.76	5.16	0.4	●	●	●
			* DNMG150408				0.8	●	●	●
			DNMG150412				1.2	●	●	●
			DNMG150416				1.6	●	●	●
			DNMG150604	12.70	6.35	5.16	0.4	●	●	●
			DNMG150608				0.8	●	●	●
			DNMG150612				1.2	●	●	●

Square, 90° negative

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade		
				I.C. dia ϕd	Thick- ness s	Hole dia ϕd_1	Corner R $r \epsilon$	Coated		
								T5105	T5115	T5125
Finishing	CF 		SNMG120408-CF	12.70	4.76	5.16	0.8	●	●	
			* SNMG120412-CF				1.2	●	●	
Medium cutting	CM 		SNMG120408-CM	12.70	4.76	5.16	0.8	●	●	●
			* SNMG120412-CM				1.2	●	●	●
Medium to heavy cutting	CH 		SNMG120408-CH	12.70	4.76	5.16	0.8	●	●	●
			* SNMG120412-CH				1.2	●	●	●
			SNMG120416-CH				1.6	●	●	●
Finishing to medium cutting	Without Chipbreaker 		SNMA120404	12.70	4.76	5.16	0.4	●	●	●
			SNMA120408				0.8	●	●	●
			SNMA120412				1.2	●	●	●
			SNMA120416				1.6	●	●	●
Medium cutting	All-round 		SNMG120404	12.70	4.76	5.16	0.4	●	●	●
			* SNMG120408				0.8	●	●	●
			SNMG120412				1.2	●	●	●
			SNMG120416				1.6	●	●	●
			SNMG120420	19.05	6.35	7.93	2.0	●	●	●
			SNMG190612				1.2	●	●	●
SNMG190616	1.6	●	●	●						

Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items

Triangular, 60° negative

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade		
				I.C.dia ϕd	Thick- ness s	Hole dia $\phi d1$	Corner R $r \epsilon$	Coated		
								T5105	T5115	T5125
Finishing	CF 		TNMG160404-CF	9.525	4.76	3.81	0.4	●	●	
			* TNMG160408-CF				0.8	●	●	
Medium cutting	CM 		TNMG160404-CM	9.525	4.76	3.81	0.4	●	●	●
			TNMG160408-CM				0.8	●	●	●
			* TNMG160412-CM	12.70	4.76	5.16	1.2	●	●	●
			TNMG220408-CM				0.8	●	●	●
TNMG220412-CM	1.2	●	●	●						
Medium to heavy cutting	CH 		TNMG160404-CH	9.525	4.76	3.81	0.4	●	●	●
			TNMG160408-CH				0.8	●	●	●
			* TNMG160412-CH	12.70	4.76	5.16	1.2	●	●	●
			TNMG220408-CH				0.8	●	●	●
			TNMG220412-CH	1.2	●	●	●			
			TNMG220416-CH	1.6	●	●	●			
Finishing to medium cutting	Without Chipbreaker 		TNMA160404	9.525	4.76	3.81	0.4	●	●	●
			TNMA160408				0.8	●	●	●
			TNMA160412				1.2	●	●	●
			TNMA160416				1.6	●	●	●
			TNMA160420	2.0	●	●	●			
			TNMA220404	12.70	4.76	5.16	0.4	●	●	●
			TNMA220408				0.8	●	●	●
			TNMA220412				1.2	●	●	●
			TNMA220416				1.6	●	●	●
			TNMA220416				1.6	●	●	●
TNMA220416	1.6	●	●				●			
Medium cutting	All-round 		TNMG110304	6.35	3.18	2.26	0.4	●	●	●
			TNMG110308				0.8	●	●	●
			TNMG160404	9.525	4.76	3.81	0.4	●	●	●
			* TNMG160408				0.8	●	●	●
			TNMG160412				1.2	●	●	●
			TNMG160416				1.6	●	●	●
			TNMG220408	12.70	4.76	5.16	0.8	●	●	●
			TNMG220412				1.2	●	●	●
			TNMG220412				1.2	●	●	●
			TNMG220416				1.6	●	●	●

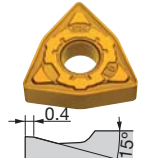
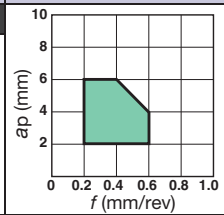
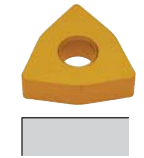
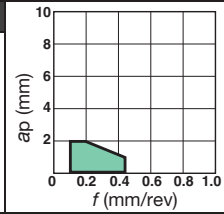
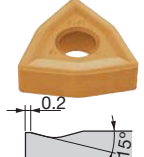
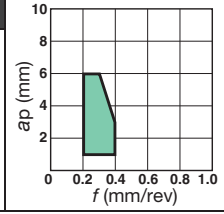
Trigon, 80° negative

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade		
				I.C.dia ϕd	Thick- ness s	Hole dia $\phi d1$	Corner R $r \epsilon$	Coated		
								T5105	T5115	T5125
Finishing	CF 		WNMG080404-CF	12.70	4.76	5.16	0.4	●	●	
			WNMG080408-CF				0.8	●	●	
			* WNMG080412-CF				1.2	●	●	
Medium cutting	CM 		WNMG080408-CM	12.70	4.76	5.16	0.8	●	●	●
			* WNMG080412-CM				1.2	●	●	●

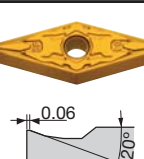
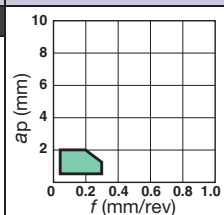
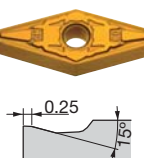
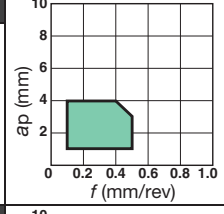
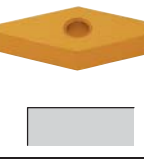
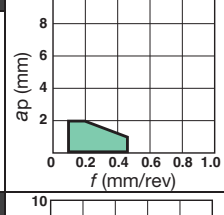
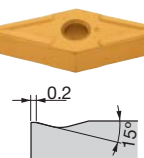
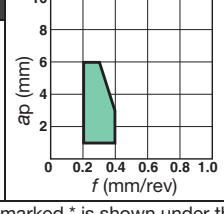
Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items



Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade		
				I.C.dia $\varnothing d$	Thick- ness s	Hole dia $\varnothing d_1$	Corner R $r \epsilon$	Coated		
								T5105	T5115	T5125
Medium to heavy cutting	CH 		WNMG080408-CH	12.70	4.76	5.16	0.8	●	●	●
			* WNMG080412-CH				1.2	●	●	●
Finishing to medium cutting	Without Chipbreaker 		WNMA080404	12.70	4.76	5.16	0.4	●	●	●
			WNMA080408				0.8	●	●	●
			WNMA080412				1.2	●	●	●
			WNMA080416				1.6	●	●	●
Medium cutting	All-round 		WNMG060404	9.525	4.76	3.81	0.4	●	●	●
			WNMG060408				0.8	●	●	●
			WNMG080404	12.70	4.76	5.16	0.4	●	●	●
			* WNMG080408				0.8	●	●	●
			WNMG080412				1.2	●	●	●
			WNMG080416				1.6	●	●	●

Rhombic, 35° negative

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade		
				I.C.dia $\varnothing d$	Thick- ness s	Hole dia $\varnothing d_1$	Corner R $r \epsilon$	Coated		
								T5105	T5115	T5125
Finishing	CF 		VNMG160404-CF	9.525	4.76	3.81	0.4	●	●	
			* VNMG160408-CF				0.8	●	●	
Medium cutting	CM 		VNMG160408-CM	9.525	4.76	3.81	0.8	●	●	●
			* VNMG160412-CM				1.2	●	●	●
Finishing to medium cutting	Without Chipbreaker 		VNMA160404	9.525	4.76	3.81	0.4	●	●	●
			VNMA160408				0.8	●	●	●
Medium cutting	All-round 		VNMG160404	9.525	4.76	3.81	0.4	●	●	●
			* VNMG160408				0.8	●	●	●
			VNMG160412				1.2	●	●	●

Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items

Chipbreaker (For positive inserts)

CM type



For multi-purpose machining

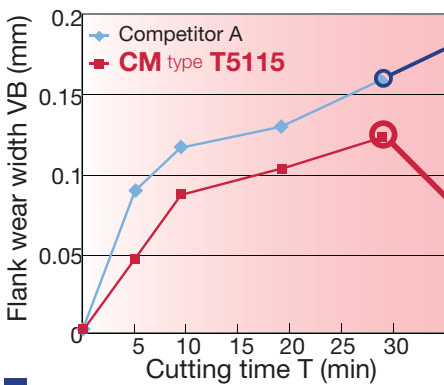
Without chipbreaker



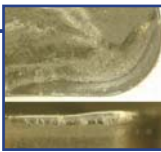
For interrupted cutting

Cutting performance

Excellent performance on cast irons



Flank Wear: after 30 min



Insert	: CCMT09T308-CM T5115
Toolholder	: A20R-SCLCR09-D220
Work material	: FCD600 (GGG60)
Cutting speed	: $V_c = 150$ m/min
Depth of cut	: $a_p = 2.0$ mm
Feed	: $f = 0.25$ mm/rev
Coolant	: Water soluble

Standard cutting conditions For positive insert

Work material	Chip-breaker	Grade	Cutting speed V_c (m/min)	Depth of cut a_p (mm)	Feed f (mm/rev)		
					Corner R 0.4 (mm)	Corner R 0.8 (mm)	Corner R 1.2 (mm)
Grey cast irons, (FC250 etc.) (GG25 etc.)	CM without	T5115	270 (140 - 400)	1.0 (0.05 - 2.0)	0.15 (0.05 - 0.2)	0.2 (0.05 - 0.3)	0.2 (0.05 - 0.3)
Ductile cast irons (FCD450 etc.) (GG45 etc.)			255 (140 - 370)				

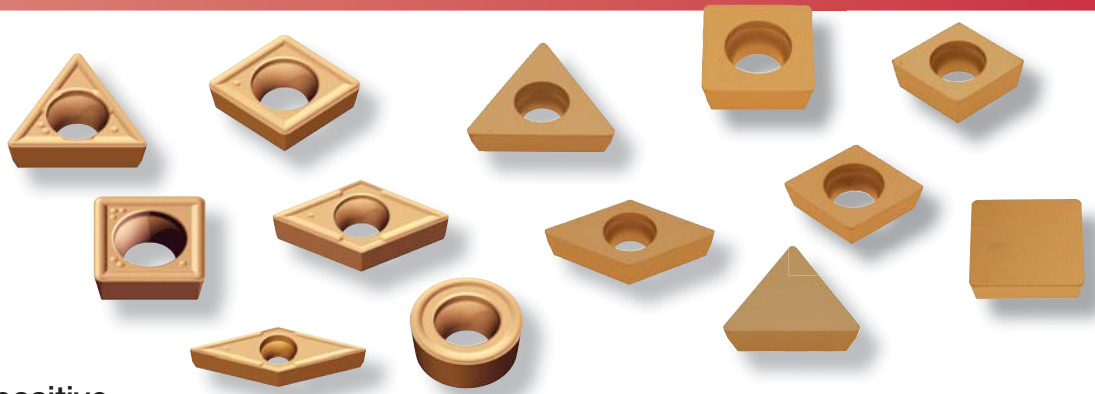
Inserts Positive type

80° Rhombic, 7° positive

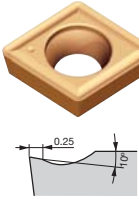
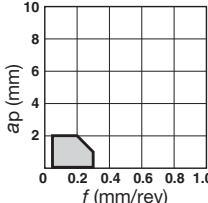
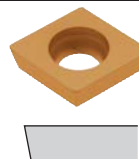
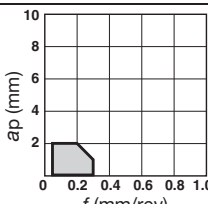
Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade		
				I.C.dia ϕd	Thick-ness s	Hole dia ϕd_1	Corner R $r \epsilon$	Coated		
Finishing to medium cutting	CM 		CCMT060204-CM	6.35	2.38	2.8	0.4	●		
			CCMT060208-CM				0.8	●		
			CCMT09T304-CM	9.525	3.97	4.4	0.4	●		
			CCMT09T308-CM*				0.8	●		
			CCMT09T312-CM				1.2	●		
			CCMT120404-CM				0.4	●		
	CCMT120408-CM	0.8	●							
	Without Chipbreaker 		CCMW060204	6.35	2.38	2.8	0.4	●		
			CCMW060208				0.8	●		
			CCMW09T304	9.525	3.97	4.4	0.4	●		
			CCMW09T308				0.8	●		

Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

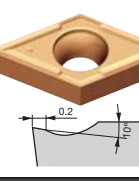
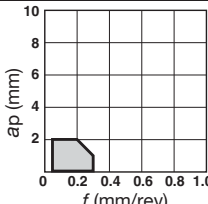
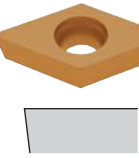
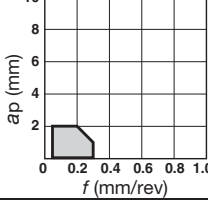
● : Stocked items



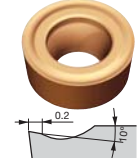
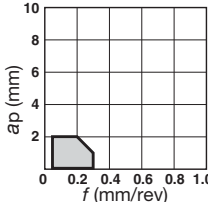
80° Rhombic, 11° positive

Application	Chipbreaker	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade	
	Appearance (Cross section)			I.C.dia ϕd	Thick- ness s	Hole dia $\phi d1$	Corner R $r \epsilon$	Coated T5115	
Finishing to medium cutting	CM 		CPMT060204-CM	6.35	2.38	2.8	0.4	●	
			CPMT060208-CM				0.8	●	
			CPMT080204-CM	7.94	2.38	3.4	0.4	●	
			CPMT080208-CM				0.8	●	
			CPMT090304-CM	9.525	3.18	4.4	0.4	●	
			CPMT090308-CM*				0.8	●	
			CPMT09T304-CM	9.525	3.97	4.4	0.4	●	
			CPMT09T308-CM				0.8	●	
			CPMT09T312-CM				1.2	●	
			CPMT120408-CM	12.7	4.76	5.5	0.8	●	
			CPMT120412-CM				1.2	●	
			Without Chipbreaker			CPMW080204	7.94	2.38	3.4
	CPMW080208	0.8	●						
	CPMW090304	9.525	3.18			4.4	0.4	●	
	CPMW090308						0.8	●	

55° Rhombic, 7° positive

Application	Chipbreaker	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade	
	Appearance (Cross section)			I.C.dia ϕd	Thick- ness s	Hole dia $\phi d1$	Corner R $r \epsilon$	Coated T5115	
Finishing to medium cutting	CM 		DCMT070204-CM	6.35	2.38	2.8	0.4	●	
			DCMT070208-CM				0.8	●	
			DCMT11T304-CM*	9.525	3.97	4.4	0.4	●	
			DCMT11T308-CM				0.8	●	
			DCMT11T312-CM				1.2	●	
	Without Chipbreaker			DCMW070204	6.35	2.38	2.8	0.4	●
	DCMW070208			0.8				●	
	DCMW11T304			9.525	3.97	4.4	0.4	●	
	DCMW11T308						0.8	●	

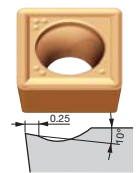
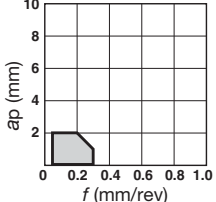
Round, 7° positive

Application	Chipbreaker	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
	Appearance (Cross section)			I.C.dia ϕd	Thick- ness s	Hole dia $\phi d1$	Corner R $r \epsilon$	Coated T5115
Finishing to medium cutting	CM 		RCMT0502M0-CM	5	2.38	2.5	-	●
			RCMT0602M0-CM	6		2.8	-	●
			RCMT0803M0-CM*	8	3.18	3.4	-	●

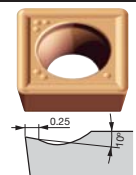
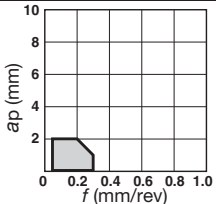
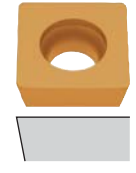
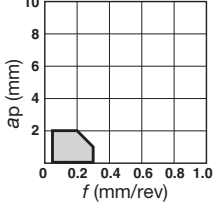
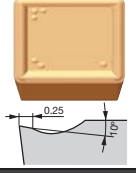
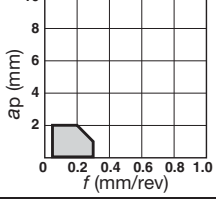

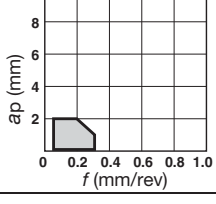
Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items


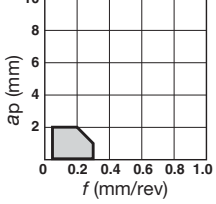
90° Square, 7° positive with hole

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia ϕd	Thick- ness s	Hole dia $\phi d1$	Corner R $r \epsilon$	Coated T5115
Finishing to medium cutting	CM 		SCMT09T304-CM	9.525	3.97	4.4	0.4	●
			SCMT09T308-CM*				0.8	●
			SCMT09T312-CM				1.2	●
			SCMT120404-CM	12.7	4.76	5.5	0.4	●
			SCMT120408-CM				0.8	●

90° Square, 11° positive

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia ϕd	Thick- ness s	Hole dia $\phi d1$	Corner R $r \epsilon$	Coated T5115
Finishing to medium cutting	CM 		SPMT090304-CM	9.525	3.18	4.4	0.4	●
			SPMT090308-CM*				0.8	●
			SPMT120404-CM	12.70	4.76	5.5	0.4	●
			SPMT120408-CM				0.8	●
	Without Chipbreaker 		SPMW090304	9.525	3.18	4.4	0.4	●
			SPMW090308				0.8	●
			SPMW120404	12.70	4.76	5.5	0.4	●
			SPMW120408				0.8	●
	CM 		SPMR090304-CM	9.525	3.18	-	0.4	●
			SPMR090308-CM*				0.8	●
			SPMR120304-CM	12.70	3.18	-	0.4	●
			SPMR120308-CM				0.8	●
			SPMR120312-CM				1.2	●
	Without Chipbreaker 		SPMN090304	9.525	3.18	-	0.4	●
			SPMN090308				0.8	●
			SPMN120304	12.70	3.18	-	0.4	●
SPMN120308			0.8				●	
SPMN120312			1.2				●	
SPMN120408			12.70	4.76	-	0.8	●	
SPMN120412						1.2	●	

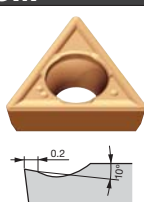
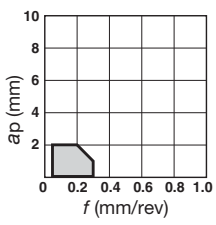

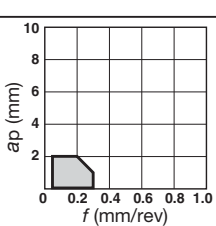
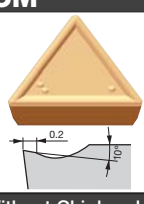
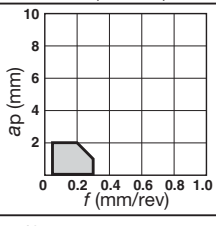
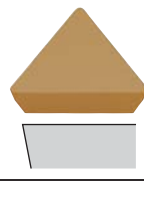
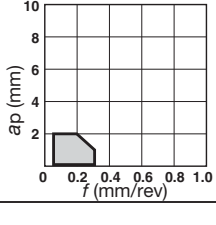
60° Triangular, 7° positive with hole

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia ϕd	Thick- ness s	Hole dia $\phi d1$	Corner R $r \epsilon$	Coated T5115
Finishing to medium cutting	CM 		TCMT090204-CM	5.56	2.38	2.5	0.4	●
			TCMT090208-CM				0.8	●
			TCMT110204-CM	6.35	2.38	2.8	0.4	●
			TCMT110208-CM				0.8	●
			TCMT110304-CM*	6.35	3.18	2.8	0.4	●
			TCMT110308-CM				0.8	●
			TCMT16T304-CM	9.525	3.97	4.4	0.4	●
			TCMT16T308-CM				0.8	●
			TCMT16T312-CM				1.2	●

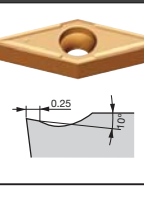
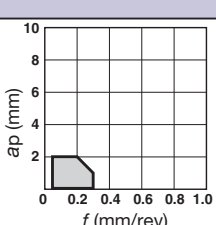
Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items

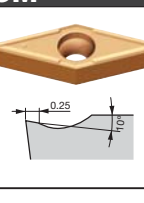
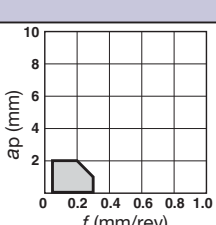
60° Triangular, 11° positive

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade		
				I.C.dia ϕd	Thick- ness s	Hole dia ϕd_1	Corner R $r \epsilon$	Coated T5115		
Finishing to medium cutting	CM 		TPMT090204-CM	5.56	2.38	2.5	0.4	●		
			TPMT090208-CM				0.8	●		
			TPMT110204-CM	6.35	2.38	2.8	0.4	●		
			TPMT110208-CM				0.8	●		
			TPMT110304-CM*	6.35	3.18	3.4	0.4	●		
			TPMT110308-CM				0.8	●		
			TPMT130304-CM	7.94	3.18	3.4	0.4	●		
			TPMT130308-CM				0.8	●		
			TPMT16T304-CM	9.525	3.97	4.4	0.4	●		
			TPMT16T308-CM				0.8	●		
	TPMT16T312-CM	1.2	●							
	Without Chipbreaker			TPMW110204	6.35	2.38	2.8	0.4	●	
				TPMW110208				0.8	●	
				TPMW130304	7.94	3.18	3.4	0.4	●	
				TPMW130308				0.8	●	
				TPMW16T304	9.525	3.97	4.4	0.4	●	
				TPMW16T308				0.8	●	
	CM 		TPMR110304-CM	6.35	3.18	-	0.4	●		
			TPMR110308-CM*				0.8	●		
			TPMR160304-CM	9.525	3.18	-	0.4	●		
TPMR160308-CM			0.8				●			
TPMR160312-CM			1.2	●						
Without Chipbreaker					TPMN110304	6.35	3.18	-	0.4	●
					TPMN110308				0.8	●
					TPMN160304	9.525	3.18	-	0.4	●
					TPMN160308				0.8	●
					TPMN160312	1.2	●			

35° Rhombic, 7° positive with hole

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia ϕd	Thick- ness s	Hole dia ϕd_1	Corner R $r \epsilon$	Coated T5115
Finishing to medium cutting	CM 		VCMT080204-CM	4.76	2.38	2.3	0.4	●
			VCMT160404-CM*	9.525	3.97	4.4	0.4	●
			VCMT160408-CM				0.8	●
			VCMT160412-CM	1.2	●			

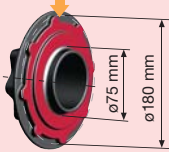
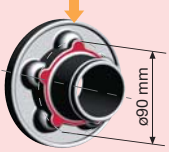
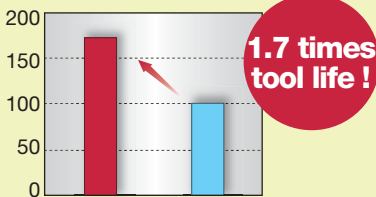
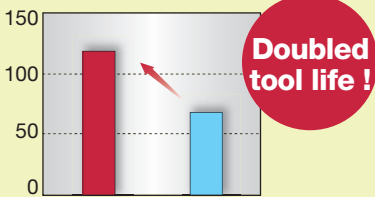
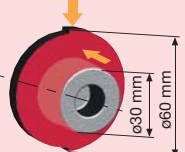
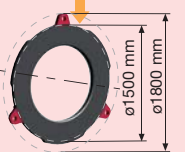
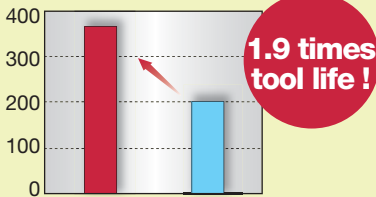
35° Rhombic, 5° positive with hole

Application	Chipbreaker Appearance (Cross section)	$f - a_p$	Insert Cat. No. (Metric)	Dimensions (mm)				Grade
				I.C.dia ϕd	Thick- ness s	Hole dia ϕd_1	Corner R $r \epsilon$	Coated T5115
Finishing to medium cutting	CM 		VBMT110304-CM	6.35	2.38	2.8	0.4	●
			VBMT110308-CM				0.8	●
			VBMT160404-CM*	9.525	3.97	4.4	0.4	●
			VBMT160408-CM				0.8	●
			VBMT160412-CM	1.2	●			

Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items

Practical Examples

Work piece type		Automotive parts	Automotive parts
Insert		CNMG120412-CM T5115	CNMG120412-CM T5125
Holder		ACLNR2525M12-A	ACLNR2525M12-A
Work material		Ductile cast iron FCD700	Ductile cast iron FCD600
			
Cutting conditions	Cutting speed : Vc (m/min)	300	85 ~ 170
	Feed : f (mm/rev)	0.30 ~ 0.40	0.25
	Depth of cut : ap (mm)	0.50	2.0 ~ 3.0
	Coolant	Water soluble	Dry
	Machining	Light interrupted face turning	Heavy interrupted face turning
Results		 <p>1.7 times tool life !</p> <p>T5100 SERIES Competitor</p> <p>Using the CM breaker the machining accuracy was improved and tool life drastically increased.</p>	 <p>Doubled tool life !</p> <p>T5100 SERIES Competitor</p> <p>Chipping was reduced drastically and machining accuracy was improved.</p>
Work piece type		Construction machine parts	Machine parts
Insert		DNMG150408-CF T5105	WNMG080412-CH T5115
Holder		ADJNR2525M15-A	AWLNR2525M08-A
Work material		Ductile cast iron FCD450	Normal cast iron FC200
			
Cutting conditions	Cutting speed : Vc (m/min)	180 ~ 220	260
	Feed : f (mm/rev)	0.25	0.30
	Depth of cut : ap (mm)	0.15 / 0.08	4.0
	Coolant	Water soluble	Dry
	Machining	External turning and light interrupted face turning	Heavy interrupted face turning
Results		 <p>1.9 times tool life !</p> <p>T5100 SERIES Competitor</p> <p>Burr was reduced and the machining accuracy was also improved.</p>	<p>Fracture was drastically reduced !</p> <p>Sudden tool breakage was eliminated and tool life significantly improved.</p>



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