Tungaloy
Member IMC Group

Keeping the Customer First

Tungaloy Report No. 359-E

CVD grade for grey and ductile cast iron turning

T5100 series

Extended version with positive CM chipbreaker

PREMIUMTEC
TUNGALOY

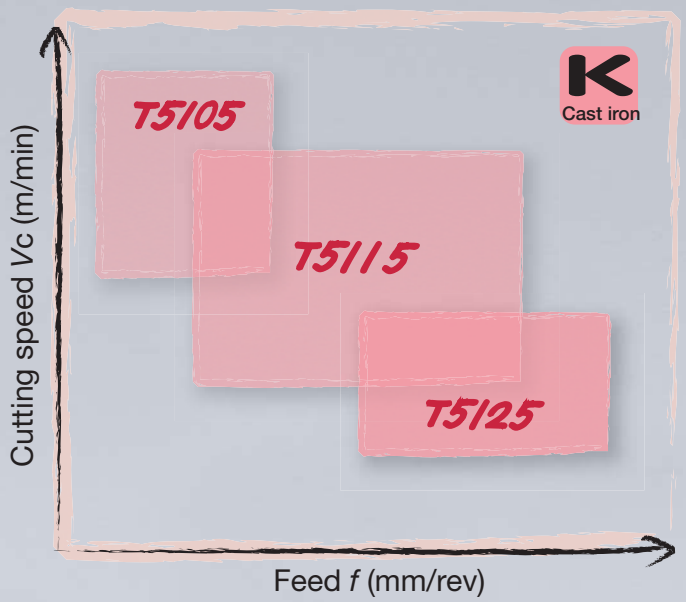
The T5100 grade and chipbreaker series suits all types of cast iron machining

T5100 Series

The fine grain and highly carbonized coating of the T5100 series greatly increases wear and impact resistance.

The specific applications of the three grade and three chipbreaker types yield excellent performance on grey and ductile cast iron.

▼ Application Range



Grades

T5105 Wear resistance

This grade exhibits superior wear and plastic deformation resistance in high-speed continuous cutting.

T5115 The first choice

This multi-purpose grade provides stable machining conditions across a wide application range that includes continuous or interrupted cutting.

T5125 For Interrupted cutting

This tough grade has a high impact resistance that prevents sudden breakage. This enables the T5125 to be applied to heavy interrupted cutting whilst offering stable tool life.

Special surface technology PREMIUMTEC TUNGALOY for CM chipbreaker (positive type)

Enhanced chip welding resistance

Smooth exterior layer

▼ Comparison of coating surfaces

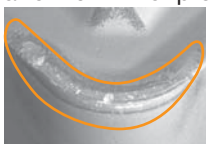
T5100 series

Conventional type

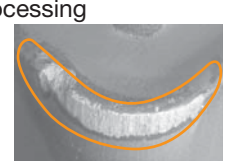
▼ Comparison of chip welding resistance

The smooth coating suppresses chip adhesion and improves workpiece surface finish

Comparison of chip welding conditions after 40 min. of processing



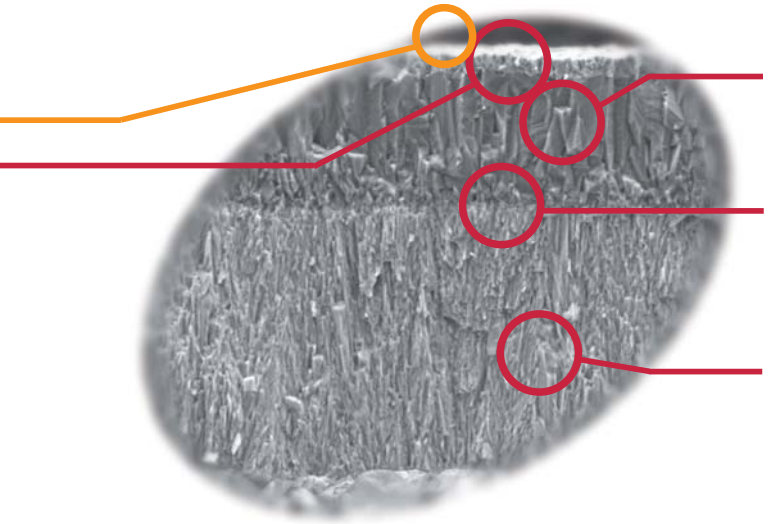
T5115



Conventional Insert

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

Appli-cation	Grade	Substrate			Coating layer		Features
	Application code	Specific gravity	HRA	GPa	Main Composition	Thickness (μm)	
Cast iron	T5105 K05 - K15	15.0	92.5	2.4	Fine columnar TiCN + Al_2O_3	16	For grey cast iron & ductile cast iron The coating layer of the T5100 series features fine grained and hard columnar crystals of Ti(C,N). This drastically improves wear resistance. Added to this, it has a dedicated cemented carbide substrate with a fine structure and high-strength that gives the three grades of the T5100 series excellent cutting performance for a wide range of cast iron turning applications.
	T5115 K10 - K20	14.8	91.5	2.7			
	T5125 K15 - K30	14.0	90.5	2.8			



Improved chipping resistance

Fine-grained particles in the aluminium layer

Stronger coating adhesion

Higher adhesion with micro particles in the middle layer

Improved wear resistance

High carbon and fine-grained Ti(C,N) crystallization

▼ Wear Comparison

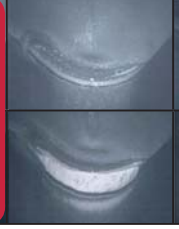
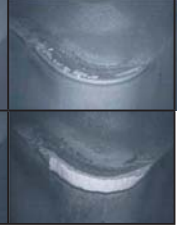
The degree of hardness is greatly increased through the high carbonization of the crystallized Ti(C,N) coating

Insert used	: **CNMG120412-CM**
Work material	: FCD600 (GGG60)
Cutting speed	: *Vc* = 200 m/min
Feed	: *f* = 0.35 mm/rev
Depth of cut	: *ap* = 2.0 mm
Work process	: Continuous cutting
Cutting fluid	: Water soluble cutting fluid

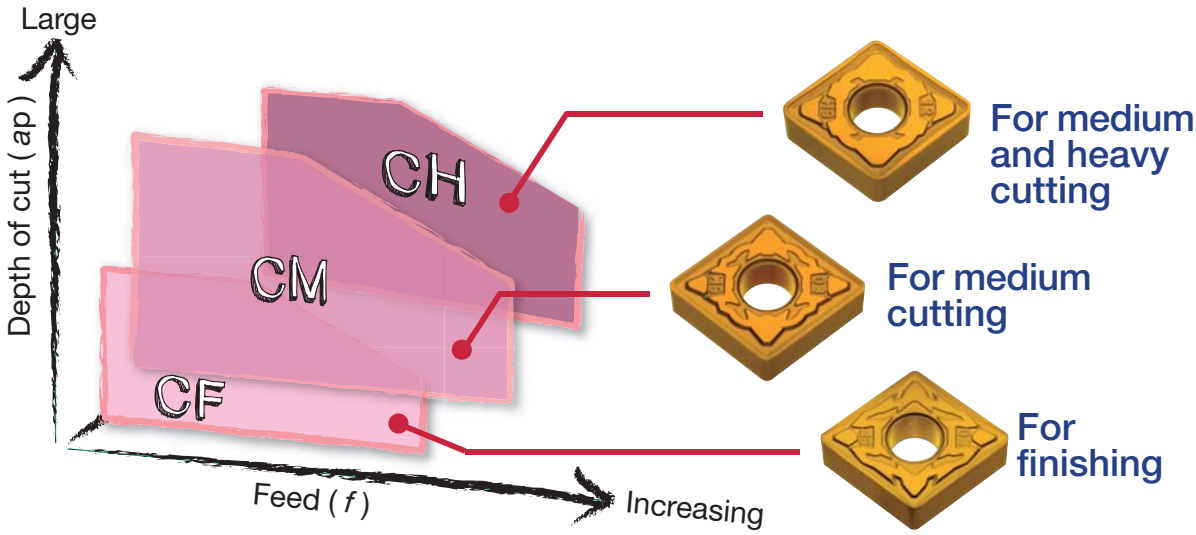
■ Comparison of grades corresponding to K05~K10

	T5105	Competitor A	Competitor B
10 min			
30 min			

■ Comparison of grades corresponding to K10~K20

	T5115	Competitor A	Competitor B
10 min			
30 min			

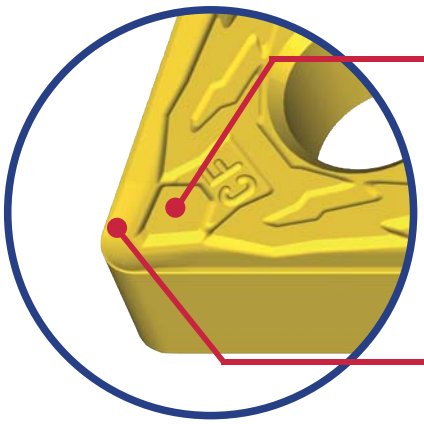
Chipbreaker (For positive type)



CF type

Low resistance chipbreaker

Ideal for deformation resistance and burr prevention



Close-fitting seat

The relief surface sits close to the cutting edge, yet avoids direct impact from the chips

➡ This stabilizes insert tool life by suppressing vibration when cutting

Arc-shaped relief

Relief angle of practically 20°

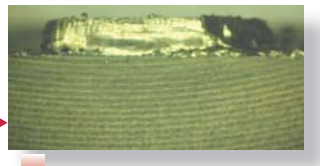
➡ Prevents chatter in soft & low rigidity materials and deformation of thin components

➡ Improves wear resistance in finishing processes

Burr prevention

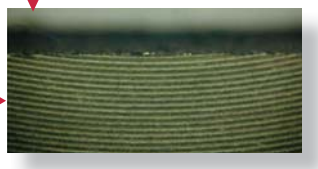
The sharp edge of the CF type chipbreaker prevents burr and edge breakout.

Competitor B



Prevents formation of burr due to sudden downward force

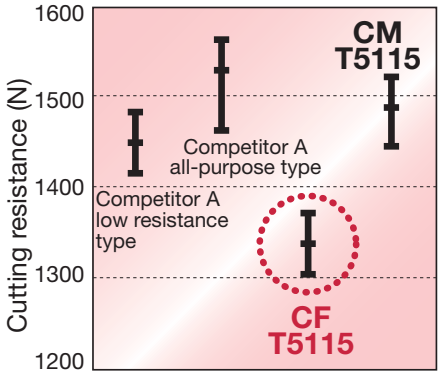
CF T5115



Insert used	: **CNMG120412-CF T5115**
Toolholder used	: ACLNR2525M12-A
Work material	: FCD600 (GGG60)
Cutting speed	: *Vc* = 150 m/min
Feed	: *f* = 0.35 mm/rev
Depth of cut	: *ap* = 2.0 mm
Work process	: Continuous and interrupted face turning
Cutting fluid	: Water soluble cutting fluid

Reduced cutting resistance

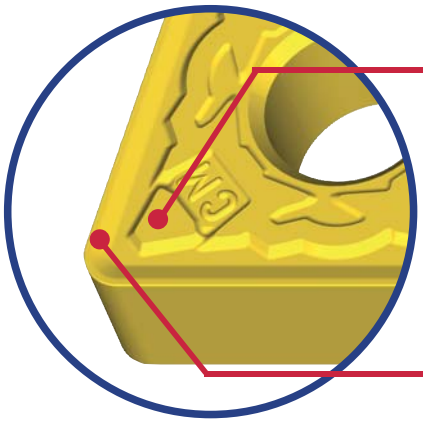
Compared with competitors the CF chipbreakers reduce resistance by more than 100N.



Arc-shaped relief of practically 20° By far the sharpest edge

Insert used	: **CNMG120412-CF T5115**
Toolholder used	: ACLNR2525M12-A
Work material	: FCD600 (GGG60)
Cutting speed	: *Vc* = 200 m/min
Feed	: *f* = 0.3 mm/rev
Depth of cut	: *ap* = 0.5 mm
Work process	: Continuous face turning
Cutting fluid	: Water soluble cutting fluid

CM type Multi-Purpose chipbreaker



Close-fitting seat

The relief surface sits close to the cutting edge, yet avoids direct impact from the chips

➡ This stabilizes insert tool life by suppressing vibration when cutting

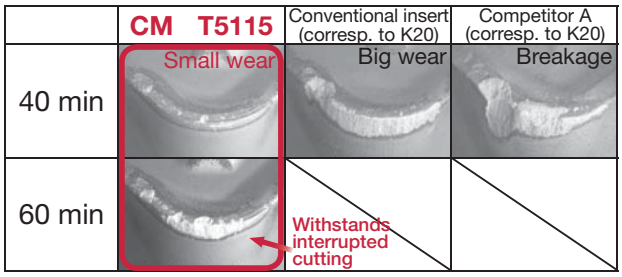
Positive land

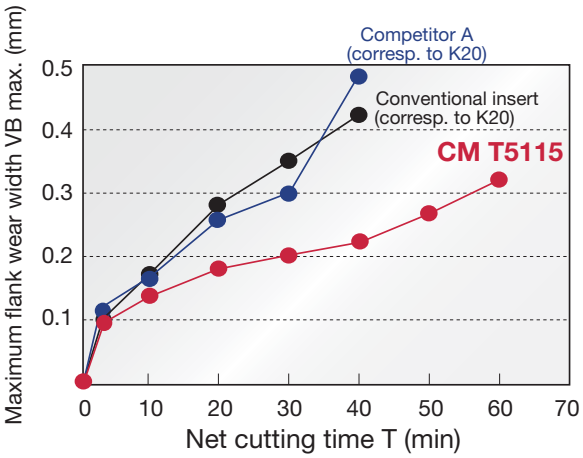
The excellent cutting edge design offers a balance of low cutting resistance with a high resistance to breakages

➡ Applicable to a wide range of processes from continuous to interrupted cutting

Long tool life in continuous and interrupted cutting

The multi-purpose CM type chipbreaker shows its superiority in processes that combine continuous and interrupted cutting





Insert used	: **CNMG120412-CM T5115**
Toolholder used	: ACLNR2525M12-A
Work material	: FCD600 (GGG60)
Cutting speed	: *Vc* = 150 m/min
Feed	: *f* = 0.35 mm/rev
Depth of cut	: *ap* = 2.0 mm
Work process	: Continuous and interrupted face turning
Cutting fluid	: Water soluble cutting fluid

Burr Prevention

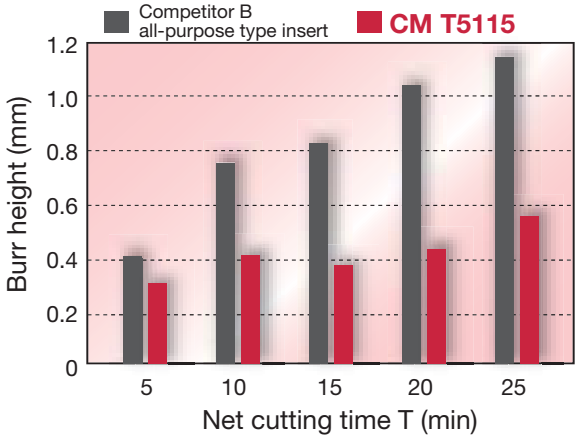
The optimal edge control of the CM chipbreaker prevents burr and edge breakout. When combined with the T5100 series, continuity is improved.

▼ After 20 minutes machining

Competitor's B all-purpose type insert

CM T5115

▼ Graph depicting burr height difference

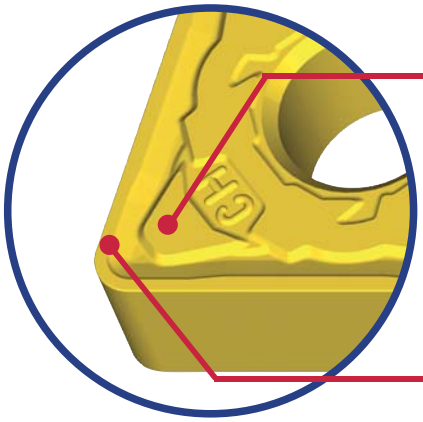


Insert used	: **CNMG120412-CM T5115**
Toolholder used	: ACLNR2525M12-A
Work material	: FCD600 (GGG60)
Cutting speed	: *Vc* = 150 m/min
Feed	: *f* = 0.35 mm/rev
Depth of cut	: *ap* = 2.0 mm
Work process	: Continuous and interrupted face turning
Cutting fluid	: Water soluble cutting fluid

CH type

Enhanced cutting edge

Chipbreaker for interrupted high feed processing



Close-fitting seat

The relief surface extends optimally close to the end of the cutting edge while avoiding direct impact from the chips

➡ Stabilizes insert tool life by suppressing vibration when cutting

Wide land and land support

Wide negative land

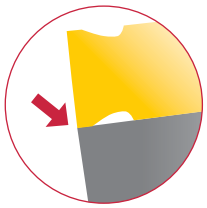
➡ Provides a cutting edge that does not break under heavy interrupted cutting and high feed machining

Land support

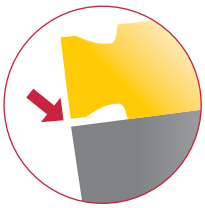
➡ Prevents vibration of the cutting edge caused by overload when machining at high speeds and depths of cut. Increases resistance to breakage and prolongs tool life.

Land support

Close proximity of the edge against the holder even in processes with overload, results in stable processing



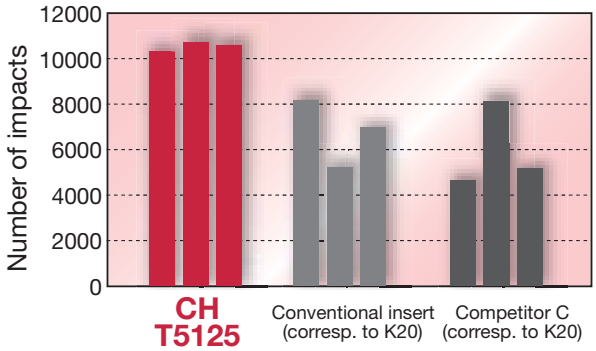
CH type chipbreaker



Conventional 3 dimensional chipbreaker

Extended tool life when interrupted cutting

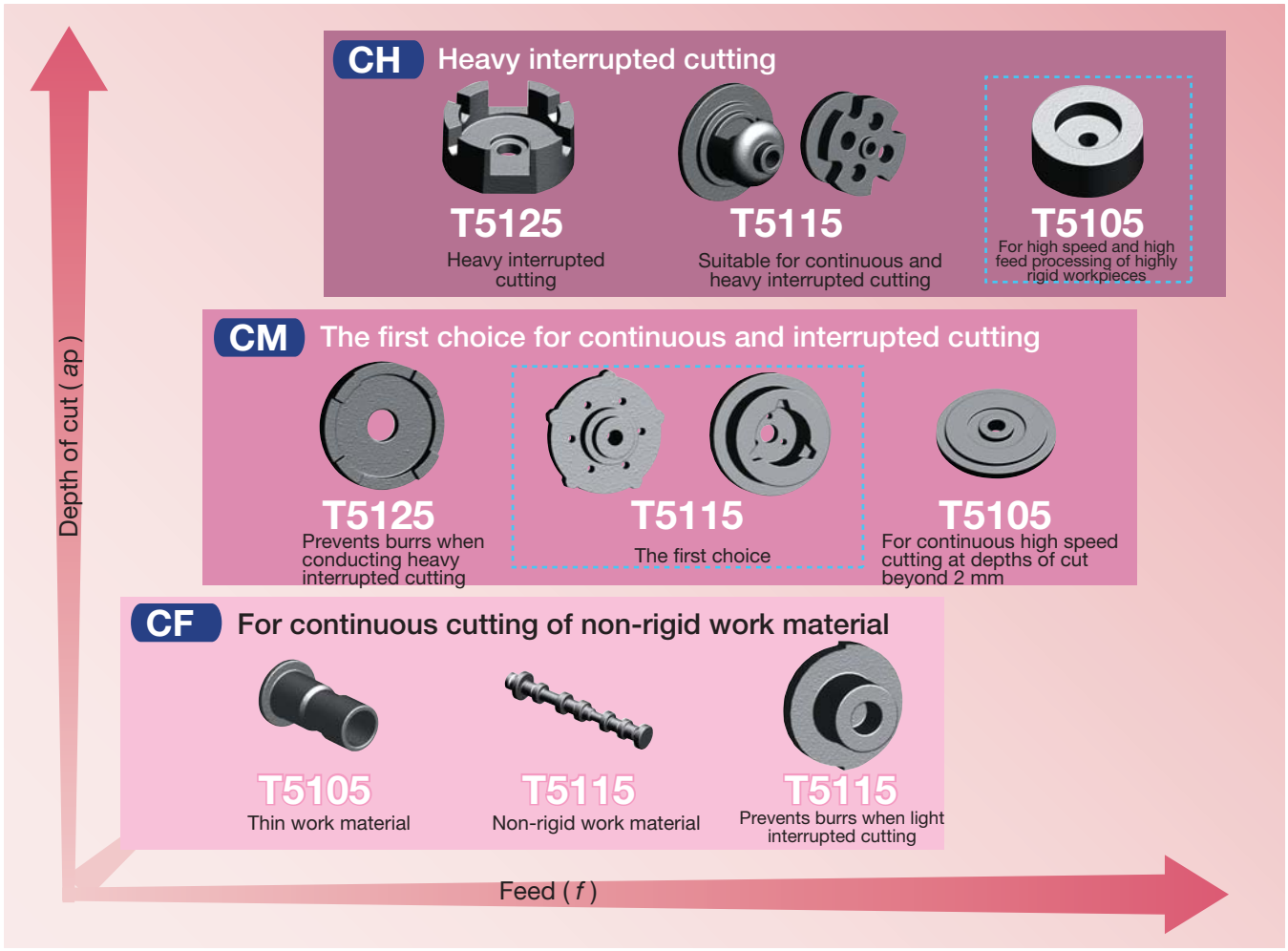
The combination of the CH type chipbreaker and the T5125 grade prevents insert chipping and chip adhesion during heavy interrupted processes, achieving 1.5 times the tool life of conventional or competing products.

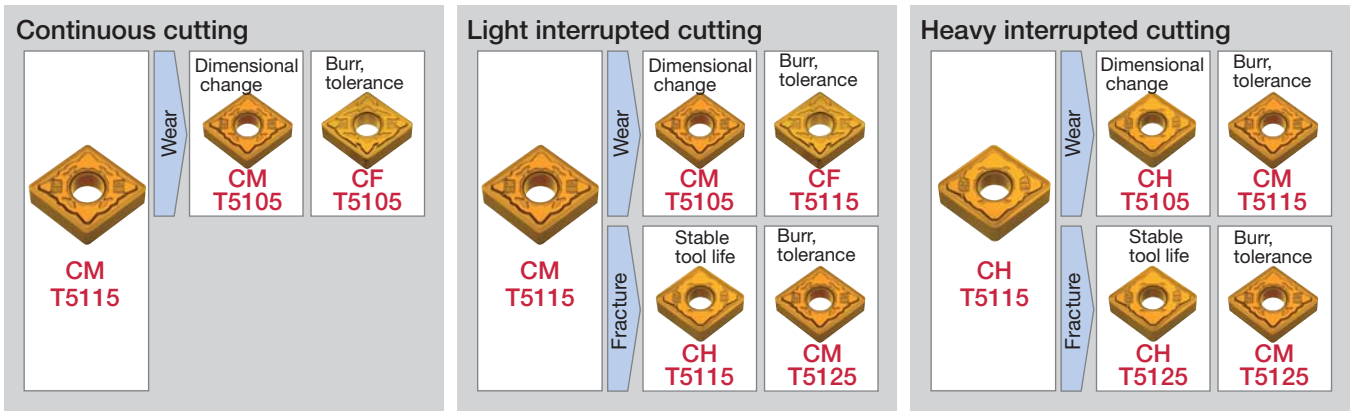


	CH T5125	Conventional insert (corresp. to K20)	Competitor C (corresp. to K20)
5 min	Normal wear	Chipping	
15 min	Small chip welding	Big chip welding	Big chip welding
Final	Normal wear 30 min	20 min	23 min

Insert used	: **CNMG120412-CH T5125**
Toolholder used	: ACLNR2525M12-A
Work material	: FCD600 (GGG60)
Cutting speed	: *Vc* = 150 m/min
Depth of cut	: *ap* = 2.0 mm
Feed	: *f* = 0.35 mm/rev
Work process	: Interrupted face turning
Cutting fluid	: Water soluble cutting fluid

Selection guide





Standard cutting conditions For negative insert

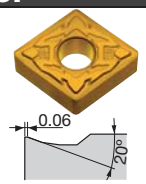
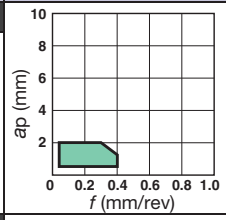
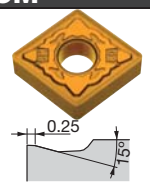
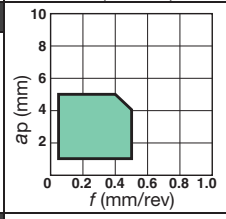
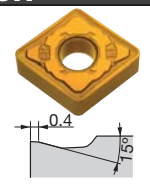
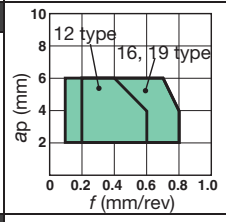
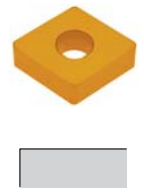
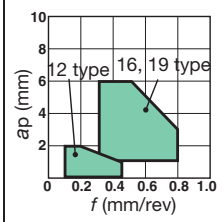
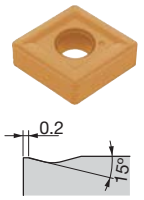
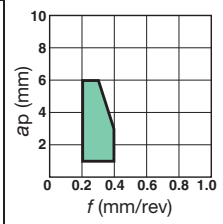
Chipbreaker	Corner radius (mm)	Depth of cut ap (mm)	Feed f (mm/rev)
CF	0.4	0.5 - **1.0** - 2.0	0.05 - **0.15** - 0.2
	0.8		0.1 - **0.25** - 0.35
	1.2		0.1 - **0.3** - 0.4
CM	0.4	1.0 - **2.0** - 5.0	0.05 - **0.15** - 0.2
	0.8		0.15 - **0.3** - 0.4
	1.2		0.15 - **0.35** - 0.5
CH	0.4	2.0 - **3.0** - 6.0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

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

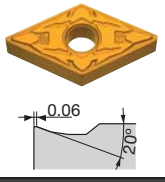
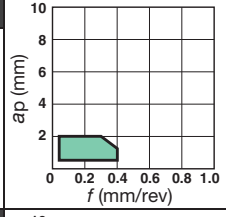
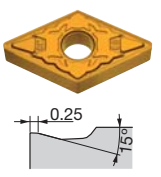
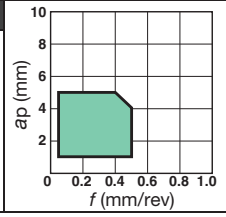
Grades	Cutting Speed Vc (m/min)	
	Grey cast iron	Ductile cast iron
T5105	180 - **330** - 480	180 - **290** - 400
T5115	140 - **270** - 400	140 - **255** - 370
T5125	120 - **210** - 300	120 - **180** - 250

Inserts Negative type

Rhombic, 80° negative

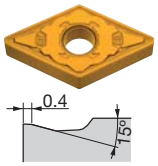
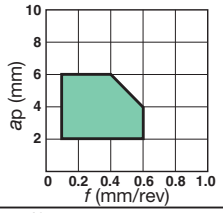
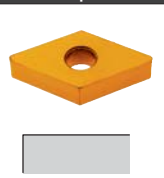
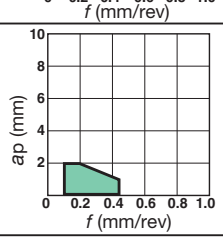
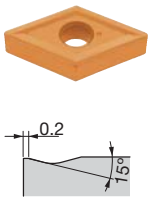
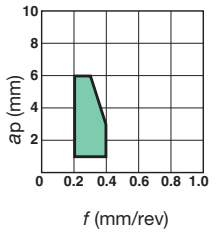
Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade Coated T5105	T5115	T5125
Finishing	CF 		CNMG120404-CF	12.70	4.76	5.16	0.4	●	●	
			CNMG120408-CF				0.8	●	●	
			* CNMG120412-CF				1.2	●	●	
Medium 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

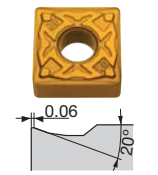
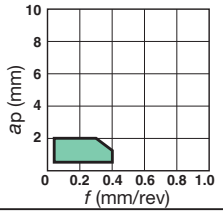
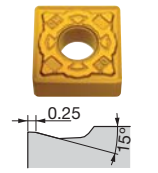
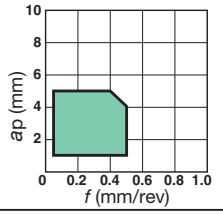
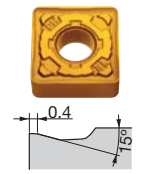
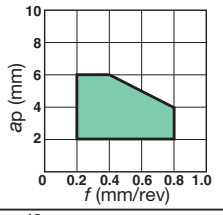
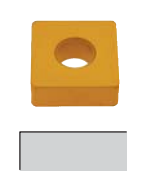
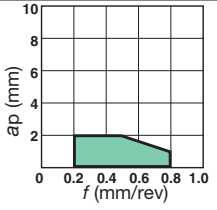
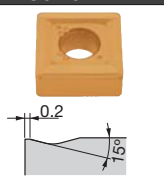
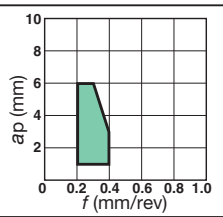
Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade Coated T5105	T5115	T5125
Finishing	CF 		DNMG150404-CF	12.70	4.76	5.16	0.4	●	●	
			DNMG150408-CF				0.8	●	●	
			* DNMG150412-CF				1.2	●	●	
			DNMG150604-CF	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 - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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**				1.2	●	●	●
			DNMG150604-CH	12.70	6.35	5.16	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				1.2	●	●	●
			DNMA150604	12.70	6.35	5.16	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	●	●	●

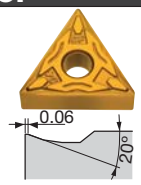
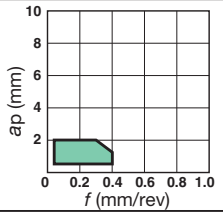
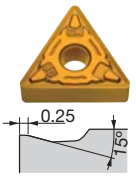
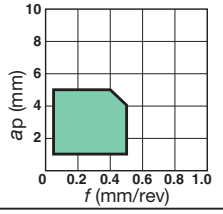
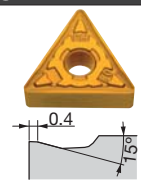
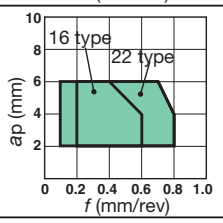
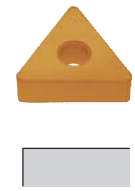
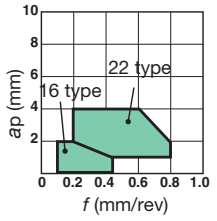
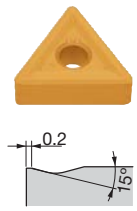
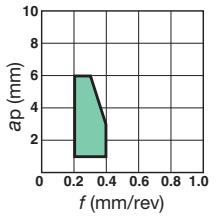
Square, 90° negative

Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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				2.0	●	●	●
			SNMG190612	19.05	6.35	7.93	1.2	●	●	●
			SNMG190616				1.6	●	●	●

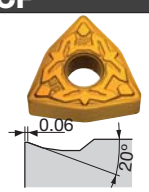
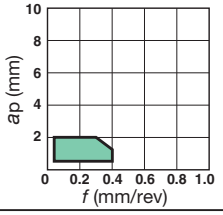
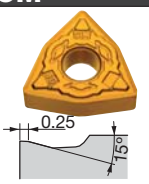
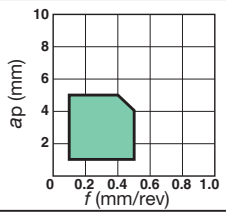
Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items

Triangular, 60° negative

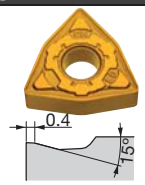
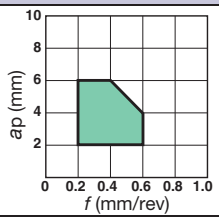
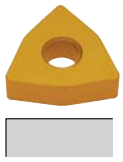
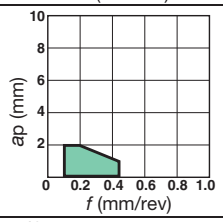
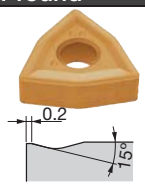
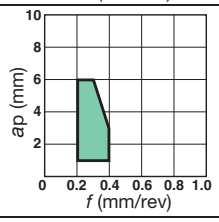
Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade Coated T5105	T5115	T5125
Finishing	**CF** 		**TNMG160404-CF**	9.525	4.76	3.81	0.4	●	●	
			* **TNMG160408-CF**				0.8	●	●	
Medium cutting	**CM** 		**TNMG160404-CM**	9.525	4.76	3.81	0.4	●	●	●
			TNMG160408-CM				0.8	●	●	●
			* **TNMG160412-CM**				1.2	●	●	●
			TNMG220408-CM	12.70	4.76	5.16	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**				1.2	●	●	●
			TNMG220408-CH	12.70	4.76	5.16	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	●	●	●
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	●	●	●
			TNMG220416				1.6	●	●	●

Trigon, 80° negative

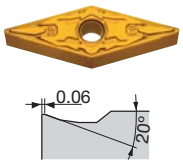
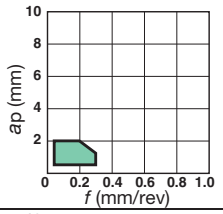
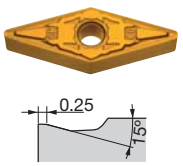
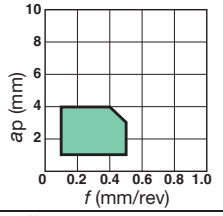
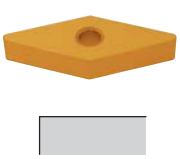
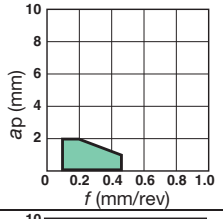
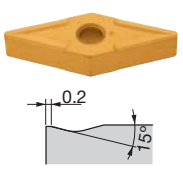
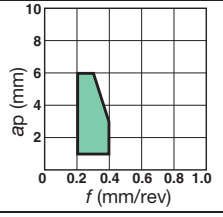
Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade Coated T5105	T5115	T5125
Finishing	**CF** 		**WNMG080404-CF**	12.70	4.76	5.16	0.4	●	●	
			WNMG080408-CF				0.8	●	●	
			* **WNMG080412-CF**				1.2	●	●	
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 - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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 - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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 type)

New **CM type**

Special surface technology

PREMIUMTEC
TUNGALOY

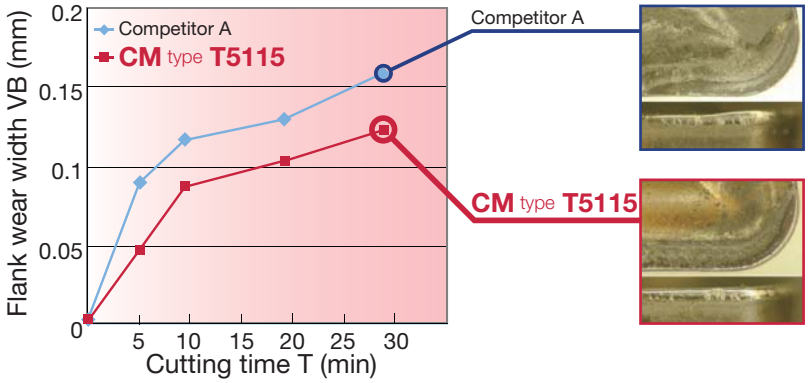
For multi-purpose cutting

Without chipbreaker

For interrupted cutting

Cutting performance

▼ **Excellent performance for cast irons**



Cutting time: after 30 min

Insert used	: **CCMT09T308-CM T5115**
Toolholder used	: A20R-SCLCR09-D220
Work material	: FCD600 (GGG60)
Cutting speed	: *Vc* = 150 m/min
Depth of cut	: *ap* = 2.0 mm
Feed	: *f* = 0.25 mm/rev
Cutting fluid	: Water soluble cutting fluid

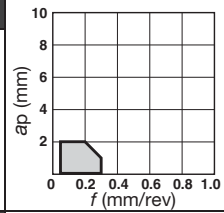
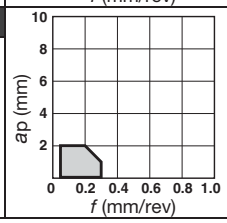
In T5115 grade, longer tool life has been achieved due to the well controlled specific coating layer and carbide substrate.

Standard cutting conditions For positive insert

Work material	Chip-breaker	Grade	Cutting speed *Vc* (m/min)	Depth of cut *ap* (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**	140 - **270** - 400	0.05 - **1.0** - 2.0	0.05 - **0.15** - 0.2	0.05 - **0.2** - 0.3	0.05 - **0.2** - 0.3
Ductile cast irons (FCD450 etc.) (GG45 etc.)			140 - **255** - 370				

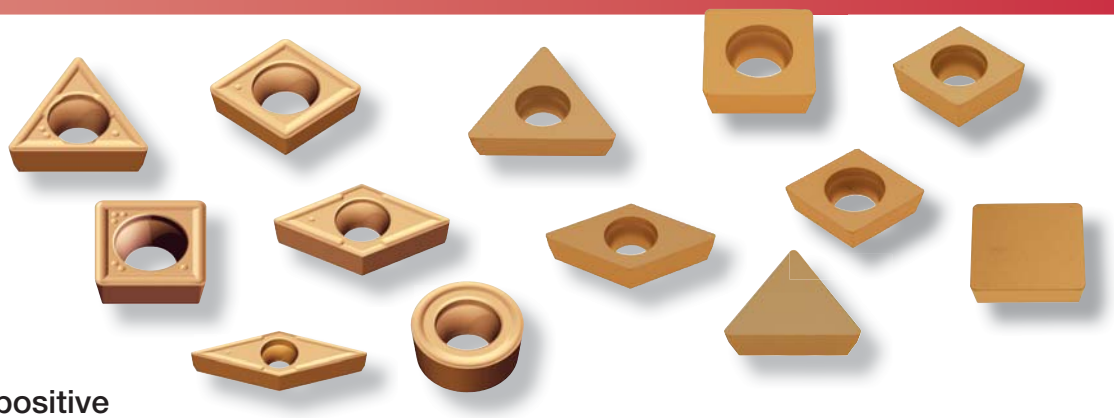
Inserts Positive type

80° Rhombic, 7° positive

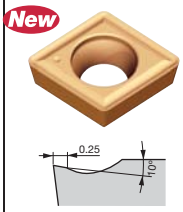
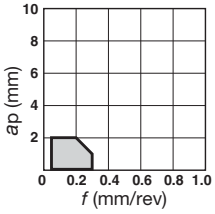
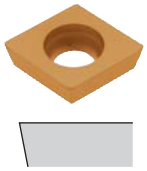
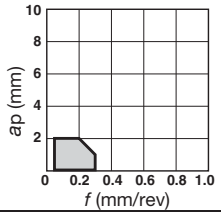
Application	Chipbreaker Appearance (Cross section)	*f* - *ap*	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R *r* ε	Grade Coated T5115
Finishing to medium cutting	**CM** New		**CCMT060204-CM**	6.35	2.38	2.8	0.4	●
			CCMT060208-CM				0.8	●
			CCMT09T304-CM	9.525	3.97	4.4	0.4	●
			CCMT09T308-CM*				0.8	●
			CCMT09T312-CM				1.2	●
			CCMT120404-CM	12.7	4.76	5.5	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.

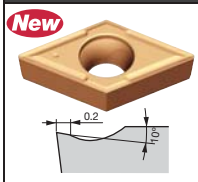
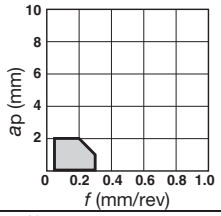
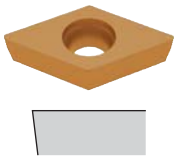
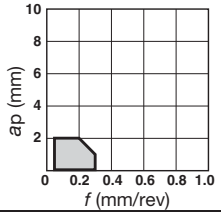
● : Stocked items



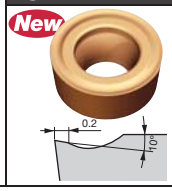
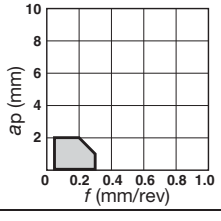
80° Rhombic, 11° positive

Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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	0.4	●
			CPMW080208				0.8	●
			CPMW090304	9.525	3.18	4.4	0.4	●
			CPMW090308				0.8	●

55° Rhombic, 7° positive

Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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	●

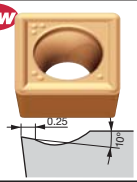
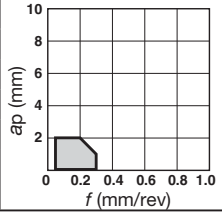
Round, 7° positive

Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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	-	●

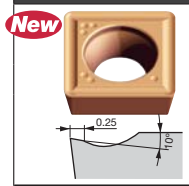
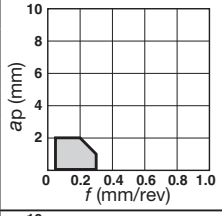
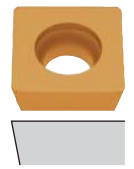
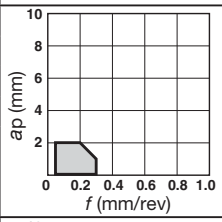
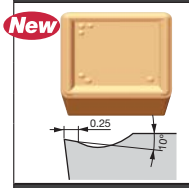
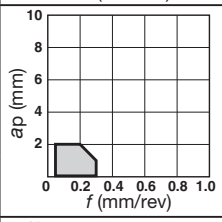
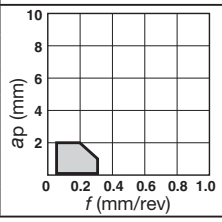
Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items

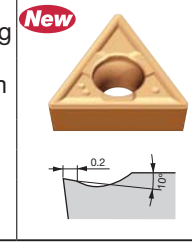
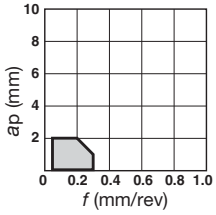
90° Square, 7° positive, with hole

Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade Coated T5115
Finishing to medium cutting	CM New 		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 - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade Coated T5115
Finishing to medium cutting	CM New 		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 New 		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	●

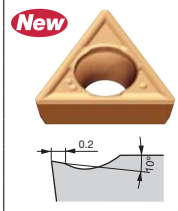
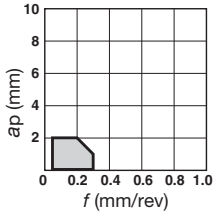
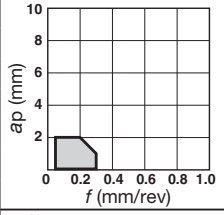
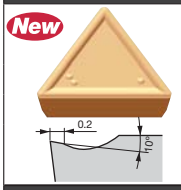
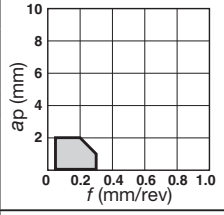
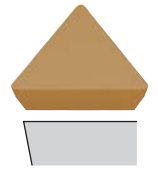
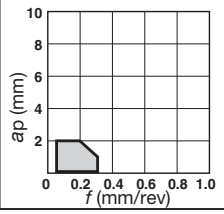
60° Triangular, 7° positive, with hole

Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade Coated T5115
Finishing to medium cutting	CM New 		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	●

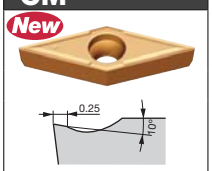
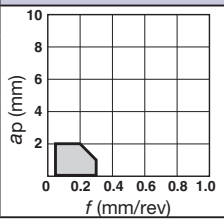
Note: The chipbreaker cross-section marked * is shown under the photographs of inserts.

● : Stocked items

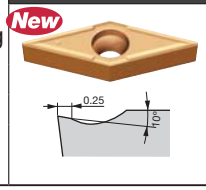
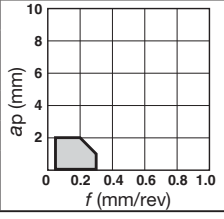
60° Triangular, 11° positive

Application	Chipbreaker Appearance (Cross section)	f - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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 - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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 - ap	Insert Cat. No. (Metric)	Dimensions (mm) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner R r ε	Grade 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

Stable surface accuracy

Insert : CNMG120412-CM T5115
Toolholder : ACLNR2525M12-A

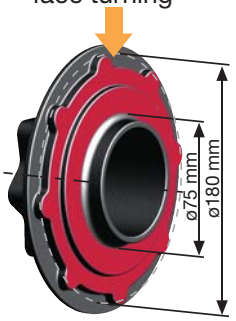
100 pcs → 170 pcs

Work material : Ductile cast iron FCD700
Work piece type : Automotive parts
Tool life criteria : Surface roughness
Cutting speed : *Vc* = 300 m/min
Feed : *f* = 0.30 ~ 0.40 mm/rev
Depth of cut : *ap* = 0.50 mm
Cutting fluid : Water soluble cutting fluid

Results

When interrupted cutting of work that demands surface precision, competitor products were unable to maintain a constant precision level. The T5115 CM type chipbreaker yields stable precision and tool life is 1.7 times better than the competition.

Light interrupted face turning



Highly chipping resistance

Insert : CNMG120412-CM T5125
Toolholder : ACLNR2525M12-A

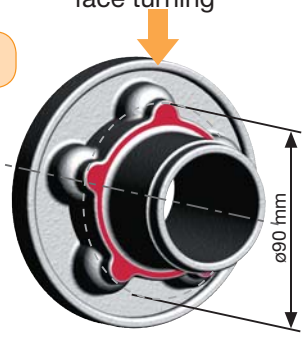
70 pcs → 140 pcs

Work material : Ductile cast iron FCD600
Work piece type : Automotive parts
Tool life criteria : Tolerance
Cutting speed : *Vc* = 85 ~ 170 m/min
Feed : *f* = 0.25 mm/rev
Depth of cut : *ap* = 2.0 ~ 3.0 mm
Cutting fluid : Dry cutting

Results

The component with interrupted face turning highlights unstable cutting; conventional products showed chipping and irregularities on the cutting edge. The T5125 CM type chipbreaker shows no chipping with tool life improvements of 100%.

Heavy interrupted face turning



Well balanced sharpness and toughness

Insert : DNMG150408-CF T5105
Toolholder : ADJNR2525M15-A

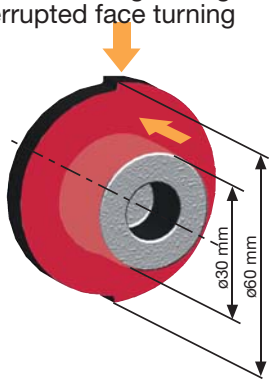
200 pcs → 370 pcs

Work material : Ductile cast iron FCD450
Work piece type : Construction machine parts
Tool life criteria : Burr and tolerance
Cutting speed : *Vc* = 180 ~ 220 m/min
Feed : *f* = 0.25 mm/rev
Depth of cut : *ap* = 0.15 / 0.08 mm
Cutting fluid : Water soluble cutting fluid

Results

When conducting interrupted face turning, the CF Type improves accuracy and eliminates burrs when external turning.
The T5105 CF type chipbreaker shows good wear stability and improves tool life by 1.8 times as well as delivers improved performance compared to competitor products.

External turning and light interrupted face turning



Anti-breakeage for heavy interrupted cutting

Insert : WNMG080412-CH T5115
Toolholder : AWLNR2525M08-A

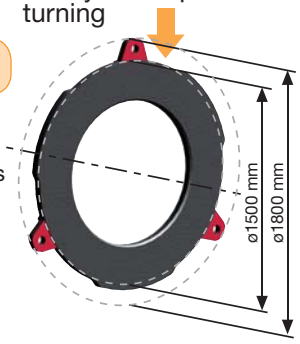
Stable processing

Work material : Normal cast iron FC200
Work piece type : Machine parts
Tool life criteria : Appearance of finished surface
Cutting speed : *Vc* = 260 m/min
Feed : *f* = 0.30 mm/rev
Depth of cut : *ap* = 4.0 mm
Cutting fluid : Dry cutting

Results

Heavy interrupted cutting with severe variations resulted in competitor inserts breaking. The T5115 CH type chipbreaker showed no breakage, making it possible to stabilize the cutting process and improve reliability.

Heavy interrupted face turning



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