

NEW PRODUCT NEWS

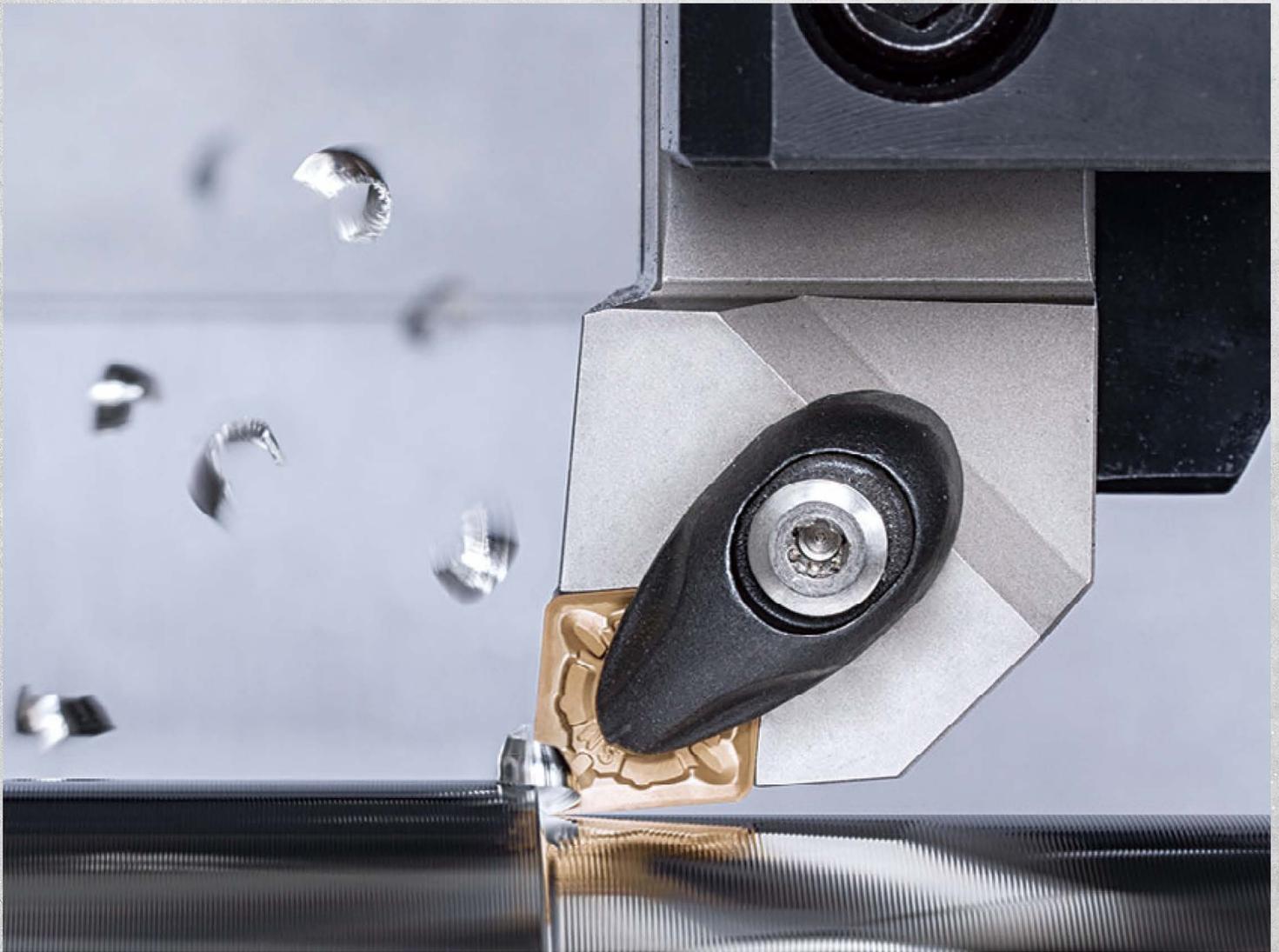
mgt
MEGA TECH
METALWORK

Tungaloy Report No. 547-G

Grades for stainless steel

T6200 & AH6200

Introducing T6225 - a new CVD grade for stainless steel





T6200 & AH6200

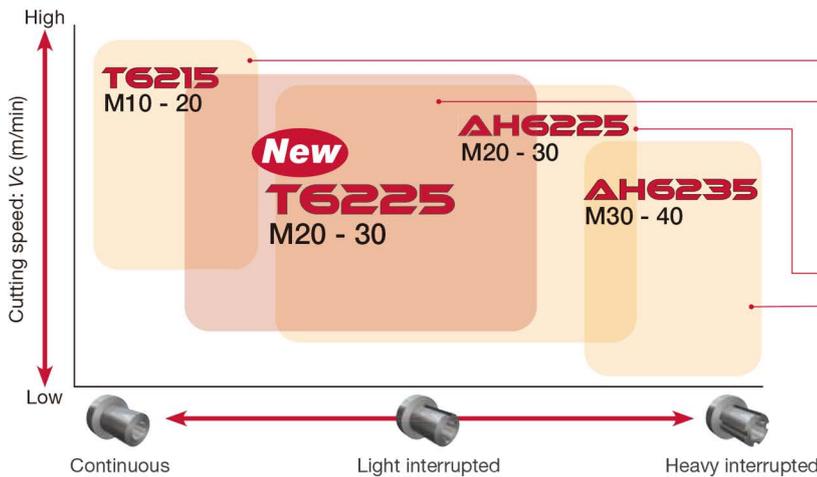


Latest grade series providing solutions for all your machining challenges in stainless steel

T6200 & AH6200

APPLICATION RANGE

M Stainless steel



T6215

A CVD-coated grade suited for high speed cutting. Demonstrates superior wear resistance during continuous cutting.

New

T6225

Versatile CVD grade covering from continuous to light interrupted cutting. Provides excellent wear resistance in the medium cutting range.

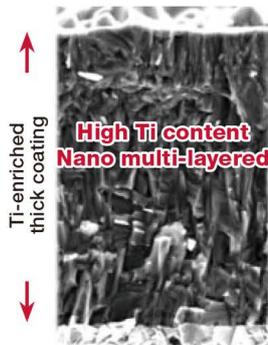
AH6225

A first-choice for stainless steel. A versatile PVD grade for excellent performance in a wide range of stainless steel applications.

AH6235

Provides high reliability during interrupted cuts or at great depths of cut.

AH6200 SERIES



AH6225 / AH6235

Versatile PVD-coated grade

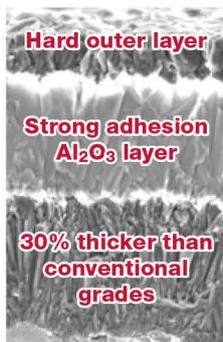
Ti-enriched coating

- Thick Ti-enriched PVD coating for enhanced thermal shock resistance.
- Reduced crater wear.

High Ti-content nano-structured multilayer coating

The outer layer consists of a high Ti-content nano-structured multilayer made possible by Tungaloy's latest coating technology. Its high hardness and nano structure provides the grade with a good balance of wear and fracture resistance, enhancing tool life and predictability.

T6200 SERIES



T6215 / T6225

Superior wear resistance

Enhanced hardness of outer layer

- Hard outer layer coating significantly reduces flank wear.

Strong adhesion of Al₂O₃ layers

- Tungaloy's latest Al₂O₃ coating technology enhances the grade's adhesion of coating, preventing edge chipping and coating delamination.

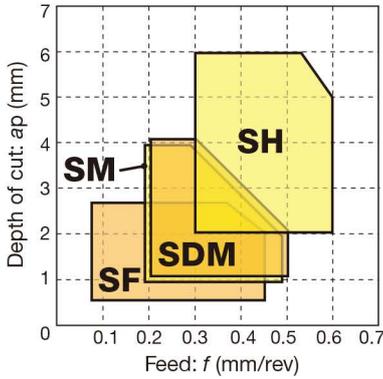
Thick coating

- 30% thicker than conventional grades.
- Provides superior wear resistance and long tool life.

Tungaloy Report No. 547-G

CHIPBREAKERS

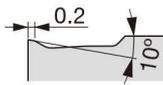
For negative inserts



Chipbreaker	Feature
SF	Demonstrates excellent chip control at high feed rates and light d.o.c. Ideal for finish machining of stainless steel.
SM	First choice for stainless steel turning. Provides light cutting action and good chip control over a wide range of cutting conditions.
SDM	New chipbreaker that generates low cutting forces. Demonstrates excellent resistance to notch and crater wear.
SH	Strong cutting edge design with high fracture resistance for medium to heavy-duty cutting. Suited for rough machining or interrupted cuts.

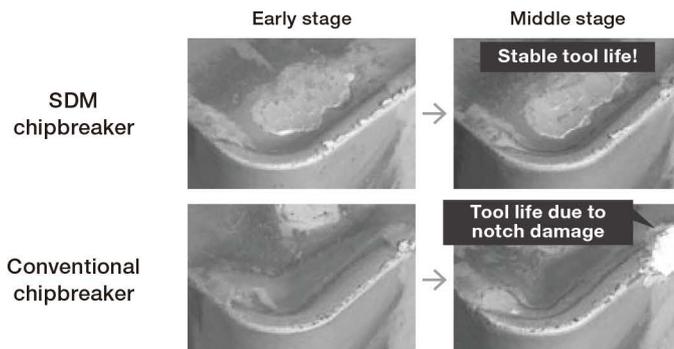
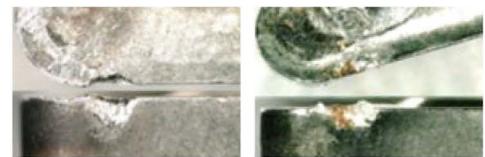
ISO	Operation	Chipbreaker	Grade	Depth of cut ap (mm)	Feed f (mm/rev)	Cutting speed: Vc (m/min)		
						Austenitic stainless steel	Ferritic / martensite stainless steel	Precipitation hardened stainless steel
M	Finishing	SF	T6215	0.5 - 2.5	0.08 - 0.45	140 - 240	160 - 280	80 - 150
			T6225	0.5 - 2.5	0.08 - 0.45	90 - 200	110 - 240	60 - 110
			AH6225	0.5 - 2.5	0.08 - 0.45	90 - 200	110 - 240	60 - 110
			AH6235	0.5 - 2.5	0.08 - 0.45	50 - 150	70 - 170	-
	Medium cutting	SM	T6215	1 - 4	0.2 - 0.5	140 - 240	160 - 280	80 - 150
			T6225	1 - 4	0.2 - 0.5	90 - 200	110 - 240	60 - 110
			AH6225	1 - 4	0.2 - 0.5	90 - 200	110 - 240	60 - 110
			AH6235	1 - 4	0.2 - 0.5	50 - 150	70 - 170	-
	Heavy cutting	SDM	T6215	1 - 4	0.2 - 0.5	140 - 240	160 - 280	80 - 150
			AH6225	1 - 4	0.2 - 0.5	90 - 200	110 - 240	60 - 110
			AH6235	1 - 4	0.2 - 0.5	50 - 150	70 - 170	-
			T6215	2 - 6	0.3 - 0.6	140 - 240	160 - 280	80 - 150
Heavy cutting	SH	AH6225	2 - 6	0.3 - 0.6	90 - 200	110 - 240	60 - 110	
		AH6235	2 - 6	0.3 - 0.6	50 - 150	70 - 170	-	

SDM chipbreaker for stainless steel machining



New SDM chipbreaker demonstrates excellent notch wear resistance due to the uniquely designed T-land profile and large rake angle. For applications that cause excessive notch damage development, SDM chipbreaker, in combination with the new grade, can dramatically improve tool life.

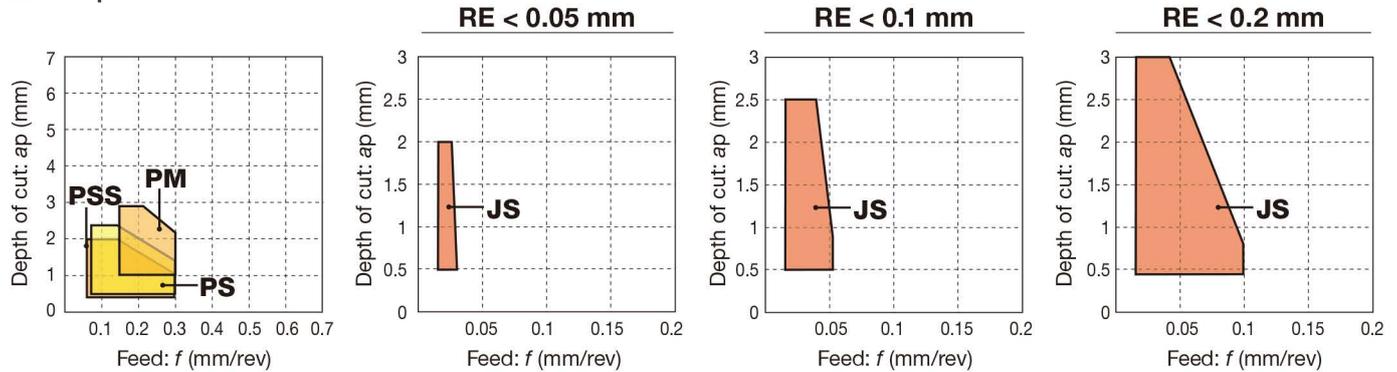
Typical notch wear damage



Workpiece material : SUS316 (X2CrNiMo17-12, 1.4404)
 Cutting speed : Vc = 150 m/min
 Feed : f = 0.3 mm/rev
 Depth of cut : ap = 2 mm
 Machining : Face turning, continuous
 Coolant : Wet

T6200 & AH6200

■ For positive inserts



Chipbreaker	Feature
PSS	Pressed-to-form 3D chipbreakers designed to provide excellent chip control and low cutting forces in finish to medium cutting.
PS	First choice for finish to medium cutting of stainless steel. Features pressed-to-form 3D chipbreakers and sharp cutting edge for excellent chip control.
PM	Chipbreaker for medium cutting with excellent chip control and process security.
JS	First choice for finish machining of small parts. 3D geometry designed to provide a good balance of edge integrity and excellent chip control during finishing operations.

PSS / PS / PM

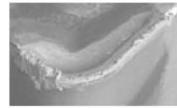
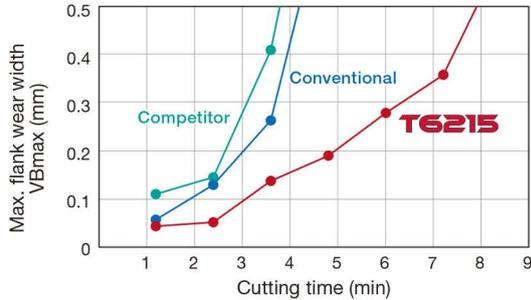
ISO	Operation	Chipbreaker	Grade	Depth of cut ap (mm)	Feed f (mm/rev)	Cutting speed: Vc (m/min)		
						Austenitic stainless steel	Ferritic / martensite stainless steel	Precipitation hardened stainless steel
M	Finishing	PSS	T6215	0.3 - 2	0.08 - 0.3	140 - 240	160 - 280	80 - 150
			AH6225	0.3 - 2	0.08 - 0.3	90 - 200	110 - 240	60 - 110
			AH6235	0.3 - 2	0.08 - 0.3	50 - 150	70 - 170	-
	Finishing to medium cutting	PS	T6215	0.5 - 2.5	0.08 - 0.3	140 - 240	160 - 280	80 - 150
			AH6225	0.5 - 2.5	0.08 - 0.3	90 - 200	110 - 240	60 - 110
			AH6235	0.5 - 2.5	0.08 - 0.3	50 - 150	70 - 170	-
Medium cutting	PM	T6215	1 - 3	0.15 - 0.3	140 - 240	160 - 280	80 - 150	
		AH6225	1 - 3	0.15 - 0.3	90 - 200	110 - 240	60 - 110	
		AH6235	1 - 3	0.15 - 0.3	50 - 150	70 - 170	-	

JS

ISO	Workpiece materials	Chipbreaker	Grade	Cutting speed Vc (m/min)	Depth of cut ap (mm)	Feed: f (mm/rev)			
						RE < 0.05	RE < 0.1	RE < 0.2	RE < 0.4
M	Austenitic stainless steel	JS	AH6225	90 - 200	0.5 - 3	0.02 - 0.03	0.02 - 0.05	0.02 - 0.1	0.05 - 0.2
	Ferritic / martensite stainless steel	JS	AH6225	110 - 240	0.5 - 3	0.02 - 0.03	0.02 - 0.05	0.02 - 0.1	0.05 - 0.2
	Precipitation hardened stainless steel	JS	AH6225	60 - 110	0.5 - 3	0.02 - 0.03	0.02 - 0.05	0.02 - 0.1	0.05 - 0.2

CUTTING PERFORMANCE

M Austenitic stainless steel SUS316L / X2CrNiMo17-12-2



T6215
7.2 min. machining



Conventional
3.6 min. machining



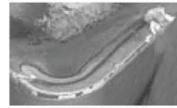
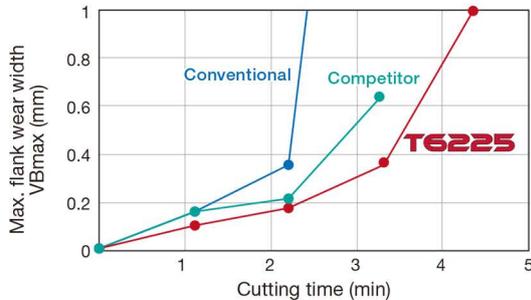
Competitor
3.6 min. machining

Insert : CNMG1204**
Cutting speed : $V_c = 240$ m/min
Feed : $f = 0.3$ mm/rev
Depth of cut : $a_p = 2$ mm
Machining : Continuous cutting
Coolant : Wet

T6215 demonstrated superior wear resistance during high speed turning of austenitic stainless steel.

New

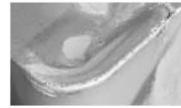
M Austenitic stainless steel SUS316L / X2CrNiMo17-12-2



T6225
2.2 min. machining



Conventional
2.2 min. machining

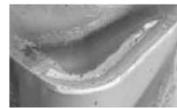
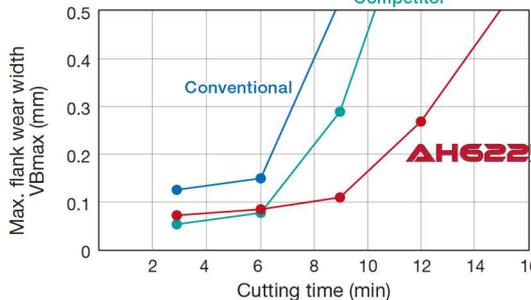


Competitor
2.2 min. machining

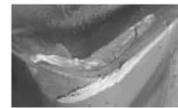
Insert : CNMG1204**
Cutting speed : $V_c = 150$ m/min
Feed : $f = 0.3$ mm/rev
Depth of cut : $a_p = 2$ mm
Machining : Continuous cutting
Coolant : Wet

T6225 demonstrated superior resistance to wear and plastic deformation during machining of austenitic stainless steel.

M Martensitic stainless steel SUS420J2 / X30Cr13



AH6225
9 min. machining



Conventional
9 min. machining

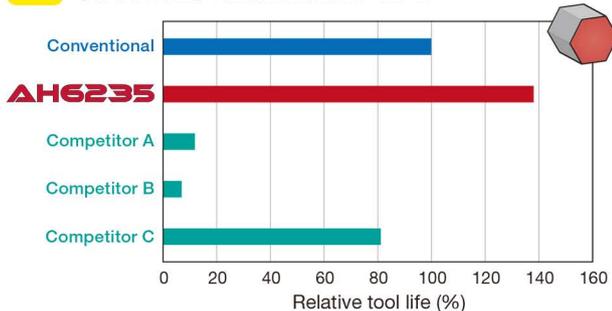


Competitor
9 min. machining

Insert : CNMG1204**
Cutting speed : $V_c = 200$ m/min
Feed : $f = 0.3$ mm/rev
Depth of cut : $a_p = 2$ mm
Machining : Continuous cutting
Coolant : Wet

AH6225 showed excellent wear resistance in martensitic stainless steel machining.

M Austenitic stainless steel SUS316L / X2CrNiMo17-12-2



Insert : CNMG1204**
Cutting speed : $V_c = 120$ m/min
Feed : $f = 0.15$ mm/rev
Depth of cut : $a_p = 2$ mm
Machining : Heavy interrupted cutting
Coolant : Wet
Criteria : Breakage

AH6235 provided superior fracture resistance during interrupted cutting of austenitic stainless steel.

T6200 & AH6200

Insert POSITIVE TYPE

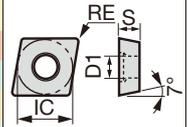
- : Continuous cutting
- ◐ : Light interrupted cutting
- ✱ : Heavy interrupted cutting

CC



Rhombic, 80°
with hole
Positive 7°

	P	M	K	N	S	H
Steel	●	●	●	●	●	●
Stainless	●	●	●	●	●	●
Cast iron	●	●	●	●	●	●
Non-ferrous	●	●	●	●	●	●
Superalloy	●	●	●	●	●	●
Hard material	●	●	●	●	●	●



Application	Chipbreaker	Designation	Coated			Dimension (mm)			
			T6215	AH6225	AH6235	RE	IC	S	D1
Medium cutting		PM CCMT060204-PM	●	●	●	0.4	6.35	2.38	2.8
		CCMT060208-PM	●	●	●	0.8	6.35	2.38	2.8
		CCMT09T304-PM	●	●	●	0.4	9.525	3.97	4.4
		CCMT09T308-PM	●	●	●	0.8	9.525	3.97	4.4
		CCMT09T312-PM	●	●	●	1.2	9.525	3.97	4.4
		CCMT120408-PM	●	●	●	0.8	12.7	4.76	5.5
		CCMT120412-PM	●	●	●	1.2	12.7	4.76	5.5
		24 CCMT060208-24	●			0.8	6.35	2.38	2.8
		CCMT09T308-24	●			0.8	9.525	3.97	4.4

● : Line up

Insert POSITIVE TYPE

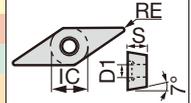
- : Continuous cutting
- ◐ : Light interrupted cutting
- ✱ : Heavy interrupted cutting

VC

Rhombic, 35°
with hole
Positive 7°



P	Steel	◐	✱
M	Stainless	●	✱
K	Cast iron	◐	✱
N	Non-ferrous	◐	✱
S	Superalloy	◐	✱
H	Hard material	◐	✱



Application	Chipbreaker	Designation	Coated		Dimension (mm)				
			T6215	AH6225 AH6235	RE	IC	S	D1	
Finishing to light cutting		PSF VCMT080202-PSF	●		0.2	4.76	2.38	2.3	
		VCMT080204-PSF	●		0.4	4.76	2.38	2.3	
		VCMT110302-PSF	●		0.2	6.35	3.18	2.8	
		VCMT110304-PSF	●		0.4	6.35	3.18	2.8	
		VCMT160404-PSF	●		0.4	9.525	4.76	4.4	
		VCMT160408-PSF	●		0.8	9.525	4.76	4.4	
		PSS VCMT110304-PSS	●	●	●	0.4	6.35	3.18	2.8
VCMT110308-PSS	●	●	●	0.8	6.35	3.18	2.8		
VCMT160404-PSS	●	●	●	0.4	9.525	4.76	4.4		
VCMT160408-PSS	●	●	●	0.8	9.525	4.76	4.4		
Finishing to medium cutting		PS VCMT110302-PS	●	●	●	0.2	6.35	3.18	2.8
		VCMT110304-PS	●	●	●	0.4	6.35	3.18	2.8
		VCMT110308-PS	●	●	●	0.8	6.35	3.18	2.8
		VCMT160404-PS	●	●	●	0.4	9.525	4.76	4.4
		VCMT160408-PS	●	●	●	0.8	9.525	4.76	4.4

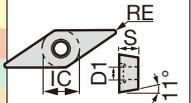
- : New product
- : Line up

VP

35° Rhombic
with hole
Positive 11°



P	Steel	◐	✱
M	Stainless	●	✱
K	Cast iron	◐	✱
N	Non-ferrous	◐	✱
S	Superalloy	◐	✱
H	Hard material	◐	✱



Application	Chipbreaker	Designation	Coated		Dimension (mm)			
			AH6225		RE	IC	S	D1
Finishing		JS VPGT110301M-JS	●		<0.1	6.35	3.18	2.8
		VPGT110302M-JS	●		<0.2	6.35	3.18	2.8
		VPGT110304M-JS	●		<0.4	6.35	3.18	2.8

Corner radius (RE) with a sign of inequality (<) means minus tolerance.

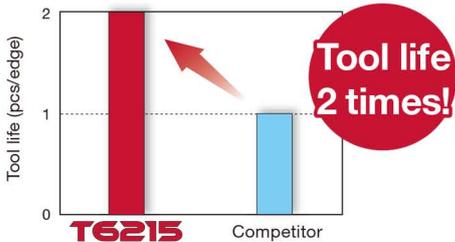
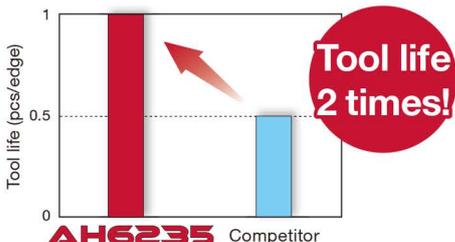
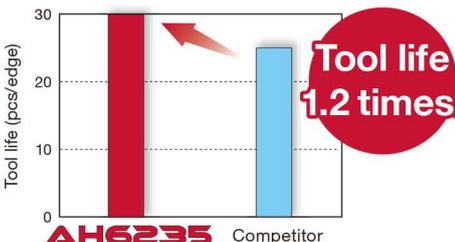
- : Line up

Tolerance



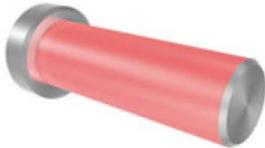
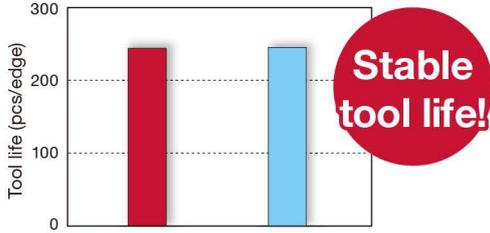
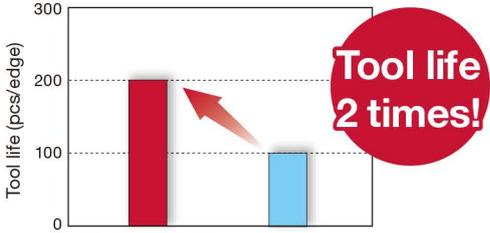
T6200 & AH6200

PRACTICAL EXAMPLES

Workpiece type		Pipe part	Machine part
Insert		DNMG150408-SM	TNMG160408-SM
Grade		T6215	T6215
Workpiece material		SUS304 / X5CrNi18-9	SUS304 / X5CrNi18-9
		 M	 M
Cutting conditions	Cutting speed: V_c (m/min)	150	200
	Feed : f (mm/rev)	0.3	0.3
	Depth of cut : a_p (mm)	3	2.5
	Machining	External turning	External face turning
	Coolant	Wet	Wet
Results		 <p>Tool life 2 times!</p> <p>T6215 provided double tool life and successfully minimized notch wear, which was a major challenge with the competitor's grade.</p>	 <p>Tool life 1.5 times!</p> <p>T6215 provided 1.5 times tool life and eliminated plastic deformation. The grade also improved surface finish, providing process security.</p>
Workpiece type		Generator part	Machine part
Insert		CNMG120408-SH	CNMG120412-SM
Grade		AH6235	AH6235
Workpiece material		SUS410 / X12Cr13	SUS304 / X5CrNi18-9
		 M	 M
Cutting conditions	Cutting speed: V_c (m/min)	70	80
	Feed : f (mm/rev)	0.15	0.2
	Depth of cut : a_p (mm)	2 - 4	1.5
	Machining	Face turning (interrupted cutting)	Face turning (interrupted cutting)
	Coolant	Wet	Wet
Results		 <p>Tool life 2 times!</p> <p>AH6235 provided double tool life and process security, eliminating insert failure during interrupted cuts.</p>	 <p>Tool life 1.2 times!</p> <p>AH6235 provided 1.2 times tool life and substantially reduced edge chipping and fracture.</p>

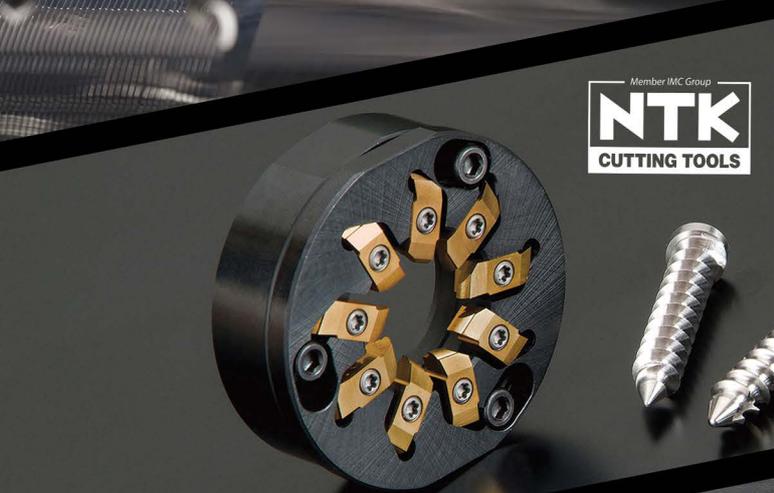
Workpiece type		Joint part	Ball valve part
Insert		CNMG120404-SM	CNMG120408-SM
Grade		AH6225	AH6225
Workpiece material		SUS304 / X5CrNi18-9	SUS304 / X5CrNi18-9
Cutting conditions			
Cutting speed: V_c (m/min)		90	150
Feed : f (mm/rev)		0.2	0.2
Depth of cut : a_p (mm)		1	1.5
Machining		External turning	External turning
Coolant		Wet	Wet
Results		<p>Tool life 2 times!</p> <p>Bar chart showing Tool life (pcs/edge) for AH6225 (red bar, ~100) and Competitor (blue bar, ~50). An arrow points from the competitor bar to the AH6225 bar.</p> <p>AH6225 doubled tool life and significantly reduced premature insert failure, helping the customer gain productivity.</p>	<p>Stable tool life!</p> <p>Bar chart showing Tool life (pcs/edge) for AH6225 (red bar, ~20) and Competitor (blue bar, ~20).</p> <p>AH6225 eliminated tool life unpredictability such as premature insert failures, while satisfying the tool life requirement of 20 pcs per edge.</p>
Workpiece type		Coupling part	Machine part
Insert		TNMG160408-SM	VNMG160404-SF
Grade		AH6225	AH6225
Workpiece material		Super duplex stainless steel	SUS440 (Martensite stainless steel)
Cutting conditions			
Cutting speed: V_c (m/min)		150	110
Feed : f (mm/rev)		0.25	0.1
Depth of cut : a_p (mm)		1	0.5
Machining		External turning	External turning
Coolant		Wet	Wet
Results		<p>Tool life 1.7 times!</p> <p>Bar chart showing Tool life (pcs/edge) for AH6225 (red bar, ~100) and Competitor (blue bar, ~60). An arrow points from the competitor bar to the AH6225 bar.</p> <p>AH6225 significantly reduced notch wear, while increasing tool life to 100 pcs per edge surpassing the required tool life of 60 pcs per edge.</p>	<p>Tool life 2 times!</p> <p>Bar chart showing Tool life (pcs/edge) for AH6225 (red bar, ~100) and Competitor (blue bar, ~50). An arrow points from the competitor bar to the AH6225 bar.</p> <p>AH6225 doubled tool life, allowing the customer to gain productivity.</p>

T6200 & AH6200

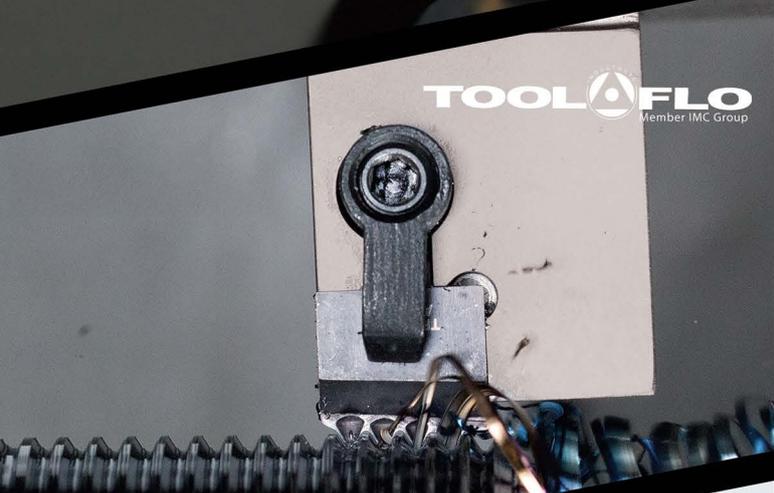
	New Machine part (Ring)	New Machine part
Workpiece type	Machine part (Ring)	Machine part
Toolholder	ATJNL2525M16-A	ACLNL2525M12-A
Insert	TNMG160408-SM	CNMG120408-SM
Grade	T6225	T6225
Workpiece material	Forging stainless	SUS316L / X2CrNiMo17-12-3
	 M	 M
Cutting conditions	Cutting speed: V_c (m/min)	60
	Feed : f (mm/rev)	0.4
	Depth of cut : a_p (mm)	2
	Machining	External and face turning
	Coolant	Wet
	Machine	CNC lathe
Results	 <p>T6225 Conventional</p> <p>T6225 provided process security, while demonstrating no edge chipping or fracture after completing 250 parts required.</p>	 <p>T6225 Competitor</p> <p>T6225 achieved double tool life thanks to its superior wear resistance.</p>



TaeguTec
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