Tungaloy
Member IMC Group

Tungaloy Report No. 323-US

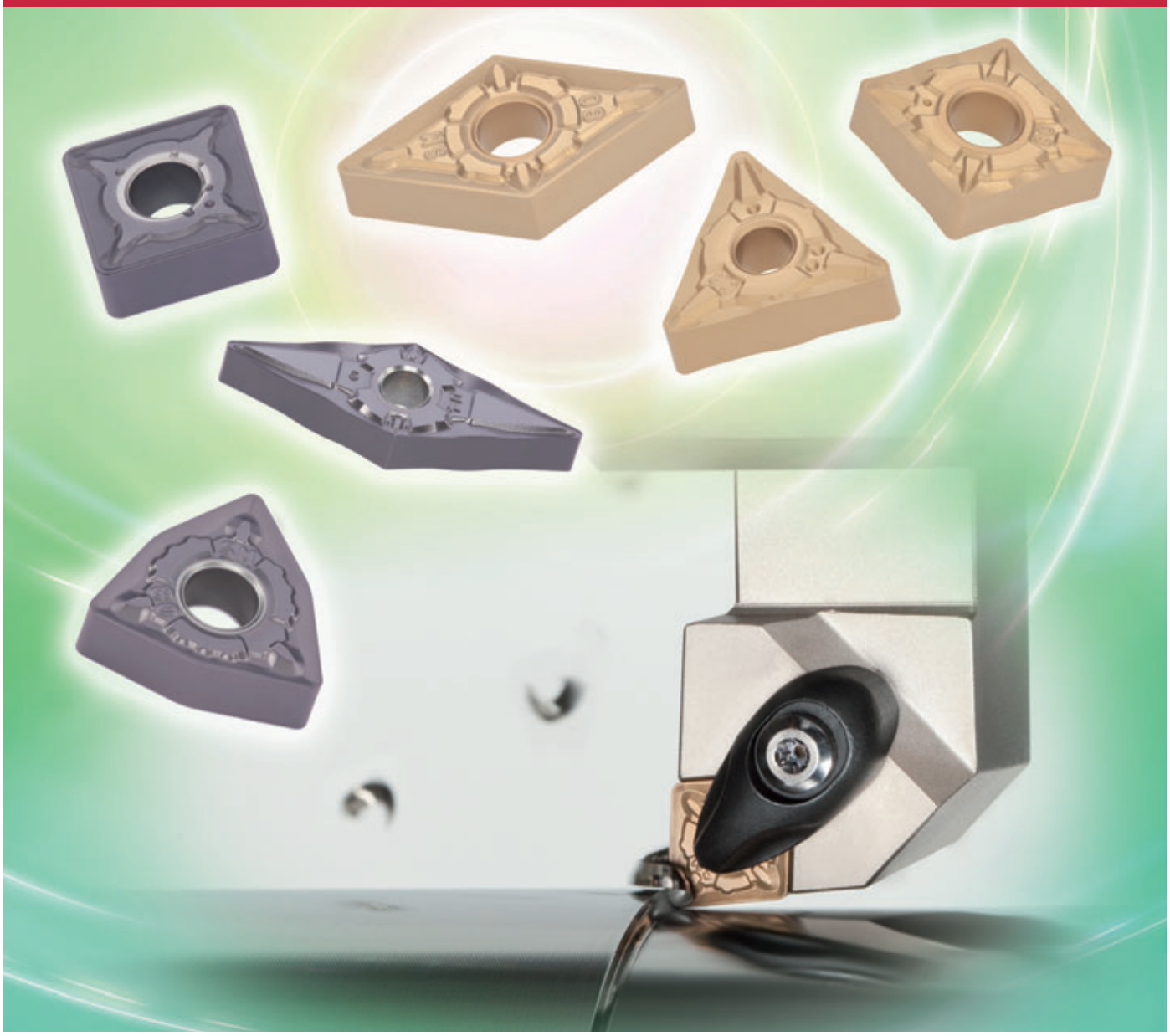
TURNLINE Stainless steel turning series

T6100 SERIES CVD coated grade

AH600 SERIES PVD coated grade

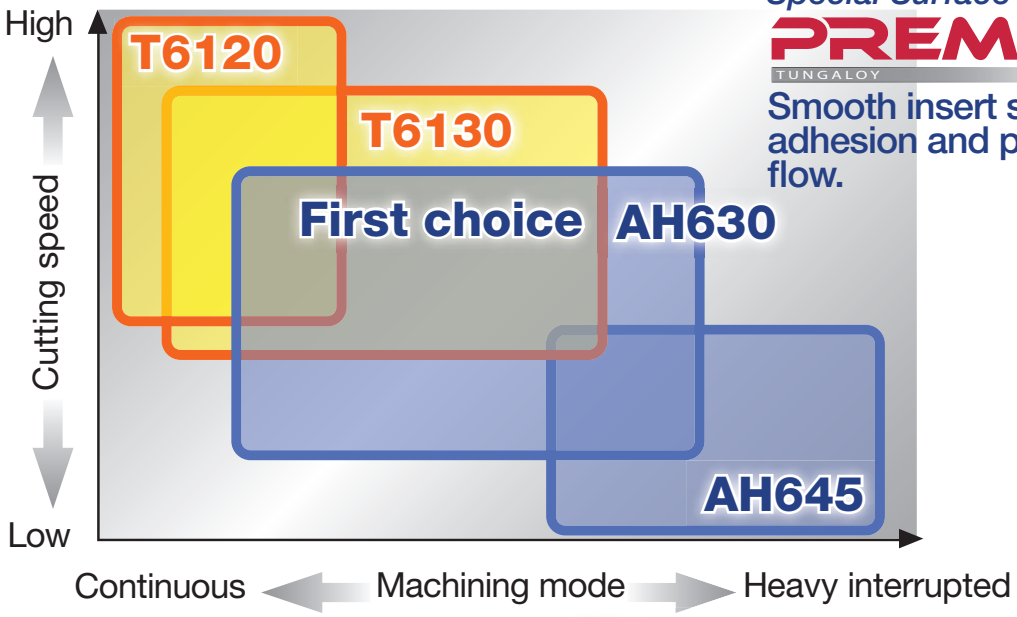
PREMIUMTEC
TUNGALOY

Most efficient grades for stainless steel turning



Incredible reliability in stainl

■ Application range of T6100 & AH600

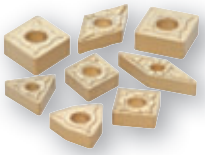


Special Surface Technology

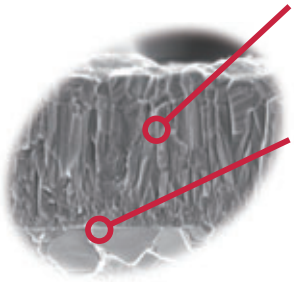
PREMIUMTEC
TUNGALOY

Smooth insert surface prevents chip adhesion and provides smooth chip flow.

T6100 SERIES
TUNGALOY



New CVD coated grade



Columnar Stabilization Technology

Excellent fracture and chipping resistance for extended tool life.

Unique substrate with improved adhesion strength

High adhesion strength significantly improves chipping and fracture resistance.

T6120

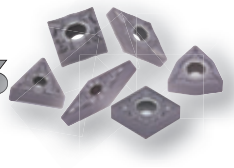
- Suitable for high speed cutting.
- Delivers excellent plastic deformation resistance.
- Especially suitable for austenite and precipitation hardened stainless steel machining.

T6130

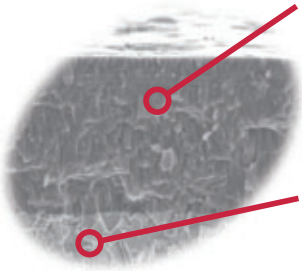
- Provides excellent wear resistance in medium to high speed machining.
- Ideal grade especially for ferrite and martensite stainless steel machining.
- Thicker layer than PVD leads to outstanding wear resistance.

Technical Award 2012 from JCTMA

AH600 SERIES
TUNGALOY



New PVD coated grade



Advanced wear and fracture resistance

This innovative coating layer reduces cracks while keeping a high level of wear resistance that enhances fracture resistance.

Extremely high reliability !

Newly developed substrate with high adhesion strength on the coating layer.

AH630

- Recommended grade for general machining with its perfect balance of fracture and wear resistance
- High chipping resistance with excellent adhesion strength

AH645

- Excellent fracture resistance when machining at low to medium cutting speed
- Suitable grade for interrupted and heavy machining of stainless steel

less steel turning !

M Stainless

Stainless

Negative type

Finishing

Continuous to light interrupted

Recommended

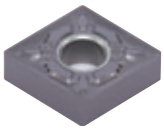
SF AH630

Wear → SF T6130

Medium cutting

Continuous to light interrupted

Recommended



SM AH630

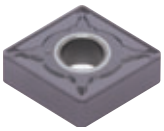
Impact → SM AH645

Wear → SM T6130

Medium to heavy cutting

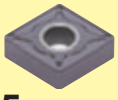
Continuous to light interrupted

Recommended



SH AH630

Impact → SH AH645



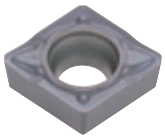
Wear → SH T6130

Positive type

Finishing

Continuous to light interrupted

Recommended



PSS AH630

Impact → PSS AH645

Wear → PSS T6130

Medium cutting

Continuous to light interrupted

Recommended

PS AH630

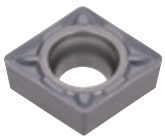
Impact → PS AH645

Wear → PS T6130

Medium to heavy cutting

Continuous to light interrupted

Recommended



PM AH630

Impact → PM AH645

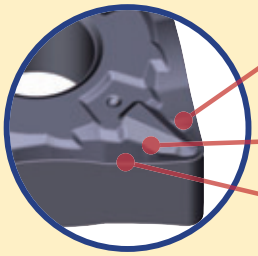
Wear → PM T6130

Chipbreaker

Negative type

For finishing operations
SF type

- Excellent chip control for finish machining
- Outstanding chip control when high feed turning at small depths of cut
- Sharp edge reduces cutting forces and burrs



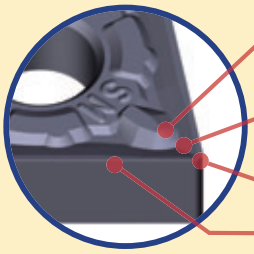
Low cutting force
➡ Large rake angle

Reduces chip adhesion
➡ Dimples around protrusion reduces contact with chips

Excellent chip evacuation
➡ Large inclination

For medium cutting
SM type

- Versatile chipbreaker applicable for a wide range of cutting conditions
- Sharp cutting edge for excellent chip control



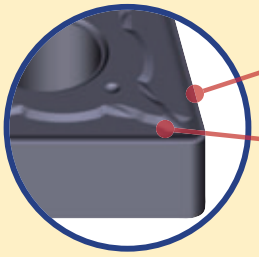
Outstanding control of chips
➡ Well-designed protrusion curls chips smoothly

Low cutting force
➡ Due to the large rake angle and deep chipbreaker

Tough cutting edge with excellent sharpness offers stable machining
➡ Sharp positive-land on the corner
➡ Toughness with wide land at the main cutting edge

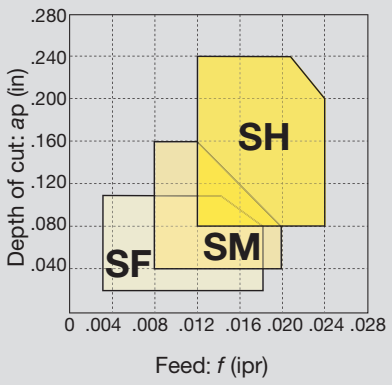
For medium to heavy cutting
SH type

- Suitable for roughing operations and interrupted machining with tough cutting edges
- Applicable for a wide range of cutting conditions and ideal for machining with a fluctuating depth of cut
- Newly designed cutting edges increase the fracture resistance



Incredible fracture resistance
➡ Provided from advanced cutting edges

Low cutting forces and excellent chip control
➡ Due to a unique chipbreaker geometry

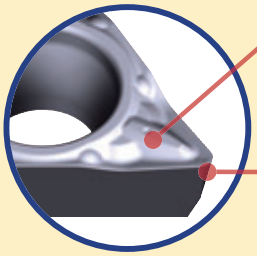


Operation	Machining mode	Chip-breaker	Grades	Depth of cut ap (in)	Feed f (ipr)
Finishing	Continuous	SF	T6120	.020 ~ .100	.003 ~ .018
	Continuous to Light interrupted		T6130		
	Heavy interrupted		AH630		
Medium cutting	Continuous	SM	T6120	.040 ~ .160	.008 ~ .020
	Continuous to Light interrupted		T6130		
	Light interrupted		AH630		
	Heavy interrupted		AH645		
Medium to heavy cutting	Continuous	SH	T6130	.080 ~ .240	.012 ~ .024
	Continuous to Light interrupted		AH630		
	Heavy interrupted		AH645		

Note: Conditions in above table are for regular size inserts.

Positive type

Finishing to light cutting
PSS type

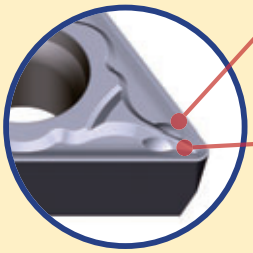


- Optimum chipbreaker for finish cutting of stainless steel
- Provides excellent chip control at small depths of cut

Remarkable chip breaking
➨ Arc shaped protrusion allows stable chip control even at small depths of cut

Stable machining with low cutting force
➨ Optimized inclination and rake angle reduces cutting forces and controls the chip flow when finish cutting

Finishing to medium cutting
PS type

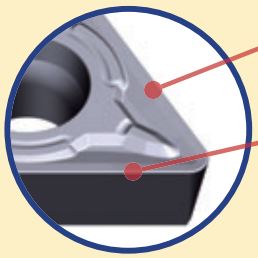


- Recommended chipbreaker for finish to medium cutting of stainless steel

Provides high reliability with low cutting force
➨ Ideal combination of optimum rake angle and tough cutting edge

Stable chip control in a wide range of cutting conditions
➨ Uniquely designed protrusion creates smooth chip curling

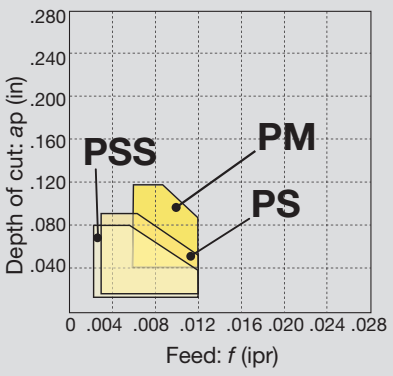
Heavy cutting
PM type



- Sharp and tough cutting edge provides high reliability for stainless steel machining

Allows exceptional chip control with low cutting force
➨ Sharp cutting edges with optimum rake angle

Reduces chipping and notch wear
➨ Flexible land width along the cutting edge prevents chipping



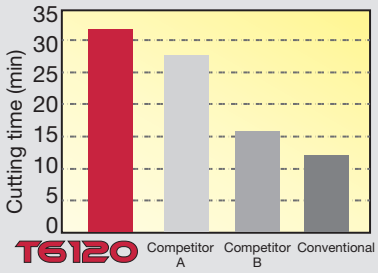
Operation	Chipbreaker	Grades	Depth of cut ap (in)	Feed f (ipr)
Finishing to Light cutting	PSS	T6120 T6130 AH630 AH645	.012 ~ .080	.003~ .012
Finishing to Medium cutting	PS	T6120 T6130 AH630 AH645	.020 ~ .100	.003 ~ .012
Heavy cutting	PM	T6120 T6130 AH630 AH645	.040 ~ .120	.006 ~ .012

Note: Conditions in above table are for regular size inserts.

Cutting performance

T6120

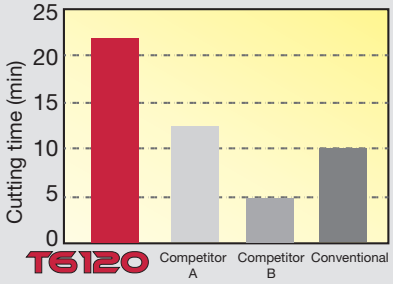
Wear resistance test



Continuous cutting
Work material: 304
Vc = 640 sfm
ap = .080"
f = .008 ipr

T6120 has higher wear resistance than competitor products when high speed cutting.

Fracture resistance test

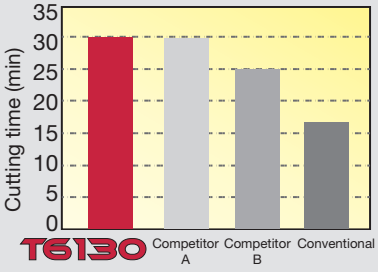


Interrupted cutting
Work material: 304
Vc = 490 sfm
ap = .080"
f = .008 ipr

T6120 has higher fracture resistance than competitors products.

T6130

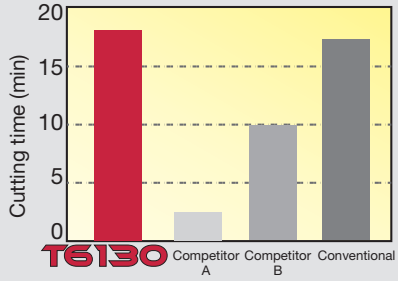
Wear resistance test



Continuous cutting
Work material: 304
Vc = 490 sfm
ap = .080"
f = .012 ipr

T6130 has higher wear resistance than both conventional and competitor grades.

Fracture resistance test

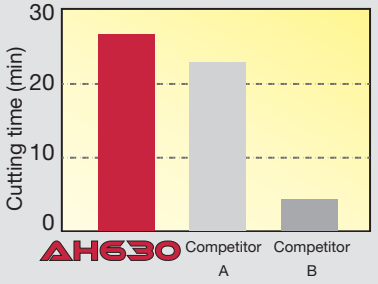


Interrupted cutting
Work material: 304
Vc = 390 sfm
ap = .080"
f = .004 ipr

T6130 has higher fracture resistance than competitor products when medium cutting to provide longer tool life.

AH630

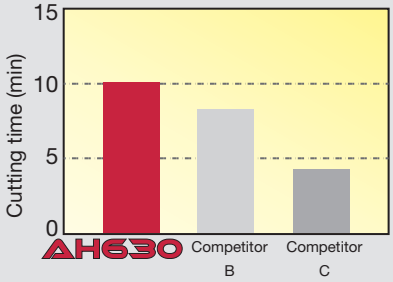
Wear resistance test



Continuous cutting
Work material: 304
Vc = 490 sfm
ap = .080"
f = .012 ipr

AH630 has higher wear resistance than competitor products.

Fracture resistance test

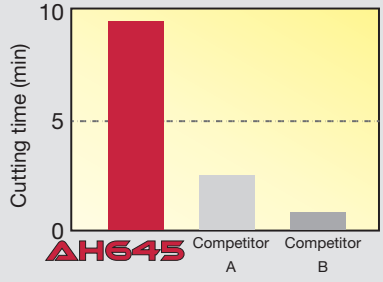


Interrupted cutting
Work material: 304
Vc = 390 sfm
ap = .040"
f = .010 ipr

AH630 has higher fracture resistance than competitor products at medium cutting speed.

AH645

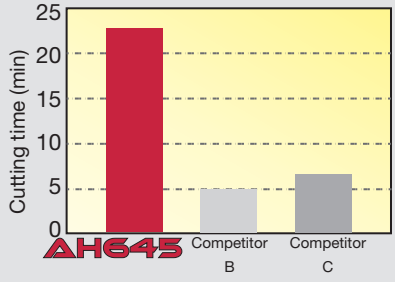
Wear resistance test



Continuous cutting
Work material: 304
Vc = 490 sfm
ap = .080"
f = .012 ipr

AH645 has higher wear resistance than competitors.

Fracture resistance test



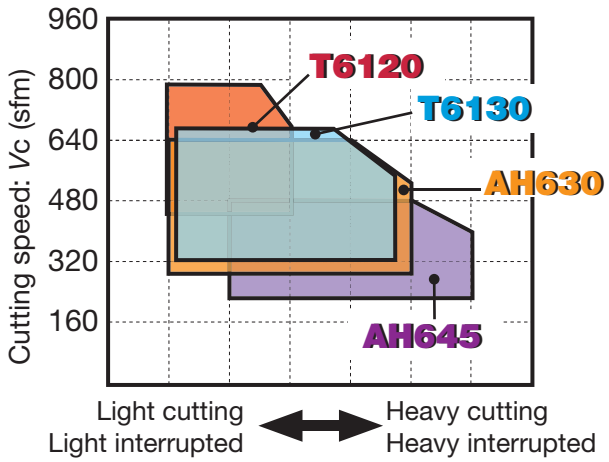
Interrupted cutting
Work material: 304
Vc = 390 sfm
ap = .040"
f = .010 ipr

AH645 has higher fracture resistance than competitors in medium speed cutting.

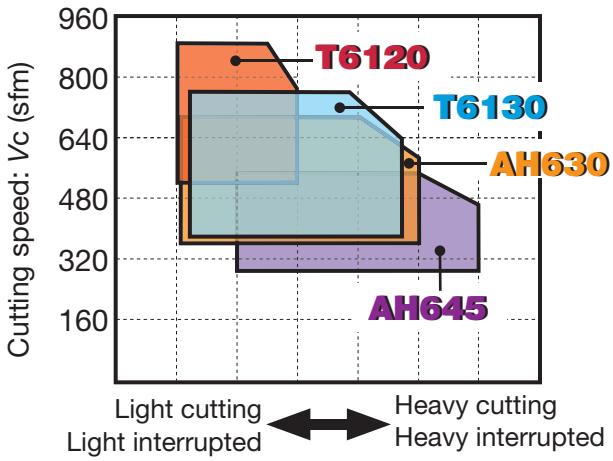
Standard cutting conditions

Standard cutting condition by work material

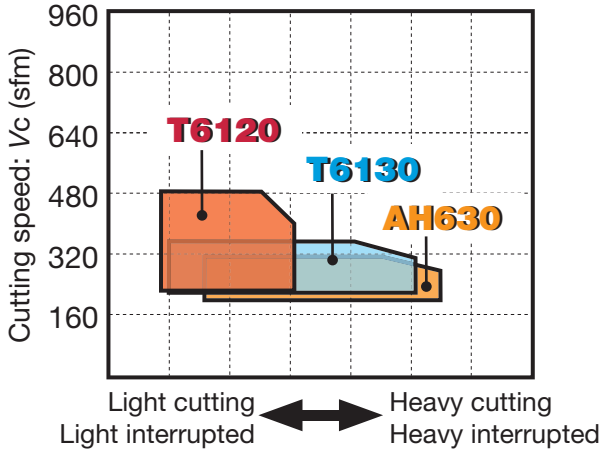
Austenitic stainless steel



Ferritic / martensite stainless steel



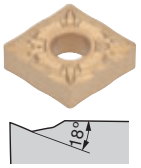
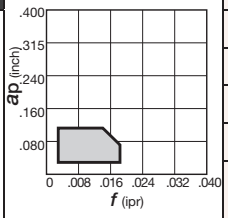
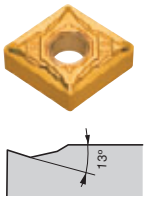
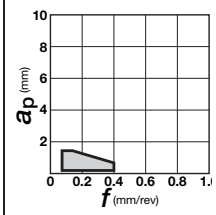
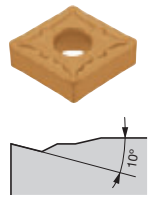
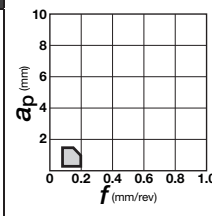
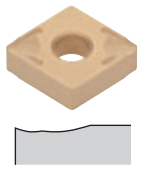
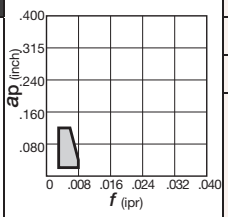
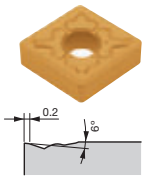
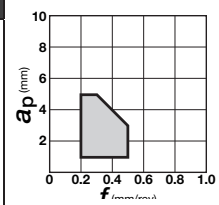
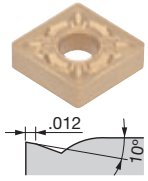
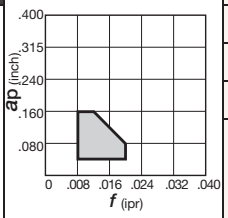
Precipitation hardened stainless steel



Work materials	Grades	Cutting speed: *Vc* (sfm)
Austenitic 304, 316 etc. *AH630: First choice	**T6120**	450 - 800
	T6130	350 - 650
	AH630	300 - 600
	AH645	230 - 500
Ferrite / Martensite 430 / 410 etc.	**T6120**	500 - 900
	T6130	400 - 800
	AH630	360 - 700
	AH645	300 - 550
Precipitation hardened 17-4PH etc.	**T6120**	250 - 500
	T6130	230 - 350
	AH630	200 - 300

Inserts Negative type

Rhombic, 80°

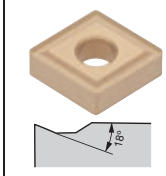
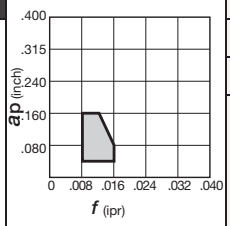
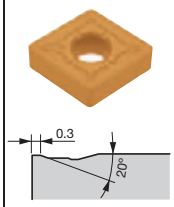
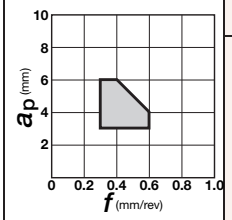
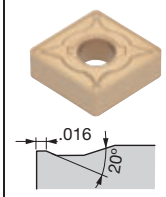
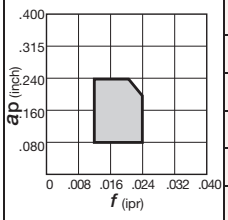
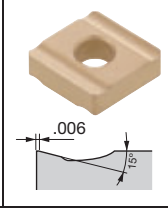
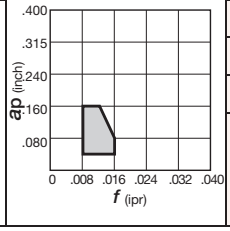
Appli-cation	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades Coated T6120	T6130	AH630	AH645	Dimensions (in) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Finishing	**SF** 		**CNMG 321 SF**	●	●	●		.375	.125	.150	.016
			CNMG 322 SF	●	●	●					.031
			CNMG 431 SF	●	●	●		.500	.187	.203	.016
			* **CNMG 432 SF**	●	●	●					.031
			CNMG 433 SF	●	●	●					.047
	TSF 		**CNMG 431 TSF**		●			.500	.187	.203	.016
			CNMG 432 TSF		●						.031
	TS 		**CNMG 432 TS**		●			.500	.187	.203	.031
	SS 		**CNMG 431 SS**	●	●	●	●	.500	.187	.203	.016
			* **CNMG 432 SS**	●	●	●	●				.031
			CNMG 433 SS	●	●	●	●				.047
Medium cutting	**TM** 		**CNMG 431 TM**		●			.500	.187	.203	.016
			CNMG 432 TM		●						.031
	SM 		**CNMG 431 SM**	●	●	●	●	.500	.187	.203	.016
			* **CNMG 432 SM**	●	●	●	●				.031
			CNMG 433 SM	●	●	●	●				.047
			CNMG 543 SM	●	●			.625	.250	.250	.047

Note: Chipbreaker cross sections are of the inserts marked *

● : Stocked items

Rhombic, 55°

Negative type

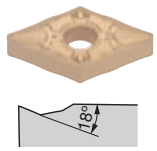
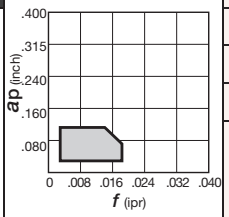
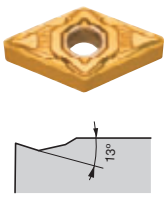
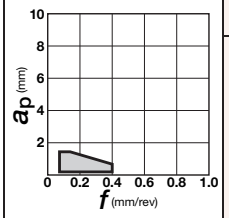
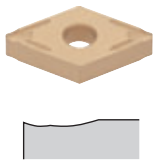
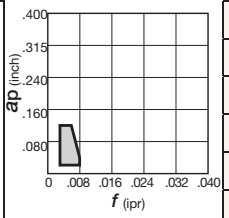
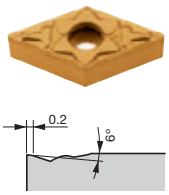
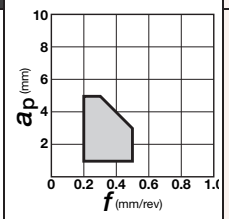
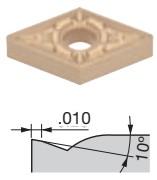
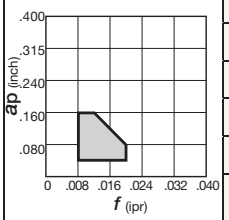
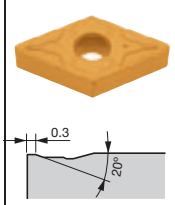
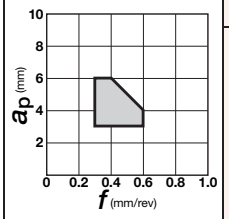
Appli-cation	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades Coated T6120	T6130	AH630	AH645	Dimensions (in) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Medium cutting	**SA** 		**CNMG 431 SA**	●	●	●	●	.500	.187	.203	.016
			* **CNMG 432 SA**	●	●	●	●				.031
			CNMG 433 SA	●	●	●	●				.047
	TH 		**CNMG 432 TH**		●			.500	.187	.203	.031
			CNMG 433 TH		●						.047
Medium to heavy cutting	**SH** 		**CNMG 432 SH**		●	●	●	.500	.187	.203	.031
			CNMG 433 SH		●	●	●				.047
			CNMG 434 SH		●	●	●				.063
			* **CNMG 543 SH**		●	●	●	.625	.250	.250	.047
			CNMG 544 SH		●	●	●				.063
			CNMG 643 SH		●	●	●	.750	.250	.312	.047
			CNMG 644 SH		●	●	●				.063
	S 		**CNMG 431 TRS**		●	●	●	.500	.187	.203	.016
			CNMG 431 TLS		●	●	●				.016
			* **CNMG 432 TRS**		●	●	●				.031
			CNMG 432 TLS		●	●	●				.031

Note: Chipbreaker cross sections are of the inserts marked *

● : Stocked items

Rhombic, 55°

Negative type

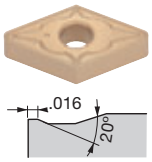
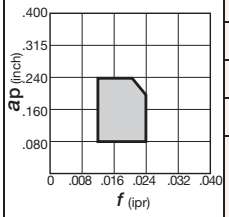
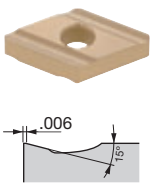
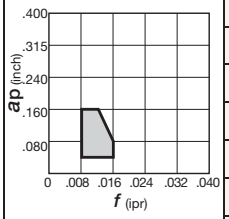
Appli-cation	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades Coated T6120	T6130	AH630	AH645	Dimensions (in) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Finishing	**SF** 		**DNMG 431 SF**	●	●	●		.500	.187	.203	.016
			***DNMG 432 SF**	●	●	●					.031
			DNMG 441 SF	○	○	○		.500	.250	.203	.016
			DNMG 442 SF	○	○	●					.031
	TSF 		**DNMG 431 TSF**		●			.500	.187	.203	.016
			DNMG 432 TSF		●						.031
	SS 		**DNMG 431 SS**	●	●	●	●	.500	.187	.203	.016
			DNMG 432 SS	●	●	●	●				.031
			***DNMG 433 SS**	●	●	●	●				.047
			DNMG 441 SS	○	○	○	○	.500	.250	.203	.016
			DNMG 442 SS	○	○	○	○				.031
			DNMG 443 SS	○	○	○	○				.047
Medium cutting	**TM** 		**DNMG 432 TM**		●			.500	.187	.203	.031
	SM 		**DNMG 431 SM**	●	●	●	●	.500	.187	.203	.016
			***DNMG 432 SM**	●	●	●	●				.031
			DNMG 433 SM	●	●	●	●				.047
			DNMG 441 SM	○	○	●	●	.500	.250	.203	.016
			DNMG 442 SM	○	○	●	●				.031
			DNMG 443 SM	○	○	●	●				.047
Medium to heavy cutting	**TH** 		**DNMG 432 TH**		●			.500	.187	.203	.031
			DNMG 433 TH		●						.047

Note: Chipbreaker cross sections are of the inserts marked *

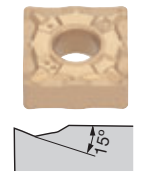
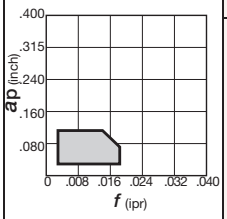
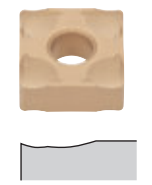
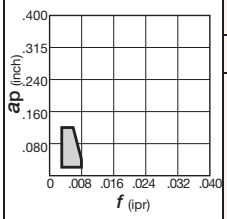
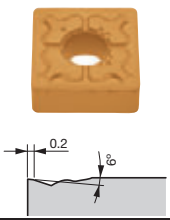
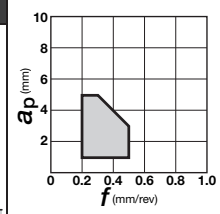
● : Stocked items

Rhombic, 55°

Negative type

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades Coated T6120	T6130	AH630	AH645	Dimensions (in) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Medium to heavy cutting	**SH** 		**DNMG 432 SH**		●	●	●	.500	.187	.203	.031
			* **DNMG 433 SH**		●	●	●				.047
			DNMG 434 SH		●	●	●				.063
			DNMG 442 SH		○	○	●	.500	.250	.203	.031
			DNMG 443 SH		○	●	○				.047
	S 		**DNMG 431 TRS**		●	●	●	.500	.187	.203	.016
			DNMG 431 TLS		●	●	●				.016
			* **DNMG 432 TRS**		●	●	●				.031
			DNMG 432 TLS		●	●	●				.031
			DNMG 441 TRS		○	○	○	.500	.250	.203	.016
			DNMG 441 TLS		○	○	○				.016
			DNMG 442 TRS		○	○	○				.031
			DNMG 442 TLS		○	○	○				.031

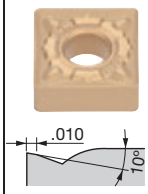
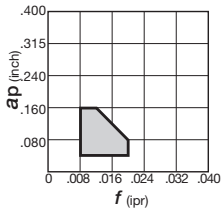
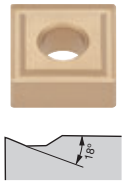
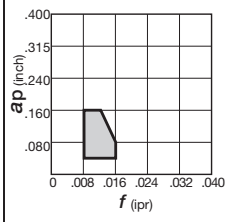
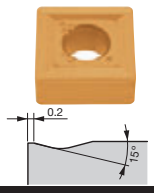
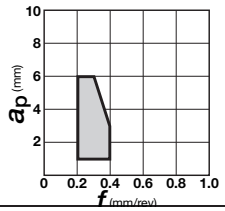
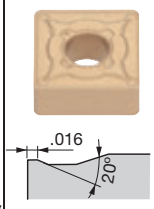
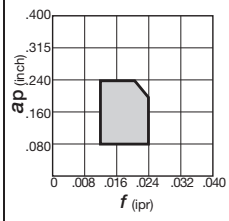
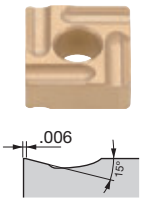
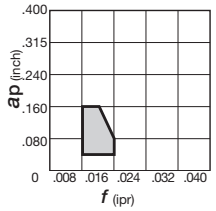
Square, 90°

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades Coated T6120	T6130	AH630	AH645	Dimensions (in) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Finishing	**SF** 		**SNMG 431 SF**	●	●	●		.500	.187	.203	.016
			* **SNMG 432 SF**	●	●	●					.031
	SS 		**SNMG 431 SS**	●	●	●	●	.500	.187	.203	.016
			* **SNMG 432 SS**	●	●	●	●				.031
			SNMG 433 SS	●	●	●	●				.047
Medium cutting	**TM** 		**SNMG 432 TM**		●			.500	.187	.203	.031

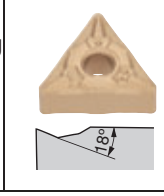
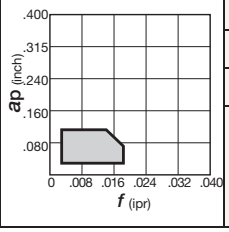
Note: Chipbreaker cross sections are of the inserts marked *

● : Stocked items

Square, 90° — Negative type

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Medium cutting	**SM** 		*SNMG 432 SM	●	●	●	●	.500	.187	.203	.031
			SNMG 433 SM	●	●	●	●				.047
			SNMG 866 SM		●			1.00	.375	.359	.094
	SA 		*SNMG 431 SA	●	●	●	●	.500	.187	.203	.016
			SNMG 432 SA	●	●	●	●				.031
			SNMG 433 SA	●	●	●	●				.047
	All-round 		SNMG 543	●	●			.625	.250	.250	.047
			SNMG 643		●			.750	.250	.312	.047
			SNMG 644		●						.063
			SNMG 866		●			1.00	.375	.359	.094
Medium to heavy cutting	**SH** 		SNMG 432 SH		●	●	●	.500	.187	.203	.031
			SNMG 433 SH		●	●	●				.047
			*SNMG 543 SH		●	●	●	.625	.250	.250	.047
			SNMG 544 SH		●	●	●				.063
			SNMG 643 SH		●	●	●	.750	.250	.312	.047
			SNMG 644 SH		●	●	●				.063
	S 		SNMG 431 TRS		●	●	●	.500	.187	.203	.016
			SNMG 431 TLS		●	●	●				.016
			*SNMG 432 TRS		●	●	●				.031
			SNMG 432 TLS		●	●	●				.031

Triangular, 60°

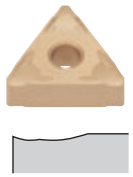
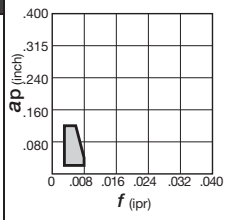
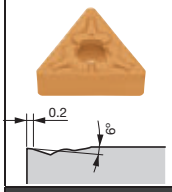
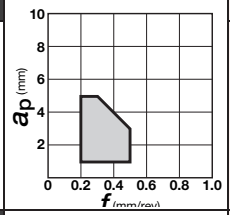
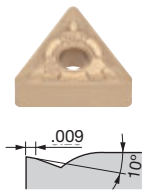
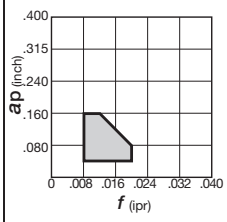
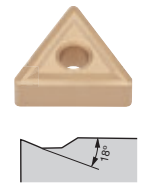
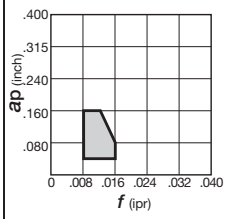
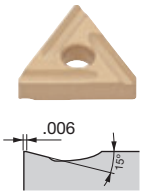
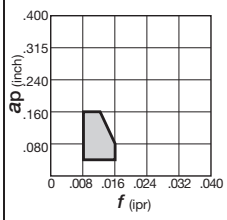
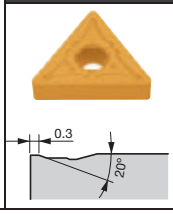
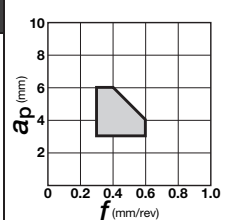
Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Finishing	**SF** 		TNMG 331 SF	●	●	●		.375	.187	.150	.016
			*TNMG 332 SF	●	●	●					.031
			TNMG 333 SF	●	●	●					.047

Note: Chipbreaker cross sections are of the inserts marked *

● : Stocked items

Triangular, 60°

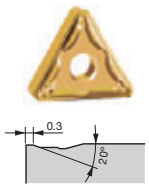
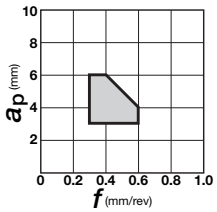
Negative type

Appli-cation	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades Coated T6120	T6130	AH630	AH645	Dimensions (in) I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Finishing	**SS** 		**TNMG 331 SS**	●	●	●	●	.375	.187	.150	.016
			TNMG 332 SS	●	●	●	●				.031
			TNMG 333 SS	●	●	●	●				.047
			* **TNMG 431 SS**	●	●	●	●	.500	.187	.203	.016
			TNMG 432 SS	●	●	●	●				.031
			TNMG 433 SS	●	●	●	●				.047
Medium cutting	**TM** 		**TNMG 432 TM**		●			.500	.187	.203	.031
	SM 		**TNMG 331 SM**	●	●	●	●	.375	.187	.150	.016
			* **TNMG 332 SM**	●	●	●	●				.031
			TNMG 333 SM	●	●	●	●				.047
			TNMG 432 SM	●	●	●	●	.500	.187	.203	.031
			TNMG 433 SM	●	●	●	●				.047
			TNMG 666 SM	●	●			.625	.250	.250	.094
	SA 		**TNMG 331 SA**	●	●	●	●	.375	.187	.150	.016
			* **TNMG 332 SA**	●	●	●	●				.031
			TNMG 333 SA	●	●	●	●				.047
			TNMG 432 SA	●	●	●	●	.500	.187	.203	.031
			TNMG 433 SA	●	●	●	●				.047
	S 		**TNMG 331 TRS**		●	●	●	.375	.187	.150	.016
			TNMG 331 TLS		●	●	●				.016
			* **TNMG 332 TRS**		●	●	●				.031
			TNMG 332 TLS		●	●	●				.031
			TNMG 431 TRS		●	●	●	.500	.187	.203	.016
			TNMG 431 TLS		●	●	●				.016
			TNMG 432 TRS		●	●	●				.031
			TNMG 432 TLS		●	●	●				.031
Heavy	**TH** 		**TNMG 432 TH**		●			.500	.187	.203	.031

Note: Chipbreaker cross sections are of the inserts marked *

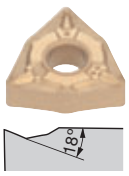
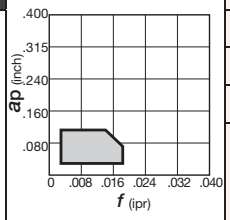
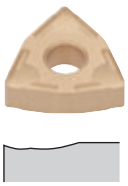
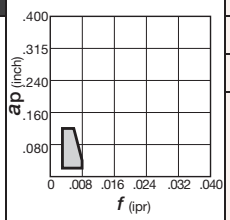
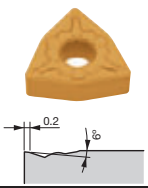
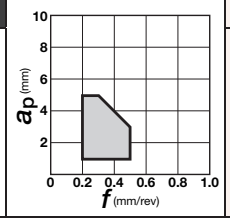
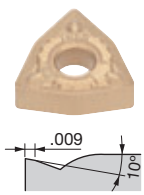
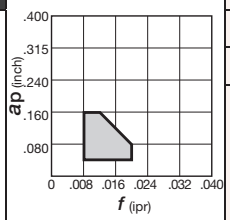
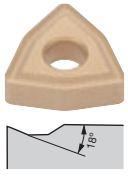
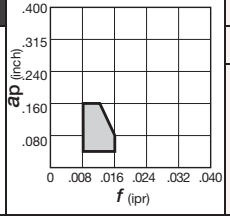
● : Stocked items

Triangular, 60° — Negative type

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Heavy	**TN32** 		**TNMG 666 TN32**		●			.625	.250	.250	.094

Trigon, 80°

● : Stocked items

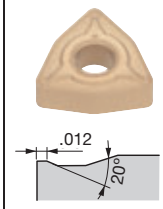
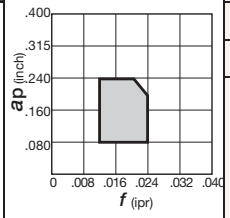
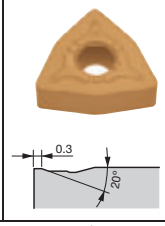
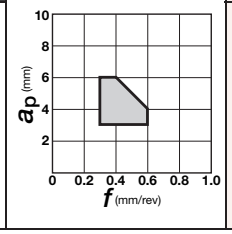
Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Finishing	**SF** 		**WNMG 331 SF**	●	●	●		.375	.187	.150	.016
			WNMG 332 SF	●	●	●					.031
			WNMG 431 SF	●	●	●		.500	.187	.203	.016
			***WNMG 432 SF**	●	●	●					.031
Medium cutting	**SS** 		**WNMG 431 SS**	●	●	●	●	.500	.187	.203	.016
			***WNMG 432 SS**	●	●	●	●				.031
			WNMG 433 SS	●	●	●	●				.047
	TM 		**WNMG 432 TM**		●			.500	.187	.203	.031
	SM 		**WNMG 431 SM**	●	●	●	●	.500	.187	.203	.016
			***WNMG 432 SM**	●	●	●	●				.031
			WNMG 433 SM	●	●	●	●				.047
Medium to heavy cutting	**SA** 		***WNMG 432 SA**	●	●	●	●	.500	.187	.203	.031
			WNMG 433 SA	●	●	●	●				.047

Note: Chipbreaker cross sections are of the inserts marked *

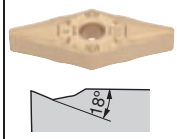
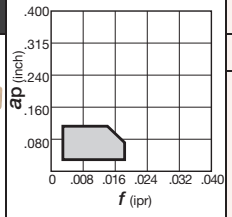
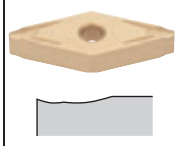
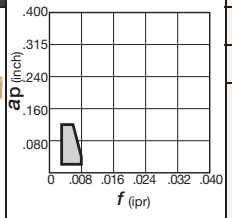
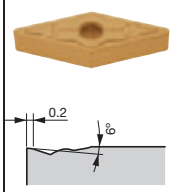
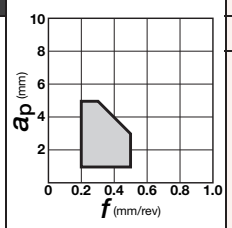
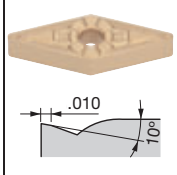
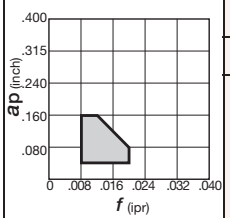
● : Stocked items

Trigon, 80°

Negative type

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Medium to heavy cutting	**SH** 		**WNMG 432 SH**		●	●	●	.500	.187	.203	.031
			***WNMG 433 SH**		●	●	●				.047
			WNMG 543 SH		●			.625	.250	.250	.047
Heavy	**TH** 		**WNMG 432 TH**		●			.500	.187	.203	.031

Rhombic, 35°

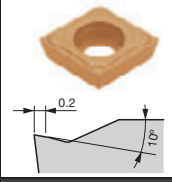
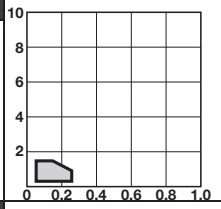
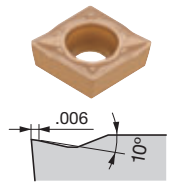
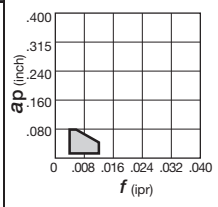
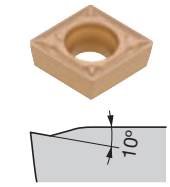
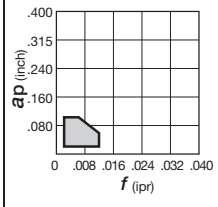
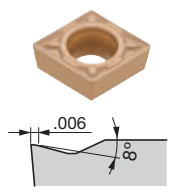
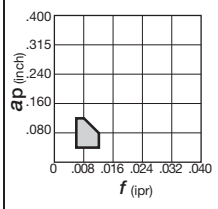
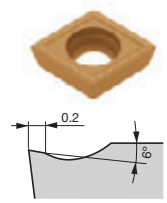
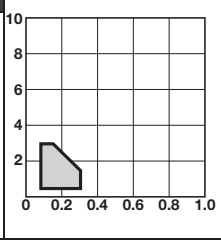
Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No.	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Finishing	**SF** 		**VNMG 331 SF**	●	●	●		.375	.187	.150	.016
			***VNMG 332 SF**	●	●	●					.031
	SS 		***VNMG 331 SS**	●	●	●	●	.375	.187	.150	.016
			VNMG 332 SS	●	●	●	●				.031
			VNMG 333 SS	●	●	●	●				.047
Medium cutting	**TM** 		**VNMG 331 TM**		●			.375	.187	.150	.016
			VNMG 332 TM		●						.031
	SM 		**VNMG 331 SM**	●	●	●	●	.375	.187	.150	.016
			***VNMG 332 SM**	●	●	●	●				.031
			VNMG 333 SM	●	●	●	●				.047

Note: Chipbreaker cross sections are of the inserts marked *

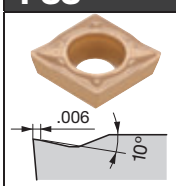
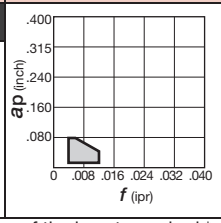
● : Stocked items

Inserts Positive type / ISO

Rhombic, 80° (7°)

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Finishing	**PF** 		CCMT060204-PF		●			.250	.094	.110	.016
			CCMT060208-PF		●						.031
			CCMT09T304-PF		●			.375	.156	.173	.016
			CCMT09T308-PF		●						.031
Finishing to light cutting	**PSS** 		CCMT060204-PSS	●	●	●	●	.250	.094	.110	.016
			CCMT060208-PSS	●	●	●	●				.031
			*CCMT09T304-PSS	●	●	●	●	.375	.156	.173	.016
			CCMT09T308-PSS	●	●	●	●				.031
			CCMT120404-PSS	●	●	●	●	.500	.187	.217	.016
			CCMT120408-PSS	●	●	●	●				.031
			CCMT120412-PSS	●	●	●	●				.047
Finishing to medium cutting	**PS** 		CCMT060202-PS	●	●	●	●	.250	.094	.110	.008
			CCMT060204-PS	●	●	●	●				.016
			*CCMT060208-PS	●	●	●	●				.031
			CCMT09T302-PS	●	●	●	●	.375	.156	.173	.008
			CCMT09T304-PS	●	●	●	●				.016
			CCMT09T308-PS	●	●	●	●				.031
			CCMT120404-PS	●	●	●	●	.500	.187	.217	.016
			CCMT120408-PS	●	●	●	●				.031
			CCMT120412-PS	●	●	●	●				.047
Medium cutting	**PM** 		CCMT060204-PM	●	●	●	●	.250	.094	.110	.016
			CCMT060208-PM	●	●	●	●				.031
			CCMT09T304-PM	●	●	●	●	.375	.156	.173	.016
			*CCMT09T308-PM	●	●	●	●				.031
			CCMT09T312-PM	●	●	●	●				.047
			CCMT120408-PM	●	●	●	●	.500	.187	.217	.031
			CCMT120412-PM	●	●	●	●				.047
	24 		CCMT060204-24		●			.250	.094	.110	.016
			CCMT060208-24		●						.031
			*CCMT090304-24		●			.375	.156	.173	.016
			CCMT090308-24		●						.031
			CCMT120408-24		●			.500	.187	.217	.031

Rhombic, 80° (11°)

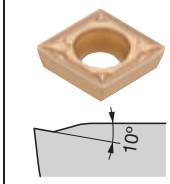
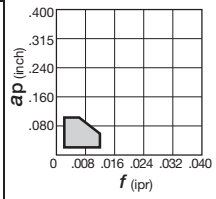
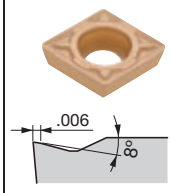
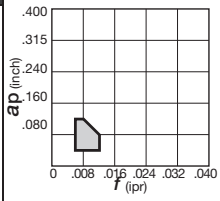
Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Finishing to light cutting	**PSS** 		CPMT080204-PSS	●	●	●	●	.313	.094	.134	.016
			CPMT080208-PSS	●	●	●	●				.031
			*CPMT090304-PSS	●	●	●	●	.375	.125	.173	.016
			CPMT090308-PSS	●	●	●	●				.031

Note: Chipbreaker cross sections are of the inserts marked *

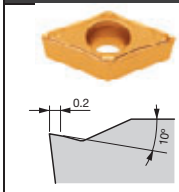
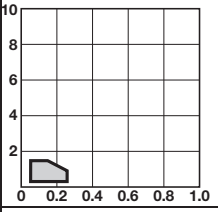
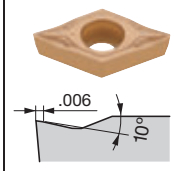
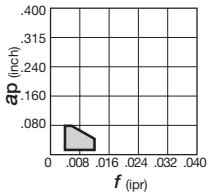
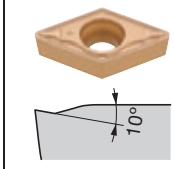
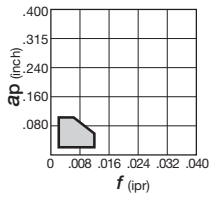
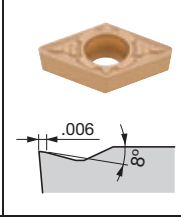
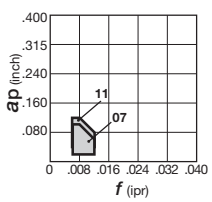
● : Stocked items

Rhombic, 80° (11°)

Positive type / ISO

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	Coated T6130	Coated AH630	Coated AH645	Dimensions (in): I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Finishing to medium cutting	**PS** 		**CPMT080202-PS**	●	●	●	●	.313	.094	.134	.008
			CPMT080204-PS	●	●	●	●				.016
			CPMT080208-PS	●	●	●	●				.031
			***CPMT090304-PS**	●	●	●	●	.375	.125	.173	.016
			CPMT090308-PS	●	●	●	●				.031
Medium cutting	**PM** 		**CPMT060204-PM**	●	●	●	●	.250	.094	.110	.016
			CPMT060208-PM	●	●	●	●				.031
			***CPMT090304-PM**	●	●	●	●	.375	.125	.173	.016
			CPMT090308-PM	●	●	●	●				.031

Rhombic, 55° (7°)

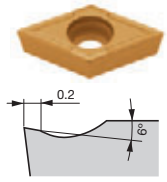
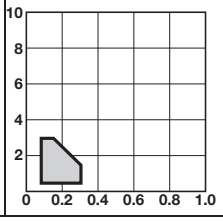
Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	Coated T6130	Coated AH630	Coated AH645	Dimensions (in): I.C.dia ød	Thick-ness s	Hole dia ød1	Corner radius rε
Finishing	**PF** 		**DCMT070208-PF**		●			.250	.094	.110	.031
			DCMT11T302-PF		●			.375	.156	.173	.008
			DCMT11T304-PF		●						.016
Finishing to light cutting	**PSS** 		**DCMT070204-PSS**	●	●	●	●	.250	.094	.110	.016
			DCMT070208-PSS	●	●	●	●				.031
			***DCMT11T304-PSS**	●	●	●	●	.375	.156	.173	.016
			DCMT11T308-PSS	●	●	●	●				.031
			DCMT11T312-PSS	●	●	●	●				.047
Finishing to medium cutting	**PS** 		**DCMT070202-PS**	●	●	●	●	.250	.094	.110	.008
			***DCMT070204-PS**	●	●	●	●				.016
			DCMT11T302-PS	●	●	●	●	.375	.156	.173	.008
			***DCMT11T304-PS**	●	●	●	●				.016
			DCMT11T308-PS	●	●	●	●				.031
			DCMT11T312-PS	●	●	●	●				.047
Medium cutting	**PM** 		**DCMT070204-PM**	●	●	●	●	.250	.094	.110	.016
			DCMT070208-PM	●	●	●	●				.031
			DCMT11T304-PM	●	●	●	●	.375	.156	.173	.016
			***DCMT11T308-PM**	●	●	●	●				.031
			DCMT11T312-PM	●	●	●	●				.047

Note: Chipbreaker cross sections are of the inserts marked *

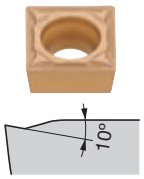
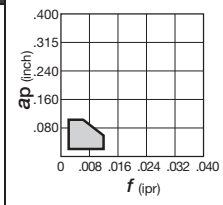
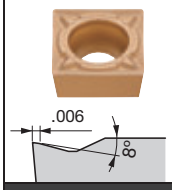
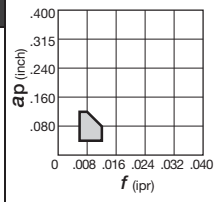
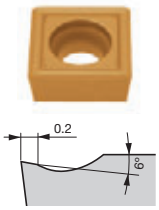
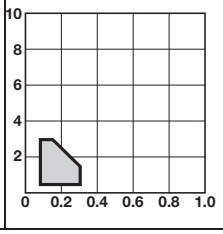
● : Stocked items

Rhombic, 55° (7°)

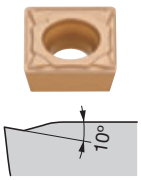
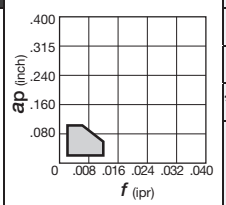
Positive type / ISO

Application	Chipbreaker / Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Medium cutting	**24** 		**DCMT11T308-24**		●			.375	.156	.173	.031

Square, 90° (7°)

Application	Chipbreaker / Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Finishing to medium cutting	**PS** 		*SCMT09T304-PS	●	●	●	●	.375	.156	.173	.016
			SCMT09T308-PS	●	●	●	●				.031
			SCMT120404-PS	●	●	●	●	.500	.187	.217	.016
			SCMT120408-PS	●	●	●	●				.031
Medium cutting	**PM** 		*SCMT09T304-PM	●	●	●	●	.375	.156	.173	.016
			SCMT09T308-PM	●	●	●	●				.031
			SCMT120408-PM	●	●	●	●	.500	.187	.217	.031
			SCMT120412-PM	●	●	●	●				.047
	24 		SCMT120408-24		●			.500	.187	.217	.031

Square, 90° (11°)

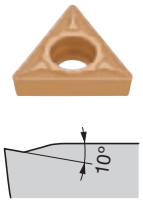
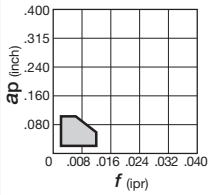
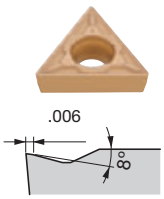
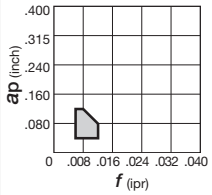
Application	Chipbreaker / Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Finishing to medium cutting	**PS** 		SPMT090304-PS	●	●	●	●	.375	.156	.173	.016
			SPMT090308-PS	●	●	●	●				.031
			SPMT120404-PS	●	●	●	●	.500	.187	.217	.016
			*SPMT120408-PS	●	●	●	●				.031

Note: Chipbreaker cross sections are of the inserts marked *

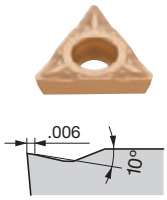
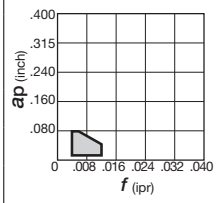
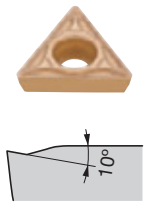
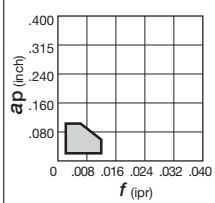
● : Stocked items

Triangular, 60° (7°)

Positive type / ISO

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No	Stocked grades Coated T6120	T6130	AH630	AH645	Dimensions (in) I.C.dia ød	Thick-ness S	Hole dia ød1	Corner radius rε
Finishing to medium cutting	**PS** 		TCMT110202-PS	●	●	●	●	.250	.094	.110	.008
			*TCMT110204-PS	●	●	●	●				.016
			TCMT110208-PS	●	●	●	●				.031
			TCMT110302-PS	●	●	●	●	.250	.125	.110	.008
			TCMT110304-PS	●	●	●	●				.016
			TCMT110308-PS	●	●	●	●				.031
			TCMT16T302-PS	●	●	●	●	.375	.156	.173	.008
			TCMT16T304-PS	●	●	●	●				.016
			TCMT16T308-PS	●	●	●	●				.031
Medium cutting	**PM** 		TCMT110202-PM	●	●	●	●	.250	.094	.110	.008
			TCMT110204-PM	●	●	●	●				.016
			TCMT110208-PM	●	●	●	●				.031
			TCMT110302-PM	●	●	●	●	.250	.125	.110	.008
			TCMT110304-PM	●	●	●	●				.016
			TCMT110308-PM	●	●	●	●				.031
			*TCMT16T304-PM	●	●	●	●	.375	.156	.173	.016
			TCMT16T308-PM	●	●	●	●				.031
			TCMT16T312-PM	●	●	●	●				.047

Triangular, 60° (11°)

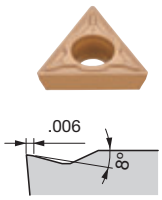
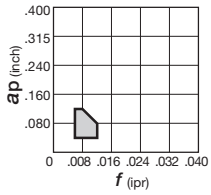
Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No	Stocked grades Coated T6120	T6130	AH630	AH645	Dimensions (in) I.C.dia ød	Thick-ness S	Hole dia ød1	Corner radius rε
Finishing to light cutting	**PSS** 		TPMT090204-PSS	●	●	●	●	.219	.094	.098	.016
			TPMT090208-PSS	●	●	●	●				.031
			*TPMT110204-PSS	●	●	●	●	.250	.094	.110	.016
			TPMT110208-PSS	●	●	●	●				.031
			TPMT110304-PSS	●	●	●	●	.250	.125	.134	.016
			TPMT110308-PSS	●	●	●	●				.031
			TPMT130304-PSS	●	●	●	●	.313	.125	.134	.016
			TPMT130308-PSS	●	●	●	●				.031
			TPMT16T304-PSS	●	●	●	●	.375	.156	.173	.016
			TPMT16T308-PSS	●	●	●	●				.031
Finishing to medium cutting	**PS** 		TPMT090202-PS	●	●	●	●	.219	.094	.098	.008
			TPMT090204-PS	●	●	●	●				.016
			TPMT090208-PS	●	●	●	●				.031
			TPMT110202-PS	●	●	●	●	.250	.094	.110	.008
			*TPMT110204-PS	●	●	●	●				.016
			TPMT110208-PS	●	●	●	●				.031
			TPMT110304-PS	●	●	●	●	.250	.125	.134	.016
			TPMT110308-PS	●	●	●	●				.031
			TPMT130304-PS	●	●	●	●	.313	.125	.134	.016
			TPMT130308-PS	●	●	●	●				.031
			TPMT16T304-PS	●	●	●	●	.375	.156	.173	.016
			TPMT16T308-PS	●	●	●	●				.031

Note: Chipbreaker cross sections are of the inserts marked *

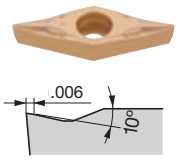
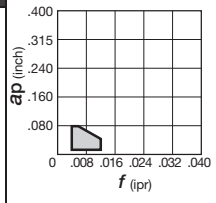
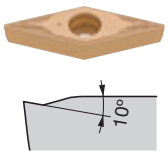
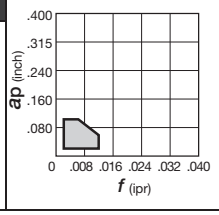
● : Stocked items

Triangular, 60° (11°)

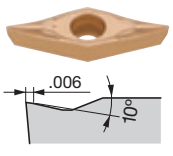
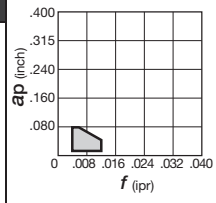
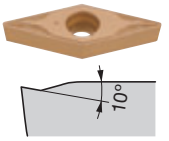
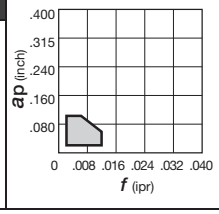
Positive type / ISO

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Medium cutting	PM 		TPMT090204-PM	●	●	●	●	.219	.094	.098	.016
			TPMT090208-PM	●	●	●	●				.031
			TPMT110204-PM	●	●	●	●	.250	.094	.110	.016
			TPMT110208-PM	●	●	●	●				.031
			TPMT110304-PM	●	●	●	●	.250	.125	.134	.016
			TPMT110308-PM	●	●	●	●				.031
			TPMT130304-PM	●	●	●	●	.313	.125	.134	.016
			TPMT130308-PM	●	●	●	●				.031
			*TPMT16T304-PM	●	●	●	●	.375	.156	.173	.016
			TPMT16T308-PM	●	●	●	●				.031
			TPMT16T312-PM	●	●	●	●				.047

Rhombic, 35° (5°)

Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Finishing to light cutting	PSS 		VBMT110304-PSS	●	●	●	●	.250	.125	.110	.016
			VBMT110308-PSS	●	●	●	●				.031
			*VBMT160404-PSS	●	●	●	●	.375	.187	.173	.016
			VBMT160408-PSS	●	●	●	●				.031
Finishing to medium cutting	PS 		*VBMT110302-PS	●	●	●	●	.250	.125	.110	.008
			VBMT110304-PS	●	●	●	●				.016
			VBMT110308-PS	●	●	●	●				.031
			VBMT160402-PS	●	●	●	●	.375	.187	.173	.008
			VBMT160404-PS	●	●	●	●				.016
			VBMT160408-PS	●	●	●	●				.031

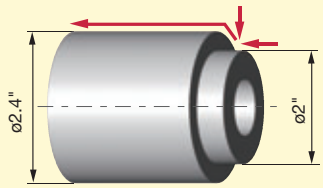
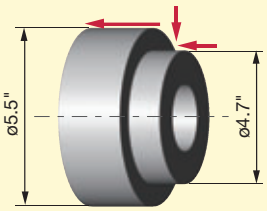
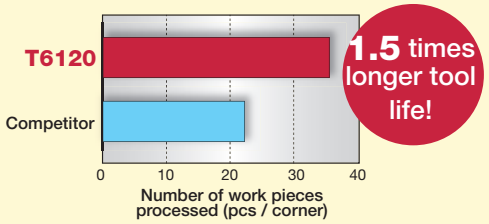
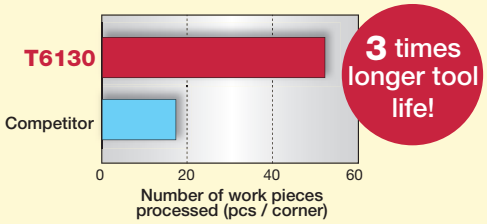
Rhombic, 35° (7°)

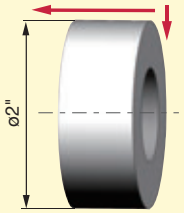
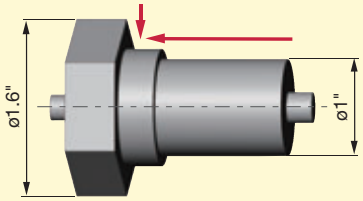
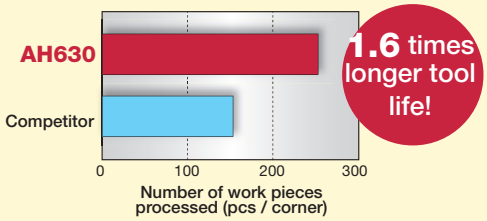
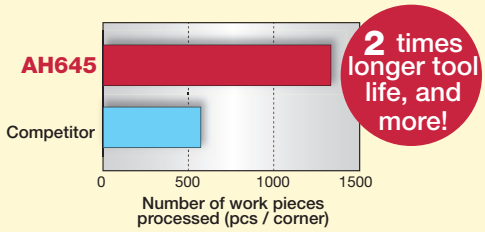
Application	Chipbreaker Appearance (Cross section)	f - ap	Cat. No	Stocked grades: Coated T6120	T6130	AH630	AH645	Dimensions (in): I.C.dia ød	Thickness s	Hole dia ød1	Corner radius rε
Finishing to light cutting	PSS 		VCMT110304-PSS	●	●	●	●	.250	.125	.110	.016
			VCMT110308-PSS	●	●	●	●				.031
			*VCMT160404-PSS	●	●	●	●	.375	.187	.173	.016
			VCMT160408-PSS	●	●	●	●				.031
Finishing to medium cutting	PS 		VCMT110302-PS	●	●	●	●	.250	.125	.110	.008
			VCMT110304-PS	●	●	●	●				.016
			*VCMT110308-PS	●	●	●	●				.031
			VCMT160404-PS	●	●	●	●	.375	.187	.173	.016
			VCMT160408-PS	●	●	●	●				.031

Note: Chipbreaker cross sections are of the inserts marked *

● : Stocked items

Practical examples

Workpiece type		Shaft	Machine parts
Insert		CNMG 432 SM	WNMG 433 SM
Grade		T6120	T6130
Work material		304	303
			
Cutting conditions	Cutting speed: *Vc* (sfm)	400	410
	Feed: *f* (ipr)	.02	.012
	Depth of cut: *ap* (inch)	.06	.05
	Machining	Continuous	Continuous
	Coolant	Wet	Wet
Results		 T6120 has excellent wear resistance, achieving 1.5 times longer tool life than competitor CVD grades.	 T6130 allows better surface finish and 3 times longer tool life than competitor inserts due to its high wear and chipping resistance.

Workpiece type		Shaft	Machine parts
Insert		CNMG 432 SM	CNMG 431 SM
Grade		AH630	AH645
Work material		304	304
			
Cutting conditions	Cutting speed: *Vc* (sfm)	490	330
	Feed: *f* (ipr)	.012	.006
	Depth of cut: *ap* (inch)	.08	.04 - .1
	Machining	Continuous	Interrupted
	Coolant	Wet	Wet
Results		 AH630 has a good balance of wear and chipping resistance, achieving 1.6 times longer tool life than competitor grades.	 AH645 has excellent fracture resistance, achieving 2 times longer tool life than competitor grades.

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