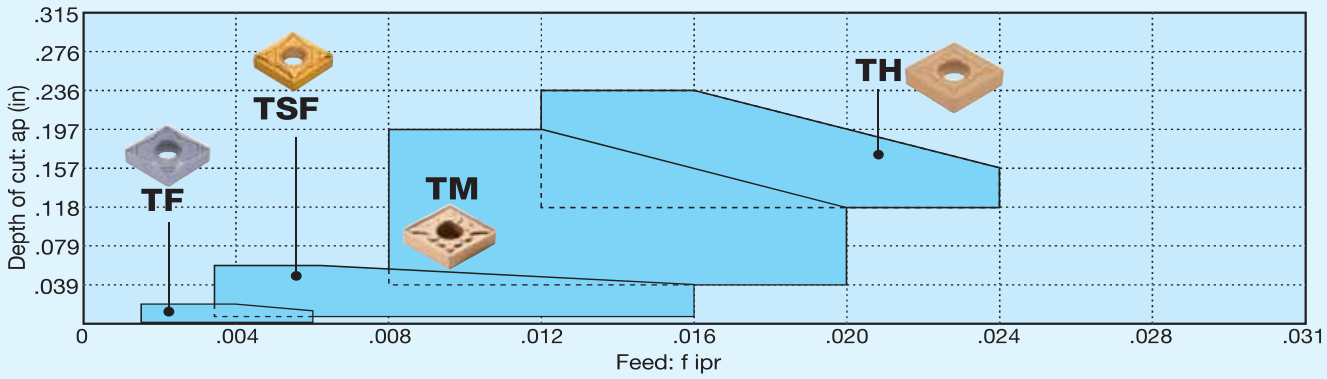
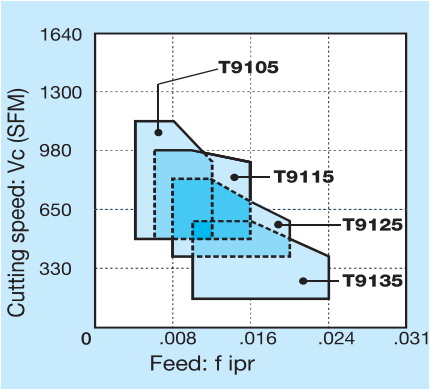
Basic Chipbreakers Negative Inserts

P Steel

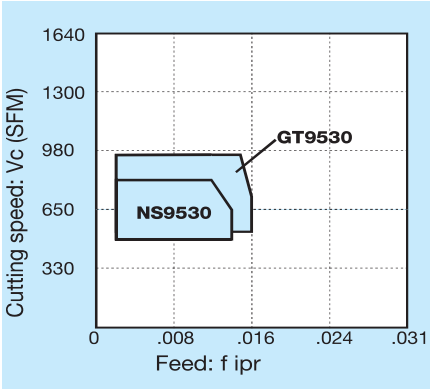
Chipbreaker System for Turning (Negative Inserts)

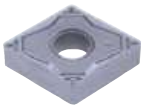


CVD coated grades



Coated cermets / Cermets



Chipbreaker	Appearance	Features
TF		The sharp cutting edge and raised projection near corner contribute to excellent chip control at very small depths of cut and low feeds. Economical M-class tolerance and low cost.
TSF		First choice chipbreaker for finishing steels. The dimple structure decreases the contact area between the insert surface and chips,resulting in significant reduction of heat occurrence.

Chipbreaker	Appearance	Features
TM		General purpose chipbreaker used for medium cutting. Unique chipbreaker geometry with sharp edges and large rake angle assures free cutting action in a wide range of cutting conditions.
TH		Double-sided 3-dimensional chipbreaker with a wide land and broad groove used for medium to heavy cutting including interruption and unfavorable surface conditions. Also performs well in high feed machining.

Standard Cutting Conditions

Operation	Work condition	Chip-breaker	Grade	Depth of cut a_p (in)	Feed f ipr	Cutting speed v_c (SFM)		
						Low carbon steels, Alloy steels	Medium carbon steels, Alloy steels	High carbon steels, Alloy steels
Precision finishing	Continuous ~ Light interrupted	**TF**	**NS9530**	.002 -.020	.001 - .006	500 - 820	330 - 820	330 - 660
Finishing	Continuous ~ Light interrupted Heavy interrupted	**TSF**	**NS9530** **GT9530** **T9105** **T9115** **T9125**	.008 - .060	.003 - .016	500 - 980 400 - 820	260 - 820 260 - 660	260 - 660 260 - 500
Medium cutting	Continuous Light interrupted Heavy interrupted	**TM**	**T9105** **T9115** **T9125** **T9135**	.040 - .200	.008 - .020	500 - 980 400 - 820 160 - 590	500 - 980 260 - 660 160 - 480	400 - 820 260 - 500 160 - 400
Medium to heavy cutting	Continuous Light interrupted Heavy interrupted	**TH**	**T9105** **T9115** **T9125** **T9135**	.120 - .240	.012 - .024	500 - 980 400 - 820 160 - 590	500 - 980 260 - 660 160 - 500	400 - 820 260 - 500 160 - 330

Grades (1-1) Relating pages

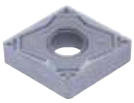
Selection System Negative Inserts

Continuous	Light interrupted	Heavy interrupted
		

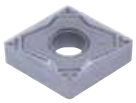
P Steel

Precision finishing [a_p = ~ .020 in]

Continuous

Basic

TF NS9530
→ Wear → 01 NS9530

Light interrupted

Basic

TF NS9530
→ Fracture → TSF GT9530

Finishing [a_p = .012 ~ .060 in]

Continuous

Basic

TSF GT9530
→ Chip control → ZF GT9530

Light interrupted

Basic

TSF GT9530
→ Fracture → TSF T9115

Heavy interrupted

Basic

TSF T9125
→ Fracture → TM T9135

Medium cutting [a_p = .039 ~ .157 in]

Continuous

Basic

TM T9115
→ Wear → TM T9105
→ Chip control → ZM T9115

Light interrupted

Basic

TM T9125
→ Fracture → TM T9135
→ Wear → TM T9115

Heavy interrupted

Basic

DM T9135
→ Fracture → THS T9135

Medium to heavy cutting [a_p = .118 ~ .236 in]

Continuous

Basic

AR T9115
→ Wear → AR T9105
→ Chip control → TM T9115

Light interrupted

Basic

THS T9125
→ Fracture → TH T9135
→ Wear → TH T9115

Heavy interrupted

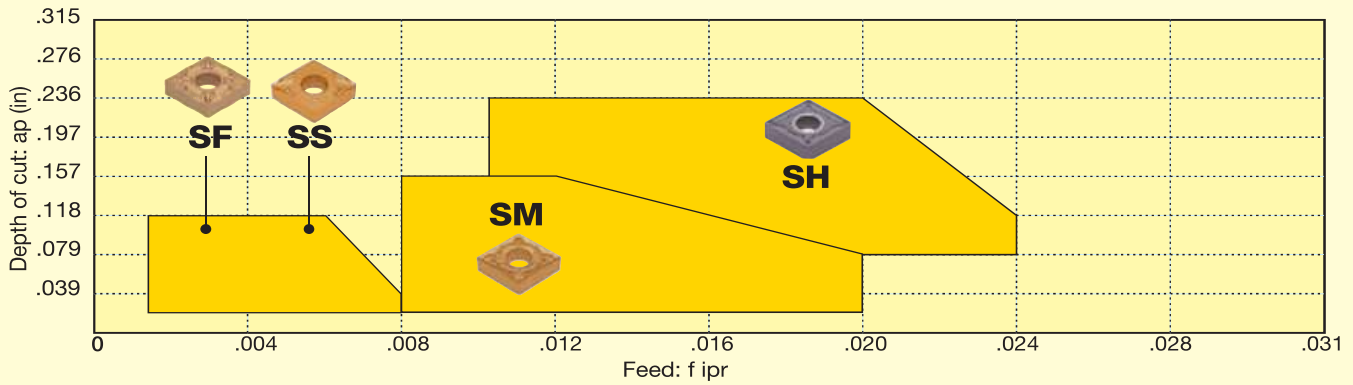
Basic

TH T9135
→ Fracture → TUS T9135

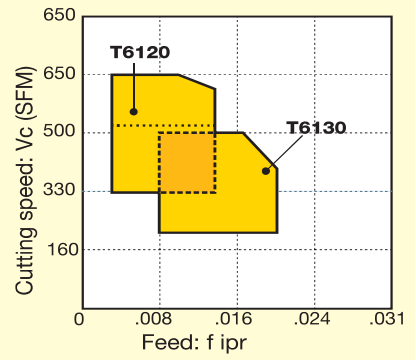
Basic Chipbreakers Negative Inserts

M Stainless Steel

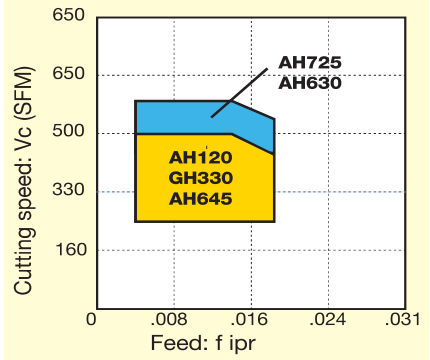
Chipbreaker System for Turning (Positive Inserts)



CVD coated grades



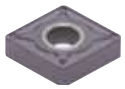
PVD coated grades



Chipbreaker	Appearance	Features
SS		3-dimensional chipbreaker with a large rake angle. Performs free cutting action and most suitable for finishing of stainless steel and mild steel.

Chipbreaker	Appearance	Features
SM		Provided with both free cutting action and excellent chip control. Best suited for machining stainless steels.

Chipbreaker	Appearance	Features
SF		General Purpose - Stainless steel finisher features excellent chip control.

Chipbreaker	Appearance	Features
SH		Heavy roughing and interupted cuts.

Standard Cutting Conditions

Operation	Work condition	Chip-breaker	Grade	Depth of cut a_p (in)	Feed f ipr	Cutting speed v_c (SFM) Stainless steels
Precision finishing	Continuous Light interrupted	**SS**	**AH120 AH630 AH645 T6120 T6130 GH330**	.020 - .120	.003 - .008	300 - 500
Finishing	Continuous Light interrupted	**SF**	**AH630 T6120 T6130**	.010 - .080	.002 - .008	300 - 550
Roughing	Continuous Light interrupted Heavy interrupted	**SM**	**AH630 AH645 AH725 T6120 T6130**	.020 - .160	.008 - .020	300 - 660
Heavy Roughing	Continuous Light interrupted Heavy interrupted	**SH**	**AH630 AH645 T6130**	.080 - .240	.012 - .024	200 - 450

Grades (1-1) Relating pages

Selection System Negative Inserts

Continuous	Light interrupted	Heavy interrupted
		

M Stainless Steel

Finishing [a_p = .010 ~ .060 in]

Continuous Low Cutting Force

Basic: **SS GH330**

- Wear → **SS T6120**
- Chip control → **SF T6130**

Light interrupted

Basic: **SF T6130**

- Fracture → **SM T6130**
- Wear → **SF T6120**

Heavy interrupted

Basic: **SM T6130**

- Fracture → **SH T6130**

Medium cutting [a_p = .039 ~ .118 in]

Continuous

Basic: **SM AH630**

- Wear → **SM T6120**
- Chip control → **SF AH630**

Light interrupted

Basic: **SM T6130**

- Fracture → **SM AH645**
- Wear → **SM T6120**

Heavy interrupted

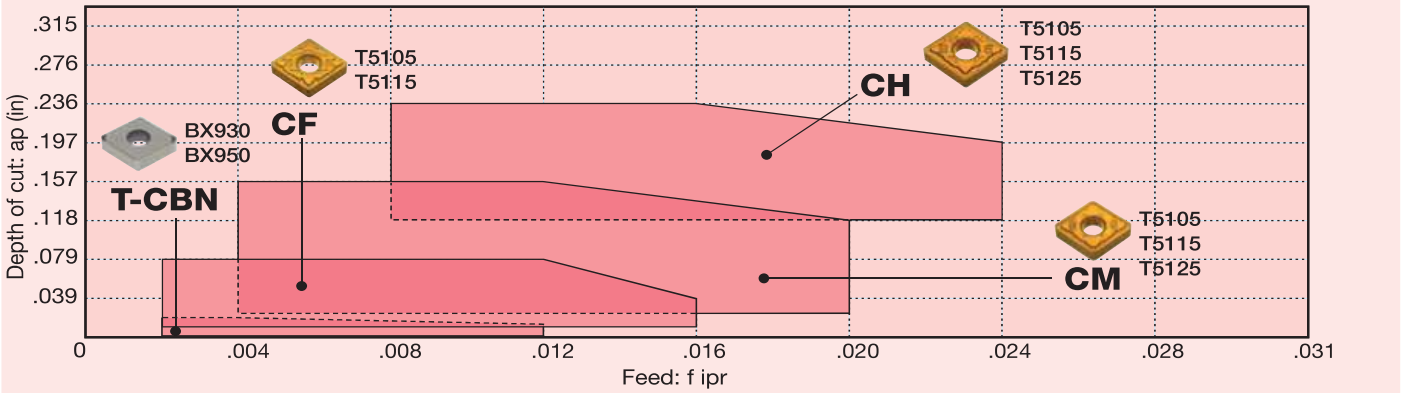
Basic: **SH T6130**

- Fracture → **SH AH645**

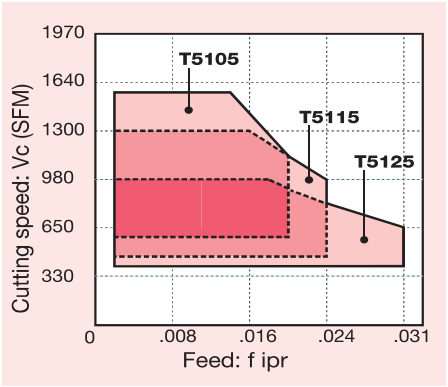
Basic Chipbreakers Negative Inserts

K Cast Iron

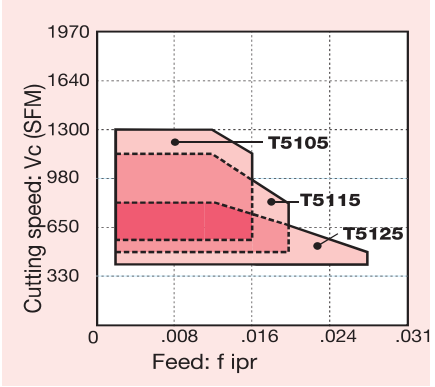
Chipbreaker System for Turning (Negative Inserts)



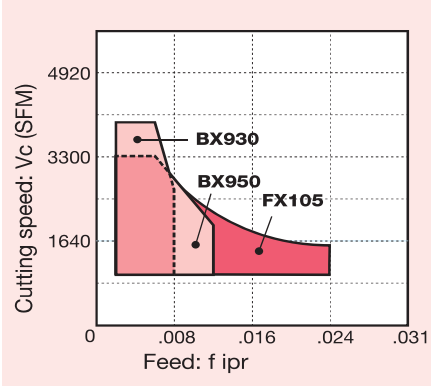
Grey cast irons



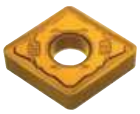
Ductile cast irons



High speed cutting: for grey cast irons



Chip-breaker	Appearance	Features
No chip-breaker (T-CBN)		T-CBN inserts. Performs well in high speed finishing of cast iron.
CF		Low cutting force chipbreaker for cast iron. Combined with an arc-shaped concave and a high rake (substantially 20° rake angle), allows drastically reducing cutting forces and suppressing the deformation of thin walled components and burr occurrence.

Chip-breaker	Appearance	Features
CM		First choice chipbreaker for cast iron. An all round chipbreaker, which is applicable for a wide range of cutting conditions from continuous to interrupted machining with the positive land and wide chip pocket
CH		Chipbreaker with reinforced cutting-edge for cast iron. Utilizing the land support and negative land design, features stable insert seating and high cutting edge strength even in heavy cutting.

Standard Cutting Conditions

Operation	Work condition	Chip-breaker	Grade	Depth of cut a_p (in)	Feed f ipr	Cutting speed v_c (SFM)	
						Grey Cast Irons	Ductile Cast Irons
Precision finishing	Continuous ~ Light interrupted	**NONE** *(T-CBN)*	**BX930** **BX950**	.002 -.020	.002 - .008 .002 - .012	980 - 3940 980 - 3280	330 - 1640 330 - 980
	Continuous	**NONE** *(CERAMIC)*	**FX105**	.002 - .120	.002 - .024	980 - 3280	-
Finishing	Continuous ~ Light interrupted	**CF**	**T5105** **T5115**	.020 - .080	.002 - .016	590 - 1580 460 - 1310	590 - 1310 460 - 1210
Medium cutting	Continuous Light interrupted Interrupted	**CM**	**T5105** **T5115** **T5125**	.040 - .160	.008 - .016	590 - 1580 460 - 1310 400 - 980	590 -1310 460 - 1210 400 - 820
Medium to heavy cutting	Continuous Light interrupted Interrupted	**CH**	**T5105** **T5115** **T5125**	.120 - .240	.004 - .024	590 - 1580 460 - 1310 400 - 980	590 -1310 460 - 1210 400 - 820

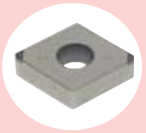
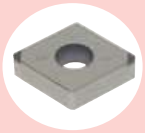
Grey cast irons: Class 25 - 40 etc.
Ductile cast irons: Class 65 - 45 - 12 etc.

Grades (1-1) Relating pages

Selection System Negative Inserts

Continuous	Light interrupted	Heavy interrupted
		

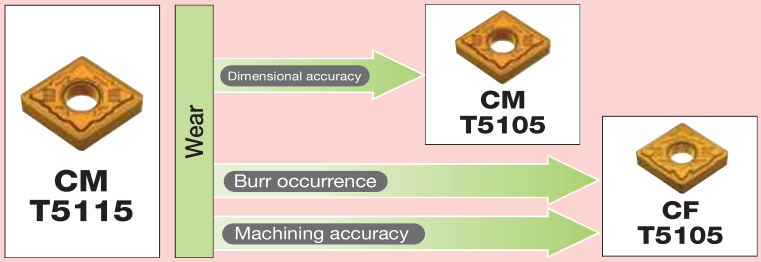
For high speed machining

Continuous	Light interrupted
	
T-CBN BX930	T-CBN BX950

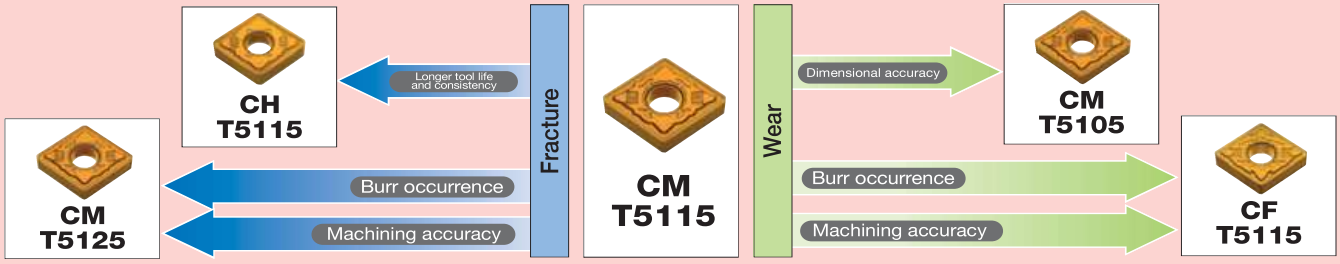
K Cast Iron

Finishing [a_p = .020 ~ .079 in], Medium cutting [a_p = .039 ~ .197 in], Medium to heavy cutting [a_p = .118 ~ .236 in]

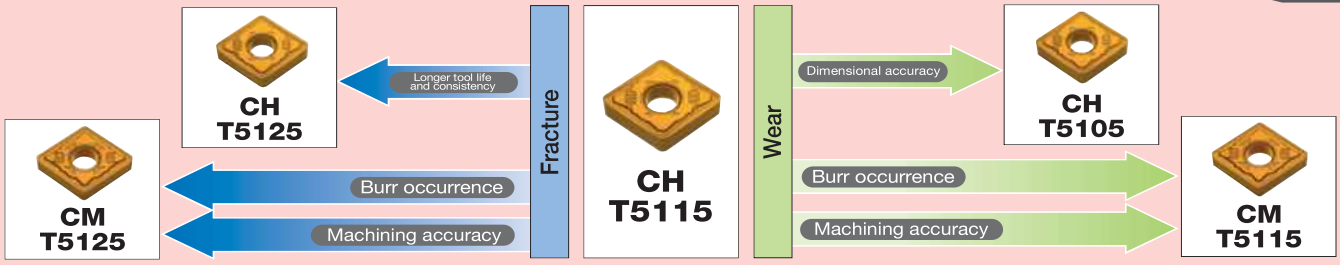
Continuous



Light interrupted



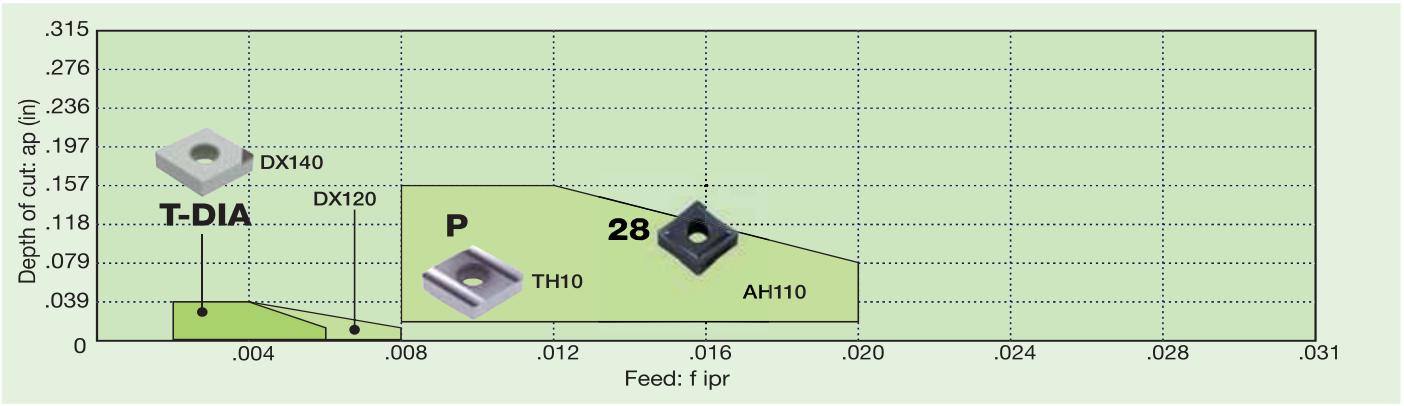
Heavy interrupted



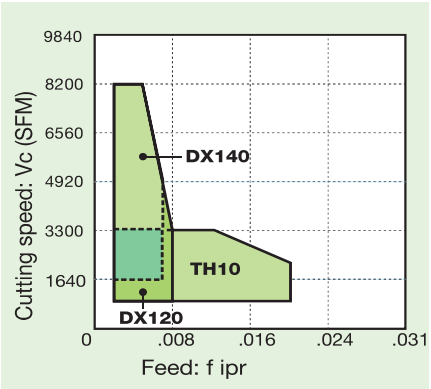
Basic Chipbreakers Negative Inserts

N Non-ferrous Metal

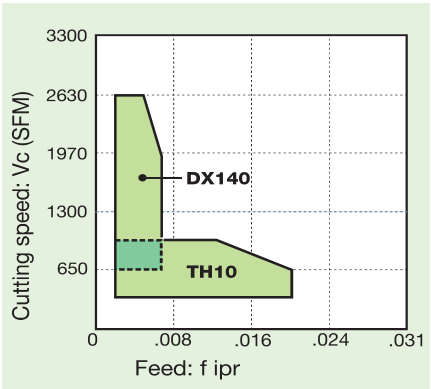
Chipbreaker System for Turning (Negative Inserts)



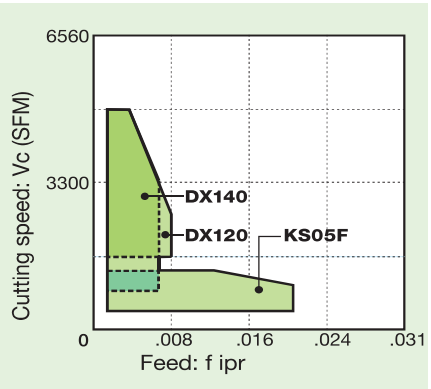
Aluminum alloys (Si < 13%)

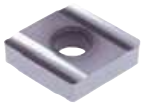


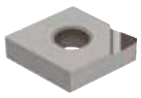
Aluminum alloys (Si ≥ 13%)



Copper alloys



Chip-breaker	Appearance	Features
No chip-breaker (T-DIA)		T-DIA inserts. Performs well in high speed finishing of non-ferrous materials.
P		Excels in sharpness of cutting edges and effectively used for machining non-ferrous metals such as aluminum alloys and copper alloys.

Chip-breaker	Appearance	Features
With chip-breaker (T-DIA)		The wide chipbreaker width contributes to excellent chip control.
28		Low cutting force chipbreaker.

Standard Cutting Conditions

Operation	Work condition	Chip-breaker	Grade	Depth of cut a_p (in)	Feed f ipr	Cutting speed v_c (SFM)		
						Aluminum Alloys (Si<12%)	Aluminum Alloys (Si>12%)	Copper Alloys
Precision finishing	Continuous	**NONE** *(T-DIA)*	**DX140**	.002 -.040	.002 - .006	1640 - 8200	1310 - 2630	1640 - 4920
	Light interrupted	*(T-DIA)*	**DX120**	.002 -.040	.002 - .008	980 - 8200	-	1640 - 4920
Finishing	Continuous ~ Light interrupted	**NONE** *(T-DIA)*	**DX140** **DX140**	.002 -.040	.002 - .006	1640 - 8200 980 - 5900	1310 - 2630 1310 - 1970	1640 - 4920 1310 - 3940
	Heavy interrupted	**P**	**TH10**	.002 -.160	.008 - .020	330 - 1640	330 - 660	330 - 660
Medium cutting	Continuous Light interrupted Heavy interrupted	**P**	**TH10**	.002 - .160	.008 - .020	330 - 3280 330 - 660	330 - 3280 330 - 660 330 - 660	330 - 980 330 - 660 330 - 660
Medium cutting	Continuous	**28**	**AH110**	.020 - .160	.008 - .020	600 -2800	300 - 1200	300 - 1200

Grades (1-1) Relating pages

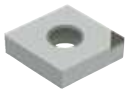
Selection System Negative Inserts

Continuous	Light interrupted	Heavy interrupted
		

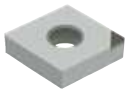
N Non-ferrous Metal

Precision finishing [a_p = ~ .020 in]

Continuous

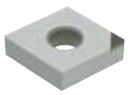
Basic

T-DIA DX140
→ Wear → T-DIA DX120

Light interrupted

Basic

T-DIA DX140
→ Surface → With chipbreaker T-DIA DX120

Finishing [a_p = .020 ~.079 in]

Continuous

Basic

T-DIA DX140
→ Surface → With chipbreaker T-DIA DX120

Light interrupted

Basic

28 AH110
→ Fracture → SA AH110
→ Wear → T-DIA DX160

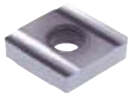
Heavy interrupted

Basic

SA AH110

Medium cutting [a_p = .039 ~ .157 in]

Continuous

Basic

P TH10
→ Wear → T-DIA DX140

Light interrupted

Basic

28 AH120
→ Wear → 28 AH110

Heavy interrupted

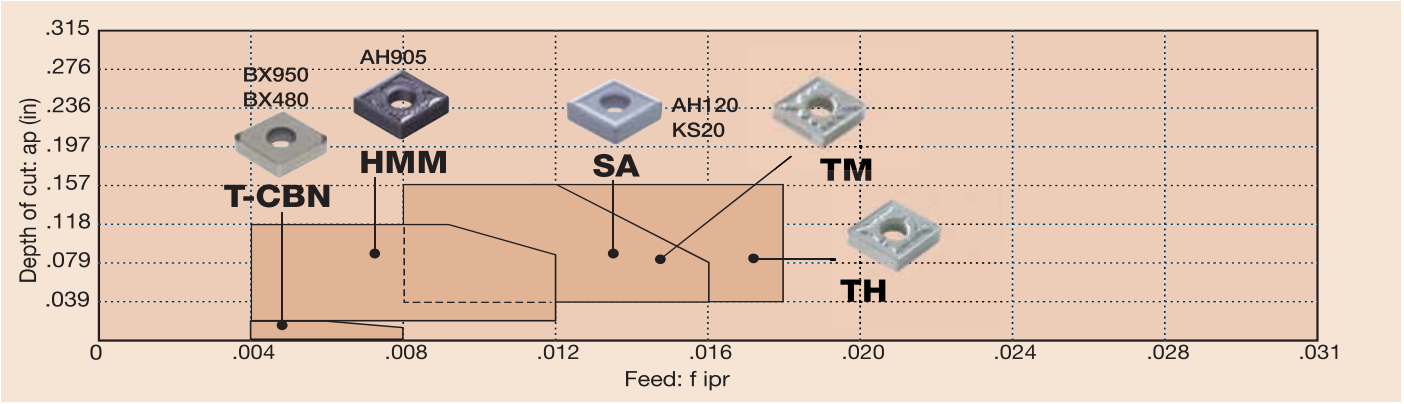
Basic

SA AH120

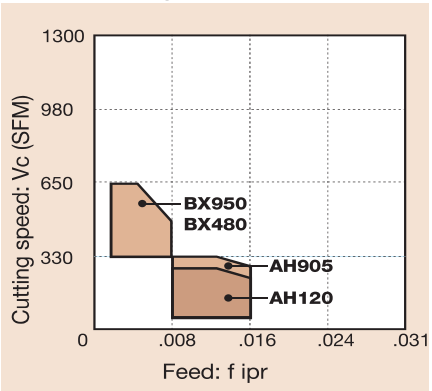
Basic Chipbreakers Negative Inserts

S Superalloys and titanium

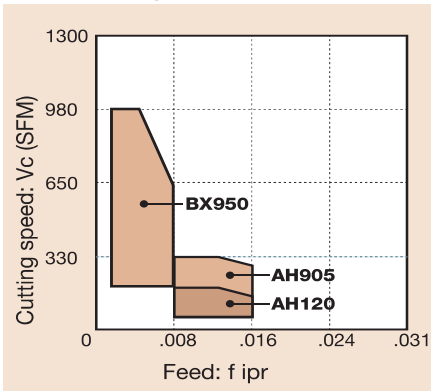
Chipbreaker System for Turning (Negative Inserts)



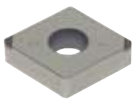
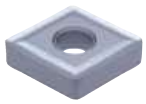
Titanium alloys



Ni-base alloys



Chipbreaker	Appearance	Features
HMM		Low cutting force chipbreaker for super alloys. Combined with the narrow positive land and uneven dots on the rake face allows a small contact area for chips, reducing cutting forces considerably.
TM		Light to medium D.O.C.'s affective in a wide variety of high temp alloys.

Chipbreaker	Appearance	Features
No chip-breaker (T-CBN)		T-CBN inserts. Performs well in finishing of heat-resistant or titanium alloys.
SA		This chipbreaker is designed to reduce the contact-area between tool and chip, preventing the insert from raising temperature during cutting.
TH		For high impact machining

Standard Cutting Conditions

Operation	Work condition	Chip-breaker	Grade	Depth of cut a_p (in)	Feed f ipr	Cutting speed v_c (SFM)	
						Titanium Alloys	NI Base Alloys
Precision finishing	Continuous ~ Light interrupted	NONE (T-CBN)	BX950 BX480	.004 -.020	.002 - .008	330 - 660	230 - 980
Finishing	Continuous ~ Light interrupted Interrupted	HMM	AH905	.020 -.120	.004 - .012	65 - 330 65 - 260 35 -260	65 - 330 65 - 160 35 - 130
Medium cutting	Continuous Light interrupted Interrupted	SA	AH120	.040 - .160	.008 - .016	100 - 260 35 - 200	65 - 160 35 - 130
Medium	Continuous	TM		.004 - .125	.006 - .012	100 - 140	80 - 125
Heavy	Interupted	TH		.050 - .160	.008 - .018	100 - 140	80 - 125

Ni-base alloys: INCONEL718 etc.
Titanium alloys: Ti-6Al-4V etc

Grades (1-1) Relating pages

Selection System Negative Inserts

Continuous	Light interrupted	Heavy interrupted
		

S Superalloys and titanium

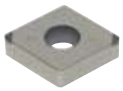
Precision finishing [a_p = ~ .020 in]

Continuous

Basic

T-CBN BX950

Light interrupted

Basic

T-CBN BX950
→ Fracture → TN01 AH110

Finishing [a_p = .020 ~ .079 in]

Continuous

Basic

HMM AH905

Light interrupted

Basic

TSF AH120
→ Fracture → TM AH120

Heavy interrupted

Basic

TM AH120
→ Fracture → AR AH120

Medium cutting [a_p = .039 ~ .157 in]

Continuous

Basic

SA AH120
→ Wear → TM AH110

Light interrupted

Basic

TM AH120
→ Fracture → SM AH645
→ Wear → SM AH630

Heavy interrupted

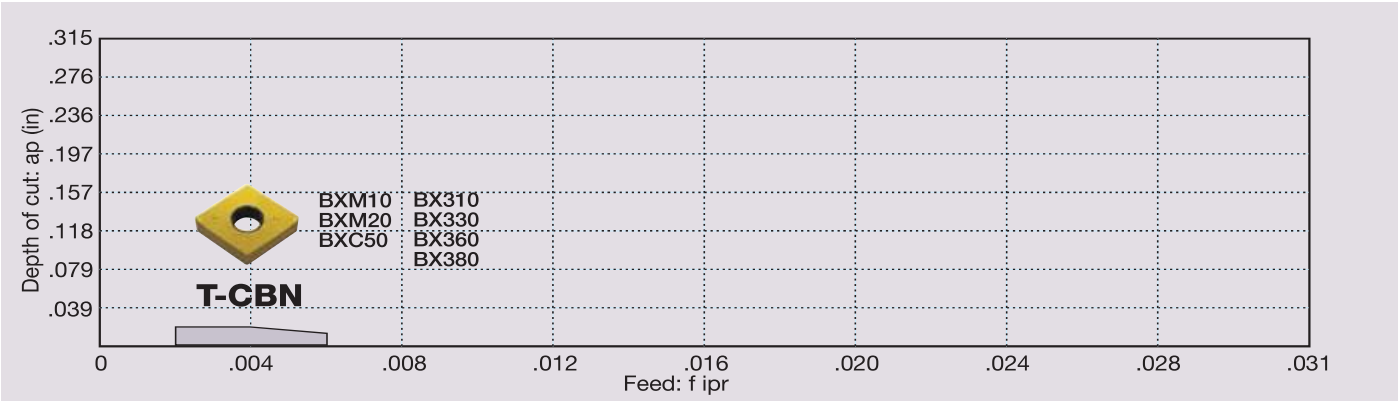
Basic

AR AH120
→ Fracture → TH AH120

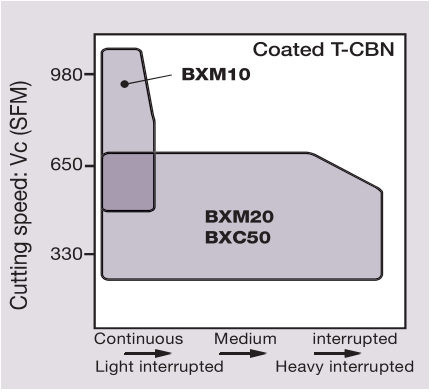
Basic Chipbreakers Negative Inserts

H Hard Materials

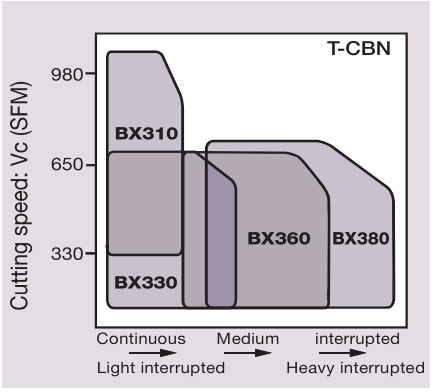
Chipbreaker System for Turning (Negative Inserts)

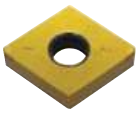


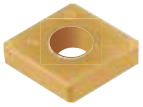
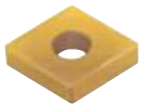
Coated T-CBN



T-CBN



Chipbreaker	Appearance	Features
No chip-breaker (T-CBN)		T-CBN inserts. Performs well in finishing of hardened steel.

Chipbreaker	Appearance	Features
HF		When used in removing a carburized layer, excels in chip control at small depth of cut.
HM		When used in removing a carburized layer, excels in chip control at large depth of cut.

Standard Cutting Conditions

Operation	Work condition	Chip-breaker	Grade	Depth of cut a_p (in)	Feed f ipr	Cutting speed v_c (SFM) Hardened & pre Hardened Steels
Precision finishing	Continuous ~ Light interrupted	**NONE** *(T-CBN)*	**BXM10**	.002 -.012	.001 - .007	500 - 1150
Finishing	Continuous ~ Heavy interrupted	**NONE** *(T-CBN)*	**BXM20**	.002 -.012	.002 - .010	230 - 720
Removing of carburized layer	Continuous	**HF HM**	**BXM20**	.008 - .030 .020 - .040	.002 - .008	230 - 720
Finishing	Heavy Interrupted	**NONE** *(T-CBN)*	**BXC50**	.002 - .020	.002 - .010	350 -720

Grades (1-1) Relating pages

Selection System Negative Inserts

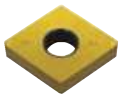
Continuous	Light interrupted	Medium interrupted	Heavy interrupted
			

H Hard Materials

Precision finishing [a_p = ~ .008 in]

Continuous

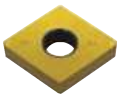
Basic



T-CBN BXM20 → For high speed Wear → **T-CBN BXM10**

Light interrupted

Basic

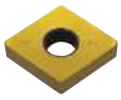


T-CBN BXM20 → For high speed Wear → **T-CBN BXC50 (DRY)**

Finishing [a_p = ~ .020 in]

Continuous

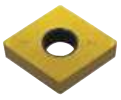
Basic



T-CBN BXM20 → For high speed Wear → **T-CBN BXM10**

Light interrupted

Basic

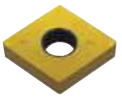


T-CBN BXM20

- Fracture → **-H BXM20 (DRY)**
- For high speed Wear → **T-CBN BXM10**

Medium ~ Heavy interrupted

Basic



T-CBN BXM20 → Fracture → **-H BXM20 & T-CBN BXC50 (DRY)**