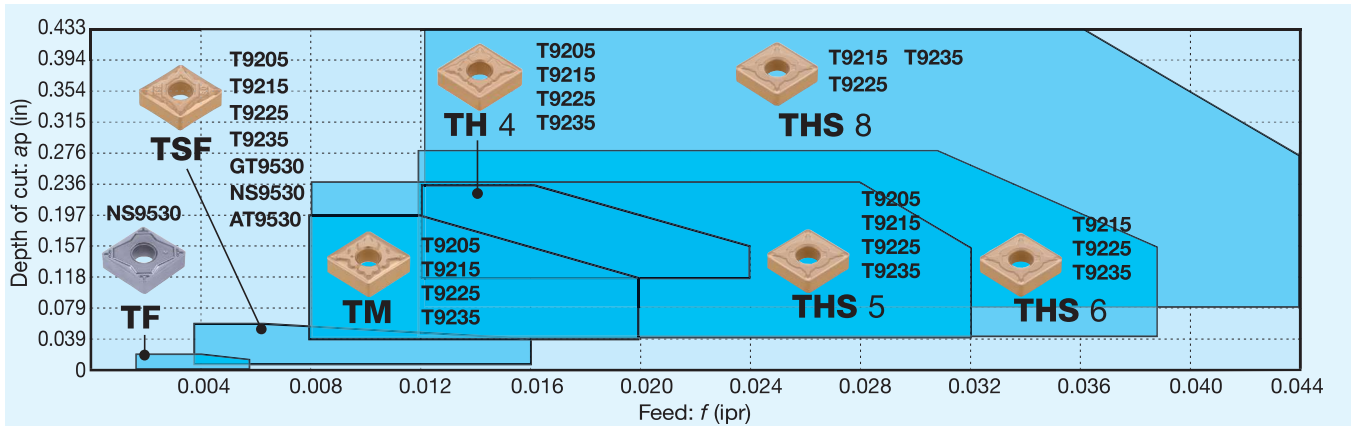


Chipbreaker Guide

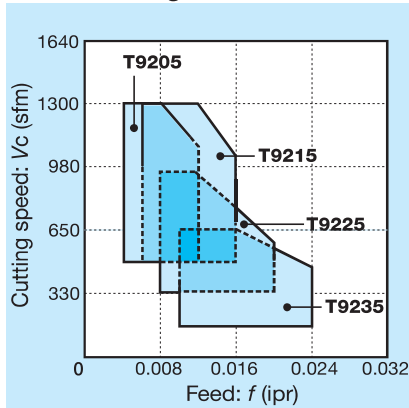
BASIC CHIPBREAKER: NEGATIVE TYPE

P Steel

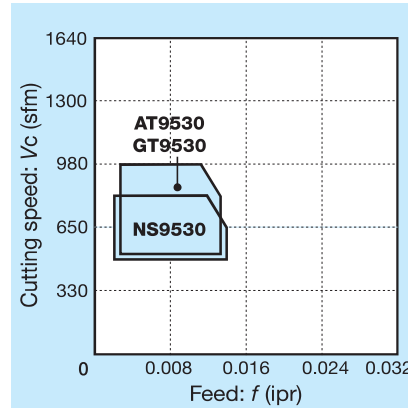
Chipbreaker System for Turning (Negative type)



CVD coated grade



Coated cermet / Cermet



Chipbreaker	Shape	Feature
TF		Excellent chip control at very small depth of cut and low feed with the sharp cutting edge and protrusion. Economical M-class insert contributes to cost reduction.
TSF		First choice for finishing. The sharp cutting edge and arc-shaped protrusion near the corner ensure excellent chip control.

Chipbreaker	Shape	Feature
TM		General-purpose chipbreaker with extensive chip control area. The protrusion in unique shape near the corner and large rake angle provide sharp cutting edge with low cutting force.
TH		Double-sided 3D chipbreaker with tough cutting edge and excellent chip control. Even suitable for high-feed machining.
THS		Suitable for varying depth of cut and excellent chip control in a broad range of depths of cut. Ideal for interrupted cutting and high-feed cutting with its tough cutting edge.

STANDARD CUTTING CONDITIONS

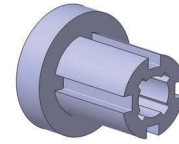
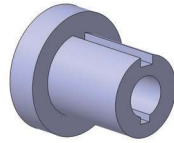
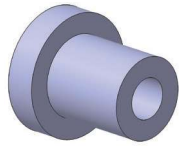
ISO	Operation	Work condition	Chip-breaker	Grade	Depth of cut ap (in)	Feed f (ipr)	Cutting speed: Vc (sfm)			
							Low carbon steels, Alloy steels	Medium carbon steels, Alloy steels	High carbon steels, Alloy steels	
P	Precision finishing	Continuous to light interrupted	TF	NS9530	0.002 - 0.020	0.001 - 0.006	500 - 820	330 - 820	330 - 660	
		Continuous to light interrupted	TSF	GT9530	0.008 - 0.060	0.003 - 0.016	500 - 980	260 - 660	260 - 660	
	Finishing	Continuous to light interrupted	TSF	AT9530	0.008 - 0.060	0.003 - 0.016	500 - 980	260 - 660	260 - 660	
		Heavy interrupted	TSF	T9225	0.008 - 0.060	0.003 - 0.016	400 - 980	400 - 980	330 - 820	
			TM	T9205	0.040 - 0.200	0.008 - 0.020	590 - 1312	590 - 1312	500 - 1150	
	Medium cutting	Continuous to heavy interrupted		TM	T9215	0.040 - 0.200	0.008 - 0.020	500 - 1312	500 - 1312	400 - 980
				TM	T9225	0.040 - 0.200	0.008 - 0.020	400 - 980	400 - 980	330 - 820
			TM	T9235	0.040 - 0.200	0.008 - 0.020	160 - 660	160 - 660	160 - 500	
			TH	T9205	0.120 - 0.240	0.012 - 0.024	590 - 1312	590 - 1312	500 - 1150	
	Medium to heavy cutting	Continuous to heavy interrupted		TH	T9215	0.120 - 0.240	0.012 - 0.024	500 - 1312	500 - 1312	400 - 980
			TH	T9225	0.120 - 0.240	0.012 - 0.024	400 - 980	400 - 980	330 - 820	
			TH	T9235	0.120 - 0.240	0.012 - 0.024	160 - 660	160 - 660	160 - 500	

Low carbon steels, Alloy steels: 1018, 1020, etc. Medium carbon steels, Alloy steels: 1045, 4140, etc. High carbon steels, Alloy steels: 8620, etc.

Selection System

SELECTION SYSTEM: NEGATIVE TYPE

P Steel



Continuous

Light interrupted

Heavy interrupted

	Continuous	Light interrupted	Heavy interrupted
Precision finishing [$a_p = \sim 0.020$ in]	<p>Basic</p>  <p>TF NS9530 B032</p> <p>Fracture → TSF GT9530 B032</p>	<p>Basic</p>  <p>TF NS9530 B032</p> <p>Fracture → TSF GT9530 B032</p>	
Finishing [$a_p = 0.012 \sim 0.060$ in]	<p>Basic</p>  <p>TSF GT9530 B032</p> <p>Chip control → ZF GT9530 B033</p>	<p>Basic</p>  <p>TSF GT9530 B032</p> <p>Fracture → TSF T9215 B032</p>	<p>Basic</p>  <p>TSF T9225 B032</p> <p>Fracture → TSF T9235 B032</p>
Medium cutting [$a_p = 0.039 \sim 0.157$ in]	<p>Basic</p>  <p>TM T9215 B034</p> <p>Wear → TM T9205 B034</p> <p>Chip control → ZM T9215 B035</p>	<p>Basic</p>  <p>TM T9225 B034</p> <p>Fracture → TM T9235 B034</p> <p>Wear → TM T9215 B034</p>	<p>Basic</p>  <p>TM T9235 B034</p> <p>Fracture → DM T9235 B035</p>
Medium to heavy cutting [$a_p = 0.118 \sim 0.236$ in]	<p>Basic</p>  <p>TH T9215 B038</p> <p>Wear → TH T9205 B038</p> <p>Chip control → TM T9215 B034</p>	<p>Basic</p>  <p>TH T9225 B038</p> <p>Fracture → TH T9235 B038</p> <p>Wear → TH T9215 B038</p>	<p>Basic</p>  <p>TH T9235 B038</p> <p>Fracture → TUS T9235 B039</p>

Grade	A
Insert	B
Ext. Toolholder	C
Int. Toolholder	D
Threading	E
Grooving	F
Milling Cutter	G
Miniature Tool	H
Endmill	I
Drilling Tool	J
Tooling System	K
User's Guide	L
Index	M

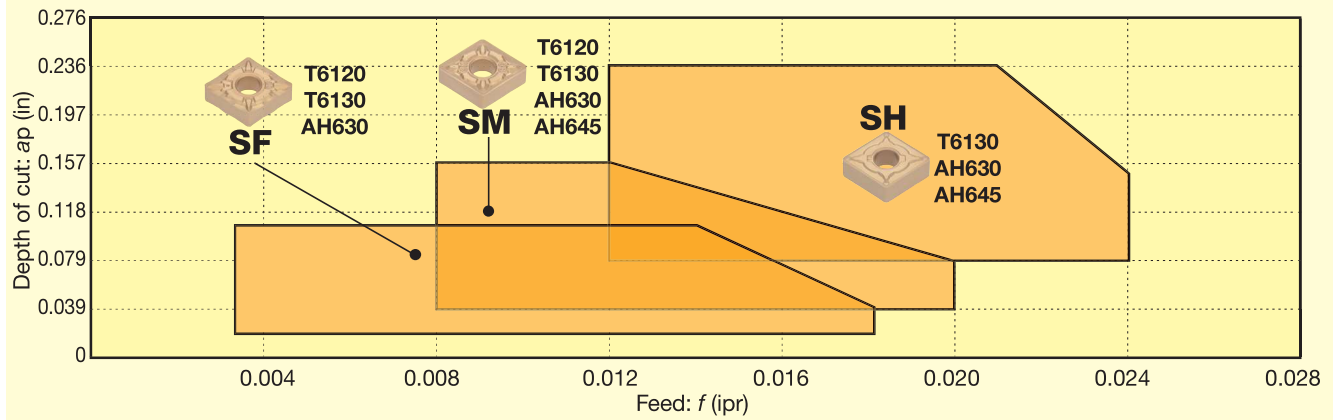
Please see the page B*** for the details.

Chipbreaker Guide

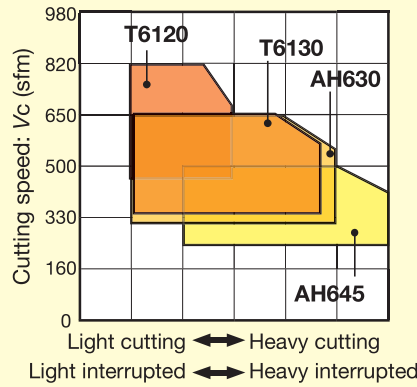
BASIC CHIPBREAKER: NEGATIVE TYPE

M Stainless Steel

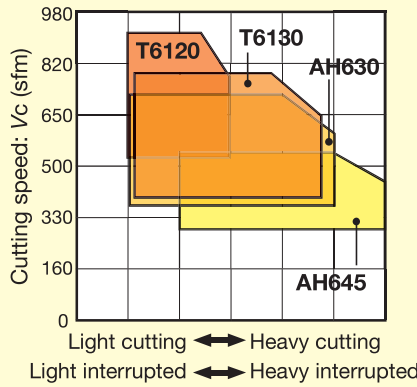
Chipbreaker System for Turning (Negative type)



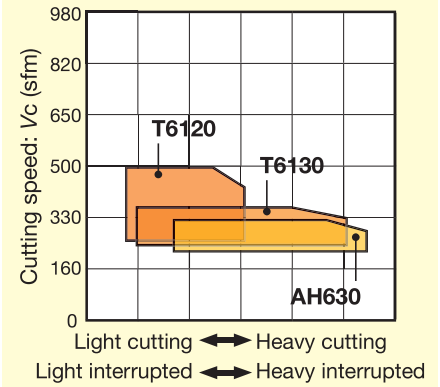
Austenitic stainless steel



Ferritic / martensite stainless steel



Precipitation hardened stainless steel



Chipbreaker	Shape	Feature
SF		Excellent chip control with small depth of cut at high feed. Suitable for finishing stainless steel.
SH		Suitable for medium to heavy cutting. High fracture resistance with specially reinforced cutting edge. Ideal for machining that requires cutting edge strength, such as roughing and interrupted cutting.

Chipbreaker	Shape	Feature
SM		General-purpose chipbreaker with sharpness and good chip control. First choice for stainless steel.

STANDARD CUTTING CONDITIONS

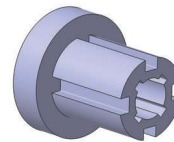
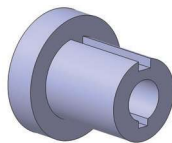
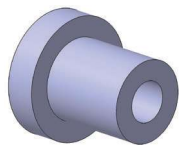
ISO	Operation	Work condition	Chipbreaker	Grade	Depth of cut ap (in)	Feed f (ipr)	Cutting speed Vc (sfm)
M	Finishing	Continuous	SF	T6120	0.020 - 0.098	0.003 - 0.018	460 - 790
		Continuous to light interrupted	SF	T6130	0.020 - 0.098	0.003 - 0.018	330 - 660
		Heavy interrupted	SF	AH630	0.020 - 0.098	0.003 - 0.018	300 - 620
	Medium cutting	Continuous	SM	T6120	0.040 - 0.160	0.008 - 0.020	460 - 790
		Continuous to light interrupted	SM	T6130	0.040 - 0.160	0.008 - 0.020	330 - 660
		Light interrupted	SM	AH630	0.040 - 0.160	0.008 - 0.020	300 - 620
		Heavy interrupted	SM	AH645	0.040 - 0.160	0.008 - 0.020	230 - 500
	Medium to heavy cutting	Continuous to light interrupted	SH	T6130	0.080 - 0.240	0.012 - 0.024	330 - 660
		Light interrupted	SH	AH630	0.080 - 0.240	0.012 - 0.024	300 - 620
Heavy interrupted		SH	AH645	0.080 - 0.240	0.012 - 0.024	230 - 500	

Stainless steels: 304SS, 316SS, etc.


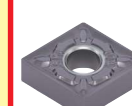
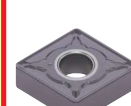
Selection System

SELECTION SYSTEM: NEGATIVE TYPE

M Stainless Steel



Continuous Light interrupted Heavy interrupted

	Continuous	Light interrupted	Heavy interrupted
Finishing $[a_p = 0.020 \sim 0.060 \text{ in}]$	<p>Basic</p>  <p>SF T6120 B033</p> <p>Fracture → SF T6130 B033</p>	<p>Basic</p>  <p>SF T6130 B033</p> <p>Fracture → SF AH630 B033</p> <p>Wear → SF T6120 B033</p>	<p>Basic</p>  <p>SF AH630 B033</p> <p>Fracture → SF AH645 B033</p> <p>Wear → SF T6130 B033</p>
Medium cutting $[a_p = 0.039 \sim 0.157 \text{ in}]$	<p>Basic</p>  <p>SM T6130 B037</p> <p>Wear → SM T6120 B037</p> <p>Chip control → SF T6130 B033</p>	<p>Basic</p>  <p>SM AH630 B037</p> <p>Fracture → SM AH645 B037</p> <p>Wear → SM T6130 B037</p>	<p>Basic</p>  <p>SM AH645 B037</p> <p>Fracture → SH AH645 B039</p>
Medium to heavy cutting $[a_p = 0.079 \sim 0.236 \text{ in}]$	<p>Basic</p>  <p>SH T6130 B039</p> <p>Fracture → SH AH630 B039</p> <p>Wear → SH T6120 B039</p> <p>Chip control → SM T6130 B037</p>	<p>Basic</p>  <p>SH AH630 B039</p> <p>Fracture → SH AH645 B039</p> <p>Wear → SH T6130 B039</p>	<p>Basic</p>  <p>SH AH645 B039</p> <p>Wear → SH AH630 B039</p>

Please see the page B*** for the details.

Grade: A

Insert: B

Ext. Toolholder: C

Int. Toolholder: D

Threading: E

Grooving: F

Milling Cutter: G

Miniature Tool: H

Endmill: I

Drilling Tool: J

Tooling System: K

User's Guide: L

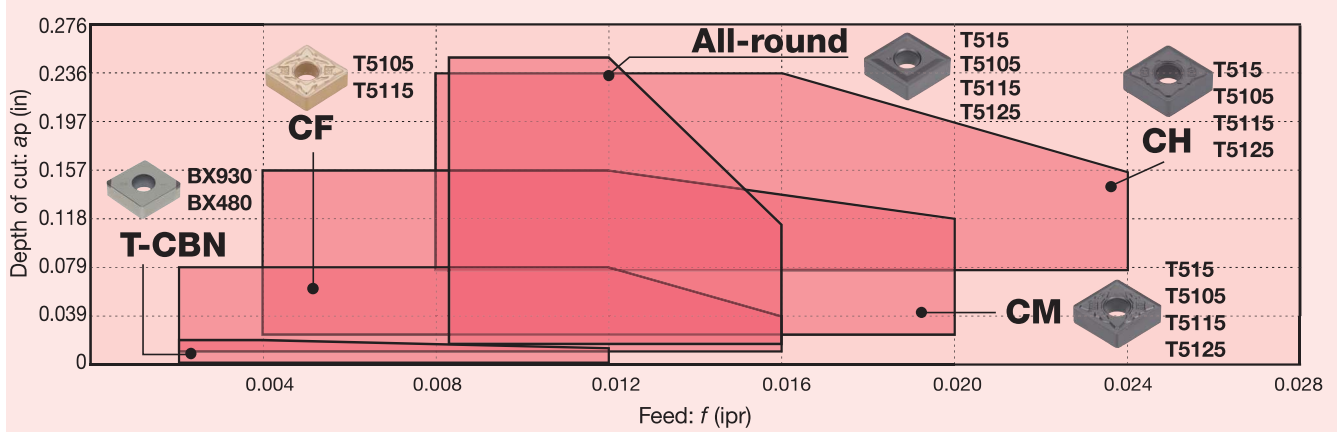
Index: M

Chipbreaker Guide

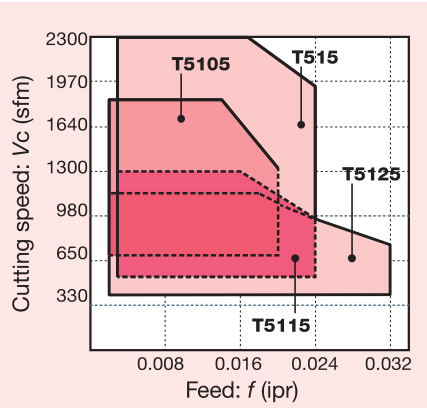
BASIC CHIPBREAKER: NEGATIVE TYPE

K Cast Iron

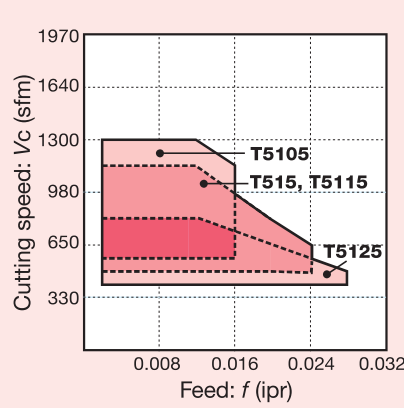
Chipbreaker System for Turning (Negative type)



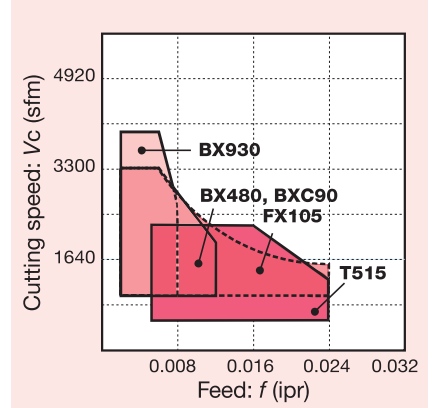
Grey cast iron



Ductile cast iron



Grey cast iron (high speed cutting)



Chipbreaker	Shape	Feature
No chip-breaker (T-CBN)		Excellent performance in high-speed finishing of cast iron with CBN sintered body on the cutting edge.
CF		Low cutting force chipbreaker for cast iron. Combined with an arc-shaped high rake angle (substantially 20°) drastically reduces cutting force and prevents the deformation and burr of thin-walled components.
All-round		Excellent performance in interrupted cutting. Highly reliable chipbreaker with great stability.

Chip-breaker	Shape	Feature
CM		First choice for cast iron. Versatile chipbreaker for a wide range of applications from continuous to interrupted cutting thanks to the positive land and wide chip pocket.
CH		Chipbreaker with reinforced cutting edge. The negative land and the land support provide stable insert seating and increase cutting edge strength, resulting in no fracture even in heavy cutting.

STANDARD CUTTING CONDITIONS

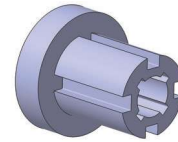
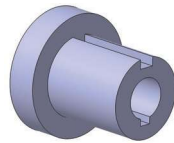
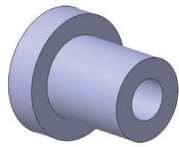
ISO	Operation	Work condition	Chip-breaker	Grade	Depth of cut ap (in)	Feed f (ipr)	Cutting speed: Vc (sfm)	
							Grey cast iron	Ductile cast iron
K	High speed cutting	Continuous	Without	BX930	0.002 - 0.020	0.002 - 0.008	984 - 3937	328 - 1640
		Light interrupted	Without	BX480	0.002 - 0.020	0.002 - 0.012	984 - 3281	328 - 984
		Continuous	Without	BXC90	0.003 - 0.118	0.002 - 0.016	984 - 3281	328 - 984
	Finishing	Continuous	All-round	T515	0.039 - 0.197	0.004 - 0.020	490 - 2297	459 - 1214
		Light interrupted	All-round	T515	0.039 - 0.197	0.004 - 0.020	490 - 2297	459 - 1214
		Heavy interrupted	All-round	T515	0.039 - 0.197	0.004 - 0.020	490 - 2297	459 - 1214
Medium cutting	Continuous	All-round	T515	0.039 - 0.197	0.004 - 0.020	490 - 2297	459 - 1214	
	Light interrupted	All-round	T515	0.039 - 0.197	0.004 - 0.020	490 - 2297	459 - 1214	
	Heavy interrupted	CH	T515	0.118 - 0.236	0.008 - 0.024	490 - 2297	459 - 1214	
Medium to heavy cutting	Continuous	All-round	T515	0.039 - 0.197	0.004 - 0.020	490 - 2297	459 - 1214	
	Light interrupted	All-round	T515	0.039 - 0.197	0.004 - 0.020	490 - 2297	459 - 1214	
	Heavy interrupted	CH	T515	0.118 - 0.236	0.008 - 0.024	490 - 2297	459 - 1214	

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

Selection System

SELECTION SYSTEM: NEGATIVE TYPE

K Cast Iron



Continuous

Light interrupted

Heavy interrupted

	Continuous	Light interrupted	Heavy interrupted
Finishing [$a_p = 0.020 \sim 0.079$ in]	<p>Basic</p>  <p>All-round T515 B035</p> <p>Wear → All-round T5105 B035</p> <p>Burr occurrence → CF T5105 B033</p>	<p>Basic</p>  <p>All-round T515 B035</p> <p>Wear → All-round T5105 B035</p> <p>Fracture → CH T515 B039</p> <p>Burr occurrence → CF T5115 B033</p>	<p>Basic</p>  <p>CH T515 B039</p> <p>Wear → CH T5105 B039</p> <p>Fracture → CH T5125 B039</p> <p>Burr occurrence → All-round T515 B035</p>
Medium cutting [$a_p = 0.039 \sim 0.197$ in]	<p>Basic</p>  <p>All-round T515 B035</p> <p>Wear → All-round T5105 B035</p> <p>Burr occurrence → CF T5105 B033</p>	<p>Basic</p>  <p>All-round T515 B035</p> <p>Wear → All-round T5105 B035</p> <p>Fracture → CH T515 B039</p> <p>Burr occurrence → CF T5115 B033</p>	<p>Basic</p>  <p>CH T515 B039</p> <p>Wear → CH T5105 B039</p> <p>Fracture → CH T5125 B039</p> <p>Burr occurrence → All-round T515 B035</p>
Medium to heavy cutting [$a_p = 0.118 \sim 0.236$ in]	<p>Basic</p>  <p>All-round T515 B035</p> <p>Wear → All-round T5105 B035</p> <p>Burr occurrence → CF T5105 B033</p>	<p>Basic</p>  <p>All-round T515 B035</p> <p>Wear → All-round T5105 B035</p> <p>Fracture → CH T515 B039</p> <p>Burr occurrence → CF T5115 B033</p>	<p>Basic</p>  <p>CH T515 B039</p> <p>Wear → CH T5105 B039</p> <p>Fracture → CH T5125 B039</p> <p>Burr occurrence → All-round T515 B035</p>

Please see the page B*** for the details.

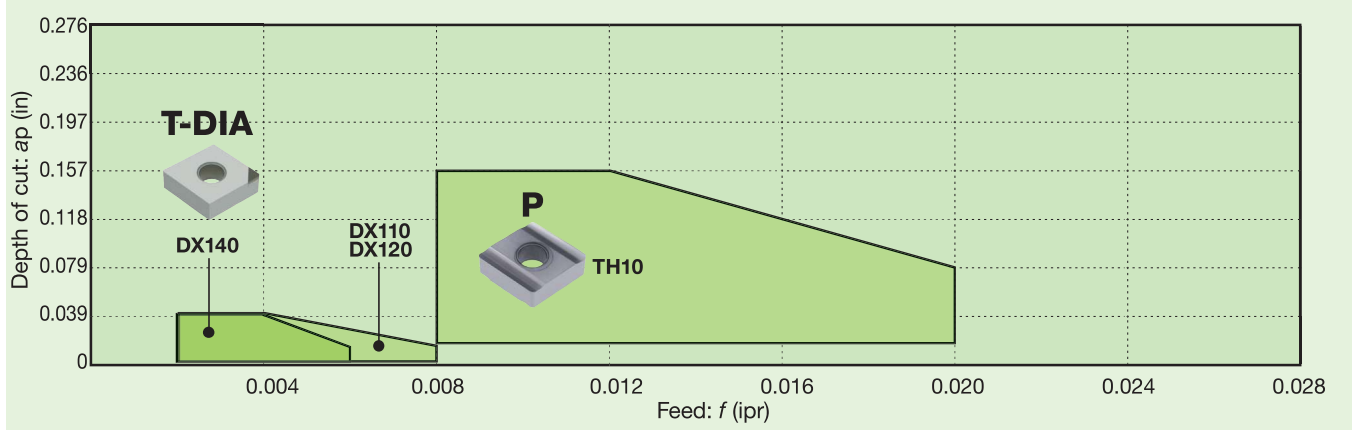
Grade	A
Insert	B
Ext. Toolholder	C
Int. Toolholder	D
Threading	E
Grooving	F
Milling Cutter	G
Miniature Tool	H
Endmill	I
Drilling Tool	J
Tooling System	K
User's Guide	L
Index	M

Chipbreaker Guide

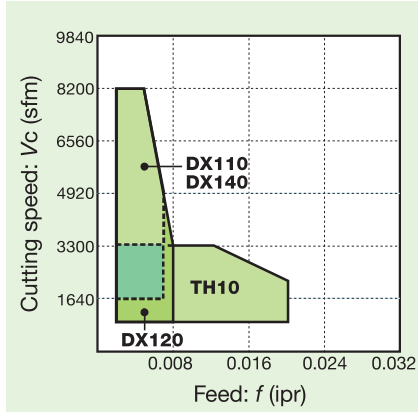
BASIC CHIPBREAKER: NEGATIVE TYPE

N Non-ferrous Metal

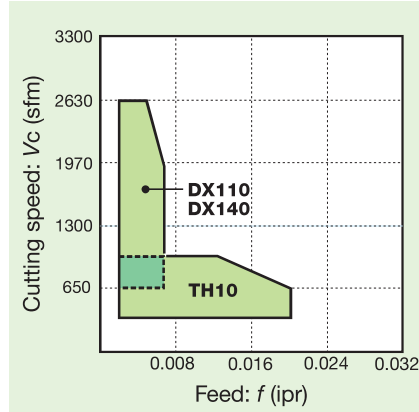
Chipbreaker System for Turning (Negative type)



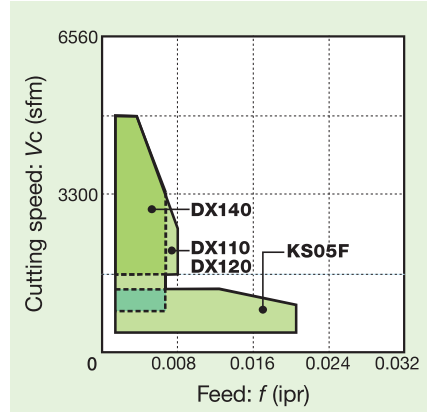
Aluminum alloy (Si < 12%)



Aluminum alloy (Si ≥ 12%)



Copper alloy



Chipbreaker	Shape	Feature
No chip-breaker (T-DIA)		Excellent performance in high-speed finishing of non-ferrous metal, such as aluminum and copper alloy, with diamond sintered body on the cutting edge.
P		Excellent sharpness for non-ferrous metal, such as aluminum and copper alloy.

Chipbreaker	Shape	Feature
With chip-breaker (T-DIA)		Wide chipbreaker for excellent chip control.

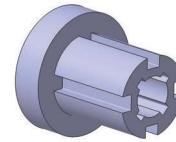
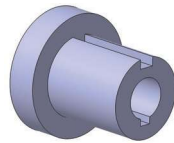
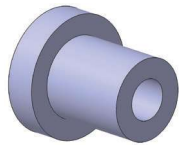
STANDARD CUTTING CONDITIONS

ISO	Operation	Work condition	Chip-breaker	Grade	Depth of cut a_p (in)	Feed f (ipr)	Cutting speed: V_c (sfm)		
							Aluminum alloy (Si < 12%)	Aluminum alloy (Si ≥ 12%)	Copper alloy
N	Precision finishing	Continuous	With	DX110	0.002 - 0.040	0.002 - 0.006	1640 - 8200	1310 - 2630	1640 - 4920
		Light interrupted	Without	DX140	0.002 - 0.040	0.002 - 0.008	980 - 8200	-	1640 - 4920
	Finishing	Continuous	Without	DX140	0.002 - 0.040	0.002 - 0.006	1640 - 8200	1310 - 2630	1640 - 4920
		Light interrupted	Without	DX140	0.002 - 0.040	0.002 - 0.006	980 - 5900	1310 - 1970	1310 - 3940
		Heavy interrupted	P	TH10	0.020 - 0.160	0.008 - 0.020	330 - 1640	330 - 660	330 - 660
	Medium cutting	Continuous	P	TH10	0.020 - 0.160	0.008 - 0.020	330 - 3280	330 - 980	330 - 980
Light interrupted		P	TH10	0.020 - 0.160	0.008 - 0.020	330 - 2630	330 - 660	330 - 660	
Heavy interrupted		P	TH10	0.020 - 0.160	0.008 - 0.020	330 - 1640	330 - 660	330 - 660	

Selection System

SELECTION SYSTEM: NEGATIVE TYPE

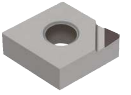
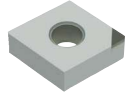
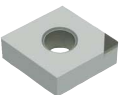
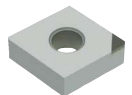
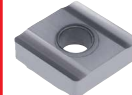
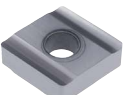
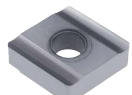
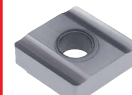
N Non-ferrous Metal



Continuous

Light interrupted

Heavy interrupted

	Continuous	Light interrupted	Heavy interrupted
Precision finishing $[a_p = \sim 0.020 \text{ in}]$	<p>Basic</p>  <p>With chipbreaker DX110</p> <p>B194, B196</p> <p>Wear → T-DIA DX140 B195, B197, B198</p>	<p>Basic</p>  <p>T-DIA DX140</p> <p>B195, B197, B198</p> <p>Surface quality → With chipbreaker T-DIA DX110 B194, B196</p> <p>Wear → T-DIA DX160 B195, B197</p>	
Finishing $[a_p = 0.020 \sim 0.079 \text{ in}]$	<p>Basic</p>  <p>T-DIA DX140</p> <p>B195, B197, B198</p> <p>Surface quality → With chipbreaker T-DIA DX110 B194, B196</p> <p>Wear → T-DIA DX160 B195, B197</p>	<p>Basic</p>  <p>T-DIA DX140</p> <p>B195, B197, B198</p> <p>Fracture → P TH10 B037</p> <p>Wear → T-DIA DX160 B195, B197</p>	<p>Basic</p>  <p>P TH10</p> <p>B037</p>
Medium cutting $[a_p = 0.039 \sim 0.157 \text{ in}]$	<p>Basic</p>  <p>P TH10</p> <p>B037</p> <p>Wear → T-DIA DX140 B195, B197, B198</p>	<p>Basic</p>  <p>P TH10</p> <p>B037</p> <p>Wear → T-DIA DX140 B195, B197, B198</p>	<p>Basic</p>  <p>P TH10</p> <p>B037</p>

Please see the page B*** for the details.

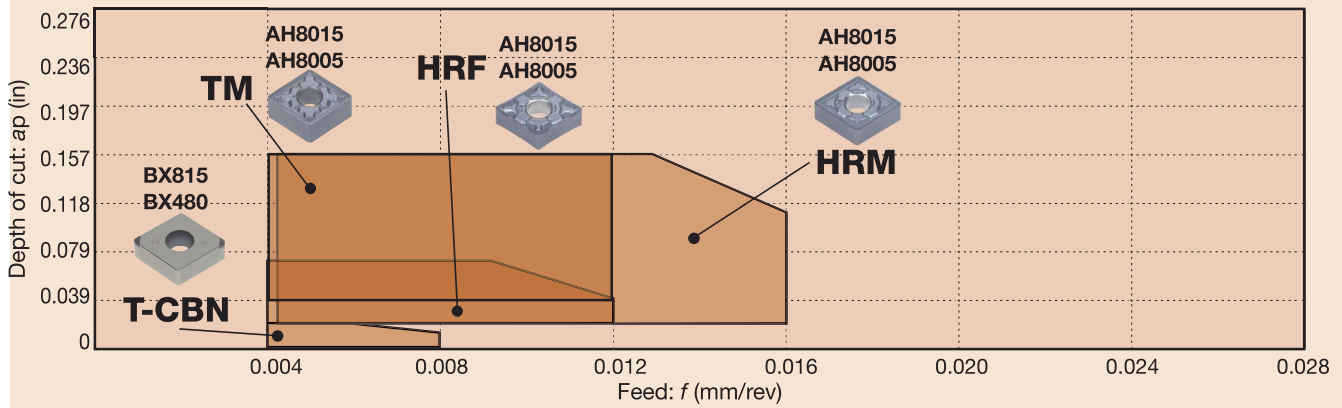
Grade	A
Insert	B
Ext. Toolholder	C
Int. Toolholder	D
Threading	E
Grooving	F
Milling Cutter Miniature Tool	G
Endmill	H
Drilling Tool	I
Tooling System	J
User's Guide	K
Index	L
	M

Chipbreaker Guide

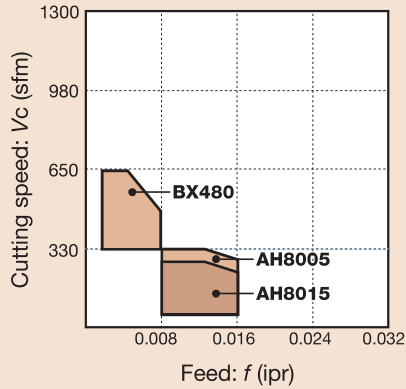
BASIC CHIPBREAKER: NEGATIVE TYPE

S Superalloys and titanium

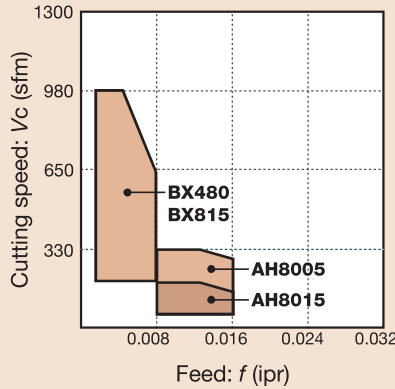
Chipbreaker System for Turning (Negative type)



Titanium alloy



Ni-base alloy



Chipbreaker	Shape	Feature
HRF		Suitable for finishing superalloy. Unique protrusion improves chip control in cutting low depth.
HRM		First choice for heat-resistant alloy. The geometry optimized for a wide range of depths of cut.

Chipbreaker	Shape	Feature
No chip-breaker (T-CBN)		Excellent performance in finishing of heat-resistant alloy and titanium alloy with CBN sintered body on the cutting edge.
TM		General-purpose chipbreaker with extensive chip control area. The protrusion in unique shape near the corner and large rake angle provide sharp cutting edge with low cutting force.

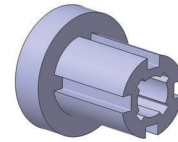
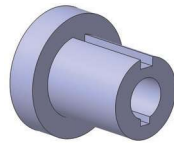
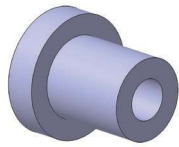
STANDARD CUTTING CONDITIONS

ISO	Operation	Work condition	Chip-breaker	Grade	Depth of cut ap (in)	Feed f (ipr)	Cutting speed: Vc (sfm)	
							Titanium alloy	Ni-base alloy
S	Precision finishing	Continuous	Without	BX480	0.004 - 0.020	0.002 - 0.008	330 - 660	230 - 980
			Without	BX815	0.004 - 0.020	0.002 - 0.008	-	230 - 1310
		Light interrupted	Without	BX480	0.004 - 0.020	0.002 - 0.008	330 - 660	-
S	Finishing to medium cutting	Continuous	HRF	AH8005	0.020 - 0.060	0.002 - 0.010	66 - 330	66 - 330
			HRF	AH8015	0.020 - 0.060	0.002 - 0.010	66 - 260	66 - 160
		Heavy interrupted	HRF	AH8015	0.020 - 0.060	0.002 - 0.010	33 - 200	33 - 130
S	Medium cutting	Continuous	HRM	AH8005	0.020 - 0.160	0.004 - 0.016	66 - 330	66 - 330
			HRM	AH8015	0.020 - 0.160	0.004 - 0.016	66 - 260	66 - 160
		Heavy interrupted	HRM	AH8015	0.020 - 0.160	0.004 - 0.016	33 - 200	33 - 130

Selection System

SELECTION SYSTEM: NEGATIVE TYPE

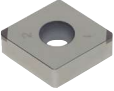
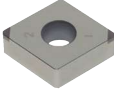


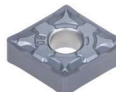


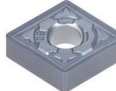
S Superalloys and titanium



Continuous

Light interrupted

Heavy interrupted

	Continuous	Light interrupted	Heavy interrupted
Precision finishing [$a_p = \sim 0.020$ in]	<p>Basic</p>  <p>T-CBN BX470 BX815</p> <p>B170 - B188</p>	<p>Basic</p>  <p>T-CBN BX470</p> <p>B170 - B188</p> <p>Fracture → No chipbreaker TH10 B038</p>	
Finishing [$a_p = 0.020 \sim 0.060$ in]	<p>Basic</p>  <p>HRF AH8005</p> <p>B033</p> <p>Fracture → HRF AH8015 B033</p> <p>Chip control → 28 AH8005 B036</p>	<p>Basic</p>  <p>HRF AH8015</p> <p>B033</p> <p>Fracture → HRM AH8015 B037</p> <p>Wear → HRF AH8005 B033</p> <p>Chip control → 28 AH8015 B036</p>	<p>Basic</p>  <p>HRF AH8015</p> <p>B033</p> <p>Fracture → HRM AH8015 B037</p> <p>Wear → HRF AH8005 B033</p>
Medium cutting [$a_p = 0.020 \sim 0.157$ in]	<p>Basic</p>  <p>HRM AH8005</p> <p>B037</p> <p>Fracture → HRM AH8015 B037</p> <p>Burr occurrence → HRF AH8015 B033</p> <p>Chip control → 28 AH8005 B036</p>	<p>Basic</p>  <p>HRM AH8015</p> <p>B037</p> <p>Fracture → TM AH8015 B034</p> <p>Wear → HRM AH8005 B037</p> <p>Chip control → 28 AH8015 B036</p>	<p>Basic</p>  <p>HRM AH8015</p> <p>B037</p> <p>Fracture → TM AH8015 B034</p> <p>Wear → HRM AH8005 B037</p>

Please see the page B*** for the details.

Grade
A

Insert
B

Ext. Toolholder
C

Int. Toolholder
D

Threading
E

Grooving
F

Milling Cutter
G

Miniature Tool
H

Endmill
I

Drilling Tool
J

Tooling System
K

User's Guide
L

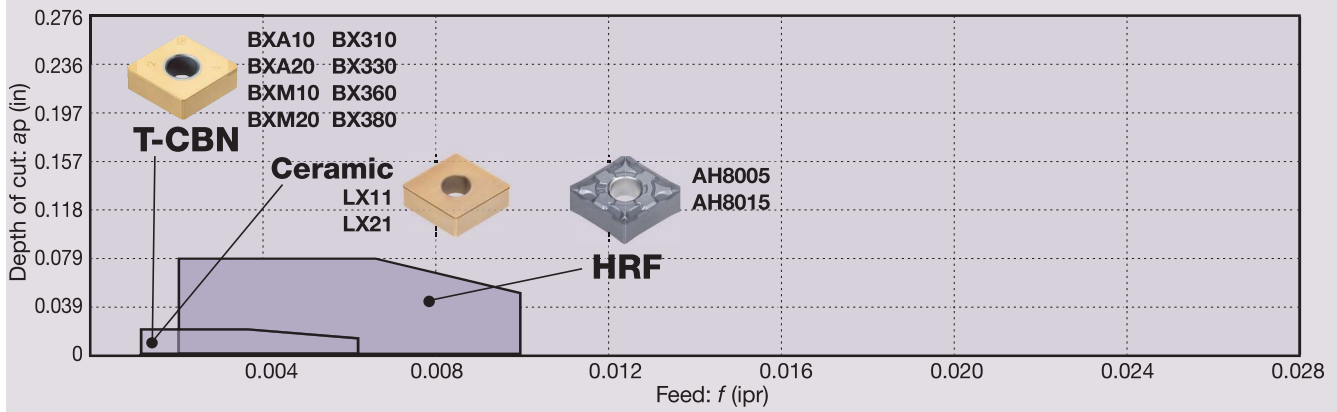
Index
M

Chipbreaker Guide

BASIC CHIPBREAKER: NEGATIVE TYPE

H Hard Materials

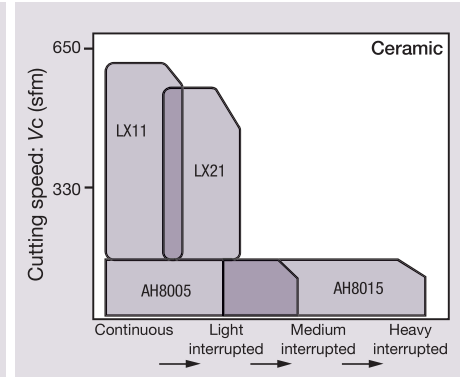
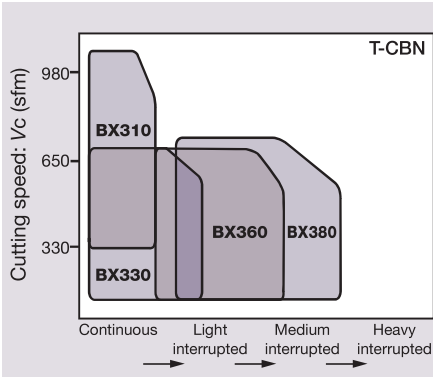
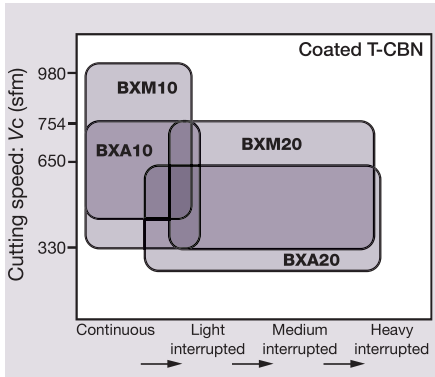
Chipbreaker System for Turning (Negative type)



Coated T-CBN

T-CBN

Ceramic, PVD coating



Chipbreaker	Shape	Feature
No chip-breaker (T-CBN)		Excellent performance in finishing of hard material with CBN sintered body on the cutting edge.
No chip-breaker (Ceramic)		Realizes economical hardened steel medium speed finishing.

Chipbreaker	Shape	Feature
HF		Excellent chip control in removing carburized layer at small depth of cut.
HM		Excellent chip control in removing carburized layer at large depth of cut.
HP		Excellent chip control in precision finishing.
HRF		Excellent chip control in Hardent steel medium finishing.

STANDARD CUTTING CONDITIONS

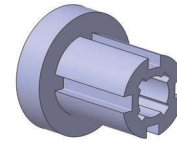
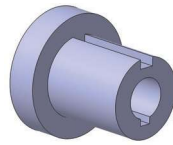
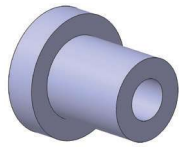
ISO	Operation	Work condition	Chipbreaker	Grade	Depth of cut ap (in)	Feed f (ipr)	Cutting speed Vc (sfm)	
H	Precision finishing	Continuous to light interrupted	HP	BXA10 BXA20 BXM10	0.002 - 0.008	0.001 - 0.007	500 - 1150	
	Finishing	Continuous to heavy interrupted	Without	BXA10 BXA20 BXM10	0.002 - 0.020	0.002 - 0.010	230 - 720	
	Finishing (Economical)	Continuous to light interrupted	Without	LX11 LX21	0.002 - 0.020	0.002 - 0.010	197 - 590	
	Removing of carburized layer	Continuous		HF	BXM20	0.008 - 0.030	0.002 - 0.008	230 - 660
				HM	BXA20 BXM20	0.020 - 0.040	0.002 - 0.008	230 - 660
Medium cutting	Continuous to medium interrupted	HRF	AH8005 AH8015	0.002 - 0.080	0.002 - 0.010	33 - 164		

Hardened steels, Pre-hardened steels: D2, H13, etc.

Selection System

SELECTION SYSTEM: NEGATIVE TYPE

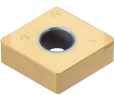

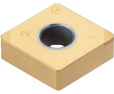

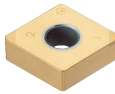



H Hard Materials



Continuous

Light interrupted

Heavy interrupted

	Continuous	Light interrupted	Heavy interrupted
Precision finishing [$a_p \sim 0.008$ in]	<p>Basic</p>  <p>T-CBN HP BXA10 B173, B176, B182</p>	<p>Basic</p>  <p>T-CBN BXA20 B172 - B181</p> <p>Fracture → -H BXM20 B172 - B180</p> <p>High-speed wear → T-CBN BXA10 B172 - B181</p>	
Finishing [$a_p \sim 0.020$ in]	<p>Basic</p>  <p>T-CBN BXA10 B172 - B181</p> <p>Eco-noming → LX11 B065</p>	<p>Basic</p>  <p>T-CBN BXA20 B172 - B181</p> <p>Fracture → -H BXM20 B172 - B180</p> <p>High-speed wear → T-CBN BXA10 B172 - B181</p> <p>Eco-noming → LX21 B065</p>	<p>Basic</p>  <p>T-CBN BXM20 B172 - B181</p> <p>Fracture → -H BXM20 B172 - B180</p>
Medium cutting [$a_p \sim 0.020$ in]	<p>Basic</p>  <p>HRF AH8005 B058</p> <p>Fracture → HRF AH8015 B172 - B180</p>	<p>Basic</p>  <p>HRF AH8015 B058</p> <p>Fracture → HRM AH8015 B058</p>	<p>Basic</p>  <p>HRF AH8015 B058</p> <p>Fracture → HRM AH8015 B058</p>

Please see the page B*** for the details.

Grade
Insert
Ext. Toolholder
Int. Toolholder
Threading
Grooving
Milling Cutter
Miniature Tool
Endmill
Drilling Tool
Tooling System
User's Guide
Index

