

# Chipbreaker Selection (Negative Inserts)

## Steel

### Molded Chipbreaker

B

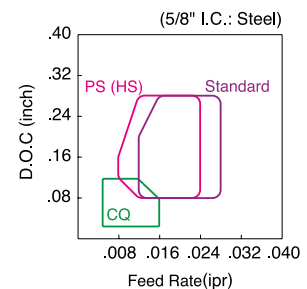
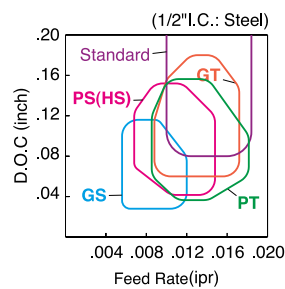
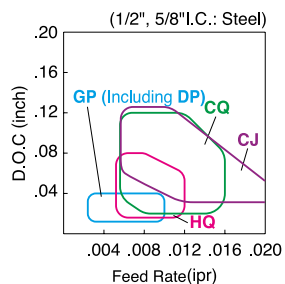
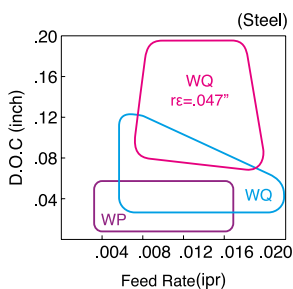


Turning Indexable Inserts

Cutting Range	Name	Design	Advantages
Finishing-Medium (With Wiper Edge)	WP		Wiper Insert. Double feed rate is available at finishing to light cutting, while maintaining a smooth finish.
Finishing-Medium (With Wiper Edge)	WQ		Wiper insert. Double feed rate possible while maintaining a smooth finish. High efficiency and good chip control.
Finishing	GP		Finishing to light cutting. Good chip control.
Finishing-Medium	HQ		Sharp cutting performance and wide range chip control with 3-D rake angle and double projection design.

Cutting Range	Name	Design	Advantages
Finishing-Medium	CQ		Good chip control at varied D.O.C. such as copying. Applicable to up facing.
Finishing-Medium (Up facing)	CJ		Ensures chips will curl even in small D.O.C. and high feed rate machining. Improves chip evacuation when copying and up facing.
Medium-Roughing	GS		Strong edge chipbreaker. Stable at continuous machining and light interrupted cutting.
Medium-Roughing	CS		Strong edge chipbreaker for general purpose machining. Stable at continuous machining and light interrupted cutting.

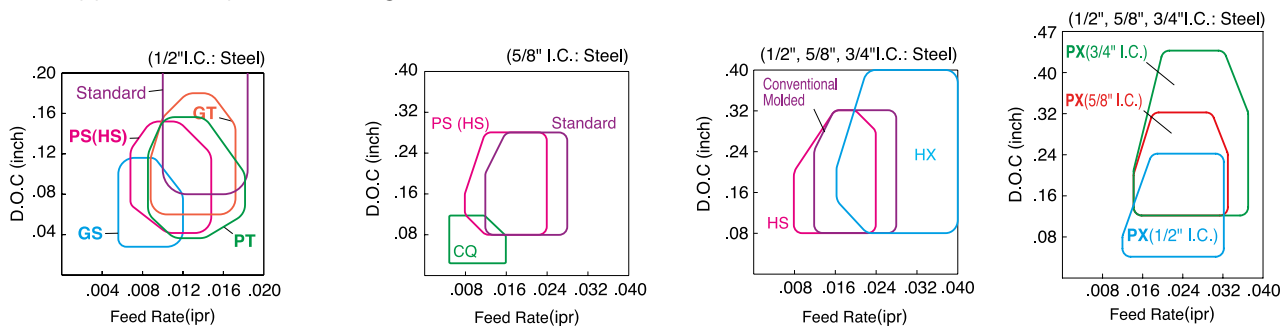
### ● Applicable Chipbreaker Range



Cutting Range	Name	Design	Advantages
Medium-Roughing	PS		General purpose with wide application range. More stable due to large contact surface.
Medium-Roughing	HS		General purpose chipbreaker. Applicable to copying.
Medium-Roughing (High Feed)	PT		Low cutting forces at high feed machining. Land support structure.
Medium-Roughing (High Feed)	GT		Strong edge chipbreaker. Wide land design and smooth chip control even at high feed rate machining.

Cutting Range	Name	Design	Advantages
Roughing	Standard		Low cutting force and suitable for large D.O.C. roughing.
Medium-Roughing (High Feed)	HT		Low cutting force at high feed rate machining. Strong edge and applicable to interrupted cutting.
Roughing	PH		For roughing of steel. Suitable for heavy interrupted cutting and for workpieces with scale due to strong cutting edge.
Single Sided Roughing (High Feed)	PX		Roughing and high feed rate operation. Low cutting force chipbreaker.

● Applicable Chipbreaker Range

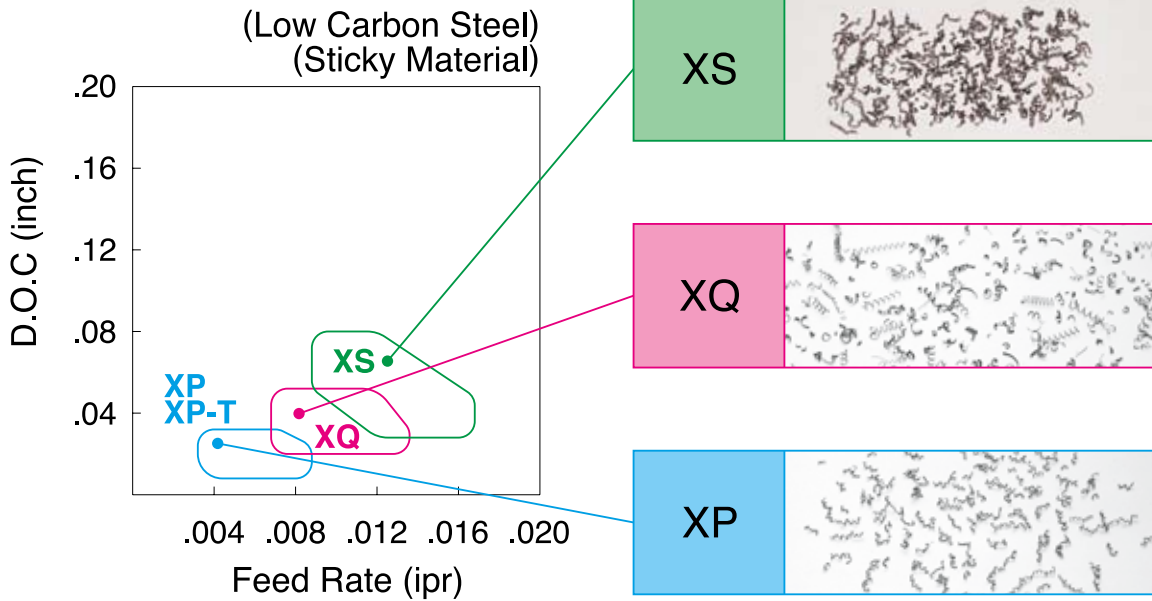


## Low Carbon Steel / Sticky Material

**B**  
 Turning Indexable Inserts

Cutting Range	Name	Design	Advantages	
Finishing	XP			Consistent chip breaking performance when machining sticky materials.
				Tough edge type for finishing. Recommended for interrupted cutting and unstable finishing machining.
Medium cutting	XQ			Consistent chip breaking at medium cutting due to moderate rake face and special design.
				Consistent chip breaking when roughing due to special rake face and rake angle design.

● Applicable Chipbreaker Range

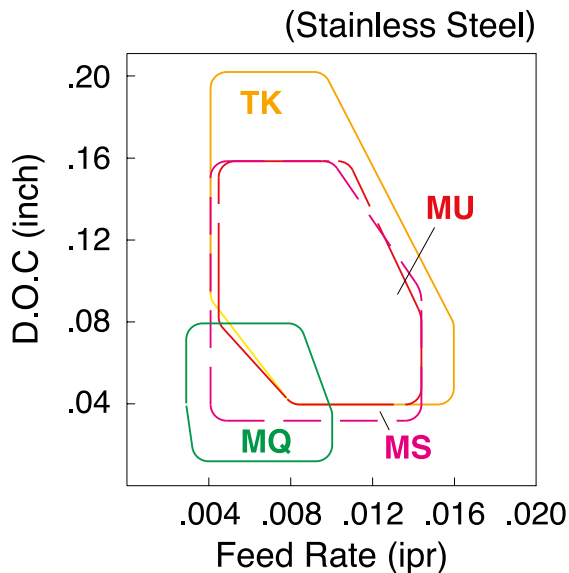


### Stainless Steel

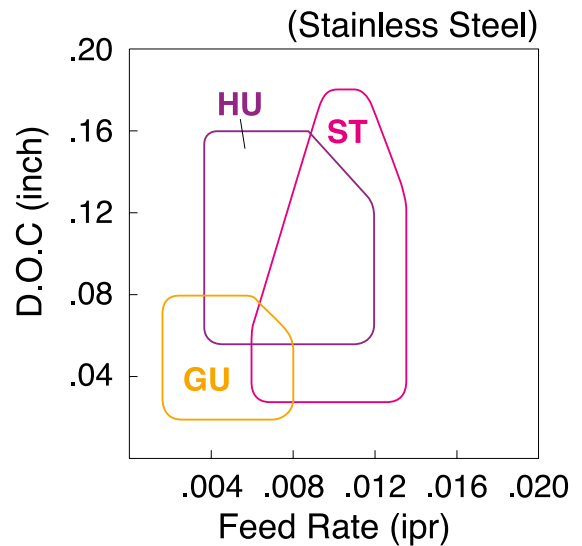
Cutting Range	Name	Design	Advantages
Finishing	<b>MQ</b>		Large rake angle and circular edge line. Low cutting force and good chip control.
Medium-Roughing	<b>MS</b>		Superior cutting edge sharpness and strength achieved by a positive land. Extra strength of cutting edge inhibits damage from wall shouldering.
Medium-Roughing	<b>MU</b>		Large rake angle reduces cutting force. Less burring achieved by diminishing damage from notching.
Medium-Roughing	<b>TK</b>		Smooth chipbreaker geometry improves chip flow with less adhesion. Large curled chips.

Cutting Range	Name	Design	Advantages
Finishing	<b>GU</b>		Sharp cutting performance and low cutting force due to 3-D rake angle. Applicable to small shaft machining.
Medium-Roughing	<b>HU</b>		Sharp cutting performance and strong edge due to 3-D rake angle. Applicable to small shaft machining.
Medium-Roughing	<b>ST</b>		Less cutting force due to large rake angle. Less notching by special design.

● Applicable Chipbreaker Range



● Applicable Chipbreaker Range



## Cast Iron

Cutting Range	Name	Design	Advantages
Sharp Cutting Oriented	Standard		Standard chipbreaker for continuous to light interrupted machining of cast iron. (Low cutting force)
	C		High feed rate chipbreaker for continuous to light interrupted machining of cast iron.
	ZS		Standard chipbreaker for light interrupted to interrupted machining of cast iron. (High stability)

Cutting Range	Name	Design	Advantages
Stability Oriented	No Chipbreaker		High feed rate chipbreaker for light interrupted machining of cast iron.
	GC		Chipbreaker for heavy interrupted machining of cast iron.

# Chipbreaker Selection (Negative Inserts)

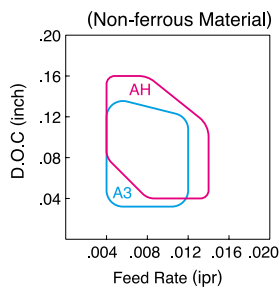
## Non-ferrous Material

Cutting Range	Name	Design	Advantages
Finishing-Medium	A3		Large rake angle and smooth surface. Good chip control and less adhesion.

Cutting Range	Name	Design	Advantages
Medium-Roughing	AH		Polished chipbreaker. Smooth chip control and less adhesion.

G class: Sharp Edge  
M class: Honed Cutting Edge

● Applicable Chipbreaker Range

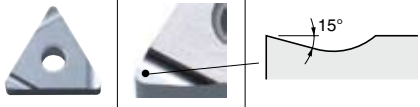
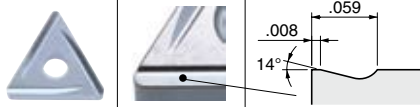
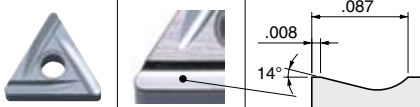


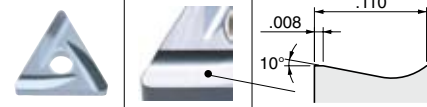
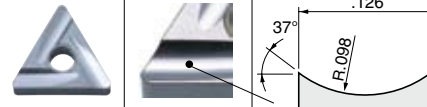
A3 Chipbreaker	
	doc=.08 inch f=.008 ipr
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AH Chipbreaker	
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## Steel

### 2 Ground Chipbreaker

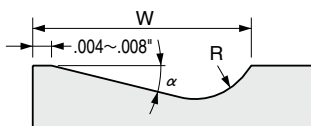
Cutting Range	Name	Design	Advantages
Finishing	S		Sharp edge and less cutting force. Good chip control and smooth chip evacuation.
Finishing-Medium	B		Suitable for general purpose machining at feed rate .006 to .010 ipr.
Medium-Roughing	C		Suitable for general purpose machining at feed rate .008 to .014 ipr.

Cutting Range	Name	Design	Advantages
Roughing	D		Suitable for general purpose machining at feed rate .012 to .018 ipr.
Medium-Roughing Low Cutting Resistance	25R		Applicable to sticky material such as low carbon steel. Large rake angle and suitable for stainless steel.

● Effectiveness of ground chipbreaker

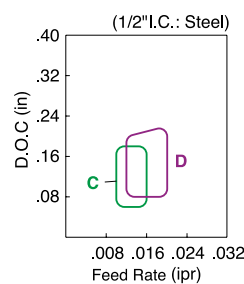
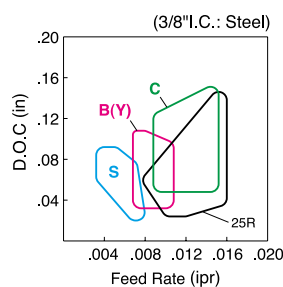
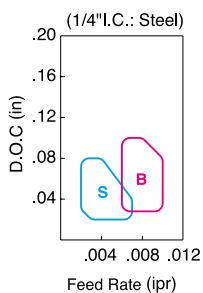
- 1) Lower cutting force and improved edge
- 2) Increased adhesion force
- 3) Improved dimension accuracy and finishing surface accuracy
- 4) Controlled chip evacuation direction

● Specification of B, C, D and Parallel ground chipbreaker



Insert Type	I.C. Size	Chipbreaker Name	W (in)	$\alpha$	R (in)
CNGG	3/8, 1/2	Without Indication (similar to C)	.087	14°	.040
WNGG	3/8	Without Indication (similar to C)	.087	14°	.040
TNGG	1/4, 3/8	B	.060	14°	.020
	3/8, 1/2	C	.087	14°	.040
DNGG	3/8, 1/2	D	.110	10°	.060
	3/8, 1/2	Without Indication (similar to C)	.100	14°	.080
VNGG	3/8	Without Indication (similar to B)	.060	14°	.020
SNGG	3/8, 1/2	B	.060	14°	.020
	1/2	C	.087	14°	.040

● Applicable Chipbreaker Range



# Chipbreaker Selection (Positive Insert)

## Steel

### Molded Chipbreaker

B



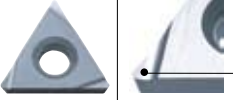


Turning Indexable Inserts

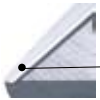
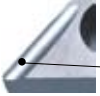
Cutting Range	Name	Design	Advantages	Cutting Range	Name	Design	Advantages
Minute D.O.C.	CF		Available for minute D.O.C. (.0008 - .008 inch) finishing.	Finishing	CK		Good cutting performance. Applicable without hand for two direction cutting on automatic lathe.
Finishing	GF		Dot located close to ridge line of cutting edge on corner. Chips fragmented in small pieces in cutting of small D.O.C.	Finishing	GP		Good chip control at finishing. Applicable to sticky material like low carbon steel, pipe material.
Finishing-Medium	GQ		Enables cutting over a wide range of conditions by using the optimum chipbreaker width according to the cutting depth.	Finishing	DP		Consistent chip breaking performance for finishing.
Finishing	XP		Consistent chip breaking performance even for low carbon steel and sticky material.	Finishing-Medium	HQ		General purpose chipbreaker for medium cutting.
Finishing-Medium	XQ		Wide chip control range and sharp cutting performance. Suitable for low carbon steel and sticky material.	Medium cutting	G		Chipbreaker for short chips at medium cutting.
Finishing-Medium	GK		Good chip evacuation at wide range by breaker dot and wide chip pocket.	Medium cutting	<b>Standard (Without Indication)</b>		Strong edge chipbreaker for medium cutting range.



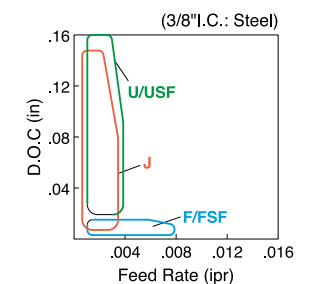
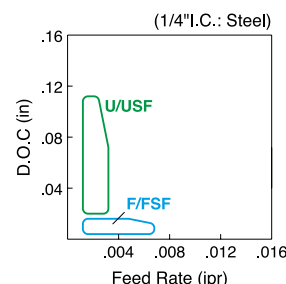
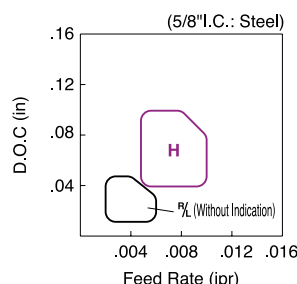
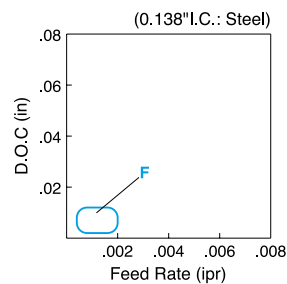
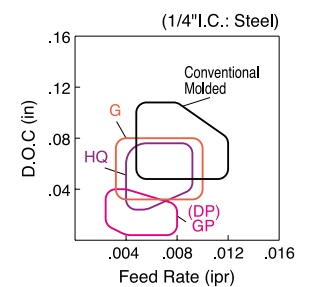
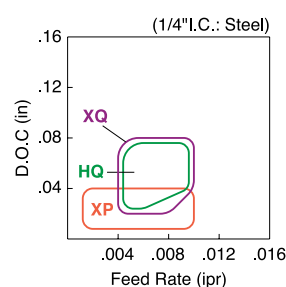
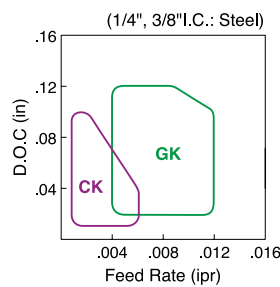
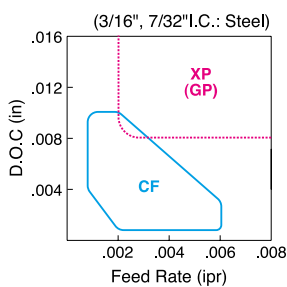
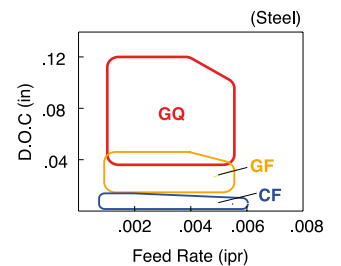
# Steel

## 2 Ground Chipbreaker

Cutting Range	Name	Design	Advantages
Finishing	Lead (Without Indication)		Good chip control at finishing to light cutting with low cutting force.
Finishing	F		Good chip control at finishing to light cutting with low cutting force.
Medium cutting	Y		Sharp cutting performance and good surface finish.

Cutting Range	Name	Design	Advantages
Low Feed	J		Slant chipbreaker width and chip control at various D.O.C. Suitable for automatic lathes.
Low Feed	U		Good chip control at low feed rates and varied D.O.C. with low cutting force.

### ● Applicable Chipbreaker Range



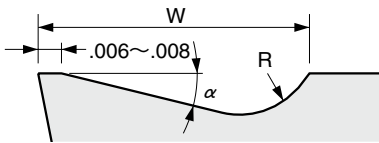


## 2 Ground Chipbreaker

Cutting Range	Name	Design	Advantages
Finishing	A		Large rake angle and low cutting force. Narrow chipbreaker width and consistent chip control.
Finishing-Medium	B		General purpose for light cutting range. Good balance between chip control and sharp cutting.

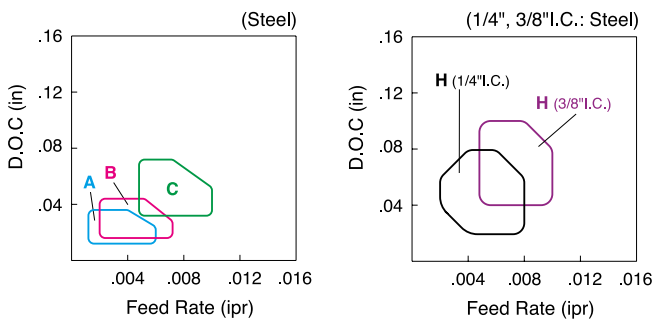
Cutting Range	Name	Design	Advantages
Medium cutting	C		Applicable to high load cutting. Good chip flow and less resistance.
Medium cutting	H		Sharp cutting performance and small curled chips.

### ● Specification of A, B, C and Parallel ground chipbreaker



Insert Type	I.C. Size	Chipbreaker Name	W (in)	$\alpha$	R (in)
TPGR	1/4	A	.040	17°	.020
	1/4, 3/8	B	.060	14°	.020
	3/8	C	.087	14°	.040
SPGR	3/8	Without Indication (similar to B)	.060	14°	.020
	1/2	Without Indication (similar to C)	.087	14°	.040

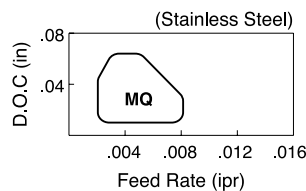
### ● Applicable Chipbreaker Range



## Stainless Steel


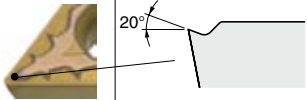

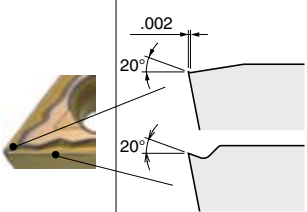
Cutting Range	Name	Design	Advantages
Finishing	MQ		Good chip evacuation at internal turning. Small curled chips. Prevents chip entanglement with toolholder and stabilizes surface roughness.

### ● Applicable Chipbreaker Range

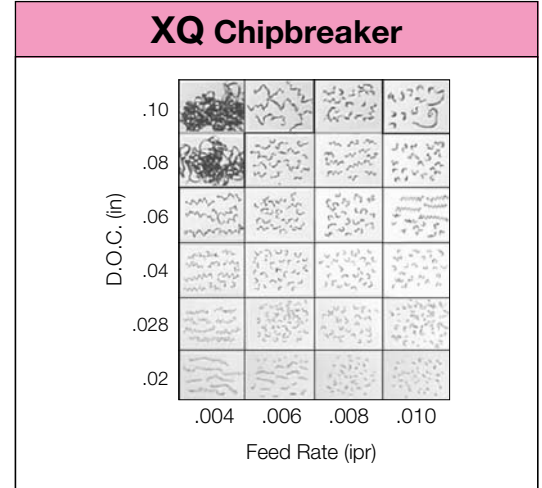
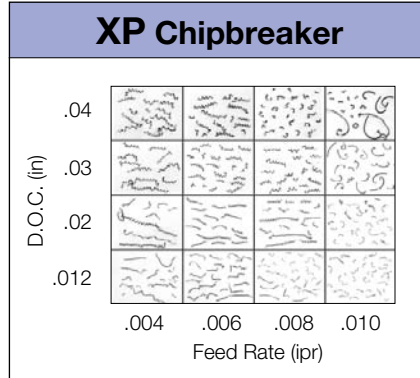
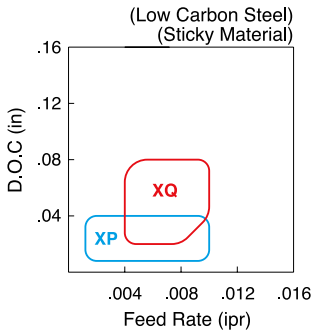


# Chipbreaker Selection (Positive Insert) [Low Carbon Steel / Sticky Material]

## Low Carbon Steel / Sticky Material


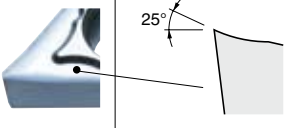

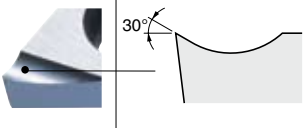
Cutting Range	Name	Design	Advantages
Finishing	XP		Consistent chip breaking performance even for low carbon steel and sticky material.
			
Finishing-Medium	XQ		Wide chip control range and sharp cutting performance. Applicable to low carbon steel and sticky material.
			

### ● Applicable Chipbreaker Range



# Chipbreaker Selection (Positive Insert) [Non-ferrous Material]

## Non-ferrous Material

Cutting Range	Name	Design	Advantages
Finishing-Medium	AH		Positive chip groove and good chip control with low cutting force. Polished surface reduces adhesion.
			
Finishing-Medium	A3		Large rake angle, smooth chip flow and less adhesion. Sharp edge and good surface finish.
			

### ● Applicable Chipbreaker Range

