

# NEW PRODUCT NEWS



Tungaloy Report No. 417S2-G

Internal turning tool

## MINI**FORCE**FTURN

**NEW CBN-TIPPED DXGQ/U INSERTS**



## MINIFORCE TURN

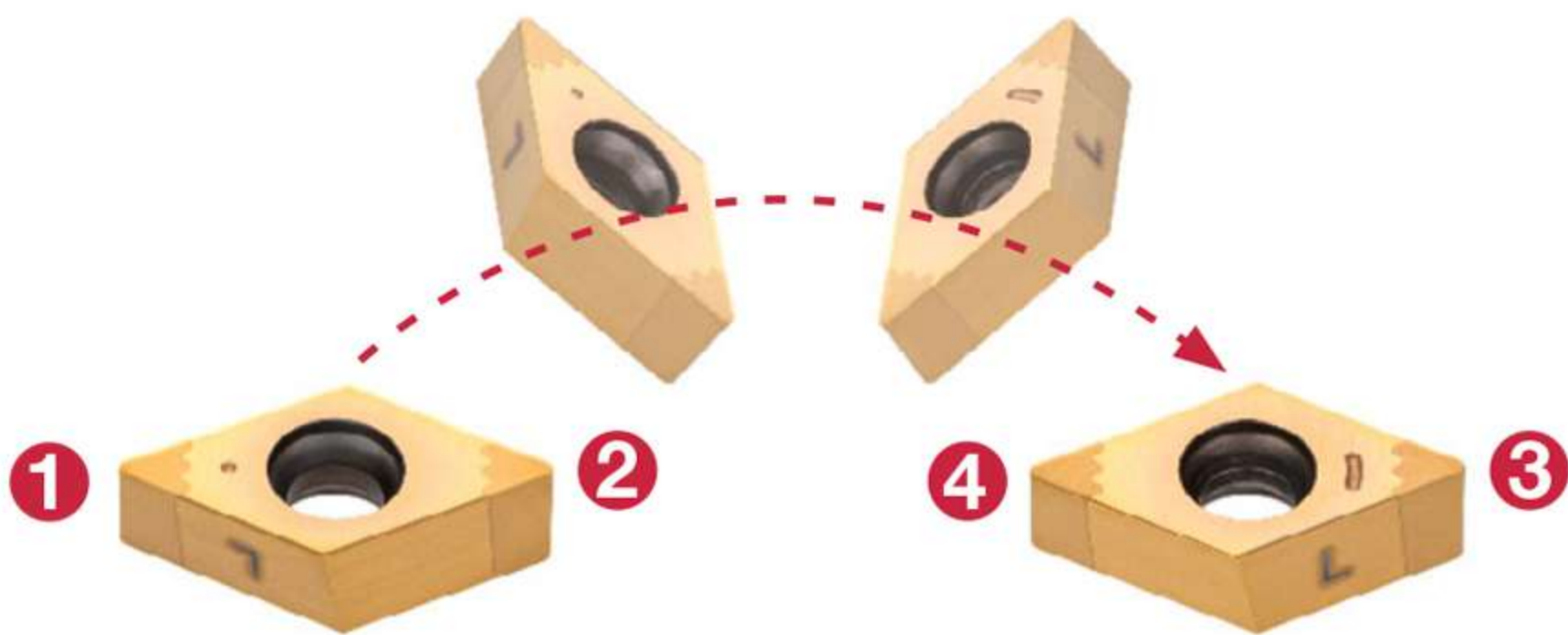
### Expansion of economical MiniForceTurn CBN grade insert line for hardened steel part turning

#### New DXGQ/U inserts for profiling and back turning

**New**

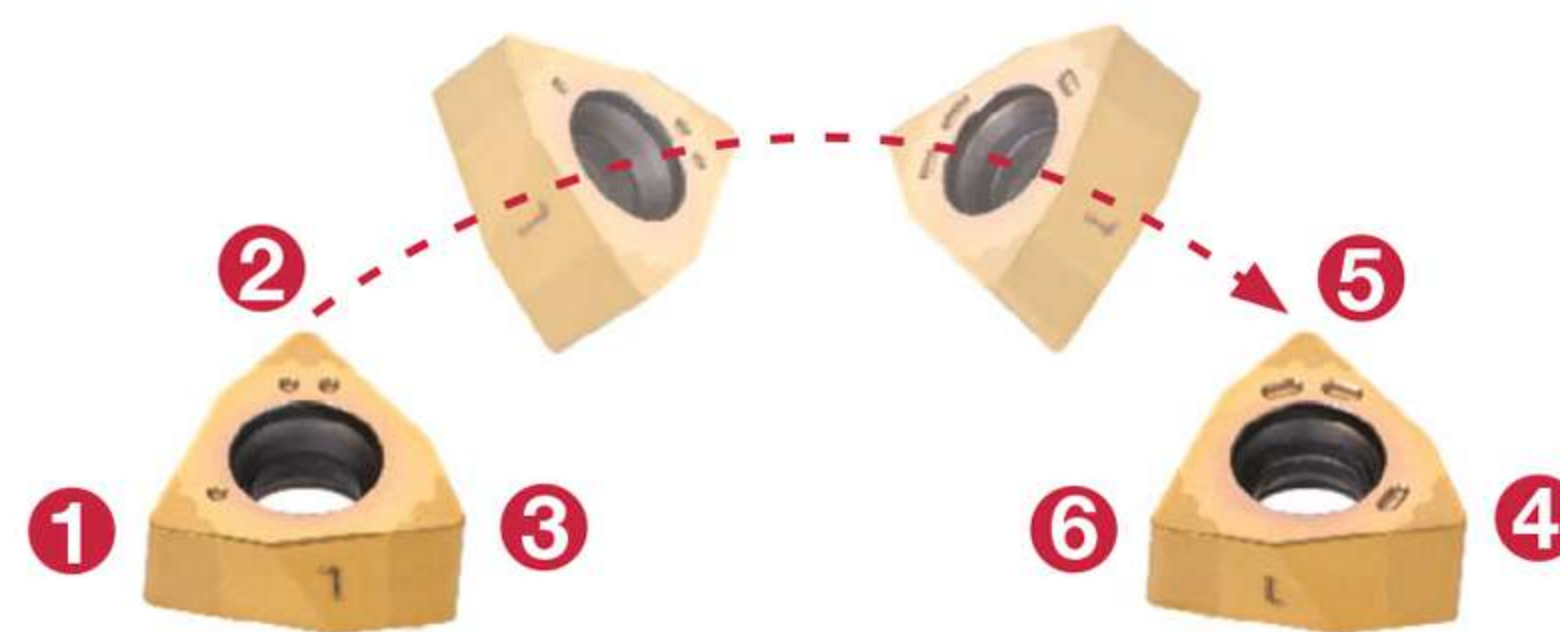
##### DXGQ/U insert

- 4 edges, rhombic 55°
- HP chipbreaker, without breaker



##### WXGQ/U insert

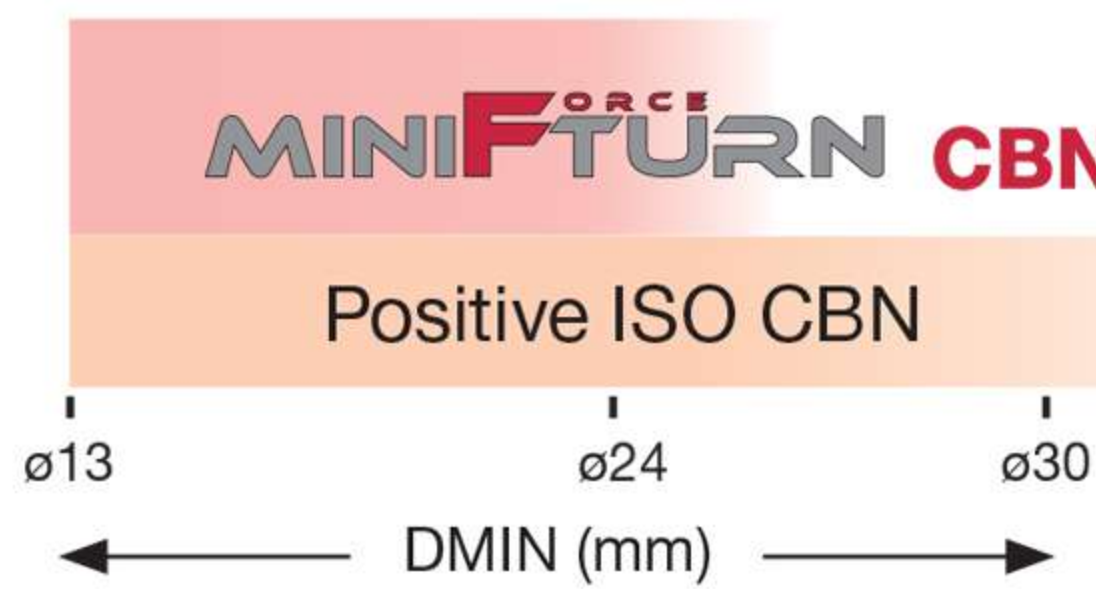
- 6 edges, Trigon 80°
- HP chipbreaker, without breaker



#### APPLICATIONS: INTERNAL TURNING AND PROFILING OF HARDENED STEEL PARTS

**New**

##### DXGQ/U insert



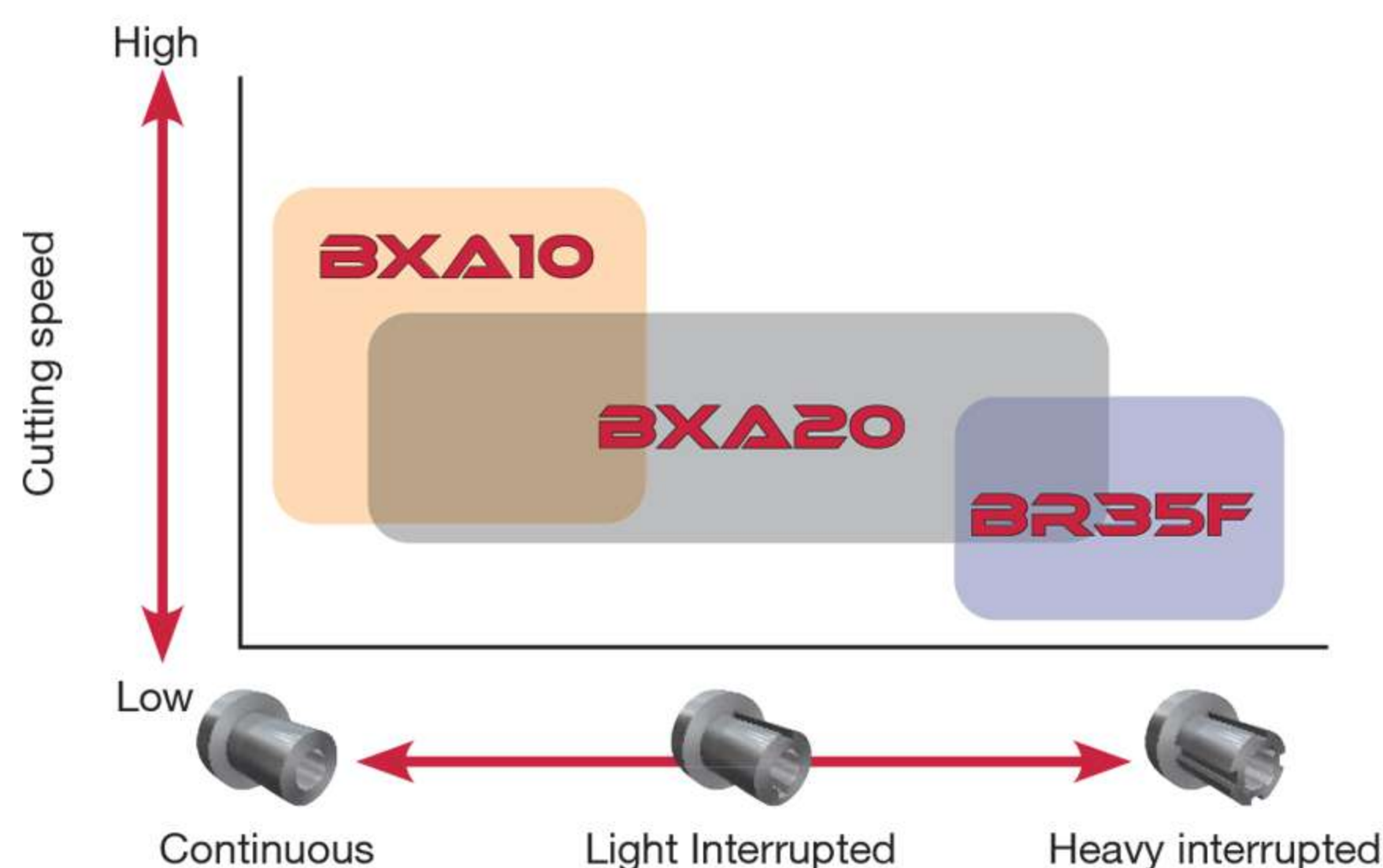
Cost-efficient double-sided CBN inserts covers minimum bore diameters from 13 - 24 mm

##### WXGQ/U insert



Cost-efficient double-sided CBN inserts covers minimum bore diameters from 12 to 32 mm

#### APPLICATION AREA



##### BXA10

- First choice for continuous to light interrupted cuts
- For  $V_c = 230$  m/min or less

##### BXA20

- Versatile grade from continuous to heavy interrupted cuts
- For  $V_c = 180$  m/min or less

##### BR35F

- First choice for heavy interrupted cuts
- For  $V_c = 150$  m/min or less

### HARDBREAKER HP

Designed for finish machining of hardened parts with close tolerances

- HP chipbreaker provides excellent surface quality and good chip control.
- Optimized chipbreaker geometry significantly reduces cutting force imposed on the cutting edge, ensuring long tool life.
- The edge preparation is designed to generate low cutting force, providing chatter-free machining and close tolerances.

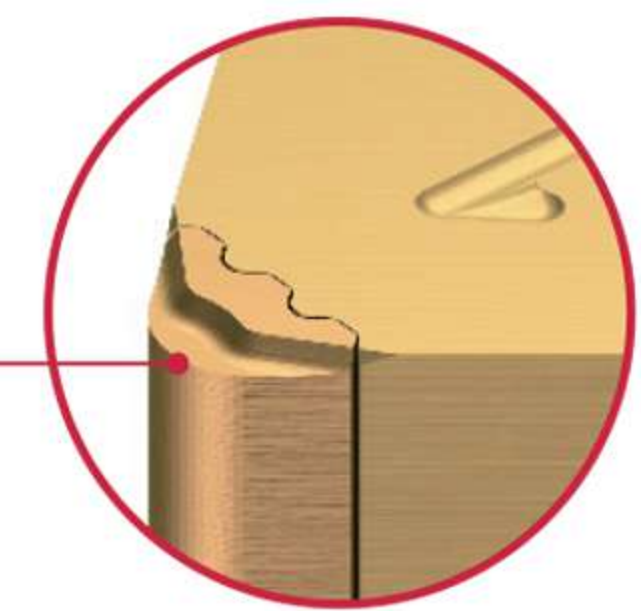
**New**



4QS-DXGU0703\*\*R/L-HP



6QS-WXGU0403\*\*R/L-HP



Optimized edge preparation for low cutting force

### CHIP CONTROL

HP chipbreaker provides excellent chip control in finish machining of hardened steel parts while eliminating chip packing during continuous cuts of I.D. turning operations.

### HARDBREAKER HP

Competitor's ISO insert (w/o chipbreaker)



- H** Insert : 6QS-WXGU040304L-HP BXA10  
 Toolholder : A16Q-SWLXR04-D180  
 Workpiece material : SCM420 / 42CrMo4 (60HRC)  
 Cutting speed :  $V_c = 150$  m/min  
 Feed :  $f = 0.1$  mm/rev  
 Depth of cut :  $a_p = 0.1$  mm  
 Coolant : Wet  
 Application : Continuous cut, I.D. turning

### CUTTING FORCES

HP chipbreaker features soft cutting geometry for reduced cutting forces while eliminating chatter during continuous cuts of I.D. turning operations that use long overhang tool setup.

	Tool overhang (mm)						
	30	35	40	45	50	55	60
<b>HARDBREAKER HP</b>	OK						
Competitor's ISO insert (w/o chipbreaker)							

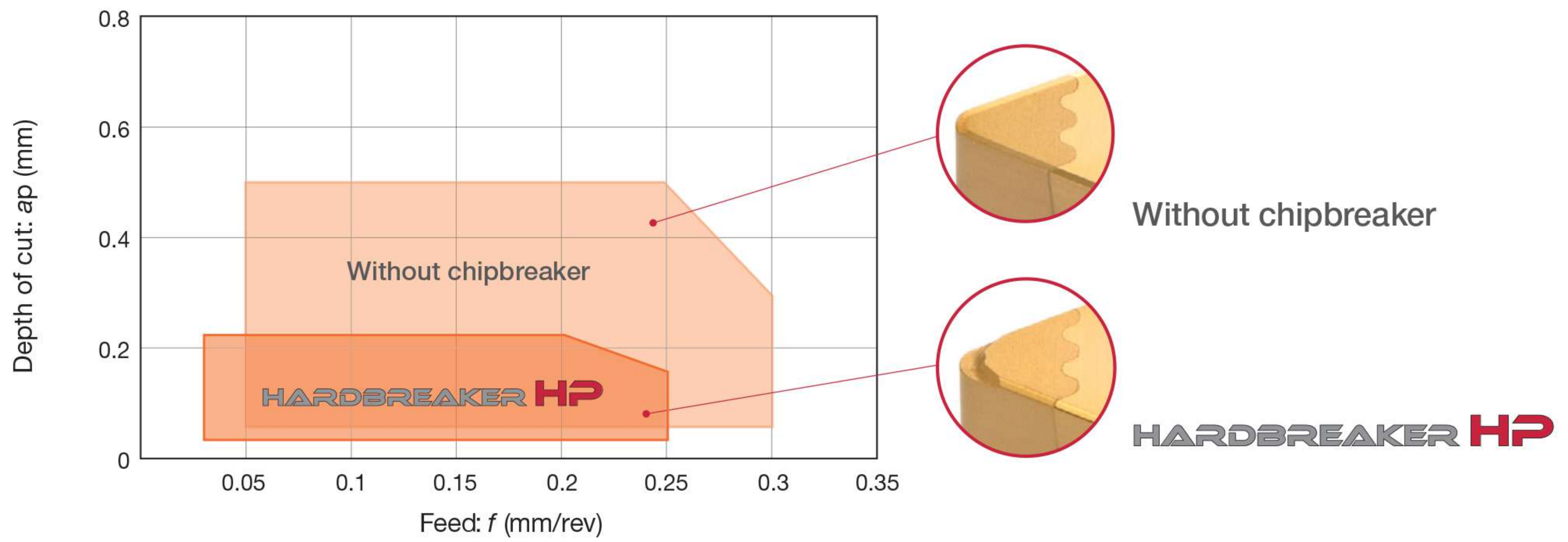
OK  
 Chatter

- H** Insert : 6QS-WXGU040304L-HP BXA10  
 Toolholder : A16Q-SWLXR04-D180  
 Workpiece material : SCM420 / 42CrMo4 (60HRC)  
 Cutting speed :  $V_c = 150$  m/min  
 Feed :  $f = 0.1$  mm/rev  
 Depth of cut :  $a_p = 0.1$  mm  
 Coolant : Wet  
 Application : Continuous cut, I.D. turning

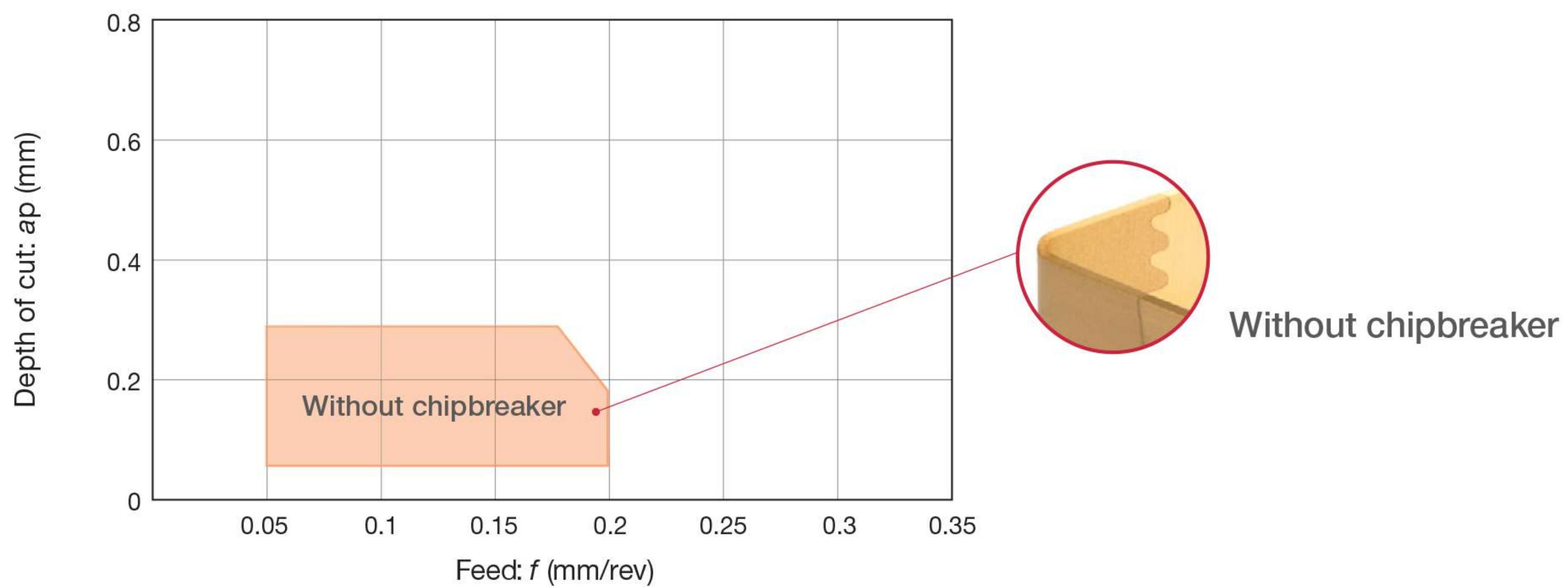
## MINIFORCE TURN

### APPLICATION AREA

#### Continuous turning



#### Interrupted turning



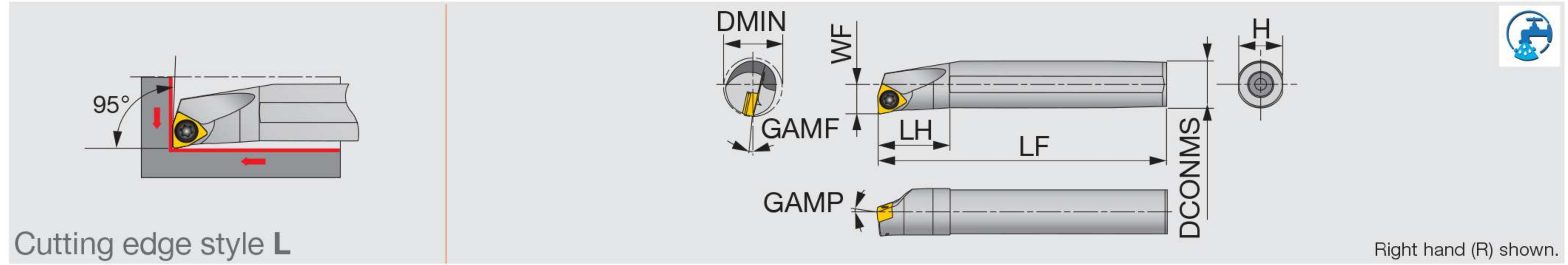
### STANDARD CUTTING CONDITIONS

ISO	Grade	Workpiece condition	Cutting speed $V_c$ (m/min)	Depth of cut $a_p$ (mm)	Feed $f$ (mm/rev)
H	BXA10	Continuous	100 - 230	0.05 - 0.5	0.05 - 0.3
		Light interrupted	100 - 230	0.05 - 0.3	0.05 - 0.2
	BXA20	Continuous	60 - 180	0.05 - 0.5	0.05 - 0.3
		Interrupted	60 - 180	0.05 - 0.3	0.05 - 0.2
	BR35F	Heavy interrupted	50 - 150	0.05 - 0.3	0.05 - 0.2

## Tungaloy Report No. 417S2-G

### A/E-SWLXR/L

Screw-on boring bar, for WXGQ/U inserts



Right hand (R) shown.

Designation	Material	DMIN	DCONMS	WF	LF	LH	H	GAMP	GAMF	RE**	Insert	Torque*
A10K-SWLXR/L04-D120	STEEL	12	10	6	125	20	9	-10	-16	0.4	WXGQ/U0403**L/R...	0.9
A12M-SWLXR/L04-D140	STEEL	14	12	7	150	24	11	-10	-14	0.4	WXGQ/U0403**L/R...	0.9
A16Q-SWLXR/L04-D180	STEEL	18	16	9	180	32	15	-10	-11	0.4	WXGQ/U0403**L/R...	0.9
A20R-SWLXR/L04-D220	STEEL	22	20	11	200	36	18	-10	-10	0.4	WXGQ/U0403**L/R...	0.9
E10M-SWLXR/L04-D120	CARBIDE	12	10	6	150	25	9	-10	-16	0.4	WXGQ/U0403**L/R...	0.9
E12Q-SWLXR/L04-D140	CARBIDE	14	12	7	180	27	11	-10	-14	0.4	WXGQ/U0403**L/R...	0.9
E16R-SWLXR/L04-D180	CARBIDE	18	16	9	200	32	15	-10	-11	0.4	WXGQ/U0403**L/R...	0.9
E20S-SWLXR/L04-D220	CARBIDE	22	20	11	250	36	18	-10	-10	0.4	WXGQ/U0403**L/R...	0.9

\*Torque: Recommended torque (N-m) for clamping \*\*RE: The holder measurements are true with this insert radius  
 Note: Use the right hand toolholder (R) for the left hand insert (L). Use the left hand toolholder (L) for the right hand insert (R)

### SPARE PARTS

Designation	Clamping screw	Wrench
A/E**-SWLXR/L...	SR34-514	T-7F

- 1 Use the right hand toolholder (R) for the left hand insert (L)
- 2 Use the left hand toolholder (L) for the right hand insert (R)



1 Right hand toolholder with left hand insert shown

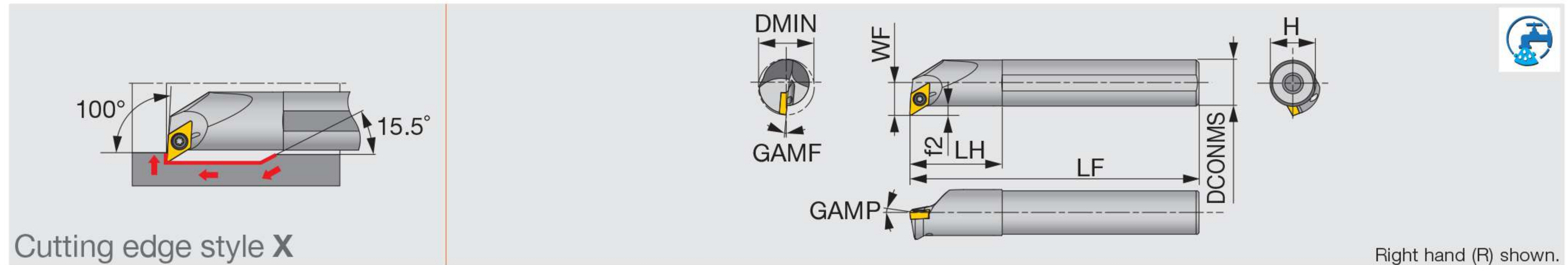


2 Left hand toolholder with right hand insert shown

# MINIFORCE TURN

### A/E-SDXXR/L

Screw-on boring bar, for DXGQ/U inserts



Right hand (R) shown.

Designation	Material	DMIN	DCONMS	WF	LF	LH	H	f2	GAMP	GAMF	RE**	Insert	Torque*
A10K-SDXXR/L07-D130	Steel	13	10	7.6	125	20	9	2.6	-14°	-16°	0.4	DXGQ/U0703**L/R...	0.9
A12M-SDXXR/L07-D160	Steel	16	12	8.6	150	24	11	2.6	-14°	-14°	0.4	DXGQ/U0703**L/R...	0.9
A16Q-SDXXR/L07-D200	Steel	20	16	10.6	180	32	15	2.6	-13°	-13°	0.4	DXGQ/U0703**L/R...	0.9
A20R-SDXXR/L07-D240	Steel	24	20	12.6	200	36	18	2.6	-13°	-12°	0.4	DXGQ/U0703**L/R...	0.9
E10M-SDXXR/L07-D130	Carbide	13	10	7.6	150	25	9	2.6	-14°	-16°	0.4	DXGQ/U0703**L/R...	0.9
E12Q-SDXXR/L07-D160	Carbide	16	12	8.6	180	27	11	2.6	-14°	-14°	0.4	DXGQ/U0703**L/R...	0.9
E16R-SDXXR/L07-D200	Carbide	20	16	10.6	200	32	15	2.6	-13°	-13°	0.4	DXGQ/U0703**L/R...	0.9
E20S-SDXXR/L07-D240	Carbide	24	20	12.6	250	36	18	2.6	-13°	-12°	0.4	DXGQ/U0703**L/R...	0.9

\*Torque: Recommended clamping torque (N·m) \*\*RE : Standard corner radius

Note: Use right-hand toolholders (R) with left-hand inserts (L); and left-hand toolholders (L) with right-hand inserts (R)

#### SPARE PARTS

Designation	Clamping screw	Wrench
A/E**-SDXXR/L...	SR34-514	T-7F

- 1 Use the right hand toolholder (R) for the left hand insert (L)
- 2 Use the left hand toolholder (L) for the right hand insert (R)



1 Right hand toolholder with left hand insert shown

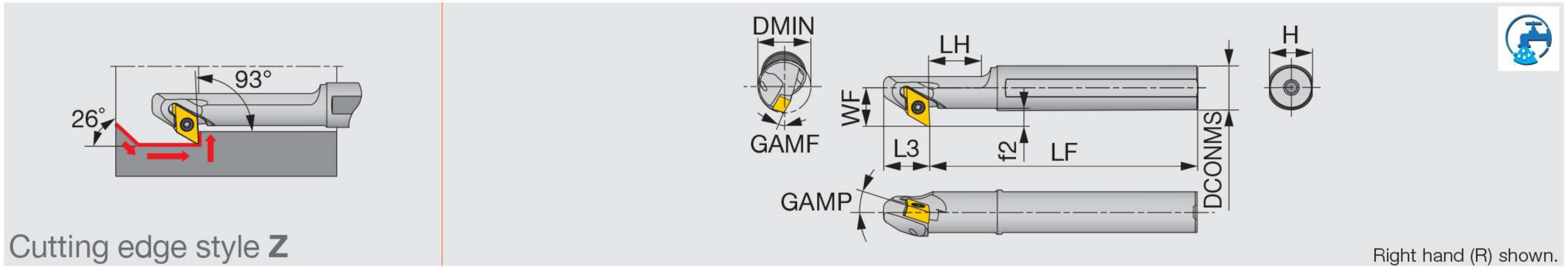


2 Left hand toolholder with right hand insert shown

## Tungaloy Report No. 417S2-G

### A/E-SDZXR/L

Screw-on boring bar, for DXGQ/U inserts



Cutting edge style Z

Right hand (R) shown.

Designation	Material	DMIN	DCONMS	WF	LF	LH	L3	H	f2	GAMP	GAMF	RE**	Insert	Torque*
A12M-SDZXR/L07-D140	Steel	14	12	10.5	150	30	13	11	4.5	-10°	-14°	0.4	DXGQ/U0703**R/L...	0.9
A16Q-SDZXR/L07-D160	Steel	16	16	12.5	180	35	13	15	4.5	-10°	-12.5°	0.4	DXGQ/U0703**R/L...	0.9
A20R-SDZXR/L07-D200	Steel	20	20	14.5	200	40	13	18	4.5	-10°	-10.5°	0.4	DXGQ/U0703**R/L...	0.9
E12Q-SDZXR/L07-D180	Carbide	18	12	10.5	180	-	13	11	4.5	-11°	-11°	0.4	DXGQ/U0703**R/L...	0.9
E16R-SDZXR/L07-D220	Carbide	22	16	12.5	200	-	13	15	4.5	-11°	-9°	0.4	DXGQ/U0703**R/L...	0.9

\*Torque: Recommended clamping torque (N·m) \*\*RE : Standard corner radius

Note: Use right-hand toolholders (R) with right-hand inserts (R); and left-hand toolholders (L) with left-hand inserts (L).

### SPARE PARTS

Designation	Clamping screw	Wrench
A/E**-SDZXR/L...	SR34-514	T-7F

- ① Right hand toolholders (R) are used with right hand inserts (R)
- ② Left hand toolholders (L) are used with left hand inserts (L)



① Right hand toolholder with right hand insert shown



② Left hand toolholder with left hand insert shown

### MARKING



Insert hand is identified on the flank side

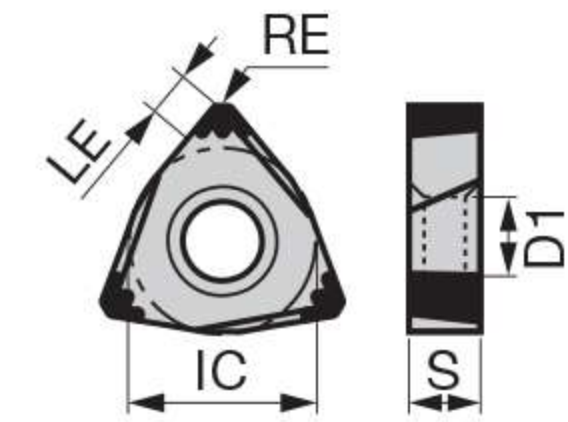
## MINIFORCE TURN

### Insert POSITIVE TYPE

- : Continuous cutting
- c : Light interrupted cutting
- ✳ : Heavy interrupted cutting

# WX

80° Trigon with hole



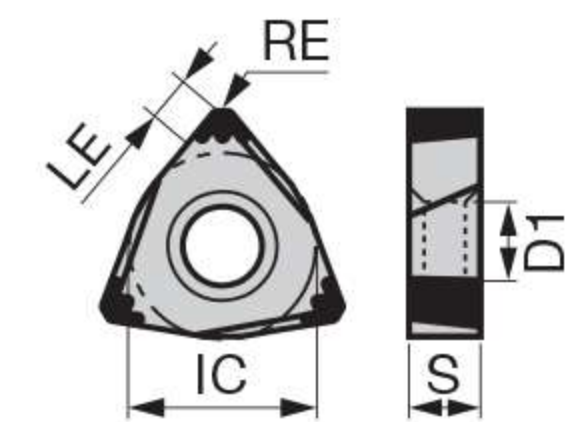
IC : 6.35 mm  
D1 : 2.7 mm  
S : 3.18 mm

Application	Designation	Dimension (mm)				Standard	Problem										
		RE	LE	No. of corners	Wiper		Burr	Flank wear	Crater wear	Chipping	BXA10	BXA20	BR35F				
Finishing	6QS-WXGQ040302SPR	0.2	1.8	6							●	●	●				
	6QS-WXGQ040302SPL		1.8	6							●	●	●				
	6QS-WXGQ040304SPR	0.4	1.8	6							●	●	●				
	6QS-WXGQ040304SPL		1.8	6							●	●	●				
	6QS-WXGQ040308SPR	0.8	1.7	6							●	●	●				
	6QS-WXGQ040308SPL		1.7	6							●	●	●				

● : Line up

# WX with chipbreaker

80° Trigon with hole



IC : 6.35 mm  
D1 : 2.7 mm  
S : 3.18 mm

Application	Designation	Dimension (mm)				Standard	Problem										
		RE	LE	No. of corners	Wiper		Burr	Flank wear	Crater wear	Chipping	BXA10	BXA20	BR35F				
Precision finishing	6QS-WXGU040304R-HP	0.4	1.8	6							●	●	●				
	6QS-WXGU040304L-HP		1.8	6							●	●	●				
	6QS-WXGU040308R-HP	0.8	1.7	6							●	●	●				
	6QS-WXGU040308L-HP		1.7	6							●	●	●				

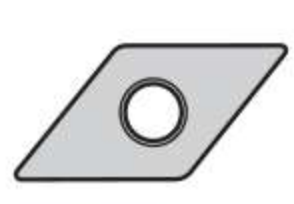
● : Line up



## Insert POSITIVE TYPE

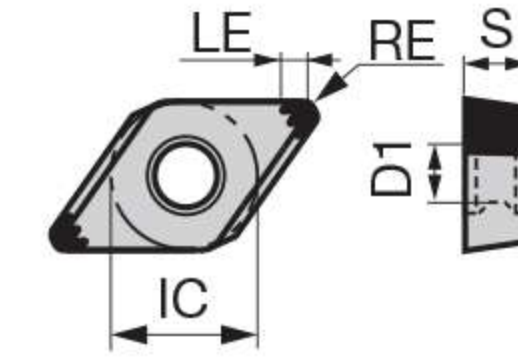
- : Continuous cutting
- ◐ : Light interrupted cutting
- ⊛ : Heavy interrupted cutting

### DX



**55° Rhombic with hole**

**New**



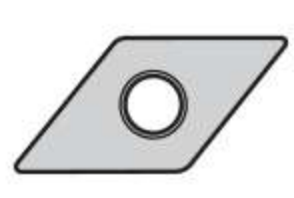
IC : 6.35 mm  
D1 : 2.7 mm  
S : 3.18 mm

Application	Designation	Dimension (mm)		No. of corners	Wiper	Standard	Problem				BXA10	BXA20	BR35F										
		RE	LE				Burr	Flank wear	Crater wear	Chipping													
Finishing	4QS-DXGQ070302SPR	0.2	2.1	4		O					●	●	●										
	4QS-DXGQ070302SPL		2.1									●	●	●									
	4QS-DXGQ070304SPR	0.4	1.9	4		O					●	●	●										
	4QS-DXGQ070304SPL		1.9									●	●	●									
	4QS-DXGQ070308SPR	0.8	1.6	4		O					●	●	●										
	4QS-DXGQ070308SPL		1.6									●	●	●									

● : New product

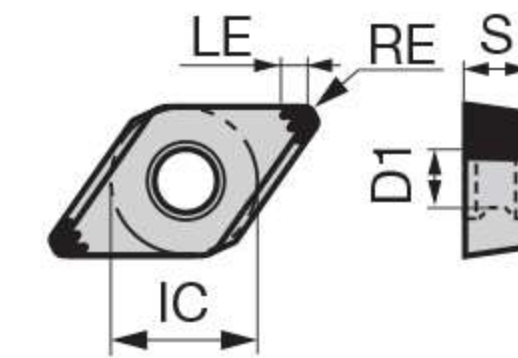
### DX

with chipbreaker



**55° Rhombic with hole**

**New**






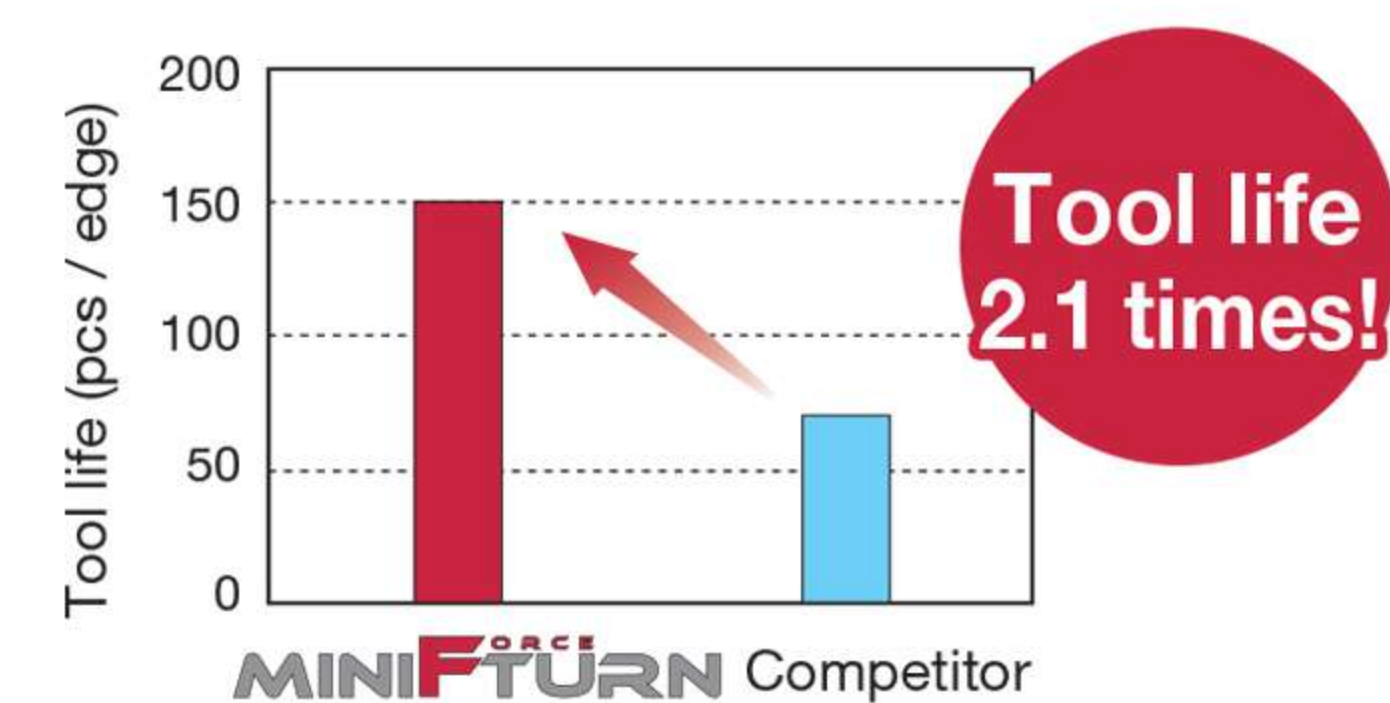

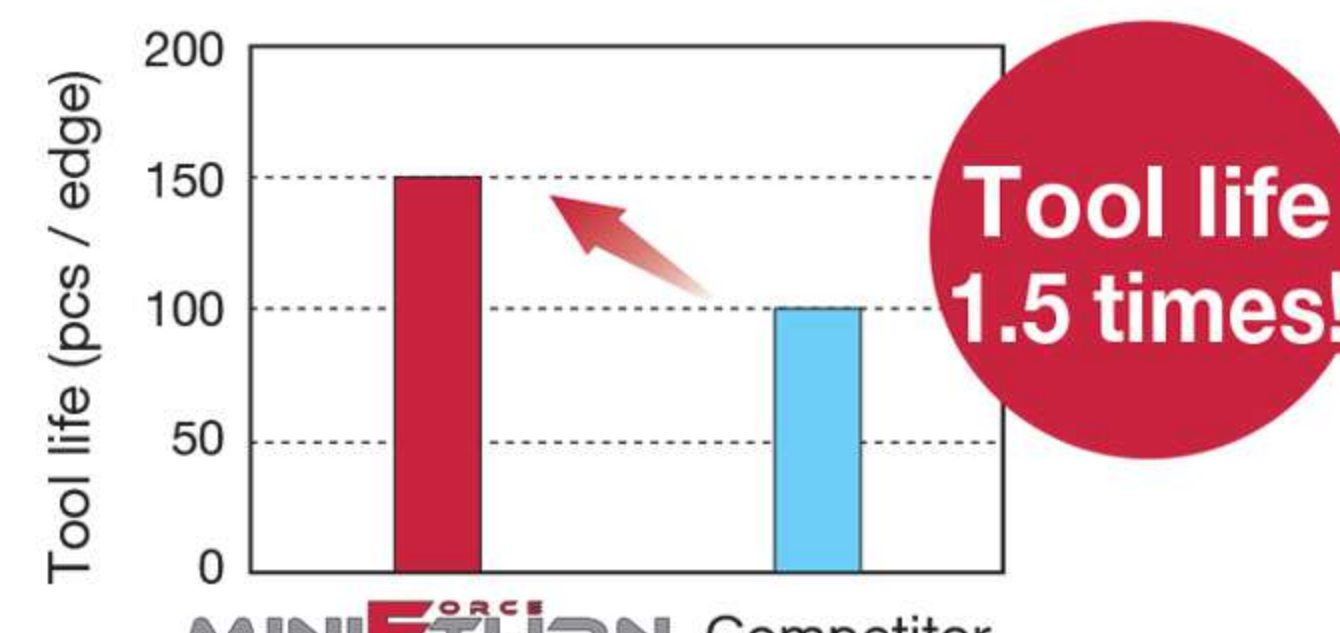
IC : 6.35 mm  
D1 : 2.7 mm  
S : 3.18 mm

Application	Designation	Dimension (mm)		No. of corners	Wiper	Standard	Problem				BXA10	BXA20	BR35F									
		RE	LE				Burr	Flank wear	Crater wear	Chipping												
Precision finishing	4QS-DXGU070304R-HP	0.4	2	4		O					●	●	●									
	4QS-DXGU070304L-HP		2									●	●	●								
	4QS-DXGU070308R-HP	0.8	1.6	4		O					●	●	●									
	4QS-DXGU070308L-HP		1.6									●	●	●								

● : New product

# MINIFORCE TURN

### ■ PRACTICAL EXAMPLES

Workpiece type		Driven gear	Machine part
Insert		<b>New</b> 4QS-DXGQ070304SPL	6QS-WXGQ040304SPL
Grade		BXA10	BXA20
		SCM420 / 18CrMo4 (50HRC)	SCM415 / 15CrMo4 (60HRC)
Workpiece material		 <b>H</b>	 <b>H</b>
Cutting conditions	Cutting speed: $V_c$ (m/min)	260	90
	Feed : $f$ (mm/rev)	0.06	0.06
	Depth of cut : $a_p$ (mm)	0.15	0.075
	Coolant	Wet	Dry
Results	 <p><b>MiniForce-Turn</b> provided better cutting edge integrity and more rigid insert clamping, compared with ISO positive inserts, achieving 2.1 times tool life increase.</p>		 <p>Strong cutting edge design of <b>MiniForce-Turn</b> insert provided fracture resistance, prolonging tool life by 2.1 times over the competitor's positive insert.</p>
Workpiece type		Gear part	
Insert		6QS-WXGQ040304SPL	
Grade		BXA10	
		SCM420 / 18CrMo4 (60HRC)	
Workpiece material		 <b>H</b>	
Cutting conditions	Cutting speed: $V_c$ (m/min)	70	
	Feed : $f$ (mm/rev)	0.03	
	Depth of cut : $a_p$ (mm)	0.1	
	Coolant	Dry	
Results	 <p><b>MiniForce-Turn</b> insert provided 1.5 times longer tool life over competitor's positive insert, while also eliminated chatter during machining.</p>		

# CONTACT US



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