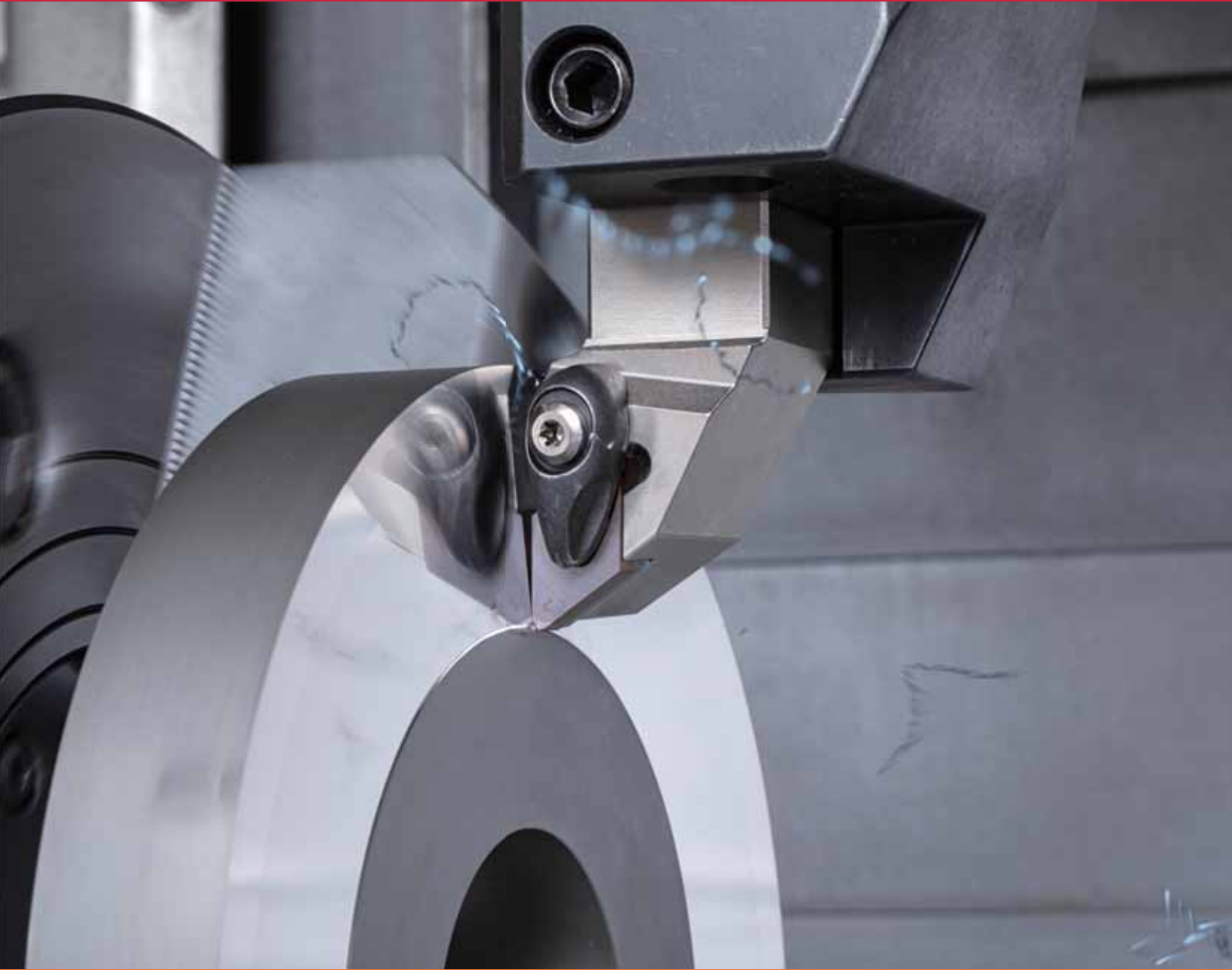


# BXA30/BXA40

www.tungaloy.com

Tungaloy Report No. 536-G

## Coated CBN grades for precision finishing of hardened steel



**INDUSTRY 4.0**  
*FEED the SPEED!*



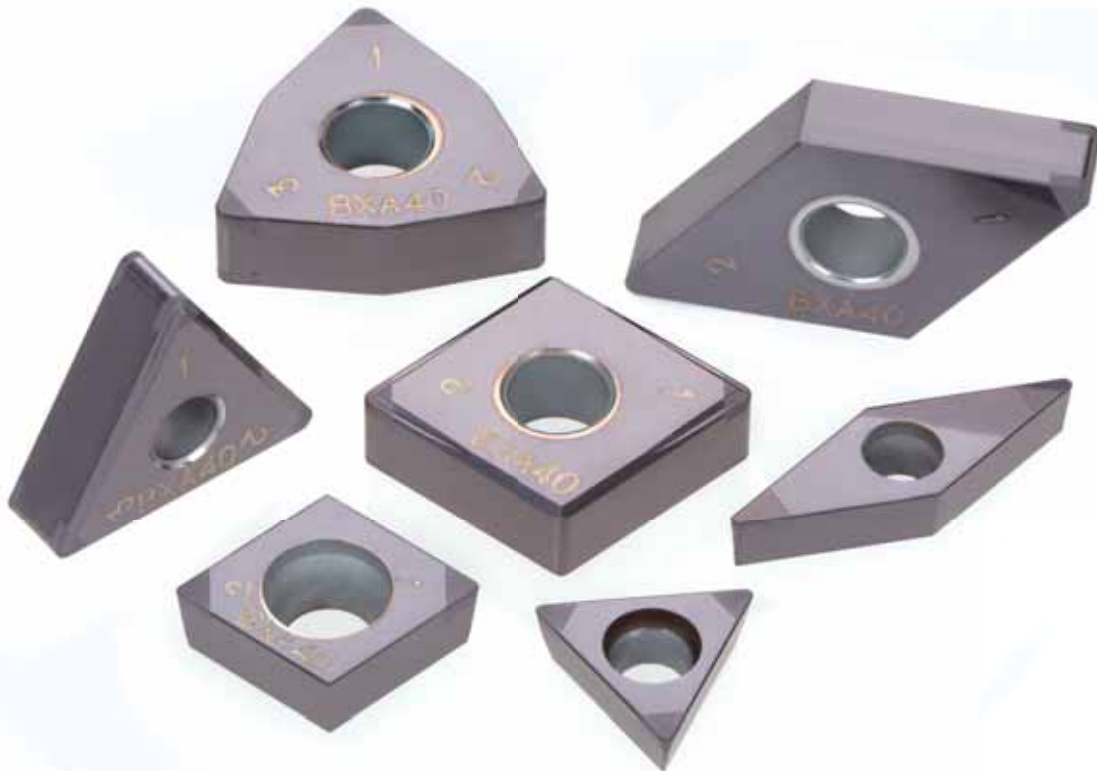
ACCELERATED MACHINING



TurnLine

# BXA30/BXA40

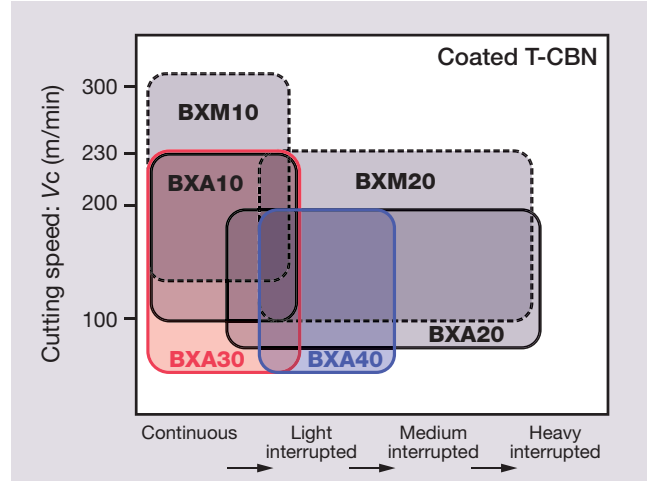
TUNGALOY



Provides high quality surface on hardened steel parts,  
when using **extremely light depths-of-cut**

## Thin PVD coating with superior adhesion to substrate

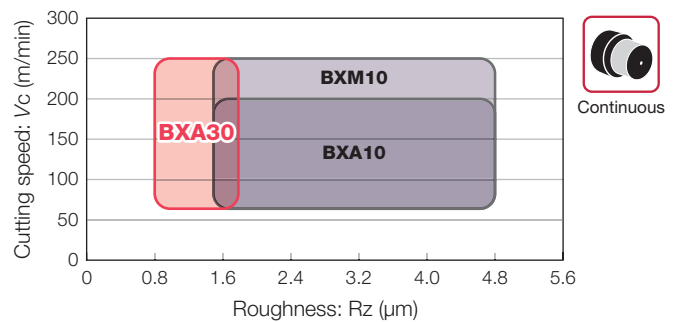
- Prevents premature insert fracture and provides machining security
- Provides good surface finish



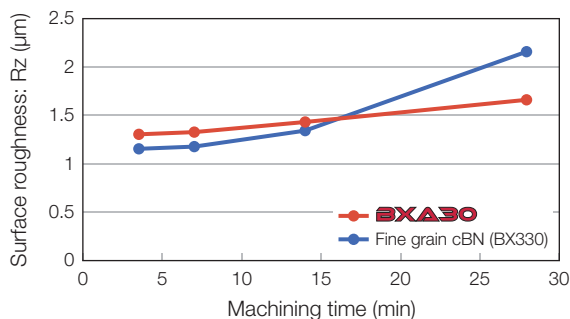
## BXA30

### Coated CBN grade for high quality surface finishing

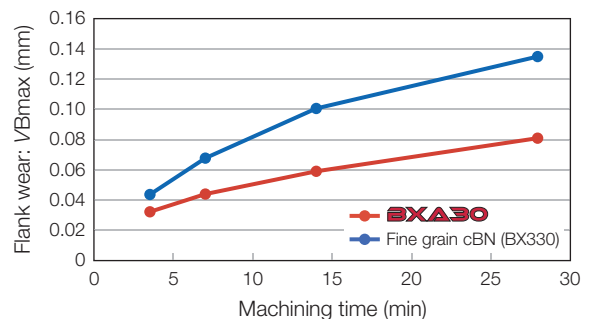
Ultra-fine cBN grain uniquely designed for superior adhesion with the PVD coating provides exceptional wear resistance and eliminates built-up edge, delivering excellent surface quality and tool life predictability.





Surface roughness



Wear resistance

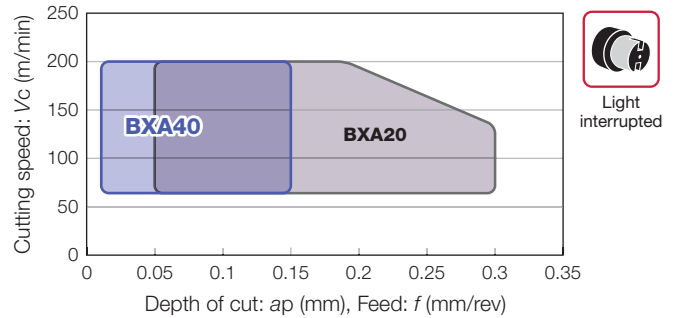


 Insert : 2QP-CNGA120408  
 Workpiece material : SCM415 (58HRC)  
 Cutting speed :  $V_c = 200$  m/min  
 Feed :  $f = 0.08$  mm/rev  
 Depth of cut :  $a_p = 0.15$  mm  
 Coolant : Wet

## BXA40

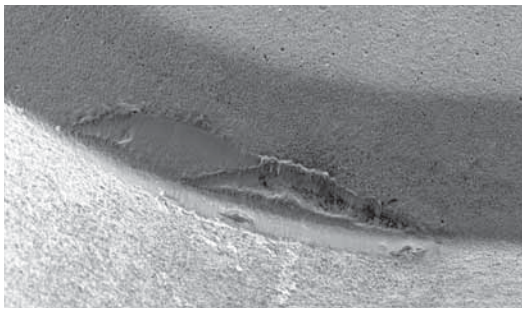
**Coated CBN grade ideal of extremely light D.O.C.**

Thanks to the cBN substrate being formulated for superior adhesion with the coating, edge chipping is significantly reduced for extended tool life during interrupted cuts using extremely light depths-of-cut and low feed rates.

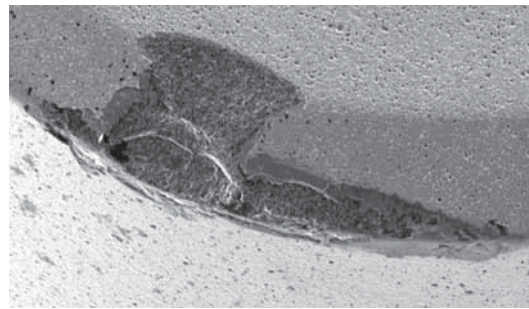


### Small depth of cutting

Depth of cut  $a_p = 0.03$  mm, Machining time 20 min



**BXA40**



Coated CBN (BXA20)

**H** Insert : 2QP-CNGA120408  
 Workpiece material : SCM415 (58HRC)  
 Cutting speed :  $V_c = 200$  m/min  
 Feed :  $f = 0.08$  mm/rev  
 Depth of cut :  $a_p = 0.03$  mm  
 Coolant : Wet

## STANDARD CUTTING CONDITIONS

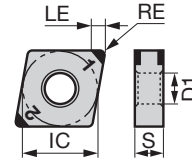
ISO	Grade	Workpiece condition	Cutting speed $V_c$ (m/min)	Depth of cut $a_p$ (mm)	Feed $f$ (mm/rev)
<b>H</b>	BXA30	Continuous	160 (50 - 230)	0.1 (0.02 - 0.15)	0.1 (0.02 - 0.15)
	BXA40	Light interrupted	140 (50 - 200)	0.1 (0.02 - 0.4)	0.15 (0.02 - 0.25)



## CBN INSERTS NEGATIVE TYPE

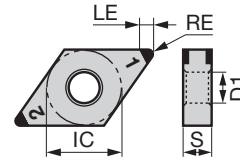
- : Continuous cutting
- ◐ : Light interrupted cutting
- ✱ : Heavy interrupted cutting

P	Steel									
M	Stainless									
K	Cast iron									
N	Non-ferrous									
S	Superalloy									
H	Hard material	●	●	●	●	●	●	●	●	●



Shape	Designation	BXA30	BXA40	No. of corners	Dimension (mm)					Edge prep.					Wiper	Chipbreaker
					LE	RE	IC	S	D1	Standard	Sharp edge	L	LFLC	H		
	<b>4QP-CNGA</b> 4QP-CNGA120404	●	●	4	2.3	0.4	12.7	4.76	5.16	○						
	4QP-CNGA120408	●	●	4	2.2	0.8	12.7	4.76	5.16	○						
	4QP-CNGA120412	●	●	4	2.4	1.2	12.7	4.76	5.16	○						
	<b>4QP-CNGA**-H</b> 4QP-CNGA120404-H		●	4	2.3	0.4	12.7	4.76	5.16						○	
	4QP-CNGA120408-H		●	4	2.2	0.8	12.7	4.76	5.16						○	
	4QP-CNGA120412-H		●	4	2.4	1.2	12.7	4.76	5.16						○	
	<b>4QP-CNGG**-H*</b> 4QP-CNGG120408-HF		●	4	2.2	0.8	12.7	4.76	5.16							○
	4QP-CNGG120412-HF		●	4	2.4	1.2	12.7	4.76	5.16							○
	4QP-CNGG120408-HM		●	4	2.2	0.8	12.7	4.76	5.16							○
	4QP-CNGG120412-HM		●	4	2.4	1.2	12.7	4.76	5.16							○

P	Steel									
M	Stainless									
K	Cast iron									
N	Non-ferrous									
S	Superalloy									
H	Hard material	●	●	●	●	●	●	●	●	●

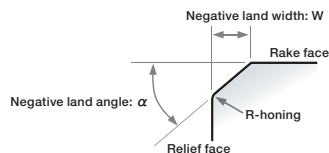


Shape	Designation	BXA30	BXA40	No. of corners	Dimension (mm)					Edge prep.					Wiper	Chipbreaker
					LE	RE	IC	S	D1	Standard	Sharp edge	L	LFLC	H		
	<b>4QP-DNGA</b> 4QP-DNGA150404	●	●	4	2.5	0.4	12.7	4.76	5.16	○						
	4QP-DNGA150408	●	●	4	2.1	0.8	12.7	4.76	5.16	○						
	4QP-DNGA150412	●	●	4	2	1.2	12.7	4.76	5.16	○						
	<b>4QP-DNGA**-H</b> 4QP-DNGA150404-H		●	4	2.5	0.4	12.7	4.76	5.16						○	
	4QP-DNGA150408-H		●	4	2.1	0.8	12.7	4.76	5.16						○	
	4QP-DNGA150412-H		●	4	2	1.2	12.7	4.76	5.16						○	
	<b>4QP-DNGG**-H*</b> 4QP-DNGG150408-HF		●	4	2.1	0.8	12.7	4.76	5.16							○
	4QP-DNGG150412-HF		●	4	2	1.2	12.7	4.76	5.16							○
	4QP-DNGG150408-HM		●	4	2.1	0.8	12.7	4.76	5.16							○
	4QP-DNGG150412-HM		●	4	2	1.2	12.7	4.76	5.16							○

● : Line up

### Edge preparation specification

	BXA30	BXA40
Standard	S01325	S01325
-H	S01335	S01335

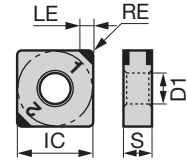


<b>S</b>	<b>0</b>	<b>1</b>	<b>3</b>	<b>2</b>	<b>5</b>
Edge prep. ID	Negative land width W			Negative land angle alpha	
T ... Chamfered					
S ... Chamfered + R-honing					
E ... R-honing alone					
F ... Sharp edge					

## CBN INSERTS NEGATIVE TYPE

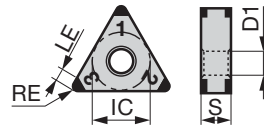
- : Continuous cutting
- ◐ : Light interrupted cutting
- ✱ : Heavy interrupted cutting

P	Steel																			
M	Stainless																			
K	Cast iron																			
N	Non-ferrous																			
S	Superalloy																			
H	Hard material	●	●																	



Shape	Designation	Dimension (mm)							Edge prep.					Wiper	Chipbreaker					
		BXA40	No. of corners	LE	RE	IC	S	D1	Standard	Sharp edge	L	LFLC	H							
	<b>4QP-SNGA</b> 4QP-SNGA120404	●	4	2.4	0.4	12.7	4.76	5.16	○											
	4QP-SNGA120408	●	4	2.4	0.8	12.7	4.76	5.16	○											
	4QP-SNGA120412	●	4	2.4	1.2	12.7	4.76	5.16	○											
	<b>4QP-SNGA**-H</b> 4QP-SNGA120408-H	●	4	2.4	0.8	12.7	4.76	5.16												○
	4QP-SNGA120412-H	●	4	2.4	1.2	12.7	4.76	5.16												○

P	Steel																			
M	Stainless																			
K	Cast iron																			
N	Non-ferrous																			
S	Superalloy																			
H	Hard material	●	●	●	●															



Shape	Designation	BXA30		BXA40		Dimension (mm)							Edge prep.					Wiper	Chipbreaker	
		No. of corners	LE	RE	IC	S	D1	Standard	Sharp edge	L	LFLC	H								
	<b>6QP-TNGA</b> 6QP-TNGA160404	●	●			6	2.2	0.4	9.525	4.76	3.81	○								
	6QP-TNGA160408	●	●			6	1.9	0.8	9.525	4.76	3.81	○								
	6QP-TNGA160412	●	●			6	2.4	1.2	9.525	4.76	3.81	○								
	<b>6QP-TNGA**-H</b> 6QP-TNGA160404-H	●				6	2.2	0.4	9.525	4.76	3.81									○
	6QP-TNGA160408-H	●				6	2	0.8	9.525	4.76	3.81									○
	6QP-TNGA160412-H	●				6	2.4	1.2	9.525	4.76	3.81									○
	<b>6QP-TNGG**-H*</b> 6QP-TNGG160408-HF	●				6	1.9	0.8	9.525	4.76	3.81									○
	6QP-TNGG160412-HF	●				6	2.4	1.2	9.525	4.76	3.81									○
	6QP-TNGG160408-HM	●				6	1.9	0.8	9.525	4.76	3.81									○
	6QP-TNGG160412-HM	●				6	2.4	1.2	9.525	4.76	3.81									○

● : Line up

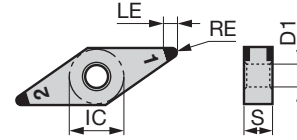
# BXA30 / BXA40

TUNGALOY

## CBN INSERTS NEGATIVE TYPE

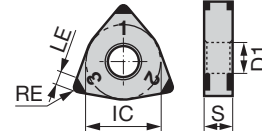
- : Continuous cutting
- ◐ : Light interrupted cutting
- ✱ : Heavy interrupted cutting

P	Steel																			
M	Stainless																			
K	Cast iron																			
N	Non-ferrous																			
S	Superalloy																			
H	Hard material	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●	●



Shape	Designation	BXA30	BXA40	No. of corners	Dimension (mm)					Edge prep.					Wiper	Chipbreaker			
					LE	RE	IC	S	D1	Standard	Sharp edge	L	LFLC	H					
	4QP-VNGA160404	●	●	4	3.1	0.4	9.525	4.76	3.81	○									
	4QP-VNGA160408	●	●	4	2.2	0.8	9.525	4.76	3.81	○									
	4QP-VNGA160412	●	●	4	3	1.2	9.525	4.76	3.81	○									
	4QP-VNGA160404-H		●	4	3.1	0.4	9.525	4.76	3.81										○
	4QP-VNGA160408-H		●	4	2.2	0.8	9.525	4.76	3.81										○
	4QP-VNGG160408-HF		●	4	2.2	0.8	9.525	4.76	3.81										○
	4QP-VNGG160408-HM		●	4	2.2	0.8	9.525	4.76	3.81										○

P	Steel																			
M	Stainless																			
K	Cast iron																			
N	Non-ferrous																			
S	Superalloy																			
H	Hard material	●																		




Shape	Designation	BXA30				No. of corners	Dimension (mm)					Edge prep.					Wiper	Chipbreaker	
							LE	RE	IC	S	D1	Standard	Sharp edge	L	LFLC	H			
	6QP-WNGA080408	●				6	2.2	0.8	12.7	4.76	5.16	○							

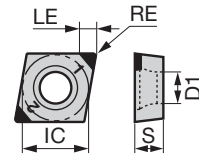
● : Line up




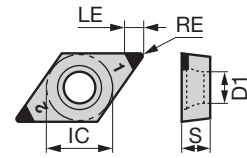
## CBN INSERTS POSITIVE TYPE

- : Continuous cutting
- : Light interrupted cutting
- : Heavy interrupted cutting

Shape	Designation	Material						Dimension (mm)					Edge prep.						
		P	M	K	N	S	H	No. of corners	LE	RE	IC	S	D1	Standard	L	LFL	CH	Wiper	Chipbreaker
		●	●	●	●	●	●							Sharp edge					
	<b>2QP-CCGW060202</b>	●	●					2	2.3	0.2	6.35	2.38	2.8	○					
	<b>2QP-CCGW060204</b>	●	●					2	2.3	0.4	6.35	2.38	2.8	○					
	<b>2QP-CCGW09T304</b>	●	●					2	2.3	0.4	9.525	3.97	4.4	○					
	<b>2QP-CCGW09T308</b>	●	●					2	2.2	0.8	9.525	3.97	4.4	○					



Shape	Designation	Material						Dimension (mm)					Edge prep.						
		P	M	K	N	S	H	No. of corners	LE	RE	IC	S	D1	Standard	L	LFL	CH	Wiper	Chipbreaker
		●	●	●	●	●	●							Sharp edge					
	<b>2QP-DCGW070202</b>	●	●					2	2.7	0.2	6.35	2.38	2.8	○					
	<b>2QP-DCGW070204</b>	●	●					2	2.5	0.4	6.35	2.38	2.8	○					
	<b>2QP-DCGW11T302</b>	●	●					2	2.7	0.2	9.525	3.97	4.4	○					
	<b>2QP-DCGW11T304</b>	●	●					2	2.5	0.4	9.525	3.97	4.4	○					
	<b>2QP-DCGW11T308</b>	●	●					2	2.1	0.8	9.525	3.97	4.4	○					




● : Line up

## CBN INSERTS POSITIVE TYPE

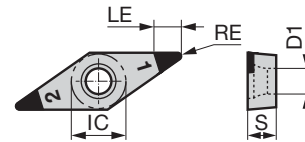
- : Continuous cutting
- : Light interrupted cutting
- : Heavy interrupted cutting



P	Steel																			
M	Stainless																			
K	Cast iron																			
N	Non-ferrous																			
S	Superalloy																			
H	Hard material	●	●●																	



Shape	Designation	BXA30	BXA40	No. of corners	Dimension (mm)					Edge prep.					Wiper	Chipbreaker	
					LE	RE	IC	S	D1	Standard	Sharp edge	L	LFLC	H			
	<b>3QP-TPGW</b> 3QP-TPGW080204	●	●	3	2.2	0.4	4.76	2.38	2.3	○							
	3QP-TPGW090202	●	●	3	2.3	0.2	5.56	2.38	2.5	○							
	3QP-TPGW090204	●	●	3	2.2	0.4	5.56	2.38	2.5	○							
	3QP-TPGW110202	●	●	3	2.3	0.2	6.35	2.38	2.8	○							
	3QP-TPGW110204	●	●	3	2.2	0.4	6.35	2.38	2.8	○							
	3QP-TPGW110302	●	●	3	2.3	0.2	6.35	3.18	3.4	○							
	3QP-TPGW110304	●	●	3	2.2	0.4	6.35	3.18	3.4	○							
	3QP-TPGW110308	●	●	3	1.9	0.8	6.35	3.18	3.4	○							
	3QP-TPGW130302	●	●	3	2.3	0.2	7.94	3.18	3.4	○							
	3QP-TPGW130304	●	●	3	2.2	0.4	7.94	3.18	3.4	○							
	3QP-TPGW16T304	●	●	3	2.2	0.4	9.525	3.97	4.4	○							
	3QP-TPGW16T308	●	●	3	1.9	0.8	9.525	3.97	4.4	○							
	3QP-TPGW160404	●	●	3	2.2	0.4	9.525	4.76	4.4	○							
	3QP-TPGW160408	●	●	3	1.9	0.8	9.525	4.76	4.4	○							



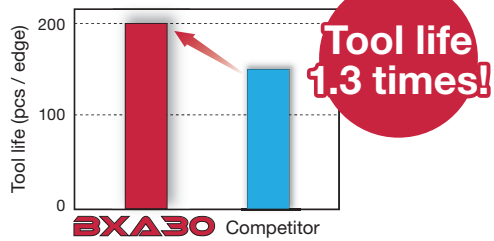
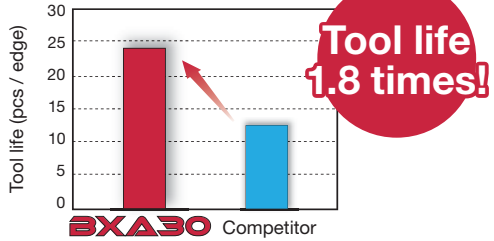


P	Steel																			
M	Stainless																			
K	Cast iron																			
N	Non-ferrous																			
S	Superalloy																			
H	Hard material	●	●●																	



Shape	Designation	BXA30	BXA40	No. of corners	Dimension (mm)					Edge prep.					Wiper	Chipbreaker	
					LE	RE	IC	S	D1	Standard	Sharp edge	L	LFLC	H			
	<b>2QP-VBGW</b> 2QP-VBGW110304	●	●	2	3.1	0.4	6.35	3.18	2.8	○							
	2QP-VBGW110308	●	●	2	2.2	0.8	6.35	3.18	2.8	○							
	2QP-VBGW160404	●	●	2	3.1	0.4	9.525	4.76	4.4	○							
	2QP-VBGW160408	●	●	2	2.2	0.8	9.525	4.76	4.4	○							
	<b>2QP-VCGW</b> 2QP-VCGW160404		●	2	3.1	0.4	9.525	4.76	4.4	○							

● : Line up

## PRACTICAL EXAMPLES

Workpiece type		Machine parts (Ring)	Bearing parts
Insert		2QP-DCGW11T304	2QP-DCGW11T304
Grade		BXA30	BXA30
Workpiece material		SCM435H / 34CrMo4 (63HRC)	SUJ2 / B1 (60HRC)
		 <b>H</b>	 <b>H</b>
Cutting conditions	Cutting speed: $V_c$ (m/min)	200	167
	Feed : $f$ (mm/rev)	0.06	0.03
	Depth of cut : $a_p$ (mm)	0.08	0.05
	Coolant	Wet	Wet
Results		 <p>With a requirement to maintain surface roughness of <math>R_z = 2.4</math> or better, BXA30 has provided 130% increase in tool life over the competitors' grade.</p>	 <p>BXA30 has maintained the required surface quality even after the coating on the cutting point peeled off, providing 180% increase in tool life.</p>
Workpiece type		Sleeve	
Insert		3QP-TPGW110304	
Grade		BXA40	
Workpiece material		SCM415H (58HRC)	
		 <b>H</b>	
Cutting conditions	Cutting speed: $V_c$ (m/min)	120	
	Feed : $f$ (mm/rev)	0.1	
	Depth of cut : $a_p$ (mm)	0.03 - 0.05	
	Coolant	Wet	
Results		 <p>When machining a shaft with interrupted cuts at a light depth of cut, BXA40 has increased tool life by 170% over the competitor's insert.</p>	

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Fax: +52-449-929-5411  
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Fax: +55-19-38262757  
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