

**Tungaloy**

Member IMC Group

Tungaloy Report No. 411-US

**TURNLINE** Small CBN insert series

**MINI T-CBN**

Expansion  
of grade

For boring down to  $\varnothing 0.177''$  with CBN inserts



## The world's smallest diameter tool for boring on hardened steel and sintered metals down to \* $\phi 0.177''$

\* with indexable tools

## The smallest indexable CBN inserts in the world

When compared to conventional brazed tools

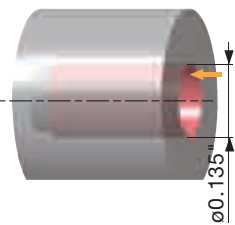
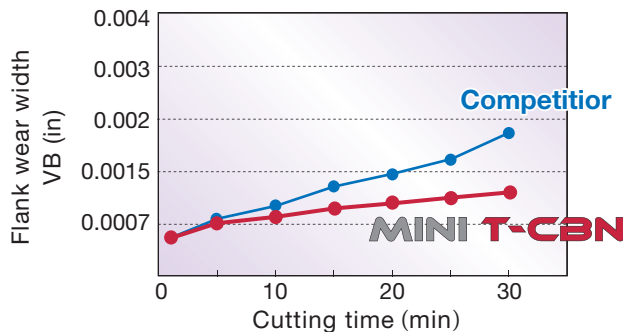
- Higher cutting edge repeatability
- Reduced tool change time
- Longer tool life even at low cutting speeds

### Applications

- Fuel injector components
- Boring of rocker arms

### High wear resistance

Offers long tool life even when boring small diameters



Insert : 1QP-CCGW03X  
 BX310  
 Toolholder : E06H-SCLCR04-D070  
 Work material : Alloy steel (60 HRC)  
 Cutting speed :  $V_c = 330$  sfm  
 Depth of cut :  $a_p = 0.004''$   
 Feed :  $f = 0.002$  ipr  
 Maching mode : Internal turning  
 Machine : Swiss type lathe



### Excellent surface finish

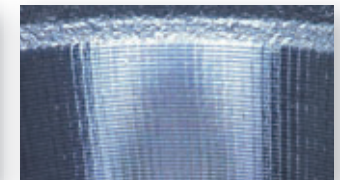
Sharp cutting edge reduces cutting forces  
 → Prevents chattering and provides the finest machined surface.

### MINI T-CBN



Outstanding surface quality

### Competitor A



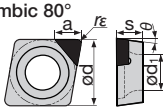
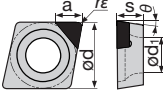
Chattering

Insert : 1QP-CCGW03X  
 BX310  
 Toolholder : E06H-SCLCR04-D070  
 Work material : Alloy steel (60 HRC)  
 Cutting speed :  $V_c = 330$  sfm  
 Depth of cut :  $a_p = 0.004''$   
 Feed :  $f = 0.002$  ipr  
 Maching mode : Internal turning  
 Boring dia. :  $\phi 0.315''$

## Standard cutting conditions

Application	Grades	Machining mode	Cutting Speed $V_c$ (sfm)	Depth of cut $a_p$ (inch)	Feed $f$ (ipr)
<b>H</b> Hard Materials	<b>BX310</b>	Continuous cutting	100 - 500	0.001 - .008	0.001 - .004
Sintered Irons	<b>BX470</b>				

# Inserts positive type

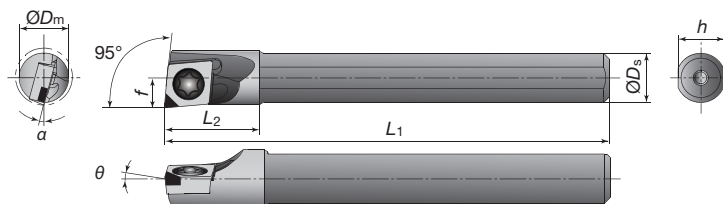
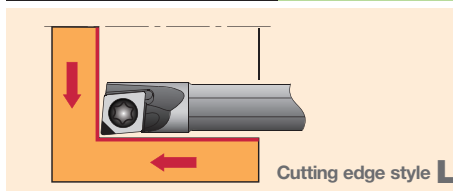
Application	Shape	Cat. No	Grade		No. of corner	Dimensions (inch)					
			BX310	BX470		Clearance angle $\theta$	I.C. dia $\phi_d$	Thickness $s$	Hole dia. $\phi_{d1}$	Corner radius $r_\epsilon$	CBN Length $a$
Finishing to medium cutting	Rhombic 80° 	1QP-CCGW03X102	●	●	1	7°	0.141	0.055	0.075	0.008	0.055
		1QP-CCGW03X104	●	●	1	7°	0.141	0.055	0.075	0.016	0.051
		1QP-CCGW04T102	●	●	1	7°	0.172	0.070	0.091	0.008	0.075
		1QP-CCGW04T104	●	●	1	7°	0.172	0.070	0.091	0.016	0.071
Finishing to medium cutting	Rhombic 75° 	1QP-EPGW03X102	●	●	1	11°	0.141	0.055	0.075	0.008	0.055
		1QP-EPGW03X104	●	●	1	11°	0.141	0.055	0.075	0.016	0.051
		1QP-EPGW040102	●	●	1	11°	0.156	0.061	0.091	0.008	0.066
		1QP-EPGW040104	●	●	1	11°	0.156	0.061	0.091	0.016	0.063

## Toolholders

**STREAMJETBARMINI**  
TUNGALOY

### SCLCR/L Boring & internal facing

S-type (Positive, screw-on)



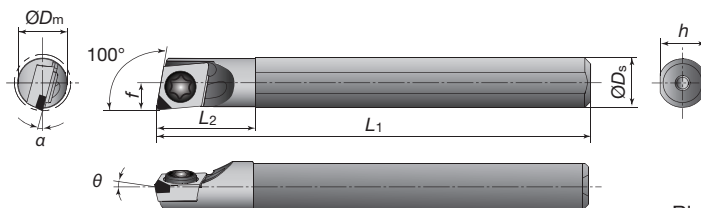
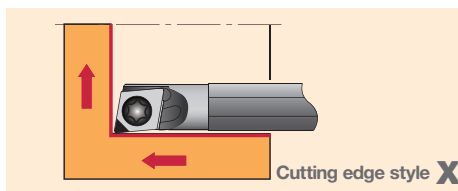
Right hand (R) shown

### Carbide shank

Cat. No	Stock		Min bore dia. $\phi_{Dm}$	Dimensions (mm)							Std. corner radius $r_\epsilon$	Insert	Parts		Torque (N·m)	
	R	L		$\phi_{Ds}$	$f$	$L_1$	$L_2$	$h$	$f_2$	$\theta$			$\alpha$	Clamping screw		Wrench
E04G-SCLCR/L03-D050	●	●	5	4	2.5	90	9	3.8	-	0°	-15°	0.2	1QP-CCGW03	CSTA-1.6	T-6F	0.6
E05G-SCLCR/L03-D060	●	●	6	5	3	90	10	4.8	-	0°	-13°					
E06H-SCLCR/L04-D070	●	●	7	6	3.5	100	12	5.75	-	0°	-13°	0.2	1QP-CCGW04	CSTB-2	T-6F	0.6
E07H-SCLCR/L04-D080	●	●	8	7	4	100	14	6.75	-	0°	-11°					

### SEXPR/L Boring & internal facing

S-type (Positive, screw-on)



Right hand (R) shown

### Carbide shank

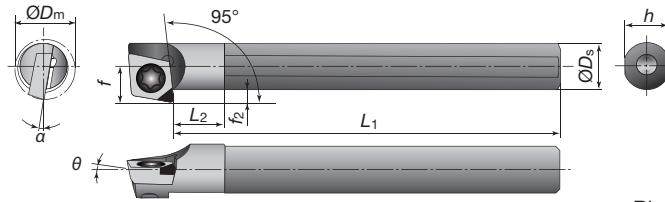
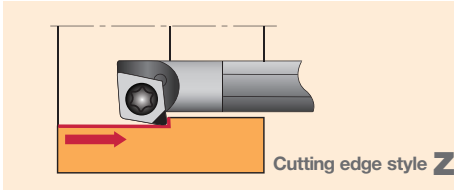
Cat. No	Stock		Min bore dia. $\phi_{Dm}$	Dimensions (mm)							Std. corner radius $r_\epsilon$	Insert	Parts		Torque (N·m)	
	R	L		$\phi_{Ds}$	$f$	$L_1$	$L_2$	$h$	$f_2$	$\theta$			$\alpha$	Clamping screw		Wrench
E04G-SEXPR/L03-D045	●	●	4.5	4	2.3	90	9	3.8	-	0°	-15°	0.2	1QP-EPGW03	CSTA-1.6	T-6F	0.6
E04G-SEXPR/L03-D050	●	●	5	4	2.5	90	9	3.8	-	0°	-13°					
E05G-SEXPR/L04-D055	●	●	5.5	5	2.65	90	10	4.8	-	0°	-12°	0.4	1QP-EPGW04	CSTB-2	T-6F	0.6
E06H-SEXPR/L04-D070	●	●	7	6	3.5	100	12	5.75	-	0°	-12°					

● : Stocked items

# SEZPR/L

Internal retracting

S-type (Positive, screw-on)



Right hand (R) shown

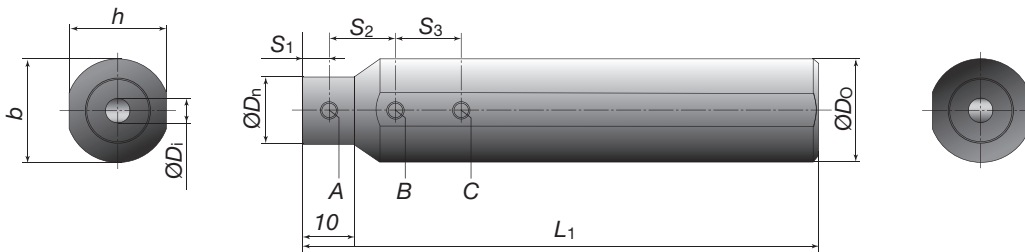
## Carbide shank

Cat. No	Stock		Min bore dia. $\varnothing D_m$	Dimensions (mm)							Std. corner radius $r_E$	Insert	Parts		Torque (N·m)	
	R	L		$\varnothing D_s$	$f$	$L_1$	$L_2$	$h$	$f_2$	$\theta$			$\alpha$	Clamping screw		Wrench
E04G-SEZPR/L03-D055	●	●	5.5	4	3.2	90	5	3.8	1.2	0°	-8°	0.2	1QP-EPGW 03	CSTA-1.6	T-6F	0.6
E05G-SEZPR/L03-D065	●	●	6.5	5	3.7	90	6	4.8	1.2	0°	-6°					

● : Stocked items

## Sleeves

**BLM** type (Round shank for Stream Jet Bar Mini)

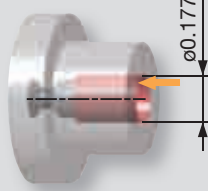
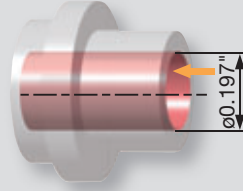
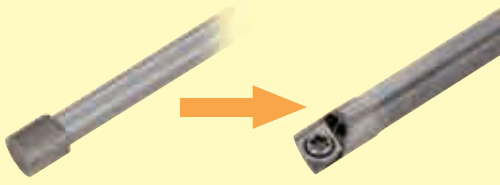
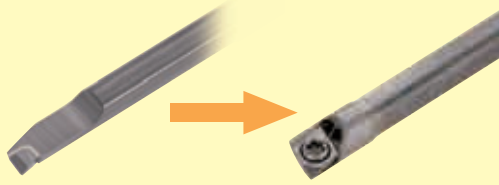


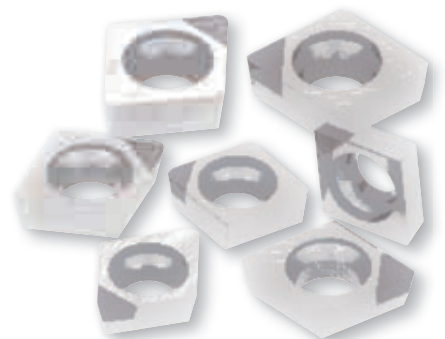
\*Optional

Cat. No.	Stock	Dimensions (mm)									Replacement parts					
		$\varnothing D_o$	$\varnothing D_i$	$\varnothing D_n$	$L_1$	$h$	$b$	$S_1$	$S_2$	$S_3$	Clamping screws			Wrench	Seal cap* (Inner screw)	
		A	B	C												
BLM159-04	●		4													
BLM159-05	●	15.875 (0.625")	5	15	100	15	15.875	5	15	15	SSH4-4	SSH4-4	SSH4-4	P-2	CA-16 (M6)	
BLM159-06	●		6						20	20						
BLM159-07	●		7						20	20						
BLM16-04	●	16	4	15	100	15	16	5	15	15	SSH4-4	SSH4-4	SSH4-4	P-2	CA-16 (M6)	
BLM16-05	●		5						20	20						
BLM16-06	●		6						20	20						
BLM16-07	●		7						20	20						
BLM19-04	●	19.05 (0.750")	4	18	100	18	19.05	5	15	15	SSH4-4	SSH4-6	SSH4-6	P-2	CA-16 (M6)	
BLM19-05	●		5						20	20						
BLM19-06	●		6						20	20						
BLM19-07	●		7						20	20						
BLM20-04	●	20	4	13	100	19	20	5	15	15	SSH4-4	SSH4-6	SSH4-6	P-2	CA-16 (M6)	
BLM20-05	●		5	14					14	14						
BLM20-06	●		6	15					15	15						
BLM20-07	●		7	16					16	16						
BLM22-04	●	22	4	13	125	21	22	5	15	15	SSH4-4	SSH4-6	SSH4-6	P-2	CA-16 (M6)	
BLM22-05	●		5	14					14	14						
BLM22-06	●		6	15					15	15						
BLM22-07	●		7	16					16	16						
BLM25-04	●	25	4	13	125	24	25	5	15	15	SSH4-4	SSH4-8	SSH4-8	P-2	CA-16 (M6)	
BLM25-05	●		5	14					14	14						
BLM25-06	●		6	15					15	15						
BLM25-07	●		7	16					16	16						
BLM254-04	●	25.4 (1.000")	4	13	125	24	25.4	5	15	15	SSH4-4	SSH4-8	SSH4-8	P-2	CA-16 (M6)	
BLM254-05	●		5	14					14	14						
BLM254-06	●		6	15					15	15						
BLM254-07	●		7	16					16	16						

● : Stocked items

# Practical examples

Workpiece type		Fuel injection part in common rail system	Automotive part (turbo charger component)
Insert		1QP-EPGW040102	1QP-CCGW03X102
Grade		BX310	BX310
Work material		52100 (60 HRC)	4137 (60 HRC)
			
Cutting conditions	Cutting speed: $V_c$ (sfm)	200	230
	Feed: $f$ (ipr)	0.0016	0.002
	Depth of cut: $a_p$ (inch)	0.004	0.0023
	Machining mode	Internal turning (continuous cutting)	Internal turning (continuous cutting)
	Coolant	Wet	Wet
Results			
		<p>Internal grinding <b>MINI T-CBN</b></p> <p>Process time is reduced by 50% compared with grinding.</p>	<p>CBN brazed tool <b>MINI T-CBN</b></p> <p>Tool cost: Reduced by 60%</p> <p>Tool change time: 1/10</p>





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