

**Tungaloy**

Member IMC Group

Keeping the Customer First

Tungaloy Report No. 411-E

**T-CBN** Small CBN insert series

**MINI T-CBN**

**NEW**

For boring down to  $\varnothing 4.5$  mm with CBN inserts



# The World's smallest diameter tool for boring on hardened steels with its \* $\varnothing 4.5$ mm

\* with indexable tools

## The smallest indexable CBN inserts in the world

When comparing to conventional brazed tool

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

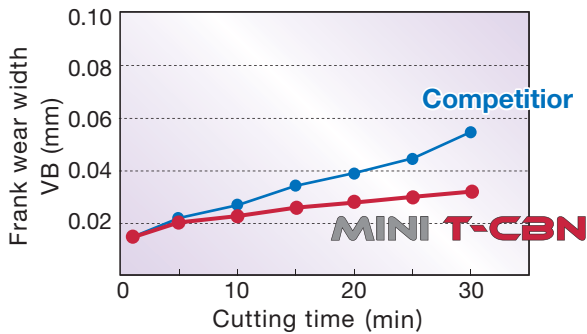
### Applications

- Fuel injector components
- Boring of rocker arms



### High wear resistance

Offers long tool life even when boring small diameters

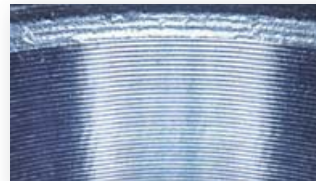


### Excellent surface finish

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

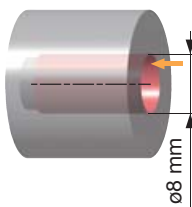
### MINI T-CBN

### Competitor A



Outstanding surface quality

Chattering



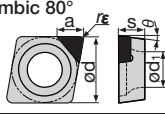
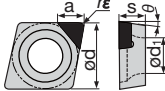
Insert : 1QP-CCGW04T102 BX310  
 Toolholder : E06H-SCLCR04-D070  
 Work material : Alloy steel  
 SCM415H (60 HRC)  
 Cutting speed :  $V_c = 100$  m/min  
 Depth of cut :  $a_p = 0.1$  mm  
 Feed :  $f = 0.05$  mm/rev  
 Machining mode: Internal turning  
 Machine : Swiss type lathe

Insert : 1QP-CCGW04T104 BX310  
 Toolholder : E06H-SCLCR04-D070  
 Work material : Alloy steel  
 SCM415H (60 HRC)  
 Cutting speed :  $V_c = 100$  m/min  
 Depth of cut :  $a_p = 0.1$  mm  
 Feed :  $f = 0.05$  mm/rev  
 Boring dia. :  $\varnothing 8$  mm

## Standard cutting conditions

Application	Grades	Machining mode	Cutting Speed $V_c$ (m/min)	Depth of cut $a_p$ (mm)	Feed $f$ (mm/rev)
<b>H</b> Hard Materials	<b>BX310</b>	Continuous cutting	30 - 150	0.03 - 0.20	0.03 - 0.10

## Inserts positive type

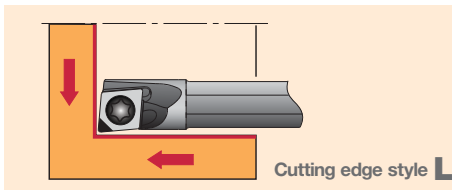
Application	Shape	Cat. No	Grade	No. of corner	Dimensions (mm)					
			BX310		Clearance angle $\theta$	I.C. dia $\phi d$	Thickness $s$	Hole dia. $\phi d_1$	Corner radius $r_\epsilon$	CBN Length $a$
Finishing to medium cutting	Rhombic 80° 	1QP-CCGW03X102	●	1	7°	3.57	1.39	1.9	0.2	1.4
		1QP-CCGW03X104	●	1	7°	3.57	1.39	1.9	0.4	1.3
		1QP-CCGW04T102	●	1	7°	4.37	1.79	2.3	0.2	1.9
		1QP-CCGW04T104	●	1	7°	4.37	1.79	2.3	0.4	1.8
Finishing to medium cutting	Rhombic 75° 	1QP-EPGW03X102	●	1	11°	3.57	1.39	1.9	0.2	1.4
		1QP-EPGW03X104	●	1	11°	3.57	1.39	1.9	0.4	1.3
		1QP-EPGW040102	●	1	11°	3.97	1.59	2.3	0.2	1.7
		1QP-EPGW040104	●	1	11°	3.97	1.59	2.3	0.4	1.6

## Toolholders

### SCLCR/L

Boring & internal facing

S-type (Positive, screw-on)



Right hand (R) shown

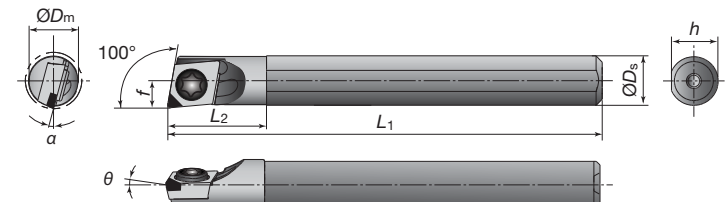
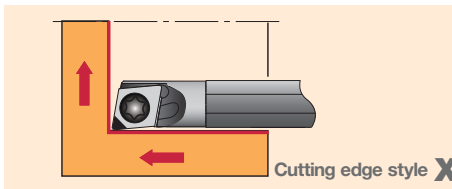
### Carbide shank

Cat. No	Stock		Min bore dia. $\phi D_m$	Dimensions (mm)							Std. corner radius $r_\epsilon$	Insert	Parts		Torque (N·m)	
	R	L		$\phi D_s$	$f$	$L_1$	$L_2$	$h$	$f_2$	$\theta$			$\alpha$	Clamping screw		Wrench
E04G-SCLCR/L03-D050	●	●	5	4	2.5	90	9	3.8	-	0°	-15°	0.2	1QP-CCGW03X1**	CSTA-1.6	T-6F	0.6
E05G-SCLCR/L03-D060	●	●	6	5	3	90	10	4.8	-	0°	-13°	0.2	1QP-CCGW03X1**	CSTA-1.6	T-6F	0.6
E06H-SCLCR/L04-D070	●	●	7	6	3.5	100	12	5.75	-	0°	-13°	0.2	1QP-CCGW04T1**	CSTB-2	T-6F	0.6
E07H-SCLCR/L04-D080	●	●	8	7	4	100	14	6.75	-	0°	-11°	0.2	1QP-CCGW04T1**	CSTB-2	T-6F	0.6

### SEXPR/L

Boring & internal facing

S-type (Positive, screw-on)



Right hand (R) shown

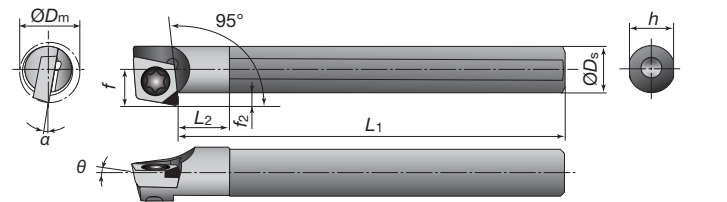
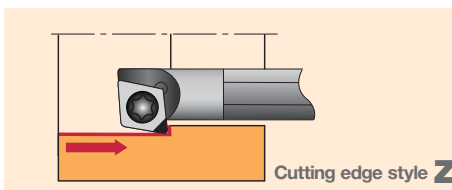
### Carbide shank

Cat. No	Stock		Min bore dia. $\phi D_m$	Dimensions (mm)							Std. corner radius $r_\epsilon$	Insert	Parts		Torque (N·m)	
	R	L		$\phi D_s$	$f$	$L_1$	$L_2$	$h$	$f_2$	$\theta$			$\alpha$	Clamping screw		Wrench
E04G-SEXPR/L03-D045	●	●	4.5	4	2.3	90	9	3.8	-	0°	-15°	0.2	1QP-EPGW03X1**	CSTA-1.6	T-6F	0.6
E04G-SEXPR/L03-D050	●	●	5	4	2.5	90	9	3.8	-	0°	-13°	0.2	1QP-EPGW03X1**	CSTA-1.6	T-6F	0.6
E05G-SEXPR/L04-D055	●	●	5.5	5	2.65	90	10	4.8	-	0°	-12°	0.4	1QP-EPGW0401**	CSTB-2	T-6F	0.6
E06H-SEXPR/L04-D070	●	●	7	6	3.5	100	12	5.75	-	0°	-12°	0.4	1QP-EPGW0401**	CSTB-2	T-6F	0.6

### SEZPR/L

Internal retracting

S-type (Positive, screw-on)



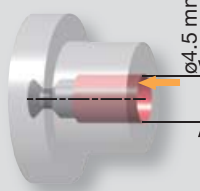
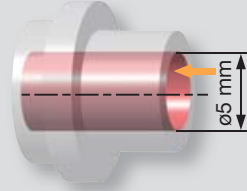
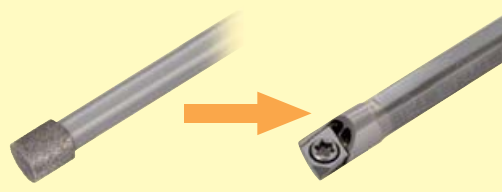
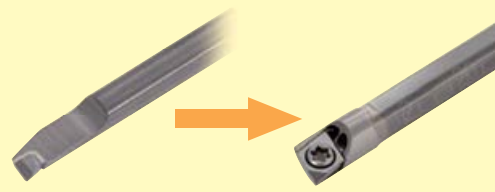
Right hand (R) shown

### Carbide shank

Cat. No	Stock		Min bore dia. $\phi D_m$	Dimensions (mm)							Std. corner radius $r_\epsilon$	Insert	Parts		Torque (N·m)	
	R	L		$\phi D_s$	$f$	$L_1$	$L_2$	$h$	$f_2$	$\theta$			$\alpha$	Clamping screw		Wrench
E04G-SEZPR/L03-D055	●	●	5.5	4	3.2	90	5	3.8	1.2	0°	-8°	0.2	1QP-EPGW03X1**	CSTA-1.6	T-6F	0.6
E05G-SEZPR/L03-D065	●	●	6.5	5	3.7	90	6	4.8	1.2	0°	-6°	0.2	1QP-EPGW03X1**	CSTA-1.6	T-6F	0.6

● : Stocked items

# Practical examples

Workpiece type		Fuel injection part in common rail system	Automotive part (turbo charger component)
Insert		<b>1QP-EPGW03X102</b>	<b>1QP-CCGW03X102</b>
Grade		<b>BX310</b>	<b>BX310</b>
Work material		<b>SUJ2 / B1 (60 HRC)</b>	<b>SCM435H / 34CrMo4 (60 HRC)</b>
			
Cutting conditions	Cutting speed $V_c$ (m/min)	60	70
	Feed $f$ (mm/rev)	0.04	0.05
	Depth of cut $a_p$ (mm)	0.1	0.06
	Machining mode	<b>Internal turning (continuous cutting)</b>	<b>Internal turning (continuous cutting)</b>
	Coolant	<b>Wet</b>	<b>Wet</b>
Results			
		<b>Internal grinding MINI T-CBN</b> Process time is reduced by 50% compared with grinding.	<b>CBN brazed tool MINI T-CBN</b> Tool cost: Reduced by 60% Tool change time: 1/10



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