



For more information

Solid carbide boring bar for small-diameter drilling and turning

# TINY<sup>INI</sup>TURNMULTI

Tungaloy Report No. 565-G

## New solid carbide boring bars for small-diameter drilling and turning







# TINY <sup>INI</sup> M TURN MULTI

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Multifunctional solid carbide boring bar for small-diameter drilling and various turning processes



## Boosts productivity for small part machining

- Multifunctional solid carbide boring bar for small-diameter drilling and various turning processes

Optimized design provides maximum tool stiffness during machining

**New**

### TBMFR07...

From drilling to internal, external, and face turning

L/D = 2 & 3



Strategically positioned on the tool body, three coolant grooves provide effective chip evacuation and control



- Creates a flat hole bottom
- Excellent chip control by unique chipbreaker shape



In combination with 4 coolant holes tool sleeve, TBMFR07 delivers superior process security

## Application ranges of multifunctional drilling and turning tool series

**New**

Solid carbide boring bar

**TINYM<sup>INI</sup>TURNMULTI**



Indexable  
**TUNGB<sup>ORE</sup>M<sup>INI</sup>**



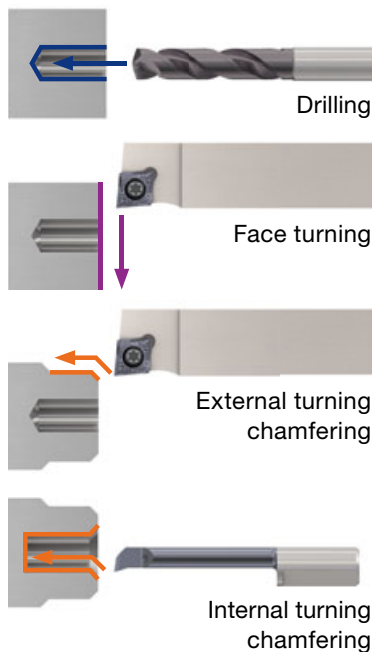
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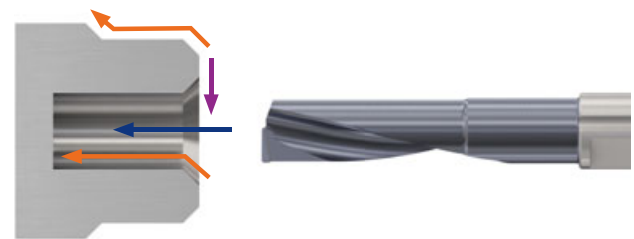
## Enables multiple tool combinations and productivity boosts for small part machining

- A single tool for multiple applications
- Allows tool combinations while increasing the number of open slots in the turret or tool posts in your CNC lathes and Swiss machines
- Able to form a flat hole bottom

### Conventional Tooling



### TINYM<sup>INI</sup>TURNMULTI



#### Enables multiple tool combinations

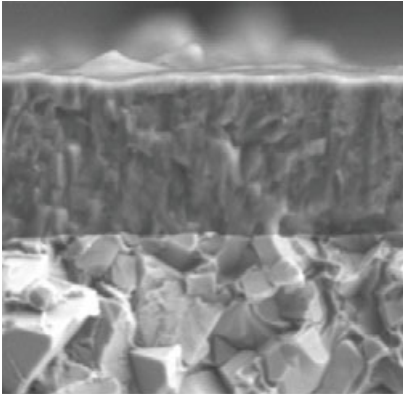
- Drilling
- Internal turning
- External turning
- Face turning
- Chamfering

#### Productivity Boosts

- Eliminates tool changeover time
- 20% Machining time reduction

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## GRADE



## SH725

### PVD coated grade SH725

(Ti,Al)N coating combined with a tough carbide substrate dedicated for small parts machining offers excellent coating adhesion and edge sharpness.

### Excellent resistance to wear and chip welding

Smooth coating surface of the cutting edge prevents coating from peeling off, while its incredible wear resistance provides longer tool life than existing grades.

### High resistance to plastic deformation

Tough carbide substrate offers stable and longer tool life.

## CUTTING PERFORMANCE

### Chip control



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Secure process with no chip entanglement



Competitor

Chips entangled on the tool

<b>M</b>	Toolholder	: JBBS19-7-L100C-4N
	Insert	: TBMFR0712001-D060 SH725
	Workpiece material	: SUS304 / X5CrNi18-9
	Cutting speed	: $V_c = 40$ m/min
	Feed	: $f = 0.02$ mm/rev
	Depth of cut	: $a_p = 0.2$ mm
	Coolant	: Wet

### Wear on the cutting edge



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Flank wear :  
 $V_{bmax} = 0.10$  mm



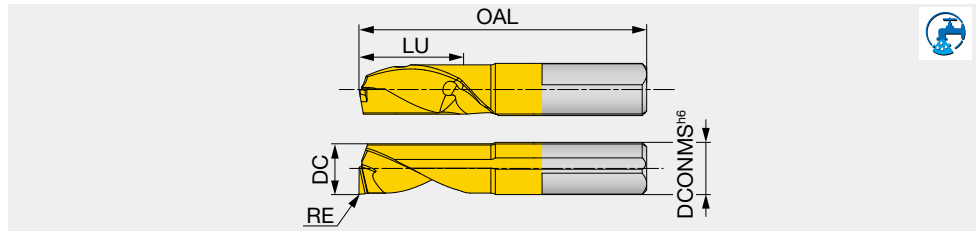
Competitor

Flank wear :  
 $V_{bmax} = 0.20$  mm

<b>P</b>	Toolholder	: JBBS254-7-L100C-4N
	Insert	: TBMFR0718003-D060
	Workpiece material	: SUJ2
	Cutting speed	: $V_c = 70$ m/min
	Feed	: $f = 0.02$ mm/rev
	Depth of cut	: $a_p = 0.75$ mm
	Tool life	: 500 pcs
	Coolant	: Internal

## TBMFR07

Solid carbide boring bar for drilling and turning (internal, external, and face)

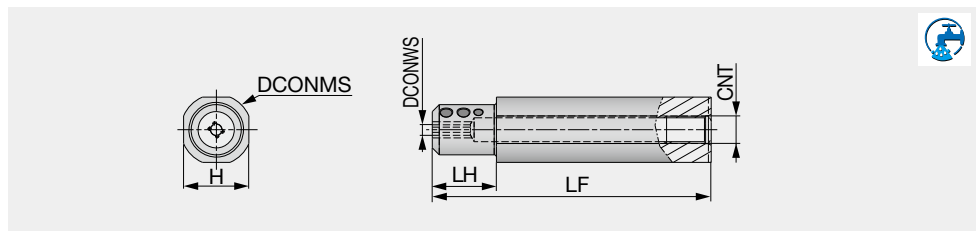


Designation	SH725	DC	DCONMS	LU	L/D	OAL	RE <sup>+0.05</sup> <sub>0</sub>
TBMFR0706001-D030	●	3	7	6	2	29.5	0.1
TBMFR0708001-D040	●	4	7	8	2	31.5	0.1
TBMFR0712002-D040	●	4	7	12	3	35.5	0.2
TBMFR0710001-D050	●	5	7	10	2	33.5	0.1
TBMFR0715003-D050	●	5	7	15	3	42.5	0.3
TBMFR0712001-D060	●	6	7	12	2	35.5	0.1
TBMFR0718003-D060	●	6	7	18	3	44.5	0.3
TBMFR0714001-D070	●	7	7	14	2	38.5	0.1

● : New product

## JBBS-4N

Sleeve for internal coolant supply with 4 coolant holes



Designation	DCONMS	DCONWS	LF	LH	H	CNT
JBBS159-7-L100C-4N	15.875	7	100	10	14.58	Rc1/8
JBBS16-7-L100C-4N	16	7	100	10	15	Rc1/8
JBBS19-7-L100C-4N	19.05	7	100	20	17.2	Rc1/8
JBBS20-7-L100C-4N	20	7	100	20	18	Rc1/8
JBBS22-7-L100C-4N	22	7	100	20	20	Rc1/8
JBBS25-7-L100C-4N	25	7	100	23	23	Rc1/8
JBBS254-7-L100C-4N	25.4	7	100	23	23.4	Rc1/8

## SPARE PARTS

Designation	Clamping screw	Wrench
JBBS**-7-L**C-4N	SSHM5-4PF-S	P-2.5

## STANDARD CUTTING CONDITIONS

ISO	Workpiece material	Grade	Cutting speed: Vc (m/min)	
			Drilling	Turning
<b>P</b>	Low carbon steels S15C, S25C, etc. C15E, C15E4, etc.	SH725	20 - 100	40 - 140
	Carbon steels, Alloy steels S55C, SCM440, etc. C55, 42CrMo4, etc.	SH725	20 - 100	40 - 140
	Prehardened steels NAK80, PX5, etc.	SH725	20 - 100	40 - 140
<b>M</b>	Stainless steels SUS304, SUS316, etc. X5CrNi18-9, X5CrNiMo17-12-3, etc.	SH725	20 - 60	40 - 140
<b>K</b>	Grey cast irons FC250, FCD300, etc. GG25, 250, GG30, 300, etc.	SH725	30 - 100	30 - 100
	Ductile cast irons FC450, FCD600, etc. GGG60, 600-3, etc.	SH725	30 - 100	30 - 100
<b>N</b>	Aluminium alloys, Copper alloys Si < 12%	SH725	50 - 200	90 - 200
<b>S</b>	Titanium alloys Ti-6Al-4V, etc.	SH725	20 - 50	30 - 100
	Superalloys Inconel718, etc.	SH725	20 - 50	30 - 100

L/D = 2


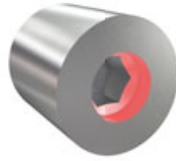
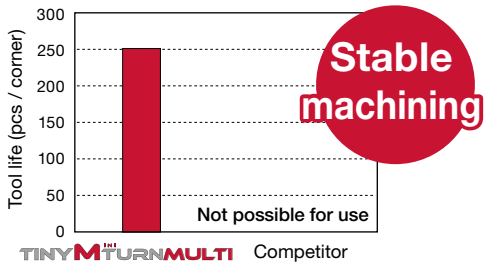
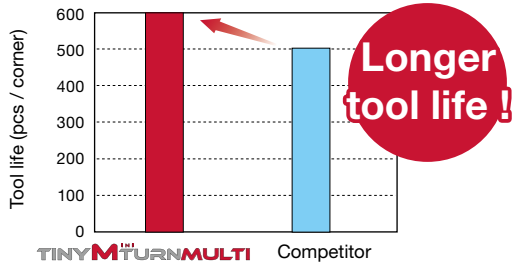





Application range	Minimum bore diameter: DMIN (mm)									
	ø3		ø4		ø5		ø6		ø7	
	Depth of cut ap (mm)	Feed f (mm/rev)	Depth of cut ap (mm)	Feed f (mm/rev)	Depth of cut ap (mm)	Feed f (mm/rev)	Depth of cut ap (mm)	Feed f (mm/rev)	Depth of cut ap (mm)	Feed f (mm/rev)
Internal and external turning	0.2 - 1.5	0.01 - 0.08	0.2 - 2	0.01 - 0.08	0.2 - 2.5	0.01 - 0.08	0.2 - 3	0.01 - 0.08	0.3 - 3.5	0.01 - 0.08
Face turning	0.02 - 0.2	0.01 - 0.06	0.02 - 0.4	0.01 - 0.06	0.2 - 0.65	0.01 - 0.06	0.2 - 0.65	0.01 - 0.06	0.25 - 0.7	0.01 - 0.07
Drilling	-	0.01 - 0.06	-	0.01 - 0.06	-	0.01 - 0.08	-	0.01 - 0.08	-	0.01 - 0.1

L/D = 3

Application range	Minimum bore diameter: DMIN (mm)									
	ø3		ø4		ø5		ø6		ø7	
	Depth of cut ap (mm)	Feed f (mm/rev)	Depth of cut ap (mm)	Feed f (mm/rev)	Depth of cut ap (mm)	Feed f (mm/rev)	Depth of cut ap (mm)	Feed f (mm/rev)	Depth of cut ap (mm)	Feed f (mm/rev)
Internal and external turning	-	-	0.2 - 2	0.01 - 0.07	0.2 - 2.5	0.01 - 0.07	0.2 - 3	0.01 - 0.07	-	-
Face turning	-	-	0.02 - 0.4	0.01 - 0.04	0.2 - 0.65	0.01 - 0.04	0.2 - 0.65	0.01 - 0.04	-	-
Drilling	-	-	-	0.01 - 0.05	-	0.01 - 0.06	-	0.01 - 0.06	-	-



## PRACTICAL EXAMPLES

Workpiece type		Joint	Machine part																												
Toolholder		JBBS19-7-L100C-4N	JBBS254-7-L100C-4N																												
Insert		TBMFR0718003-D060	TBMFR0718003-D060																												
Grade		SH725	SH725																												
Workpiece material		SUS316 / X5CrNiMo17-12-3	S45C / C45																												
		 <b>M</b>	 <b>P</b>																												
Cutting conditions	Cutting speed: $V_c$ (m/min)	30	70																												
	Feed : $f$ (mm/rev)	0.04	0.02																												
	Depth of cut : $a_p$ (mm)	-	0.8																												
	Machining	Drilling	Internal turning																												
	Coolant	Internal	Internal																												
Results		 <p><b>Stable machining</b></p> <p>TINY <b>M</b>TURNMULTI Competitor</p> <p>Vibration was an issue with the competitor tool. TinyMiniTurnMulti successfully eliminated vibration during machining, providing process security.</p>	 <p><b>Longer tool life !</b></p> <p>TINY <b>M</b>TURNMULTI Competitor</p> <p>Repeated catastrophic failures were an issue with the competitor tool. TinyMiniTurnMulti provided excellent chipping resistance, increasing tool life.</p>																												
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