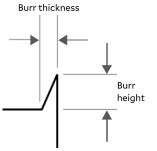
XEBEC Brush™ Turning

Deburring and polishing on CNC lathes without live tooling



Applicable burr size

Burr thickness ≤ 0.1 mm
(Burrs this size can be easily bent by fingernails)



VIDEO

Applicable equipment

This tool can be mounted on:

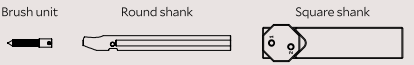


Lathe (with live tools)

Lathe (without live tools)

Tool composition

Brush and shank are sold separately. Assemble before use.



Brushes

Brush (color)	Product code	Brush diameter (mm)	Brush length ℓ (mm)	Matching holder	Fig.
A11 (red)	A11-TB025	ϕ2.5	15	TM-SH-06	1a
	A11-TB06	ϕ6	30	TM-SH-S2020 / TM-SH-S2525 / TM-SH-12	1a
	A11-CB06M	ϕ6	30	TM-SH-S2020 / TM-SH-S2525	1b
A21 (white)	A21-TB06	ϕ6	30	TM-SH-S2020 / TM-SH-S2525 / TM-SH-12	1a
	A21-CB06M	ϕ6	30	TM-SH-S2020 / TM-SH-S2525	1b
A32 (blue)	A32-TB06	ϕ6	30	TM-SH-S2020 / TM-SH-S2525 / TM-SH-12	1a
	A32-CB06M	ϕ6	30	TM-SH-S2020 / TM-SH-S2525	1b

■ Holders must be at least 30 mm inside tool blocks and securely fastened.

Round shanks

Product code	Length L (mm)	Shank dia. Ds (mm)	Bore size D (mm)	Cutting dia. (mm)	Max. side hole (mm)	Matching brush	Fig.
TM-SH-06	107	ϕ6	≥ 11	≥ ϕ12	< ϕ3	A11-TB025	2
TM-SH-12	133	ϕ12	≥ 20	≥ ϕ21	No limit	A11-TB06 / A21-TB06 / A32-TB06	2

■ Brush angle is fixed.

Square shanks

Product code	Length L (mm)	Shank height Hs (mm)	Height H (mm)	Shank width Ws (mm)	Width W (mm)	Shank length Ls (mm)	Matching brush	Fig.
TM-SH-S2020	124	20	26	20	24	90	A11-TB06 / A21-TB06 / A32-TB06	3
							A11-CB06M / A21-CB06M / A32-CB06M	
TM-SH-S2525	134	25	31	25	24	100	A11-TB06 / A21-TB06 / A32-TB06	3
							A11-CB06M / A21-CB06M / A32-CB06M	

■ Brush angle is set by the user. Refer to "How to use: External thread deburring mechanism" for brush angle recommendations.



Fig. 1a



Fig. 1b



Fig. 2

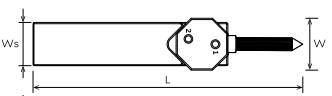


Fig. 3a

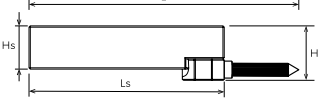
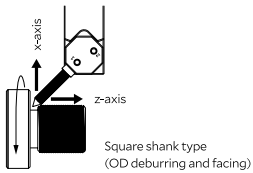


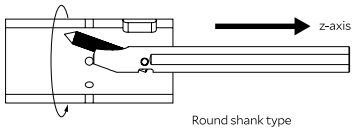
Fig. 3b

Pull the brush, do not push

This is a specialist pull turning and facing tool. Pulling the brush reduces bristle deflection and negotiates discontinuous geometries such as crossholes. The bristles will break if the brush is pushed. The tool must be pulled in the x-axis away from the main spindle when facing and pulled in the z-axis away from the main spindle when ID or OD deburring.



Square shank type
(OD deburring and facing)



Round shank type
(ID deburring)

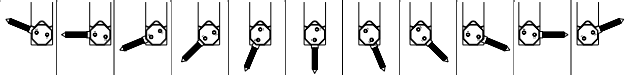
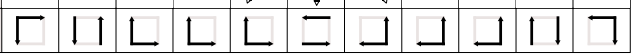
Depth of cut (Round shank)

The brush angle of XEBEC Brush Turning Round Shank is fixed at 20 degrees. Maximum depth of cut is 2.0 mm.
Usable bristle length varies with the brush diameter.

Brush diameter (mm)	Brush angle	Max. usable bristle length
ϕ2.5 (TB025)	20 deg. (Fixed)	3.0 mm
ϕ6 (TB06)		5.5 mm

Brush angle (Square shank)

The square shank has eleven different angles to match the deburring edge. Arrows indicate permissible cutting direction.

Angle (degrees)	112.5	90	67.5	45	22.5	0	-22.5	-45	-67.5	-90	-112.5
Z-axis ⟷ Spindle Tailstock											
Cutting direction											

Depth of cut (Square shank)

The usable bristle length and maximum depth of cut of the square shank vary with the brush angle.
Depth of cut is no more than 2.0 mm. Refer to the following tables for details.

Brush angle	Max. usable bristle length ℓ	
	Facing	OD turning
90 / 0 deg.	15 mm	15 mm
22.5 deg.	5 mm	15 mm
45 deg.	15 mm	15 mm
67.5 deg.	15 mm	5 mm
112.5 deg.	15 mm	5 mm

Brush angle	Max. depth of cut	
	Facing	OD turning
90 / 0 deg.	0.5 mm	0.5 mm
22.5 deg.	2.0 mm	1.0 mm
45 deg.	1.5 mm	1.5 mm
67.5 deg.	1.0 mm	2.0 mm
112.5 deg.	1.0 mm	2.0 mm

■ Refer to "How to use: External thread deburring mechanism" for brush angle recommendations.

Go to page 49 to select brush color

Crosshole deburring mechanism (Round shank)

A shallow brush angle and large depth of cut are required to remove burrs on crossholes. The pressure exerted on the brush pushes it into a crosshole, with its tapered tip scraping off burrs as the brush is pulled back and out of the hole. If cycle time permits, the workpiece should be rotated both clockwise (CW) and counter-clockwise (CCW) for uniform edge quality.



Rotate the workpiece in both directions if cycle time permits.

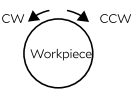
The maximum crosshole size for the small brush (A11-TB025) is ϕ3 mm. The bristles of the small brush are stiffer than the larger brush because they are only half the length. This limits the size of crosshole which can be deburred. The large brush (A11-TB06) has no crosshole size restriction.

External thread deburring mechanism (Square shank)

A steep brush angle is required to remove burrs on an external thread. The recommended brush angle for deburring the crests is 22.5 degrees. This concentrates most of the grinding power in the tip of the brush, while preventing bristles from being deflected on either side of a crest. Spreading and deflection of the brush results in a loss of grinding power and should be avoided.

Shank type	Target edges	Brush type	Brush angle
Square shank	Full thread (incl. start and end)	TB06 (Turning)	22.5 deg. 
	Thread (incl. start)		
	Thread (start only)	CB06 (Chamfer)	45 deg. 

The workpiece should be rotated clockwise (CW) for a right-hand thread and counter-clockwise (CCW) for a left-hand thread. If the correct rotational direction and brush angle (22.5 deg.) are used, the brush can be pulled easily along the thread. However, the angled brush will catch on the thread and break if the incorrect rotational direction is used.



Rotate the workpiece CW for a right-hand thread. Rotate CCW for a left-hand thread.

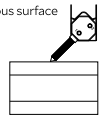
Machining parameters

Parameter	Range (same for all sizes)	Starting parameters (same for all sizes)
Cutting speed (m/min)	60 - 250	150
Feed (mm/rev)	0.1 - 0.5	0.3
Depth of cut (mm)	0.5 - 2.0	1.0 (continuous cutting surface)
		0.5 (discontinuous cutting surface)

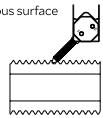
MANUAL

- Use on large burrs will greatly increase brush wear and shorten tool life.
- Starting parameters vary depending on the brush angle of the square shank. Refer to the manual for details.

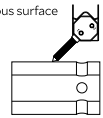
Continuous surface



Continuous surface



Discontinuous surface



Applications

Crosshole deburring



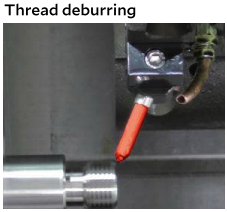
Material: Carbon steel

Main bore diameter: Outer 16 mm, Inner 12 mm

Crosshole diameter: 3 mm

Brush (color)	Holder	Angle (deg.)	Depth of cut (mm)	Cutting speed (m/min)	Feed rate (mm/rev)	Rotational direction
A11-TB025 (red)	TM-SH-06	20 (Fixed)	1.5	150	0.1	CW + CCW

Thread deburring



Material: Stainless steel

Thread size: 24 x 2 mm

Brush (color)	Holder	Angle (deg.)	Depth of cut (mm)	Cutting speed (m/min)	Feed rate (mm/rev)	Rotational direction
A32-TB06 (blue)	TM-SH-S2020	22.5	0.5	150	0.1	CW

Groove polishing



Material: YXR3 (HRC 60)

Brush (color)	Holder	Angle (deg.)	Depth of cut (mm)	Spindle speed (min^{-1})
A32-CB06M (blue)	TM-SH-2020	90	1.0	720