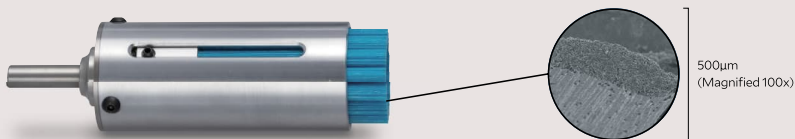
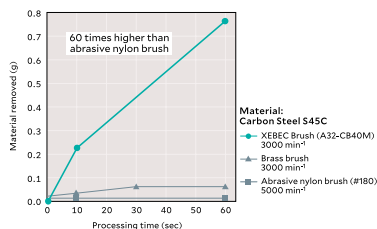


XEBEC Brush uses unique abrasive ceramic fiber material instead of abrasive grain. Each bristle consists of 1,000 ceramic fibers that work as cutting edges. Overwhelming grinding power, consistent cutting performance, and no deformation enables CNC deburring immediately after machining operations inside the same machine tool.



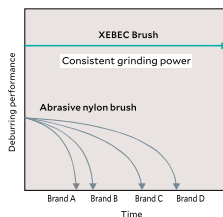
High grinding power

The content ratio of ceramic fiber is approximately 80%. Cutting edges on the brush tips offer excellent grinding power.



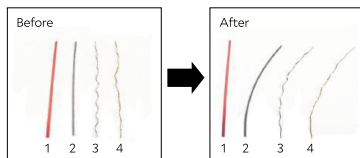
Consistent grinding performance

New cutting edges are always exposed. Consistent grinding performance throughout due to the uniform structure of the fiber.



No deformation

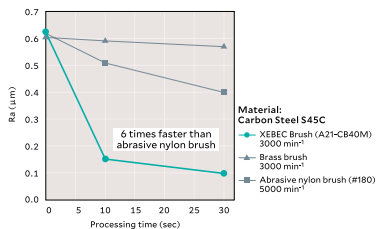
Maintains its straight shape and does not spread out like an old toothbrush. Easy to manage on mass production lines.



1. XEBEC Brush (A11 red bristle)
2. Abrasive nylon brush
3. Steel wire brush
4. Brass wire brush

Optimal for polishing

The high grinding power of ceramic fiber makes this tool optimal for polishing. Achievable surface roughness is $R_a = 0.1 \mu\text{m}$ ($R_z = 0.4 \mu\text{m}$).

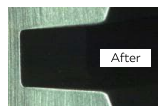


Brush selection

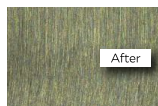
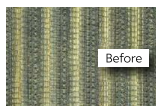
Workpiece material	Resin		Copper, Brass	
			Aluminum	
Burr size			Steel	
			Stainless steel	
			HRSA steel	
			Cast iron	
Grinding power	Micro fine burrs		Hard material	
Brush (color)	Burr thickness ($\leq 0.1 \text{ mm}$)		Burr thickness (0.1 - 0.2 mm)	
Grinding power	A13 (pink)	A11 (red)	A21 (white)	A32 (blue)
→ High				

- Not all brush colors are available in all sizes.
- HRSA (heat resistant super alloy)

Deburring



Polishing

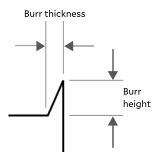


XEBEC Brush™ Surface Patented

Deburring, cutter mark removal, and surface polishing

Applicable burr size

Burr thickness ≤ 0.2 mm
(Burs this size can be bent by fingernails)



VIDEO



Applicable equipment

This tool can be mounted on equipment shown below.



Machining
center



Lathe
(with live tools)



Dedicated
machine



Robot

Tool composition

Brush and sleeve are sold separately.
Assemble brush and sleeve before use.



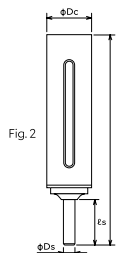
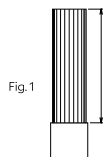
Brush



Sleeve

Brushes

Brush (color)	Product code	Brush diameter (mm)	Bristle length ℓ (mm)	Matching sleeve	Fig.
A13 (pink)	A13-CB06M	$\phi 6$	30	S06M	1
	A13-CB15M	$\phi 15$	50	S15M-P	1
	A11-CB06M	$\phi 6$	30	S06M	1
A11 (red)	A11-CB15M	$\phi 15$	50	S15M-P	1
	A11-CB25M	$\phi 25$	75	S25M	1
	A11-CB40M	$\phi 40$	75	S40M-SD10	1
	A11-CB60M	$\phi 60$	75	S60M	1
	A11-CB100M	$\phi 100$	75	S100M	1
	A21-CB06M	$\phi 6$	30	S06M	1
A21 (white)	A21-CB15M	$\phi 15$	50	S15M-P	1
	A21-CB25M	$\phi 25$	75	S25M	1
	A21-CB40M	$\phi 40$	75	S40M-SD10	1
	A21-CB60M	$\phi 60$	75	S60M	1
	A21-CB100M	$\phi 100$	75	S100M	1
	A32-CB06M	$\phi 6$	30	S06M	1
A32 (blue)	A32-CB15M	$\phi 15$	50	S15M-P	1
	A32-CB25M	$\phi 25$	75	S25M	1
	A32-CB40M	$\phi 40$	75	S40M-SD10	1
	A32-CB60M	$\phi 60$	75	S60M	1
	A32-CB100M	$\phi 100$	75	S100M	1



MANUAL

■ Bristle bundles are embedded in a single line on the periphery (except for $\phi 6$ type).

■ Brush size is approximate as the tip expands with rotation.

■ Brushes larger than $\phi 100$ are available by special order. Refer to page 10.

Sleeves

Product code	Brush dia. (mm)	External dia. Dc (mm)	Shank dia. Ds (mm)	Overall length L (mm)	Shank length ℓs (mm)	Matching brush	Fig.
S06M	$\phi 6$	$\phi 10$	$\phi 6$	70	29	A13/A11/A21/A32-CB06M	2
S15M-P	$\phi 15$	$\phi 18.5$	$\phi 6$	90	29	A13/A11/A21/A32-CB15M	2
S25M	$\phi 25$	$\phi 30$	$\phi 8$	140	30	A11/A21/A32-CB25M	2
S40M-SD10	$\phi 40$	$\phi 45$	$\phi 10$	140	30	A11/A21/A32-CB40M	2
S60M	$\phi 60$	$\phi 65$	$\phi 12$	150	35	A11/A21/A32-CB60M	2
S100M	$\phi 100$	$\phi 110$	$\phi 16$	162	40	A11/A21/A32-CB100M	2

■ Overall length L is sleeve length not including brush projection.

■ The case of the S15M-P is made of fiber-reinforced plastic (FRP).

Go to page 47 to select brush color

Applications

Higher quality automated deburring

Cylinder head



Material: Aluminum
Follows: Face milling
Tool: A11-CB100M

Before

Abrasive nylon brush was used. It was time-consuming and not able to remove all burrs.

After

All burrs are removed by high grinding power. Quality is stable. The cycle time is shortened by a high feed rate.

Automation of time-consuming polishing

Metal mold



Material: Hard material
Follows: End milling
Tool: A11-CB25M

Before

40 minutes hand polishing per workpiece. Uneven quality resulted in complaints.

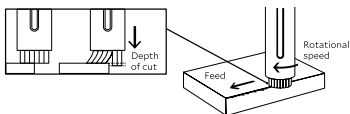
After

Shortened the polishing time to one minute per workpiece by automation. Achieved uniform polishing quality.

How to use

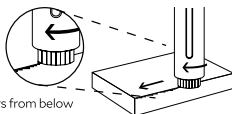
Rotational speed

Recommended parameters differ depending on brush size. Refer to the chart below for starting parameters for each brush size.



Rotational direction

Set the rotational direction so that the brush pushes the burrs up from below.



Upcut against burrs from below

Feed rate - Deburring

Burr thickness: 0.05 mm
(Very easily bent by fingernails)

4000 mm/min

Burr thickness: 0.1 mm
(Easily bent by fingernails)

2500 mm/min

Feed rate - Polishing

Cutter mark removal, polishing

250 - 850 mm/min

Depth of cut - Vertical burrs

Formed by end milling & drilling
(Are vertical to brush tip)

0.5 mm

Depth of cut - Horizontal burrs

Formed by face milling
(Are horizontal to brush tip)

1.0 mm

Depth of cut - Polishing

Cutter mark removal, polishing

0.3 - 0.5 mm

Starting parameters

Product code	Rotational speed (min ⁻¹)			Depth of cut (mm)			Feed rate (mm/min)			Brush protrusion (mm)	
	Deburring	Cutter mark removal, polishing	Maximum	Vertical burrs	Horizontal burrs	Cutter mark removal, polishing	Burr thickness 0.05 mm	Burr thickness 0.1 mm	Cutter mark removal, polishing	Deburring	Cutter mark removal, polishing
A13-CB06M A11-CB06M A21-CB06M	8000	10000	10000	0.5	0.5	0.3	4000	2500	250	10	10
A32-CB06M A13-CB15M	8000	10000	10000	0.3	0.3	0.3	4000	2500	250	10	10
A11-CB15M A21-CB15M A32-CB15M	4800	6000	6000	1.0	1.0	0.5	4000	2500	450	10	10
A11-CB25M A21-CB25M A32-CB25M	4800	6000	6000	0.5	1.0	0.5	4000	2500	450	10	10
A11-CB25M A21-CB25M A32-CB25M	4000	5000	5000	0.5	1.0	0.5	4000	2500	700	15	10
A11-CB40M A21-CB40M A32-CB40M	2400	3000	3000	0.5	1.0	0.5	4000	2500	800	15	10
A11-CB60M A21-CB60M A32-CB60M	1600	2000	2000	0.5	1.0	0.5	4000	2500	850	15	10
A11-CB100M A21-CB100M A32-CB100M	960	1200	1200	0.5	1.0	0.5	4000	2500	850	15	10

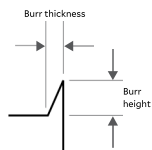
■ Plastic workpieces may deform or discolor. If this occurs, reducing rotational speed to approximately 10% of the starting parameter may solve the problem.

XEBEC Brush™ Surface End Type

Cutter mark removal and polishing on sealing surfaces

Applicable burr size

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



VIDEO

Applicable equipment

This tool can be used with equipment that controls rotational speed.



Machining
center



Lathe
(with live tools)



Dedicated
machine



Robot



Rotary tool
(electric)

Brushes

Brush (color)	Product code	Brush dia. (mm)	Shank dia. Dc (mm)	Bristle length ℓ (mm)	Overall length L (mm)	Standard rotational speed (min ⁻¹)	Maximum rotational speed (min ⁻¹)	Fig.
A13 (pink)	A13-EB01S	$\phi 1$	$\phi 3$	15	52	7000 - 12000	15000	3
	A13-EB015S	$\phi 1.5$	$\phi 3$	15	52	7000 - 12000	15000	3
	A13-EB02S	$\phi 2$	$\phi 3$	15	52	7000 - 12000	15000	3
	A13-EB025S	$\phi 2.5$	$\phi 3$	15	52	7000 - 12000	15000	3
	A13-EB03M	$\phi 3$	$\phi 3$	30	67	4000	6000	3
A11 (red)	A11-EB01S	$\phi 1$	$\phi 3$	15	52	7000 - 12000	15000	3
	A11-EB015S	$\phi 1.5$	$\phi 3$	15	52	7000 - 12000	15000	3
	A11-EB02S	$\phi 2$	$\phi 3$	15	52	7000 - 12000	15000	3
	A11-EB025S	$\phi 2.5$	$\phi 3$	15	52	7000 - 12000	15000	3
	A11-EB06M	$\phi 5$	$\phi 3$	20	57	7000	12000	4
	A21-EB06M	$\phi 5$	$\phi 3$	20	57	7000	12000	4
A21 (white)	A21-EB06M	$\phi 5$	$\phi 3$	20	57	7000	12000	4
A32 (blue)	A32-EB06M	$\phi 5$	$\phi 3$	20	57	7000	12000	4

■ Brush size is approximate as the tip expands with rotation.

Precautions for use

The grinding load must be less than 2 N for hand use.
The brush will break if:

- used beyond the maximum rotational speed
- used beyond the maximum indentation load
- used with a pneumatic rotary tool

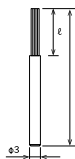


Fig. 3

Tip angle approx. 100 deg.

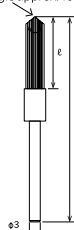


Fig. 4

A11-EB06M
A21-EB06M
A32-EB06M



MANUAL

Go to page 49 to select brush color