

Product Lineup

Ceramic Stone Type

Target Bore Diameter in Primary Processing	Head Size	Head Shape	Blue Equivalent to #800	Orange Equivalent to #400	Gray Equivalent to #220
Over ϕ 3mm	ϕ 3mm	Ball (Sphere)	CH-PB-3B	CH-PO-3B	CH-PM-3B
	ϕ 3 \times 3mm	Cylinder (Column)	CH-PB-3R	CH-PO-3R	CH-PM-3R
Over ϕ 4mm	ϕ 4mm	Ball (Sphere)	CH-PB-4B	CH-PO-4B	CH-PM-4B
	ϕ 4 \times 4mm	Cylinder (Column)	CH-PB-4R	CH-PO-4R	CH-PM-4R
Over ϕ 5mm	ϕ 5mm	Ball (Sphere)	CH-PB-5B	CH-PO-5B	CH-PM-5B
	ϕ 5 \times 5mm	Cylinder (Column)	CH-PB-5R	CH-PO-5R	CH-PM-5R
	ϕ 5mm \times 10mm	Cylinder (Column)	—	—	CH-PM-5R-C01
Over ϕ 6mm	ϕ 6mm	Ball (Sphere)	CH-PB-6B	CH-PO-6B	CH-PM-6B
Over ϕ 10mm	ϕ 10mm	Ball (Sphere)	—	—	CH-PM-10B

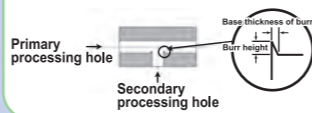


- head: ceramic abrasive stone (Ball: ϕ 3 to 6, 10, Cylinder: ϕ 3 to 5)
- shaft: ϕ 1.5 \times 40 mm
- shank: ϕ 3 \times 30 mm

Ceramic Fiber Rod Type

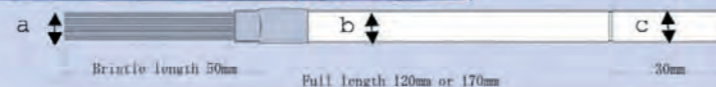
Target Bore Diameter in Primary Processing	Brush Diameter a	Shaft Diameter b	Shank Diameter c	Full Length	Product Code
ϕ 3.5 to 5mm	ϕ 1.5mm	ϕ 2.5mm	ϕ 3mm	120mm	CH-A12-1.5M
			ϕ 3mm	120mm	CH-A12-3M
ϕ 5 to 8mm	ϕ 3mm	ϕ 4mm	ϕ 4mm	170mm	CH-A12-3L
			ϕ 6mm	120mm	CH-A12-5M
ϕ 8 to 10mm	ϕ 5mm	ϕ 6mm	ϕ 6mm	170mm	CH-A12-5L
			ϕ 6mm	120mm	CH-A12-7M
ϕ 10 to 20mm	ϕ 7mm	ϕ 8mm	ϕ 6mm	120mm	CH-A12-7M
			ϕ 8mm	170mm	CH-A12-7L

Definition of cross-hole burrs in terms of XEBEC's tool



※Remark
Tool revolutions need more than 10000min⁻¹. (Maximum 20000min⁻¹)

Chucking position marking



Precaution in use

<Ceramic Stone Type>

[Pre-operation Inspection]

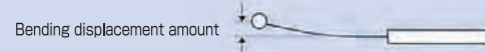
- When the tool is mounted on a rotating tool, insert the shank end all the way to the bottom of a chuck, and secure it tightly.
- Conduct a test run for one minute or more before starting operation, and three minutes or more after changing the tool, to confirm the absence of any abnormality such as vibration and looseness of the chuck. Even if there are no abnormalities during test run, if you notice anything unusual such as vibration during tool operation, stop immediately. There may be the risk of breakage, deformation, or damage to the head and shaft.

[Maximum revolutions]

- Use below the maximum 6000 min⁻¹ for ϕ 10, 10000 min⁻¹ for ϕ 6, 12000 min⁻¹ for ϕ 5, 13000 min⁻¹ for ϕ 4, and 15000 min⁻¹ for ϕ 3. Usage over the maximum revolutions may result in breakage of the head and shaft.

[Cutting Load]

- Use a cutting load of 5N or less (i.e., 500 gf, with a bending displacement of 2 mm or less) when deburring a workpiece. Usage with an excessive cutting load may cause a dangerous broken or damaged shaft.



[Size of Target Burr]

- The tool is designed to remove fine burrs where base thickness is 0.2 mm or less after machine processing.

[Truing / Dressing]

- If the tool head (ceramic stone) is deformed from use, reshape it by lightly pressing the periphery onto an electrodeposited diamond stone while rotating the tool. Do dressing the same way.

[Head Size Selection]

- Select a head size that is slightly larger than the bore diameter in secondary processing. If a smaller head is used, it may get into secondary processing hole and may result in breakage of head and shaft.

WARNING! Follow the precaution in use and safety measures for operators above without fail. If you fail to observe them, there are following risks.

- A tool or a part of a tool may crack, drop off, distort or break.
- Broken pieces of a tool or grinding dust may stick into your skin, or at worst stick into your eyes, causing blindness.
- Dust generated by machining process may bring up skin irritancy or allergy.

<Ceramic Fiber Rod Type>

- Select the tool that corresponds to the diameter of the cylinder to be worked. Failing to do so may cause dangerous breakage of the brush fiber rods and shank along with deformation and/or damage.
- Ensure to set the tool to rotate only after the front end is inserted inside the cylinder to be worked. Failing to do so will cause the fiber rod to break and scatter in danger.
- If the secondary hole is larger (than the primary hole), it may cause the brush to be unevenly worn or break.

[Pre-operation inspection]

- When the tool is machine-mounted, insert shank into the chuck up to chucking position marking on the tool (30 mm from tool end) and fix it tightly.
- If you find anything unusual such as vibration during tool operations, stop immediately; or hazardous breakage, deformation, or damage to the brush fiber rods and/or shaft may result.

[Maximum revolutions]

- Use below maximum 12000min⁻¹ for 3M/3L, 5M/5L, 7M/7L and below maximum 20000min⁻¹ for 1.5M. Usage over the maximum revolutions may result in dangerous breakage of the tool.

[Size of target burr]

- The tool is designed for removal of burrs where base thickness is 0.1mm or less after machine processing.

Operator Safety Measures

(For both Ceramic Stone Type and Ceramic Fiber Rod Type)

[For Protective Equipment]

- Always wear protective goggles, gloves and masks when operating the tool.
- Wear long sleeves, tight cuff, and clothing to minimize skin exposure.

[Pre-operation inspection]

- When mounting on machines, insert the shank end all the way to the bottom of the chuck, and secure it tightly.
- Stop the tool immediately if you find anything unusual such as vibration; dangerous head or shaft breakage, deformation or even tool breakdown may occur.

[Beware of Grinding Powder]

- Grinding powder and burrs may scatter within an area around the work as the tools revolve; please stay clear of this area.
- When using on high-precision equipment, the abrasive powder may adversely affect the sliding parts, so please be sure to collect any dust and keep clean the equipment.

[Caution to your surroundings]

- The area around your work is hazardous in case flying pieces of fiber rods from the tools and grinding powder may scatter, enclose your working area to prevent other people entering, or have the people surrounding your work area protective equipment as well.

Please visit our homepage for details. URL <http://www.xebec-tech.com>

Your order



XEBEC TECHNOLOGY CO.,LTD.

4-3-3 Koujimachi, Chiyoda-ku, Tokyo, Japan

Phone. +81-3-3239-3481 FAX. +81-3-5211-8964

URL <http://www.xebec-tech.com>

E-mail info@xebec-tech.co.jp



ISO9001 Conformity

Differentiated Material !!

Only XEBEC's ceramic fiber has created!

XEBEC products are manufactured in a plant that meets ISO 9001 international quality control and assurance standards.

Cross-Hole Deburring Tool

Select XEBEC for fine deburring of cross-holes 3.5mm to 20mm in diameter!!

Patented

Ceramic Stone Type

Easy-to-use with hand grinder.



- Tool head is made of ceramic fiber abrasive stone. Cutting edges are exposed over the entire surface.
- Efficient removal of fine burrs where the base thickness is 0.2 mm or less after machine processing.
- Ideal for point processing of cross-hole fine deburring.
- Flexible shaft for soft contact with the workpiece.
- Also use in a machining center, NC lathe, robot, etc.

Ceramic Fiber Rod Type

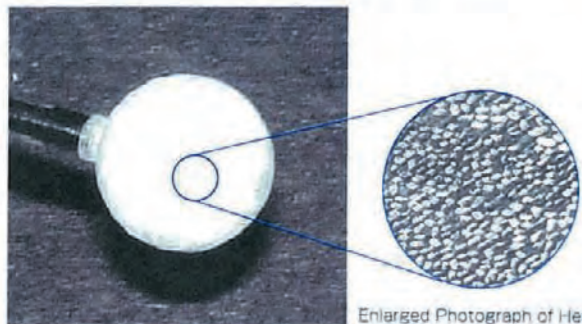
Optimal for the automation of cross-hole deburring.



- Powerful tip grinding with "XEBEC Cutting Fiber" for rods made of ceramic fiber abrasive stone.
- Burrs are completely removed without damaging periphery of the cross-hole and without breaking the edge pattern.
- Centrifugal force generated by rotation efficiently removes cross-hole fine burrs in cylinders.
- Precision removal of all fine burrs where the base thickness is 0.1 mm or less after machine processing.
- Also can be used for polishing or scale removal on inner wall surfaces of cylinders.

Ceramic Stone Type

Material and Structure



Enlarged Photograph of Head

Material

- The "Meister Finish" is an abrasive stone made of XEBEC ceramic fibers which have the optimum crystal structure for grinding. Formed into ball and cylinder shape, the stone surface has multitude of fiber cutting edges providing superior grinding force and performance.
- The self-sharpening action of the cutting edge on the fine ceramic fiber rod tips provides superior grinding ability. Continuous cutting edges provide a stable and continuous grinding performance.

Structure

- The shaft flexibility allows soft contact with the workpiece.

Deburring Performance

"Point processing" or "Contouring" efficiently removes only fine cross-hole burrs.

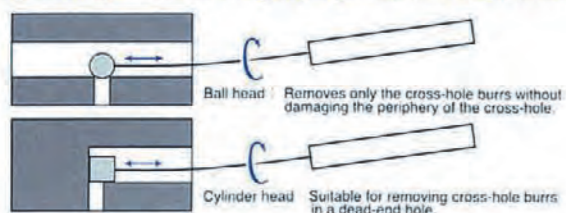
Comparison of deburring finish of cross-hole burrs generated in $\phi 3.5$ mm drill processing

Before Deburring	After Deburring (Comparison by same processing condition)	
Material: Carbon steel Tool Revolutions: 5000min ⁻¹ Processing Time: 1sec. Bore diameter in primary processing: $\phi 5$ mm Bore diameter in secondary processing: $\phi 3.5$ mm	XEBEC Cross-Hole Deburring Tool (equivalent to #220, shape of head= ball) Point processing removes only burrs.	Competitor's diamond burr (equivalent to #220, shape of head= ball) Edge patterns are broken and back burrs are generated.
		Competitor's diamond burr (equivalent to #220, shape of head= cylinder) Portions other than edges are also processed.

Usage, Applications

Point processing (Insert from primary processing hole)

By choosing a head that is slightly larger than the bore of cross-hole, burrs can be efficiently removed.

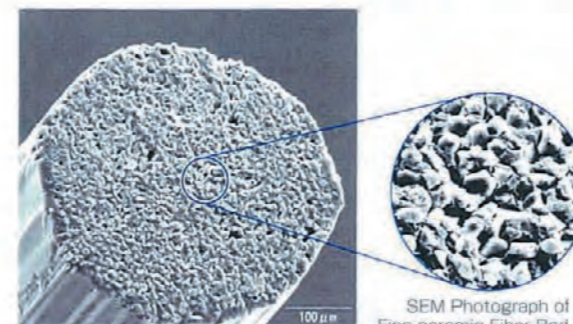


Automated deburring application on a machining center

		Workpiece	Crank Shaft / Material : Carbon steel
		Tool Used	CH-PM-5R-C01
Description		After drilling, Cross-Hole Deburring of pin and journal (obliquely-crossed)	
Conditions		Tool Revolutions : 1500min ⁻¹ / Depth of Cut : 0.5mm / Processing Time : Approx. 3sec.	
Effectiveness	Before	Manual deburring left burrs and resulted low process yield.	
	After	No burrs left and edge quality stabilized. Achieved full automation with machining center and cost down.	

Ceramic Fiber Rod Type

Material and Structure



SEM Photograph of Fine ceramic Fiber Rod Tip

Material

- Using the technology of "Cutting Fiber", which is the world's first fiber rod made from ceramic abrasive stone, we have produced a columnar fiber rod.
- One ceramic fiber rod is made by binding together 1,000 ceramic fiber filaments which have optimum crystal structure for grinding, each 10 μ m in diameter. The tip has 1,000 high-density cutting edges.
- The self-sharpening action of the cutting edge on the fine ceramic fiber rod tips provides superior grinding ability. Continuous cutting edges provide a stable and continuous grinding performance.

Structure

- This rigid fiber rod with high grinding capability is then shaped into a flexible brush to allow soft contact with the workpiece.

Deburring Performance

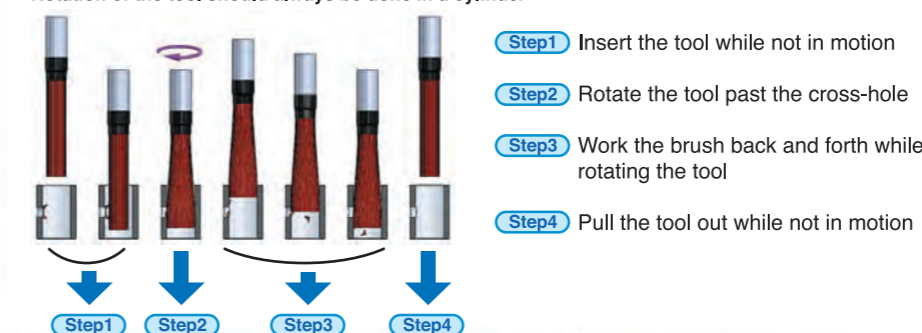
Burrs are accurately removed without damaging periphery of the cross-hole and without breaking the edge pattern.

Deburring of cross-hole burrs generated in $\phi 4$ mm drill processing

Before Deburring	After Deburring	Profile curve of arrowed portion in photograph
Processing method: Processing from both sides of the primary processing hole.		vertical scale=100 μ m/10mm horizontal scale=500 μ m/10mm
Material: Carbon steel Applied tool: CH-A12-5M Bore diameter in primary processing: $\phi 10$ mm Bore diameter in secondary processing: $\phi 4$ mm Tool rpm: 10000min ⁻¹ Feed rate: 5mm/sec		

Tip of rod effectively removes burrs under rotational / centrifugal force.

Rotation of the tool should always be done in a cylinder.



Usage, Applications

Automated deburring application with a custom machine

		Workpiece	General Machine Component (Valve Case) / Material: Aluminum Alloy
		Tool Used	CH-A12-3M (Insert from primary processing hole)
Description		After drilling, minimize the burr size with a drill and to deburr	
Conditions		Tool Revolutions: 10000min ⁻¹ Feed rate: 300mm/min	
Effectiveness	Before	Long manual processing time with a cutter and left scratches on the finishing surface.	
	After	Work efficiency improved with automated deburring by a custom machine and no more burrs left.	

Cross-Hole Deburring Tool Brush Type

High Grinding Power Blue Brush: A33 series

For cylinders inner wall

- Realizing automated deburring and polishing of inner wall of stainless steel, hard-to-cut and ferrous material
- 2 times higher grinding power than red brush (A12 series)



Centrifugal force generated by rotation helps to flare brush to remove cross-hole burrs in cylinders

Brush tip has grinding power. Deburring and edge finishing is done by the brush tips

Realizes automated deburring and cutter mark removal with machine equipment such as machining centers, robotics

Features

- Thanks to unique brush material (ceramic fiber)
 - it maintains consistent performance
 - no deformation after repeated use

Deburring and polishing performance is consistent

Line up

Product code	Diameter of primary processing bore	Full length	Brush diameter (a)	Shaft diameter (b)	Shank diameter (c)	Max speed
CH-A33-3M	φ 5~8mm	130mm	φ 3mm	φ 4mm	φ 3mm	14000min ⁻¹
CH-A33-5M	φ 8~10mm		φ 5mm	φ 6mm	φ 6mm	
CH-A33-7M	φ 10~14mm		φ 7mm	φ 8mm	φ 6mm	
CH-A33-11M	φ 14~20mm		φ 11mm	φ 12mm	φ 12mm	
CH-A33-3L	φ 5~8mm	180mm	φ 3mm	φ 4mm	φ 4mm	12000min ⁻¹
CH-A33-5L	φ 8~10mm		φ 5mm	φ 6mm	φ 6mm	
CH-A33-7L	φ 10~14mm		φ 7mm	φ 8mm	φ 8mm	
CH-A33-11L	φ 14~20mm		φ 11mm	φ 12mm	φ 12mm	



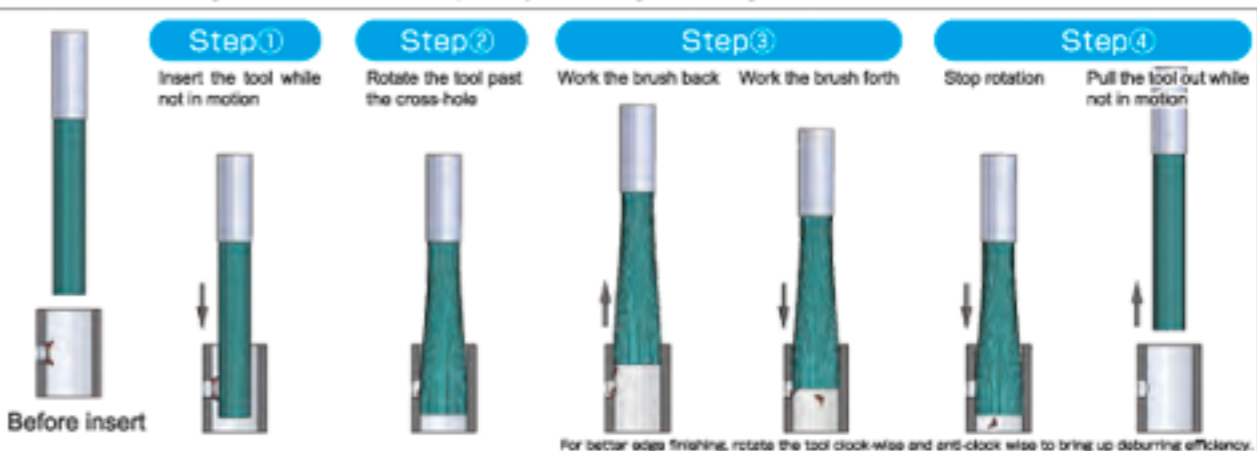
CROSS-HOLE DEBURRING TOOL

Usage

Brushes flare out under centrifugal force and the tips remove burrs

Before use

- No grinding power on the side of the brushes
- Please use in a machine which can operate more than 8000min⁻¹ of brush rotation speed.
- Usage over the maximum rotation speed may result in dangerous breakage of the tool.



Targeted bore diameter and initial parameter

Min. required rotation speed to flare the brush

Brush size	Targeted bore dia.	Min. S to flare NEW brush (60mm)
3M/L	φ5	6,500
	φ8	8,000
5M/L	φ8	6,500
	φ10	7,000
7M/L	φ10	5,500
	φ14	7,000
11M/L	φ14	5,500
	φ20	7,000

- Rotation speed : Please add 1000~3000 min⁻¹ to the "minimum required rotation speed to flare the brush" depending on burr size.

- *Always use below the maximum rotation speed.
- *Rotation speed should be adjusted depending on finishing result.

- Feed: 300mm/min

Precautions in use

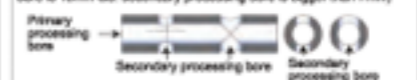
Precautions when using Cross-Hole Deburring Tool Brush Type

- Select the tool that corresponds to the diameter of the primary processing bore to be worked. Failing to do so may cause dangerous breakage of the brush fiber rods and shaft along with deformation and/or damage.
- Ensure to set the tool to rotate only after the front end is inserted inside the bore to be worked. Failing to do so will cause the fiber rod to break and scatter in danger.
- Below cases may cause the fiber rod to break.

Tapered : When the dia. of secondary processing bore is more than 100% of primary processing bore. (Ex. Primary processing bore is 10mm dia., secondary processing bore is bigger than 10mm dia.)



Cross-shaped : When the dia. of secondary processing bore is more than 70% of primary processing bore. (Ex. Primary processing bore is 10mm dia., secondary processing bore is bigger than 7mm)



[Targeted burr size]

- The tool is designed for removal of burrs where base thickness is up to 0.1mm after machine processing.

[For usage with machine tools]

- When using on high-precision equipment, the abrasive powder may adversely affect the sliding parts, so please be sure to collect any dust and keep clean the equipment.

[Pre-operation inspection]

- When the tool is machine-mounted, insert shank into the chuck up to chucking position and fix it tightly. If you find anything unusual such as vibration during tool operations, stop immediately, or hazardous breakage, deformation, or damage to the brush fiber rods and/or shaft may result.

[Maximum rotation speed]

- Use below maximum 14000 min⁻¹ for 3M,5M,7M and below maximum 12000 min⁻¹ for 11M, 3L, 5L, 7L and below 10000 min⁻¹ for 11L.

Definition of cross-hole burrs in terms of XEBEC's tool



Operator safety measures

[For protective Equipment]

- Always wear protective goggles, gloves and masks when operating the tool.
- Wear long sleeves tight cuff and clothing to minimize skin exposure.

[Beware of grinding powder]

- Grinding powder and burrs may scatter within an area around the work as the tools revolve; please stay clear of this area.

[Caution to your surroundings]

- The area around your work is hazardous in case flying pieces of fiber rods from the tools and grinding powder may scatter, enclose your working area to prevent other people entering, or have the people surrounding your work area protective equipment as well.



Follow the precaution in use and safety measures for operators above without fail. If you fail to observe them, there are following risks.

- A tool or a part of a tool may crack, drop off, distort or break.
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- Dust generated by machining process may bring up skin irritation or allergy.

For more information

<http://www.xebec-tech.com>