

XEBEC Brush™ Crosshole Instruction Manual (Custom tool)

Read this instruction manual before using this product. Failure to do so can result in serious injury or death. This instruction manual must be kept in the vicinity of the machine at all times so that it is accessible to the operator.

This is a customized product. Read the following carefully.

This product is customized according to the design modifications specified by you, the client, and manufactured by XEBEC TECHNOLOGY CO., LTD. Before using this product, read the following and proceed to use the product if you agree with the content. Irrespective of whether you agree with the following, proceeding to use the product will be taken as agreement.

Product testing

This product is a remodeling of a standard product according to the design modifications specified by you, the client, and XEBEC has not performed product testing of this customized product. Understand that safety testing and performance testing has been performed on our standard products.

Disclaimer

XEBEC accepts no liability for damages incurred due to any of the following:
 (1) Injury or damage due to failure to observe the instructions in the Instruction Manual
 (2) Injury or damage occurring due to specification differences between the customized product and the standard product
 (3) Any other reasons that are unattributable to XEBEC

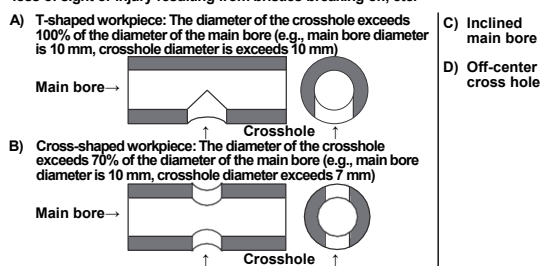
WARNING

Be sure to observe the contents of this manual. Using the product in a way that is not consistent with the contents of this manual may result in serious injury or death.

WARNING

- There is the risk of operator loss of sight or injury resulting from this product detaching from the processing equipments, bristles breaking off, workpieces breaking, etc. There is also the risk of damage to machines, jigs, and workpieces.
- Fragments, cutting particles, burrs, etc., occur due to processing with this product, and these can pierce the eyes or skin of workers causing loss of sight and injury.
- Dust occurring as a result of processing with this product can cause lung damage, irritate skin, and bring on allergic reactions.
- Even if there is no problem at the pre-work check, if vibration or other abnormality occurs during use, discontinue use immediately. Continuing to use the product when there is an abnormality presents the risk of operator loss of sight or injury resulting from this product detaching from the processing equipments, bristles breaking off, workpieces breaking, etc.
- Do not use the product while exceeding the maximum rotational speed, depth of cut, or brush projection, as there is the risk of operator loss of sight or injury resulting from this product detaching from the processing equipment, bristles breaking off, workpieces breaking, etc.
- Machining at a constant point for a prolonged time causes the tip of the tool to become hot which presents the risk of operator loss of sight or injury resulting from bristles coming loose or breaking off. Adjust the processing times on locations being processed so that it does not become hot. Also be careful not to touch the locations being processed directly with bare hands after use.
- Use the tool suitable to the hole diameter. There is the risk of operator loss of sight or injury resulting from bristles breaking off, parts breaking, etc., if a tool not suitable to the hole diameter is used.
- Start rotation of the product tip after it has been inserted into the cylinder to be machined. Using the product in ways other than described in this document or rotating it outside the cylinder presents a risk of operator loss of sight or injury resulting from the bristles breaking off and being flung.

- The following examples illustrate situations that present the risk of operator loss of sight or injury resulting from bristles breaking off, etc.



NOTICE

Furthermore, as a result of the situations described above, there is also the risk of damage to machining tools, jigs, and workpieces.

Operator Safety Protection

Use of protective equipment

Wear personal protective gear including goggles, masks, gloves, and earmuffs to prevent loss of sight, injury, or lung damage caused by damaged parts flying off the product. Wear clothing with long sleeves or other clothing that does not expose the skin, and fasten the cuffs and hems tightly.

Attention to the work area

- Install an enclosure so that persons other than the operator do not enter the work area, and ensure that all persons, if any, in the work area are wearing protective equipment.
- Keep the floor of the work area clean at all times to prevent the risk of slipping or tripping on dust, cutting particles, oil, water, or other substance.
- There is the risk of fire caused by heating, sparks, or other factor resulting from use of the product. Do not use the product close to a flammable liquid or in an explosive atmosphere. Also be sure to enact fire prevention measures.

Precaution regarding cutting particles

Fragments, cutting particles, and other substances generated during work will be scattered into the surrounding area. Be sure to use a dust collector or other means to collect them.

Pre-Work Check

Perform test operation for 1 minute or more before starting work, and for 3 minutes or more after the machine tool or product was changed, and check that there is no looseness, vibration, or other abnormality of the machine and the part where the product is installed.

When doing this, start rotation with the product tip inserted 20 mm or more into the inside of the main bore.

Precautions for Use

Starting and stopping rotation

WARNING When starting work, start rotation with the product tip inserted into the bore. Also, when stopping work, make sure rotation has stopped completely while the tool tip is still inside the bore.

Installation onto a machining center or other machine

WARNING When installing onto processing equipment, grip the tool shank by 30 mm or more. If gripped with a grip length other than the specified one, this product may fall from the processing equipment due to vibrations during the machining. There is the risk that this may cause operator loss of sight or injury.

- When the product is used with precision machining equipment, there is the risk that cutting particles may have an adverse effect on the equipment sliding parts.
- Be sure to properly collect cutting particles and wash thoroughly.
- When installing, use a chuck that is correct for the shank diameter.
- Install and use on processing equipment that can control the rotational speed.

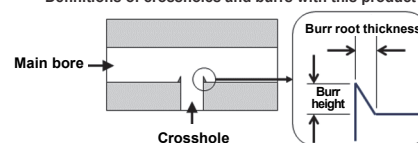
Features

- Centrifugal force generated by rotation causes the brush to expand and remove fine burrs from the crosshole inside the cylinder.
- It polishes and removes black scale from the inside surface of the cylinder, and removes cutting particles and foreign matter from the hole bottom surface.
- The abrasive material is ceramic fiber that contains no abrasive grains at all.
- The brush tip generates grinding power. The tip of the bristle removes burrs and finishes the edges.
- CNC deburring and cutter mark removal can be achieved by installing onto a machining center, robot, drilling machine, or other machining equipment.
- The original brush material (ceramic fibers) enables consistent deburring and polishing capability without changes to the cutting performance or brush shape.

How to Use

This product is used for removal of post-machining fine burrs with a root thickness of 0.1 mm or less, and for removal of fine burrs from the inside of cylinders with inner diameters of $\phi 3.5$ mm - $\phi 20$ mm.

Definitions of crossholes and burrs with this product



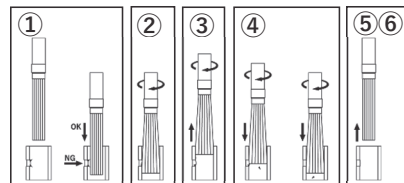
Maximum rotational speed

Values for the standard product are included here as a reference for the maximum rotational speed. As these values can only be considered reference points, the user should take it upon themselves to set their own conditions, testing the product starting with conditions that produce the least load, with due consideration for safety.

- In the table below, refer to the data for the diameter of the brush to be used or the next larger diameter. When doing so:
 - Use a rotational speed lower than the maximum for the selected brush diameter.
 - If the bristle length of the brush being used is larger than the bristle length of the selected brush, before starting use, confirm that the spreading of the bristles is not excessive when the brush is rotated. If there is excessive spreading of the bristles, reduce the rotational speed.

Product code / Bristle Color		Brush diameter	Target hole diameter	Bristle length (mm)	Maximum rotational speed (min ⁻¹)
Red	Blue				
CH-A12-1.5M		$\phi 1.5$	$\phi 3.5$ to $\phi 5$	50	20,000
CH-A12-3M	CH-A33-3M	$\phi 3$	$\phi 5$ to $\phi 8$		
CH-A12-5M	CH-A33-5M	$\phi 5$	$\phi 8$ to $\phi 10$		
CH-A12-7M		$\phi 7$	$\phi 10$ to $\phi 20$	Red: 50 Blue: 60	14,000
	CH-A33-7M	$\phi 7$	$\phi 10$ to $\phi 14$		
CH-A12-11M	CH-A33-11M	$\phi 11$	$\phi 14$ to $\phi 20$	Red: 50 Blue: 60	12,000
CH-A12-3L	CH-A33-3L	$\phi 3$	$\phi 5$ to $\phi 8$		
CH-A12-5L	CH-A33-5L	$\phi 5$	$\phi 8$ to $\phi 10$		
CH-A12-7L		$\phi 7$	$\phi 10$ to $\phi 14$		
	CH-A33-7L	$\phi 7$	$\phi 10$ to $\phi 14$		
CH-A12-11L	CH-A33-11L	$\phi 11$	$\phi 14$ to $\phi 20$		

Procedure for use



WARNING Start rotation of the product tip after it has been inserted into the cylinder to be machined. There is a risk of operator loss of sight or injury resulting from the bristles breaking off and being flung.

The bristles wear as they perform their deburring work, and this may cause the shape and position of the tool tip to change. In particular, when working the area in the vicinity of the entrance to the main bore, adjust the work start position so that the bristles do not fly out of the cylinder when rotating.

- With brush rotation stopped, insert the brush in the main bore.
- Start brush rotation when it has been inserted past the crosshole.
- Machine while pulling the brush.
 - * Machining while pulling the brush back will prevent burrs from being pressed flat against the inner diameter of the cylinder.
- Machine while pushing the brush.
- Stop the brush rotation.
- After brush rotation has stopped, remove the brush from the cylinder.



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This document can also be viewed at the following website.
<http://www.xebec-tech.com/>

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