

# XEBEC Brush™ Surface 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. As a result of the above, 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.
  - If either the rotational speed or the brush projection amount exceeds the maximum, 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.
  - Machining at a constant point for a prolonged time causes the brush 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.

### 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. Wear a protective mask and be sure to use a dust collector or other means to collect the particles.

### 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.

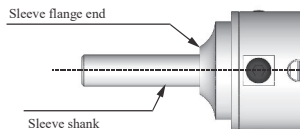
### Precautions for Use

### Installation onto a machining center or other machine

#### WARNING

When chucking, slide the sleeve shank onto the chuck (collet, float holder, etc.) of the machining equipment securely all the way to the base. (The sleeve flange end should directly contact the chuck.) If not inserted all the way to the base when chucked, vibration during machining may cause breakage of the sleeve shank. 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 and the depth of cut. The motor output of the rotating shaft where the brush is attached must be 4.0 kW or more for brush diameters of  $\phi 60$  and must be 6.0 kW for brush diameters of  $\phi 100$ .



### Features

- After cutting process, this product removes burrs with the burr root thickness of 0.2 mm or less. It is also ideal for cutter mark removal and surface polishing.
- 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. (Can be installed on machining equipment with a collet chuck, milling chuck, drill chuck, or similar means.)
- The original brush material (ceramic fibers) enables consistent deburring and polishing capability without changes to the cutting performance or brush shape.
- The abrasive material is ceramic fiber that contains no abrasive grains at all.
- The product can be used for both dry and wet machining.

## How to Use

Values for the standard product are included here as a reference for the maximum rotational speed, maximum brush projection, maximum depth of cut, and maximum grinding load. 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.

## Operator Safety Protection

### Correct depth of cut and grinding load

- If used with an excessive depth of cut or grinding load, the optimal effects will not be achieved and there will be significant progress of wear and breakage of the fiber material, resulting in shorter tool life.
- The product is most effective when machining with the tip of the bristle. The depth of cut should be 0.5 mm - 1.0 mm as a guide and set the upper limit to 1.5 mm.
- When performing polishing of end-type flat parts, use with a depth of cut 1 mm or less, and when working manually, use with a grinding load of 2N or less. Do not use with an excessive depth of cut or pressure.

### Maximum rotational speed/Maximum brush projection

- A sleeve (outer cylinder) is installed around the product in order to adjust the brush projection amount from the sleeve and adjust the flexibility and conformability. Be sure to install the dedicated sleeve for use with XEBEC Brush Surface. A sleeve is not used with products that have a product code starting with EB (top rows in the table), and which have a brush diameter of  $\phi 5$  or less.
  - A longer amount of brush projection increases flexibility and conformability, while a shorter amount of brush projection reduces flexibility and conformability.
  - From the brush diameters shown in the table below, choose the brush diameter closest to but larger than the brush diameter you are using. For example, if your custom tool is  $\phi 50$ , refer to the information for  $\phi 60$  in the table.
- When doing so:
- Use a rotational speed lower than the maximum specified 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 projecting 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 (mm)	Bristle length (mm)	Maximum rotational speed (min <sup>-1</sup> )	Maximum brush projection (mm)
Pink (A13)	Red (A11)	White (A21)	Blue (A32)				
EB01S	EB01S			$\phi 1$	15	15000	-
EB01SS	EB01SS			$\phi 1.5$	15	15000	-
EB02S	EB02S			$\phi 2$	15	15000	-
EB02SS	EB02SS			$\phi 2.5$	15	15000	-
EB03M				$\phi 3$	30	6,000	-
	EB06M	EB06M	EB06M	$\phi 5$	20	12,000	-
CB06M	CB06M	CB06M	CB06M	$\phi 6$	30	10,000	10
CB15M	CB15M	CB15M	CB15M	$\phi 15$	50	6,000	15
	CB25M	CB25M	CB25M	$\phi 25$	75	5,000	20
	CB40M	CB40M	CB40M	$\phi 40$	75	3,000	20
	CB60M	CB60M	CB60M	$\phi 60$	75	2,000	20
	CB100M	CB100M	CB100M	$\phi 100$	75	1,200	20

### Adjustment of bristle length, rotational speed, and the depth of cut

- As the length of the bristle becomes shorter as a result of use, the bristle stiffness increases, grinding power rises, and conformability decreases. Adjust the grinding power and conformability by reducing the rotational speed and the depth of cut.
- If burrs are not removed, increase the rotational speed and the depth of cut.
- If excessive removal occurs, reduce the rotational speed and the depth of cut.

### Truing, dressing

If the grindstone shape became deformed as a result of use, rotate the tool while gently pressing the head part onto a diamond disc blade to correct the shape.

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

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