XEBEC Brush™ Surface Instruction Manual

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.

SAFETY PRECAUTIONS

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.
- 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 the brush does not become hot. Also be careful not to touch the locations being processed directly with bare hands after use.

NOTICE

As a result of the above, there is also the risk of damage to machines, 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.
- In particular be careful that children do not enter the work area.
- 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.

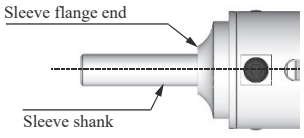
Precautions for Use

Installation onto a machining center or other machine

- 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 perform washing.

⚠ **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 installing, use a chuck that is correct for the shank diameter.
- Install and use on machining 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 ø60 and must be 6.0 kW for brush diameters of ø100.



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 remove burrs and finish 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

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 of 1 mm or less.
- With a brush diameter of φ6 (CB06M), the depth of cut for A11, A21 and A31 should be 0.5mm or less, and that of A32 should be 0.3mm or less.

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 brush shape deforms as a result of use, rotate the brush while gently pressing it onto an diamond disc blade to correct the shape.

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 ø5 or less.
- A longer amount of brush projection increases flexibility and conformability, while a shorter amount of brush projection reduces flexibility and conformability.
- Use within the ranges for rotational speed and brush projection shown in the table below.

Product code / Bristle color					Brush diameter (mm)	Bristle length (mm)	Maximum rotational speed (min^{-1})	Maximum brush projection (mm)
Pink (A13)	Red (A11)	White (A21)	Blue (A31)	Blue (A32)				
EB01S	**EB01S**				φ1	15	15000	-
EB015S	**EB015S**				φ1.5	15	15000	-
EB02S	**EB02S**				φ2	15	15000	-
EB025S	**EB025S**				φ2.5	15	15000	-
EB03M					φ3	30	6000	-
	EB06M	**EB06M**			φ5	20	12000	-
CB06M	**CB06M**	**CB06M**	**CB06M**	**CB06M**	φ6	30	10000	10
CB15M	**CB15M**	**CB15M**	**CB15M**	**CB15M**	φ15	50	6000	15
	CB25M	**CB25M**	**CB25M**	**CB25M**	φ25	75	5000	20
	CB40M	**CB40M**	**CB40M**	**CB40M**	φ40	75	3000	20
	CB60M	**CB60M**	**CB60M**	**CB60M**	φ60	75	2000	20
	CB100M	**CB100M**	**CB100M**	**CB100M**	φ100	75	1200	20

"EB": Sleeve is Not required.
"CB": Sleeve is required.

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

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