XEBEC Brush™ Wheel Type 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.**
- **If either the rotational speed or depth of cut 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 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.**

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. (Also wear personal protective equipment when using the brush in a machining center, etc.)

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.

Precautions for Use

Installation onto a machining center or other machine

⚠ WARNING **Ensure attachment of the shank to the brush main unit is done properly.**
Machining while attachment is not done properly presents the risk of damage to machining equipment, jigs, and workpieces and operator loss of sight or injury resulting from the brush detaching, breaking, or fracturing.

⚠ WARNING **When installing the main unit onto machining equipment, insert the shank by 30 mm or more and chuck firmly.**
Machining while the chucking allowance of the shank is less than 30 mm or when chucking is not done properly presents the risk of damage to machining equipment, jigs, and workpieces and operator loss of sight or injury resulting from the shank detaching, breaking or fracturing.

- 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.
- Use only the dedicated shank.
- When installing, use a chuck that is correct for the shank diameter.
- Use only the dedicated fastening screw to attach the shank.

Features

- CNC deburring can be achieved by installing onto a machining center, robot, drilling machine, or other machining equipment.
- The tip of the bristle removes burrs and finishes the edges. After cutting process, this product removes burrs with the burr root thickness of 0.1mm or less.
- The original brush material (ceramic fibers) enables consistent deburring and polishing capability without changes to the cutting performance or brush shape.
- The product can be used for both dry and wet machining.

Attaching the Shank to the Brush Main Unit

1. Match the end of the dedicated shank with the hole in the brush main unit, then push the dedicated shank to the very back of the hole.
2. Use the fastening screw (supplied) to fasten the brush main unit and the dedicated shank.

- Tightening torque: 1.5 [N m]
- Use a hexagonal wrench (optional) to tighten the fastening screw.
- Damage to the brush main unit may result if it is tightened too much.

How to Use

Use on machining equipment that can control the rotational speed and the depth of cut.

Maximums for processing conditions

Values for the standard product are included here as a reference for the maximum for each processing condition. 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.

- From the cutting speeds shown in the table below, calculate the rotational speed to suit the brush diameter you are using.
  [Formula for calculation]
  Rotational speed = cutting speed × 1000 ÷ (π × brush diameter)
- Adjust the cutting speed so that the maximum rotational speed of 3000min-1 is not exceeded.

Maximum cutting speed (m/min)	Maximum rotational speed (min^{-1})	Maximum feed per bundle (mm/bundle)	Maximum depth of cut (mm)
350	3000	1.5	0.5

Initial processing conditions

Values for the standard product are included here as references for each of the processing conditions. 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.

- From the cutting speeds and feed rates shown in the table below, calculate the rotational speed and feed speed to suit the brush diameter and bundle count you are using.
  [Formula for calculation]
  Rotational speed = cutting speed × 1000 ÷ (π × brush diameter)
  Feed speed = rotational speed × feed rate × bundle count
- If burrs are not removed, adjust the processing conditions. keeping them under the maximums.

Cutting speed (m/min)	Feed per bundle (mm/bundle)	Depth of cut (mm)
250	0.5	0.2

Appropriate rotational speed, depth of cut

- The product is most effective when machining with the tip of the bristle.
- If used with an excessive rotational speed or depth of cut, there will be significant progress of wear and breakage of the bristles, resulting in shorter brush life.
- As the length of the bristle becomes shorter as a result of use, bristle stiffness increases and this means that bristles can break easier. Furthermore, there is a tendency for grinding power to rise and conformability to decrease. Adjust the grinding power and conformability by reducing the rotational speed and the depth of cut.
- The length of the bristles will reduce with use, so maintain a constant depth of cut with the cutter radius offset.

Appropriate feed per bundle

- If burrs are not removed, reduce the feed per bundle by 10% to 20% at a time.
- To increase the tool life, increase the feed per bundle by 10% to 20% at a time.

Truing, dressing

If the brush shape deforms as a result of use, correct the shape by gently pressing the brush tip onto a diamond disc blade while rotating the brush.

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

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