

XEBEC Stone™ Flexible Shaft Instruction Manual (Overall length over 150 mm to 220 mm)

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 equipment, failure or detaching of the grindstone part, 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 equipment, failure or detaching of the grindstone part, 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 failure or detaching of the grindstone part. 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 this product detaching from the processing equipment, failure or detaching of the grindstone part, parts breaking, etc., if a tool not suitable to the hole diameter is used, such as if the grindstone diameter is too small, etc.
- 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 this product detaching from the machining apparatus, failure or detaching of the grindstone part, parts breaking, etc.
- If either the rotational speed or bending displacement exceeds the maximum (the reference value for bending displacement is 5mm), there is the risk of operator loss of sight or injury resulting from this product detaching from the machining apparatus, the grindstone part breaking off, parts fragmenting, 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. 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. When doing this, start rotation with the product tip inserted into a bore with a diameter of $\phi 20$ mm or less.

Precautions for Use

Starting and stopping rotation

WARNING

When starting work, insert the product tip 30 mm or more into a bore with a diameter of $\phi 20$ mm or less, then start rotation with the product lightly touching the target location. Also, when stopping work, make sure rotation has stopped completely while the tool tip is still inside the bore. If rotation is started with the product tip outside of the hole, the shaft may swing greatly, and this can result in the head or shaft breaking. There is the risk that this may cause operator loss of sight or injury.

Installation onto processing equipment and rotary tools

WARNING

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

- When used in a machining center, etc., abrasive material and cutting particles that occur during work can fly into the sliding parts of the device. Use a dust collector, etc., to collect dust and make sure the device is clean. If the dust is not collected properly and the device is not clean while the device is being used, there is a possibility that abrasive material and cutting particles from this product can have an adverse effect on the machine tool.
- 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.
- This product cannot be used with pneumatic tools.

Features

- Effective for deburring crossholes after drilling and cutting process.
- This tool can be used with a machining center or hand tool.
- The head part uses a ceramic grindstone that produces cutting edges on the entire surface.
- The flexible shaft allows for soft contact with the workpiece. This also reduces vibration of the grindstone.



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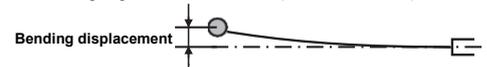
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How to Use

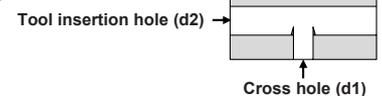
- Values for the standard product are included here as a reference for the maximum rotational speed and the maximum bending displacement. As these values can only be considered reference points, the user should take it upon themselves to set their own conditions, testing the product starting with conditions that produce the least load, with due consideration for safety.
- This product is optimal for removal of post-machining fine burrs with a burr root thickness of 0.2 mm or less.

Maximum bending displacement

- The tool should be lightly applied to the workpiece with the bending displacement below 5mm (the reference value).



Definitions of crossholes with this product



Maximum rotational speed

- The values in the table below are for reference only.

Head diameter	Usable machining hole diameters (mm)		Maximum rotational speed (min ⁻¹)
	d2	d1	
$\phi 3$	$\phi 3$ to 20	$\phi 3$ or less	1000
$\phi 4$	$\phi 4$ to 20	$\phi 4$ or less	
$\phi 5$	$\phi 5$ to 20	$\phi 5$ or less	
$\phi 6$	$\phi 6$ to 20	$\phi 6$ or less	

- Use the correct tool for the target machining hole diameter.
- The recommended rotational speed will deliver sufficient grinding performance and suitable conformability, producing high processing efficiency and good finish quality.

Selecting the head size

When inserting from the tool insertion hole, select a head that is slightly larger than the crosshole diameter. If a smaller head is used, the product may enter into the crosshole, causing damage to the product.

Dry and wet machining

This tool can be used for both dry and wet machining, however wet machining prevents clogging and improves machining efficiency.

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.