

XEBEC Stone™ Flexible Shaft Instruction Manual (OAL 150mm)

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 apparatus, failure or detaching of the grindstone part, workpieces breaking, etc.
- Fragments, grinding 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 apparatus, 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 apparatus, 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 tip of the tool 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 the amount of bending displacement exceeds the upper limit of the use (the amount of bending displacement is 5 mm), there is the 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.

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

Be sure to wear personal protective gear including goggles, masks, gloves, and earmuffs to prevent injuries common during machining. 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 grinding particles

Fragments, grinding 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 is changed, and check that there is no looseness, vibration, or other abnormality of the machine and the part where the product is installed. Start rotating the tool while the head part is inserted into the hole of $\phi 20\text{mm}$ or less.

Precautions for Use

Start and stop rotation

⚠ Before starting the work, insert the head part into a hole diameter 20 mm or less with the depth of 30 mm or more. Lightly press the tool against the workpiece and start rotation. Before removing the tool out of the cylinder, ensure to stop the tool rotation while the head part is inserted into the cylinder.

Rotating the tool outside the cylinder may cause significant vibration of the shaft and break off the head and shaft parts. This may cause the risk of operator loss of sight or injury.

Installation onto processing equipment and rotary tools

⚠ **WARNING:** When installing onto processing equipment, grip the tool shank by 30mm 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 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.

Features

- Point processing can be used to remove burrs occurring at the crosshole after cutting.
- 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.

How to Use

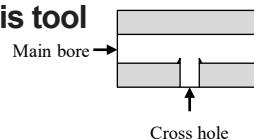
This product is optimal for removal of post-machining fine burrs with a burr root thickness of 0.2 mm or less.

Upper limit of the bending displacement amount

- Lightly press the tool against the workpiece and do not exceed the amount of bending displacement of 5 mm.



Definitions of crosshole and burrs with this tool



Maximum rotational speed/

Recommended rotational speed

- Use within the range shown below.
- 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.

Head diameter	Product code	Usable machining hole diameters (mm)		Maximum rotational speed (min ⁻¹)
		Main bore	Cross hole	
$\phi 3$	CH-PM-3B-L	$\phi 3-20$	$\phi 3$ or less	1000
$\phi 4$	CH-PM-4B-L	$\phi 4-20$	$\phi 4$ or less	3000
$\phi 5$	CH-PM-5B-L	$\phi 5-20$	$\phi 5$ or less	
$\phi 6$	CH-PM-6B-L	$\phi 6-20$	$\phi 6$ or less	
$\phi 10$	CH-PM-10B-L	$\phi 10-20$	$\phi 10$ or less	2000

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.

Selecting the head size

When inserting from the main bore, select a head that is slightly larger than the crosshole diameter. If a smaller head is used, the product may enter into the cross hole, 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.

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



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