

XEBEC Brush™ Surface Extra-Large 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.

Features

- After cutting process, this product removes burrs with the burr root thickness of about 0.2 mm. 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 and brush shape.
- The abrasive material is ceramic fiber that contains no abrasive grains at all.

This document may also be viewed at
the below website:
https://www.xebec-tech.com/instruction_manual/



SAFETY PRECAUTIONS

Be sure to observe the methods described in this manual.

Using the product in ways inconsistent with the methods described in 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 machining 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 operators 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 machining equipments, bristles breaking off, workpieces breaking, etc.
- Do not use the product while exceeding the maximum rotational speed, depth of cut, or brush projection, as there is the risk of operator loss of sight or injury resulting from this product detaching from the machining equipment, 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 for the same locations being processed so that they do not become hot. Also be careful not to touch the locations being processed directly with bare hands after use.
- Use the slide ring (shank, base holder, ring) for XEBEC Brush Surface suitable to the applicable brush diameter. There is the risk of operator loss of sight or injury resulting from bristles breaking off, parts breaking, etc., if a slide ring not suitable to the applicable brush diameter is used.

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.
- 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:** When chucking, slide the shank onto the chuck of the machining equipment securely all the way to the base.

If not inserted all the way to the base when chucked, vibration during machining may cause this product to fall from the machining equipment.

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.
- 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.

How to Use

Truing, dressing

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



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Specifications

Tool configuration

Brush



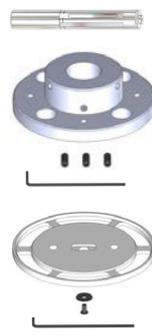
Accessories:

- Screws (M5 cap screw) x4
- Hexagonal hex wrench x 1

Product range

Brush diameter (mm)	Bristle (Color)	Product code
φ125	A11 (Red)	A11-CB125M
	A21 (White)	A21-CB125M
	A32 (Blue)	A32-CB125M
φ165	A11 (Red)	A11-CB165M
	A21 (White)	A21-CB165M
	A32 (Blue)	A32-CB165M
φ200	A11 (Red)	A11-CB200M
	A21 (White)	A21-CB200M
	A32 (Blue)	A32-CB200M

Slide ring



Shank (fits all sizes)

Base holder (fits all sizes)

Accessories:

- Screws (M5 set screw) x3
- Hexagonal hex wrench x 1

Ring (differs depending on the brush diameter)

Accessories:

- Screws (M5 extra low head cap screw) x1
- Flat washer x1
- Hexagonal hex wrench x 1

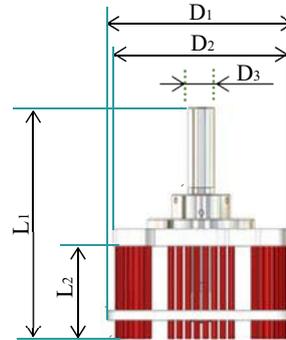
Product range

* The ring is a consumable. Replace when there is looseness where it is fitted, or if wear to the bristles becomes noticeable.

Brush diameter (mm)	Product code
φ125	SR125M
φ165	SR165M
φ200	SR200M

Dimensions

Brush diameter D ₂ (mm)	Overall length L ₁ (mm)	Bristle length L ₂ (mm)	Ring diameter D ₁ (mm)	Shank diameter D ₃ (mm)	Weight (g)
φ125	182 to 192	75	135	25	1920
φ165			176		2320
φ200			211		2750



Processing conditions

Initial processing conditions

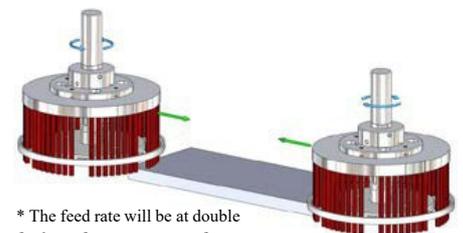
Brush diameter (mm)	Depth of cut (mm)					Rotational speed (min ⁻¹)			Feed rate (mm/min)		Brush projection (mm)	
	Vertical burr	Horizontal burr	Cutter mark removal	Polishing	Maximum	Recommended	Maximum	Burr root thickness (mm)		Cutter mark removal	Recommended	Maximum
								0.05	0.1			
φ125	0.5	1.0	0.5	0.3 to 0.5	1.5	800	1000	4000	2500	300	15	20
φ165	0.5	1.0	0.5	0.3 to 0.5	1.5	600	750	4000	2500	300	15	20
φ200	0.5	1.0	0.5	0.3 to 0.5	1.5	480	600	4000	2500	300	15	20

- Do not use the product while exceeding the maximum rotational speed, depth of cut, or brush projection.
- The product is most effective when machining with the tip of the bristle.
If used with an excessive depth of cut or grinding load, the intended effects of the tool will not be achieved and there will be significant progress of wear and breakage of the fiber material, resulting in shorter tool life.
- A slide ring is fitted to the brush in order to slide the base holder to adjust the brush projection and adjust the flexibility and conformability.
A longer amount of brush projection increases flexibility and conformability, while a shorter amount of brush projection reduces flexibility and conformability.

Guide to adjustments

Situation	Deburring	Cutter mark removal and polishing
If burrs and cutter marks are not completely removed	<ul style="list-style-type: none"> ● While remaining aware of the maximum rotational speed, increase the rotational speed by 25% each. ● Reduce the feed rate by 10 to 20% each. 	<ul style="list-style-type: none"> ● Increase the number of passes. ● While remaining aware of the maximum rotational speed, increase the rotational speed by 25% each.
If burrs and cutter marks are removed but the edge is too rounded	<ul style="list-style-type: none"> ● Reduce the rotational speed by 25% each. ● Increase the feed rate by 10 to 20% each. 	<ul style="list-style-type: none"> ● Reduce the rotational speed by 25% each. ● Increase the feed rate by 20 to 40% each.
To increase the tool life		
If burrs and cutter marks are removed but the brush is worn unevenly	<ul style="list-style-type: none"> ● Double the feed rate and process in return passages ● Process with reverse rotation of the brush on the return path (Refer to the figure at right) 	

Brush reverse rotation Forward brush rotation



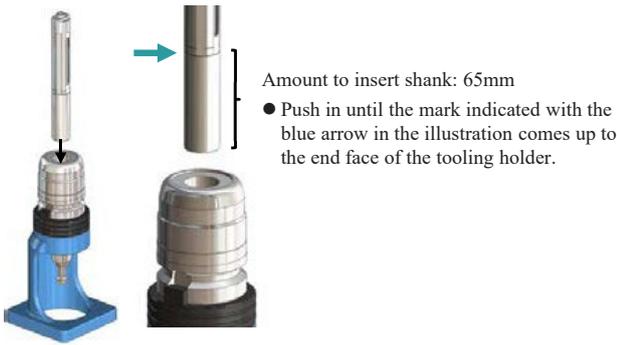
* The feed rate will be at double feed rate for one passage of a path one way.

Figure: When there is uneven wearing

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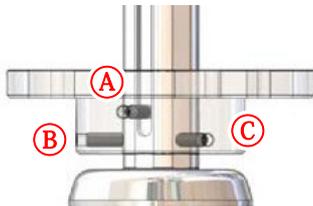
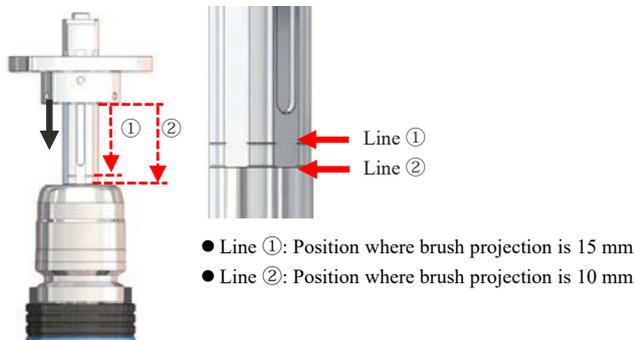
Assembly

- ① **Firmly fix** the shank in the tooling holder.



- ② **Push the base holder into the shank, then firmly fix** using screws (accessories: M5 set screws x3).

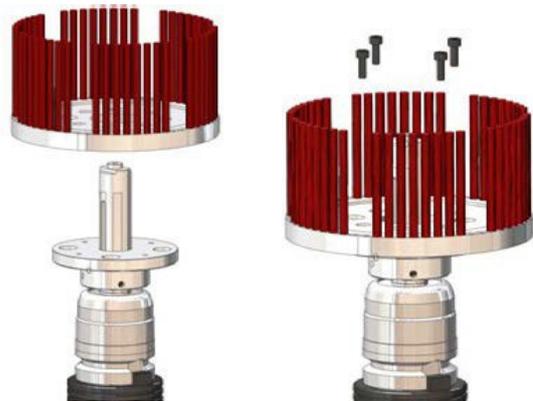
- When installing a new brush, you can set to the specified brush projection by matching the shank line to the position of the lower end face of the base holder.



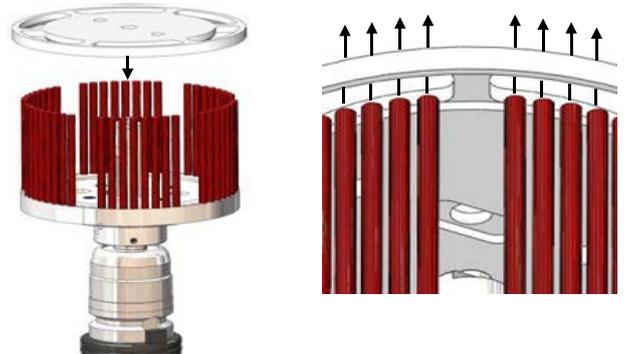
- Fix the 3 locations in the above figure with screws.

1. Push the position A screw all the way to the back of the groove in the shank to fix it.
2. Next insert the screws into positions B and C, pushing against the flat parts of the shank to fix them in place.

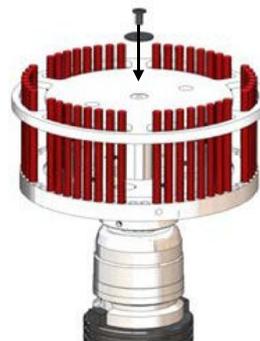
- ③ **Push the brush into the shank, then firmly fix** to the base holder using screws (brush accessories: M5 cap screws x4).



- ④ **Pass the bundles of bristles through the slotted holes on the ring, and match the center of the ring with the flat section on the end of the shank.**



- ⑤ **Use the screw (accessories: M5 extra low head cap screw and flat washer) to firmly secure** the ring.



Adjusting the brush projection from the ring

1. Loosen the screws (M5 set screws x3) fixing the base holder to the shank in Step ② of "Assembly", adjust the brush projection, and **firmly fix** using the screws.
2. As shown in the below figure, after fixing position A, fix position B and C.

