XEBEC

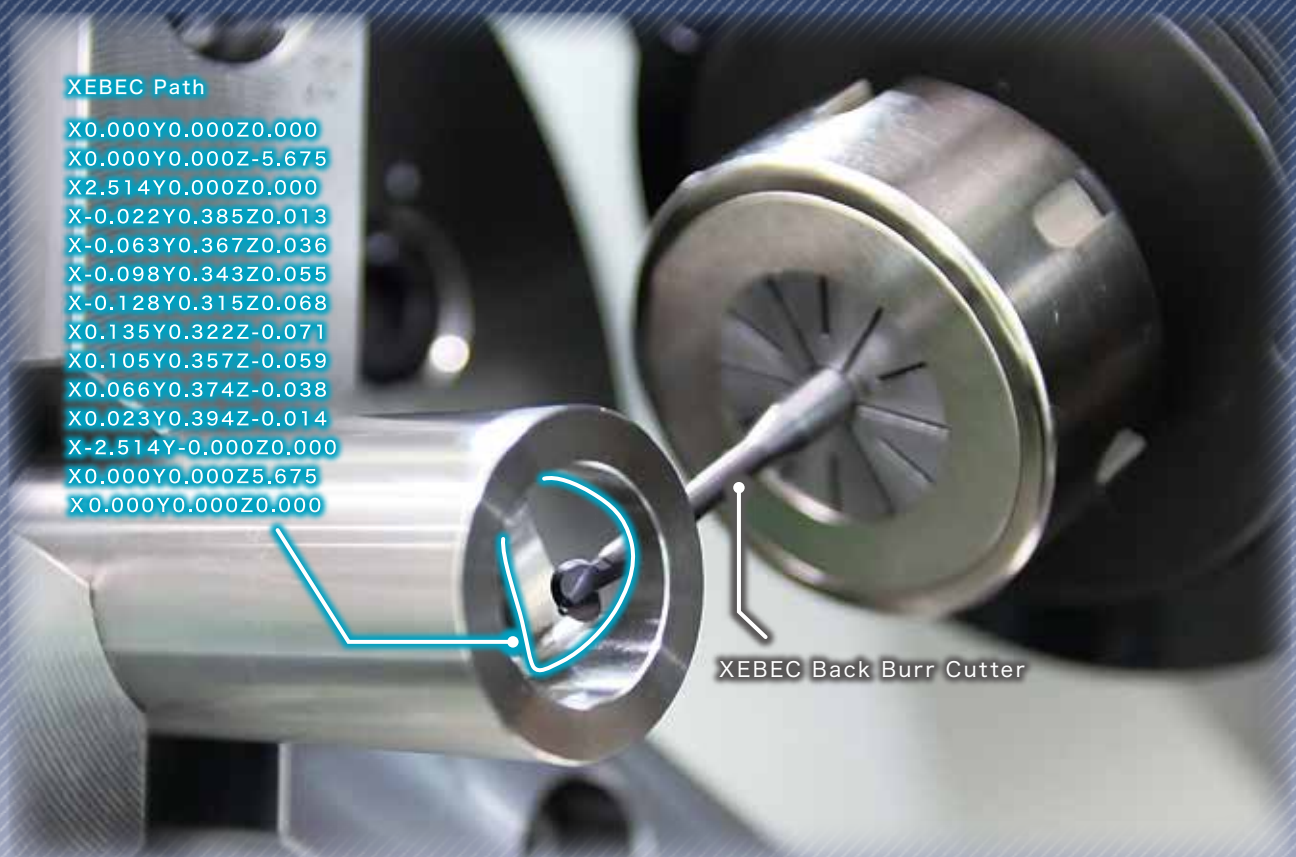## XEBEC Back Burr Cutter and Path™

The reliable CNC back deburring tool with innovative path data

The XEBEC Path plots point data to remove back burrs on a 3D curved edge while shifting the contact point of the spherical cutting edge.

XEBEC Path
X0.000Y0.000Z0.000
X0.000Y0.000Z-5.675
X2.514Y0.000Z0.000
X-0.022Y0.385Z0.013
X-0.063Y0.367Z0.036
X-0.098Y0.343Z0.055
X-0.128Y0.315Z0.068
X0.135Y0.322Z-0.071
X0.105Y0.357Z-0.059
X0.066Y0.374Z-0.038
X0.023Y0.394Z-0.014
X-2.514Y-0.000Z0.000
X0.000Y0.000Z5.675
X0.000Y0.000Z0.000

XEBEC Back Burr Cutter

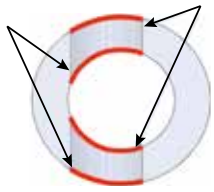**Feature1** / *Uniform edge shape by consistent deburring amount*

Feature2 / *Faster operating time thanks to the unique cutter design*

Feature3 / *Long tool life by using the entirety of the cutting blade*

XEBEC® TECHNOLOGY CO.,LTD.

Applicable Areas

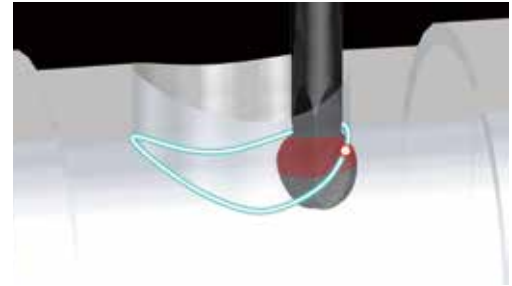| Four edges are processed in one approach	Up to the ratio between the primary and secondary hole is 1:1	Off-center hole	Planar hole

Features of XEBEC Back Burr Cutter and Path

■ XEBEC Path

● **Uniform edge shape** by consistent deburring amount

Stainless Steel	BEFORE	▶	AFTER

Range of Blade Use

● **Faster operating time** thanks to the unique cutter design

● **Long tool life** by using the entirety of the cutting blade

■ XEBEC Back Burr Cutter

● Micro-grain cemented carbide: Sharp and long lasting

● Highly heat-resistant AlTiCrN coating: Support materials from non-ferrous (e.g. aluminum) to difficult-to-cut materials (e.g. titanium and inconel)

● Helical Blade: Clearner cutting edge and prevent secondary burrs

Content of XEBEC Path

● Path data is provided by the set as shown in Figure 1 through 3.
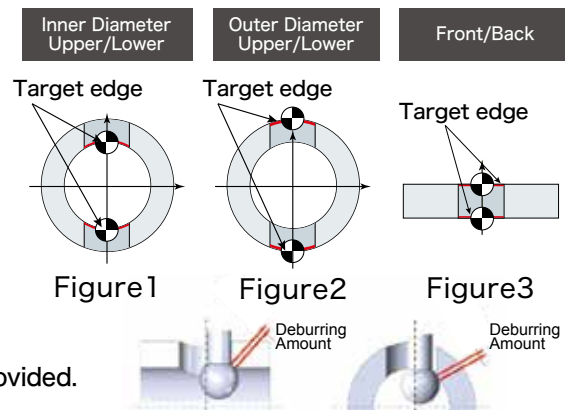
● Point group data is generated based on ◕.

● Optimal path data is generated by XEBEC's innovative software.
For use in machining center, 1 set of path data consists of 40 kinds of paths ; 2 edges (upper and lower), 2 modes (incremental and absolute) and 2 rotation directions (up and down).
For each of the 8 types, 5 deburring amounts are provided.
1 CD contains 1 set of path data.
For use in combined lathe, 20 (xyz axis) and 10 (xzc axis) files are provided.

Inner Diameter Upper/Lower — Target edge — Figure1

Outer Diameter Upper/Lower — Target edge — Figure2

Front/Back — Target edge — Figure3

Deburring Amount

Product Code	Cutter Diameter (mm)	Deburring Amount（mm）					Allowable Cumulative Error（mm）
		（1）	（2）	（3）	（4）	（5）	
XC－08－A	φ0.8	0.02	0.04	0.06	0.08	0.10	0.03
XC－13－A	φ1.3	0.04	0.06	0.08	0.10	0.12	0.05
XC－18－A/B	φ1.8	0.07	0.09	0.11	0.13	0.15	0.08
XC－28－A/B	φ2.8	0.08	0.11	0.14	0.17	0.20	0.10
XC－38－A/B	φ3.8	0.09	0.13	0.17	0.21	0.25	0.12
XC－48－A/B	φ4.8	0.10	0.15	0.20	0.25	0.30	0.15
XC－58－A/B	φ5.8	0.10	0.15	0.20	0.25	0.30	0.18

Specifications

【Regular type(XC-OO-A)】

【Straight type(XC-OO-B)】
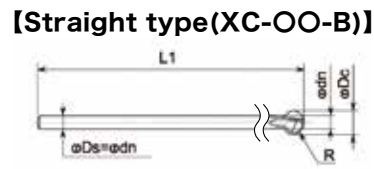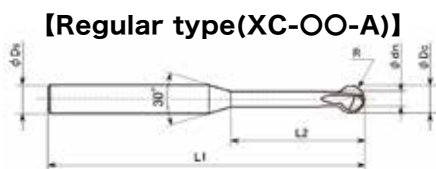
Product Code	R (mm)	φDc (mm)	φdn (mm)	L2 (mm)	L1 (mm)	φDs (mm)
XC−08−A	0.4	0.8	0.48	5	60	3.0
XC−13−A	0.65	1.3	0.78	8	60	3.0
XC−18−A	0.9	1.8	1.1	10	60	3.0
XC−28−A	1.4	2.8	1.7	15	70	4.0
XC−38−A	1.9	3.8	2.4	20	70	4.0
XC−48−A	2.4	4.8	3.0	25	70	6.0
XC−58−A	2.9	5.8	3.5	30	70	6.0
XC−18−B	0.9	1.8	1.1	——	50	1.1
XC−28−B	1.4	2.8	1.7	——	70	1.7
XC−38−B	1.9	3.8	2.4	——	85	2.4
XC−48−B	2.4	4.8	3.0	——	105	3.0
XC−58−B	2.9	5.8	3.5	——	120	3.5

《Attention》

1. This cutter is an exclusive tool for NC machines. Never use it as a hand tool because the cutter may break and cause an injury.
2. Processing with a cutter with the wrong size may cause breakage of the product, tools, or machinery. Make sure to verify the dimensions before use.
3. Make sure that the run-out of the cutting edge is less than 0.01mm before starting processing.

Standard Processing Conditions

Product Code	Feed per rev (fn) (mm/rev)	Spindle Speed (n) (min⁻¹)	Table Feed (Vf) (mm／min)
XC−08−A	0.03	43000	1300
XC−13−A	0.03	27000	800
XC−18−A	0.03	19500	580
XC−28−A	0.08	12500	1000
XC−38−A	0.13	9200	1200
XC−48−A	0.15	7200	1100
XC−58−A	0.15	6000	900
XC−18−B	0.05	9700	480
XC−28−B	0.10	6200	620
XC−38−B	0.10	4600	460
XC−48−B	0.10	3600	360
XC−58−B	0.10	3000	300

1. The spindle speed and table feed are rough standards for initial processing.
2. If an abnormal vibration or noise occurs, or the spindle speed and/or table feed fail to meet the standard conditions listed in the table, lower the spindle speed and table feed at an equal rate.

Precautions

● Can be mounted on machining center (XYZ-axis) and combined lathe (XZY or XZC-axis).
● Please use while making the processing error of the hole position as small as possible.

XEBEC Back Burr Cutter and Path Order Code Request Sheet
(Type B : For Inner Diameter Upper and Lower Edges)

MBP-03

XEBEC TECHNOLOGY CO.,LTD.

This sheet is used to confirm the dimensions of deburring areas and to confirm whether or not point group data (Name : XEBEC Path for Back Burr Cutter) can be generated. If a path can be generated then the path order code and optimal cutter diameter will be notified to a customer.

1. Deburring Location

This sheet is for **edges on the inner diameter of the orthogonal crossholes, being processed with a 3-axis simultaneous control machining center (XYZ-axis).** Make sure that the sheet type matches the locations that burrs will be removed.

Type B Inner Diameter Upper/Lower Edges +Z

― : Burr locations
↓ : Cutter direction

[Restrictions for generating a path]

Orthogonal Crosshole | Supports secondary hole diameter of Φ1mm or more
The primary processing hole diameter to secondary hole diameter can be up to 1:1

Off-center Crosshole | Supports secondary hole diameter of Φ1mm or more
Supports an amount of shift that does not cause the primary hole to be broken.

* This process is not applicable if either the primary or secondary hole is a female screw or the material surface.
* There is the possibility a path cannot be generated for certain hole combinations.

[Caution]

Make sure to enter accurate values. The XEBEC Path for Back Burr Cutter is generated based on these values and if any erroneous values are entered, an incorrect path will be generated which will cause the workpiece, cutter or machine to break.
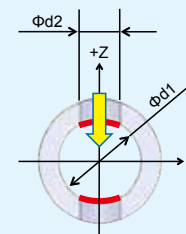XEBEC Technology is not responsible for any damage caused in cases such as this.

Orthogonal or off-center crosshole
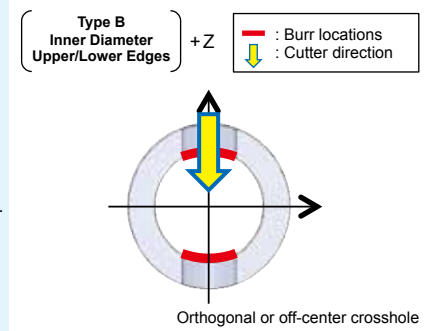
▼ Enter the dimensions in the boxes below.

*Fill in all spaces. For "0", enter "0".
*Enter up to the 3rd decimal. *Circle whether + or -.

2. Hole Diameters

Φd2
+Z
Φd1

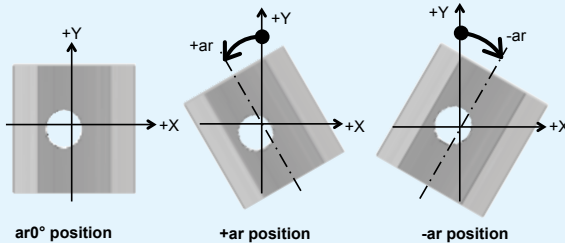― : Burr locations
↓ : Cutter direction

➤ **Primary hole (φD1)**

☐☐.☐☐ mm

➤ **Secondary hole (φd2)**

☐☐.☐☐ mm

3. Primary Hole Position

Check the position of the primary hole to an XY plane in the machine. Enter the angle of the **primary hole in regards to the Y axis.**
Be careful of the +/- direction.

+Y / +X — **ar0° position**

+ar +Y / +X — **+ar position**

+Y / -ar / +X — **-ar position**

[Primary hole's relationship with the Y axis]

If parallel to the Y axis : ar=0°
Orientation in the CCW direction with the +Y axis as the starting point : ar=+☐°
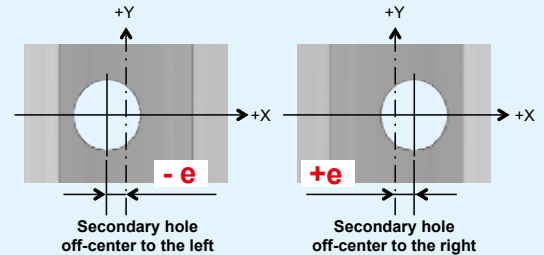Orientation in the CW direction with the +Y as the starting point+ar=- ☐°

➤ **Primary hole angle orientation ar**
*Check the box ☑

☐+ ☐− ☐☐.☐☐ °

4. Secondary Hole Position

Enter the position of the secondary hole in regards to the primary hole in the ar0° position.
Be careful of the +/- direction.

+Y / +X **- e**
Secondary hole off-center to the left

+Y / +X **+e**
Secondary hole off-center to the right

[Secondary hole's relationship with the primary hole]

If the secondary hole is on-center to the primary hole: e=0mm
If the secondary hole is off-center to the left of the primary hole: e=-☐mm
If the secondary hole is off-center to the right of the primary hole: e=+☐mm

➤ **Amount of shift e**
*Check the box ☑

☐+ ☐− ☐☐.☐☐ mm

Customer Information and Confirmation of Path Use Conditions

Please check the boxes. An order cannot be placed unless the following boxes are filled out.

☐ **I agree to not use any tools besides the XEBEC Back Burr Cutter when using the XEBEC Path.**
☐ **I agree that XEBEC Technology has granted the authority to use the XEBEC Path for Back Burr Cutter and that I will not hand over or distribute this data outside the company.**
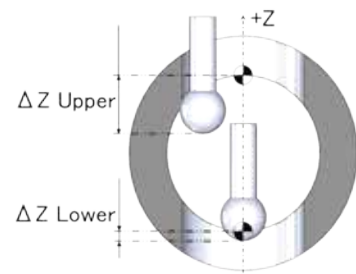
Company Name

Dept.

Name

Phone:

E-mail

(FAX)

▼Only for XEBEC Technology.▼ Order Code Contact Sheet

XEBEC Technology will inform the order code for the XEBEC Path and tool diameter of the XEBEC Back Burr Cutter based on the workpiece dimensions filled in the Order Code Request Sheet.
Please order with the following order code after confirming the path use conditions and tool interference.

XEBEC Path Order Code No.	
△ Z Upper（mm）	
△ Z Lower（mm）	
XEBEC Back Burr Cutter Diameter	**Product Code**
φ	
Reason for disapproval (*Only if path generation is disapproved)	

+Z
Δ Z Upper
Δ Z Lower

[Caution]

• The tool interference in vertical direction has not been confirmed. Check the cutter length and ΔZ (maximum amount of descent), and make sure to confirm there is no tool interference from the processing environment (jig, holder, workpiece, etc.) Then select the appropriate cutter from the catalog.
• Only the optimal tool diameter is selected according to the workpiece dimensions filled in on the Order Code Request Sheet.
• ΔZ (maximum amount of descent) is the furthest the tool will fall from the starting point until the deburring operation is complete.

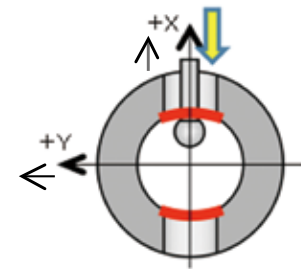## No. of sheets being submitted :   /

※Enter the number of sheets if more than one sheet will be submitted.
(e.g.) If three sheets will be submitted, mark the first as "1/3", the second "2/3" and the third "3/3".

This sheet is used to confirm the dimensions of deburring areas and to confirm whether or not point group data (Name : XEBEC Path for Back Burr Cutter) can be generated. If a path can be generated then the path order code and optimal cutter diameter will be notified to a customer.

1.Deburring Location

This sheet is for edges on an orthogonal crosshole, being processed with a 3-axis simultaneous combined lathe (XZY-axis). Make sure that the sheet type matches burr locations.

**Type BY
Inner Diameter
Upper/Lower Edges**

━ : Burr location
⬇ : Cutter direction

【**Restrictions for generating a path**】

Orthogonal Crosshole | Supports secondary hole diameter of Φ1mm or more
The primary processing hole diameter to secondary hole diameter can be up to 1:1

Off-center Crosshole | Supports secondary hole diameter of Φ1mm or more
Supports an amount of shift that does not cause the primary hole to be broken.

* This process is not applicable if either the primary or secondary hole is a female screw or the material surface.
* There is the possibility a path cannot be generated for certain hole combinations.

【**Caution**】
Make sure to enter accurate values. The XEBEC Path for Back Burr Cutter is generated based on these values and if erroneous values are entered, an incorrect path will be generated which will cause a workpiece, cutter or machine to break. XEBEC Technology is not responsible for any damage caused in cases such as this.

Orthogonal or off-center crossing

▼**Enter the dimensions in the boxes below.**
*Fill in all spaces. For "0", enter "0".
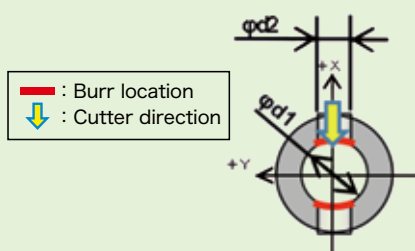*Enter up to the 3rd decimal. *Circle whether + or -.

2. Axial Composition

+X
+Y
+Z
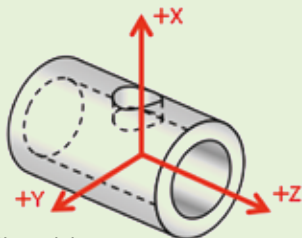
Check the axial composition and check the box on diameter or radius mode.

Point group data is generated at XZY-axis.

➢ **Controlling Mode**
*Check the box ☑

☐ Diameter mode
or
☐ Radius mode

3. Hole Diameters

━ : Burr location
⬇ : Cutter direction

φd2
φd1

*Enter an aimed value.

➢ **Primary hole (φd1)** [___ . ___] mm

➢ **Secondary hole (φd2)** [___ . ___] mm

4.Secondary Hole Position

Check the position of the primary hole at ZY-planar. Enter the position of the secondary hole in regards to the primary hole. Be careful of the +/- direction.

+Z   +Y   −e
+Z   +Y   +e

Secondary hole off-center to the left
Secondary hole off-center to the right

If the secondary hole is on-center to the primary hole: e=0mm
If the secondary hole is off-center to the left of the primary hole: e=-☐mm
If the secondary hole is off-center to the right of the primary hole: e=+☐mm

➢ **Amount of shift e**
*Check the box ☑
☐ +
☐ −
[___ . ___] mm

Customer Information and Confirmation of Path Use Conditions

Please check the boxes. An order cannot be placed unless the following boxes are filled out.
☐ I agree to not use any tools besides the XEBEC Back Burr Cutter when using the XEBEC Path.
☐ I agree that XEBEC Technology has granted the authority to use the XEBEC Path for Back Burr Cutter and that I will not hand over or distribute this data outside the company.

Company Name

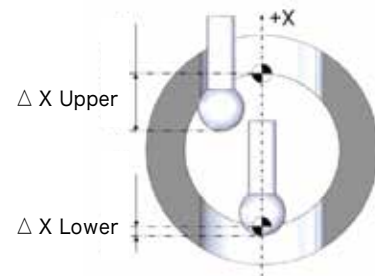Dept.

Name

Phone:

E-mail

(FAX)

▼**Only for XEBEC Technology.**▼   **Order Code Contact Sheet**

XEBEC Technology will inform the order code for the XEBEC Path and tool diameter of the XEBEC Back Burr Cutter based on the workpiece dimensions filled in the Order Code Request Sheet.
Please order with the following order code after confirming the path use conditions and tool interference.

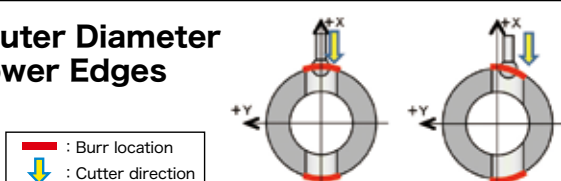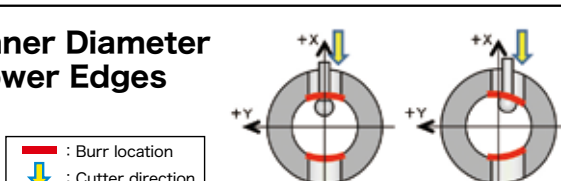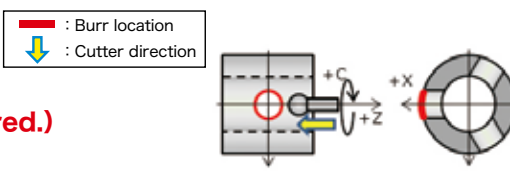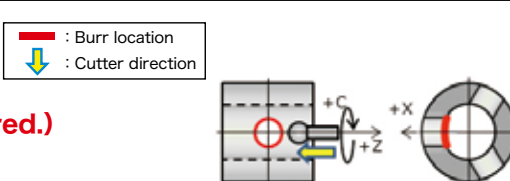|	
XEBEC Path Order Code No.	
△ X Upper (mm)	
△ X Lower (mm)	
XEBEC Back Burr Cutter Diameter	**Product Code**
φ	
Reason for disapproval (*Only if path generation isdisapproved)	

△ X Upper
△ X Lower
+X

【**Caution**】
• The tool interference in vertical direction has not been confirmed. Check the cutter length and ΔX (maximum amount of descent), and make sure to confirm there is no tool interference from the processing environment (jig, holder, workpiece, etc.) Then select the appropriate cutter from the catalog.
• Only the optimal tool diameter is selected according to the workpiece dimensions filled in on the Order Code Request Sheet.
• ΔX (maximum amount of descent) is the furthest the tool will fall from the starting point until the deburring operation is complete.
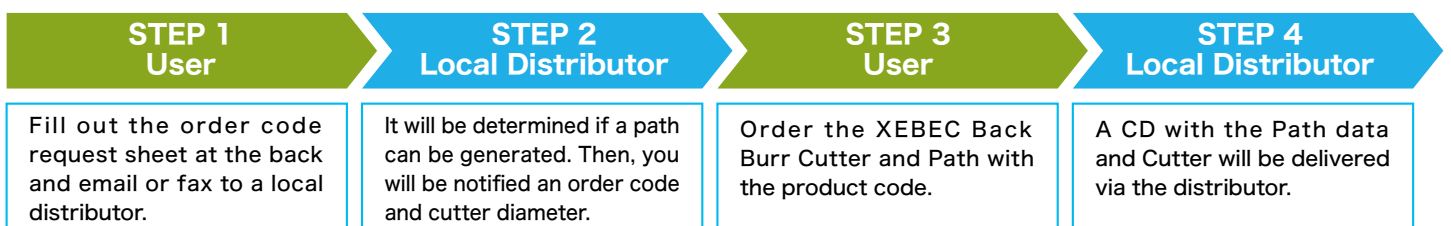
No. of sheets being submitted : _____ / _____

※Enter the number of sheets if more than one sheet will be submitted.
(e.g.) If three sheets will be submitted, mark the first as "1/3", the second "2/3" and the third "3/3".

XEBEC Path for Back Burr Cutter Corresponding Chart

Machine Type	Deburring Location		Order Code Request Sheet
3-Axis Simultaneous Control Machining Center (XYZ axis)	**■ Type A: Outer Diameter Upper and Lower Edges** ■ : Burr location ⬇ : Cutter direction		Website*
	■ Type B: Inner Diameter Upper and Lower Edges ■ : Burr location ⬇ : Cutter direction		Catalog or Website*
	■ Type C: Planar Hole Front and Back Edges ■ : Burr location ⬇ : Cutter direction		Website*
3-Axis Simultaneous Combined Lathe (XZY axis)	**■ Type AY: Outer Diameter Upper and Lower Edges** ■ : Burr location ⬇ : Cutter direction		Website*
	■ Type BY: Inner Diameter Upper and Lower Edges ■ : Burr location ⬇ : Cutter direction		Catalog or Website*
3-Axis Simultaneous Combined Lathe (XZC axis)	**■ Type AC: Outer Diameter** **(Polar coordinate interpolation required.)** Orthogonal or off-center crosshole	■ : Burr location ⬇ : Cutter direction	Website*
	■ Type BC: Inner Diameter **(Polar coordinate interpolation required.)** Orthogonal or off-center crosshole	■ : Burr location ⬇ : Cutter direction	Website*

*XEBEC Website http://www.xebec-tech.com

How to order

STEP 1 User	STEP 2 Local Distributor	STEP 3 User	STEP 4 Local Distributor
Fill out the order code request sheet at the back and email or fax to a local distributor.	It will be determined if a path can be generated. Then, you will be notified an order code and cutter diameter.	Order the XEBEC Back Burr Cutter and Path with the product code.	A CD with the Path data and Cutter will be delivered via the distributor.