Burrless chamfering with a patented, multi-blade, V-shaped design

XEBEC Burrless Chamfering Cutter™

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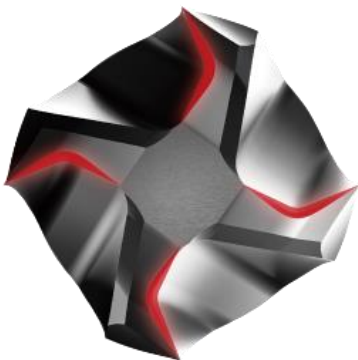
About XEBEC Burrless Chamfering Cutter

A chamfering tool that does not generate burrs and therefore eliminates the need for another deburring process. This helps reduce the cycle time and tool costs.
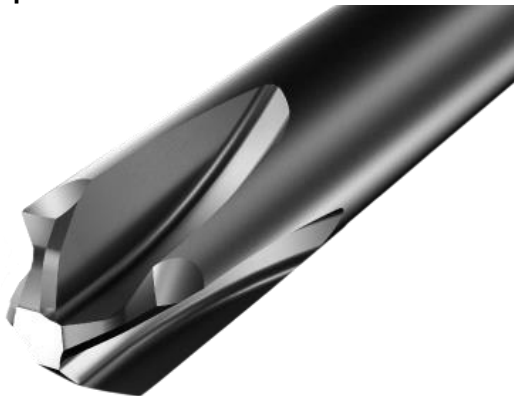
Features
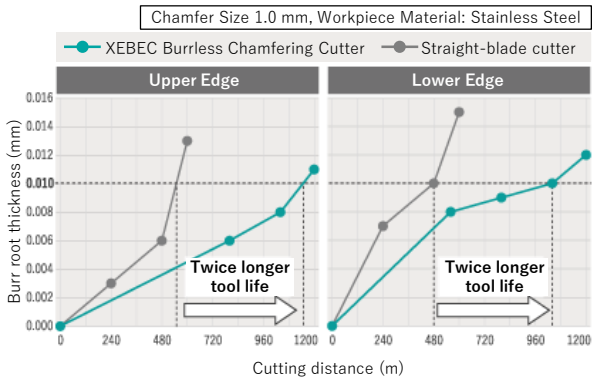
Patented V-shaped blade design

Unique design cuts a finished chamfer without secondary burrs. This eliminates the need for another deburring process.

Twice longer tool life than a conventional chamfering cutter

Chamfer Size 1.0 mm, Workpiece Material: Stainless Steel

XEBEC Burrless Chamfering Cutter — Straight-blade cutter

Upper Edge / Lower Edge

Burr root thickness (mm)

Twice longer tool life

Cutting distance (m)

Tests have shown that the tool life of this cutter is at least twice as long as that of a conventional chamfering cutter.

Multiple blades

Multi-blade design enables high feed rate. This reduces machining time for more efficient chamfering.
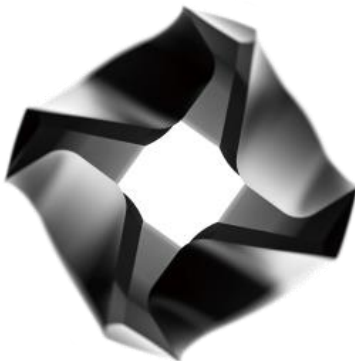
Flat tip

Ensures positional accuracy. The flat tip design prevents rounding and chipping that may cause tool length measurement errors.

Specifications

AlTiCrN coated

Applicable materials: Steel P, stainless steel M, cast iron K, heat resistant alloy S, nonferrous metal N

Product code	Chamfering alignment diameter Dc (mm)	Shank diameter Dcon (mm)	Overall length LF (mm)	Neck length L1 (mm)	Maximum depth of cut APMX (mm)	Cutting angle KAPR (°)	Number of blades	Target chamfering size	Suggested retail price (JPY)	Fig
XC-C-03-M	φ2	φ6	50	5	1	45	3	C0.3 - C0.6	6,700	1
XC-C-06-M	φ4	φ6	60	–	2	45	4	C0.7 - C1.5	7,200	2

Uncoated

Applicable materials: Nonferrous metal N, Plastic O

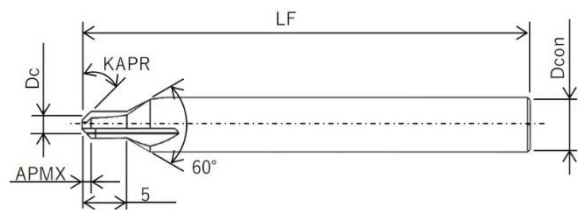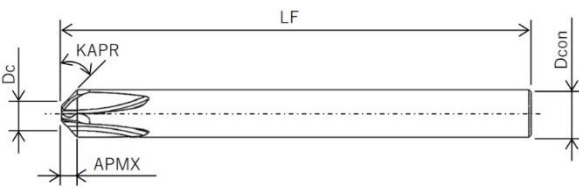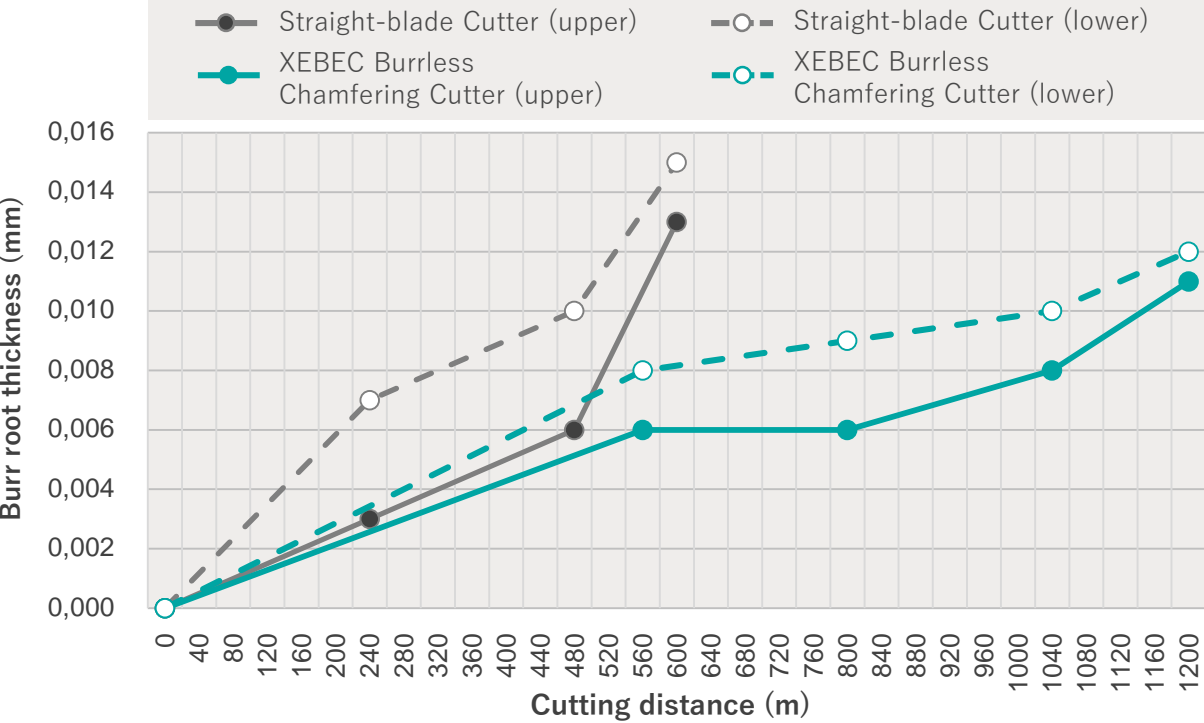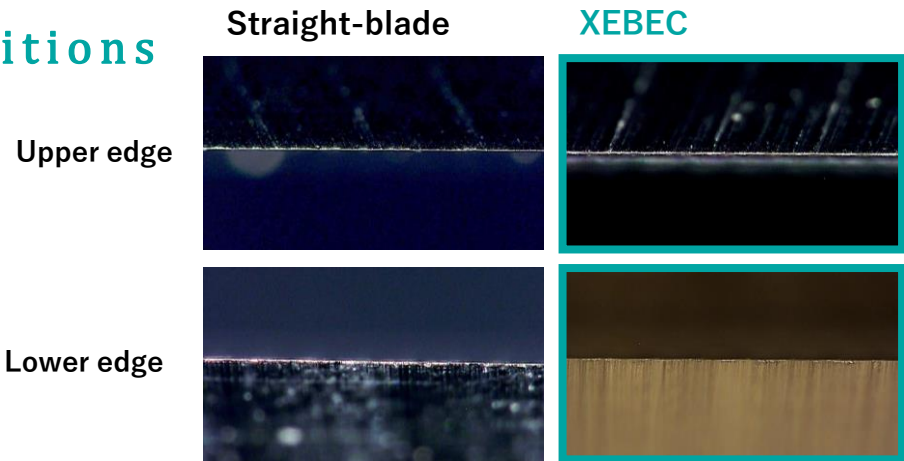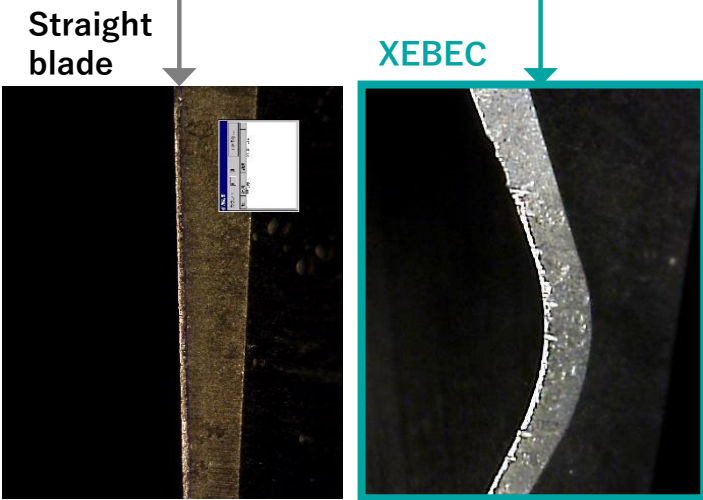| Product code	Chamfering alignment diameter Dc (mm)	Shank diameter Dcon (mm)	Overall length LF (mm)	Neck length L1 (mm)	Maximum depth of cut APMX (mm)	Cutting angle KAPR (°)	Number of blades	Target chamfering size	Suggested retail price (JPY)	Fig
XC-C-03-N	φ2	φ6	50	5	1	45	3	C0.3 - C0.6	6,500	1
XC-C-06-N	φ4	φ6	60	–	2	45	4	C0.7 - C1.5	7,000	2

Fig1

Fig2

XEBEC vs. Straight-blade Cutter
Upper Edge and Lower Edge

Legend:
- Straight-blade Cutter (upper)
- Straight-blade Cutter (lower)
- XEBEC Burrless Chamfering Cutter (upper)
- XEBEC Burrless Chamfering Cutter (lower)

Y-axis: Burr root thickness (mm)
X-axis: Cutting distance (m)

Edge Conditions

	Straight-blade	XEBEC
Upper edge		
Lower edge		
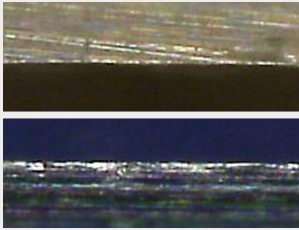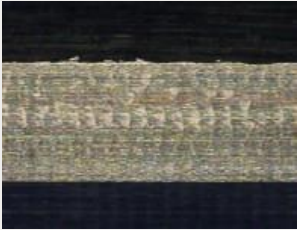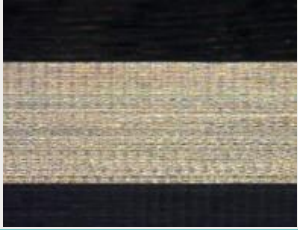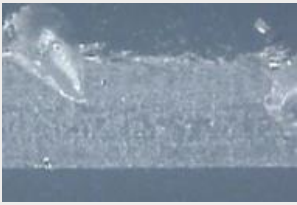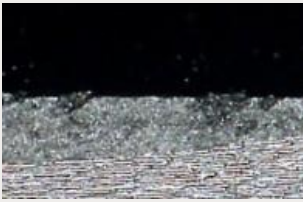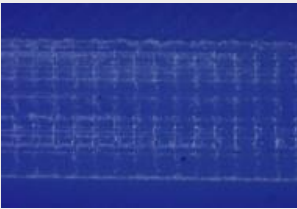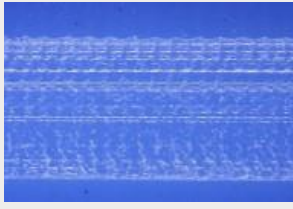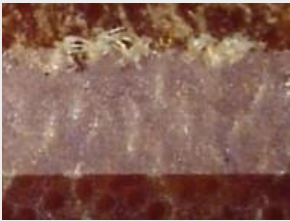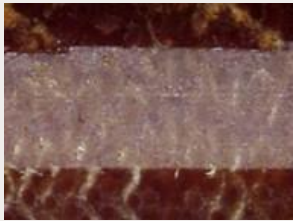
Blade Tip Conditions

	Straight blade	XEBEC

XEBEC vs. Straight-Blade Tool

Material	Straight blade	XEBEC
SUS404		
Aluminum		
PP		
CFRP		
MC nylon		
Fabric Bakelite		

*Photos of the workpiece edges taken when chamfered with the tool used for the same distance.
*Photos compare the workpiece edge conditions after the tools have been used for the same cutting distance.

How to use

Position this tool so that Dc (Chamfering Alignment Diameter) is aligned with the Chamfer Center Point. Dc (Chamfer Alignment Diameter) is the center of the V-shape indicated by the red dot below.

Chamfer Center Point

Chamfer Alignment Diameter (Dc)
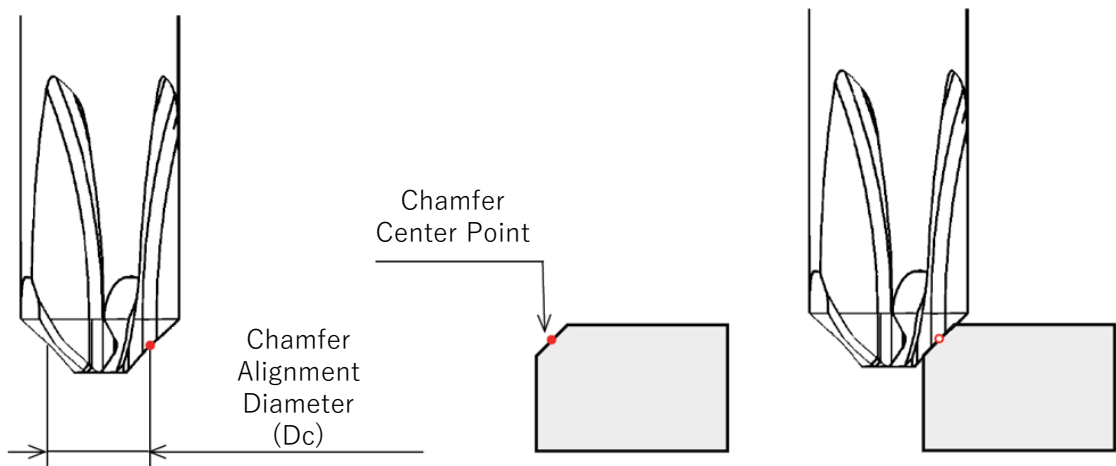
Chamfer Size Adjustment Chart

Create the machining program by referring to Offsets A and B in the table below for desired chamfer size. This ensures Dc (Chamfer Alignment Diameter) and the Chamfer Center Point are aligned properly.

Formulas for calculating Offsets A and B

- $A = (Dc-C)/2$
- $B = (APMX+C)/2$

C = Chamfering size
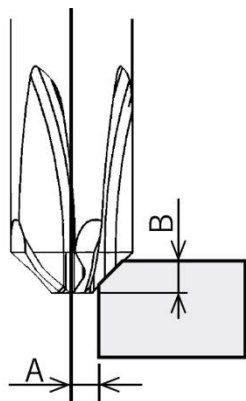
Chamfering Size	Offsets (mm)	
	A	B
C0.3	0.85	0.65
C0.4	0.8	0.7
C0.5	0.75	0.75
C0.6	0.7	0.8
C0.7	1.65	1.35
C0.8	1.60	1.40
C0.9	1.55	1.45
C1.0	1.50	1.50
C1.1	1.45	1.55
C1.2	1.40	1.60
C1.3	1.35	1.65
C1.4	1.30	1.70
C1.5	1.25	1.75

Machining Parameters

1. Rotational speed and feed rate are a guide for initial use.
2. To improve the machining result, take steps such as adjusting the rotational speed and feed rate, or try smaller chamfer sizes and increase them gradually to obtain the desired chamfer size.
3. If vibration or abnormal noise is detected, lower the rotational speed and feed rate, or try smaller chamfer sizes and increase them gradually to obtain the desired chamfer size.
4. If burrs are generated when machining plastics, maintain the feed per tooth at 0.07(mm/tooth) and use the same rotational speed as the tool you normally work with.

Product code: XC-C-03-M/N

Workpiece material	Steel	Stainless Steel	64 titanium	Inconel	Aluminum alloys	Plastics
Product code (coating)	XCXC-C-03-M (AlTiCrN)				XC-C-03-N (Uncoated)	
Cutting speed (m/min)	60 - 100	40 - 80	45 - 60	20 - 30	200 - 300	60 - 100
Rotational speed (min^{-1})	12000	9000	8000	4000	40000	12000
Feed rate (mm/min)	1800	1350	1200	600	6000	1800
Feed per tooth (mm/t)	0.05	0.05	0.05	0.05	0.05	0.05

Product code: XC-C-06-M/N

Workpiece material		Steel	Stainless Steel	64 titanium	Inconel	Aluminum alloys	Plastics
Product code (coating)		XC-C-06-M(AlTiCrN)				XC-C-06-N (Uncoated)	
Cutting speed (m/min)		60 - 100	40 - 80	45 - 60	20 - 30	200 - 300	60 - 100
Standard machining parameters for C1.0	Rotational speed (min^{-1})	6300	4800	4000	2000	20000	6300
	Feed rate (mm/min)	1260	960	800	400	4000	1760
	Feed per tooth (mm/t)	0.05	0.05	0.05	0.05	0.05	0.07

Applications

Burrless chamfering of fixturing jig

Holes were counter sunk and a belt sander was used on the circumferential edges for manual chamfering. However, these tools caused secondary burrs. By using XEBEC Burrless Chamfering Cutter, the chamfering time was reduced by 90% and the deburring process eliminated. This also resulted in tool cost reduction.

Workpiece category (Industry)	Jig used for aluminum ladders
Material	Aluminum
Tool	XC-C-06-N
Chamfering size	0.7
Machining conditions	S20000,F4000

## Burrless chamfering of machine tool component

It took about 5 minutes to remove secondary burrs from both front and back of the workpiece by hand with oil stone after chamfering. This scratched the surface. With XEBEC Burrless Chamfering Cutter, the deburring process was eliminated, and the finish result improved, without any scratch.

Workpiece category (Industry)	Machine tool component
Material	Carbon Steel (JIS S50C)
Tool	XC-C-06-M
Chamfering size	C1.5
Machining conditions	S6300、F1000

Burrless chamfering of cooling water block （Semiconductor manufacturing equipment）

The chamfering tool that was used previously caused secondary burrs, and manual deburring was needed after chamfering. With XEBEC Burrless Chamfering Cutter, the chamfering time was reduced by 75% (from 60 to 15 seconds) and the deburring process eliminated.
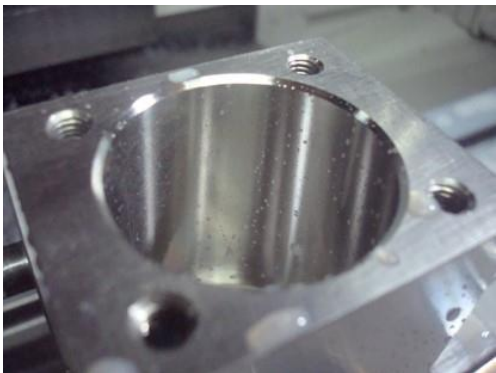
Workpiece category (Industry)	Cooling water block (Semiconductor manufacturing equipment)
Material	Stainless Steel (JIS SUS304)
Tool	XC-C-06-M
Chamfering size	1.0
Machining conditions	S3800、F610

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