Ceramic Fiber Deburring & Surface Finish Solutions

XEBEC®
Deburring Technologies, LLC

www.deburringtechnologies.com

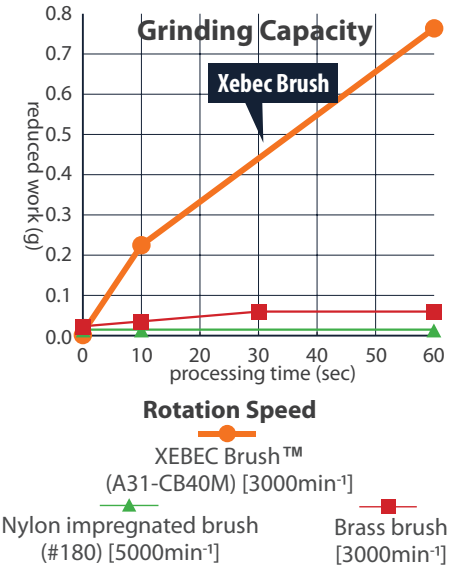
2017

Xebec® Beats the Competition

Save time & money! Automate the deburring process.

Xebec Technology Co., LTD offers a wide range of deburring and surface finishing solutions that dramatically improve manufacturing productivity and greatly reduce costs. Xebec products utilize a unique, patented process to produce brushes, sticks and stones of solid ceramic fibers that simply outperform older technologies.

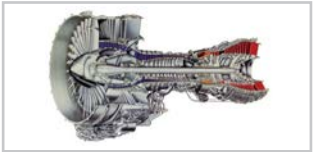
The ceramic fibers are woven to create self-sharpening filaments that maintain consistent cutting action on the tips. Unlike wire and abrasive impregnated nylon brush filaments, the unique design of the Xebec fiber rod maintains its shape with no deformation even after repeated use. This leads to consistent performance time after time.



Ceramic fiber products can be used in CNC, robotic or hand held devices on materials up to 65Rc for:

- Surface deburring, finishing and polishing
- Cross hole deburring and bore finishing
- Polishing of molds and other detailed parts

Our **FOCUS** is identifying and offering value added deburring solutions for machined parts. We have demonstrated success in the following market segments:



Aerospace

- Blades
- Actuation Systems
- Landing Gear
- Fuel Systems
- Engine Components
- Structural Parts
- Air & Space

Powertrain

- Cylinder Blocks
- Head Covers
- Crankshafts
- Camshafts
- Connecting Rods
- Fuel Injection
- On & Off Road

Firearms

- Slides
- Barrels
- Triggers
- Frame
- Hammers
- Cylinders
- Civilian & Military

Medical

- Tibia Trays
- Bone Screws
- Spinal Implants
- Knees
- Hips
- Shoulders
- Orthopedic & Dental

Energy

- Blisks
- Rotor Blades End
- Rotor Blades Blend
- Turbine Blades
- Christmas Tree
- Manifolds
- Fossil & Wind Energy

Production

- Valves
- Mold & Die
- Fittings
- Precision Parts
- Swiss Machined
- Bushings
- Hi Volume Production

Successful Applications

Aerospace

Part	**Wing Rib**
Material	Aluminum Alloy
Details	Deburring of end milled surface
Tool Used	Xebec Brush™ Surface A11-CB25M
Parameters	Rotation Speed: 4000min^{-1} Depth of Cut: 0.028in Feed: 134 IPM

Part	**Body**
Material	Aluminum Alloy
Details	Deburring of end milled surface
Tool Used	Xebec Brush™ Surface A11-CB100M
Parameters	Rotation Speed: 960min^{-1} Depth of Cut: 0.026in Feed: 134 IPM

Part	**Landing gear part**
Material	Aluminum Alloy
Details	Deburring of milled surface
Tool Used	Xebec Brush™ Surface A11-CB40M
Parameters	Rotation Speed: 3000^{-1} Depth of Cut: 0.031in Feed: 147 IPM

Part	**Turbine disk**
Material	Inconel
Details	Deburring of grinded surface
Tool Used	Xebec Brush™ Surface A31-CB40M
Parameters	Rotation Speed: 1500^{-1} Depth of Cut: 0.020in Feed: 94 IPM

Part	**Turbine blade**
Material	SU316
Details	Deburring of ball end milled surface
Tool Used	Xebec Brush™ Surface A11-CB25M
Parameters	Rotation Speed: 1000^{-1} Depth of Cut: 0.020in Feed: 94 IPM

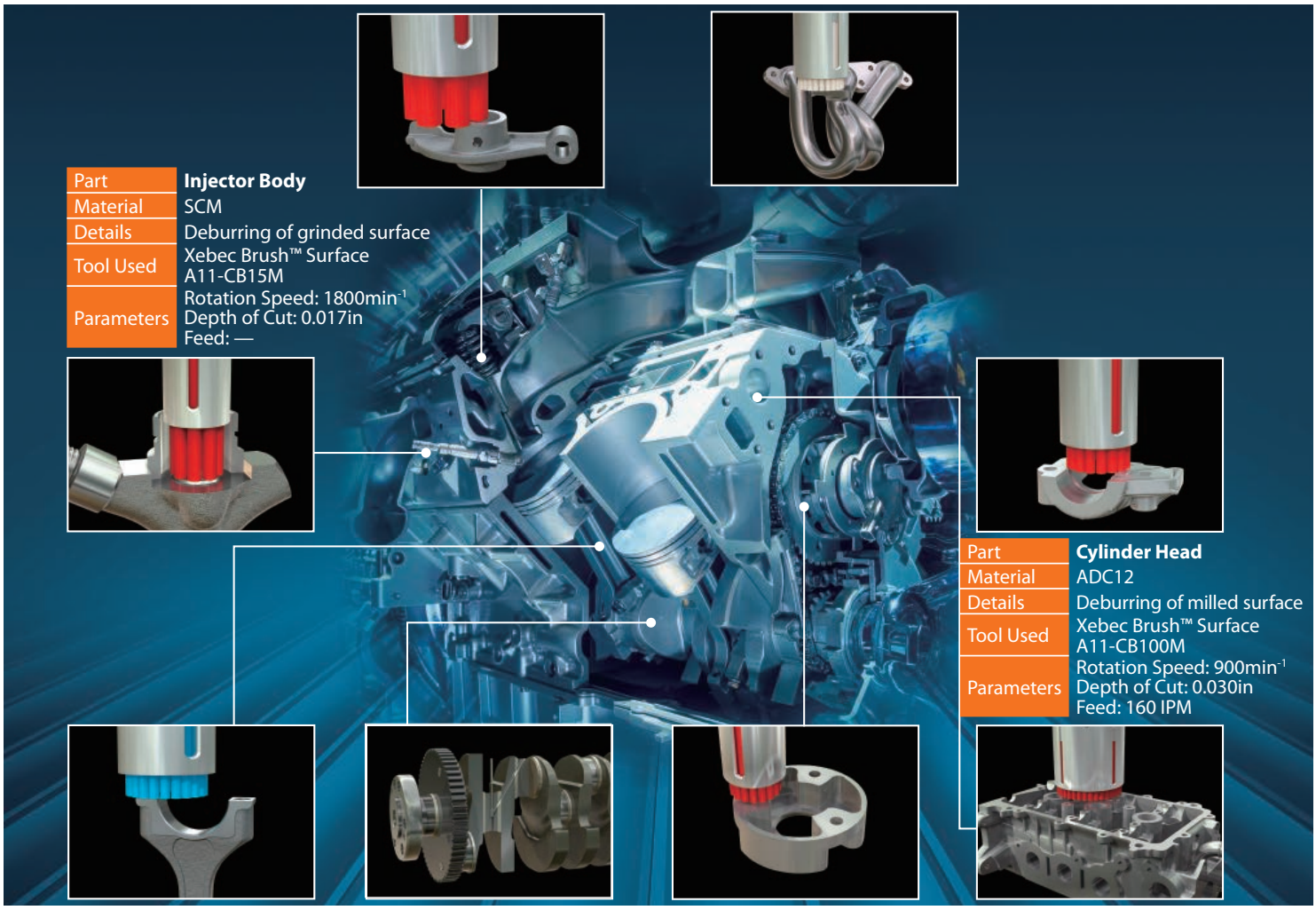
Part	**Blisk**
Material	Inconel
Details	Deburring of ball end milled surface
Tool Used	Xebec Brush™ Surface A21-CB25M
Parameters	Rotation Speed: 4000^{-1} Depth of Cut: 0.020in Feed: 94 IPM

Automotive

Part	Rocker Arm
Material	SCr420
Details	Deburring of milled surface
Tool Used	Xebec Brush™ Surface A11-CB40M
Parameters	Rotation Speed: 3000min^{-1} Depth of Cut: 0.020in Feed: 80 IPM

Part	Exhaust Manifold
Material	AC4C
Details	Deburring of milled surface
Tool Used	Xebec Brush™ Surface A21-CB60M
Parameters	Rotation Speed: 1000min^{-1} Depth of Cut: 0.020in Feed: 120 IPM

Part	Cam Cap
Material	ADC12
Details	Deburring of milled surface
Tool Used	Xebec Brush™ Surface A11-CB40M
Parameters	Rotation Speed: 1941min^{-1} Depth of Cut: 0.020in Feed: 147 IPM



Part	Connecting Rod
Material	S45C
Details	Deburring of milled surface
Tool Used	Xebec Brush™ Surface A31-CB60M
Parameters	Rotation Speed: 1300min^{-1} Depth of Cut: 0.016in Feed: 54 IPM

Part	Crank Shaft
Material	S48C
Details	Crosshole deburring
Tool Used	Xebec Stone™ Flexible Shaft CH-PM-5R-C01
Parameters	Rotation Speed: 1350min^{-1} Depth of Cut: 0.020in Feed: 15 IPM

Part	Housing
Material	Sintered metal
Details	Deburring of milled surface
Tool Used	Xebec Brush™ Surface A11-CB40M
Parameters	Rotation Speed: 500min^{-1} Depth of Cut: 0.020in Feed: 80 IPM

Surface Deburring & Finishing

Brush Color

All Xebec brushes are made from the same proprietary ceramic fibers manufactured into rods, or bristles, of different thicknesses. The greater the bristle thickness, the more aggressive the cutting action of the brush and therefore the more material removed. The brush color signifies the relative thickness of the bristles.

PINK: Softer and more flexible than the white and red versions. It results in no change in part dimensions or features. It is best used for detailed deburring of smaller more intricate parts or soft metals without breaking edges. Ideal for deburring small bores Ø0.3MM.

RED: More flexible and will conform to slight work piece variations. It is best used on burrs that are ≤ 0.1mm (.0039") in thickness or materials that are < 45 Rc.

WHITE: More rigid and more aggressive grinding action that will provide longer tool life and run at higher speeds. Best suited for harder materials. Due to its rigidity, it is not best suited for interruptions and uneven surfaces.

BLUE: Most aggressive cutting Fiber. It is three to four times more aggressive than white. It can handle burrs up to 0.5mm when the burr is vertical to the brush tip and 1mm when the burr is horizontal to the brush tip.

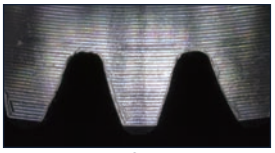
Surface Brush Applications

- Deburring of fine burrs where the base thickness is 1mm (.040") or less after machine processing and finishing of edges
- Fine deburring of surfaces, edges radiuses and small diameter bores
- Precision parts such as automotive engine parts that must be deburred while maintaining edge quality with out secondary burrs
- Grinding and finishing of flat surfaces and uneven surfaces

Successful Applications

Edge Deburring

Category	Machine part
Workpiece	Spur gear
Material	Carbon steel S45C
Process Details	Edge deburring after gear cutting process



Before

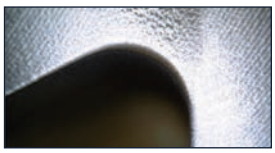
After

XEBEC product used: A31-CB25M
Rotation speed: 3500min^{-1} **Depth of cut:** 1mm
Processing time: N/A **Feed:** 2500mm/min

Fine Deburring

Category	Automotive part
Workpiece	Cooling fins
Material	Carbon steel Aluminum alloy
Process Details	Edge deburring

Before

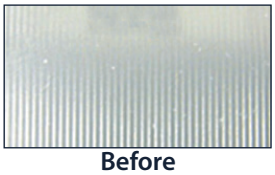


After

XEBEC product used: A31-CB25M
Rotation speed: 3500min^{-1} **Depth of cut:** 1mm
Processing time: N/A **Feed:** 2500mm/min

Cutter Mark Removal

Category	Medical part
Workpiece	Artificial hip joint
Material	Titanium alloy
Process Details	Cutter mark removal after ball end milling process



Before

After

XEBEC product used: A21-CB25M
Rotation speed: 1500min^{-1} **Depth of cut:** 1mm
Processing time: N/A **Feed:** 100mm/min

Surface Deburring & Finishing

XEBEC Brush™ Surface

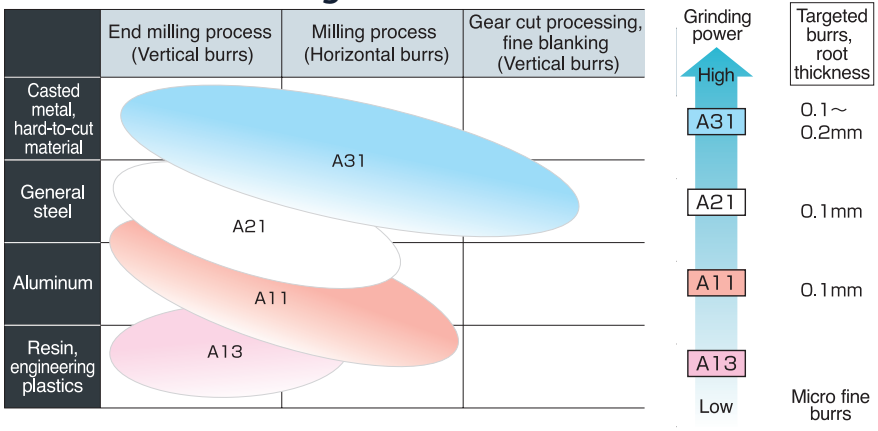
- Improve surface finish in reduced cycle time
- Simultaneously deburr and finish edges
- Continuous cutting edge provides consistent grinding performance

Brush Dimensions				Aggressiveness Less < < < < < < < < > > > > > > > > More				Required sleeve to hold brush (see below)	Max RPM
Diameter		Length		Pink	Red	White	Blue		
mm	in	mm	in						
6	0.236	30	1.181	A13-CB06M EDP **30015**	A11-CB06M EDP **30006**	A21-CB06M EDP **30012**	A31-CB06M EDP **30021**	S06M	10,000
15	0.591	50	1.969	A13-CB15M EDP **30013**	A11-CB15M EDP **30005**	A21-CB15M EDP **30011**	A31-CB15M EDP **30020**	S15M-P	6,000
25	0.984	75	2.953		A11-CB25M EDP **30004**	A21-CB25M EDP **30010**	A31-CB25M EDP **30019**	S25M	5,000
40	1.575	75	2.953		A11-CB40M EDP **30003**	A21-CB40M EDP **30009**	A31-CB40M EDP **30018**	S40M-SD10	3,000
60	2.363	75	2.953		A11-CB60M EDP **30002**	A21-CB60M EDP **30008**	A31-CB60M EDP **30017**	S60M	2,000
100	3.937	75	2.953		A11-CB100M EDP **30001**	A21-CB100M EDP **30007**	A31-CB100M EDP **30016**	S100M	1,000

XEBEC Brush™ Sleeve

Sleeve Description	EDP Number	Dimensions							
		Shank Diameter		Shank Length		Sleeve External Ø		Overall Length	
		mm	in	mm	in	mm	in	mm	in
S06M	**40006**	6	0.236	29	1.142	10	0.394	70	2.756
S15M-P	**40007**	6	0.236	29	1.142	18	0.709	90	3.543
S25M	**40004**	8	0.315	30	1.181	30	1.181	140	5.511
S40M-SD10	**40003**	10	0.315	30	1.181	45	1.771	140	5.511
S60M	**40002**	12	0.472	40	1.575	65	2.559	150	5.906
S100M	**40001**	16	0.630	35	1.378	110	4.330	162	6.378

Bristles and Grinding Power



Brush Selection

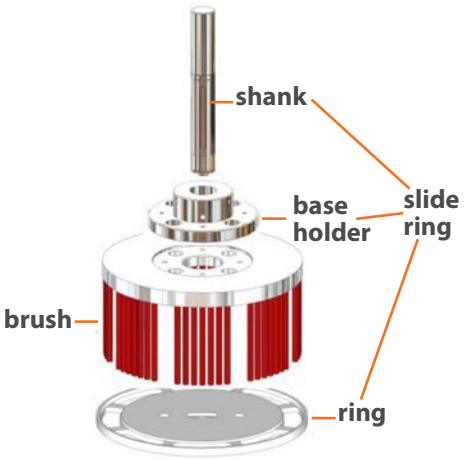
When selecting a deburring brush, first take into consideration the size of the burr and the work piece material. Blue is the most aggressive & can handle the largest burrs. White is the next aggressive followed by red and pink.

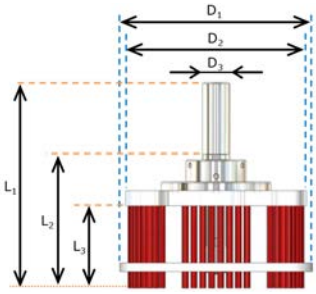
Because each application is unique, final choice in selection of deburring brush is dependent upon burr size & your surface finish requirement.

Surface Deburring & Finishing

XEBEC Brush™ Surface Extra-Large

- Reduce number of passes
- Process without lap marks
- Suitable for deburring and polishing workpieces with a width of 100mm or greater, such as cylinder heads, cylinder blocks and machinery beds.





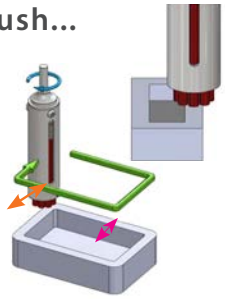
Dimensions													Aggressiveness Less < < < < < <> > > > > > > More			Slide Ring	Max RPM
Brush Ø		L_1		L_2		L_3		D_1		D_2		D_3		Red	White	Blue		
mm	in	mm	in	mm	in	mm	in	mm	in	mm	in	mm	in					
125	4.921							135	5.315	125	4.921			A11-CB125M EDP **30025**	A21-CB125M EDP **30026**	A31-CB125M EDP **30027**	SR125M **EDP 40010**	1000
165	6.496	187	7.362	122	4.803	75	2.953	176	6.929	165	6.496	25	0.984	A11-CB165M EDP **30028**	A21-CB165M EDP **30029**	A31-CB165M EDP **30030**	SR165M **EDP 40011**	750
200	7.874							211	8.307	200	7.874			A11-CB200M EDP **30031**	A21-CB200M EDP **30032**	A31-CB200M EDP **30033**	SR200M **EDP 40012**	600

Operating Parameters

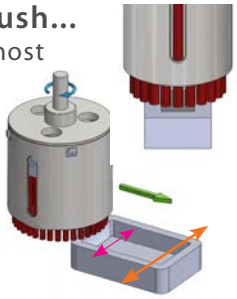
Brush Diameter (mm)	Depth of Cut (mm)					Rotation Speed (mm-1)		Feed Rate (mm/min)			Recommended Brush Projection (mm)
	Vertical Burr	Horizontal Burr	Cutter Mark Removal	Polishing	Max	Recommended	Max	Burr Root Thickness (mm) 0.05	Burr Root Thickness (mm) 0.1	Cutter Mark Removal	
125	0.5	1.0	0.5~1.0	0.3~0.5	1.5	800	1000	4000	2500	300	15
165	0.5	1.0	0.5~1.0	0.3~0.5	1.5	600	750	4000	2500	300	15
200	0.5	1.0	0.5~1.0	0.3~0.5	1.5	480	600	4000	2500	300	15

Choosing the Correct Brush Size

Use a smaller brush...
for those that prefer a less expensive tool that requires multiple passes.



Use a bigger brush...
for those that are most concerned about minimizing cycle time.



Choose a brush size which is 1.5 to 2 times wider than the width of the surface of the work piece. This allows the brush to engage the work piece edge by 90° for optimal grinding power.

XEBEC Brush™ Wheel Type

- For deburring and polishing of side surfaces and inner diameters

The main brush unit and shank are sold separately. Insert a shank into a brush before use. Shanks are reusable. When replacing, order only a brush part.

*Not suitable for use on hand held devices

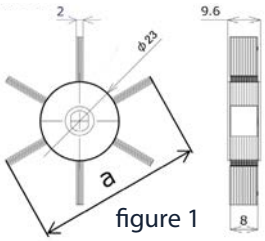


figure 1

Main unit

EDP Number	Part Number	Brush Ø mm	Brush Ø in	# of bundles	Bristle (color)	Dimension
60007	W-A11-50	50	1.968	6	A11(red)	figure 1
60008	W-A11-75	75	2.952	6	A11(red)	figure 1

Shank

EDP Number	Part Number	Shank Length mm	Shank Length in	Shank Ø	Set Screw	Dimension
60009	W-SH-M	70	2.750	8	M4	figure 2
60010	W-SH-L	150	5.900	12	M4	figure 3

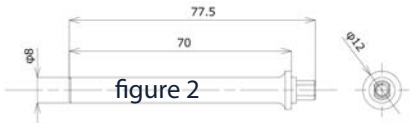


figure 2

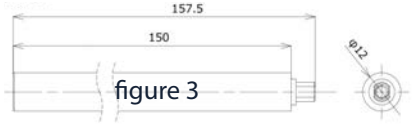
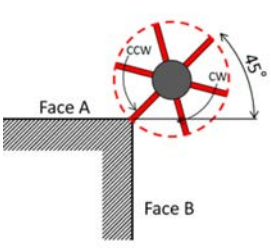


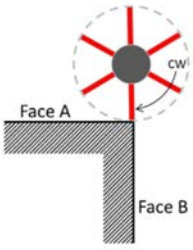
figure 3

Processing Conditions

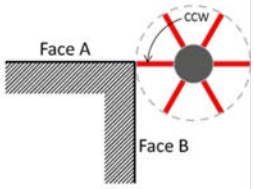
The best approach is to place a center of a brush at the center angle to the edge, figure 1. Burrs on A-side and B-side can both be removed. Edge quality becomes stable if a brush is rotated in both clockwise and counter-clockwise directions. Brush position on figure 2 is effective for burrs on A-side in the same way as figure 3 for burrs on B-side.



(fig1)



(fig2)



(fig3)

- Process conditions may differ depending on burrs. Make adjustments according to quality of work piece
- If burrs remain, increase number of passes
- To extend tool life, increase feed per bundle

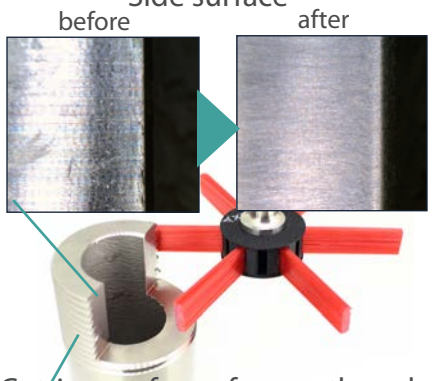
** As bristles are worn out, bristle length becomes shorter and increase stiffness, causing bristles to be broken. If bristles breakage occurs, please decrease the depth of cut.*

W-A11-50	Rotation Speed (min⁻¹)	Feed Rate mm/min	Feed Rate in/min	Depth of Cut mm/min	Depth of Cut in/min
Range of Use	955 ~ 2230	Max 20070	790	Max 0.5	0.019
Recommended	1590	4770	187	0.2	0.008

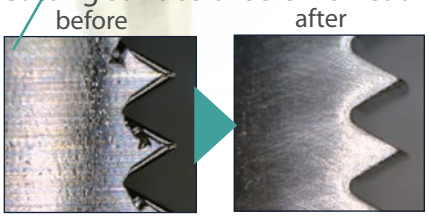
W-A11-75	Rotation Speed (min⁻¹)	Feed Rate mm/min	Feed Rate in/min	Depth of Cut mm/min	Depth of Cut in/min
Range of Use	640 ~ 1490	Max 14310	563	Max 0.5	0.019
Recommended	1140	3420	134	0.2	0.008

Examples

Side surface



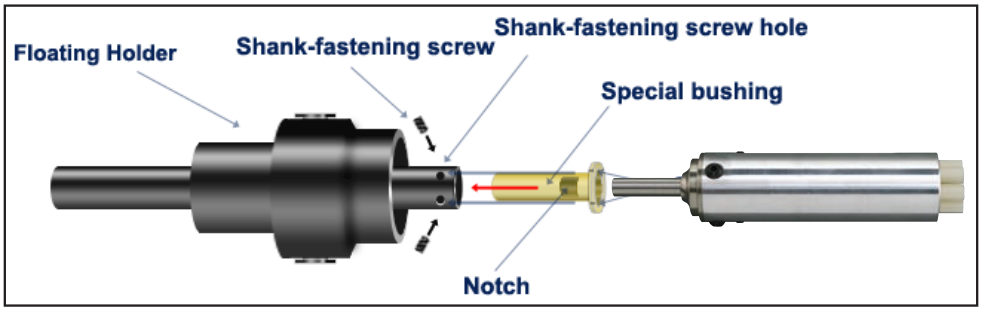
Cutting surface of screw thread



Surface Deburring & Finishing

XEBEC Floating Holder™

- Improves brush life and surface finish
- Excellent choice for CNC milling operations
- The deburring & surface finishing brush floats on the work piece under constant pressure (depth of cut) due to an internal spring in the floating holder. The pressure can be adjusted by using various spring tensions
- Floating holder can be used (with included bushing) on brushes ranging from 6mm to 40mm in size. (Currently not available for 60mm & 100mm)



** Bushing included for 25mm, 15mm and 6mm brushes.*

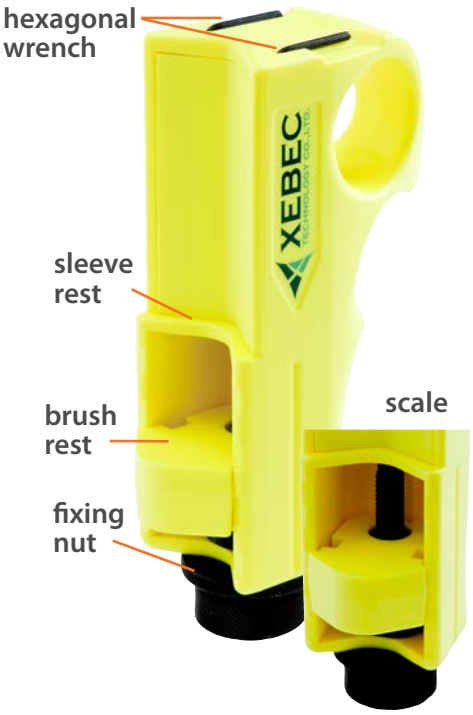
EDP Number	Part Number	Holder Shank	Axial Float		Gage Length		Shank Diameter		Matching Brush Sleeve EDP
			mm	inch	mm	inch	mm	inch	
50002*	FH-ST12-SL10	10mm	6	0.236	60.5	2.282	12	0.472	40003,40004, 40006, 40007
50006	FH-ST20-60	12mm	6	0.236	51.5	2.028	20	0.787	40002
50005	FH-ST20-100	16mm	6	0.236	51.5	2.028	20	0.787	40001

XEBEC Brush Length Adjustment Tool™

Part Number: XP-EZ-001

EDP: 50004

- Allows quick in-machine brush adjustment
- No need to take the Cutting Fiber Brush out of the machine
- No need to measure brush projection length each time
- Ideal for use in mass production lines

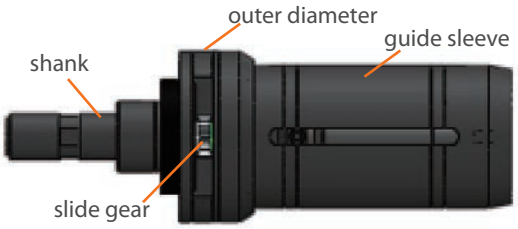


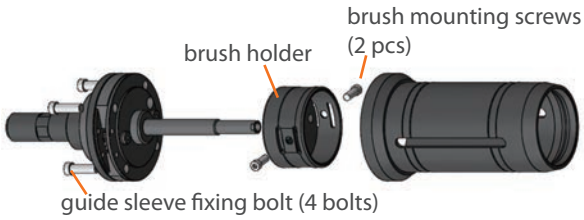
How to Use Brush Length Adjustment Tool

1. Move brush rest using adjustment knob to set the amount of brush projection
2. Tighten the locking nut
3. Hold the unit in one hand, and align sleeve rest with sleeve tip
4. Loosen the screws to allow the brush to drop to the brush rest
5. Tighten the screws to secure brush in place

XEBEC Self Adjusting Sleeve™

- Completely automate your process
- Reduce machine down time
- Maintain optimal brush setting

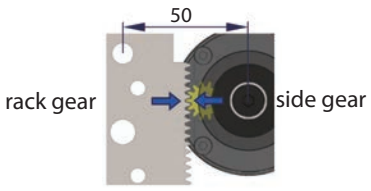




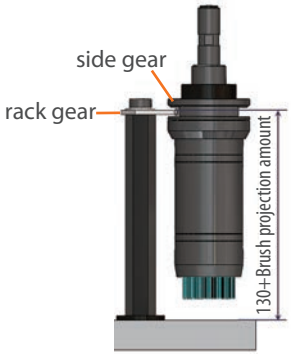
EDP Number	Part Number	Overall Length		Shank Length		Outermost Diameter		Shank Diameter		Main Body Weight	Maximum Rotation Speed	Supporting Brush
		mm	in	mm	in	mm	in	mm	in			
50010	XP-AUTO6M	124.1	4.886	35.0	1.378	37	1.457	10	0.394	220	10000	A13-CB06M, A11-CB06M, A21-CB06M, A31-CB06M
50011	XP-AUT15M	136.3	5.366	35.0	1.378	37	1.457	10	0.394	270	6000	A13-CB15M, A11-CB15M, A21-CB15M, A31-CB15M
50012	XP-AUT25M	189.0	7.441	41.5	1.634	60	2.362	16	0.630	795	5000	A11-CB25M, A21-CB25M, A31-CB25M
50013	XP-AUT40M	189.0	7.441	41.5	1.634	60	2.362	16	0.630	910	3000	A11-CB40M, A21-CB40M, A31-CB40M

How it Works

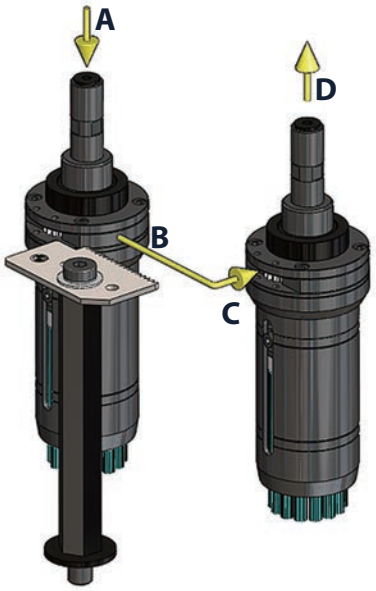
1 Always check that mating gears are in the engaging direction



2 Adjust the positions and heights of the rack gear and the side gear



3 As shown in the figure at right, move the sleeve in the following order: A-B-C-D



4 By adjusting the passing through distance of B, the amount of projection can be can be set.

*Upper limit feeding speed for rack gear passing through time : F=10000 mm/min

Crosshole Deburring & Finishing

XEBEC Brush™ Crosshole Deburring

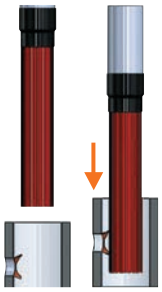
- Removal of fine burrs (base thickness is 0.1mm (.0039") or less) generated around cross-holes
- Polishing of inner wall surfaces of cylinders such as screw holes and removing EDM scale
- Polishing the bottom surface of dead-end holes
- Product is not well suited for interruptions and bores/cylinders with threads as the rapidly rotating fibers may break when abruptly meeting obstacles

For 1 to 2 ratio crosshole.
Ex: 7.5mm to 15 mm crosshole and bore.

Target Bore Ø		Brush Ø		Overall Length		Shank Length		Shank Ø		Aggressiveness Less < < > > More		Max RPM
mm	in	mm	in	mm	in	mm	in	mm	in	Red	Blue	
3.5 - 5	0.140 - 0.197	1.5	0.060	120	4.724	70	2.756	3	0.118	CH-A12-1.5M **EDP 20007**	-	20,000
5 - 8	0.197 - 0.315	3	0.118	120	4.724	70	2.756	3	0.118	CH-A12-3M **EDP 20001**	-	12,000
				170	6.693	120	4.724	4	0.158	CH-A12-3L **EDP 20004**	-	
5 - 8	0.197 - 0.315	3	0.118	130	5.12	70	2.756	3	0.118	-	CH-A33-3M **EDP 20008**	12,000
				180	7.09	120	4.724	4	0.158	-	CH-A33-3L **EDP 20012**	
8 - 10	0.315 - 0.394	5	0.197	120	4.724	70	2.756	6	0.232	CH-A12-5M **EDP 20002**	-	12,000
				170	6.693	120	4.724			CH-A12-5L **EDP 20005**	-	
8 - 10	0.315 - 0.394	5	0.197	130	5.12	70	2.756	6	0.232	-	CH-A33-5M **EDP 20009**	12,000
				180	7.09	120	4.724				CH-A33-5L **EDP 20013**	
10 - 14	0.394 - 0.551	7	0.276	120	4.724	70	2.756	6	0.232	CH-A12-7M **EDP 20003**	-	12,000
				170	6.693	120	4.724	8	0.315	CH-A12-7L **EDP 20006**	-	
10 - 14	0.394 - 0.551	7	0.276	130	5.12	70	2.756	6	0.232	-	CH-A33-7M **EDP 20010**	12,000
				180	7.09	120	4.724	8	0.315	-	CH-A33-7L **EDP 20014**	
14 - 20	0.551 - 0.787	11	0.433	130	5.12	70	2.756	12	0.472		CH-A33-11M **EDP 20011**	12,000
				180	7.09	120	4.724				CH-A33-11L **EDP 20015**	
14 - 20	0.551 - 0.787	11	0.433	120	4.724	70	2.756	12	0.472	CH-A12-11M **EDP 20018**		12,000
				170	6.693	120	4.724			CH-A12-11L **EDP 20017**		12,000

How to Use Effectively removes burrs under rotational/centrifugal force

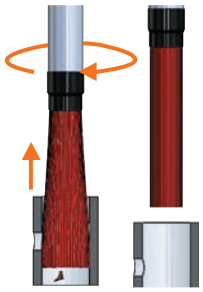
1 **Insert brush while not in motion**
*If you rotate the brush outside the cylinder, the bristles may be damaged or scattered.



2 **Rotate brush past the crosshole**

3 **Work brush back and then forward**
*Pulling the brush back past the crossholes prevents burrs from being laid flat against the interior surface of the cylinder.

4 **Stop brush rotation and remove brush while it is at rest**
*Working the brush both clockwise and counterclockwise will increase the deburring effect and result in a more uniform edge.

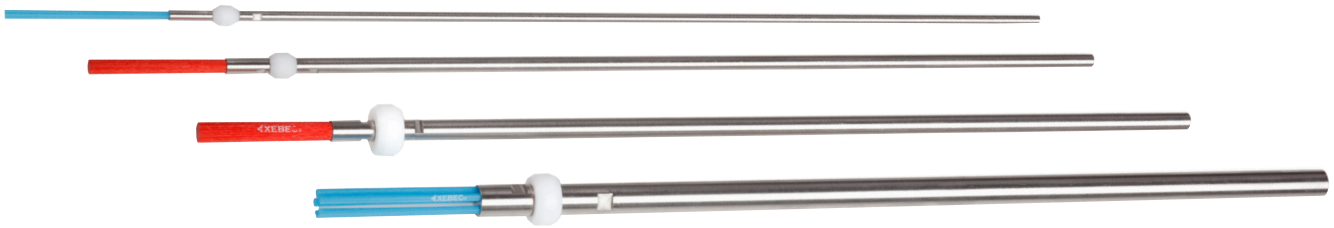


Suggested starting operating parameters are 8,000 to 10,000 RPM at 12 to 15 inches per minute feed rate.

Crosshole Deburring & Finishing

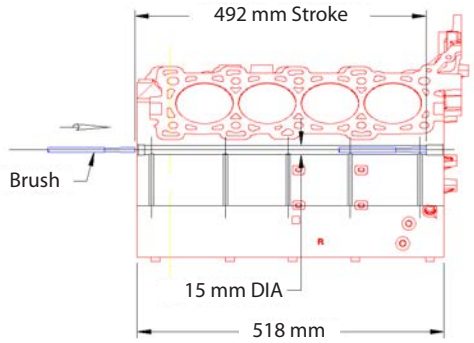
XEBEC Brush™ Crosshole Extra-Long

- Custom made to fit your application
- Used for depths between 140mm and 1,000mm
- Brush part is replaceable and shank part can be reused
- Brush and shank parts are attached at the joint by a collar, that stabilizes the tool and prevents tool rotation



Brush Specifications

Item Code	Target Bore Ø	Brush Ø	Total Length	Recommended RPM
CH-A12-3F	Ø 5 ~ 8 mm	Ø 3 mm	170 ~ 400 mm	8000 ~ 12000 min^{-1}
CH-A12-5F	Ø 8 ~ 10 mm	Ø 5 mm	170 ~ 400 mm	8000 ~ 12000 min^{-1}
CH-A12-7F	Ø 10 ~ 20 mm	Ø 7 mm	170 ~ 400 mm	8000 ~ 12000 min^{-1}
CH-A33-3F	Ø 5 ~ 8 mm	Ø 3 mm	180 ~ 410 mm	8000 ~ 12000 min^{-1}
CH-A33-5F	Ø 8 ~ 10 mm	Ø 5 mm	180 ~ 410 mm	8000 ~ 12000 min^{-1}
CH-A33-7F	Ø 10 ~ 14 mm	Ø 7 mm	180 ~ 410 mm	8000 ~ 12000 min^{-1}
CH-A33-11F	Ø 14 ~ 20 mm	Ø 11 mm	180 ~410 mm	8000 ~12000 min^{-1}



How to Order

1. Send user's workpiece drawing & required size information with request form
2. Xebec sends the tool drawing for user confirmation
3. Receive user confirmation about tool specification
4. Xebec sends final quotation for order
5. Purchase order sent with drawing and signature of user confirmation

Successful Applications

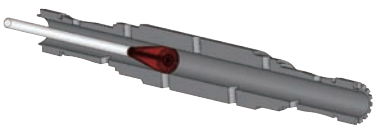
Category	Automotive part
Workpiece	Screw
Material	Stainless steel SUS304
Process Details	Machining center/ Crosshole deburring of internal diameter

XEBEC product used: CH-A33-5M
Rotation speed: 10000min^{-1} **Depth of cut:** 1mm
Feed: 300mm/min

Category	Automotive part
Workpiece	Input shaft
Material	SCM
Process Details	Custom machine/ Crosshole deburring of internal diameter

XEBEC product used: CH-A 12-7M
Rotation speed: 10000min^{-1} **Feed:** 800mm/min

Category	Automotive axle part
Workpiece	Drive shaft
Material	SCM435
Process Details	Custom machine/ Crosshole deburring of internal diameter

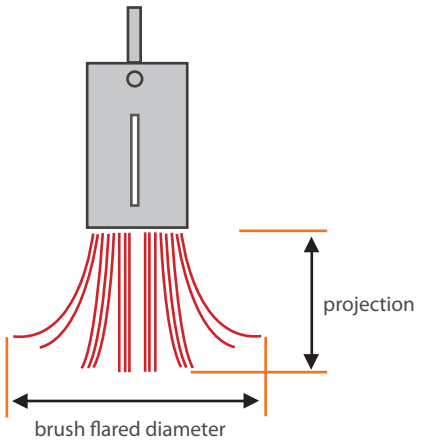


XEBEC product used: CH-A 12-7F
Rotation speed: 10000min^{-1} **Feed:** 400mm/min

Crosshole Deburring & Finishing

XEBEC Brush™ Surface for Crosshole Deburring Large Diameters

Deburring brush flare
Maximum bore diameter
& brush projection



15mm Brush

	Brush Projection (p) RPM	30mm 1.181″	40mm 1.574″	45mm 1.771″	50mm 1.968″	Sleeve Required for Brush
		Flared Diameter				
A11-CB15M RED	6000 rpm	1.023″	1.771″	2.165″	2.362″	40007
	5000 rpm	0.984″	1.417″	1.574″	1.968″	
	4000 rpm	0.826″	1.062″	1.062″	1.062″	
A21-CB15M WHITE	6000 rpm	0.984″	1.417″	1.811″	2.283″	
	5000 rpm	0.866″	1.062″	1.062″	1.417″	
	4000 rpm	0.826″	0.866″	0.866″	0.905″	

25mm Brush

	Brush Projection (p) RPM	30mm 1.181″	40mm 1.574″	45mm 1.771″	50mm 1.968″	60mm 2.362″	70mm 2.755″	Sleeve Required for Brush
		Flared Diameter						
A11-CB25M RED	5000 rpm	1.574″	2.519″	3.346″	4.173″	-	-	40004
	4000 rpm	1.456″	1.771″	2.874″	3.385″	4.724″	-	
	3000 rpm	1.377″	1.692″	2.204″	2.992″	4.094″	4.724″	
A21-CB25M WHITE	5000 rpm	1.377″	1.771″	2.755″	2.755″	4.015″	-	
	4000 rpm	1.299″	1.653″	2.244″	2.244″	2.992″	3.661″	
	3000 rpm	1.259″	1.456″	1.811″	1.811″	2.362″	2.559″	

40mm Brush

	Brush Projection (p) RPM	30mm 1.181″	40mm 1.574″	45mm 1.771″	50mm 1.968″	60mm 2.362″	70mm 2.755″	Sleeve Required for Brush
		Flared Diameter						
A11-CB40M RED	4000 rpm	-	-	3.700″	4.330″	-	-	40003
	3000 rpm	1.968″	2.401″	2.874″	3.346″	4.842″	-	
	2000 rpm	1.811″	2.165″	2.283″	2.559″	3.425″	4.330″	
	1000 rpm	1.771″	1.850″	1.929″	1.968″	2.047″	2.086″	
A21-CB40M WHITE	4000 rpm	-	-	2.755″	3.267″	-	-	
	3000 rpm	1.850″	2.125″	2.440″	2.716″	3.543″	4.527″	
	2000 rpm	1.771″	1.929″	2.165″	2.244″	2.559″	2.834″	
	1000 rpm	1.692″	1.732″	1.732″	1.732″	1.771″	1.811″	

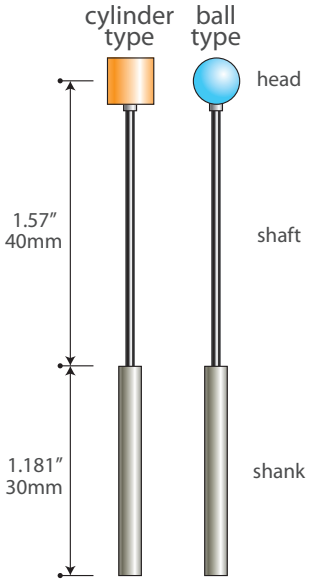
*Not suitable for use on hand held devices

Crosshole Deburring & Finishing

XEBEC Stone™ Flexible Shaft

- Tool head made of alumina fiber abrasive stone; cutting edges exposed over the entire surface
- Flexible shaft allows for soft contact with work piece
- Efficient removal of fine burrs where the base thickness is 0.2 mm or lass after machining

Head		Aggressiveness Less < < < < < < < < > > > > > > > > > More			Max RPM
Shape	Size	Blue - #800	Orange - #400	Gray - #220	
Ball	3 mm 0.118 in	CH-PB-3B EDP **10001**	CH-PO-3B EDP **10008**	CH-PM-3B EDP **10015**	15,000
	4 mm 0.157 in	CH-PB-4B EDP **10002**	CH-PO-4B EDP **10009**	CH-PM-4B EDP **10016**	13,000
	5 mm 0.197 in	CH-PB-5B EDP **10003**	CH-PO-5B EDP **10010**	CH-PM-5B EDP **10017**	12,000
	6 mm 0.236 in	CH-PB-6B EDP **10004**	CH-PO-6B EDP **10011**	CH-PM-6B EDP **10018**	10,000
	10 mm 0.393 in			CH-PM-10B EDP **10027**	7,000
Cylinder	3 x 3 mm 0.118 x 0.118 in	CH-PB-3R EDP **10005**	CH-PO-3R EDP **10012**	CH-PM-3R EDP **10019**	15,000
	4 x 4 mm 0.157 x 0.157 in	CH-PB-4R EDP **10006**	CH-PO-4R EDP **10013**	CH-PM-4R EDP **10020**	13,000
	5 x 5 mm 0.197 x 0.197 in	CH-PB-5R EDP **10007**	CH-PO-5R EDP **10014**	CH-PM-5R EDP **10021**	12,000
	5 x 10 mm 0.197 x 0.393 in			CH-PM-5R-C01 EDP **10022**	12,000

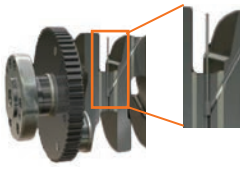


- Shaft: Ø0.059x1.57″ (1.5x40mm)
- Shank: Ø0.118x1.181″ (3x30mm)
- Tool length: 2.755″ (70mm)

Successful Applications

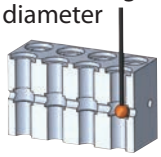
Category	Automotive engine part
Workpiece	Crankshaft
Material	Carbon steel S48C
Process Details	Custom Machine/ Crosshole deburring of internal diameter

XEBEC product used:
CH-PM-5R-CO1
Rotation speed: 1500min^{-1}



Category	Automotive brake part
Workpiece	ABS block
Material	Aluminum alloy
Process Details	Machining Center/ Crosshole deburring of internal diameter

XEBEC product used:
CH-PO-5B
Rotation speed: 6000min^{-1}



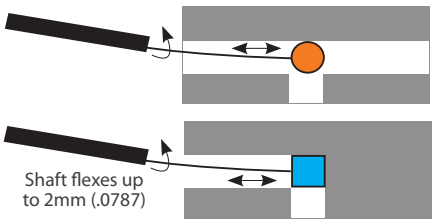
Head Type

Ball

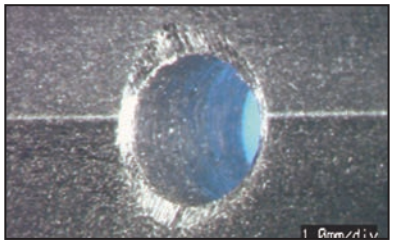
- Removes only the crosshole burrs without damaging the periphery of the crosshole
- Ideal for crossholes which are perpendicular to the primary hole

Cylinder

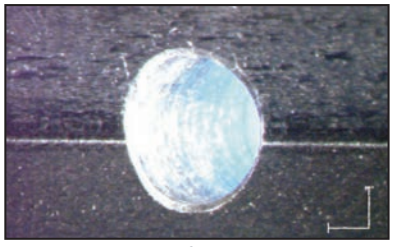
- Suitable for removing crosshole burrs in blind holes and elliptical shaped crossholes



Example



Before



After

Hand Tools

Safe, Reliable, High Quality Finish

- Superior polishing performance, suitable for mold polishing/finishing
- Xebec Brush adapts to irregular/ curved shape parts
- Tools can be formed to fit workpiece shape
- Tools are suitable for parts with narrow features and corners that cannot be reached with conventional tools

XEBEC Brush™ End Type

- Optimal for reducing waviness on surfaces, and for deburring and polishing of flat and curved surfaces
- Use by contacting the tapered tip of the brush to the surface of a workpiece
- Recommended rotation speed: 7000min^{-1}

Applications

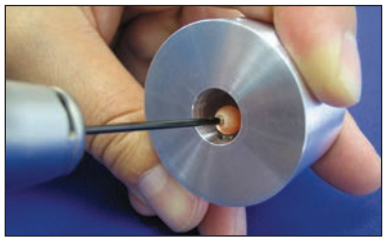
- Post-machining minute deburring of detailed components
- Removing tool marks after end milling
- Surface finishing; removing post-processing marks and scales
- EDM scale removal

Brush Dimensions				Shank Dimensions				Overall Length		Aggressiveness Less < < > > More				Max RPM
Diameter		Length		Diameter		Length								
mm	in	mm	in	mm	in	mm	in	mm	in	Pink	Red	White	Blue	
3	0.118	30	1.181	3	0.118	37	1.456	67	2.63	A13-EB03M **30014**	-	-		20,000
6	0.236	20	0.787	3	0.118	28	1.102	58	2.28	-	A11-EB06M **60001**	A21-EB06M **60002**	A11-EB06M-F31-DT01 **60006**	12,000

** #60001, 60002, 60006 Tip has 100 degree included angle*

XEBEC Stone™ Flexible Shaft

- Flexible shaft allows soft contact with a work piece
- Use the tool by moving it lightly and placing it into contact (bend displacement of around 0.5mm)
- Recommended rotation speed: 5000 ~ 8000min^{-1}



Applications

- Edge deburring
- Round surface polishing

For the complete Xebec Stone™ Flexible Shaft product offering, see page 15.

XEBEC Stone™ Mounted Point

- Can be used with air tools with high rotational speed
- Use by contacting the tapered tip to the surface/bearing surface of the work piece
- Recommended rotation speed: 15000min^{-1}

Applications

- Deburring at edge areas

EDP Number	Part Number	Head Diameter		Head Length		Shank Size		Grit	Max RPM
		mm	inch	mm	inch	mm	inch		
60003	AX-PM-5RF	5	.196	8	.315	ø 3 x 30	.118 x 1.181	#220	30,000
60004	AX-PM-3R	3	.118	20	.787	ø 3 x 20	.118 x .787	#220	60,000
60005	AX-PM-6T	6	.236	20	.787	ø 3 x 20	.118 x .787	#220	60,000

** #60005 Tip has 100 degree included angle*

- Cutting edges are continually exposed over the entire surface due to self sharpening alumina fiber ceramic rod
- Efficient removal of burrs with base thickness up to 0.2mm
- Works great for any material up to 57 Rc such as tool steel & high temp alloys

XEBEC Ceramic Stone™ Meister Finish

- Innovative ceramic stone with no breakage, no cracking, no chipping; can be formed to fit the shape of the work piece
- Recommended rotation speed: 7000min^{-1}

Applications

- Blind hole bearing surface deburring
- Polishing of flat surfaces, free curves, ribs, bosses, of various forming molds

For the complete Xebec Ceramic Stone™ Meister Finish product offering, see page 18.

Meister Finish

XEBEC Ceramic Stone ™ Meister Finish

- Ideal for precise polishing of flat surfaces, free curves, ribs, bosses, of various forming molds
- Excellent polishing performance for material up to HRC57 including NAK and general steel - use Xebec Ceramic Stone Diamond for material harder then HRC57
- No breaking, no cracking, no chipping

XEBEC Ceramic Stone™ Meister Finish Holder

for handheld deburring

Part Number	EDP Number	W mm	W inch	Quantity Per Pack
SSH-4	**70962**	4	.157	1 holder
SSH-6	**70963**	6	.236	1 holder
SSH-10	**70964**	10	.393	1 holder

Stick Type

Dimensions (mm) w	h	l	Red #1200	White #1000	Blue #800	Black #600	Orange #400	Light Brown #300	Dark Brown #220	VIOLET #120
0.5	4	100	AR-0504M **70043**	AW-0504M **70049**	AB-0504M **70017**	AP-0504M **70061**	AO-0504M **70067**	AL-0504M **70073**	AD-0504M **70010**	-
0.5	6	100	AR-0506M **70045**	AW-0506M **70052**	AB-0506M **70057**	AP-0506M **70063**	AO-0506M **70069**	AL-0506M **70080**	AD-0506M **70085**	-
0.5	10	100	AR-0510M **70047**	AW-0510M **70054**	AB-0510M **70059**	AP-0510M **70065**	AO-0510M **70071**	AL-0510M **70082**	AD-0510M **70087**	-
0.8	4	100	AR-0804M **70091**	AW-0804M **70096**	AB-0804M **70077**	AP-0804M **70105**	AO-0804M **70620**	AL-0804M **70076**	AD-0804M **70014**	-
1	1	100	AR-1001M **70127**	AW-1001M **70135**	AB-1001M **70141**	AP-1001M **70148**	AO-1001M **70155**	AL-1001M **70337**	AD-1001M **70167**	-
1	2	100	AR-1002M **70128**	AW-1002M **70012**	AB-1002M **70142**	AP-1002M **70621**	AO-1002M **70019**	AL-1002M **70161**	AD-1002M **70050**	AV-1002M **70173**
1	4	100	AR-1004M **70001**	AW-1004M **70002**	AB-1004M **70003**	AP-1004M **70004**	AO-1004M **70005**	AL-1004M **70006**	AD-1004M **70007**	AV-1004M **70008**
1	6	100	AR-1006M **70025**	AW-1006M **70026**	AB-1006M **70027**	AP-1006M **70028**	AO-1006M **70029**	AL-1006M **70030**	AD-1006M **70031**	AV-1006M **70032**
1	10	100	AR-1010M **70133**	AW-1010M **70018**	AB-1010M **70078**	AP-1010M **70153**	AO-1010M **70016**	AL-1010M **70013**	AD-1010M **70075**	AV-1010M **70178**
2	4	100	AR-2004M **70235**	AW-2004M **70242**	AB-2004M **70249**	AP-2004M **70256**	AO-2004M **70263**	AL-2004M **70270**	AD-2004M **70277**	AV-2004M **70283**
2	6	100	AR-2006M **70237**	AW-2006M **70244**	AB-2006M **70251**	AP-2006M **70258**	AO-2006M **70265**	AL-2006M **70272**	AD-2006M **70279**	AV-2006M **70285**
3	4	100	AR-3004M **70289**	AW-3004M **70295**	AB-3004M **70301**	AP-3004M **70307**	AO-3004M **70313**	AL-3004M **70319**	AD-3004M **70325**	AV-3004M **70331**
3	6	100	AR-3006M **70291**	AW-3006M **70297**	AB-3006M **70303**	AP-3006M **70309**	AO-3006M **70315**	AL-3006M **70321**	AD-3006M **70327**	AV-3006M **70333**

XEBEC Ceramic Stone™ Heat Resistant

- Does not soften
- Outstanding efficiency
- Attach to an ultrasonic polisher for optimal performance

Dimensions (mm) T	W	L	Red #1200	Blue #800	Dark Brown #220	Violet #120
1	4	100	HR-1004M **70683**	HB-1004M **70705**	HD-1004M **70706**	HV-1004M **70690**
1	6	100	HR-1006M **70684**	HB-1006M **70686**	HD-1006M **70688**	HV-1006M **70691**
1	10	100	HR-1010M **70685**	HB-1010M **70687**	HD-1010M **70689**	HV-1010M **70692**
2	4	100	HR-2004M **70693**	HB-2004M **70696**	HD-2004M **70699**	HV-2004M **70702**
2	6	100	HR-2006M **70694**	HB-2006M **70697**	HD-2006M **70700**	HV-2006M **70703**
2	10	100	HR-2010M **70695**	HB-2010M **70698**	HD-2010M **70701**	HV-2010M **70704**

All meister finish items are non-stock standards; 1-2 week delivery

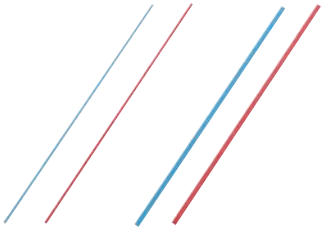
Rod Type

Dimensions (mm) Diameter	Length	Red #1200	White #1000	Blue #800	Black #600	Orange #400	Light Brown #300	Gray #220
1	50	PR-10S **70626**	PW-10S **70628**	PB-10S **70630**	PP-10S **70632**	PO-10S **70634**	PL-10S **70636**	PM-10S **70638**
1	100	PR-10M **70627**	PW-10M **70629**	PB-10M **70631**	PP-10M **70633**	PO-10M **70635**	PL-10M **70637**	PM-10M **70639**
1.5	50	PR-15S **70614**	PW-15S **70640**	PB-15S **70642**	PP-15S **70615**	PO-15S **70644**	PL-15S **70646**	PM-15S **70648**
1.5	100	PR-15M **70625**	PW-15M **70641**	PB-15M **70643**	PP-15M **70624**	PO-15M **70645**	PL-15M **70647**	PM-15M **70649**
2	50	PR-20S **70650**	PW-20S **70652**	PB-20S **70654**	PP-20S **70656**	PO-20S **70658**	PL-20S **70660**	PM-20S **70662**
2	100	PR-20M **70651**	PW-20M **70653**	PB-20M **70655**	PP-20M **70657**	PO-20M **70659**	PL-20M **70661**	PM-20M **70663**
2.34	50	PR-234S **70616**	PW-234S **70672**	PB-234S **70617**	PP-234S **70675**	PO-234S **70677**	PL-234S **70618**	PM-234S **70619**
2.34	100	PR-234M **70671**	PW-234M **70673**	PB-234M **70674**	PP-234M **70676**	PO-234M **70678**	PL-234M **70679**	PM-234M **70680**
3	50	PR-30S **70600**	PW-30S **70601**	PB-30S **70602**	PP-30S **70603**	PO-30S **70604**	PL-30S **70605**	PM-30S **70606**
3	100	PR-30M **70613**	PW-30M **70612**	PB-30M **70611**	PP-30M **70610**	PO-30M **70609**	PL-30M **70607**	PM-30M **70608**
3	150	PR-30L **70664**	PW-30L **70665**	PB-30L **70666**	PP-30L **70667**	PO-30L **70668**	PL-30L **70669**	PM-30L **70670**

XEBEC Ceramic Stone™ Pencil

for fine detail work

- Ideal for polishing the stamping and narrow part of molds in material up to HRC57



Part #	EDP	Grit	Color	T mm	T in	W mm	W in	L mm	L in	Pencil Holder	Quantity Per Pack
A-R-0505S	**70950**	#1200	Red	0.5	.019	0.5	.019	50	1.969	PCL05	3 stones
A-R-0909S	**70951**	#1200	Red	0.9	.036	0.9	.036	50	1.969	PCL09	3 stones
A-B-0505S	**70952**	#800	Blue	0.5	.019	0.5	.019	50	1.969	PCL05	3 stones
A-B-0909S	**70953**	#800	Blue	0.9	.036	0.9	.036	50	1.969	PCL09	3 stones

XEBEC Ceramic Stone™ Pencil Holder

Part #	EDP	Description	Quantity Per Pack
PCL05	**70960**	Pencil Holder for AR-0505S, AB-0505S	1 holder
PCL09	**70961**	Pencil Holder for AR-0909S, AB-0909S	1 holder

XEBEC Ceramic Stone™ Diamond

for Polishing

- Best solution for EDM scale removal for maximum productivity.
- Attach to an ultrasonic polisher for optimal performance.

Stick Type

Dimensions (mm) W	H	L	Black #200	Blue green #400	Gray #800
1	4	100	DM1004M **70900**	DF1004M **70901**	DS1004M **70902**
1	6	100	DM1006M **70903**	DF1006M **70905**	DS1006M **70907**
1	10	100	DM1010M **70904**	DF1010M **70906**	DS1010M **70908**

Rod Type

Dimensions (mm) ø	Length	Bluegreen #400
3	50	PDF30S **70909**
3	100	PDF30M **70910**

All meister finish items are non-stock standards; 1-2 week delivery

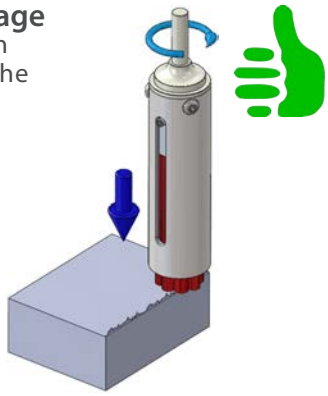
Application Tips

For more application tips,
scan the QR code or visit
www.deburringtechnologies.com.

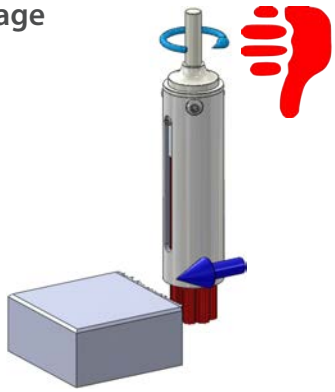
Workpiece Engagement

The brush cuts on the end, not the side. Cutting on the side of the brush will cause damage to the brush.

Correct usage
Cutting with the end of the brush.

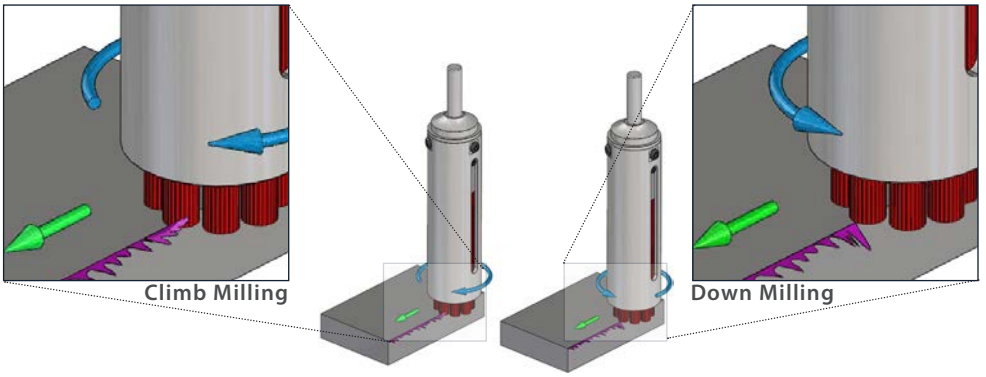


Wrong usage
Contacting the side of the brush.



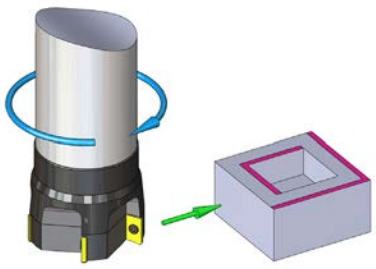
Climb Milling versus Down Milling

Rotation direction should be up cutting. Grinding power is greater when the rotation direction of the front side of traveling is against the burr generation, known as climb milling.



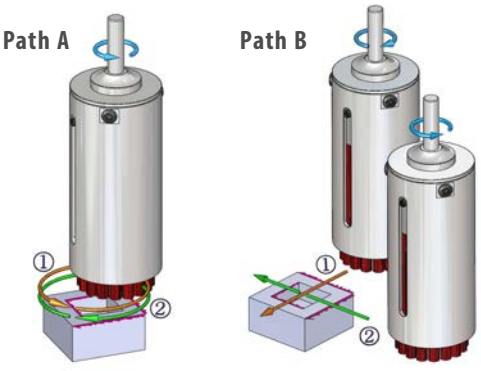
The burr size and burr location change depending on the rotation & travel of the cutting tool while face milling. In this example, either path A or B works well because you are lifting the burr which improves removal. For example the edges in pink have been rolled over by the face mill while other edges may have a much smaller burr to remove.

Cutting process



Bigger burrs on the edges in pink

Climb milling toward bigger burr



Compensating for tool wear

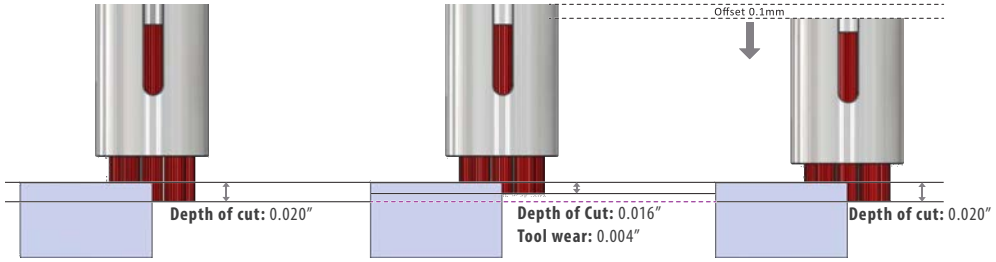
After running a series of parts, calculate approximate tool wear and program an automatic offset.

- Set depth of cut (0.020")
- After running a series of parts, measure the brush length to calculate tool wear. For example, when it wears 0.004" after 100 pcs.
- Offset 0.004" per 100 pcs. When you offset at shorter intervals as 0.039 inch/pc, you can expect longer tool life.
- Projection length from a sleeve needs to be adjusted, when it becomes shorter than 0.20"

Unused condition
Depth of cut: 0.020"

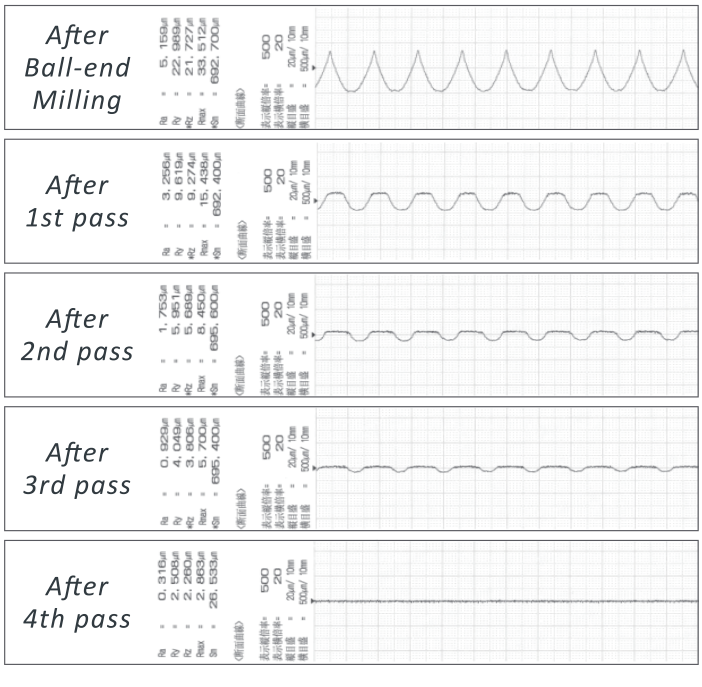
After 100 pcs deburring
Tool wear: 0.004"
Depth of cut: 0.016"

Offset program setting
Offset cut: 0.004" per 100pcs
Depth of cut: 0.020"



How to maximize surface finish

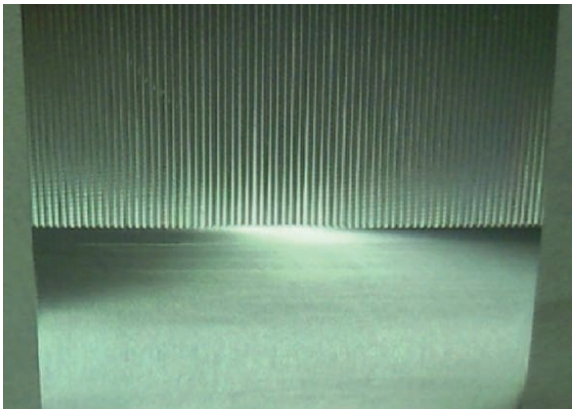
Cusps removal : 1/2 Rule When used in initial polishing parameters, each pass improves surface roughness by approximately 1/2. back-calculation will yield you required pass numbers.



<Rmax>
1319 µ inch
½
608 µ inch
½
333 µ inch
½
224 µ inch
½
114 µ inch

Tool: A21-CB25M
Material: A5052(Aluminium)
Parameters: 5,000min^{-1}, F350mm/min, D0.2mm

Before
1319 µ inch/Ra 200 µ inch



After
Rmax 114 µ inch/Ra 12 µ inch

For help with applications and operating parameters, call the Deburring Technologies Technical Hotline

1-800-434-9775

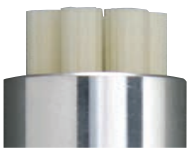
Operating Parameters

Material/Brush Choice

Material	1st Brush Choice	2nd Brush Choice
Aluminum	●	○
Steel	○	●
Hard to cut	●	○

Xebec Brush™ Surface Starting Operating Parameters for Automated Machining

		Brush Diameter (mm)		6	15	25	40	60	100	FEED RATE	
		Maximum RPM		10,000	6,000	5,000	3,000	2,000	1,000	finishing	deburring
Material	SFPM	Brush Choice 1st	2nd	RPM	RPM	RPM	RPM	RPM	RPM	IPM	IPM
Low Carbon Steel	600	WHITE	BLUE	9707	3883	2330	1456	971	582	47	94
Medium Carbon Steel	550	WHITE	BLUE	8898	3559	2136	1335	890	534	40	80
High Carbon Steel	500	WHITE	BLUE	8089	3236	1941	1213	809	485	34	67
Cast Steel	450	BLUE	WHITE	7280	2912	1747	1092	728	437	27	54
300 Series Stainless	525	WHITE	RED	8494	3397	2038	1274	849	510	47	94
400 Series Stainless	575	WHITE	RED	9303	3721	2233	1395	930	558	47	94
Grey Cast Iron	400	BLUE	WHITE	6471	2589	1553	971	647	388	54	107
Ductile Cast Iron	350	BLUE	WHITE	5662	2265	1359	849	566	340	47	94
Alloy Cast Iron	300	BLUE	WHITE	4854	1941	1165	728	485	291	40	80
Aluminum Cast Alloys	700	RED	WHITE	10000	4530	2718	1699	1132	679	80	161
Aluminum Diecast Alloys	800	RED	WHITE	10000	5177	3106	1941	1294	777	74	147
Aluminum Wrought Alloys	900	RED	WHITE	10000	5824	3495	2184	1456	874	67	134
Zinc Diecastings	800	RED	WHITE	10000	5177	3106	1941	1294	777	67	134
Copper	600	RED	WHITE	9707	3883	2330	1456	971	582	60	121
Brass, Free Machining	600	RED	WHITE	9707	3883	2330	1456	971	582	74	148
Cast Bronze	500	RED	WHITE	8089	3236	1941	1213	809	485	47	94
Nickel Alloys	200	BLUE	WHITE	3236	1294	777	485	324	194	40	80
Titanium Alloys	200	BLUE	WHITE	3236	1294	777	485	324	194	40	80
Plastic, Thermosetting	500	PINK	RED	8089	3236	1941	1213	809	485	80	161
Plastic, Thermoplastic	800	PINK	RED	10000	5177	3106	1941	1294	777	80	161
			Brush Projection "Initial Set-Up"	0.3125" - 0.3750"	0.3750" - 0.5625"	0.5000" - 0.6250"	0.5000" - 0.6250"	0.5000" - 0.7500"	0.5000" - 0.7500"		



p = brush projection

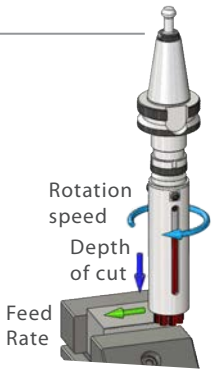
Parameter Recommendations

Rotation Speed
80% of the maximum rotation speed

Feed Rate
About F40" - F160"/min

Depth of Cut
0.02 - 0.04", depending on direction of burr generation; recommended to cut 0.02" for vertical burrs, 0.04" for horizontal burrs

- Recommended to use coolant, no matter the application
- If the amount of brush projection is below 0.2", the grinding power increases and it affects the finish



Xebec Stone™ Flexible Shaft Starting Operating Parameters

Material	Description	3mm Stone	4mm Stone	5mm Stone	6mm Stone
Aluminum/Castings	1000 - 3000	● 12000 RPM	● 9100RPM	● 7000 RPM	● 6100 RPM
Aluminum/Castings	5052 - 6061	● 13000 RPM	● 9900 RPM	● 7600 RPM	● 6600 RPM
Copper/Brass	C93200 - B - 148-52	● 12000 RPM	● 9100 RPM	● 7000 RPM	● 6100 RPM
Carbon Steel/Alloys	1010 - 1060	● 13500 RPM	● 10200 RPM	● 7800 RPM	● 6800 RPM
Low Alloy Steel	S1 - O2 - 4140 - 5150	● 13700 RPM	● 10300 RPM	● 8000 RPM	● 7000 RPM
High Alloy Steel	H11 - T15 - M42	● 13900 RPM	● 10400 RPM	● 8200 RPM	● 7200 RPM
Stainless Steel/Castings	403 - 405 - 17 - 4 PH	● 13500 RPM	● 10200 RPM	● 8000 RPM	● 7000 RPM
300 Series Stainless	304 - 316	● 12200 RPM	● 9300 RPM	● 7200 RPM	● 6200 RPM
Cast Iron - Gray & Nodular	All	● 13200 RPM	● 9900 RPM	● 7600 RPM	● 6600 RPM
White/Hardened Cast Iron	All	● 14500 RPM	● 11000 RPM	● 8700 RPM	● 7600 RPM
Titanium	TiAL6V4 - 6V6AL2Sn	● 14000 RPM	● 10500 RPM	● 8200 RPM	● 7300 RPM
High Temp Alloys	Inconel - Hastelloy	● 14500 RPM	● 11000 RPM	● 8700 RPM	● 7600 RPM
Maximum RPM		15,000	13,000	12,000	10,000

● 220 grit equivalent

● 400 grit equivalent

● 800 grit equivalent

Select stone diameter according to the size of the crosshole. Stone size should be smaller than the main bore and at least 25% larger than the crosshole diameter. Do not displace the shaft of the tool more than 2mm. Stones may be dressed with a diamond honing stone.

How to Change Parameters

- If burrs remain, increase rotation speed to the maximum
- If the edge is too rounded after removing the burrs:

- Decrease the rotation speed in increments of 40”/min
- If you want to shorten cycle time, increase the feed rate in increments of 40”/min

	Rotation Speed	Depth of Cut	Feed
To increase grinding power	↑	↑	↓
To decrease grinding power	↓	↓	↑

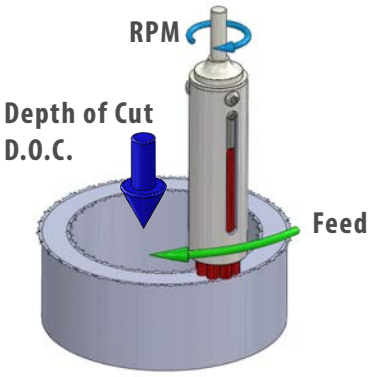
Maximizing Performance

Maximizing Deburring Operation

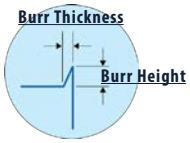
1. Increase RPM to the maximum allowed
2. Decrease feed rate in 10% increments
3. Do not change original parameters but increase number of passes
4. You can try a more rigid brush that will increase grinding power

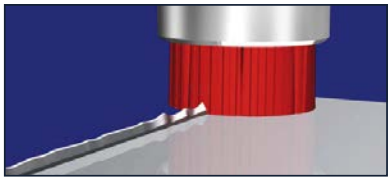
Maximizing Tool Life

1. Decrease RPM in 10% increments
2. Increase feed rate by 10% increments
3. You can try another brush color A21 White, A11 Red, A31 Blue with the same parameters

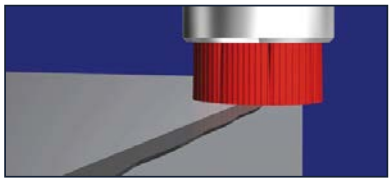


Depth of Cut - All Brush Grades			
polishing	vertical burr	horizontal burr	heavy burr
0.012”	0.020”	0.040”	0.060”





Vertical Burr
Burr that is upwardly generated on edge after end milling or drilling. In this case, tip of a brush can contact the burr vertically.



Horizontal Burr
Burr that is sideways-generated on edge after face milling. In this case, tip of a brush can contact the burr horizontally.

Xebec Technology Co., LTD offers a wide range of deburring and surface finishing solutions that dramatically improve manufacturing productivity and greatly reduce costs. Xebec products utilize a unique, patented process to produce brushes, sticks and stones of solid ceramic fibers that simply outperform older technologies.

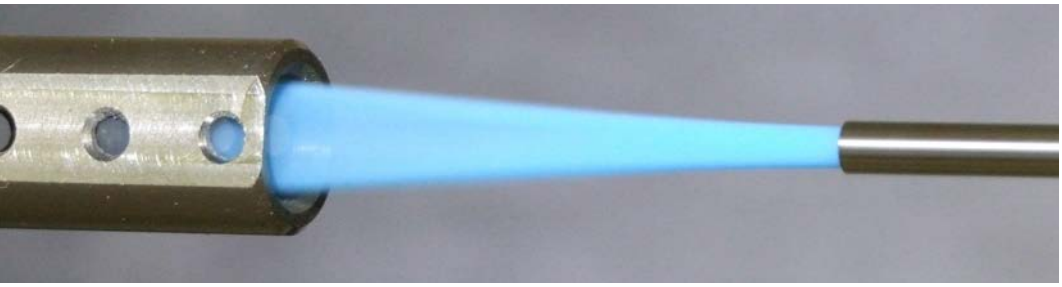
The ceramic fibers are woven to create self-sharpening filaments that maintain consistent cutting action on the tips. Unlike wire and abrasive impregnated nylon brush filaments, the unique design of the Xebec fiber rod maintains its shape with no deformation even after repeated use. This leads to consistent performance time after time.

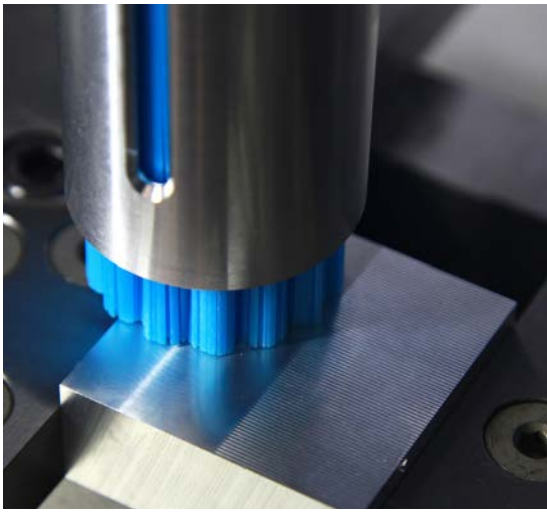
Ceramic fiber products can be used in CNC, robotic or hand held devices on materials to 65Rc for:

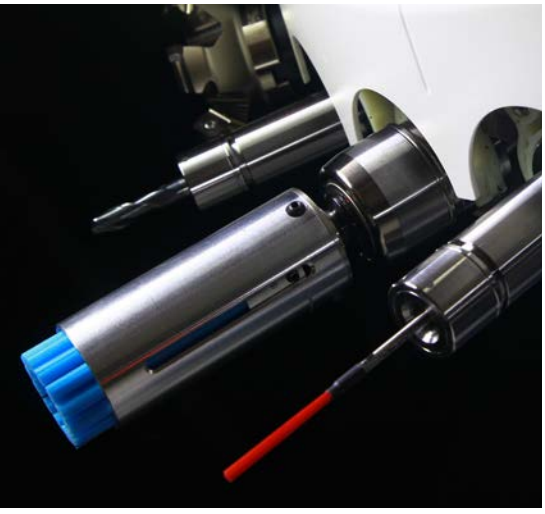
- Surface deburring, finishing and polishing
- Cross hole deburring and bore finishing
- Polishing of molds and other detailed parts

For application tips,
scan the QR code or visit
www.deburringtechnologies.com.

Deburring Technologies, LLC
800.306.5901 fax 937.482.4011
tech line 800.434.9775
sales@deburringtechnologies.com







XEBEC®
Deburring Technologies, LLC

www.deburringtechnologies.com

SAFETY WARNING Cutting fiber brushes and stones are cutting tools and are often rotated at high speeds with a power tool or in a machine tool. They should never be operated at higher than the maximum speeds listed. When using these tools, safety glasses and gloves should be worn. Breathing the dust created by using these products for prolonged periods of time should be avoided.

TEST TOOL POLICY Due to the unique design of Xebec products, we have achieved optimal success when Deburring Technologies technical personnel assist in the selection of proper tool and operating parameters. Provided our representative has reviewed an application and provided processing recommendations, we are pleased to provide reasonable quantities of test product with a "Guaranteed Trial" purchase order. Such product will be invoiced and is payable per our normal NET – 30 DAY terms. Should the product not perform as promised, simply contact us for a return authorization within forty five (45) days of purchase with a written report of how the product failed to meet the promised performance. Once we have received and inspected the product we will issue full credit for the returned product. All returns for other than guaranteed trial performance must be received within thirty (30) days from date of purchase and be received in new condition in the original packaging. Once we have received and inspected the product we will issue full credit for the returned product.

XEB-CAT17 *Published March 2017*

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