



GRISH FIBER OPTIC POLISHING



TOTAL SOLUTIONS FOR YOUR
POLISHING REQUIREMENTS



GRISH group always adheres to the business philosophy which is 'Pursuing the physical and spiritual happiness of all employees while contributing to the progress and development of human society'. The company is people-oriented, giving full opportunity to its employees to show the talents and skills, striving to create more values for customers, and realizing the coordinated development of individual employees, enterprises, customers and society.

Just like toothpastes and cosmetics products that make people more beautiful, the precision grinding and polishing materials developed and produced by GRISH company can be used to improve the surface accuracy and beauty of various high-precision parts, and become the favorite of many customers.

New voyage calls for new passion and new mission contains new hope. We always comply with the development and processing needs of various industries; constantly create new technologies, products, develop various processes and entire polishing solutions in order to support customers' development and success.

A handwritten signature in black ink that reads "Katsu Heiko". The signature is written in a cursive, flowing style.

Katsu Heiko
President of Grish Group



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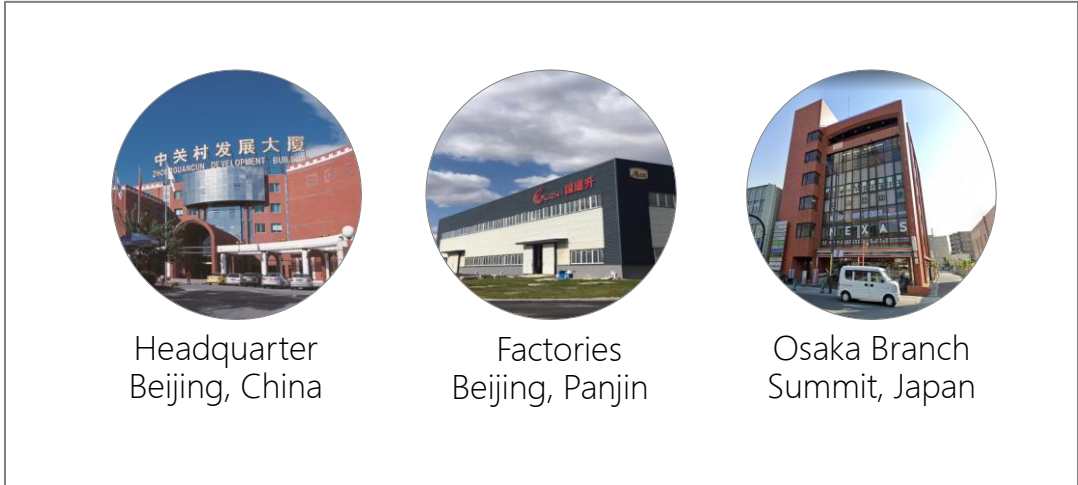
Company Basic Information

Name	Beijing Grish Hitech Co., Ltd.
Founded	June 2001
CEO	Katsu Heiko
Address	Rm 402, Block C, Zhongguancun Development Building, No. 12, Shangdi information Rd., Haidian District, Beijing, China 100085
Business	<ol style="list-style-type: none"> 1. Manufacture and sale of the polishing materials, Polishing machines and tools etc. 2. Research and Develop products upon the customers' request. 3. Provide complete polishing solution to the customers.

Company History

2001	Beijing Grish established.
2002	Lapping film diamond series was developed.
2005	Fangshan plant and R&D center founded.
2007	ISO9001, ISO14001, OHSAS18001 Certified.
2008	Polycrystalline diamond project developed.
2011	Electrostatic line went into production.
2012	Yanshan plant went into production.
2015	Acquiring Japan Company Summit.
2017	Panjin plant went into production.
2018	Polishing machine plant went into production.
2019	Solid Wax and Dental Polishing Products developed.
2020	Grinding & polishing solutions and supporting materials for compound semiconductors developed.

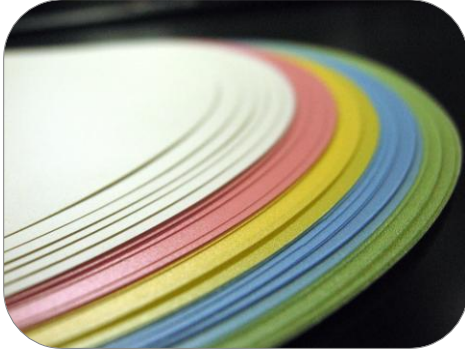
Subsidiaries



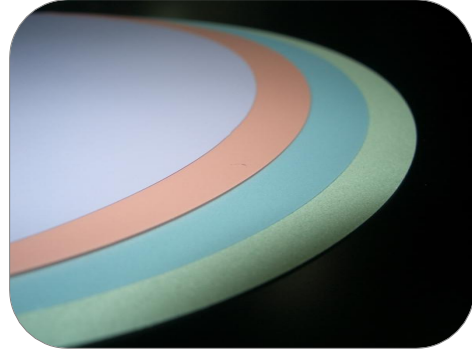
Overseas Customers & Distributors



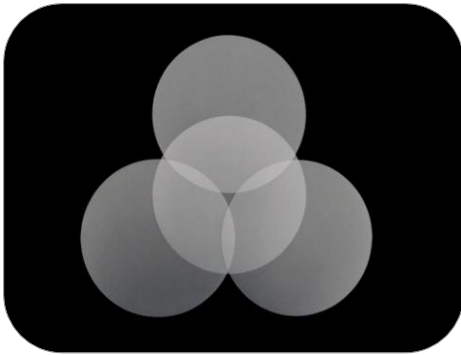
Grish Products for Fiber Optic



Diamond Lapping film



SiC/AO/CO Lapping film



Final Polishing film



Fiber Optic Polisher



MPO Polishing Pads

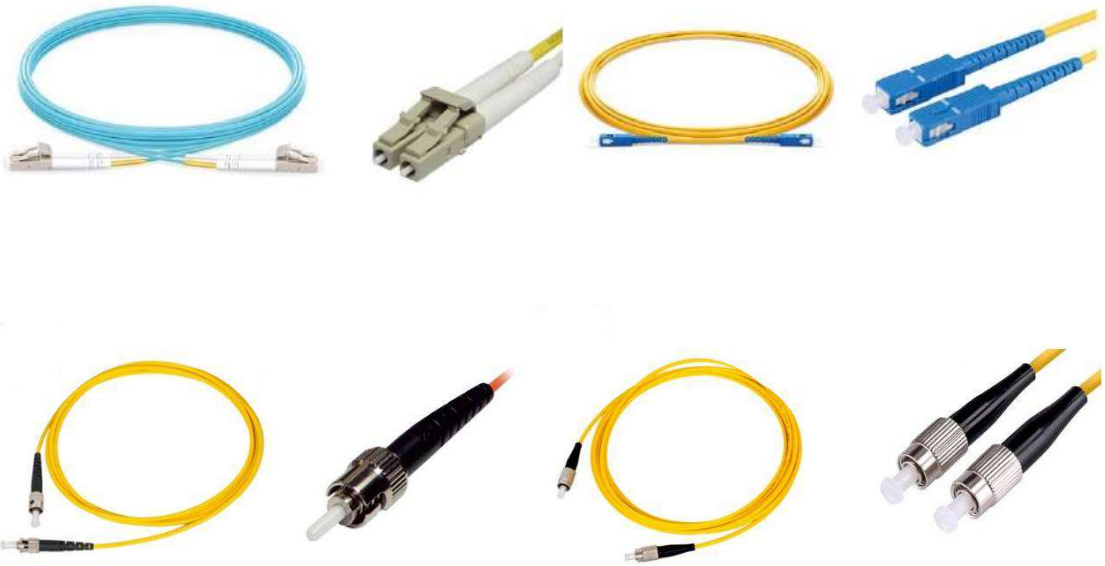


AO/CO/SiC Slurry

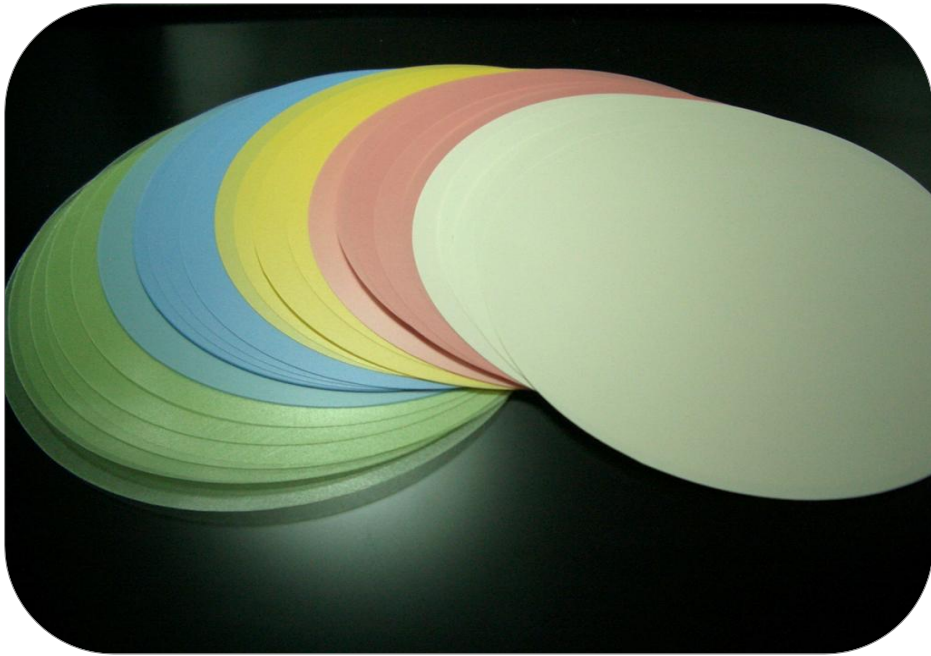


LC/SC/ST/FC

Lapping & Polishing Solution



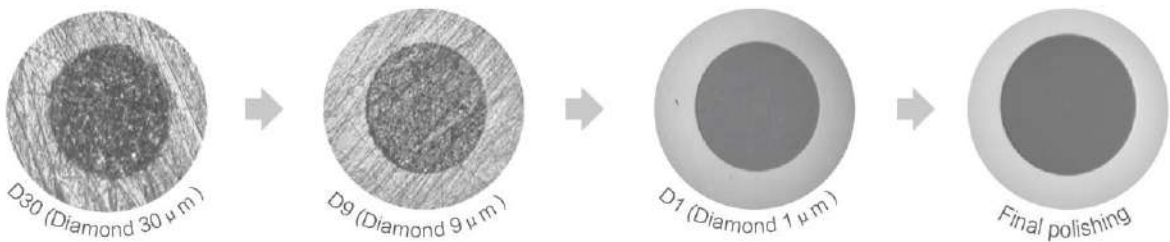
Polishing Solution



No.	Step	Polishing Film	Slurry	Pad	Time	Life
1	Resin Removal	SC/D30	DI Water	80D	30-35s	≥50
2	Rough Polishing	D9	DI Water	80D	30-35s	≥50
3	Fine Polishing	D1	DI Water	80D	35-40s	≥50
4	Final Polishing	SiO ₂	DI Water	70D	20-30s	≥10

Note:

Classical Fiber Optic Connector recommended Polishing process: D30-D9-D1- Final polishing,
 Below is good end-face pictures in 400 times magnification for each polishing Step:





Lapping Film

GRISH Lapping film / Polishing film is coated with precisely graded minerals (such as diamond, aluminum oxide, silicon carbide, silicon oxide, cerium oxide and so on) on the high strength polyester backing to provide a uniform, consistent finish. With or without PSA (Pressure Sensitive Adhesive) backing, and available in sheets, discs and rolls for meeting the use on any type of polishing equipment. These films are widely used in the polishing of fiber optic connectors, roller, hard disk and metal parts etc.

Specification

Abrasive Grit Size	Diamond (D)	Silicon Carbide (SC)	Aluminum Oxide (AO)	Silicon Oxide (SO)	Cerium Oxide (CO)
80μm #180	●				
60μm #240	●				
45μm #360	●				
40μm #400	●		●		
30μm #600	●	●	●		
20μm #800			●		
16μm #1000	●	●	●		
15μm #1200	●	●	●		
12μm #1500			●		
9μm #2000	●	●	●		
6μm #2500	●				
5μm #3000		●	●		
3μm #4000	●	●	●		
2μm #6000	●		●		
1μm #8000	●	●	●		
0.5μm #10000	●		●		
0.3μm #15000			●		●
0.01μm				●	
Standard Size	Round: Φ70mm, Φ110mm, Φ127mm (5in), Φ203mm (8in) Rectangle: 114mm*114mm, 152mm*152mm (6in*6in), 228mm*280mm (9in*11in)				

Remark: Customizations are available upon requests.

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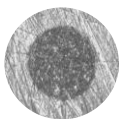
Applications

Product series	Application and explanation
D (Diamond)	Lapping for fiber optic connector, fiber array and glass pig tail (angle removal, rough grinding, medium polishing and fine polishing).
	Polishing for magnetic heads and hard disks.
	Lapping and polishing for optical glasses, optical crystal and LED.
	Lapping and polishing for semiconductor wafer (gallium arsenide, indium phosphide etc.)
	Edge polishing for silicon wafer.
SC (Silicon Carbide)	Epoxy and glass removal.
	Lapping and polishing for plastic ferrules.
	Fine finishing and polishing for magnetic heads.
AO (Aluminum Oxide)	Polishing for fiber optic connector.
	Polishing for silicon wafer used in solar cells.
	Polishing for hard disks.
	Polishing for ITO.
SO (Silicon Oxide)	Lapping and polishing for optical crystal.
	The final super-precise polishing of fiber optic connector.
CO (Cerium Oxide)	The final polishing for fiber optic connectors.
	Polishing for optical devices.

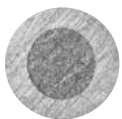
◆ Fiber Optic Connector Polishing



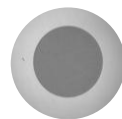
Recommended polishing process: D30, D9, D1 and final polishing.
Below is good end-face pictures in 400 times magnification for each polishing step:



D30 (Diamond 30µm)



D9 (Diamond 9µm)



D1 (Diamond 1µm)



Final Polishing Film

◆ MTP/MPO connector



◆ Hard disk



◆ Hard alloy

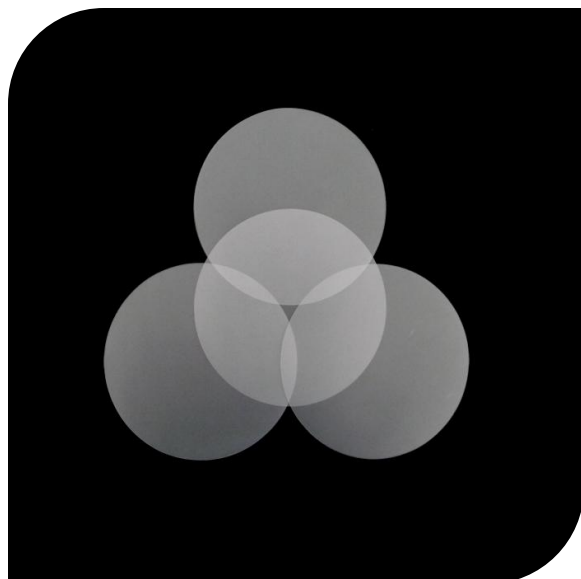


◆ Metallography polishing



Features

- ◆ Superior finish surface.
- ◆ Consistent polishing performance.
- ◆ Long life and highyield.
- ◆ Applicable to both dry and wet polishing.



Final Polishing Film

GRISHG finishing film is specially researched and developed for the final polishing of optical fiber connector. There will be no unexpected scratch or defect on the surface of connector and the fiber height or interferometer data can reach the international standard without any problem. Only the purified water is needed as the polishing medium when use the final polishing film.

Specification

Name	Total transparent or semitransparent	
Mineral	SiO ₂	
Grit	0.008-0.015micro	Laser granularity Instrument NPA-150
Backing specification	3mil	Optical fiber thickness instrument
Storage conditions	Disc: φ110mm, φ127mm(5inch), φ203mm(8inch)	Disc or roll products can be customized according to customers' requirements
Standard Size	Sheet: 114mm*114mm, 152mm*152mm(6inch)	

Highlights

- ◆ High efficiency with good polishing ability;
- ◆ Long lifetime can greatly save costs;
- ◆ Provide the stable fiber height.

Fiber Optic Polisher

Fiber Optic Polisher is a special machine to polish various types of Optical Fiber connectors, which is mainly used to polish Ceramic Ferrule connectors like Patch Cords, Pigtail, PLC Splitter, POF Fiber and other Fiber relevant items. Optical Fiber polisher is widely applied in Telecommunication industry, which is an irreplaceable facility in Optical Fiber polishing. Currently 4 or 5 optical Fiber Polishers as one complete production line is widely adopted for Optical Fiber polishing, meanwhile equipped with different types of polishing Jig like PC, APC, UPC etc as parts of comprehensive production line.



Specification

Technical Parameters	Voltage	AC220V
	Frequency	50HZ
	Power	50W
	Rotation Speed	30-200r/min

Highlights

Control part.:

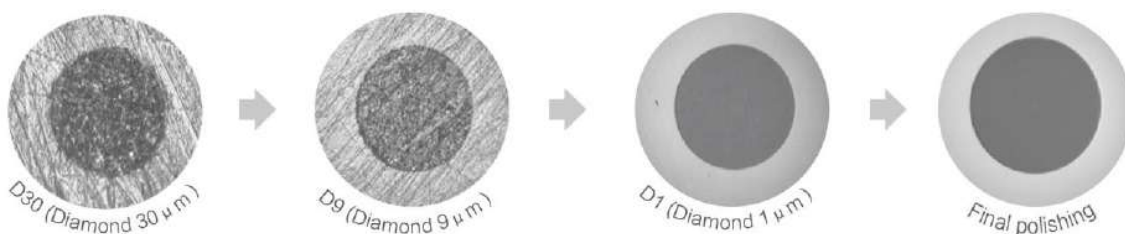
- ◆ Adopt PLC system, 7-inch color screen human-machine interface, touch screen operation; modify and call program and parameters intuitively and quickly.
- ◆ Good operation interface, intuitive display of production capacity, grinding time, and other production information
- ◆ Slow start time, running time, and grinding speed can be adjusted in real-time for different grinding processes.
- ◆ Large memory for storing many grinding programs, each program can set grinding speed, grinding time, and slow start time independently.
- ◆ The program has an automatic compensation function for grinding time, and the compensation time can be customized to ensure the consistency of polished products.
- ◆ Key electrical parts are imported brands, with stable performance and long life.
- ◆ Up to 50 heads can be ground, which greatly improves the grinding efficiency.

Mechanical structure part:

- ◆ Adopting single motor drive, fixed rotation to revolution ratio, stable grinding track.
- ◆ The internal harmonic reducer transmission is adopted, with strong transmission rigidity and no speed fluctuation, further improving the stability of grinding disc operation.
- ◆ Key components are imported brands, with long service life and high stability.

Company advantages:

- ◆ The company integrates the R&D and manufacturing of consumables and equipment and can provide customers with systematic solutions from equipment, consumables, and processing technology to achieve the best use of equipment and consumables.





Polishing Oil

GRISH Polishing oil is a kind of polishing agent with high purity and low ion content. Auxiliary coarse grinding or fine grinding makes the grinding end face more delicate and easier to polish. Good product stability and long storage time.

Suitable for polishing optical fiber, metal, alloy, precision optical devices, stainless steel, crystals and sapphire precision polishing.

Specification

Name	PGE-2
Packing specification	500ml/Bottle (It can be adjusted according to customer needs)
Storage conditions	<ol style="list-style-type: none"> 1) Storage temperature: 0°C ~ 40°C; 2) Storage humidity: 20-70%; 3) The product is recommended to be used within 2 years.

Highlights

- ◆ High purity and low ion content;
- ◆ Auxiliary coarse grinding or fine grinding makes the grinding end face more delicate and easier to polish;
- ◆ Good product stability and long storage time.

Note

- ◆ The product can be used directly or diluted with deionized water;
- ◆ When mixing this product with other additives, stir for 4-6 minutes;
- ◆ It is suggested that this product should not be reused.



MPO/MTP

Lapping & Polishing Solution



MPO/MTP Polishing Solution

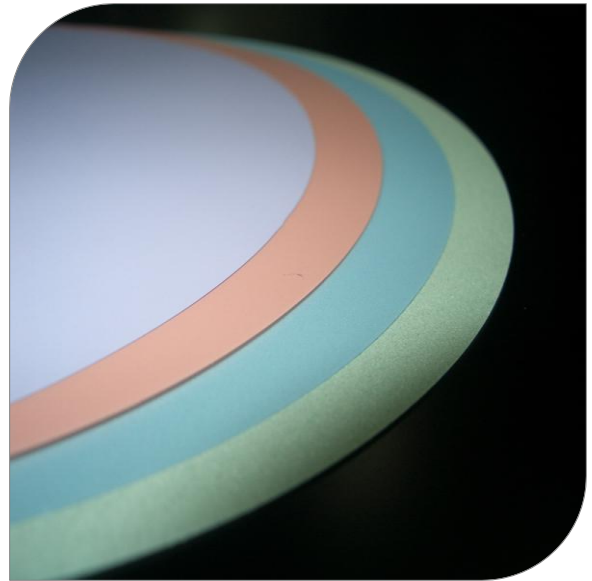


No.	Step	Polishing Film	Slurry	Pad	Pressure (lb)	Speed (rpm)	Time (sec.)	Life
1	Resin Removal	SC16	DI Water	Glass	2	10	60	≥1
2	Middle Polishing	SC3	DI Water	Glass	2	100	140	≥1
3	Fiber Height Polishing	PUMD	AO Slurry	Glass	5	150	200	≥40
4	Final Polishing	PUMZ	CO Slurry	Glass	6	180	20	≥40

Note:
This process is only for Domaille Machine.

SiC Lapping Film

MPO (Multi-fiber and pluggable) , Fiber optic connector is a kind of Plug&Play connector, featuring Multiple Fibers as signal Transmitting Channel. Therefore, it will request the polishing film being with higher grinding force, meanwhile new polishing layer will come out after upper layer peels off so as to ensure all fibers with positive value fiber height. Grish SC series polishing film for MPO utilizes the scientific coating recipe, being made with high-tech coating machine, it is able to meet different polishing demands of customers



Specification

Type	Girt size(μm)			
12A	16	9	3	1
12B	16	9	3	1

Note:
Film size customization available upon customer's request.

Highlights

- ◆ Slurry coating film Uniform coating layer results in consistent polishing performance;
- ◆ Featuring better High cutting force during polishing;
- ◆ High yields;
- ◆ Choose 12A or 12B according processes of customers.



MPO/MTP Polishing Pad

GRISH MPO/MTP polishing pad, with an excellent interconnecting microporous structure, in the process of polishing can have excellent polishing stability and will be more durable on polishing life. It can be used together with Grish MPO polishing liquid, and is suitable for ultra-precision polishing of MPO/MTP.

Specification

Name	Material	Abrasive	Color	Thickness (mm)	Shaw Hardness (A)	Density (g/cm ³)	Standard Pad Size
MPO/MTP Polishing Pad	Polyurethane (PU)	None	Black	0.70-1.10	70-90	0.500-0.700	Disc: Φ 127mm , with PSA Sheet: 140mm*140mm , with PSA

Note:
It's available upon request.

Highlights

- ◆ Stable quality, good wear-resistance;
- ◆ With good flexibility and elasticity, help to effectively avoid scratch;
- ◆ The fluff gap on the surface can store a large amount of polishing fluid to improve the polishing efficiency;
- ◆ Adhesive easy to strip off , no residual adhesive, easy to use.

Applications

- ◆ Widely used in wafer/glass/metal/ceramic etc high – level flat polishing.

AO/CO Polishing Slurry

Grish AO/CO polishing slurry is a kind of water-based, Eco-friendly polishing liquid, producing it with Superior Ultra fine polishing abrasives, featuring good dispersion, uniform Grit sizes, High polishing efficiency, mainly applied to fine polishing of MPO/MTP.



Specification

Name	Type	Grit (D50,μm)
AO Polishing Slurry	AO-1-50B	0.5-1.0
	AO-1-50C	0.5-1.0
CO Polishing Slurry	CO-1-30B	0.5-1.0
	CO-1-30C	0.5-1.0

Highlights

- ◆ Good dispersibility and uniform particle size.
- ◆ Little sedimentation, easy to shake well.
- ◆ High polishing efficiency.
- ◆ Good polishing effect of end face, no broken edge, and no scratches.
- ◆ Good product consistency.
- ◆ Easy to clean, no residue.

Effections

- ◆ MPO/MTP AO Polishing Slurry surface after polishing: (400X Fiber-End Inspector)



- ◆ MPO/MTP CO Polishing Slurry surface after polishing: (400X Fiber-End Inspector)



Micron (μm) and Mesh Conversion

Particle size	ASTM	Tyler	GB	BSS	JIS-R-6001	GRISH
400μm	#38					
420μm	#40	#35	#40	#36		
355μm	#45	#42	#45	#44		
320μm					#50	
300μm	#50	#48	#50	#52		
270μm	#53				#60	
250μm	#60	#60	#60	#60		
230μm					#70	
210μm	#70	#65	#70	#72		
200μm	#75					
194μm					#80	
180μm	#80	#80	#80	#85		
163μm					#90	
150μm	#100	#100	#100	#100		
137μm					#100	
125μm	#120	#115	#120	#120		
115μm					#120	
105μm	#140	#150	#140	#150		
100μm						#150
97μm					#150	
90μm	#170	#170	#170	#170		
82μm					#160	
80μm	#180	#180	#180	#180		#180
75μm	#200	#200	#200	#200		
69μm					#180	
63μm	#230	#250	#230	#240		
60μm	#250	#240	#250	#250		#240
57μm					#240	
53μm	#270	#270	#270	#300		
50μm	#300					#320
48μm					#280	
45μm	#325	#325	#325	#350		#360
40μm					#320	#400
37μm	#400	#400	#400	#400		
35μm					#360	
33μm	#425	#425	#425	#425		
30μm					#400	#600
25μm	#500	#500	#500	#500	#500	
23μm	#600					
20μm	#625	#625	#625	#625	#600	#800

Particle size	ASTM	Tyler	GB	BSS	JIS-R-6001	GRISH
17μm					#700	
16μm						#1000
15μm	#800	#800	#800	#800		#1200
14μm					#800	
13μm	#1000					
12μm						#1500
11.5μm					#1000	
10μm	#1250	#1250	#1250	#1250		
9.5μm					#1200	
9μm						#2000
8.5μm	#1670					
8μm					#1500	
6.7μm					#2000	
6.5μm	#2000					
6μm						#2500
5.5μm					#2500	
5μm	#2500	#2500	#2500	#2500		#3000
4μm					#3000	
3.4μm	#4000					
3μm					#4000	#4000
2.7μm	#5000					
2.5μm	#6000					
2μm	#6250	#6250	#6250	#6250	#6000	#6000
1.25μm	#7000					
1.2μm					#8000	
1μm	#12500	#12500	#12500	#12500		#8000
0.5μm					#10000	#10000
0.4μm						#15000
0.3μm					#15000	#20000
0.2μm					#20000	
0.1μm					#30000	

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