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TOTAL SOLUTIONS FOR FIBER OPTIC POLISHING



BEIJING GRISH HITECH CO., LTD.

Four Corners Pressure Fiber Polishing Machine

Polishing jig



GRS-H-F09

Pressure Mode	GRS-H-F09
Rotation Speed	170rpm/revolution 1rpm/rotation
Material	Imported S136 Mold Steel
Timer	Digital
Power	50Hz 120W
Range of Rotation	30-170rpm
Working Voltage	AC 220V 40W
Working Temperature	-10~+50°C

1. High-quality mold steel S136
2. Dual motor control, stable performance and high efficiency.
3. Imported OMRON timers, Taiwan brand counters. Select the range of 30 ~ 170rpm speed
4. Heat treatment stability more than 50°C. Grinding time and grinding can achieve precise control of the process.



Central Pressure Fiber Polishing Machine

Polishing jig



GRS-HZ-F09



1. Processing all kinds of standard optical fiber connector: FC, SC, ST, LC, MU, MT-RJ, E2000.
2. Grinding processing of plastic optical fiber, optical fiber and other types of medical products.
3. Central pressure, simple operation. Convenient to unload and replace polishing films.
4. The processing quality is stable, low repair rate.

MPO/MTP Fiber Optic Polisher



GRISH GFC-01 Fiber Polisher is mainly used for polishing the end face of MPO/MTP connectors including PC and APC type. The polishing process is stable, the operation is simple and convenient. Excellent finishing result is easy to be achieved. If it is matched with other customized jigs, it can also be used for polishing other kinds of optical fiber connectors.

Specification

Technical Parameters	Voltage	AC 220V 50Hz	Power	65W	
	Gas source	Pre-filter accuracy is recommended:3um	Pressure Range	0~10Kg	
	Rotation Speed	20~200r/min	Lapping Film Size	5inch disc	
	Polishing process	Polishing steps: 4 steps		Net Weight	35Kg
		Slow-start time: 0~60s		Machine Size	Pressure Arm Raised Condition: 370mm(Width)x500mm(Deep)x530mm(Height) Pressure Arm Down Condition : 370mm(Width)x500mm(Deep)x370mm(Height) (Fiber support not included)
		Slow pressurization time: 0~60s			
Total Polishing Time: 0~999s					

Features

Control part:

- ◆ The pressure system adopts closed-loop control to accurately control the pressure. The pressure range is adjustable from 0 to 10kg.
- ◆ PLC system, good operation interface, intuitive display of production capacity, polishing time and other production information.
- ◆ 7 "color screen friendly interface , the operation mode combined with touch screen and button; Procedure call/adjustment and parameter adjustment intuitive and fast.
- ◆ Slow start mode, Adjustable running time and rotation speed, Applicable to different processes.
- ◆ Large storage memory, can store a large number of polishing programs, each program can independently set the polishing speed, Polishing time and slow start time.
- ◆ The program has the automatic compensation function of polishing time, the compensation time can be customized to ensure the consistency of polishing films.

Mechanical structure part:

- ◆ The pressure arm adopts pneumatic cone-pin positioning, which is easy to operate, stable structure and accurate positioning.
- ◆ Internal use of harmonic reducer drive, drive rigidity, no drive clearance, can very well improve the stability of the grinding plate operation.
- ◆ Compatible with polishing disc of many domestic and foreign manufacturers, with a wide range of applications.
- ◆ Appearance: the appearance adopts the stable platform structure, the overall structure of the equipment is stable.
- ◆ Accessories: key parts, electrical parts selected imported brands, stable performance.

Company advantages:

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

Fiber Polisher GFP-150



GFP-150

Grish Four Corner Pressure Fiber Optic Polishing Machine is a special machine to polish various types of Optical Fiber connector's ferrule, which is mainly used to polish Ceramic Ferrule 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 ferrule 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
	Power	30-200r/min

Features

Control part:

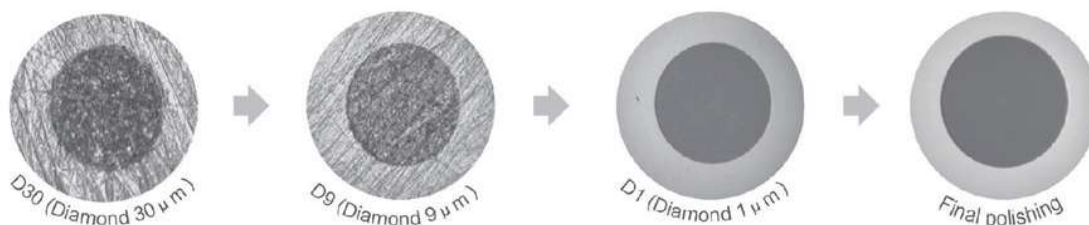
- ◆ Adoptable PLC system, 7-inch color screen friendly interface, touch screen operation; modify and execute program, parameters intuitively and quickly.
- ◆ Easy operation interface, intuitive display of production capacity, polishing time, and other production information
- ◆ Slow start time, running time, and polishing speed can be adjusted in real-time for different polishing processes.
- ◆ Large memory for storing many polishing programs, each program can set polishing speed, polishing time, and slow start time independently.
- ◆ The program has an automatic compensation function for polishing time, and the compensation time can be customized to ensure the consistency of polished products.
- ◆ Up to 50 heads can be ground, which greatly improves the polishing efficiency.

Mechanical structure part:

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

Company advantages:

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



Fiber Connectors Polishing Solutions



Table A

Expoxy Removal	Mineral	available Micron sizes	
		30	15
Grish diamond lapping film	D	deep Green D30	Light yellow D15
		light Green D30	Light Grey D15
Grish Lapping film	S/C		Brown SC15

Table B

Refine	Mineral	available Micron sizes				
		9	6	3	1	0.5
Grish diamond lapping films	D	D9 Cyan	D6 Yellow	D3 Pink	D1 Grey	D0.5 Brown
		D9 dusty yellow		D3 light Pink	D1 Grey	
		D9 Ocean blue			D1 Purple	
		D9 Ocean blue				

Table C

Final polishing	Mineral	available Micron sizes	
		0.02	0.03
Grish final polishing film	SIO	Tranparent (Grit size not specified)	

Fiber Connectors Polishing Solutions

Beijing Grish as an leading Fiber optic polishing solution supplier and manufacturer in China can offer full one-stop polishing solution to our customers, including Polisher, jig, polishing consumables, Rubber pads etc.

All solution will be ensured to be perfect combination of all items.

Regarding PC&APC ferrule, Grish recommended polishing solution as below:



Polishing Process

Process parameters applicable to $\Phi 1.25\text{mm}$ LC fiber connectors

Step		Polishing Film		Process		
		Micronl	Mineral	Pad	Liquid	Time
A	Epoxy Removal	30 μm	Diamond	80D	Dry	30-35s
B	Refine	9 μm	Dianond	80D	DI water	30-35s
	Refine	1 μm	Dianond	80D	DI water	35-40s
C	Final Polishing	0.02 μm	SiO ₂	70D	DI water	30-40s

Process parameters applicable to optical fiber connectors such as $\Phi 2.5\text{mm}$ SC

Step		Polishing Film		Process		
		Micronl	Mineral	Pad	Liquid	Time
A	Epoxy Removal	30 μm	Diamond	80D	Dry	30-35s
B	Refine	9 μm	Dianond	80D	DI water	30-35s
	Refine	1 μm	Dianond	80D	DI water	35-40s
C	Final Polishing	0.02 μm	SiO ₂	70D	DI water	30-40s

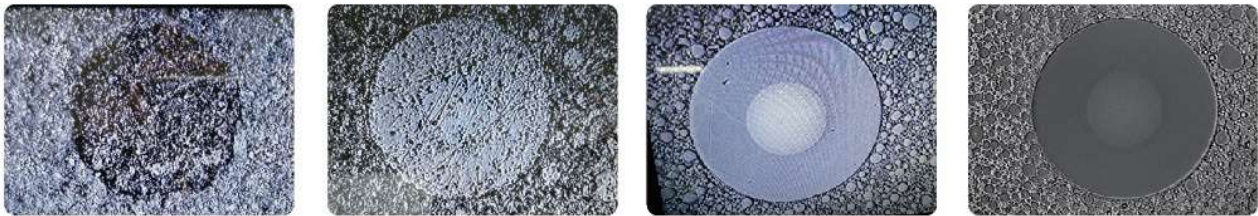
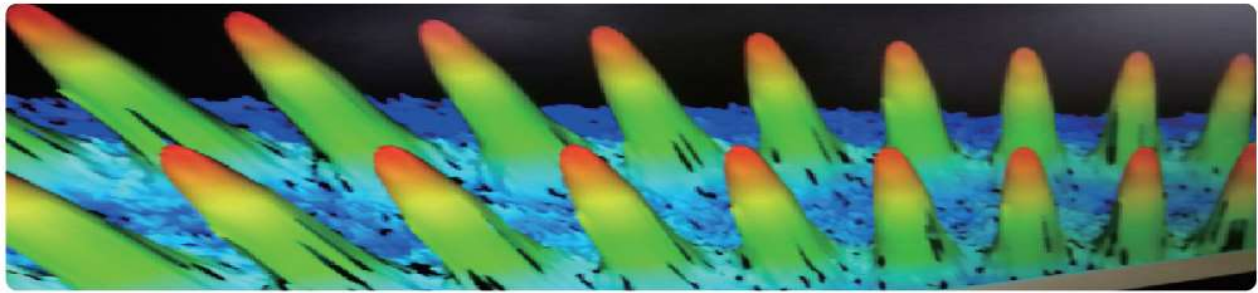
Grish is able to offer proper polishing process according to customer current connector type, onsite or online technical service are also available to help customers to get an ideal polishing result.

MPO/MTP Polishing Solution



No.	Step	Polishing Film	Slurry	Pad	Pressure (lb)	Speed (rpm)	Time (sec.)
1	MPO Epoxy Removal	SC	DI Water	Glass	2	100	20-60
2	Leveling	SC	DI Water	Glass	2	100	120
3	Fiber Protrusion	PUMD	AO Slurry	Glass	5	150	150
4	Fine Polishing	PUMZ	CO Slurry	Glass	6	180	60

Note: The above process can be adjusted according to different machine and polishing requirements. (MPO-24pieces)



FERRULE

Measurement Parameter	Units	Pass/Fail Limits		Measured Value	Verdict
		Min	Max		
Ferrule Radius of Curvature X	mm	-10000.00*	2000.00*	4040.83	PASS
Ferrule Radius of Curvature y	mm	5.00		89.36	PASS
Tilt Angle X	°	-0.1500	0.1500	-0.0671	PASS
Tilt Angle Y	°	-0.2000	0.2000	0.0592	PASS
Dome Height	nm			674.74	N/A

*- Pass value must be less than Min and greater than Max

FIBER HEIGHT LIMITS

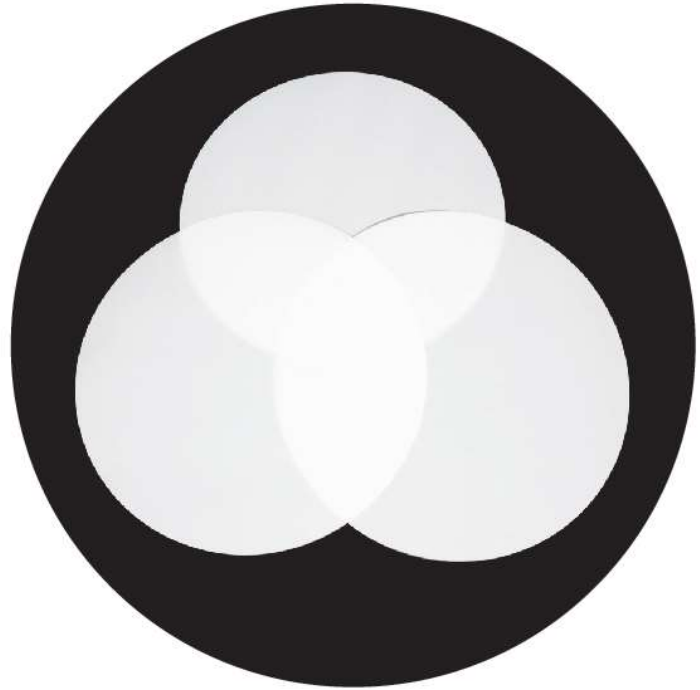
Measurement Parameter	Units	Pass/Fail Limits		Measured Value	Verdict
		Min	Max		
Max-Min	nm			277	N/A
Max Adj Diff	nm	0.00	500	135	PASS
Minus Coplanarity	nm	0.0	300.0	173.3	PASS
Coplanarity Plane Angle X	°			-0.0941	N/A

FIBERS

Measurement Parameter	Units	Pass/Fail Limits		Fiber Number / Measured Value / Verdict											
		Min	Max	1	2	3	4	5	6	7	8	9	10	11	12
Height	nm	1000	3500	1904	1980	2011	2035	2050	2079	2092	2099	2073	2014	1957	1822
ROC	mm	1		3.07	3.00	3.11	3.02	3.16	3.13	2.99	3.08	3.06	3.02	3.04	2.94
Core Dip	nm			89	81	92	76	92	85	81	83	85	83	86	84

SO Final Polishing Film

SO Final Polishing Film is engineered for the final step in polishing fiber optic connectors. The final polish with it can help to get optimum fiber surface quality and control the fiber height relative to the ferrule end face, thus helping achieve the specific return-loss and insertion-loss performance.



Specification

Model	SO-02H
Color	Translucent white
Backing specification	75 μ m (3 mil)
Standard Size	Disc: ϕ 110mm, ϕ 127mm(5inch), ϕ 203mm(8inch)
	Sheet: 114mm*114mm, 152mm*152mm(6inch)

Remark: Customizations are available upon requests.

Highlights

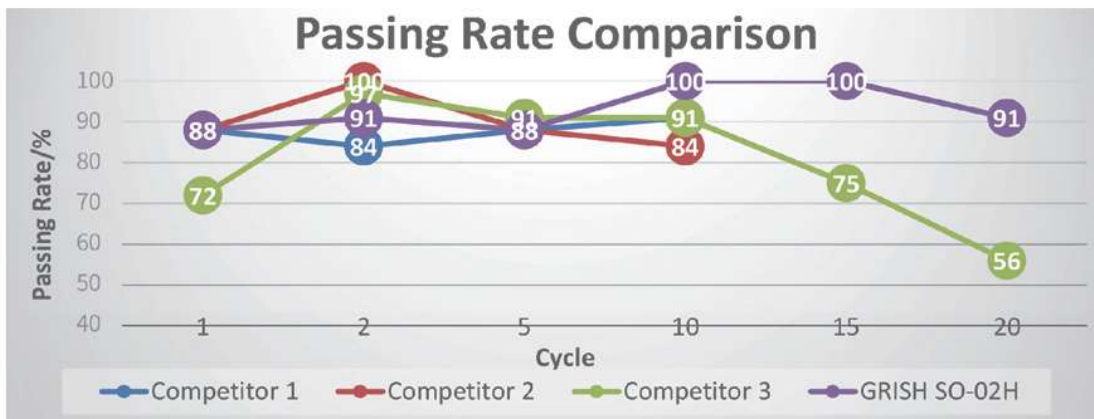
- ◆ With good polishing performance, it can achieve fine end surface and high passing rate;
- ◆ Longer life time to reduce more cost;
- ◆ Uniform fiber height around -50~-30nm.



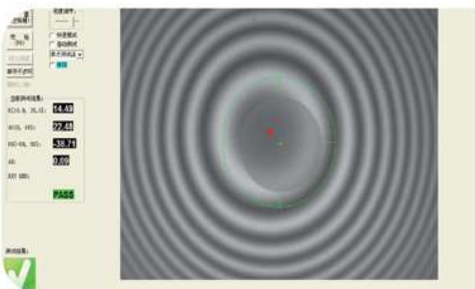
Polishing conditions:

Test Data

- ◆ Polishing machine: 4 corner polisher;
- ◆ Connector type: SC/PC, 32 connectors per cycle;
- ◆ Process: D30/ D9/ D1/ SO-02H.



◆ The above data is for reference only. The actual polishing results are determined by polishing conditions, polishing machine used and connector type.



3D parameters polished by SO-02H



End-face polished by SO-02H

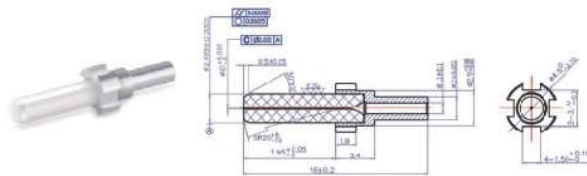
Standard Ferrule

Features High precision and reliability
 Varieties of ferrule: SC, ST, LC, MU, SMA
 Varieties of endface: Flat, PC, Cone, Step, Pre-angled

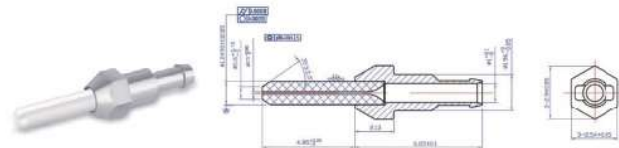
Specification

SC & LC Ferrule		Singlemode	Singlemode	Singlemode	Singlemode
Outside Diameter	(mm)	SC Φ 2.4990/LC Φ 1.2490			
OD Tolerance	(mm)	± 0.0005	$\pm 0.001/-0$	± 0.003	
Concentricity	(mm)	≤ 0.001	≤ 0.004	≤ 0.005	≤ 0.003
Inner Diameter	(mm)	$\Phi 0.125-\Phi 0.127$		± 0.125	
ID Tolerance	(mm)	$+0.001/-0$	$+0.004/-0$	$+0.005/-0$	
Ferrule Length	(mm)	SC: 10.50 ± 0.05 /LC: 6.45 ± 0.05			
End Curve Radius	(mm)	SC: $20+5/-10$			

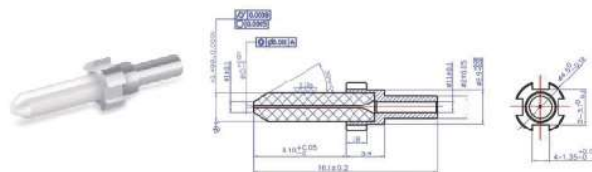
SC/SM/PC



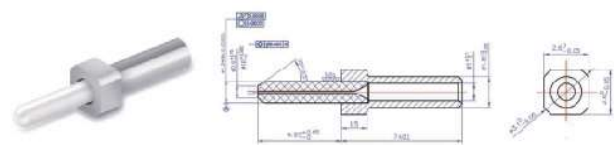
LC/SM



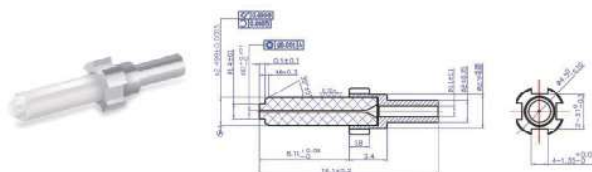
SC/SM/Cone



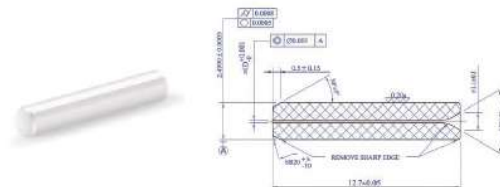
MU/SM



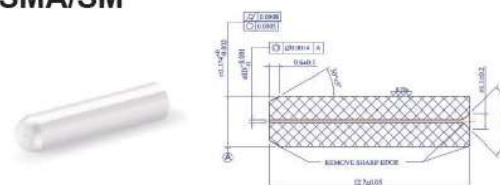
SC/SM/Step



ST/SM/PC

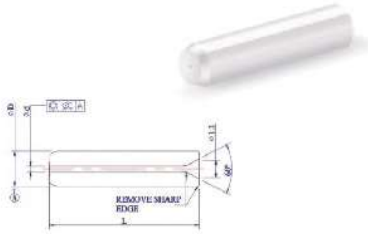


SMA/SM



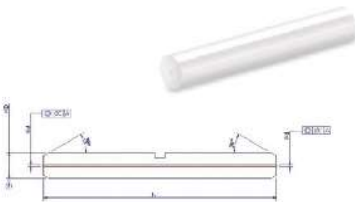
Non-standard Ferrule

LargeHole Ferrule



Part No.	FEN-LH-SC	FEN-LH-LC	FEN-LH-SMA	FEN-LH-SDL
Outside Diameter (mm)	Φ2.4990	Φ1.2490	Φ3.174	Φ1.1-Φ3.2
OD Tolerance (mm)	±0.0001	+0.005/-0.0015	+0-0.004	±0.001
Length (mm)	0.001	0.004	0.005	0.003
ID Range (μm)	128~200	210~400	401~700	
ID Tolerance (μm)	≤5	≤10		
Concentricity (μm)	≤10	≤20	≤20	

Other specified Ferrule



Part No.	FEN-SC-Funnel-1	FEN-SC-Funnel-2
Outside Diameter (mm)	Φ1.8~Φ2.5	Φ1.00~Φ1.40
Inner Diameter (mm)	Φ0.125~Φ0.127	
ID Range (mm)	Φ1.00	Φ0.42
Concentricity (mm)	≤0.001(Single mode);≤0.004(Multi mode)	
Inner Hole Length (mm)	0~5	

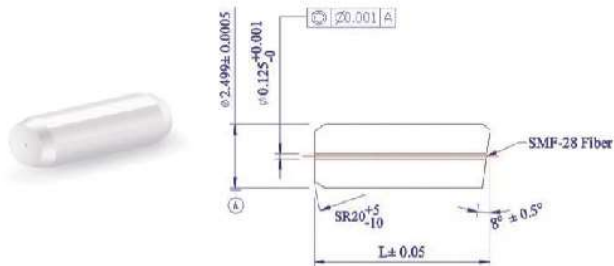
FunnelFerrule



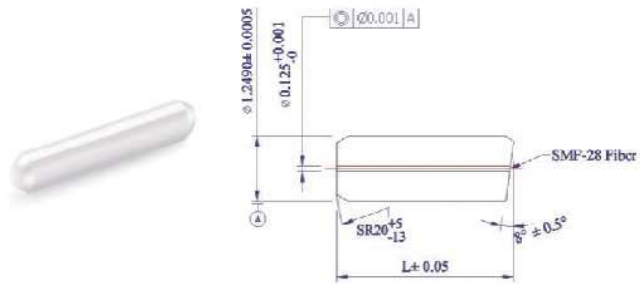
Part No.	FEN-SC-1	FEN-SC-2
Outside Diameter (mm)	Φ0.24990±0.0005	Φ1.2490±0.0005
Inner Diameter (mm)	Φ0.125~Φ0.127	
ID Range (mm)	≤0.001 (Concentricity assurance at both ends)	
Concentricity (mm)	Slot or no slot	
Inner Hole Length (mm)	2.0-14.5	

Fiber Stub

FES-SC-PA



FES-LC-PA



Type	SC SM Stub	FEN-LC-2
Outside Diameter (mm)	Φ0.24990±0.0005	Φ1.2490±0.0005
Inner Diameter (mm)	Φ0.125~Φ0.127	
Concentricity (mm)	≤0.001	
Length (mm)	5-20	

Standard MT Ferrule Series

GRISH MT ferrule is produced with high-precision molding technology, which conforms to international standards such as IEC 61754-5 and GR-1435.



12F



16F



24F



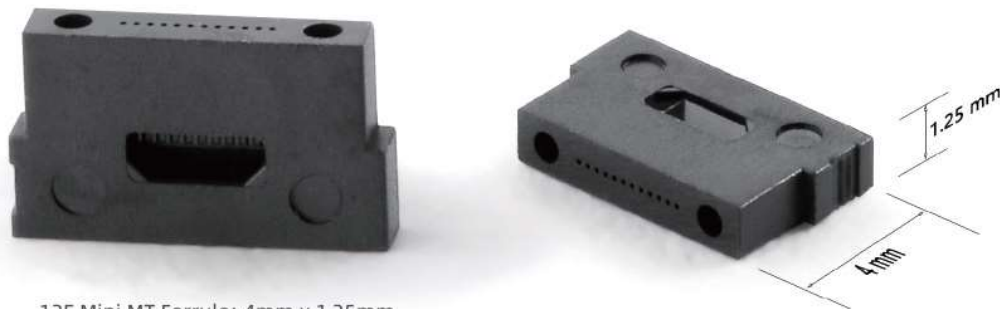
36F

Technical Specification

Ferrule Hole	Type&Grade	Fiber Hole Diameter(mm)	Guide Pin Hole Diameter(mm)	Insertion Loss(dB)
MT-12	MM Standard	0.125+0.002/-0	0.7±0.001	Typical=0.25 Max 0.5
	MM Low Loss	0.125+0.002/-0	0.7+0/-0.001	Typical=0.12 Max0.35
	SM Standard	0.125+0.0013/-0	0.7+0/-0.001	Typical=0.25 Max0.7
	SM Low Loss	0.125+0.0009 /-0	0.6990+0.0006/-0	Typical=0.12 Max0.35
MT-24	MM Standard	0.125+0.002/-0	0.7±0.001	Typical=0.25 Max0.5
	MM Low Loss	0.125+0.002/-0	0.7+0/-0.001	Typical=0.12 Max0.35
	SM Standard	0.125+0.0013/-0	0.7+0/-0.001	Typical=0.25 Max0.7
	SM Low Loss	0.125+0.0009 /-0	0.6990+0.0006/-0	Typical=0.12 Max0.35
MT-16	MM Standard	0.125+0.002/-0	0.55±0.001	Typical=0.25 Max0.5
	MM Low Loss	0.125+0.002/-0	0.55+0/-0.001	Typical=0.12 Max0.35
	SM Standard	0.725+0.0073/-0	0.55+0/-0.001	Typical=0.25 Max0.7
	SM Low Loss	0.1250+0.0009 /-0	0.5490±0.0006/-0	Typical=0.12 Max 0.35
MT-36	MM Standard	0.125+0.002/-0	0.7±0.001	Typical=0.25 Max0.5

Non-standard MT Ferrule Series

Non-standard ferrules can also be customized at GRISH according to specific requirements. For example: 12F Mini ferrule



12F Mini MT Ferrule: 4mm x 1.25mm

Technical Specification

Ferrule Hole	Type&Grade	Fiber Hole Diameter(mm)	Guide Pin Hole Diameter(mm)	Insertion Loss(dB)
MT-12	MM Standard	0.125+0.002/-0	0.7±0.001	Typical=0.25 Max 0.5
	MM Low Loss	0.125+0.002/-0	0.7+0/-0.001	Typical=0.12 Max0.35

Connector Kits Type



Connector Kits composition



Housing Color



Guide Pin



Pin Type	Pin Diameter
12F Multimode Standard	0.698 ± 0.001mm
12F Multimode Low Loss	0.6985 ± 0.0005mm
12F Singlemode Low Loss	0.698 ± 0.00025mm
16F Multimode Standard	0.548 ± 0.001mm
16F Multimode Low Loss	0.5485 ± 0.0005mm
16F Singlemode Low Loss	0.5485 ± 0.00025mm

Fiber Adhesive



GRISH Fiber Adhesive is a kind of thermo-cured epoxy resin adhesive, which is environmentally friendly solvent-free, 100% solid content, and suitable for high-temperature conditions. It can continuously work at 200°C and withstand the high temperature of 300-400°C for several hours with the same performance. GRISH Fiber Adhesive is resistant to dissolution and etching by a variety of solvents and chemicals and is an ideal adhesive for bonding optical fibers, metals, glass, ceramics and most plastics.

Specification

Parameters	Compound	Viscosity (Mpas,25°C)	Ratio	Using Time	Temperature Resistance
Product Name	A Translucent	A: 2500-3000	10:1	10 hours	-60~200°C
Fiber Adhesive	B Translucent	B: 100-200			

Features

Long life after mixing; easy handling; low skin sensitization; easy penetration into fiber bundles; turns from amber to deep red when curing.

Curing Conditions

60°C	80°C	100°C	120°C	150°C
1 hours and 21 minutes	18 minutes	6 minutes	2 minutes	1 minutes

Physical Properties

Parameters	Specific Gravity	Shore Hardness	Glass Transition Temperature(Tg)	Strength			Dilatation Coefficient (in/in/C)	Impact Strength (ASTM-D-256-56)	Thermal Conductivity	Weight Increase Percent	Thermal-shock Resistance (-55°C-150°C 10 cycles)
				Bending	Compressive	Shear					
Agent A	1.2	89	> 110°C	13000 PSI	24000 PSI	1800 PSI	51 degrees 10-6 in/C (lower than Glass Transition Temperature)	0.361/1b.-in	0.36w/m.k	0.02% (In 7 days at 96% humidity conditions)	Pass
Agent B	1						200 degrees 10-6in/in/C (higher than Glass Transition Temperature)				

Applications

- GRISH Fiber Adhesive is usually used in thicker applications where turning it into colloid at or slightly higher than room temperature, then raising the temperature to make it completely cured.
- GRISH Fiber Adhesive is suitable for brushing, dipping, pouring, or mechanical gluing process.



Beijing Grish Hitech Co., Ltd.

ADD: Rm402, Block C, Zhongguancun Development Building
No.12 Shangdi information Rd., Haidian District, Beijing, China
TEL: 0086-10-51653168 **E-MAIL:** grish@grish.com