



# **OPTICAL FIBER PRODUCTS MANUAL**

**FiberHome Telecommunication Technologies Co., Ltd.**

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## **Company Profile**

FiberHome Communications Technologies Ltd. is a leading equipment supplier and global solution provider in the field of information technology and telecommunications. This high-tech enterprise is under the State-owned Assets Supervision and Administration Commission of the State Council. It is also the largest enterprise located in Wuhan Optical Valley, China. FiberHome was founded in 1974, formerly known as Wuhan Post and Telecommunications Research Institute. After 50 years of continuous and in-depth development, its business has been extended to research and development, manufacturing, marketing and sales, and engineering services in four major fields, namely, fiber optic communications, data network communications, wireless communications and intelligent applications. In particular, the company has provided end-to-end solutions in opto-electronic devices, optical pre-fabricated rods, fiber optic cables and optical communication systems to many countries around the world.

## **FiberHome® High Temperature Optical Fiber(HTF)**

### **Description**

Fiberhome adopts PCVD(plasma chemical vapor deposition) equipment and process technology with independent intellectual property right.Optical fiber refractive index distribution control is accurate and repeatable.High temperature optical fiber can be used in communication , sensing and other fields in high-temperature environments.High temperature resistant resin coating and polyimide coating can ensure the normal operation fiber below 150°C and 300°C respectively.

### **Application**

Used in the mining industry、 aerospace industry、 military、 oil and gas and other fields

### **Characteristics**

- Excellent high-temperature working stability
- Excellent optical performance and geometric size
- Customizable optical fiber refractive index profile

HTSM-150

Type	HT 9/125-12/250-150(G.652.D)	HT 9/125-12/250-150(G.657.B3)	Unit
Optical Requirements			
Attenuation@1310nm	$\leq 0.4$	$\leq 0.4$	dB/km
Attenuation@1550nm	$\leq 0.25$	$\leq 0.25$	dB/km
Mode Field Diameter (MFD)@1310nm	$9.2 \pm 0.4$	$8.6 \pm 0.4$	$\mu\text{m}$
Cable Cutoff Wavelength( $\lambda_{cc}$ )	$\leq 1300$	$\leq 1300$	nm
Geometrical Requirements			
Cladding Diameter	$125 \pm 1.0$	$125 \pm 1.0$	$\mu\text{m}$
Cladding Non-Circularity	$\leq 1.0$	$\leq 1.0$	%
Core-Cladding Concentricity Error	$\leq 0.8$	$\leq 0.8$	$\mu\text{m}$
Coating Diameter	$245 \pm 10$	$245 \pm 10$	$\mu\text{m}$
Coating-Cladding Concentricity Error	$\leq 10.0$	$\leq 10.0$	$\mu\text{m}$
Mechanical Requirements			
Proof Test	$\geq 100$	$\geq 100$	kpsi
Operating Temperature Range	$-65 \sim +150$	$-65 \sim +150$	$^{\circ}\text{C}$
Coating Materials	Special Polyester	Special Polyester	-

Note: According to customer needs, various core diameters and all kinds of refractive index profile optical fibers are processed with high-temperature coatings.

HTSM-300

Type	HT 9/125-12/250-300(G.652.D)	HT 9/125-12/250-300(G.657.B3)	Unit
Optical Requirements			
Attenuation@1310nm	$\leq 1.0$	$\leq 1.0$	dB/km
Attenuation@1550nm	$\leq 0.8$	$\leq 0.8$	dB/km
Mode Field Diameter (MFD)@1310nm	$9.2 \pm 0.4$	$8.6 \pm 0.4$	$\mu\text{m}$
Cable Cutoff Wavelength( $\lambda_{cc}$ )	$\leq 1300$	$\leq 1300$	nm
Geometrical Requirements			
Cladding Diameter	$125 \pm 2.0$	$125 \pm 2.0$	$\mu\text{m}$
Cladding Non-Circularity	$\leq 1.0$	$\leq 1.0$	%
Core-Cladding Concentricity Error	$\leq 0.8$	$\leq 0.8$	$\mu\text{m}$
Coating Diameter	$245 \pm 10$	$245 \pm 10$	$\mu\text{m}$
Mechanical Requirements			
Proof Test	$\geq 75$	$\geq 75$	kpsi
Operating Temperature Range	-65~+300	-65~+300	°C
Coating Materials	Polyimide	Polyimide	-

Note: 1、 The optical fiber needs to be wound on an optical fiber disk that diameter greater than 36cm with near-zero tension when performing attenuation tests.

2、 According to customer needs, various core diameters and all kinds of refractive index profile optical fibers are processed with high-temperature coatings.

HTMM-150

Type	HTG 62.5/125-27/250 -150(OM1)	HTG 50/125-20/250- 150(OM2)	HTG 50/125-20/250- 150(OM3)	HTG 50/125-20/250 -150(OM4)
Optical Requirements				
Attenuation@850nm (dB/km)	$\leq 3.0$	$\leq 3.0$	$\leq 3.0$	$\leq 3.0$
Attenuation@1300nm (dB/km)	$\leq 1.0$	$\leq 1.0$	$\leq 1.0$	$\leq 1.0$
Bandwidth @850nm (MHz • km)	$\geq 200$	$\geq 500$	$\geq 1500$	$\geq 3500$
Bandwidth @1300nm (MHz • km)	$\geq 200$	$\geq 500$	$\geq 500$	$\geq 500$
Effective Bandwidth (MHz • km)	-	-	2000	4700
Numerical Aperture	$0.275 \pm 0.015$	$0.20 \pm 0.015$	$0.20 \pm 0.015$	$0.20 \pm 0.015$
Geometrical Requirements				
Core Diameter ( $\mu\text{m}$ )	$62.5 \pm 2.5$	$50 \pm 2.5$	$50 \pm 2.5$	$50 \pm 2.5$
Core Non-Circularity (%)	$\leq 5.0$	$\leq 5.0$	$\leq 5.0$	$\leq 5.0$
Cladding Diameter ( $\mu\text{m}$ )	$125 \pm 1.0$	$125 \pm 1.0$	$125 \pm 1.0$	$125 \pm 1.0$
Cladding Non-Circularity (%)	$\leq 1.0$	$\leq 1.0$	$\leq 1.0$	$\leq 1.0$
Core-Cladding Concentricity Error( $\mu\text{m}$ )	$\leq 1.5$	$\leq 1.0$	$\leq 1.0$	$\leq 1.0$
Coating Diameter ( $\mu\text{m}$ )	$245 \pm 10$	$245 \pm 10$	$245 \pm 10$	$245 \pm 10$
Coating-Cladding Concentricity Error ( $\mu\text{m}$ )	$\leq 10.0$	$\leq 10.0$	$\leq 10.0$	$\leq 10.0$
Mechanical Requirements				
Proof Test (kpsi)	$\geq 100$	$\geq 100$	$\geq 100$	$\geq 100$
Operating Temperature Range( $^{\circ}\text{C}$ )	-65~+150	-65~+150	-65~+150	-65~+150
Coating Materials	Special Polyester	Special Polyester	Special Polyester	Special Polyester

Note: According to customer needs, various core diameters and all kinds of refractive index profile optical fibers are processed with high-temperature coatings.

HTMM-300

Type	HTG 62.5/125-27/250 -300(OM1)	HTG 50/125-20/250- 300(OM2)	HTG 50/125-20/250- 300(OM3)	HTG 50/125-20/250 -300(OM4)
Optical Requirements				
Attenuation@850nm (dB/km)	$\leq 5.0$	$\leq 5.0$	$\leq 5.0$	$\leq 5.0$
Attenuation@1300nm (dB/km)	$\leq 2.0$	$\leq 2.0$	$\leq 2.0$	$\leq 2.0$
Bandwidth @850nm (MHz • km)	$\geq 200$	$\geq 500$	$\geq 1500$	$\geq 3500$
Bandwidth @1300nm (MHz • km)	$\geq 200$	$\geq 500$	$\geq 500$	$\geq 500$
Effective Bandwidth (MHz • km)	-	-	2000	4700
Numerical Aperture	$0.275 \pm 0.015$	$0.20 \pm 0.015$	$0.20 \pm 0.015$	$0.20 \pm 0.015$
Geometrical Requirements				
Core Diameter ( $\mu\text{m}$ )	$62.5 \pm 2.5$	$50 \pm 2.5$	$50 \pm 2.5$	$50 \pm 2.5$
Core Non-Circularity (%)	$\leq 5.0$	$\leq 5.0$	$\leq 5.0$	$\leq 5.0$
Cladding Diameter ( $\mu\text{m}$ )	$125 \pm 2.0$	$125 \pm 2.0$	$125 \pm 2.0$	$125 \pm 2.0$
Cladding Non-Circularity (%)	$\leq 1.0$	$\leq 1.0$	$\leq 1.0$	$\leq 1.0$
Core-Cladding Concentricity Error ( $\mu\text{m}$ )	$\leq 1.5$	$\leq 1.5$	$\leq 1.5$	$\leq 1.5$
Coating Diameter ( $\mu\text{m}$ )	$155 \pm 5.0$	$155 \pm 5.0$	$155 \pm 5.0$	$155 \pm 5.0$
Mechanical Requirements				
Proof Test(kpsi)	$\geq 75$	$\geq 75$	$\geq 75$	$\geq 75$
Operating Temperature Range( $^{\circ}\text{C}$ )	-65~+300	-65~+300	-65~+300	-65~+300
Coating Materials	Polyimide	Polyimide	Polyimide	Polyimide

Note: 1、 The optical fiber needs to be wound on an optical fiber disk that diameter greater than 36cm with near-zero tension when performing attenuation tests.

2、 According to customer needs, various core diameters and all kinds of refractive index profile optical fibers are processed with high-temperature coatings.

## **FiberHome® Radiation Resistant Optical Fiber(RRF)**

### **Description**

Radiation resistant optical fiber is a type of special optical fiber that has developed rapidly in recent years. It can effectively avoid the impact of harsh environments such as gamma rays and X-rays in radiation environments on the transmission of optical signals.

FiberHome radiation resistant fiber optic not only fully utilizes its advantages of electromagnetic interference resistance, light weight, small size and strong confidentiality, but also achieves mechanical and environmental adaptability in different irradiation environments (irradiation doses ranging from 10Gy to 250K Gy), meeting the needs of different scenarios for use. Meet the usage needs in different conditions.

### **Application**

FiberHome radiation resistant optical fibers can be applied to nuclear submarines, nuclear power detection, ground nuclear facilities, and space vehicles, etc.

### **Characteristics**

- Low irradiation additional attenuation
- Low attenuation, low dispersion, meeting the working requirements of communication windows
- Accurate control of geometric dimensions, low welding loss
- Good coating protection and excellent peeling performance



### Radiation Resistant Single-Mode Optical Fiber

Features	Conditions	RD SM-10Gy	RD SM-10KGy	RD SM-250KGy
Optical Requirements				
Attenuation (dB/km)	1310nm	≤0.40	≤0.45	≤0.45
	1550nm	≤0.25	≤0.40	≤0.40
Dispersion Coefficient (ps/(nm·km))	1550nm	≤19	≤19	≤19
Zero Dispersion Slope (ps/(nm <sup>2</sup> ·km))	-	≤0.092	≤0.092	≤0.092
PMD Maximum Individual Fiber (ps/√km)	-	≤0.125	≤0.125	≤0.125
Cable Cutoff Wavelength λ <sub>cc</sub> (nm)	-	≤1330	≤1330	≤1330
Mode Field Diameter MFD (μm)	1310nm	9.2±0.4	9.0±0.6	9.0±0.6
	1550nm	10.1±0.5	10.0±0.7	10.0±0.7
Effective Group Index Of Refraction (N <sub>eff</sub> )	1310nm	1.463	1.462	1.462
	1550nm	1.463	1.462	1.462
Geometrical Requirements				
Cladding Diameter (μm)	-	125±1.0	125±1.0	125±1.0
Cladding Non-Circularity (%)	-	≤1.0	≤1.0	≤1.0
Coating Diameter (μm)	-	245±10	245±10	245±10
Coating-Cladding Concentricity Error (μm)	-	≤12.0	≤12.0	≤12.0
Core-Cladding Cconcentricity Error (μm)	-	≤0.6	≤0.6	≤0.6
Environmental Requirements (1310nm & 1550nm)				
Temperature Dependence (dB/km)	-60°C ~+85°C	≤0.05	≤0.05	≤0.05
Temperature-Humidity Cycling (dB/km)	-10°C~+85°C, 98% RH	≤0.05	≤0.05	≤0.05
Water-Soaked Dependence (dB/km)	23°C, for 30 days	≤0.05	≤0.05	≤0.05
Damp Heat Dependence (dB/km)	85°C and 85% RH, for 30 days	≤0.05	≤0.05	≤0.05
Dry Heat (dB/km)	85°C, for 30 days	≤0.05	≤0.05	≤0.05
Mechanical Requirements				
Proof Test (N)	-	≥9.0	≥9.0	≥9.0
Macro-Bend Induced Attenuation 10 turns Φ 30mm	1550nm	≤0.2	≤0.2	≤0.2
	1625nm	≤0.5	≤0.5	≤0.5
Macro-Bend Induced Attenuation 1 turn Φ 20mm	1550nm	≤0.2	≤0.2	≤0.2
	1625nm	≤0.5	≤0.5	≤0.5
Coating Strip Force (N)	Peak Force	1.3~8.9	1.3~8.9	1.3~8.9
Dynamic Stress Corrosion Susceptibility Parameter (N <sub>a</sub> )	-	≥20	≥20	≥20
Delivery Length (km/reel)	-	2.1~25.2	2.1~25.2	2.1~25.2
Radiational Requirements				
Radiation Induced Attenuation (dB/km) , Dose: 1000 rad	1310nm	≤0.4	≤0.4	≤0.4
	1550nm	≤0.3	≤0.3	≤0.3
Radiation Induced Attenuation (dB/km) , Dose: 10000 Gy	1310nm	-	≤10	≤10
	1550nm	-	≤10	≤10
Radiation Induced Attenuation (dB/km) ,	1310nm	-	-	≤18

Dose: 250000 Gy	1550nm	-	-	≤20
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Radiation Resistant 50/125 μm Multimode Optical Fiber

Features	Conditions	RDG 50/125-10Gy	RDG 50/125-10KGy	RDG 50/125-250KGy
Optical Requirements				
Attenuation (dB/km)	850nm	≤3.0	≤3.0	≤3.0
	1300nm	≤1.0	≤1.0	≤1.0
Bandwidth (MHz·km)	850nm	≥1500	≥500	≥500
	1300nm	≥500	≥500	≥500
Numerical Aperture (NA)	-	0.20±0.015	0.20±0.015	0.20±0.015
Point Discontinuities (dB)	1300nm	≤0.10	≤0.10	≤0.10
Geometrical Requirements				
Core Diameter (μm)	-	50±2.5	50±2.5	50±2.5
Core Non-Circularity (%)	-	≤6.0	≤6.0	≤6.0
Cladding Diameter (μm)	-	125±1.0	125±1.0	125±1.0
Cladding Non-Circularity (%)	-	≤1.0	≤1.0	≤1.0
Coating-Cladding Concentricity Error (μm)	-	≤12.0	≤12.0	≤12.0
Coating Diameter (μm)	-	245±10	245±10	245±10
Core-Cladding Concentricity Error (μm)	-	≤1.5	≤1.5	≤1.5
Environmental Requirements (850nm & 1300nm)				
Temperature Dependence (dB/km)	-60℃ ~+85℃	≤0.20	≤0.20	≤0.20
Temperature-Humidity Cycling (dB/km)	-10℃~+85℃, 98% RH	≤0.20	≤0.20	≤0.20
Water-Soaked Dependence (dB/km)	23℃, for 30 days	≤0.20	≤0.20	≤0.20
Damp Heat Dependence (dB/km)	85℃ and 85% RH, for 30 days	≤0.20	≤0.20	≤0.20
Dry Heat (dB/km)	85℃, for 30 days	≤0.20	≤0.20	≤0.20
Mechanical Requirements				
Proof Test (N)	-	≥9.0	≥9.0	≥9.0
Macro-Bend Induced Attenuation 2 turns Φ 30mm	850nm	≤0.2	≤0.2	≤0.2
	1300nm	≤0.3	≤0.3	≤0.3
Coating Strip Force (N)	Typical Average Force	1.0~5.0	1.0~5.0	1.0~5.0
	Peak Force	1.3~8.9	1.3~8.9	1.3~8.9
Dynamic Stress Corrosion Susceptibility Parameter(N <sub>d</sub> )	-	≥20	≥20	≥20
Delivery Length (km/reel)	-	2.2~8.8	2.2~8.8	2.2~8.8

Radiational Requirements				
Radiation Induced Attenuation (dB/km), Dose: 1000 rad	1300nm	≤1.0	≤1.0	≤1.0
Radiation Induced Attenuation (dB/km), Dose: 10000 Gy	1300nm	-	≤14	≤14
Radiation Induced Attenuation (dB/km), Dose: 250000 Gy	1300nm	-	-	≤20

#### Radiation Resistant 62.5/125 μm Multimode Optical Fiber

Features	Conditions	RDG 62.5/125-10Gy	RDG 62.5/125-10KGy
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Optical Requirements			
Attenuation (dB/km)	850nm	≤2.7	≤2.7
	1300nm	≤0.6	≤0.6
Bandwidth (MHz·km)	850nm	≥300	≥300
	1300nm	≥600	≥600
Numerical Aperture (NA)	-	0.275±0.015	0.275±0.015
Point Discontinuities (dB)	1300nm	≤0.10	≤0.10

Geometrical Requirements			
Core Diameter (μm)	-	62.5±2.5	62.5±2.5
Core Non-Circularity (%)	-	≤6.0	≤6.0
Cladding Diameter (μm)	-	125±1.0	125±1.0
Cladding Non-Circularity (%)	-	≤1.0	≤1.0
Coating-Cladding Concentricity Error (μm)	-	≤12.0	≤12.0
Coating Diameter (μm)	-	245±10	245±10
Core-Cladding Concentricity Error (μm)	-	≤1.5	≤1.5

Environmental Requirements (850nm & 1300nm)			
Temperature Dependence (dB/km)	-60°C ~+85°C	≤0.20	≤0.20
Temperature-Humidity Cycling (dB/km)	-10°C ~+85°C, 98% RH	≤0.20	≤0.20
Water-Soaked Dependence (dB/km)	23°C, for 30 days	≤0.20	≤0.20
Damp Heat Dependence (dB/km)	85°C and 85% RH, for 30 days	≤0.20	≤0.20
Dry Heat (dB/km)	85°C, for 30 days	≤0.20	≤0.20

Mechanical Requirements			
Proof Test (N)	-	≥9.0	≥9.0
Macro-Bend Induced Attenuation 2 turns Φ 30mm	850nm	≤0.2	≤0.2
	1300nm	≤0.2	≤0.2
Coating Strip Force (N)	Typical Average Force	1.0~5.0	1.0~5.0

	Peak Force	1.3~8.9	1.3~8.9
Dynamic Stress Corrosion Susceptibility Parameter (N <sub>d</sub> )	-	≥20	≥20
Delivery Length (km/reel)	-	2.2~8.8	2.2~8.8
Radiational Requirements			
Radiation Induced Attenuation (dB/km) , Dose: 1000 rad	1300nm	≤0.5	≤0.5
Radiation Induced Attenuation (dB/km) , Dose: 10000 Gy	1300nm	-	≤45

## FiberHome® Dispersion Compensating Fiber(DCF)

### Description

PCVD equipment and technology with independent intellectual property rights of fiberhome was used to manufacture dispersion compensation fiber. The refractive index distribution of the fiber is precisely controlled and residual dispersion at compensated working wavelength can be optimized. The optical fiber has good repeatability, excellent optical properties and precise geometric dimensions, which can be customized to meet different central wavelength and dispersion requirements.

### Application

DWDM networks

CATV cable television system

Dispersion accommodation

Single mode fiber communication system for long distance and metropolitan area networks based on recommendation G.652.D

### Characteristics

- Precise geometry
- Accurate control of refractive index distribution and good optical performance
- Optimization of residual dispersion at compensated operating wavelength
- Can be customized to meet different center wavelength and dispersion requirements

Type	DCF-G.652.C/175	DCF-G.652.C/225	Unit
Optical Requirements			
Operating Wavelength@1550nm	1525~1565	1525~1565	nm
Mode Field Diameter (MFD)@1550nm	$5.0 \pm 1.0$	$5.0 \pm 1.0$	$\mu\text{m}$
Attenuation@1550nm	$\leq 0.65$	$\leq 0.65$	dB/km
Dispersion Coefficient@1545nm	-90~-190	-90~-190	ps/(nm • km)
Relative Dispersion Slope @1545nm	$0.0036 \pm 20\%$	$0.0036 \pm 20\%$	$\text{nm}^{-1}$
Geometrical Requirements			
Cladding Diameter	80~95	80~95	$\mu\text{m}$
Coating Diameter	$175 \pm 15$	$225 \pm 15$	$\mu\text{m}$
Cladding Non-Circularity	$\leq 1.0$	$\leq 1.0$	%

Core-Cladding Concentricity	$\leq 1.0$	$\leq 1.0$	$\mu\text{m}$
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## FiberHome—SIMMF

### FiberHome® Step-Index Multi Mode Fiber (SIMMF)

#### Description

Fiberhome silica-cladding step index multi-mode fiber optimizes the optical properties of the 850nm and 1300nm operating wavelengths with very low attenuation. According to customer requirements to the greatest extent, a series of silica-cladding step index multi-mode fibers with different core diameters, cladding diameters and numerical apertures can be customized.

Fiberhome adopts PCVD (Plasma Chemical Vapor Deposition) equipment and process technology with independent intellectual property rights, which ensures accurate control of optical fiber refractive index distribution and good repeatability.

#### Application

Optical fiber sensing

Laser energy transmission

Data communication

LAN and cable TV

Medical device applications

#### Characteristics

- Good stripping performance
- Good dimensional uniformity
- High coupling efficiency between LED and laser sources

Step-Index Multi Mode Fiber					
Type	SI 50/125-22/250	SI 100/140-22/250	SI 105/125-15/250	SI 105/125-22/250	SI 110/125-20/250
Optical Requirements					
Numerical Aperture	0.22±0.02	0.22±0.02	0.15±0.02	0.22±0.02	0.20±0.02
Attenuation@850nm (dB/km)	≤3.0	≤3.0	≤8.0	≤4.0	≤15.0
Attenuation@1300nm (dB/km)	≤2.0	≤1.2	≤18.0	≤8.0	≤25.0
Geometrical Requirements					
Core Diameter (μm)	50.0±2.0	100.0±3.0	105.0±3.0	105.0±3.0	110.0±3.0
Cladding Diameter (μm)	125.0±2.0	140.0±3.0	125.0±2.0	125.0±2.0	125.0±2.0
Coating Diameter (μm)	250.0±10.0	250.0±10.0	250.0±10.0	250.0±10.0	250.0±10.0
Core-Cladding Concentricity (μm)	≤3.0	≤3.0	≤3.0	≤3.0	≤3.0
Core Non-Circularity (%)	≤3.0	≤3.0	≤3.0	≤3.0	≤3.0
Cladding Non-Circularity (%)	≤2.0	≤2.0	≤2.0	≤2.0	≤2.0
Core	Pure Silica Glass				
Cladding	F Doped Silica Glass				
Coating	Dual-Layer UV-Acrylate				
Mechanical Requirements					
Proof Test (kpsi)	100	100	100	100	100

Step-Index Multi Mode Fiber					
Type	SI 200/220-22/500	SI 200/240-22/500	SI 400/440-22/730	SI 600/660-22/960	SI 800/840-22/1400E
Optical Requirements					
Numerical Aperture	0.22±0.02	0.22±0.02	0.15±0.02	0.22±0.02	0.20±0.02
Geometrical Requirements					
Core Diameter (µm)	200.0±5.0	200.0±5.0	400.0±8.0	600.0±10.0	800.0±10.0
Cladding Diameter (µm)	220.0±5.0	240.0±5.0	440.0±8.0	660.0±10.0	840.0±10.0
Coating Diameter (µm)	500.0±20.0	500.0±20.0	730.0±30.0	960.0±30.0	1400.0±50.0
Core-Cladding Concentricity (µm)	≤3.0	≤3.0	≤3.0	≤3.0	≤3.0
Core	Pure Silica Glass				
Cladding	F Doped Silica Glass				
Coating	Dual-Layer UV-Acrylate Or ETFE				
Mechanical Requirements					
Proof Test (kpsi)	100	100	100	100	100



## **FiberHome® Graded-Index Multi Mode Fiber (GIMMF)**

### **Description**

Fiberhome silica-cladding graded index multi-mode fiber optimizes the optical properties of the 850nm and 1300nm operating wavelengths with very low attenuation and high bandwidth. According to customer requirements to the greatest extent, a series of silica-cladding graded index multi-mode fibers with different core diameters, cladding diameters and numerical apertures can be customized.

Fiberhome adopts PCVD (Plasma Chemical Vapor Deposition) equipment and process technology with independent intellectual property rights, which ensures accurate control of optical fiber refractive index distribution and good repeatability.

### **Application**

Optical fiber sensing

Laser energy transmission

Data communication

LAN and cable TV

Medical device applications

### **Characteristics**

- Good stripping performance
- Good dimensional uniformity
- High coupling efficiency between LED and laser sources

Graded-Index Multi Mode Fiber						
Type	GI 50/125-20/250	GI 80/125-30/250	GI 100/125-29/250	GI 100/140-29/250	GI 105/125-30/250	GI 100/125-14/250
Optical Requirements						
Numerical Aperture	0.20±0.015	0.30±0.02	0.29±0.02	0.29±0.02	0.30±0.02	0.14±0.02
Attenuation@850nm (dB/km)	≤2.45	≤3.5	≤3.5	≤3.2	≤4.0	≤20.0
Attenuation@1300nm (dB/km)	≤0.6	≤0.7	≤0.7	≤0.8	≤1.2	–
Bandwidth@850nm (MHz·km)	≥100	≥100	≥100	≥100	≥100	–
Bandwidth@1300nm (MHz·km)	≥200	≥200	≥200	≥200	≥200	–
Geometrical Requirements						
Core Diameter (μm)	50.0±2.0	80.0±3.0	100.0±3.0	100.0±3.0	105.0±3.0	100.0±3.0
Cladding Diameter (μm)	125.0±2.0	125.0±2.0	125.0±2.0	140.0±2.0	125.0±2.0	125.0±2.0
Coating Diameter (μm)	250.0±10.0	250.0±10.0	250.0±10.0	250.0±10.0	250.0±10.0	250.0±10.0
Core-Cladding Concentricity (μm)	≤3.0	≤3.0	≤3.0	≤3.0	≤3.0	≤3.0
Core Non-Circularity (%)	≤2.0	≤5.0	≤2.0	≤3.0	≤2.0	≤3.0
Cladding Non-Circularity (%)	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0	≤1.0
Core	Ge/F Doped Silica Glass					
Cladding	Pure Silica Glass					
Coating	Dual-Layer UV-Acrylate					
Mechanical Requirements						
Proof Test (kpsi)	100	100	100	100	100	100

Graded-Index Multi Mode Fiber					
Type	GI 105/125-24/250	GI 50/80-29/165	GI 300/330-25/500	GI 200/220-22/500	GI 230/250-22/500
Optical Requirements					
Numerical Aperture	0.24±0.02	0.29±0.02	0.25±0.02	0.22±0.02	0.22±0.02
Attenuation@850nm (dB/km)	≤3.5	≤4.0	≤3.5	≤3.2	≤4.0
Attenuation@1300nm (dB/km)	≤1.5	≤2.0	≤7.0	≤6.0	≤5.0
Bandwidth@850nm (MHz·km)	≥100	≥100	-	-	-
Bandwidth@1300nm (MHz·km)	≥200	≥200	-	-	-
Geometrical Requirements					
Core Diameter (μm)	105.0±3.0	50.0±3.0	300.0±10.0	200.0±4.0	230.0±5.0
Cladding Diameter (μm)	125.0±2.0	80.0±2.0	330.0±5.0	220.0±3.0	250.0±5.0
Coating Diameter (μm)	250.0±10.0	165.0±8.0	500.0±20.0	500.0±20.0	500.0±20.0
Core-Cladding Concentricity (μm)	≤3.0	≤3.0	≤3.0	≤3.0	≤3.0
Core Non-Circularity (%)	≤2.0	≤2.0	-	-	-
Cladding Non-Circularity (%)	≤1.0	≤1.0	-	-	-
Core	Ge/F Doped Silica Glass				
Cladding	Pure Silica Glass				
Coating	Dual-Layer UV-Acrylate				
Mechanical Requirements					
Proof Test (kpsi)	100	100	100	100	100

## **FiberHome® Hard Polymer-Cladding Fiber (HPCF)**

### **Description**

Fiberhome low-hydroxyl large-core hard polymer cladding optical fiber can be used in 650nm and 850nm devices and systems. The hard polymer cladding can provide higher tensile strength and better block the moisture, making this fiber widely used in communications, industrial fields and near-infrared spectroscopy environment.

Hard polymer cladding: made of fluoroacrylate, which protects the core of the fiber and acts as the fiber cladding. The HPCF will not break easily in strong bending conditions or in open construction environments.

Large core diameter: The fiber core diameter range of 200  $\mu\text{m}$ ~1000  $\mu\text{m}$  provides high coupling efficiency and wide tolerance accuracy range in data connections or other connectors.

### **Application**

High energy laser transmission

Medium and short distance communication

Electrical signal transmission

Medical sensing

Optical fiber lighting

### **Characteristics**

- High coupling efficiency of LED and laser light source
- Outstanding fatigue resistance
- Excellent radiation resistance
- Good compatibility with various light sources

Hard Polymer-Cladding Fiber								
Type	HP 200/230- 37/500E	HP 200/230- 40/500	HP 200/230- 46/500	HP 300/330- 37/650E	HP 400/430- 37/730E	HP 600/630- 37/1040E	HP 600/630- 37/750E	HP 1000/1100- 37/1400E
Optical Requirements								
Numerical Aperture	0.37±0.2	0.40±0.2	0.46±0.2	0.37±0.2	0.37±0.2	0.37±0.2	0.37±0.2	0.37±0.2
Attenuation @850nm (dB/km)	≤8.0	≤5.0	≤8.0	≤8.0	≤8.0	≤8.0	≤8.0	≤8.0
OH Content	Low OH	Low OH	Low OH	Low OH	Low OH	Low OH	Low OH	Low OH
Refractive Index Profile	Step Index	Step Index	Step Index	Step Index	Step Index	Step Index	Step Index	Step Index
Geometrical Requirements								
Core Diameter (μm)	200.0±3.0	200.0±3.0	200.0±3.0	300.0±6.0	400.0±8.0	600.0±10.0	600.0±10.0	1000.0±20.0
Cladding Diameter (μm)	230+0/-8	230+0/-8	230+5/-10	330+5/-10	430+5/-10	630+5/-10	630+5/-10	1100+10/-30
Coating Diameter (μm)	500.0 ±25.0	500.0 ±25.0	500.0 ±25.0	650.0 ±30.0	730.0 ±30.0	1040.0 ±30.0	750.0 ±30.0	1400.0 ±50.0
Core-Cladding Concentricity (μm)	≤5.0	≤5.0	≤5.0	≤6.0	≤8.0	≤8.0	≤8.0	≤8.0
Core Material	Pure Silica Glass	Doped Silica Glass	Pure Silica Glass	Pure Silica Glass	Pure Silica Glass	Pure Silica Glass	Pure Silica Glass	Pure Silica Glass
Cladding Material	Fluoroacrylate							
Coating Material	ETFE	Acrylate	Acrylate	ETFE	ETFE	ETFE	ETFE	ETFE
Mechanical Requirements								
Short Term Bend Radius (mm)	≥10	≥10	≥10	≥16	≥29	≥58	≥58	≥73
Long Term Bend Radius (mm)	≥16	≥16	≥16	≥24	≥47	≥94	≥94	≥118
Operating Temperature (°C)	-60°C~+85°C							

Proof Test (kpsi)	100	100	75	100	75	75	75	85
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## FiberHome—PDF

### FiberHome® Passive Fiber ( PDF)

#### Description

Owing excellent laser damage resistance, lower attenuation and high light transmittance(range from 800 nm to 1600 nm), Fiberhome **power delivery fiber** can deliver high laser power.

#### Application

High power laser transmission, laser welding, laser cutting, laser medical treatment, spectral detection ,lighting,sensors,etc.

#### Characteristics

- Excellent optical properties
- Good geometric uniformity
- Lower attenuation
- High resistance to optical damage
- Product size can be customized

#### Q B H

Type	PDF-50/70/360	PDF-100/120/360	Unit
Optical Requirements			
Operating Wavelength (nm)	800~2100	800~2100	nm
Core NA	$0.22 \pm 0.02$	$0.22 \pm 0.02$	-
Attenuation@1200nm	$\leq 10.0$	$\leq 10.0$	dB/km
Geometrical Requirements			
Core Diameter	$50.0 \pm 2.0$	$102.0 \pm 3.0$	$\mu\text{m}$
Inner Clad Diameter	$70.0 \pm 3.0$	$120.0 \pm 3.0$	$\mu\text{m}$
Outer Clad Diameter	$365.0 \pm 8.0$	$365.0 \pm 8.0$	$\mu\text{m}$
Outer Coating Diameter	$560.0 \pm 20.0$	$560.0 \pm 20.0$	$\mu\text{m}$
Core-Clad Offset	$\leq 3.0$	$\leq 3.0$	$\mu\text{m}$
Core Non-Circularity	$\leq 3.0$	$\leq 3.0$	%
Material			
Outer Coating Material	Acrylate	Acrylate	-
Inner Coating Material	Low Index Acrylate	Low Index Acrylate	-
Mechanical Requirements			

Proof Test (kpsi)	$\geq 100$	$\geq 100$	kpsi
Pump Pigtail			
Type	PDF-D-200/220	PDF-D-135/155	PDF-D-220/242
Optical Requirements			
Operating Wavelength (nm)	800~1600	800~1600	800~1600
Core NA	$0.22 \pm 0.02$	$0.22 \pm 0.02$	$0.22 \pm 0.02$
Attenuation@1200nm (dB/km)	$\leq 10.0$	$\leq 10.0$	$\leq 10.0$
Geometrical Requirements			
Core Diameter ( $\mu\text{m}$ )	$200.0 \pm 3.0$	$135.0 \pm 2.0$	$220.0 \pm 4.0$
Cladding diameter ( $\mu\text{m}$ )	$220.0 \pm 4.0$	$155.0 \pm 3.0$	$242.0 \pm 4.0$
Coating diameter ( $\mu\text{m}$ )	$320.0 \pm 15.0$	$320.0 \pm 20.0$	$360.0 \pm 20.0$
Core-Clad Offset ( $\mu\text{m}$ )	$\leq 3.0$	$\leq 3.0$	$\leq 3.0$
Core non-circularity (%)	$\leq 3.0$	$\leq 3.0$	$\leq 3.0$
Material			
Outer Coating Material	Acrylate	Acrylate	Acrylate
Inner Coating Material	Low Index Acrylate	Low Index Acrylate	Low Index Acrylate
Mechanical Requirements			
Proof Test (kpsi)	$\geq 100$	$\geq 100$	$\geq 100$

Pump Pigtail				
Type	PDF-S-200/220	PDF-S-105/125	PDF-S-220/242	PDF-S-400/440
Optical Requirements				
Operating Wavelength (nm)	800~1600	800~1600	800~1600	800~1600
Core NA	$0.22 \pm 0.02$	$0.22 \pm 0.02$	$0.22 \pm 0.02$	$0.22 \pm 0.02$
Attenuation@1200nm (dB/km)	$\leq 10.0$	$\leq 10.0$	$\leq 10.0$	$\leq 10.0$
Geometrical Requirements				
Core Diameter ( $\mu\text{m}$ )	$200.0 \pm 3.0$	$105.0 \pm 3.5$	$220.0 \pm 4.0$	$400.0 \pm 3.0$
Cladding diameter ( $\mu\text{m}$ )	$220.0 \pm 4.0$	$125.0 \pm 3.0$	$242.0 \pm 4.0$	$440.0 \pm 4.0$
Coating diameter ( $\mu\text{m}$ )	$320.0 \pm 15.0$	$245.0 \pm 15.0$	$360.0 \pm 20.0$	$560.0 \pm 20.0$
Core-Clad Offset ( $\mu\text{m}$ )	$\leq 3.0$	$\leq 3.0$	$\leq 3.0$	$\leq 3.0$
Core non-circularity (%)	$\leq 3.0$	$\leq 3.0$	$\leq 3.0$	$\leq 3.0$
Material				
Outer Coating Material	Acrylate	Acrylate	Acrylate	Acrylate
Inner Coating Material	Acrylate	Acrylate	Acrylate	Acrylate
Mechanical Requirements				

Proof Test (kpsi)	$\geq 100$	$\geq 100$	$\geq 100$	$\geq 100$
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## FiberHome F-PMF

### FiberHome® FOG-Using Polarization-Maintaining Fiber(F-PMF)

#### Description

Fiberhome PM fiber series are designed for FOG and other polarization devices, the structure of the series is panda geometry with patented stress applying part and precise geometry control. Good performance of extinction ratio can support your product well.

#### Application

Fiber optic gyroscope  
Fused biconical tapered coupler  
Polarization sensitive device  
Fiber polarization sensor

FOG-Using PMF				
Type	PM1310A-80/135	PM1310A-80/165	PM1550B-80/135	PM1550B-80/165
Optical Requirements				
Operating Wavelength (nm)	1310	1310	1550	1550
Cutoff Wavelength (nm)	1100~1290	1100~1290	1290~1520	1290~1520
Mode Field Diameter (μm)	6.0±1.0	6.0±1.0	6.5±1.0	6.5±1.0
Attenuation (dB/km)	≤0.6	≤0.6	≤0.6	≤0.6
Beat Length (mm)	≤3.0	≤3.0	≤3.5	≤3.5
Crosstalk (dB@1000m)	≤-22	≤-22	≤-22	≤-22
Geometrical Requirements				
Cladding Diameter (μm)	80.0±1.0	80.0±1.0	80.0±1.0	80.0±1.0
Coating Diameter (μm)	135.0±3.0	165.0±5.0	135.0±3.0	165.0±5.0
Concentricity (μm)	≤1.0	≤1.0	≤1.0	≤1.0
Environmental Requirements (1310nm & 1550nm)				
Operating Temperature(℃)	-50~85	-50~85	-50~85	-50~85
Mechanical Requirements				
Proof Test (kpsi)	100	100	100	100



**FiberHome® Ultra-Thin Diameter Polarization-Maintaining Fiber(U-PMF)****Description**

Fiberhome ultra-thin diameter polarization-maintaining fiber products use the unique thin coating control technology to reduce the diameter of the outer coating from 135  $\mu\text{m}$  to 100  $\mu\text{m}$ , effectively increasing the length of the fiber optic ring under the same volume, and solving the miniaturization of the fiber optic gyro device for high precision.

**Application**

Fiber optic gyroscope

Fused biconical tapered coupler

Polarization sensitive device

Fiber polarization sensor

<b>U-PMF</b>			
Type	PM850E-60/100	PM1310A-60/100	PM1550B-60/100
<b>Optical Requirements</b>			
Operating Wavelength (nm)	850	1310	1550
Cutoff Wavelength (nm)	650~830	1100~1290	1290~1520
Mode Field Diameter ( $\mu\text{m}$ )	$3.8 \pm 1.0$	$6.0 \pm 1.0$	$6.5 \pm 1.0$
Attenuation (dB/km)	$\leq 3.0$	$\leq 0.6$	$\leq 0.8$
Beat Length (mm)	$\leq 2.5$	$\leq 3.0$	$\leq 3.5$
Crosstalk (dB@100m)	$\leq -25$	$\leq -25$	$\leq -25$
<b>Geometrical Requirements</b>			
Cladding Diameter ( $\mu\text{m}$ )	$60.0 \pm 1.0$	$60.0 \pm 1.0$	$60.0 \pm 1.0$
Coating Diameter ( $\mu\text{m}$ )	$102.0 \pm 3.0$	$102.0 \pm 3.0$	$102.0 \pm 3.0$
Concentricity ( $\mu\text{m}$ )	$\leq 1.0$	$\leq 1.0$	$\leq 1.0$
<b>Environmental Requirements (850nm &amp; 1310nm &amp; 1550nm)</b>			
Operating Temperature ( $^{\circ}\text{C}$ )	$-50 \sim 85$	$-50 \sim 85$	$-50 \sim 85$
<b>Mechanical Requirements</b>			
Proof Test (kpsi)	100	100	100

## FiberHome® Fluorine-Doped Capillary Tube(FDT)

### Description

Fiberhome adopts PCVD (Plasma Chemical Vapor Deposition) equipment and process technology with independent intellectual property rights, which ensures accurate control of optical fiber refractive index distribution and good repeatability. FiberHome fluorine-doped capillary products have a multi-layer structure with low internal refractive index and high external refractive index, which is suitable for various application requirements such as high-power beam combiner and photonic lantern.

### Application

High-power beam combiner

Photonic lantern

### Characteristics

- Good optical performance
- Good dimensional uniformity
- Good temperature resistance

Fluorine-Doped Capillary Tube									
Type	FDT 775/425- 11	FDT 775/425- 22	FDT 1100/800- 22	FDT 1250/980- 22	FDT 1400/1100- 22	FDT 1500/800- 22	FDT 1650/1350- 22	FDT 1700/1200- 22	FDT 1800/1300- 22
Length(nm)	1000±5								
NA	0.11	0.22							
Material Quality	Fluorine Doped Silica								
External Diameter(μm)	775±50	775±50	1100±50	1250±50	1400±50	1500±50	1650±50	1700±50	1800±50
Internal Diameter(μm)	425±50	425±50	800±50	980±50	1100±50	800±50	1350±50	1200±50	1300±50

Ratio Of External Diameter To Internal Diameter Of Fluorine Doped Layer	>1.1
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Note: According to customer needs, different sizes and specifications of products can be customized.

## FiberHome—MCF

### FiberHome® Multi-Core Fiber (MCF)

#### Description

Multi-core fiber(MCF) is a reasonable arrangement of multiple cores in an optical fiber, so that each core can independently and without interference to achieve the transmission of information, each core of this optical fiber can be considered to be able to carry the capacity of a single-mode fiber, which means that more cores can support a larger transmission capacity, is the optical fiber transmission system to achieve the best technical solutions to achieve the transmission of ultra-large capacity and ultra-high frequency spectral efficiency.

Fiberhome multi-core fiber adopts trench-assisted structure, which combines the characteristics of low crosstalk and low attenuation, and has typical application prospects in the fields of optical fiber communication, sensing and medical treatment.

#### Application

Fiber sensors

Ultra large capacity transmission system

#### Characteristics

- Excellent geometrical consistency
- Low attenuation
- Low cross talk
- Customized to meet customer requirements

### Multi-Core Fiber

Features	Conditions	MCF 4/125	MCF 7/150	MCF 7/200	MCF 8/150
Optical Requirements					
Adjacent Core Cross Talk(dB/km)	-	$\leq -45$	$\leq -45$	$\leq -45$	$\leq -40$
Attenuation(dB/km)	1310nm	$\leq 0.45$	$\leq 0.45$	$\leq 0.45$	$\leq 0.45$
	1550nm	$\leq 0.25$	$\leq 0.25$	$\leq 0.25$	$\leq 0.25$
Dispersion(ps/(nm·km))	1550nm	$\leq 22$	$\leq 22$	$\leq 22$	$\leq 22$
Zero Dispersion Wavelength(nm)	-	1300±20	1300±20	1300±20	1300±20
Cable Cutoff Wavelength ( $\lambda_{cc}$ )(nm)	-	$\leq 1330$	$\leq 1330$	$\leq 1330$	$\leq 1330$
Mode Field Diameter (MFD)( $\mu\text{m}$ )	1310nm	8.5±0.5	8.5±0.5	8.5±0.5	8.5±0.5
	1550nm	9.4±0.6	9.4±0.6	9.4±0.6	9.4±0.6
Geometrical Requirements					
Cladding Diameter( $\mu\text{m}$ )	-	125±1	150±2	200±2	150±1
Core-To-Core Distance( $\mu\text{m}$ )	-	41.5±1.5	41.5±1.5	61±1	32±1.5
Coating Diameter( $\mu\text{m}$ )	-	245±10	245±10	390±10	245±10
Mechanical Requirements					
Short Term Bend Radius(mm)	-	$\geq 7.5$	$\geq 7.5$	$\geq 7.5$	$\geq 7.5$
Long Term Bend Radius(mm)	-	$\geq 15$	$\geq 15$	$\geq 15$	$\geq 15$
Proof Test(N)	-	$\geq 8.8$	$\geq 8.8$	$\geq 8.8$	$\geq 8.8$
Dynamic Fatigue Parameter( $N_d$ )	-	$\geq 20$	$\geq 20$	$\geq 20$	$\geq 20$

## **FiberHome® Few-Mode Fiber(FMF)**

### Description

FiberHome few-mode optical fiber (FMF) is a new type of optical fiber designed based on the concept of mode division multiplexing. FMFs are between single-mode fibers and multi-mode fibers, The transmission capacity of optical fibers is improved by introducing a controllable number of linear polarization mode multiplexing, and the refractive index design of few-mode fibers and the multiple-input, multiple-output digital signal processing (MIMO-DSP) of the receiver are used to limit and compensate for the adverse effects of mode coupling and inter-mode dispersion to ensure the transmission distance In addition, FMFs have a slightly larger core radius than single-mode fibers, resulting in a larger effective mode field area, which is advantageous in terms of nonlinearity tolerance.

FiberHome FMFs taking advantages of PCVD process, which can realize the accurate design of the complex guided wave structure of the optical fiber and the accurate control of the optical fiber size, realize the customization requirements of various types of core structure such as step-index, graded-index and auxiliary channel design can get various types of core layer structure. According to different design, 3-mode, 4-mode, 6-mode, 7-mode FMFs can be realized.

### Application

Fiber optic sensing

Mode division multiplexing(MDM)

### Characteristics

- Strictly controlled optical and geometrical parameters
- Low attenuation
- Customized waveguide is available
- Low DMD for graded index fiber
- High DMD for step index fiber

Four Mode Fiber

Optical Requirements@ 1550nm	Conditions	FM SI-4	FM GI-4	Unit
Dispersion	LP01	$\leq 24$	$\leq 23$	ps/(nm • km)
	LP11	$\leq 27$	$\leq 23$	ps/(nm • km)
	LP21	$\leq 23$	$\leq 23$	ps/(nm • km)
	LP02	$\leq 5$	$\leq 23$	ps/(nm • km)
Dispersion Slope	LP01	$\leq 0.11$	$\leq 0.11$	ps/(nm <sup>2</sup> • km)
	LP11	$\leq 0.11$	$\leq 0.11$	ps/(nm <sup>2</sup> • km)
	LP21	$\leq 0.11$	$\leq 0.11$	ps/(nm <sup>2</sup> • km)
	LP02	$\leq 0.10$	$\leq 0.10$	ps/(nm <sup>2</sup> • km)
Effective Area	LP01	$\geq 120$	$\geq 100$	$\mu\text{m}^2$
	LP11	$\geq 145$	$\geq 100$	$\mu\text{m}^2$
	LP21	$\geq 160$	$\geq 100$	$\mu\text{m}^2$
	LP02	$\geq 100$	$\geq 100$	$\mu\text{m}^2$
Attenuation	LP01	$\leq 0.23$	$\leq 0.24$	dB/km
	LP11	$\leq 0.24$	$\leq 0.24$	dB/km
	LP21	$\leq 0.24$	$\leq 0.24$	dB/km
	LP02	$\leq 0.24$	$\leq 0.24$	dB/km
Differential Group Delay	LP11-LP01	$\leq 7$	$\leq 0.7$	ps/m
	LP21-LP01	$\leq 13$	$\leq 0.7$	ps/m
	LP02-LP01	$\leq 5$	$\leq 0.7$	ps/m
Geometrical Requirements				
Cladding Diameter		$125 \pm 1.0$	$125 \pm 1.0$	$\mu\text{m}$
Core Diameter		$15 \pm 0.3$	$12 \pm 0.3$	$\mu\text{m}$
Cladding Non-Circularity		$< 0.7$	$< 0.7$	%
Operating Wavelength		1450 ~ 1700	1450 ~ 1700	nm
Coating Diameter		$245 \pm 10$	$245 \pm 10$	$\mu\text{m}$

