

## ZTT GROUP

Established in 1992, ZTT started from optical fiber communications and was listed on Shanghai Stock Exchange (SSE) in 2002 (Stock Code in SSE: 600522). ZTT has pictured a diversified industrial portfolio for marine equipment, renewable energy, new materials, smart grid, optical communications and other diversified industrial products. ZTT Group is now hosting 80 subsidiary companies and over 16,000 employee, operating 5 overseas plants located in India, Brazil, Indonesia, Morocco and Turkey . ZTT owns more than 2500 patents with independent intellectual property rights, presided over or participated in more than 500 international and national industry standards. The products of ZTT are exported to 160 countries and regions .The company has ranked among the top 500 Chinese enterprises for consecutive years and broke through \$13.4 billion in sales revenue in 2022. ZTT follows the new economic model of fostering cleaner production and accelerating green and low-carbon development, works hard to serve as the pioneer of persistent endeavor to achieve national goal involving carbon dioxide emissions peaking by 2030 and carbon neutrality by 2060, emerging as a green manufacturing technology group assuming regional economy.



## Optical Fiber



Add: No.88 Qixin Road, NETDA, Nantong, Jiangsu, P.R. China, 226009

Tel: 86-0513-80100986 Email: sales@zttcable.com Http://www.zttcable.com

## Company Profile

Zhongtian Technology Fiber Optic Co., Ltd is a national new high-tech enterprise. This high-tech manufacturer is one of the holding subsidiaries from Jiangsu Zhongtian Technology Co., Ltd. It is established in 2002, mainly focused on manufacturing fiber optic, and located at Nantong Economics and Technological Development Zone, Jiangsu Province. The annual capacity of manufacturing fiber optic nearly reaches 60 million km.

- Mission** Connecting Wonderful Life with Optic-Electric Network
- Vision** Creating Value for Customers, Employees and the Society
- Values** Honorary Brand, Customer Oriented and Strivers Founded

## Industry-leading technical capabilities

### High-end talent team

Our company currently has 2 doctors, 15 masters, and more than 30 senior titles. We have undertaken 11 provincial and ministerial projects and more than 30 municipal projects. Through various R&D projects and production line transformation and expansion, a solid theoretical, experienced and well-trained engineer team has been established.

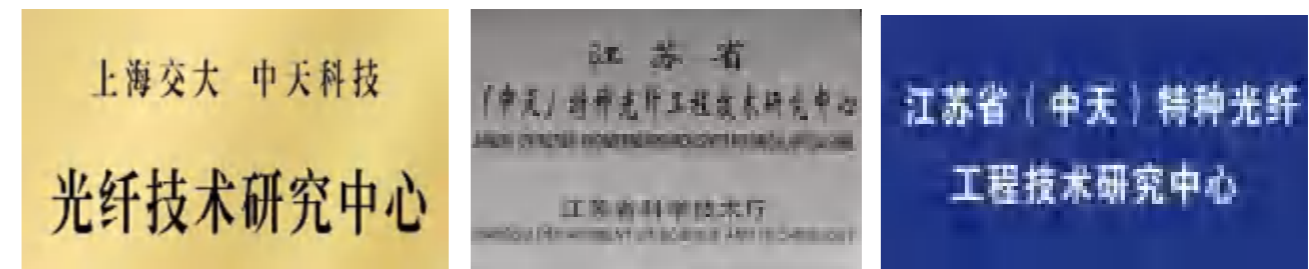
### High-tech achievements

We have accumulated rich experience in R & D project management. In recent years, we have undertaken three national torch plan projects; won the Jiangsu Science and Technology Progress Award; we participated in the formulation and revision of many national and industry standards.



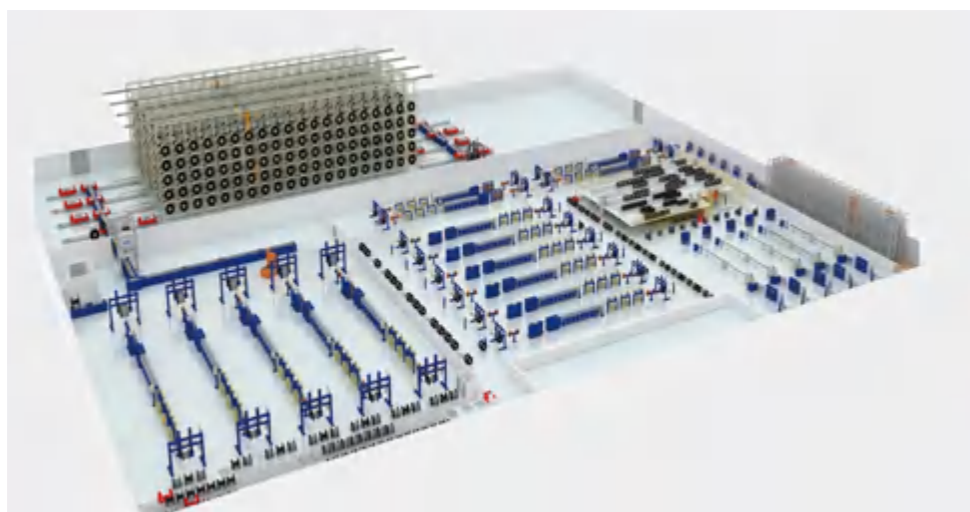
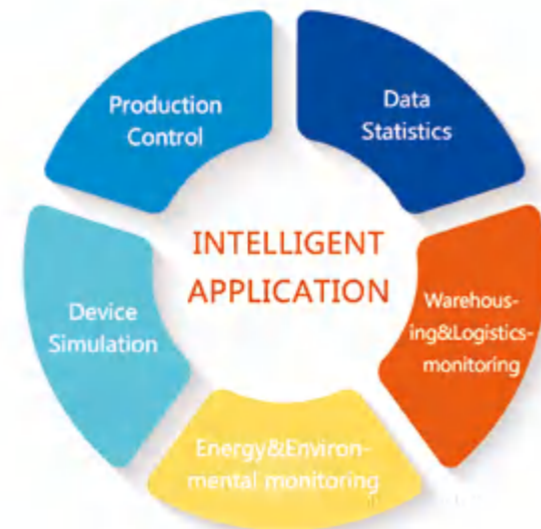
### High-level R & D platform

We have cooperated with many well-known universities in the field of fiber-optic communication technology and new products, and established a number of industry-university-research demonstration sites and test bases.



■ High-efficiency intelligent manufacturing

We deeply embraces the Industrial Internet, continuously improves its level of automated production, and builds intelligent factory clusters. We have achieved intelligent management in production, material distribution and environmental monitoring.



■ System and Product Certification

■ High quality products that meet international standards



■ Domestic & International system certification

ZTT fiber optics has passed ISO9001: 2015; ISO14001:2015、OHSAS18001:2007、TL9000-H R5.5/R5.0、SA8000: 2014、First-class safety production standardization enterprise, energy management system certification, intellectual property management system certification.



Third Party Certificate of Product Certification



CNAS Certification

## Expand overseas distribution

Throughout the development years, ZTT expanded and established global plants in Germany, Turkey, Uzbekistan, India, Indonesia, Morocco, and Brazil. ZTT also has local production bases in Nantong, Yancheng, Zhengzhou, Chengdu, Foshan, and etc.

Relying on the ZTT Telecommunication Business Group platform, Zhongtian Technology Optical Fiber Co., Ltd. actively expands overseas business, and relies on overseas factories to provide high-quality products and provide reliable network facilities for global customers.



Serving 100+ communications operators worldwide



AS A LEADING COMPANY IN THE FIELD OF OPTICAL COMMUNICATION, ZHONGTIAN GROUP WON THE "BEST OPERATOR PARTNER AWARD".



## Optical Fiber Product Map

### Low Loss Single-mode Optical Fiber (LL G.652.D)

ZTT low loss single mode optical fiber is designed for long distance transmission system and adopts VAD+OVD technology. On the basis of the precise control of refractive index, the fiber reduces the attenuation at C and L waveband.

### Extended Wavelength of Non-dispersion Shifted Single-mode Fiber (G.652D)

ZTT extended wavelength of non-dispersion shifted single mode optical fiber adopts advance perform and drawing technique which reduces the water peak value at 1383nm. The fiber working wavelength extends to E wave band(1360nm-1460nm) to realize the full-wave transmission of O, E, S, C, L (1260nm-1625nm) .

### Low Loss and Large Effective Area of Single-mode Optical Fiber(G.654)

ZTT G.654 fiber has low attenuation at C and L wave band; meanwhile, increase the effective area to suppress the nonlinear effect, which allows larger incident power, increases the nonlinear tolerance of the transmission system to meet the requirements of long distance and high capacity transmission and provide more system redundancy.

### High Temperature Resistant Fiber

We can provide 150°C and 300°C resistant fiber, which could be used for high temperature communication and sensing application. The temperature resistant polyester or polyimide fiber can meet the performance requirements of 150°C and 300°C.

### Non-zero Dispersion Shifted Single-mode Optical Fiber(G655)

ZTT non-zero dispersion shifted single mode optical fiber optimizes the attenuation and chromatic dispersion at 1550nm. The fiber has small attenuation and suitable chromatic dispersion at 1550nm which suppress the FWM and meet the transmission requirement of DWDM at C (1530nm-1565nm) and L (1565nm-1625nm) waveband.

### Extreme cold endurance single mode fiber (-70°C)

Extreme cold endurance fiber can meet the requirement of Extremely low temperature environment(-70°C), by improving coating properties, coating process controlling and reducing fiber micro-bending loss.

### Bending Insensitive G.652.D

BI G.652.D has the excellent bending resistance of G.657 fiber. MFD of BI G.652.D fiber is Compatible with G.652.D. BI G.652D fibers are compatible with G.652.D and G.657.A1 fiber splicing. We can provide 250µm and 200µm coating diameter fiber.

### Submarine cable fiber with High strength and long spool length

Compared with normal fiber,ZTT Submarine cable fiber have higher strength and longer spool strength. Proof Stress was improved from 1% to 2%.Fiber spool length was improved from 24km to 100km.

### Bending-loss Insensitive Single-mode for Access Network (G657A, G657B)

ZTT bending loss insensitive single mode optical fiber for access network has the properties of extended wavelength non-dispersion shifted single mode fibers and has bending resistance property with min. bending radius 7.5mm and 1 turn and bending loss<0.5dB.

### Ultra Low Bending Loss Single Mode Fiber(ULB)

ULB fiber is a single mode fiber which has a high numerical aperture and is bending insensitive single mode fiber, whose cladding diameter is 125µm or 80µm.The fiber waveguide structure is optimized and bending insensitivity is promoted .

### Multi-mode Optical Fiber (OM2, OM2+, OM3,OM4)

The conventional type is OM2+, OM3, OM4 and the customers can choose the type according to the use requirement. ZTT multi-mode optical fiber supports 10Gb/s transmission system; the transmission distance is in the range of 300—500m at 850nm.

### Small Size Single-mode Fiber (200µm)

ZTT small size single mode fiber is to reduce the uncolored fiber from 250µm to 200µm through the precise control of the coating, which reduce the cable diameter efficiently and realize the larger fiber cables installation in the same duct resource to decrease the waste of duct space.



## Optical Fiber Product Specification

### Extended Wavelength of Non-dispersion Shifted Single-mode Fiber ( G.652.D )

ZTT extended wavelength of non-dispersion shifted single mode optical fiber adopts advance perform and drawing technique which reduces the water peak value at 1383nm. The fiber working wavelength extends to E wave band(1360nm-1460nm) to realize the full-wave transmission of O, E, S, C, L ( 1260nm-1625nm ) . Meanwhile, the innovated PMD rubbing equipment realizes the stable and good PMD coefficient when the high-speed production and it can meet the long distance and high-speed transmission.

ZTT optical fiber adopts advanced coating curing technique to provide good dynamic fatigue resistance property and increase the service life of optical fibers.

### Applications

ZTT extended wavelength of non-dispersion shifted single mode optical fiber meets the conditions of backbone network, MAN, AN, submarine communication and power system test. The fiber is suitable for all kinds of cables, and the main structure is:

- Optical fiber ribbon cable
- Central tube optical fiber cable
- ADSS cable
- FTTX cable
- Tight buffer fiber cable
- Under water cable

### Characteristics

- Realizing O, E, S, C, L ( 1260nm-1625nm ) full-wave transmission and increasing the transmission bandwidth
- Choosing different coating material flexibly to meet different conditions.
- Low PMD coefficient to meet high-speed transmission
- Good dynamic fatigue resistance property is suitable for different conditions.

### Product specification

Description		Specification
Attenuation (dB/km)	1310 nm	≤0.34
	1550 nm	≤0.20
	1625 nm	≤0.23
Zero Dispersion Wavelength (nm)		1312±12
Zero Dispersion Slope (ps/nm <sup>2</sup> ·km)		≤0.092
Dispersion Coefficient (ps/nm·km)	1550 nm	≤18
	1625 nm	≤22
PMD (ps/√km)	Individual value	≤0.1
	Typical value	≤0.04
Cable Cutoff Wavelength (nm)		≤1260
Macro-bending Loss (dB)	(100turns,Φ50 mm) 1550 nm	≤ 0.05
	(100turns,Φ50 mm) 1625 nm	≤ 0.10
Mode Field Diameter (μm)	1310 nm	9.2±0.4
Fiber Curl Radius (m)		≥4.0
Cladding Diameter (um)		125±1
Core/clad Concentricity Error (um)		≤0.6
Cladding Non-circularity (%)		≤1.0
Coating Diameter (um)		245±10
Clad / coating Concentricity Error (um)		≤12
Coating Non-circularity (%)		≤6.0
Proof Stress (%)		≥1.0
Tensile strength test (GPa)	15% Weber fracture probability	2.76
	50% Weber fracture probability	3.45
Fatigue Resistance Parameter(Nd)		≥ 20
Peak Coating Strip Force (N)		[1.3,8.9]
Temperature Cycling Induced Attenuation (dB/km)		≤ 0.05
Damp Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Water Immersion Induced Attenuation (dB/km)		≤ 0.05

## Low Loss Single-mode Optical Fiber (LL G.652.D)

ZTT low loss single mode optical fiber is designed for long distance transmission system and adopts VAD+OVD technology. On the basis of the precise control of refractive index, the fiber reduces the attenuation at C and L waveband. Meanwhile, the fiber can be compatible with G.652D fiber to meet long distance and high-capacity transmission requirement; the fiber also provides more system redundancy to meet 100G communication.

ZTT low loss single mode optical fiber adopts the UV curing technology with double acrylic resin coating of insensitive bending loss which protects the fiber coating and reduces the bending loss introduced and meets different conditions. ZTT optical fiber adopts advanced coating curing technique to provide good dynamic fatigue resistance property and increase the service life of optical fibers.

### Applications

The fiber has the characteristic of low loss and supports the long distance and high capacity transmission; meanwhile, good coating material and innovated coating technique make the fiber good bending resistance and suitable for different conditions and structures of optical fiber cables.

- Optical fiber ribbon cable
- Slot cable
- Tight buffer fiber cable
- Stranding loose tube cable
- Central tube optical fiber cable
- Other kinds of cables

### Characteristics

- Low attenuation at C and L wave band
- Coating with good protection and bending resistance property
- Low PMD coefficient to meet long distance and high capacity transmission
- Good dynamic fatigue resistance property is suitable for different conditions.

### Product specification

Description		Specification
Attenuation (dB/km)	1310 nm	≤0.32
	1550 nm	≤0.18
	1625 nm	≤0.2
Zero Dispersion Wavelength (nm)		1312±12
Zero Dispersion Slope (ps/nm <sup>2</sup> ·km)		≤0.092
Dispersion Coefficient (ps/nm·km)	1550 nm	≤18
	1625 nm	≤22
	Individual value	≤0.1
	Typical value	≤0.04
Cable Cutoff Wavelength (λ <sub>cc</sub> ) (nm)		≤1260
Macro-bending Loss (dB)	(100turns, Φ50 mm) 1550 nm	≤ 0.05
	(100turns, Φ50 mm) 1625 nm	≤ 0.10
Mode Field Diameter (μm)	1310 nm	9.2±0.4
Fiber Curl Radius (m)		≥4.0
Cladding Diameter (μm)		125±1
Core/clad Concentricity Error (μm)		≤0.6
Cladding Non-circularity (%)		≤1.0
Coating Diameter (μm)		245±10
Clad / coating Concentricity Error (μm)		≤12
Coating Non-circularity (%)		≤6.0
Proof Stress (%)		≥1.0
Tensile strength test (GPa)	15% Weber fracture probability	2.76
	50% Weber fracture probability	3.45
Fatigue Resistance Parameter(Nd)		≥ 20
Peak Coating Strip Force (N)		[1.3, 8.9]
Temperature Cycling Induced Attenuation (dB/km)		≤ 0.05
Damp Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Water Immersion Induced Attenuation (dB/km)0		≤ 0.05

## Ultra Low Loss and Large Effective Area Single-mode Optical Fiber(G.654.E)

ZTT low loss and large effective area of single mode optical fiber is designed for long distance transmission system, and manufactured with MCVD technique. On the basis of the precise control of the refractive index, the fiber has low attenuation at C and L wave band; meanwhile, increase the effective area to suppress the nonlinear effect, which allows larger incident power, increases the nonlinear tolerance of the transmission system to meet the requirements of long distance and high capacity transmission and provide more system redundancy.

ZTT low loss and large effective area of single mode optical fiber adopts the UV curing technology with double acrylic resin coating of insensitive bending loss which protects the fiber coating and reduces the bending loss introduced and meets different conditions. ZTT optical fiber adopts advanced coating curing technique to provide good dynamic fatigue resistance property and increase the service life of optical fibers.

### Applications

The optical fiber has the characteristics of low loss and large effective area; the fiber supports the long distance and high capacity transmission; meanwhile, good coating material and innovated coating technique make the fiber good bending resistance and suitable for different conditions and structures of optical fiber cables.

- Optical fiber ribbon cable
- Slot cable
- Tight buffer fiber cable
- Stranding loose tube cable
- Central tube optical fiber cable
- Other kinds of cables

### Characteristics

- Low attenuation at C ( 1530nm-1565nm ) and L wave band ( 1565nm-1625nm )
- Large effective area to suppress the nonlinear effect
- Low PMD coefficient to meet long distance and high

### Product specification

Description		Specification
Attenuation (dB/km)	1550 nm	≤0.17
	1625 nm	≤0.20
Attenuation Point Discontinuity (dB)	1550 nm	0.05
Attenuation Wavelength (dB/km)	1525-1575 nm	≤0.02
	1550-1625 nm	≤0.03
Dispersion Slope (ps/nm <sup>2</sup> ·km)	1550 nm	0.05~0.07
Dispersion Coefficient (ps/nm·km)	1550 nm	17~23
PMD (ps/√km)	Individual value	0.15
	Typical	≤0.06
Cable Cutoff Wavelength (nm)		≤1530
Macro-bending Loss (dB)	100turns Φ60 mm 1625 nm	≤0.1
Mode Field Diameter (μm)	1550 nm	12.5±0.5
Effective Area (μm <sup>2</sup> )	1550 nm	125 ( typical )
Fiber Curl Radius (m)		≥4
Cladding Diameter (μm)		125±1
Core/clad Concentricity Error (μm)		≤0.6
Cladding Non-circularity (%)		≤1
Coating Diameter (μm)		245±10
Clad / coating Concentricity Error (μm)		≤12
Coating Non-circularity (%)		≤6
Proof Stress (%)		≥1
Fatigue Resistance Parameter(Nd)		≥20
Peak Coating Strip Force (N)		[1.3,8.9]
Temperature Cycling Induced Attenuation (dB/km)		≤0.05
Damp Heat Aging Induced Attenuation (dB/km)		≤0.05
Heat Aging Induced Attenuation (dB/km)		≤0.05
Water Immersion Induced Attenuation (dB/km)		≤0.05



## Non-zero Dispersion Shifted Single-mode Optical Fiber(G.655)

ZTT non-zero dispersion shifted single mode optical fiber adopts MCVD technology and optimizes the attenuation and chromatic dispersion at 1550nm. The fiber has small attenuation and suitable chromatic dispersion at 1550nm which suppress the FWM and meet the transmission requirement of DWDM at C ( 1530nm-1565nm ) and L ( 1565nm-1625nm ) waveband.

ZTT non-zero dispersion shifted single mode optical fiber adopts the UV curing technology with double acrylic resin coating of insensitive bending loss which protects the fiber coating and reduces the bending loss introduced and meets different conditions. ZTT optical fiber adopts advanced coating curing technique to provide good dynamic fatigue resistance property and increase the service life of optical fibers.

### Applications

ZTT non-zero dispersion shifted single mode optical fiber can meet different cable structures because of the acrylic resin coating of insensitive bending resistance.

- Optical fiber ribbon cable
- Slot cable
- Tight buffer fiber cable
- Stranding loose tube cable
- Central tube optical fiber cable
- Under water cable

### Characteristics

• Suitable for transmission at C ( 1530nm-1565nm ) and L ( 1565nm-1625nm ) waveband and Low attenuation, chromatic dispersion, PMD and zero dispersion slope to meet system transmission requirement.

- Choosing different coating material flexibly to meet different requirements.
- Good dynamic fatigue resistance property is suitable for different conditions.

### Product specification

Description		Specification
Attenuation (dB/km)	1550 nm	≤0.22
	1625 nm	≤0.24
Attenuation Point Discontinuity (dB)	1550 nm	≤0.10
Zero Dispersion Wavelength (nm)		≤1520
Non-zero Dispersion Area (nm)		1530~1565
Dispersion Coefficient (ps/nm·km)	1530~1565 nm	2~6
	1565~1625 nm	4.5~11.2
PMD (ps/√km)	Individual value	≤0.1
Cable Cutoff Wavelength (nm)		≤1450
Macro-bending Loss (dB)	(100turns , Φ50 mm) 1550 nm	≤ 0.05
	(100turns , Φ50 mm) 1625 nm	≤ 0.05
Mode Field Diameter (um)	1550 nm	9.6±0.5
Fiber Curl Radius (m)		≥4.0
Cladding Diameter (um)		125±1
Core/clad Concentricity Error (um)		≤0.6
Cladding Non-circularity (%)		≤1.0
Coating Diameter (um)		245±10
Clad / coating Concentricity Error (um)		≤12
Coating Non-circularity (%)		≤6.0
Proof Stress (%)		≥1.0
Fatigue Resistance Parameter(Nd)		≥20
Peak Coating Strip Force (N)		[1.3,8.9]
Temperature Cycling Induced Attenuation (dB/km)		≤ 0.05
Damp Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Water Immersion Induced Attenuation (dB/km)		≤ 0.05

## Bending Insensitive G.652.D

BI G.652.D has the excellent bending resistance of G.657 fiber. MFD of BI G.652.D fiber is Compatible with G.652.D. BI G.652D fibers are compatible with G.652.D and G.657.A1 fiber splicing. We can provide 250 $\mu$ m and 200 $\mu$ m coating diameter fiber.

### Application

- Optical fiber ribbon cable
- Miniaturized Optical Fiber Devices
- Central tube optical fiber cable
- Tight buffer fiber cable

### Characteristics

- LOW attenuation in all wavelength
- Compatible with G.652D and G.657A1 fiber
- LOW splice loss with G.652D and G.657A1
- Smaller coating diameter

### Product specification

Description	Specification	
Attenuation (dB/km)	1310nm	$\leq 0.33$
	1550nm	$\leq 0.19$
	1625nm	$\leq 0.2$
Zero Dispersion Wavelength (nm)		1312 $\pm$ 12
Zero Dispersion Slope (ps/nm <sup>2</sup> ·km)		$\leq 0.092$
Dispersion Coefficient (ps/nm·km)	1550nm	$\leq 18$
	1625nm	$\leq 22$
PMD (ps/ $\sqrt$ km))		$\leq 0.1$
Cable cutoff (nm)		$\leq 1260$
Macro-bending Loss(dB)	1550nm (10turns , $\phi$ 30mm)	$\leq 0.25$
	1625nm (10 turns , $\phi$ 30mm)	$\leq 1$
	1550nm (1 turns , $\phi$ 20mm)	$\leq 0.75$
	1625nm (1 turns , $\phi$ 20mm)	$\leq 1.5$
	1550nm (100 turns , $\phi$ 50mm)	$\leq 0.03$
	1625nm (100 turns , $\phi$ 50mm)	$\leq 0.05$
Mode Field Diameter ( $\mu$ m)	1310nm	9.2 $\pm$ 0.4
Fiber Curl Radius (m)		$\geq 4.0$
Cladding Diameter ( $\mu$ m)		125 $\pm$ 1
Core/clad Concentricity Error ( $\mu$ m)		$\leq 0.5$
Cladding Non-circularity (%)		$\leq 1.0$
Coating Diameter ( $\mu$ m)		245 $\pm$ 10
Clad / coating Concentricity Error ( $\mu$ m)		$\leq 12$
Coating Non-circularity (%)		$\leq 6$
Proof Stress (%)		$\geq 1.05$
Tensile strength test (GPa)	15% Weber fracture probability	2.76
	50% Weber fracture probability	3.45
Fatigue Resistance Parameter(Nd)		$\geq 20$
Peak Coating Strip Force (N)		[1.3,8.9]
Temperature Cycling Induced Attenuation (dB/km)		$\leq 0.05$
Damp Heat Aging Induced Attenuation (dB/km)		$\leq 0.05$
Heat Aging Induced Attenuation (dB/km)		$\leq 0.05$
Water Immersion Induced Attenuation (dB/km)		$\leq 0.05$

## Bending-loss Insensitive Single-mode for Access Network ( G657A, G657B )

ZTT bending loss insensitive single mode optical fiber for access network has the properties of extended wavelength non-dispersion shifted single mode fibers and has bending resistance property with min. bending radius 7.5mm and 1 turn and bending loss < 0.5dB.

ZTT bending loss insensitive single mode optical fiber adopts the UV curing technology; the coating material can be chosen; the fiber has single and double coating with easy stripping and small coating to meet different conditions.

ZTT bending loss insensitive single mode optical fiber adopts VAD+OVD or PCVD technology for perform drawing. When fiber splicing, the customer can customize different fiber with different methods according to the specified conditions to match the fiber splicing and reduce the splicing loss.

### Application

- Ribbon cable
- Central tube optical fiber cable
- ADSS cable
- Indoor cable
- Slot cable
- Tight fiber cable
- Underwater cable
- Tight buffer fiber cable

### Characteristics

- Realize O, E, S, C, L ( 1260nm-1625nm ) full-band transmission;
- Choosing different coating material flexibly to meet different requirements
- Low PMD coefficient to meet long distance and high capacity transmission
- Good dynamic fatigue resistance property is suitable for different conditions

### Product specification

Description		G657A1	G657A2	G657B3
Attenuation (dB/km)	1310nm	≤0.35	≤0.35	≤0.40
	1550nm	≤0.21	≤0.21	≤0.30
	1625nm	≤0.23	≤0.23	≤0.40
Zero Dispersion Wavelength (nm)		1312±12	1312±12	1300±50
Zero Dispersion Slope (ps/nm <sup>2</sup> ·km)		≤0.092	≤0.092	≤0.092
Dispersion Coefficient (ps/nm·km)	1550nm	≤18	≤18	≤18
	1625nm	≤22	≤22	≤22
PMD (ps/√km)		≤0.1	≤0.1	≤0.1
Cable Cutoff Wavelength (nm)		≤1260	≤1260	≤1260
Macro-bending Loss (dB)	1550nm(10turns , 30mm)	≤0.25	≤0.03	/
	1625nm(10turns , 30mm)	≤1	≤0.1	/
	1550nm (1turn , 20mm)	≤0.75	≤0.1	≤0.03
	1625nm (1turn , 20mm)	≤1.5	≤0.2	≤0.1
	1550nm (1turn , 15mm)		≤0.5	≤0.08
	1625nm (1turn , 15mm)		≤1	≤0.25
	1550nm (1turn , 10mm)			≤0.15
	1625nm (1turn , 10mm)			≤0.45
MFD (um)	1310nm	8.8±0.4	8.6±0.4	8.6±0.4
Fiber Curl Radius (m)		≥4.0	≥4.0	≥4.0
Cladding Diameter (um)		125±0.7	125±0.7	125±0.7
Core/clad Concentricity Error (um)		≤0.5	≤0.5	≤0.5
Cladding Non-circularity (%)		≤1.0	≤1.0	≤1.0
Coating Diameter (um)		245±10	245±10	245±10
Clad / coating Concentricity Error (um)		≤12	≤12	≤12
Coating Non-circularity (%)		≤6	≤6	≤6
Tensile strength test(GPa)	15% Weber fracture	2.76	2.76	2.76
	50% Weber fracture	3.45	3.45	3.45
Fatigue Resistance Parameter(Nd)		≥20	≥20	≥20
Peak Coating Strip Force (N)		[1.3,8.9]	[1.3,8.9]	[1.3,8.9]
Temperature Cycling Induced Attenuation (dB/km)		≤ 0.05	≤ 0.05	≤ 0.05
Damp Heat Aging Induced Attenuation (dB/km)		≤ 0.05	≤ 0.05	≤ 0.05
Heat Aging Induced Attenuation (dB/km)		≤ 0.05	≤ 0.05	≤ 0.05
Water Immersion Induced Attenuation (dB/km)		≤ 0.05	≤ 0.05	≤ 0.05

## Multi-mode Optical Fiber ( OM2+, OM3,OM4 )

ZTT multi-mode optical fiber adopts MCVD technology with precise control of refractive index and provides customer-made multi-mode optical fiber. The conventional type is OM2+, OM3, OM4 and the customers can choose the type according to the use requirement. ZTT multi-mode optical fiber supports 10Gb/s transmission system; the transmission distance is in the range of 300—500m at 850nm. The fiber is designed for low-cost 850nm vertical cavity surface emitting laser as the light source of Gigabit Ethernet with good properties, which provides the solutions for the low-cost and high bandwidth.

ZTT optical fiber adopts advanced coating curing technique to provide good dynamic fatigue resistance property and increase the service life of optical fibers.

### Application

- LAN
- Data storage service
- Tight buffer fiber cable
- Central office area
- Medical imaging
- Computer center

### Characteristics

- The fiber is suitable for 10Gb/s transmission system with high performance; the transmission distance is 300-500m
- The fiber is suitable for low loss 850nm system
- Realize the efficient coupling of LED and laser light source
- Efficient bending resistance property and high bandwidth property

	Type	1GB/S	10GB/S	40&100GB/S
System Link Length : 850nm	OM2+	700m	150m	/
	OM3	950m	300m	100m
	OM4	1100m	500m	150m
Transmission length	Bandwidth	OM2+	OM3	OM4
	OFL BW@850	≥700 MHZ*KM	≥1500 MHZ*KM	≥3500 MHZ*KM
	OFL BW@1300	≥500 MHZ*KM	≥500 MHZ*KM	≥500 MHZ*KM
	EMB BW@850	≥950 MHZ*KM	≥2000 MHZ*KM	≥4700 MHZ*KM

### Product specification

Description		Specification
Attenuation (dB/km)	850 nm	≤2.5
	1300 nm	≤0.7
Attenuation inhomogeneity (dB/km)	850 nm	≤0.08
Attenuation Point Discontinuity (dB)	850 nm	≤0.1
Numerical aperture		0.2±0.015
Fiber Curl Radius (m)		≥4
Fiber Core Diameter (um)		50±2.5
Core Non-circularity (%)		≤5.0
Cladding Diameter (um)		125±1
Core/clad Concentricity Error (um)		≤1.0
Cladding Non-circularity (%)		≤1
Coating Diameter (um)		245±5
Clad / coating Concentricity Error (um)		≤8.0
Coating Non-circularity (%)		≤5
Proof Stress (%)		1
Tensile strength test (GPa)	15% Weber fracture probability	2.76
	50% Weber fracture probability	3.45
Fatigue Resistance Parameter(Nd)		≥20
Peak Coating Strip Force (N)		[1.3,8.9]
Temperature Cycling Induced Attenuation (dB/km)		0.05
Damp Heat Aging Induced Attenuation (dB/km)		0.05
Heat Aging Induced Attenuation (dB/km)		0.05
Water Immersion Induced Attenuation (dB/km)		0.05

## Small Size Single-mode Fiber ( 200um )

ZTT small size single mode fiber is to reduce the uncolored fiber from 250um to 200um through the precise control of the coating, which reduce the cable diameter efficiently and realize the larger fiber cables installation in the same duct resource to decrease the waste of duct space.

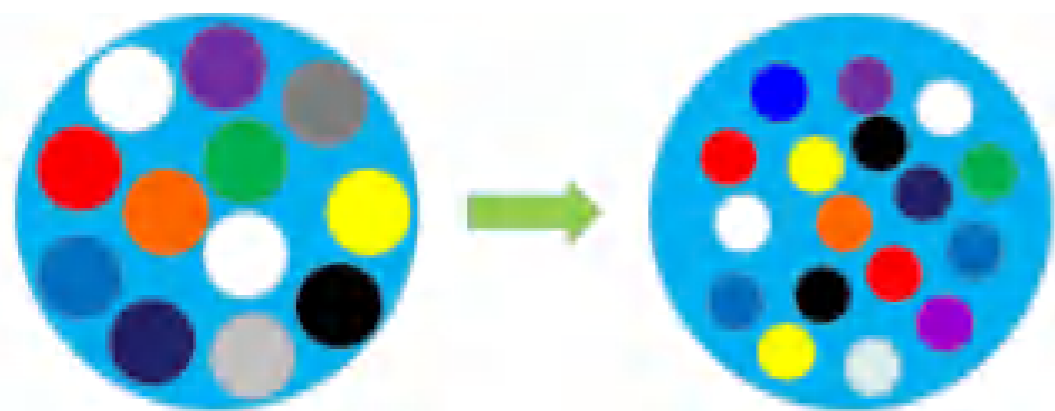
ZTT small size single mode fiber adopts the optimized coating technique and chooses the special coating material, which protects the bare fiber and reduces the bending loss to make fiber keep the lower attenuation during the cabling and construction and stable dynamic fatigue parameters.

### Application

- Optical fiber ribbon cable
- Miniaturization optical fiber devices
- Central tube optical fiber cable
- Tight buffer fiber cable

### Characteristics

- Realizing O, E, S, C, L ( 1260nm-1625nm ) full-band transmission and increasing the transmission bandwidth
- Small PMD coefficient to meet the use of high rate transmission
- Good dynamic fatigue property is suitable for different environment
- Small diameter is suitable for narrow duct and limited space



### Product specification

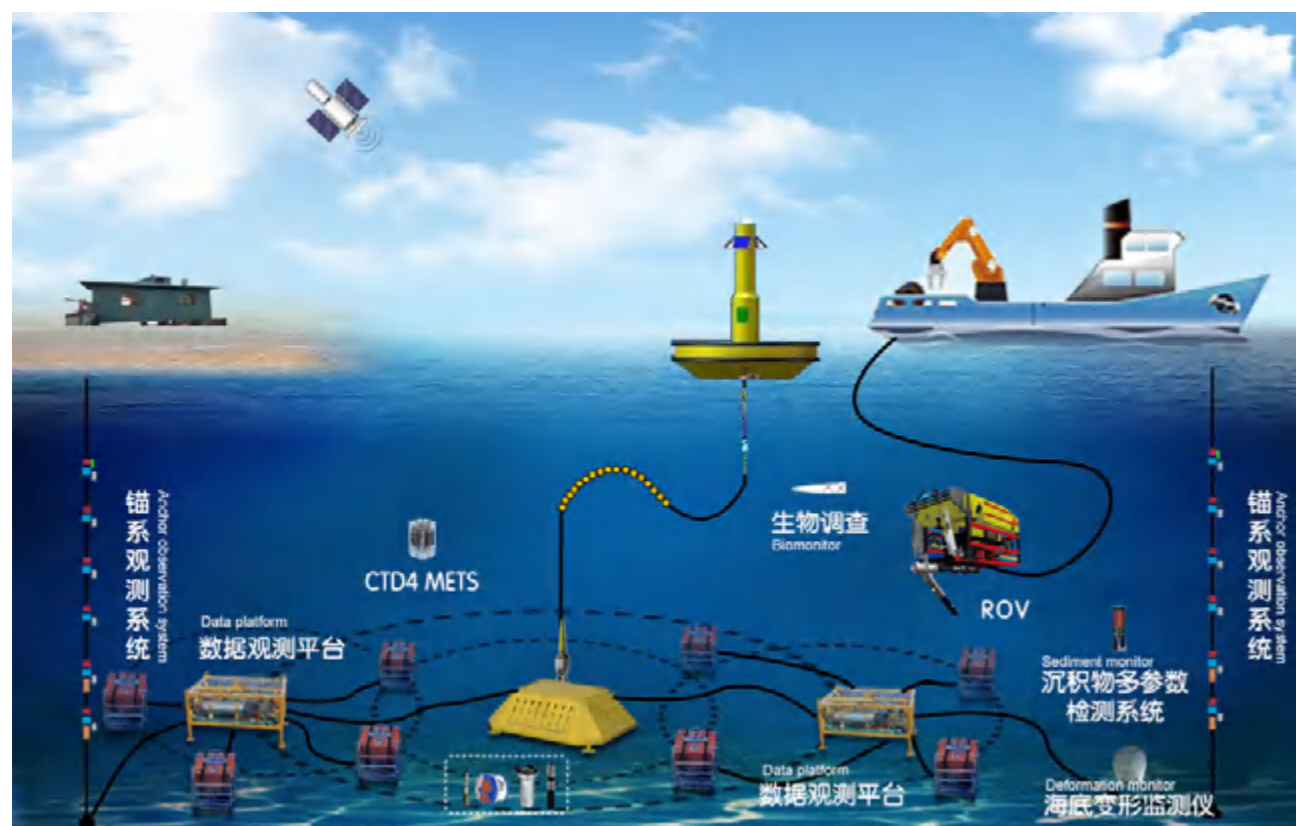
Description		Specification
Attenuation (dB/km)	1310 nm	≤0.34
	1383 nm	≤0.34
	1550 nm	≤0.20
	1625 nm	≤0.23
Zero Dispersion Wavelength (nm)		1312±12
Zero Dispersion Slope (ps/nm <sup>2</sup> ·km)		≤0.092
Dispersion Coefficient (ps/nm·km)	1550 nm	≤18
	1625 nm	≤22
PMD (ps/√km)	Individual value	≤0.1
	Typical value	≤0.04
Cable Cutoff Wavelength (Acc) (nm)		≤1260
Mode Field Diameter (μm)	1310 nm	9.2±0.4
Fiber Curl Radius (m)		≥4.0
Macro-bending Loss (dB)	1550nm(10turns , 30mm)	≤0.25
	1625nm(10turns , 30mm)	≤1
	1550nm (1turn , 20mm)	≤0.75
	1625nm (1turn , 20mm)	≤1.5
Cladding Diameter(μm)		125±0.7
Core/clad Concentricity Error(μm)		≤0.6
Cladding Non-circularity (%)		≤1.0
Coating Diameter (μm)		200±10
Clad / coating Concentricity Error(μm)		≤12
Coating Non-circularity (%)		≤6.0
Tensile strength test (GPa)	15% Weber fracture probability	2.76
	50% Weber fracture probability	3.45
Fatigue Resistance Parameter(Nd)		≥ 20
Peak Coating Strip Force (N)		[1.3,8.9]
Temperature Cycling Induced Attenuation (dB/km)		≤ 0.05
Damp Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Water Immersion Induced Attenuation (dB/km)		≤ 0.05

## Ultra Low Bending Loss Single Mode Fiber(ULB)

ULB is a single mode fiber which has a high numerical aperture and is bending insensitive single mode fiber, whose cladding diameter is 125um or 80um. The fiber waveguide structure is optimized and bending insensitivity is promoted. Fiber bending loss is in low level and fiber service life is at least 20years of when fiber is winded In 100 circles of small radius. The fiber working wavelength, MFD, numerical aperture, and bending loss can be customized according to customer requirements.

### Application

- Equipments which request rigorous in bending loss
- Hydrophone
- Data transmission
- Sensor



### Characteristics

- cladding diameter in 80um and 125um;
- high numerical aperture ,bending insensitive In 100 circles;
- Special coating material to induce bending loss.

### Product specification

Type	ULB125-1310	ULB125-1550	ULB80-1550
Working wavelength ( nm )	1310	1550	1550
attenuation ( dB/km )	@1310≤0.5; @1550≤0.23	@1310≤0.5; @1550≤0.23	@1550≤0.35
Cable cutoff wavelength ( nm )	≤1300	≤1530	≤1530
Mode field diameter ( um )	@1310nm: 8.4± 0.6	@1550nm: 8.4± 0.6	@1550nm: 6.4±0.6
Numerical aperture	0.16	0.16	0.21
Bending loss ( dB )	200circles R7.5mm @1550≤0.3; 10circles R5.0mm @1550≤0.1	200circles R7.5mm @1550≤0.1; 10circles R5.0mm @1550≤0.05	200circles R5.0mm @1550≤0.1; 10circles R2.5mm @1550≤0.02
Cladding diameter ( um )	125±1.0	125±1.0	80±1.0
*Coating diameter ( um )	243±5	243±5	165±5
*Proof tension ( kpsi )	100	100	100

\* Coating diameter can be customized according to customer requirements.

\* Proof tension can be greater than 100kpsi, such as 150kpsi,200kpsi.

## Submarine cable fiber with high strength and long

Compared with normal fiber,ZTT Submarine cable fiber have higher strength and longer spool strength. Proof Stress was improved from 1% to 2%.Fiber spool length was improved from 24km to 100km.

### Application

- ADSS
- Submarine cable
- OPPC
- OPGW
- OPLC

### Characteristics

- Fiber meets 2% proof stress requirements
- Fiber spool length can reach more than 100km



### Product specification

Description		specification
Attenuation (dB/km)	1310 nm	≤0.34
	1383 nm	≤0.34
	1550 nm	≤0.20
	1625 nm	≤0.23
Zero Dispersion Wavelength (nm)		1312±12
Zero Dispersion Slope (ps/nm <sup>2</sup> ·km)		≤0.092
PMD (ps/√km))	Maximum value	≤0.1
	Typical value	≤0.04
Cable cutoff(λ <sub>cc</sub> ) (nm)		≤1260
Macro-bending Loss (dB)	(100turns,Φ50 mm) 1550 nm	≤ 0.05
	(100turns,Φ50 mm) 1625 nm	≤ 0.10
Mode field diameter (μm)	1310 nm	9.2±0.4
Fiber Curl Radius (m)		≥4.0
Cladding Diameter(μm)		125.0±1.0
Core/clad Concentricity Error(μm)		≤0.6
Cladding Non-circularity (%)		≤1.0
Coating Diameter (μm)		245±7
Clad / coating Concentricity Error(μm)		≤12
Coating Non-circularity (%)		≤6.0
Proof Stress (%)		≥2.0
Tensile strength test (GPa)	15% Weber fracture probability	2.76
	50% Weber fracture probability	3.45
Fatigue Resistance Parameter(Nd)		≥ 20
Peak Coating Strip Force (N)		[1.3,8.9]
Temperature Cycling Induced Attenuation (dB/km)		≤ 0.05
Damp Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Water Immersion Induced Attenuation (dB/km)		≤ 0.05



## Extreme cold endurance single mode fiber (-70°C )

Extreme cold endurance fiber can meet the requirement of Extremely low temperature environment(-70°C ), by improving coating properties, coating process controlling and reducing fiber micro-bending loss.

### Application

It can meet the communication and communication use in extremely cold regions. It is suitable for all types of cable structures :

- Ribbon cable
- Skeleton cable
- ADSS cable
- OPGW

### Characteristics

- Meet the requirements of low temperature fiber optic requirements for G.652.D
- Additional attenuation at -70 °C≤0.03

## Product specification

Description	specification	
Attenuation (dB/km)	1310 nm	≤0.34
	1550 nm	≤0.20
	1625 nm	≤0.23
Attenuation Point Discontinuity (dB)	1550 nm	≤0.02
Attenuation Wavelength (dB/km)	1285 nm ~ 1330 nm	≤0.03
	1525 nm ~ 1575 nm	≤0.02
Zero Dispersion Wavelength (nm)		1312±12
Zero Dispersion Slope (ps/nm <sup>2</sup> ·km)		≤0.092
Dispersion Coefficient (ps/nm·km)	1550 nm	≤18
	1625 nm	≤22
PMD (ps/√km)	Maximum value	≤0.1
	Typical value	≤0.04
Cable cutoff (λ <sub>cc</sub> ) (nm)		≤1260
Macro-bending Loss (dB)	(100turns,Φ50 mm) 1550 nm	≤ 0.05
	(100turns,Φ50 mm) 1625 nm	≤ 0.10
Mode field diameter (μm)	1310 nm	9.2±0.4
Refractive Index	1310 nm	1.466
	1550 nm	1.467
Fiber Curl Radius (m)		≥4.0
Cladding Diameter(μm)		125.0±1.0
Core/clad Concentricity Error(μm)		≤0.6
Cladding Non-circularity (%)		≤1.0
Coating Diameter (μm)		245±7
Clad / coating Concentricity Error(μm)		≤12
Coating Non-circularity (%)		≤6.0
Proof Stress (%)		≥1.0
Tensile strength test (GPa)	15% Weber fracture probability	2.76
	50% Weber fracture probability	3.45
Fatigue Resistance Parameter(Nd)		≥ 20
Peak Coating Strip Force (N)		[1.3,8.9]
Temperature Cycling Induced Attenuation (dB/km)		≤ 0.05
Damp Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Heat Aging Induced Attenuation (dB/km)		≤ 0.05
Water Immersion Induced Attenuation (dB/km)		≤ 0.05
Fatigue Resistance Parameter(Nd)		≤ 0.03



## High Temperature Resistant Fiber

The maximum temperature of ordinary optical fibers is generally not allowed to exceed +85 °C .If the temperature exceeds normal usage for a long time , the fiber coating will deteriorate , which has a bad influence on Fiber strength and service life.

We can provide 150 °C and 300 °C resistant fiber , which could be used for high temperature communication and sensing application. The High temperature resistance is promoted by using special coating material and special design of coating die and curing process. The temperature resistant polyester or polyimide fiber can meet the performance requirements of 150°C and 300°C .

### Application

- Temperature resistant polyester& polyimide coating
- Stable performance at high temperature
- Precise control on fiber geometry
- Stable optical and mechanical properties

### Characteristics

- High temperature sensing Applications
- Semiconductor manufacturing
- Corrosive environment
- Sensors for oil and gas wells
- Ultra high vacuum equipment
- Radiation Resistant Sensor



## Product specification

### 1、High Temperature Resistant Single Mode fiber

Type	MTSM	HTSM
Mode Field Diameter@1310nm ( μ m )	9.2±0.4	9.2±0.4
Cable cutoff wavelength ( nm )	≤1260	≤1260
Attenuation@1310nm ( dB/km )	≤0.4	≤1
Attenuation@1550nm ( dB/km )	≤0.25	≤0.8
Cladding diameter ( μ m )	125±1	125±1
Coating diameter ( μ m )	245±10	160±10
Cladding Non-circularity ( % )	≤1	≤1
Core/clad Concentricity Error ( μ m )	≤0.8	≤0.8
Proof tension ( kpsi )	100	100
Coating material	Temperature resistant polyester	polyimide
environmental temperature ( °C )	Short term: 200 Long term: 150	Short term: 350 Long term: 300

\*MTSM:Moderate Temperature Single Mode Fiber(150°C ~200°C );

\*HTSF:High Temperature Single Mode Fiber ( 300°C ~350°C ) ;

\*Coating and cladding diameter can be customized according to customer requirements.

### 2、Temperature Resistant Multimode Fiber

Type	MTMM	HTMM)
Attenuation@850nm ( dB/km )	≤3.0	≤4.0
Attenuation@1300nm ( dB/km )	≤1.0	≤2.0
Attenuation@850nm ( MHz · km )	≥150	≥150
Attenuation@1300nm ( MHz · km )	≥300	≥300
Core diameter ( μ m )	50±2.5	50±3
Cladding diameter ( μ m )	125±1	125±2
Coating diameter ( μ m )	245±10	160±10
Cladding Non-circularity ( % )	≤1	≤1
Core/clad Concentricity Error ( μ m )	≤1.5	≤1.5
Proof tension ( kpsi )	100	100
Coating material	Temperature resistant polyester	Polyimide
environmental temperature ( °C )	Short term: 200 Long term: 150	Short term: 350 Long term: 300

\*MTMM:Moderate Temperature Multimode Fiber(150°C ~200°C );

\*HTMM:High Temperature Multimode Fiber ( 300°C ~350°C )