

# Optical Fibre Cable Technical Specification

## Self-Supporting Aeria Cable

### **GYFXBY-nB6a1**

Yangtze Optical Fibre and Cable Joint Stock Limited Company

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## 1. Scope

This Specification covers the design requirements and performance standard for the supply of optical fibre cable in the industry. YOFC ensures a stable quality control system for our cable products through several programs including ISO 9001, ISO 14001 and OHS.

Cable type	Application
GYFXBY-nB6a1	Self-supporting aerial installation

### 1.1 Cable Description

Optical fibres are housed in loose tubes that are made of high-modulus plastic and filled with waterproof compounds.

FRP is applied as strength member.

Water blocking yarns are used in and over the cable core to prevent it from water ingress.

polyethylene sheath are applied as outer sheath.

### 1.2 Reference

The cable offered by YOFC are designed, manufactured and tested according to the standards as follows:

ITU-T G.657	Characteristics of a single-mode optical fibre
GR-20	Generic Requirements for Optical Fiber and Optical Fiber Cable
ANSI_ICEA-S-87-640	Standard for optical fiber outside plant communications cable

### 1.3 Life Time

Optical fibre cables supplied in compliance with this specifications is capable to withstand the typical service condition for a period of twenty-five (25) years without detriment to the operation characteristics of the cable.

## 2. Optical Fibre

2.1 Optical Fibres supplied in this specification meet the requirements of ITU-T G.657A1

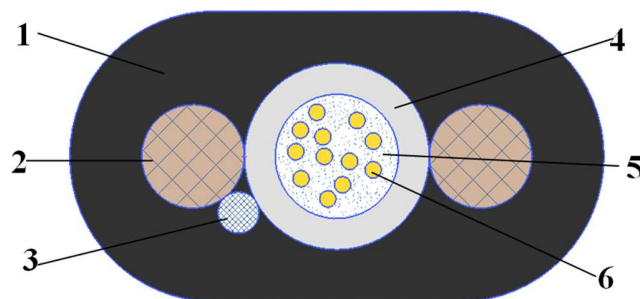
Parameters	Specification
MFD (1310nm)	9.2+/-0.4um
MFD (1550nm)	10.4+/-0.5um
Cladding diameter	125um±1.0um
Fiber diameter	245+/-7um, with UV coating, and colored to : 250+/-15um
Core/cladding concentricity error	≤ 0.6um
Coating/cladding concentricity error	≤ 12.0um
Cladding non circularity	≤ 1.0%
Cut off wavelength	$\lambda_{cc} \leq 1260\text{nm}$
Attenuation coefficient	1310nm: 0.36dB/km max after cabling
	1383nm: 0.36dB/km max after cabling
	1550nm: 0.22dB/km max after cabling
Bending-loss performance of optical fiber @1550nm	≤0.25dB (10 turns around a mandrel of 30mm diameter)
Polarization mode dispersion link value	≤0.1ps/√km
Zero-dispersion wavelength	1312+/-12nm
Zero-dispersion slope	≤0.091ps/nm <sup>2</sup> .km

## 3. Optical Cable

### 3.1 Technical Characteristics

- The unique second coating and stranding technology provide the fibres with enough space and bending endurance, which ensure good optical property of the fibres in the cable
- Accurate process control ensures good mechanical and temperature performance
- High quality raw material guarantees the long service life of cable

### 3.2 Cross Section of Cable



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1. PE sheath 2.Non-metallic strength member 3. Water blocking material  
4.Loose tube 5.Tube filling 6.Optical fiber  
Structure of other fibre counts refer to 3.4

### 3.3 Fibre and Loose Tube Identification

The color code of fibres will be identification in accordance with the following color sequence, other sequence also is available.

Fiber color code	1	2	3	4	5	6
	Blue	Orange	Green	Brown	Slate	White
	7	8	9	10	11	12
	Red	Black	Yellow	Purple	Pink	Aqua
	13	14	15	16	17	18
	Blue with black ring	Orange with black ring	Green with black ring	Brown with black ring	Slate with black ring	White with black ring
	19	20	21	22	23	24
Red with black ring	Black with yellow ring	Yellow with black ring	Purple with black ring	Pink with black ring	Aqua with black ring	

The color of the tube will be natural.

### 3.4 Dimensions and Descriptions

The standard structure of GYFXBY cable is shown in the following table.

Item	contents	Value
Loose tube	number	1
	Outer diameter (mm)	3.0
Max. fiber counts per tube	G.657A1	2~24
strength member	material	FRP
	number	2
	diameter (mm)	1.6
Water Blocking Material	Material	Water Blocking Yarn
	number	2
sheath	Material	PE
	Color	Black
	Thickness (mm)	Nominal: 0.8
Cable diameter(mm) Approx.		8.1 × 4.5 (±0.3)
Cable weight(kg/km) Approx.		35

### 3.5 Main Mechanical and Environmental Performance

Item	Value
	2~24
Tensile performance(N)	1350
Crush(N/100mm)	1500
Operation temperature:	-40°C~+70°C
Installation temperature	-10°C~+60°C
Storage temperature	-40°C~+70°C

### 3.6 Recommended Installation Parameter

NESC Environmental Loading Condition for Subscriber Drop Application	1% installation sag		3% installation sag	
	Maximum span distance (meter)	Sag at Environmental Loading (%)	Maximum span distance (meter)	Sag at Environmental Loading (%)
Heavy	45.2	4.5	56.3	5.4
Medium	76.8	4.0	97.1	5.3
Light	101.3	3.7	133.8	5.1

Note: Longer spans are possible if maximum applied load is not exceeded during environmental loading. Span calculations require known initial loading (force or percent sag), cable weight and anticipated environmental loads.

## 4 Mechanical, Physical and Environmental Test Characteristics

The mechanical and environmental performance of the cable are in accordance with the following table. Unless otherwise specified, all attenuation measurements required in this section shall be performed at 1550nm.

Items	Test Method	Requirements
Tension	<b>FOTP-38</b> Load: According to 3.5 Sample length: Not less than 100m. Duration time: 60min.	Fibre strain: $\leq 0.6\%$ Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements
Crush	<b>FOTP-41</b> Load: According to 3.5 Duration of load: 1min	Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements
Impact	<b>FOTP-25</b> Radius: 300 mm Impact energy: 4.4J Impact number: 2 Impact points: 3	Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements
Low and high temperature cable Bend	<b>FOTP-37</b> Mandrel radius: 20*D Turns:4 Temperature:-30 °C and +60 °C	Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements
Repeated bending	<b>FOTP-104</b> Bending radius: 20*D Cycles: 25 Load: 150N	Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements

<b>Torsion</b>	<b>FOTP-85</b> Cycles: 10 Length under test: 4m Turns: $\pm 180^\circ$ Load: 150N	Additional attenuation: $\leq 0.05\text{dB}$ No damage to outer jacket and inner elements
<b>Water Penetration</b>	<b>FOTP-82</b> Time : 24 hours Sample length : 1m Water height : 1m	No water leakage.
<b>Temperature cycling</b>	<b>FOTP-3</b> Sample length: at least 1000m Temperature range: $-40^\circ\text{C} \sim +70^\circ\text{C}$ Cycles: 2 Temperature cycling test dwell time: 24hours	The change in attenuation coefficient shall be less than 0.05dB/km.
<b>Other parameters</b>	According to <b>GR-20</b>	

## 5 Packaging and Drum

### 5.1 Cable Sheath Marking

Unless otherwise specified, the cable sheath marking shall be as follows:

- Color: white
- Contents: YOFC, the year of manufacture, the type of cable, cable number, length marking
- Interval: 1 m

Outer sheath marking legend can be changed according to user's requests.

### 5.2 Reel Length

Standard reel length: 2/3 km/reel, other length is also available.

### 5.3 Cable Drum

The cables are packed in fumigated wooden drums.

### 5.4 Cable Packing

Both ends of the cable will be sealed with suitable plastic caps to prevent the entry of moisture during shipping, handling and storage. The inner end is available for testing.