Optical Fibre Cable Specification

Small Figure-8 Central Tube Cable

GYAXTC8Y-J-4/8/12B1.3

Yangtze Optical Fibre and Cable Company Ltd.

1. General

This specification covers the design requirements and performance standard for the supply of optical fibre cable in the industry. It also includes YOFC premium designed cable with optical, mechanical and geometrical characteristics.

Cable type	Application
GYAXTC8Y-J-4/8/12B1.3	Self-support aerial installation

1.1 Cable Description

YOFC cable has excellent optical transmission and physical performance, to meet customer requirements.

1.2 Quality

YOFC ensures a stable quality control system for our cable products through several programs including ISO 9001, ISO 14001 and OHS.

1.3 Reliability

Initial and periodic qualification tests for raw material and cable product are performed to assure the cable's performance and durability in the field environment.

1.4 Reference

ITU-T G.652	Characteristics of a single-mode optical fibre
IEC 60794-1-1	Optical fibre cables-part 1-1: Generic specification-General
IEC 60794-1-2	Optical fibre cables-part 1-2: Generic specification-Basic optical cable test procedure
IEC 60794-3	Optical fibre cables-part 3: Sectional specification-Outdoor cables
IEC 60794-3-10	Optical fibre cables-part 3-10: Outdoor cables-Family specification for duct and direct buried optical communication cables
IEC 60794-3-11	Optical fibre cables-Part 3-11: Outdoor cables-Detailed specification for duct and directly buried single-mode optical fibre telecommunication cables

1.5 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

Optical Fibres supplied in this specification meet the requirements of ITU-T G.652.D

Parameter	Specification
MFD (1310nm)	8.7~9.5 um
Cladding diameter	125±1.0um
Fiber diameter	235~255um, 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	λcc ≤1260nm
Attenuation coefficient	1310nm: 0.35dB/km max after cabling 1550nm: 0.21dB/km max after cabling
Bending-loss performance of optical fiber @1310nm&1550nm	≤0.05dB (100 turns around a mandrel of 50mm diameter)
Polarization mode dispersion maximum individual fibre	≤0.2ps/ √ km
Polarization mode dispersion link value	≤0.1ps/ √ km
Zero-dispersion wavelength	1300~1324nm
Zero-dispersion slope	≤0.092ps/nm^2·km

3. Optical Cable

3.1 General Design

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

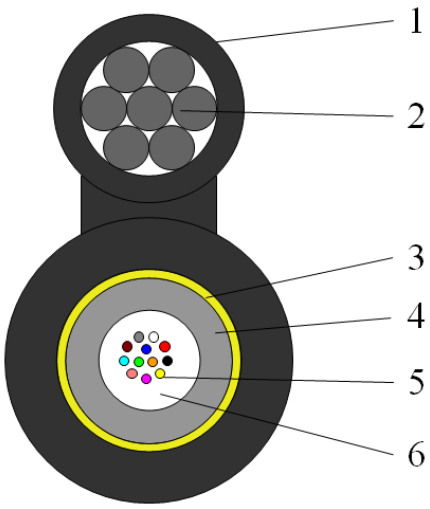
Strand wire is applied as Messenger.

Aramid yarn as central strength member

Figure 8 type PE sheath are applied as outer sheath

3.2 Construction

3.2.1 Cross Section of Cable



1 **Outer sheath :** black polyethylene.

2 **Messenger wire :** shall be 7*1.0mm strand wire

3 **Aramid yarn *:*** Additional strengthening elements.

4 **Tube filling :** suitable water tightness compound

5 **Optical fiber :** The fiber shall be made of high grade silica, compound silica glasses or equivalent material.

6 **Loose tube:** high modules thermoplastic material.

GYAXTC8Y-J-12B1.3

Schematic for reference only

3.2.2 Dimensions and Descriptions of Cable Constructions

The standard structure of GYAXTC8Y-J cable is shown in the following table, other structure and fibre count are also available according to customer requirements.

Items		Value		
		4	8	12
Fiber	Fiber type	ITU. G.652D		
	Fiber counts	4	8	12
Messenger	Material	Strand wire		
	Diameter (mm)	7*1.0		
Loose tube	Material	PBT		
	Diameter (mm)	3.0		
Outer sheath	Material	HDPE		
	Thickness (mm)	Nominal: 1.0		
Cable diameter approx. (±0.5mm)		5.2*11.4		
Cable weight approx. (kg/km)		90		

3.2.3 Main Mechanical and Environmental Performance of Cable

Tensile performance(N)	**Crush(N/100mm)**	
3000	Short term	Long term
	1000	300

Operation temperature: -30℃～+70℃

3.2.4 Color Code of the Fibre and Loose tube

Each fibre can be identifiable throughout the length of the cable in accordance with the following color sequence.

Fiber Color Code	1	2	3	4	5	6
	Blue	Orange	Green	Brown	Grey	White
	7	8	9	10	11	12
	Red	Black	Yellow	Purple	Pink	Aqua

Loose tube will be identification in Natural.

3.3 Mechanical, Electrical 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.

Item	Test Method	Requirements
Tension	**IEC 60794-1-2-E1** Load: According to 3.2.3 Sample length: Not less than 50m. Duration time: 1min.	Additional attenuation after test: ≤0.1dB No damage to outer jacket and inner elements
Crush	**IEC 60794-1-2-E3** Load: According to 3.2.3 Duration of load: 1min	Additional attenuation after test: ≤0.1dB No damage to outer jacket and inner elements
Impact	**IEC 60794-1-2-E4** Radius: 300mm Impact energy: 3J Impact number: 1 times on each point Impact points: 3	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Bend	**IEC 60794-1-2-E11A** Mandrel radius: 10Dmm Turns:10 Cycles:5	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Repeated bending	**IEC 60794-1-2-E6** Bending radius: 20Dmm Cycles: 30 Load: 150N	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Torsion	**IEC 60794-1-2-E7** Cycles:10 Length under test: 1m Turns: ± 90° Load: 150N	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Temperature cycling	**IEC 60794-1-2-F1** Sample length: at least 1000m Temperature range: -30℃→+70℃ Cycles: 2 Temperature cycling test dwell time: 12 hours	The change in attenuation coefficient shall be less than 0.1 dB/km
Water Penetration	**IEC 60794-1-2-F5B** Time : 24 hours Sample length : 3m Water height : 1m	No water leakage.
Other parameters	According to **IEC 60794 ,**	

4. Packaging and Drum

4.1 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.

4.2 Reel Length

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

4.3 Cable Drum

The cables are packed in fumigated wooden drums.

4.4 Cable Packing

Both cable ends are protected against water penetration and firmly secured to the drum, so the cable cannot move and the turns cannot slide when it is moved, handled or laid. The inner end has around 3 meters of accessible length to perform reception tests.