

Duct Cable

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
GYFZY-12/24B1.3	duct 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.

Optical properties of the SM fibre are achieved through a germanium doped silica based core with a pure silica cladding which meets ITU-T G652D, UV curable acrylate protective coating is applied over the glass cladding to provide the necessary maximum fibre lifetime.

Geometrical, optical, and mechanical characteristics of fibre in cable as the following table:

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
	1550nm: 0.22dB/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 link value	≤0.1ps/ $\sqrt{\text{km}}$
Zero-dispersion wavelength	1312+/-12nm
Zero-dispersion slope	≤0.091ps/nm ² .km

3. Optic Cable

3.1 General Design

FRP is applied as central strength member.

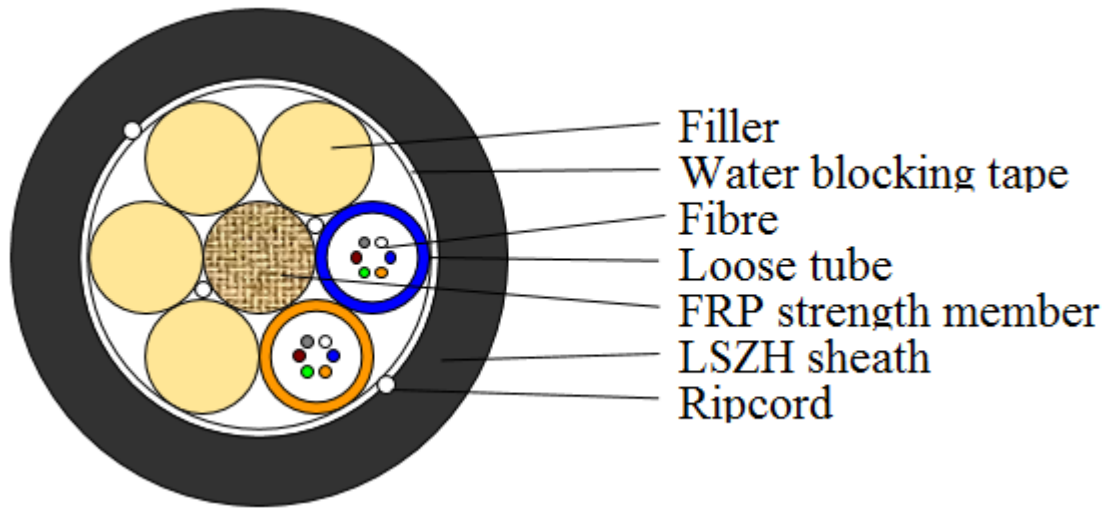
Loose tubes and fillers are SZ stranded around the central strength member.

Dry water blocking material is used in and over the cable core to prevent it from water ingress.

LSZH sheath is applied as outer sheath.

3.2 Construction

3.2.1 Cross Section of Cable



GYFZY-12B1.3

Structure of other fibre counts refer to 3.2.2

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 guarantee the long service life of cable

3.2.2 Dimensions and Descriptions of Cable Constructions

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

Item	contents	Value	
		12	24
Loose tube	Number	2	4
	Outer diameter (mm)	1.9	
Filler	Number	4	2
Max. fiber counts per tube	G.652D	6	
Central strength member	Material	FRP	
	Diameter(mm)	2.0	
Water Blocking Material	Material	Water Blocking Tape & Yarn	
Ripcord	Number	2	
Outer sheath	Material	LSZH	
	Color	Black	
	Thickness (mm)	Nominal: 1.5	

Cable diameter(mm) Appro.	9.2
Cable weight(kg/km) Appro.	90

3.2.3 Main Mechanical and Environmental Performance of Cable

Fiber counts	Tensile performance(N)	Crush(N/100mm)
	Short term	Short term
12/24	1500	1500

Operation temperature: -40°C ~ +70°C

3.2.4 Color Code of the Fibre and Loose Tube and Filler

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

The color of the fillers will be natural.

	1	2	3	4	5	6
color code	Blue	Orange	Green	Brown	Grey	White
	7	8	9	10	11	12
	Red	Black	Yellow	Violet	Pink	Aqua

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: 300 mm Impact energy: 10J Impact number: 1 times Impact points: 3	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements
Bend	IEC 60794-1-2-E11A Mandrel radius: 12.5Dmm 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	Additional attenuation: ≤0.1dB

	Cycles:10 Length under test: 1m Turns: $\pm 90^\circ$ Load:150N	No damage to outer jacket and inner elements
Temperature cycling	IEC 60794-1-2-F1 Sample length: at least 1000m Temperature range: $-40^\circ\text{C} \rightarrow +70^\circ\text{C}$ 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: $1 \pm 0.2\%$ m

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

4.2 Reel Length

Standard reel length: 1/ 2/3 km/reel, other length is also available.

4.3 Cable Drum

The cables are packed in fumigated wooden drums.