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Optical Fiber Flat Cable Technical Specification

GJYXMF-nB6

1. Scope

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

Cable type	Application
Flat cable-nB6	Duct installation and aerial installation together with tension strand wire

n represent the number of fibers in the cable.

1.1 Cable Description

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

Two FRPs are applied as strength member.

Loose tube is putted in the central of the cable and protected by two FRPs.

Polyethylene sheath are applied as outer sheath.

1.2 Reference

The cables are designed, manufactured and tested according to the standards as follows:

ITU-T G.657	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

1.3 Life Time

Optical fibre cables supplied in compliance with this specifications is capable to withstand the typical service condition for a period of THIRTY (30) years without detriment to the operation characteristics of the cable.

2. Optical Fibre

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

Characteristics	Conditions	Specified Values	Units
Optical characteristics			
Attenuation	1310 nm 1550 nm	<0.35 <0.21	[dB/km] [dB/km]
Chromatic Dispersion	1310 nm 1550 nm 1625 nm	≤3.5 ≤18 ≤22	[ps/(nm • km)] [ps/(nm • km)] [ps/(nm • km)]
Zero dispersion wavelength		1312±10	[nm]
Zero dispersion slope		≤0.092	[ps/(nm2 • km)]
PMD Maximum Individual Fibre Link Design Value (M=20,Q=0.01%)		 ≤0.1 ≤0.06	 [ps/km] [ps/km]
Cable cutoff wavelengthλ cc		≤1260	[nm]
Mode field diameter (MFD)	1310 nm 1550 nm	9.2±0.4 10.3±0.5	[μ m] [μ m]
Core-clad Concentricity		≤0.5	[μ m]
Cladding diameter		125±1	[μ m]
Cladding Non-circularity		≤0.8	[%]
Coating diameter		245±5	[μ m]

Proof test		⩾0.69	[Gpa]

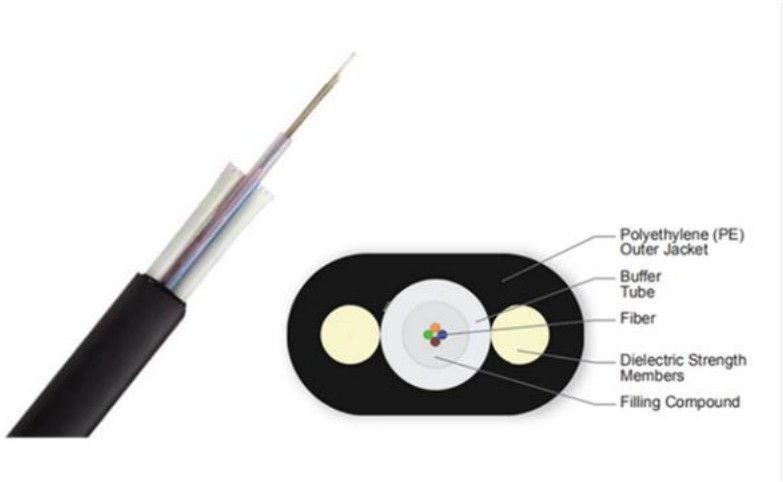
Optical Cable

2.2 Technical Characteristics

• **Tube**: thermoplastic material containing optical fibers and filled with a suitable water tightness compound.
• **Peripheral Strength Member**: 2 FRP beside of tube.
• **Outer Sheath**: HDPE

In case of aerial installation between poles, the maximum permitted span is 50 meter with 1% installation sag.
The cables withstand the maximum additional loads generated by wind and ice in the following environment:
(a) temperature –5°C, wind speed 100 km/h
(b) temperature –20°C , wind speed 50 km/h , ice radial thickness 8 mm
The use of proper fittings is recommended, in order to achieve the mentioned performance.

2.3 Cross Section of Cable



Flat cable-nB1.3
Structure of other fibre counts refer to 3.4

2.4 Fibre and Loose Tube Identification

The color code of fibers and loose tube will be identification in accordance with the following color sequence, other sequence also is available.

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

2.5 Dimensions and Descriptions

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

Item	Contents	Value
		8/12 cores
Loose tube	Max. fiber counts/tube	8/12
	Outer diameter (mm)	2.0mm
Strength member	Material	2 x FRP
	Diameter (mm)	2.0mm
Sheath	Material	PE
	Color	Black
Cable diameter(mm) Approx.		4.2*8.0mm
Cable weight(kg/km) Approx.		40kg/km

2.6 Main Mechanical and Environmental Performance

Item	Value
Tensile performance(N)	1000
Crush(N/100mm)	1000
Operation temperature:	-40℃～+70℃
Installation temperature	-40℃～+70℃
Storage temperature	-40℃～+70℃

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	**IEC 60794-1-2-E1** Static: 400N, 5 min. Dynamic:1000N, 5 min.	**Static**:Δl/l fiber ≤ 0.05%, Δα ≤ 0.05 dB under test, reversible **Dynamic**: Δl/l fiber ≤ 0.33%, Δα reversible
Crush	**IEC 60794-1-2-E3** 1000 N/100mm, max. 5 min	Δl/l fiber ≤ 0.33%, Δα reversible
Impact	**IEC 60794-1-2-E4** 5 J, 3 impacts, R=300 mm	Δα ≤ 0.05 dB, reversible, no damage
Bend	**IEC 60794-1-2-E11A** D=15xOD, 5 cycles	Δα ≤ 0.05 dB after test, no damage
Repeated bending	**IEC 60794-1-2-E6** R=20xOD, 100N, 100 cycles	No break of fibers or cable`s elements
Torsion	**IEC 60794-1-2-E7** ± 90°,2 m, 400N, 5 cycles	Δα ≤ 0.05 dB after test, no damage
Water Penetration	**IEC 60794-1-2-F5B** 3 m sample,1 m water column	No water leakage.
Temperature cycling	**IEC 60794-1-2-F1** -40 -> +70 °C, 2 cycles	Δα ≤ 0.05 dB/Km, reversible
Other parameters	According to **IEC 60794-1**	

5 Packaging and Drum

5.1 Cable Sheath Marking

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

Color: white

Contents: Brand, the year of manufacture, the type of cable, cable number, length marking Interval: 1±0.2% 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 plywood 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.