

OPTICAL FIBER CABLE_DIRECT BURIED CABLE GYTY53-12B1.3

1. GENERAL

1) SCOPE

This specification covers the general requirements and performance of CABLE which offered including optical characteristics, electrical characteristics, mechanical characteristics, geometrical characteristics.

2) REFERENCES

The CABLE which offered shall be designed, manufactured and tested according to international standards as follows:

ISO 9001	Quality Management Systems
ISO 14001	Environmental Management Systems
IEEE Std P.1222	IEEE Standard construction of composite fiber for use on electric utility power lines
IEC 60793-1	Optical fiber Part 1: Generic specifications
IEC 60793-2	Optical fiber Part 2: Product specifications
IEC 60794-1-2	Optical fiber cables – Part 4: Sectional specification – Aerial optical cables along electrical power lines
EIA/TIA 598	Color code of fiber optic cables
ITU-T G.650	Definition and test methods for the relevant parameters of single-mode fibers
ITU-T G.652	Characteristics of a single-mode optical fiber cable
ITU-T G.651	Characteristics of a multimode optical fiber cable
ITU-T G.657	Characteristics of Bending loss insensitive single mode fiber for access network

3) ANTI-RODENT PERFORMANCE

Rat-proof optical fiber cable with high quality corrugated steel tape with thickness of 0.25mm, and with double sheath of PE of good quality (Polyethylene) to ensure the cable has good anti-rodent performance and very suitable for use direct buried.

2. OPTICAL FIBER

G. 652D Type

The optical fiber shall be made of high pure silica and germanium doped silica. UV curable acrylate material is applied over fiber cladding as optical fiber primary protective coating. The detail data of optical fiber performance are shown in the following table:

Category	Description	Specifications
Optical Characteristics	Attenuation Coefficient: at 1310 nm Max: at 1550 nm Max:	≤ 0.35dB/km ≤ 0.21dB/km
	Chromatic Dispersion: between 1285 - 1330 nm: at 1550nm	≤ 3.5 ps/nm·km ≤ 18 ps/nm·km
	Chromatic dispersion coefficient	λ_{omin} :1300nm λ_{oMax} :1324nm Somax:0.092ps/(nm ² *km)
	Point Discontinuity: at 1310&1550 nm	≤ 0.1 dB
	Polarization Mode Dispersion (PMD) PMD Q value	≤ 0.2 ps/√km ≤ 0.08 ps / √km.
	The optical fiber core and sheath shall be of the E9 / 125 type. The protective cover must be in direct contact with the surface of the optical fiber to protect it and avoid cracking of the optical fiber	E9 / 125 type
	Cable Cut off Wavelength (λ_{cc})	≤ 1260 nm
Geometrical Characteristics	Mode Field Diameter: at 1310 nm at 1550 nm	9.2 ±0.4μm 10.4±0.5μm
	The uniformity attenuation at any projected wavelength	≤ 0.1 dB/km
	Cladding Diameter	125 ±1.0μm
	Mode field (Core/clad) concentricity error	≤ 0.5 μm
	Cladding Non-Circularity	≤1%
	Coating Diameter	245 ± 7μm
	Core / Cladding Concentricity error	≤ 0.6μm

	The increase in attenuation of 100 optical fiber cores wrapped on a 50 mm diameter chuck at 1310 nm: at 1550 nm:	≤0,05 dB; ≤ 0,05 dB
	Coating-Cladding Concentricity error	≤ 12um
	Effective Group Index of Refraction: at 1550 nm	1.4675
	Coating non-circularity The test must be carried out according to IEC/EN 60793-1-21.	≤6%
	Optical fiber shall be able to withstand a strain at minimum 8N for one second. This must correspond to a maximum optical fiber elongation of 1%	minimum 8 N for one second
Environmental Characteristics	Temperature Cycling Induced Attenuation: at 1550nm and 1625 nm (-60°C to +85°C)	0.05dB/km
	Variation of attenuation in the temperature range -40 °C to +65 °C must not exceed: at 1310 nm: at 1550 nm:	0,05 dB/km;
		0,05 dB/km.
	Macro bending Loss: at 1550nm and 1625 nm (100 turns; Φ 60 mm)	≤ 0.1dB

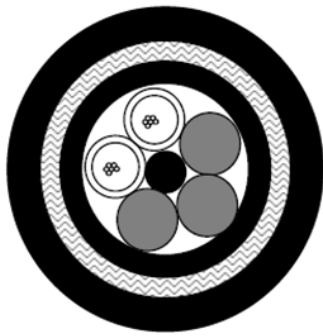
3. DRAWING AND DATASHEET OF CABLE

Optical Fiber Cable Specifications

Type:

GYTY53-12B1.3

Structure:



Details			
Phosphating steel wire	Diameter	1.5	mm
Losse tube	Outer/Inner Dia.	2.0/1.4	mm
Optical fiber	No.	12	
Filler	No.	3	
Jelly			
Filling compound			
MDPE inner sheath	Thickness	0.8	mm
Corrugated steel tape	Thickness	0.25	mm
MDPE outer sheath	Thickness	1.6	mm

Fiber: 12 x G.652D

Tube/Fibers	2/ 6
Color of Optical fiber	Blue,Orange,Green,Brown,Grey,White
Color of buffer tube	Blue,Orange

Overall diameter	11.5	mm
Weight	141	kg/km

Tech. Data	Standard: IEC 60794	
	Features: Water blocking, Moistureproof, Crashing resistant, Tesile resistant	
	Application:Direct-burial	
	Allowalbe tensile strength	3000 N
	Water ingress resistance	1meter, 24hours, 3samples
	Minimum Bending Radius (Dynamic)	25 D
	Minimum Bending Radius (Static)	12.5 D
	Life Expectancy	≥30 Years
Temperature	operating temperature range	-40℃ ~ +70℃

Note: All dimension and datas are nominal value.

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4. COLOR IDENTIFICATION OF FIBER IN CABLE

4.1 Fiber color code

Each fiber will be identifiable throughout the length of the cable in accordance with the following color sequence. Fiber color in each tube starts from No. 1 Blue.

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

4.2 Color Codes for Loose Tube

The loose tubes will be identifiable in accordance with the following color sequence. If there are fillers, the color is Black.

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

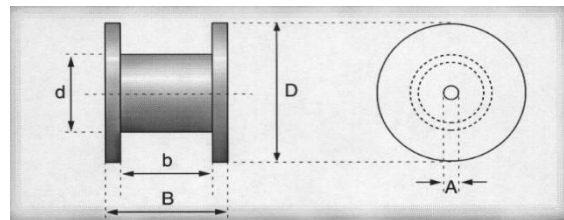
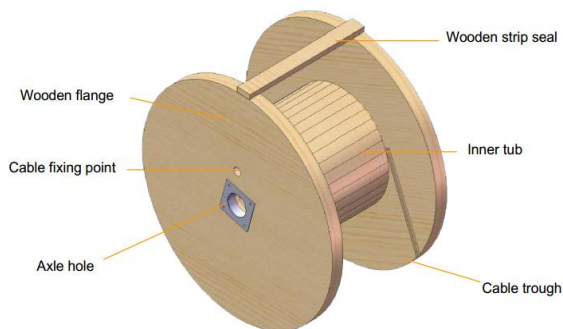
5. CHARACTERISTIC OF OPTICAL CABLE

Optical fiber cable shall be accordance with applicable standard of optical fiber cable and requirement of customer. The following test items shall be carried out according to corresponding reference.

Tests of Completed Optical Fiber Cable		
1	Impact test	IEC-60794
2	Crush test	IEC-60794
3	Water penetration(0.1bar/24h)	≤1m
4	Attenuation test	ITU

6. PACKING AND DRUM FOR CABLE

CABLE shall be wound on a non-returnable wooden drum or metal drum. Both ends of CABLE shall be securely fastened to drum and sealed with a shrinkable cap. The required marking shall be printed with a weather-proof material on the outsides of drum according to customer's requirement.



Cable Diameter (mm)	Drum Length (km)	Drum Dimensions & Weights					
		D	b	B	d	A	weight
		m	m	m	m	m	t
11.5	4	1.35	0.61	0.7	0.6	0.08	0.122