

Technical Data Sheet

for

Underground Direct-buried Armored Fiber Optic Cable

[GYFTY53-2,4,12,24,48,96B1.3]

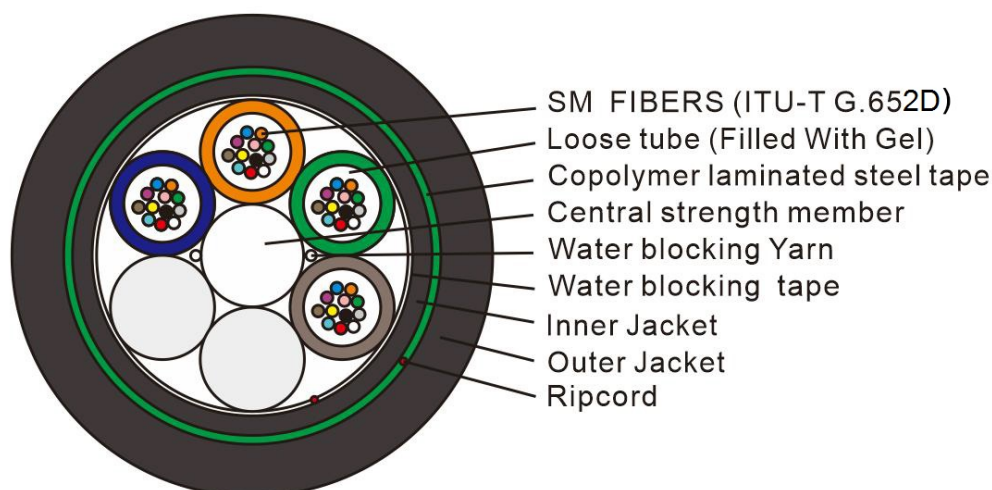
GYFTY53-2/4/12/24/48/96F

Underground steel-tape armored cable with up to 96 fibres for direct buried installations, double sheath for anti-rodent purpose

1. General

- 1.1 The specification covers the construction and properties of optical fiber cable.
- 1.2 The cable shall be direct use in underground access network.
- 1.3 The cable generally meets any latest relevant IEC, ITU-T Recommendation or better.
- 1.4 The single mode fiber shall operate in 1310nm and 1550nm.
- 1.5 The cable could serve for 40 years without any significant deterioration.

2. Cross Section of Cable



GYFTY53-48B1.3

3. Optical Fiber in the Cable

3.1 Construction

Fiber	Type	Single mode type ITU-T G.652D
	Material	Ge doped fused silica
Mode field diameter	1310 nm	9.2 ± 0.4 μm
Core concentricity error		≤ 0.5 μm
Cladding diameter		125 ± 0.7 μm
Cladding non-circularity		≤ 1.0%
Coating	Material	UV curable acrylic
	diameter	250 ± 10 μm (Colored)

3.2 Optical characteristics

Attenuation	@1310 nm	≤0.35 dB/km
	@1383 nm	≤0.35 dB/km
	@1550 nm	≤0.20 dB/km
	@1625nm	≤0.25 dB/km
Zero-dispersion Wavelength		1300~1324 nm
Zero-dispersion slope		≤0.092ps/(nm ² /km)
Chromatic Dispersion Coefficient	1330 nm	≤3.5 (ps/nm.km)
	1550 nm	≤18(ps/nm.km)
Cable Cut-off Wavelength (λ _{cc})		≤1260nm
Polarization Mode Dispersion(PMD)		≤0.2 ps/km ^{1/2}
Macrobend Loss (Before Cable)	G.652D	30mm radius x 100turn: ≤0.1dB (at1550)
Fiber proof-tested		0.69 GPa

4. Optical Cable

4.1 Construction

Cable Type		GYFTY53
Number of Fibers		2/F/4F/12F/24F/48F/96F
Fiber	Construction	Consult 3.1
Central Strength Member	Material	FRP
Water Blocking Member	Cable Filling Compound	Water Blocking Thixotropic Gel
Tube	Material	PBT
	Filling Compound Material	Water Blocking Thixotropic Gel
Filler	Material	PP
Aarmor	Material	Steel Tape
Sheath	Material	PE
	Inner Sheath Thickness	0.9 ±0.2 mm
	Outer Sheath Thickness	1.6 ±0.2 mm

4.2 Buffer Tube Stranding, cable size and weight

Fiber Counts	Fiber number per tube	Number of tube/filler	Tube Diameter (Ø.1mm)	CSM Diameter (Ø.1mm)	Cable Diameter (¥ 0.3mm)	Approx.Weight (kg/km)
2F	2	1/5	1.8	1.8	11.5mm	145
4F	4	1/5	1.8	1.8	11.5mm	145
12F	6	2/4	1.8	1.8	11.5mm	145
24F	6	4/2	1.8	1.8	11.5mm	145
48F	12	4/2	1.9	2.0	12.1mm	177
96F	12	8/0	1.9	3.2	13.1mm	212

4.3 Identification

Color Code for Fiber

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

Color Code for Tube

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

5. Optical Fiber Cable Characteristic

5.1 Mechanical Properties

Item	Test Method	Specification at 1550nm
Tensile	IEC 60794-1-2-E1 Tensile Force Short Term(N): 3000N Tensile Force Long Term (N): 1000N	Attenuation change ≤ 0.05 dB δL load $\leq 0.5\%$ δL rest $\leq 0.05\%$
Bending	IEC 60794-1-2-E11A Mandrel Radius. : 20 cable Dia. No. of turn : 4 No. of cycle : 3	Attenuation change ≤ 0.05 dB No fiber break and no sheath damage

Crush	IEC 60794-1-2-E3 -Long load: 1000 N/100mm -Short load: 3000 N/100mm	Attenuation change ≤ 0.05 dB No fiber break and no sheath damage
Cyclic Flexing	IEC-60794-1-2-E8 100 cycles, 2 cycles per min. D=20xOD	Attenuation change ≤ 0.05 dB
Torsion	IEC 60794-1-2-E7 Length : 1 m Twist angle : $\leq 180^\circ$ No. of cycles : 10	Attenuation change ≤ 0.05 dB No fiber break and no sheath damage
Impact	IEC 60794-1-2-E4 Impact energy: 10J Radius: 300 mm, 3 points No. of impacts : 2 points (1 time/point)	Attenuation change ≤ 0.05 dB No fiber break and no sheath damage
Temperature Cycling	IEC 60794-1-2-F1 No. of cycles : 1 Temperature: -20 to +70℃ Soak time: 12 hours (4km/drum)	Attenuation change ≤ 0.1 dB/km No fiber break and no sheath damage
Drip test	IEC-794-1-2-E14 Sample length: 30 cm Temp: 60 ± 5℃ Time: 24 hours	No filling compound drip
Sheave test	IEC-794-1-2-E18 D=40*OD, 1400 N	Attenuation change ≤ 0.1 dB/km

5.2 Material Test

Test	Test Method	Detail Specifications	Acceptance Criteria
Filling gel drip	IEC-60794-1-2 Method E14	80℃	≤ 0.05 gr
Filling material OIT	ASTM D 3895 and GR-20 Clause 6.3.1		≥ 20 min
Cable material compatibility:	GR-20 Clause 6.3.4	85℃, 30 days	
-Fiber stripping force	IEC 60793-1-32	30 mm	1.0 $\leq$ Fstip $\leq$ 9.0 N
-PBT tube properties	Tube wrapping around a 75 mm mandrel	Per GR-20 Clause 6.3.4	No cracks or delamination
Jacket material			
-Carbon black contents			2.6 + 0.25%
-Yield strength (un-aged)	FOTP 89 or IEC 60811	HDPE	18 N/mm ²
-Elongation (un-aged)			300%
-Elongation (aged)		100℃/240 hrs	300%
-OIT	ASTM D 3895 and GR-20 Clause 6.4.1		≥ 20 min

5.3 Cable Environmental Properties

Item	Test Method	Specification at 1550nm
Cable Cold and Hot Bend	IEC 60794-1-2 method E11 Lowest Temperature = -20℃ Highest Temperature = +70℃ Dmandrel 15 xDcable	Attenuation change ≤0.05 dB
Temperature Cycling	IEC 60794-1-2 method F1 No. of cycles : 1 Temperature: -20 to +70℃ Soak time: 12 hours (4km/drum)	Attenuation change ≤ 0.1 dB/km No fiber break and no sheath damage
Water Penetration (un-aged cable)	IEC 60794-1-2 method F5A Head of water : 1 m Time : 24 hours Sample length: 1m	No water penetration. Report water penetration depth.
Water Penetration (aged cable)	IEC 60794-1-2 method F5A after aging Height of water : 1 m Time : 24 hours Sample length: 1m	No water penetration. Report water penetration depth.

5.4 Fiber Performance Test

All attenuations of all the fibers in the cable shall be tested (100%) by OTDR at 1310 nm, 1550 nm and 1625 nm. The maximum attenuation shall be :

Max attenuation @ 1310 nm 0.35 dB/km

Max attenuation @ 1550 nm 0.22 dB/km

Max attenuation @ 1625 nm 0.22 dB/km

6. Cable sheath Marking

- Marking Color White
- Interval 1m
- Method: Ink-jet printing
- Contents(for example for GYFTY53 48 fibers)

0000M XXXXX GYFTY53-48B1.3 FO Cable 4 x 12 SM G.652D FIBEST 2024

Explain:

******M:** Length marking ,starting number is 0000M

GYFTY53-48B1.3: Part Number

XXXXX : The name of brand.

FO Cable 4 x 12 : Where 4 is the number of tubes and 12 is the number of fibers in a tube.

SM G.652D : Fiber type code.

FIBEST : The name of manufacturer.

2024: The year of manufacture

- ❖ The sheath marking can be changed with customer's requirement.

7.Packing and shipping**7.1 Cable Drum: Wooded drum**

Standard reel length: 4,000m
(Other length is available according to user's request)

7.2 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.

