F.O. ARMORED, HDPE, MULTI-TUBE, SINGLE JACKET

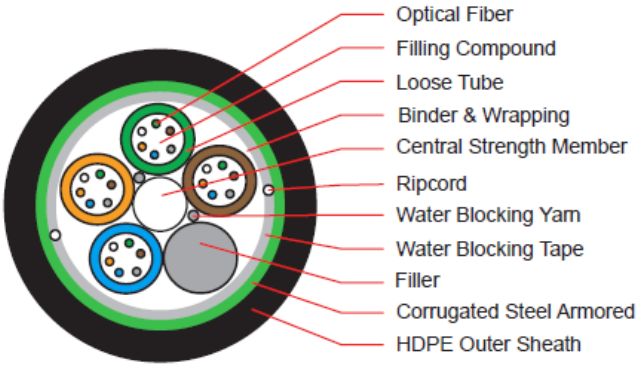
UFC96XXM
UFC56XXM
UFC46XXM
UFC36XXM
UFC26XXM

Scope of Application

This specification covers the general requirements for fiber optic telecommunication cables used for campus backbone, building backbone, indoor and outdoor in duct, lash aerial or direct buried installation LINK fiber optic cable supports application such as 40/100Gbps Ethernet, IEEE802.3ae,10G Ethernet, IEEE802.3z, Gigabit Ethernet, Fast Ethernet, Ethernet,100BASE-F, 52/155/622Mbps and 1.2Gbps ATM, FDDI, Fiber channel and others.

LINK Outdoor, Armored, HDPE, Multi-tube, fiber optic cable. Singlemode and Multimode color coded fibers, central strength member, jelly filled color code loose tube, PE Filler, SZ-Stranded around the a high strength steel wire central strength member. The water-blocking yarn & tape, rip cord, corrugated steel tape armored for rodent protection and UVproof, black HDPE outer jacket.

Drawing



Technical Standard

- ANSI/TIA-568.3-E
- ANSI/TIA-568.3-D
- ANSI/ICEA 640
- Telcordia (Bellcore) GR-20-CORE
- ITU-T G.652D (Singlemode)
- ITU-T G.651 (Multimode)

ISO/IEC 11801:2011
ISO/IEC 11801:2017
IEC 60793, IEC 60794-1-2
EN 50173-1
TIS 2165-2561
RoHS Compliant

OPTICAL FIBER

Items		Specifications
Fiber Type		9/125 μm (OS2)
Max. / Typ. Attenuation	1310 nm	≤ 0.35/0.33 dB/km
	1383 nm	≤ 0.35/0.31 dB/km
	1550 nm	≤ 0.21/0.19 dB/km
	1625 nm	≤ 0.23/0.20 dB/km
Core	Mode Field Diameter	9.2±0.4 μm @ 1310 nm 10.4±0.5 μm @ 1550 nm
Cladding Diameter		125 ± 0.7μm
Coating Diameter, Primary		242 ± 5 μm
Coating Diameter, Secondary		250 ± 5 μm
Cladding Non-circularity		≤ 0.7 %
Core/Cladding Concentricity error		≤ 0.5 μm
Coating/Cladding Concentricity error		≤ 12 μm
Attenuation (Homogeneity)		Max 0.1 dB/km
Zero Dispersion Wavelength		1300 ~ 1324 nm
Zero Dispersion Slope		≤ 0.092 ps/(nm^2.km)
Cut-off Wavelength	λ o (Fiber)	1150 ~ 1330 nm
	λ ∞ (Cable)	≤1260nm
Proof Test Stress		100 Kpsi
Chromatic Dispersion	λ ; 1285~1340 nm	≤ 3.5 ps/nm.km
	λ = 1550 nm	≤ 18 ps/nm.km
	λ = 1625 nm	≤ 22 ps/nm.km
Polarization mode dispersion (PMD)		≤ 0.20 ps/√km
Fiber Curl		≥ 4M
Numerical Aperture		0.130 ± 0.010
Group refractive index	1310 nm	1.4676
	1550 nm	1.4682

Table 1 The Optical, Geometrical Performance of the Singlemode Fiber (The specification conforms to the requirement of ISO/IEC11801, ANSI/TIA-568.3-E, IEC 60793-2B1.3, ITU-T G.652D)

OPTICAL FIBER

Items		Specifications			
Fiber Type		50/125 µm (OM2)	50/125 µm (OM3)	50/125 µm (OM4)	50/125 µm (OM5)
Max./ Typ. Attenuation (dB/km)	850 nm	≤ 2.7 / ≤ 2.5	≤ 2.7 / ≤ 2.3	≤ 2.7 / ≤ 2.3	≤ 2.7 / ≤ 2.3
	1300 nm	≤ 0.8 / ≤0.7	≤ 0.8 / ≤ 0.6	≤ 0.8 / ≤ 0.6	≤ 0.8 / ≤ 0.6
	953 nm	N.A	N.A	N.A	≤ 2.3 / ≤ 2.0
Bandwidth (MHz/km)	850 nm	≥ 500	≥ 1500	≥ 3500	≥ 3500
	1300 nm	≥ 500	≥ 500	≥ 500	≥ 500
	953 nm	N.A	N.A	N.A	≥ 1850
850nm Laser Bandwidth (MHz/km)		N.A	≥ 2000	≥ 4700	≥ 4700
953nm Laser Bandwidth (MHz/km)		N.A	N.A	N.A	≥ 2470
Core Diameter (µm)		50.0 ± 2.5	50.0 ± 2.5	50.0 ± 2.5	50.0 ± 2.5
Cladding Diameter (µm)		125 ± 1	125 ± 1	125 ± 1	125 ± 1
Core Non-circularity (%)		≤ 5	≤ 5	≤ 5	≤ 5
Cladding Non-circularity (%)		≤ 1.0	≤ 1.0	≤ 1.0	≤ 1.0
Core/Cladding Concentricity error (µm)		≤ 1.5	≤ 1.5	≤ 1.5	≤ 1.5
Coating Diameter, Primary (µm)		242 ± 5	242 ± 5	242 ± 5	242 ± 5
Coating Diameter, Secondary (µm)		250 ± 5	250 ± 5	250 ± 5	250 ± 5
Coating Non-Circularity (%)		≤5	≤5	≤5	≤5
Coating/Cladding Concentricity error (µm)		≤12	≤12	≤12	≤12
Attenuation (Homogeneity)		Max 0.1 dB/km	Max 0.1 dB/km	Max 0.1 dB/km	Max 0.1 dB/km
Proof Test Stress (kpsi)		100	100	100	100
Bending Loss @ 850 & 1300 nm (100 turns,		≤ 0.5 dB	≤ 0.5 dB	≤ 0.5 dB	≤ 0.5 dB
Zero-Dispersion Wavelength		1295~1315nm	1295~1315nm	1295~1315nm	1295~1315nm
Zero-Dispersion Slope (ps/(nm^2.km))		≤ 0.101	≤ 0.101	≤ 0.101	≤ 0.101
Numerical Aperture		0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015	0.200 ± 0.015
Group refractive index	850 nm	1.482	1.482	1.482	1.482
	1300 nm	1.477	1.477	1.477	1.477

Table 2 The optical, Geometrical Performance of the Multimode Fiber (The specification conforms to the requirement of ISO/IEC11801, ANSI/TIA-568.3-E, IEC 60793-2A1a, IEC 60793-2A1b, ITU -T G.651)

CABLE CONSTRUCTION

The construction of the cable shall be in accordance with Table 3 below.

Item		Description		
Number of fibers		6-24	36-60	72
Loose Tube	Material	PBT (Polybutylene Terephthalate) with color coding		
	Filling Compound	Thixotropic Jelly Compound		
	Fiber per Tube	6	12	
	Number	1-4	3-5	6
Filler Rod	Material	Plastic rod, natural color		
	Number	4-0	2-0	0
Stranding	Method	Reverse oscillating lay (ROL) technique (SZ Direction)		
Central Strength Member	Material	High Strength Steel Wire (FRP is available on request)		
	Color	Natural		
Water Blocking Yarn	Material	Suitable Water Swellable Materials		
Binder & Wrapping	Material	Polyester yarn		
Covering	Material	Water Blocking Tape		
Ripcord	Material	Plastic thread		
	Number	2		
Armored	Material	Corrugated chrome steel tape coated with polymer on both side		
Outer Sheath	Material	UV-Proof, Black HDPE		
	Thickness (Approx.)	1.8 mm.		
Cable Diameter (Approx.)		10.0 ± 1.0 mm.	10.5 ± 1.0 mm.	11.0 ± 1.0 mm.
Cable Weight (Approx.)		90 ± 10 kg./km.	105 ± 10 kg./km.	125 ± 10 kg./km.

The construction of the cable shall be in accordance with Table 4 below.

Item		Description		
Number of fibers		96	120	144
Loose Tube	Material	PBT (Polybutylene Terephthalate) with color coding		
	Filling Compound	Thixotropic Jelly Compound		
	Fiber per Tube	12		
	Number	8	10	12
Filler Rod	Material	Plastic rod, natural color		
	Number	0	0	0
Stranding	Method	Reverse oscillating lay (ROL) technique (SZ Direction)		
Central Strength Member	Material	High Strength Steel Wire (FRP is available on request)		
	Color	Natural		
Water Blocking Yarn	Material	Suitable Water Swellable Materials		
Binder & Wrapping	Material	Polyester yarn		
Covering	Material	Water Blocking Tape		
Ripcord	Material	Plastic thread		
	Number	2		
Armored	Material	Corrugated chrome steel tape coated with polymer on both side		
Outer Sheath	Material	UV-Proof, Black HDPE		
	Thickness (Approx.)	1.8 mm.		
Cable Diameter (Approx.)		12.3 ± 1.0 mm.	13.6 ± 1.0 mm.	14.7 ± 1.0 mm.
Cable Weight (Approx.)		145 ± 10 kg./km.	170 ± 10 kg./km.	200 ± 10 kg./km.

Table 3 and 4 Construction of Outdoor, Armored, HDPE, Multi-tube, Fiber optic cable.

TEMPERATURE RANGE

For the cables covered by this specification, the following temperature ranges apply.

- Operation Temperature : -40°C to +70°C
- Installation Temperature : -40°C to +70°C
- Storage/Shipping Temperature : -40°C to +75°C

MECHANICAL PERFORMANCE TEST

Item		Specification
Maximum Tensile load	Installation	2,700 N.
	Operation	1,500 N.
Maximum Crush resistance		3,400 N./10 cm.
Minimum bending Radius	Installation	20 x Cable Diameter
	Operation	10 x Cable Diameter

Table 5 Mechanical Specification of the cable.

FIBER AND LOOSE TUBE IDENTIFICATION

The color code of the loose tubes and the individual fibers within each loose tube shall be in accordance with Table 6 TIA/EIA-598-C (Rev. TIA/EIA-598-A) and EIA-359-A Color Code for Fiber and Loose tube Identification.

No.	Fiber color	Loose Tube color
1	Blue	Blue
2	Orange	Orange
3	Green	Green
4	Brown	Brown
5	Slate	Slate
6	White	White
7	Red	Red
8	Black	Black
9	Yellow	Yellow
10	Violet	Violet
11	Rose	Rose
12	Aqua	Aqua

Table 6 TIA/EIA-598-C Color Code for Fiber and Loose tube Identification.

MECHANICAL SPECIFICATION

- Tensile loading Test — TIA/EIA-455-33A and IEC 60794-1-2-E1A
- Compression Test — TIA/EIA-455-41A and IEC 60794-1-2-E3
- Repeated Bending Test — TIA/EIA-455-104A and IEC 60794-1-2-E6
- Impact Test — TIA/EIA-455-25B and IEC 60794-1-2-E4
- Cable Bending Test — IEC 60794-1-2-E11B
- Cable Twist or Torsion Test — TIA/EIA-455-85A and IEC 60794-1-2-E7
- Temperature Cycling Test — TIA/EIA-455-3A and IEC 60794-1-2-F1
- Water Penetration Test — TIA/EIA-455-82B and IEC 60794-1-2-F5

ORDER INFORMATION

OUTDOOR, ARMORED, HDPE, MULTI-TUBE, SINGLE JACKET, FIBER OPTIC CABLE

Descriptions	OS2, SM 9/125 µm	OM2, MM 50/125 µm	OM3, MM 50/125 µm	OM4, MM 50/125 µm	OM5, MM 50/125 µm
6 Core	UFC9606M	UFC5606M	UFC4606M	UFC3606M	UFC2606M
12 Core	UFC9612M	UFC5612M	UFC4612M	UFC3612M	UFC2612M
24 Core	UFC9624M	UFC5624M	UFC4624M	UFC3624M	UFC2624M
48 Core	UFC9648M	UFC5648M	UFC4648M	UFC3648M	UFC2648M
60 Core	UFC9660M	UFC5660M	UFC4660M	UFC3660M	UFC2660M
72 Core	UFC9672M	UFC5672M	UFC4672M	UFC3672M	UFC2672M
96 Core	UFC9696M	UFC5696M	UFC4696M	UFC3696M	UFC2696M
120 Core	UFC96120M	UFC56120M	UFC46120M	UFC36120M	UFC26120M
144 Core	UFC96144M	UFC56144M	UFC46144M	UFC36144M	UFC26144M

Specifications subject to change without notice.