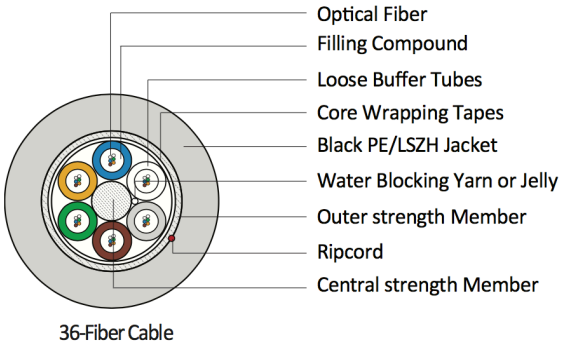
Fiber Optic, Loose-tube cable, non-armored, jelly-filled, 12-576 fibers

Features and benefits

- Fiber-count 2-144 fibers
- Multi loose-tube design
- LSZH jacket for Indoor/Outdoor applications
- Lightweight construction
- Plenum (OFNP / FT6), LSZH Riser OFNR (FT-4-ST1)
- OS2, OM3 and OM4 performance types
- Color-coded fibers for easy identification
- Compact design for limited conduit space
- Rodent resistant



Description

Opterna single jacket non-armored multi loose tube cable is a UV-stabilized, fully water blocked cable for outdoor duct applications (PE outer jacket) or Indoor/Outdoor applications (LSZH outer jacket). The loose tube design provides stable and highly reliable transmission parameters for a variety of voice, data, video and imaging applications.

This lightweight cable offers durability and flexibility required for many outside plant applications. Its compact design is suitable for limited conduit space and the cables are well suited for campus-type environments in and between buildings without building entry joints.

Multi loose tube cables comprise multiple loose tubes stranded around a central strength member (CSM). These tubes are either filled with optical fibers or replaced with PE fillers to maintain geometry of the cable during SZ stranding.

The fiber cable contains multiple color coded loose tube that contains a maximum of 12 fibers in each tube or 24 fibers per tube in case of 432 and 576 fibers. All fibers are coated with a 250 µm layer. Both the fiber and the loose tubes are color coded as per Telcordia requirements. The optical fibers are contained inside the multi loose tube with thixotropic gel to prevent water penetration and protect the fibers against shock. The multi loose tubes are SZ stranded around a dielectric central strength member and surrounded by water blocking yarn around the central strength member, an overall water blocking tape, overall glass yarn, rip cord and a PE or LSZH jacket. The glass yarn layer provides tensile strength and offers limited rodent protection.

Specifications

Optical Characteristics: Singlemode- 9 µm OS2 - G.652D, G.655D, G.657A/B

Fiber Type		Unit	OS2 G.652D		G.655D		G.657A		G.657B	
Wavelength		nm	1310	1550	1310	1550	1310	1550	1310	1550
Attenuation		dB/km	≤ 0.40	≤ 0.30	≤ 0.24	≤ 0.26	≤ 0.35	≤ 0.21	≤ 0.35	≤ 0.21
Chromatic dispersion		Ps/nm.km	≤ 3.5	≤ 18	2.0 – 6.0	4.5 - 11.2	≤ 3.5	≤ 18	≤ 3.5	≤ 18
Zero dispersion wavelength		nm	1300 ~ 1324		-		1300 ~ 1324		1300 ~ 1324	
Zero dispersion slope		ps/nm2.km	≤ 0.092		-		≤ 0.092		≤ 0.092	
PMD		ps/√km	≤ 0.2		≤ 0.2		≤ 0.2		≤ 0.2	
Cut-off wavelength		nm	≤ 1260		≤ 1450		≤ 1260		≤ 1260	
Mode-field diameter		µm	9.2 ± 0.4	10.4 ± 0.5	9.6 ± 0.5	-	8.6 ± 0.4	10.4 ± 0.5	8.6 ± 0.4	10.4 ± 0.5
Macro Bend Loss	30mm radius x 100 turns	dB	-	≤ 0.05	-	≤ 0.10	-	-	-	
	15mm radius x 100 turns		-	-	-	-	-	≤0.25/0.03	-	≤0.03/0.03
	10mm radius x 100 turns		-	-	-	-	-	≤0.75/0.1	-	≤0.1/0.08
	7.5mm radius x 100 turns		-	-	-	-	-	-	-	≤0.5/0.15
Core/Clad Concentricity Error		µm	≤ 0.6		≤ 0.6		≤ 0.6		≤ 0.6	
Cladding Diameter		µm	125 ± 1		125 ± 1		125 ± 1		125 ± 1	
Cladding Non-circularity		%	≤ 1.0		≤ 1.0		≤ 1.0		≤ 1.0	
Coating Diameter		%	245 ± 15		245 ± 15		245 ± 15		245 ± 15	
Proof Test Level		Kpsi	≥ 100		≥ 100		≥ 100		≥ 100	
Fiber curl		m	≥ 4		≥ 4		≥ 4		≥ 4	

Specifications

Optical Characteristics: Multimode - 62.5 µm (OM1), 50µm (OM2, OM3, OM4)

Fiber Type		OM1		0M2		0M3		0M4	
Wavelength	nm	850	1300	850	1300	850	1300	850	1300
Attenuation	dB/km	≤ 3.5	≤ 1.0	≤ 3.0	≤ 1.0	≤ 3.0	≤ 1.0	≤ 3.0	≤ 1.0
Over filled Launch Bandwidth (LED based sources)	MHz.km	≤ 200	≤ 500	≤ 500	≤ 500	≤ 1500	≤ 500	≤ 3500	≤ 500
Effective Modal Bandwidth (850 nm Laser based sources)	MHz.km	-		-		≤ 2000		≤ 4700	
Numerical aperture	-	0.275 ± 0.015		0.20 ± 0.015		0.20 ± 0.015		0.20 ± 0.015	
Core diameter	µm	62.5 ± 3.0		50 ± 3.0		50 ± 3.0		50 ± 3.0	
Core Non-Circularity	%	≤ 6.0		≤ 6.0		≤ 6.0		≤ 6.0	
Cladding diameter	µm	125 ± 2.0		125 ± 2.0		125 ± 2.0		125 ± 2.0	
Cladding Non-Circularity	%	≤ 2.0		≤ 2.0		≤ 2.0		≤ 2.0	
Core / Cladding Concentricity Error	µm	≤ 3.0		≤ 3.0		≤ 3.0		≤ 3.0	
Coating diameter	µm	245 ± 5.0		245 ± 5.0		245 ± 5.0		245 ± 5.0	
Proof test level	Kpsi	≤ 100		≤ 100		≤ 100		≤ 100	

Cable construction

Construction of single unit cables		
Number of fibers		Max. 576
Number of fibers per tube		6, 12 or 24
Filling Compound in Loose Buffer Tube		Thixotropic Jelly Compound
Loose buffer tube		PBT (Polybutylene Terephthalate) SZ stranded around FRP
Filler		Polyethylene rod (if necessary)
Central Strength Member		FRP (with PE over-coating if necessary)
Water blocking material		Water blocking yarn or tape around CSM
Core wrapping tape		Water blocking tape
Outer strength member		Glass yarns
Outer Jacket Material	Material	UV Black PE/LSZH
	Thickness	Nominal 1.5mm PE/1.8mm LSZH

Color of fiber

01 – Blue	07 – Red
02 – Orange	08 – Black
03 – Green	09 – Yellow
04 – Brown	10 – Violet
05 – Grey	11 – Pink
06 – White	12 – Aqua

Transmission performance

Buffer tubes number	Color	Buffer tubes number	Color	Buffer tubes number	Color
1	Blue	13	Blue/BK stripe (S)	25	Blue/BK stripe (D)
2	Orange	14	Orange/BK stripe (S)	26	Orange/BK stripe (D)
3	Green	15	Green/BK stripe (S)	27	Green/BK stripe (D)
4	Brown	16	Brown/BK stripe (S)	28	Brown/BK stripe (D)
5	Grey	17	Grey/BK stripe (S)	29	Grey/BK stripe (D)
6	White	18	White/BK stripe (S)	30	White/BK stripe (D)
7	Red	19	Red/BK stripe (S)	31	Red/BK stripe (D)
8	Black	20	Black/BK stripe (S)	32	Black/BK stripe (D)
9	Yellow	21	Yellow/BK stripe (S)	33	Yellow/BK stripe (D)
10	Violet	22	Violet/BK stripe (S)	34	Violet/BK stripe (D)
11	Pink	23	Pink/BK stripe (S)	35	Pink/BK stripe (D)
12	Aqua	24	Aqua/BK stripe (S)	36	Aqua/BK stripe (D)

Application	OS1/OS2 Singlemode (1310/1383/1550)	OM1 Multimode (850/1300)	OM2 Multimode (850/1300)	OM3 Multimode (850/1300)	OM4 Multimode (850/1300)
100Base-FX, Ethernet, @ 1300nm	-	2000m	2000m	2000m	2000m
100Base-LX, @ 1310nm	10000m	-	-	-	-
1000Base-SX, Gigabit, Ethernet @ 850nm	-	275m	550m	550m	550m
100Base-LX, Gigabit Ethernet, @ 1310nm	1000m	550m	550m	550m	550m
10GBase-SR, 10Gbps @ 850nm	-	33m	82m	300m	550m
10GBase-LR, 10Gbps @ 1310nm	1000m	-	-	-	-
40GBase-SR, 40Gbps @ 850nm	-	-	-	100m	150m
40GBase-LR4, 40Gbps @ 1310nm	1000m	-	-	-	-
100GBase-SR10, 100Gbps @ 850nm	-	-	-	100m	150m
100Base-LR4, 100Gbps, @ 1310nm	1000m				
100Base-ER4, 100Gbps, @ 1550nm	30000m	-	-	-	-

Environmental data

Temperature range	**Value**
Storage	- 25° C to +80° C
Service	- 25° C to +70° C
Installation	- 20° C to +70° C

Mechanical specifications

Tensile Load / Strength	IEC 60794-1-2-E1	2700N
Crush Resistance	IEC 60794-1-2-E3	1100N/10cm
Impact Resistance	IEC 60794-1-2-E4	3 impacts @ 3 points, 5Nm /5J
Torsion Test	IEC 60794-1-2-E7	± 180°, ± 1 turn/2m
Cable Bend	IEC 60794-1-2-E11	20 D for 4 turns, 10 Cycles
Drip test	IEC-60794-1-E14	30 cm, 70°C, 24 hour
Temperature Cycling	IEC 60794-1-2-F1	23°C → -40°C → 70°C
Water penetration	IEC 60794-1-2-F5	1 meter head, 3 meter / 24 hours

Physical specifications

No. of fibers	No. of fibers per tube	*Cable diameter PE/LSZH	Nominal weight	Maximum tensile load		Crush load		Min. bend radius	
				Short term	Long term	Short term	Long term	Loaded	Installed
		mm	Kg/km	N	N	N/cm	N/cm	mm	mm
12	6	12.4/12.7	130/165	2700	1000	110	55	260	130
24	6	12.4/12.7	130/165	2700	1000	110	55	260	130
36	6	12.4/12.7	130/165	2700	1000	110	55	260	130
48	12	13.0/13.3	145/185	2700	1000	110	55	270	135
72	12	13.0/13.3	145/185	2700	1000	110	55	270	135
96	12	14.3/14.6	175/215	2700	1000	110	55	290	145
144	12	17.1/17.1	245/285	2700	1000	110	55	360	175
288	12	19.2	301	2700	1000	110	55	390	195

*Denotes nominal value for PE / LSZH Jacketed Cable

Part numbers

Description	**Part code**
Fiber Optic Single Jacket Non-armored Multi Loose Tube, PE jacket	FC-XXX-MLT-NA-YYY-PE
Fiber Optic Single Jacket Non-armored Multi Loose Tube, LSZH jacket	FC-XXX-MLT-NA-YYY-LZ

XXX = OS1, OS2, 7A1, 7A2, 7B2, 7B3, 655, OM1, OM2, OM3, OM4
YYY = Number of Cores

Standard reel length 4000m