



## Central Loose Tube Optical Fiber Ribbon Cables

Lightem offers a board variety of fiber optic cable for different outdoor condition, such as central loose tube armored cable, duct armored cable, direct buried cable, steel wire armored cable, non metallic outdoor cable, ADSS cable and figure 8 Cable. Fitting most of the outdoor application environment, whatever for duct buried, direct buried or aerial cabling.

Lightem central loose tube optical fiber ribbon cables are suitable for installation in aerial or duct environment for telco infrastructure, metropolitan network, access network, especially suitable for the situation where high density fibers with limited space are required.

Lightem cables are using the premium quality fiber. Singlemode G652D, multimode 50/125um or 62.5/125um, OM3 and OM4 fibers are available. Lightem also offers the customization service on the fiber, colours and construction of the cables for catering different cases.

### Features

- Fiber count up to 432
- Direct buried application
- Corrugated steel tape armored, dual PE providing, and UV protection
- Excellent protection
- Flame retardant or LSZH jacket is available
- Comply to TIA/EIA568b-3 and ISO/IEC 11801

### Fire Performances

#### General

Flame Retardant	IEC 60332-1, IEC 60332-2, IEC 60332-3, BS EN 50265, BS EN 50266
Fire Retardant	BS EN ISO 4589-3 Annex A (FT >= 280°C)
Low Smoke Capacity	IEC 61034 1/2, BS EN 50268-2 Annex B (>=60% Light Transmittance)
The Values for The Light Transmittance	BS EN 50268-2
Oxygen Index Testing Method	BS EN ISO 4589-2, ASTM D-2863
Halogen Free	IEC 60754-1/2, BS EN 50267-2-3 Annex A (pH >=4.3)

### Specifications

#### General

Flame Rating	LSZH / FRNC*
Fiber Category	Singlemode / Multimode
Temperature Range	
Installation	-5 °C to +50°C
Operation	-30°C to +70°C
Storage	-40°C to +70°C
Cable Design	
Fiber Count	2-12
Fiber Colouring	Blue, Orange, Green, Brown, Slate, White, Red, Black, Yellow, Violet, Rose, Aqua
Buffer Tube colour	White
Tape	Water-swellaable
Tensile Strength Elements and/or Armouring Layer	Smooth steel tape and 2 steel wires
Outer Jacket Material	Polyethylene (PE)
Outer Jacket Colour	Black

\*For LSZH model only

#### Mechanical Characteristics Cable

	6-36	38-48	50-72	84-96	108-144	146-216	218-281	Unit
Fiber Count	6-36	38-48	50-72	84-96	108-144	146-216	218-281	
Outer Diameter	11.5	13.2	13.9	14.5	16.0	18.7	18.7	mm
Nominal Weight	145	178	200	215	245	330	330	kg/km
Max. Tension (Short-term)				1500				N
Max. Tension (Long-term)				600				N
Max. Crushing Loading (Short-term)				1000				N/100mm <sup>2</sup>
Max. Crushing Loading (Long-term)				300				N/100mm <sup>2</sup>
Min. Bending Radius (Static)				10Times O.D.				MM
Min. Bending Radius (Dynamic)				20Times O.D.				MM

## Fiber Specifications (Singlemode)

Characteristics		G652D	G657A1	G657A2	
<b>Optical Characteristics</b>					
Attenuation	1310nm	≤ 0.40 dB/km	≤ 0.40 dB/km	≤ 0.40 dB/km	
	1383nm*	≤ 0.34 dB/km	≤ 0.35 dB/km	≤ 0.35 dB/km	
	1460nm*	-	≤ 0.25 dB/km	≤ 0.25 dB/km	
	1490nm*	-	-	≤ 0.23 dB/km	
	1550nm	≤ 0.30 dB/km	≤ 0.30 dB/km	≤ 0.30 dB/km	
	1625nm*	≤ 0.23 dB/km	≤ 0.23 dB/km	≤ 0.23 dB/km	
	Attenuation vs. Wavelength	1285-1330nm*	≤ 0.03 dB/km	≤ 0.03 dB/km	≤ 0.03 dB/km
	Max. α difference	1525-1575nm*	≤ 0.02 dB/km	≤ 0.02 dB/km	≤ 0.02 dB/km
	Dispersion coefficient	1285-1340nm	≥ -3.4 ≤ 3.4 ps/(nm · km)	≥ -3.4 ≤ 3.4 ps/(nm · km)	-
		1550nm	≤ 18 ps/(nm · km)	≤ 18 ps/(nm · km)	-
1625nm		≤ 22 ps/(nm · km)	≤ 22 ps/(nm · km)	-	
Zero dispersion wavelength		1312±12 nm	1300-1324 nm	1300-1324 nm	
Zero dispersion slope		≤ 0.091 ps/nm <sup>2</sup> · km	≤ 0.092 ps/nm <sup>2</sup> · km	≤ 0.092 ps/nm <sup>2</sup> · km	
Typical value		0.086 ps/nm <sup>2</sup> · km	0.086 ps/nm <sup>2</sup> · km	0.04 ps/nm <sup>2</sup> · km	
<b>PMD</b>					
Maximum Individual Fibre		≤ 0.1 ps/√km	≤ 0.1 ps/√km	≤ 0.1 ps/√km	
Link Design Value(M=20,Q=0.01%)		≤ 0.06 ps/√km	≤ 0.06 ps/√km	≤ 0.06 ps/√km	
Typical value		0.04 ps/√km	0.04 ps/√km	0.04 ps/√km	
Cable cutoff wavelength λ <sub>cc</sub>		≤ 1260 nm	≤ 1260 nm	≤ 1260 nm	
Mode field diameter(MFD)	1310nm	8.7-9.5 μm	8.4-9.2 μm	8.4-9.2 μm	
	1550nm	9.9-10.9 μm	9.3-10.3 μm	9.3-10.3 μm	
Effective group index of refraction(Neff)	1310nm	1.466	1.466	1.466	
	1550nm	1.467	1.467	1.467	
Point discontinuities	1310nm	≤ 0.05 dB	≤ 0.05 dB	≤ 0.05 dB	
	1550nm	≤ 0.05 dB	≤ 0.05 dB	≤ 0.05 dB	
<b>Geometrical Characteristics</b>					
Fiber Core Diameter		9 +/-1μm	9 +/-1μm	9 +/-1μm	
Cladding diameter		125.0±0.7 μm	125.0±0.7 μm	125.0±0.7 μm	
Cladding non-circularity		≤ 1.0 %	≤ 0.7 %	≤ 0.7 %	
Coating diameter		245.0±7 μm	245.0±5 μm	245.0±5 μm	
Coating-cladding concentricity error		≤ 12.0 μm	≤ 12.0 μm	≤ 12.0 μm	
Coating non-circularity		≤ 6.0 %	≤ 6.0 %	≤ 6.0 %	
Core-cladding concentricity error		≤ 0.6 μm	≤ 0.5 μm	≤ 0.5 μm	
Curl(radius)		≥ 4 m	≥ 4 m	≥ 4 m	
Delivery length		2.1 to 50.4 km/reel	2.1 to 50.4 km/reel	2.1 to 50.4 km/reel	

\*Attenuation loss of barefiber

## Fiber Specifications (Multimode)

Characteristics		62.5/125 (OM1)	50/125 (OM2)	OM3/OM4	OM5
<b>Geometry Characteristics</b>					
Core Diameter		62.5±2.5 μm	50±2.5 μm	50±2.5 μm	50±2.5 μm
Core Non-circularity		≤ 5.0 %	≤ 5.0 %	≤ 5.0 %	≤ 5.0 %
Cladding Diameter		125.0±1.0 μm	125.0±1.0 μm	125.0±1.0 μm	125.0±1.0 μm
Cladding Non-circularity		≤ 1.0 %	≤ 1.0 %	≤ 0.6 %	≤ 0.6 %
Coating Diameter		245±7 μm	245±7 μm	245±7 μm	245±7 μm
Coating/Cladding Concentricity Error		≤ 10.0 μm	≤ 10.0 μm	≤ 10.0 μm	≤ 10.0 μm
Coating Non-circularity		≤ 6.0 %	≤ 6.0 %	≤ 6.0 %	≤ 6.0 %
Core/Cladding Concentricity Error		≤ 1.5 μm	≤ 1.5 μm	≤ 1.0 μm	≤ 1.0 μm
Delivery Length		up to 17.6 km/reel	up to 17.6 km/reel	up to 8.8 km/reel	up to 8.8 km/ reel
<b>Optical Characteristics</b>					
Attenuation	850nm	≤ 3.5 dB/km	≤ 3.5 dB/km	≤ 3.5 dB/km	≤ 3.5 dB/km
	953nm*	-	-	-	≤ 1.7 dB/km
	1300nm	≤ 1.5 dB/km	≤ 1.5 dB/km	≤ 1.5 dB/km	≤ 1.5 dB/km
Overfilled Modal Bandwidth	850nm	≥ 200 MHz · km	≥ 500 MHz · km	≥ 1500/ ≥ 3500 MHz · km	≥ 3500 MHz · km
	953nm	-	-	-	≥ 1850 MHz · km
	1300nm	≥ 500 MHz · km	≥ 500 MHz · km	≥ 500/ ≥ 500 MHz · km	≥ 500 MHz · km
Effective Modal Bandwidth	850nm	-	-	≥ 2000/ ≥ 4700 MHz · km	≥ 4700 MHz · km
	953nm	-	-	-	≥ 2470 MHz · km
10Gb/sWDM		-	-	-100/150 m	150 m
40Gb/sWDM		-	-	300/500 m	440 m
40GBASE-SR4 / 100GBASE SR10	850nm	-	-	1000/1100 m	200 m
10GBASE-SR	850nm	-	150 m	300/500 m	-
1000BASE-SR	850nm	-	750 m	1000/1100 m	-
<b>DMD Specification</b>					
Numerical Aperture		0.275±0.015	0.200±0.015	0.200±0.015	0.200±0.015
Group Refractive index		1,496	1,482	1,482	1,482
		1,491	1,477	1,477	1,477
Zero Dispersion Wavelength, λ <sub>0</sub>		1320-1365 nm	1295-1340 nm	1295-1340 nm	1297-1328 nm
Zero Dispersion Slope,S <sub>0</sub>		-	-	-	≤ 4(-103)/(840λ√840) <sup>4</sup> )
		-	-	-	ps/nm <sup>2</sup> · km
Zero Dispersion Slope,S <sub>0</sub>	1295nm ≤ λ <sub>0</sub> ≤ 1310nm	-	≤ 0.105 ps/nm <sup>2</sup> · km	≤ 0.105 ps/nm <sup>2</sup> · km	-
	1310nm ≤ λ <sub>0</sub> ≤ 1340nm	-	≤ 0.000375/(1590-λ <sub>0</sub> ) ps/nm <sup>2</sup> · km	-	-
	1320nm ≤ λ <sub>0</sub> ≤ 1348nm	≤ 0.11 ps/nm <sup>2</sup> · km	-	≤ 0.000375/(1590-λ <sub>0</sub> )ps/nm <sup>2</sup> · km	-
	1348nm ≤ λ <sub>0</sub> ≤ 1365nm	≤ 0.001(1458-λ <sub>0</sub> ) ps/nm <sup>2</sup> · km	-	-	-

\*Attenuation loss of barefiber

# Ordering Information

\* Ordering Code Example

