



## Single Loose Tube Fire Resistant Cable

4 to 48 250µm fibre single gel filled loose tube steel tape armoured cable with steel wire strength members and Low Smoke Zero Halogen (LSZH) jacket.

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### Features

- Corrugated steel tape armouring for enhanced impact crush and rodent resistance
- Available with various fibre types
- Colour coded fibres
- IEC 60332-3-24, IEC-60331-25, IEC 60794 compliant
- LSZH jacket

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### Applications

- Internal applications
- External duct and direct burial applications
- Applications that require data transfer during the event of a fire

## Specifications

### 1. Cable Specification

#### 1.1 Fibre Colour Code

No.	1	2	3	4	5	6	No ring on fiber
Color	Blue	Orange	Green	Brown	Slate	White	
No.	7	8	9	10	11	12	
Color	Red	Black	Yellow	Violet	Pink	Aqua	

No.	13	14	15	16	17	18	One ring on fiber
Color	Blue	Orange	Green	Brown	Slate	White	
No.	19	20	21	22	23	24	
Color	Red	Black	Yellow	Violet	Pink	Aqua	

No.	25	26	27	28	29	30	Two ring on fiber
Color	Blue	Orange	Green	Brown	Slate	White	
No.	31	32	33	34	35	36	
Color	Red	Black	Yellow	Violet	Pink	Aqua	

No.	37	38	39	40	41	42	Three ring on fiber
Color	Blue	Orange	Green	Brown	Slate	White	
No.	43	44	45	46	47	48	
Color	Red	Black	Yellow	Violet	Pink	Aqua	

#### 1.2 SST Tube Color Code

No.	1
Color	Natural

## 1.3 Cable Configuration

Item	contents	Value						
		4	6	8	12	24	36	48
Stainless Steel Tube	Material	SST						
	Type of filling compound	Jelly						
	Diameter(mm) approx	2.5	2.5	2.5	3.6	3.6	3.6	3.6
	Thickness(mm) approx	0.18	0.18	0.18	0.18	0.18	0.18	0.18
	Number	1	1	1	1	1	1	1
Max. fibre counts per tube		4	6	8	12	24	36	48
Strength member	Material	Steel wire	Steel wire	Steel wire	Steel wire	Steel wire	Steel wire	Steel wire
	Diameter(mm) approx	0.6	0.6	0.6	0.6	0.6	0.6	0.6
	Number	2	2	2	2	2	2	2
Inner sheath	Material	LSZH	LSZH	LSZH	LSZH	LSZH	LSZH	LSZH
	Color	Black	Black	Black	Black	Black	Black	Black
Corrugated Armour Tape	Material	Steel Tape	Steel Tape	Steel Tape	Steel Tape	Steel Tape	Steel Tape	Steel Tape
	Coating Material	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic	Plastic
Outer sheath	Material	LSZH	LSZH	LSZH	LSZH	LSZH	LSZH	LSZH
	Color	Black	Black	Black	Black	Black	Black	Black
Cable diameter(mm) ( $\pm 0.4$ )		12.0	12.0	12.0	12.0	13.1	13.1	13.1
Cable weight (kg/km) ( $\pm 20\%$ )		215	215	215	215	235	235	253

Note: The outer diameter of the cable in the table is for reference. The actual OD value after commissioning production shall prevail.

## 1.4 Mechanical Performance of Cable

Tensile performance (N)	Crush (N/100mm)
Long/Short term	Long/Short term
1000/3000	1000/3000

## 1.5 Minimum Allowable Bending Radius

Static: 15D

Dynamic: 30D

D is the out diameter of the cable

## 2. Mechanical, Electrical and Environmental Test Characteristics

Item	Test Method	Requirements
Tensile performance	IEC 60794-1-21-E1 Load: Tensile Strength Cable length under tension: Not less than 50m. Duration of load sustain: 1min. Velocity of transfer device: 10mm/min	The increase in attenuation shall not exceed 0.15dB, and fibre strain should not higher than 0.6 % under load. No attenuation increase after test at 1550nm. Under visual examination without magnification, no damage to the sheath or to the cable elements after test.
Crush	IEC 60794-1-21-E3 Load and Duration: Long term load 1000N/100mm for 10 min; Short term load 3000N/100mm for 1 min. Number of tests: 3 Spacing between test places: 500 mm	Under long term load, the increase in attenuation shall less than 0.05dB at 1550 nm during the test. Under short term load, the increase in attenuation shall less than 0.05dB at 1550 nm after the test. Under visual examination without magnification, no damage to the sheath or to the cable elements. The imprint of the striking surface on the sheath is not considered mechanical damage.
Impact	IEC 60794-1-21-E4 Impact energy: 10 J with striking surface radius of 300 mm; Number of impacts: 1, each at 3 different places spaced not less than 500mm apart.	No change in attenuation after test at 1550nm. Under visual examination without magnification, no damage to the sheath or to the cable elements. The imprint of the striking surface on the sheath is not considered mechanical damage.
Repeated bending	IEC 60794-1-21-E6 Bending radius: 30times cable diameter Cycles: 25 Load: 150N Duration of cycle: Approximately 2s.	No change in attenuation at 1550nm after test. Under visual examination without magnification, no damage to the sheath or to the cable elements
Torsion	IEC 60794-1-21-E7 Cycles:10 Length under test: $\approx$ 1.0 m Turns: $\pm 90^\circ$ Load:150N	Under visual examination without magnification, there shall be no damage to the sheath or to the cable elements. The variation in attenuation for each fibre shall be $\leq 0.10$ dB at 1 550 nm during the test and no permanent change after test.
Temperature cycling	IEC 60794-1-22-F1 Sample length: at least 1000m Temperature range: $-40^\circ\text{C} \sim +70^\circ\text{C}$ Cycles:2 Temperature cycling test dwell time: 12 hours	The change in attenuation coefficient shall be less than 0.10 dB/km at 1550nm.
Water Penetration	IEC 60794-1-22-F5B Time : 24 hours Sample length : 3m Water height : 1m	No water shall be detected at the unsealed end of the sample during and at the end of the test.
Compound flow	IEC 60794-1-21-E14 Sample count:5 Sample length: $300 \pm 5$ mm, Remove length: $130 \pm 2,5$ mm, Time:24h	No filling compound dripped.
flame retardant	IEC-60332-3-24	
Fire Resistant	IEC-60331-25	
Other parameters	According to IEC 60794	

Remark: "No attenuation changes" is considered as the attenuation changes  $\leq 0.05$  dB.

### 3. Optical properties of the SM fibre is according to ITU-T-G.652D

#### G652D :

Description	Specification
	After Cable
Mode Field diameter @1310nm	9.2±0.4µm
Mode Field diameter @1550nm	10.4±0.5µm
Cladding diameter	125.0± 1µm
Core concentricity error	≤0.6µm
Cladding non-concircularity	≤ 0.8%
Coating diameter	245±10µm (Before colored)
	250±15µm (colored)
Coating/cladding concentricity error	≤ 12µm
Cable cutoff wavelength	≤1260 nm
Point discontinuity	≤0.05dB
Attenuation coefficient @ 1310 nm	≤0.36dB/km
@ 1383 nm	≤0.36dB/km
@ 1550 nm	≤0.22dB/km
@ 1625nm	≤0.24dB/km
Macro-bend induced attenuation	
100 turns, 30mm radius @1550n/1625m	≤0.05dB
PMD	
Max. individual fibre	≤0.2 ps/km <sup>1/2</sup>
PMD <sub>α</sub>	≤0.1 ps/km <sup>1/2</sup>
Zero-dispersion wavelength	1300 ~ 1324 nm
Zero-dispersion slope	≤ 0.092 ps/(nm <sup>2</sup> .km)
Chromatic dispersion coefficient	
@ 1288-1339 nm	≤3.5ps/(nm. km)
@ 1271-1360nm	≤5.3ps/(nm. km)
@ 1550 nm	≤18ps/(nm. km)
@ 1625 nm	≤22ps/(nm. km)
Proof test level	100 kpsi (0.69 Gpa), 1% strain
Coating strip force(peak value)	1.3~8.9N
Fibre curl (Radius)	≥ 4 m

## Ordering Information

	Fibre Type		Jacket Type		Fibre Count	
	9	G.652.D	1	LSZH	04	4
OFC-LTF	1	OM1			...	...
	2	OM2			48	48
	3	OM3				
	4	OM4				

## Example order code

OFC-LTF - 9 1 - 24

Single Loose Tube Cable Fire Resistant Singlemode LSZH 24 Fibres

## Technical Drawing

