ES-23-INTBLSZH-Rev.0

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Specification

Indoor Round Drop Optic Cable

Compact and Easy-to-Locate Fiber Optic Cable for the Last Link in Your FTTx Network

1. SCOPE

1.1 Application

This specification covers the general requirements for fiber optic telecommunication cables.

1.2 Cable Description

Tight buffered Fiber, Dielectric Strength Member and LSZH (Low Smoke Zero Halogen)

2. OPTICAL FIBER

The optical, geometrical, mechanical and environmental performance of the optical fiber shall be in accordance with Table 1 below.

Table 1. Performance of The Single Mode Fiber (ITU-T G. 657 A1)

Parameters	Value
Physcal Characteristics	
Clad Diameter	125±0.7 ㎛
Core-Clad Concentricity Error(Offset)	≤0.5 ㎛
Cladding Non-Circularity, maximum	≤0.7%
Coating Diameter	245 ㎛±10 ㎛
Coating-Clad Concentricity Error(Uncolored)	≤12 ㎛
Tensile Proof Test	100 kpsi (0.69 GPa)
Coating Strip Force	Range: 1.0N ≤ CSF ≤ 8.9N
Optical Specification	
Attenuation (After cable) at 1310nm at 1550nm	Maximum ≤ 0.36 dB/km ≤ 0.22 dB/km
Dispersion, maximum	* 18 ps(nm-km) at 1550nm * 3.5 ps(nm-km) from 1285nm to 1330nm at 1310nm
Group Refractive Index at 1310 nm at 1550 nm	 1.466 1.467
Mode Field Diameter at 1310 nm at 1550 nm	 8.8 ± 0.4 μm 9.8 ± 0.5 μm
Polarization Mode Dispersion (PMD)[1] Fiber PMD Link Design Value (LDV)[2]	 < 0.04 ps/√km
Chromatic Dispersion Zero Dispersion Wavelength (λ0) Zero Dispersion Slope (S0) Typical Dispersion Slope	 1300 - 1324 nm ≤ 0.092 ps/nm2-km 0.086 ps/nm2-km
Cut-off Wavelength (λCC)	≤ 1260 nm
Attenuation Uniformity / Point Discontinuities at 1310 nm and 1550 nm	≤ 0.05 dB
Mechanical Specifications	

Macro bending Attenuation: **The maximum attenuation with bending does not exceed the specified values under the following deployment conditions:**		
Deployment Condition	**Wavelength**	**Induced Attenuation**
10 turns, 30 mm diameter	**1550 nm**	**< 0.25 dB**
	1625 nm	**< 1.0 dB**
1 turn, 20 mm diameter	**1550 nm**	**< 0.75 dB**
	1625 nm	**< 1.5 dB**
Coating Strip Force, maximum	**8.9N**	
Coating Strip Force, minimum	**1.3N**	
Environmental Characteristics (at 1310, 1550 & 1625 nm)		
Temperature Cycling (-60º + 85º C)	**≤ 0.05 dB/km**	
High Temperature Aging (85 ± 2º C)	**≤ 0.05 dB/km**	
Temperature & Humidity Cycling (at -10º C to +85º C and 95% RH)	**≤ 0.05 dB/km**	
Water Immersion (23 ± 2º C)	**≤ 0.05 dB/km**	

3. CABLE CONSTRUCTION

The construction of the cable shall be in accordance with Table 2.

Table 2. Construction of The Cable

ITEMS		DESCRIPTION	
Number of Fiber		**1**	**2**
Tight Buffered	**Material**	**OFNR LSZH (Low Smoke Zero Halogen)**	
	Diameter	**900±50㎛**	
Strength Member		**Aramid Yarns**	
Outer Jacket	**Materials**	**UV Stability OFN or OFNR LSZH (Low Smoke Zero Halogen,)**	
	Diameter(mm)	**3.0±0.1mm**	
	Color	**Black**	
Weight(kg/km)		**9.5**	**8.2**

4. IDENTIFICATION

4.1 The Color Code of the individual fiber

Table 3. The Color Code of the buffered

1	2
Blue	**Orange**

4.2 Outer jacket color : Black

*** Note) Other color available upon request.**

5. PHYSICAL / MECHANICAL / ENVIRONMENTAL PERFORMANCE AND TESTS

5.1 Temperature Range

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

- Storage/Shipping temperature range : -30 to 60℃
- Operating temperature range : -30 to 70℃

5.2 Mechanical and Environmental Performance of the Cable

The mechanical and environmental performance of the cable shall be in accordance with Table 4 below.

Table 4. The Mechanical and Environmental Performance of the Cable

ITEMS	TEST METHOD AND ACCEPTANCE CRITERIA
Tensile Loading Test	# Test method: IEC60794-1-E1 - Mandrel diameter : 30D (D = cable diameter) - Tensile load : 800N for 10 minutes # Acceptance Criteria - Attenuation increment: ≤0.10 dB
Crush Test	# Test method: IEC60794-1-E3 - Applied load : 500N/100mm - Duration of loading : 5 minutes # Acceptance Criteria - Attenuation increment : ≤0.10 dB
Impact Test	# Test method: IEC60794-1-E4 - Height of impact: 150mm - Drop hammer mass: 0.5kg - No. of impact : 10 point # Acceptance Criteria - Attenuation Increment: ≤0.10 dB
Bending Test	# Test method: IEC60794-1-E11A - Sheave diameter: 20D (D = cable diameter) - No. of flexing cycles: 25 cycles - Flexing speed: 30 cycles/minute # Acceptance Criteria - Attenuation Increment: ≤0.10 dB
Temperature Cycling Test	# Test method: TIA/EIA-455-3A - Temperature cycling schedule : 20℃→-30℃→70℃→-30℃→70℃→20℃ - Soak time at each temperature: 8 hours # Acceptance Criteria - Attenuation Increment:≤0.10dB/km

6. PACKING AND MARKING

6.1 Cable Marking

The jacket shall be marked at intervals of one meter with following information. Other marking is also available if requested by customer.

1) Cable type (ex, "Drop Cable")
2) Fiber type and counts
3) Name of the manufacturer
4) Year of manufacture
5) Length marking

6.2 Cable Packing

6.2.1 Standard length of the cable shall be 1000m.
Other cable length is also available if requested by customer.
6.2.2 Each length of the cable shall be wound on a separate Plastic reel.
6.2.3 Both ends of the cable shall be sealed with suitable plastic caps to prevent the entry of moisture during shipping, handling and storage.
6.2.4 The cable ends shall be securely fastened to the reel to prevent the cable from becoming loose in transit or during placing operations.

6.3 Cable Reel

6.3.1 Details given below shall be distinctly labeled on both outer sides of the reel flange:

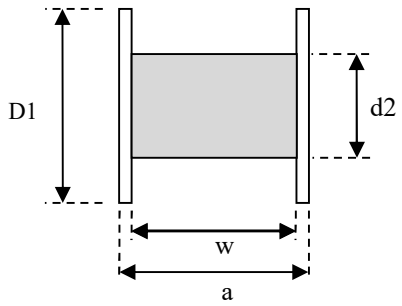
1) Cable type and fiber counts
2) Length of cable in meters
3) Gross weight in kilograms
4) Reel number
5) Name of the manufacturer
6) Year of manufacture

6.3.2 The cable shall be shipped on reels designed to prevent damage to the cable during shipment and installation.

6.4 Packing Detail

6.4.1 Reel dimension

Cable Type	Dimension				Cable Length	Weight (kg / EA)
	D1	d2	W	a		
1F	300mm	150mm	265mm	295mm	1km	0.7kg



6.4.2 Carton Box

Material		Size (mm)	Weight (kg / EA)
Kraft liner brown	1F	370(W) x 350(L) x 370(H)	0.7

6.4.3 Pallet packing

Material	Size (mm)	Weight (kg/EA)	Box Quantity (EA)
Wooden	1100(W) x 1100(L) x 130(H)	11.0	45

7. QUALITY CONTROL

7.1 Incoming Inspection

All the raw materials that are used for optical fiber cable shall be inspected by the raw material testing methods that are specified by the manufacturer and that are based on 'Korea Standard' or 'ASTM'.
In some cases, suppliers' test report shall substitute for the raw material manufacturer's test. Any materials that do not meet the manufacturer's raw material specification shall be rejected or scrapped, and the passed materials only shall be used in the process. Some raw material specifications and subsequent raw material test method may be changed without notice, if and only if the new specification and the new test method do not affect the quality of optical fiber cable.

7.2 In-Process Inspection

Semi-final goods shall be inspected in accordance with specified manufacturer's testing method. The testing method may be changed without notice, if it does not affect quality of optical fiber cable.

7.3 Final Cable Inspection

Following quality properties of finished cable shall be tested to assure the field performances.
√ Construction / Material
√ Mechanical characteristics
√ Optical characteristics

7.4 Quality System

International Industrial Certification (IIC) applied ISO 9001 and ISO 14001 to assure the conformance to specified requirements during our production.

8. SAFETY

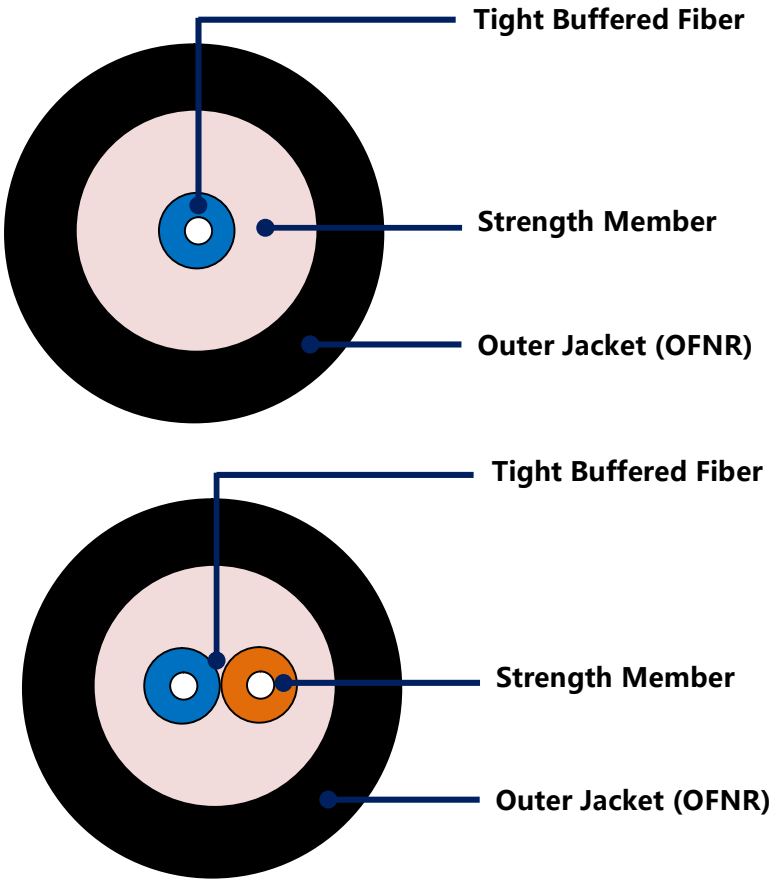
8.1 ROHS Directive

All cables and any associated packing and labeling materials shall meet RoHS (Restriction of the Use of certain Hazardous Substances) regulations as appropriate.

8.2 ISPM 15 Directive

All wooden packing materials shall meet ISPM(International Standard for Phytosanitary Measures) regulations as appropriate.

Cross-Sectional Drawing



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