Fiber Cable Design

◎ Product Highlights:

☆ Central Strength Members:

For high strength and flexibility required for outdoor cables to be easily pulled or blow into ducts, the preferred central strength member material is steel. The steel is hot-rolled with anti-corrosion treatment. The steel central member is continuous throughout the cable length. It is coated with plastic, having a diameter dictated by the cable geometry. Stranded steel is used when light cable and high flexibility are required. Stranded steel is characterized by high modulus and tensile strength, not easily generated Hydrogen due to oxidization, which in turn may effect the fiber attenuation. As an alternative option to steel, FRP can be used as central strength member. The dielectric nature of glass fibers renders them immune to electromagnetic interference (EMI) and lighting. Dielectric cables can be laid in unprotected conduits and even in air handing spaces and plenums, as there is no danger of electrical shock.

☆ Jelly :

Jelly is characterized by higher dripping point and long term stability.

☆ Corrugated Steel Tape:

Steel tape is usually coated with polymer on both sides. The polymer coating enhances the adhesion of the steel to the jacket material during extrusion, creating an extremely rugged cable. The steel tape provides protection against water penetration and corrosion, also providing necessary physical protection. The steel tape can be corrugated to increase the tensile strength, thus enhancing cable flexibility. Besides, steel tape also renders the cables immune to lighting and provides rodent protection.

☆ Aluminum Moisture Barrier:

The aluminum moisture barrier prevents ingress from water penetration and also provides good physical protection. It is a critical element for providing water-blocking protection for the fiber cables.

☆ Jacket Materials:

PE:

Polyethylene (PE) is used as cable jackets mostly for outdoor applications. It is characterized by high tensile strength and resistance to abrasion. PE will not crack or become brittle at low temperature and will retain its mechanical properties and stability at high temperature. With the inclusion of carbon black in the formulation. PE can have extremely good aging properties and high UV and weather resistance to most chemicals and solvents.

PVC:

Polyvinyl Chloride (PVC) is used mostly for indoor applications. PVC material is flexible and flame retardant. It does not allow fire to propagate along the cable when ignited. PVC is characterized by high tensile strength and abrasion resistance. It will not crack or deteriorate when used indoors and at moderate temperatures.

LSZH:

Low Smoke Zero Halogen compound (LSZH) is used mostly for indoor applications. LSZH material is flexible and flame retardant, meeting flammability requirements of IEC 60332-1 and IEC 60332-3C. Besides, LSZH material emits low amounts of smoke, complying to IEC 61034 and does not emit toxic, corrosive halogen gases complying to IEC 60754-1 standard.

◎ Standards:

1）Fiber testing is carried out in accordance to TIA/EIA-455, IEC-794-1 and EN-187000 standards.

2）Fiber optic cables meet Bellcore standard in the outdoor environment.

3）LSZH jacket meets IEC60332-1 & IEC60332-3C standards.

◎ Fiber Characteristics:

SINGLE MODE FIBERS

Parameter	Standard Single Mode Fiber per ITU-T G.652D	Non-Zero Dispersion Shifted Fiber per ITU-T G.655	Non-Zero Dispersion Shifted Fiber per ITU-T G.656	Units
Fiber Code	9	8	7	
Attenuation, Loose Tube Cables @1310nm @1550nm @1625nm	 ≤0.35 ≤0.22 ≤0.25	 - ≤0.22 ≤0.26	 - ≤0.22 ≤0.26	dB/km
Attenuation Tight Buffer Cables @1310nm @1550nm	 ≤0.38 ≤0.28	 - -		dB/km
Dispersion 1260-1360nm (O Band) 1460-1530nm (S Band) 1530-1565nm (C Band) 1565-1565nm (L Band)	 ≤0.35 - ≤18.0 ≤22.0	 N/A - 1-10 7-12	 - 2-7 7-10 10-14	ps/(nm∗km)
Zero Dispersion Wavelength	1311±11	<1520	<1420	nm
Mode Field Diameter @1310nm @1550nm	 9.2±0.5 10.4±1.0	 N/A 8.5±0.6	 - 9.0±0.5	μm
Cable Cut-off Wavelength	≤1260	<1450	<1310	nm
Cladding Diameter	125±1.0	125±1.0	125±1.0	μm
Core/Cladding Concentricity Error	≤0.5	≤0.5	≤0.6	μm
Cladding Non-Circularity	≤1.0	≤1.0	≤1.0	%
Coating Diameter	245±10	245±10	245±10	μm
Proof-Test Level	0.7	0.7	0.7	GN/㎡

MULTIMODE FIBERS

Parameter	50/125μm		62.5/125μm	Units
Fiber Code	5	4	6	
ISO/IEC11801	OM2	OM3	OM1	
Attenuation, Loose Tube Cables @850nm @1300nm	 ≤2.8 ≤0.9		 ≤3.2 ≤1.0	dB/km
Attenuation Tight Buffer Cables @850nm @1300nm	 ≤3.0 ≤1.0		 ≤3.5 ≤1.0	dB//km
Bandwidth @850nm @1300nm	 ≥500 ≥800	 ≥2000 ≥500	 ≥200 ≥500	MHz∗km
Numerical Aperture	0.20±0.015		0.275±0.015	-
Core Diameter	50±3		62.5±3	μm
Cladding Diameter	125±2		125±2	μm
Core Non Circularity	≤6		≤6	%
Cladding Non-Circularity	≤2		≤2	%
Core/Cladding Offset	≤3		≤3	μm
Coating Diameter	245±10		245±10	μm
Proof-Test Level	0.7		0.7	GN/㎡