

GYXTW --AERIAL INSTALLATION CABLE

1.1 SCOPE

This specification covers the design requirements and performance standard for the supply of optical fiber cable. This specification covers the general requirements and performance of cable which our offering including optical characteristics, mechanical characteristics and geometrical characteristics.

1.2 Cable Description

Loose tube cable is a design that has high tensile strength and flexibility in a compact cable size. Our loose tube cable provides excellent optical transmission and physical performance.

1.3 Quality

We ensure a continuing level of quality in our cable products through several quality control programs including ISO 9001 and all the materials have passed REACH and ROHS.

1.4 Reliability

We ensure product reliability through rigorous qualification testing of each product family. Both initial and periodic qualification testing are performed to assure the cable's performance and durability in the field environments.

1.5 Reference

The cable which Our offering are designed, manufactured and tested according to international standards as follows:

IEC 60794-1-1	Optical fiber cables. Part 1: Generic specification
IEC 60794-1-2	Generic specification- basic optical cable test procedures
IEC 60793-3	Outer cables- sectional specification
IEC 60794-3-20	Outdoor cables- family specification for optical self-supporting aerial telecommunication cables
EIA/TIA 598 B	Color code of fiber optic cables
ITU-T G.650	Definition and test methods for the relevant parameters of single-mode fibers
ITU-T G.652	Characteristics of a single-mode optical fiber cable
ITU-T G.655	Characteristics of a non-zero dispersion-shifted single-mode optical fiber and cable

2. Optical Fiber

--The optical fiber is made of high pure silica and germanium doped silica. UV curable acrylate material is applied over fiber cladding as optical fiber primary protective coating. The detail data of optical fiber performance are shown in the following table.

--OFS G.652 fiber use special spun device successfully controlled the value of PMD, and make sure that it

keeps stable in cabling.

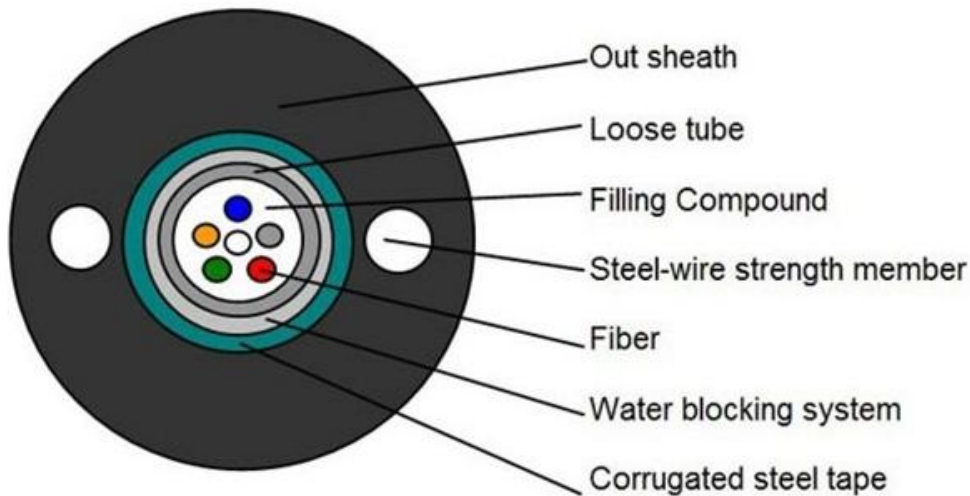
--Approved by optical communication products ministry of quality supervision and inspection center, the connection between OFS fiber in and outside is good .The single-end connect-loss won't be over 0.1dB and the double-end connect-loss is all little than 0.05dB.

--Apply to non-relay communication network. Features: proof test >1%

Optical fiber characteristics (G.652 FIBER)

Category	Description		Specifications	
			Before cabling	After cabling
Optical Specifications	Attenuation @1550 nm		≤0.20 dB/km (max.)	≤0.22 dB/km (max.)
	Attenuation @1625 nm		≤0.23dB/km	≤ 0.24 dB/km
	Zero Dispersion Wavelength		≤1520 nm	
	Zero Dispersion Slope		≤ 0.084 ps/nm ² ·km	
	Polarization Mode Dispersion(PMD)		≤0.08 ps/km	
	Cable Cutoff Wavelength (λ_{cc})		≤1450 nm	
	Macro bending Loss (1 turn; Φ32 mm) @1550 nm (100 turns; Φ60 mm) @1625 nm (100 turns; Φ50 mm) @1310 & @1625 nm		≤ 0.05 dB ≤ 0.05 dB ≤0.05 dB	
	Mode Field Diameter	@1550 nm	9.6±0.5μm	
Dimensional Specifications	Cladding Diameter		124.8 ±0.7μm	
	Core/clad concentricity error		≤0.6μm	
	Cladding Non-Circularity		≤1.0%	
Mechanical Specifications	Min bending radius		12.5D (static)	25D (dynamic)
	Proof Test level		≥1.2%	
	Fiber Curl Radius		≥4.0m	
	Peak Coating Strip Force		0.9~6.8N	

3 Cable Structure



3.1.1 Dimension and Properties

General properties	Unit	Value
Fiber count (G.652)		2-24
Max. No of loose tube		1
Fiber No. per tube		MAX 24
Loose tube	mm	2.0-2.5
Steel wire	pc	2
Armor	material	Corrugated steel tape
Water blocking tape thickness	mm	0.2
Outer sheath material	mm	MDPE
Cable OD	mm	8.2±0.3
Cable weight	Kg/km	80
Max. allowable pulling force	N	1500/600
Crush resistance	N/100mm	1000/300

Remark: The weight of zinc coating of steel wire surface shall be no less than 20 g/m². Strand shall have a left lay.

3.1.2 Working conditions

Temperature range	Transport and storage: - 4°C to +70°C	Min Bending Radius
	Installation: -10°C to +60°C	Installation: 20 x OD
	Operation: -40°C to +70°C	Operation: 10 x OD

Note: 1. the nominal outer diameter may vary by ± 5%. 2. The nominal cable weight may vary by ±10%.

3.1.3. FIBERS AND TUBE COLOR CODE SCHEME: according to EIA/TIA 598B

Fiber color	Blue	Orange	Green	Brown	Grey	White	Red	Black	Yellow	Violet	Pink	Aqua
Tube color	Blue	Orange	Green	Brown	Grey	White	Red	Black	Yellow	Violet	Pink	Aqua

3.1.4. MAX REEL LENGTH: 4000m / DRUM.

4. TEST REQUIREMENTS

The cable is in accordance with applicable standard of cable and requirement of customer.

The following test items are carried out according to corresponding reference.

No	Item	Reference
Tests of Optical Fiber		
1	Attenuation coefficient	IEC 60793-1-40
2	Chromatic dispersion	IEC 60793-1-42
3	Mode field diameter	IEC 60793-1-45
4	Cladding diameter	IEC 60793-1-20
5	Cladding non-circularity	IEC 60793-1-20
6	Core/clad concentricity error	IEC 60793-1-20
7	Cable cutoff wavelength	IEC 60793-1-44

Tests of Outdoor cable (After cabling)			
1	Tensile Test	IEC-60794-1-E1	-Max. allowable pulling force: installation tensile; sample length: no less than 50 meters, time: 10 minutes; - Fiber strain at max. load : max. 0.33 % No damage to the outer jacket and inner elements. Reversible
2	Crush test	IEC-60794-1-E3	-Load: short time crush strength, time: 5 minutes, length: 100 mm, number of tests: 3; No damage to the outer jacket and inner elements. Reversible
3	Impact test	IEC-60794-1-E4	-Impact energy: 3J , radius: 10.0 mm, impact points: 3 -Number of impacts: 1 -No breakage of the optical fiber, No splits or cracks in the outer jacket. -Attenuation increase ≤ 0.1 dB, reversible
4	Repeated bending test	IEC-60794-1-E6	1m cable length, bending radius: 20 times cable's diameter. 25 cycles, duration of cycle: 2s. No damage to the outer jacket and inner elements. Reversible
5	Torsion test	IEC-60794-1-E7	2m cable length, ± 180 degrees, 5cycles; no damage to the outer jacket -Attenuation increase ≤ 0.1 dB, reversible
6	Bending test	IEC-60794-1-E11	- Diameter of mandrel: $20 \times D$,number of turns/helix: 4 number of cycles: 3 , No damage to the outer jacket and inner elements (20 °C). reversible
7	Temperature cycling test	IEC-60794-1-F1	-Temperature step: $+20^{\circ}\text{C} \rightarrow -40^{\circ}\text{C} \rightarrow +70^{\circ}\text{C} \rightarrow -40^{\circ}\text{C} \rightarrow +70^{\circ}\text{C} \rightarrow +20^{\circ}\text{C}$, time per each step: 12 hrs, number of cycles: 2 cycles -they shall be no change in attenuation variation for reference value (the attenuation to be measured before test at $+20 \pm 3^{\circ}\text{C}$) - reversible
8	Water penetration test	IEC-60794-1-F5	-Water height: 1 m, sample length: 3m, duration of test: 24 hrs. - No water leakage at the end of the sample
9	Drip test	IEC-60794-1-E14	Three 0.3m samples suspended vertically in a climate chamber, raised temperature to $+70^{\circ}\text{C}$. no filling compound shall drip from tubes after 24 hr

5. PACKING AND DRUM

5.1 Our cables are packed in carton, coiled on Bakelite & wooden reel. During transportation, right tool should be used to avoid damaging the package, and handle carefully. Cables should be protected from moisture; Cables should be kept away from high temperature condition and spark; Cables should be protected from over bending and crushing; Cables should be protected from mechanical damage.



5.The color of marking is white.(At every meter, the outer sheath of the fiber cable shall be printed)
The inner end of cable is sealed with heat shrinkable end cap to prevent ingress of water and is made available for testing.

The outer end of cable is equipped with heat shrinkable end cap.

Outer sheath making can be changed according to user's requests.