TECHNICAL SPECIFICATION

For

Self Support Aerial Installation Cable

According to ITU-T G.6

1. GENERAL

1.1 SCOPE

This listed specification covers the design requirements and performance standard for the supply of optical fiber cable in the industry. It also includes ZP premium designed cable with optical, mechanical and geometrical characteristics.

Cable type	Application
ADSS	Self support aerial installation cable

1.2 Cable Description

ZP cable possesses high tensile strength and flexibility in compact cable sizes. At the same time, it provides excellent optical transmission and physical performance.

1.3 Quality

Excellent quality control is achieved through intense in-house quality check and stringent audit acceptance by ISO 9001.

1.4 Reliability

Initial and periodic product qualification tests for performance and durability are performed rigorously to ensure product reliability.

1.5 Reference

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

IEC 60793-1	Optical fiber Part 1: Generic specifications
IEC 60793-2	Optical fiber Part 2: Product specifications
IEC 60794-4	Optical fiber cables-Part 4: Sectional specification-Aerial optical cables along electrical power lines
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

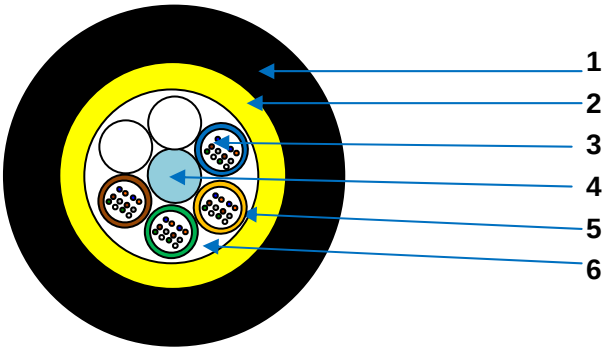
- The optical fiber is made of high pure silica and germanium doped silica. UV curable acrylate material is applied over fiber cladding as optical fiber primary protective coating. The detail data of optical fiber performance are shown in the following table.
- ITU/T G.652 optical fiber uses special spun device to successfully control the value of PMD to ensure stability during cabling.
- Apply to non-relay communication network. Features: proof test >1%

G.652D Fiber in cable

Category	Description	Specifications	
		Before cabling	After cabling
Optical Specifications	Attenuation @1310 nm	≤0.34 dB/km	≤0.36 dB/km
	Attenuation @1383 nm	≤0.34 dB/km	≤0.35 dB/km
	Attenuation @1550 nm	≤0.20 dB/km	≤0.22 dB/km
	Attenuation @1625 nm	≤0.23dB/km	≤0.25 dB/km
	Zero Dispersion Wavelength	1300~1324 nm	
	Zero Dispersion Slope	≤ 0.092 ps/nm^2·km	
	PMD Link value (M=20cables Q=0.01%) maximum PMD_Q	0.2 ps/√km	
	Cable Cutoff Wavelength (λ_{cc})	≤1260 nm	
	Macro bending Loss (100 turns; Φ50 mm) @1550 nm (100 turns; Φ50 mm) @1625 nm	 ≤ 0.05 dB ≤ 0.10 dB	
	Mode Field Diameter @1310 nm	9.2±0.4μm	
Dimensional Specifications	Cladding Diameter	125 ±1μm	
	Core/clad concentricity error	≤0.6μm	
	Cladding Non-Circularity	≤1.0%	
Mechanical Specifications	Proof stress	≥0.69Gpa	

3. CABLE STRUCTURE

3.1 Cable Type: ADSS



Technical Characteristics

- The unique extruding technology provides the fibers in the tube with good flexibility and bending endurance
- The unique fiber excess length control method provides the cable with excellent mechanical and environmental properties
- Multiple water blocking material filling provides dual water blocking function
- Aramid yarns can provide good tension performance

Construction：

1. PE outer sheath
2. Strength member (Aramid yarns)
3. Fiber and jelly
4. Central strength member (FRP)
5. Loose tube
6. Cable jelly

Dimension and Properties

Physical	Fiber count	12 G652D	24 G652D	48 G652D
	Fiber No. per tube	6	6	8
	Cable OD	9.9 mm	9.9 mm	9.9mm
	Cable weight	Approx. 98kg/km		
	Operation temperature range	-40 deg C to + 70 deg C		
	Installation temperature range	-10 deg C to + 60 deg C		
	Transport and storage temperature range	-40 deg C to + 70 deg C		
Mechanical	Max. allowable pulling force	2000N		
	Crush resistance	1000 N/10cm		
	Minimal installation bending radius	20 x OD		
	Minimal operation bending radius	10 x OD		

Color code scheme: According to EIA/TIA 598 C

Fiber color	blue	orange	green	brown	gray	white	red	black	/	/	/	/
Tube color	blue	orange	green	brown	gray	white	/	/	/	/	/	/

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

4. TEST REQUIREMENTS

Approved by various professional optical and communication product institution, ZP also conduct various in-house testing in its own Laboratory and Test Center. She also conduct test with special arrangement with the Chinese Government Ministry of Quality Supervision & Inspection Center of Optical Communication Products (QSICO). ZP possess the technology to keep its fiber attenuation loss within Industry Standards.

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.

Routine tests of optical fiber

Mode field diameter	IEC 60793-1-45
Mode field Core/clad concentricity	IEC 60793-1-20
Cladding diameter	IEC 60793-1-20
Cladding non-circularity	IEC 60793-1-20
Coating Diameter	IEC 60793-1-21
Attenuation coefficient	IEC 60793-1-40
Chromatic dispersion	IEC 60793-1-42
Cable cut-off wavelength	IEC 60793-1-44

Test for outdoor cable

4.1 Tension — IEC 60794-1-E1

Sample length	No less than 50 meters
Load	Max. allowable pulling force
Test results	10 minutes Fiber strain:≤0.6% Additional attenuation:≤0.1dB No damage to outer jacket and inner elements

4.2 Crush — IEC 60794-1-E3

Plate size	100mm length
Load	Short crush resistance
Duration time	5 minutes
Test number	3
Test results	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements

4.3 Impact — IEC 60794-1-E4

Impact energy	3J
Radius	12.5mm
Impact points	3
Impact number	1
Test result	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements

4.4 Repeated bending — IEC 60794-1-E6

Sample length	1m
Bending radius	20*D
Cycles	30
Test result	Additional attenuation: ≤0.1dB

4.5 Torsion	IEC 60794-1-E7
Sample length	2m
Angles	±180 degree
cycles	5
Load	150N
Test result	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements

4.6 Bending	IEC 60794-1-E11
Mandrel diameter	20*D
Turn number	4
Cycles	3
Temperature	20 ^{o}C
Test result	Additional attenuation: ≤0.1dB No damage to outer jacket and inner elements

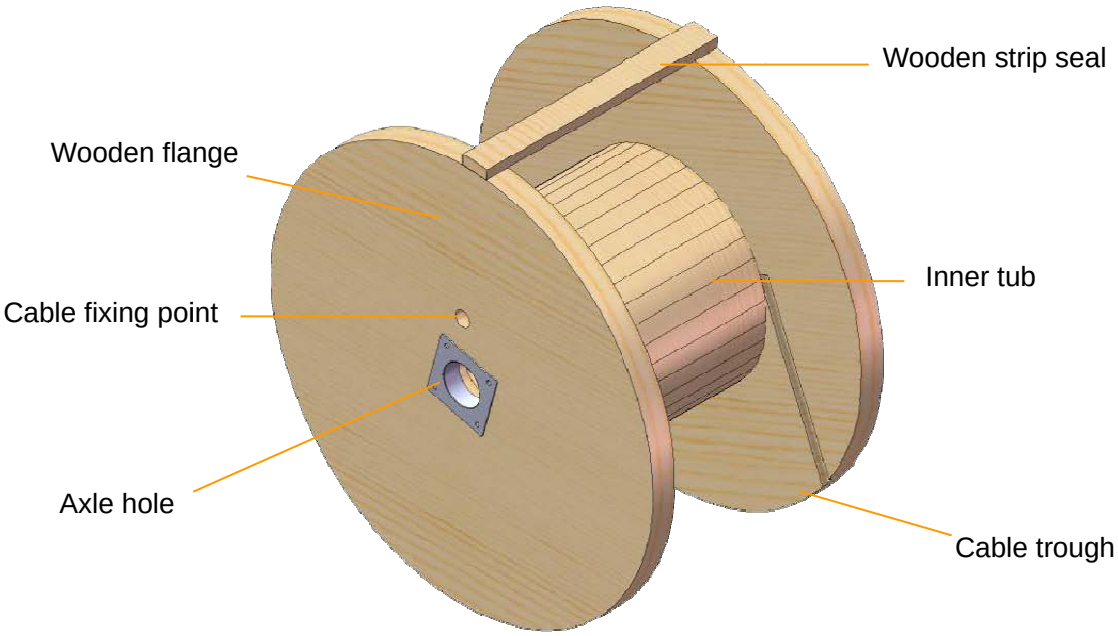
4.7 Temperature cycling	IEC 60794-1-F1
Temperature step	+20^{o}C →-40^{o}C →+70^{o}C →-40^{o}C →+70^{o}C →+20^{o}C
Time per each step	12 hrs
Cycles	2
Test result	Attenuation variation for reference value (the attenuation to be measured before test at +20±3 ^{o}C) ≤ 0.10 dB/km

4.8 Water penetration	IEC 60794-1-F5
Water height	1m
Sample length	3m
Duration	24 hrs
Test result	No water leakage at the end of the sample

4.9 Drip	IEC 60794-1-E14
Sample Number	3
Sample length	0.3m
Temperature	70 ^{o}C
Duration	24 hrs
Test result	No filling compound shall drip from tubes

5. PACKING AND DRUM

5.1 ZP ˙ cables are packed in carton, coiled on Bakelite & wooden drum. During transportation, right tools should be used to avoid damaging the package and to handle with ease. Cables should be protected from moisture; kept away from high temperature and fire sparks; protected from over bending and crushing; protected from mechanical stress and damage.



5.2 The color of cable marking is white. (The printing shall be carried out at interval of 1 meter on the outer sheath of cable) The inner end of cable is then 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 marking legend can be changed according to user's requests.

5.3 Outdoor cable packing

Bakelite & wooden drum

Strong wooden batten protection