All-Dielectric Self-Supporting Fiber Cable

OptoWire AS-L(A)-4/8/12FO-1KN

Fiber Count	KN
AS-L(A)-4/8/12/16 FO	**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 Optowore premium designed cable with optical, mechanical and geometrical characteristics.

DESCRIPTION

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

QUALITY

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

RELIABILITY

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

REFERENCE

The cable which Optowire 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 60794-3-20	Outdoor cables –Part 3-20: Family specification for self-supporting aerial telecommunication cables
ITU-T G.650	Definition and test methods for the relevant parameters of single-mode fibers
ITU-T G.657	Characteristics of a bending-loss insensitive single-mode optical fiber
EIA/TIA 598	Color code of fiber optic cables

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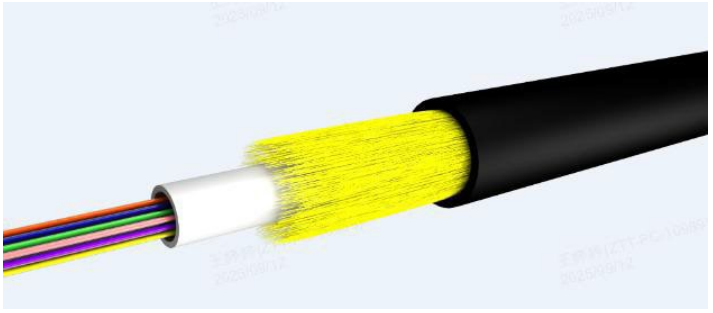
OPTICAL FIBER

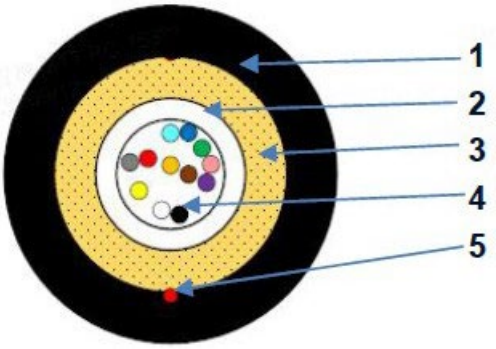
The optical fiber is made of high pure silica and germanium doped silica. UV curable acrylate material is applied over fiber cladding as optical fiber primary protective coating. The detail data of optical fiber performance are shown in the following table.

G. 657A2

Category	Description	Specifications
		After cabling
Optical Specifications	Attenuation @1310nm	≤0.38 dB/km
	Attenuation @1550 nm	≤0.25 dB/km
	Dispersion @1310nm	≤3.5 ps/nm·km
	Dispersion @1550nm	≤18.0 ps/nm·km
	Zero Dispersion Wavelength	1300~1324 nm
	Zero Dispersion Slope	≤0.092 ps/nm2·km
	Cable Cutoff Wavelength (λcc)	≤1260 nm
	Macro bending Loss (10 turns; Φ30 mm) @1550 nm (10 turns; Φ30 mm) @1625 nm (1 turns; Φ20 mm) @1550 nm (1 turns; Φ20 mm) @1625 nm (1 turns; Φ15 mm) @1550 nm (1 turns; Φ15 mm) @1625 nm	 ≤ 0.03 dB ≤ 0.1 dB ≤ 0.1 dB ≤ 0.2 dB ≤ 0.5 dB ≤ 1.0 dB
	Mode Field Diameter @1310 nm	8.6±0.4μm
Dimensional Specifications	Cladding Diameter	125±1μm
	Coating diameter	245±10μm
	Core/cladding concentricity error	≤0.5 μm
	Cladding Non-Circularity	≤1.0 %
Mechanical Specifications	Proof stress	≥0.69Gpa

CABLE STRUCTURE





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

Construction :

1. Outer sheath (TPU, black, UV proof)
2. Central Loose tube
3. Strength member (Aramid yarns)
4. Fiber and jelly
5. Ripcord (Red,1)

Dimension and Properties

Physical	**Fiber count**	**4**	**8**	**12**	**16**
	Cable structure	Central loose tube			
	Strength members	Aramid yarns			
	Loose tube diameter (mm)	2.8			3.6
	Outer sheath	TPU			
	Cable diameter (mm)	4.7			5.4
	Cable weight (±10% kg/km)	21			27
	Fiber count	4			
Mechanical	**Max. tensile load**	1000N			
	Max. crush resistance	800N/100mm			
	Min. bending radius	20 x cable diameter			20 x cable diameter
		10 x cable diameter			10 x cable diameter
	Temperature range	-20℃ ~ +70℃			-20℃ ~ +70℃
		-10℃ ~ +50℃			-10℃ ~ +50℃

Color code scheme

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

TEST REQUIREMENTS

Approved by various professional optical and communication product institution, Optowire also conduct various in-house testing in its own Laboratory and Test Center. She also conducts test with special arrangement with the Chinese Government Ministry of Quality Supervision & Inspection Center of Optical Communication Products (QSICO).

Optowire 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
Attenuation coefficient	IEC 60793-1-40
Chromatic dispersion	IEC 60793-1-42
Cable cut-off wavelength	IEC 60793-1-44

TEST LIST

Tension Loading Test

Test Standard	IEC 60794-1-21 E1
Sample length	No less than 50 meters
Load	Max. Tensile load
Duration time	1 minute
Test results	Change of attenuation: ≤0.1dB/km after test (Test by OTDR)
	No damage to outer jacket and inner elements

Crush/Compression Test

Test Standard	IEC 60794-1-21 E3
Sample length	Crush load
Load	1 minute
Duration time	3
Test results	Change of attenuation: ≤0.1dB/km after test (Test by OTDR)
	No damage to outer jacket and inner elements

Impact Resistance Test

Test Standard	IEC 60794-1-21 E4
Impact energy	3J
Radius	300mm
Impact points	3
Impact number	1
Test result	Change of attenuation: ≤0.1dB/km after test (Test by OTDR)
	No damage to outer jacket and inner elements

Repeated Bending Test

Test Standard	IEC 60794-1-21 E6
Bending radius	20 X diameter of cable
Cycles	25 cycles
Test result	No damage to outer jacket and inner elements

Torsion/Twist Test

Test Standard	IEC 60794-1-21 E4
Sample length	2m
Angles	±180 degree
Cycles	5
Test result	Change of attenuation: ≤0.1dB/km after test (Test by OTDR)
	No damage to outer jacket and inner elements

Temperature cycling Test

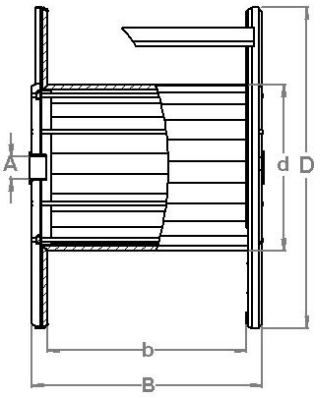
Test Standard	IEC 60794-1-22 F1
Temperature step	+20℃ →-40℃ →+70℃ →+20℃
Time per each step	12 hrs
Cycles	2
Test result	Attenuation variation for reference value (the attenuation to be measured before test at +20±3℃) ≤ 0.15 dB/km and is reversible after test

Water penetration Test

Test Standard	IEC 60794-1-22 F5B
Height of water column	1m
Sample length	3m
Test time	24 hrs
Test result	No water leakage from the opposite of the cable

PACKING AND DRUM

Optowire cables are coiled on bake lite, wooden or ironwood 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.



Wood Drum

Optowire Cable	D*d*B cm (weights kg) D: including seal plate thickness Dimensions±5cm, Weight (kg)±15%
Type / Length	4Km/reel
AS-L(A)-4/8/12/16 FO-1KN	75*40*75 (118)

Note: The drum size & cable weight as above is estimated and final size & weight shall be confirmed before shipment.

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.