

Indoor Optical Fiber Cable

OptoWire IR-ST & IR-MT

Fiber count	KN	FRP
OptoWire IR-ST (8 – 24) FO OptoWire IR-MT (14 – 96) FO	0.3	2

Description

All-Dielectric Indoor distribution cable suitable for vertical installation.

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 Optowire premium designed cable with optical, mechanical and geometrical characteristics

1.2 Cable name

OptoWire IR-ST(8-24)FO/IR-MT(14-96)

1.3 Cable 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.

1.4 Quality

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

1.5 Reliability

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

1.6 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 60794-2	Optical fiber cables-part 2 indoor cables- sectional specification
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 and cable
EIA/TIA 598-C	Color code of fiber optic cables

2. Optical Fiber

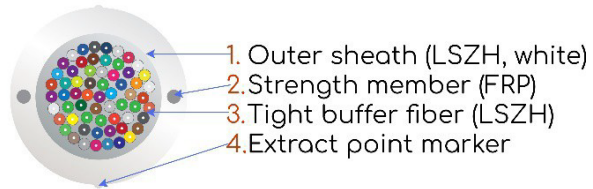
The optical fiber is made of high pure silica and germanium doped silica. UV curable acrylate material is applied over fiber cladding as optical fiber primary protective coating. The detail data of optical fiber performance are shown in the following table.

G. 657A2

Category	Description	Specifications	
		Before cabling	After cabling
Optical Specifications	Attenuation @1310 nm	≤0.35 dB/km	≤0.40 dB/km
	Attenuation @1550 nm	≤0.21 dB/km	≤0.25 dB/km
	Zero Dispersion Wavelength	1300~1324 nm	
	Zero Dispersion Slope	≤0.092 ps/nm ² ·km	
	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 ≤ 0.10 dB ≤ 0.10 dB ≤ 0.20 dB ≤ 0.50 dB ≤ 1.00 dB	
Dimensional Specifications	Cladding Diameter	125±1μm	
	Cladding Non Circularity	≤1.0%	
	Core/Clad Concentricity Error	≤0.5μm	
Mechanical Specifications	Proof Stress	≥0.69Gpa	

3. Cable structure

OptoWire IR-ST(8-24) FO



Physical	Fiber count	8	12	14	16	18	20	24
	Tight buffer fiber diameter	0.9±0.05mm						
	FRP diameter	1.2±0.1mm *2						
	Outer sheath thickness	Nom. 1.2/2.4mm						
	Cable OD	11.0mm±0.5mm						
	Cable weight kg/km±15%	89	93	95	97	89	99	100
	Operation temperature range	-20°C~60°C						
	Installation temperature range	0°C~50°C						
	Transport and storage temperature range	-20°C~60°C						
Mechanical	Max. tensile load	300N						
	Crush resistance	1000 N/10cm						
	Minimal installation bending radius	20D						
	Minimal operation bending radius	10D						

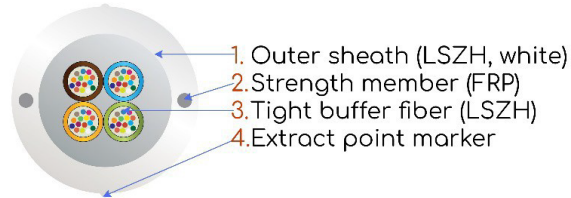
Color code scheme:

Tight Buffer Color	1	2	3	4	5	6	7	8	9	10	11	12
	Blue	Orange	Green	Brown	Grey	White	Red	Black	Yellow	Violet	Pink	Aqua

Notes: from 13 to 24 fiber colors are same with black tracer, instead of 20 fiber is with white tracer

3. Cable structure

OptoWire IR-MT(14-96) FO



Dimension and Properties:

Physical	Fiber count	24	44	68	28	22	17	24	14	96	
	Buffer number * Fiber number	10*2+4*1	10*4+4*1	16*4+4*1	6*4+4*1	5*4+2*1	5*3+2*1	5*4+4*1	5*2+4*1	24*4	
	Single soft buffer fiber diameter	0.9±0.05mm									
	Multi soft buffer fiber diameter	0.9±0.1mm									
	FRP diameter	1.2±0.1mm*2									
	Outer sheath thickness	1.0/2.2mm	1.0/2.2mm	1.0/2.2mm	1.1/2.2mm	1.0/2.2mm	1.0/2.2mm	1.0/2.2mm	1.0/2.2mm	1.0/2.2mm	1.0/2.2mm
	Cable OD	11.0mm±0.5mm									
	Cable weight kg/km±15%	90	93	100	92	88	90	93	91	100	
	Operation temperature range	20°C~60°C									
	Installation temperature range	0°C~50°C									
	Transport and storage temperature range	-20°C~60°C									
Mechanical	Max. tensile load	300N									
	Crush resistance	1000N/10cm									
	Minimal installation bending radius	20D									
	Minimal operation bending radius	10D									

Color code scheme:

Fiber color	1	2	3	4	5	6	7	8	9	10	11	12
	Blue	Yellow	Red	White	Green	Violet	Orange	Grey	Aqua	Black	Brown	Pink
Fiber color	Blue	Yellow	Red	White	Green	Violet	Orange	Grey	Aqua	Black	Brown	Pink

Notes: notes from 13 to 24 fiber colors are same with black tracer, instead of 20 fiber is with white tracer

4. 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. OptoWire also conduct 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	
Cladding diameter	IEC 60793-1-20
Cladding non-circularity	IEC 60793-1-20
Attenuation coefficient	IEC 60793-1-40

4.1 Tension Loading test	
Test Standard	IEC 60794-1-21 E1
Sample length	No less than 50 meters
Load	Max. tension load
Duration time	1 minute
Test results	Additional attenuation: $\leq 0.4\text{dB}$
	No damage to outer jacket and inner elements

4.2 Crush/Compression Test	
Test Standard	IEC 60794-1-21 E3
Load	Crush load
Duration time	1 minutes
Test number	3
Test results	Additional attenuation: $\leq 0.4\text{dB}$
	No damage to outer jacket and inner elements

4.3 Impact Resistance Test	
Test Standard	IEC 60794-1-21 E4
Impact energy	1J
Radius	300mm
Impact points	3
Impact number	1
Test result	Additional attenuation: $\leq 0.4\text{dB}$
	No damage to outer jacket and inner elements

4.4 Torsion/ Twist Test

Test Standard	IEC 60794-1-21 E7
Sample length	2m
Angles	±180 degree
cycles	10
Test result	Additional attenuation: ≤0.4dB
	No damage to outer jacket and inner elements

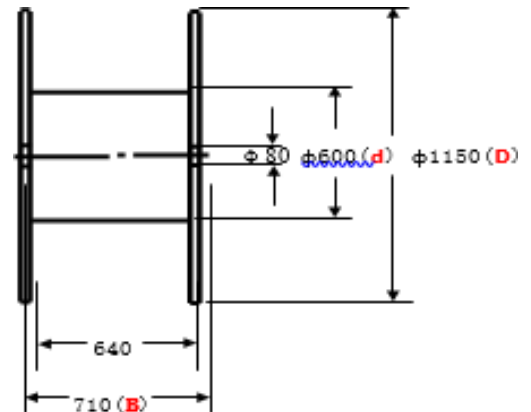
4.5 Temperature cycling Test

Test Standard	IEC 60794-1-22 F1
Temperature	-20°C~+60°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°C) ≤ 0.4dB/km

5. Packing and Drum

5.1 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.

Plywood	
OptoWire Cable	D*d*B m (weights kg) D: including seal plate thickness
Length Type	2Km/reel
8~96F	1.15*0.6*0.71
	1.15*0.6*0.71
	1.15*0.6*0.71
	1.15*0.6*0.71
	1.15*0.6*0.71
	1.15*0.6*0.71



Description	Value
Flange diameter (mm)	1150 (0~+10)
Barrel diameter (mm)	600 (±10)
Outer diameter width (mm)	710 (-10~0)
Inner diameter width (mm)	640 (±10)
Shaft hole diameter (mm)	80 (0~+3)

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

5.2 The color of cable marking is black or other colors. (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 or ironwood drum. Strong wooden batten protection.