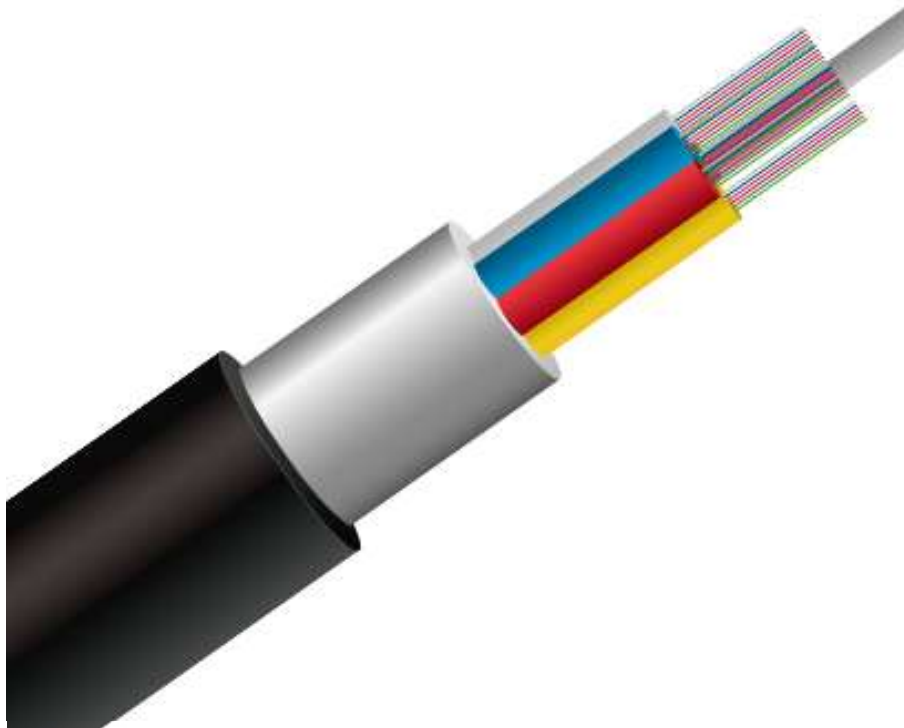
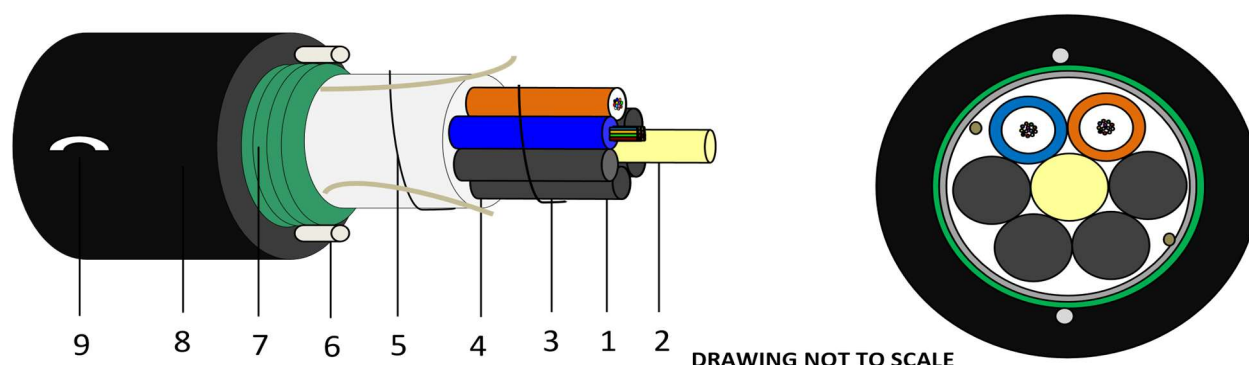


OPTICAL FIBER CABLETECHNICAL DATA SHEETDUCT- DIRECT BURIED CABLELOOSE TUBE CONSTRUCTIONSDOUBLE STEEL WIRE AND STEEL TAPE WITH RIP CORDANTI-CORROSION AND UV RESISTANCE CABLEWATER PROTECTED - RODENT PROTECTED - ANTI-TERMITE48 FIBERS, COMPLYING WITH ITU-T G.652D**A-DQ(ZN)(ZM)(SR)2Y 4x12 E9/125 LG**

International Code: A-DQ(ZN)(ZM)(SR)2Y 4x12 E9/125 LG

Cable Application



Cable can be designated as duct-buried (metallic) rodent protected cable. Cable can be installed by pulling in duct or buried or on cable trays. Fiber optic cables are used for triple-play (Voice-video-data), FTTx applications in telecommunication projects, long-haul, backbone, metropolitan, broadband, utility and intelligent traffic control, supervisory control and data acquisition (SCADA), cable TV (CATV), military, etc.

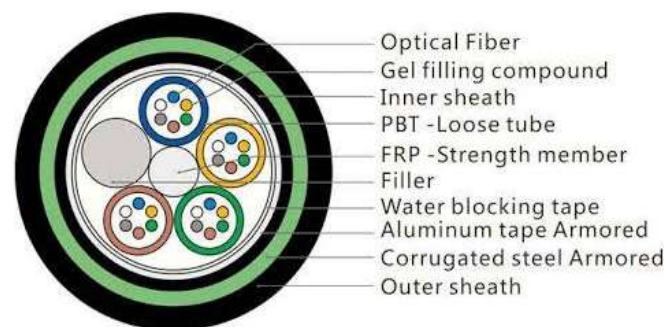
Cable Construction

Item	Cable Element	Cable Construction
1	Fibers	48F, Single Mode Fiber ITU-T G.652D
2	Dielectric central strength member	FRP (Fiber Reinforced Plastic)
3	Loose Tube (Jelly Filled)	PBTP material, with 12Fiber loose tube
4	Water Blocking elements	Water Blocking Yarns for water blocking along core.
5	Core Wrapping (Longitudinal)	Water Blocking tape wrapped over SZ stranded core with binder
6	Metallic Steel Strength Members	Longitudinal two steel wire serving as extra strength
7	Metallic Steel Tape Armoring	ECCS, Corrugating steel tape for rodent/mechanical protection

8	Outer Polyethylene Sheath	HDPE, 1.8 mm nominal thickness, Black Color and UV Resistant
9	Method of Cable Marking	Hot Foil Stamping with White tape
-	Ripcord	Two Polyester Ripcords under steel tape for easy sheathing removal
-	Outer Cable Diameter	12.0mm (Approx.)
-	Cable Weight	143 kg/km (Approx.)
-	Mechanical Requirements	Maximum Tensile Strength - 2000N / Crush Strength - 1000N
-	Minimum bending radius	(during installation)=20 x Cable OD = 240 mm (installed cable)=15 x Cable OD = 180 mm

Installation Guidelines

- Avoid exceeding the specified maximum tensile load during installation.
- Maintain the specified minimum bending radius during installation and after installation.
- Avoid sharp bends, kinks, twisting, and excessive pulling force.
- Use suitable cable pulling equipment and accessories during duct installation.
- Seal the cable ends properly to prevent moisture and contamination from entering the cable.
- Avoid dragging the cable directly over sharp or abrasive surfaces.
- Protect the cable from excessive impact, crushing, and mechanical stress during installation.
- Follow the manufacturer's recommended installation procedures and applicable cable standards.



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Cable Design

Outdoor cable - Jelly filled loose tube/filler elements are stranded around a dielectric central strength member (FRP) by reverse oscillation lay (SZ) method, FRP provided for extra tensile strength, cable core protected from water penetration inside the core by water blocking elements (yarns and Tape) applied in all interstices surrounding loose tubes and completely covering the stranded core by , core wrapped by tape, two steel wires diametrically opposite to each other serving as extra strength and anti-buckling members, corrugating steel tape for rodent & mechanical protection and outer sheath of high density Polyethylene (UV resistant)

Cable Application Standards

IEC 60793, IEC 60794-1-2, ITU-T Recommendations, TIA/EIA-455, and applicable fiber optic cable installation and testing standards.

Color Code

FIBER COLOR (1-6Fibers)	BLUE	ORANGE	GREEN	BROWN	Grey	White
FIBER COLOR (7-12Fibers)	Red	Black	Yellow	Purple	Pink	Aqua

Loose Tube Colors

TUBE COLOR (1-6 Tubes)	BLUE	ORANGE	GREEN	BROWN	-	-
TUBE COLOR (7-12Tubes))	-	-	-	-	-	-

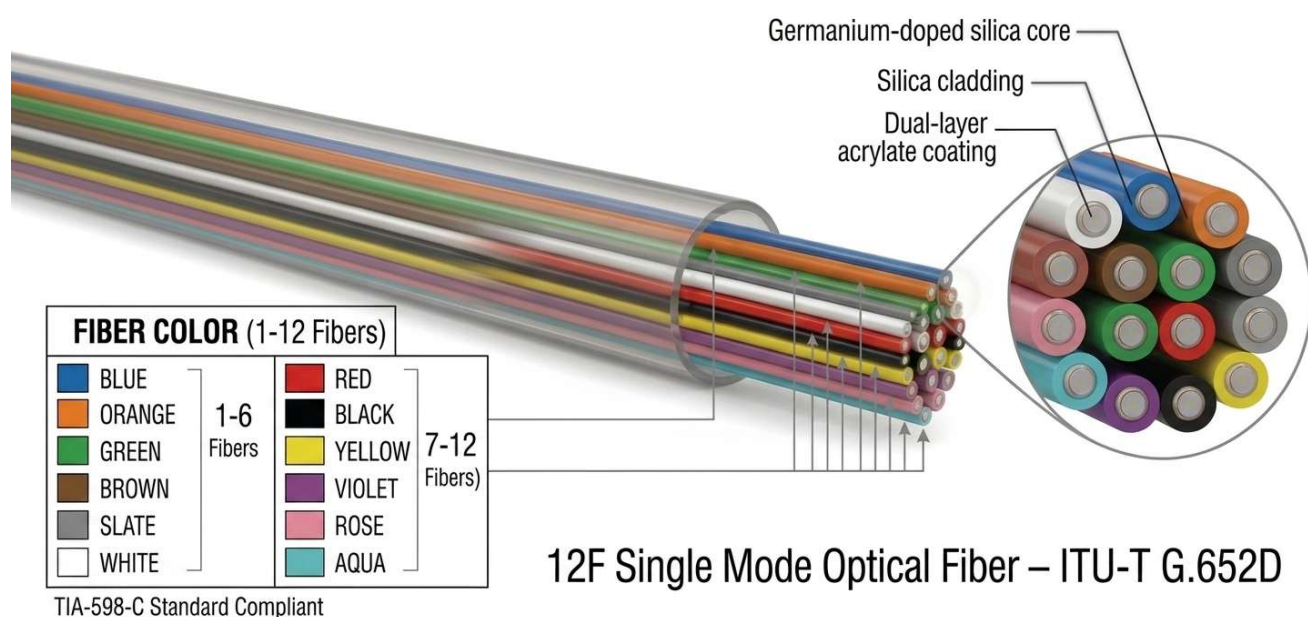
Cable Marking

Fiber Light 48 F SM Fiber Optic Outdoor Armored Cable – ITU-T G.652D, IEC 60793, IEC 60794-1-2, XXXX

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Optical Fiber (ITU-T G.652D)

Optical Single Mode fibers made of a germanium doped silica core, silica cladding and dual layer of acrylate coating over cladding. Coloring is applied over the coating for easy identification. Fibers are optimized at a wavelength of 1310nm and 1550nm region but can be used in 1380nm region complying with the ITU-T G.652 A, B, C, D and IEC 60793-2-50 type B.1.3 specifications.



Structural Specification

Parameter	Specification
Mode Field Diameter @ 1310 nm	9.2 ± 0.4 μm
Mode Field Diameter @ 1550 nm	10.4 ± 0.5 μm
Cladding Diameter	125.0 ± 0.7 μm
Coating Diameter (Colored)	255 ± 10 μm
Core/Mode Field Concentricity Error	≤ 0.6 μm
Cladding Non-Circularity	≤ 1.0%

Optical Specification

Parameter	Specification
Attenuation @ 1310 nm	≤ 0.35 dB/km
Attenuation @ 1550 nm	≤ 0.22 dB/km
Dispersion @ 1285–1330 nm	≤ 3.5 ps/(nm·km)
Dispersion @ 1550 nm	≤ 18.0 ps/(nm·km)
Zero Dispersion Wavelength (λ_0)	1300–1324 nm
Zero Dispersion Slope (S_0)	≤ 0.092 ps/(nm ² ·km)
Polarization Mode Dispersion (PMD)	≤ 0.2 ps/ $\sqrt{\text{km}}$
Cable Cut-off Wavelength (λ_{cc})	≤ 1260 nm
Point Discontinuity @ 1310/1550 nm	≤ 0.2 dB
Effective Group Index of Refraction (N_{eff})	1.4675 @ 1310 nm / 1.4681 @ 1550 nm

Mechanical Specification

Proof test $\geq 1\%$ (100 kpsi or 0.7 GPa)

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Technical Characteristics for Optical Fiber Cable

Test	Specification	Test Conditions	Acceptance Criteria
Temperature Cycle	IEC 60794-1-F1	-20°C to +70°C, 1 hr, 2 cycles	Attenuation change $\leq \pm 0.1$ dB/km
Tensile Strength	IEC 60794-1-E1A	Maximum 2000 N, 10 min	Attenuation change $\leq \pm 0.1$ dB/km
Crush	IEC 60794-1-E3	2000 N/100 mm, 10 min	Attenuation change $\leq \pm 0.1$ dB/km
Impact	IEC 60794-1-E4	3 impact points, 1 m height, 1 kg	Attenuation change $\leq \pm 0.1$ dB/km
Cable Bend Radius	IEC 60794-1-E11	15 × OD, no load	Attenuation change $\leq \pm 0.1$ dB/km
Repeated Bending	IEC 60794-1-E6	20 × OD, 1 kg, 2 cycles	Attenuation change $\leq \pm 0.1$ dB/km
Twist	IEC 60794-1-E7	2 m, 1 kg, 180°, 5 cycles	Attenuation change $\leq \pm 0.1$ dB/km
Kink	IEC 60794-1-E10	15 × OD	No defect on fiber or sheath
Water Penetration Test (WPT)	IEC 60794-1-F5B	L = 3 m, H = 1 m, 24 h	No water leakage

Environmental Properties for Optical Fiber Cable

Parameter	Specification
Relative Humidity	5% to 95%
Operating Temperature	-40°C to +70°C
Installation / Transportation / Storage Temperature	-20°C to +65°C

Optical Properties for Optical Fiber Cable

Parameter	Specification
Average Attenuation @ 1310 nm	≤ 0.35 dB/km
Average Attenuation @ 1550 nm	≤ 0.22 dB/km
Chromatic Dispersion @ 1285–1330 nm	≤ 3.5 ps/(nm·km)
Chromatic Dispersion @ 1550 nm	≤ 18.0 ps/(nm·km)
PMD (Maximum for Each Individual Fiber)	≤ 0.2 ps/ $\sqrt{\text{km}}$

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Standard Cable Length

Standard Cutting Length: 3000mts $\pm$ 10%

Drum Marking

All necessary cable information shall be marked on the wooden drum outer flanges by using water proof Ink or water proof label or aluminum plate.

Packing and Shipping

The cable wooden drum shall be of the standard manufacturing length but special length if any can also be provided on customer request. The wooden drum barrel diameter shall not be less than 50 times of the nominal outer diameter of the cable. The cable ends shall be sealed with shrinkable end caps on both sides of the cable. The cable wooden drum is protected by whether proof sheet and wooden battens. The direction of rotation shall be marked on the drum flange.

Cable Features

The Cable Lifetime more than 30 years.

