

Technical Specification Sheet: Underground Single-Mode Fiber Optic Cable

1. GENERAL

- **Product Type:** Single-Mode, Stranded Loose-Tube, Gel-Filled (or Dry Water-Blocking), Corrugated Steel Armored, Double-Jacketed, Direct Burial Fiber Optic Cable.
- **Application:** For direct burial, duct, and conduit installation in outdoor/outside plant (OSP) environments. Suitable for long-haul telecommunications, CATV, and backbone networks.

2. OPTICAL FIBER SPECIFICATIONS

- **Fiber Type:** ITU-T G.652.D (Standard Single-Mode Fiber)
 - Attenuation: ≤ 0.36 dB/km @ 1310 nm, ≤ 0.22 dB/km @ 1550 nm
 - **Typical/Real-World Spec:** ≤ 0.34 dB/km @ 1310 nm, ≤ 0.20 dB/km @ 1550 nm
- **Mode Field Diameter:** 9.2 ± 0.4 μm @ 1310 nm
- **Cable Cutoff Wavelength (λ_{cc}):** ≤ 1260 nm
- **Zero-Dispersion Wavelength (λ_0):** 1300 – 1324 nm
- **Dispersion @ 1550 nm:** ≤ 18 ps/(nm·km)
- **Macrobend Loss:** ≤ 0.1 dB for 100 turns @ 30 mm radius (1550 nm)

3. CABLE CONSTRUCTION (from center to exterior)

Layer	Component	Material & Specification
Core	Central Strength Member	Fiberglass-Reinforced Plastic (FRP) rod or Dielectric steel wire. Diameter: ~2.0 mm.
Inner	Buffer Tubes	High-modulus PBT (Polybutylene Terephthalate). Tubes are loose , stranded around the strength member.
	Optical Fibers	12, 24, or 144 fibers per tube standard. Fibers are color-coded per EIA/TIA-598-A (Blue, Orange, Green, Brown...).

Layer	Component	Material & Specification
	Filling Compound	Water-blocking gel or Dry/Bonded water-swallowable yarns/powders.
Protection	Armor Layer	Corrugated Steel Tape (CST) longitudinally applied and bonded. Provides crush resistance (> 4000 N/cm) and rodent protection.
Jacket	Inner Jacket	Black MDPE (Medium-Density Polyethylene) for moisture/abrasion resistance.
	Outer Jacket	Black HDPE (High-Density Polyethylene) . UV-resistant, high-tensile strength. Thickness: ~2.0 mm.
Marking	Cable Legend	Printed with manufacturer ID, fiber type, meter/feet markings, and sequential length markers.

4. MECHANICAL & ENVIRONMENTAL PERFORMANCE

Parameter	Requirement	Test Standard
Tensile Strength	Installation (Short-Term): ≥ 2700 N (600 lbf) Operational (Long-Term): ≥ 600 N (133 lbf)	GR-20, IEC 60794-1-2-E1
Crush Resistance	≥ 4000 N/cm (Armored)	GR-20, IEC 60794-1-2-E3
Impact Resistance	Withstands repeated impacts per GR-20	GR-20
Bend Radius	Installation: 20 x Cable Diameter Operational: 10 x Cable Diameter	-

Parameter	Requirement	Test Standard
Operating Temperature	Standard: -40°C to +70°C Extended: -60°C to +85°C (available)	-
Water Penetration	Passes longitudinal water-blocking test.	GR-20, IEC 60794-1-2-F5

5. DIMENSIONS & WEIGHT (Example for a common 24-fiber cable)

Fiber Count	Approx. Diameter	Approx. Weight	Min. Bend Radius (Installed)
12 Fibers	13.5 mm (0.53 in)	240 kg/km	270 mm
24 Fibers	14.0 mm (0.55 in)	270 kg/km	280 mm
48 Fibers	16.0 mm (0.63 in)	350 kg/km	320 mm

6. COMPLIANCE & STANDARDS

- **Telcordia:** GR-20-CORE (General Requirements for Optical Fiber and Optical Fiber Cable)
- **IEC:** IEC 60794 (Optical fibre cables)
- **ITU-T:** G.652 (Characteristics of a single-mode optical fibre and cable)
- **ANSI/TIA:** TIA-568.3-D (Optical Fiber Cabling and Components Standard)
- **RoHS:** Compliant