Industrial-Grade 10Gbps Single-Mode Bare Optical Fiber – Wide Temperature Range (-40°C to +85°C), Low Dispersion for Harsh Environments

Product Overview

Winner industrial single-mode bare optical fiber is designed for high-reliability deployments in thermally demanding settings such as factory automation, outdoor telecom infrastructure, medical imaging systems, and energy-sector networks. Built on a precision 9/125 µm core/cladding platform with a 250 µm dual-layer UV-cured acrylate coating, the fiber maintains geometric integrity and optical performance across its full operating spectrum (1260–1625 nm).

With chromatic dispersion of <18 ps/(nm・km) at 1550 nm and ultra-low attenuation (≤0.20 dB/km @1550 nm, ≤0.34 dB/km @1383 nm), it supports uncompensated 10G transmission over 80 km and is fully compatible with 25G/100G industrial Ethernet standards. The fiber’ s core-cladding concentricity error (≤0.6 µm) and cladding non-circularity (≤1.0%) ensure minimal splice loss and high connector repeatability—even after thermal cycling. Its cutoff wavelength of ≤1260 nm guarantees true single-mode operation, while robust coating adhesion enables reliable handling in field installations.

Technical Specifications

Brand Name	Winner

Model Number	G.652.D (standard); G.654.E, G.655, G.657.A1/A2 available on request
Fiber Type	Single-Mode Bare Optical Fiber
Core Diameter	9 μm
Cladding Diameter	125 ± 0.7 μm
Coating Diameter	250 μm
Core/Cladding Concentricity Deviation	⩽0.6 μm
Cladding Roundness Deviation	⩽1.0%
Cut-off Wavelength (λ_c)	⩽1260 nm
Chromatic Dispersion	<18 ps/(nm・km) @1550 nm <22 ps/(nm・km) @1625 nm
Attenuation	⩽0.33 dB/km @1310 nm ⩽0.34 dB/km @1383 nm ⩽0.20 dB/km @1550 nm ⩽0.24 dB/km @1625 nm

Operating Temperature Range	-40°C to +85°C

Applications

- Industrial automation and control networks requiring continuous operation in extreme temperatures
- Outdoor 5G fronthaul/midhaul sites exposed to desert heat or arctic cold
- Medical diagnostic and surgical equipment demanding signal fidelity and EMI immunity
- Oil & gas, rail, and power utility communication systems with stringent reliability requirements
- Data center interconnects in unconditioned edge facilities or remote locations

Standards & Reliability

Winner industrial fiber complies with ITU-T G.652.D, IEC 60793-2-50 B1.3, and Telcordia GR-20-CORE Category 1 (outdoor) and Category 3 (indoor/outdoor). It undergoes rigorous thermal cycling tests (-60°C to +90°C) to validate long-term stability. Compatible with standard fusion splicers, APC/UPC connectors, and industrial transceivers including 10GBASE-LR, 25GBASE-ER, and SFP28 modules.