Low-Dispersion 250 Micron Single-Mode Bare Optical Fiber – ITU-T G.652.D/G.655 Compliant for High-Speed Long-Haul Transmission

Product Overview

Winner low-dispersion single-mode bare optical fiber is manufactured to meet stringent ITU-T standards—including G.652.D for conventional single-mode applications and G.655 for non-zero dispersion-shifted fiber (NZ-DSF) deployments requiring ultra-low chromatic dispersion in the C+L bands. With a standard 9/125 μm core/cladding geometry and 250 μm UV-cured dual acrylate coating, the fiber delivers exceptional geometric precision and optical performance across the full operating spectrum (1260–1625 nm).

Chromatic dispersion is tightly controlled to <18 ps/(nm・km) at 1550 nm and <22 ps/(nm・km) at 1625 nm, enabling uncompensated 10G transmission up to 80 km and supporting coherent 100G/400G systems with reduced digital signal processing burden. The fiber exhibits ultra-low attenuation (⩽0.20 dB/km @1550 nm, ⩽0.34 dB/km @1383 nm), confirming its low water peak (LWP) compliance per ITU-T G.652.D. Combined with core-cladding concentricity ⩽0.6 μm and cladding non-circularity ⩽1.0%, it ensures low splice loss and high connector repeatability. The cutoff wavelength of ⩽1260 nm guarantees true single-mode operation, while a macrobend radius of ⩾4 m provides robustness in dense routing environments.

Technical Specifications

Brand Name	Winner
Model Number	G.652.D (standard); G.655, G.654.E, 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
Cladding Non-Circularity	⩽1.0%
Core/Cladding Concentricity Error	⩽0.6 μm
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

Macrobend Radius	⩾4 m
Operating Temperature Range	-40°C to +85°C

Applications

- Long-haul and submarine communication systems requiring precise dispersion management (G.655 variant)
- Metro and regional networks deploying 10G/25G/100G DWDM without dispersion compensation modules
- Data center interconnects (DCI) up to 80 km with direct-detect or coherent optics
- 5G mobile xHaul (fronthaul/midhaul/backhaul) demanding low latency and high spectral efficiency
- Industrial and utility networks operating in extreme temperature ranges with space-constrained pathways

Standards & Compatibility

Winner low-dispersion fiber complies with ITU-T G.652.D, G.655, IEC 60793-2-50, and Telcordia GR-20-CORE. It is fully compatible with standard single-mode transceivers (e.g., 10GBASE-LR, 100GBASE-ER4), fusion splicers, and APC/UPC connectors. For bend-critical indoor deployments, G.657.A2 variants offer enhanced macrobend performance down to 7.5 mm radius while maintaining low dispersion characteristics.