

Corning® SMF-28® ULL Optical Fiber Portfolio

Product Information



Corning's SMF-28® ULL optical fiber portfolio has the lowest loss of any 80 μm^2 terrestrial-grade, single-mode fiber available in the market with millions of kilometers deployed worldwide. SMF-28 ULL fibers are designed for the most challenging long-haul and high data rate networks, enabling customers to scale their core networks to $\geq 400\text{G}$ data rates at a lower overall cost per bit. Ultra-low-loss fiber also allows carriers and cloud operators to extend optical reach at very high data rates and makes core networks scalable for higher capacities as the demand for bandwidth continues to grow.

This fiber is available in the following two options, which vary based on ITU-T compliance requirements:

SMF-28 ULL optical fiber with advanced bend, which is an ITU-T G.654.C-compliant fiber that also meets the fiber macrobend loss requirements of the ITU-T G.657.A1 standard.

SMF-28 ULL optical fiber, which is compliant with ITU-T G.652.B and ITU-T G.654.C.

All products in the SMF-28 ULL fiber portfolio are also available in a smaller 200 μm outer diameter for use in high-density cable designs.



SMF-28 ULL Optical Fiber with Advanced Bend Specifications

ITU-T G.654.C-compliant fiber

Meets the fiber macrobend loss requirements of ITU-T G.657.A1 standard

Maximum Attenuation

Wavelength (nm)	Maximum Value* (dB/km)
1550	$\leq 0.16\text{-}0.17$
1625	$\leq 0.18\text{-}0.19$

*Alternate attenuation offerings available upon request.

Macrobend Loss

Mandrel Radius (mm)	Number of Turns	Wavelength (nm)	Induced Attenuation* (dB)
10	1	1550	≤ 0.75
10	1	1625	≤ 1.5
15	10	1550	≤ 0.25
15	10	1625	≤ 1.0

Meets or exceeds the macrobend loss requirements of the ITU-T G.657.A1 standard.

*The induced attenuation due to fiber wrapped around a mandrel of a specified radius.

Point Discontinuity

Wavelength (nm)	Point Discontinuity (dB)
1550	≤ 0.05

Cable Cutoff Wavelength (λ_{cc})

$\lambda_{cc} \leq 1520\text{ nm}$

Mode Field Diameter

Wavelength (nm)	Mode Field Diameter (μm)
1550	10.5 ± 0.5

Dispersion

Wavelength (nm)	Dispersion Value [ps/(nm·km)]
1550	≤ 18
1625	≤ 22

Polarization Mode Dispersion (PMD)

	Value (ps/√km)
PMD Link Design Value	$\leq 0.04^*$
Maximum Individual Fiber PMD	≤ 0.1

*Complies with ITU-T G.650-2 Appendix IV, ($m = 20$, $Q = 0.01\%$), August 2015.

The PMD link design value is a term used to describe the PMD of concatenated lengths of fiber (also known as PMD_0). This value represents a statistical upper limit for total link PMD. Individual PMD values may change when fiber is cabled.

ColorPro® Identification Technology

SMF-28 ULL fiber is also available in colored variants, enabled by ColorPro® identification technology. Corning fibers with ColorPro® identification technology deliver better efficiency in cable manufacturing, simplify inventory management, and leverage an enhanced fiber product offering.

How to Order

Contact your sales representative, or call the Optical Fiber Customer Service Department:
Ph: 1-607-248-2000 (U.S./Can.)
+44-1244-525-320 (Europe)
Email: cofic@corning.com
Please specify the fiber type, attenuation, and quantity when ordering.





SMF-28 ULL Optical Fiber Specifications

ITU-T G.652.B and ITU-T G.654.C-compliant fiber

Maximum Attenuation

Wavelength (nm)	Maximum Value* (dB/km)
1310	≤ 0.30 - 0.31
1550	≤ 0.16 - 0.17
1625	≤ 0.18 - 0.19

*Alternate attenuation offerings available upon request.

Macroband Loss

Mandrel Radius (mm)	Number of Turns	Wavelength (nm)	Induced Attenuation* (dB)
16	1	1550	≤ 0.1
25	100	1310	≤ 0.05
25	100	1550	≤ 0.05
30	100	1625	≤ 0.05

*The induced attenuation due to fiber wrapped around a mandrel of a specified radius.

Point Discontinuity

Wavelength (nm)	Point Discontinuity (dB)
1310	≤ 0.05
1550	≤ 0.05

Cable Cutoff Wavelength (λ_{cc})

$\lambda_{cc} \leq 1260$ nm

Mode Field Diameter

Wavelength (nm)	Mode Field Diameter (μ m)
1310	9.2 ± 0.5
1550	10.5 ± 0.5

Dispersion

Wavelength (nm)	Dispersion Value [ps/(nm·km)]
1550	≤ 18
1625	≤ 22

Zero Dispersion Wavelength (λ_0): 1300 nm ≤ λ_0 ≤ 1324 nm
 Zero Dispersion Slope (S_0): ≤ 0.092 ps/(nm²·km)

Polarization Mode Dispersion (PMD)

	Value (ps/√km)
PMD Link Design Value	≤ 0.04*
Maximum Individual Fiber PMD	≤ 0.1

*Complies with ITU-T G.650-2 Appendix IV, (m = 20, Q = 0.01%), August 2015.

The PMD link design value is a term used to describe the PMD of concatenated lengths of fiber (also known as PMD₀). This value represents a statistical upper limit for total link PMD. Individual PMD values may change when fiber is cabled.



Dimensional Specifications

Glass Geometry

Fiber Curl	≥ 4.0 m radius of curvature
Cladding Diameter	125.0 ± 0.7 μm
Core-Clad Concentricity	≤ 0.8 μm (ITU-T G.654.C-only compliant) ≤ 0.6 μm (ITU-T G.652.B-compliant)
Cladding Non-Circularity	≤ 0.7%

Coating Geometry	Standard Offering	Smaller Coating Diameter Option
Coating Diameter	242 ± 5 μm	200 ± 5 μm
Coating-Cladding Concentricity	< 12 μm	≤ 10 μm

Environmental Specifications

Environmental Test	Test Condition	Induced Attenuation 1310 nm, 1550 nm, and 1625 nm (dB/km)
Temperature Dependence	-60°C to +85°C*	≤ 0.05
Temperature Humidity Cycling	-10°C to +85°C up to 98% RH	≤ 0.05
Water Immersion	23°C ± 2°C	≤ 0.05
Heat Aging	85°C ± 2°C	≤ 0.05
Damp Heat	85°C at 85% RH	≤ 0.05

*Operating Temperature Range: -60°C to +85°C
Reference temperature = +23°C

Mechanical Specifications

Proof Test

The entire fiber length is subjected to a tensile stress ≥ 100 kpsi (0.69 GPa). Higher proof test levels are available.

Length

Fiber lengths available up to 50.4 km/spool.

Performance Characterizations

Characterized parameters are typical values.

Core Diameter	8.2 μm
Effective Group Index of Refraction (n_{eff})	1310 nm: 1.4606 1550 nm: 1.4620
Fatigue Resistance Parameter (n_d)	20
Coating Strip Force	Dry: 0.6 lbs. (3 N) Wet, 14-day room temperature: 0.6 lbs. (3 N)
Rayleigh Backscatter Coefficient (for 1 ns Pulse Width)	1310 nm: -77 dB 1550 nm: -83 dB