

# Corning® SMF-28e+® LL Optical Fiber

## Product Information



Corning® SMF-28e+® LL optical fiber is an ITU-T Recommendation G.652.D compliant optical fiber which builds on Corning's low-loss fiber technology to enable extended networking distances for long-haul, metro, and access applications. SMF-28e+ LL fiber offers industry-leading specifications for attenuation and polarization mode dispersion values; these values provide a solid foundation for new network deployments as well as upgrades to existing networks.

### Optical Specifications

#### Maximum Attenuation

Wavelength (nm)	Maximum Value* (dB/km)
1310	≤ 0.32
1383**	≤ 0.32
1490	≤ 0.21
1550	≤ 0.18
1625	≤ 0.20

\* Alternate attenuation offerings available upon request.

\*\* Attenuation values at this wavelength represent post-hydrogen aging performance.

#### Attenuation vs. Wavelength

Range (nm)	Ref. λ (nm)	Max. α Difference (dB/km)
1285 – 1330	1310	0.03
1525 – 1575	1550	0.02

The attenuation in a given wavelength range does not exceed the attenuation of the reference wavelength (λ) by more than the value α.

#### Macrobend Loss

Mandrel Diameter (mm)	Number of Turns	Wavelength (nm)	Induced Attenuation* (dB)
32	1	1550	≤ 0.03
50	100	1310	≤ 0.03
50	100	1550	≤ 0.03
60	100	1625	≤ 0.03

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

#### Point Discontinuity

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

#### Cable Cutoff Wavelength (λ<sub>cc</sub>)

λ<sub>cc</sub> ≤ 1260 nm

#### Mode-Field Diameter

Wavelength (nm)	MFD (μm)
1310	9.2 ± 0.4
1550	10.4 ± 0.5

#### Dispersion

Wavelength (nm)	Dispersion Value [ps/(nm·km)]
1550	≤ 18.0
1625	≤ 22.0

Zero Dispersion Wavelength (λ<sub>0</sub>): 1304 nm ≤ λ<sub>0</sub> ≤ 1324 nm

Zero Dispersion Slope (S<sub>0</sub>): ≤ 0.092 ps/(nm<sup>2</sup>·km)

#### Polarization Mode Dispersion (PMD)

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

\*Complies with IEC 60794-3: 2001, Section 5.5, Method 1, (m = 20, Q = 0.01%), September 2001.

The PMD link design value is a term used to describe the PMD of concatenated lengths of fiber (also known as PMD<sub>0</sub>). This value represents a statistical upper limit for total link PMD. Individual PMD values may change when fiber is cabled.

#### How to Order

Contact your sales representative, or call the Optical Fiber Customer Service Department:

Ph: 1-607-248-2000 (U.S. and Canada)  
+44-1244-525-320 (Europe)

Email: [cofic@corning.com](mailto:cofic@corning.com)

Please specify the fiber type, attenuation, and quantity when ordering.



## Dimensional Specifications

### Glass Geometry

Fiber Curl	$\geq 4.0$ m radius of curvature
Cladding Diameter	$125.0 \pm 0.7$ $\mu\text{m}$
Core-Clad Concentricity	$\leq 0.5$ $\mu\text{m}$
Cladding Non-Circularity	$\leq 0.7\%$

### Coating Geometry

Coating Diameter	$242 \pm 5$ $\mu\text{m}$
Coating-Cladding Concentricity	$< 12$ $\mu\text{m}$

## Environmental Specifications

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

\*Reference temperature = +23°C

Operating Temperature Range: -60°C to +85°C

## Mechanical Specifications

### Proof Test

The entire fiber length is subjected to a tensile stress  $\geq 100$  kpsi (0.69 GPa).\*

\*Higher proof test levels available.

### Length

Fiber lengths available up to 50.4 km/spool.

## Performance Characterizations

Characterized parameters are typical values.

Core Diameter	8.2 $\mu\text{m}$
Numerical Aperture	0.14 NA is measured at the one percent power level of a one-dimensional far-field scan at 1310 nm.
Effective Group Index of Refraction ( $N_{\text{eff}}$ )	1310 nm: 1.4676 1550 nm: 1.4682
Fatigue Resistance Parameter ( $N_d$ )	20
Coating Strip Force	Dry: 0.6 lbs. (3N) Wet, 14-day room temperature: 0.6 lbs. (3N)
Rayleigh Backscatter Coefficient (for 1 ns Pulse Width)	1310 nm: -77 dB 1550 nm: -82 dB