Corning® SMF-28e+® Photonic Optical Fiber

CORNING

A full spectrum fiber for components and assemblies with tighter geometry for more consistent splicing

Corning's SMF28e+® photonic fiber provides further evidence of Corning's long history of service to original equipment manufacturers (OEMs). This fiber's attributes are specifically customized for optical connectorization and component applications, allowing OEMs to reduce manufacturing costs, standardize processes, and improve performance.

Applications:

- Connectors
- EDFA
- Couplers
- Pigtails
- DWDM components
- Other components

Features:

- Industry-leading optical and geometry specifications
- Exceptional performance and splice-ability
- Suitable for all transmission systems and fully compatible with SMF-28e+® optical fiber, the world's most widely demanded full-spectrum fiber
- In compliance with, or exceeds the industry's most stringent requirements including:
  - ITU-T Recommendations G.652 (Tables A, B, C & D)
  - IEC Specifications 60793-2-50 Type B1.3
  - TIA/EIA 492-CAAB
  - Telcordia Generic Requirements GR-20-Core
  - ISO 11801 OS2
- Improved macro-bend specification from less than 0.05 dB to less than 0.03 dB, allowing better handling and ease of installation
- Tighter zero dispersion wavelength specification
- New coating for improved micro-bending

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Optical Specifications

Fiber Cutoff Wavelength (λ_{cf})	≤ 1305 nm

Maximum Attenuation	Wavelength (nm)	Maximum Value* (dB/km)
	1310	≤ 0.35
	1383 ± 3**	≤ 0.35
	1490	≤ 0.24
	1550	≤ 0.20
	1625	≤ 0.23

* Maximum specified attenuation value available within the stated ranges
** Attenuation post-hydrogen aging according to IEC 60793-2-50 Section C.5 for B.1.3 fibers.

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_0): 1304 nm ≤ λ_0 1324 nm
Zero Dispersion Slope (So): ≤ 0.088 ps/(nm²•km)

Polarization Mode Dispersion (PMD)	Value (ps/√km)
PMD Link Design Value	≤ 0.06*
Maximum Individual Fiber	≤ 0.1

* Complies with IEC 60794-3: 2001, Section 5.5, Method 1, September 2001

The PMD link design 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 PMD. Individual PMD values may change when fiber is cabled. Corning's fiber specification supports network design requirements for 0.5 ps/√km maximum PMD.

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

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Key Geometric, Mechanical and Environmental Specifications

Cladding Diameter (µm)	125.0 ± 0.3
Core-Clad Concentricity (µm)	≤ 0.3
Cladding Non-Circularity (%)	≤ 0.7
Core Diameter (µm)	8.2
Coating Diameter (µm)	242 ± 5
Coating-Cladding Concentricity (µm)	< 12
Coloring Diameter* (µm)	250 +15/-9
Fiber Curl (m)	≥ 5.0 radius of curvature

* If applicable

Environmental Test	Test Condition	Induced Attenuation 1310 nm, 1550 nm & 1625 (dB/km)
Temperature Dependence (°C)	-60 to 85 *	≤ 0.05
Temperature-Humidity Cycling (°C)	-10 to 85 * up to 98% RH	≤ 0.05
Water Immersion (°C)	23 * ± 2	≤ 0.05
Dry Heat Soak (°C)	85 * ± 2	≤ 0.05
Damp Heat (°C)	85 * at 85% RH	≤ 0.05
Operating Temperature Range (°C)	-60 to 85	
Proof Test (kpsi)	≥ 200	
Lengths	Available up to 50.4 km per spool	

* Reference temperature: 23°C

Performance Characterizations*

Numerical Aperture	0.12
Refractive Index Difference (%)	0.36
Effective Group Index of Refraction (N_{eff})	1.4670 @ 1310 nm 1.4677 @ 1550 nm
Fatigue Resistance Parameter (N_d)	20
Coating Strip Force	Dry: 0.6 lb. (3N) Wet 14 day room temperature: 0.6 lb. (3N)
Rayleigh Backscatter Coefficient	-77 dB @ 1310 nm -82 dB @1550 nm

* Values in this table are nominal or calculated values

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The Single-Mode Fiber for Connectors and Components

Corning uses its legendary geometry control and quality leadership to manufacture SMF-28e+® photonic fiber. We focus on tailoring product attributes that allow OEMs to minimize scrap and overall insertion loss while improving active and splice performance. Through precise manufacturing techniques, we assure geometric performance along the entire length of fiber while maintaining nominal mode-field performance.

We proof stress the entire length of SMF-28e+® photonic fiber to ≥ 200 kpsi, which provides OEMs with increased reliability and reduced handling concerns. In addition, we specify a fiber cutoff wavelength of 1280 nm, enabling operability at both 1310 nm and 1550 nm in bare fiber applications.

Designed for Versatility and Performance

For better understanding of the applicable value to customers, Corning has completed studies using active and passive alignment techniques as well as modeled results. This research shows that significant splice performance improvement can result from focusing on nominal geometry performance and reducing deviation of a fiber's core-clad concentricity, cladding diameter, cladding non-circularity and fiber curl. This improvement minimizes high-loss outliers and reduces the average splice loss, contributing to maximized OEM process efficiencies.

Corning manufactures the family of SMF-28e+® fibers using an Outside Vapor Deposition (OVD) process, which produces a totally synthetic, ultra-pure fiber. As a result, Corning fibers have consistent geometric properties, high strength, and low attenuation. OEMs can count on Corning SMF-28e+® photonic fiber to deliver excellent performance and reliability, reel after reel. Measurement methods comply with ITU recommendations G650, IEC 60793-1, and Telcordia GR20-CORE.

Formulas

Dispersion:

$$D(\lambda) \approx \frac{S_0}{4}\left[\lambda - \frac{\lambda_0^4}{\lambda^3}\right] \; ps/(nm \cdot km)$$

For 1200 nm ≤ λ ≤ 1625 nm

Cladding Non Circularity:

$$\frac{Cladding}{Non-Cladding} = \left[1 - \frac{MinCladdingDiameter}{MaxCladdingDiameter}\right] x100$$

For more information about Corning's leadership in Specialty Fiber technology visit our website at www.corning.com/specialtyfiber

To obtain additional technical information, an engineering sample or to place an order for this product, please contact us at:

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