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Corning® SMF-28™ Optical Fiber
Product Information



PI1036
Issued: April 2002
Supersedes: December 2001
ISO 9001 Registered

Corning® Single-Mode Optical Fiber

The Standard For Performance

Corning® SMF-28™ single-mode optical fiber has set the standard for value and performance for telephony, cable television, submarine, and utility network applications. Widely used in the transmission of voice, data, and/or video services, SMF-28 fiber is manufactured to the most demanding specifications in the industry. SMF-28 fiber meets or exceeds ITU-T Recommendation G.652, TIA/EIA-492CAAA, IEC Publication 60793-2 and GR-20-CORE requirements.

Taking advantage of today's high-capacity, low-cost transmission components developed for the 1310 nm window, SMF-28 fiber features low dispersion and is optimized for use in the 1310 nm wavelength region. SMF-28 fiber also can be used effectively with TDM and WDM systems operating in the 1550 nm wavelength region.

Features And Benefits

- Versatility in 1310 nm and 1550 nm applications
- Enhanced optical properties that optimize transmission performance
- Outstanding geometrical properties for low splice loss and high splice yield
- OVD manufacturing reliability and product consistency
- Optimized for use in loose tube, ribbon, and other common cable design

The Sales Leader

Corning SMF-28 fiber is the world's best selling fiber. In 2001, SMF-28 fiber was deployed in over 45 countries around the world. All types of network providers count on this fiber to support network expansion into the 21st Century.

Protection And Versatility

SMF-28 fiber is protected for long-term performance and reliability by the CPC® coating system. Corning's enhanced, dual acrylate CPC coatings provide excellent fiber protection and are easy to work with. CPC coatings are designed to be mechanically stripped and have an outside diameter of 245 µm. They are optimized for use in many single- and multi-fiber cable designs including loose tube, ribbon, slotted core, and tight buffer cables.

Patented Quality Process

SMF-28 fiber is manufactured using the Outside Vapor Deposition (OVD) process, which produces a totally synthetic ultra-pure fiber. As a result, Corning SMF-28 fiber has consistent geometric properties, high strength, and low attenuation. Corning SMF-28 fiber can be counted on to deliver excellent performance and high reliability, reel after reel. Measurement methods comply with ITU recommendations G.650, IEC 60793-1, and Bellcore GR-20-CORE.

Optical Specifications

Attenuation

Wavelength	Attenuation* (dB/km)	
(nm)	Premium	Standard
1310	≤0.34	≤0.35
1550	≤0.20	≤0.22

*Alternate attenuation values available upon request

Point Discontinuity

No point discontinuity greater than 0.10 dB at either 1310 nm or 1550 nm.

Attenuation at the Water Peak

The attenuation at 1383 ± 3 nm shall not exceed 2.1 dB/km.

Attenuation vs. Wavelength

Range (nm)	Ref. λ (nm)	Max. α Difference (dB/km)
1285 - 1330	1310	0.05
1525 - 1575	1550	0.05

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

Attenuation with Bending

Mandrel Diameter (mm)	Number of Turns	Wavelength (nm)	Induced Attenuation* (dB)
32	1	1550	≤0.50
50	100	1310	≤0.05
50	100	1550	≤0.10
60	100	1550	≤0.05

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

Cable Cutoff Wavelength (λ_{ccf})

$\lambda_{ccf} \leq 1260$ nm

Mode-Field Diameter

9.2 ± 0.4 µm at 1310 nm
10.4 ± 0.8 µm at 1550 nm

Dispersion

Zero Dispersion Wavelength (λ_0):
1302 nm ≤ λ_0 ≤ 1322 nm

Zero Dispersion Slope (S_0):
≤ 0.092 ps/(nm²•km)

$$\text{Dispersion} = D(\lambda) \approx \frac{S_0}{4}\left[\lambda - \frac{\lambda_0^4}{\lambda^3}\right] \text{ps/(nm•km)},$$

for 1200 nm ≤ λ ≤ 1600 nm

λ = Operating Wavelength

Polarization Mode Dispersion

Fiber Polarization Mode Dispersion (PMD)

	Value (ps/√km)
PMD Link Value	≤ 0.1*
Maximum Individual Fiber	≤ 0.2

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

The PMD link value is a term used to describe the PMD of concatenated lengths of fiber (also known as the link quadrature average). This value is used to determine a statistical upper limit for system PMD performance.

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

Environmental Specifications

Environmental Test Condition	Induced Attenuation 1310 nm/1550 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°± 2°C*	≤0.05
Heat Aging, 85° ± 2°C*	≤0.05

*Reference temperature = +23°C

Operating Temperature Range

-60ºC to +85ºC

Dimensional Specifications

Length (km/reel): fiber lengths available up to 50.4*

* Longer spliced lengths available at a premium.

Glass Geometry

Fiber Curl: ≥ 4.0 m radius of curvature
Cladding Diameter: 125.0 ± 0.7 µm
Core-Clad Concentricity: ≤ 0.5 µm
Cladding Non-Circularity: ≤ 1.0%

Defined as: $\left[1-\frac{\text{Min. Cladding Diameter}}{\text{Max. Cladding Diameter}}\right] \times 100$

Coating Geometry

Coating Diameter: 245 ± 5 µm
Coating-Cladding Concentricity: <12 µm

Mechanical Specifications

Proof Test

The entire fiber length is subjected to a tensile proof stress ≥ 100 kpsi (0.7 GN/m²)*.

* Higher proof test levels available at a premium.

Performance Characterizations

Characterized parameters are typical values.

Core Diameter: 8.2 µm

Numerical Aperture: 0.14

NA is measured at the one percent power level of a one-dimensional far-field scan at 1310 nm.

Zero Dispersion Wavelength **(λ_0):** 1313 nm

Zero Dispersion Slope **(S_0):** 0.086 ps /(nm²•km)

Refractive Index Difference: 0.36%

Effective Group Index of Refraction,
(N_{eff} @ nominal MFD):

1.4677 at 1310 nm
1.4682 at 1550 nm

Fatigue Resistance Parameter **(n_d)**: 20

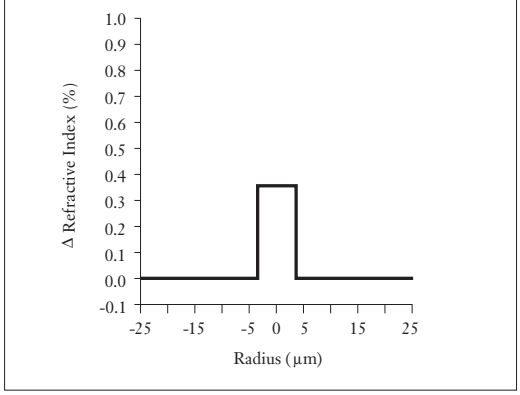
Coating Strip Force:

Dry: 0.6 lbs. (3N)
Wet, 14-day room temperature: 0.6 lbs. (3N)

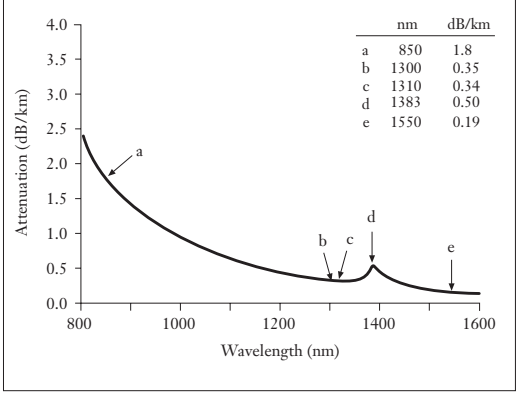
Rayleigh Backscatter Coefficient
(for 1 ns pulse width):

1310 nm: -77 dB
1550 nm: -82 dB

Refractive Index Profile (typical fiber)



Spectral Attenuation (typical fiber)



Ordering Information

To order Corning® SMF-28™ fiber, contact your sales representative, or call the Optical Fiber Customer Service Department at **607-248-2000** or **+44-1244-287-437** in Europe. Please specify the following parameters when ordering.

Fiber Type: Corning® SMF-28™ Fiber

Fiber Attenuation: dB/km

Fiber Quantity: km

Other: (Requested ship date, etc.)

Corning Incorporated
www.corning.com/opticalfiber

One Riverfront Plaza
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U.S.A.

Phone: 800-525-2524 (U.S. and Canada)
607-786-8125 (International)

Fax: 800-539-3632 (U.S. and Canada)
607-786-8344 (International)

Email: cofic@corning.com

Europe

Phone: 00 800 6620 6621 (U.K.*, Ireland, Italy, France, Germany, The Netherlands, Spain and Sweden)

+1 607 786 8125 (All other countries)

Fax: +1 607 786 8344

Asia Pacific

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Fax: 1-800-148-568

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