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Corning® Optical Fiber

Product Information

PI1036

Issued: 1/99
Supersedes: 11/98
ISO 9001 Registered

Corning® SMF-28™ CPC6 Single-Mode Optical Fiber

GENERAL

Corning® SMF-28™ single-mode fiber is considered the "standard" optical fiber for telephony, cable television, submarine, and private network applications in the transmission of data, voice and/or video services. Corning SMF-28 fiber is manufactured to the most demanding specifications in the industry.

SMF-28 fiber is optimized for use in the 1310 nm wavelength region. The information-carrying capacity of the fiber is at its highest in this transmission window, and it is also where dispersion is the lowest. SMF-28 fiber also can be used effectively in the 1550 nm wavelength region.

Corning's enhanced, dual layer acrylate CPC6 coating provides excellent fiber protection and is easy to work with. CPC6 can be mechanically stripped and has an outside diameter of 245 μm. CPC6 is optimized for use in many single and multi-fiber cable designs including loose tube, ribbon, slotted core, and tight buffer cables.

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 .

FEATURES & BENEFITS

- Versatility in 1310 nm and 1550 nm applications.
- Outstanding geometrical properties for low splice loss and high splice yields.
- OVD manufacturing reliability and product consistency.
- Optimized for use in ribbon, loose tube, and other common cable designs.

OPTICAL SPECIFICATIONS

- **Attenuation**

Uncabled Fiber Attenuation Cells		
Wavelength (nm)	Attenuation Cells (dB/km)	
	Premium*	Standard
1310	≤0.35	≤0.40
1550	≤0.25	≤0.30

** Lower attenuation available in limited quantities.*

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 does not exceed 2.1 dB/km.

OPTICAL SPECIFICATIONS, (continued)

Attenuation vs Wavelength		
Range (nm)	Ref. λ (nm)	Max Increase α (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
75	100	1310	≤ 0.05
75	100	1550	≤ 0.10

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

- **Cable Cutoff Wavelength (λ_{ccf})**

  λ_{ccf} < 1260 nm

- **Mode-Field Diameter**

  8.80 to 9.80 μm at 1310 nm
  9.50 to 11.50 μm at 1550 nm

- **Dispersion**

  Zero Dispersion Wavelength (λ_o): 1301.5 nm ≤ λ_o ≤ 1321.5 nm

  Zero Dispersion Slope (S_o): ≤0.092 ps/(nm^2•km)

Fiber Polarization Mode Dispersion (PMD)	
	Value (ps/$\sqrt{km}$)
PMD Link Value	≤0.1*
Maximum Individual Fiber	≤0.2

*Complies with IEC SC 86A/WG1, Method 1, September 1997

◀ 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 emerging network design requirements for a 0.5 psec/$\sqrt{km}$ maximum PMD.

Dispersion Calculation
Dispersion = D (λ): $\approx \frac{S_o}{4}\left[\lambda - \frac{\lambda_o^4}{\lambda^3}\right]$ ps/(nm•km), for 1200 nm ≤ λ ≤ 1600 nm λ = Operating Wavelength

ENVIRONMENTAL SPECIFICATIONS

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

*Reference temperature = +23°C

Operating Temperature Range

-60° C to +85° C

DIMENSIONAL SPECIFICATIONS

Standard Length (km/reel): 2.2 - 25.2

**Longer spliced lengths available at a premium.*

Glass Geometry

Fiber Curl: ≥ 4.0 m radius of curvature

Cladding Diameter: 125.0 ± 1.0 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 length of fiber is subjected to a tensile proof stress ≥ 100 kpsi (0.7 GN/m^2)*.

** Higher proof test available at a premium.*

PERFORMANCE CHARACTERIZATIONS

Characterized parameters are typical values.

Core Diameter:

8.3 μm

Numerical Aperture:

0.13

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

Zero Dispersion Wavelength (λ_o):

1312 nm

Zero Dispersion Slope (S_o):

0.090 ps/(nm^2•km)

Refractive Index Difference:

0.36%

Effective Group Index of Refraction (N_{eff}):

1.4675 at 1310 nm
1.4681 at 1550 nm

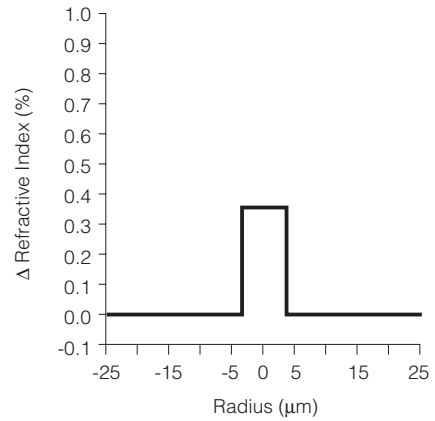
Fatigue Resistance Parameter (n_d):

20

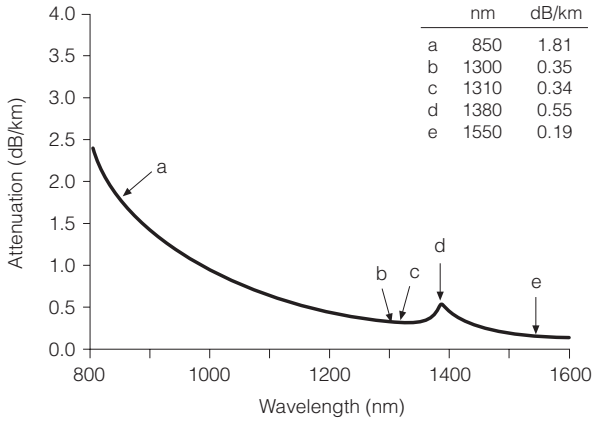
Coating Strip Force:

Dry: 0.6 lbs. (2.7 N)
Wet, 14 days room temperature: 0.6 lbs. (2.7 N)

Refractive Index Profile (typical fiber)



Spectral Attenuation (typical fiber)



	nm	dB/km
a	850	1.81
b	1300	0.35
c	1310	0.34
d	1380	0.55
e	1550	0.19

Ordering Information

To order Corning® SMF-28™ optical fiber, contact your sales representative, or call the Telecommunications Products Division Customer Service Department at **910-395-7659** (North America) and **+1-607-974-7174** (International). Please specify the following parameters when ordering.

Fiber Type: *Corning® SMF-28™ single-mode fiber*

Coating: *CPC6 (245 μm outside diameter)*

Fiber Attenuation Cell: *dB/km*

Fiber Quantity: *kms*

Other: *(Requested ship date, etc.)*

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Corning fiber is made in the USA.

Count on *Corning*® Fiber