Corning® LEAF® Optical Fiber

CORNING
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A Powerful Network Needs:

Backbone by LEAF Fiber.

With the ever-accelerating race for bandwidth, network designers are challenged to build a network for the present that will also maximize future technologies. Deploy the fiber that revolutionized network technology and gives you room to move. Break the bandwidth barrier with a fiber so technologically advanced it gives you the optical backbone you need for today's *and* tomorrow's networks – Corning® LEAF® optical fiber.

Find out what the world's most powerful networks have in common: Backbone by LEAF fiber.

The Large Effective Area Advantage

LEAF fiber's large effective area (A_{eff}) offers higher power-handling capability, improved optical signal-to-noise ratio, longer amplifier spacing, and maximum dense wavelength division multiplexing (DWDM) channel plan flexibility compared with other non-zero dispersion-shifted fibers (NZ-DSFs). Fiber with a large A_{eff} also provides a critical performance advantage – the ability to uniformly reduce all non-linear effects (Figure 1). Non-linear effects represent the greatest performance limitations in today's multi-channel DWDM systems.

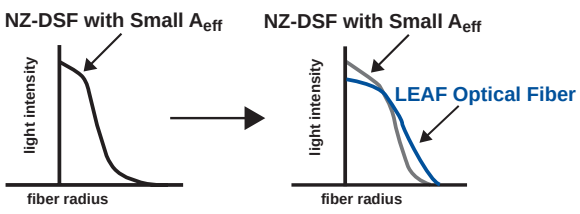
The Next Generation

In addition to outperforming other NZ-DSFs in the conventional band (C-Band: 1530-1565 nm), LEAF fiber facilitates the next technological development in fiber-optic networks -- the migration to the long band (L-Band: 1565-1625 nm). In both C-Band and L-Band operation, LEAF fiber has demonstrated greater ability to handle more channels by reducing non-linear effects such as four-wave mixing, self-phase modulation and cross-phase modulation in multi-channel DWDM transmission.

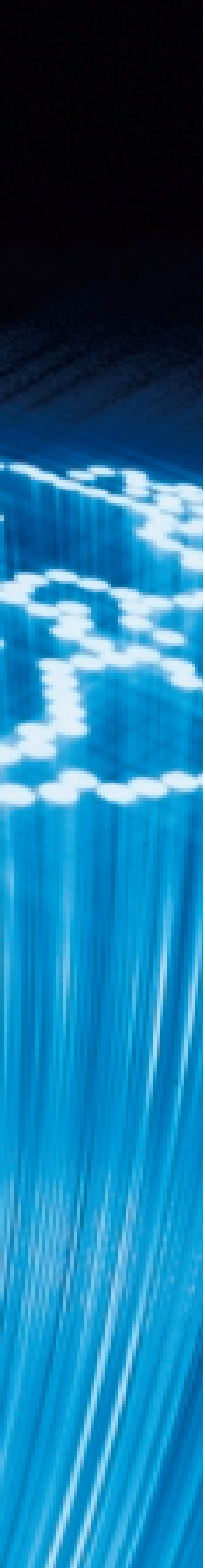
Reduce Network Costs

With its increased optical reach advantage, LEAF fiber requires fewer amplifiers and regenerators, and therefore provides immediate and long-term cost savings. LEAF fiber is also compatible with installed base fibers and photonic components. In fact, LEAF fiber's slightly larger mode-field diameter improves its splicing performance, especially when connecting to standard single-mode fiber such as Corning® SMF-28™ fiber. And, as with all Corning optical fiber, LEAF fiber's geometry package is the best in the industry. With LEAF fiber, it is easy and economical to increase the information-carrying capacity of your network.

Figure 1



LEAF fiber's larger A_{eff} increases the area where the light can propagate, thereby reducing non-linear effects.



Fiber For Today & Tomorrow

While LEAF fiber is exceptionally suited to operate with already-installed 2.5 Gbps systems, it is techno-economically optimized for today's high-channel-count 10 Gbps systems, and provides the ability to upgrade in the future to tomorrow's 40+ channel, 10 Gbps systems. Additionally, LEAF fiber's unparalleled specifications on polarization mode dispersion (PMD) allow fiber installed today to operate at data rates higher than 10 Gbps. The combination of LEAF fiber's large A_{eff} and its demonstrated Raman upgradeability allows transmission engineers to design and build networks advantaged over other fiber plants. As the world's most advanced NZ-DS fiber, LEAF fiber is ready for future technology when your network is.

LEAF Fiber – All About Value

With LEAF fiber's proven large A_{eff} advantage, the industry's best geometry package, and inherent future-proof design, LEAF fiber continues to be the fiber of choice for today's high-capacity and tomorrow's all-optical networks. Network providers on the cutting edge have embraced large A_{eff} technology as the fiber "backbone" for high-data-rate networks now and in the future.

Technology Awards

Corning Incorporated has received multiple industry awards for its patented LEAF optical fiber. Independent panels of experts have chosen LEAF fiber based on its technical merits for the following awards:

- "Annual Technology Award" from *Fiberoptic Product News*
- "Commercial Technology Achievement Award for Fiber-Optics" from *Laser Focus World* Magazine
- "Circle of Excellence Award" from *Photonics Spectra* Magazine
- "R&D 100 Award" from *R&D Magazine*

Coating

Corning 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. CPC coatings are optimized for use in many single- and multi-fiber cable designs, including loose tube, ribbon, slotted core and tight buffer cables.

Optical Specifications

Attenuation

≤ 0.25 dB/km at 1550 nm

≤ 0.25 dB/km at 1625 nm

- No point discontinuity greater than 0.10 dB at 1550 nm
- Attenuation at 1383 ± 3 nm shall not exceed 1.0 dB/km

Attenuation vs Wavelength		
Range (nm)	Ref. λ (nm)	Max Increase α (dB/km)
1525 - 1575	1550	0.05
1625	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. In all cases, a maximum attenuation of ≤ 0.25 dB/km applies at 1550 nm and 1625 nm.

Attenuation With Bending			
Mandrel Diameter (mm)	Number of Turns	Wavelength (nm)	Induced Attenuation (dB)
32	1	1550 & 1625	≤0.50
75	100	1550 & 1625	≤0.05

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

Mode-Field Diameter

- 9.20 to 10.00 µm at 1550 nm

Dispersion

- Total Dispersion: 2.0 to 6.0 psec/(nm•km) over the range 1530 to 1565 nm
- 4.5 to 11.2 psec/(nm•km) over the range of 1565 to 1625 nm

Fiber Polarization Mode Dispersion (PMD)	
	Value (ps/√km)
PMD Link Design Value	≤0.08*
Maximum Individual Fiber	≤0.2

Fiber PMD (Available 1Q 2001+)	
	Value (ps/√km)
PMD Link Design Value	≤0.04*
Maximum Individual Fiber	≤0.1

+*Please contact your cabler for availability*

**Complies with IEC SC 86A/WG1, Method 1, September 1997 (n=24, Q=0.1%)*

The PMD link design value is a term used to describe the PMD of concatenated lengths of fiber (also known as PMD_Q). This value represents a statistical upper limit for total link PMD.

PMD values may change when fiber is cabled. Corning's fiber specification supports emerging network design requirements for high-data-rate systems operating at 10 Gbps (TDM) rates and higher.

Environmental Specifications

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

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

**Reference Temperature* = +23°C

Dimensional Specifications

Standard Length (km/reel)

- 4.4 - 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.

Effective Area (A_{eff})

- 72 μm^2

Effective Group Index of Refraction (N_{eff})

- 1.469 at 1550 nm

Fatigue Resistance Parameter (n_d)

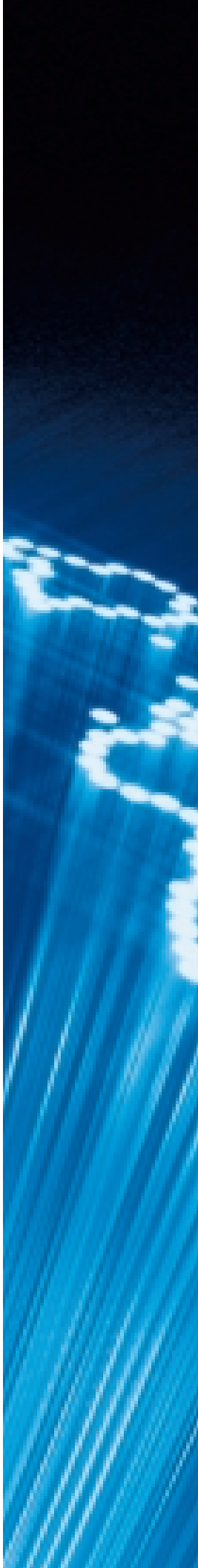
- 20

Coating Strip Force

- Dry, 2.8 N (0.6 lbs)
- Wet, 14 days room temperature: 2.7 N (0.6 lbs)

Consistency with Global Standards

The values in this product information sheet demonstrate Corning® LEAF® fiber's conformity with ITU-T Recommendation G.655, IEC 60793-2 for B4 class fibers and Belcore/Telcordia GR-20-CORE.



Dispersion Calculation

$$\text{Dispersion} = D(\lambda) = \left(\frac{D(1565\text{ nm}) - D(1530\text{ nm})}{35} * (\lambda - 1565)\right) + D(1565\text{ nm})$$

λ = *Operating wavelength up to 1565*

$$\text{Dispersion} = D(\lambda) = \left(\frac{D(1625\text{ nm}) - D(1565\text{ nm})}{60} * (\lambda - 1625)\right) + D(1625\text{ nm})$$

λ = *Operating wavelength from 1565–1625*

Special selections of LEAF fiber attributes are available upon request.

Ordering Information

To order Corning® LEAF® optical fiber, contact your sales representative, or call Optical Fiber Customer service at **910-395-7659** (North America) and **+1 607-974-7174** (International). Please specify the following parameters when ordering.

Fiber Type: Corning® LEAF® Non-Zero Dispersion-Shifted Single-Mode Fiber

Fiber Attenuation Cell: dB/km

Fiber Quantity: kms

Other: (Requested ship date, etc.)

Corning Incorporated
Optical Fiber
Corning, NY 14831

Tel: 800-525-2524 (North America)
Tel: +1 607-786-8125 (International)

Fax: 800-539-3632 (North America)
Fax: +1 607-786-8344 (International)

E-mail: info@corningfiber.com
Internet: www.corning.com/opticalfiber

Europe

Tel: +800-2800-4800 (U.K.*, Ireland, France, Germany, The Netherlands, Spain and Sweden)

*Callers from U.K. dial (00) before the phone number

Tel: +1 800-781-516 (Italy)
+44-20-7659-7994

For all other European countries

Fax: +44-20-7408-2357
E-mail: europe@corningfiber.com