

# Corning: Reliably Small

A suite of fibers providing “End-to-End” compact EDFA packaging solutions with uncompromising reliability.

Enabling 10 mm bend radius.

Corning understands the changing needs of the telecom industry. Fibers must have the capacity to reliably handle steadily increasing information at higher data rates, in an ever decreasing footprint.

As module packages shrink in response to these changes, long lengths of fiber are deployed in permanently bent configurations, requiring consideration of the optical and mechanical impact of continuous, tightly wound coils.

Corning offers a complete suite of fibers ideally suited for compact optical amplifiers, modules and photonic components which are capable of performing reliably down to a 10 mm bend radius.

## Coupler Fibers

- 980 nm
- Pump Pigtails, FBT Couplers, Taps, etc.

## Erbium-Doped Fibers

Gain Medium

## Signal Transmission Fibers

- 1550 nm / C-Band
- Components Leads, Taps, Input/Output



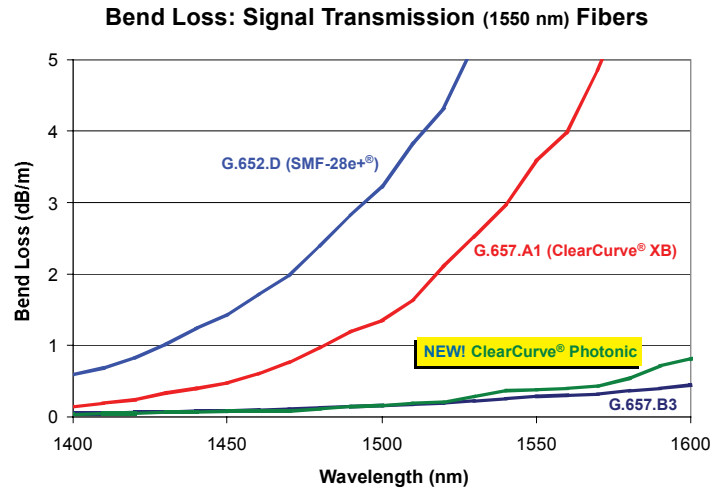
CORNING

# Optical Solutions

## Signal Transmission Fiber

### NEW! Corning® ClearCurve® Photonic Specialty Optical Fiber

Designed specifically for the optimizing performance of photonic components, ClearCurve® Photonic fiber provides low bend loss even when meters of fiber are coiled to a 10 mm bend radius. Tighter geometrical control promotes good coupler and micro-optic component performance and exceptional splicing, as well as superior long term mechanical reliability for permanent deployment in a bent configuration.

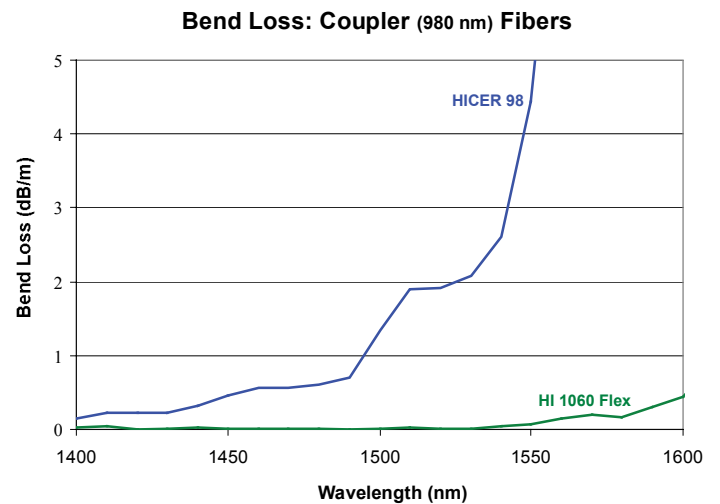


All fibers tested at 10 mm bend radius and data is shown as dB per meter.

## Coupler Fiber

### Corning® HI 1060 Flex Specialty Optical Fiber

Engineered for fused biconic taper (FBT) component manufacturing, HI 1060 Flex fiber is ideally suited for miniature EDFA components where pump and signal optimization are important by combining ultra-low bend loss, low excess loss and excellent spliceability.



All fibers tested at 10 mm bend radius and data is shown as dB per meter.

## Erbium Fiber

### Corning® ER1550C3 Specialty Optical Fiber

Ideally suited to ultra-compact EDFA modules. Minimizes bend induced loss when coiled, especially at longer wavelengths, particularly in continuous, tight bend applications. Consistently minimizes splice loss to Corning Specialty High Index Fibers. An available high absorption version enables shorter coil lengths to further minimize packaging volume.

Bend Loss (dB/m)						
Bend Radius	16 mm		10 mm		5 mm	
Erbium Type	1570 nm	1620 nm	1570 nm	1620 nm	1570 nm	1620 nm
ER 1550C3 LC	<0.005	<0.005	0.02	0.13	16.5	>25
ER 1550C3	-	-	-	-	<0.05	0.05

ER 1550C3 fiber is designed specifically to be bent to very small radius with low bend loss.

# Uncompromising Reliability

## Mechanical considerations for tightly coiled optical fibers must assure long term reliability in addition to superior performance.

The physical limits which drive strength are determined by the glass diameter of the fiber and not the coating diameter. These limits must continue to be adhered to regardless of the optical performance of the fiber in order to assure long term mechanical reliability in its application.

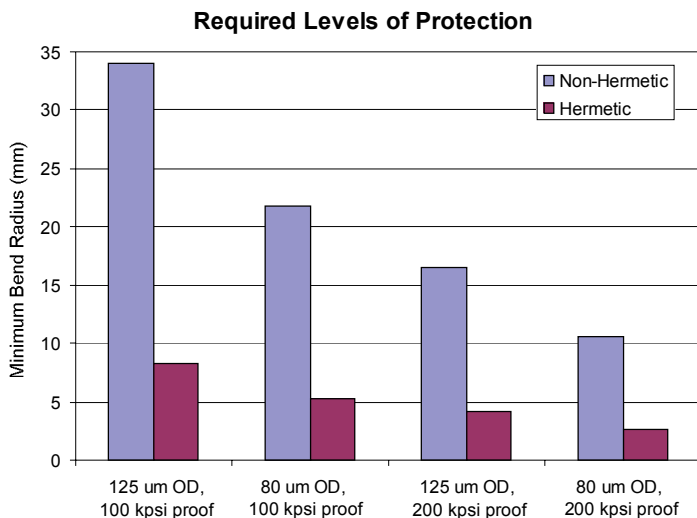
After extensive studies and decades of experience, Corning has determined the optimum levels of protection required for a variety of challenging applications.

### Level 1: Proof Test to 200 kpsi

Proof test is a processing step which eliminates flaws that lead to failure below a given strength. Standard proof test level is typically 100 kpsi. By increasing the proof test level to 200 kpsi, a fiber can withstand being placed under a higher stress level.

### Level 2: Coat with Hermetic Carbon

Coiled Erbium doped fibers permanently subjected to bend induces stress are susceptible to a mechanical aging failure known as fatigue. Ambient water vapor (OH) surrounding a coiled fiber promoted stress corrosion. A hermetic carbon coating layer applied during coating manufacture provides a protective barrier that prevents moisture molecules from attacking the glass. Corning has successfully implemented hermetic coating to inhibit fatigue in fiber in long haul undersea applications since 1992.



**Assumptions:**\* Allowed Safe Stress Level = 1/5 Proof Test Level  
40 year life, zero failure.\*\*

### Level 3: Reduce Glass Cladding Diameter to 80 μm

Reducing the glass cladding diameter of a fiber can enable a significant step-change in package size. Corning offers a full suite of fibers in EDFAs, optical modules and photonic components with an 80 μm cladding diameter to support further reduction of package size with our uncompromising reliability.

\* WP 5053

\*\* Use of these guidelines will not guarantee that a fiber will not fatigue or fail. They are based on the knowledge of the strength distribution of Corning fibers as manufactured and does not include any reduction in strength distribution from subsequent handling.

# Corning's commitment to fiber reliability.

Corning's ongoing research and test activities continuously improve the knowledge and understanding of how new applications affect the performance and reliability of Corning® optical fibers. Listed below are a series of Corning White Papers summarizing these studies and providing guidelines for best practice when using fibers in tight bend applications .

- Reference**      WP3690 "The Mechanical Reliability of Corning® Optical Fiber in Bending"
- WP1282 "The Mechanical Reliability of Corning® Optical Fibers in Small Bend Scenarios"
- WP5053 " Mechanical Reliability: Applied Stress Design Guidelines"
- WP3627 "Suggested Guidelines for the Handling of Optical Fiber"

## Corning's Outside Vapor Deposition Process

Corning's patented Outside Vapor Deposition (OVD) manufacturing process creates the most consistent fiber in the world. Producing 100 percent synthetic glass, the OVD process greatly reduces, if not eliminates, impurities that can affect fiber performance. It also provides a greater degree of control and flexibility in fiber design.

For more information about Corning's leadership in Specialty Optical Fiber technology visit our website at [www.corning.com/specialtyfiber](http://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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