

## Corning® Hermetic Single-Mode and Multimode Specialty Optical Fibers



Corning® Hermetic single-mode and multimode fibers are designed for applications requiring improved fatigue resistance, high useable strength and excellent resistance to hydrogen permeation into optical fibers. Corning's specialty designed hermetic layer provides a protective barrier to help shield the glass from exposure to hydrogen, water, and corrosive chemicals while maintaining optical qualities comparable to standard fibers. The properties of the hermetic layer increase the fatigue performance of the fiber five times compared with nonhermetic fibers. Corning's hermetic layer is a thin layer of amorphous carbon that is bonded to the glass surface of the optical fiber. The fiber is manufactured with Corning's patented outside vapor deposition (OVD) process. The Hermetic single-mode and multimode specialty fibers offer high reliability and consistent performance for a variety of applications.

### Applications

- Hydrogen-rich environments
- Long distance undersea links
- Sensors
- Increased fatigue resistance for tight bend applications

### Features

- No hydrogen aging at room temperature up to 85°C
- Low attenuation
- Outstanding consistency and uniformity using Corning's patented OVD process
- Efficient coupling
- Dual acrylate coating system provides excellent protection from microbend-induced attenuation and superior mechanical robustness
- Fibers include:
  - Single-mode: optimized for 1310 nm and 1550 nm wavelengths
  - Multimode: optimized for 850 nm and 1300 nm wavelengths
  - Inquire for other glasses

| Key Optical Specifications   | SMFHA                                       | MMFHA                         |
|------------------------------|---------------------------------------------|-------------------------------|
| Operating Wavelength (nm)    | 1310, 1550                                  | 850, 1300                     |
| Fiber Cutoff Wavelength (nm) | ≤ 1260                                      |                               |
| Maximum Attenuation (dB/km)  | 0.4 @ 1310 nm<br>0.25 @ 1550 nm             | 2.5 @ 850 nm<br>0.7 @ 1300 nm |
| Mode-Field Diameter (μm)     | 9.2 ± 0.4 @ 1310 nm<br>10.4 ± 0.5 @ 1550 nm |                               |
| Bandwidth (MHz-km)           |                                             | ≥ 500                         |

| Key Geometric, Mechanical, and Environmental Specifications | SMFHA                                             | MMFHA     |
|-------------------------------------------------------------|---------------------------------------------------|-----------|
| Cladding Outside Diameter (μm)                              | 125 ± 0.7                                         | 125 ± 2.0 |
| Coating Outside Diameter (μm)                               | 245 ± 10                                          | 245 ± 10  |
| Core-to-Cladding Concentricity (μm)                         | ≤ 0.5                                             | ≤ 1.5     |
| Core Diameter (μm)                                          | 8.2 (nominal)                                     | 50 ± 2.5  |
| Standard Lengths                                            | 500 m, 1 km, 2 km, 5 km, 10 km*                   |           |
| Proof Test (kpsi)                                           | 200 or 225                                        |           |
| Operating Temperature (°C)                                  | -60 to +85                                        |           |
| Coating                                                     | Dual layer UV curable acrylate and hermetic layer |           |

\*10 km lengths available for SMFHA only

| Performance Characterizations†                    | SMFHA                                | MMFHA |
|---------------------------------------------------|--------------------------------------|-------|
| Numerical Aperture                                | 0.12                                 | 0.20  |
| Refractive Index Difference (%)                   | 0.36                                 | 1.0   |
| Fatigue Resistance Parameter ( $n_f$ )            | > 100                                | > 100 |
| Effective Group Index of Refraction ( $N_{eff}$ ) | 1.4675 @ 1310 nm<br>1.4681 @ 1550 nm |       |

†Values in this table are nominal or calculated values

| Hydrogen Resistance (Single-Mode Only)     |                                            |
|--------------------------------------------|--------------------------------------------|
| Test Condition                             | Results                                    |
| 21-Day Exposure to Hydrogen @ 11 ATM, 85°C | ≤ 0.2 dB/km induced attenuation at 1240 nm |

Note: Expected attenuation at 1310 nm and 1550 nm for 30-year life at 5 atmospheres hydrogen and 10°C is ≤ 0.05 dB/km.

Corning offers fiber stripping and splicing support for Hermetically coated fibers.

Reference: White Paper "Corning's Hermetically Coated Erbium-doped Specialty Fibers" by Kohli and Glaesemann

For more information about Corning's leadership in specialty fiber technology, visit our website at [corning.com/specialtyfiber](https://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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