

## SPECIALTY SINGLE-MODE FIBER

## Specification Sheet

**ClearLite Micro 1550 Photonic Fibers**

CL MICRO 1550 17 GyroSil™ and CL MICRO 1550 21



Leading Optical Innovations

**Product Description**

OFS offers two Micro Photonic Fibers operating at 1550 nm for use in gyroscopes, military cables and devices, fused fiber couplers and other photonic devices. Micro photonic fibers are designed with cladding ODs of 80  $\mu\text{m}$  versus the more common optical fiber cladding OD of 125  $\mu\text{m}$ . 80  $\mu\text{m}$  has long been the “standard” size in gyroscope and other sensor applications due to the tighter coils achievable when a thinner fiber is used. 80  $\mu\text{m}$  fibers perform equally well in integrated photonic packages where size is an issue and fibers undergo tight bend radii.

OFS has been manufacturing GyroSil fiber for many years. Designed with an NA of 0.17, it has excellent bend performance in gyros and sensors. The single acrylate coating gives a slim fiber diameter of 130  $\mu\text{m}$ .

Micro 1550 21 fiber offers an even higher NA of 0.21 for exceptional bend performance and a carbon/polyimide coating with a diameter of only 100  $\mu\text{m}$ , making it the smallest diameter fiber offered by OFS. Carbon is a very thin undercoat (only a few hundred Angstroms thick) that provides a hermetic barrier and greatly extends the lifetime of fibers that experience high humidity environments. The carbon is followed by a polyimide coating that allows wide temperature performance of -65 to +300°C continuous operation. See our full line of ClearLite Specialty Coated Photonic Fibers for additional coated fibers with 125  $\mu\text{m}$  cladding.

**Typical Applications****Micro 1550 17 GyroSil Fiber:**

- Gyroscopes and sensors
- Integrated photonic devices and components

**Micro 1550 21 Fiber:**

- Small form sensors and devices that will experience exceptional environments
- Oil and gas applications
- Military cables

**Features and Benefits**

- 80  $\mu\text{m}$  cladding with a choice of coatings:
  - 130  $\mu\text{m}$  single-coat urethane acrylate for easy strippability and slim form
  - 100  $\mu\text{m}$  carbon and PYROCOAT™ for -65 to +300°C temperature range and hermeticity
- Choice of NAs: 0.17 and 0.21
- Choice of mode field diameters: 7.5 and 6.0  $\mu\text{m}$

**Related Products & Capabilities**

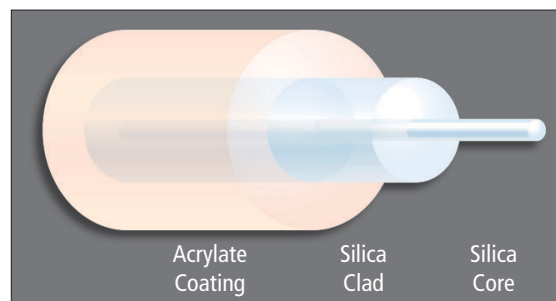
- ClearLite Micro Photonic fibers are available in a variety of wavelengths.
- For use at 1550 nm wavelength, we also offer polarization-maintaining and full-size OD fibers.
- ClearLite 1310 Micro Photonic fibers may also be used at the 1550 nm wavelength for certain applications.

**Ask us about options available for these fibers:**

- Cabling**
- Connectorization**
- Metalization**
- Additional Coatings**
- Other Upgrades**

**To order items on this spec sheet, please contact our facility in:**

- Avon, Connecticut  
1-860-678-0371  
1-888-438-9936 toll free  
(USA and Canada only)  
Fax 1-860-674-8818
- or by email inquiry to:  
Info@SpecialtyPhotonics.com



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**OFS Specialty Photonics Division**

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25 Schoolhouse Road, Somerset, NJ 08873  
Priorparken 680 DK-2605 Broendby, Denmark

**www.SpecialtyPhotonics.com**

## Fiber Specifications

Optical Properties	CL MICRO 1550 17 GyroSil	CL MICRO 1550 21
Operating wavelength	1550 nm	1550 nm
Cutoff wavelength	≤1500 nm	≤1500 nm
Mode field diameter @ 1550 nm	7.5 ± 0.75 μm	6.0 ± 0.75 μm
Attenuation @ 1550 nm	≤0.70 dB/km	≤1.0 dB/km
Numerical aperture (nominal)	0.17	0.21
Dimensions/Geometric Properties		
Core diameter (nominal)	6.5 μm	5.3 μm
Clad diameter	80 ± 2 μm	80 ± 2 μm
Coating/buffer diameter	130 ± 4 μm	100 ± 4 μm
Clad non-circularity	≤2.0%	≤2.0%
Core/clad offset	≤0.75 μm	≤0.75 μm
Coating/Buffer Descriptions		
Coating material	Single UV Acrylate	Carbon/PYROCOAT
Operating temperature	-40 to +85°C	-65 to +300°C
Mechanical and Testing Data		
Short-term bend radius	≥7 mm	≥5 mm
Long-term bend radius	≥11 mm	≥6 mm
Proof test level	≥100 kpsi (0.689 GPa)	≥150 kpsi (1.034 GPa)
Product Description Code	SMM-E1550A	SMM-G1550JZ
Order by Part Number	BF06159	F9697-03

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## SPECIALTY SINGLE-MODE FIBER

## Specification Sheet

## GeoFibers

## GEO 1310 11 AND GEO 1310 16



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## Product Description

Single-mode GeoFibers are designed for use in geophysical applications at the dual wavelengths of 1310/1550 nm. They are offered with two different numerical apertures (NA) of 0.11 and 0.16. In general, fibers with higher NA have enhanced optical bend performance. The 0.11 NA is the standard for fibers deployed linearly and the 0.16 fiber performs well in coiled sensors or inside sensors with small bend radii. OFS is vertically integrated and manufactures fiber preforms using the OFS patented MCVD process. GeoFibers are protected with the dual carbon/polyimide coating system for optimal performance in down-hole deployment.

**Primary Coating.** Years of highly specialized experience and research have gone into designing these optical fibers and applying the customized coating combinations that enable their use in harsh environments. The first line of defense is a very thin primary coating of carbon that chemically bonds with the glass to provide a hermetic seal against moisture at all temperatures. Carbon dramatically extends the lifetime of the fiber by stopping fiber “fatigue” (crack growth activated by water vapor). Carbon has the additional feature of providing a barrier against H<sub>2</sub> ingress at temperatures up to 130°C.

**Secondary Coatings.** OFS recommends a secondary coating of PYROCOAT polyimide, a high-temperature material that allows fiber to perform in environments ranging up to 300°C. It is applied in a thin, continuous coating during the draw process and gives the fiber an outer diameter (OD) of only 155 μm.

## Typical Applications

- Data links
- Single-mode sensors
- Down-hole deployment
- Above-ground well networking
- Raman back-scattering

## Features and Benefits

- Tough glass for harsh environments
- Wavelength performance at both 1310 and 1550 nm
- Choice of NAs: 0.11 and 0.16
- High survivability in water, high temperatures, high pressure, and active chemical environments
- Abrasion resistant
- Long lengths up to 14 km

## Related Products &amp; Capabilities

- See our full line of ClearLite Specialty Coated fibers in a variety of wavelengths.
- Other fibers are available at 1310 nm wavelength without specialty coatings.

## Ask us about options available for these fibers:

- Cabling**
- Connectorization**
- Metalization**
- Additional Coatings**
- Other Upgrades**

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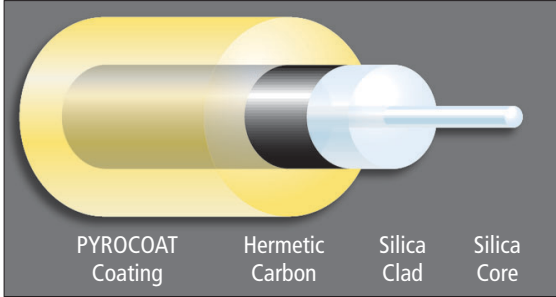
## OFS Specialty Photonics Division

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25 Schoolhouse Road, Somerset, NJ 08873  
Priorparken 680 DK-2605 Broendby, Denmark

[www.SpecialtyPhotonics.com](http://www.SpecialtyPhotonics.com)

# Fiber Specifications

	<b>GEO 1310 11</b>	<b>GEO 1310 16</b>
<b>Optical Properties</b>		
Operating wavelength	1310/1550 nm	1310/1550 nm
Cutoff wavelength	≤1290 nm	≤1290 nm
Mode field diameter @ 1310 nm	9.3 ± 0.5 μm	6.7 ± 1.0 μm
Mode field diameter @ 1550 nm	10.5 ± 1.0 μm	7.5 ± 1.0 μm
Attenuation @ 1310 nm	≤0.7 dB/km	≤0.8 dB/km
Attenuation @ 1550 nm	≤0.6 dB/km	≤0.6 dB/km
Numerical aperture (nominal)	0.11	0.16
<b>Dimensions/Geometric Properties</b>		
Core diameter (nominal)	8.4 μm	6.3 μm
Clad diameter	125 ± 2 μm	125 ± 2 μm
Coating diameter	155 ± 5 μm	155 ± 5 μm
Clad non-circularity	<2.0%	<2.0%
Coating concentricity	≥80%	≥80%
Core/clad offset	≤1.0 μm	≤1.0 μm
<b>Coating/Buffer Descriptions</b>		
Coating material	Hermetic Carbon/PYROCOAT	Hermetic Carbon/PYROCOAT
Operating temperature	-65 to +300°C	-65 to +300°C
<b>Mechanical and Testing Data</b>		
Short-term bend radius	≥4 mm	≥4 mm
Long-term bend radius	≥4 mm	≥4 mm
Proof test level	≥200 kpsi (1.38 GPa)	≥200 kpsi (1.38 GPa)
Product Description Code	<b>SMT-A1310JZ</b>	<b>SMB-D1310JZ</b>
Order by Part Number	<b>BF05717</b>	<b>F9001-01</b>



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## SPECIALTY SINGLE-MODE FIBER

## Specification Sheet

**ClearLite Specialty Coated Photonic Fibers****CL CARBON/POLY 1310 11 and CL POLY 1310 11**

Leading Optical Innovations

**Product Description**

Designed for performance in exceptional environments, these fibers operate at the standard transmission wavelengths of 1310 and 1550 nm.

Both of these fibers are coated with PYROCOAT™ polyimide coating that allows wide temperature performance of -65 to +300°C. Polyimide is a thin coating and is applied to a thickness of only 15 µm on a 125 µm cladding. This gives a coated fiber outer diameter (OD) of 155 µm, as opposed to a standard 250 µm OD for dual acrylate coatings. Both fibers feature a matched clad design with 0.11 NA and large MFDs of 9.3/10.5 µm at the opening wavelengths.

Carbon/Poly 1310-11 also has a base coating of carbon beneath the PYROCOAT coating to provide hermetic protection to the fiber. Most optical fiber breaks originate in microscopic cracks on the fiber surface that propagate over time due to the destructive effects of water vapor. These breaks can be significantly reduced by the

presence of the carbon layer, which provides a hermetic seal on the fiber. The carbon layer is only a few hundred Angstroms thick, but greatly enhances the N-value, or life-time, of the fiber.

**Typical Applications**

- Oil and gas applications
- High-temperature environments
- High application stress and tight coil applications
- High humidity environments

**Features and Benefits**

- Temperature performance of -65 to +300°C continuous operation
- Enhanced fiber lifetime
- 125 µm cladding with a choice of thin coating for smaller packages: 155 µm PYROCOAT polyimide or 155 µm Carbon/PYROCOAT
- Large MFD for mode matching with standard fibers

**Related Products & Capabilities**

- ClearLite specialty coated photonic fibers are available in a variety of wavelengths.
- Other fibers are available at 1310 nm without specialty coatings.

Ask us about options available for these fibers:

- Cabling**
- Connectorization**
- Metalization**
- Additional Coatings**
- Other Upgrades**

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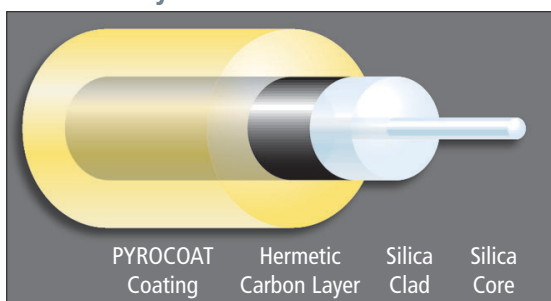


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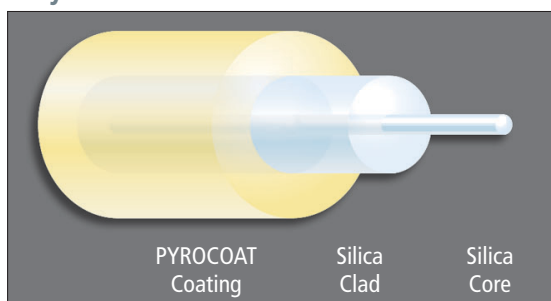
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**Carbon/Poly 1310 11**

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**Poly 1310 11**

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# Fiber Specifications

## Optical Properties

### CL CARBON/POLY 1310 11

### CL POLY 1310 11

Operating wavelength	1310/1550 nm	1310/1550 nm
Cutoff wavelength	≤1290 nm	≤1290 nm
Mode field diameter @ 1310 nm	9.3 ± 0.5 μm	9.3 ± 0.5 μm
Mode field diameter @ 1550 nm	10.5 ± 1.0 μm	10.5 ± 1.0 μm
Attenuation @ 1310 nm	≤0.70 dB/km	≤0.70 dB/km
Attenuation @ 1550 nm	≤0.60 dB/km	≤0.60 dB/km
Numerical aperture (nominal)	0.11	0.11

## Dimensions/Geometric Properties

Core diameter (nominal)	8.4 μm	8.4 μm
Clad diameter	125 ± 2 μm	125 ± 2 μm
Coating/buffer diameter	155 ± 5 μm	155 ± 5 μm
Clad non-circularity	≤2.0%	≤2.0%
Core/clad offset	≤1.0 μm	≤1.0 μm

## Coating/Buffer Descriptions

Coating material	Carbon/PYROCOAT	PYROCOAT
Operating temperature	-65 to +300°C	-65 to +300°C

## Mechanical and Testing Data

Short-term bend radius	≥8 mm	≥10 mm
Long-term bend radius	≥10 mm	≥17 mm
Proof test level	≥100 kpsi (1.38 GPa)	≥100 kpsi (1.38 GPa)

## Product Description Code

SMT-A1310J

SMT-A1310H

## Order by Part Number

BF04447

BF04446

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