

Cladding Mode Free Photosensitive Single-Mode Fiber

Nufern's Cladding Mode Free (CMF) fiber is designed to allow more uniform grating-writing in WDM applications. CMF virtually eliminates all cladding modes allowing tighter channel spacing for high speed communications. Cladding Mode Free fiber is mode-matched to SMF-28™ for telecommunication system use. The polyimide coated CMF fiber is ideally suited for use in a WDM distributed sensing networks operating in high temperature and harsh environments.

Typical Applications

- Couplers
- C+L Band Gratings

Polyimide Version

- Sensors

Features & Benefits

- Excellent cladding mode suppression — allows for tighter channel spacing
- Mode matched to conventional transmission fibers — low splice loss (<0.1 dB typically)

Polyimide Version

- High Temperature coating — enables distributed WDM sensing in harsh environments

Optical Specifications

Operating Wavelength (nominal)	1450 - 1600 nm
Mode Field Diameter	9.1 ± 0.5 μm @ 1550 nm
Second Mode Cut-Off	1370 ± 70 nm
Numerical Aperture (nominal)	0.13

Geometrical & Mechanical Specifications

Clad Diameter	125.0 ± 1.5 μm
Coating Diameter	245 ± 15 μm
Core-Clad Concentricity	< 0.5 μm
Coating/Clad Offset	≤ 5 μm
Coating Material	UV Cured, Dual Acrylate
Operating Temperature	- 55 to +85° C
Short-Term Bend Radius	≥ 6 mm
Long-Term Bend Radius	≥ 13 mm
Proof Test Level	≥ 200 kpsi (1.4 GN/m ²)

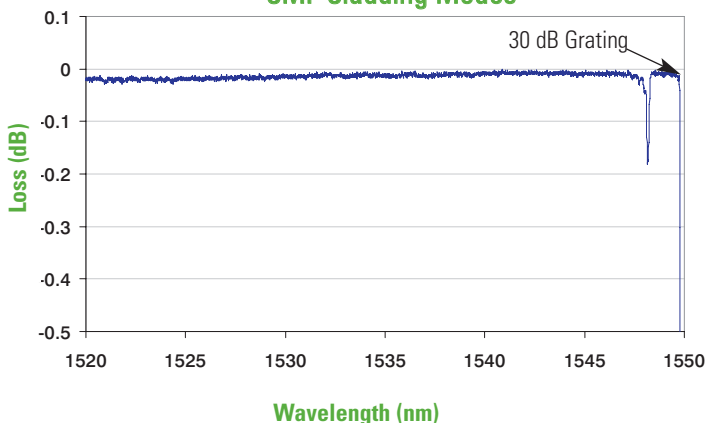
CMF

Operating Wavelength (nominal)	1450 - 1600 nm
Mode Field Diameter	9.1 ± 0.5 μm @ 1550 nm
Second Mode Cut-Off	1370 ± 70 nm
Numerical Aperture (nominal)	0.13

CMF-P

Operating Wavelength (nominal)	1450 - 1600 nm
Mode Field Diameter	9.1 ± 0.5 μm @ 1550 nm
Second Mode Cut-Off	1370 ± 70 nm
Numerical Aperture (nominal)	0.13

CMF Cladding Modes



RoHS

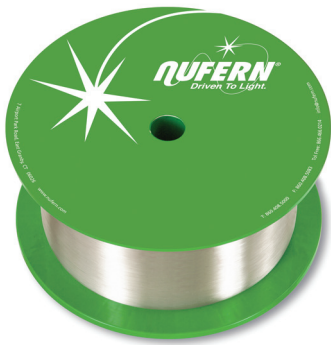


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Cladding Mode Offset Photosensitive Single-Mode Fiber

Nufern's Cladding Mode Offset Fibers offer enhanced performance when writing two or more gratings adjacent to each other (circa 9 nm offset). Cladding Mode Offset fibers exhibit low splice loss to the industry-standard telecommunications fiber. This photosensitive fiber provides a cost-savings for grating-writing because customers can write highly repeatable, quality gratings in a short time.

Typical Applications

- OADM
- C+L Band Gratings
- Sensors

Features & Benefits

- High photosensitivity — shorter grating writing time
- High cladding mode offset ~ 9nm — allows for tighter channel spacing
- Tight mechanical and optical tolerances — high component manufacturing yields

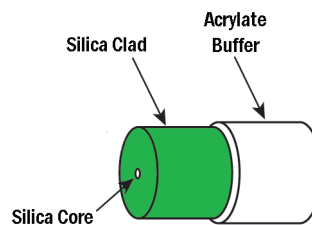
Optical Specifications

Operating Wavelength (nominal)	1550 nm
Mode Field Diameter	4.0 ± 0.3 μm @ 1550 nm
Second Mode Cut-Off	< 1450 nm
Cladding Mode Offset (nominal)	9 nm
Numerical Aperture (nominal)	0.30
Bend Loss at 1550 nm (100 turns, 25 mm radius)	< 0.001 dB
Bend Radius for 0.05 dB per 100 Turns @ 1550 nm	Much less than LTBR

Geometrical & Mechanical Specifications

Clad Diameter	125.0 ± 1.5 μm
Coating Diameter	250 ± 20 μm
Core-Clad Concentricity	< 0.5 μm
Coating/Clad Offset	≤ 5 μm
Coating Material	UV Cured, Dual Acrylate
Operating Temperature	- 55 to +85° C
Short-Term Bend Radius	≥ 12 mm
Long-Term Bend Radius	≥ 25 mm
Proof Test Level	≥ 100 kpsi (0.7 GN/m ²)

GF4A

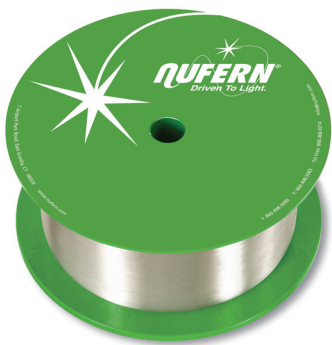


RoHS



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Cladding Mode Suppressed Photosensitive Single-Mode Fiber

Nufern Cladding Mode Suppressed Photosensitive Fiber is designed for very good cladding mode suppression—cladding modes are suppressed to less than 0.1 dB for a 30 dB grating and low splice loss. This photosensitive fiber provides cost-savings for grating-writing because customers can write highly repeatable, quality gratings in a short time.

Typical Applications

- Couplers
- DWDM
- Broadband

Features & Benefits

- Excellent cladding mode suppression — Allows for tighter channel spacing
- Mode matched to conventional transmission fibers — Low splice loss

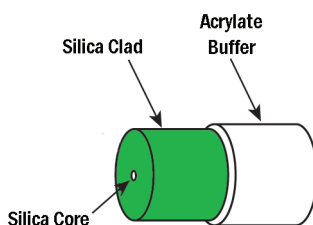
Optical Specifications

Operating Wavelength (nominal)	1400 - 1600 nm
Mode Field Diameter	9.6 ± 0.8 μm @ 1550 nm
Second Mode Cut-Off	< 1380 nm
Cladding Mode Suppression (nominal)	< 0.1 dB for a 30 dB Grating
Numerical Aperture (nominal)	0.14
Bend Loss @ 1550 nm (100 turns, 25 mm radius)	< 0.10 dB
Bend Radius for 0.05 dB per 100 Turns @ 1550 nm	26 mm

Geometrical & Mechanical Specifications

Clad Diameter	125.0 ± 1.5 μm
Coating Diameter	250 ± 20 μm
Core-Clad Concentricity	< 0.5 μm
Coating/Clad Offset	≤ 5 μm
Proof Test Level	≥ 100 kpsi (0.7 GN/m ²)
Coating Material	UV Cured, Dual Acrylate
Operating Temperature	- 55 to +85° C
Short-Term Bend Radius	≥ 12 mm
Long-Term Bend Radius	≥ 25 mm

CMS2



Fiber Construction



RoHS

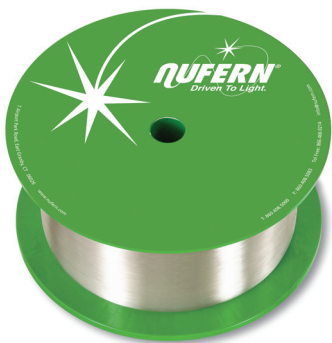


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Cladding Mode Suppressed Photosensitive Single-Mode Fiber

Nufern CMS-HP fiber is a photosensitive single-mode fiber designed for the production of complex Bragg grating structures, such as those with high channel count, wherein cladding mode suppression is a fundamental requirement. This fiber sets a new standard for photosensitive telecom fibers, with its excellent cladding mode suppression, high intrinsic photosensitivity, low birefringence, and low polarization mode dispersion (PMD). It allows easy, uniform grating writing; tighter channel spacing; and low splice loss to standard transmission fibers.

Typical Applications

- Dispersion compensators
- DWDM gain flattening filters

Features & Benefits

- Excellent cladding mode suppression — Allows for tighter channel spacing
- Mode matched to conventional transmission fibers — Low splice loss
- Designed to achieve low PMD — Enables the development of low PDL devices

Optical Specifications

Operating Wavelength (nominal)	1450 - 1600 nm
Mode Field Diameter	6.5 ± 1.0 μm @ 1550 nm
Second Mode Cut-Off	1400 ± 50 nm
Cladding Mode Suppression (nominal)	< 0.05 dB for a 35 dB Grating
Numerical Aperture (nominal)	0.18
Bend Loss @ 1550 nm (100 turns, 25 mm radius)	< 0.10 dB
Bend Radius for 0.05 dB per 100 Turns @ 1550 nm	26 mm

CMS-HP

Geometrical & Mechanical Specifications

Clad Diameter	125 ± 1 μm
Coating Diameter	245 ± 15 μm
Core-Clad Concentricity	< 0.5 μm
Coating/Clad Offset	≤ 5 μm
Proof Test Level	≥ 200 kpsi (1.4 GN/m ²)
Coating Material	UV Cured, Dual Acrylate
Operating Temperature	- 55 to +85° C
Short-Term Bend Radius	≥ 6 mm
Long-Term Bend Radius	≥ 13 mm



RoHS

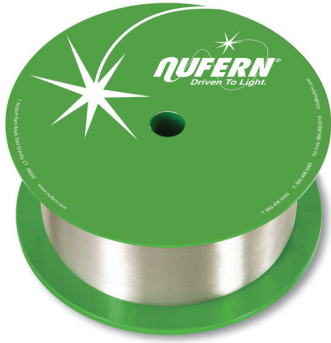


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Photosensitive Single-Mode Fiber

Nuferm photosensitive fibers are designed to reduce grating-writing times associated with industry-standard telecommunication fiber and can be easily spliced. These photosensitive fibers provide cost-savings for grating-writing because customers can write highly repeatable, quality gratings in a short time.

Typical Applications

- WDM
- Gain flattening filters
- Dispersion compensators
- Pump stabilizers

Features & Benefits

- Enhanced photosensitivity — Shorter grating writing time
- Mode-matched to transmission fibers — Low splice loss
- Tightly controlled specifications — Excellent uniformity

Optical Specifications

Operating Wavelength (nominal)
Mode Field Diameter
Second Mode Cut-Off
Numerical Aperture (nominal)
Bend Loss @ 1550 nm
(100 turns, 25 mm radius)
Bend Radius for 0.05 dB
per 100 Turns @ 1550 nm

Geometrical & Mechanical Specifications

Clad Diameter
Coating Diameter
Core-Clad Concentricity
Coating/Clad Offset
Proof Test Level
Coating Material
Operating Temperature
Short-Term Bend Radius
Long-Term Bend Radius

GF1

1500 – 1600 nm
9.3 ± 0.5 μm @ 1310 nm
10.5 ± 1.0 μm @ 1550 nm
1260 ± 75 nm
0.13
< 0.02 dB
Less than LTBR

GF1AA

1500 – 1600 nm
NA
10.5 ± 0.8 μm @ 1550 nm
1350 ± 100 nm
0.13
< 0.02 dB
Less than LTBR

GF3

1500 – 1600 nm
NA
7.5 ± 0.5 μm @ 1550 nm
1350 ± 50 nm
0.16
< 0.001 dB
Less than LTBR

GF1B

1550 nm
NA
10.4 ± 0.8 μm @ 1550 nm
1260 ± 100 nm
0.13
< 0.09 dB
26 mm

125.0 ± 1.5 μm

250 ± 20 μm

< 0.5 μm

≤ 5 μm

≥ 100 kpsi (0.7 GN/m²)

UV Cured, Dual Acrylate

- 55 to +85° C

≥ 12 mm

≥ 25 mm

125.0 ± 1.5 μm

250 ± 20 μm

< 1.0 μm

≤ 5 μm

≥ 100 kpsi (0.7 GN/m²)

UV Cured, Dual Acrylate

- 55 to +85° C

≥ 12 mm

≥ 25 mm

125.0 ± 1.0 μm

245 ± 15 μm

< 0.5 μm

≤ 5 μm

≥ 100 kpsi (0.7 GN/m²)

UV Cured, Dual Acrylate

- 55 to +85° C

≥ 12 mm

≥ 25 mm

125.0 ± 1.0 μm

245 ± 15 μm

< 0.5 μm

≤ 5 μm

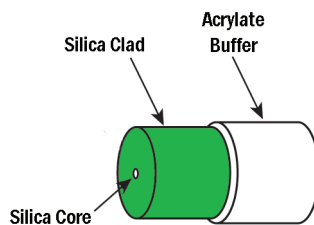
≥ 100 kpsi (0.7 GN/m²)

UV Cured, Dual Acrylate

- 55 to +85° C

≥ 12 mm

≥ 25 mm



Fiber Construction

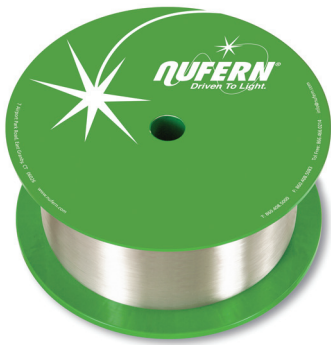


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Photosensitive 980 nm Polarization Maintaining Fiber

Nufern photosensitive 980 nm polarization maintaining fiber is designed to perform all functions of a 980 nm PM fiber but with enhanced photosensitivity for fabrication of gratings. This fiber is designed for use in pump diodes, couplers and multiplexers. PS-PM980 allows component manufacturers to make low cost fibertails for 980 nm pumps. Using one fiber that provides excellent photosensitivity, as well as polarization maintaining attributes, substantially reduces writing time thus lowering costs.

Typical Applications

- Grating-based pump diode pigtailed
- Couplers
- Multiplexers

Features & Benefits

- PANDA-style stress structure for increased birefringence — Superior optical performance and uniformity
- High photosensitivity — Enables low cost, high yield grating fabrication
- Tightly controlled specifications — Excellent uniformity

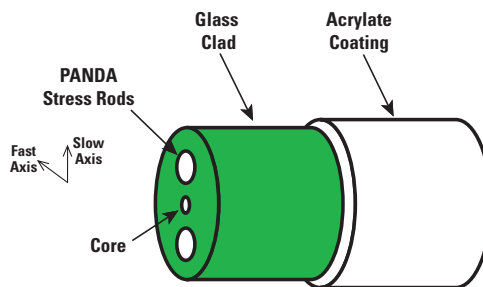
Optical Specifications

Operating Wavelength (nominal)	980 nm
Mode Field Diameter	$6.6 \pm 1.0 \mu\text{m}$ @ 980 nm
Second Mode Cut-Off	$900 \pm 70 \text{ nm}$
Attenuation	$\leq 3.0 \text{ dB/km}$ @ 980 nm
Beat Length	$\leq 3.3 \text{ mm}$ @ 980 nm
Normalized Cross Talk	$\leq -40 \text{ dB}$ at 2 meters
Normalized Cross Talk (nominal)	$\leq -25 \text{ dB}$ at 100 meters

Geometrical & Mechanical Specifications

Clad Diameter	$125.0 \pm 1.5 \mu\text{m}$
Coating Diameter	$245 \pm 15 \mu\text{m}$
Core-Clad Concentricity	$< 0.5 \mu\text{m}$
Coating/Clad Offset	$\leq 5 \mu\text{m}$
Proof Test Level	$\geq 100 \text{ kpsi}$ (0.7 GN/m^2)
Coating Material	UV Cured, Dual Acrylate
Operating Temperature	-40 to +85° C

PS-PM980



RoHS



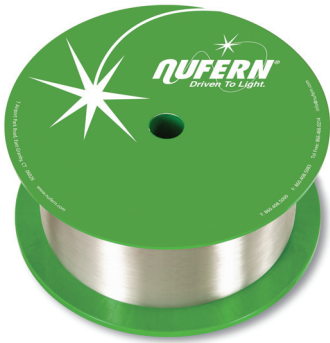
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Photosensitive Select Cut-Off Single-Mode Fiber



Nufern PS1060 photosensitive fiber is designed for use in writing fiber Bragg gratings for pump stabilizers or diode output wavelengths in the 980 to 1060 nm range. PS1060 is also used in coupler applications. This photosensitive fiber provides a cost-savings for grating-writing because customers can write highly repeatable, quality gratings in a short time.

Typical Applications

- Pump stabilizers
- Diode pigtailling
- Couplers

Features & Benefits

- High photosensitivity — Enables low cost, high yield grating fabrication
- Mode matched to standard transmission fiber — Low splice loss

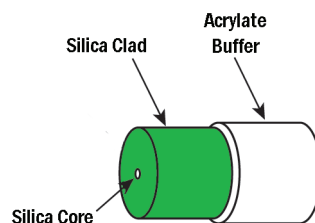
Optical Specifications

Operating Wavelength (nominal)	980 - 1060 nm
Mode Field Diameter	$6.2 \pm 0.8 \mu\text{m}$ @ 1060 nm
Second Mode Cut-Off	$920 \pm 50 \text{ nm}$
Attenuation (nominal)	20 dB/km @ 1060 nm
Numerical Aperture (nominal)	0.13

Geometrical & Mechanical Specifications

Clad Diameter	$125.0 \pm 1.5 \mu\text{m}$
Coating Diameter	$245 \pm 15 \mu\text{m}$
Core-Clad Concentricity	$< 0.5 \mu\text{m}$
Coating/Clad Offset	$\leq 5 \mu\text{m}$
Proof Test Level	$\geq 100 \text{ kpsi}$ (0.7 GN/m ²)
Coating Material	UV Cured, Dual Acrylate
Operating Temperature	- 55 to +85° C
Short-Term Bend Radius	$\geq 12 \text{ mm}$
Long-Term Bend Radius	$\geq 25 \text{ mm}$

PS1060



Fiber Construction



RoHS



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