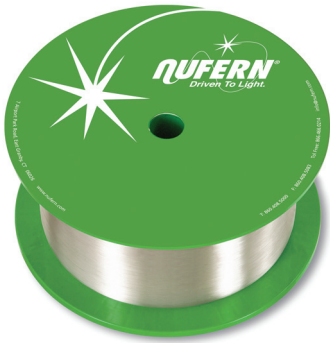


Planar Waveguide Single-Mode Fiber



Nufern extra high-performance Planar Waveguide Fiber provides a solution to the splicing challenges for high NA waveguiding structures. Industry developments indicate the call out for easy interfacing of new planar waveguide (PWG) technology with existing fiber infrastructures. Planar Waveguide Fiber is an excellent bridge fiber between high NA planar waveguides and low NA transmission fiber. This fiber allows outstanding optical coupling with planar waveguides. In addition, the composition of PWG1-XP is tailored to thermally expand the core during splicing and thus achieve low splice loss to transmission fibers.

Typical Applications

- Fibertails for Planar Waveguides
- Bridge Fiber

Features & Benefits

- High numerical aperture — Bend insensitive fiber for miniature packages
- Thermally expandable core — Low splice loss to transmission fiber
- Small Mode Field Diameter — High coupling efficiency with Planar Waveguides

Optical Specifications

Operating Wavelength (nominal)
Mode Field Diameter
Second Mode Cut-Off
Numerical Aperture (nominal)
Bend Loss @ 1550 nm
(100 turns, 13 mm radius)
Bend radius for 0.05 dB per
100 turns @ 1550 nm

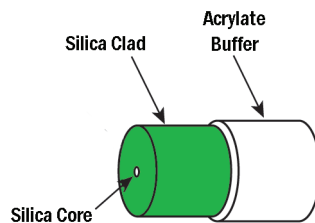
PWG1-XP

1550 nm
 $4.8 \pm 0.5 \mu\text{m}$ @ 1550 nm
 $1330 \pm 50 \text{ nm}$
0.26
< 0.001 dB
Much less than LTBR

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

$125.0 \pm 0.5 \mu\text{m}$
 $245 \pm 10 \mu\text{m}$
 $\leq 0.3 \mu\text{m}$
 $\leq 5 \mu\text{m}$
 $\geq 200 \text{ kpsi (1.4 GN/m}^2\text{)}$
UV Cured, Dual Acrylate
- 55 to + 85° C
 $\geq 6 \text{ mm}$
 $\geq 13 \text{ mm}$



Fiber Construction



RoHS



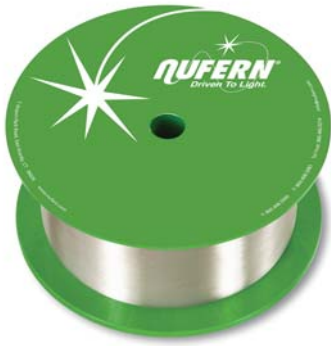
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<http://www.optoscience.com>

東京本社 〒160-0014 東京都新宿区内藤町1番地 内藤町ビルディング
TEL: 03 (3356) 1064 FAX: 03 (3356) 3466 E-mail: info@optoscience.com
大阪支店 〒532-0011 大阪市淀川区西中島7-7-2 新大阪ビル西館
TEL: 06 (6305) 2064 FAX: 06 (6305) 1030 E-mail: osk@optoscience.com
名古屋営業所 〒450-0002 名古屋市中村区名駅2-37-21 東海ソフトビル
TEL: 052 (569) 6064 FAX: 052 (569) 8064 E-mail: ngo@optoscience.com

Ultra-High NA Single-Mode Fibers



Nufern Ultra-High NA fibers are excellent bridge fibers between high NA waveguides and low NA transmission fiber. Ultra-High NA fibers provide excellent coupling efficiencies to high NA waveguides. In addition, the composition of Ultra-High NA fibers are tailored to thermally expand the core during splicing thus achieving lower splice loss to transmission fiber.

Typical Applications

- Fluoride and other non-silica fibers
- Planar Waveguides
- Fiber tails for high NA sources

Features & Benefits

- High numerical aperture — Bend insensitive fiber for miniature packages
- Thermally expandable core — Low splice loss to transmission fiber
- Small Mode Field Diameter — High coupling efficiency with Planar Waveguides

Optical Specifications

Operating Wavelength (nominal)	1100 - 1600 nm
Mode Field Diameter@ 1100 nm	3.3 ± 0.3 μm
Mode Field Diameter@ 1310 nm	4.0 ± 0.3 μm
Mode Field Diameter@ 1550 nm	4.8 ± 0.3 μm
Second Mode Cut-Off	1000 ± 50 nm
Numerical Aperture (nominal)	0.28
Bend Loss @ 1100 nm (100 turns, 25 mm radius)	< 0.001 dB
Bend Loss @ 1550 nm (100 turns, 25 mm radius)	-
Bend Radius for 0.05 dB (per 100 turns, 1100nm)	Much Less than LTBR
Bend Radius for 0.05 dB (per 100 turns, 1550nm)	-

UHNA1

Operating Wavelength (nominal)	1100 - 1600 nm
Mode Field Diameter@ 1100 nm	3.3 ± 0.3 μm
Mode Field Diameter@ 1310 nm	4.0 ± 0.3 μm
Mode Field Diameter@ 1550 nm	4.8 ± 0.3 μm
Second Mode Cut-Off	1000 ± 50 nm
Numerical Aperture (nominal)	0.28
Bend Loss @ 1100 nm (100 turns, 25 mm radius)	< 0.001 dB
Bend Loss @ 1550 nm (100 turns, 25 mm radius)	-
Bend Radius for 0.05 dB (per 100 turns, 1100nm)	Much Less than LTBR
Bend Radius for 0.05 dB (per 100 turns, 1550nm)	-

UHNA3

Operating Wavelength (nominal)	960 - 1600 nm
Mode Field Diameter@ 1100 nm	2.6 ± 0.3 μm
Mode Field Diameter@ 1310 nm	3.3 ± 0.3 μm
Mode Field Diameter@ 1550 nm	4.1 ± 0.3 μm
Second Mode Cut-Off	900 ± 50 nm
Numerical Aperture (nominal)	0.35
Bend Loss @ 1100 nm (100 turns, 25 mm radius)	< 0.001 dB
Bend Loss @ 1550 nm (100 turns, 25 mm radius)	-
Bend Radius for 0.05 dB (per 100 turns, 1100nm)	Much Less than LTBR
Bend Radius for 0.05 dB (per 100 turns, 1550nm)	-

UHNA4

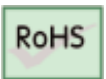
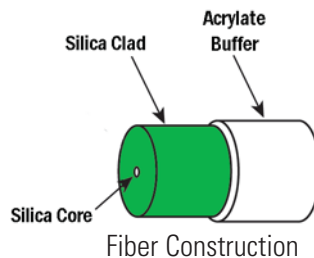
Operating Wavelength (nominal)	1100 - 1600 nm
Mode Field Diameter@ 1100 nm	2.6 ± 0.3 μm
Mode Field Diameter@ 1310 nm	3.3 ± 0.3 μm
Mode Field Diameter@ 1550 nm	4.0 ± 0.3 μm
Second Mode Cut-Off	1050 ± 50 nm
Numerical Aperture (nominal)	0.35
Bend Loss @ 1100 nm (100 turns, 25 mm radius)	< 0.001 dB
Bend Loss @ 1550 nm (100 turns, 25 mm radius)	-
Bend Radius for 0.05 dB (per 100 turns, 1100nm)	Much less than LTBR
Bend Radius for 0.05 dB (per 100 turns, 1550nm)	-

UHNA7

Operating Wavelength (nominal)	1500 - 2000 nm
Mode Field Diameter@ 1100 nm	-
Mode Field Diameter@ 1310 nm	-
Mode Field Diameter@ 1550 nm	3.2 ± 0.3 μm
Second Mode Cut-Off	1450 ± 50 nm
Numerical Aperture (nominal)	0.41
Bend Loss @ 1100 nm (100 turns, 25 mm radius)	-
Bend Loss @ 1550 nm (100 turns, 25 mm radius)	< 0.001 dB
Bend Radius for 0.05 dB (per 100 turns, 1100nm)	-
Bend Radius for 0.05 dB (per 100 turns, 1550nm)	Much less than LTBR

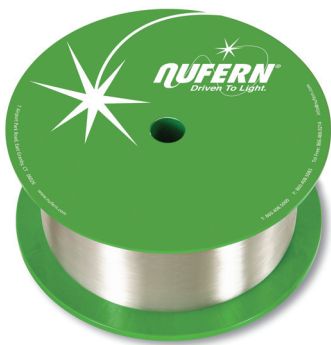
Geometrical & Mechanical Specifications

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



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東京本社 〒160-0014 東京都新宿区内藤町1番地 内藤町ビルディング
 TEL: 03 (3356) 1064 FAX: 03 (3356) 3466 E-mail: info@optoscience.com
 大阪支店 〒532-0011 大阪市淀川区西中島7-7-2 新大阪ビル西館
 TEL: 06 (6305) 2064 FAX: 06 (6305) 1030 E-mail: osk@optoscience.com
 名古屋営業所 〒450-0002 名古屋市中村区名駅2-37-21 東海ソフトビル
 TEL: 052 (569) 6064 FAX: 052 (569) 8064 E-mail: ngo@optoscience.com



Ultra-High NA Select Cut-Off Fiber

Nufer Ultra-High NA fibers are excellent bridge fibers between high NA waveguides and low NA transmission fiber. Ultra-High NA fibers provide excellent coupling efficiencies to high NA waveguides. In addition, the composition of Ultra-High NA fibers are tailored to thermally expand the core during splicing thus achieving lower splice loss to transmission fiber.

Typical Applications

- Fluoride and other non-silica fibers
- Planar Waveguides
- Fiber tails for high NA sources

Features & Benefits

- High numerical aperture — Bend insensitive fiber for miniature packages
- Thermally expandable core — Low splice loss to transmission fiber
- Small Mode Field Diameter — High coupling efficiency with Planar Waveguides

Optical Specifications

Operating Wavelength (nominal)
Mode Field Diameter
Second Mode Cut-Off
Numerical Aperture (nominal)

PS-GSF-3/125

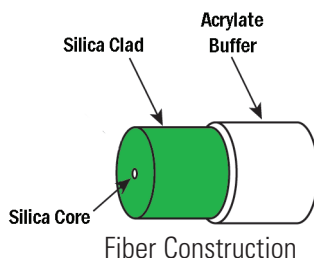
980 - 1600 nm
 $5.0 \pm 1.0 \mu\text{m}$ @ 1550 nm
 $920 \pm 50 \text{ nm}$
0.28

Geometrical & Mechanical Specifications

Clad Diameter
Coating Diameter
Core-Clad Concentricity
Coating/Clad Offset
Proof Test Level
Core Composition
Coating Material
Operating Temperature

$125.0 \pm 1.0 \mu\text{m}$
 $245 \pm 15 \mu\text{m}$
 $< 0.5 \mu\text{m}$
 $\leq 5 \mu\text{m}$
 $\geq 100 \text{ kpsi}$ (0.7 GN/m²)
Photosensitive
UV Cured, Dual Acrylate
- 40 to + 85° C

Note: The active version of this fiber, PS-ESF-3/125, is also available.



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東京本社 〒160-0014 東京都新宿区内藤町1番地 内藤町ビルディング
TEL: 03 (3356) 1064 FAX: 03 (3356) 3466 E-mail: info@optoscience.com
大阪支店 〒532-0011 大阪市淀川区西中島7-7-2 新大阪ビル西館
TEL: 06 (6305) 2064 FAX: 06 (6305) 1030 E-mail: osk@optoscience.com
名古屋営業所 〒450-0002 名古屋市中村区名駅2-37-21 東海ソフトビル
TEL: 052 (569) 6064 FAX: 052 (569) 8064 E-mail: ngo@optoscience.com