

# 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

|                      | UHNA1  | UHNA3  | UHNA4  | UHNA7                  |
|----------------------|--|--|--|------------------------|
| Operating Wavelength | 1100 – 1600 nm   | 960 – 1600 nm  | 1100 – 1600 nm   | 1500 – 2000 nm         |
| Core NA              | 0.280  | 0.350  | 0.350  | 0.410                  |
| Mode Field Diameter  | 4.0 ± 0.3 μm @ 1310 nm<br>4.8 ± 0.3 μm @ 1550 nm<br>3.3 ± 0.3 μm @ 1100 nm | 3.3 ± 0.3 μm @ 1310 nm<br>4.1 ± 0.3 μm @ 1550 nm<br>2.6 ± 0.3 μm @ 1100 nm | 3.3 ± 0.3 μm @ 1310 nm<br>4.0 ± 0.3 μm @ 1550 nm<br>2.6 ± 0.3 μm @ 1100 nm | 3.2 ± 0.3 μm @ 1550 nm |
| Cutoff               | 1000 ± 50 nm   | 900 ± 50 nm  | 1050 ± 50 nm   | 1450 ± 50 nm           |

## Geometrical & Mechanical Specifications

|                             | UHNA1                               | UHNA3                               | UHNA4                               | UHNA7                               |
|-----------------------------|-------------------------------------|-------------------------------------|-------------------------------------|-------------------------------------|
| Cladding Diameter           | 125.0 ± 1.0 μm                      | 125.0 ± 1.0 μm                      | 125.0 ± 1.0 μm                      | 125.0 ± 1.0 μm                      |
| Core Diameter               | 2.5 μm                              | 1.8 μm                              | 2.2 μm                              | 2.4 μm                              |
| Coating Diameter            | 250.0 ± 20.0 μm                     | 250.0 ± 20.0 μm                     | 250.0 ± 20.0 μm                     | 250.0 ± 20.0 μm                     |
| Coating Concentricity       | < 5.0 μm                            | < 5.0 μm                            | < 5.0 μm                            | < 5.0 μm                            |
| Core/Clad Offset            | ≤ 0.50 μm                           | ≤ 0.50 μm                           | ≤ 0.50 μm                           | ≤ 0.50 μm                           |
| Coating Material            | UV Cured, Dual Acrylate             | UV Cured, Dual Acrylate             | UV Cured, Dual Acrylate             | UV Cured, Dual Acrylate             |
| Operating Temperature Range | -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                             |
| Proof Test Level            | ≥ 100 kpsi (0.7 GN/m <sup>2</sup> ) | ≥ 100 kpsi (0.7 GN/m <sup>2</sup> ) | ≥ 100 kpsi (0.7 GN/m <sup>2</sup> ) | ≥ 100 kpsi (0.7 GN/m <sup>2</sup> ) |



7 Airport Park Road, East Granby, CT 06026 • 860.408.5000 • Toll-free 866.466.0214 • Fax 860.844.0210 E-mail info@nufern.com • www.nufern.com Nufern products are manufactured under an ISO 9001:2008 certified quality management system.



Standard specifications and design parameters are listed above. Specifications are subject to change without notice. Other configurations such as alternative form factors, optimized cut-off and UV cured color coating may be available. Let us know how Nufern can assist with your requirements.