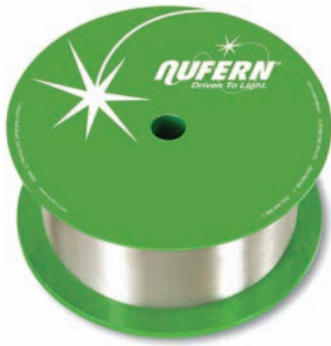


# Triple Clad Ytterbium-Doped Polarization Maintaining Fibers



Nufern's Yb-doped triple-clad fibers are specifically designed to match industry standard diode power delivery fibers. As with our highly successful double clad fiber series these fibers are available with either single-mode or Nufern's robustly single-mode LMA core technology. These fibers incorporate PANDA-style stress elements for superior polarization maintaining properties. The triple clad fibers utilize an additional 0.23 NA inner glass cladding waveguide. This additional feature ensures splice-ability with beam or pump delivery fibers and high power connectorization. It additionally provides an all glass primary waveguide for highest long-term power level capacity.

## Typical Applications

- PM fiber lasers and amplifier
- Very high power PM fiber lasers & amplifiers
- Lasers & amplifiers with classically spliced pumps
- Connectorized lasers & amplifiers

## Features & Benefits

- LMA core technology — Robustly single-mode high output power with reduced non-linearities
- 0.23 NA inner glass cladding — Compatibility to fiber coupled pumps, compatibility to standard connectors
- PANDA-style PM — Superior performance
- Proprietary low Index coating — Captures otherwise spilled light in challenging designs

### Optical Specifications

Operating Wavelength (nominal)	1060 – 1115 nm
Cladding Absorption	0.80 ± 0.15 dB/m @ 915 nm
Cladding Absorption (nominal)	2.5 dB/m @ 975 nm
Core Numerical Aperture	0.12 (nominal)
Mode Field Diameter	7 ± 1 μm @ 1060 nm
Second Mode Cutoff	960 ± 70 nm
Inner Cladding Numerical Aperture (nominal)	0.23
Outer Cladding Numerical Aperture (nominal)	0.46
Birefringence (nominal)	2.0 x 10 <sup>-4</sup>

### PM-YTF-5/105/125

Operating Wavelength (nominal)	1060 – 1115 nm
Cladding Absorption	0.80 ± 0.15 dB/m @ 915 nm
Cladding Absorption (nominal)	2.5 dB/m @ 975 nm
Core Numerical Aperture	0.12 (nominal)
Mode Field Diameter	7 ± 1 μm @ 1060 nm
Second Mode Cutoff	960 ± 70 nm
Inner Cladding Numerical Aperture (nominal)	0.23
Outer Cladding Numerical Aperture (nominal)	0.46
Birefringence (nominal)	2.0 x 10 <sup>-4</sup>

### PLMA-YTF-20/300/330

Operating Wavelength (nominal)	1060 – 1115 nm
Cladding Absorption	0.60 ± 0.15 dB/m @ 915 nm
Cladding Absorption (nominal)	2.0 dB/m @ 975 nm
Core Numerical Aperture	0.06 ± 0.01
Mode Field Diameter	20 ± 2 μm
Second Mode Cutoff	300 ± 15 nm
Inner Cladding Numerical Aperture (nominal)	0.23
Outer Cladding Numerical Aperture (nominal)	0.46
Birefringence (nominal)	3.5 x 10 <sup>-4</sup>

### PLMA-YTF-30/300/330

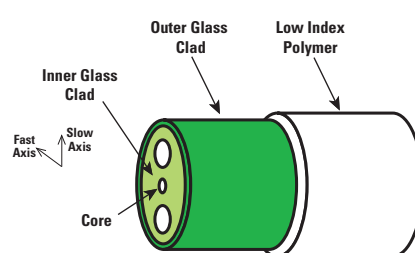
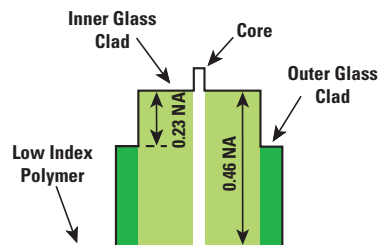
Operating Wavelength (nominal)	1060 – 1115 nm
Cladding Absorption	1.4 ± 0.3 dB/m @ 915 nm
Cladding Absorption (nominal)	4.5 dB/m @ 975 nm
Core Numerical Aperture	0.06 ± 0.01
Mode Field Diameter	30 ± 3 μm
Second Mode Cutoff	300 ± 15 nm
Inner Cladding Numerical Aperture (nominal)	0.23
Outer Cladding Numerical Aperture (nominal)	0.46
Birefringence (nominal)	3.0 x 10 <sup>-4</sup>

### Geometrical & Mechanical Specifications

Core Diameter	7 ± 1 μm
Inner Clad Diameter	105 ± 5 μm
Outer Clad Diameter	125 ± 1 μm
Coating Diameter	245 ± 15 μm
Inner Cladding Material	Silica
Outer Cladding Material	Glass
Coating Material	Low Index Polymer
Proof Test Level (Radius Bend Method)	≥100 kpsi (0.7 GN/m <sup>2</sup> )

Core Diameter	20 ± 2 μm
Inner Clad Diameter	300 ± 15 μm
Outer Clad Diameter	330 ± 15 μm
Coating Diameter	470 ± 20 μm
Inner Cladding Material	Silica
Outer Cladding Material	Glass
Coating Material	Low Index Polymer
Proof Test Level (Radius Bend Method)	≥75 kpsi (0.5 GN/m <sup>2</sup> )

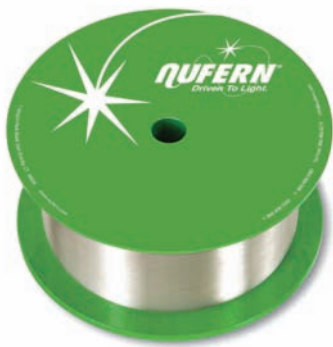
Core Diameter	30 ± 3 μm
Inner Clad Diameter	300 ± 15 μm
Outer Clad Diameter	330 ± 15 μm
Coating Diameter	470 ± 20 μm
Inner Cladding Material	Silica
Outer Cladding Material	Glass
Coating Material	Low Index Polymer
Proof Test Level (Radius Bend Method)	≥75 kpsi (0.5 GN/m <sup>2</sup> )



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# Triple Clad Ytterbium-Doped Large-Mode Area Fibers

Nufern's Yb-doped triple clad fibers are specifically designed to match industry standard diode power delivery fibers. As with our highly successful double clad fiber series these fibers are available with either single-mode or Nufern's robustly single-mode LMA core technology. The triple clad fibers incorporate an additional 0.23 NA inner glass cladding waveguide. This additional feature ensures splice-ability with beam or pump delivery fibers and high power connectorization. It additionally provides an all glass primary waveguide for highest long-term power level capacity.

## Typical Applications

- SM LMA fiber lasers & amplifiers
- Lab standards where connectorization is required
- Extreme environment laser applications
- Portable test and calibration apparatus

## Features & Benefits

- Nufern LMA technology — Robust SM operation, minimized non-linear effects
- Triple clad construction — Easy, conventional splicing, highest long term power handling capability
- Proprietary low Index coating — Captures otherwise spilled light in challenging designs

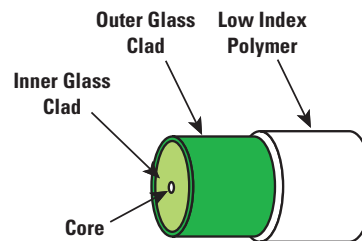
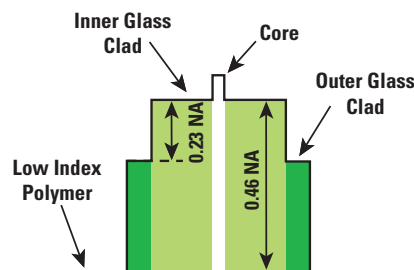
## Optical Specifications

Operating Wavelength (nominal)	1060 – 1115 nm
Inner Cladding Absorption	0.50 ± 0.15 dB/m @ 915 nm
Inner Cladding Absorption (nominal)	1.5 dB/m @ 975 nm
Core Numerical Aperture	0.06 ± 0.01
Inner Cladding Numerical Aperture (nominal)	0.23
Outer Cladding Numerical Aperture (nominal)	0.46

## Geometrical & Mechanical Specifications

Core Diameter	22 ± 2 μm
Inner Clad Diameter	400 ± 20 μm
Outer Clad Diameter	480 ± 15 μm
Coating Diameter	640 ± 25 μm
Inner Cladding Material	Silica
Outer Cladding Material	Glass
Coating Material	Low Index Polymer
Proof Test Level (Radius Bend Method)	≥ 100 kpsi (0.7 GN/m <sup>2</sup> )

## LMA-YTF-22/400/480



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