

EyeSafe 25 Micron Core Thulium-Doped LMA Double Clad Fibers



Nuferm thulium-doped double clad fibers utilize glass compositions specifically optimized for a high degree of cross-relaxations between Tm ions, enabling efficient conversion of 793 nm pump photons into signal photons at 2 μm. The precision matched –M fiber version offers even higher absorption and efficiency compared to the –HE version. In addition, the waveguide design in –M version is specifically tailored to suppress higher order modes for improved beam quality and enabling highly reliable splicing to precision matched passive fibers. The fiber features a 25 μm core and 400 μm clad diameter allowing for a large mode field diameter and power scaling while minimizing non-linear effects such as SBS and SRS. A polarization maintaining Tm doped 25/400 is also available. In addition, precision matched 25/400 passive fibers are available for use in components and beam delivery.

Typical Applications

- High power 2 μm CW and pulsed EyeSafe lasers & amplifiers
- EyeSafe industrial & medical lasers
- Military and commercial LIDAR
- 2 μm fiber lasers for pumping Ho lasers

Features & Benefits

- Unique low NA Tm-doped core design — Robust single-mode beam quality
- Optimized composition for 793 nm pumping — Very high conversion efficiency
- High pump absorption — Short fiber length, efficient lasing in the ~2 μm window

Optical Specifications

	LMA-TDF-25P/400-M	PLMA-TDF-25P/400-HE
Operating Wavelength	1900 – 2100 nm	1900 – 2100 nm
Core NA	0.090 ± 0.010	0.090
First Cladding NA (5%)	≥ 0.460	≥ 0.460
Cladding Attenuation	≤ 15.0 dB/km @ 860 nm	≤ 15.0 dB/km @ 860 nm
Cladding Absorption	0.65 ± 0.15 dB/m at 1180 nm	0.80 ± 0.10 dB/m at 1180 nm
Birefringence	2.00 dB/m at 793 nm N/A	2.40 dB/m at 793 nm nominal 2.5×10^{-4}

Geometrical & Mechanical Specifications

Cladding Diameter	400.0 ± 10.0 μm	400.0 ± 15.0 μm
Core Diameter	24.0 ± 1.5 μm	25.0 ± 2.5 μm
Coating Diameter	550.0 ± 15.0 μm	550.0 ± 20.0 μm
Core/Clad Offset	≤ 2.00 μm	N/A
Coating Material	Low Index Acrylate	Low Index Acrylate
Proof-test Level	≥ 100 kpsi (0.7 GN/m ²)	≥ 100 kpsi (0.7 GN/m ²)

The passive version of each fiber is also available.



Custom developed fiber (FUD) 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 Nuferm can assist with your requirements.

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25/400 with 0.09 NA Matched Passive LMA Double Clad Fiber



Nufern's Large Mode Area (LMA) passive double clad fibers are ideal for high power fiber lasers and amplifiers used in military, industrial, and medical applications. This fiber features a 25 micron diameter core and 400 micron diameter clad size with a low NA (0.09) core. It is precision matched to Tm-doped 25P/400 LMA to ensure excellent splice compatibility and low loss. As with all Nufern standard LMA fibers, this fiber is proof-tested to 100 kpsi, an industry requirement for long term reliability. It utilizes the latest fiber design and NuCOAT-FA™ coating technology to ensure excellent preservation of beam quality and extended operating life at the high power levels demanded by today's industrial fiber laser applications.

Typical Applications

- Eye Safe lasers & amplifiers
- Military and commercial lidar
- ~ 2 μm fiber lasers for pumping solid state Ho lasers
- High peak power pulsed fiber amplifiers

Features & Benefits

- NuCOAT-FA™ fluoroacrylate coating — Greater fiber durability in extreme operating & storage conditions.
- Unique LMA core design — Useful for transmitting high CW powers
- "Few" moded core design — Easy to maintain single mode LP01 beam through fiber & components.
- Tight geometric tolerances — Superior optical performance and uniformity
- All fiber proof tested to > 100 kpsi — Critical for ensuring long term reliability when coiling

Optical Specifications

Operating Wavelength	800 – 2100 nm
Core NA	0.090 \pm 0.010
First Cladding NA (5%)	\geq 0.460
Cladding Attenuation	\leq 15.0 dB/km @ 1095 nm

Geometrical & Mechanical Specifications

Cladding Diameter	395.0 \pm 5.0 μm
Core Diameter	24.0 \pm 1.5 μm
Coating Diameter	550.0 \pm 15.0 μm
Core/Clad Offset	\leq 2.00 μm
Clad Non-Circularity	\leq 0.5 %
Coating Material	Low Index Acrylate
Proof-test Level	\geq 100 kpsi (0.7 GN/m ²)

LMA-GDF-25/400-09M



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