



EyeSafe Large Core Thulium-Doped Multimode Double Clad Fibers

Nufern Thulium-doped double clad fiber utilizes a glass composition specifically optimized for highly efficient operation around the important 2 μm wavelength when pumped at $\sim 793\text{ nm}$. The high Tm concentration of these fibers allows short device lengths and high pump conversion efficiency. The high NA (0.46) large pump cladding waveguide allows for efficient coupling of high pump powers while the ultra-large core diameter (55 μm) facilitates ultra-high output powers without the onset of parasitic non-linear effects such as SBS and SRS.

Typical Applications

- High power CW and pulsed EyeSafe ($\sim 2\ \mu\text{m}$) lasers and amplifiers
- EyeSafe industrial and medical lasers
- Military and commercial LIDAR

Features & Benefits

- Optimized composition for 793 nm pumping — Very high conversion efficiency
- High pump absorption — Short fiber length, efficient lasing in the $\sim 2\ \mu\text{m}$ window

Optical Specifications

Operating Wavelength (nominal)	2000 nm
Peak Cladding Absorption @ 1180 nm	$1.3 \pm 0.3\ \text{dB/m}$
Peak Cladding Absorption @ 793 nm (nominal)	4 dB/m
Birefringence (nominal)	1.5×10^{-4}
Core Numerical Aperture (nominal)	0.20
Cladding Numerical Aperture (5%)	≥ 0.46

Geometrical & Mechanical Specifications

Core Diameter	$55 \pm 5\ \mu\text{m}$
Clad Diameter	$500 \pm 25\ \mu\text{m}$
Coating Diameter	$640 \pm 40\ \mu\text{m}$
Core-Clad Concentricity	$\leq 4\ \mu\text{m}$
Proof Test Level	$\geq 100\ \text{kpsi}$ (0.7 GN/m ²)
Coating Material	Low Index Polymer

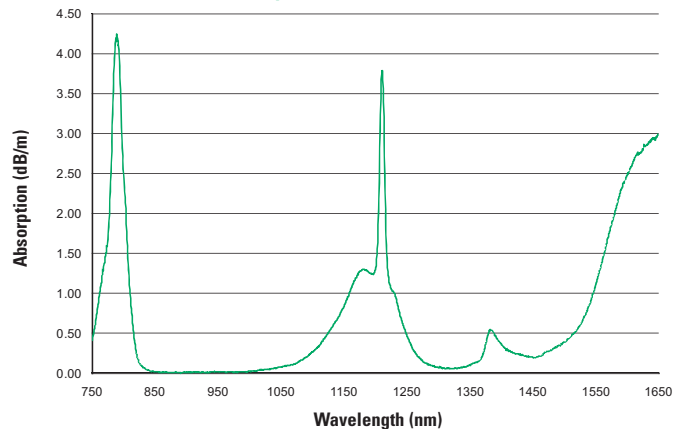
PM-TDF-55/500

MM-TDF-55/500

PM-TDF-40/400

Operating Wavelength (nominal)	2000 nm	2000 nm	2000 nm
Peak Cladding Absorption @ 1180 nm	$1.3 \pm 0.3\ \text{dB/m}$	$1.3 \pm 0.3\ \text{dB/m}$	$1.3 \pm 0.3\ \text{dB/m}$
Peak Cladding Absorption @ 793 nm (nominal)	4 dB/m	4 dB/m	4 dB/m
Birefringence (nominal)	1.5×10^{-4}	-	1.5×10^{-4}
Core Numerical Aperture (nominal)	0.20	0.20	0.20
Cladding Numerical Aperture (5%)	≥ 0.46	≥ 0.46	≥ 0.46
Core Diameter	$55 \pm 5\ \mu\text{m}$	$55 \pm 5\ \mu\text{m}$	$40 \pm 4\ \mu\text{m}$
Clad Diameter	$500 \pm 25\ \mu\text{m}$	$500 \pm 25\ \mu\text{m}$ flat to flat	$400 \pm 15\ \mu\text{m}$
Coating Diameter	$640 \pm 40\ \mu\text{m}$	$640 \pm 40\ \mu\text{m}$	$550 \pm 20\ \mu\text{m}$
Core-Clad Concentricity	$\leq 4\ \mu\text{m}$	$\leq 4\ \mu\text{m}$	$\leq 3\ \mu\text{m}$
Proof Test Level	$\geq 100\ \text{kpsi}$ (0.7 GN/m ²)	$\geq 100\ \text{kpsi}$ (0.7 GN/m ²)	$\geq 100\ \text{kpsi}$ (0.7 GN/m ²)
Coating Material	Low Index Polymer	Low Index Polymer	Low Index Polymer

Absorption for PM-TDF-55/500



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Nufern products are manufactured under an ISO 9001:2000 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.

