

# Eye Safe 25P/250 Thulium-Doped LMA Double Clad Fibers



Coherent 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  $\mu$ m. The precision matched -M fiber version offers higher absorption and extraordinary efficiency. 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. While the high Tm concentration of -M version is optimal for operation at higher wavelengths in the 2  $\mu$ m gain spectrum, the -LC fiber features a lower Tm-concentration best suited for operation in the shorter wavelength region. Both fibers feature a 25  $\mu$ m core and 250  $\mu$ m clad diameter allowing for a large mode field diameter and short device lengths thereby minimizing non-linear effects such as SBS and SRS. Precision matched 25/250 passive fibers are available for use in components and beam delivery.

## Typical Applications

- Eye Safe (~2 $\mu$ m) lasers & amplifiers
- Military and commercial lidar
- ~2 $\mu$ m fiber lasers for pumping solid state Ho lasers
- High peak power pulsed fiber amplifiers

## Features & Benefits

- NuCOAT<sup>TM</sup> fluoroacrylate coating — Greater fiber durability in extreme environmental operating & storage conditions
- Unique low NA Tm-doped core design — Robust single-mode beam quality
- Optimized composition for 793nm pumping — Very high conversion efficiency
- High pump absorption — Short fiber length, efficient lasing in the ~2 $\mu$ m window
- All fiber proof tested to > 100 kpsi — Critical for ensuring long term reliability when coiling

## Optical Specifications

	LMA-TDF-25P/250-M	LMA-TDF-25P/250-LC
Operating Wavelength	1900 – 2100 nm	1900 – 2100 nm
Core NA	0.090 $\pm$ 0.010	0.090
First Cladding NA (5%)	$\geq$ 0.460	$\geq$ 0.460
Cladding Attenuation	$\leq$ 15 dB/km @ 860 nm	$\leq$ 15 dB/km @ 860 nm
Cladding Absorption	2.10 $\pm$ 0.30 dB/m at 1180 nm 6.30 dB/m at 793 nm	1.00 $\pm$ 0.20 dB/m at 1180 nm 3.00 dB/m at 793 nm

## Geometrical & Mechanical Specifications

Cladding Diameter	250.0 $\pm$ 5.0 $\mu$ m	250.0 $\pm$ 5.0 $\mu$ m
Core Diameter	24.0 $\pm$ 1.5 $\mu$ m	25.0 $\pm$ 2.0 $\mu$ m
Coating Diameter	395.0 $\pm$ 15.0 $\mu$ m	395.0 $\pm$ 15.0 $\mu$ m
Core/Clad Offset	$\leq$ 2.00 $\mu$ m	N/A
Coating Material	Low Index Acrylate	Low Index Acrylate
Proof test Level	$\geq$ 100 kpsi (0.7 GN/m <sup>2</sup> )	$\geq$ 100 kpsi (0.7 GN/m <sup>2</sup> )

The passive version of each fiber is also available.



Nufern • 7 Airport Park Road, East Granby, CT 06026 • 860.408.5000 • Toll-free 866.466.0214 • Fax 860.844.0210 • Email: tech.sales@coherent.com  
www.coherent.com ; www.shop.coherent.com • Coherent products are manufactured under an ISO 9001:2008 certified quality management system.



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 Coherent can assist with your requirements.