

Eye Safe 10P/130 Thulium-Doped Single-Mode 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 μm. The precision matched –M fiber version offers even higher absorption and efficiency than the –HE version. In addition, the waveguide design in the –M version is specifically tailored to offer a truly single-mode operation in monolithic fiber laser and amplifier systems when spliced to the precision matched passive fibers. These fibers, along with matching passive fibers, are available in 130 μm cladding diameter for ease of handling, cleaving and splicing, enabling reliable manufacturing of low power, eye-safe, fiber lasers and amplifiers.

Typical Applications

- Low to mid power CW and pulsed lasers & amplifiers
- Eye Safe industrial & medical lasers
- Military and commercial LIDAR
- Pumping of Ho-doped lasers & amplifiers

Features & Benefits

- Optimized core composition — High efficiencies when pumped at 793 nm
- Optimized waveguide design — Truly single-mode operation
- High absorption — Useful for generating high peak powers
- NuCOAT_{FA}TM fluoroacrylate coating — Greater fiber durability in extreme operating and storage conditions
- All fiber proof tested to > 100 kpsi — Critical for ensuring long term reliability when coiling

Optical Specifications

	SM-TDF-10P/130-M	PM-TDF-10P/130-HE
Operating Wavelength	1900 – 2100 nm	1900 – 2100 nm
Core NA	0.150	0.150
First Cladding NA (5%)	≥ 0.46	≥ 0.46
Cutoff	1825 ± 75 nm	N/A
Cladding Attenuation	≤ 15.0 dB/km @ 860 nm	≤ 15 dB/km @ 860 nm
Cladding Absorption	1.50 ± 0.30 dB/m at 1180 nm	1.60 ± 0.30 dB/m at 1180 nm
	9.00 dB/m at 793 nm	9.60 dB/m at 793 nm
Birefringence	N/A	nominal 1.5 × 10 ⁻⁴

Geometrical & Mechanical Specifications

	SM-TDF-10P/130-M	PM-TDF-10P/130-HE
Cladding Diameter	130.0 ± 1.5 μm	130.0 ± 1.0 μm
Core Diameter	10.0 μm	10.0 ± 1.0 μm
Coating Diameter	215.0 ± 10.0 μm	215.0 ± 10.0 μm
Coating Concentricity	< 5.0 μm	N/A
Core/Clad Offset	≤ 1.00 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.



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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.

10/130 Precision Matched Passive Double Clad Fibers for 2 Micron



These Coherent precision matched passive double-clad fibers feature a 10 μm core diameter and a 130 μm clad diameter and are optimized to match Coherent's active Tm-doped 10P/130 fibers. This precise matching allows for the lowest splice loss, improving performance for all applications, including low to mid-power CW and pulsed fiber lasers and amplifiers operating in the 2 μm wavelength range. The small core, 0.15 NA fiber facilitates low bend loss and highly efficient single-mode operation while the telecom-like 130 μm cladding diameter makes handling, including cleaving and splicing, as simple as possible.

Typical Applications

- Low to mid power CW and pulsed Eye Safe 2 μm lasers & amplifiers
- Eye Safe industrial & medical lasers
- Military and commercial LIDAR

Features & Benefits

- NuCOATTM fluoroacrylate coating — Greater fiber durability in extreme environmental operating & storage conditions
- Robust single-mode core at $\sim 2 \mu\text{m}$ — Easy to maintain single-mode LP01 beam through fiber and components
- PANDA-style stress structure for increased birefringence — Superior optical performance
- All fiber proof tested to > 100 kpsi — Critical for ensuring long term reliability when coiling
- Tight geometric tolerances — Excellent lot to lot uniformity

Optical Specifications

Operating Wavelength
Core NA
First Cladding NA (5%)
Cladding Attenuation
Birefringence

SM-GDF-10/130-15M

800 – 2100 nm
0.150 \pm 0.010
 ≥ 0.460
 $\leq 15.0 \text{ dB/km @ } 1095 \text{ nm}$
N/A

PM-GDF-10/130-2000-M

800 – 2100 nm
0.150
 ≥ 0.460
 $\leq 15.0 \text{ dB/km @ } 1095 \text{ nm}$
nominal 1.5×10^{-4}

Geometrical & Mechanical Specifications

Cladding Diameter
Core Diameter
Coating Diameter
Coating Concentricity
Core/Clad Offset
Clad Non-Circularity
Coating Material
Proof-test Level

130.0 \pm 1.0 μm
10.0 \pm 1.0 μm
215.0 \pm 10.0 μm
< 5.0 μm
 $\leq 0.70 \mu\text{m}$
 $\leq 0.5 \%$
Low Index Acrylate
 $\geq 100 \text{ kpsi (} 0.7 \text{ GN/m}^2\text{)}$

130.0 \pm 1.0 μm
10.0 \pm 1.0 μm
245.0 \pm 10.0 μm
< 5.0 μm
 $\leq 0.70 \mu\text{m}$
N/A
Low Index Acrylate
 $\geq 100 \text{ kpsi (} 0.7 \text{ GN/m}^2\text{)}$



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