Eye Safe 10P/130 Thulium-Doped Single-Mode Double Clad Fibers

Nufern 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}™ 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 ± 0.015	0.150
First Cladding NA (5%)	≥ 0.46	≥ 0.46
Cladding Attenuation	≤ 15.0 dB/km @ 860 nm	≤ 15 dB/km @ 860 nm
Cladding Absorption	1.20 ± 0.30 dB/m at 1180 nm 3.60 dB/m at 793 nm	1.60 ± 0.30 dB/m at 1180 nm 4.70 dB/m at 793 nm
Birefringence	N/A	nominal 1.5×10^{-4}
Geometrical & Mechanical Specifications		
Cladding Diameter	130.0 ± 1.5 µm	130.0 ± 1.0 µm
Core Diameter	10.0 ± 1.0 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
Prooftest Level	≥ 100 kpsi (0.7 GN/m²)	≥ 100 kpsi (0.7 GN/m²)

The passive version of each fiber is also available.

RoHS

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 Nufern can assist with your requirements.

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光技術をサポートする
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10/130 Precision Matched Passive Double Clad Fibers for 2 Micron

These Nufern precision matched passive double-clad fibers feature a 10 µm core diameter and a 130 µm clad diameter and are optimized to match Nufern'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

- NuCOAT_{FA}™ fluoroacrylate coating — Greater fiber durability in extreme environmental operating & storage conditions
- Robust single-mode core at ~2 µm — 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	**SM-GDF-10/130-15M**	**PM-GDF-10/130-2000-M**
Operating Wavelength	800 – 2100 nm	800 – 2100 nm
Core NA	0.150 ± 0.010	0.150
First Cladding NA (5%)	≥ 0.460	≥ 0.460
Cladding Attenuation	≤ 15.0 dB/km @ 1095 nm	≤ 15.0 dB/km @ 1095 nm
Birefringence	N/A	nominal 1.5×10^{-4}
Geometrical & Mechanical Specifications		
Cladding Diameter	130.0 ± 1.0 µm	130.0 ± 1.0 µm
Core Diameter	10.0 ± 1.0 µm	10.0 ± 1.0 µm
Coating Diameter	215.0 ± 10.0 µm	245.0 ± 10.0 µm
Coating Concentricity	< 5.0 µm	< 5.0 µm
Core/Clad Offset	≤ 0.70 µm	≤ 0.70 µm
Clad Non-Circularity	≤ 0.5 %	N/A
Coating Material	Low Index Acrylate	Low Index Acrylate
Prooftest Level	≥ 100 kpsi (0.7 GN/m²)	≥ 100 kpsi (0.7 GN/m²)

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RoHS

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 Nufern can assist with your requirements.