Erbium and Ytterbium-Doped PM Fibers for LiDAR Applications

As "eye-safe" LiDAR applications continue to proliferate, the need for high efficiency and reliable fibers capable of delivering high pulse energies and good beam quality becomes critical. Coherent offers a family of high-performance Erbium and Erbium/Ytterbium doped single and double clad fibers. These fibers are optimized to achieve record efficiencies in the 1.5 µm wavelength range while suppressing parasitic 1 µm Amplified Spontaneous Emission (ASE). By balancing the trade-offs between efficiency, power threshold, and 1 µm ASE, Coherent offers the highest performance Erbium/Ytterbium-doped fibers available. Our product portfolio includes fibers with a variety of core sizes, each optimized for the rigorous demands of a harsh environment and/or mobile LiDAR applications.

Typical Applications

- Autonomous Vehicle
- Defense
- Wind Energy
- Wind Shear

Features & Benefits

- Designs spanning preamplifier to power amplifier stages to achieve high pulse energies and narrow linewidth
- Exceptional beam quality and polarization properties for coherent LiDAR
- NuCOAT™ coating for long-term reliability in extreme environments

Optical Specifications	**PM-ESF-7/125**	**PM-EYDF-10/125-XPH 1392590**	**PM-EYDF-12/130-XPH 1392591**	**PLMA-EYDF-25P/300-XPH 1394400**
Operating Wavelength	1530 – 1625 nm	1530 – 1625 nm	1530 – 1625 nm	1530 – 1625 nm
Core NA	0.150	0.210	0.210	0.090
First Cladding NA (5%)	N/A	≥ 0.46	≥ 0.46	≥ 0.46
Mode Field Diameter	8.8 ± 1.0 µm @ 1550 nm 9.1 ± 1.0 µm @ 1620 nm	N/A	N/A	N/A
Cutoff	1460 ± 60 nm	N/A	N/A	N/A
Cladding Attenuation	N/A	≤ 30.0 dB/km @ 1095 nm	≤ 30.0 dB/km @ 1095 nm	≤ 30.0 dB/km @ 1095 nm
Normalized Cross Talk	≤ - 35.0 dB at 4 m @ 1300 nm	≤ - 35.0 dB at 10 m @ 1300 nm	≤ - 25.0 dB at 10 m @ 1300 nm	N/A
Cladding Absorption	N/A	3.10 ± 0.50 dB/m at 915 nm	4.10 ± 0.60 dB/m at 915 nm	3.00 ± 0.50 dB/m at 915 nm
Core Absorption	55.0 ± 5.0 dB/m near 1530 nm	100.0 ± 20.0 dB/m near 1530 nm	100.0 ± 20.0 dB/m near 1530 nm	100.0 ± 20.0 dB/m near 1535 nm
Birefringence	3.5×10^{-4}	1.5×10^{-4}	1.5×10^{-4}	1.5×10^{-4}
Geometrical & Mechanical Specifications				
Cladding Diameter	125.0 ± 1.5 µm	125.0 ± 1.5 µm	130.0 ± 2.0 µm	300.0 ± 8.0 µm
Core Diameter	7.4 ± 0.6 µm	10.0 ± 1.0 µm	12.0 ± 1.5 µm	25.0 ± 2.0 µm
Coating Diameter	245.0 ± 15.0 µm	215.0 ± 5.0 µm	215.0 ± 5.0 µm	450.0 ± 15.0 µm
Coating Concentricity	< 5.0 µm	N/A	N/A	N/A
Core/Clad Offset	≤ 0.50 µm	≤ 1 µm	≤ 1 µm	≤ 2.00 µm
Coating Material	Acrylate	Low Index Acrylate	Low Index Acrylate	Low Index Acrylate
Operating Temperature Range	-40 to 85 °C	N/A	N/A	N/A
Prooftest Level	≥ 100 kpsi (0.7 GN/m²)	≥ 100 kpsi (0.7 GN/m²)	≥ 100 kpsi (0.7 GN/m²)	≥ 100 kpsi (0.7 GN/m²)

Single and double clad passive fibers are also available for amplifier components and beam delivery requirements.

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7 Airport Park Road, East Granby, CT 06026 • 860.408.5000 • E-mail eby_info@coherent.com • www.nufern.com • Products are manufactured under an ISO 9001:2008 certified quality management system.

RoHS

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