

C-Band Erbium Doped Fibers



Nuferm's high performance C-Band Erbium-Doped 980-HP Fibers are designed for use in single and multi-channel C-band amplifiers and ASE sources. The 80 μm version is suitable for small form-factor amplifiers and metro amps. The "HI" version is designed to achieve the highest possible optical efficiencies in applications where available pump power is limited. All Nuferm erbium-doped fibers are fabricated with a proprietary technology and have highly consistent and reproducible spectroscopy

Typical Applications

- Single and multi-channel C-band amplifiers
- ASE sources
- Small form factor amps
- Metro amps

Features & Benefits

- Highly consistent and reproducible spectroscopy — high manufacturing yields when matching to a GFF
- Excellent core concentricity — low splice loss to single-mode fibers
- High aluminum concentration — inherent gain flatness

Optical Specifications

	EDFC-980-HP	EDFC-980-HP-80
Operating Wavelength	1530 – 1565 nm	1530 – 1565 nm
Core NA	0.230	0.230
Mode Field Diameter	$5.8 \pm 0.5 \mu\text{m}$ @ 1550 nm	$5.8 \pm 0.5 \mu\text{m}$ @ 1550 nm
Cutoff	$920 \pm 50 \text{ nm}$	$920 \pm 50 \text{ nm}$
Core Attenuation	$\leq 10.0 \text{ dB/km}$ @ 1200 nm	$\leq 15.0 \text{ dB/km}$ @ 1200 nm
Saturation Power	0.18 mW @ 1530 nm	0.180 mW @ 1530 nm
Core Absorption	$6.00 \pm 1.00 \text{ dB/m}$ near 1530 nm $6.50 \pm 3.50 \text{ dB/m}$ near 980 nm	$6.50 \pm 3.50 \text{ dB/m}$ at 980 nm $6.00 \pm 1.00 \text{ dB/m}$ near 1530 nm

Geometrical & Mechanical Specifications

	EDFC-980-HP	EDFC-980-HP-80
Cladding Diameter	$125.0 \pm 1.0 \mu\text{m}$	$80.0 \pm 1.0 \mu\text{m}$
Core Diameter	$3.2 \mu\text{m}$	$3.2 \mu\text{m}$
Coating Diameter	$245.0 \pm 10.0 \mu\text{m}$	$165.0 \pm 10.0 \mu\text{m}$
Coating Concentricity	$< 5.0 \mu\text{m}$	$< 5.0 \mu\text{m}$
Core/Clad Offset	$\leq 0.30 \mu\text{m}$	$\leq 0.30 \mu\text{m}$
Coating Material	UV Cured, Dual Acrylate	UV Cured, Dual Acrylate
Operating Temperature Range	-40 to 85 °C	-40 to 85 °C
Proof Test Level	$\geq 200 \text{ kpsi}$ (1.4 GN/m ²)	$\geq 200 \text{ kpsi}$ (1.4 GN/m ²)



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L-Band Erbium Doped Fibers



Nuferm high performance L-Band Erbium-doped fibers are designed for use in L-band amplifiers and compact ASE sources. The 80 μm version is a reduced-cladding fiber ideal for small form-factor devices. All Nuferm erbium-doped fibers are fabricated with a proprietary doping technology and have highly consistent and reproducible spectroscopy, ensuring intra-lot and lot-to-lot uniformity. These fibers are extensively characterized and accompanied by lot specific data.

Typical Applications

- L-band amplifiers
- Compact ASE sources
- Small form factor packages

Features & Benefits

- Highly consistent and reproducible spectroscopy — no need to batch matching GFFs
- Excellent core concentricity — low splice loss
- Detailed lot-specific characterization data — compatible with modeling programs

Optical Specifications

	EDFL-980-HP	EDFL-980-HP-80	EDFL-1480-HP
Operating Wavelength	1565 – 1625 nm	1565 – 1625 nm	1565 – 1625 nm
Core NA	0.250	0.250	0.250
Mode Field Diameter	$5.5 \pm 0.5 \mu\text{m}$ @ 1550 nm	$5.5 \pm 0.5 \mu\text{m}$ @ 1550 nm	$5.3 \pm 0.5 \mu\text{m}$ @ 1550 nm
Cutoff	$920 \pm 50 \text{ nm}$	$920 \pm 50 \text{ nm}$	$1420 \pm 50 \text{ nm}$
Core Attenuation	$\leq 15.0 \text{ dB/km}$ @ 1200 nm	$\leq 15.0 \text{ dB/km}$ @ 1200 nm	$\leq 15.0 \text{ dB/km}$ @ 1200 nm
Core Absorption	$25.0 \pm 2.0 \text{ dB/m}$ near 1530 nm $18.5 \pm 11.5 \text{ dB/m}$ near 980 nm	$25.0 \pm 2.0 \text{ dB/m}$ near 1530 nm $18.5 \pm 11.5 \text{ dB/m}$ near 980 nm	$15.0 \pm 3.0 \text{ dB/m}$ at 980 nm $30.0 \pm 3.0 \text{ dB/m}$ near 1530 nm

Geometrical & Mechanical Specifications

	EDFL-980-HP	EDFL-980-HP-80	EDFL-1480-HP
Cladding Diameter	$125.0 \pm 1.0 \mu\text{m}$	$80.0 \pm 1.0 \mu\text{m}$	$125.0 \pm 1.0 \mu\text{m}$
Core Diameter	$2.8 \mu\text{m}$	$2.8 \mu\text{m}$	$4.5 \mu\text{m}$
Coating Diameter	$245.0 \pm 10.0 \mu\text{m}$	$165.0 \pm 10.0 \mu\text{m}$	$245.0 \pm 10.0 \mu\text{m}$
Coating Concentricity	$< 5.0 \mu\text{m}$	$< 5.0 \mu\text{m}$	$< 5.0 \mu\text{m}$
Core/Clad Offset	$\leq 0.30 \mu\text{m}$	$\leq 0.30 \mu\text{m}$	$\leq 0.30 \mu\text{m}$
Coating Material	UV Cured, Dual Acrylate	UV Cured, Dual Acrylate	UV Cured, Dual Acrylate
Operating Temperature Range	-40 to 85 °C	-40 to 85 °C	-40 to 85 °C
Proof Test Level	$\geq 200 \text{ kpsi}$ (1.4 GN/m ²)	$\geq 200 \text{ kpsi}$ (1.4 GN/m ²)	$\geq 200 \text{ kpsi}$ (1.4 GN/m ²)



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L-Band Erbium Doped Fibers



Nufern high performance L-Band Erbium-doped fibers are designed for use in L-band amplifiers and compact ASE sources. The 80 μm version is a reduced-cladding fiber ideal for small form-factor devices. All Nufern erbium-doped fibers are fabricated with a proprietary doping technology and have highly consistent and reproducible spectroscopy, ensuring intra-lot and lot-to-lot uniformity. These fibers are extensively characterized and accompanied by lot specific data.

Typical Applications

- L-band amplifiers
- Compact ASE sources
- Small form factor packages

Features & Benefits

- Highly consistent and reproducible spectroscopy — no need to batch matching GFFs
- Excellent core concentricity — low splice loss
- Detailed lot-specific characterization data — compatible with modeling programs

Optical Specifications

	EDFL-980-HP	EDFL-980-HP-80	EDFL-1480-HP
Operating Wavelength	1565 – 1625 nm	1565 – 1625 nm	1565 – 1625 nm
Core NA	0.250	0.250	0.250
Mode Field Diameter	$5.5 \pm 0.5 \mu\text{m}$ @ 1550 nm	$5.5 \pm 0.5 \mu\text{m}$ @ 1550 nm	$5.3 \pm 0.5 \mu\text{m}$ @ 1550 nm
Cutoff	$920 \pm 50 \text{ nm}$	$920 \pm 50 \text{ nm}$	$1420 \pm 50 \text{ nm}$
Core Attenuation	$\leq 15.0 \text{ dB/km}$ @ 1200 nm	$\leq 15.0 \text{ dB/km}$ @ 1200 nm	$\leq 15.0 \text{ dB/km}$ @ 1200 nm
Core Absorption	$25.0 \pm 2.0 \text{ dB/m}$ near 1530 nm $18.5 \pm 11.5 \text{ dB/m}$ near 980 nm	$25.0 \pm 2.0 \text{ dB/m}$ near 1530 nm $18.5 \pm 11.5 \text{ dB/m}$ near 980 nm	$15.0 \pm 3.0 \text{ dB/m}$ at 980 nm $30.0 \pm 3.0 \text{ dB/m}$ near 1530 nm

Geometrical & Mechanical Specifications

Cladding Diameter	$125.0 \pm 1.0 \mu\text{m}$	$80.0 \pm 1.0 \mu\text{m}$	$125.0 \pm 1.0 \mu\text{m}$
Core Diameter	$2.8 \mu\text{m}$	$2.8 \mu\text{m}$	$4.5 \mu\text{m}$
Coating Diameter	$245.0 \pm 10.0 \mu\text{m}$	$165.0 \pm 10.0 \mu\text{m}$	$245.0 \pm 10.0 \mu\text{m}$
Coating Concentricity	$< 5.0 \mu\text{m}$	$< 5.0 \mu\text{m}$	$< 5.0 \mu\text{m}$
Core/Clad Offset	$\leq 0.30 \mu\text{m}$	$\leq 0.30 \mu\text{m}$	$\leq 0.30 \mu\text{m}$
Coating Material	UV Cured, Dual Acrylate	UV Cured, Dual Acrylate	UV Cured, Dual Acrylate
Operating Temperature Range	-40 to 85 °C	-40 to 85 °C	-40 to 85 °C
Proof Test Level	$\geq 200 \text{ kpsi}$ (1.4 GN/m ²)	$\geq 200 \text{ kpsi}$ (1.4 GN/m ²)	$\geq 200 \text{ kpsi}$ (1.4 GN/m ²)



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PM Erbium-Doped Single-Mode Fiber



Nufern's high performance erbium-doped fiber and industry leading PM PANDA-style fiber capabilities are combined in a unique PM erbium fiber product, PM-ESF-7/125. Featuring a high erbium concentration (peak absorption 55 dB/m) and high pump conversion efficiency achieved with proprietary technology that delivers industry leading tolerances on the key spectroscopic parameters. The non-PM SM-ESF-7/125 is also available for applications that do not require a polarized signal.

Typical Applications

- PM amplifiers
- Polarized lasers
- Ultra-short pulse laser

Features & Benefits

- PANDA-style stress structure for increased birefringence — superior optical performance and uniformity
- High Er dopant concentration — enables short length devices
- High efficiency — good conversion of pump to signal power

Optical Specifications

	PM-ESF-7/125	SM-ESF-7/125
Operating Wavelength	1530 – 1610 nm	1530 – 1625 nm
Core NA	0.150	0.150
Mode Field Diameter	8.8 ± 1.0 μm @ 1550 nm 9.1 ± 1.0 μm @ 1620 nm	8.8 ± 1.0 μm @ 1550 nm 9.1 ± 1.0 μm @ 1620 nm
Cutoff	1460 ± 60 nm	1400 ± 60 nm
Normalized Cross Talk	≤ - 35.0 dB at 4 m @ 1300 nm	N/A
Core Absorption	55.0 ± 5.0 dB/m near 1530 nm	55.0 ± 5.0 dB/m near 1530 nm
Birefringence	3.5 × 10 ⁻⁴	N/A

Geometrical & Mechanical Specifications

	PM-ESF-7/125	SM-ESF-7/125
Cladding Diameter	125.0 ± 1.5 μm	125.0 ± 1.5 μm
Core Diameter	7.0 μm	7.0 μm
Coating Diameter	245.0 ± 15.0 μm	245.0 ± 15.0 μm
Coating Concentricity	< 5.0 μm	< 5.0 μm
Core/Clad Offset	≤ 0.50 μm	≤ 0.50 μm
First Cladding Material	Depressed	N/A
Coating Material	UV Cured, Dual Acrylate	UV Cured, Dual Acrylate
Operating Temperature Range	-40 to 85 °C	-40 to 85 °C
Proof Test Level	≥ 100 kpsi (0.7 GN/m ²)	≥ 100 kpsi (0.7 GN/m ²)



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C-Band & L-Band Photosensitive Erbium-Doped Fiber



Nufern's high performance PS-ESF-3/125 is the ideal fiber for distributed feedback (DFB) and distributed Bragg reflector (DBR) lasers. Engineered to be inherently photosensitive, these fibers enable short device lengths and good pump conversion efficiency. Variants of this fiber with higher gain and/or photosensitivity are available upon request as custom products.

Typical Applications

- Ultra-short very narrow linewidth all-optical DFB and DBR lasers

Features & Benefits

- Inherently photosensitive with moderate Er dopant concentration—Enables short length devices with a superimposed fiber grating structure
- High efficiency—Good conversion of pump to signal power
- Perfectly matched passive fiber available—Facilitates the construction of fiber-based components and pigtailed with low pump and signal coupling losses

Optical Specifications

Operating Wavelength	1530 – 1625 nm
Core NA	0.280
Mode Field Diameter	5.0 ± 1.0 μm @ 1550 nm
Cutoff	920 ± 50 nm
Core Absorption	8.5 ± 1.0 dB/m near 1530 nm

PS-ESF-3/125

Geometrical & Mechanical Specifications

Cladding Diameter	125.0 ± 1.0 μm
Core Diameter	3.0 μm
Coating Diameter	245.0 ± 15.0 μm
Coating Concentricity	< 5.0 μm
Core/Clad Offset	≤ 0.50 μm
Coating Material	UV Cured, Dual Acrylate
Operating Temperature Range	-40 to 85 °C
Proof test Level	≥ 100 kpsi (0.7 GN/m ²)

The passive version of this fiber is also available.



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