

Endlessly Single Mode Fibers

The IXF-ESM family are microstructured photonic crystal fibers that display an endlessly single mode behavior and do not exhibit a high order mode cut off. They are therefore ideally suited for excellent broadband mode delivery in the visible and NIR wavelength ranges. ESM fibers are available with a $\varnothing 5$, $\varnothing 10$ and $\varnothing 20 \mu\text{m}$ core and in PM and non-PM versions.

The IXF-ESM-20-250-PM fiber is suitable for operation above 750 nm and exhibits record high Brillouin threshold for high power single frequency laser delivery.



IXF-ESM fibers can be connectorized into patchcords or fiber assemblies for easier integration, handling and improved robustness. Bare fiber and patchcords can be hydrogen loaded.

Benefits & Features

- Singlemode over the VIS and NIR wavelength range
- Standard and PM version
- $\varnothing 20 \mu\text{m}$ core version, for operation above 750 nm with record high Brillouin threshold
- Connectorization into patchcords possible
- Optional Hydrogen loading, for UV patchcords manufacturing
- ESM fibers with solarization resistant silica are available upon request

Applications

- Singlemode light delivery
- Visible lasers
- Solarization resistant UV patchcords
- Atom trapping and cooling
- Quantum applications

IXF-ESM-	5-125	5-125-PM	10-125	10-225-PM	20-250-PM
Optical parameters					
LP ₁₁ cutoff wavelength (nm)	None				
Numerical aperture @1064 nm ^{(1), (3)}	0.2	0.2	0.1	0.1	0.06
MFD @1064 nm (μm) ⁽¹⁾	4.5 ± 0.5	4.5 ± 0.5	8.8 ± 1.0	8.8 ± 1.0	16.7 ± 1.5
Effective area @1064 nm (μm^2) ^{(1), (3)}	14	16	60	60	212
Attenuation (dB/km)					
@532 nm	≤ 50	≤ 38	≤ 40	≤ 38	N.A. ⁽²⁾
@1060 nm	≤ 20	≤ 20	≤ 12	≤ 15	≤ 32
@1550 nm	≤ 15	≤ 30	≤ 5	≤ 10	≤ 25
Birefringence	N.A	≥ 1.8 × 10 ⁻⁴	N.A	≥ 1.4 × 10 ⁻⁴	≥ 1.1 × 10 ⁻⁴

Physical and Material parameters

Core material	Pure Silica				
Core diameter (μm)	5 ± 0.3	5 ± 0.3	10 ± 0.6	10 ± 0.6	20 ± 1.2
Cladding diameter (μm)	125 ± 3	125 ± 3	125 ± 5	225 ± 5	241 ± 6
Cladding non-circularity (%)	≤ 2	≤ 7.5	≤ 2	≤ 2	≤ 2
Coating diameter (μm)	245 ± 10	240 ± 10	250 ± 10	355 ± 10	359 ± 10
Coating type	Dual coat high index acrylate				
Proof-testing (kpsi)	≥ 20				

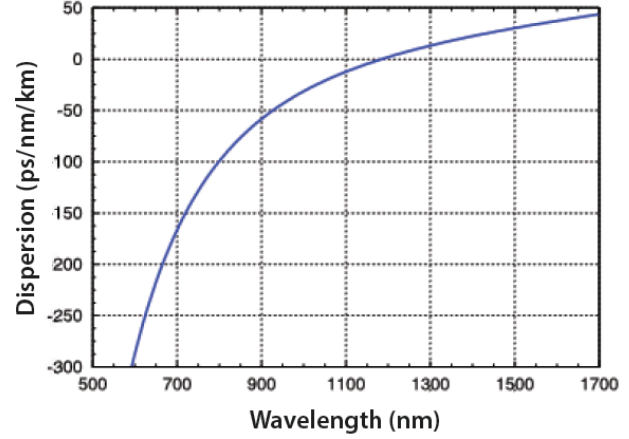
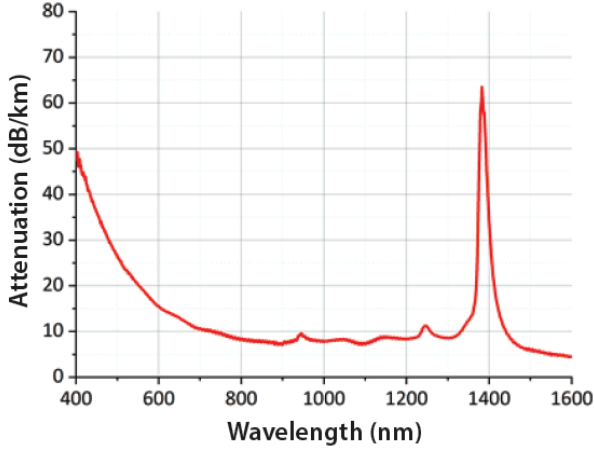
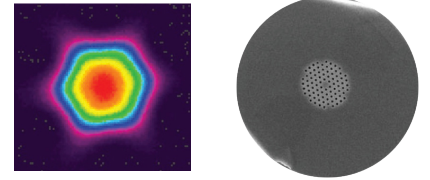
(1) Calculated value from simulation

(2) Not applicable – guided light starting from 750 nm wavelength

(3) Typical

IXF-ESM Series

ESM fibers exhibit a gaussian profile and endlessly singlemode behavior. They are well suited to transport one or multiple optical signals across the UV-VIS-NIR wavelength range while remaining singlemode, for example for imaging or spectroscopy applications. Their large core size and singlemode behavior make them particularly adapted to transport high power visible and UV signals.



Typical attenuation and dispersion of IXF-ESM-10-225-PM fiber.

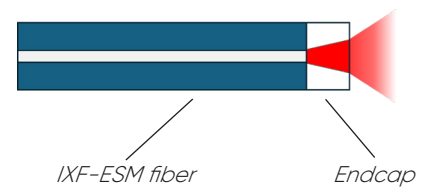
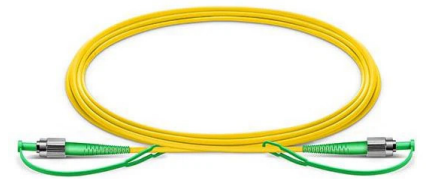
PATCHCORDS & FIBER ASSEMBLIES

ESM fibers can be connectorized into patchcords or pigtails for easier integration, handling and improved robustness. When connectorized, fiber end-faces are terminated with thin endcaps to seal and protect the hollow microstructure while maintaining the optical beam quality. Endcaps also reduce the power density at the glass/air interface which is beneficial for high-power or UV operation.

Patchcords can be hydrogen loaded to make solarization resistant delivery patchcords for UV applications.

Patchcord

Length (m)	Up to 12, longer lengths upon request
Connectors	Non-PM : FC (APC or PC), SC (APC or PC), SMA.
	PM : FC (APC or PC) Other upon request
Jacket	No jacket (bare fiber)
	Ø900 µm hytrel
	Ø3 mm PVC
	Stainless steel
Endcap length (µm), typical	100, other lengths upon request
Endcap material	Fused silica
Transmission (%) *	≥ 60
PER (dB) *	≥ 20
<small>For PM fibers only</small>	
Hydrogen loading	Optional



* Measured at 532 nm or 553 nm

Exail reserves the right to change, at any time and without notice, the specifications, design, function or form of its products described herein.

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