

IXF-RAD-SENSE-HI

Radiation Sensing Fiber

Radiation sensing fibers are designed to perform fiber-based dosimetry, taking advantage of the linear and repeatable response of the Radiation Induced Attenuation (RIA) versus dose. The RIA response is independent of the particle type (X-rays, Gamma-rays, neutrons), dose rate and temperature, making these fibers well-suited for Total Ionizing Dose (TID) measurements. Point and distributed dosimetry are possible either by coiling Rad-Sense fiber into a small form factor, or by laying the fiber around a facility, effectively replacing dozens or hundreds of point sensors with a single fiber and interrogator.



Exail's radiation sensing fibers are commonly used with radiation hardened lead fibers.

Benefits & Features

- 530 nm operation
- High radiation sensitivity
- Repeatable sensitivity from batch to batch
- Cabling possible for indoor/outdoor deployment
- Other coatings available upon request
- Compatible with Rad-Hard fibers

Applications

- Point dosimetry
- Distributed Optical Fiber Radiation Sensing (DOFRS)
- TID monitoring in nuclear, fusion & high-energy facilities

Related Products

- IXF-RAD-SENSE-SM-1550
- IXF-RAD-SENSE-SM-1550-PI

Related Publications

- [Alessi, A., Guttilla, A., Girard, S., Agnello, S., Cannas, M., Robin, T., Boukenter, A. and Ouerdane, Y. \(2019\), Radiation Effects on Aluminosilicate Optical Fibers: Spectral Investigations From the Ultraviolet to Near-Infrared Domains. Phys. Status Solidi A, 216: 1800485. https://doi.org/10.1002/pssa.201800485](https://doi.org/10.1002/pssa.201800485)
- [C. Campanella et al., "Temperature Dependence of Radiation Induced Attenuation of Aluminosilicate Optical Fiber," in IEEE Transactions on Nuclear Science, vol. 69, no. 7, pp. 1515-1520, July 2022, doi: 10.1109/TNS.2022.3150870](https://doi.org/10.1109/TNS.2022.3150870)

Parameters

Cutoff wavelength (nm)	1050 ± 75
Attenuation @1310 nm (dB/km)	< 5
Attenuation @530 nm (dB/km)	< 50
Mode field diameter @1310 nm (μm)	9 ± 1
Numerical aperture	0.12 ± 0.01
Core/Clad concentricity (μm)	< 1
Cladding diameter (μm)	125 ± 1
Coating diameter (μm)	245 ± 15
Proof test level (kpsi)	100

Design parameters

Sensitivity coefficient @530 nm (dB·m ⁻¹ ·Gy(SiO ₂) ⁻¹) *	1.7 (typical)
Coating material	Dual acrylate
Operating temperature range (°C)	-60 to +85

* extracted from available literature (± 15 %)

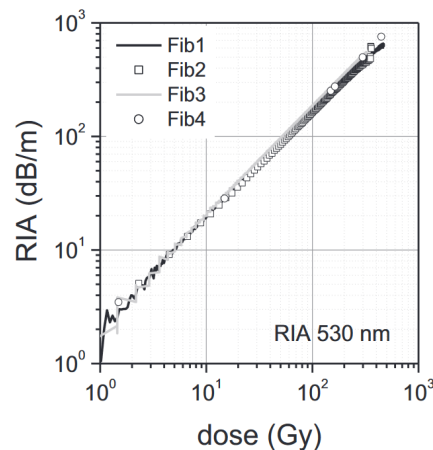


Image from Alessi, A., Guttilla, A., Girard, S., Agnello, S., Cannas, M., Robin, T., Boukenter, A. and Ouerdane, Y. (2019), Radiation Effects on Aluminosilicate Optical Fibers: Spectral Investigations From the Ultraviolet to Near-Infrared Domains. Phys. Status Solidi A, 216: 1800485. https://doi.org/10.1002/pssa.201800485

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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