"The Mid-IR Fibers and Devices Company"

IRF-Se Series
Chalcogenide LWIR Fibers (1.5 to 10µm)

www.irflex.com

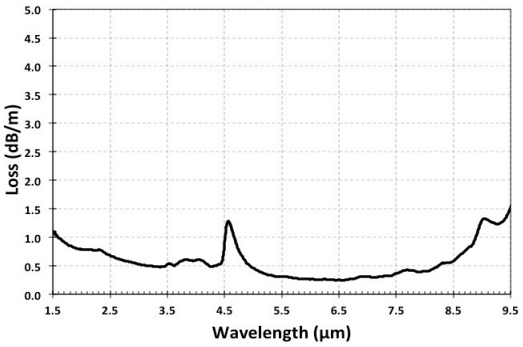
Chalcogenide glass is based on the chalcogen elements (sulfur, selenium and tellurium) with the addition of other elements such as arsenic, antimony, or germanium. It offers promising properties such as transmission in mid and far infrared regions of spectra, lower values of phonon energies, high refractive index and very large nonlinearities as compared to silica. Chalcogenide glass fibers are the ideal candidates for mid-infrared applications that require high power laser delivery, chemical sensing, thermal imaging and temperature monitoring.

IRflex's **IRF-Se Series** long-wave infrared (LWIR) fiber, made from extra high purity chalcogenide glass As_2Se_3, is specially designed and manufactured to generate and/or guide mid-infrared wavelengths from **1.5 to 10µm** with high transmission efficiency and nonlinearities about 1000 times that of silica glass fiber.

Applications

- Mid-IR laser beam delivery
- IR spectroscopy
- Chemical sensing
- Scientific and medical diagnostics IR-imaging system
- Nonlinear supercontinuum generation

Attenuation Spectrum for IRF-Se series



Benefits

- Low loss
- Broad transmission ranges from 1.5 to 10µm
- High power handling strength
- High mechanical flexibility

IRflex Corporation is the only U.S. company totally dedicated to the development and manufacture of mid-infrared fibers and devices for wavelength from 1.5 to 11micron.

IRflex has several patents on specialty optical fibers and expertise in specialty optical fiber design and development. A suite of patents relating to chalcogenide glass based fiber optics has been licensed to IRflex from the U.S. Naval Research Laboratory (NRL). These strong patent portfolio and intellectual know-how, coupled with advanced manufacturing processes, are the core competencies which enable IRflex to sustain its leadership in the mid-infrared industry and provide cutting-edge products for mid-infrared applications.

Technical Specifications

Transmission Range (μm)	1.5 – 10
Typical Optical Loss (dB/m)	<0.2 @ 6.7μm
Glass Composition	As_2Se_3
Refractive Index	2.7
Numerical Aperture (NA)	0.27 – 0.33
Core Non-Circularity (%)	<1
Core/Clad Concentricity Error (μm)	<3
Tensile Proof Test (kpsi)	>15
Chemical Resistance	Insoluble in water, concentrated hydrochloric acid, non-oxidizing acids, alcohol, acetone, gasoline, and toluene. Soluble in strong alkaline solutions, such as KOH

Fiber Model	Core Diameter (μm)	Cladding Diameter (μm)	Coating Diameter (μm)	Operation Wavelength (μm)
RF-Se-100 (R&D)	100	170	330	1.5 - 10
RF-Se-100	100	170	330	1.5 – 8
RF-Se-300	300	370	550	1.5 – 9.7
RF-Se-12	12	170	330	1.5 – 9.7
RF-SeG-12*	12	170	330	1.5 – 9.7

* This fiber's clad structure is $GeAs_2Se_5$, which gives higher NA of 0.76, it is specially designed for supercontinuum generation.

All the fibers are commercially available and can be sold as bare fiber or terminated with connectors.

The standard fiber cables are terminated with stainless steel ferrules, FC/PC, FC/APC or SMA905 connectors. IRflex's FC/B® connector - the FC connector at Brewster Angle enables perfect coupling without reflection with polarized laser beam, is also available upon request.

The protective jacket can be stainless steel, stainless steel with PVC or clear FEP sheathing, PVDF and PVC.

Other different cable assembling configurations are offered upon request.

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Made in America