



## IRF-S SERIES

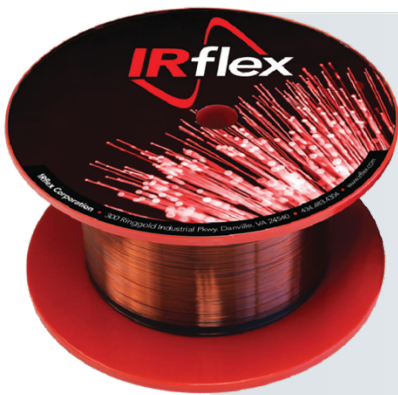
# Chalcogenide MWIR Fibers (1.5 to 6.5 $\mu$ m)

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 the 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-S Series** mid-wave infrared (MWIR) fiber, made from extra high purity chalcogenide glass  $As_2S_3$ , is specially designed and manufactured to generate and/or guide mid-infrared wavelengths from 1.5 to 6.5 $\mu$ m with high transmission efficiency and nonlinearities about 100 times that of silica glass fiber.

## Applications

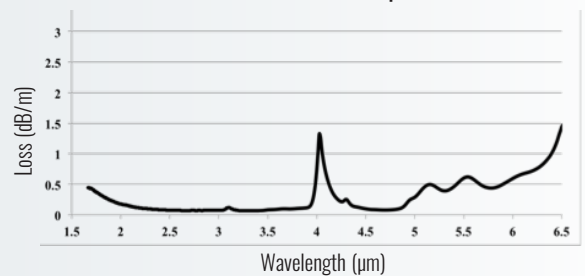
- Mid-IR laser beam delivery
- IR spectroscopy
- Chemical sensing
- Scientific and medical diagnostics IR-imaging system
- Nonlinear supercontinuum generation
- Infrared countermeasure (IRCM)



## Benefits

- Extra low loss, 0.05dB/m @2.8 $\mu$ m
- High power handling strength, tested in house, 6.9W CW in a 9 $\mu$ m core diameter fiber for 30 minutes without damage or degradation
- High mechanical flexibility

IRF-S-100 Attenuation Spectrum



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

IRflex has several patents on specialty chalcogenide optical fibers and expertise in these fibers' design and development. These strong patent portfolios 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 ( $\mu\text{m}$ )	1.5 – 6.5
Typical Optical Loss (dB/m)	0.05 @ 2.8 $\mu\text{m}$
Glass Composition	As <sub>2</sub> S <sub>3</sub>
Refractive Index	2.4
Numerical Aperture (NA)	0.30±0.02
Core Non-Circularity (%)	<1
Core/Clad Concentricity Error ( $\mu\text{m}$ )	<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 Models	Core /Clad/Coating Diameter ( $\mu\text{m}$ )	Cutoff Wavelength ( $\mu\text{m}$ )	Operation Wavelength ( $\mu\text{m}$ )*
<b>IRF-S-5</b>	5/100/280	1.988	1.5 – 2.95
<b>IRF-S-6.5</b>	6.5/125/300	2.46	1.5 – 4.15
<b>IRF-S-50</b>	50/85/275	-	1.5 – 6.5
<b>IRF-S-100</b>	100/170/340	-	1.5 – 6.5
<b>IRF-S-200</b>	200/250/470	-	1.5 – 6.5

\* Operation wavelength ( $\mu\text{m}$ ) range is defined as >50% more light remains inside of the core.

All fibers can be sold as bare fibers. All bare fibers, except IRF-S-5 and IRF-S-50, can be terminated with connectors and sold as cables.

The standard fiber cables are terminated with FC/PC, FC/APC or SMA905 connectors with stainless steel ferrules. 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.

All statements and technical information related to the products herein are based upon information believed to be reliable or accurate. However, IRflex assumes no responsibility for any inaccuracies. Users assume all risks and liability whatsoever in connection with the use of a product or its application. IRflex reserves the right to change at any time without notice the design or specifications of its products described herein. (Version: 202301)



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