DataSheet

Polarizers

Opto-Physics Infrared Polarizers (GS57500 Series)

Polarizers are commonly used to polarize radiation from unpolarized sources, attenuated radiation from polarized sources, or act as polarizing beamsplitters. Specac offers a range of holographic wire polarizers laid onto a transmitting substrate material for use in the 2 - 35µm (5000cm^{-1} - 285cm^{-1}) spectral range.

These precision polarizers are manufactured in a class 1000 clean room facility at Specac's United Kingdom factory, by means of a holographic fabrication technique originally developed in conjunction with the United Kingdom's National Physical Laboratory (NPL).

The process involves exposing a photo-resist coating on a suitable material substrate to an interferometrically-generated fringe pattern from a monochromatic UV source. The regular sinusoidal profile of the developed photo-resist is subsequently metal coated at an oblique angle to create an array of fine parallel lines at a set period.

This technique lends itself well to the generation of extremely uniform sub-micron grid wire spacings at 2500 lines / mm, which have significantly reduced level of light scattering in comparison to traditional ruled wire grid polarizers. As the wire grid is formed on the photo-resist itself, the technique is also well suited to fabricating polarizers on substrates that do not otherwise lend themselves to the ruling process.

Specac offers a wide range of polarizers on infrared material substrates such as Barium Fluoride (BaF2), Calcium Fluoride (CaF2), KRS-5, Zinc Selenide (ZnSe), and Germanium (Ge), in a range of categories to meet a broad scope of customer requirements.

Features of GS57500 Series Polarizers

- 2500 lines/mm on substrate
- Choice of KRS-5, CaF2, BaF2, and ZnSe substrates
- 18mm C.A. / 25mm O.D. and 34mm C.A. / 50mm O.D. options
- Free standing by use of own ring mount
- Econmical price

Applications

- Infrared spectroscopy of materials (typically plastics / polymers and crystallography)
- Infrared microscopy (sample characterization)
- NIR/Mid-IR thermal imaging systems
- Plasma diagnostics
- Beamspiltters in polarized light interferometry
- Analysis in infrared astronomy
- Low power laser polarization and beam attenuation
- Coupling devices for Mid-IR and long wavelength lasers

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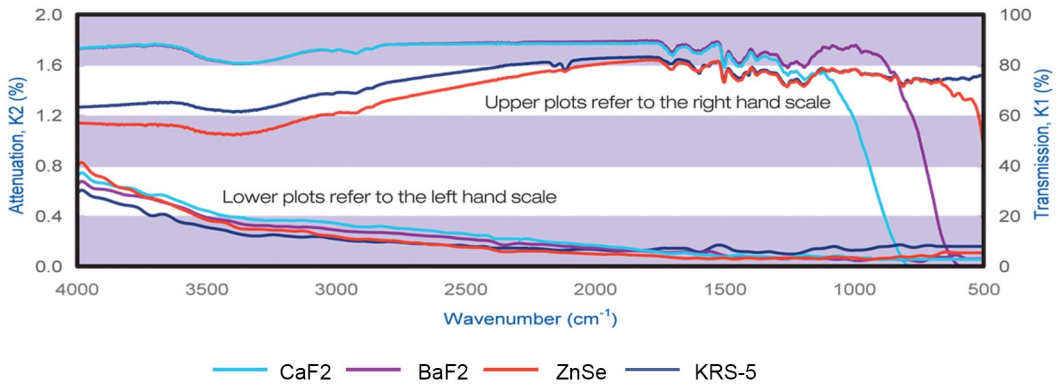
Typical Transmission (K1) and Attenuation (K2) Plots for Opto-Physics Polarizers



Substrate Material	Wavelength (µm) / Wavenumber (cm^{-1})	Typical Extinction Ratio (K1/K2)
KRS-5	2.5 / 4000 5 / 2000 10 / 1000	100 300 300
CaF2	2.5 / 4000 5 / 2000 10 / 1000	100 300 300
BaF2	2.5 / 4000 5 / 2000 10 / 1000	100 300 400
ZnSe	2.5 / 4000 5 / 2000 10 / 1000	100 300 400

Opto-Physics Polarizer Specifications

Wire Grid Spacing (lines/mm)	2500	2500
Mounting Ring Diameters (mm)	25.0 +0.0/-0.2	50.0 +0.0/-0.2
Mounting Ring Thickness (mm)	5.0 ±0.1	6.0 ±0.1
Polarizer Clear Aperture (mm)	18.0 ±0.1	34.0 ±0.1
Substrate Thickness (mm)	2.0 +0.0/-0.2	4.0 +0.0/-0.2

	Clear Aperture (mm)	Mounting Ring Dia. (mm)	Parallelism (arc minutes)	Flatness (fringes per inch @633 nm)	Part Number
KRS-5	18	25	5	4	GS57500
	34	50	5	4	GS57504
CaF2	18	25	3	2	GS57501
	34	50	3	2	GS57505
BaF2	18	25	3	2	GS57502
	34	50	3	2	GS57506
ZnSe	18	25	3	2	GS57503
	34	50	3	2	GS57507

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