DataSheet

Polarizers

FTIR Infrared Polarizers (GS12000 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 ransmitting 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 4000 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. In particular the GS12000 Series are spring mounted to fit directly into the aperture ports of all Benchmark baseplate compatible accessories.

Features of GS12000 Series Polarizers

- 4000 lines/mm on substrate
- Choice of KRS-5, Ge, BaF2, CaF2 and ZnSe substrate
- 34.9 O.D., 25mm C.A. spring ring mounted only
- Compatible with Specac FTIR Accessories
- Fit into polarizer rotatable mount GS12500

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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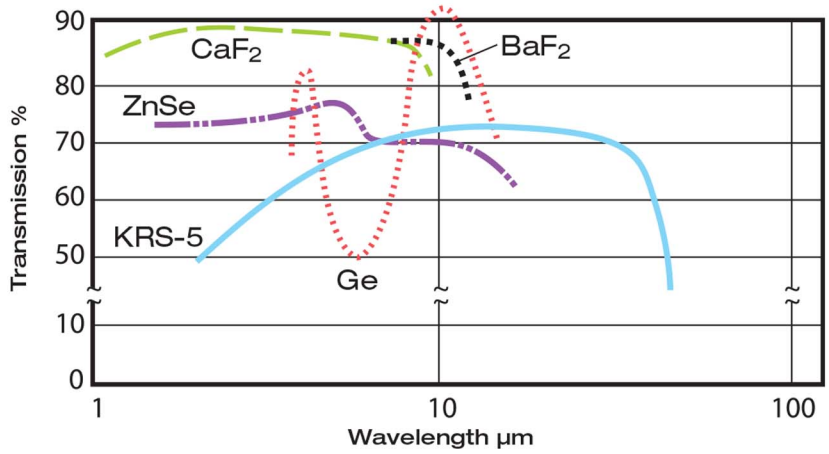

These specifications represent typical minimum performance. Actual results may vary. Maximum operating temperature for Ge is 80°C, all others are 110°C. Other materials, including sapphire, CsI and MgF and custom specifications available upon request.

	Part Number	GS12000	GS12700	GS12800	GS12900	GS12950
	Substrate	KRS-5	CaF2	BaF2	Ge	ZnSe
	Spectral Range (µm)	2 - 35	1 - 10	1 - 12.5	8 - 12	1 - 15
	Grid Period (µm)	0.25	0.25	0.25	0.4	0.25
	OD (mm)	34.9	34.9	34.9	34.9	34.9
	CA (mm)	25	25	25	25	25
	t (mm)	7.9	7.9	7.9	7.9	7.9
Transmission Efficiency % (K1)	2.5µm	72	89	88		76
	5.0µm	84	88	88		85
	8.0µm				87	
	10.0µm	75	50	84	91	74
Transmission of Unwanted Radiation % (K2)	2.5µm	1.50	1.00	1.10		1.40
	5.0µm	0.50	0.28	0.30		0.50
	8.0µm				0.35	
	10.0µm	0.23	0.10	0.20	0.25	0.20
Degree of Polarization % (K1-K2)/(K1+K2)	2.5µm	95.8	97.8	97.5		96.3
	5.0µm	98.8	99.3	99.3		98.8
	8.0µm				99.2	
	10.0µm	99.7	99.6	99.5	99.4	99.4
Extinction Ratio expressed as K1/K2	2.5µm	48:1	89:1	80:1		54:1
	5.0µm	168:1	314:1	293:1		170:1
	8.0µm				249:1	
	10.0µm	326:1	500:1	420:1	364:1	370:1

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