

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 transmitting substrate material for use in the 2 - 35 $\mu\text{m}$  (5000 $\text{cm}^{-1}$  - 285 $\text{cm}^{-1}$ ) 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 (BaF<sub>2</sub>), Calcium Fluoride (CaF<sub>2</sub>), 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, BaF<sub>2</sub>, CaF<sub>2</sub> 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

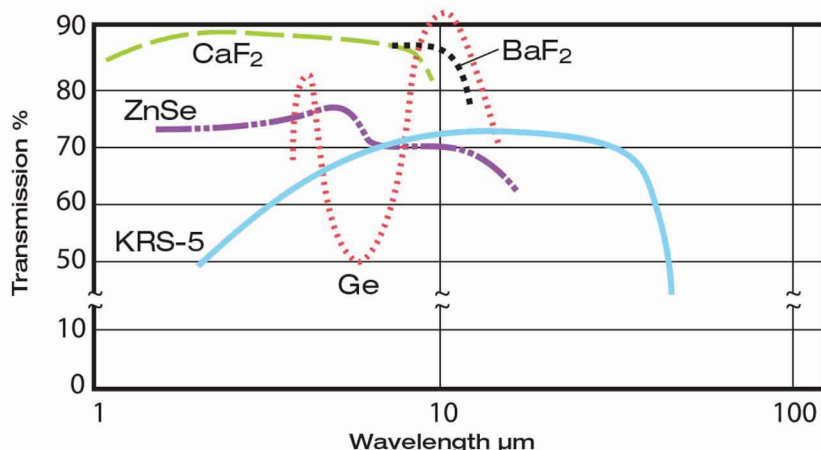
- Infrared spectroscopy of materials (typically plastics / polymers and crystallography)
- Infrared microscopy (sample characterization)
- NIR/Mid-IR thermal imaging systems
- Plasma diagnostics
- Beamsplitters in polarized light interferometry
- Analysis in infrared astronomy
- Low power laser polarization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

Illustrations, descriptions and specifications in this datasheet were correct at the time of going to press. However, Specac's policy is one of continuous product development and we reserve the right to change descriptions and specifications at any time.

For the latest details please contact your local Specac office or representative.

Polarizers

FTIR Infrared Polarizers



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	CaF <sub>2</sub>	BaF <sub>2</sub>	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
<b>Transmission Efficiency % (K1)</b>						
	2.5μm	72	89	88		76
	5.0μm	84	88	88		85
	8.0μm				87	
	10.0μm	75	50	84	91	74
<b>Transmission of Unwanted Radiation % (K2)</b>						
	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
<b>Degree of Polarization % (K1-K2)/(K1+K2)</b>						
	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
<b>Extinction Ratio expressed as K1/K2</b>						
	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

SPECAC LTD.,  
River House 97 Cray Avenue, Orpington,  
Kent. BR5 4HE UK  
T: +44 (0) 1689 873134 F: +44 (0) 1689 878527  
E: sales@specac.co.uk Registered in England No. 01008689

SPECAC INC.,  
414 Commerce Dr., Suite 175, Fort Washington, PA 19034  
T: Toll Free +1 800 447 2558  
E: sales@specac.co.uk W: www.specac.com

MD 11 - 07/15