

**Polarizers****High Extinction Ratio Polarizers  
(GS57010 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 $\mu$ m (5000cm<sup>-1</sup> - 285cm<sup>-1</sup>) 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.

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.

**Features of GS57010 Series Polarizers**

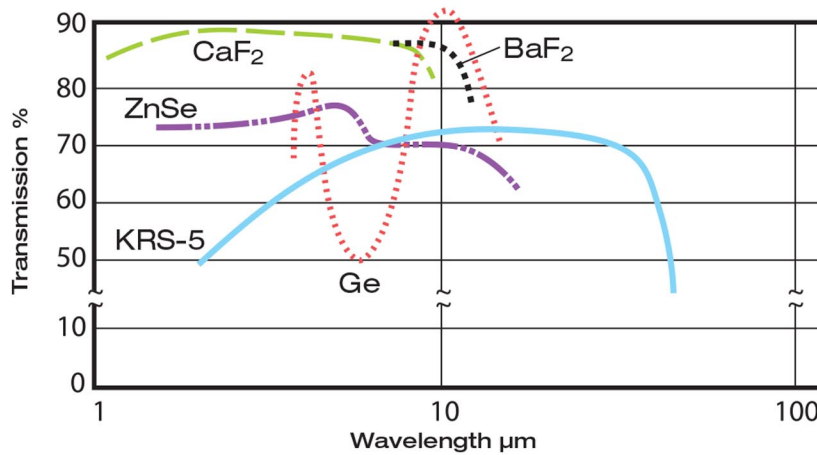
- 4000 lines/mm on substrate
- Coated for high extinction ratio without loss of throughput
- Choice of KRS-5, Ge, BaF<sub>2</sub>, CaF<sub>2</sub> and ZnSe substrates
- Choice of C.A. and O.D. sizes
- Free standing by use of own ring mount
- Fit into polarizer rotatable mount options GS57340 Series and GS12510 Benchmark Series (38mm C.A.)

**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

## Polarizers

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	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
Transmission	2.5μm	70	84	84		74
Efficiency % (K1)	5.0μm	80	86	86	85	81
	8.0μm				88	
	10.0μm	72	48	80		72
Transmission of Unwanted Radiation % (K2)	2.5μm	0.35	0.25	0.28		0.52
	5.0μm	0.15	0.13	0.15		0.20
	8.0μm				0.14	
	10.0μm	0.12	0.05	0.07	0.14	0.12
Degree of Polarization % (K1-K2)/(K1+K2)	2.5μm	99.0	99.4	99.3		96.6
	5.0μm	99.6	99.6	99.6		99.5
	8.0μm				99.6	
	10.0μm	99.7	99.8	99.8	99.6	99.6
Extinction Ratio expressed as K1/K2	2.5μm	200:1	336:1	300:1		142:1
	5.0μm	533:1	662:1	573:1		405:1
	8.0μm				607:1	
	10.0μm	600:1	960:1	1143:1	629:1	600:1

	Substrate		Ring Mount		Part Number
	OD (mm)	CA (mm)	OD (mm)	t (mm)	
KRS-5	25.0*	unmounted	N/A	N/A	GS57002
	29.0	25.0	41.0	6.7	GS57011
	42.0	38.0	55.0	8.7	GS57013
	54.0	50.0	70.0	8.7	GS57015
Ge	25.0*	unmounted	N/A	N/A	GS57004
	29.0	25.0	41.0	6.7	GS57071
	42.0	38.0	55.0	8.7	GS57073
	54.0	50.0	70.0	8.7	GS57075
	75.0	71.0	90.0	9.7	GS57074
CaF2	25.0*	unmounted	N/A	N/A	GS57007
	29.0	25.0	41.0	6.7	GS57081
	42.0	38.0	55.0	8.7	GS57083
	54.0	50.0	70.0	8.7	GS57085
	75.0	71.0	90.0	9.7	GS57087
BaF2	25.0*	unmounted	N/A	N/A	GS57009
	29.0	25.0	41.0	6.7	GS57091
	42.0	38.0	55.0	8.7	GS57093
	54.0	50.0	70.0	8.7	GS57095
	75.0	71.0	90.0	9.7	GS57097
ZnSe	25.0*	unmounted	N/A	N/A	GS57017
	29.0	25.0	41.0	6.7	GS57051
	42.0	38.0	55.0	8.7	GS57053
	54.0	50.0	70.0	8.7	GS57055
	75.0	71.0	90.0	9.7	GS57057

\* The unmounted 25.0mm polarizers are 2mm thick.

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.

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