

Holographic Polarizers



Holographic polarizers are much more efficient than ruled gratings because of the much shorter periods and extreme uniformity across the surface of the substrate – light scatter associated with gratings is eliminated.

Specac manufactures these polarizers with sub micron grid spacing using a technique originally developed in conjunction with the United Kingdom National Physical Laboratory (NPL).

Suitable infrared transmitting substrates are coated with a photo-resist and then exposed to an interferometrically generated fringe pattern from monochromatic light. The developed photo resist, which has a regular sinusoidal profile, is then coated at an oblique angle with aluminum, or gold, to create an array of fine parallel lines at a set period.

Specac manufactures a range of standard and high extinction ratio (HER) polarizers on a variety of substrates.

Custom units including large area, image quality, alternative substrates and mechanical assemblies are available upon request.

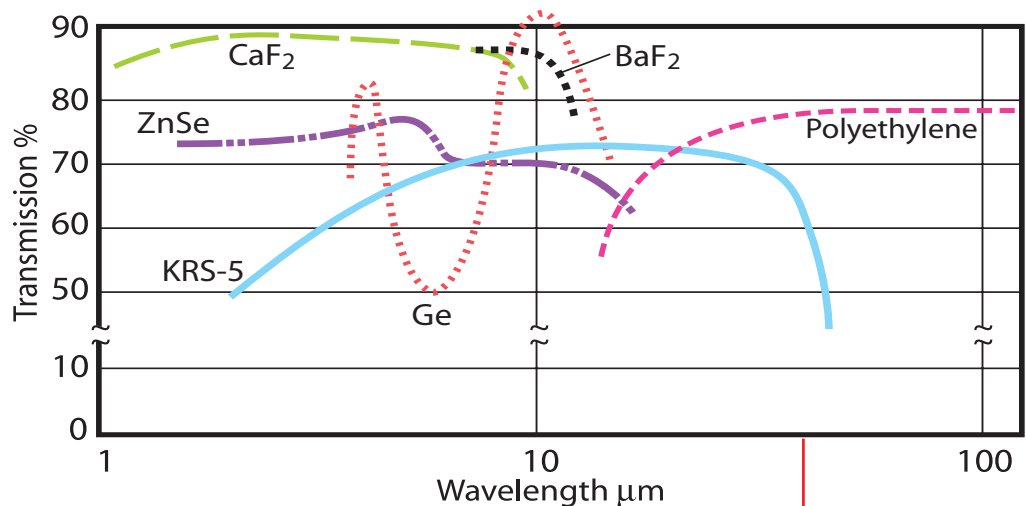
Features

- High efficiency
- No light scatter
- Choice of substrates
- Aluminum or Gold grids
- High Extinction Ratio
- Image Quality available
- Custom design and manufacture

Applications

- Infrared spectroscopy of materials
- Beamsplitters
- Infrared astronomy, microscopy
- Low intensity laser polarization and beam attenuation
- Material characterization/analysis
- Coupling devices for mid-IR and long wavelength lasers
- Plasma diagnostics, thermal imaging systems

Transmission Efficiency (K1)



Substrate Quality Spectral Range (µm) Grid Period (µm)	KRS-5		CaF2		BaF2		Ge		ZnSe		Polyethylene	
	Standard	HER	Standard	HER	Standard	HER	Standard	HER	Standard	HER	Standard	
	2 - 35		1 - 10		1 - 12.5		8 - 12		1 - 15		20 - 1000	
	0.25		0.25		0.25		0.4		0.25		4.0	
Transmission Efficiency % (K1)	2.5µm	72	70	89	84	88	84			76	74	80% average over working range (20 - 1000)
	5.0µm	84	80	88	86	88	86			85	81	
	8.0µm							87	85			
	10.0µm	75	72	50	48	84	80	91	88	74	72	
Transmission of Unwanted Radiation % (K2)	2.5µm	1.50	0.35	1.00	0.25	1.10	0.28			1.40	0.52	4% @ 30µm
	5.0µm	0.50	0.15	0.28	0.13	0.30	0.15			0.50	0.20	
	8.0µm							0.35	0.14			
	10.0µm	0.23	0.12	0.10	0.05	0.20	0.07	0.25	0.14	0.20	0.12	
Degree of Polarization % (K1-K2)/(K1+K2)	2.5µm	95.8	99.0	97.8	99.4	97.5	99.3			96.3	98.6	90% @ 30µm
	5.0µm	98.8	99.6	99.3	99.6	99.3	99.6			98.8	99.5	
	8.0µm							99.2	99.6			
	10.0µm	99.7	99.7	99.6	99.8	99.5	99.8	99.4	99.6	99.4	99.6	
Extinction / Contrast Ratio expressed as K1/K2	2.5µm	48:1	200:1	89:1	336:1	80:1	300:1			54:1	142:1	20.1 @ 30µm
	5.0µm	168:1	533:1	314:1	662:1	293:1	573:1			170:1	405:1	
	8.0µm							249:1	607:1			
	10.0µm	326:1	600:1	500:1	960:1	420:1	1143:1	364:1	629:1	370:1	600:1	

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.

Ordering Information

Substrate	Substrate		Ring Mount		Part Number	
	OD (mm)	CA (mm)	OD (mm)	t (mm)	Standard	HER
KRS-5	25.0	unmounted	N/A	N/A	57001	57002
	29.0	25.0	41.0	6.7	57010	57011
	42.0	38.0	55.0	8.7	57012	57013
	54.0	50.0	70.0	8.7	57014	57015
Ge	25.0	unmounted	N/A	N/A	57003	57004
	29.0	25.0	41.0	6.7	57070	57071
	42.0	38.0	55.0	8.7	57072	57073
	54.0	50.0	70.0	8.7	57074	57075
	75.0	71.0	90.0	9.7	57076	57077
CaF2	25.0	unmounted	N/A	N/A	57006	57007
	29.0	25.0	41.0	6.7	57080	57081
	42.0	38.0	55.0	8.7	57082	57083
	54.0	50.0	70.0	8.7	57084	57085
	75.0	71.0	90.0	9.7	57086	57087
BaF2	25.0	unmounted	N/A	N/A	57008	57009
	29.0	25.0	41.0	6.7	57090	57091
	42.0	38.0	55.0	8.7	57092	57093
	54.0	50.0	70.0	8.7	57094	57095
	75.0	71.0	90.0	9.7	57096	57097
ZnSe	25.0	unmounted	N/A	N/A	57016	57017
	29.0	25.0	41.0	6.7	57050	57051
	42.0	38.0	55.0	8.7	57052	57053
	54.0	50.0	70.0	8.7	57054	57055
	75.0	71.0	90.0	9.7	57056	57057
*Polyethylene	29.5	25.0	41.0	6.7	57020	N/A

*Polyethylene polarizers are manufactured by photolithographic process

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