Free standing wire grid polarizres

Extremely efficient polarizers for the mid-IR to millimeter wavelengths using free standing wire grids (unsupported wires).

The only requirement is that the wavelength is much greater than the wire spacing. The absorption of radiation in the wires is very low and the polarization efficiency is unaffected by any small irregularities in the wire spacing at wavelengths significantly larger than the period (d) (λ>> d). At wavelengths close to the period (d), the polarization efficiency drops and becomes a more complex function of the wire diameter and wire spacing.

Tungsten or gold plated tungsten wires of 5, 10, 25 or 50µm diameter, or beryllium-copper wire of 25 or 50µm, can be wound onto a support ring, or frame, and the wire spacing varied between 12.5µm and 1.8mm according to customer requirements.

Mounts can be custom designed and fabricated in a choice of material including aluminum, stainless steel, Invar, Tufnol, glass fiber and molybdenum. The wires can be bonded using special adhesives depending on application.

Features

- Mid-IR to mm wavelengths, 20µm - >10mm
- High degree of polarization
- High transmission efficiency
- No beam deviation or dispersion
- Choice of materials and custom design

Applications

- Far-IR wavelength polarization
- Interferometric Beamsplitters
- Variable attenuation/reflection of polarized sources
- Coupling devices for long wavelength lasers (gas discharge or optical pumped)

Quantum Design EUROPE

Quantum Design GmbH
Im Tiefen See 58
D-64293 Darmstadt

Please contact: Dr. Joachim Weiss,
06151 8806-72, E-Mail: weiss@qd-europe.com
www.qd-europe.com

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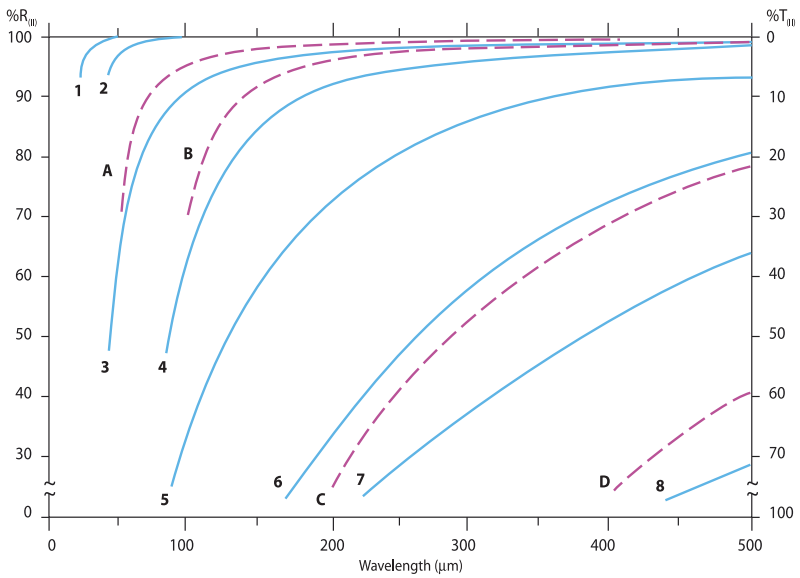
Transmission characteristics of free standing wire grid polarizers showing effect of wire diameter and period



Curve	wire diameter (µm), a	Period (µm), d	a/d
1	5	12.5	0.4
2	10	25	0.4
3	5	25	0.2
4	10	50	0.2
5	5	50	0.1
6	10	100	0.1
7	5	100	0.05
8	10	200	0.05
A	5	25	0.2
B	10	50	0.2
C	5	100	0.05
D	10	200	0.05

Note: Curves A - D = 45o incidence (rotated about wire direction)

Ordering information

Part Number	Anodized Aluminum Frame			Wire Diameter (a) (µm)	Period (d) (µm)
	O.D.(mm)	I.D.(mm)	Thick(mm)		
GS57200	50	25	10	5	12.5
GS57201	50	25	10	10	25
GS57202	80	50	12	5	12.5
GS57203	80	50	12	10	25
GS57204	105	75	12	5	12.5
GS57205	105	75	12	10	25
GS57206	130	100	12	5	12.5
GS57207	130	100	12	10	25
GS57100	140	120	12.7	10	25
GS57110	140	120	12.7	10	50
GS57130	133.35	95.25	12.7	10	25
GS57135	133.35	95.25	12.7	5	12.5

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