



# FIR- and THz- Polarizers

For operation in FIR and THz regions we supply polyethylene polarizers designed to polarize radiation from 7 microns to MM waves. They are the sort of diffraction gratings and operate in transmission. The polarizer grating is made by forming grooves of a triangle profile on the substrate and subsequent deposition of a metal coating (aluminum) on one of the groove facets.



### Applications:

- THz microscopy;
- Molecular orientation studies of crystal and polymer films;
- Imaging;
- Sensors and detectors;
- FTIR spectroscopy;
- THz spectroscopy studies.

### Features:

- Used in extremely wide wavelength range from MIR (7 m) to THz (3 mm and even more);
- Substrate is high density polyethylene (HDPE);
- High FIR transmission;
- High degree of polarization;
- Polarizers are supplied in holders (protective ring with marked grid direction).

### Advantages of polyethylene grid polarizers over free-standing wire grid polarizers:

- Lower cost;
- One polarizer can be used for the wide wavelength range

Substrate material	Hard polyethylene (HDPE)
Spectral range, $\mu\text{m}$	$\geq 7$
Typical operation aperture, mm	25
Standard holder size at typical aperture, mm	D34.9 x 7.9
Maximal operation aperture, mm	100*
Grooves per mm	1200
Transmission efficiency K1 (average), %	70 - 80
Transmission of unwanted radiation K2, %	<1 @ 8 $\mu\text{m}$ <0.1 @ 30-1000 $\mu\text{m}$
Degree of polarization (K1-K2)/(K1+K2), %	>98 @ 8 $\mu\text{m}$ >99.5 @ 30-1000 $\mu\text{m}$
Extinction ratio $E=K1/(2*K2)$	35-40 @ 8 $\mu\text{m}$ 350-400 @ 30-1000 $\mu\text{m}$

\* For square shape polarizer max aperture size can be higher, up to 110 x 110 mm.

### Sizes and Shapes:

Polyethylene polarizers are produced using the ruled grating technique. The grid is ruled onto large size material, which is subsequently cut. Thus clear aperture can be round or, on customer request square or rectangular. The polarizers with clear aperture (CA) 25 mm are available from stock. For price quotation and delivery please fax or e-mail us.

