

FRESNEL RHOMBS

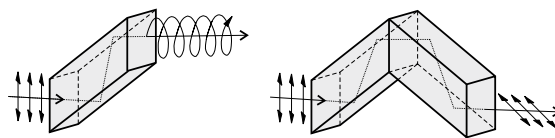
Features

- Rotate polarization, operates over a wide wavelength range
- $\lambda/2$ rhomb is two optically contacted $\lambda/4$ rhombs

Due to unequal phase shifts arising in orthogonally polarized components of an incident wave at total internal reflection, Fresnel Rhombs are used to alter the polarization type of radiation. They are designed so that two full internal reflections inside a rhomb provide $\pi/2$ phase difference between the orthogonally polarized components of radiation. Hence, if there is a 45° angle between the polarization of the linearly polarized incident plane, the emerging beam is circularly polarized, i. e. the rhomb effect is similar to that of a quarter-waveplate. Therefore, two identical Fresnel rhombs, installed in series, will provide $\pi/2$ phase difference similar to that of a half-waveplate, i. e. the device can rotate the beam polarization plane by 90° , leaving the beam direction invariable.

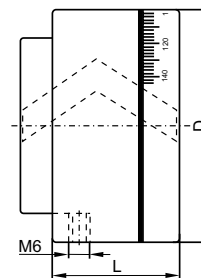
Due to the low dispersion of the refractive index of the materials being used Fresnel rhombs are achromatic over a wide spectral range.

Air-Spaced Fresnel Rhombs are available on request for high power applications.



$\lambda/4$ Fresnel rhomb

$\lambda/2$ Fresnel rhomb



$\lambda/2$ rhomb with mount

Specifications

Material	BK7, UV FS
Operating spectral range	BK7: 400–2000 nm
	UV FS: 210–400 nm
Surface quality	20 – 10 scratch & dig (MIL-PRF-13830B)
Surface flatness	$\lambda/10$ @ 633 nm (all polished surfaces)
Retardation tolerance	$\pm 2^\circ$
Broad band AR coating	$R < 1\%$
Laser damage threshold	$> 0.5 \text{ J/cm}^2$, 10 nsec pulse, 1064 typical

Unmounted

Material	Wavelength range, nm	Retardation	Clear aperture, mm	Catalogue number	Price, EUR
BK7	600–900	$\lambda/2$	10	481-0210	442
		$\lambda/4$	10	481-0410	223
	400–700	$\lambda/2$	10	481-0212	442
		$\lambda/4$	10	481-0414	223
UV FS	210–400	$\lambda/2$	10	481-1210	589
		$\lambda/4$	10	481-1410	355

Fresnel rhombs with other dimensions and parameters or coatings as well as unmounted rhombs are available upon request.

Mounted

Material	Wavelength range, nm	Retardation	Clear aperture, mm	Holder diameter D, mm	Holder length L, mm	Catalogue number	Price, EUR
BK7	600–900	$\lambda/2$	10	73	55	480-0210	791
		$\lambda/4$	10	65	25	480-0410	403
	400–700	$\lambda/2$	10	73	55	480-0212	791
		$\lambda/4$	10	65	25	480-0414	403
UV FS	210–400	$\lambda/2$	10	73	55	480-1210	938
		$\lambda/4$	10	65	25	480-1410	535

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Mounting Suggestion

