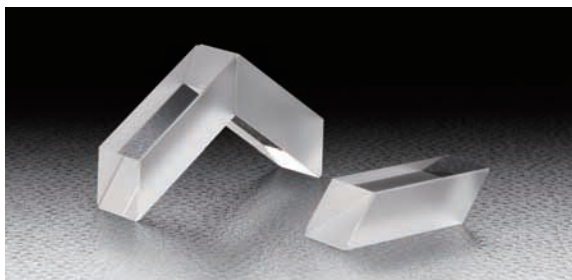


Fresnel Rhomb Waveplates | FRWP



The optical retardation can be given without the wavelength dependence for all visible ranges. It can be used in optical systems that manipulate the polarization orientation of the white-light source or spectroscopic measurement using polarization.

- There are two types of Fresnel rhomb waveplate. A half waveplate can rotate the polarization orientation and a quarter waveplate can convert linear polarization into circular polarization.
- As the entrance, exit and reflecting surfaces are processed at a high parallelism, the beam deflection is suppressed.
- When the linear polarization orientation of incident light is 45 degrees against the sides of square faces, the specified optical retardation will be obtained. The light will exit as linear polarization with -45 degrees orientation for the half waveplate, and as circular polarization for the quarter waveplate.



Specifications	
Material	BK7
Surface flatness of substrate	$\lambda/10$
Coating	Edge faces: Anti-reflection coating Side surfaces: Uncoated
Design wavelength	587.6nm
Incident angle	0°
Surface Quality (Scratch-Dig)	40-20

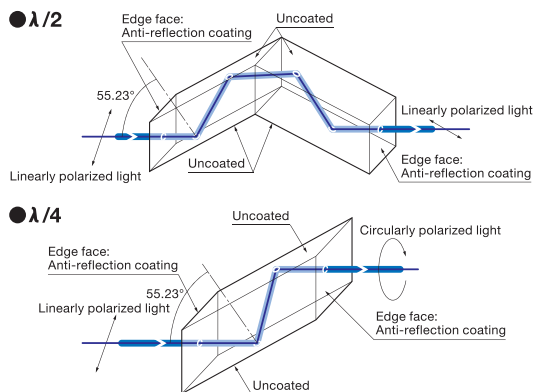
Guide

- ▶ Fresnel rhomb waveplates made of synthetic fused silica is also available.
- ▶ For Fresnel rhomb waveplates with different size, wavelength range, or retardation, please contact our International Sales Division.

Attention

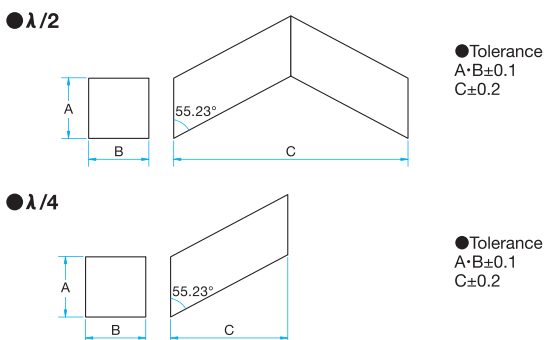
- ▶ The quarter waveplate has optical axis shift (refer to the optical axis shift listed in the table below). Use the Fresnel rhomb waveplate by mounting it horizontally or vertically and rotating the polarization orientation of the incidence beam.
- ▶ If finger prints or grease stain the polished surfaces of the Fresnel rhomb waveplate, the specified optical retardation will not be obtained. Use it carefully to prevent the side surfaces contact with anything. (An FRH mounted in a holder is also available).
- ▶ If the incidence angle varies, the specified optical retardation performance will not be obtained.
- ▶ The Fresnel rhomb waveplate is less dependant to the wavelength, and it can be used in extended range outside the visible range. However the effectiveness of the anti-reflection coating drops outside the visible range and the transmittance decreases.
- ▶ When the linear polarization orientation of incident light is aligned at 0 degree or 90 degrees against the side of square face, the polarization orientation will not change and output. (this is same for half waveplate and quarter waveplate)

Schematic



Outline Drawing

(in mm)



$\lambda/2$		
Part Number	A×B×C [mm]	optical axis shift [mm]
FRWP-1010-2	10×10×40.0	<0.5
FRWP-1515-2	15×15×58.6	<0.5

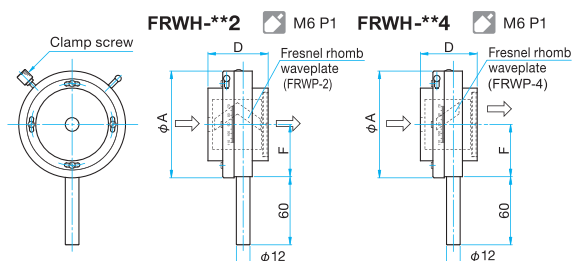
$\lambda/4$		
Part Number	A×B×C [mm]	optical axis shift [mm]
FRWP-1010-2	10×10×20.0	13.5
FRWP-1515-4	15×15×29.3	20.2

Fresnel Rhomb Waveplate Holders

This is a product with Fresnel rhomb waveplate mounted in a holder. For a $\lambda/2$ plate (FRH-**2), the optical axis of waveplate and rotation axis of holder are aligned.

Outline Drawing

(in mm)



Part Number	Center height F [mm]	Diameter φA [mm]	Thickness D [mm]
FRWH-102	46	94	53
FRWH-152	57.5	116	74
FRWH-104	46	94	50
FRWH-154	57.5	116	46

Specifications			
Part Number	Part number of waveplate	Sensitivity [°]	Weight [kg]
FRWH-102	FRB-1010-2	1	0.59
FRWH-152	FRB-1515-2	1	1.05
FRWH-104	FRB-1010-4	1	0.57
FRWH-154	FRB-1515-4	1	1.81

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