56 Sparta Avenue • Newton, New Jersey 07860
(973) 300-3000 Sales • (973) 300-3600 Fax
www.thorlabs.com

THORLABS

PBW254-106 - September 20, 2017

Item # PBW254-106 was discontinued on September 20, 2017. For informational purposes, this is a copy of the website content at that time and is valid only for the stated product.

CO_2 LASER BREWSTER POLARIZER

- **10.6 µm Brewster Polarizer**
- **Zero Beam Displacement**
- **Ø1/2" and Ø1" Size Options**

PBW254-106

PBW127-106

PBW254-106 CO_2 Laser Polarizer Mounted in a KS1RS Kinematic Rotation Mount

OVERVIEW

Features

- Two ZnSe Plates at Brewster Angle with Polarization Coating for 10.6 µm
- Chevron Configuration Corrects for the Displacement of Transmitted Beam
- Ø1/2" and Ø1" Versions Available

Animation showing light propagation through Brewster Polarizer

Thorlabs' CO_2 Laser Polarizers are designed specifically as Brewster polarizers for CO_2 lasers (10.6 µm). Each polarizer is composed of two zinc selenide windows with a polarizing coating on the outside face of each window, making this device bidirectional. The polarizer is then housed in a Ø1/2" or Ø1" cylindrical mount. The ZnSe windows are arranged in a chevron configuration within the cylindrical mount, resulting in no spatial offset to the transmitted beam, while the reflected s-polarization beam is ejected through slots in the cylindrical mount. The zero spatial offset allows this polarizer to be inserted and removed from a system without significantly affecting the downstream beam path. The movie to the right illustrates a beam propagating through the polarizer.

Click to Enlarge
PBW254-106 housed in an SM1L30C slotted lens tube and mounted in a KS1RS kinematic rotation mount

These polarizers are compatible with the SM05P05 (Ø1/2") or the SM1P1 (Ø1") adapters, allowing the Brewster polarizers to be mounted on any SM05- or SM1-threaded mount, respectively. Additionally, the Brewster polarizers may be mounted into a slotted lens tube (SM05L30C for Ø1/2" or SM1L30C for Ø1"). The rightmost image shows the PBW254-106 in an SM1L30C slotted lens tube mounted on a KS1RS kinematic rotation mount,while the near right image shows the PBW127-106 in an SM05L30C slotted lens tube mounted on a KS05RS kinematic rotation mount. The slotted lens tube gives the option to block or unblock the beam ejected from the polarizer. However, caution should be exercised when blocking portions of the CO_2 beam in order to avoid potential damage to other parts.

Click to Enlarge
PBW127-106 housed in an SM05L30C slotted lens tube and mounted in a KS05RS kinematic rotation mount

As a result of their design, the polarizers offered here are sensitive to impact, and care should be exercised when handling these devices. Dropping a polarizer may adversely affect its performance or crack the ZnSe windows. Additionally, when handling optics, one should always wear gloves. This is especially true when working with zinc selenide, as it is a hazardous material. For your safety, please follow all proper precautions, including wearing gloves when handling these polarizers and thoroughly washing

your hands afterward.

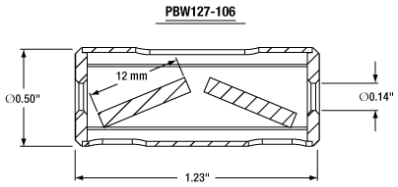
Specifications	PBW127-106	PBW254-106
Design Wavelength	10.6 µm	
Clear Aperture	Ø0.14" (3.5 mm)	Ø0.32" (8.0 mm)
Polarizing Coating	$T_p \geq 95\%$, $R_s \geq 97\%$	
Angle of Incidence[a]	67.4°	
Extinction Ratio[b]	≥1500:1	
Surface Quality	40-20 Scratch-Dig	
Surface Flatness	λ @ 633 nm	

- The angle of incidence between laser beam and ZnSe windows. See *Graphs* tab for more information
- The extinction ratio (ER) is the ratio of maximum to minimum transmission of a linearly polarized input. When the transmission axis and input polarization are parallel, the transmission is at its maximum; rotate the polarizer by 90° for minimum transmission.

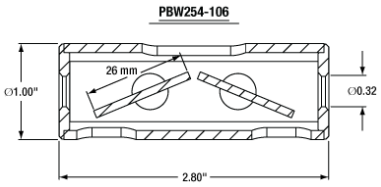
SPECS

Specifications	PBW127-106	PBW254-106
Design Wavelength	10.6 µm	
Polarizer Length	1.23" (31.3 mm)	2.80" (71.1 mm)
ZnSe Plate Dimension (H × W)	26 mm × 12.1 mm (1.02" × 0.48")	12 mm × 6 mm (0.47" × 0.24")
Dimensional Tolerance	±0.25 mm (±0.01")	
ZnSe Plate Thickness	2.0 mm (0.08")	
Thickness Tolerance	+0.00 mm/-0.10 mm (+0.00"/-0.004")	
Polarizer Clear Aperture	Ø0.14" (3.5 mm)	Ø0.32" (8.0 mm)
Polarizing Coating	$T_p \geq 95\%$, $R_s \geq 97\%$	
Angle of Incidence[a]	67.4°	
Extinction Ratio[b]	≥1500:1	
Surface Quality	40-20 Scratch-Dig	
Surface Flatness	λ @ 633 nm	

- The angle of incidence between laser beam and ZnSe windows. See *Graphs* tab for more information
- The extinction ratio (ER) is the ratio of maximum to minimum transmission of a linearly polarized input. When the transmission axis and input polarization are parallel, the transmission is at its maximum; rotate the polarizer by 90° for minimum transmission.



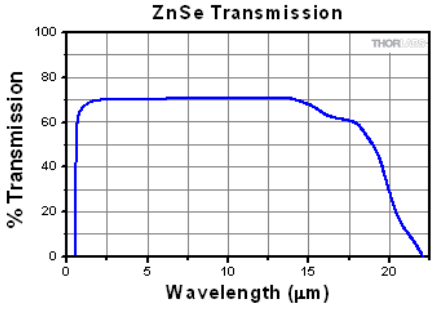
Click to Enlarge



Click to Enlarge

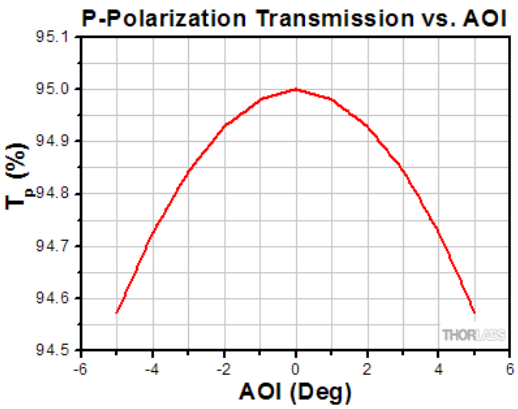
GRAPHS

ZnSe Transmission Data

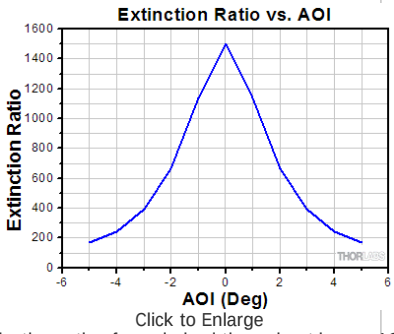


Click to Enlarge
The transmission curve above was obtained using a 6.3 mm thick, uncoated sample of ZnSe; the incident light was normal to the surface. Please

note that this is
the measured transmission, including surface reflections.



Click to Enlarge
Percent transmission of p-polarized throughput beam. AOI is measured from the normal of the polarizer's face plate.



Click to Enlarge
Extinction ratio of p-polarized throughput beam. AOI is measured from the normal of the polarizer's face plate.

Part Number	Description	Price	Availability
PBW127-106	Ø1/2" ZnSe Brewster Window Polarizer, 10.6 µm	$1,739.00	Today
PBW254-106	Ø1" ZnSe Brewster Window Polarizer, 10.6 µm	$1,600.00	Lead Time