VENUSLAB
OPTOELECTRONICS

Precision
Meets
Simplicity

Polarizer

Brewster Angle Polarizer

VLBP Series High-Power Brewster Angle Polarizers

- Ultra-High Damage Threshold
- Superior Extinction Ratio
- Surface Quality
- Substrate Options

One Platform Many Possibilities

Contact Us sales@venuslabtech.com

Get a Quote

Get Expert Advice
+65 8099 5547

Visit Us
www.venuslabtech.com

Overview

Product Overview:

The Venuslab **VLBP Series** are thin-film plate polarizers optimized for use at the **Brewster Angle (approx. 56°)**. Unlike standard absorptive polarizers, these optics utilize high-efficiency dielectric coatings to separate S-polarized and P-polarized light with minimal absorption, making them ideal for intra-cavity laser applications and high-power beam steering.

When oriented at the Brewster angle, the P-polarized component is transmitted with high efficiency (**Tp > 98%**), while the S-polarized component is reflected (**Rs > 99%**). This design eliminates the need for optical cement, significantly increasing the laser induced damage threshold (LIDT) compared to cemented polarizing cubes.

Application Note:

Mounting Tip: To achieve maximum extinction ratio, precise angular alignment is required. These polarizers are best mounted in kinematic rotation mounts to fine-tune the angle to the exact Brewster condition.

Technical Specifications

Technical Specifications (VLBP-HP Series)

Specification	Value / Description
Surface Flatness	λ/10 @ 632.8 nm (over clear aperture)
Wavefront Distortion	≤ λ/10 @ 632.8 nm
Surface Quality	10-5 Scratch-Dig (High Precision Laser Grade)
Extinction Ratio	Tp / Ts > 1000:1
Transmission Efficiency	Tp > 98% (at design wavelength)
Reflection Efficiency	Rs > 99% (for S-polarization)
Parallelism	≤ 1 arc min
Angle of Incidence	56° ± 3° (Brewster Angle)
Damage Threshold	~20 J/cm² @ 10ns, 10Hz (See specific model)
Coating	High-Power Dielectric AR Coating
Clear Aperture	> 90% of Diameter
Cleaning Recommendation	Solvent cleaning (Alcohol/Acetone mixture) with lens tissue.

Technical Specifications (VLBP-STD Series)

Specification	Value / Description
Substrate Material	H-K9L (N-BK7 Equivalent)
Surface Flatness	≤ λ/10 @ 632.8 nm
Surface Quality	10-5 Scratch-Dig
Extinction Ratio	Tp / Ts > 500:1
Transmission Efficiency	Tp > 95%
Reflection Efficiency	Rs > 99%
Angle of Incidence	56° ± 3° (Angular tuning required)
Damage Threshold	5 J/cm² @ 10ns, 10Hz
Coating	Standard Dielectric Coating

Selection Chart

High-Power Laser Line Polarizers

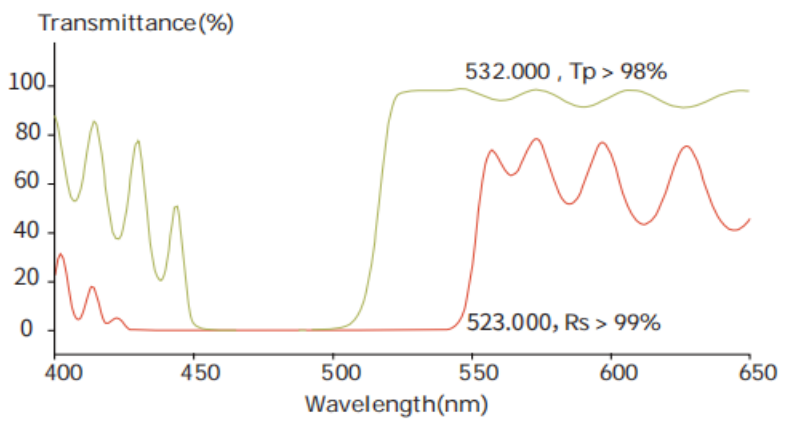
Model	Substrate	Dimensions (mm)	Wavelength (nm)	LIDT (Damage Threshold)
VLBP-25.4-532-HP	BK7 (K9)	Ø25.4 x 5	532 nm	**20 J/cm² @ 10ns**
VLBP-30-532-HP	BK7 (K9)	Ø30 x 4	532 nm	**20 J/cm² @ 10ns**
VLBP-50-532-HP	BK7 (K9)	Ø50 x 5	532 nm	**20 J/cm² @ 10ns**
VLBP-25.4-1030-Q	**Quartz (JGS1)**	Ø25.4 x 5	1030 nm	15 J/cm² @ 10ns
VLBP-50.8-1030-Q	**Quartz (JGS1)**	Ø50.8 x 6	1030 nm	15 J/cm² @ 10ns
VLBP-25.4-1064-HP	BK7 (K9)	Ø25.4 x 5	1064 nm	**20 J/cm² @ 10ns**
VLBP-30-1064-HP	BK7 (K9)	Ø30 x 4	1064 nm	**20 J/cm² @ 10ns**
VLBP-50-1064-HP	BK7 (K9)	Ø50 x 5	1064 nm	**20 J/cm² @ 10ns**

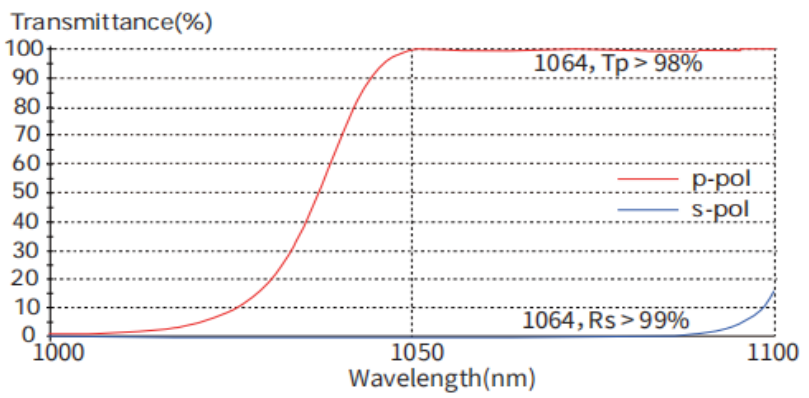
Standard Telecom Polarizers

Model	Substrate	Dimensions (mm)	Wavelength (nm)	LIDT
VLBP-25.4-1550-STD	BK7 (K9)	Ø25.4 x 5	1550 nm	5 J/cm² @ 10ns
VLBP-30-1550-STD	BK7 (K9)	Ø30 x 4	1550 nm	5 J/cm² @ 10ns
VLBP-50-1550-STD	BK7 (K9)	Ø50 x 5	1550 nm	5 J/cm² @ 10ns

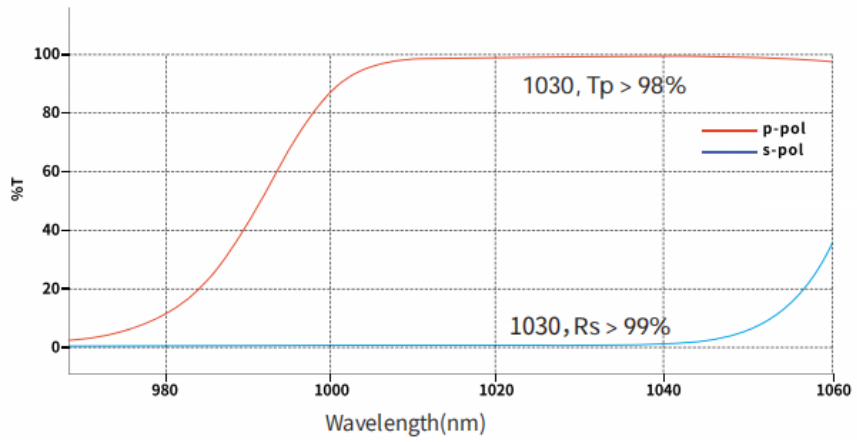
Reference Curve

Performance @ Brewster Angle (56°)





Brewster Angle Polarizer



Explore Series

Model	Substrate	LIDT (Damage Threshold)	Dimensions (mm)	Wavelength (nm)
VLBP-25.4-532-HP	BK7 (K9)	20 J/cm² @ 10ns	Ø25.4 x 5	532 nm
VLBP-25.4-1064-HP	BK7 (K9)	20 J/cm² @ 10ns	Ø25.4 x 5	1064 nm
VLBP-25.4-1030-Q	Quartz (JGS1)	15 J/cm² @ 10ns	Ø25.4 x 5	1030 nm
VLBP-25.4-1550-STD	BK7 (K9)	5 J/cm² @ 10ns	Ø25.4 x 5	1550 nm

📩 Get in touch with our team to explore configurations,request a quote,or learn more about customized solutions tailored to your needs.

Let us help you moves cience forward—faster ands marter.