Polarizing Beam Splitter Cubes

Polarization optics are used to split unpolarized light into s-pol and p-pol beams. In the following, a list of common polarization optics can be found which are described in more detail in their corresponding subchapters.

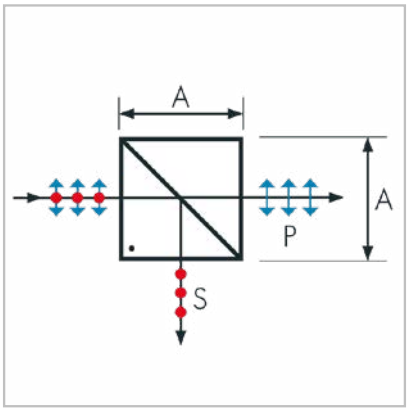
In general, two different types of polarization optics are used, depending on the application. Polarization separation of type I is the result of a coating whereas polarization separation of type II is the result of birefringency.

These polarizers have a special coating that makes the splitting of s-pol and p-pol beams possible. The entrance and exit surfaces are both AR coated.

There are different cubes available: narrowband, broadband, and high power polarizers.

Dot indicates prism with coating on the hypothenuse. For best performance the beam has to enter through this side.

Narrowband Polarizing Beam Splitter Cubes



This is the most common type of beam splitter cube for polarization separation and has the following characteristics:

- Optimized for one wavelength
- Cemented surfaces
- Applicable at up to medium power levels
- High extinction ratio
- Inexpensive

Nomenclature

PBS	-532	-050
Product code (**P**olarizing **B**eam **S**plitter)	Wavelength in nm	Dimension in inches x 100

Germany & Other Countries
Laser Components GmbH
Tel: +49 8142 2864 – 0
Fax: +49 8142 2864 – 11
info@lasercomponents.com
www.lasercomponents.com

France
Laser Components S.A.S.
Tel: +33 1 39 59 52 25
Fax: +33 1 39 59 53 50
info@lasercomponents.fr
www.lasercomponents.fr

United Kingdom
Laser Components (UK) Ltd.
Tel: +44 1245 491 499
Fax: +44 1245 491 801
info@lasercomponents.co.uk
www.lasercomponents.co.uk

Specifications:

- **Material:** BK7
- **Dimension tolerance:** ± 0.25 mm
- **Beam deviation:** < 3 arcmin
- **Surface figure:** 3/0.5 according to ISO 10110
  λ/4 according to MIL-O-1380A
- **Surface quality:** 5/4 x 0.063 for 1.0" substrates ccording to ISO 10110
  20-10 according to MIL-O-1380A
- **Extinction ratio:** Tp/Ts > 1000:1
  with Tp > 95 %
  Rs > 99.8 %
- **Clear aperture:** 85 % of the dimensions
- **Damage threshold:** ca. 1 kW/cm² (cw)
  ca. 0.5 J/cm² (10 ns)
- **Wavelength:** For single wavelength in the range of 440 nm – 1550 nm
- **Dimensions [mm]:** 10.0; 12.7; 15.0; 20.0; 25.4; 30.0; 38.1; 50.8

If you can manage with less-demanding specifications in your application, we have less expensive cubes with a surface quality of 60-40 according to MIL-O-1380A available.

High Power Polarizing Beam Splitter Cubes

These cubes are optically contacted and specially designed for use in high power lasers. The characteristics possible in respect of damage threshold correspond to that of thin film polarizers.

The separation of polarization occurs at 90°. Compared to thin film polarizers, there is no offset of the transmitted p-pol beam (see drawing).

Nomenclature

PBSC	-532	-050
Product code (High Power Polarizing Beam Splitter)	Wavelength in nm	Dimension in inches x 100

Specifications:

- **Material:** BK7, fused silica
- **Dimension tolerance:** ± 0.25 mm
- **Beam deviation:** < 3 arcmin
- **Surface figure:** 3/0.5 according to ISO 10110
  λ/4 according to MIL-O-1380A
- **Surface quality:** 5/4 x 0.063 for 1.0" substrates according to ISO 10110
  20-10 according to MIL-O-1380A
- **Extinction ratio:** Tp/Ts > 200:1
  whereas Tp_{UV} > 90.0 %
  $Tp_{VIS/NIR}$ > 95.0 %
  Rs ≥ 99.0 %
- **Clear aperture:** 85 % of the dimensions
- **Damage threshold:** ca. 10 J/cm² (10 ns) for Vis, NIR
  ca. 5 J/cm² (10 ns) for UV
- **Wavelength:** For single wavelength in the range of 248 nm – 1550 nm
- **Dimensions [mm]:** 10.0; 12.7; 15.0; 20.0; 25.4

Germany & Other Countries
Laser Components GmbH
Tel: +49 8142 2864 – 0
Fax: +49 8142 2864 – 11
info@lasercomponents.com
www.lasercomponents.com

France
Laser Components S.A.S.
Tel: +33 1 39 59 52 25
Fax: +33 1 39 59 53 50
info@lasercomponents.fr
www.lasercomponents.fr

United Kingdom
Laser Components (UK) Ltd.
Tel: +44 1245 491 499
Fax: +44 1245 491 801
info@lasercomponents.co.uk
www.lasercomponents.co.uk

Broadband Beam Splitter Cubes

The polarizers are cemented and can be used for lasers with up to medium power levels.

The mentioned LDT values can not be guaranteed for cemented cubes, these are expected values.

Due to their coating, they can also be used for large bandwidths.

Nomenclature

PBSH	-450-680	-050
Product code (Broadband Polarizing Beam Splitter)	Wavelength range in nm	Dimension in inches x 100

Specifications:

- **Material:** BK7, SF2
- **Dimension tolerance:** ± 0.25 mm
- **Beam deviation:** < 3 arcmin
- **Surface figure:** 3/0.25 according to ISO 10110
  λ/8 according to MIL-O-1380A
- **Surface quality:** 5/4 x 0.063 for 1.0" substrates according to ISO 10110
  20-10 according to MIL-O-1380A
- **Extinction ratio:** Tp/Ts > 500:1
  whereas Tp ≥ 90.0 % (average)
  Rs ≥ 99.8 % (average)
- **Clear aperture:** 85 % of the dimensions
- **Damage threshold:** ca. 100 W/cm² (cw)
  ca. 0.5 J/cm² (10 ns)
- **Wavelength ranges:** 440 nm – 680 nm
  650 nm – 1000 nm
  900 nm – 1400 nm
  1200 nm – 1600 nm
- **Dimensions [mm]:** 10.0; 12.7; 25.4; 38.1; 50.8

Germany & Other Countries
Laser Components GmbH
Tel: +49 8142 2864 – 0
Fax: +49 8142 2864 – 11
info@lasercomponents.com
www.lasercomponents.com

France
Laser Components S.A.S.
Tel: +33 1 39 59 52 25
Fax: +33 1 39 59 53 50
info@lasercomponents.fr
www.lasercomponents.fr

United Kingdom
Laser Components (UK) Ltd.
Tel: +44 1245 491 499
Fax: +44 1245 491 801
info@lasercomponents.co.uk
www.lasercomponents.co.uk