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Beam Splitters

Beam splitters allow a beam to be split into two beams of differing power, however, the most popular power split is 50:50 at a 45° incidence angle. The polarization needs to be considered when specifying a beam splitter otherwise the reflected and transmitted beams will not have the correct power. We have developed a special 'polarization insensitive' coating which eliminates this problem for the 50:50 case.

- Advanced in-house design
- Up to 500W/cm² power handling
- High quality laser grade material

The following standard beam splitter are available..

Model	Material	Diameter mm	ET mm	Transmission %	Reflectance %	Coating
BPZ-1-3-45	ZnSe	25.4	3	50	50	AR/50%-PIB
BPZ-1-3-50-P	ZnSe	25.4	3	50	50	AR/50%-45P
BPZ-1-3-50-R	ZnSe	25.4	3	50	50	AR/50%-45R
BPZ-1-3-45-3-50-S	ZnSe	25.4	3	50	50	AR/50%-45S
BPZ-1-3-99-R	ZnSe	25.4	3	1	99	AR/99%-45R
BPZ-1.5-3-45	ZnSe	38.05	3	50	50	AR/50%-PIB
BPZ-1.5-4-45	ZnSe	38.05	4	50	50	AR/50%-PIB
BPZ-1.5-3-10-R	ZnSe	38.05	3	90	10	AR/10%-45R
BPZ-1.5-3-1-R	ZnSe	38.05	3	99	1	AR/1%-45R
BPZ-1.5-3-50-P	ZnSe	38.05	3	50	50	AR/50%-45P
BPZ-1.5-3-50-R	ZnSe	38.05	3	50	50	AR/50%-45R
BPZ-1.5-3-50-S	ZnSe	38.05	3	50	50	AR/50%-45S
BPZ-1.5-3-5-R	ZnSe	38.05	3	95	5	AR/5%-45R
BPZ-1.5-4-50-R	ZnSe	38.05	4	50	50	AR/50%-45R
BPZ-1.5-5-50-R	ZnSe	38.05	5	50	50	AR/50%-45R
BPZ-2-5-45	ZnSe	50.8	5	50	50	AR/50%-PIB

Remark:

- 1) The above items are flat/flat;
- 2) The angle of incidence is 45 degree;
- 3) The above items are polarisation-insensitive.

Windows

ZnSe windows can be fabricated in dimensions from 4.0mm to 300mm diameter, and in thicknesses from 1.0mm up to 50mm. The windows are AR coated at 10.6um. Many standard sizes are manufactured and held in stock.

- Hi-tech manufacturing methods
- Latest ultra-low absorption coatings
- High quality laser grade material

The following standard windows are available.

Model	Material	Diameter mm	ET mm	Incidence deg	T %	R %	Coating
WZ4920	ZnSe	12.5	2	0	99.4	0.1	AR/AR
WZ5030	ZnSe	12.7	3	0	99.4	0.1	AR/AR
WZ5910	ZnSe	15	1	0	99.4	0.1	AR/AR
WZ5960U	ZnSe	15	6	0	71	14.5	Uncoated ZnSe
WZ6330	ZnSe	16	3	0	99.4	0.1	AR/AR
WZ1020	ZnSe	25.4	2	0	99.4	0.1	AR/AR
WZ1030	ZnSe	25.4	3	0	99.4	0.1	AR/AR
WZ1030U	ZnSe	25.4	3	0	71	14.5	Uncoated ZnSe
WZ1040	ZnSe	25.4	4	0	99.4	0.1	AR/AR
WZ1130	ZnSe	28	3	0	99.4	0.1	AR/AR
WZ1140	ZnSe	28	4	0	99.4	0.1	AR/AR
WZ1150	ZnSe	28	5	0	99.4	0.1	AR/AR
WZ11830U	ZnSe	30	3	0	71	14.5	Uncoated ZnSe
WZ1530	ZnSe	38.05	3	0	99.4	0.1	AR/AR
WZ1530P	ZnSe	38.05	3	0	99.4	0.1	AR/AR
WZ1540	ZnSe	38.05	4	0	99.4	0.1	AR/AR
WZ1550	ZnSe	38.05	5	0	99.4	0.1	AR/AR
WZ1560	ZnSe	38.05	6	0	99.4	0.1	AR/AR
WZ17580	ZnSe	44.5	8	0	99.4	0.1	AR/AR
WZ19730	ZnSe	50	3	0	99.4	0.1	AR/AR
WZ19740	ZnSe	50	4	0	99.4	0.1	AR/AR
WZ19750	ZnSe	50	5	0	99.4	0.1	AR/AR
WZ1975099	ZnSe	50	5	0	1	99	AR/99%
WZ2030U	ZnSe	50.8	3	0	71	14.5	Uncoated ZnSe
WZ2040	ZnSe	50.8	4	0	99.4	0.1	AR/AR
WZ2050	ZnSe	50.8	5	0	99.4	0.1	AR/AR
WZ2050U	ZnSe	50.8	5	0	71	14.5	Uncoated ZnSe
WZ2060	ZnSe	50.8	6	0	99.4	0.1	AR/AR
WZ2530	ZnSe	63.5	3	0	99.4	0.1	AR/AR
WZ3030	ZnSe	76.2	3	0	99.4	0.1	AR/AR

Brewster Windows

Brewster windows operate at an angle of incidence equal to the 'Brewster angle' which is 67.4 for ZnSe at 10.6mm. In order to present a square profile to the incident beam, they are about 2.5 times longer than their width. They fully transmit linearly polarized light in the P-plane and reflect about 50% of the S-plane component. Consequently, they can be used to enhance ('clean-up') the polarization or by rotating it about the beam axis, they can be used as an attenuator. Coated versions enhance the reflectance of the S-component but at the expense of restricting the power. Usually, Brewster windows are used in pairs.

- Wedged to between 1 and 3 arcminutes in order to overcome multiple interference
- Coated or uncoated versions and many sizes available
- High quality laser grade material

The following standard Brewster windows are available.

Model	Material	Diameter mm	ET mm	Incidence deg	T %	R %	Coating
BWZ2510	ZnSe	25	3	0	71	14.5	Uncoated ZnSe
BWZ3315	ZnSe	33	3	0	71	14.5	Uncoated ZnSe
BWZE4015	ZnSe	40	3	67.4	98% P-Pol	99.5S-Pol	AR/U-EB
BWZ4218	ZnSe	42	3	0	71	14.5	Uncoated ZnSe
BWZ5018	ZnSe	50	3	0	71	14.5	Uncoated ZnSe
BWZE5018	ZnSe	50	3	67.4	98% P-Pol	99.5S-Pol	AR/U-EB
BWZ5320	ZnSe	53	3	0	71	14.5	Uncoated ZnSe
BWZ6122	ZnSe	61	3	0	71	14.5	Uncoated ZnSe
BWZ6323	ZnSe	63	3	0	71	14.5	Uncoated ZnSe
BWZ6625	ZnSe	66	3	0	71	14.5	Uncoated ZnSe
BWZE6625	ZnSe	66	3	67.4	98% P-Pol	99.5S-Pol	AR/U-EB
BWZ10038	ZnSe	100	3	0	71	14.5	Uncoated ZnSe
BWZ11542	ZnSe	115	3	0	71	14.5	Uncoated ZnSe
BWZ13248	ZnSe	132	3	0	71	14.5	Uncoated ZnSe

Beam Combiner

Beam Combiners are ideal for applications where diode lasers are being used for system alignment. Designed for used at 45 degree, they transmit the long wavelength beam and align it with the 90 degree reflected diode beam.

1. Beam Combiner for CO₂ Laser (wavelength 10.6um)

Average transmission > 99%@10.6um, Average reflection > 85%@650nm (or 633nm)

Diameter Tolerance: +0/-0.13mm

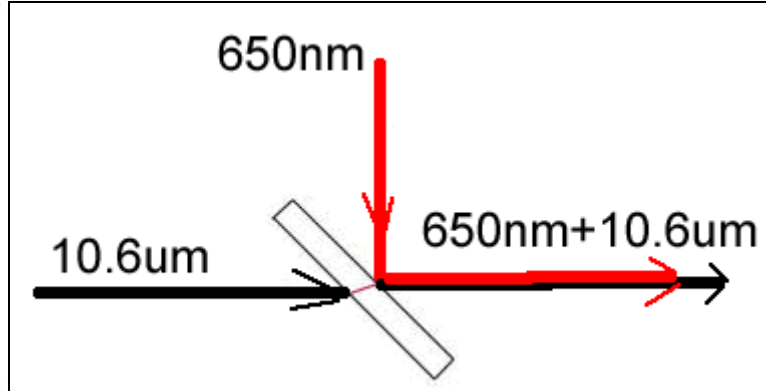
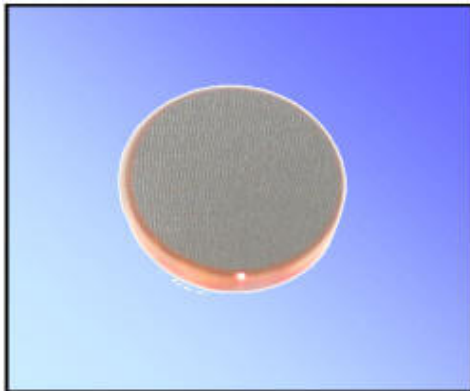
Thickness: ±0.25mm

Side1: T>99%@10.6um, 45AOI

Side2: T>99%@10.6um R>85%@650nm or 633nm 45AOI

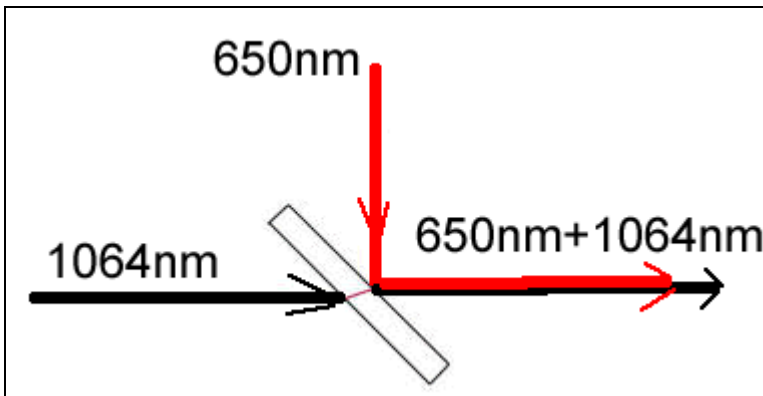
Flatness: $\lambda/20$ @10.6um

Part No.	Material	Diameter (inch)	Thickness (mm)	Remark
BCZ-0.5-2-650	ZnSe	0.5	2	MaxT10.6μm/MaxR650nm
BCZ-0.75-2-650	ZnSe	0.75	2	MaxT10.6μm/MaxR650nm
BCZ-1.0-3-650	ZnSe	1.0	3	MaxT10.6μm/MaxR650nm
BCZ-1.1-3-650	ZnSe	1.1	3	MaxT10.6μm/MaxR650nm
BCZ-1.5-3-650	ZnSe	1.5	3	MaxT10.6μm/MaxR650nm
BCZ-1-3-9.4-650	ZnSe	1.0	3	MaxT9.5μm/MaxR650nm
BCZ-20-2-650	ZnSe	20mm	2	MaxT10.6μm/MaxR650nm
BCZ-0.5-2-633	ZnSe	0.5	2	MaxT10.6μm/MaxR633nm
BCZ-0.75-2-633	ZnSe	0.75	2	MaxT10.6μm/MaxR633nm
BCZ-1-3-633	ZnSe	1	3	MaxT10.6μm/MaxR633nm
BCZ-1.5-3-633	ZnSe	1.5	3	MaxT10.6μm/MaxR633nm



2. Beam Combiner for Nd:YAG Laser (wavelength 1064nm)

Average transmission > 99%@1064nm, Average reflection > 85%@650nm



Diameter Tolerance: +0/-0.13mm

Thickness: ±0.25mm

Side1: T>99%@1064nm, 45AOI

Side2: T>99%@1064nm, R>85%@650nm, 45AOI

Flatness: $\lambda/2$ @1064nm per 25mm dia

Part No.	Material	Diameter (inch)	Thickness (mm)
BCBK-0.5-2	BK7	0.5	2
BCBK-0.75-2	BK7	0.75	2
BCBK-0.75-3	BK7	0.75	3
BCBK-1.0-3	BK7	1.0	3
BCBK-1.0-3.4	BK7	1.0	3.4
BCBK-1.1-3	BK7	1.1	3
BCBK-1.5-3	BK7	1.5	3

3. Beam Combiner for Green Laser (532nm)

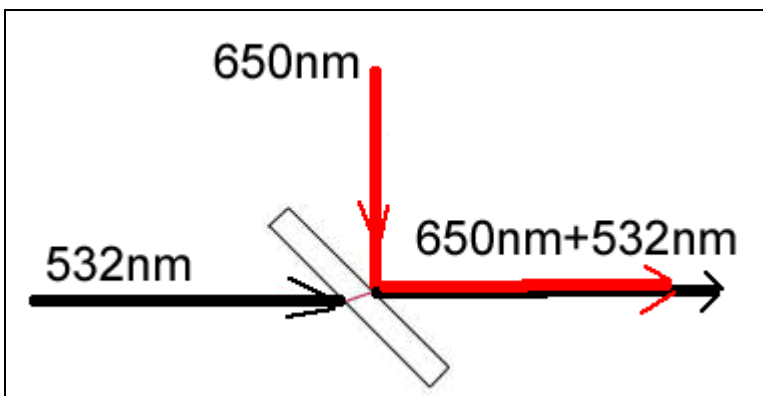
Diameter Tolerance: +0/-0.13mm

Thickness: ±0.25mm

Side1: T>99%@532nm, 45AOI

Side2: T>99%@532nm, R>85%@650nm, 45AOI

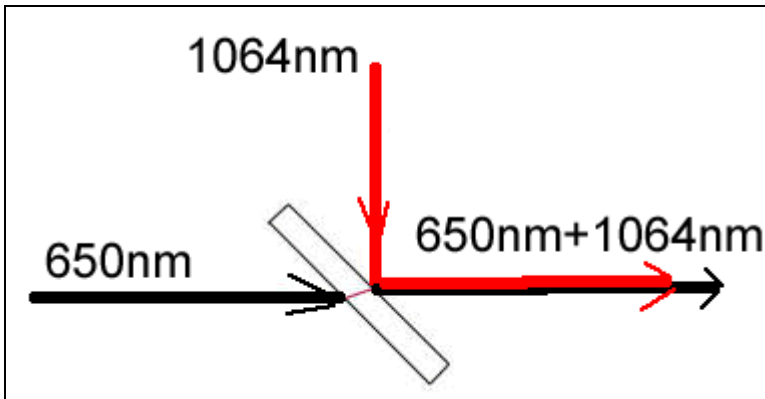
Flatness: $\lambda/2$ @560nm per 25mm dia



Part No.	Material	Diameter (inch)	Thickness (mm)
BCBK-1-3-532T650R	BK7	1	3

4. Reverse Beam Combiner

Reverse YAG Beam Combiner refers to an optic component used to transmit a short wavelength beam (eg. 650nm) at an angle of incidence of 45° while reflecting a long wavelength 1064nm.



Diameter Tolerance: +0/-0.13mm

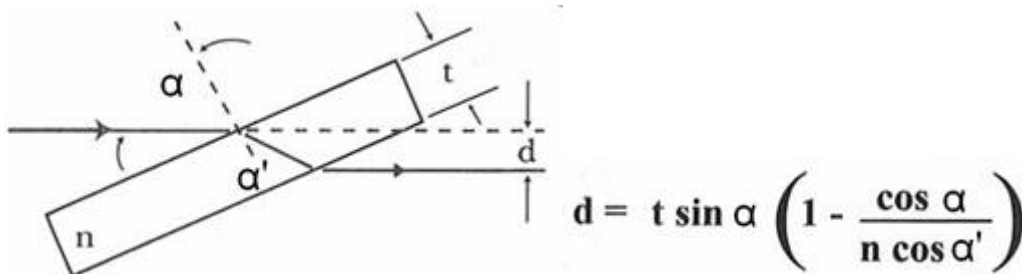
Thickness: ±0.25mm

Side1: T>99%@650nm, 45AOI

Side2: T>99%@650nm R>99%@1064nm, 45AOI

Flatness: $\lambda/2$ @1064nm per 25mm dia

Part No.	Material	Diameter (inch)	Thickness (mm)
BCBK-1-3.5-1064R	BK7	1	3.5
BCBK-1-7-1064R	BK7	1	7
BCBK-2-6.35-1064R	BK7	2	6.35



Where,

- α is angle of incidence
- n is index of refraction
- t is thickness
- d is displacement of the material

For example: BCZ-1-3, $d=1\text{mm}$; BCBK-1-3, $d=0.8\text{mm}$