

Available in:
✓ Production Quantities
✓ Custom Sizes

Cube Beamsplitters

Cube beamsplitters are recommended for use with collimated or nearly collimated light. Convergent or divergent beams will contribute unwanted spherical aberration to an optical system.

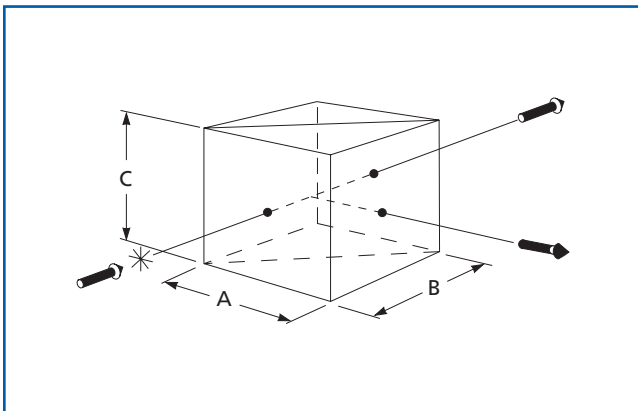
Cube beamsplitters have several advantages over plate beamsplitters:

- Easier to mount
- Ideal for beam superposition
- Less ghosting
- Less deformation resulting from mechanical stress
- Coatings more resistant to degradation over time because they are sealed into the body of the cube.

Cube beamsplitters are available in three types: broadband hybrid, includes broadband dielectric, and laser-line nonpolarizing. The selection includes different sizes and covers the ultraviolet, visible, and near-infrared spectra.

Cube beamsplitters consist of matched pairs of right angle prisms cemented together. The hypotenuse of one prism has a partial reflection coating. A black dot on the ground side of the prism indicates which prism has the partial reflector on the hypotenuse. The incident beam must enter the prism containing the partial reflector first. Melles Griot offers a variety of cube beamsplitters, as detailed on the following pages.

Melles Griot offers a range of cube beamsplitter mounts. Full details can be found in chapter 25, *Mirror/Beamsplitter Mounts and Prism Tables*.



03 BSC broadband hybrid cube beamsplitters

Broadband Hybrid Cube Beamsplitters

- A hybrid metal dielectric coating exhibits moderate absorption with little polarization sensitivity.
- These beamsplitters are fairly insensitive to changes in angle of incidence.
- Performance is relatively flat across a large spectral band.

SPECIFICATIONS: VISIBLE AND NEAR-IR BROADBAND HYBRID CUBE BEAMSPLITTERS

Edge Tolerance: ± 0.3 mm

Material: BK7, grade A fine annealed

Face Flatness: $\lambda/2$ per clear aperture at 632.8 nm

Transmission: $45\% \pm 6\%$ ($\pm 5\%$ variation with wavelength)

Absorption: $<10\%$

Transmitted Beam Deviation: <10 arc minutes

Coatings:

HEBBAR™ antireflection coating (entrance and exit faces)

Surface Quality: 60–40 scratch and dig, beveled edges

Visible and Near-IR Broadband Hybrid Cube Beamsplitter

Wavelength Range (nm)	A=B=C (mm)	PRODUCT NUMBER
Visible 420–700	5.0	03 BSC 001
	10.0	03 BSC 003
	12.7	03 BSC 005
	20.0	03 BSC 007
	25.4	03 BSC 009
	30.0	03 BSC 011
	40.0	03 BSC 013
	50.8	03 BSC 015
Near-IR 700–1100	5.0	03 BSC 023
	10.0	03 BSC 025
	12.7	03 BSC 026
	20.0	03 BSC 027
	25.4	03 BSC 029
	50.8	03 BSC 035

SPECIFICATIONS:**UV BROADBAND HYBRID CUBE BEAMSPLITTERS****Edge Tolerance:** ± 0.3 mm**Material:** UV-grade synthetic fused silica**Face Flatness:** $\lambda/4$ per clear aperture at 632.8 nm**Transmission:**43% \pm 6% for 280–400 nm wavelength range38% \pm 6% for 250–280 nm wavelength range

s- and p-components matched to within 5% for both ranges

Absorption: <24%**Transmitted Beam Deviation:** <10 arc minutes**Coatings:**

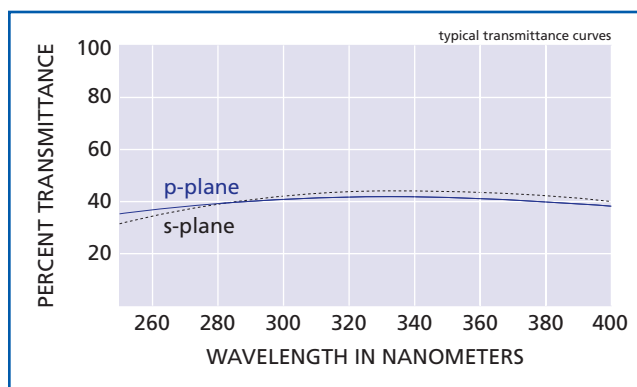
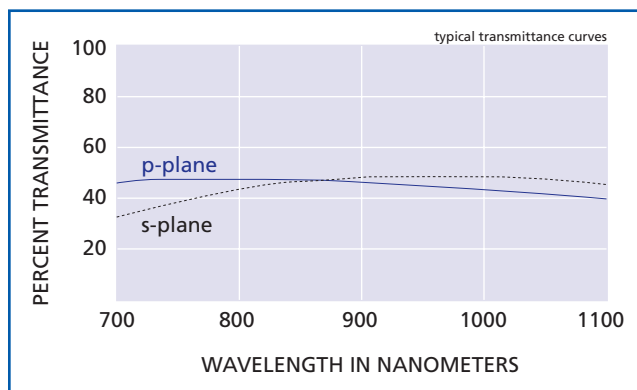
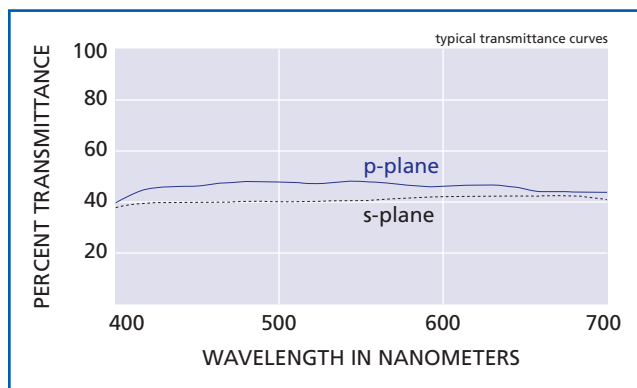
<1% reflectance (entrance and exit faces)

Surface Quality: 40–20 scratch and dig, beveled edges**UV Broadband Hybrid Cube Beamsplitter**

Wavelength Range (nm)	A=B=C (mm)	PRODUCT NUMBER
250–400	12.7	03 BSC 055
	25.4	03 BSC 057

APPLICATION NOTE**Measuring Collimated Beams**

A plate or cube beamsplitter can introduce spherical aberration into an uncollimated beam. A shear plate collimation tester (see Chapter 51, *Lab Accessories*) can be used to assess the state of the collimation.

**Broadband hybrid cube beamsplitter for 250–400 nm****Broadband hybrid cube beamsplitter for 700–1100 nm****Broadband hybrid cube beamsplitter for 420–700 nm**

Broadband Dielectric Cube Beamsplitters

- The dielectric coating has negligible absorption .
- Reflected and transmitted beams have similar intensities for average s- and p-polarizations over a broad wavelength range.
- These beamsplitter are extremely polarization sensitive.

SPECIFICATIONS: VISIBLE AND NEAR-IR BROADBAND DIELECTRIC CUBE BEAMSPLITTERS

Edge Tolerance: ± 0.3 mm

Material: BK7, grade A fine annealed

Face Flatness: $\lambda/2$ per clear aperture at 632.8 nm

Transmission: 50% \pm 5%

($\pm 3\%$ variation with wavelength), for average polarization

Absorption: <0.5%

Transmitted Beam Deviation: <10 arc minutes

Coatings:

HEBBAR™ antireflection coating (entrance and exit faces)

Surface Quality: 60–40 scratch and dig, beveled edges

SPECIFICATIONS: UV BROADBAND DIELECTRIC CUBE BEAMSPLITTERS

Edge Tolerance: ± 0.3 mm

Material: UV grade synthetic fused silica

Face Flatness: $\lambda/4$ per clear aperture at 632.8 nm

Transmission:

50% \pm 5% for 280–440 nm wavelength range

45% \pm 5% for 250–280 nm wavelength range

Absorption: <10%

Transmitted Beam Deviation: <10 arc minutes

Coatings: <1% reflectance (entrance and exit faces)

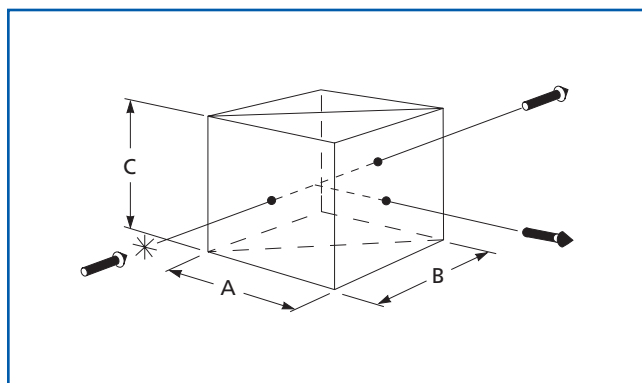
Surface Quality: 40–20 scratch and dig, beveled edges

Broadband Dielectric Cube Beamsplitters

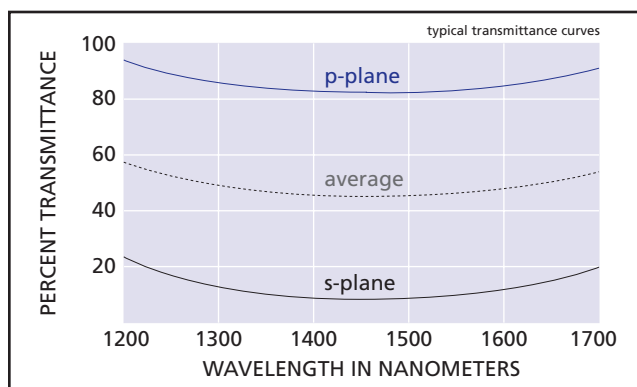
Wavelength Range (nm)	A=B=C (mm)	PRODUCT NUMBER
UV 250–440	12.7	03 BSD 076
	25.4	03 BSD 077
Visible 450–650	5.0	03 BSD 002
	10.0	03 BSD 004
	12.7	03 BSD 006
	20.0	03 BSD 008
	25.4	03 BSD 012
	30.0	03 BSD 014
Near-IR 650–900	40.0	03 BSD 016
	50.8	03 BSD 018
	5.0	03 BSD 042
	10.0	03 BSD 044
	12.7	03 BSD 046
	20.0	03 BSD 048
Near-IR 900–1300	25.4	03 BSD 052
	50.8	03 BSD 058
	5.0	03 BSD 062
	10.0	03 BSD 064
	12.7	03 BSD 066
	20.0	03 BSD 068
Near-IR 1300–1600	25.4	03 BSD 072
	50.8	03 BSD 078
	5.0	03 BSD 024
	10.0	03 BSD 026
	12.7	03 BSD 027
	20.0	03 BSD 028
	25.4	03 BSD 032
	50.8	03 BSD 038

CUSTOM BEAMSPLITTERS

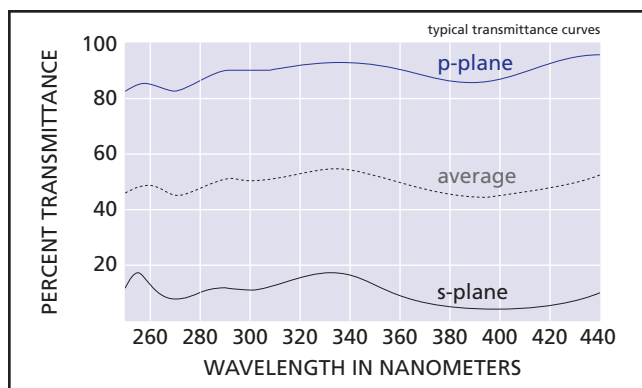
In addition to the standard products listed here, Melles Griot produces a variety of custom beamsplitters. These beamsplitter coatings can be applied to almost any right angle prism listed on page 10.4 if you require a size not offered here. Alternately, we also have the expertise to design and fabricate custom coatings for other wavelengths or split ratios.



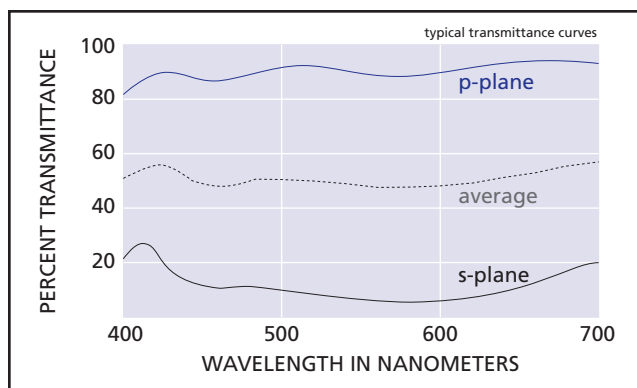
03 BSD broadband dielectric cube beamsplitter



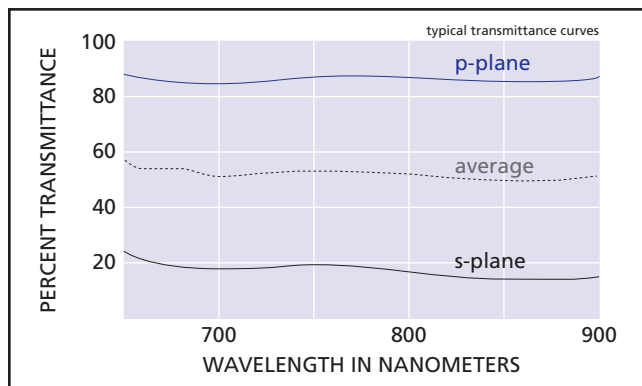
Broadband dielectric cube beamsplitter for 1300–1600 nm



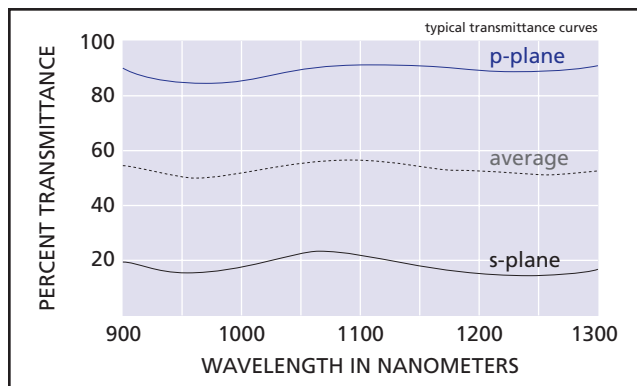
Broadband dielectric cube beamsplitter for 250–440 nm



Broadband dielectric cube beamsplitter for 450–650 nm



Broadband dielectric cube beamsplitter for 650–900 nm



Broadband dielectric cube beamsplitter for 900–1300 nm

Laser-Line Nonpolarizing Dielectric Cube Beamsplitters

- The beamsplitters are designed for applications in which polarization effects must be kept to a minimum.
- They are optimized for high performance at specific wavelengths.
- Their all totally dielectric construction provides negligible absorption.

SPECIFICATIONS: LASER-LINE NONPOLARIZING DIELECTRIC CUBE BEAMSPLITTERS

Edge Tolerance: ± 0.3 mm

Material: BK7, grade A fine annealed

Face Flatness: $\lambda/2$ per clear aperture at 632.8 nm

Transmission:

50% \pm 5% for any polarization with the s- and p-components matched to within 3%

Absorption: <0.5%

Transmitted Beam Deviation: <10 arc minutes

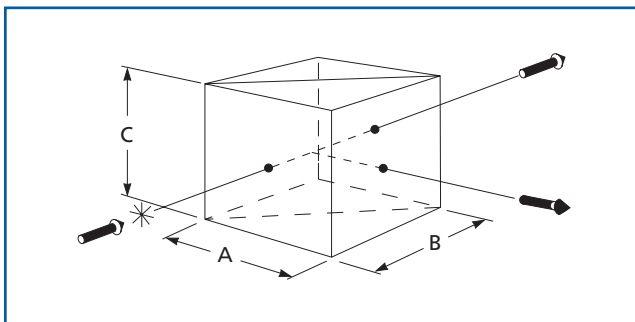
Coatings:

HEBBAR™ antireflection coating (entrance and exit faces)

Surface Quality: 60–40 scratch and dig, beveled edges

Laser-Line Nonpolarizing Dielectric Cube Beamsplitters

Wavelength (nm)	A=B=C (mm)	PRODUCT NUMBER
632.8	5.0	03 BSL 042
	10.0	03 BSL 043
	12.7	03 BSL 046
	20.0	03 BSL 044
	25.4	03 BSL 045
670	5.0	03 BSL 032
	10.0	03 BSL 033
	12.7	03 BSL 036
	20.0	03 BSL 034
	25.4	03 BSL 035
780	5.0	03 BSL 052
	10.0	03 BSL 053
	12.7	03 BSL 056
	20.0	03 BSL 054
	25.4	03 BSL 055
830	5.0	03 BSL 062
	10.0	03 BSL 063
	12.7	03 BSL 066
	20.0	03 BSL 064
	25.4	03 BSL 065

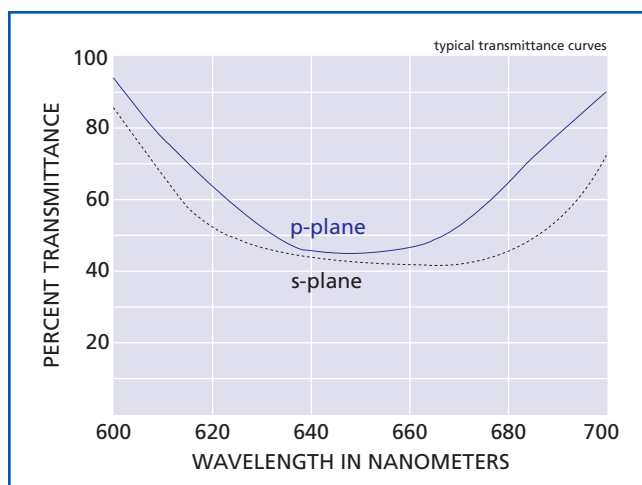


03 BSL laser-line nonpolarizing dielectric cube beamsplitters

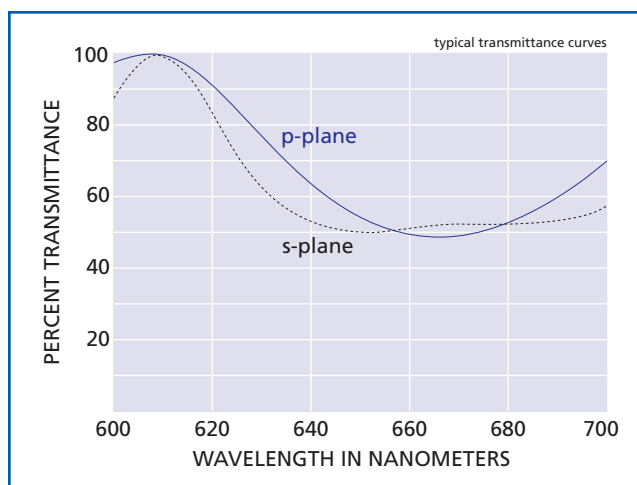
APPLICATION NOTE

Laser-Line Nonpolarizing Dielectric Cube Beamsplitters

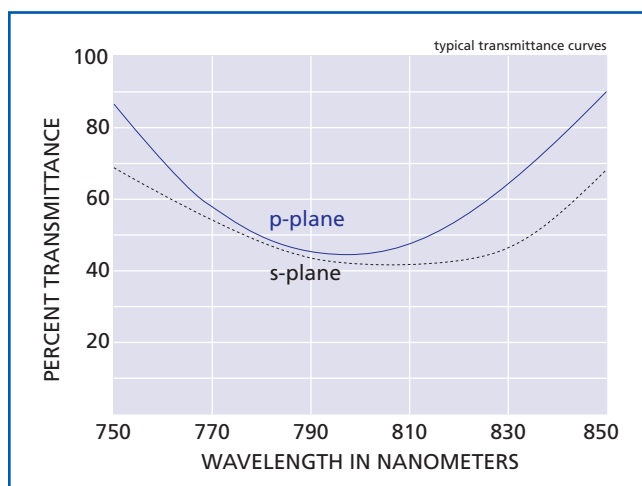
Laser-line nonpolarizing cube beamsplitters are particularly useful with randomly polarized lasers. In a randomly polarized laser, polarization ratio and direction can be time varying. Using a randomly polarized laser with a polarization sensitive component, can lead to changes in transmission value over time. A non-polarizing dielectric beamsplitter ensures stable performance regardless of the sources polarization state.



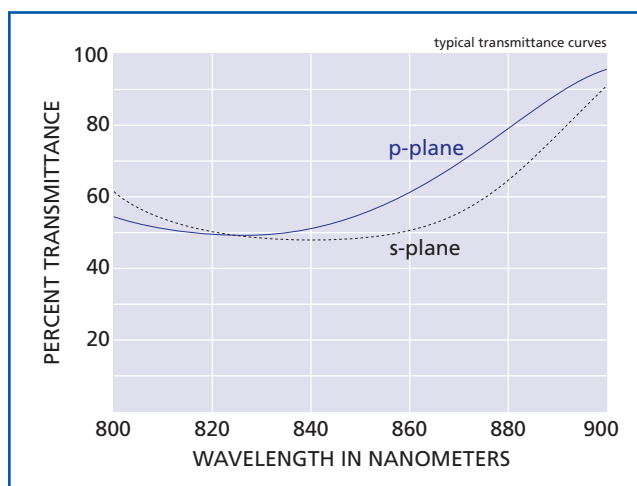
Laser-line nonpolarizing dielectric cube beamsplitter
for 632.8 nm



Laser-line nonpolarizing dielectric cube beamsplitter
for 670 nm



Laser-line nonpolarizing dielectric cube beamsplitter
for 780 nm



Laser-line nonpolarizing dielectric cube beamsplitter
for 830 nm