

Chromium Plate Half Mirrors

CPHB

RoHS

Application Systems

Machine Vision

Manual Positions

Motion Control Products

Optical & Mirror Holder

FA Parts

Measurement & Control

FA Electrical Parts

Tool & Measure

Cleanroom & AntiStatic

Index

Mirrors

Beamsplitters

Filters

Polarizers

Lenses

Multi-Element Optics

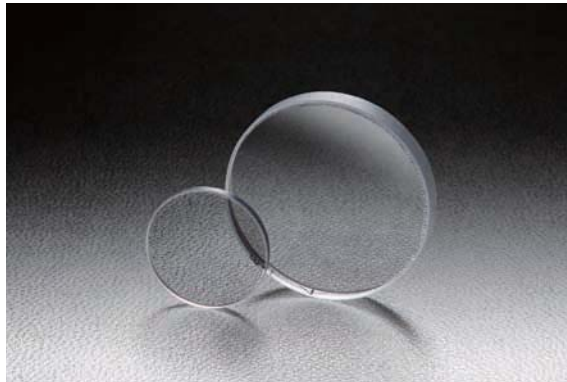
Prisms

Substrates & Windows
Holder & Vibration isolator

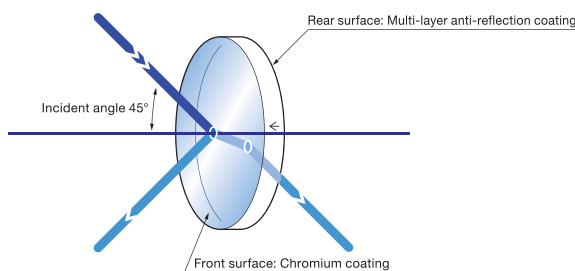
Chromium plate half mirrors are part of plate beamsplitters that are coated with chromium (Cr) on the surface of optical parallels or wedged substrates.

The other surfaces are coated with multi-layer anti-reflection.

- Half mirror divides input beam to reflectance and transmittance in 1:1. A beamsplitter of R:T=1:1 is called "Half Mirror".
- Approximately one third of the input beam is lost because of absorption of chromium. However these beamsplitters do not depend on wavelength, polarization and incident angle of the input beam, and provide a highly neutral reflectivity.
- Plate beamsplitters have beam deviations on transmission and ghost on rear surface reflections. Wedged substrates are used to prevent ghost.

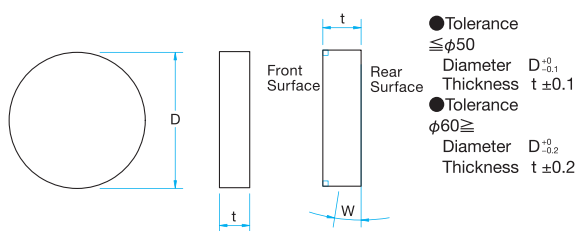


Schematic



Outline Drawing

(in mm)



Specifications

Material	BK7
Surface Flatness	$\lambda/10$
Coating	Front surface: Chromium Rear surface: Multi-layer anti-reflection coating
Incident angle	45°
Transmittance	Average 30±5% (The average value of the P-Polarization and the S-Polarization)
Divergence ratio (reflectance : transmittance)	1 : 1
Laser Damage Threshold	0.25J/cm ² (Laser pulse width 10ns, repetition frequency 20Hz)
Surface Quality (Scratch-Dig)	40-20
Clear aperture	90% of actual aperture

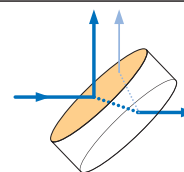
Guide

- ▶ Please contact our International Sales Division for customized products. (Customized on size, wavelength or R:T, etc.) **Reference** C063
- ▶ For a guarantee in reflected wavefront error or transmitted wavefront error, please contact our International Sales Division.

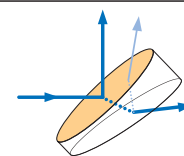
Attention

- ▶ The beam deviation at transmission of a wedged beamsplitter is large compared to a one made of optical parallel.
- ▶ The amount of beam deviation of a beamsplitter depends on the thickness of the substrate and the wavelength or the incident angle of the input beam.
- ▶ Transmission curves are based on actual measurements and may be different with manufacturing lots.
- ▶ Surface flatness is the reflected wavefront distortion of the surface prior to coating.
- ▶ Be sure to wear laser safety goggles when checking optical path and adjusting optical axis.

Optical Parallel



Wedged Substrate



Specifications

Part Number	Wavelength Range [nm]	Diameter D [mm]	Thickness t [mm]	Parallelism W
CPHB-30C03-10-550	400 - 700	$\phi 30$	3	<5"
CPHB-30C05-10W-550	400 - 700	$\phi 30$	5	1°±5'
CPHB-40C04-10-550	400 - 700	$\phi 40$	4	<5"
CPHB-50C05-10-550	400 - 700	$\phi 50$	5	<5"
CPHB-50C08-10W-550	400 - 700	$\phi 50$	8	1°±5'
CPHB-60C06-10-550	400 - 700	$\phi 60$	6	<5"
CPHB-100C10-10-550	400 - 700	$\phi 100$	10	<5"
CPHB-100C15-10W-550	400 - 700	$\phi 100$	15	1°±5'
CPHB-30C03-10-800	750 - 850	$\phi 30$	3	<5"
CPHB-30C05-10W-800	750 - 850	$\phi 30$	5	1°±5'
CPHB-50C05-10-800	750 - 850	$\phi 50$	5	<5"
CPHB-50C08-10W-800	750 - 850	$\phi 50$	8	1°±5'

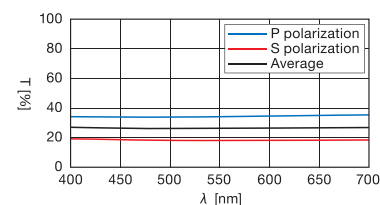
Compatible Optic Mounts

GBH-30S, -50S / GMB-40S, -60S / KMH-MP30-NL, MP50-NL, / KMH-100

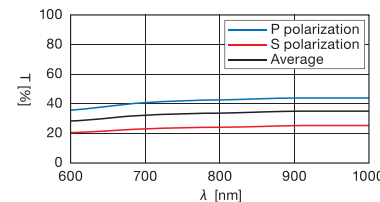
Typical Transmittance Data

CPHB-550

T: Transmission



CPHB-800



Application Note

About light behaviour on a beamsplitter

A half mirror is designed with reflectance and transmission of light with a 1:1 ratio. If light incident direction and polarization conditions change, it may impact the ratio.

Reflectance and transmittance properties of the light incident

Chrome coating and multi-wavelength coating application.

Reflection properties change when light is projected onto the coated and black surfaces.

Any configuration similar to Michelson interferometer may require both sides to have light incident. In this case, light ratios may be unbalanced.

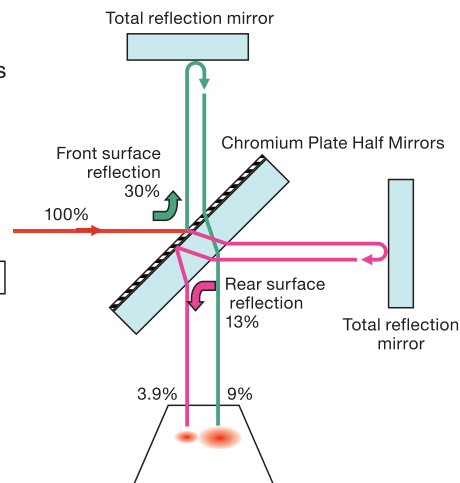
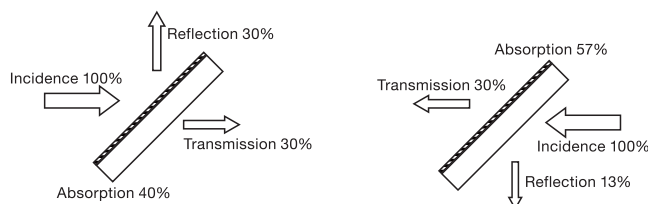
Choose the following set up if the light incident direction can be selected.

Light incident onto the coated surface of plate type beamsplitter.

Light incident onto the \bigcirc mark surface for cube type beamsplitter.

If the light incident is on the wrong surface, the specifications mentioned in the catalogue cannot be realized.

Reflectance and transmittance properties of the light incident



The unbalanced light ratio levels of reflectance and transmittance light incident direction may be different. This will depend on the half mirror type.

The unbalance light ratios of reflectance and transmittance light incident.

Chromium Plate
CPHB

Hybrid Cube
HCHB

Laser Line Plate
BDHB

Chromium Cube
CCHB

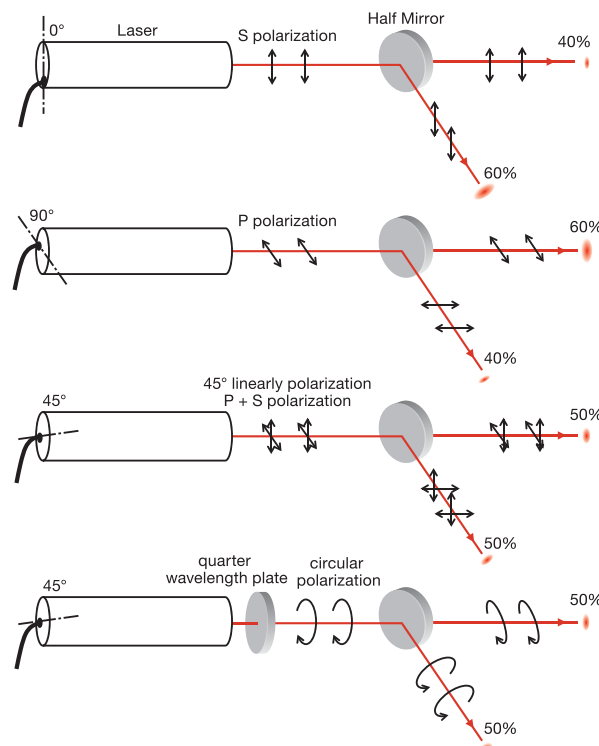
Dielectric Cube
DCHB etc

The reflectance and the transmittance of a polarized light incident

Use a laser

The light incident from any laser polarized. Because of this, even though it is used in the experiments and the optical system which are not related to the polarization, it is necessary to take into account the polarization characteristics of the beam splitter.

The transmittance and the reflectance may change in accordance with the type of beamsplitter and its polarization direction. To split the light into a balanced light ratio, a non-polarized beam splitter (NPCHB) is recommended. The polarization properties of the laser has no influence to it.



Application Systems

Machine Vision

Manual Positions

Motion Control Products

Optical & Mirror Holder

F A Parts

Measurement & Control

FA Electrical Parts

Tool & Measure

Cleanroom & AntiStatic

Index

Mirrors

Beamsplitters

Filters

Polarizers

Lenses

Multi-Element Optics

Prisms

Substrates & Windows

Holder & Vibration isolator