Instruments for testing under-mounted beam splitters



Overview

Thorlabs · Optical BeamsplittersThorlabs offers a wide range of optical beamsplitters. Our plate beamsplitters have a coated front surface that determines.

Key Takeaways

Precision optical profilers, interferometers, and polarization analyzers are commonly used to test under-mounted beam splitters for wavefront quality, splitting ratio, and polarization performance. Key Testing Instruments1. Optical Interferometers Interferometers, such as those offered by Zygo, use low-coherence or laser-based interference to measure surface flatness, wavefront distortion, and parallelism of beam splitters with nanometer precision.

They are ideal for under-mounted configurations because they can capture detailed topography without disassembling the optical system. 2. Polarization and Extinction Ratio Analyzers For polarizing beam splitters, instruments that measure extinction ratio and polarization purity are essential.

These analyzers quantify the ratio of P- to S-polarized light in transmitted and reflected beams, ensuring the splitter meets design specifications. 3. Power and Intensity Meters Non-polarizing and dichroic beam splitters require testing of splitting ratios.

High-precision photodetectors or power meters measure the intensity of transmitted and reflected beams to verify the intended split, including wavelength-dependent performance for dichroic splitters. 4. Wavefront Sensors Wavefront sensors can detect aberrations or distortions introduced by the beam splitter.

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These are particularly useful for plate or pellicle splitters where thin-film interference or membrane tension may affect beam quality. 5. Displacement and Alignment Tools For under-mounted or integrated beam splitters, displacement interferometers or precision alignment stages allow measurement of lateral or angular displacement between input and output beams, ensuring proper alignment within optical assemblies.

Considerations for Under-

Mounted TestingNon-contact measurement is preferred to avoid damaging delicate pellicle or thin-film splitters. Wavelength-specific testing may be required for dichroic or multi-band splitters. Environmental control (temperature, vibration) is critical for high-precision interferometry.

Custom fixtures may be needed to access under-mounted splitters without disassembly.

Summary

Testing under-mounted beam splitters typically involves a combination of interferometry for wavefront and surface quality, polarization analysis for polarizing splitters, and power/intensity measurements for splitting ratios. Leading instruments include Zygo optical profilers for nanometer-scale surface mapping and Keysight displacement or polarization beam splitters for precise alignment and performance verification. These tools ensure that under-mounted beam splitters meet optical specifications without compromising system integrity.

Article Content

Thorlabs · Optical Beamsplitters

Thorlabs offers a wide range of optical beamsplitters. Our plate beamsplitters have a coated front surface that determines the beam splitting ratio while the back surface is wedged and AR coated in

Optical Beamsplitters | Beamsplitter Selection | Edmund

Beamsplitters are also ideal for fluorescence applications, optical interferometry, or life science or semiconductor instrumentation. Light can be split by percentage of

Beamsplitter Family PDF Asset Page | Keysight

This document describes how Keysight''s family of high performance beamsplitters offers industry-leading polarization and beam control with low wavefront distortion.

The Role of Beamsplitters in Optical Test and Measurement

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Splitting Light Beams: Beamsplitters are adept at dividing a single beam of light into two or more separate beams. This functionality serves various optical testing and measurement

ZYGO | Precision Optical Metrology | Optical Components

ZYGO is a worldwide supplier of optical metrology systems, custom optical components, and complex electro-optical systems design and manufacturing.

Beam Splitters – optical power splitter, beamsplitter, thin-film ...

Beam splitters are devices for splitting a laser beam into two or more beams. There are different types, including polarizing and non-polarizing versions.

Beam splitter

A beam splitter or beamsplitter is an optical device that splits a beam of light into a transmitted and a reflected beam. It is a crucial part of many optical experimental

Beam Splitters

There are a variety of beam splitters for these applications, with different advantages and disadvantages. Dielectrically coated beam splitters have a high laser damage threshold.

Prism and Beamsplitter Mounts

Kinematic Square Optical Mounts TECHSPEC® components are designed, specified, or manufactured by Edmund Optics. Learn More

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Dichroic Beamsplitters, which split light by wavelength, are often used as laser beam combiners or as broadband hot or cold mirrors. Non-Polarizing Beamsplitters,

Thorlabs Beamsplitter Cube Overview | PDF | Optics | Lens (Optics)

Beam Splitter Catalogue - Thorlabs - Free download as PDF File (.pdf), Text File (.txt) or read online for free. Thorlabs offers several types of pre-mounted beamsplitters and optics housed in cubes

Testing Fiber Optic Splitters Or Other Passive Devices

Testing splitters with an OTDR is not the same in each direction. Other Passive Devices There are other passive devices that require testing, but the test methods are similar. Fiber optic

Beamsplitters Selection Guide For Optical Applications | Optometrics

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This beamsplitter guide highlights the functionality, form factor, role and key considerations when selecting beamsplitters for optical applications.

Selecting the Right Beamsplitter

Disadvantages of the plate beamsplitter are the ghost images produced by having light reflect off both surfaces of the glass, lateral displacement of the beam due to thickness of the glass, difficulty to mount without deformation, and their sensitivity to polarized light, which I will discuss later.

Cube Beamsplitters

Cube Beamsplitters are used to split incident light into two separate components. Cube Beamsplitters are durable, easy to mount Beamsplitters that feature equal

White Light Interferometry

A focusinglens is used to image the source onto the test mirror by way of a beam splitter that removes the source from the path of the return beam and a scatterplate. The scatterplate is placed at the

Beam Splitters: Types, Applications, and Selection

Metasurface-based beam splitters are highly efficient, compact, and can operate over a wide range of wavelengths. They have the potential to

What is a Beam Splitter?

Concerning durability and handling, cube beam splitters are often preferred over plates. Non-polarizing Beam Splitter Cubes Non-polarizing usually does not imply that such a cube is

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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