Insert-type beam splitter equipment



Overview

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Key Takeaways

An insert-type beam splitter is an optical component designed to be placed directly into an optical path to split or combine light beams, typically in cube or plate form.

Overview

An insert-type beam splitter functions by dividing an incident light beam into two separate beams at a specified reflection/transmission ratio or, conversely, combining two beams into one. These devices are commonly used in interferometry, laser systems, microscopy, and imaging setups. The "insert-type" designation generally refers to a beam splitter that can be physically inserted into an optical path without requiring permanent integration into the system.

Types and Construction

Cube Beam Splitters: Constructed from two right-angle prisms cemented together, with a coated hypotenuse interface. They are durable, minimize transverse beam offset, and are available in polarizing and non-polarizing forms. Cube splitters are often preferred when minimal beam displacement is critical.

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Plate Beam Splitters: Consist of a thin, flat glass plate with a reflective coating on one surface and an anti-reflection coating on the other. They are typically used at a 45° angle of incidence and can introduce a small spatial shift in the transmitted beam. Plate splitters are convenient for insertion into existing optical paths due to their flat, compact form.

Polarizing vs Non-Polarizing: Polarizing beam splitters separate light based on polarization using birefringent materials, while non-polarizing splitters divide light regardless of polarization state. The choice depends on whether polarization control is required in the application.

Key Considerations

Wavelength Range: Some splitters are designed for broadband use, while others target specific wavelength ranges or notch filtering. Optical Losses: Metallic coatings may introduce higher losses, whereas dielectric or dichroic coatings can minimize losses. Power Splitting Ratio: Standard splitters have fixed ratios (e.g., 50/50), while variable splitters allow continuous adjustment using rotating disks or waveplates.

Insertion Impact: When inserting a beam splitter, consider wavefront errors and potential beam displacement, which can affect system resolution and contrast. ApplicationsInsert-type beam splitters are widely used in: Laser systems for splitting or combining beams. Microscopy setups, including TIRF and STED, where precise beam control is essential.

Interferometry for measuring optical path differences. Imaging and projection systems where controlled light distribution is required. By selecting the appropriate type, coating, and orientation, an insert-type beam splitter can be effectively integrated into optical systems to achieve the desired beam manipulation with minimal loss or distortion.

Article Content

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Get exactly the reflectance and transmittance characteristics you require with custom beamsplitters manufactured to your specifications. These are plate

Thorlabs · Plate 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 order to

Optical Beamsplitters | Beamsplitter Selection | Edmund Optics

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Beamsplitters are optical components used to split input light into two separate parts. Beamsplitters are common components in laser or illumination systems. Beamsplitters are also ideal for fluorescence

Beamsplitters Product Overview

With special coating equipment it is possible to reduce the surface tensions as far as possible and to produce very flat beam splitters with a standard thickness of 1 mm.

All You Need to Know About Beam Splitters

At its essence, a beam splitter is a device that can direct light into two unique paths. Most beam splitters are fabricated from glass cubes. When a light beam comes into contact with these...

Beam splitter

It is currently used in modern three-CCD cameras. An optically similar system is used in reverse as a beam-combiner in three- LCD projectors, in which light from

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A simple beamsplitter may be a very thin sheet of glass inserted in the beam at an angle to divert a portion of the beam in a different direction. A more sophisticated type consists of two right-angle

Beam Splitters – optical power splitter, beamsplitter, thin

The most common types are plate beam splitters and cube beam splitters. Plate beam splitters use a partially reflective coating on a transparent substrate, while

Beam Splitter

This type polarizing beam splitter is called a Wollaston-like beam splitter, which makes the ordinary and extraordinary beams have the same deflecting angles but in different propagation directions (Fig. 5 a.i).

What Are Optical Beam Splitters?

What Are Optical Beam Splitters? Key Takeaways Beam splitters, essential for applications such as teleprompters and holograms, have different types that play a vital role in splitting light beams, while

How does a beam splitter work? Common types and use cases

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To fully understand how beam splitters work, it is important to delve into their operational principles, common types, and the numerous use cases where they find application. Principle of

42 Beamsplitter Manufacturers in 2026

Types of Beamsplitters There are two types of beamsplitters, depending on the polarization characteristics of the reflected beam 1. Non-polarizing Beamsplitter (NPBS) Non-polarizing

Beamsplitters Guide: Principles, Types, and Applications

Beamsplitters are used in a variety of optical equipment and play an important role in various industries. In this article, we will explain the principles, types, and applications of

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

Beam splitter cubes can be used not only for simple light beams, but also for beams carrying images, e.g. in various types of cameras and projectors. Generally, cube beam splitters cannot tolerate a high

Exploring Beam Splitters: Types and Applications

Exploring Common Types of Beam Splitters Cube Beam Splitter: Cube beam splitters are constructed by stacking two triangular glass prisms and bonding them with epoxy or urethane resins. The

Optical Beam Splitter Guide: Cube, Plate & Polarizing Types

Beam splitter technologies can be categorized according to their construction and optical behavior, including cube beamsplitters, plate beamsplitters, polarizing beamsplitters, non-polarizing

Beam Splitter Selection Guide

Optical Beamsplitter Selection Guide Overview An Optical Beamsplitter is an optic or optical device that is used to split a beam of light in two. Newport offers a wide variety of Beamsplitters in various shapes.

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

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