ZITHA TECH SPECIALTY CABLES (Pty) Ltd

What are the models of passive beam splitters



Overview

Learn how beam splitters work, compare cube and plate designs, and explore applications in lasers, microscopy, and interferometry.

Key Takeaways

Passive beam splitters are optical devices that divide light into transmitted and reflected beams, and they come in plate, cube, polarizing, non-polarizing, and wavelength-selective types.1. Plate Beam Splitters

Plate beam splitters consist of a thin, flat glass plate with a partially reflective coating on one surface. They are typically designed for a 45° angle of incidence and can split light at a fixed reflection/transmission (R/T) ratio, such as 50:50 or 70:30. Non-polarizing plate beam splitters use dielectric coatings to minimize polarization sensitivity, making them suitable for broadband or laser applications, while polarizing plate beam splitters separate light into orthogonal polarization states, transmitting P-polarized light and reflecting S-polarized light at 90° angles .

2. Cube Beam Splitters



© 2026 ZITHA TECH SPECIALTY CABLES (Pty) Ltd - All rights reserved

Cube beam splitters are made by cementing two right-angle prisms together to form a cube. The hypotenuse of one prism is coated with a partially reflective layer. Cube splitters can be non-polarizing or polarizing. Non-polarizing cubes are designed to maintain the polarization state of the incident light, while polarizing cubes separate light into orthogonal polarizations. Cube splitters are often preferred for their mechanical stability and low wavefront distortion .

3. Polarizing vs Non-Polarizing Splitters
• Polarizing Beam Splitters (PBS): Separate light into S- and P-polarized components. They are highly accurate and reduce wavefront distortion, making them ideal for precision optical systems .

• Non-Polarizing Beam Splitters (NPBS): Designed to split unpolarized light at a specific R/T ratio without significantly altering polarization, suitable for general-purpose or broadband applications .
4. Wavelength-Selective (Dichroic) Beam Splitters

Dichroic beam splitters reflect specific wavelengths while transmitting others. Examples include hot mirrors (reflect IR, transmit visible) and cold mirrors (reflect visible, transmit IR). These are widely used in fluorescence microscopy, imaging systems, and thermal management applications .

5. Variable Beam Splitters

Some passive splitters allow continuous adjustment of the splitting ratio. This can be achieved using a rotating disk with a gradient coating or a combination of a rotatable half-wave plate and a polarizing beam splitter, enabling precise control of power distribution between output beams .

Summary

Passive beam splitters can be classified by geometry (plate or cube), polarization handling (polarizing or non-polarizing), wavelength selectivity (dichroic), and adjustability (fixed or variable splitting ratio). The choice depends on the application requirements, including wavelength range, polarization sensitivity, and optical power distribution.

© 2026 ZITHA TECH SPECIALTY CABLES (Pty) Ltd - All rights reserved

Article Content

Beam Splitters — Abridged Guide

Quick-reference guide for beam splitters — key equations, type comparison tables, Fresnel reflectance, polarizing designs, and a

2025-01-16 White Paper: Beam Splitters for Quantum Applications

The generality of beam splitter models underscores their significance across various quantum technologies, providing a robust

What are Beamsplitters?

Options range from laser beam combiners designed for specific laser wavelengths to broadband hot and cold mirrors for splitting

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

Deciphering the Passive Optical Splitter in PON Network

Splitters are electronics-free, consuming no power, aligning with the passive nature of Passive Optical Networking

Design and optimization of optical power splitters for optical access ...

This paper aims to study the design, simulation, and optimization of low-loss Y-branch passive optical splitters up to 64

Passive Optical Splitters

Based on our extensive knowledge on passive optical components combined with the decades of experience of working closely with

White Paper

This white paper provides an in-depth look at beam splitters, essential hardware for quantum technologies, with applications in

Unlocking the Power of Optical Networks: Understanding Passive

There are two main types of passive optical splitters: PLC-based splitters and FBT-based splitters. PLC-based splitters

How Beamsplitters Work: Principles and Applications

© 2026 ZITHA TECH SPECIALTY CABLES (Pty) Ltd - All rights reserved

Beamsplitters are fundamental components in optical engineering, serving to precisely divide a single input beam of

Optical Splitters in Modern Networks

This principle enables the reallocation technique of optical signals in multiple fibers, giving rise to the development of

Beamsplitters Guide: Principles, Types, and Applications

Beamsplitters play a central role in laser applications due to the low absorption and ability

Introduction to Passive Optical Network Splitter Architectures

Fiber Broadband Association Technology Committee February 2025 The choice of splitter architecture for a passive optical network

How Does a Beam Splitter Work? Types, Principles & Applications

Learn how beam splitters work, compare cube and plate designs, and explore applications in lasers, microscopy, and interferometry.

Beam Splitter

The beam splitter is a passive device that transforms input vacuum states to vacuum states in the output arms. In the present section

Understanding Fiber Splitters: The Backbone of Fiber

A fiber splitter, also known as a beam splitter, is a passive optical device that splits an optical

White Paper

This white paper provides an in-depth look at beam splitters, essential hardware for quantum technologies, with applications in

Methods and applications of on-chip beam splitting: A

This paper introduces their research status, including optimization design methods, functions

Exploring Beam Splitters: Types and Applications

What Is a Beam Splitter? Working Principles, Types, and Applications Beam splitters play a critical role in modern optical technology,

Beamsplitters Selection Guide For Optical Applications | Optometrics

© 2026 ZITHA TECH SPECIALTY CABLES (Pty) Ltd - All rights reserved

This beamsplitter guide highlights the functionality, form factor, role and key considerations when selecting

Selecting the Right Beamsplitter

For example, they are typically used in interferometers in order for a single beam to interfere with itself.

Fiber optic splitter – Physics and Radio-Electronics

Fiber optic splitter definition A fiber optic splitter is a passive optical device that enables a light signal on an optical fiber to be

Optical Beamsplitters Explained | Cube & Polarizing Types

A beam splitter, or beamsplitter, is an optical component used to divide incident light into two separate beams based on wavelength,

Optical Beamsplitters | Beamsplitter Selection | Edmund Optics

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

Fiber Optic Couplers Selection Guide: Types, Features ...

They are simple fiber optic components that are used to redirect light waves. Passive couplers either use micro-lenses, graded

All You Need to Know About Beam Splitters

Explore the types, workings, and uses of beam splitters in high-tech devices.

Polarization Beam Combiners/Splitters

Polarization Beam Combiners/Splitters are essential optical components designed to manage the polarization states of light in fiber

The Buyer''s Guide to Beam Splitters | Blue Ridge Optics

Matching the beam splitter''s specifications to the characteristics of the light source ensures optimal performance. This

Beamsplitters: A Guide for Designers | Optics

Alternately, other elements of the system can be designed to compensate for any aberrations introduced by the cube in a

How Beamsplitters Work: Principles and Applications

Beamsplitters are fundamental components in optical engineering, serving to precisely divide a single input beam of

© 2026 ZITHA TECH SPECIALTY CABLES (Pty) Ltd - All rights reserved

Optical Splitters in Modern Networks

This principle enables the reallocation technique of optical signals in multiple fibers, giving rise to the development of

Beamsplitters Guide: Principles, Types, and Applications

Beamsplitters play a central role in laser applications due to the low absorption and ability

Introduction to Passive Optical Network Splitter Architectures

Fiber Broadband Association Technology Committee February 2025 The choice of splitter architecture for a passive optical network

How Does a Beam Splitter Work? Types, Principles & Applications

Learn how beam splitters work, compare cube and plate designs, and explore applications in lasers, microscopy, and interferometry.

Beam Splitter

The beam splitter is a passive device that transforms input vacuum states to vacuum states in the output arms. In the present section

Optical Beam Splitter Guide: Cube, Plate & Polarizing Types

What Is a Beamsplitter A beamsplitter is a passive optical component designed to divide, combine, or redirect optical power within an

Fundamental properties of beam-splitters in classical and

Abstract. A lossless beam-splitter has certain (complex-valued) probability amplitudes for sending an incoming photon into one of two

What is an Optical Splitter? The Ultimate Guide to Fiber Optic Splitters

An Optical Splitter (also known as a fiber optic splitter or beam splitter) is a passive optical power management device.

Shop Beam Splitters & Passive Optical Splitters

Explore our collection of optical cable splitters and PON splitters for sale. Optical beam splitters are used to split the fiber optic light

Understanding Fiber Splitters: The Backbone of Fiber Optic Networks

A fiber splitter, also known as a beam splitter, is a passive optical device that splits an optical signal into multiple

White Paper

© 2026 ZITHA TECH SPECIALTY CABLES (Pty) Ltd - All rights reserved

This white paper provides an in-depth look at beam splitters, essential hardware for quantum technologies, with applications in

Methods and applications of on-chip beam splitting: A review

This paper introduces their research status, including optimization design methods, functions and applications in large

Exploring Beam Splitters: Types and Applications

What Is a Beam Splitter? Working Principles, Types, and Applications Beam splitters play a critical role in modern optical technology,

Beam Splitters — Abridged Guide

Quick-reference guide for beam splitters — key equations, type comparison tables, Fresnel reflectance, polarizing designs, and a

2025-01-16 White Paper: Beam Splitters for Quantum Applications

The generality of beam splitter models underscores their significance across various quantum technologies, providing a robust

What are Beamsplitters?

Options range from laser beam combiners designed for specific laser wavelengths to broadband hot and cold mirrors for splitting

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

Deciphering the Passive Optical Splitter in PON Network

Splitters are electronics-free, consuming no power, aligning with the passive nature of Passive Optical Networking

Design and optimization of optical power splitters for optical access ...

This paper aims to study the design, simulation, and optimization of low-loss Y-branch passive optical splitters up to 64

Passive Optical Splitters

Based on our extensive knowledge on passive optical components combined with the decades of experience of working closely with

White Paper

© 2026 ZITHA TECH SPECIALTY CABLES (Pty) Ltd - All rights reserved

This white paper provides an in-depth look at beam splitters, essential hardware for quantum technologies, with applications in

Unlocking the Power of Optical Networks: Understanding Passive

There are two main types of passive optical splitters: PLC-based splitters and FBT-based splitters. PLC-based splitters

Beam Splitters — Abridged Guide

Quick-reference guide for beam splitters — key equations, type comparison tables, Fresnel reflectance, polarizing designs, and a

2025-01-16 White Paper: Beam Splitters for Quantum Applications

The generality of beam splitter models underscores their significance across various quantum technologies, providing a robust

What are Beamsplitters?

Options range from laser beam combiners designed for specific laser wavelengths to broadband hot and cold mirrors for splitting

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

Deciphering the Passive Optical Splitter in PON Network

Splitters are electronics-free, consuming no power, aligning with the passive nature of Passive Optical Networking

Design and optimization of optical power splitters for optical access ...

This paper aims to study the design, simulation, and optimization of low-loss Y-branch passive optical splitters up to 64

Passive Optical Splitters

Based on our extensive knowledge on passive optical components combined with the decades of experience of working closely with

White Paper

This white paper provides an in-depth look at beam splitters, essential hardware for quantum technologies, with applications in

Unlocking the Power of Optical Networks: Understanding Passive

© 2026 ZITHA TECH SPECIALTY CABLES (Pty) Ltd - All rights reserved

There are two main types of passive optical splitters: PLC-based splitters and FBT-based splitters. PLC-based splitters

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

Contact Us

Continue your research online:

Website: https://zithatech.co.za
Technical inquiry: https://zithatech.co.za/contact.html

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

© 2026 ZITHA TECH SPECIALTY CABLES (Pty) Ltd - All rights reserved