ZITHA TECH SPECIALTY CABLES (Pty) Ltd

Fiber Optic Microchannel Plate



Overview

Microchannel Plate (MCP) | SZPHOTON Electron MultipliersHigh-performance microchannel plate (MCP) from SZPHOTON. Amplify electrons, ions, and photons throu.

Key Takeaways

A Fiber Optic Microchannel Plate (MCP) is a specialized electron multiplier made from fused fiber optic structures, capable of amplifying electrons, ions, or photons for high-resolution detection and imaging.Structure and Fabrication

Fiber optic MCPs are produced using fiber optic techniques. The process begins with glass tubes containing a solid, acid-etchable core, which are drawn into single fibers. These fibers are stacked in a hexagonal array and fused to form multi-fiber bundles, which are then sliced into thin wafers. The solid cores are chemically removed, leaving millions of microscopic channels or pores, typically 4–25 micrometers in diameter, arranged in a honeycomb structure. The channels are coated with conductive and secondary-emissive materials, and thin metal electrodes are deposited on the input and output surfaces to enable electron multiplication .

Operational Principles

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Each microchannel acts as an independent secondary-electron multiplier. When a particle or photon enters a channel, it strikes the channel wall, producing secondary electrons. These electrons cascade through the channel, resulting in a large amplification of the original signal. The gain of the MCP depends on the channel length-to-diameter ratio (L/D), the bias voltage applied across the plate (typically around 1000 V), and the angle of the channels relative to the plate surface .

Applications

Fiber optic MCPs are widely used in applications requiring high spatial and temporal resolution, including:

• Imaging and spectroscopy: UV, X-ray, and visible light detection in scientific instruments .

• Mass spectrometry: Time-of-flight detectors for ions and electrons .

• Night vision devices: Image intensifier tubes for low-light imaging .

• Particle detection: Electron, ion, and photon counting in physics and astronomy experiments .
Advantages

Using fiber optic fabrication allows MCPs to achieve:

• High uniformity and precision in channel geometry.

• Compact and lightweight design suitable for imaging systems.

• Customizable geometries and large imaging areas through advanced techniques like atomic layer deposition (ALD) on capillary arrays . Fiber optic MCPs combine the benefits of high gain, fast response, and excellent spatial resolution, making them essential components in modern detection and imaging technologies.

Article Content

Microchannel Plate (MCP) | SZPHOTON Electron Multipliers

High-performance microchannel plate (MCP) from SZPHOTON. Amplify electrons, ions, and photons through secondary emission.

Fiber Optic Plates Selection Guide

With fiber optic plate, you can directly coupling image plane to the sensory surface. With this setup, light

Microchannel Plates | Suppliers | Photonics Buyers'' Guide | Photonics ...

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It consists of a thin, flat glass or ceramic plate with millions of microscopic channels or pores running perpendicular to its surface.

Fiber Optic Plates (FOP) | SIMTRUM Photonics Store

Micro-Channel Plate (MCP) ... Photomultipliers Tube (PMT) ... Assemblies and

MCP / Microchannel Plate / Photon and Electron

Enabling the vision of tomorrow through photon and electron amplification. Incom''s MCP technology

Micro Channel Plate (MCP)

Micro Channel Plate (MCP) Pore diameter: 5~50μm or on request Bias Angle: 0~20o Gain: ≥104 (1000V)

Microchannel Plates and Microchannel Plate Detectors

Microchannel Plates and Microchannel Plate Detectors Del Mar Ventures product portfolio includes many innovative products for

What is the process of microchannel plate manufacturing?

Microchannel Plate Manufacturing Process The manufacturing of microchannel plates (MCPs) is a sophisticated process that

SZPHOTON – SZPHOTON – Specialty Fiber Optic Components | Fiber Optic ...

Including: Fiber Optic Plate, Fiber Optic Tape r, Capillary Array, Microchannel Plate, Microwell Plate Blackening Window Fiber Array,

Enhancing microchannel plate fiber diameter control with LSTM-PI-DE ...

Microchannel plates (MCP) with high resolution, high gain, and low noise are required to meet strict technical

Microchannel Plates and MCP Detectors and Imaging Systems

Each equipped with a single Au coated MCP plate and a phosphor screen on a fiber optic plate, which also serves as a vacuum to

SCHOTT Guiding photons for improved imaging and detection

Beyond fiber optics What has been possible with SCHOTT fiber optic technology is now moving to the next level. Whether your

Standard Fiber Optic Plate (sFOP) | SZPHOTON Image

Standard fiber optic plate from SZPHOTON. Image relay with custom surface shapes (flat, concave,

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Fiber Optic Plates (FOP) Application Military Equipment, Security Check, Communication, Aerospace

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What is a fiber plate? – SZPHOTON – Specialty Fiber Optic

A fiber plate is a type of optical component made from fused optical fibers. These plates are used in a variety of applications,

Image Intensifiers and Image Converters – microchannel plate ...

the resolution of the microchannel plate the details of the image transfer e.g. from the phosphor to the image sensor (e.g. with lens

Microchannel plates (MCPs) | Hamamatsu Photonics

Microchannel plate (MCP) is a two-dimensional sensor that detects electrons, ions, VUV rays, X-rays and gamma rays

Product Development Update: 2 Micron Pore MCPs

Noise screening on microchannel plates is most often done by proximity focusing the output from the test microchannel plate onto a

Related Video Reference

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

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