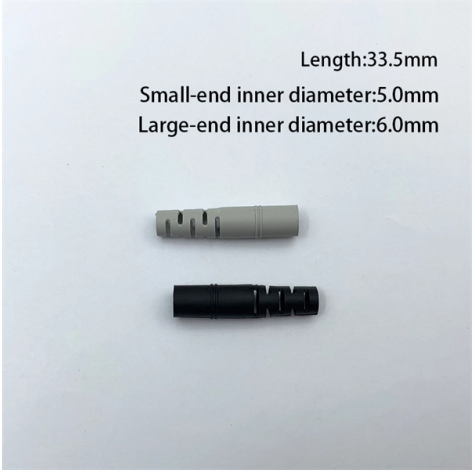
COETZER OPTICAL SYSTEMS (Pty) Ltd

Structure of Plastic Optical Cable



Overview

A fiber-optic cable, also known as an optical-fiber cable, is an assembly similar to an electrical cable but containing one or more optical fibers that are used to carry light. The optical fiber elements are typically individually coated with plastic layers and contained in a protective tube suitable for the environment where the cable is used.

Key Takeaways

Plastic optical cables consist of a polymer core, polymer cladding, protective coatings, and an outer jacket, designed to transmit light efficiently while providing mechanical flexibility and protection.Core and Cladding

The core of a plastic optical fiber (POF) is made entirely of polymer materials such as PMMA (acrylic), polystyrene, or polycarbonate, which guide light through total internal reflection . Surrounding the core is the cladding, also made of polymer but with a lower refractive index to confine light within the core. In some designs, the core may be doped to increase its refractive index, while high-performance fibers use perfluorinated polymers to reduce propagation losses . Typical core diameters range from 0.25 mm to 1.5 mm, much larger than glass fibers, making them easier to handle and terminate .

Protective Coatings

Over the cladding, a primary coating of plastic is applied to protect the fiber from mechanical damage and environmental stress . This coating does not affect the optical properties but ensures durability and flexibility. Some POFs may include additional buffer layers or resin coatings to further strengthen the fiber and facilitate handling during installation .

Strength Members and Outer Jacket

Plastic optical cables often include strengthening fibers or a plastic sheath to provide tensile strength and prevent fiber breakage during bending or pulling . The outer jacket is typically made of flexible plastic materials, giving the cable robustness and protection against abrasion, moisture, and other environmental factors. This design allows POFs to be cut to length, routed through tight spaces, and used in patch cords or inter-building connections .

Summary

In essence, a plastic optical cable is composed of:

• Core: Polymer material guiding light (PMMA, polystyrene, polycarbonate)

• Cladding: Polymer with lower refractive index to confine light

• Primary coating: Protective plastic layer

• Strength members: Optional fibers or resin for mechanical support

• Outer jacket: Flexible plastic sheath for environmental protection Plastic optical cables are flexible, cost-effective, and suitable for short-distance data transmission, industrial light guides, and applications where ease of handling and installation is important .

Article Content

Fiber-optic cable

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A fiber-optic cable, also known as an optical-fiber cable, is an assembly similar to an electrical cable but containing one or more optical fibers that are used to carry light. The optical fiber elements are typically individually coated with plastic layers and contained in a protective tube suitable for the environment where the cable is used. Different types of cable are used for fiber-optic communication in different applications, for exa

Plastic Optical Fibers

Polymer optical fiber or plastic optical fiber (POF) refers to optical fibers fabricated out of plastic polymers such as polymethyl

Structure of fiber optic cable (FOC)

This tutorial lesson explains about the structre of fiber optic cable (FOC) and the functions of core, cladding and coating.

Construction of Fiber Optics: Anatomy of a Cable

The construction of fiber optics isn''t complete without the plastic coating that goes over the cladding to give strength to the optical

Plastic Optical Fiber

Plastic optical fiber (POF) (or Polymer optical fibre) is an optical fiber which is made out of plastic. Traditionally PMMA (acrylic) is the

Fiber optic cables and their structure

A plastic sheath is applied directly over the optical sheath. This type of structure mechanically strengthens the fiber and provides the

Structure of fiber optic cable (FOC)

Fiber optic cables use light to transmit data, instead of electricity as in twisted pair cables. Different types of fiber optic cables have

Glass vs Plastic Optical Fiber – Differences & Uses

Compare glass and plastic optical fibers: cost, flexibility, durability, and speed. Learn which fiber type fits telecom,

Optical Fibre Cable

Optical fiber is a technology used to transmit data by sending short light pulses along a long fiber, which is typically

Plastic Optical Fibers

Plastic optical fibers can be woven into a textile; however, bending of the fibers is an issue during the manufacturing process and

What is an Optical Fiber? Definition, Structure, Propagation, Modes ...

An optical fiber is basically a combination of core and cladding. Here, the core is a cylindrical dielectric composed of glass, through

Fiber Optics: What is it? and How Does it Work?

For example, plastic optical fiber is used in lighting, automobiles (data communication between different parts of the vehicle), music

Fiber Optic Cable: Types, Uses, Benefits & How to Choose the Right Cable

Fiber optic cable is a cable assembly that transmits information as pulses of light through very thin strands of glass or

POF vs GOF: Plastic Optical Fiber vs Glass Optical Fiber

Introduction The fiber optic communication system consists of three major components: an optical source (e.g., LED, laser), a

Optical Fiber Structure

Optical fiber can be classified according to its fabrication material; in general, optical fibers are made of silica or plastic materials.

Fiber Optical Cables Structure and Production Materials

Fiber Optical Cables Structure and Production Materials Optical Fiber Structure In the initial stage, glass or silica material was

Fibre Optic Cable

Fibre optic cable is defined as a type of cabling that transmits data as pulses of light, allowing for high-volume data transfer at high

THE BASICS OF FIBER OPTIC CABLE a Tutorial

POF is a newer plastic-based cable which promises performance similar to single mode cable, but at a lower cost. While fiber optic

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