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Fiber optic cable or communication 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

Fiber optic cable is a type of communication cable that transmits data using light pulses through strands of glass or plastic fibers.

Fiber optic cables are designed to carry information over long distances at high speeds by transmitting data as pulses of light rather than electrical signals, which are used in traditional copper cables . The core of the fiber, made of highly transparent glass or plastic, allows light to travel with minimal signal loss, while the surrounding cladding reflects the light back into the core to maintain signal integrity . A protective coating and outer layers provide durability and resistance to environmental damage .

Advantages Over Traditional Cables

Fiber optic cables offer several key benefits compared to copper cables:

• Higher bandwidth and speed: They can transmit large amounts of data quickly, supporting modern high-speed internet and telecommunications .

• Longer transmission distances: Signals degrade less over distance, making them ideal for backbone networks .

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• Immunity to electromagnetic interference: Since they use light instead of electricity, fiber optic cables are not affected by EMI or RFI .

• Durability and low maintenance: They resist corrosion and heat, reducing long-term maintenance costs .

Types of Fiber Optic Cables

There are two primary types of fiber optic cables:

• Single-mode fiber: Has a small core diameter, allowing a single light mode to propagate, ideal for long-distance, high-speed communication .

• Multimode fiber: Has a larger core, supporting multiple light modes, suitable for medium-range applications .

Applications

Fiber optic cables are widely used in telecommunications, internet networks, and cable television systems . They are also employed in medical, defense, industrial, and commercial applications, including sensors, imaging tools, and laser systems . Their ability to transmit data efficiently and reliably makes them a critical component of modern communication infrastructure.

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