

Which type of cable does optical fiber belong to



Overview

Optical fiber is used as a medium for telecommunication and computer networking because it is flexible and can be bundled as cables. It is especially advantageous for long-distance communications, because infrared light propagates through the fiber with much lower attenuation compared to electricity in electrical cables. This allows long distances to be spanned with few repeaters.

Key Takeaways

Optical fiber belongs to the fiber optic cable category, a distinct type of network cable that transmits data using light rather than electrical signals. Classification and Characteristics

Optical fiber cables are not copper-based like twisted-pair (e.g., Cat5e, Cat6) or coaxial cables (e.g., RG-6); instead, they use light pulses transmitted through glass or plastic fibers to carry information. This fundamental difference places them in a separate category known as fiber optic cables, which are optimized for high-speed, long-distance data transmission with minimal signal loss.

Key Features of Fiber Optic Cables

- **Transmission Medium:** Light traveling through a core of ultra-pure glass or plastic, surrounded by cladding to ensure total internal reflection.
- **Signal Type:** Optical signals (light pulses) instead of electrical signals used in copper cables.

- **Bandwidth and Speed:** Capable of extremely high data rates, often supporting terabits per second over long distances .
 - **Distance and Interference:** Can transmit over tens to hundreds of kilometers without significant signal degradation and is immune to electromagnetic interference .
 - **Applications:** Used in telecommunications, data centers, enterprise networks, and long-haul internet backbones .
- Subcategories

Fiber optic cables are further classified based on mode and construction:

- **Single-Mode Fiber (SMF):** Narrow core, long-distance transmission, typically used in telecom and long-haul networks .
- **Multimode Fiber (MMF):** Wider core, shorter distances, commonly used in local area networks (LANs) and data centers . In summary, optical fiber is a specialized cable category distinct from copper-based cables, designed for high-speed, long-distance, and interference-resistant data transmission using light as the medium .

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Optical fiber

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