Fiber optic cable trunk or backbone



Overview

Structured cabling is the planned, documented cabling system that connects work areas, network rooms, equipment rooms and data center racks through a repeatable physical infrastructure.

Key Takeaways

A fiber optic trunk cable serves as the high-capacity backbone of a network, connecting major distribution points and enabling high-speed, high-density data transmission.

Overview

A fiber optic trunk cable, also known as a backbone cable, is a multi-fiber assembly designed to carry large volumes of data between key network aggregation points, such as equipment rooms, main cross-connects, and telecommunications rooms within a building or data center. Unlike horizontal cabling that connects end devices, trunk cables form the permanent or semi-permanent backbone, supporting high-speed links and future network expansion.

Structure and Components

Trunk cables typically consist of: Optical fibers: Multiple glass or plastic strands that transmit light signals, with fiber counts ranging from 12 to 144 or more, depending on network capacity requirements. Sheath: A protective outer layer that shields fibers from physical damage and environmental hazards. Connectors: Pre-terminated MPO/MTP or LC/SC connectors on both ends for plug-and-play deployment, ensuring consistent polarity and minimal insertion loss.

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Enclosures and sub-units: Some trunks bundle multiple fiber sub-units within a single jacket, often reinforced with aramid yarn for tensile strength. Modern trunks may feature dual-jacket designs for added durability and are factory-tested to meet ultra-low loss requirements, essential for high-speed networks such as 100G, 400G, 800G, and beyond.

Function and Applications

Trunk cables act as the backbone of high-density fiber networks, providing: High-capacity aggregation: Connecting main distribution areas (MDAs) to horizontal distribution areas (HDAs) or between racks in data centers. Scalable infrastructure: Supporting current and future high-speed Ethernet standards while reserving fibers for network upgrades. Stable, long-distance transmission: Maintaining signal quality over longer distances compared to horizontal cabling.

In data centers, trunk cables are often paired with harness or breakout cables, which convert multi-fiber connectors into individual fibers for connection to end devices, enabling compatibility with different port types and speeds.

Key Considerations

When deploying fiber optic trunk cables: Connector type: MPO/MTP connectors are standard for high-density backbones, with MPO-16 becoming common for 800G-SR8 applications. Fiber type: OM4 or OM5 multimode fibers are recommended for high-speed building backbones. Installation environment: Plenum-rated jackets (OFNP) or CPR Euroclass-compliant jackets may be required depending on local codes.

Polarity and loss management: Proper planning ensures minimal insertion loss and correct signal routing across the backbone. By forming the central nervous system of a network, fiber optic trunk cables enable efficient, scalable, and high-speed communication across enterprise and data center infrastructures.

Article Content

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Structured Cabling: Backbone Cabling vs Horizontal Cabling

Fiber optic cables are the preferred choice for backbone applications due to their superior bandwidth, long-distance capabilities, and ability to future-proof the network, making them ideal for

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MTP/MPO trunk cables are pre-terminated, high-density fiber optic cables designed to aggregate multiple fibers into a single compact connection.

What Is MPO/MTP Trunk Cable? Data Center Backbone Complete

2. What Are MPO/MTP Trunk Cables? Core Definition & Industry Standards An MPO/MTP trunk cable is a factory pre-assembled, fixed-count multi-fiber optical cable designed specifically for permanent

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A trunk cable is a type of fiber optic cable that can carry large amounts of data at once through a telecommunications system. It acts as the

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MTP®/MPO fiber cables can be classified from multiple perspectives, including cable structure, fiber count, polarity, fiber mode, and jacket rating.

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