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Dual-core fiber optic patch cord splicing

Overview

Get low-loss fiber patch cables & cords with various connector options that support fiber optic cabling up to 400G. 100% tested.

Key Takeaways

Dual-core fiber optic patch cords can be spliced using either fusion or mechanical splicing, ensuring precise alignment of both cores for minimal signal loss.Understanding Dual-Core Patch Cords

A dual-core fiber optic patch cord contains two separate optical fibers within a single jacket, allowing simultaneous transmission of signals through both cores. These cords are commonly used in high-speed networks, data centers, and applications requiring redundancy or bidirectional communication . The splicing process must ensure that both cores are aligned correctly to maintain low attenuation and high signal integrity.

Splicing MethodsFusion Splicing

Fusion splicing is the preferred method for dual-core patch cords due to its permanent, low-loss connection. The process involves:

• Preparing the fibers: Strip the outer jacket and buffer, then clean and cleave each fiber precisely .

• Aligning the fibers: Use a fusion splicer capable of handling dual fibers, ensuring both cores are aligned end-to-end.

• Fusing the fibers: An electric arc melts the fiber ends, creating a continuous glass joint with minimal insertion loss (typically ~0.1 dB) and near-zero back reflection .

• Protecting the splice: Apply a heat-shrink sleeve or protective enclosure to maintain mechanical strength and environmental protection. Fusion splicing is ideal for permanent installations and high-bandwidth applications, as it provides the lowest signal loss and highest durability .

Mechanical Splicing

Mechanical splicing is a temporary or quick solution, suitable for testing or short-term connections:

• Align the fibers using a mechanical splice holder.

• Apply index-matching gel to reduce light reflection and loss.

• Secure the fibers in the holder, which maintains alignment without fusing the glass . Mechanical splicing is easier to perform in the field and allows disconnection if needed, but it typically has slightly higher loss (~0.3 dB) compared to fusion splicing .

Using Pigtails for Dual-Core Splicing

For singlemode dual-core patch cords, it is common to use fiber pigtails to facilitate splicing. Pigtails are pre-terminated fibers that can be fusion-spliced to the dual-core patch cord, ensuring consistent performance and easier handling . This approach is especially useful when connecting to patch panels or network equipment.

Best Practices

• Clean and cleave fibers carefully to avoid contamination and misalignment .

• Use a dual-fiber fusion splicer if available, as it can splice both cores simultaneously, improving efficiency and consistency.

• Test the splice using an optical power meter or OTDR to verify low insertion loss and proper signal transmission.

• Protect the splice with heat-shrink sleeves or enclosures to prevent mechanical damage and environmental exposure .

Summary

Splicing dual-core fiber optic patch cords requires precision and proper technique. Fusion splicing is the most reliable method for permanent, low-loss connections, while mechanical splicing can be used for temporary or quick setups. Using pigtails and following best practices ensures optimal performance, durability, and minimal signal degradation in dual-core fiber networks .

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