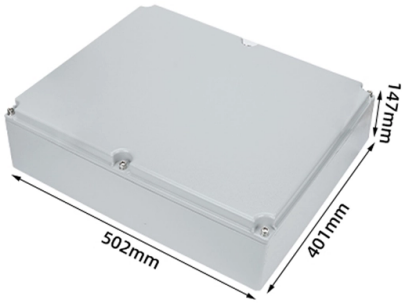
How to splice a 2-core fiber optic cable



Overview

Explore fiber optic cable splicing and its advantages over connectorization. Learn how to join and extend fiber optic cables effectively.

Key Takeaways

Two-core fiber optic cables can be spliced using either mechanical or fusion splicing, with fusion splicing providing the lowest insertion loss and most permanent connection.

Overview of Fiber Optic Splicing

Fiber optic splicing is the process of joining two fiber optic cables end-to-end to create a continuous optical path. It is essential when cable runs exceed standard lengths, when repairing damaged cables, or when connecting different types of fiber cables. Splicing ensures low light loss (attenuation) and minimal back reflection, making it preferable over connectors for permanent installations.

Splicing Methods1.

Mechanical Splicing

Involves aligning the two fiber ends using a mechanical alignment device and an index-matching gel to reduce light loss. The fibers are held in place without permanently fusing the glass, allowing for temporary or quick connections. Typical insertion loss is around 0.

3 dB, and it is suitable for short-term or emergency repairs. Tools required include a fiber stripper, cleaver, cleaning materials, and the mechanical splice assembly. 2.

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Fusion Splicing

Uses a fusion splicer to precisely align the fiber ends and then welds them together with an electric arc. Produces a permanent, low-loss connection with typical insertion loss of 0. 01–0.

03 dB. Preferred for long-term installations, high data-rate networks, and single-mode fibers. Requires careful preparation: stripping the fiber coating, cleaning, cleaving to a smooth end, and precise alignment in the splicer.

Step-by-

Step Guide for Two-Core Fiber SplicingPrepare the CableStrip the outer jacket and protective layers to expose the two cores. Clean the fibers with isopropyl alcohol and lint-free wipes.

Cleaving

Use a fiber cleaver to cut the fiber ends cleanly, ensuring a smooth, perpendicular surface for optimal light transmission.

Splicing

Mechanical: Insert fibers into the alignment device, apply index-matching gel, and secure the assembly. Fusion: Place fibers in the fusion splicer, align automatically, and initiate the fusion process to weld the fibers.

Protection

Cover the splice with a protective sleeve or heat-shrink tube to prevent mechanical damage and maintain alignment.

Testing

Use an optical power meter or OTDR to verify the splice loss and ensure proper signal transmission.

Best Practices

Keep all tools and fibers clean to avoid contamination. Handle fibers carefully to prevent microbends or cracks. For permanent installations, fusion splicing is recommended due to its lower loss and higher reliability.

Mechanical splicing is useful for temporary setups or emergency repairs. By following these steps and choosing the appropriate splicing method, a two-core fiber optic cable can be joined efficiently with minimal signal degradation, ensuring reliable network performance.

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There are generally two methods of optic cable splicing: mechanical splicing and fusion splicing. Mechanical splicing usually requires a plastic or glass alignment device and index-matching gel. The

Splicing Fiber Optic Cables | A Beginner''s Guide

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