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Cold splicing method for fiber optic pigtails



Overview

Confused about fiber optic pigtails—which connector type, which polish, fusion or mechanical splice?

Key Takeaways

Cold splicing connects fiber optic pigtails quickly and efficiently using a V-groove connector without fusion welding.Overview of Cold Splicing

Cold splicing is a method used to join two fiber optic pigtails or a pigtail to a fiber cable without the need for a fusion splicer. It relies on a fiber optic cold splicer, which contains a precise V-shaped groove to align the fiber cores accurately. This method is faster and more convenient than fusion splicing, making it ideal for FTTH (fiber-to-the-home) installations and field operations where portability and speed are important . Cold splicing can be applied in two main forms:

• Quick connectors at the fiber end – for rapid field terminations.

• Butt splicing of fiber cores – for permanent joints between pigtails or trunk fibers .
Tools and Materials Needed
• Fiber optic cold splicer (with V-groove alignment)

• Fiber stripper

• Fiber cleaver or cutting knife

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• Alcohol wipes for cleaning

• Snap-ring cold connectors

Step-by-Step Cold Splicing Procedure

• Install the cold connector: Place the cold connector into the splicer and secure the snap rings on both sides, ensuring the middle slot is properly aligned .

• Prepare the first fiber: Strip approximately 3 cm of the fiber coating, clean the bare fiber with alcohol, and cleave it to about 1.4 cm .

• Insert the first fiber: Place the stripped and cleaved fiber into one end of the cold connector, ensuring it snaps into the V-groove.

• Prepare the second fiber: Repeat the stripping, cleaning, and cleaving process for the second fiber.

• Insert the second fiber: Place it into the opposite end of the cold connector, snapping it securely into the V-groove.

• Secure and test: Push the snap rings tightly, verify alignment, and test the connection for signal continuity and loss. A successful splice is achieved when the fibers are properly docked and the optical signal passes with minimal loss .

Advantages of Cold Splicing

• Quick and easy: No fusion splicer or high-voltage equipment required.

• Field-friendly: Portable and suitable for on-site installations.

• Cost-effective: Lower equipment cost compared to fusion splicing.

• Reliable for FTTH: Provides sufficient performance for home and small-scale deployments .

Considerations

• Cold splicing generally has slightly higher insertion loss than fusion splicing (typically around 0.05–0.1 dB).

• Proper cleaning and cleaving are critical to minimize signal loss.

• Not recommended for high-precision or long-haul networks where minimal loss is critical . Cold splicing is increasingly popular in FTTH deployments due to its speed, simplicity, and low cost, making it a practical alternative to fusion splicing for many field applications .

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Splicing is generally used to terminate singlemode fibers by splicing preterminated pigtails onto each fiber.

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Terminating Fiber With Splice-On Connectors

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Fusion splices are also much more reliable than mechanical splices. And so far, all the splice-on connectors we have seen also cost

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