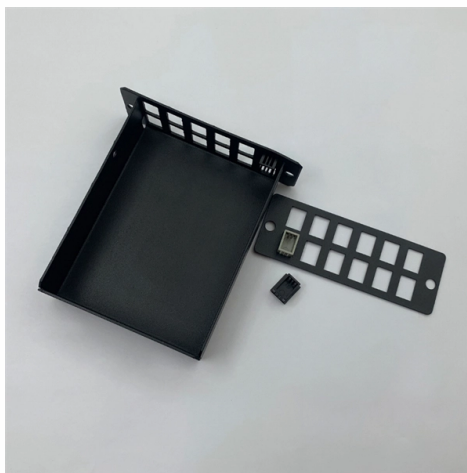


How to splice fiber optic cable cores



Overview

Fiber optic splicing focuses on creating low loss connections that support high-speed data transmission.

Key Takeaways

Fiber optic cable splice cores can be connected using either fusion splicing for a permanent, low-loss joint or mechanical splicing for a temporary or quick connection.

Step 1: Prepare the Fiber

Begin by stripping the outer jacket and protective coating of the fiber optic cable to expose the bare fiber core. Use a precision fiber stripper to remove the coating without damaging the glass core. Clean the exposed fiber with lint-free wipes and isopropyl alcohol until it squeaks when rubbed, indicating it is free of oils and debris. Ensure the bending radius of the fiber is greater than 30 mm to prevent stress or breakage during handling .

Step 2: Cleave the Fiber

Use a precision fiber cleaver to create a flat, perpendicular end on each fiber. A proper cleave is critical for minimizing signal loss and ensuring a strong splice. Inspect the cleaved ends under a microscope to confirm a smooth, mirror-like surface .



Step 3: Choose the Splicing Method

- **Fusion Splicing:** This method uses a fusion splicer to align the fiber cores precisely and weld them together with an electric arc. Fusion splicing provides the lowest insertion loss (typically 0.01–0.03 dB) and minimal back reflection, making it ideal for permanent installations .
- **Mechanical Splicing:** This method aligns the fiber cores within a mechanical assembly and uses an index-matching gel to facilitate light transmission. Mechanical splicing is faster and allows for temporary connections, with typical losses around 0.1–0.3 dB .

Step 4: Perform the Splice

For fusion splicing, place each fiber in the V-grooves of the splicer, ensuring proper alignment. Activate the splicer to generate an electric arc that fuses the fibers together. After splicing, slide a protective sleeve over the joint and use a heat oven to secure it. For mechanical splicing, insert the fibers into the splice holder, apply the index-matching gel, and close the assembly to hold the fibers in precise alignment .

Step 5: Test and Secure

After splicing, test the connection using an optical power meter or OTDR to verify low insertion loss and proper signal transmission. Once confirmed, secure the splice in a splice tray or enclosure to protect it from mechanical stress and environmental factors .

Best Practices

- Always use manufacturer-recommended consumables and tools to reduce failure rates .
- Avoid touching the fiber core with bare hands to prevent contamination.
- Maintain a clean workspace and dispose of fiber scraps safely to prevent injury.
- Follow proper safety precautions, as fiber shards can be hazardous . By following these steps, you can achieve a reliable, low-loss connection between fiber optic cable splice cores suitable for both permanent and temporary installations.

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