Fiber splicing in a Finnish fiber fusion machine

Overview

Fusion splicing of fibers is a technique of making low-loss fiber joints by fusing fiber endfaces together. It is widely used in fiber optics.

Key Takeaways

Fiber splicing in a Finnish fusion splicer, such as the APS FX35, uses precise core-to-core alignment and controlled heat to create low-loss, permanent fiber connections.Overview of Fusion Splicing

Fusion splicing is a process that permanently joins two optical fiber ends by melting them together with an electric arc, creating a continuous glass path that minimizes signal loss and back reflectance . Unlike mechanical splicing, which relies on sleeves and gels, fusion splicing produces a strong, durable joint suitable for long-term telecommunications networks . Typical splice loss is very low, often below 0.05 dB when performed correctly .

APS FX35 Features

The APS FX35, a Finnish fiber fusion splicer, is designed for FTTx applications and supports various fiber types, including 250µm, 900µm, flat cables, and fiber jumpers . Key features include:

- Core-to-core alignment system for ultra-low splicing loss
- AUTO splicing mode with real-time fiber core display
- Integrated heating for protective sleeves, completing in about 25 seconds

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• Battery life supporting up to 330 splicing and heating cycles

• Fiber identification to ensure correct fiber type and orientation These features make the FX35 suitable for both field installations and controlled environments, providing consistent, high-quality splices .
Splicing Procedure
• Prepare the fibers: Strip the protective coating to expose the bare glass, then clean and cleave the fiber ends with a precision cleaver. A clean, sharp cleave is critical to minimize splice loss .

• Load fibers into the splicer: Place the fibers into the V-grooves or holders. The FX35 uses a camera system to align the fiber cores automatically .

• Splice the fibers: The machine generates an electric arc to melt the fiber tips and fuse them together. Core alignment ensures minimal signal loss .

• Protect the splice: Apply a heat-shrink sleeve over the splice point. The FX35 heats the sleeve to create a secure, sealed barrier against moisture and mechanical stress .

• Inspect the splice: The splicer estimates optical loss and indicates if a splice needs to be redone. Visual inspection can confirm proper alignment and absence of defects .
Best Practices
• Always use the manufacturer-recommended cleaver and follow the FX35 manual for optimal settings .

• Keep fibers free from dust and debris during preparation and splicing .

• For fibers with special coatings or large cores, repeat the ARC step if minor defects appear, but avoid more than two attempts .

• Regularly calibrate the splicer and clean electrodes to maintain consistent performance . Using these procedures, the APS FX35 can achieve reliable, low-loss splices suitable for FTTx, FTTH, and other high-performance optical networks .

Article Content

Fusion Splicing of Fibers – electric discharge, fusion splicers

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