

How to use a fusion splicer to fuse multimode optical fibers



Overview

In September 2019, FOC posted an article explaining the difference between mechanical and fusion splices.

Key Takeaways

Fusion splicing multimode fibers involves precise fiber preparation, alignment, and melting with a fusion splicer to create a low-loss, permanent joint. Safety Precautions

Before starting, ensure proper safety measures: wear high-rated safety goggles and cut-resistant shoes, handle glass shards carefully, and use anti-static wrist straps or mats to protect both yourself and the splicer electronics from static discharge. Always check the splicer's power supply and electrode condition before beginning work .

Fiber Preparation

- Strip the Fiber Coating: Use a multi-hole stripper suitable for multimode fibers (typically 250µm for bare fiber, 900µm for coated fiber). Apply uniform pressure to avoid microfractures .
- Clean the Fiber: Wipe the exposed fiber with an isopropyl alcohol (IPA) swab to remove oils and debris .



- **Cleave the Fiber:** Use a precision cleaver to create a flat, mirror-like end face. A poor cleave can cause high splice loss or failure .

Splicing Procedure

- **Load the Fibers into the Splicer:** Open the splicer's windshields and place each fiber into the V-groove, ensuring clamps face up. Close the covers gently to avoid bending or stressing the fiber .

- **Align the Fiber Cores:** Modern fusion splicers use dual cameras and precision motors to align multimode fiber cores within microns. Multimode fibers can be more challenging due to their larger core and graded-index profile, so follow the splicer's recommended settings .

- **Fuse the Fibers:** The splicer generates an electric arc to melt the fiber ends and push them together, forming a continuous glass pathway. This creates a permanent, low-loss joint with typical losses as low as 0.02 dB .

Post-Splice Steps

- **Inspect the Splice:** Check the splice under the splicer's microscope or using an optical time-domain reflectometer (OTDR) to ensure minimal loss and proper alignment .

- **Protect the Splice:** Slide a splice protection sleeve over the joint and heat it to secure the splice mechanically and protect it from environmental stress .

Tips for Multimode Fibers

- Use manufacturer-recommended splicer settings for multimode fibers to account for core size and numerical aperture differences .

- Avoid mixing fibers from different manufacturers or types, as mismatched cores can increase splice loss .

- Handle fibers gently to maintain bend radius above 30 mm and prevent microbending losses . By carefully following these steps, you can achieve high-performance, durable multimode fiber splices suitable for telecommunications, data centers, and industrial networks .

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1. fusion splicer meaning A fusion splicer is a specialized device used to permanently join two optical fibers by melting

Fusion Splicer

A fusion splicer is a device that permanently joins two optical fibers by melting them together using an electric arc.

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Abstract Fusion splice techniques for multicore fibers (MCFs) are discussed here. We demonstrate a swing electrode

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VHO-Splice-fusion

It features: Electrical arc fusion Automatic programs stored for different types of fibers Approximately 25 second splice time 2-axis

How Does a Fusion Splicer Work?

Optical fusion splicer joins two optical fibers by melting end faces using an electric arc, creating a permanent bond

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Fusion splicing is a method for creating a permanent joint between two optical fibers. It involves heating the bare fiber ends until they

18 Mass_Fusion_Splicing_of_Optical_Fiber_Ribbon_Cable_A

Abstract To build a fiber optic network, one may eventually join two fiber ends with a connector or fusion splicer. Ribbon cable can be

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