Correct Operating Procedures for Optical Fiber Splicing

Overview

In this guide, we cover the basics of fiber optic splicing, how to perform splicing using two different methods, and finally some best practices to perform good fiber splicing.

Key Takeaways

Optical fiber splicing requires meticulous preparation, precise alignment, and strict adherence to safety and quality standards to ensure low-loss, permanent connections.

Preparation and Safety

Before splicing, ensure all tools and work surfaces are clean. Wear safety glasses to protect against fiber shards, and dispose of fiber scraps in a closable container. Work in a well-ventilated area and avoid flammable gases, as the electric arc used in fusion splicing can be hazardous.

Do not eat, drink, or smoke in the workspace.

Required Tools

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Essential tools include: Fiber strippers for jacket, buffer, and coating removalPrecision cleaver for scoring and breaking fibers at a 90° angleIsopropyl alcohol and lint-free wipes for cleaningKevlar shears and cable slitting tools for accessing fibersFusion splicer or mechanical splicing deviceHeat-shrink splice protection sleeves and splice trays for protection Step-by-Step Splicing ProcedureInstall Splice Protection Sleeve: Place the sleeve on one fiber before stripping or cleaving to avoid damage. Strip the Fiber: Remove the 900 µm buffer first, then the 250 µm coating in one step to minimize nicks. Clean the Fiber: Use lab-grade isopropyl alcohol and lint-free wipes to remove debris.

Cleave the Fiber: Score and break the fiber at a precise 90° angle; a poor cleave leads to high splice loss. Insert Fibers into Splicer: Place fibers gently into the V-grooves, ensuring the ends do not touch any surfaces to prevent contamination. Align and Splice: Use the splicer's automatic program to align and fuse the fibers with an electric arc.

Test the Splice: Measure insertion loss and reflectance using an OTDR or insertion loss meter to verify quality. Apply Protection: Heat the splice protection sleeve to secure the joint, then place the fiber in a splice tray and enclosure to prevent bending or environmental damage.

Post-

Splice Handling

Ensure fibers are tensioned and straight before crimping or securing. Maintain large bending radii inside splice trays to prevent microbends. Document splice locations and test results for quality assurance.

Best Practices

Maintain clean and calibrated tools; a dirty cleaver or splicer can compromise splice quality. Follow manufacturer specifications for splicer settings and fiber types. Adhere to local regulations and provider standards, including proper branding, professional conduct, and safe worksite practices.

Use fusion splicing for permanent, low-loss connections and mechanical splicing for temporary or emergency repairs. By following these procedures, technicians can achieve reliable, low-attenuation fiber connections suitable for high-performance networks, including FTTP, ISP backbones, and enterprise installations.

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Standard for Installing and Testing Fiber Optics

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This document describes the steps and considerations for performing fiber optic splicing. It explains that the fiber must be cleaned and cut correctly using the appropriate tools. It also covers the materials,

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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