How to splice a 96-core optical cable



Overview

This is where fiber optic cable splicing—the process of creating a permanent, high-performance join between two fiber ends—becomes critical.

Key Takeaways

Splicing a 96-core optical cable involves identifying fibers using the tube-and-fiber color code, organizing them in splice trays, and performing fusion splicing sequentially by tube and fiber.

Fiber Identification and Color Coding

For a 96-core cable, fibers are organized into multiple buffer tubes, each containing up to 12 fibers. The TIA-598-C standard defines a 12-color sequence for fibers: Blue, Orange, Green, Brown, Slate (Gray), White, Red, Black, Yellow, Violet, Rose (Pink), Aqua (Light Blue). This sequence repeats for each tube.

The tubes themselves are also color-coded in a 12-tube standard: Blue, Orange, Green, Brown, Slate, White, Red, Black, Yellow, Violet, Rose, Aqua. To identify a specific fiber, divide the fiber number by 12 to determine the tube, then locate the fiber within that tube using the 12-color sequence (e.g., Fiber #34 is Violet in the Green tube).

Splicing Procedure

Prepare the Splice Tray or MUFF: Open the splice tray and organize the 96 fibers into their respective tubes. Ensure the tray has enough space for all fibers and splice protection sleeves. Install Splice Protection Sleeves: Place a sleeve on each fiber before stripping or cleaving to prevent damage during splicing.

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Strip and Clean Fibers: Strip the outer 900 µm and inner 250 µm coatings in one step. Clean the bare fiber with isopropyl alcohol to remove debris. Cleave Fibers: Use a precision cleaver to cut fibers at a 90° angle.

Proper cleaving is critical for low-loss splices. Insert Fibers into Fusion Splicer: Place fibers into the V-grooves of the splicer, ensuring correct alignment. Some splicers allow direct connector splicing with pre-polished pigtails.

Perform Fusion Splice: Select the appropriate fiber type in the splicer menu and start the automated fusion process. The splicer generates an arc to weld the fiber cores together. Test Splice Quality: Use an OTDR or insertion loss meter to verify splice integrity.

Ensure minimal attenuation and proper alignment. Organize and Protect Splices: Place spliced fibers into the splice tray or MUFF, maintaining large bending radii. Secure splice protection sleeves and close the tray.

Sequence Strategy

Splice by Tube: Start with the first tube (Blue) and complete all 12 fibers before moving to the next tube. This ensures systematic organization and reduces errors. Label and Document: Clearly label each fiber and tube in the tray for future maintenance.

Maintain Fiber Order: Follow the color-coded sequence strictly to match connectors and network design. By following this tube-first, fiber-second approach, technicians can efficiently splice all 96 fibers while maintaining proper identification, minimizing loss, and ensuring long-term reliability.

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