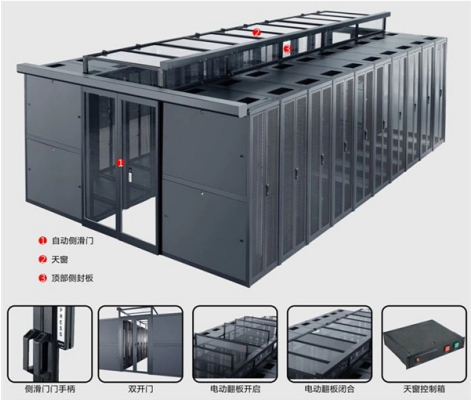
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144 Optical Cable Splicing Process



Overview

Splicing a fiber optic cable is a critical process in the installation and maintenance of fiber optic networks.

Key Takeaways

Fusion splicing of 144-core optical cables is the preferred method, using ribbonized fibers and mass fusion splicing for low-loss, high-density connections.Overview

Splicing a 144-core optical cable involves joining multiple fibers to create a continuous optical path with minimal signal loss. High-count cables like 144-core are typically ribbonized, meaning fibers are grouped in 12-fiber ribbons, which allows for mass fusion splicing rather than splicing each fiber individually, improving efficiency and reducing errors .

Tools and Materials Needed
• Fusion splicer capable of handling ribbon fibers

• Fiber cleaver for precise end preparation

• Stripping tools to remove the outer jacket and buffer coatings

• Isopropyl alcohol and lint-free wipes for cleaning fibers

• Splice protection sleeves to secure the spliced fibers

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• Microscope or inspection device to verify cleave quality and alignment
Step-by-Step Fusion Splicing Process
• Cable Preparation:
• Strip the outer jacket and sub-unit tubes to expose the ribbons.

• Separate the 12-fiber ribbons carefully, avoiding stress or bending beyond the minimum radius (typically >30 mm), .

• Fiber Cleaning and Cleaving:
• Clean each fiber with an IPA-soaked swab to remove oils and debris.

• Use a precision cleaver to create a flat, mirror-like end on each fiber. Poor cleaving can cause high splice loss .

• Ribbon Alignment:
• Place the 12-fiber ribbon into the fusion splicer's V-groove.

• Ensure all fibers are aligned correctly; ribbon splicers can handle multiple fibers simultaneously.

• Fusion Splicing:
• Initiate the splicing process using the splicer's electric arc.

• The splicer melts and fuses the fiber ends, creating a permanent, low-loss joint.

• Typical insertion loss for ribbon fusion splices is around 0.1 dB per fiber .

• Splice Protection:
• Slide a protective sleeve over the spliced ribbon and heat-shrink it to secure the joint.

• Organize the ribbons in the splice tray to prevent bending or stress.

• Testing and Verification:
• Inspect each splice under a microscope to ensure proper alignment and minimal back reflection.

• Perform optical time-domain reflectometer (OTDR) testing to verify signal integrity across all fibers.

Best Practices
• Always handle fibers gently to avoid microbends or stress.

• Use manufacturer-recommended consumables for splicing and protection sleeves.

• Ribbon splicing is preferred for high-density cables like 144-core to save time and reduce cumulative splice loss .

• Maintain a clean work environment to prevent contamination, which can degrade splice quality.
Summary

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For a 144-core optical cable, the most efficient and reliable method is mass fusion splicing of 12-fiber ribbons, ensuring low insertion loss, high reliability, and organized cable management. Mechanical splicing is generally reserved for temporary or emergency repairs, while fusion splicing is standard for permanent, high-performance installations .

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