Main optical cable splicing sequence

Overview

To support integrators, here''s an easy to follow guide for fiber optic cable splicing discussing mechanical splicing and fusion splicing.

Key Takeaways

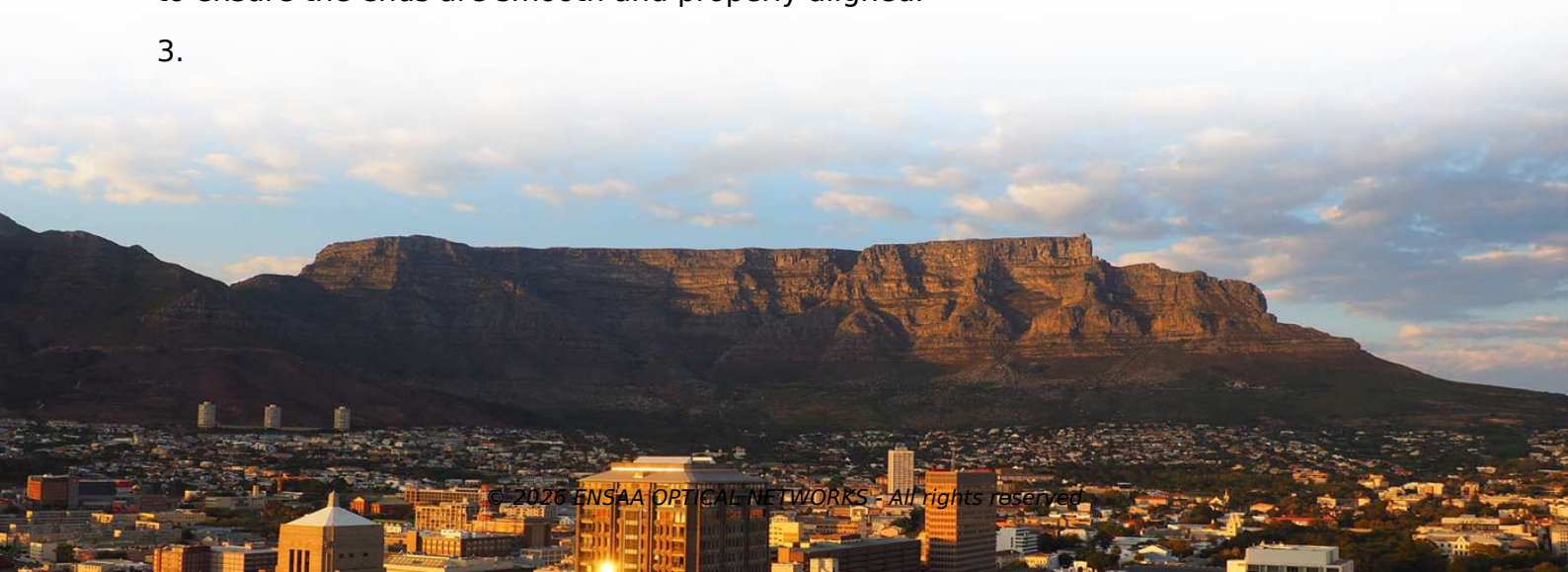
Optical cable splicing involves preparing the fibers, aligning them precisely, joining them via fusion or mechanical methods, and protecting the splice to ensure minimal signal loss. 1. Preparation of the FiberThe first step is to strip the outer jacket, buffer, and coating from the fiber to expose the bare glass core without causing damage.

This requires specialized tools such as fiber strippers, Kevlar shears, and cable slitting tools. The exposed fiber must then be cleaned thoroughly using lint-free wipes and 99%+ isopropyl alcohol to remove any contaminants that could affect the splice quality. 2.

Cleaving the Fiber

Next, the fiber ends are cleaved using a precision cleaver to create a flat, mirror-like surface. A proper cleave is critical because a chipped or angled end can cause high signal loss or splice failure. The cleaved fibers are then inspected under a microscope to ensure the ends are smooth and properly aligned.

3.



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Alignment of Fibers

For fusion splicing, the fibers are placed in a fusion splicer's V-grooves, and the machine aligns them automatically. For mechanical splicing, the fibers are aligned manually within a splice unit using an alignment apparatus and index-matching gel to reduce light loss and back reflection. 4.

Joining the Fibers

Fusion Splicing: An electric arc melts the fiber ends, fusing them into a single continuous fiber. This method provides a permanent, low-loss connection ideal for long-haul networks. Mechanical Splicing: The fibers are held together in a mechanical fixture with index-matching gel filling any air gaps.

This method is faster and suitable for temporary or field repairs. 5. Protection of the SpliceAfter joining, the splice must be protected using heat-shrink sleeves or mechanical splice enclosures to provide mechanical strength and prevent damage.

The protected splice is then placed in a splice tray and housed in a splice closure to shield it from moisture, dirt, and physical stress. 6.

Testing the Splice

Finally, the splice quality is verified using an Optical Time-Domain Reflectometer (OTDR) or a Visual Fault Locator (VFL). These tools measure signal loss, detect defects, and ensure the splice meets network performance standards.

Summary

The main steps of optical cable splicing are: Fiber preparation and cleaningPrecision cleavingFiber alignmentJoining fibers (fusion or mechanical)Splice protectionTesting and verification Following these steps carefully ensures a low-loss, durable splice that maintains signal integrity across the network. Proper training, precision tools, and adherence to best practices are essential for successful splicing.

Article Content

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Fiber Optic Cable Splicing Explained

Splicing in optical fiber is the joining two fiber optic cables together. There are 2 methods of cable splicing, mechanical or fusion.

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