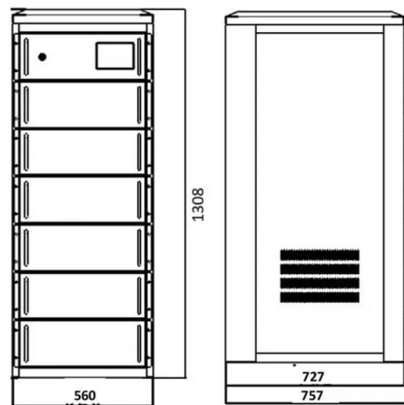


Splicing sequence of two-core drop optical cable



Overview

Another technique is fusion splicing, where the fibers are fused together, e.g. using an electrical arc.

Key Takeaways

Splicing two cores of a drop optical cable involves precise fiber preparation, alignment, fusion, protection, and testing to ensure a low-loss, permanent connection.

Step 1: Cable Preparation

Begin by stripping the outer jacket of the dual-core drop cable to expose the individual fibers. Carefully remove the buffer coating from each fiber using a fiber stripper, leaving the bare glass core exposed. Clean the fibers thoroughly with isopropyl alcohol to remove any dust, grease, or debris, which is critical for minimizing signal loss and back reflection .

Step 2: Fiber Cleaving

Use a precision fiber cleaver to cut the fiber ends at a perfect 90-degree angle. A clean, flat cleave is essential for proper alignment and fusion. Poor cleaving can result in high insertion loss or weak mechanical strength .

Step 3: Fiber Alignment



Place the prepared fibers into a fusion splicer. Modern splicers use either core alignment (for single-mode fibers) or cladding alignment (for multi-mode fibers). Core alignment ensures the fiber cores are precisely centered along the same axis, which is crucial for low-loss transmission. The splicer may automatically adjust the fibers using cameras or V-grooves to achieve optimal alignment.

Step 4: Fusion Splicing

Activate the fusion splicer to create an electric arc that melts and fuses the fiber ends together. This forms a continuous optical path with minimal signal loss, typically less than 0.1 dB. Fusion splicing provides strong mechanical integrity and long-term reliability.

Step 5: Protective Sleeve Application

After splicing, slide a heat-shrink protection sleeve over the splice. Use a heat oven or the splicer's built-in heater to shrink the sleeve, securing the splice and protecting it from mechanical stress, moisture, and environmental factors.

Step 6: Testing and Verification

Perform a signal test using an optical power meter or OTDR (Optical Time-Domain Reflectometer) to verify the splice quality. Check for insertion loss, back reflection, and overall signal integrity. A successful splice should meet the network's performance standards and ensure stable transmission.

Optional: Mechanical Splicing

For temporary or emergency connections, mechanical splicing can be used. This involves aligning the fibers in a small housing with an index-matching gel to bridge the gap. Mechanical splices are faster and require less equipment but typically have higher insertion loss (0.2-0.75 dB) and lower long-term reliability.

Best Practices

- Always clean and inspect fibers before splicing.
- Use proper cleaving tools to ensure flat fiber ends.
- Avoid bending fibers sharply to prevent microbends.
- Label and document splices for future maintenance.
- Ensure environmental protection for outdoor installations. By following these steps, technicians can achieve low-loss, durable splices for dual-core drop optical cables, ensuring reliable network performance and minimal signal degradation.

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