

Fiber optic cable splicing 1 tube with 4 cores



Overview

Guide for proper splicing of fiber optic fibers Splicing has become an integral part, especially in the field of electrical installations.

Key Takeaways

Splicing a 1-tube, 4-core fiber optic cable is best done using fusion splicing for a permanent, low-loss connection, following careful preparation and alignment of each fiber core.

Preparation Steps

- Strip the Outer Jacket: Use a cable splitter to remove 3-5 cm of the outer jacket to expose the loose tube containing the 4 cores, taking care not to damage the fibers inside .
- Expose Individual Fibers: Carefully strip the 250 μ m coating from each fiber using precision stripping pliers. Avoid bending the fibers excessively; maintain a bending radius greater than 30 mm .
- Clean the Fibers: Wipe each fiber with an IPA-soaked swab to remove any dust or oils. Do not touch the glass surface to prevent contamination .

Splicing Methods

- Fusion Splicing (Recommended)
- Align Fibers: Insert each fiber into the fusion splicer's fiber holder. Most splicers have holders for 250 μ m fibers, suitable for small multi-core cables .

- **Splice Process:** The splicer uses an electric arc to fuse the fiber ends, creating a continuous optical path with minimal attenuation (~ 0.1 dB) and nearly zero back reflection .
- **Protection:** Place the spliced fibers into a splice sleeve or cassette to protect the joint and manage excess fiber length. Ensure proper bending radii inside the cassette .

Mechanical Splicing (Alternative)

- **Temporary or Quick Splice:** Fibers are aligned in a mechanical holder with index-matching gel. This method is faster but has slightly higher loss (~ 0.3 dB) and is less permanent .
- **Use Case:** Suitable for temporary connections or emergency repairs where fusion splicing equipment is unavailable .

Testing and Quality Assurance

- **Insertion Loss Measurement:** Use an OTDR or insertion loss meter to verify the quality of each splice .
- **Check Alignment:** Ensure all 4 cores are properly aligned and tensioned to prevent microbends or signal degradation .

Best Practices

- Always use manufacturer-recommended consumables and splice sleeves to ensure long-term reliability .
- Keep all tools, including cleavers and splicers, clean and calibrated .
- Handle fibers gently to avoid breakage, and maintain a clean work environment to prevent contamination . By following these steps, a 1-tube, 4-core fiber optic cable can be spliced efficiently, ensuring low signal loss, durability, and reliable network performance .

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