

How to connect overhead optical fiber cables for telecommunications transmission



Overview

There are two methods to install overhead fiber optic cables: the moving reel method and the stationary reel method.

Key Takeaways

Connecting overhead fiber optic cables involves proper cable selection, secure aerial installation, and precise splicing at designated points to ensure signal integrity and durability.

1. Choose the Right Cable Type

Overhead fiber optic cables can be self-supporting (ADSS) or messenger-supported. Self-supporting cables do not require additional support wires, while messenger-supported cables are tied to a steel messenger wire for tension support. For power line proximity, All-Dielectric Self-Supporting (ADSS) cables are preferred because they can be installed near high-voltage lines without conducting electricity .

2. Prepare the Route and Poles

- Conduct a route survey to identify obstacles, utilities, and pole locations .
- Ensure proper permits and coordination with local authorities and pole owners .
- Maintain minimum clearances: typically 2 meters horizontally from power lines, at least 5 meters above ground, and 1.5 meters from rooftops .

- Pole spacing varies: 25–40 meters in urban areas, 40–50 meters in suburban areas, and up to 67 meters in extreme environments .

3. Install the Cable

- Use either the moving reel method (cable is pulled along the pole line using a reel truck) or the stationary reel method (cable is pulled from a fixed reel and supported temporarily), .
- Ensure the bending radius is respected: at least 10–15 times the cable diameter during handling and 20 times during deployment .
- For messenger-supported cables, secure the cable to the steel messenger wire using lashing techniques. For self-supporting cables, attach directly to dead-end and intermediate poles .
- Consider sag and tension to prevent overstressing the cable under wind or ice loads .

4. Grounding and Safety

- Ground the messenger wire if used, and ensure lightning protection measures are in place .
- Follow the National Electrical Safety Code for clearances and safety near power lines .

5. Splicing and Connecting Fibers

- Leave slack at regular intervals (typically every 100 meters) to allow for splicing or repairs .
- Splice fibers in designated splice points using fusion splicing for minimal signal loss.
- Protect splices with weatherproof enclosures mounted on poles or in aerial splice closures .
- Test each splice for optical loss and continuity before finalizing the installation.

6. Final Checks

- Inspect the entire route for proper tension, sag, and clearances.
- Verify that all splices are secure and protected.
- Document the installation for future maintenance and troubleshooting. By following these steps, overhead fiber optic cables can be safely connected and maintained, ensuring reliable communication performance over long distances .

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