Sag Requirements for Aerial Optical Cable Lines



Overview

The FOA Reference For Fiber Optics -Outside Plant Every span must be analyzed for the size of messenger, the tension required for the span length and cable.

Key Takeaways

Sag in aerial optical cables must be carefully controlled to ensure safety, maintain performance, and comply with NESC and industry standards, typically limiting sag to less than 2% of span length and tension to below 30% of cable minimum breaking strength.

Key Standards and Guidelines

National Electrical Safety Code (NESC): Clearance and sag requirements for aerial cables are defined in Section 23 of the NESC. These standards are widely adopted in the U. S. and internationally, and they provide guidance for light, medium, and heavy loading conditions, including ice, wind, and temperature effects on cable sag and tension.

Industry Best Practices: Sag Limit: Sag is generally limited to less than 2% of the span length to prevent over-tensioning and ensure cable longevity. Tension Limit: Maximum tension should not exceed 30% of the cable's minimum breaking strength. Span Analysis: Each span must be analyzed for messenger size, cable weight, and required tension to meet sag requirements.



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Clearance: Cables must maintain sufficient height above the ground and obstacles, including traffic, buildings, and trees, with additional clearance in areas prone to weather impacts. Cable Types and Sag ConsiderationsADSS (All-Dielectric Self-Supporting): Self-supporting cables without metallic elements; can be installed in power spaces by qualified personnel. Sag and tension must account for cable weight, span length, and environmental loads.

Figure-8 Cables: Integrated steel messenger and optical fiber; sag is influenced by both the messenger and cable weight. Strand and Lash Cables: Lashed to a messenger wire; sag must be carefully set to avoid over-tensioning and ensure proper clearance.

Environmental and Installation Factors

Wind and Ice Loading: Sag increases under ice accumulation and wind pressure.

NES

C provides three suggested loading combinations (light, medium, heavy) to calculate sag and tension. Temperature Effects: Cable elongation due to temperature changes must be considered in sag calculations. Creep: Cable sag increases over time due to material creep, especially in the first year of installation.

Installation Practices

Cables should be installed neatly and securely lashed to the messenger, with no loose hanging sections. Service loops and splice closures must respect the cable's minimum bend radius and be properly secured. Custom sag and tension charts provided by manufacturers should be consulted for specific cable types and span lengths to ensure compliance and performance.

Summary

Proper sag management in aerial optical cable lines is critical for mechanical integrity, optical performance, and safety. Compliance with NESC standards, adherence to manufacturer sag/tension charts, and consideration of environmental loads are essential. Sag should generally be

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