

Pulling the fiber optic cable through the duct

Article Overview

Fiber optic cable can be safely installed in ducts using proper pulling techniques, tension control, lubrication, and equipment selection to prevent damage and ensure long-term performance.

Preparation Before Pulling

Before starting, inspect and clean the duct to remove debris, sharp edges, or obstructions that could damage the cable during installation . Check the duct layout for bends, offsets, or tight turns, as these can significantly increase pulling tension . Plan the cable path carefully and ensure that the duct is properly sized, with a fill ratio below 65% for microducts to reduce friction and prevent buckling .

Pulling Methods

Manual Pulling

Manual pulling is suitable for short distances, typically under 200-300 meters. Use a pulling rope, pulling eyes, and grips attached to the cable's strength members (not the jacket) to avoid fiber damage . Monitor tension continuously and maintain the cable's minimum bend radius to prevent signal degradation .

Mechanical Pulling

For medium distances, mechanical pullers or winches can be used. These devices help maintain consistent tension and reduce physical effort. Always use a break-away swivel to prevent twisting and ensure the pulling force is applied to the cable's strength members .

Air Blowing

For long-distance or complex routes, air blowing is preferred. This method uses high-speed airflow to push or suspend the cable through the duct, minimizing mechanical stress and friction . Air blowing can cover distances up to 5 km in one go, making it ideal for backbone or access networks . Ensure ducts are clean, dry, and smooth-walled for optimal performance.

Lubrication and Tension Control

Apply specialized cable lubricant to reduce friction, especially in long or curved ducts . Always check the maximum pulling tension specified in the cable datasheet. Standard outdoor fiber cables can typically withstand up to 600 pounds-force (2670 N), while premises cables are limited to around 50 pounds (222 N), .

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Exceeding these limits can permanently damage the fibers.

Equipment and Accessories

- o Pulling eyes and grips: Attach to strength members to prevent fiber breakage .
- o Innerducts: Provide mechanical protection and allow multiple cables to be pulled simultaneously .
- o Swivels: Prevent twisting during the pull .
- o Lubricants: Reduce friction and ease cable movement .

Best Practices

- o Avoid pulling on the cable jacket alone; always use the strength members .
- o Maintain proper bend radius and avoid sharp turns .
- o Store cable in coils at manholes for short pulls and ensure slack for duct stretch .
- o For long runs, consider combining pulling and air blowing methods depending on duct conditions . By following these guidelines, fiber optic cables can be installed efficiently, safely, and with minimal risk of damage, ensuring reliable network performance over the long term.

Trying to decide between pulling and air blowing for duct fiber optic cable installation? Here's a simple breakdown of the differences,

Engineering comparison of fiber blowing and pulling installation methods, covering duct

Fiber optic cable which passes through manholes containing petroleum-based waste will require special protection. Some petroleum

One of two methods in a fiber optic network installation is to lay the cable into place: blowing

The following items are key considerations in preparation for installing the fiber optic cable when the construction is ready for cable

Cable duct pulling techniques for 2025: Improve fiber optic installation safety, reduce friction, and lower costs with

Learn how to pull fiber optic cable through conduit with this informative article. Find step-by-step instructions and tips

1.02 Methods used for placing fiber optic cables in ducts are essentially the same as those used for placing

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copper cable. However,

The document provides a method statement for pulling fiber optic cables for the AWAN project. It outlines health and safety

As fiber optic cable is sensitive to excessive pulling, bending and crush forces, much care shall be taken to avoid

How to safely pull fiber cable through shared conduit My small, private K12 has an outbuilding that currently has an ethernet cable

Compare fibre blowing and pulling installation methods for ducts. Learn cost, span length, and quality differences to

The cable is then attached to the pull line and drawn through the conduit. This method is commonly used for longer

Learn about duct fiber optic cables--their design, key applications (FTTx, urban networks,

Standard optical fiber cables (like uni-tube, multi-tube, unarmored & armored), microduct cables, and micro-ducts can be installed by

A new OFS technical guide covers comprehensive steps for installation of fiber-optic cable in underground plant.

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