

Communication Attached Optical Cable



Overview

Fiber Optics For Electrical Utilities OPAC (optical power attached cable) is a type of fiber optic cable that is installed by attaching to a host conductor.

Key Takeaways

Communication Attached Optical Cable (OPAC) is a fiber-optic cable installed along overhead power lines by attaching it to a host conductor, enabling high-bandwidth communications without major infrastructure changes.

OPAC, also known as optical power attached cable, is an all-dielectric fiber-optic cable designed to be installed along existing overhead power lines by attaching it to host conductors such as phase wires, ground wires, optical ground wire (OPGW), or optical phase conductor (OPPC) (). This approach allows utilities to expand telecommunications capacity efficiently while leveraging existing infrastructure.

Installation Methods

The cable is typically installed using wrapping, lashing, or clipping techniques, with wrapped cable systems being the most common. Installation involves specialized equipment, often called a "tug," which moves along the host conductor, wrapping or securing the cable in place (). For medium or low voltage lines, the wrapping machine can sometimes be pulled by hand, while high-voltage transmission lines require motorized or radio-controlled units. Each manufacturer may have proprietary systems, so equipment and cable designs are generally not interchangeable ().

Cable Design and Features

OPAC cables are lightweight and compact, often using loose-tube fibers with extra length to accommodate wrapping tension, typically about 1 meter per wrap (). The cable jacket is engineered to resist abrasion, extreme temperatures, weather exposure, and ice buildup, and special devices are used near high-voltage towers to prevent coronal discharge (). Singlemode fibers are commonly used for long-distance immunity to electromagnetic interference, and multiple cables can sometimes be installed on a single conductor.

Applications

OPAC is widely used for network monitoring, power system management, and high-bandwidth communications along electrical grids (). Its design allows installation on spans exceeding 2 kilometers and tower heights over 200 meters, often under live-line conditions without interrupting power distribution (). This makes it a cost-effective alternative to integrated metallic solutions like OPGW, as it remains fully non-conductive and easier to retrofit.

Advantages

- Non-conductive and safe for installation on live lines
 - Lightweight and compact, minimizing additional load on power lines
 - Durable against environmental stressors such as ice, wind, and temperature extremes
 - Flexible installation on existing infrastructure without major modifications
 - Supports high-bandwidth communications for utility and telecommunication applications
- OPAC has been widely adopted since the 1980s, with installations across multiple continents, providing utilities a reliable and efficient method to integrate fiber-optic communications into power networks ().

Article Content

Fiber Optics For Electrical Utilities

OPAC (optical power attached cable) is a type of fiber optic cable that is installed by attaching to a host conductor along overhead

Optical attached cable explained

Optical attached cable (OPAC) is a type of fibre-optic cable that is installed by being attached to a host conductor along overhead

Engineering:Optical attached cable

Optical attached cable (OPAC) is a type of fibre-optic cable that is installed by being attached to a host conductor along overhead

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Optical attached cable (OPAC) plays a central role in utility telecommunications by enabling the construction of dedicated, utility

Optical attached cable

Optical attached cable (OPAC) is a type of fibre-optic cable that is installed by being attached to a host conductor along overhead

The NEC and Optical Fiber Cable and Raceway Rules

Optical fiber cables can be in the same raceway, cable tray, cable routing assembly, or enclosure with conductors of

The FOA Reference For Fiber Optics -Outside Plant Construction

Outside Plant Construction Guide Introduction Review Of Fiber Optic Technology. Project Preparation And Guidelines. Underground

What is a Active Optical Cable (AOC)?

In simple terms, an active optical cable has modules at either end of an optical fiber cable that allows direct

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Fiber Optic Cable Buying Guide Understand how to choose fiber optic cable by comparing single-mode vs. multimode, network

Understanding Fiber Optic Cables and Connectors

Read Whitepaper: Discover the fiber optic cable and connector types, specifications, benefits, typical applications and use in data

What Is DAC Cable, Direct Attach SFP+ Cable Passive vs Active

High speed direct attach cable (DAC) assemblies, or twinax cable assembly used in data centers. It provides a lower

Active Optical Cables (AOC) Explained

Direct Attach Cables (DAC) and Active Optical Cable (AOC) serve similar purposes in network infrastructure, yet they differ in

DAC/AOC vs. Transceivers with Fiber Optic Cables: What's the

DAC (Direct Attached Copper), AOC (Active Optical Cable), and transceivers with fiber optic cable solutions are

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The FOA Reference For Fiber Optics

Fiber Optic Data Links The purpose of this document is to define a “fiber optic datalink,” its purpose, design and performance. It is

What Is Fiber Optic Cable?

A fiber optic cable is a long-distance network telecommunications cable made from strands of glass fibers that uses

What is DAC Cable? The Definitive Guide

What is a DAC cable? A DAC cable is short for direct-attach copper cable. It is a pre-terminated Twinax copper cable

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