

RIVO MULTITRADE OPTICAL SYSTEMS

High-voltage power line overhead optical cable



Overview

An optical ground wire (also known as an OPGW or, in the IEEE standard, an optical fiber composite overhead ground wire) is a type of cable that is used in overhead power lines. Such cable combines the functions of grounding and telecommunications. An OPGW cable contains a tubular structure with one or more optical fibers in it, surrounded by layers of steel and aluminum wire. The OPGW cable is run between the tops of high-voltage electricity pylons.

Key Takeaways

High-voltage overhead optical cables, or OPGW, combine grounding and high-speed optical communication in a single cable installed atop power transmission lines.

An Optical Ground Wire (OPGW) is a specialized cable used in high-voltage power transmission systems that serves dual purposes: it functions as a conventional overhead ground wire for lightning protection and grounding, while also housing optical fibers for telecommunications and data transmission. OPGW cables are typically installed at the top of electricity pylons, replacing or supplementing traditional shield wires.

Construction

OPGW cables consist of:



- Central tubular structure containing one or more optical fibers, often in a loose-tube design filled with jelly to prevent fiber strain .
- Surrounding layers of steel and aluminum wires, providing mechanical strength, corrosion resistance, and electrical conductivity for grounding .
- Optional aluminum-clad stainless steel or extruded aluminum designs, which balance tensile strength, conductivity, and corrosion resistance . The optical fibers are insulated from electrical currents, making them immune to high-voltage interference, lightning strikes, and electromagnetic noise . Single-mode fibers are commonly used for long-distance, high-speed transmission, supporting modern communication protocols like DWDM, SDH, and OTN .

Advantages

- Dual functionality: Combines grounding and communication, reducing the need for separate installations .
- High reliability: Installed above ground, OPGW is less prone to physical damage compared to buried cables .
- Lightning protection: Shields phase conductors from lightning strikes and bonds towers to earth ground .
- Long-distance communication: Supports high-speed data transmission over hundreds of kilometers without repeaters .
- Adaptability: Can operate in various weather conditions and high-voltage environments, typically above 110 kV .

Installation and Applications

OPGW cables are widely used in transmission lines, substations, and intercity communication networks. They are particularly suitable for:

- High-voltage lines where simultaneous power and communication infrastructure is desired.
 - Utility companies needing secure, high-speed communication for line protection, monitoring, and control.
 - Leasing fiber capacity to third parties for commercial telecommunications .
- Installation involves anchoring the cable to towers using galvanized steel or stainless steel clamps, with joint closures providing environmental protection for fiber splices . Modern designs, such as Spiral Space® technology, allow high fiber counts in compact cables while minimizing strain and ensuring long-term reliability .

Summary

OPGW cables are a critical component in modern power transmission, offering a cost-effective, reliable solution for combining electrical grounding and high-speed optical communication. Their robust construction, immunity to electrical interference, and adaptability to harsh environments make them the preferred choice for high-voltage overhead lines worldwide .

Article Content

OPGW Cable

OPGW for Power Transmission & Grid Communication. OPGW integrates the functions of an overhead ground wire and an optical

Optical ground wire

OverviewHistoryConstructionComparison with other methodsApplicationInstallationExternal links

An optical ground wire (also known as an OPGW or, in the IEEE standard, an optical fiber composite overhead ground wire) is a type of cable that is used in overhead power lines. Such cable combines the functions of grounding and telecommunications. An OPGW cable contains a tubular structure with one or more optical fibers in it, surrounded by layers of steel and aluminum wire. The OPGW cable is run between the tops of high-voltage electricity pylons. The conductive part of the cable serves to bond adjacent tow

Optical Fiber Cables Near High Voltage Circuits

Due to the influence of factors such as tower configuration, line phasing, etc., Corning Optical Communications recommends that the

Optical Power Ground Wire(OPGW) for Transmission Line

OPGW (Optical Power Ground Wire) is also called Optical Fiber Composite Overhead Ground Wire. The main function is to place the

InSky Optical Ground Wire Cables | Incab America LLC

Used by electric utilities on transmission lines with the voltage of 35 kV and higher for creating optical communication lines and

Fiber solutions for overhead cable networks

We develop fiber solutions for aerial transmission lines. These can be used for both power transmission and broadband

Review of the usage of fiber optic technologies in electrical power ...

OPGW, which stands for Optical Ground Wire, refers to overhead protective (grounding) cables containing optical

What is Aerial Fiber Optic Cable and Types

What is Aerial Fiber Optic Cable? Aerial fiber optic cable is a type of optical fiber transmission cable used for aerial

Fiber Technology at Electrical Utilities: Techniques for installing ...

OPAC cables can be installed over energized power lines, obviously only by well-trained installers familiar with electrical and fiber

Optical ground wire

An optical ground wire (also known as an OPGW or, in the IEEE standard, an optical fiber composite overhead ground wire) is a type

Fiber Optics and Broadband over Power Lines in Smart Grid: A ...

More specically, by adopting a bottom-up presentation concept, the available ber optic cables that can be deployed across the

Solutions for Fibre-Optic Cables installed on Overhead Power ...

Abstract The criticality of fibre-optic cable design for overhead power transmission line applications presents a

Aerial fiber optic cable offering OPGW, ADSS, Skywrap | AFL Global

As the leading world manufacturer of fiber optic cable, AFL is uniquely positioned to provide a full line of all-dielectric self-supporting

High voltage fiber optics assembly solutions

Properly protected, optical fibers can be used in high-voltage installations without fear of damage or degradations of its performance.

Overhead cable

In heavily populated regions of the UK, the only overhead cable that would be visible is the telephone line. Power cables and fiber

OPGW Cable Supplier | Optical Ground Wire for Power Transmission

Abptel, as a leading manufacturer of OPGW (Optical Ground Wire) cables, specializes in providing robust and reliable solutions for

Related Video Reference

This video was associated with the source search result. Verify technical details against current product documentation and project requirements.

Contact Us

Continue your research online:

Website: <https://rivomultitrade.co.za>

Technical inquiry: <https://rivomultitrade.co.za/contact.html>

This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

