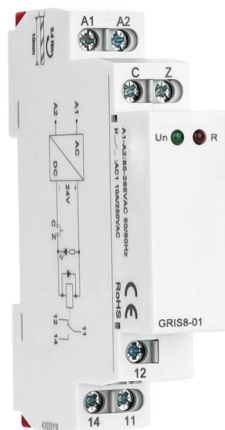


Composition of OPGW optical fiber cable



Overview

Two or three stainless steel optical tubes are helically stranded in the inner layer of a multiple-layer cable.

Key Takeaways

An OPGW cable consists of optical fibers housed in a stainless steel tube, surrounded by layers of aluminum, aluminum-clad steel, or alloy wires for mechanical strength and lightning protection.

At the heart of an OPGW cable is the optical fiber unit, which contains single-mode fibers for high-speed, long-distance data transmission. These fibers are placed inside a hermetically sealed stainless steel tube that protects them from moisture, mechanical stress, and temperature fluctuations. The tube is often filled with water-blocking gel to prevent water ingress and provide additional cushioning for the fibers during installation and operation.

Metallic Armor and Conductive Layers

Surrounding the central fiber tube are layers of metallic wires that provide mechanical strength, electrical conductivity, and lightning protection. These layers typically include:

- Aluminum-clad steel wires: Provide tensile strength and support the cable under mechanical loads.
- Aluminum or alloy wires: Offer corrosion resistance and help conduct fault currents to ground.

- The arrangement of these wires can be trapezoidal or concentric, depending on the design and fiber count .

Cable Designs

OPGW cables are generally manufactured in two main constructions:

- **Central Loose Tube Type:** A single stainless steel tube at the center houses up to 48 fibers. The tube may be optionally covered with an aluminum layer, and the surrounding metallic wires provide mechanical protection and electrical conductivity .
- **Multi Loose Tube Type:** Designed for higher fiber counts (up to 144 fibers), this type uses two or three stainless steel tubes helically stranded within the cable. This design accommodates large-scale communication needs while maintaining mechanical and electrical performance .

Additional Features

- **Mechanical Strength:** The metallic layers ensure the cable can withstand tension, wind, and ice loads.
- **Electrical Functionality:** The conductive wires serve as a ground path for lightning strikes and fault currents.
- **Environmental Protection:** Stainless steel tubes and water-blocking gels protect fibers from moisture, temperature changes, and lateral pressure . Overall, OPGW cables integrate telecommunication and grounding functions in a single robust structure, making them ideal for high-voltage transmission lines while providing high-speed fiber optic communication.

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Development of installation guides and procedures for the stringing, mechanical installation and splicing of the OPGW cable,

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Optical fibre composite overhead ground wire (OPGW) includes fibre and at the same time maintains all the original

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OVERHEAD OPTICAL FIBER CABLE SYSTEMS OPGW is one of the most reliable fiber optic medium for the telecom service

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AFL HexaCore Optical Ground Wire (OPGW) cable utilizes fiber-bearing stainless steel tubes stranded

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