48-core OPGW optical cable type

Article Overview

A 48-core OPGW cable is an optical ground wire designed for high-voltage transmission lines, combining lightning protection with high-capacity fiber-optic communication.

Overview

A 48-core Optical Ground Wire (OPGW) is a self-supporting cable installed at the top of high-voltage transmission towers. It serves a dual purpose: providing lightning protection and grounding while enabling high-speed optical communication for smart grid and long-distance data transfer applications . The 48 fibers allow for substantial communication capacity, making it suitable for major transmission projects requiring both system protection and data connectivity .

Construction Types

1. Central Loose Tube Type

o Structure: Optical fibers are housed in a stainless steel tube filled with water-blocking gel, providing protection against environmental stress and mechanical strain. The tube is surrounded by layers of aluminum-clad steel (ACS) wires or aluminum alloy wires .
o Advantages: Compact design, high mechanical strength, excellent sag-tension performance, and clear fiber identification using color codes and ring marks. Suitable for standard transmission lines under normal environmental conditions .
o Applications: Long-distance routes with moderate mechanical and environmental demands.

2. Multi Loose Tube Type

o Structure: Multiple stainless steel tubes, each containing optical fibers, are helically stranded within the cable. This design supports fiber counts exceeding 48, up to 144 fibers .
o Advantages: Designed for extreme mechanical stress, high fiber density, and large current capacity.
o Applications: Very high fiber count requirements, industrial zones, coastal areas, or severely contaminated environments.

3. CentraCore Design

o Structure: Fibers are housed in a central gel-filled stainless steel tube inside a thick-walled aluminum pipe, with aluminum-clad steel and aluminum alloy wires stranded around it .
o Advantages: Compact, lightweight, robust, and capable of handling fault currents while protecting fibers. Fibers are grouped in bundles of 12 with color-coded threads for easy identification.

o Applications: Replacement of existing shield wires, high-density fiber deployment, and areas with mechanical or environmental constraints.

Materials and Fiber Protection

o Optical Fibers: High-purity silica with germanium doping, coated with UV-curable acrylate for primary protection .
o Armor Layers: Stainless steel tubes, aluminum-clad steel wires, and aluminum alloy layers provide tensile strength, crush resistance, and environmental durability .
o Environmental Resistance: Stainless steel tube designs offer excellent corrosion resistance, suitable for coastal or industrial areas .

Standards and Performance

o Compliance: IEC 60794, IEEE 1138, and other international standards .
o Mechanical Properties: High tensile strength, low additional load on towers, and resistance to twisting and lateral pressure .
o Electrical Properties: Provides a path for fault currents and lightning protection without damaging the optical fibers .
o Customization: Fiber mix (e.g., G.652D + G.655), sheath, armor layers, and fiber count can be tailored to project requirements .

Applications

o High-voltage and extra-high-voltage transmission lines.
o Smart grid communication and monitoring.
o Replacement of traditional shield wires with integrated optical communication.
o Long-distance data transmission in challenging environmental conditions. In summary, a 48-core OPGW cable is a versatile, high-performance solution for modern transmission networks, offering both mechanical protection and high-capacity optical communication in a single integrated cable system .

This article provides a comprehensive technical breakdown of the 48-core Optical Fiber Composite Overhead Ground

OPGW cables are primarily deployed along overhead power lines, replacing traditional static/shield wires while enabling seamless

OPGW cables are specialized cables that combine the functions of a ground wire for electrical protection and a fiber

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The OPGW Cable (optical power ground wire), also known as the optical ground wire, is a type of cable or wire that is used in

Introduction Aberdare Cables has expanded the range of its products on the overhead conductors range by the addition of the

Norden Optical Ground Wire (OPGW) features a central stainless steel tube with aluminium-clad steel (AS) and aluminium-alloy (AA)

Introducing fibre optic systems for OHTL Overhead optical fibre cable systems have become a key factor in telecommunications

It combines the functions of a ground wire, providing lightning protection and fault current grounding, with the ability to carry optical

Beginning with optical ground wire (OPGW), introduced in 1984 as AFL"s flagship product, the line now

OPGW cables consist of optical fibers enclosed within a hermetically sealed metallic tube, surrounded by

This document provides technical specifications for an optical ground wire (OPGW) cable manufactured by ZTT India Pvt. Limited.

OPGW must be capable of withstanding the mechanical and environmental stresses inflicted on overhead cables (such those caused

OPGW optical cable (optical ground cable) of 48 cores has 48 optical fibers integrated into the OPGW structure. This type of cable is

Professional OPGW Wire manufacturer from China, Meet your kinds of requirement OPGW cable. With over 30 years production

It provides the dual function of lightning grounding and fiber-optic communication.

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