Materials for Suspension Wires and Optical Cables in Communications

Article Overview

Suspension wires are typically made of galvanized or stainless steel for strength and corrosion resistance, while optical cables use ultra-pure silica fibers with protective coatings and strength members.

Suspension Wires

Suspension wires, also known as messenger strands, are used to support aerial fiber optic cables. The most common material is carbon steel with a zinc coating to provide cathodic protection against rust, even at cut ends . For enhanced corrosion resistance, especially in coastal or aggressive environments, zinc-aluminum coatings are used. The wires are often arranged in six-wire strands around a central wire, providing high tensile strength and durability . Lashing wires, which secure the optical cable to the messenger strand, are typically stainless steel with diameters ranging from 0.038" to 0.045". Common stainless steel grades include 430 for general use, 302 for corrosive environments, and 316 for the most severe conditions, offering high tensile strength and resistance to chlorides and sulfides . These materials are selected based on environmental exposure, cable weight, and installation requirements.

Optical Cables

The core of an optical cable is the optical fiber, made from ultra-pure silica (SiO_2). The core may be doped with germanium to control the refractive index for single-mode or multimode transmission . Each fiber is coated with a dual-layer UV-cured acrylate: a soft primary coating for shock absorption and a hard secondary coating for mechanical protection . Optical cables also include strength members such as aramid yarns, fiberglass rods, or steel wires to prevent stretching and maintain structural integrity . Buffer tubes house the fibers, often filled with gel or dry water-blocking materials to protect against moisture. The outer jacket is made from polyethylene, PVC, or flame-retardant compounds, providing environmental protection against UV, moisture, and mechanical damage . For aerial applications, OPGW (Optical Ground Wire) combines optical fibers with aluminum and stainless steel elements, allowing the cable to function as both a communication medium and a grounding conductor . Loose tube construction is commonly used to minimize fiber strain during installation and environmental changes.

Summary

o Suspension wires: Carbon steel, galvanized or zinc-aluminum coated; stainless steel lashing wires (grades 430, 302, 316).
o Optical fibers: Ultra-pure silica with germanium doping, dual-layer acrylate coatings.
o Strength members: Aramid yarns, fiberglass, steel rods.
o Protective elements: Buffer tubes, water-blocking gels, outer jackets (PE, PVC, flame-retardant).

o Specialized aerial cables: OPGW with aluminum and stainless steel for combined communication and grounding . These materials are selected to ensure mechanical strength, corrosion resistance, and long-term reliability in various environmental conditions, from urban installations to harsh outdoor aerial deployments.

Explore the 5 key fiber optic cable components and materials used in modern networks.

The simultaneous availability of compact sources and of low-loss optical fibres led to a worldwide effort for developing optical fibre

Browse our optical communication connectivity products designed to help you enable your communication networks. Easily create a

Different types of cable are used for fiber-optic communication in different applications, for example long

1. Introduction With this paper "Introduction to Telecommunication Cables" Europacable aims to provide a technical overview of

How tightly it is wound can vary from location to location based on environmental conditions, the type of lashing wire, corrosion

Fiber optic cables are used for long-distance and high-performance data networking. They are capable of transmitting

Explore the strength, design, and statics of suspension bridge cables, from material

Fiber-optic cables are at the core of modern communication networks, enabling the transmission of data at high speeds

The optical fibre must be of high quality which is verified through different qualification tests including long-term aging such as

Use our fiber 101 tutorials and videos and get the fiber optic basics to learn why optical fiber has

Arrange your fiber optic cable installation So, there you have it: a quick overview of the materials used to make fiber

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

Lower loss: Optical fiber has lower attenuation (loss of signal intensity) than copper conductors, allowing longer cable runs and fewer

Fiber optics technology uses light pulses to transmit data, resulting in quicker, more reliable data transfers between

Since aerial cables are expected to last a very long time, the messenger wire and lashing wire material should be chosen

Web: https://in-au.co.za