

Material Selection for Outdoor Cable Trays



Network Cabinet & Rack

Overview

Learn how to choose the right cable tray by material, tray type, cable load, environment, and industry use.

Key Takeaways

Common materials for outdoor cable trays include galvanized steel, stainless steel, aluminum, and fiberglass reinforced plastic (FRP), each offering unique benefits for corrosion resistance, strength, and environmental durability. Galvanized Steel

Galvanized steel (HDG) is a widely used option for outdoor cable trays due to its high mechanical strength and cost-effectiveness. The zinc coating protects the underlying steel from corrosion, making it suitable for general outdoor environments. It is ideal for applications where impact resistance is important, such as areas exposed to falling debris or heavy equipment. However, in highly corrosive environments like coastal areas or chemical plants, additional coatings or alternative materials may be required.

Stainless Steel



Stainless steel, particularly 300-series (304 or 316), offers superior corrosion resistance, especially in harsh chemical or marine environments . It is highly durable, aesthetically appealing, and can withstand extreme weather conditions. Stainless steel is often chosen for industrial, pharmaceutical, or coastal applications where long-term reliability and minimal maintenance are critical. The main drawback is its higher initial cost compared to galvanized steel .

Aluminum

Aluminum trays are lightweight, rust-resistant, and easy to install, making them suitable for outdoor installations where handling and labor costs are a concern . Aluminum naturally resists corrosion, including salt-air exposure, though it should be avoided in direct contact with dissimilar metals to prevent galvanic corrosion. It provides a good balance of strength, corrosion resistance, and cost, making it popular for general outdoor use .

Fiberglass Reinforced Plastic (FRP)

FRP is non-conductive, UV-resistant, and highly resistant to chemicals, making it ideal for electrically sensitive or highly corrosive environments . It is lightweight, does not degrade under sunlight, and is suitable for areas exposed to saltwater or industrial chemicals. FRP trays are often used in chemical plants, marine installations, and outdoor data or fiber optic networks. They also provide excellent insulation and reduce the risk of electrical faults .

Key Considerations

When selecting materials for outdoor cable trays, consider:

- Environmental exposure: Salt spray, chemicals, UV radiation, and moisture.
- Mechanical load: Total cable weight, span between supports, and potential impact.
- Electrical requirements: Conductivity for grounding (metallic trays) or non-conductivity (FRP).
- Maintenance and lifecycle cost: Stainless steel and FRP require less maintenance but have higher initial costs, while galvanized steel is cheaper upfront but may need periodic inspection .
- Installation complexity: Aluminum and FRP are lighter and easier to handle, reducing labor time . By evaluating these factors, you can choose the most suitable material for your outdoor cable tray installation, ensuring durability, safety, and long-term performance.

Article Content

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Learn how to choose an outdoor cable tray for rain, heat, corrosion, UV, wind, drainage, load and long-term outdoor

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Compare each cable tray type by cable load, ventilation, protection, corrosion exposure, installation access, and maintenance needs

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In designing supports for a cable tray system, consideration should be given to the loads associated with future cable additions and

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CABLE TRAY SYSTEMS GUIDE

The Ladder Tray features light, rugged, tubular steel construction. It is designed for mechanical support and strain relief in long runs

Types of Cable Trays: Ladder, Perforated, Basket, Solid & Channel

Material selection, including metallic or non-metallic options, adds flexibility to handle various conditions such as

Cable Tray Material Selection for Offshore Facilities

Based on extensive field experience, this article recommends materials for cable trays for offshore facilities

Cable Trays Selection Guide: Types, Features, Applications

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A practical guide to product selection and installation This guide for engineers and installers has been developed by ABB as a

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Explore the types of cable trays, their advantages, applications, and standard sizes. Learn how they improve cable

Types of Cable Typically Used in Cable Tray

Types of Cable Typically Used in Cable Tray The purpose of a cable tray system is to support, route, and protect cable as part of the

Cable Tray and Raceway Installation Specification

This document serves as a comprehensive technical specification for the engineering, installation, and inspection of cable tray and

7 Types of Cable Trays: How to Choose the Right One

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