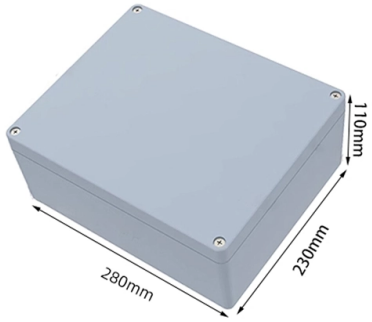
Material Requirements for Low-Voltage Cable Trays



Overview

This guide for engineers and installers has been developed by ABB as a practical reference regarding cable tray characteristics, installation, and requirements.

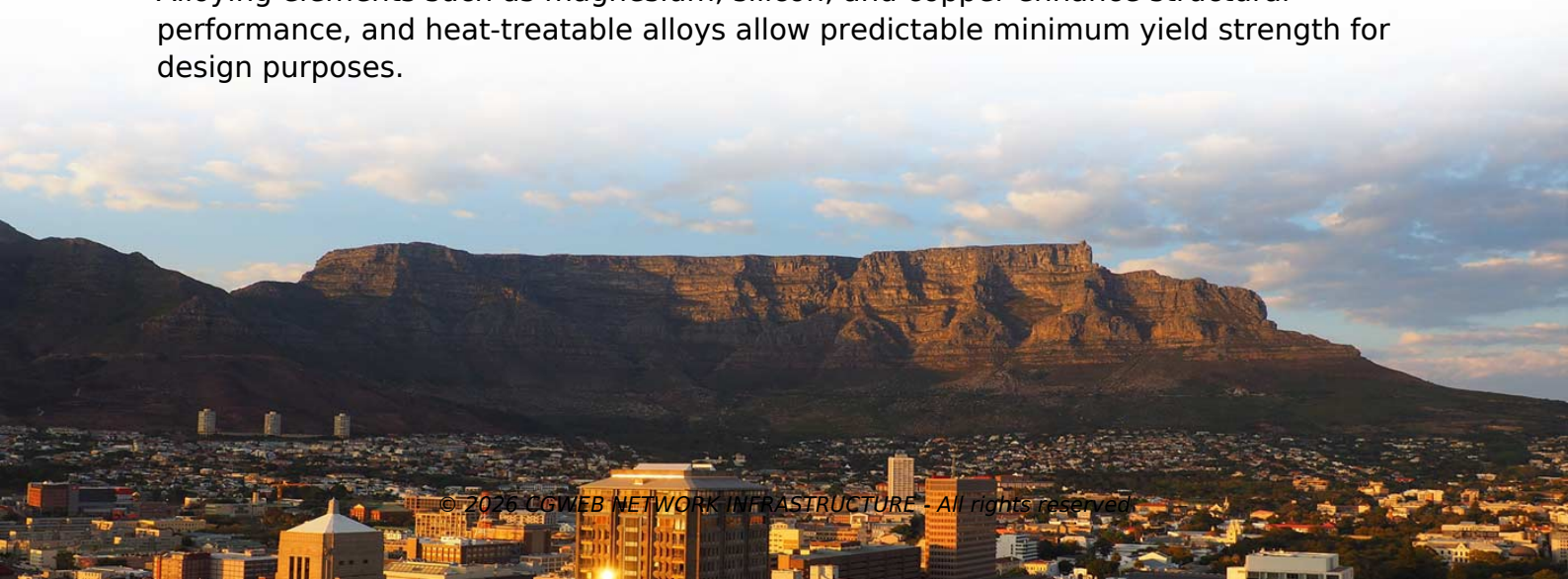
Key Takeaways

Cable trays for low-voltage systems are typically made from aluminum, galvanized steel, stainless steel, or fiberglass-reinforced plastics, selected based on strength, corrosion resistance, and environmental conditions.

Aluminum Cable Trays

Aluminum is widely used due to its lightweight, corrosion resistance, and ease of fabrication. Pure aluminum is soft and ductile, so commercial applications often use alloyed and heat-treated forms to achieve higher strength. Commonly, 6063-T6 aluminum extrusions are used for ventilated cable trays, offering adequate mechanical strength and good corrosion resistance for most indoor and outdoor low-voltage installations.

Alloying elements such as magnesium, silicon, and copper enhance structural performance, and heat-treatable alloys allow predictable minimum yield strength for design purposes.



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Steel Cable Trays

Steel trays are preferred for applications requiring high mechanical strength. They are typically fabricated from hot-dip galvanized steel or pre-galvanized steel to improve corrosion resistance. For environments with higher corrosion risk, stainless steel is used, commonly AISI 316L, which contains over 10.

5% chromium and less than 1. 2% carbon, forming a protective oxide layer that resists pitting, stress corrosion, and cracking. Steel trays are suitable for industrial environments, heavy-duty installations, and areas exposed to moisture or chemicals.

Fiberglass-

Reinforced Plastic (FRP) Cable TraysFRP trays are manufactured using pultrusion processes with polyester or vinyl ester resins. They provide high corrosion resistance, electrical insulation, and a favorable strength-to-weight ratio.

FR

P is ideal for highly corrosive environments, such as chemical plants or coastal installations, where metal trays may degrade over time.

Material Selection Considerations

When selecting materials for low-voltage cable trays, the following factors are critical: Environmental conditions: Indoor, outdoor, corrosive, or high-humidity areas. Mechanical load: Weight of cables and potential impact or vibration. Electrical properties: Non-conductive materials like FRP may be preferred in certain installations.

Cost and fabrication: Aluminum and galvanized steel are generally more economical, while stainless steel and FRP are used for specialized conditions.

Summary

Aluminum (6063-T6): Lightweight, corrosion-resistant, suitable for most indoor/outdoor applications. Galvanized Steel: Strong, economical, suitable for industrial and commercial installations. Stainless Steel (316L): High corrosion resistance, ideal for harsh or chemical environments.

FR

P: Non-conductive, highly corrosion-resistant, suitable for extreme environments. Selecting the appropriate material ensures long-term durability, safety, and compliance with low-voltage system requirements while minimizing maintenance and replacement costs.

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Article Content

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Cable tray must be capable of supporting not just the weight of the cable, but also the weight of any equipment or materials attached to the cable tray. Additionally, dynamic environmental elements

Codes and Standards | Cable Tray Institute

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Practices for grounding and bonding of cable trays

Grounding and bonding of cable trays There are three wiring options for providing an EGC in a cable tray wiring system: An EGC conductor in or on

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