

Article Overview

Recent updates to cable tray regulations focus on safety, installation standards, conductor sizing, and fire protection, guided by IEC 61537 and the 2023 NEC revisions.

International Standards (IEC 61537)

The IEC 61537 standard provides globally recognized guidelines for metal cable tray systems, covering construction, testing, and performance requirements. Key aspects include:

- o Mechanical Strength: Trays must withstand cable loads, environmental stress, and external pressure, validated through load testing.
 - o Corrosion Resistance: Materials or coatings must resist corrosion, especially in harsh environments like marine or chemical facilities.
 - o Electrical Continuity: Metallic trays often serve as grounding paths and must maintain electrical continuity.
 - o Fire Resistance: Trays are tested for high-temperature and fire conditions, critical in hospitals, power plants, and industrial facilities.
 - o Ventilation and Fill Ratio: Proper perforation and fill capacity prevent overheating and ensure cable cooling.
 - o Installation Compatibility: Trays must accommodate bends, risers, and accessories for seamless integration.
- Compliance with IEC 61537 ensures long-term safety, efficiency, and international market compatibility.

U.S. Regulations (NEC Article 392 and 2023 Updates)

The National Electrical Code (NEC) Article 392 governs cable tray installation in the U.S., with recent updates emphasizing safety and accessibility :

- o Cable Types: Only use conductors rated for open-air environments, such as Tray Rated (Type TC) or Metal-Clad (Type MC).
- o Clearances: Maintain at least 12 inches of vertical clearance above trays for installation and maintenance.
- o Prohibited Areas: Cable trays cannot be installed in hoistways or enclosed spaces and must remain accessible.
- o Grounding: Metallic trays can serve as equipment grounding conductors if they meet NEC requirements.
- o Fill Limits: Power cables must not exceed 40% of tray cross-sectional area; control cables, 50%.
- o Separation: High-power and low-power cables must be separated to prevent electromagnetic interference (EMI).
- o Small Conductors: The 2023 NEC update (Article 690.31(C)) clarifies the use of small conductors like PV wire and DG cable on rooftops, including ampacity calculations, tray sizing, and layering/bundling rules.

Firestopping Requirements

Latest regulations for cable trays

Fire safety regulations now require firestopping at wall and slab penetrations where cable trays pass through :

- o Openings must be sealed with fire-resistant materials such as firestop packs, mastic, or mineral wool.
- o Gaps around cables should not exceed 1 cm², and packing thickness must be at least 24 cm.
- o Large openings require a fire-resistant backing plate before sealing.
- o Proper layout ensures accessibility for installation and maintenance while maintaining fire protection.

Practical Implications

- o **Material Selection:** Choose aluminum, steel, or FRP based on environmental conditions and load requirements.
- o **Design Compliance:** Ensure tray width, layering, and conductor spacing meet NEC and IEC standards.
- o **Safety and Maintenance:** Updated regulations improve fire safety, reduce EMI, and facilitate easier maintenance.
- o **Global Projects:** Following IEC 61537 ensures compatibility for international installations, while NEC compliance is mandatory in the U.S. By adhering to these updated regulations, engineers and contractors can enhance safety, prevent system failures, and ensure regulatory compliance in modern electrical installations.

The flexibility and scalability of cable trays make them an ideal choice for environments where cable density and

IEC 61537:2023 specifies requirements and tests for cable tray systems and cable ladder systems intended for the support and

In this installment of our Code Corner series, Ryan Mayfield focuses on the 2023 National

This document describes regulations for cable trays from the National Electrical Code. It defines cable trays and their components. It

Cable Tray Technical Guide A practical guide to product selection and installation This guide for engineers and installers has been

We partnered with the Eaton B-Line series experts for this article detailing the NEMA

The Cable Tray Institute is making available the current edition of this practical guide for the proper installation of aluminum or steel

However, cable tray installation involves multiple regulations and technical standards. This article provides a

Latest regulations for cable trays

detailed guide on

Core rules for selecting, installing, grounding, and filling cable trays--clearances, materials, separation, and bonding

This document specifies requirements and tests for cable tray systems and cable ladder systems intended for the support and

Explore the cable tray standards of 30 countries across five continents. Learn about the key

B. Cable tray systems are defined to include, but are not limited to straight sections of [ladder type] [trough type] [solid bottom type]

In accordance with its continuous improvement policy, Legrand reserves the right to change the specifications and illustrations

The latest edition (2024) defines strict requirements for: Construction, materials, and load capacity. Dimensions, grounding, and

Understand Cable Tray Regulations worldwide. Learn key standards like NEC (US), BS

Cable tray system design shall comply with National Electrical Code®; (NEC®) Article 392, NEMA BI-50015 (formerly VE 1), and

Web: <https://kremgroup.co.za>

