Requirements for Low-Voltage Cabling in Cable Trays

Article Overview

Low voltage cable trays must comply with international and national standards such as IEC 61537, UL 568, NEC, CEC, and NEMA VE 1 to ensure safety, mechanical integrity, and proper cable management.

Key Standards

IEC 61537 is the internationally recognized standard for cable tray systems, covering construction, mechanical strength, corrosion resistance, and electrical continuity. It applies to metal trays made of steel, stainless steel, aluminum, or other metallic materials, ensuring trays can safely support cables and withstand environmental factors over time . UL 568 specifies performance requirements for nonmetallic (fiberglass) cable trays, including ladder, ventilated, solid bottom, and channel types, ensuring safe application in low voltage systems . National Electrical Code (NEC, NFPA 70) and Canadian Electrical Code (CEC C22.1-Part 1) provide installation requirements, including ampacity, spacing, and conductor support for low voltage cables . NFPA 79 and NFPA 70E address electrical safety and protection against shock or arc hazards in industrial and commercial installations . NEMA VE 1 defines manufacturing requirements for metal cable trays, including ladder, channel, wire mesh, and solid bottom types, with load/span class designations . NEMA FG-1 (for nonmetallic trays) has been rescinded but remains a reference for fiberglass systems .

Practical Considerations for Low Voltage Systems

When selecting cable trays for low voltage applications such as data, telecom, or building automation, consider the following :

o Cable Type and Diameter: Identify all cables (Cat6/6A/7, fiber optic, coaxial, control cables) and their outer diameters.
o Total Quantity and Weight: Calculate the total weight per meter/foot, including a 20-30% margin for future expansion.
o Bend Radius: Ensure the tray accommodates the minimum bend radius of fiber optic and high-grade copper cables without pinching or stress.
o Tray Design: Ladder trays offer strength, ventilation, and easy access; solid or channel trays provide protection and aesthetic appeal.
o Material Selection: Aluminum, stainless steel, or fiberglass may be chosen based on corrosion resistance, mechanical strength, and environmental conditions .

Compliance and Certification

Manufacturers must provide CE marking or equivalent certification to demonstrate compliance with

applicable directives and standards. Third-party audits (e.g., UL, LCIE, IMQ) verify adherence to mechanical, electrical, and fire safety requirements . By following these standards and guidelines, low voltage cable tray installations achieve safety, reliability, and long-term performance, minimizing risks of overheating, signal interference, and structural failure.

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

Master low voltage cabling standards to ensure safety and performance. Learn how TIA,

Installation of Cable in Cable Trays ensures proper routing, cable management, NEC compliance,

NEC section 318-5 (e) indicates that multiconductor cables rated 600 volts or less are permitted in the same cable tray, however,

Article 723 addresses the pathways used for limited-energy cables--raceways, cable routing assemblies, cable trays,

BICSI Standards for Data Cable Installations BICSI is another global membership community to be familiar with, if you

As an industry leader in cable tray, Eaton offers one of the widest ranges of cable management solutions available in the market

Which National Electrical Code Articles Apply to Low Voltage Cabling? Key NEC references include Articles 725

Type ITC - Instrumentation Tray Cable - (NEC Article 727) - These types of cables are instrumentation cables and are available in

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

Best Practice: Use separate trays, conduits, or divider systems to isolate voltage classes.

This document lists the most typical mistakes that EPC teams should not make while installing instrumentation cable

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Cable tray and conduit system planning is a vital aspect of modern electrical infrastructure.

Per NEC 392, the national electrical code section for cable tray, all cable tray systems must be properly BONDED, per section

When it comes to powering, automating and protecting facilities?from factories and petrochemical plants to data

This guide covers the cable tray types and their appropriate applications, the fill rules for each configuration, ampacity

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