Methods for electrostatic bridging of cable trays



Overview

The choice of method should be discussed with a local inspector. The best decision may be to extend only the cables, creating a discontinuity in the cable tray.

Key Takeaways

Electrostatic bridging is generally not required if cable trays are properly grounded and bonded, but grounding and shielding measures are essential to prevent electrostatic buildup and EMI.

Grounding and Bonding Practices

Metallic cable trays must always be grounded according to NEC Article 250. 96, regardless of whether they serve as an equipment grounding conductor (EGC) for the circuits they carry. Proper bonding between tray sections ensures electrical continuity and prevents potential differences that could lead to electrostatic discharge or EMI issues.

For installations where the tray itself is used as an EGC, grounding clamps or bonding jumpers are recommended to mechanically secure the connection and maintain continuity under fault conditions. Non-metallic trays do not conduct electricity, so separate EGCs or grounding conductors within the cables are used to maintain safety and prevent electrostatic accumulation. In all cases, the grounding system should connect back to the main power source to ensure a low-impedance path for fault currents.

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Electrostatic Considerations

Electrostatic buildup is primarily a concern in signal, communication, or sensitive electronic circuits. While standard power cable trays may not require special electrostatic bridging, shielded or solid-bottom trays can provide additional protection against EMI and static discharge. Steel trays offer effective shielding up to ~100 kHz, while aluminum or copper shielding is more effective at higher frequencies, which can help mitigate electrostatic effects in high-speed data or instrumentation circuits.

Best Practices

Ensure continuous grounding of all metallic tray sections. Use insulated conductors when bonding aluminum trays to prevent electrolytic corrosion. For sensitive circuits, consider shielded trays or covers to reduce EMI and static interference.

Maintain proper separation between high-power and low-power cables to minimize induced voltages and electrostatic effects. Verify compliance with NEC 392 and relevant standards for grounding, bonding, and tray fill limits.

Conclusion

Electrostatic bridging as a separate procedure is not typically required if cable trays are correctly grounded, bonded, and, where necessary, shielded. The key is to maintain a continuous, low-impedance grounding path and implement shielding for sensitive circuits to prevent electrostatic buildup and EMI interference. Proper installation according to NEC and industry best practices ensures both safety and operational reliability.

Article Content

IEC 61537:2023

This document specifies requirements and tests for cable tray systems and cable ladder systems intended for the support and accommodation of cables and possibly other electrical equipment in

Cable Tray Technical Guide A practical guide to product selection and ...

The choice of method should be discussed with a local inspector. The best decision may be to extend only the cables, creating a discontinuity in the cable tray.

Cable Tray Trunking & Ladder Installation Method for Projects

The purpose of this article is to define the sequence and methodology for the installation of electrical cable trays, cable trunking, cable raceways and boxes, junction and pull boxes.

GUIDE CABLE TRAYS TECHNICAL

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NEMA VE 1-2017 Specifies requirements for metal cable trays and associated fittings designed for use in accordance with the rules of Canadian Electrical Code, Part I and the National Electrical Code®

Cable Tray Ladder Trunking Wire Basket Installation Guidelines

Cable tray is the bridge that allows for safe transport of wires across open spans. The National Electrical Code publishes the standards for all types of electrical applications. Articles 318, 250, and 800 cover

Cable Tray Installation Method Statement

Below is the detailed cable tray installation method statement not only for cable tray but also applicable for GI ladder and trunking for indoor and outdoor applications and in service rooms like pump rooms,

ITER Cabling Handbook

This document deals with cables trays, cables and connector installation and segregation, cable trays earthing and E.M.C. directives. These rules shall be applied in the cabling engineering workflow for

Guide to cable support systems

The systems are suspended from the ceiling with threaded rods, stand-off brackets allow raised floor mounting of cable trays, ladders and mesh cable trays. The universal systems comprise ceiling

LEGRAND CABLE TRAYS TECHNICAL GUIDE

Not all cable trays are equivalent. The mechanical and electrical characteristics, tests, certifications, overall quality management, recommendations mentioned in this technical guide only apply to our

Best practice guide to cable ladder and cable tray systems

Cable ladder and cable tray systems The following recommendations are intended to be a practical guide to ensure the safe and proper installation of cable ladder and cable tray systems

Precautions for Cable Tray Installation

Cable Tray Installation Guide The correct installation of cable trays is crucial for establishing a reliable and efficient cable system. It ensures that cables are

Safely Installing, Maintaining and Inspecting Cable Trays

Cable trays are not raceways, but they are treated as a structural component of a facility''s electrical system. Cable trays are a part of a planned cable management system to support, route, protect and

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Installations of Cable Trays Method Statement – Your Best Step By

Cable trays are easy to install, and since they come in different sizes, you can choose the right tray for your individual needs. But to install them properly on-site, you shall have a method statement to be

Introduction to 3 types of cable bridges and their

In our life, there is a common cable tray cable trough, tray type, and ladder. Here are the characteristics and uses of these three types of bridges with understanding.

Practices for grounding and bonding of cable trays

A bare copper equipment grounding conductor should not be placed in an aluminum cable tray due to the potential for electrolytic corrosion of the aluminum cable tray in a moist environment. For such

Cable Tray Technical Guide A practical guide to product selection and ...

A practical guide to product selection and installation This guide for engineers and installers has been developed by ABB as a practical reference regarding cable tray characteristics, installation, and

Explaining NEC Article 392 on Cable Trays

NEC Article 392 explains cable trays, their components, appropriate wiring methods for cable trays, and instances where they are and are not

IEC 61537:2023 | IEC

Where necessary, cable tray systems and cable ladder systems can be used for the arrangement of cables into groups. This document does not apply to conduit systems, cable trunking systems and

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This document is for preliminary research. Verify specifications against current standards, product documentation and project requirements.

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