

Cable trays do not require grounding

Article Overview

Ungrounded cable trays pose serious safety hazards and violate NEC requirements; all metallic trays must be properly grounded and bonded.

Safety Risks of Ungrounded Cable Trays

Cable trays that are not grounded can create significant electrical hazards, including the risk of electric shock, fire, and equipment damage. Without a proper grounding path, stray currents from faults or power surges cannot safely flow to the earth, leaving personnel and equipment exposed to dangerous voltages . Ungrounded trays also increase the likelihood of electromagnetic interference (EMI) affecting sensitive control or communication circuits .

NEC Requirements

The National Electrical Code (NEC) Article 392 mandates that all metallic cable trays must be grounded, regardless of whether they are used as an equipment grounding conductor (EGC) or not . Metallic trays can serve as the EGC if they meet specific criteria, including minimum cross-sectional area and UL classification . Non-metallic trays require separate EGCs or bonding jumpers to ensure electrical continuity . Grounding ensures that the tray system is electrically continuous and bonded back to the power source .

Best Practices for Grounding and Bonding

- o Bonding Between Sections: Each tray section should be electrically bonded to the next using grounding clamps, splice plates, or bonding jumpers to maintain continuity .
- o Equipment Grounding Conductors: If cables in the tray contain EGCs, these should be bonded to the tray at intervals to enhance safety and mechanical stability .
- o Material Considerations: Avoid bare copper conductors in aluminum trays to prevent electrolytic corrosion; insulated conductors with proper connectors are recommended .
- o Resistance Levels: Grounding systems should maintain low resistance, ideally 4 ohms or less, to ensure effective fault current diversion .

Alternatives and Special Cases

- o In facilities where trays carry only low-energy signal or communication circuits, grounding may focus on lightning protection and EMI mitigation rather than power fault protection .
- o For non-metallic trays, a separate EGC or bonding conductor is required to meet safety standards .

Conclusion

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Failing to ground cable trays is a serious safety violation and can compromise both personnel safety and equipment reliability. Proper grounding and bonding, in compliance with NEC standards, are essential for all metallic trays, while non-metallic trays require alternative grounding methods. Following these practices ensures electrical safety, reduces EMI, and maintains system integrity .

This article provides a comprehensive framework that governs various aspects of cable tray installations, including

As non-metallic cable trays cannot work as a conductor, they should preferably have a separate EGC along with the

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

All metallic cable trays must be grounded as outlined in NEC Article 250.96, even if the tray isn't being used as an

Electrical grounding is essential for personal safety and protection against arcing that can occur in any part of the wiring system,

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

However, while wire mesh trays offer mechanical and thermal advantages, proper grounding and bonding are critical

Cable tray systems are not required to be mechanically continuous, but shall be electrically continuous. Cable trays are also bonded

Learn how to verify the safety of your electrical systems with our guide on testing cable tray grounding, ensuring full

Cable tray wiring systems have excellent safety and dependability records. These excellent records are the result of cable tray's

Tray cables being installed in cable trays do not have to be pulled into the termination equipment enclosures. Tray cable may be

NEMA VE 1-2017 Specifies requirements for metal cable trays and associated fittings designed for use in

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accordance with the rules

The cable tray carries metallic sheathed cables, such as bare micc. - In the event of a fault on the circuit the fault path will be the

Steel and aluminum cable tray systems can serve as equipment grounding conductors if specific criteria are met. These include

Communication Cables - types CMP, CMR, CMG, CM, CMX Fire Alarm Cables - type NPLF - NPLFP, FPL-FPLP (CI) Type TC -

To meet this requirement some manufacturers recommend that the cable tray system be bonded to the facility ground

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