Grounding of cable trays and conduits

Overview

All metallic cable trays shall be grounded as required in Article 250.96 regardless of whether or not the cable tray is being used as an equipment grounding conductor (EGC).

Key Takeaways

Metallic cable trays and conduits can serve as equipment grounding conductors (EGC) if properly bonded and grounded according to NEC standards, with additional grounding wires used where required for safety and continuity.

Grounding Principles

Grounding ensures that any stray electrical currents are safely directed to the earth, reducing the risk of electric shock, fire, or equipment damage. Metallic cable trays and conduits are often used as part of the grounding system, either as the primary EGC or in combination with separate grounding conductors. All metallic trays must be grounded regardless of whether they are used as an EGC.

Methods of Grounding Cable Trays

Using the Cable Tray as the EGCThe tray itself can serve as the EGC in qualifying installations, provided it meets NEC requirements for metal cross-sectional area and continuity. Sections of the tray must be electrically continuous, and bonding connections should be made at joints to maintain a low-impedance path for fault currents. Separate Equipment Grounding Conductor (EGC)A bare or insulated copper conductor can be installed in or on the tray to serve as the EGC.

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It is recommended to bond the EGC to each or alternate tray sections using grounding clamps to prevent mechanical displacement during fault conditions. For aluminum trays, insulated conductors are preferred to avoid electrolytic corrosion, with insulation removed at bonding points using tin- or zinc-plated connectors. Parallel EGCsA single conductor can serve as a common EGC for all circuits in the tray, running parallel to the tray to ensure safety and compliance with NEC Section 318-3(b)(1) Exception 2.

Conduit Grounding

Metallic conduits, such as EMT, RMC, or IMC, are also used as grounding paths. They must be properly bonded to equipment enclosures and the main grounding system to ensure continuity. Conduits can be connected to cable trays via bushed or flanged connections to maintain a continuous grounding path.

Safety and Compliance Considerations

Low Grounding Resistance: The grounding system should ideally have a resistance of 4 ohms or less to ensure effective fault current diversion. Material Selection: Use corrosion-resistant materials and appropriate plating for connectors, especially in moist or outdoor environments. Separation of Conductors: High-power and low-power cables should be separated to prevent electromagnetic interference (EMI) while maintaining proper grounding.

Code Compliance: All installations must adhere to NEC Article 250 (Grounding and Bonding) and Article 392 (Cable Tray Systems) to ensure safety and inspection compliance.

Best Practices

Bond each tray section mechanically and electrically to maintain continuity. Avoid placing bare copper EGCs in aluminum trays in moist environments. Use insulated conductors with proper bonding clamps for aluminum or outdoor installations.

Ensure all metallic enclosures, trays, and conduits are part of the grounding system to facilitate overcurrent protection operation. By following these practices, cable tray and conduit systems provide a safe, low-impedance path for fault currents, protecting personnel and equipment while maintaining NEC compliance.

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MP Husky manufacturers Cable Tray Systems, Cable Bus System, Wire Mesh/Wire,Cable Tray, & Cable Management Systems. Our cable support

ER Trunking Cable Trays

About this product Cable trays are systems used for the safe transportation and protection of electrical cables, designed to fit the pathways within buildings and structural installations. Type: Trunking

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About this product Cable tray is a system used for the safe transportation and protection of electrical cables, designed to fit the pathways within buildings and structural installations. Type | Marine Type

(PDF) Cable Laying and Pulling

In cable trenches in outdoors switchyards.• In cable trays or cable ducts• Fixed with clamps (usually at walls and ceilings).• In conduits.

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