

What type of cable is needed for cable tray installation

Article Overview

Approved tray cables include Type TC, TC-ER, PLTC, ITC, and VNTC, each designed for safe installation in cable trays according to NEC standards.

Overview of Tray Cables

Tray cables are multi-conductor or multi-pair cables specifically designed for installation in cable trays without additional conduit. They are widely used in industrial plants, commercial buildings, and utility installations where organized, accessible routing is required for power, control, and instrumentation circuits . Not all cables can be installed in trays; only NEC-listed tray-rated cables are permitted to ensure safety, fire resistance, and mechanical durability .

Common Tray Cable Types

- o Type TC (Tray Cable): Standard 600V multi-conductor cable listed under UL 1277. Conductors are typically copper, insulated with THHN, THWN, XHHW, or XLPE, and jacketed with PVC or CPE. Suitable for installation in trays, raceways, and outdoor locations when supported .
- o Type TC-ER (Exposed Run): Meets all TC requirements plus additional crush and impact resistance, allowing installation outside trays, along structural members, or in open air without conduit .
- o PLTC (Power-Limited Tray Cable): Designed for control and signaling circuits, providing insulation and protection suitable for tray installation under NEC Article 725 .
- o ITC (Instrument Tray Cable): Used for instrumentation and control applications, often with additional shielding to reduce electromagnetic interference .
- o VNTC (Ventilated Tray Cable): Similar to TC but designed for ventilated trays, allowing better heat dissipation and airflow around the cables .

Key Considerations

- o Voltage Class: Ensure the cable type matches the system voltage requirements. TC cables are typically rated for 600V, while PLTC and ITC may have different voltage ratings .
- o Environmental Conditions: Material selection (PVC, CPE, XLPE) depends on exposure to moisture, chemicals, or temperature extremes .
- o NEC Compliance: Follow NEC Article 392 for cable tray systems, including grounding, bonding, tray fill limits, and separation of power and data cables to prevent interference .
- o Mechanical Protection: For exposed runs or areas prone to physical damage, use TC-ER or armored variants to ensure durability .



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Summary

For safe and compliant cable tray installations, select NEC-listed tray cables appropriate for the application: Type TC for standard tray runs, TC-ER for exposed installations, PLTC for control circuits, and ITC/VNTC for instrumentation or ventilated tray systems. Proper selection ensures electrical safety, regulatory compliance, and long-term reliability of the installation .

Tray cables (TC) are multi-conductor cables designed and rated for installation in cable trays and raceways or

Learn how to install cable trays correctly. Get the ultimate step-by-step guide on setting up a seamless and reliable

Discover the essentials of cable tray installations, including permitted cable types, flame testing, mechanical and application

Tray can be manufactured in various types of material including aluminum, steel and fiber and other nonmetallic materials. Cable tray

For an overview of tray system types and applications, see cable tray raceways for additional context. For over thirty years, the use

Fast installation with dependable support. Everything you need to build a cable management system, including Cablofil wire mesh

This guide covers the critical steps, from selecting the right electrical cable tray and performing accurate

NEC Article 392 explains cable trays, their components, appropriate wiring methods for

A practical guide to product selection and installation This guide for engineers and installers has been developed by ABB as a

Cable trays support cables across open spans in the same way that roadway bridges support traffic. Cable trays can provide a safe

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

Key Takeaways NEC Article 392 governs cable tray systems. Only approved tray-rated cables should be

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installed.

Quality Type TC, Type PLTC, or Type ITC small diameter multiconductor control and instrumentation cables will not be damaged

Discover the different types of cable trays, their many benefits when used in electrical wiring and network cabling,

Data centers almost exclusively use cable tray (usually wire mesh or ladder type) for both power and data cables

Design recommendations for ladder cable tray When supporting small diameter multi-conductor control and instrumentation cables,

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