

# Standard for Vertical Shaft Cable Tray Supports

## Article Overview

Vertical shaft cable trays must comply with IEC 61537, NEMA VE 1, UL 568, and NEC/CEC standards, ensuring proper load support, material selection, and safe installation.

## Overview

Vertical shaft cable trays are designed to support and route electrical, control, and communication cables in vertical runs, such as shafts, risers, or multi-story installations. They provide a safe, organized pathway for cables while maintaining mechanical integrity, fire safety, and accessibility for maintenance and future expansion .

## Materials and Construction

Cable trays for vertical shafts are manufactured from steel, stainless steel, aluminum, or nonmetallic materials. Material selection depends on environmental conditions:

- o Steel: Pre-galvanized or hot-dip galvanized for corrosion resistance .
- o Stainless steel: AISI 316L or similar grades for high corrosion resistance, especially in chlorinated or humid environments .
- o Aluminum: Lightweight, corrosion-resistant, suitable for indoor and outdoor applications .
- o Nonmetallic (fiberglass): UL 568 compliant, resistant to chemical corrosion and electrical insulation requirements . Vertical shaft trays may be ladder, ventilated trough, solid bottom, or channel type, depending on cable type, heat dissipation needs, and structural requirements .

## Design Specifications

Key design considerations for vertical shaft cable trays include:

- o Load capacity: Must support the weight of cables and any additional mechanical loads. NEMA VE 1 provides span and load class designations .
- o Rung spacing: Typically 150-230 mm (6-9 inches) to maintain cable support and prevent sagging .
- o Bend radius: Minimum bend radius must be maintained to prevent cable damage at entry/exit points .
- o Thermal expansion: Vertical trays must accommodate expansion/contraction due to temperature changes .
- o Corrosion protection: Coatings or material selection must match environmental exposure, including humidity, chemicals, or outdoor conditions .

## Standards and Compliance

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Vertical shaft cable trays must adhere to multiple standards:

- o IEC 61537: International standard for metal and nonmetallic cable tray systems, covering construction, testing, and performance .
- o NEMA VE 1: Specifies manufacturing requirements for metal cable trays, including ladder, channel, and solid bottom types .
- o UL 568: Covers performance and safety requirements for fiberglass cable trays .
- o NEC (NFPA 70) and CEC (C22.1 Part 1): Provide installation rules, ampacity tables, and safety requirements for cable trays in the U.S. and Canada .
- o NFPA 79 and NFPA 70E: Address industrial machinery and electrical safety, including protection against shock and arc flash hazards .

## Installation Best Practices

- o Ensure vertical alignment and secure anchoring to structural supports.
- o Maintain minimum clearances from other services and walls.
- o Use splice plates and support brackets at recommended intervals to maintain structural integrity .
- o Consider fireproofing or covers for vertical shafts in high-risk areas.
- o Verify compatibility with cable types, including power, control, and instrumentation cables .

## Summary

Vertical shaft cable trays are critical for safe and organized vertical cable routing. Compliance with IEC 61537, NEMA VE 1, UL 568, and NEC/CEC standards ensures proper load support, material durability, and electrical safety. Proper design, material selection, and installation practices are essential to prevent mechanical failure, overheating, or fire hazards in commercial, industrial, and utility installations .

Not all cable trays are equivalent. The mechanical and electrical characteristics, tests, certifications, overall quality management,

This guide covers cable ladder systems, cable tray systems, channel support systems and associated supports intended for the

Ventilated trough cable tray is often used when the specifier does not want to use ladder cable tray to support small diameter

Cable Tray Installation Method Statement 1. Cable Tray Installation Cable trays should be installed in

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accordance with the latest

The Cable Tray Institute (CTI) was founded in 1991 to support the cable tray industry by engaging in research, development,

In accordance with its continuous improvement policy, Legrand reserves the right to change the specifications and illustrations

Vertical adjustable splice plates should be designed and placed so as to maximize the rigidity of the cable tray, unless vertical

**SOLID-BOTTOM CABLE TRAY** Providing additional cable protection, solid-bottom cable tray is sometimes preferred to support and

revised classification for corrosion, revised SWL test types and procedures, new tests for lengths mounted vertical running horizontal

Explore the essential cable tray support spacing requirements for safe and efficient installations. Learn NEC guidelines

Cable ladder and cable tray systems The following recommendations are intended to be a practical guide to ensure

Understanding the IEC Standard for Cable Tray Cable trays play a vital role in supporting

Cable Management Support Systems Cable Support Systems are well designed to provide necessary support for cable trays, cable

Cable tray length is selected based on the load to be supported, the distance between the supports (also referred to as the span),

IEC 61537:2023 specifies requirements and tests for cable tray systems and cable ladder systems intended for the support and

Overloading cable trays can lead to a breakdown of the tray, its connecting points, and/or supports, causing hazards to persons

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