

Cable tray compensators and expansion joints

Article Overview

Expansion joints and compensators in cable trays are essential for accommodating thermal expansion and contraction, preventing structural stress, misalignment, and damage to cables and supports.

Purpose of Expansion Joints

Cable trays, typically made of metal, expand when heated and contract when cooled. Without proper expansion joints, this movement can cause bending, bolt failure, or misalignment of the tray system, especially in outdoor or high-temperature industrial environments . Expansion joints absorb these movements, allowing the tray to expand and contract freely while maintaining system integrity .

Standards and Guidelines

- o NEC Section 300-7(b) requires raceways, including cable trays, to have expansion joints where necessary to compensate for thermal expansion or contraction .
- o NEMA VE 1 provides detailed recommendations for metallic cable tray systems, including the use of expansion joint splice plates, bonding jumpers, and proper support placement .
- o Expansion joints should be installed at intervals determined by the tray material, temperature variations, and environmental conditions to ensure long-term reliability .

Installation Considerations

- o Support Placement: Supports should be located within 2 feet of each side of the expansion joint splice plate. The tray should not be clamped too tightly to allow free movement .
- o Anchoring and Guides: The tray should be anchored at the midpoint between expansion joints, with expansion guides at other supports to allow sliding during thermal changes .
- o Gap Setting: The expansion joint gap is calculated based on the maximum and minimum expected tray temperatures, using a nomograph or manufacturer guidelines to determine the correct spacing .
- o Material Selection: Aluminum expands more than steel; for example, a 100-foot aluminum tray may expand about 2 inches over a 100°F temperature change, while steel expands less .

Accessories and Compensators

Cable tray manufacturers provide a range of accessories to facilitate expansion, including:

- o Expansion joint splice plates to connect tray sections while allowing movement
- o Bonding jumpers sized to match the tray's fault current capacity

Cable tray compensators and expansion joints

o Separators, end edges, wall supports, and floor fixings in HDG, stainless steel, or aluminum These components ensure mechanical strength, alignment, and electrical continuity while accommodating thermal movement.

Practical Tips

- o Expansion joints should be installed at points of significant temperature variation or structural expansion joints, but the tray's thermal behavior must be considered independently of the supporting structure .
- o Regular inspection and maintenance of expansion joints and guides help prevent misalignment, tray bending, or bolt elongation over time .
- o Properly designed expansion joints enhance the longevity and safety of cable tray systems, particularly in rooftop installations, outdoor environments, or large industrial facilities . By following these guidelines, engineers and installers can ensure that cable tray systems remain functional, safe, and durable under varying thermal conditions.

Discover best practices for cable tray expansion joint installation to accommodate thermal changes, ensuring

The cable ladders & trays should be anchored at the support nearest to its midpoint between the expansion splice plates and

A cable tray system may be affected by thermal expansion and contraction, which must be taken into account during installation. To

A cable tray system may be affected by thermal expansion and contraction, which must be taken into account during

Cable ladders PTR type have been tested to verify the electrical continuity in accordance with CEI EN 61537 standard. The test

2020 Code Language: N 392.44 Expansion Splice Plates. Expansion splice plates for cable trays shall be provided where necessary

Technical data on fiberglass cable tray thermal expansion, contraction, installation, and gap settings. Includes tables and diagrams.

Step 2: Determine the gap setting between the cable tray expansion splice joints at the time of the installation to account properly the

Cable tray compensators and expansion joints

-- 01 Expansion splice -- 02 Mid-span splice -- Note: For purposes of illustration, bonding jumper not shown but is required at

T0 209 - Expansion joint - ZT - Cable trays and Trunkings

A.Expansion splice plates for cable trays must be provided where necessary to compensate for thermal expansion and contraction

All materials expand and contract due to temperature changes, including cable tray systems. Understanding where

Cable trays should be fastened to the support system using guides that allow for longitudinal movement. 5.4.4 Expansion Connectors

Reasonable setting of cable tray expansion joints is a key link to ensure the safe operation of the cable tray system,

The cable tray needs to be anchored at the support closest to the midpoint between the expansion joints with hold down clamps and

Cable trays shall not be used to support any rigging for cable installation Guidelines for Engineers. Cable clamps or straps suitable

Web: <https://bssoda.pl>

