Reasons for not using cable trays when laying cables in factory buildings

Overview

Cable trays are more preferable in large buildings or factories since they are not closed and can be readily repaired.

Key Takeaways

Cable trays may be avoided in factory buildings due to load limitations, maintenance challenges, environmental conditions, and safety concerns.

Load-

Bearing and Structural LimitationsCable trays have a finite load capacity, and older or improperly designed trays may not support the increasing number of cables required for modern industrial equipment. Overloading can lead to sagging, deformation, or even structural failure, which risks power supply interruptions and potential damage to the tray system itself. In factories with heavy machinery or dynamic loads, vibrations can further stress trays, making them less reliable.

Maintenance and Accessibility Challenges

If trays are installed too high, too low, or in complex layouts, maintenance becomes difficult. Messy or overcrowded trays complicate troubleshooting, cable replacement, and inspection, increasing downtime and labor costs. Poorly planned layouts can also hinder future expansions or modifications, making cable trays less practical in rapidly evolving industrial environments.

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Environmental and Corrosion Concerns

Factories often expose cable trays to harsh conditions such as high humidity, chemical spills, dust, or extreme temperatures. Standard steel trays may corrode or degrade quickly under these conditions, requiring frequent maintenance or replacement. While materials like stainless steel, aluminum, or fiberglass-reinforced plastics can mitigate corrosion, they increase costs and may not always be feasible.

Safety and Electrical Considerations

Overcrowded trays can cause heat buildup, increasing the risk of fire and reducing cable lifespan. Improper grounding, sharp edges, or misaligned joints can lead to electrical hazards, including short circuits or arcing. In areas with high-voltage and sensitive signal cables, trays may not provide sufficient separation to prevent electromagnetic interference, making alternative routing methods preferable.

Space and Layout Constraints

Cable trays require physical space and support structures. In factories with dense equipment layouts, HVAC ducts, or pipe racks, installing trays may be impractical or interfere with other systems. Limited ceiling height or structural obstacles can prevent the use of standard tray designs, necessitating alternative cable management solutions such as conduits or direct-burial systems.

Aesthetic and Operational Considerations

In some cases, cable trays may be considered visually untidy or may not align with the desired industrial aesthetics. Poorly designed trays can detract from the overall appearance of the facility and may complicate operational workflows if they obstruct access to equipment. In summary, while cable trays offer organized and scalable cable management, factors such as load capacity, maintenance difficulty, environmental exposure, safety risks, space constraints, and operational considerations can make them unsuitable for certain factory building applications.

Article Content

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This document provides information for engineers, technicians, and trades/crafts people to avoid potential wire or cable damage during installation, testing, and modification of cable systems at

Safely Installing, Maintaining and Inspecting Cable Trays

Overloading cable trays can lead to a breakdown of the tray, its connecting points and/or supports, causing hazards to persons underneath the cable tray and even leading to possible electric shock

Cable Tray Questions | Cable Tray Institute

NEC section 318-5 (e) indicates that multiconductor cables rated 600 volts or less are permitted in the same cable tray, however, separation of power and control cables is necessary as indicated in other

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Installation Of Cable In Cable Trays: NEC, Safety

Cable tray layout must take into consideration the design limits of the cable. To minimize damage and verify integrity after installation, follow the practices outlined in cable handling and testing procedures

ITER Cabling Handbook

When cable trays have to connect two buildings and have to go through accessible trenches, the minimum size of the trenches must allow human access along the cable trays placed in these

Tray Cable and Cable Trays Vs. Conduit: A Helpful Overview

Despite these several advantages of tray cable and cable trays, there are a number of disadvantages to them as well. They offer little protection to the cables against outside influences

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