High temperature inside cable trays



Overview

Selecting the best tray cables for high-temperature applications safeguards your systems, workforce and investment.

Key Takeaways

Cable trays and their contents must be carefully selected and ventilated to handle high temperatures safely, with materials and cables rated for the expected heat.

Cable Tray Material Performance

Cable tray materials respond differently to elevated temperatures. Fiberglass trays lose 10% of their strength at 100°F and up to 50% at 200°F, requiring additional supports for high-heat applications. Aluminum trays perform better, losing only 9% of strength at 200°F and about a third at 300°F.

Low-carbon steel trays are the most heat-resistant, maintaining strength up to 600°F and only losing 50% at 1000°F. Protective coatings on steel trays should also be considered, as they may degrade under extreme heat.

Cable Selection for High Temperatures

Cables inside trays must match the thermal environment. Standard 600V building wires have a maximum continuous temperature rating of 90°C (194°F), while specialty cables like Teflon® insulated nickel-coated wires can withstand up to 500°F. High-temperature tray cables often use XLPE, silicone rubber, or fluoropolymer (FEP, PTFE) insulation, with robust thermoplastic or thermoset jackets for UV, chemical, and oil resistance.

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Continuous operating ratings can range from 90°C to 150°C or higher, with short-circuit ratings up to 250°C.

Heat Dissipation and Ventilation

Overheating in cable trays can accelerate insulation aging, reduce electrical performance, and increase fire risk. Key strategies to manage heat include: Open tray designs to allow airflow and natural cooling. Proper spacing between cables to prevent heat buildup.

Ventilation planning based on cable load, tray location, and environmental conditions. Monitoring ambient temperature and humidity to ensure cables remain within safe operating limits.

Practical Recommendations

Select tray materials appropriate for the expected temperature range, favoring steel for extreme heat. Use high-temperature-rated cables with suitable insulation and jacket materials. Design trays for ventilation, including open structures and adequate spacing.

Consider additional supports for trays in high-heat areas to compensate for reduced material strength. Regularly inspect cable trays and cables for signs of thermal degradation, such as insulation cracking or discoloration. By combining heat-resistant materials, high-temperature cables, and effective ventilation, cable trays can safely operate in environments with elevated temperatures, ensuring reliability and reducing fire hazards.

Article Content

Best Tray Cable for High-Temperature Applications

Selecting the best tray cables for high-temperature applications safeguards your systems, workforce and investment. XLPE, silicone and fluoropolymer-insulated tray cables from

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Selecting the right materials for cable tray use at high temperatures

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There are many considerations in choosing the correct cable tray material for use in high temperatures. With a careful analysis of your environment and the materials available, you are sure to find a cable

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Selecting the right materials for cable tray use at high temperatures

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A practical guide to product selection and installation This guide for engineers and installers has been developed by ABB as a practical reference regarding cable tray characteristics, installation, and

Prevent Fire and Electric Hazards When Cable Trays Used

If not designed and installed properly, wiring inside cable trays may pose hazards such as fire, electric shock, and arc-flash blast events.

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Cable Trays

Cable trays distribute bundles of electrical cables from power supplies to electrical equipment and components throughout the plant. Cable tray systems consist of insulated electrical cables layered

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