

Classification of Fire Resistance and Flame Retardant Ratings for Cable Trays

Article Overview

Fire-resistant cables maintain circuit operation during fire, while flame-retardant cables prevent flame spread; both are classified by international standards such as IEC 60331, IEC 60332, BS 6387, and DIN 4102.

Fire-Resistant vs Flame-Retardant Cables

Fire-Resistant Cables (FR): Designed to maintain electrical circuit integrity during fire, ensuring critical systems like fire alarms, emergency lighting, and smoke ventilation continue operating. They typically use mica tape, ceramicized silicone, or magnesium oxide insulation to withstand temperatures from 750°C up to 1000°C for specified durations (e.g., 30, 60, 90 minutes) without losing conductivity . **Flame-Retardant Cables (FRT):** Designed to limit flame propagation and self-extinguish after exposure to fire. They do not maintain power during fire but prevent fire from spreading along cable trays. Flame-retardant cables often use PVC, LSZH, or flame-retardant XLPE with additives that release inert gases and form a carbonized layer to block heat transfer .

Standards and Ratings

IEC 60331: Specifies tests for circuit integrity under fire conditions, including temperature and duration. Ratings indicate the time a cable can maintain operation during fire (e.g., 30, 60, 90 minutes). **IEC 60332:** Focuses on flame propagation tests for single and bunched cables. Categories (A, B, C, D) define the severity of the flame test and acceptable char height, typically ≤ 2.5 m for vertical tests . **BS 6387:** UK standard for fire-resistant cables, classifying performance under flame, water, and mechanical stress. Ratings like PH30, PH60, PH90 indicate minutes of operation under fire conditions . **DIN 4102-12 / DIN 0472-814:** German standards for system integrity, ensuring cables maintain function including supports and fixings during fire. Ratings like FE180/E30 indicate 30 minutes of system integrity . **GB/T 19666:** Chinese standard defining both flame-retardant and fire-resistant cables, typically tested at 750-800°C . **LSZH and Halogen-Free Ratings:** Some flame-retardant cables are low-smoke, zero-halogen, reducing toxic gas emissions during combustion, suitable for high-density or public areas .

Practical Application in Cable Trays

- o **Fire-Resistant Cables:** Used in emergency systems, fire alarms, smoke extraction, and evacuation lighting. Routed separately in cable trays to ensure uninterrupted operation during fire .
 - o **Flame-Retardant Cables:** Used in general power and signal distribution where limiting fire spread is the priority, such as office buildings, residential complexes, and industrial facilities .
- Selection Guidelines:** Choose cable type based on system criticality, fire safety objectives, and applicable standards. Fire-resistant cables are costlier and should be used only where circuit integrity is essential, while flame-retardant cables are

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more economical for general fire prevention .

Summary

Cable trays require careful selection of fire-resistant or flame-retardant cables based on operational needs and compliance with international standards. Fire-resistant cables ensure circuit continuity, while flame-retardant cables prevent fire propagation. Ratings from IEC, BS, DIN, and GB/T standards provide measurable performance criteria, guiding safe and effective installation in buildings and industrial systems .

Clarify the differences between fire resistant and flame retardant cables, including detailed

Flame retardant cable is characterized by delaying the spread of flame along the cable so that the fire does not

Explore 5 essential fire resistant cable standards by country. Compare IEC, BS, and DIN

Scary thought, isn't it? This is exactly why flame retardant and fire-resistant cables aren't just technical jargon - they're

In environments where safety is critical, such as commercial buildings, hospitals, and data centers, selecting the

To evaluate the fire resistance of cables, IEC60332-1, IEC60332-2, and IEC60332-3 have

At present, in cable industry, Fire Retardant, Low Smoke Halogen Free (LSOH) OR Low Smoke Fume (LSF), Fire Resistant cables

Basor Electric, sensitive to the need to minimize the consequences of a fire, has subjected its cable trays

Learn about essential fire safety measures for cable trays to safeguard your electrical

Knowing the flammability rating of these specific materials will give you an insight as to how it ignites, spreads, and

Choosing the right cable type is crucial for any engineering project. Many purchasers and

Nevertheless, Europe and the United States have different approaches to fire safety, which translates into different

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Selecting flame-retardant control cables in 2026? Our updated guide covers fire class ratings, conductor specs & selection criteria.

By choosing fire-resistant FRP cable trays, incorporating flame-retardant additives, and following proper installation

What is a Fire Resistant Cable? Fire-resistant cables are cables that continue to operate in

IEC 60332 Cable The IEC 60332 standard for cables is a standard for the flame resistance

Web: <https://millstraining.co.za>

