Ensuring fire safety and installation flexibility for electrical connections

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In the event of a fire, it's essential for alarms, lighting, and fire-fighting systems to continue operating long enough to allow evacuation, as well as supporting the fire brigade in their work. Safety has to be matched with installation flexibility, allowing for scalable design changes, as well as real-life requirements that the installer faces on-site. Surface mounted fire-protection enclosures can fulfil these needs.

Chris Lloyd, Managing Director at Spelsberg UK, discusses requirements for electrical connection fire safety.

In Essen, Western Germany, the Limbecker Platz shopping mall is one of the North Rhein Westphalia region's largest. With around 200 individual stores and numerous restaurants, Limbecker Platz receives thousands of visitors every day. For a busy mall, safety is paramount, and reducing risk in the event of fire is a high priority for a crowded, indoor area.

"In an emergency situation, a fire-protected electrical installation ensures that essential electrical systems, such as emergency lighting, ventilation systems, lifts and equipment for the rescue of human lives and firefighting, remain available and function reliably," says Thomas Decker, Managing Director of the electrical installation contractor, Elektro Decker GmbH that managed the project at Limbecker Platz.

Protecting electrical junctions and connections can mean the difference between life and death in the event of fire. As well as large, crowded malls, industrial buildings, multi-storey commercial or residential blocks, and hotels, all need this level of safety.

Flexible installation

In many situations, the cables and electrical junctions that power fire-protection devices could be best protected by encasing them within concrete. However, the inherent inflexibility of this approach means that fire protection system designers are restricted and would have to work in detail with the building architect from the outset. Even then, this limits the flexibility to make changes to the fire protection system. Furthermore, the real-life situation on-site isn't always represented by the actual plans, which can make installation more difficult.

Alternatively, the flexibility of conventional surface-mount enclosures ensures ease in planning and installation. These enclosures can be quickly mounted, adjusted to suit on-site and, if the need requires it, their position can be changed. This flexible and scalable approach was important to Limbecker Platz, however, the crucial requirement for the shopping mall was to ensure that these surface-mount enclosures had the level of protection sufficient to withstand a fire.

Electrical functional integrity

Surface-mounted fire protection enclosures are constructed from heat- and fire-resistant materials to ensure electrical functional integrity for up to 90 minutes. E30 certification guarantees functional integrity for 30 minutes in the event of a fire, providing circuit protection for devices such as alarm systems or emergency lighting. The extended E90 certification provides circuit protection for as much as 90 minutes,

which might be required for booster stations for the supply of extinguishing water, smoke and heat venting systems, as well as fire brigade lifts.

When selecting an enclosure to meet these levels of fire protection, it's important to check that testing and approval has been granted according to recognised standards such as DIN 4102 part 12, EN 60670, and IEC 62208. To achieve these levels, the enclosure will be constructed from thermoplastic, and will also need to be resilient to impact. As well as withstanding flame, in an emergency situation the risk of suffering physical force is high. This fire-protection specification is met by Spelsberg's WKE enclosures, which matched the requirements of Limbecker Platz.

Underground installation

It's not just buildings but below ground too where secure and reliable operation of fire protection systems is needed at all times. In September 2020, Berlin's 'Kanzlerbahn' underground train line U55, one of the capital's busiest routes connecting the city centre to the Brandenburg Gate, was connected to the new U5 line. The expansion project, which was 10 years in the making, had to ensure the highest level of safety to match the high train frequency and passenger volume.

To achieve this, Spelsberg's WKE cable junction boxes were specified. These enclosures also include integrated fuses that enable nonreactive cable branching so, in the event of a fault, the functional integrity in the main section is unaffected.

Discussing requirements

At the same time, to ensure safety and flexibility along miles of tunnel, the Spelsberg Rapidbox can also provide E90 fire protection for tap conductor connections rated to 400V. Rapidbox removes the need for electrical installers to cut the supply cable

when fitting cable taps and additional sockets, saving significant time compared to installing a new supply cable, while maintaining safety throughout.

It's useful to discuss enclosure requirements with a dedicated engineering team, especially for fire-safety. At Spelsberg UK, with an on-site engineering service including CNC customisation, we can advise accordingly.

Image captions:

Image 1: Spelsberg LIFELINE fire protection enclosures

About Spelsberg

Spelsberg is one of the largest manufacturers of electrical enclosures in the world. With over 4,000 enclosures available as standard and further customisation possible, it offers solutions for almost any application.

With the largest supply of non-metallic enclosures, ex-stock in the UK, its products are often available for delivery within 24 hours; customisation is possible on any product, including bespoke entries, engraved corporate logos or fitted terminals, within 48 hours. Products can be ordered direct from Spelsberg or from most leading supply specialists including RS, Rapid, Farnell and CPC.

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