

Gotthard Railway Tunnel relies on Spelsberg WKE fire-resistant junction boxes

It would be no exaggeration to call the Gotthard Railway Tunnel an engineering marvel. Stretching 57 km in length, at up to 2,450 m¹ deep through the Swiss Alps - it's both the longest and deepest tunnel in the world. This application environment presents a substantial challenge to those trying to ensure fire safety, especially when it comes to protecting vital electricals in the event of an emergency. That's why the junction boxes trusted to provide this protection are WKE fire-resistant enclosures from Spelsberg.

Anyone who has ever commuted through Europe can understand the importance of ensuring fire safety in tunnels. Fires underground are especially hard to tackle due to high levels of smoke and heat in an enclosed area, which can be exacerbated by airflow through the tunnel. With the Gotthard Railway Tunnel constituting two parallel tunnels connected by access points with a combined length of around 154 km, fire protection solutions have been specified by contractors to deliver the utmost performance in this most extreme of situations. Spelsberg's WKE junction boxes are no different.

Spelsberg has long been an established supplier of high-performance enclosures, with the company's products included in everything from battleships to prisons. The company has a strong track record in fire resistant solutions also, with the inherent features of the WKE an indicator of this application know-how. In all cases, the WKE is designed to offer protection to vital electrical systems that may power smoke extractors or emergency lighting inside the tunnel, maximising the escape window for passengers inside.

A halogen-free Duroplast fibre-reinforced thermosetting plastic chassis is matched to a variety (depending on customer specification) of pre-fitted ceramic terminal blocks. As a result, the WKE can be offered with either 30 (E30), 60 (E60) or 90 (E90) minutes of protection depending on the demands of the application. This rating is defined under the standards of DIN 4102-12, which signposts how long a fire-resistant enclosure and cabling can operate at temperatures of 1000°C. The WKE also attains the FE180 standard for insulation integrity under IEC 60331-11. Functional life is proven with a rating of F400 under the standard for smoke and heat control systems, EN12101-3. Materials in the WKE are designed to produce minimal smoke when burning, mitigating against the release of harmful chemicals. In a tunnel of this scale, proven exceptional performance is the minimum benchmark.

Additional to required fire-resistance, the WKE must be able to address the other environmental challenges of the Gotthard Railway Tunnel. While heaters and coolers are installed across the length of the tunnel, temperature fluctuations can present differing operating conditions for enclosures installed at different points along its length. Another concern is the effect that pressure and suction loads have upon hollow enclosures as a train passes by. Trains along the Gotthard Tunnel can pass at well over 160 km/h, with the air compression this causes placing stresses upon the enclosures. Furthermore, debris generated from brakes, rails and other environmental factors greatly increases the risk of corrosion.

The WKE provides an ingress rating up to IP66, which delivers an effective seal against debris or moisture, protecting the performance of the enclosure and its electricals within. Robustness is further guaranteed with an impact rating up to IK 10, suitable for the most demanding applications. A damaged enclosure will not work effectively, and this is especially true of a fire-resistant model. The inherent durability of the WKE ensures that if the worst does happen, the junction boxes will be ready to perform their utmost.

On average, nearly 10,000 people travel the Gotthard Railway Tunnel every day. Lessons learnt in tunnel fire safety have influenced every safety aspect of its design, from its connecting access tunnels to the WKE junction boxes that hold its electricals. Building an engineering wonder is one thing, but to ensure its fire safety is a different challenge all together. Every safety feature installed in the Gotthard Railway Tunnel has the potential to save hundreds of lives in an emergency. In this case, keeping the lights on can make all the difference.

¹ *Gotthard Base Tunnel, Wikipedia* https://en.wikipedia.org/wiki/Gotthard_Base_Tunnel 8.10.18

Photo Caption: It would be no exaggeration to call the Gotthard Railway Tunnel an engineering marvel. Lessons learnt in tunnel fire safety have influenced every safety aspect of its design. That's why the junction boxes trusted to provide this protection are WKE fire-resistant enclosures from Spelsberg

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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