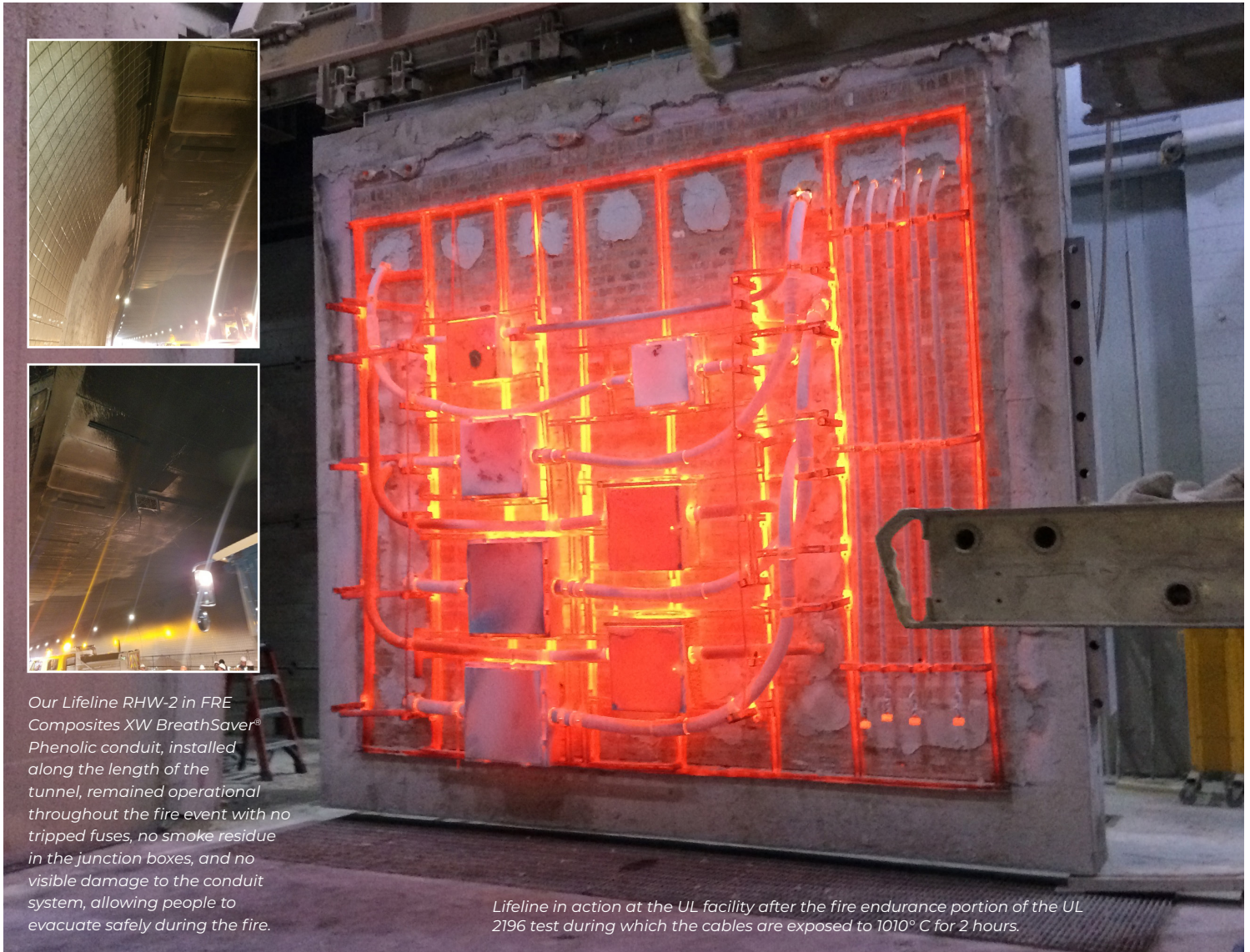


CASE STUDY:

Powering Emergency Systems During a Major Fire Event in Baltimore Area Tunnel



Our Lifeline RHW-2 in FRE Composites XW BreathSaver® Phenolic conduit, installed along the length of the tunnel, remained operational throughout the fire event with no tripped fuses, no smoke residue in the junction boxes, and no visible damage to the conduit system, allowing people to evacuate safely during the fire.

Lifeline in action at the UL facility after the fire endurance portion of the UL 2196 test during which the cables are exposed to 1010° C for 2 hours.

Lifeline® Fire Resistive Cables

Customer

Baltimore-area transit authority

Challenge

To implement powerful and reliable emergency lighting in a roadway tunnel, complying with NFPA 502 code requirements.

Solution

Lifeline® RHW-2, 600V, Two-Hour Fire Resistive Cables in FRE XW BreathSaver® Phenolic Conduit

Benefit

UL-2196 listed system that powered emergency systems during a major fire event, leading to no casualties.



Prysmian

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SPL-FPT-0021-0324

CASE STUDY:

Lifeline® Fire Resistive Cables

Powering Emergency Systems During a Major Fire Event in Baltimore Area Tunnel



Background

Safety is the utmost importance for any transportation authority, particularly when it comes to roadways in tunnels. The industry had a devastating realization in 1999 that changed its viewpoint on what safety measures needed to be implemented. In the spring of 1999, 39 people died in a European tunnel fire equipped with all the required safety standards of the time, including fire-rated emergency rooms every 70 yards. The investigation found that most people died from smoke inhalation and the inability to navigate to safety in the darkness, and not directly from the heat of the fire which reached 1800°F and continued burning for at least 50 hours. Engineers realized the importance of powerful and reliable emergency smoke pumps to keep the tunnel air as clear as possible and having emergency lighting that would remain operational in a fire event.

This incident led to the implementation of new standards. In the United States, the National Fire Protection Association (NFPA) created the NFPA 502, a standard for road tunnels, bridges and other limited-access highways. This standard emphasizes the need for improved safety systems in roadways following the lessons learned from the accident in 1999, standards that are still utilized by transportation authorities today.

Additionally, in September 2012, Underwriter Laboratories (UL) delisted all UL-2196 certifications after finding the testing parameters were not sufficient to ensure 2-hour circuit integrity to comply with NFPA 502. An improved and significantly more rigorous test was released by UL in 2017 and required all new products to re-test and re-list in order to comply with code regulations.

Challenges

A Baltimore-area transit authority was looking to improve the safety of its tunnel through an NFPA 502-compliant cabling system powering energy-efficient LED emergency lighting fixtures. It turned to Prysmian for a UL-2196 listed, 600V cable and conduit system solution with a two-hour fire rating. The Baltimore transit authority was looking to find a solution that implements the latest LED technology with powerful and reliable emergency lighting that would remain operational in a fire event.

Solution

The solution was the best life-safety system on the market, the UL-2196 listed LifeLine® RHW-2 two-hour fire-resistive cables installed in FRE XW BreathSaver® Phenolic conduit. The system was installed along the length of the tunnel and periodically spliced to provide power to the emergency lighting. Dvorak, LLC installed the system per the manufacturer's installation guidelines to ensure it followed NFPA 502 code standards and the UL 2196. The combination of the UL-2196 listed products and installation resulted in powerful and reliable emergency systems in the tunnel. Installed per approved methods, this emergency system was designed and certified to remain operational in a fire event for a minimum of two hours.

Benefits

The benefits of this system were proven when a vehicle combusted inside the tunnel in the summer of 2019. The vehicle was carrying highly flammable solvents, and flames spread 50 feet in all directions. The heat was so severe that the tiles along the tunnel wall began melting and falling off. The metal components in the ceiling also melted, including the light fixtures and lane signal system. All electrical systems in the direct exposure area were destroyed and rendered inoperable, except the UL-2196 listed Lifeline® and BreathSaver® emergency cable and conduit system.

All emergency circuits powering the LED light fixtures remained operational and no power was lost on the LifeLine® protected emergency circuits. The Lifeline® and BreathSaver® fire-resistive cable system protected equipment and remained operational throughout the event with no tripped fuses, no smoke residue in the junction boxes, and no visible damage to the conduit system. Prysmian's Lifeline® cables proved their reliability and worth in helping prevent what could have escalated into a dangerous and costly accident.

"The installation process was very smooth with few obstacles along the way, and overall, a great project experience," said T.J. Lippa, project manager at Dvorak, LLC. "Hearing that the system remained operational and did its job was a huge relief given the fire damage to other materials in the tunnel. Overall, working with the Prysmian was a good situation."