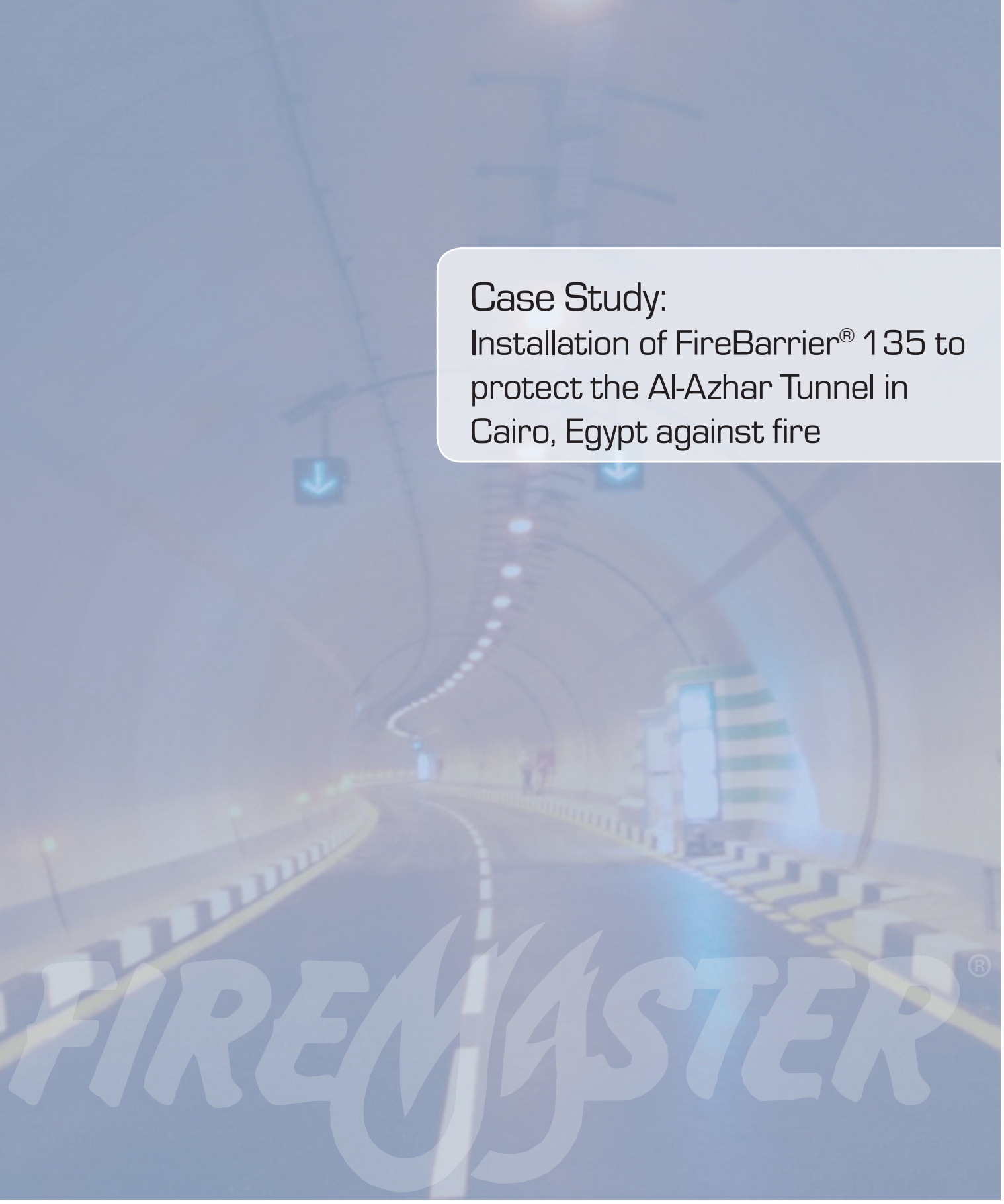

Case Study:
Installation of FireBarrier® 135 to protect the Al-Azhar Tunnel in Cairo, Egypt against fire

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The challenge

The rapid expansion of Cairo, which is now a city of 18 million inhabitants and one million vehicles, is putting pressure on the city's infrastructure, a substantial proportion of which is degrading.

The development of underground infrastructure is seen as the new frontier, and in particular, Egypt's National Authority for Tunnels expressed a desire to build an urban road tunnel beneath the centre of Cairo. This tunnel was intended to:

- **Reduce traffic congestion - and the associated pollution and noise - in central Cairo**
- **Protect Islamic Cairo from encroaching urban degradation**
- **Speed up cross-city access for cars and buses**
- **Permit the removal of 1970s flyovers, making the area more pedestrian-friendly.**

Vinci Construction Grands Projets (then Campenon Bernard SGE) put together a joint venture of constructors to design and build the twin-bore El Azhar road tunnel, 2.4 km long and completed in just 40 months.

While the El Azhar project presented a range of challenges, key amongst these was the need to ensure fire safety to exceptionally high standards.

Why FireBarrier 135 was chosen to protect the tunnel

In light of several contemporary European tunnel fires, the decision was taken to protect the El Azhar tunnel against the heat that would be generated by a 100 MW fire. This was achieved through the use of unusual escape systems, whereby users slide into a safe passage beneath each road deck, and the application of a protective fire coating.

This coating was Morgan's FireBarrier 135 which, having been compared to all of the competing products available, was judged to be the optimum product. In particular, it was found to have superior qualities in terms of fire resistance with minimal thickness, structural resistance, ability to withstand washing, ease of application and manufacturing rates and quality.

FireBarrier 135 provided superb protection from concrete spalling in case of fire, which if allowed to progress could cause the tunnel to collapse. The concrete used in the El Azhar project had a potential spalling temperature of just 200°C, making this property imperative.

A total of 57,000m² of FireBarrier 135 was installed

The result

A total of 57,000m² of FireBarrier 135 was installed on both bores of the El Azhar tunnel: application was by spraying over a mesh reinforcement.

Despite high summer temperatures, the installation of FireBarrier 135 was completed well ahead of schedule and with usage exactly in line with that estimated prior to installation.

Advantages conveyed by FireBarrier in this project included single layer application, virtually no wastage, an excellent surface finish that can be painted and withstands jet washing, superb fire performance in the application conditions and high strength - in this case, allowing the lighting system to be supported from the lining in the roof.

FireBarrier 135 provided a very high degree of fire protection with a lining thickness of just 47mm

Advantages FireBarrier in this project included single layer application, virtually no wastage, an excellent surface finish that can be painted and withstands jet washing

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We focus our resources on the delivery of products that help our customers to solve technically challenging Problems, enabling them to address global trends such as energy demand, advances in healthcare and environmental sustainability.

What differentiates us?

- Advanced material science and processing capabilities
- Extensive applications engineering experience
- A strong history of innovation and reinvention
- Consistent and reliable performance
- A truly global footprint
- We find and invest in the best people

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