

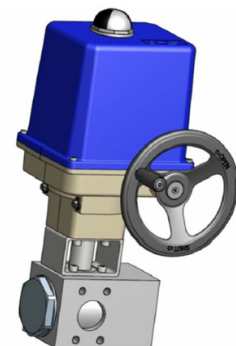
TUNNEL FIRE PROTECTION
THE SMARTER WAY OF FIRE FIGHTING

FOGTEC- A team of tunnel safety experts

FOGTEC is the worldwide leading company for fixed fire fighting systems (FFFS) in tunnels and underground facilities and offers a wide range of services for the clients:

- CONSULTING & RISK ANALYSIS
- DEVELOPMENT AND DESIGN OF FFFS
- FULL SCALE FIRE TESTS
- RAMS & LCC CALCULATIONS
- SIL CERTIFIED CONTROL SYSTEMS
- TRAINING OF FIRE BRIGADES AND OPERATORS
- INSTALLATION OF FFFS
- MAINTENANCE AND OPERATION
- INTEGRATION OF FFFS INTO THE OVERALL TUNNEL SAFETY CONCEPT

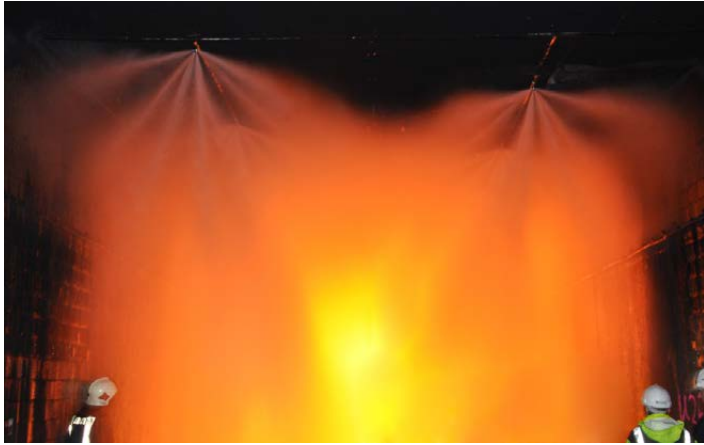
Low Life Cycle Costs: FOGTEC's patented section valves allow a regular remote testing without discharging water – ensuring a high system availability and low Life Cycle Costs.



Full scale fire tested technology

HIGH PRESSURE WATER MIST SYSTEMS

A significant reduction of smoke, an excellent blocking of radiant heat and a superior cooling of the tunnel structure are benefits of high pressure water mist systems. Multiple full scale fire tests have proven the efficiency for class A and class B fires.



- EFFECTIVE FIRE SUPPRESSION
- PREVENTION OF FIRE SPREAD
- RADIANT HEAT BLOCKING
- TUNNEL STRUCTURE COOLING
- BENEFICIAL FOR SHORT AND LONG TUNNELS

LOW PRESSURE WATER SPRAY SYSTEMS

FOGTEC has optimized low pressure water spray systems with lower energy requirements based on full scale fire tests. The system efficiently cools the surrounding and reduces the smoke when fighting class A and class B fires.



- EFFECTIVE FIRE SUPPRESSION
- PREVENTION OF FIRE SPREAD
- RADIANT HEAT BLOCKING
- LOWER ENERGY REQUIREMENTS
- BENEFICIAL FOR SHORT TUNNELS

DETECTION SYSTEMS

Highly reliable and accurate detection systems are a vital part of efficient fire fighting. FOGTEC detection systems localize fires precisely, are highly available with low maintenance costs and can be integrated into FOGTEC's fixed fire fighting systems.

Why Fixed Fire Fighting Systems in tunnels?



Lower costs and higher safety

- IMPROVED LEVEL OF LIFE SAFETY
- EASIER ACCESS FOR RESCUE SERVICES
- PROTECTION OF THE TUNNEL STRUCTURE
- HIGH AVAILABILITY OF THE INFRASTRUCTURE
- SAME SAFETY LEVEL AT LOWER INVESTMENT COSTS
- LOWER LIFE CYCLE COSTS
- TESTED WITH FULL SCALE FIRES
- REDUCTION OF INSURANCE COSTS

FFFS - Compensation potential

PASSIVE PROTECTION

Thanks to the superior cooling effect of FFFS the heat exposure to the tunnel structure is limited. Passive protection measures can be eliminated or minimized, whereby remarkable cost savings can be achieved.

VENTILATION

Due to significant smoke reduction and cooling of the fumes after activating the FFFS, the ventilation capacity can be greatly reduced. In some cases longitudinal ventilation can be used instead of semi-transversal or transversal ventilation systems.

OTHERS

A rapid activation of a FFFS minimizes damages throughout the tunnel leading to reduced closure times and a higher availability of the infrastructure. Distances between emergency exits may be extended due to improved life safety conditions.

Fire protection research

FULL SCALE FIRE TESTS

FOGTEC's FFFS have proven their efficiency for class A and class B fires and different ventilation strategies. More than 200 full scale tests with fire loads of over 200 MW have led to a unique research know-how.



The SOLIT² research project supported by the German Federal Ministry of Economics and Technology. Following the SOLIT¹ project, SOLIT² focused on compensation measures when installing FFFS into road tunnels. A large number of full scale fire tests were carried out. An increase in life safety, improved accessibility for fire fighters and a superior cooling of the tunnel structure was achieved whilst reducing ventilation capacity and passive fire protection measures.

The improvement of safety and fire protection in new and existing tunnels was the main target of the UPTUN research project supported by the European Union. FOGTEC's water mist system was tested for full scale class A and class B fires. The published UPTUN Engineering Guidance is widely used for the design of water based FFFS.

www.solit.info

THE SMARTER WAY OF FIRE FIGHTING

Reference projects- road and rail tunnels

DARTFORD CROSSING - M25 HIGHWAY, LONDON (UK)



FOGTEC was appointed to protect both tunnel bores of the Dartford Crossing with a state-of-the-art high pressure water mist system. The contract included the development, design, manufacturing, installation, maintenance and commissioning of the FFFS. Prior full scale fire tests have proven the outstanding cooling effect of water mist, especially relevant for the protection of the cast iron structure of the older tunnel bore.

First SIL2 approved fire fighting system in a tunnel.

To secure the high availability of one of England's most important and busiest transport link, the system has to fulfil SIL2 requirements. Redundant diesel driven pump stations, welded stainless steel piping and FOGTEC's patented remote service section valves are part of the sophisticated safety system.

EUROTUNNEL / CHANNEL TUNNEL (FRANCE / UK)

After two severe fires with extensive damage to the tunnel structure, Eurotunnel decided to improve its safety concept. Following successful tests with fire loads of over 200MW a FOGTEC water mist system was installed.

System availability of over 99,98%.

RAMS studies were carried out to ensure the design availability of the system of over 99,98%. The innovative safety solution ensured its return on investment in less than two years. The developed concept is an innovative safety measure for long rail tunnels.



NEW TYNE CROSSING, NEWCASTLE (UK)

A positive return on investment when installing a FOGTEC water mist system into the Tyne Tunnels was the outcome of a cost-benefit analysis. The installation into both tunnel bores was carried out in 14 weeks with only minor traffic interruptions. Thanks to the FFFS and other state-of-the-art safety measures the Tyne Tunnels were called as the safest in the UK.

„Safest tunnels in the UK after installation of a FOGTEC water mist system.“



M30 MOTORWAY, MADRID (SPAIN)

Full scale fire tests were successfully carried out jointly with Madrid's fire brigade before receiving the order to protect vital parts of the M30 highway in Madrid. Up to 22m wide tunnel areas are protected against severe HGV fires. In addition numerous technical rooms are protected with FOGTEC's high pressure water mist system.



VIRGOLO TUNNEL - BRENNER HIGHWAY (ITALY)

FOGTEC's first water mist system in a road tunnel was installed in 2006 into the longest tunnel on the Brenner highway. The system design is based on full scale fire tests and high quality materials. Diesel driven pump units operate the system independently from the electric power supply. Almost ten years after installation, the FFFS has shown positive lifecycle costs with low maintenance requirements.



GET IN TOUCH

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