



# Fire Protection for Tunnel & Infrastructure

Performance. Reliability. Responsibility.

**VID** FIREKILL®

# The challenge of tunnel fires

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Fires in tunnels are among the most dangerous to manage. These confined environments, often with high traffic density and limited escape routes, leaving zero tolerance for delays or mistakes. When a fire breaks out, time is critical – and so is the technology behind the response.

Today, risks are evolving. The rise of electric vehicles has introduced new fire scenarios, including battery thermal runaway. Tunnel infrastructure needs safer, faster, and more efficient firefighting solution against modern risks.



# Our solution: TUNPROTEC®

VID FIREKILL has developed **TUNPROTEC®**, a low-pressure water mist system tailored for tunnels and underground facilities. It's a clean and effective alternative that uses only potable water — no chemicals, no foam, and no PFAS. Unlike traditional deluge systems it operates in a whole volume of the cross section by creating a water mist cloud and utilizing even 4 times less water. The fine mist rapidly cools the area, suppresses flames, and controls smoke, even in EV fire scenarios. All of that with way much lower pressure requirements than in high pressure solutions.

Installation is smart and modular. The mist is distributed through 6-meter-long nozzle pipes with a repeatable mounting pattern, allowing quick installation and flexible configurations. All joints can be done with PN16 pressed fittings available widely on global market. Multiple valve options are available to suit project needs, including remote self-test functionality for automated maintenance.



# Tested for the risks of today and tomorrow

The **TUNPROTEC®** system is based on VID FIREKILL's proven low-pressure water mist technology – a solution that has been proven in some of the most demanding tunnel fire scenarios, including full-scale HGV fire testing with heat release rates up to 250 MW and pool fires, under 3-5 m/s ventilation speed.

Independent testing conducted by **DBI (Danish Institute of Fire and Security Technology)**<sup>1</sup> as a part of ELBAS research program demonstrated the technology's outstanding ability to reduce temperatures in the electric car surroundings and underneath on the battery modules. In these tests, a full-size EV (Tesla Model 3) was ignited to simulate a worst-case battery fire with thermal runaway. The water mist system was activated after 7.5 minutes.

## Despite late activation, the results were significant:

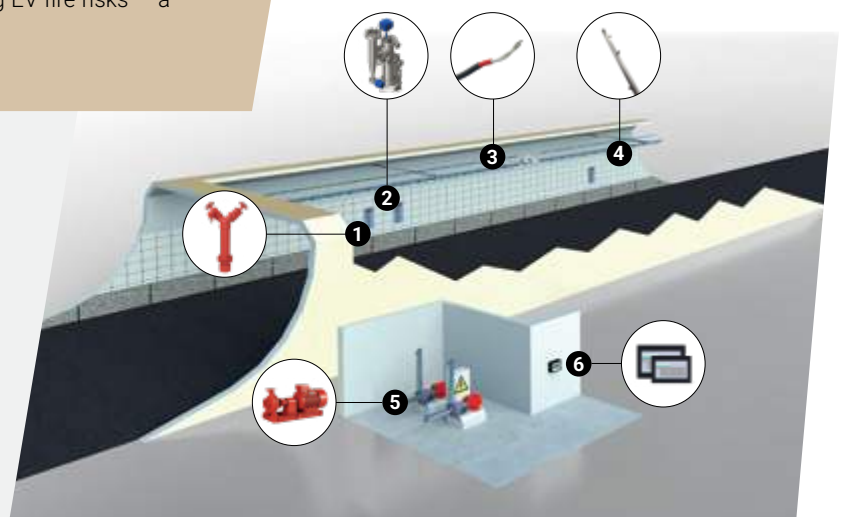
Battery temperatures dropped from 880 °C to 70 °C within 15 minutes.

30 minutes after activation, the battery cooled to just 30 °C.

Fire spread to adjacent vehicles was eliminated very quickly.

These results confirm the strong potential of VID FIREKILL's low-pressure water mist technology to address emerging EV fire risks – a key consideration for future tunnel safety.

- 1 Hydrant
- 2 Zone valve
- 3 Linear heat detection
- 4 Nozzle pipe
- 5 Electric or diesel Pump/s
- 6 Monitor - interface to peripheral system e.g. SCADA





# Compliant. Certified. Proven.

When lives, infrastructure, and critical assets are at stake, compliance isn't optional – it's essential. That's why **TUNPROTEC®** has been developed in full alignment with international tunnel safety standards and rigorously tested by accredited third-party institutions.

The system can be designed with full compliance with EN 14972-1, the European guideline for water mist protection, NFPA 750, NFPA 502 and PIARC guidelines for Fixed Fire Fighting Systems in tunnels. All components are produced in ISO-certified facilities (ISO 9001 and ISO 14001) and have been subjected to demanding reliability and endurance tests including, for example, FM Approvals component testing.

To validate its real-world performance, **TUNPROTEC®** has successfully passed full-scale fire tests simulating the most challenging tunnel fire scenarios, including:

Runehammar (RISE, Sweden): Liquid fuel and HGV fires with heat release rates up to 100 MW

San Pedro de Anes (Efectis, Spain): Extreme fire testing with scenarios up to 250 MW of HGV set up with plastic pallets as a part of fuel package.

These trials confirm the system's ability to suppress high-intensity fires – from solid and liquid fuel fires (Class A and B) to challenging EV battery fire scenarios.

**TUNPROTEC®**  
delivers not only performance,  
but full peace of mind.



# What you gain with TUNPROTEC®

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Choosing the right fire protection system for a tunnel is not just about extinguishing flames – it's about protecting lives, infrastructure, and long-term investment. **TUNPROTEC®** delivers exactly that, combining advanced performance with practical, measurable benefits for both operators and authorities.

Thanks to its **zonal activation logic**, the system reacts quickly – targeting the fire precisely where it occurs and keeping the rest of the tunnel operational. This minimizes disruption, supports safe evacuation, and helps infrastructure recover faster after an incident.

Its **low-pressure design** means smaller pump rooms, and dramatically reduced water usage – all of which translate into lower installation costs, less energy consumption, and simpler maintenance over time.

The system is also fully compatible with modern tunnel monitoring and control systems, including **SCADA integration**, enabling real-time diagnostics and smart activation or testing logic.



# Built for a cleaner future

In today's regulatory and environmental landscape, fire protection must do more than suppress fires — it must also protect the world around us. TUNPROTEC® is designed with this responsibility in mind.

The system uses **only potable water** and operates at **low pressure**, eliminating the need for chemical agents, foams, or PFAS — substances now under increasing restriction across the EU. With upcoming regulations banning the use of fluorinated firefighting systems, **TUNPROTEC®** offers a **future-proof solution** that's already compliant with the next generation of safety and environmental standards.

But sustainability isn't just about what the system avoids — it's also about what it optimizes.

Thanks to its low **water flow, the water tanks required are much smaller** than those used for traditional deluge systems — significantly reducing system footprint. This makes a major difference in retrofit applications, where space is limited and every square meter counts.

Smaller tanks also mean **less water discharged during activation**, which translates to smaller **sump or drainage tanks**, reduced water collection and treatment needs, and lower operational impact overall.

In short, by drastically reducing both **water and energy consumption**, **TUNPROTEC®** minimizes environmental impact across its entire lifecycle — from installation to operation and maintenance.

Whether you're operating a road tunnel, a rail system, or a critical urban corridor, **TUNPROTEC®** helps you protect more than infrastructure. It helps you protect people, budgets — and the planet.



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<sup>1</sup> Verified by independent full-scale testing at DBI (2024), demonstrating reduced thermal radiation, smoke and heat release in tunnel conditions, with no use of chemicals or PFAS-based agents.

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