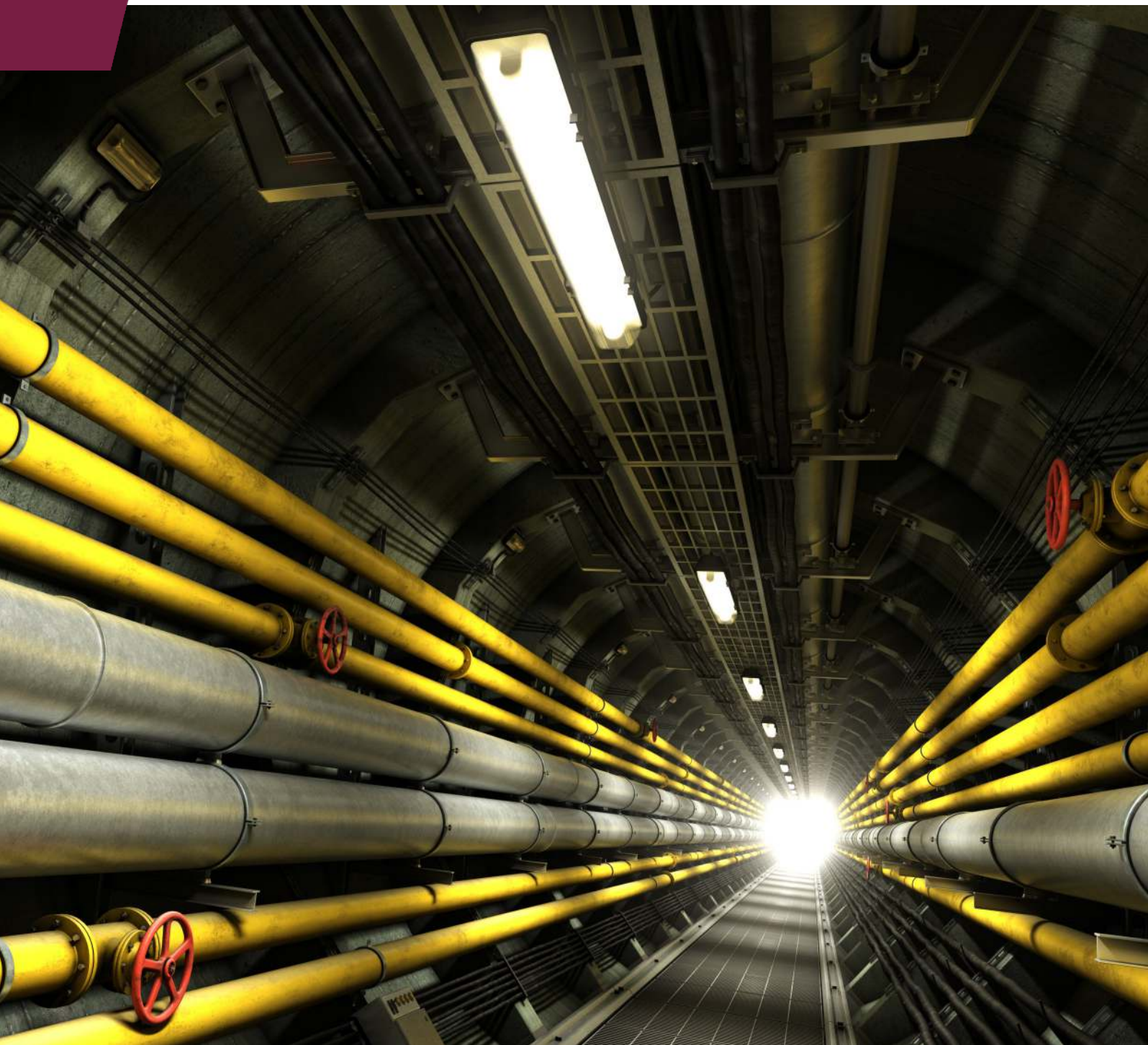




Cable Tunnel Low Pressure Watermist Fire Protection



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VID FIREKILL

VID FIREKILL located in Svendborg, Denmark, is a world leading innovative developer and manufacturer of water-based firefighting products, specializing in fixed water-based systems utilizing environmentally friendly firefighting methods.

We offer a large range of successfully tested and approved products matching our customer's individual requirements, and we always strive for the highest possible quality.

All our products are unique, offering either a better performance, a better approval, or a better solution than what is found on the market today.

With the advances in watermist fire protection technology and the continued addition of VID FIREKILL products, approvals, and covered applications, we form the spearhead of the fire protection industry.

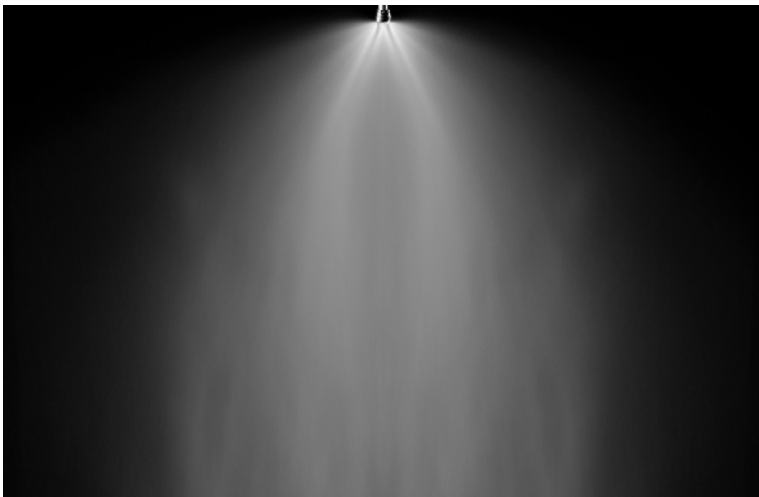


Fig. 1 K6 nozzle water spray

Low Pressure Watermist

Facts about low pressure watermist

- Low pressure watermist can be designed, installed and maintained with the same skillset as a conventional sprinkler system.
- Low pressure watermist systems (EN < 16 bar, NFPA <12.1 bar) use the same components as conventional sprinkler systems.

A green technology

- Low pressure watermist has a significantly lower water consumption than conventional sprinkler systems.
- Low pressure watermist has a lower power consumption than high pressure watermist.

Why protect your cable tunnel installations?

A cable tunnel fire, no matter how small, can cause extensive disruption and damage not only to the building structures, but also to critical community interests such as power and communication cables, and lead to subsequent substantial loss.

By installing a Low Pressure Watermist system, the outbreak of fire can be suppressed, controlled, and in most cases, extinguished before property or equipment is damaged.



Fig. 2 Cable tunnel fire test

The **FIREKILL™** system efficiently:

- Lowers ambient temperatures
- Prevents structural collapse inside concrete structures
- Ensures quick re-opening of highly important infrastructure networks
- Enables quick intervention of fire services

Benefits of installing a Low Pressure Watermist firefighting system

It is well known that a Fixed Fire Fighting System can significantly improve protection or safety by either extinguishing the fire or reducing the fire heat release rate (HRR) in a cable tunnel fire. Additional benefits are:

- Increased level of safety
- Protection of the tunnel structure
- Protection of highly critical infrastructure
- Low life cycle costs
- Quicker and easier access for fire brigade
- Quick re-opening after a fire

Compensation effects

It is lesser known that low pressure watermist can significantly reduce the need of other safety measures such as:

- Avoid or decrease passive fire protection
- Reduce insurance costs

Technical comparison

Technical comparison with other water-based technologies			
	Sprinkler/Deluge	High Pressure Watermist	Low Pressure Watermist
Water consumption	Require 2 - 5 times more water than High and Low Pressure Watermist	Corresponding to Low Pressure Watermist	Corresponding to High Pressure Watermist
Water pressure at nozzles and pumps	Nozzles: 1.1 – 2.5 bar Pump: 6 – 8 bar	Nozzles: 35 - 80 bar Pump: 60 – 140 bar	Nozzles: 8 - 10 bar Pump: 12 - 15 bar
Power/pumps	Equal or more power (kwh) required compared to Low Pressure Watermist	High capacity and complex pumps, typically require twice the power (kwh) compared to Low Pressure Watermist	Lower power (kwh) requirements than Sprinkler/Deluge and High Pressure Watermist
Piping	Typically twice as heavy, and larger dimensioned pipes compared to High and Low Pressure Watermist	Smaller pipe dimensions compared to Sprinkler/Deluge	Thin-walled lightweight and smaller pipe dimensions compared to Sprinkler/Deluge
Cost material/installation	Corresponding to Low Pressure Watermist	Higher compared to Sprinkler/Deluge and Low Pressure Watermist	Typically 20-40% lower compared to High Pressure Watermist
Maintenance/service	Larger nozzle orifices and more robust components reduce maintenance compared to High Pressure Watermist. However, corrosion problems over time must be expected	Smaller nozzle orifices and more complex valves, require more often maintenance and service compared with Sprinkler/Deluge and Low Pressure Watermist Systems	Larger nozzle orifices and more simple and robust valves require less maintenance compared to e.g. High Pressure Watermist

Fig. 3 Comparison table

The FIREKILL™ cable tunnel solution

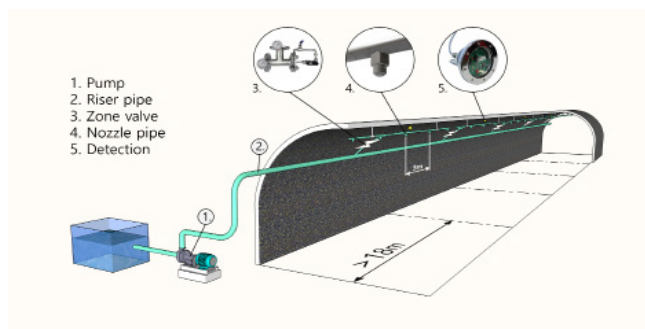


Fig. 4A Dry pipe system, Deluge

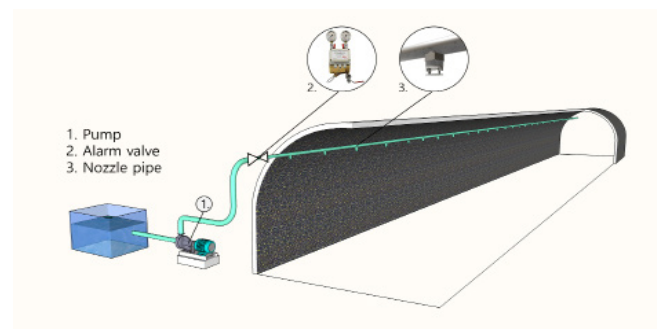


Fig. 4B Wet pipe system - automatic nozzles

The FIREKILL™ cable tunnel solution works as a zoned deluge system (total flooding) where the entire tunnel is divided into fire zones or with automatic nozzles. The length of one deluge zone should be min. 18 meter. Systems using automatic nozzles should be designed with a minimum of 6 nozzles / 18-meter length. Deluge systems should be designed with 2 – 3 active fire zones, or according to AHJ, either control, suppress, or extinguish a cable tunnel fire. In each deluge fire zone, a zone control valve and fire detection must be installed. For wet pipe systems, a minimum of one wet pipe alarm valve should be installed. The system is tested with forced ventilation of 4.1 m/l.

The FIREKILL™ cable tunnel solution - overview

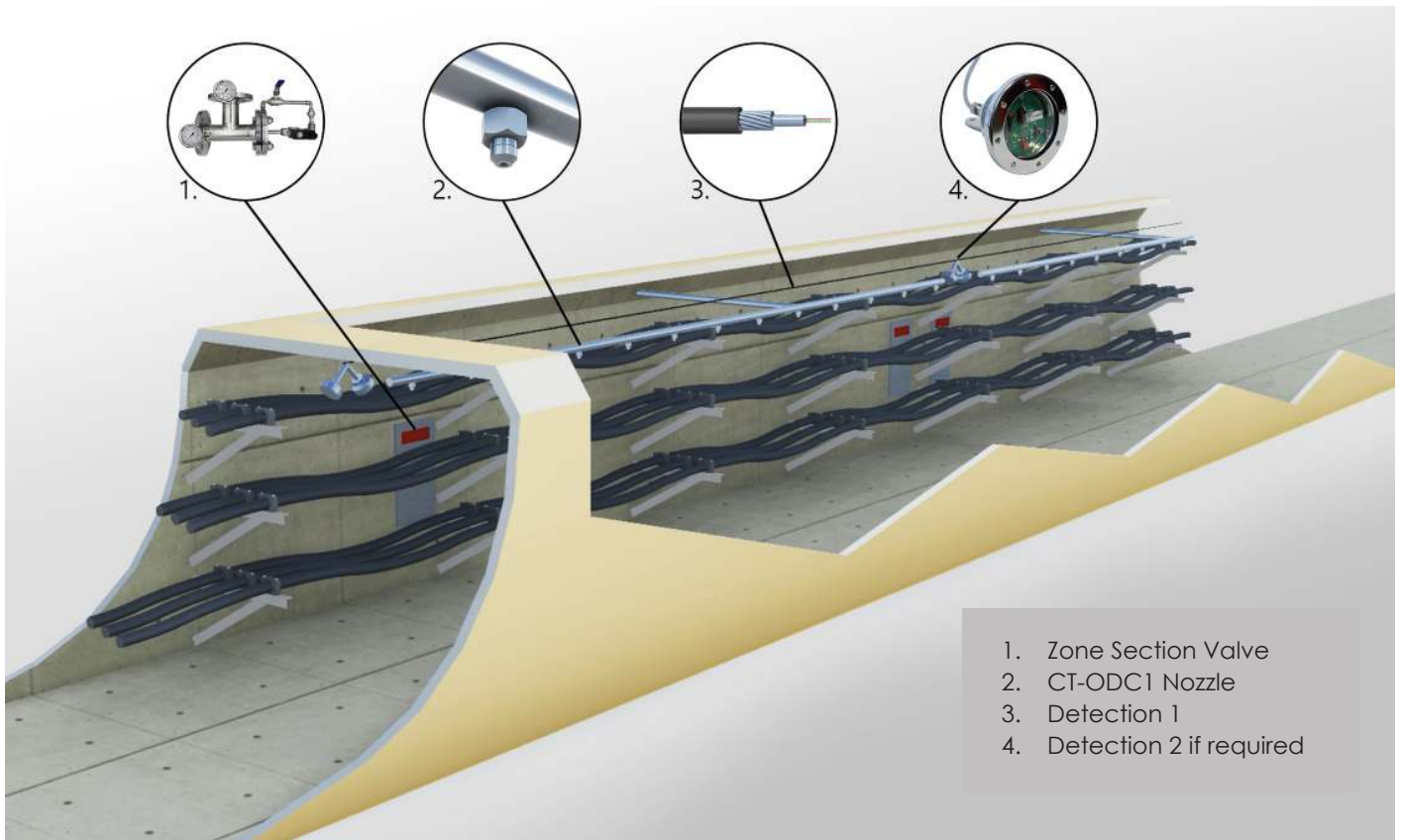


Fig. 5 Principal cable tunnel lay-out

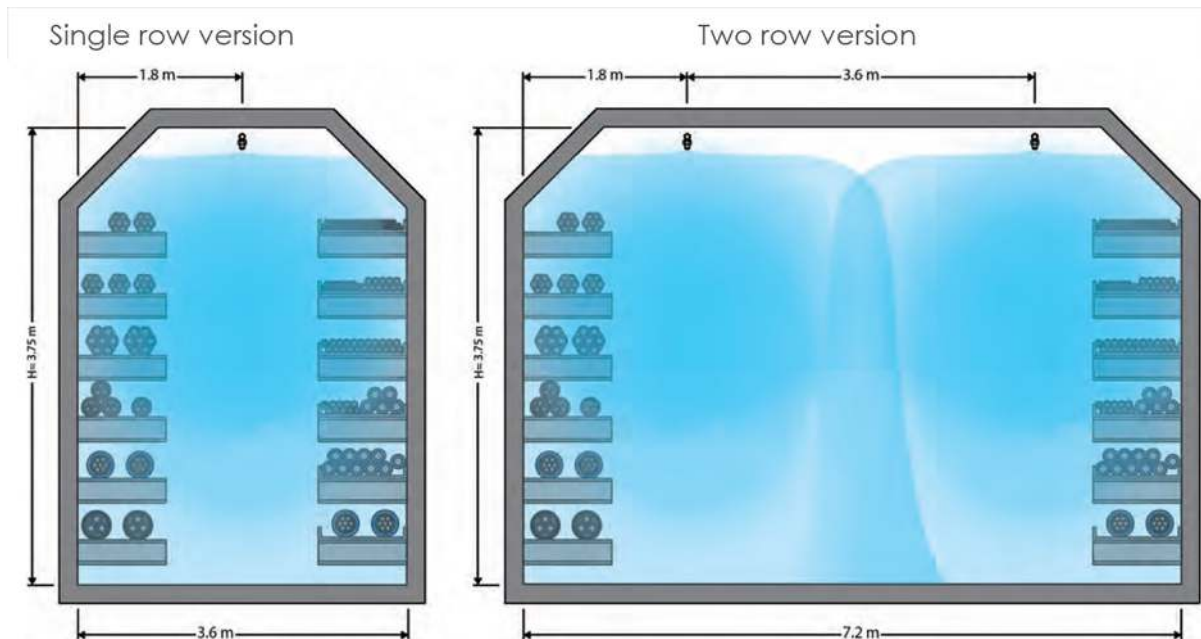


Fig. 6 Cable tunnel cross-section

Fig. 7 Cable tunnel cross-section

For cable tunnels wider than the above shown double row version 7.20 m, additional nozzle rows could be added, in principle allowing to protect any cable tunnel width.

Tests and approvals

- The nozzles have been fire tested according to prEN 14972, part 11
- Third party witness test by DnVGL
- Upon request SIL2 approval
- Di-electric test EN 3 - 7



Components VID FIREKILL cable tunnel solution



The OH-DC1 nozzle with nozzle guard, working water pressure: 8 bar – 16 bar, K-factor: 13.4 (l/min./1bar) Materials: Brass + NiSn / AISI 316L.



The CT-ODC1 nozzle, working water pressure: 8 bar – 16 bar, K-factor: 13.4 (l/min./1bar) Materials: Brass + NiSn / AISI 316L.



The N-pipe is a thin-walled stainless steel pipe which comes in different dimensions prepared for direct installation of CT-ODC1 nozzles into the pipes in prefabricated installation threads.



An electrically operated control valve designed primarily to operate deluge systems. Robust, reliable, and easy to maintain as the valve can easily be disassembled from the system and is capable of functioning in highly corrosive environments as all exposed parts are in AISI 316L stainless steel.



Model F filters are high-capacity filters designed for watermist systems where the need of robust and reliable filtration is needed to ensure the full functionality of the system. The Model F filter's uniqueness is the extra-large capacity, as well as being 100% corrosion resistant.



Robust and reliable flame detector able to detect the light radiated specifically from carbon oxidation. The Model Deflametec has been found to be highly applicable in a multitude of applications and locations.



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