



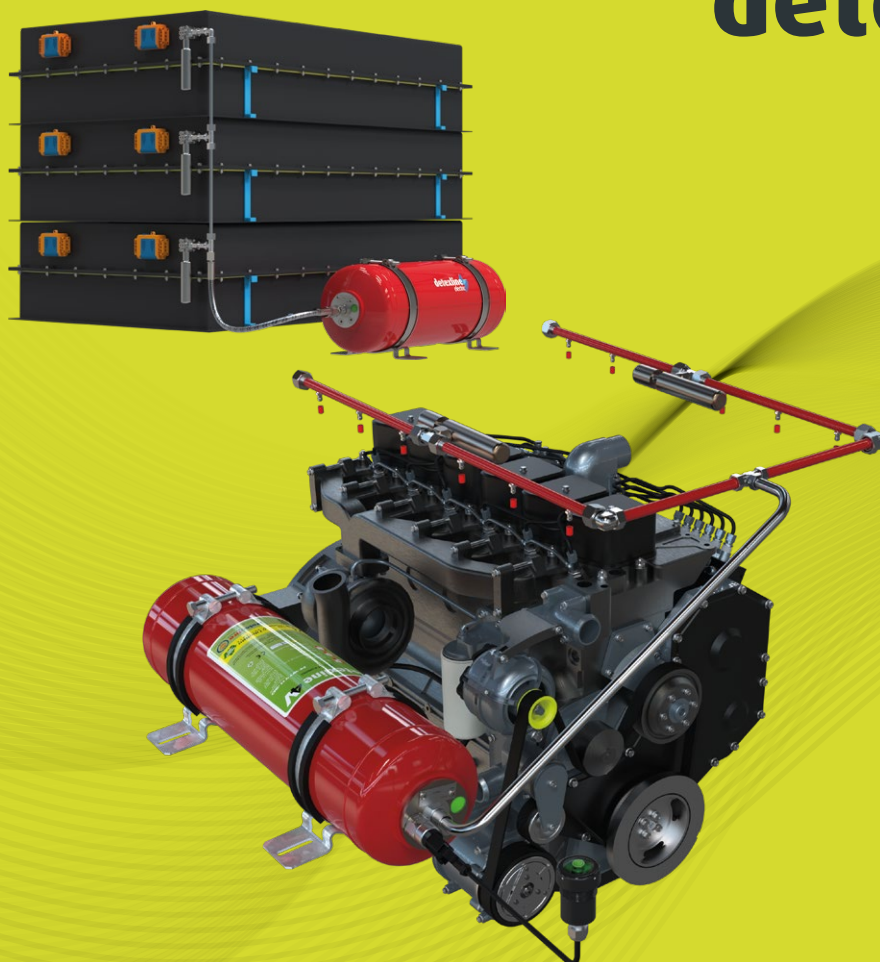
Buses / Trucks / On-Road vehicles / Railway

Revolutionary Fire Suppression Systems



Made in Germany

detexline 4V



- Almost No Maintenance
- No Pressure Required
- No Electricity Needed
- Robust Design
- Ultra-Fast Detection
- Ultra-Fast Extinguishing
- Long-Term Savings

**Hydrogen
Electric
Diesel**



UNECE
R107 approved system

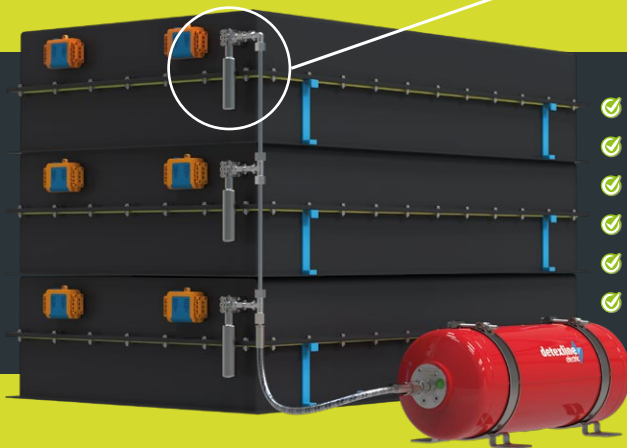




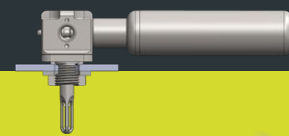
Smart Fire Suppression for Batteries

Innovative Protection for Multiple Battery Packs

SPY.P



- ✓ Quick battery connection
- ✓ Detection, extinguishing, and directional valve - All in one unit!
- ✓ Thermo-pneumatic activation
- ✓ Directional valve system - extinguishes only where the fire is
- ✓ No electricity required
- ✓ Virtually maintenance-free



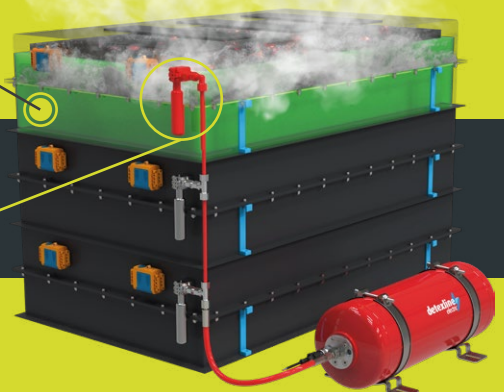
TiboRex
ABSOLUTE

Temperature
Detection



Battery
Flooding

rapid cooling



SPY.P

spy-p is the new form of individual protection for Lithium batteries.

This innovative system combines detection, suppression, and a **directional valve**. This makes it possible to identify exactly where the fire is located and direct the extinguishing agent exclusively to the affected cell.

When activated, it targets only the compromised battery cell, leaving other batteries and surrounding systems unaffected. By flooding the affected cells, it provides cooling and prevents the fire from spreading to adjacent batteries.

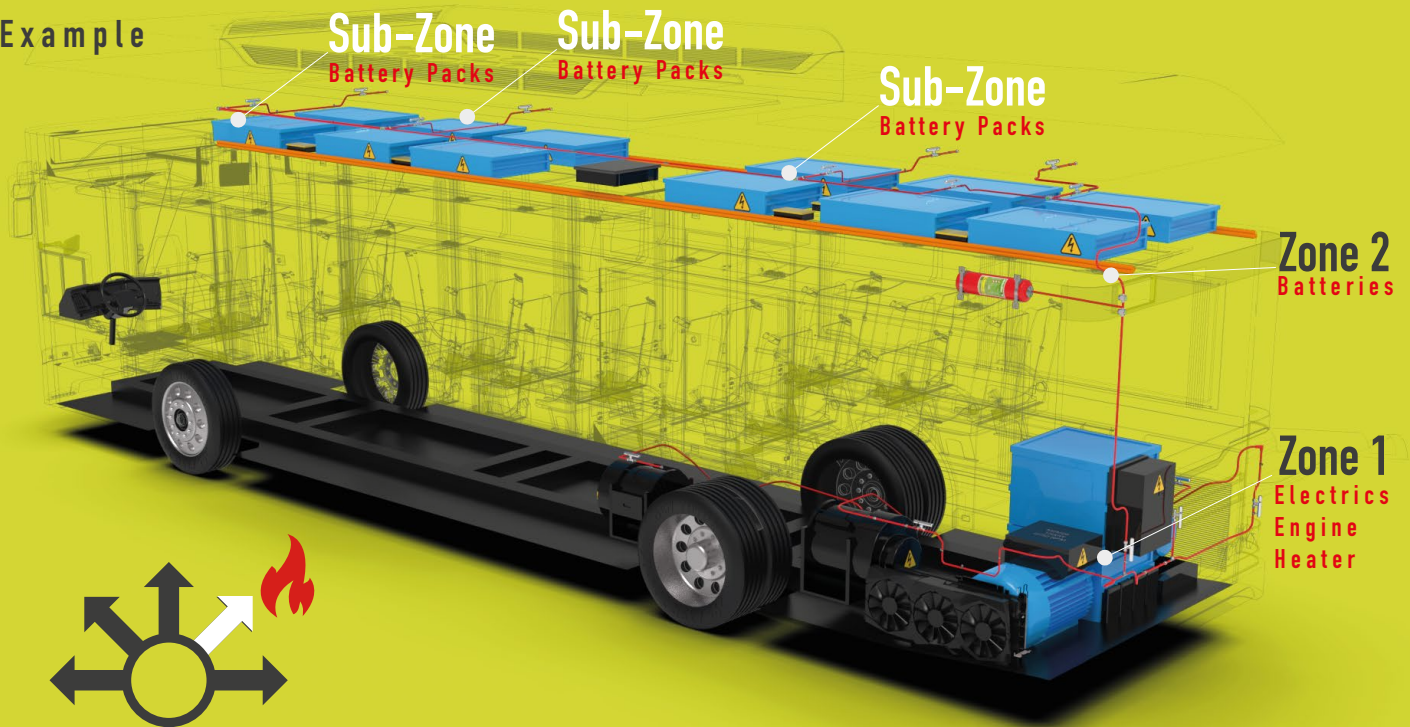
The system is designed to create the necessary time window for a fire brigade to intervene safely after activation, protecting surrounding equipment and reducing risks during firefighting operations.





Fully Pneumatic - Self Contained

Example



Directional Valves for Electric and Hydrogen Buses

- ✓ Smaller extinguishing agent container
- ✓ Independent detection
- ✓ Independent extinguishing
- ✓ Fully mechanical - No electricity
- ✓ Multiple zones and sub-Zones



Independent detection and extinguishing zones connected to the same extinguishing container

By enabling independent activation of each suppression circuit, the directional valve significantly reduces system complexity while enhancing safety, reducing agent consumption, and optimizing response time. This not only minimizes potential downtime but also ensures that only affected areas are targeted, preserving the integrity of unaffected components.



1 Line System (detection and extinguishing)
Single pipeline for detection and extinguishing.



No Pressure
The extinguishing agent container is made of stainless steel and is pressure-free in the operating state. The tubing is also pressureless.



No Electricity
No electricity needed in the system.



10 Years - No Parts Change
Long savings - durable and resistant parts.



Ultra-fast Detection
Response speed: Ultra Fast Response.
False alarm proof. Based on "temperature" parameter for pneumatic activation.



Operation Temperature Range: -30°C to 80°C
Prepared for extreme climates, whether in the desert or in the mountains.



Capable of Working in Extreme Conditions
Shock and vibration resistant.



Stainless Steel
Precision manufacturing - highly durable stainless steel.



Very Low Maintenance
The absence of pressure, combined with the system's simplicity, means maintenance is almost exclusively visual.



Fully Mechanical / Pneumatic
The entire system is self-contained. It does not require manual operations and does not depend on external controls, such as control panels or electrical detectors.

Possibility of multiple temperature ranges in a single system.
57 °C | 68 °C | 79 °C | 93 °C | 110 °C | 141 °C | 182 °C | 230 °C | 260 °C

Operates in highly ventilated places and in open spaces



Can be installed in Any Position/Angle

TiboRex
ABSOLUTE

Extinguishing Agent
Liquid - TiboRex Absolute



Fluorine Free



Long-Term Savings

Factors that make Detexline the most economical system:

No Replacements
10 Years

Almost Maintenance-Free for 10 years:

No need for the usual annual maintenance as it is not pressurized!

No False Alarms:

Patented, accurate and reliable detection system.

Make Your Own Maintenance:

Your own staff - no need for external companies.

How it Works

The detexline system operates with an unpressurized container and piping network, ensuring maximum safety during standby.

Activation occurs through SPY thermal detectors, which respond to excessive heat. When triggered, the detectors release the pressure in the pilot line and cylinder control valve, initiating the discharge of the extinguishing agent.

Tiborex Absolute is then deployed through fine spray nozzles, creating an immediate cooling effect and extinguishing the fire within seconds.

The system can also be manually activated remotely, and optional alarm and test buttons can be integrated for added functionality and system monitoring.

Name	detexline® 4v
Temperature Range	-50°C / -30°C to 80°C
Detection Technology	Rise of Pressure
Detection and Extinguishing Line	1 single piping network
System Pressure	No pressure
Detection Technology	SPY detection element - Stainless steel
Trigger Temperature	Glass ampoule, 9 independent temperatures
Life of Detectors	10 years
Nozzle Type	Fine spray nozzle
Extinguishing Agent	Tiborex Absolute
Extinguishing Agent Volume	4, 7 14, 24L
Extinguishing Technology	Fine spray technology
Extinguishing Container (pressure)	Pressureless (sealed cartridge inside)
Product Material	Stainless steel
Alarm Signal Switch	Yes
Maintenance Inspection	Annually
Parts Replacement Duration	10 years

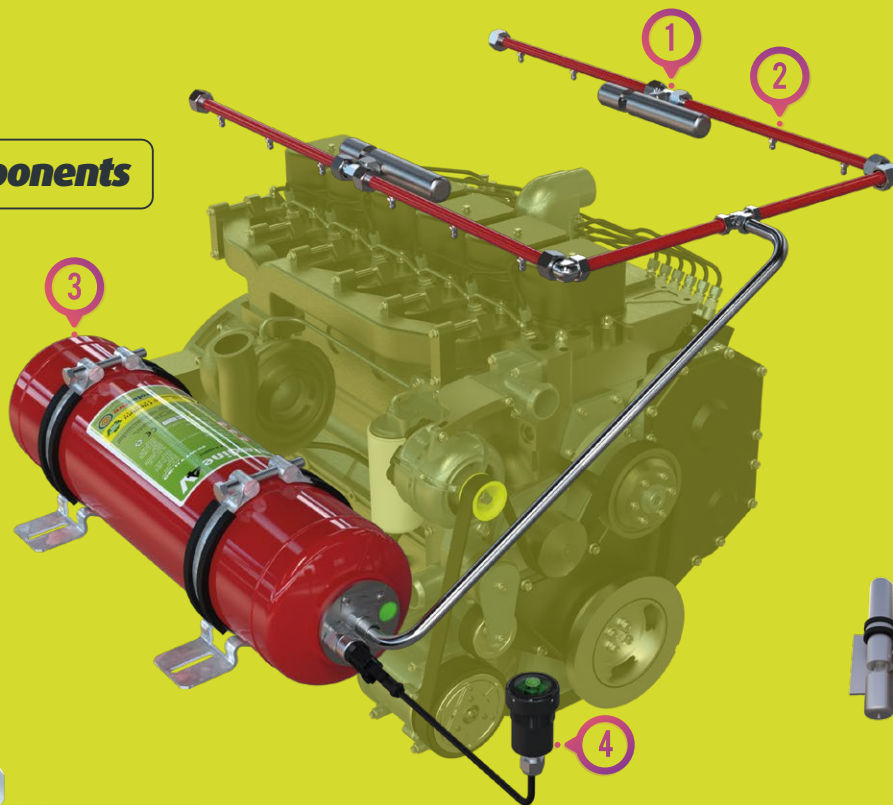
Certifications for protectfire various systems:





System components

Watch the video



detex 360° version



1 SPY thermo-pneumatic detector

- Unique patented detector
- No electricity required
- High-finish stainless steel
- Response speed: Ultra Fast Response RTI 12
- Available detection temperatures:
- -57°C -68°C -79°C -93°C -110°C -141°C -182°C -230°C 260°C



2 Fine-Spray Nozzles

- Unique patented nozzle solution
- Quick and easy to install - Reduces installation time by ~70%.
- Very small - Virtually fits anywhere
- Stainless steel
- Fine spray technology
- Up to 75° spray pattern
- High quality nozzle caps



3 Extinguishing Agent Tank

- Patented - Unique Pneumatic Release System
- Can be placed in any position!
- Stainless steel with electrostatic paint finish Ral3000
- Patented - Stainless steel actuation system
- Liquid Agent: Tiborex Absolute - exclusive protectfire agent
- Effective against liquid, solid and grease fires.

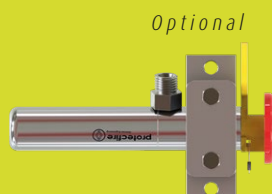


4 Optical and Acoustic Alarm

- Compact control panel
- Acoustic signal
- Test button
- Led light

Pneumatic Manual Actuator

- Unique patented pneumatic activation system
- Stainless steel
- Safety locking system
- Argon gas activation



WET CHEMICAL AGENT
ACCORDING TO
NFPA 17-A

TiboRex
ABSOLUTE





Extinguishing Agents Comparison

	TiboRex Absolute	Water	Foam	Powder	Gas
Fast Temperature Reduction	+	-	-	-	-
Surface Blanketing	+	-	+	-	-
Quenching Effect	+	-	+	-	+
Fine-Spray Technology	+	+	-	-	-
Fluorine Free	+	+	-	-	+
Temperature Range -50°C to +80°C	+	-	-	+	-
Danger to Persons	+	+	-	-	-

Ultrafast extinguishing

Only small amounts of extinguishing agent required. Tiborex rapidly delivers a huge cooling power. The object to be protected remains almost undamaged.

Ultrafast cooling

Enormous reduction of surface temperature. Avoidance of re-ignition. Reduced effect of fire. Quick interruption of combustion process.

The Cooling Effect

The impressive cooling effect of Tiborex Absolute is predominantly hinged on two fundamental physical attributes:

Quenching effect

Rapid removal of thermal energy therefore removing heat, hence no combustion or fire in hidden cavities.

Blanketing fat and oil fires

When mineral, animal or vegetable fats and oils burn, Tiborex Absolute uses chemical reactions to form a closed, gas-proof protective layer quenching the fire and protecting the hot fat or oil from re-ignition by cooling them down very quickly.

Residue monitoring and guaranteed quality

Residues of the extinguishing agent on the object can be identified with the help of ultraviolet light. A chemical analysis (DNA) can verify and confirm that the original Tiborex Absolute was used.

Environmental friendliness

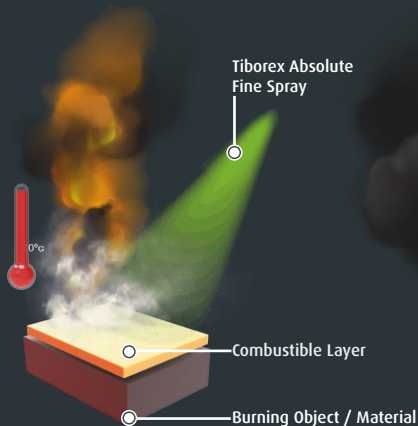
Ecological and 100% fluorine-free extinguishing agent. Biodegradable. Non toxic to humans and animals.

Water Evaporation-Driven Cooling: Tiborex Absolute employs specially developed fine-spray nozzles that release the extinguishing agent in droplets smaller than 100µm. This design ensures ultra-rapid evaporation of the liquid component within the extinguishing agent. By utilizing the necessary enthalpy of evaporation, which stands at 2.26 MJ/kg (equivalent to the energy required to evaporate 1 liter of water), energy is swiftly extracted from the burning object. This process results in a significant and prompt reduction in temperature.

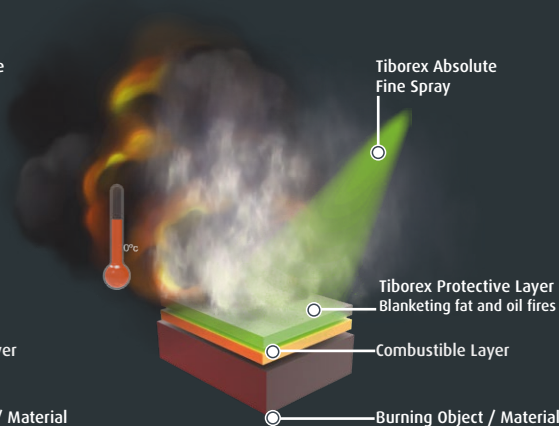
Sublimation-Induced Cooling: As the aqueous phase evaporates, certain key constituents within Tiborex Absolute form crystalline structures. Operating within the existing combustion temperature, these solid structures transition from the crystalline phase to a gaseous state. This phase transition necessitates a substantial enthalpy of evaporation, equivalent to 7.23 MJ/kg of heat.

3 stages fire suppression

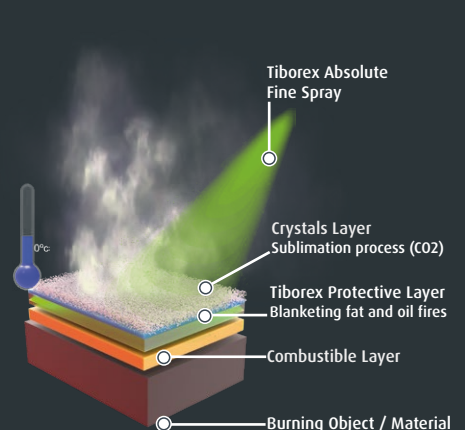
1 Cooling Effect Fine Spray Droplets that penetrate fire



2 Oxygen Suffocation by evaporation



3 Ultra Cooling through Sublimation Layering with solid crystals that convert to gas





detexline 4V

Automatic fire suppression systems for: Buses | Trucks | On-road vehicles | Railway

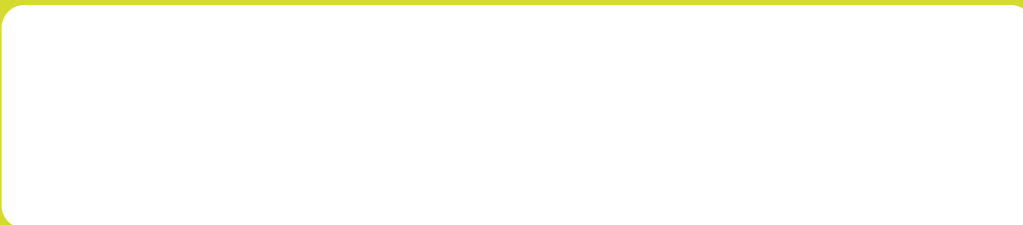


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