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vehicle fire protection

Vehicle fire protection solutions for high risk industries.

MINING |
CONSTRUCTION |
PUBLIC TRANSPORT |
PORT HANDLING |
WASTE & RECYCLING |
FORESTRY |
BATTERY STORAGE

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Vehicle fire protection solutions for high risk industries.

With over 100 years' experience, Dafo Vehicle is at the forefront of heavy vehicle fire protection technology. It was one of the first companies in the world to develop integrated firefighting solutions for vehicles.

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Why Dafo Vehicle?

Dafo Vehicle is the world-leader in vehicle fire suppression solutions.

Applying over 100 years' experience, Dafo Vehicle drives for continuous improvement, research and development to deliver cutting-edge vehicle fire protection solutions to its customers. Its systems are used globally for both integrated solutions for OEM production lines and retrofit solutions for end users.

Dedication to quality, environment and cost

- Optimising fire protection solutions for individual vehicles, ensuring they are effective in mitigating industry risks and meeting user requirements.
- Focused on sustainability, measuring and mitigating the impact of your solution throughout its product lifecycle.
- Reducing the total cost of ownership for your system by continually improving component durability, decreasing material consumption and manufacturing costs.

Total Risk Management

- Working closely with you to seamlessly deliver and implement your fire protection solution.
- A full fire risk analysis before any installation identifies potential fire hazards, ensuring your solution best addresses your vehicle's unique risks.
- Taking full responsibility for your fire risk management, including: system design and documentation, prototype and pre-series installation, delivery, service and maintenance.

At the forefront of technology innovation

- Continuously participating in various research projects and industry initiatives to improve vehicle safety further.
- Ongoing research and innovation inhouse across electrical, mechanical and software development to deliver products that meet evolving market demands.
- Working closely with OEM customers to integrate our systems into their communication processes, enabling full fleet management participation.

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Overview of Vehicle Fire Protection Solutions & Technologies

As a result of its drive for ongoing research and development, today, Dafo Vehicle has a complete range of automotive-grade fire protection technology. Dafo Vehicle adapts its suppression solutions based on this technology to meet specific customer needs, risks and applications effectively.

Dafo Vehicle Fire Protection specialises in fire detection and suppression solutions for:

Public transport -
With a specific focus on buses and coaches.

Heavy duty mobile equipment (HDME) -
Including working machines and equipment in agriculture, construction, container handling, forestry, truck/haulage, materials handling, mining operations and waste handling.

Energy storage - Including li-ion battery storage facilities and charging stations and hydrogen storage sites.

Industrial applications - Heavy industry applications, such as li-ion battery manufacturing, warehouses and testing facilities, petrochemical industry and metal works.

Integrated detection and control -
Automotive grade detection and control components integrated into various OEM products and solutions, such as electric, gas and hydrogen vehicles and transport.

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System operation

The basis of a Dafo Vehicle system is the suppression agent, Forrex. Forrex is designed as the leading technology for robust and easy-to-maintain vehicle fire detection and suppression. It is specifically developed to suppress fires in combustion engines, and it is highly effective on flammable liquid fires, such as petrol, diesel and hydraulic oils.

Forrex combines features of liquid and dry chemicals, including unique solutions to offer effective flame suppression and protection against re-ignition, as it acts to cool down the overheated components quickly in the event of a fire.

Suppression - Dafo Vehicle's systems are based on non-pressurised cylinder technology, minimising the risk of injury, as well as any potential leakages. Propulsion is provided through either a nitrogen cartridge (SV-K), or through maintenance-free 'airbag' technology (Vulcan).

The systems are easy to maintain and refill on site, reducing downtime and operational costs. In case of discharge, the agent is easily cleaned with water. It is non-corrosive and biodegradable, making the system's environmental footprint minimal after discharge.

Detection - Dafo Vehicle detection technology allows for robust detection of fire and fire risk in vehicles using linear heat detection. This is supported with solutions to detect gas, including smoke, carbon monoxide, natural gas and hydrogen. The detection systems are developed and implemented in line with stringent automotive standards regarding vibration to ensure they remain effective in all scenarios.

Technology

Using technology insights, Dafo Vehicle creates and delivers integrated and effective fire suppression solutions, which are tailormade to meet requirements across different industries and applications.

Every effective fire suppression solution starts with a thorough fire risk assessment, which is then used to inform the system's design, development and implementation, including any training support services required for end users and service partners.

Early warning detection system solution

With growing reliance on battery power and storage, Dafo Vehicle has developed an early warning detection fire protection solution, which specifically addresses the risks associated with li-ion batteries.

The system is designed to detect potential battery failure, at the earliest possible stage, and take immediate action to cool the battery components, using the suppression agent Forrex EVTM. This will stop or delay a potentially hazardous situation, preventing a fire from developing further.

The early warning detection system solution can be applied either outside the battery pack or as an integrated part of the pack, depending on the level of protection required.


ELECTRIC
VEHICLE
BATTERY

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Buses & Coaches

On a traditional combustion engine-powered bus, most fires start in the engine compartment or surrounding areas. Typically, these are the result of a failure in the electrical system.

Electrification

The global transition to renewable fuels is rapidly increasing the demand for electric (EV) and hybrid electric (HEV) buses and coaches. Currently, almost 50% of buses manufactured globally are electric, and this is only set to increase in the coming years. This reliance on li-ion power brings about fire safety risks, which are not widely understood within the industry.

Should a li-ion battery malfunction, the consequences can be severe, potentially resulting in thermal runaway, with rapid fire and heat propagation, alongside the emission of highly toxic gases. For buses and coaches, this poses significant risks to the vehicle driver, passengers and the environment where the bus is operating.

Safety First

A tested and certified vehicle fire suppression system, combined with reliable detection, is the best first-line of defence against fire risk. Dafo Vehicle's suppression system for buses and coaches is thoroughly tested using international vehicle standards to ensure the highest performance. The system also passes several function/durability tests in areas such as electromagnetic compatibility (EMC), vibration, corrosion, and high/low functioning temperatures.

Regulations

Passenger safety concerns have driven tighter regulations, meaning fire suppression and detection technology is required for many forms of public transport. Dafo Vehicle's fire suppression system for buses and coaches is approved against the UNECE Regulation No. 107, and is also P-marked in accordance with SPCR 183.

A Tailored Solution

Leading global bus manufacturers have selected Dafo Vehicle's bus fire suppression solution as standard fit. The system is tailored to suit different bus models, ensuring it seamlessly integrates into the bus manufacturing process.

A low total cost of ownership (TCO) is important for every bus operator, so the system is designed to:

- Be easy to install and maintain and be robust and reliable
- Contribute to minimal downtime and improved profitability for the operator.

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Heavy-Duty Mobile Equipment (HDME)

- Many of the world's good and services are transported through ports, handled by heavy-duty machines several times during the journey to their destinations.
- Mines all over the world have heavy-duty vehicles extracting and transporting ore.
- Forestry and waste vehicles are operating in conditions where a potential fire could be damaging to the environment and spread beyond control.

All of these machines are in operation 24/7, under challenging and demanding conditions in sensitive environments. They also often carry flammable liquids in close proximity to hot areas, such as engines and transmissions, creating numerous fire risks.

A well designed and reliable fire suppression system helps to mitigate risks for operational downtime, spread of fire and destruction of valuable assets.

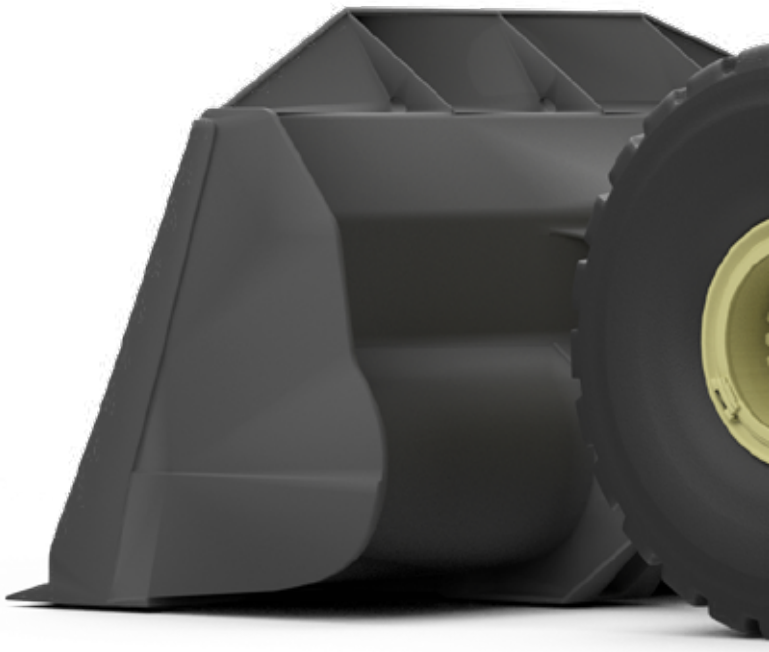
Electrification

Demand for more sustainable fuel sources is seeing an increase in electric and hybrid vehicles and machinery in HDME operations. Fleet electrification is likely to go hand with the implementation of self-operating vehicles. This introduces greater EV/battery related fire risks, as there are more electrical components present, alongside more wiring and higher power running through the electrical system.

A Safer Solution

In collaboration with manufacturers, distributers and end users, Dafo Vehicle has developed a robust fire suppression system for HDME vehicles with low lifecycle costs. It addresses and protects against individual vehicle fire hazards, including leaking fuel, hydraulic fuel, lubrication, as well as the build-up flammable deposits.

By working closely with OEM customers, we can ensure smooth design integration of our systems into different vehicle models, manufacturing processes (for easy installation at the assembly line) and communications protocols (for full vehicle/fleet management connectivity).



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Electric and Hybrid Electric Vehicles

The difference between traditional combustion engines and EV and HEVs from a fire risk perspective is related to the location and character of potential fire sources. In EV and HEVs, a combination of extinguishing methods is often required to mitigate the various risks.

Dafo Vehicle has developed an early warning detection fire protection solution, which specifically addresses the risks associated with EV and HEVs effectively and safely.

The Unique Risks

Modern li-ion batteries contain high amounts of energy, and in rare cases, can fail for a number of reasons, including short-circuiting, overcharging, overheating or mechanical damage. If not controlled quickly, battery failure can lead to an irreversible thermal runaway process.

In thermal runaway, a fire becomes self-sustaining, as it produces its own oxygen to further fuel the fire. Extinguishing a fire in this state is extremely challenging. Significant quantities of toxic gases will also be emitted from the battery, causing further risks for people close to the vehicle.

The Dafo Vehicle safeEVTM solution provides effective cooling for a failing battery, slowing fire development to allow for safe evacuation.

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Safe with Dafo Vehicle

Active fire protection is an integral part of effective fire prevention. Your solution should be tailored to your individual risks to minimise fire damage, reduce downtime and increase productivity. That’s exactly what Dafo Vehicle prioritises.

Today, the Dafo Group is present in almost all major markets, offering support in any location through its global network.

Don’t compromise on safety - get in touch.

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