



# Why Dafo Vehicle?

## ABOUT DAFO

Dafo has been in business for over 100 years and has always been in the front line of technology engineering and part of regulatory development on a worldwide basis. Our Head office which has a size of 4 500 m<sup>2</sup> is located in Tyresö, Sweden.

Dafo was one of the first companies in the world which started to develop integrated firefighting solutions for vehicles. The overall objective of Dafo has always been to work with continuous improvements, research and developments to make our systems more reliable, sustainable and innovative. Over the years Dafo has obtained vast experience and knowledge from our end user installations which have been used as a basis for eliminating false alarms and false releases. As a result of the development Dafo can today proudly present two different state of the art reliable solutions both without vulnerable and pressurized agent containers.

In 2018 Dafo Brand AB decided to separate its vehicle fire detection and suppression operations from its core fire safety equipment business. The name of the new company was Dafo Vehicle Fire Protection. The Dafo Vehicle Fire Protection have numbers of sales and service location within global coverage.

Today we install the Dafo Fire Suppression system in the product line of many OEMs for example Volvo, Hyster, Kalmar, Terex, Atlas Copco, Kone Crane, Epiroc, Komatsu, John Deere, MAN, Scania, VDL, Wright Bus, Higer, BYD, Hyundai, Solaris, Gemilang, MCV, Otokar, etc. In addition, we also conduct retrofit installations at many operators through our international partner network.

Dafo have many years of experience to design and retrofit installation for used vehicles at thousands per annum. For example we are currently carrying out 3 200 retrofit installations on KMB buses in Hong Kong.

Vehicle fire suppression systems needs to be efficient on both cost and functionality. With this in mind it is important to compare technical qualities and reliability of the system as well as the price. And when comparing prices make sure to compare the total cost of ownership. Through Dafo Vehicle's solutions you will get low lifecycle costs, full service and function traceability as well as reduced liability loss exposure.



## CHOICE OF RIGHT AGENT

Since the startup of this business back in 1976, Dafo have used many different solutions such as Halon, dry powder, pressurized liquid containers, pressurized tube detection etc. In the 90's Dafo developed the first wet chemical extinguishing agent on the market called Forrex.



## Dafo Vehicle Forrex

The basis of Dafo Vehicle's system is the suppression agent Forrex which is specially developed to suppress fires in combustible engines. Forrex is highly effective on flammable liquid fires like petrol, diesel and hydraulic oils. The system combines the features of liquid and dry chemical, includes unique and propriety tailormade solutions and offers outstanding flame knockdown and unique protection against re-ignition as it will cool down the overheated engine parts in case of a thermal event.

- Proprietary blend - The Forrex is Dafo's own proprietary blend. The included surfactants improve the fluidity and fire-extinguishing performance of Forrex.
- Effective Flame Knockdown – Forrex is discharged through overlapping fields of spray which coats all areas of the engine and cutting off the fuels' oxygen supply.
- High penetration capability - Forrex spray droplets are slightly coarse but still small enough to create area liquid film cooling layer which absorbs the radiant heat. Forrex is also extremely effective at following the outline of the engine components in the risk area to ensure it reaches every part where the fire may be. This is particularly important for flammable liquid fires.
- Excellent cooling - Forrex effectively reduces the temperature on any superheated surfaces below the ignition points of any flammable liquid.
- Prevents reignition – increased heat absorption with ability to cling on 3-dimensional surfaces and exclude oxygen.
- Clean up after discharge – In case of discharge it is easy to clean off with water.
- Freeze protection down to -50° C
- Environmentally friendly
- Non-hazardous, no risk for personnel during discharge
- Resistant to ageing
- Non-corrosive

## EXTHINGUISHMENT

The Dafo Vehicle's system is designed in a way to knock out the fire and protect against re-ignition.

The suppression time is usually approx. 1 (one) second.

The discharge time of the agent is approx. 15-20 seconds.

Once the fire is extinguished, the system will efficiently cool down the overheated engine parts and prevent a re-ignition.



## AIRFLOW

The Dafo Vehicle's system can be installed in different kinds of machines in various environments and geographical areas.

The system is designed to meet different requirements as it is for example not always possible to shut of the fan-function.

Our system is capable to extinguish fires even if the fan is running.

## PROPER DESIGN

The Dafo Vehicle fire suppression system is a well-integrated and effective solution which is based on thorough Risk Assessment, design, installation, documentation with subsequent, training and related services.

The Dafo Vehicle fire suppression system consists of four integrated elements; Detection, Alarm, Suppression and Control which work together in a coordinated, fast and efficient way to suppress fires.

### **Detection:**

The detection system consists of an ultra-reliable Linear Heat Detection Cable routed throughout all high-risk areas inside the engine compartment to ensure early detection of a fire.

### **Alarm:**

The alarm panel placed inside of the operator cabin, will alarm the machine operator upon detection. The machine operator can also release the system manually from the panel. An external alarm, protected but in plain sight, will alarm the machine operator and the staff around the machine by sound and flashlight. If needed, the fire alarm can also be seen from the control room for each machine and the control room operator can release the fire suppression system from this location.

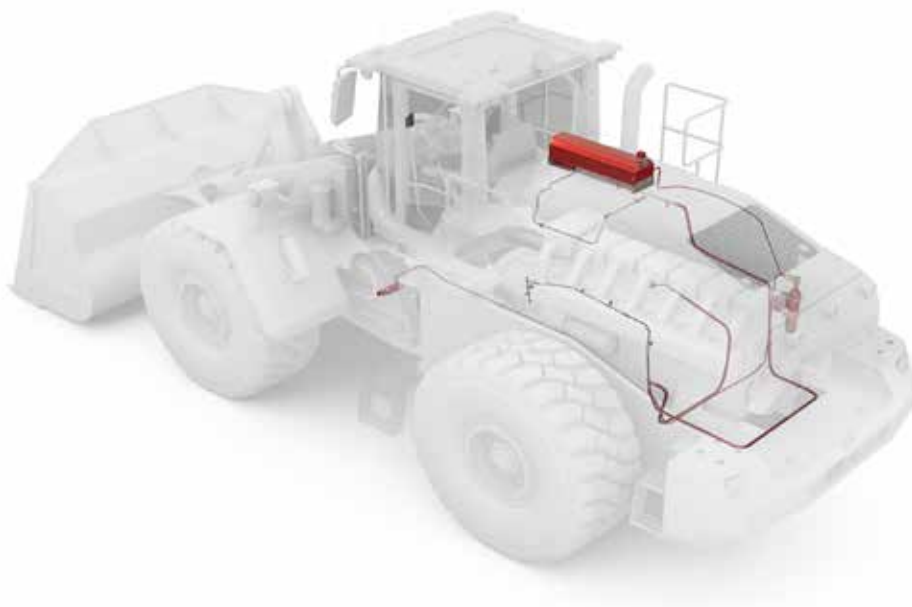
### **Suppression:**

The distribution network is composed of flexible fire resistance hydraulic hoses, stainless steel pipes with full cone nozzles that will protect all areas or specifically locations with many potential fire hazards such as turbo charger, catalytic converter, pumps, fuel lines, generators, transmission belts, filters and hydraulic package.

### **Control:**

Freshly released family of Dafo's new generation control units has following key features:

- Back-up power and no need to replace batteries
  - Real Time Clock and Event Log
- Allows access to full historical data in order to analyze historical events
  - Full compatibility with Dafo's upcoming solutions, including multi-zone CO-detectors
- Model dependent features include:
  - 1, 2 or 3 detections and suppression Zones
  - 1 or 2 CANbus networks (SAE J1939)
  - Up to 4 analogue inputs and 2 digital outputs
  - M12 or MX150 connectors



## LOW TCO

The Dafo Vehicle's system is designed to meet the demands of the final user.

According to our strategy, the final user should not suffer of high service & maintenance costs or trouble because of false releases or malfunctions.

A low total cost of ownership (TCO) is an important key factor for every operator. Dafo Vehicle's fire suppression systems, with its superior low maintenance frequency and reliability, contributes to increased profitability through less downtime for the operator.

The annually service can be done within minimum downtime to secure vehicles own productivity.



## EASY AND COST EFFECTIVE SERVICE

Year

TO EXCHANGE:	1	2	3	4	5	6	7	8	9	10
9V BATTERY (IF NEEDED)	X	X	X	X	X	X	X	X	X	X
ACUTATOR					X					X
AGENT FORREX										X
NITROGEN PROPELLENT CARTRIDGE										X
PISTON OF THE AGENT TANK										X

## CERTIFICATIONS

A tested and certified Vehicle Fire Suppression System in combination with a reliable fire detection system is the best first line of response in case of an emergency such as at a thermal incident. Dafo Vehicle's fire suppression systems are thoroughly tested for fire performance ability and environmental durability such as Electromagnetic Compatibility (EMC), vibration, corrosion and temperature extremes according to international vehicle standards to ensure the highest performance.

**Dafo Vehicle Fire Suppression has wide range of global approvals a few are listed below:**

Fire suppression system approved as a component with regard to UNECE Regulation No. 107 – Swedish Transport Agency (E5)

P-marked in accordance with SPCR 183 – RSIE Research Institutes of Sweden.

Certificate of Approval of AS 5062 - Global-Mark.

I.S 6278 approved – The standards institution of Israel

AIS-135 approved – ARAI India



## TRADE ORGANISATIONS

**Dafo Vehicle Fire Protection is also a member of several Trade Organizations, some of them are listed below:**

**FKG** - The Scandinavian Automotive Supplier Association

**APTA** - American Public Transport Association

**UITP** - International Association of Public Transport

**GPN** - Global Passenger Network



## TOTAL RISK MANAGEMENT SERVICE PROVIDER

Dafo Vehicle Fire Protection has a well proven implementation process in which we work closely with our customers throughout the whole process.

### Dafo Vehicle Fire Protection takes full responsibility for:

- The risk assessment phase
- Adaptation
- Prototype installation
- Documentation/optimization
- Documentation/validation
- Pre-serial installation/training
- Supply chain management
- Serial deliveries
- Service & maintenance

Prior to any installation of fire suppression systems, Dafo Vehicle Fire Protection conducts a fire risk analysis in order to identify potential fire hazards.

Dafo Vehicle Fire Protection always optimize the fire protection solution for the vehicle. Much effort is spent on reducing material consumption but also reducing installation time at serial production. This process also includes ways to establish flawless solutions for the installation e.g. Poka-yoke as well as establishing smarter solutions i.e. in order not to block access to critical components which are part of the vehicle's powertrain.

The risk management process includes smooth system integration. Dafo Vehicle Fire Protection offers on-site technical support both for mechanical and electrical integration in order to support OEMs.

## WITH THE ENVIRONMENT IN MIND

The environment is in constant focus in the Dafo Vehicle Fire Protection organization. We want to make sure that we do our part to leave the smallest ecological footprint possible.

### Below are some examples of what we do:

- Dafo Vehicle Fire Protection continuously works towards sustainability, meaning environmental sensitivity without compromising safety. Dafo Vehicle is measuring and mitigating impacts from manufacture to end-of-life.
- We make sure to reduce our carbon footprint for a cleaner environment
- All components on Dafo Vehicle suppression system are 100% recyclable



## LOCAL PRESENCE

Dafo Vehicle Fire Protection is continuously increasing our geographical proximity by following our OEM customers in their global expansion by supporting their distributors around the globe. Through our local partners Dafo Vehicle Fire Protection is close to our customers in order to assist them with installation, easy access to spare parts and refilling of extinguishing cylinders, within 24/7 availability.

Dafo Vehicle Fire Protection is continuously setting up hubs/distribution centers in strategic geographical areas to be closer to market and to reduce the delivery time as this is important to our customers.



## IN THE FRONT LINE OF TECHNOLOGY ENGINEERING

**Dafo Vehicle Fire Protection is in the front line of technology engineering by:**

- participating in several research projects.
- continuously developing new products and services in order to meet the challenges on the market.
- working with our OEM customers by integrating our systems into their communication protocols.
- being focused on sustainability, meaning environmental sensitivity without compromising safety as well as measuring and mitigating impacts from manufacture to end-of-life.
- implementing certification in accordance with IATF 16 949.
- adapting our design to meet tomorrow's technology.



## SOCIAL MEDIA

Please follow us on social media, this is a great way for you and your customers to be updated and receive our latest news.



<https://www.facebook.com/dafovehicle>



<https://www.linkedin.com/company/dafovehicle/>



<https://www.youtube.com/c/dafovehicle>



<https://twitter.com/dafovehicle>



<https://www.instagram.com/dafovehicle/>

## THINK SMART, THINK SAFE!

By choosing Dafo Vehicle Fire Protection's extinguishing system you decide to protect your vehicle, people, your customer's interests and the environment with a reliable fire suppression system that works in all geographic areas and in all different segments.



***Expect more from your fire suppression system***

