

AUTOMATIC FIREFIGHTING
SYSTEMS IN
VEHICLES

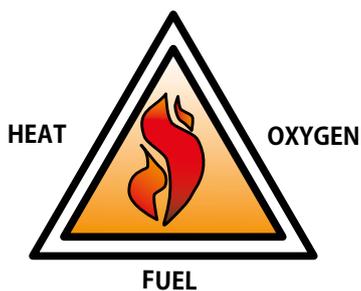




Hazard type

El riesgo considerado, según normativa será:

- *fuego de materiales sólidos*
- *fuego de líquidos combustibles inflamables.*



The large vehicles which are on the market have a high value both intrinsically and because of the losses involved in having them due to a breakdown or accident. With these vehicles we can include industrial machinery, construction equipment, public transport, agricultural machinery and mining vehicles.

Heavy machinery such as excavators, tunnel boring machines, loaders, HGVs, dumpers or compactors contain large quantities of fuel as well as oil at high temperatures. These vehicles must be protected to prevent damage caused by a possible fire inside.

The fire protection should be considered in two stages:

- The protection of workers occupying the vehicle, to prevent injury in case of fire or explosion.
- The physical protection of the vehicles, to minimize damage in case of fire.

The hazard to be considered, according to the regulations, will be the risk of fire in combustible solids and flammable liquids.

The interior of a vehicle must be protected by an automatic extinguishing system to control any incident caused by leaks, spills or the accumulation of vapour from flammable and combustible liquids.

This automatic extinguishing system must protect the various parts of the engine as well as hydraulic lines, the transmission and parts located under the driver's cab, using nozzles properly located to cover all risk areas.

Fire hazard

Industrial vehicles have: powerful engines, where high temperatures are generated; large tanks containing combustible oils, lubricants and liquids; and hydraulic lines capable of causing a fire due to an accident or a leak.

Should the spilled liquid reach its ignition temperature because of the heat from the engines, it will start a fire.

This hazard produces fast spreading fires and high destructive ability of machinery due to the presence of readily combustible solids such as belts and tyres.

As there is a high risk of fire in engines, an automatic fire safety system should be installed to prevent accidental fires. In case of fire, the damage will be reduced by acting quickly to extinguish the fire, thus avoiding more serious damage and the risk of explosion due to the presence of combustible liquids.

General considerations

Given the characteristics of the hazard, the agent which SIEX recommends for this type of applications is dry chemical.

Protection of the engine can be by total flooding or local application, depending on the enclosure design and the existence of ventilation openings.

The fire suppression system inside a vehicle will be a standalone system consisting of dry chemical agent stored in pressurized steel cylinders. So this helps save space, and installation is easy, in addition to requiring very simple maintenance.

SPECIAL ATTENTION

DETECTION

It is necessary to have a detection system that automatically triggers the release of the extinguishing system to produce the discharge immediately the fire is detected.

The system can also be released manually by the driver of the vehicle.

The release mechanism can be electric, from fire control unit, pneumatic, using detection piping, or mechanical-pneumatic using our detection kit; this provides a standalone unit needing no electricity.



Solution



DRY CHEMICAL

SIEX™ IND systems use ammonium phosphate as the extinguishing agent. Its appearance is crystals or bright white powder. It is a white solid mixture of several components, finely divided and with a high dispersal capacity in the space. It is therefore considered to be the most appropriate agent for engine applications.

It is a safe extinguishing agent and the most used one for engine fires: Combustible liquids, lubricants, belts and tyres

THE EQUIPMENT

SIEX pre-engineered modular dry chemical systems pressurized with N₂ are standard and have a large number of cylinder sizes, which facilitates the most cost-effective and suitable installation for the needs of each hazard.

This system makes it possible to protect risks which are impossible with other agents, such as open engines or ones with

large ventilation openings. Since the complete sealing of the engine compartment is not required, it can be used in local application mode.

OPERATION

It works by breaking the chain reaction of fire due to its ability to smother the fire with carbon dioxide formed when it decomposes.

Its application creates a residue that coats the fuel, isolating it from the oxygen in the air and preventing reignition.

CODES

There are several local and international technical rules, such as NFPA-17: Standard for Dry Chemical Extinguishing Systems.

AGENT PROPERTIES

HARMLESS TO THE OZONE LAYER
THEY CAN BE USED FOR BOTH TOTAL FLOODING AND LOCAL APPLICATION.
ECONOMICAL
MAY BE APPLIED IN ENCLOSURES WITH OPENINGS
WIDE EXPERIENCE IN ITS USE
HIGH EXTINGUISHING CAPABILITY
VERSATILE SYSTEM DESIGN
SUITABLE FOR HAZARDS WITH FLAMMABLE LIQUIDS IN SUSPENSION
EASILY ACCESSIBLE

BENEFITS OF SIEX-IND PRE-ENGINEERED MODULAR SYSTEMS

- SIEX™ IND pre-engineered dry chemical systems are easy to design and install.
- Dry chemical discharge is suitable for both total flooding and local application. Both the engine and the transmission must be protected, as well as the hydraulic lines below the driver.
- Activated electrically, manually or mechanically for fully standalone systems.
- Dry chemical has a low market price, is easy to refill, and is accessible anywhere in the world.
- SIEX has flat discharge nozzles for proper protection of openings, creating a curtain of dry powder that prevents the spread of fire through the gaps.

DETECTION



SIEX detection systems can be tailored for every type of vehicle and customer preference. The advantage of these systems is that they need no external power supply, but are completely standalone and automatic.

Typical applications are those in which the hazard is located in small, enclosed volumes such as in the case of vehicle engines.

WITH DETECTION PIPING

The flexible detection and discharge tube is connected to the valve, and is internally pressurized (12-18 bar) with the extinguishing agent itself. It bursts and depressurizes when the temperature reaches 80 °C or 110 °C in the presence of a heat source. The composition of the tube makes it suitable for use in dirty, damp or greasy environments, etc.

The calibrated detector tube is designed to detect fires in the protected hazard and to pneumatically activate the extinguishing system selected.

The **DIRECT SYSTEM** for small spaces discharges agent along the pipe itself when it bursts due to the temperature of the fire in the shape of a nozzle at the exact place the fire was generated. So it both detects and extinguishes the fire in the early stages with very satisfactory results.

The standard supply consists of: bottle or cylinder, valve (with a pressure switch port), fixing hardware, end of line with a pressure gauge and pneumatic tube. This system does not require any discharge nozzles.

The **INDIRECT SYSTEM** discharges the agent through a pipework and nozzle system, with the tube acting solely as a means of fire detection, and the cylinder valve is activated when the tube is depressurized as it bursts due to the heat of the fire. The standard supply includes: bottle or cylinder, valve (with a pressure switch and pressure gauge port), fixing hardware, end of line with a pressure gauge or manual release, detection tube and discharge nozzles.

MECHANICAL-PNEUMATIC DETECTOR KIT

Detection can be performed by our mechanical-pneumatic release KIT which operates efficiently and independently.

It has a built-in, approved heat-sensitive bulb, available with various burst temperatures for mechanical detection of the fire. The pilot cartridge included in the KIT triggers the agent discharge pneumatically through a flexible copper hose connected to the head of the dry chemical storage cylinder.

Agent discharge is via a system of pipes and nozzles inside the engine being protected.

OTROS RIESGOS ESPECIALES PROTEGIDOS POR SIEX:

ESTACIONES DE SERVICIO	CENTROS DE TELECOMUNICACIONES	EDIFICIOS HISTÓRICOS
ARCHIVOS Y BIBLIOTECAS	HOTELES	PARKING ROBOTIZADO
CPDs	HOSPITALES	AEROGENERADORES
CABINAS DE PINTURA	COLEGIOS	ACERÍAS
CUADROS ELÉCTRICOS	ESTACIONES DE TREN Y METRO	BANCOS
COCINAS INDUSTRIALES	TRENES	OFICINAS
TURBINAS Y GENERADORES	TRANSFORMADORES	VEHÍCULOS
TÚNELES DE CARRETERA	PLATAFORMAS OFFSHORE	CINTAS TRANSPORTADORAS
PLANTAS DE GAS NATURAL	PLANTAS TERMO-SOLARES	BOMBAS DE GAS
SALAS LIMPIAS	MÁQUINAS-HERRAMIENTA	OIL & GAS
TÚNELES DE CABLES	INDUSTRIA DE LA IMPRESIÓN	PROCESADO DE MADERA



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