

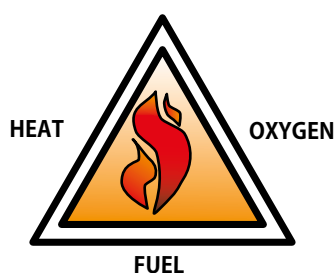
**AUTOMATIC FIREFIGHTING  
SYSTEMS IN  
FLAMMABLE LIQUID  
STORES**





## Hazard type

**FLAMMABLE LIQUIDS WILL  
POSE HIGHER RISKS THE  
LOWER THE FLASH POINT**



These are places locating products, with the following characteristics:

- Where the flash point is less than 37.8 °C and the vapour pressure (absolute) does not exceed 2.8 bar at 37.8 °C.
- Among others: gasoline, kerosene, ethyl alcohol, etc.

The hazards inherent to these flammable products are as follows:

- Burn easily.
- Explosive atmospheres may occur, especially with inadequate ventilation.
- Possibility of spills, creating a risk of moving fires, and even splashing and overflows caused by the spills.

Among the key actions to reduce risk, we recommend having industrial absorbents, retention soils, adequate storage, separation of incompatible materials, reduced stock, staff training, etc. However, by their features, they involve hazards that are difficult

to control and/or contain, so danger of fire never disappears. This requires full protection of the enclosure, avoiding the spread to other areas as much as possible.

These products are stored in different types of storage solutions—drums or tanks—depending on the location, size and type of product. Flammable liquids may even be stored inside buildings primarily used for something else or in buildings used exclusively for this purpose.

Since it is a mobile and open hazard, it seems that the best solution is water or dry chemical.

# Sources of fire

An accidental fire comprises its beginning and immediate spread. However, considering that the oxidizer (air) is always present and that the chain reaction is a result of the fire, the basic conditions that will cause the breakout are fuel and activation energy. Therefore, to assess the risk of fire you have to consider the probability of fuel and flashpoints coexisting in the same space and time, and with sufficient intensity flash point.

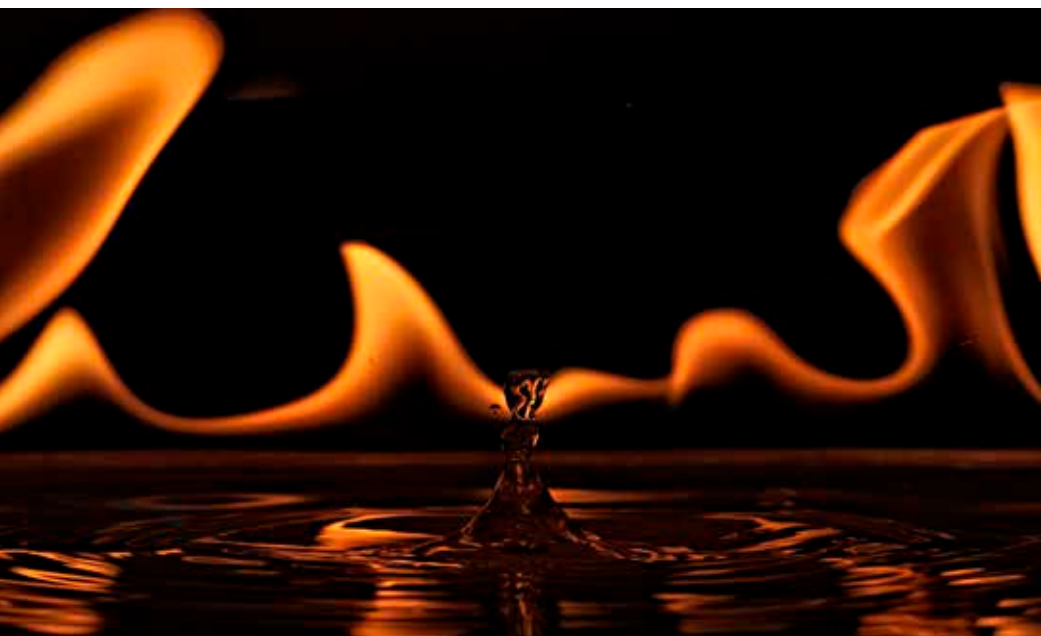
## THE MAIN CAUSES OF FIRE WHICH CAN OCCUR IN THIS SORT OF INSTALLATION ARE:

- Sparks from electrical equipment and installations.
- Non-observance of smoking bans.
- Electrostatic discharges.
- Sparks caused by exhaust pipes of vehicles or fork-lift trucks.
- Sparks caused by abrasion work
- Sparks caused by the striking of tools or other metallic objects.
- Sparks or overheating caused by welding.
- Heat generated by the decomposition of organic matter.
- Presence of hot surfaces (heaters, furnaces).
- Natural phenomena (lightning).

*This type of hazard generates great quantities of heat which implies certain consequences include loss and damage to physical goods and damage to structures. Risks located inside property pose a greater risk and increase the risk of explosion and personal injury.*

## THE THREE KEY PROPERTIES WHICH FIRE PROTECTION SYSTEMS FOR THESE HAZARDS MUST HAVE ARE:

- *Fast detection to avoid fire spread.*
- *Control, suppression and/or extinguishment.*
- *Cooling, the need for sudden drops in temperature.*



# SIEX recommendations



Of the substances found in nature, water has the higher specific heat, after hydrogen and helium. The latent heat of vaporization is the highest of all liquids, making it an excellent firefighting medium.

The features that make it the best choice are:

## **Environmentally friendly.**

Currently water is a scarce resource and thus its use is optimized: Maximum efficiency with the smallest amount of agent.

## **Low space requirement.**

Considerable savings since the size of the water tanks installed is clearly lower than with traditional systems, thanks to significant savings in the water used.

## **Rapid temperature drop in the hazard.**

The high specific surface area of the water droplet rapidly reduces the temperature and maintains it over time. Thus damage to people and the structure is avoided, and the fire is prevented from spreading.

## **High suppression and control capability.**

The surface of water discharged is far superior to sprinkler systems and therefore the heat absorbed is much greater for the same quantity of water.

## **Minimum number of nozzles.**

Optimizing the design parameters of the nozzles maximizes their coverage compared to other systems and therefore reduces the number of these that need to be installed.

## **Lower pipe sizes required.**

Smaller pipe sizes: SIEX™ WATER MIST uses 90% less water than traditional systems.

## **Light and easy installation.**

Loads due to the weight of the piping and the liquid itself are reduced. Installation becomes more cost-effective, by improving handling of installation elements translates into shorter assembly times and working times, compared to other systems.

## **Less damage from particles and smoke**

The discharge of water mist has the effect of scrubbing smoke and particles produced by the fire, which facilitates evacuation and the work of fire fighters responsible for extinguishing the fire.

## **Reduced water damage.**

Unlike traditional sprinkler systems, the small droplet size and the low flow of water mist systems minimize damage. Sometimes the deterioration caused by massive flooding exceeds damage produced by the fire.

## Protection Objectives

### Fire control.

Limits the growth and spread of fire by cooling, smothering and separation of fuel and fire barrier.

### Fire suppression.

Drastic reduction of the heat release rate of fire.



Fixed dry chemical fire protection systems are used to extinguish fires in special hazards requiring large quantities of this extinguishing agent, such as class A, B, C, K and D fires and fires in open spaces (local application). They can also be used on fires involving certain types of electrical equipment.

### PROPERTIES:

- Does not reduce the oxygen in the atmosphere
- Suitable for occupied areas
- Rapid extinguishment
- It increases the safety margin
- High extinguishing capability.
- Non-corrosive to electrical or electronic materials.

### APPLICATIONS:

- Fires in flammable and/or combustible liquids.
- Flammable liquid or combustible gases in transfer, filling or emptying.
- Surface fires in solids
- Fires in live electrical components.

*Effective when fast flame extinguishing is required, delivering the necessary security against flammable and combustible liquids.*

## System description.



DEPENDING OF THE WATER STORAGE WE HAVE:

**High pressure pumpsets:** In the event of combining high-risk hazards or large surface areas.

**Cylinder bank with water and nitrogen:** Small hazards.

DEPENDING ON THE PIPEWORK USED:

**Wet pipe systems,** with closed nozzles. Fully pressurized pipework. Fast discharge.

**Dry pipe systems** with open nozzles. Non-pressurized pipework.

**Pre-action.** Wet pipe system pressurized up to the valve. From the selector valve onwards, the piping is dry with a closed nozzle.

Allows double safety for the hazard: suppressing fire and also avoiding risks associated with water due to accidental releases, including drips.



DEPENDING ON THE POWDER STORAGE WE HAVE:

**Pressurized cylinders up to 110 kg.**

Small hazards.

**Powder tanks up to 2,000 kg**

Large hazards.

DEPENDING ON THE APPLICATION THEY MAY BE INSTALLED IN THE FOLLOWING SYSTEMS:

**Total flooding.**

**Local application.**

## COMMON PROTECTION MEASURES

*Allow detection at an early stage and have a rapid response system.*

*Use an extinguishing system with high cooling power that minimizes the level of risk.*

*Protection of people in the area, preventing the spread of fire and/or suppressing it.*

*Scrupulous identification of containers.*

*The use of self-righting, self-closing storage containers, with flame arrester systems and dispensing containers if necessary.*

*Avoid the accumulation of flammable liquids at work stations.*

*The use of noncombustible sands and derivatives and powder for absorbing possible spillage to prevent any spillage reaching the drainage system. Physical barriers should be created for this purpose.*

*Using manual transfer pumps. Containers must have anti-tipping devices.*

*Suitable vehicles for moving tanks including their periodic inspection.*

*Improve visibility in escape routes, of key importance in an underground system.*

*Minimize smoke.*

## OTHER SPECIAL HAZARDS PROTECTING BY SIEX:

SERVICE STATIONS	TELECOMMUNICATION CENTRES	HISTORIC BUILDINGS
ARCHIVES AND LIBRARIES	HOTELS	ROBOTIC PARKINGS
DPCs	HOSPITALS	WIND TURBINES
PAINT SPRAY BOOTHS	EDUCATIONAL ESTABLISHMENTS	STEEL INDUSTRY
ELECTRICAL PANELS	TRAIN AND UNDERGROUND STATIONS	BANKS
INDUSTRIAL KITCHEN	TRAINS	OFFICES
TURBINES AND GENERATORS	TRANSFORMERS	LARGE VEHICLES
ROAD TUNNELS	OFFSHORE PLATFORMS	CONVEYOR BELTS
NATURAL GAS PLANTS	SOLAR THERMAL PLANTS	GAS PUMPS
CLEAN ROOMS	MACHINE TOOLS	OIL & GAS
CABLE TUNNELS	PRINTING INDUSTRY	TIMBER INDUSTRY



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