PROTECCIÓN DE
RIESGOS ESPECIALES

AUTOMATIC FIREFIGHTING SYSTEMS IN

GAS PUMPS

Models to be protected

Since they operate with easily ignitable material, gas pumps are a high fire hazard.

Rapid actuation of extinguishing equipment prevents further damage to the work area.

Pumps fall into three main categories:

- **Reciprocating piston:** reciprocating piston in a cylinder. A suitable set of valves allows the liquid to be sucked into a cylinder at one stroke and driven to the turbine at the next. Accordingly, the flow will be intermittent unless air containers are installed or there are a sufficient number of cylinders to make the flow uniform.

- **Rotary piston:** pressure is generated using gears or impellers which deliver the liquid centrifugally within the closed housing. A uniform flow is generated and there are no valves.
- **Rotodynamic:** based on Bernoulli's principle of ideal fluids: "The energy of a fluid remains constant along its entire length."

The first two operate on the principle of positive displacement, i.e., they pump a given amount of fluid (leaks apart) regardless of the pump head.

The third type is named after a rotating element, the impeller, which transfers velocity to the fluid and generates pressure. The outer casing, shaft and driver complete the pumpset.

The most suitable protection for these elements will be dry chemical or foam. Both extinguishing agents are safe, with dry chemical being used most in flammable liquid, gas and chemical fires.

They both work by covering the tank and extinguishing the fire by smothering, totally eliminating O2 the essential to the existence of fire.

Fire hazard

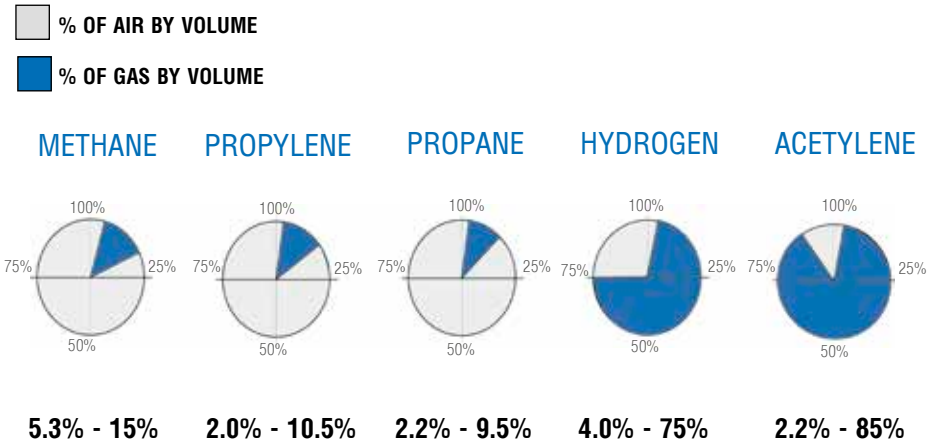
Gas pump hazards are derived from the actual medium being pumped.

Flammable gases

Acetylene, ammonia, hydrogen, propane, propylene and methane are flammable gases, also known as fuel gases. They burn when mixed with an oxidizer and if they are provided with a source of ignition.

- The combustible gases can ignite when there is a certain ratio with air or other oxidizing agents.
- Self-igniting gases have a flash point of 100 °C. These gases may ignite at room temperature in combination with air or other oxidizing agents.
- Oxidant gases support combustion but are not themselves flammable.

The diagram shows the flammability limits.



The blue portions show the percentiles where combustible gases pose a particular risk of ignition or explosion.

There is a fire risk even at low concentrations and this increases with the percentage gas concentration. Once the concentration has exceeded the UEL value, the air becomes "too rich" to burn and the chances of a fire occurring are reduced.

In the right conditions, any leakage of combustible gas in a confined space could create an explosive atmosphere.

Furthermore, in open or closed spaces with considerable natural ventilation, the percentage of gas may reach the lower threshold, which as the graph shows, results in involving a danger of ignition or explosion.

To reduce these risks, protective measures are incorporated, such as odorization for easy identification and substantial improvements in control, maintenance, monitoring, production, etc. This reduction does not entail the total elimination of risk, so it is essential to have effective means of extinguishing.

RISK FACTORS

Factors that may lead to a fire in these facilities are mainly of external origin:

- Environmental: changes in temperature, pressure, humidity.
- Electrical or mechanical faults.
- Affecting near-by elements.
- Maintenance operations
- Internal combustion vehicles or machinery

SOLUTION

Dry chemical systems may be cartridge operated or stored pressure, depending on the capacity of the tank.

DRY CHEMICAL TANKS (cartridge operated)

Dry chemical fixed fire fighting systems are used to extinguish fires in hazards where significant quantities of the extinguishing agent are required, such as combustible liquids or electrical fires and applications in open spaces (local application).

They can be used for both total flooding and local application. The system consists of: Dry chemical tank and propellant gas (nitrogen), pipework and nozzles. SIEX™ IND has specific nozzles for total flooding, local application, and flat discharge for protection with a powder curtain.

Dry chemical has a low market price, is easy to refill, and is accessible anywhere in the world.

DRY CHEMICAL CYLINDERS (stored pressure)

SIEX™ IND pre-engineered dry chemical systems are easy to design and install in locations where only a small quantity of agent is required. They can be activated electrically and/or manually, and pneumatic and mechanical actuation is also possible for completely standalone systems. SIEX has suitable release heads for all possible solutions, in order to provide the best protection for each space.

Its low 25 bar operating pressure means that conventional pipework and fittings can be used, resulting in cost savings on installation material.

Our commitment

CHOICE OF SYSTEMS

SIEX has the widest range of products and systems to suit different needs, both as regards pressures and extinguishing agents.

COMPETITIVE PRICE

Optimizing all of our processes make us more and more competitive worldwide.

SPECIALIZED ENGINEERING

Our highly qualified staff ensure the best service for customers both as regards technical advice on the choice of system, and solving any problems that might arise after installation. Backed up by our extensive experience and a track record of successful projects.

INNOVATION

At the forefront of innovation in every product we develop, ensuring the technical features offered.

QUALITY GUARANTEE

All products meet the highest quality requirements and internationally recognised official approvals.

OTHER SPECIAL HAZARDS PROTECTING BY SIEX:

SERVICE STATIONS
ARCHIVES AND LIBRARIES
DPCs
PAINT SPRAY BOOTHS
ELECTRICAL PANELS
INDUSTRIAL KITCHEN
TURBINES AND GENERATORS
ROAD TUNNELS
NATURAL GAS PLANTS
CLEAN ROOMS
CABLE TUNNELS

TELECOMMUNICATION CENTRES
HOTELS
HOSPITALS
EDUCATIONAL ESTABLISHMENTS
TRAIN AND UNDERGROUND STATIONS
TRAINS
TRANSFORMERS
OFFSHORE PLATFORMS
SOLAR THERMAL PLANTS
MACHINE TOOLS
PRINTING INDUSTRY

HISTORIC BUILDINGS
ROBOTIC PARKINGS
WIND TURBINES
STEEL INDUSTRY
BANKS
OFFICES
LARGE VEHICLES
CONVEYOR BELTS
GAS PUMPS
OIL & GAS
TIMBER INDUSTRY

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