

WATER MIST

“Water efficacy in micro-drops”

Due to the restrictions imposed by the Montreal Protocol for the ozone layer protection, has emerged the need of finding new Halon 1301 replacements.

During the last years, the use of clean agents (FE-13, FM-200, FE-25, INERGEN, ARGON, etc...) is increasing because of their zero ozone depletion potential, their extinguish efficacy comparable with the Halon one and also because no residues left after application.

Simultaneously, other alternative systems have appeared, less important in the market but with a high technological level, such as the water mist. Everybody knows the water extinguish capacity.

As its name indicates, in Water Mist systems, water is divided into very small drops, obtaining a considerable refrigeration capacity increased for the same quantity of water. In case of discharge, as very small liquid quantities are used, equipment damage is nearly insignificant.

Regarding the water mist extinguishment mechanism or the fire control, we may divide them into three main mechanism:

- Flame/ Fire heat absorption.
- Oxygen displacement
- Radiation reduction.

Flame / Heat absorption (cooling): Flame cooling means the progressive lowering and extinguishment of fire or fire control. When reducing the drop size, the total water surface is increased, this means to rise the heat absorption speed. Energy is absorbed by evaporation (from liquid to steam). With this effect, the

flame steam phase temperature goes down lower than the minimum required value to keep the combustion reaction.

Oxygen displacement: flame oxygen reduction may be obtained by inerting the hazard or by the local oxygen reduction in the mentioned flame. Water drops, when passing from liquid to steam, increase their volume approximately 1800 times (at 100°C and 1bar). If the step from liquid to steam occurs fast enough, water steam displaces the air around the flame. If oxygen quantity is reduced lower than certain levels, fire is extinguished by suffocation.

Radiation Reduction: It limits the fire prolongation to other areas as heat radiation is reduced through the hazard, avoiding that fire affects to combustion surfaces that are not started the ignition. This mechanism doesn't mean a fire extinguishment element by itself, but joint to the above mentioned ones it's of a paramount importance in a fire development.

Water mist use must meet one of the following purposes:

- a) Fire control: by limiting the fire increase and prolongation. Discharge time must be long enough to allow that manual actuation controls the fire.
- b) Fire suppression: Substantial and quick reduction of the fire factors, heat release and gas issue, during the discharge.
- c) Fire extinguishment: after the system discharge (normally 10 minutes) this must be able to avoid the reignition of the fire, until combustion materials have disappeared at all. Systems must be capable to extinguish fires for the pertinent application.

SIEX water mist systems operate with working pressures from 80 to 200 bar, to disintegrate water in small drops (from 25 to 80 microns) which are discharged over the fire to high speed.



SIEX uses two types of systems depending of the application and the water quantity need for protecting the hazard:

- **Cylinder systems (UAC):** These systems are used when less than 850 litres of water are need. They are made with manifold water cylinders, manufactured following the Standard, with different sizes, with internal anticorrosive treatment and N2 cylinders to 200bar (driving agent) manufactured following the European Standards. Possibility of

manual, pneumatic, electrical (solenoid or hammer) or with remote manual activation.

- **Systems with pumping station (UAP):** These equipments come associated with tanks with the possibility of storing water up to 3000 litres, this means to increase the water quantity need. SIEX develops pumping stations with caudal from 32 l/min. to 220 l/min. with their respective electrical control panels, maneuver and signalling.

Depending on the hazard to protect, SIEX offers different nozzle kinds made of stainless steel and with discharge flows from 1.2 l/min to 48 l/min. There are open nozzles which discharge directly on the hazard after activation of the system (manual or electrical through the control panel) and close nozzles, sprinkler type, which only discharge after breaking the incorporated thermal detection bulb for a certain temperature.

Ecological
extinguish
agent, does not
damage the
environment

Possibility of
cylinder systems
(UAC) or with
pumping
systems (UAP)

For more information: 

General characteristics

- *Suitable for occupied areas and equipments.*
- *Inexpensive refills*
- *Drastic temperature reduction of the hazard after activation*
- *Ecological agent, no environmental damage.*
- *Electrically non conductive, due to the small drops.*
- *Very reduce damage by water*
- *Hume washing and toxic gases water soluble.*

Applications

- *Marine uses.*
- *Archives.*
- *Restaurant and hotels kitchen protection.*
- *Engine rooms, generators.*
- *Text processing centres.*
- *Telecommunication rooms.*
- *Mechanical stairs.*
- *Trains, railways.*
- *Important value actives.*



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