

ENGINEERING
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Article | SEM-SAFE® high-pressure water mist system

30,000 Danfoss nozzles are ready to fight fire

Danfoss Fire Safety A/S



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SEM-SAFE®

30,000 Danfoss nozzles are ready to fight fire

One of the largest high-pressure water mist system for fire fighting has been installed in a new hospital in Denmark: Aarhus University Hospital in Skejby. Danfoss Fire Safety is the company that delivered the system – and the solution saves the hospital millions.

PHOTO: GLENN SIMONSEN

Danfoss Fire Safety has been in the water mist system market for several years. The Aarhus University Hospital is one of the biggest hospitals in Denmark and is fully protected by the SEM-SAFE® high-pressure water mist fire fighting system, a solution that saved the hospital millions in installation costs.

With Danfoss Fire Safety solution, the contractor has saved as much as 11.4m euros on other construction areas: lower costs for the insulation of ventilation ducts, for glass, chimney dampers, fire doors, etc.

To get the complete picture, we first need to know how the Danfoss Fire Safety solution works.

We all recognize the little nozzles which hang down from the ceiling in offices, cinemas, hospitals, and elsewhere. If fire breaks out, fine water mist is sprayed over the fire.

The SEM-SAFE® high-pressure water mist nozzle cover a large area, thus reducing significantly the number of nozzles that are required to be installed. The SEM-SAFE® nozzle are connected via stainless steel pipes to a SEM-SAFE® high-pressure water mist pump unit. Section valve help direct the water to the areas affected by fire, where water mist is released through the nozzles.

The SEM-SAFE® high-pressure water mist system uses very little water: from a third to a tenth the quantity. The high-pressure water mist causes the heat generated by the fire to drop dramatically – which is precisely why major savings are obtained with the high-pressure water mist solution.

Normally, quite a lot of insulation is needed around ventilation ducts to stop warm air transporting the fire along them. Prevented by a high-pressure water mist solution.

The builders could also install cheaper types of glass in areas where the fire could spread to surrounding buildings. All in all, the installations are more straightforward, and that leads to major savings.

Easier to install

At Aarhus University Hospital, Danfoss Fire Safety cooperated with the consulting engineering company DNU Rådgivergruppen, which has been part of the project right from the start. This is vital in order to obtain the optimum savings – because a lot of the elements of the structure can be planned differently with a high-pressure water mist system.



Facts

How it operates:

- The water is filtered, separating particles measuring as little as small as 10 microns. Then, it is piped into a buffer tank.
- A stand-by pump maintains a constant pressure of 10-14 bar in the pipe system.
- If a SEM-SAFE® nozzle is activated because of a fire, the main pumps are activated and the water is released into the system at a pressure of 130 bar.



With 30,000 installed nozzles, the SEM-SAFE® high-pressure water mist installation at Aarhus University Hospital is one of the largest of its kind.

“In the construction of hospitals with limited space for technical installations, the high-pressure water mist installation is the optimal choice. It means major savings on building components, increased flexibility, and greater architectural freedom of scope,” says fire advisor Kenneth Jaquet, Rådgivergruppen DNU I/S.

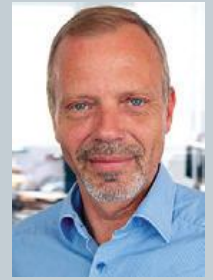
The pipe diameter is much smaller which means that the installation time is much shorter. With a sprinkler system, it takes two to three people to lift a pipe. Here, only one person is needed. Bends are easier to do, and it is easier to make the pipes fit under the ceiling. ▶



Facts

In the long connecting corridors, fire doors have been replaced by a nozzles mounted in the ceiling where the fire doors would normally sit. When activated, the nozzles release a curtain of water mist, which can isolate the smoke in a restricted area. With this solution, you also avoid fire doors shutting by mistake or being damaged by collisions.

In the construction of hospitals with limited space for technical installations, **the high-pressure water mist installation is the optimal choice.**



*Kenneth Jaquet,
fire advisor, Rådgivergruppen DNU I/S*

► Hospitals like the one in Skejby, Aarhus – and the health-care system overall – make up one of the markets which Danfoss Fire Safety has identified as being of particular interest. The company has already installed water mist systems in several hospitals and expects that the Aarhus University Hospital will open the door to more projects.

Besides the major savings obtained by installing the SEM-SAFE® high-pressure water mist system, there is another important thing worth mentioning: the fast reaction of the system to a fire. No matter whether a sprinkler system or a water mist system has been installed, the goal is to contain the fire until the fire brigade arrives. For added safety, fire hose cabinets are installed in the hospital building. The placement of the fire hose cabinets ensures coverage of all areas in the building. The fire hose

cabinets are connected to the SEM-SAFE® high-pressure water mist pump unit, for added simplicity in installation. The design of the fire hose cabinets makes them easy to use.

The water mist solution saves 2 to 7 minutes for emergency response personnel compared to a sprinkler solution, where the fire fighters must first roll out their equipment before entering the building.



Quick and easy installation of the SEM-SAFE® high-pressure water mist nozzle.

SEM-SAFE®

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