

Case story | SEM-SAFE® high-pressure water mist system

The New University Hospital (DNU) in Aarhus, Denmark

One of the largest water mist for fire fighting installations in Denmark's first super-hospital

Danfoss Fire Safety A/S

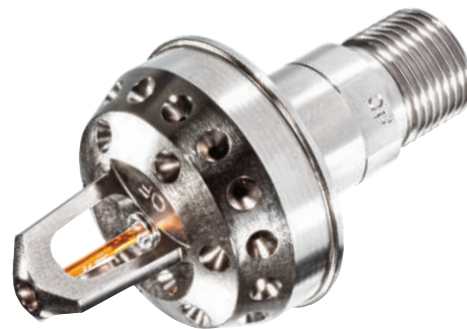


The new University hospital in Skejby, Aarhus (DNU) is Denmark's first super hospital. The hospital will not only provide quality treatment, but will also be a prestigious learning and training centre with modern research facilities. The project is a pioneer for the development of "Healing Architecture" in the hospital sector and is designed to meet the future demands for patient treatment and procedures.

Building description

Construction started in 2012 and is expected to be finalized in 2020. Upon completion, the hospital will be the same size as a Danish provincial town, with its own buildings, streets and neighborhoods. DNU will be added to the existing three-storey Aarhus University hospital in Skejby to form a combined hospital complex of approximately 400,000 m² with buildings between four and eighteen storeys.

Ensuring fire protection for a structure of this size and with a large number of staff, patients and visitors is a high priority. In line with this state-of-the-art hospital, SEM-SAFE® high-pressure water mist system for fire fighting from Danfoss was chosen for fire protection of the DNU hospital.



SEM-SAFE® high-pressure water mist system

The project has been the result of close collaboration between Danfoss, Kemp-Lauritzen (official Danfoss distributor in Denmark) and consulting engineering company, DNU Rådgivergruppen. The advantages of a high-pressure water mist system were solidly confirmed. All fire protection requirements were satisfied by choosing a SEM-SAFE® high-pressure water mist system.

Simplex CEN micro nozzles and VdS drilled nozzles have been chosen. The CEN nozzle has a large spacing of 5.5 meter, with its wide spray angle and the specially designed spray pattern. Upon project completion, a total of 30,000 nozzles will be installed.

High-pressure water mist has excellent fire suppression properties, including the capture of soot particles, strong reduction of radiant heat and rapid lowering of the temperature to acceptable levels. Fire is controlled efficiently, while water consumption and water damage is kept to a minimum. In case of system activation due to a fire, the clean-up is faster and there is minimum business interruption and impact on patient care.

The benefits of SEM-SAFE®

The benefits of SEM-SAFE® high-pressure water mist system are many in comparison with traditional sprinklers. The most important being the economic advantage, as SEM-SAFE® is a money saving solution. For DNU more than 11 million Euros were saved with SEM-SAFE® due to lower costs for building structure and design.

The superior cooling features of the SEM-SAFE® water mist system make it the perfect choice for glass facades, as it removes the risk of thermal stress cracks associated with traditional sprinklers.

Usually a lot of isolation material has to be used for vents in order to prevent any hot air being transported. With SEM-SAFE® this is avoided and significant savings are made.

The SEM-SAFE® system is characterized by small pipe dimensions and fewer nozzles, which results in considerable reduction of installation time and cost, impossible to achieve with a traditional sprinkler system.

The small pipe diameters make the system easy to integrate with other installations in a hospital. It is an optimal solution for modern hospitals as well as being highly suited for retrofitting existing buildings.

Fire safety consultants Kenneth Jaquet and Bertel Kjeldsen, Rådgivergruppen DNU I/S states:

"By installing a high-pressure water mist system at The New Aarhus University Hospital (DNU), we have selected the optimal technology when it comes to protecting the building, its fixtures and equipment in the event of a fire. This technology also allows for considerable savings in terms of building components.

The high-pressure water mist system has provided a high level of architectural freedom, such as the ability to mount nozzles in the moulding in corridor areas so that the ceiling can easily be removed to provide access to technical installations during service visits.

At DNU, the technology has also allowed planners to replace widely-used automatic fire doors in service corridors with high-pressure water mist curtains, which are a more reliable and operations-friendly solution. The building has also been equipped with high-pressure hose reels, which can be used by emergency response teams in the event of a fire. The high-pressure hose reels are an integrated part of the high-pressure water mist system, thus avoiding the need for a separate pipe network for traditional hose reels.

In a hospital construction with limited space for technical installations, the high-pressure water mist system is the optimal choice when using smaller and fewer pipe sizes, as it provides the utmost flexibility."



The innovation behind SEM-SAFE® has allowed for water curtains to replace traditional fire doors.