

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

Alsik Hotel in Denmark: modern high-rise building protected by SEM-SAFE® high-pressure water mist fire safety system

Danfoss Fire Safety A/S



Green building all the way

Alsik Hotel, Spa and Conference opened in the spring of 2019 in the heart of Sønderborg, a beautiful harbour city in southern Denmark. Right from the concept stage, the Alsik high-rise building played a special role in a city that has made a commitment to becoming one of the most environmentally-friendly places in Denmark. This is known as ProjectZero, and Alsik Hotel has fully embraced the legacy this project represents for the local community: sustainable growth and a carbon free future.

Natural Scandinavian design

Designed by one of Denmark's leading architectural firms, Henning Larsen, the 19-storey aluminium and glass high-rise hotel completes world-renowned Frank Gehry's waterfront masterplan for Sønderborg and Flensborg Fjord.

Alsik Hotel has an impressive surface area of 24,800 m². The building includes 190 rooms, 9 conference rooms, a spa, wellness treatments, fitness studio and 2 restaurants. Both the interior and exterior design draw inspiration from Nordic wildlife and its unique light.

Alsik Hotel was thus built with sustainability in mind in order to optimize the supply and use of energy, water and materials during

the construction stage, but also to ensure that running the hotel is as environmentally-friendly as possible. All these elements have a big influence on the building's lifetime cost.

Reliable fire safety

To comply with the sustainability vision of the building and the city, the suppliers for this building were carefully selected and only the most mature and energy-efficient ones were considered. Danfoss Fire Safety is extremely proud to have been chosen as the supplier of the fire protection system for Alsik and to be part of a construction project that makes a real statement in terms of expertise in clean-tech solutions. Our SEM-SAFE® high-pressure water mist fire safety system covers all areas in the building.

100% environmentally-friendly fire fighting technology

The SEM-SAFE® system uses water as the extinguishing agent, which is a sustainable fire safety technology. It is harmless to people and environmentally friendly. Thus, we aim at contributing to better and more eco-friendlier solutions for the buildings and cities of tomorrow.

The intelligent use of water for fire fighting applications

The SEM-SAFE® high-pressure water system uses water micro-droplets released through the nozzle into protected areas. An ultra fine mist is formed, with a two-fold extinguishing effect. In addition to cooling the fire, it simultaneously starves the fire of oxygen. The cooling effect also lowers the risk of re-ignition. This makes high-pressure water mist highly effective in the fight against fire and protects against heat damage.

SEM-SAFE® in short

The SEM-SAFE® system comprises of a high-pressure modular pump unit, section valves, piping and water mist nozzles. With small pipe dimensions, large coverage, minimal water consumption, a compact pump unit and simple design, the SEM-SAFE® system is the perfect choice to protect hotel buildings against fire, with reliability and cost-saving in mind. A total of 2,500 SEM-SAFE® high-pressure water mist nozzles have been installed in Alsik, covering OH1, OH3 and OH4 applications such as offices, hotel rooms, restaurants, meeting rooms, atrium and storages. In addition, we have supplied 37 section valves. The entire Alsik hotel is covered by two SEM-SAFE® high-pressure water mist pump units.

Fire protection for people and assets

The goal is to save lives and limit damage to the equipment and the hotel building. In case of a fire, the SEM-SAFE® system will activate immediately in the areas where a fire is detected. High-pressure water mist has excellent properties in capturing the smoke particles, thus increasing the chances for a safe evacuation of guests and staff. The SEM-SAFE® high-pressure water mist system uses very little water compared to other technologies on the market. In addition, water damage is kept to a minimum.

Maintenance-free Danfoss pumps

The SEM-SAFE® high-pressure water mist system uses Danfoss PAH high-pressure pumps, which are lubricated by water, making them virtually maintenance-free.

Tested and approved system

The design of the SEM-SAFE® high-pressure water mist is based on full scale fire tests. The system chosen for the Alsik project has been tested in accordance with CEN/TS 14972 and approved by the Danish Institute of Fire and Security Technology to comply with the European standard for water mist systems prEN 14972 for Ordinary Hazard Groups OH1, OH3 and OH4.

Best choice for window cooling

The windows of the building go from floor to ceiling, allowing light to project further into the room. The excellent cooling features of the SEM-SAFE® high-pressure water mist technology make it the perfect choice for protecting glass facades. SEM-SAFE® has passed the EN-1364-1 fire resistance test for non-load bearing elements, thus allowing for lighter glass in the building facade. Savings can be obtained by using our technology, as there is no need for expensive fire-resistant glass.



"We chose high-pressure water mist as it requires less installation in the building, and thus saves space.

For us, the advantage of the SEM-SAFE® high-pressure water mist fire safety system is, that it is a very safe system for people staying in a hotel environment while also incurring limited damage to interiors and technical

installations in case of a fire.

The system itself has a low water consumption, which releases space in the building that otherwise would have been needed for a big water reservoir, for example.

We are very happy with the product and the installation.

We will definitely recommend Danfoss Fire Safety to others."

John Knudsen

Project Director at Bitten og Mads Clausens Fond



Best fire safety solution for high-rise buildings

The SEM-SAFE® high-pressure water mist system is the ideal choice for the Alsik high-rise hotel:

- ✓ It does not require large water reservoirs
- ✓ Pipes are thin for added flexibility in installation
- ✓ There is no need for sprinkler units on every floor to prevent pressure loss