

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

# Alsion in Denmark

Large-scale project in Denmark using high-pressure water mist

Danfoss Fire Safety A/S



The Alsion building was finished on 30 October 2007 and was opened by Her Majesty Queen Margrethe II of Denmark. Alsion was built to create a unique environment in a unique building at a unique location to stimulate local & regional growth. Therefore, a unique fire protection system was chosen: the innovative SEM-SAFE® high-pressure mist system from Danfoss.

## Building description

The building covers a gross area of 28,400 m<sup>2</sup> and a total of 10 blocks. Each block consists of four levels and one basement.

The building has three different applications:

University/education of 15,400 m<sup>2</sup>, concert hall of 1,795 m<sup>2</sup> and research park of 5,900 m<sup>2</sup>.

## Fire test criteria

The system chosen for the Alsion project had to comply with the European standard draft prEN 14972, prepared by the Technical Committee CEN/TC919 "Fixed fire fighting systems", the secretariat of which is held by BSI.

The SEM-SAFE® high-pressure water mist system was thus tested according to the fire test procedures described in this standard. The tests were carried out to prove that an automatic high-pressure water mist system achieved better results than comparable tests carried out with a sprinkler system.

After successful testing, the SEM-SAFE® high-pressure water mist system was approved by DIFT (Danish Institute of Fire and Security Technology) to comply with the European standard for water mist system prEN 14972 for Ordinary Hazard Group 1.



**SEM-SAFE® high-pressure water mist system**

To protect the Alston building, a SEM-SAFE® high-pressure pump unit was used. The type of nozzle used is our CEN nozzle with a 5.5 metres spacing at a height of 3 metres and a nominal release temperature of 57°C.

**A total of 2,200 nozzles were installed:**

- 2,000 closed nozzles (wet system) – offices, corridors, restaurants, classrooms, etc.
- 200 open nozzles (dry system) – atrium, concert hall, etc.



Alston Concert Hall, famous for its exceptionally good acoustics, is fully protected with SEM-SAFE®.

**Torben Sten Hansen from the Danish consulting engineering firm Sloth Møller states:**

*“The water mist system fits well with the innovative “spirit” characterising the project. There are many reasons as to why water mist was chosen over a traditional sprinkler system.*

*First of all, the system is much more flexible to incorporate than the sprinkler system. It requires less space as the pipes are smaller. This makes it easier to incorporate the pipes in a way that makes them less conspicuous. The actual nozzle is also smaller than the traditional sprinkler nozzle and is therefore less conspicuous when mounted in the ceiling. In other words, a water mist fire protection system is more aesthetic and thus preferred by most architects.*

*Another strong argument is that the solution is very economical. The water volume used in a fire situation is less than ten per cent of the volume used when a sprinkler system is activated. This means that a lot of water is saved. But what is more important is to limit the damage caused by the fire, which is the whole concept behind water mist.*

*The water mist is good for cooling down glass. It acts as a sort of “water film” which quickly spreads over even large glass surfaces, cooling them down.”*

The vision is to make a close connection between Research Park, university and culture by creating innovative and unique solutions. High-pressure water mist is the direct result is a direct result of this vision. It is an innovative and effective method for fire fighting in buildings.

