

THE GROWTH OF WATER MIST

With the European standard for water mist systems now published and implemented, the systems are now making headway

"The unfailing and sustained efforts behind the scenes have helped to catapult the technology into the real world."

More than 20 years have elapsed since a group started to work on a European standard for water mist. This group was TG3 positioned under WG5 (sprinkler systems) within TC 191, a technical body responsible for fixed firefighting systems within CEN, the European Committee for Standardization.

In 2008, the first technical specification was published followed by a second one in 2011. In 2016, the working group for water mist systems was upraised and WG10 was established. And now finally, the first part of the European Standard EN 14972 has been published. The document enumerates requirements and lists recommendations for the design, installation, inspection and

maintenance of all types of fixed land-based water mist systems. CEN members had until 30th June to implement the document as a national standard and have until December to withdraw any conflicting national standards.

EN 14972-1:2020 will give benefit to the water mist manufacturers who, in parallel with the standardization work, have been undertaking fire tests within the scope of the document. Erling Mengshoel, chairman of the board of Prevent Systems, has been representing Norway in the CEN group since 2013. He says: "Although water mist has steadily gained a substantial market share in recent years, the standard is a major milestone. In Norway, the most sprinklered country in the world per head, water mist now

represents ten per cent of the overall residential sprinkler market."

Protecting history

Right from the beginning, representatives of the International Water Mist Association (IWMA) have been involved ensuring neutrality. "Within TG3 and later on WG10, an amalgamation of stakeholders, all contributors were and of course still are considered equal", says Bettina McDowell, IWMA general manager. The unfailing and sustained efforts behind the scenes have helped to catapult the technology into the



Station (ISS) carries portable water mist fire extinguishers.

During an expansion of the Queens University in Belfast, Northern Ireland, it was decided that the new 10,000 square metre annex should have a fixed firefighting system installed.

The institution houses a cancer research center containing highly valuable electrical equipment, and with a water mist system the risk of water damage is reduced to a minimum which results in shorter interruptions in the case of a fire.

The aesthetic appearance of the newly built annex was of importance when deciding for water mist.

Alex Palle, CEO at VID Fire-Kill explains: "As the semi-concealed design of the FIREKILLTM low-pressure water mist nozzles allows a perfect blending with the surroundings of the modern architectural building, our water mist system was found to meet the aesthetical design requirements, the fire protection requirements as well as the requirement for the reduction of water distributed from the nozzles and was therefore chosen for the project."

With reference to EN 14972, VID Fire-Kill supplied a system compliant with EN 14972 part 1 including the use of automatic nozzles compliant with EN 14972 parts 2, 4 and 5, and an atrium system compliant with EN 14972 part 10.

A further project, where a water mist system has been installed with reference to EN 14972, is DNV-Gødstrup, a new 145,000 square metre super hospital complex in Western Denmark. Supplier of the fire safety system was Danfoss Fire Safety.

The hospital consists of a 127,000 square metre somatic department, a 13,000 square metre psychiatric department and a 5,000 square metre research and education

centre. The state-of-the-art hospital will provide more than 400 patient beds.

"The technology chosen to protect specific areas in the Regional Hospital Gødstrup is the SEM-SAFE® high-pressure water mist firefighting system. It comprises a high-pressure modular pump unit, section valves, piping and water mist nozzles. Apart from that we have supplied two SEM-SAFE® high-pressure water mist pump units and an integrated flow test system controlling 52 sections", says Henrik Bygbjerg, global director R&D, service, EHS&Q at Danfoss Fire Safety.

Approximately 10,000 of Danfoss Fire Safety's SEM-SAFE® high-pressure water mist nozzles were delivered to protect the hospital. The nozzles used had previously been proof fit for purpose through large-scale fire testing.



The system chosen for the DNV-Gødstrup project complies with the Danish rules issued by The Danish Institute of Fire and Security Technology (DBI) and is approved in accordance with the DBI Guidelines 254-1 and DBI 254-2 (both bear references to EN 14972).

Bettina McDowell says: "The list of famous and not so famous buildings and projects that are protected with water mist has continuously been

real world. Admittedly, the idea to use a relatively small amount of water to fight fires did not take off straight away. But since 1880, when F.E. Myers manufactured a backpack system with a lance that produced droplets to fight small forest fires, the technology has undergone a huge development and has come a long way. Today, there are many famous buildings and spaces that are protected with water mist systems like St. Patrick's Church in the centre of Manhattan, La Scala in Milan, the clock tower in Mecca, St. Mark's Basilica in Venice, the archive at the Bodleian Library at Oxford University and Windsor Castle. Also, the Eurotunnel between the United Kingdom and the continent is protected with water mist and even the International Space

getting longer over the years. One of the reasons is that manufacturers have been using the technical specification TS 14972 as a basis for their work for years."

Water mist: the benefits

An additional reason is most probably the list of benefits: Water mist is a suppressant agent that is applicable on a broad range of fire types. It does not harm humans, it reduces the heat and the oxygen within the fire triangle and the cooling effect prevents re-ignition. Water mist systems are easy to install, retrofit and extend. The components are relatively small as only a relatively small amount of water is needed. Due to the size of the droplets water mist is well distributed, fills many nooks and crevices within seconds of activation.

Ann Micheli, managing director at Ultra Fog, says: "EN 14972-1:2020 has been a long time in the making, and its publication is a noteworthy step in the right direction. It is so often the case that legislation and standards lag behind the advance of new technologies, and nowhere

more so than in the water mist fire suppression industry. As a manufacturer of water mist fire suppression systems, our priority is to ensure that our customers are installing quality controlled, tested and certified systems. A harmonised European standard with clearly defined test protocols against which our systems can be tested and approved will help raise the profile

"Water mist systems are based on performance-based testing for the applications they protect."

of water mist solutions in Europe. EN 14972 has the potential to fill that gap."

Henrik Gustafson, operations manager – industrial applications, at Firefly AB, states: "The standard sets a clear framework for the water mist industry on how to work with design, installation, inspection and maintenance for fixed land-based water mist systems. It will help the whole industry on a day-to-day basis and I expect we will see more and more water mist on the market in the following years."

Performance-based testing

Water mist systems are based on performance-based testing for the applications they protect. The standard lists criteria for using water mist in buildings and how the systems should be tested and documented. It consists of 17 parts, parts 2 to 17 being acknowledged test protocols water mist manufacturers have to test their systems against. Annex A in the standard provides a guideline for developing representative fire test protocols for how to undertake large scale fire testing to prove ability to control, suppress or extinguish fires.

With the standard in place, fire safety engineers, authorities having



jurisdiction, architects and insurance companies – to name but a few – can now refer to a standard which the water mist manufacturer must follow ensuring the system specified meets the requirements. Fire consultants, designers and installers of water mist systems now have a standard they can use and base their work on not unlike the standard for sprinkler systems. The key difference is that water mist is performance based, not stipulating a minimum water density required as sprinkler systems do.

Henrik Bygbjerg says: "A recognized European standard for water mist is paramount. More buildings will opt for a technology already proven and tested through extensive full-scale testing over the decades." Markku Vuorisalo, director engineering at Marioff, adds: "The publication of EN 14972 clearly is a landmark achievement for the industry and it is expected to change the way the whole industry is working. Harmonized test protocols are making it easier to compare the systems, third party approvals may not always be needed which would provide flexibility."

"With a European standard covering land-based applications in place, we expect a growing interest for the technology for building protection. In fact, I expect more buildings to be specified with water mist in the very near future", concludes Bettina McDowell.

