European standard for watermist systems finally published

The long-awaited European watermist standard EN 14972-1 was published on 23 December 2020. Fire consultants, designers and installers of watermist 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 watermist is performance-based, not stipulating a minimum water density required as sprinkler systems do. '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 watermist in the very near future,' says Bettina McDowell, general manager of the International Water Mist Association (IWMA).

Henrik Bygbjerg, global director R&D, service, EHS&Q at Danfoss Fire Safety, supports this view and adds: 'A recognized European standard for watermist 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.'

More than 20 years have elapsed since a group started to work on a European standard for watermist. 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 watermist systems was formed and WG10 was established. And then, finally, the first part of the European Standard EN 14972-1:2020 was published. The document enumerates requirements and lists recommendations for the design, installation, inspection and maintenance of all types of fixed land-based watermist systems. CEN members have until 30 June 2021 to implement the document as a national standard and withdraw any conflicting national standards by December 2021.

EN 14972-1:2020 will give benefit to the watermist 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 watermist 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, watermist now represents 10% of the overall residential sprinkler market.'

Right from the beginning, IWMA representatives have been involved in 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.

The unfailing and sustained efforts behind the scenes have helped to catapult the technology into the 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 watermist 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 watermist and even the International Space Station (ISS) carries portable watermist fire extinguishers.

Also during an expansion of the Queens University in Belfast, Northern Ireland, it was decided that the new 10,000m² annex should have a fixed firefighting system installed.

The institution houses a cancer research centre containing highly valuable electrical equipment, and with a watermist 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 watermist. Alex Palle, CEO at VID Fire-Kill explains: 'As the semi-concealed design of the FIREKILL low-pressure watermist nozzles allows a perfect blending with the surroundings of the modern architectural building, our watermist system was found to meet the aesthetical design requirements, the fire protection requirements as well as the requirement for the reduction of water

▼ **Example A of atrium protection to EN14972 part 10. Image courtesy of VID Fire-Kill.**

◀ **Example of a small pump and water tank – a benefit for watermist. Image courtesy of VID Fire-Kill.**

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 watermist system has been installed with reference to EN 14972, is DNV-Gødstrup, a new 145,000m^2 super hospital complex in Western Denmark. The building process began in September 2012 and the opening is scheduled for May 2021. Supplier of the fire safety system was Danfoss Fire Safety.

The hospital consists of a 127,000m^2 somatic department, a 13,000m^2 psychiatric department and a 5,000m^2 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 watermist firefighting system. It comprises a high-pressure modular pump unit, section valves, piping and watermist nozzles. Apart from that we have supplied two SEM-SAFE high-pressure watermist pump units and an integrated flow-test system controlling 52 sections,' says Henrik Bygbjerg.

Approximately 10,000 of Danfoss Fire Safety's SEM-SAFE high-pressure watermist 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 watermist has continuously been 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.

'An additional reason is most probably the list of benefits: watermist 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. Watermist 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 watermist is well distributed, fills many nooks and crevices within seconds of activation.'

Ann Micheli, managing director at Ultra Fog, adds: '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 watermist fire suppression industry. As a manufacturer of watermist 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 of watermist 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 watermist industry on how to work with design, installation, inspection and maintenance for fixed land-based watermist systems. It will help the whole industry on a day-to-day basis and I expect we will see more and more watermist on the market in the following years.'

Watermist systems are based on performance-based testing for the applications they protect. The standard lists criteria for using watermist in buildings and how the systems should be tested and documented. It consists of 17 parts, parts 2 to 17 being acknowledged test protocols watermist 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 watermist manufacturer must follow ensuring the system specified meets the requirements.

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