

Watermist: from gap filler to stand-alone technology

When watermist reappeared on the stage of fire protection in the late 1980s, it filled a gap that halon, after its phasing-out, had left. At that point, the research that had been carried out in Sweden since the mid-1970s, had reached a point of development that enabled the two scientists Mats Rosander and Krister Giselsson to introduce their findings basically right after the catastrophic fire that had occurred on the *Scandinavian Star* in April 1990 killing 158 people.



Bettina McDowell



Derek Killaspy

Bettina McDowell is General Manager at the International Water Mist Association.

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Watermist offshore

Since then, watermist has become an established technology for the use on board ships. In 1995, the International Maritime Organization (IMO) adopted Resolution A.800 (guidelines for approval of sprinkler systems equivalent to that referred to in SOLAS Regulation II-2/12), which was amended in May 2008 (resolution Res.MSC.265). In 2009, the International Water Mist Association (IWMA) carried out a research project on behalf of IMO. This scaling project proved that in certain spaces – like machinery spaces – less is more. Since 2013, it is mandatory to carry watermist lances on board container ships.

But watermist has not remained an offshore technology. Watermist manufacturers started to supplement marine- with land-based applications

many years back. Sprinkler manufacturers have added watermist to their portfolios.

The boxes and the benefits

Anything new must of course justify its coming into being and bring new and exceptional benefits. When it comes to watermist these are – amongst others – the cooling effect that prevents re-ignition, the local inerting effect that suffocates the fire, the room-filling effect and the green aspect. A look at the fire triangle attests that watermist reduces the heat and the oxygen whereas traditional sprinklers only have an effect on the heat. And watermist also wets the surroundings (thus affecting also the third side of the triangle although

▼ In case of a fire: the liquid expands, the bulb breaks, the system is activated.



not as much as traditional sprinkler systems). Another point is the classes of fire that watermist covers. Watermist ticks more boxes than other fire suppression systems with Class D fires – that involve burning metals – being the only exception.

Watermist – a most versatile technology

All along the way, numerous experimental and scientific research programmes have been carried out regarding watermist in various applications. The potential efficacy of watermist fire suppression systems has also been showcased in a wide range of applications worldwide – also in the UK. Here, one particular area of concern are historic buildings, and it is no secret that both Windsor Castle – which was severely damaged by a fire in 1992 – and the Houses of Parliament are both fitted with water mist systems – the Houses of Parliament with a high-pressure water mist system and Windsor Castle with a high-pressure and a low-pressure system.

Apart from historic and heritage buildings, other typical applications, to name but a few, are the care and healthcare sector, data centres and hazardous areas where the residue after a fire is an issue. And then there are tall buildings.

Watermist fire protection for tall buildings – the safety and business benefits

'UK Home Office statistics show that risk of casualties or fatalities are higher when fires occur in buildings of four stories or more. Smoke, heat and fire can travel rapidly across and between levels, with smoke being the leading single cause of death in residential fires,' says Derek Killaspy, Managing Director at Fireworks Fire Protection Ltd.

Following the Grenfell fire, the Ministry of Housing introduced new safety measures in 2020 including mandatory use of 'sprinkler' systems for all new apartment blocks over 11m high. These measures, along with guidelines on duty of care, are a great step forward. However, traditional sprinklers are a long way behind watermist fire suppression when it comes to performance and life-saving capabilities.

The only fire-suppression solution that combats smoke

Bettina McDowell, IWMA general manager, explains: 'Here at IWMA, we are working to raise awareness of the live-saving



Image courtesy of Danbar Fire Safety

advantages of watermist for fire protection. That is what we have set out to do: save lives, but also properties and jobs!'

When fires occur, evacuating residents is difficult and all the more dangerous as exit routes can be obscured by smoke. One of the major advantages of watermist is that it is the only solution that can suppress and reduce the spread of smoke, helping to provide a survivable environment. When activated, watermist molecules bond with smoke particles, which then fall harmlessly to the floor. This ability to combat smoke is crucial to saving lives. Watermist also delivers faster fire and heat suppression than any other water-based fire suppression system – as proven during independent testing by BRE (Building Research Establishment) and many other international fire and safety test organisations.

Significantly lower water requirements

Traditional sprinklers use significantly larger amounts of water when activated. This can lead to whole floors being completely flooded, posing a threat to structural integrity and causing further collateral damage to the property and contents. Watermist typically uses around 70% less water than sprinklers and so poses no threat to structural integrity when in operation and greatly reduces the risk of damage to contents and other areas unaffected by the fire. This also greatly reduces the space required for water storage tanks.

▲ 90% to 99% of droplets are smaller than 1 millimetre.

Safeguards all areas of multi-use buildings

When it comes to complete building protection, Bettina McDowell says: 'We have seen growing interest in the use of watermist fire suppression systems from constructors, as the same system can be used to protect all areas of multi-use buildings – not only living areas but restaurants, underground car parks and office spaces and private data rooms for example.'

Faster installation and retrofitting

The lower quantities of water needed by watermist systems mean that secondary pumps are not required to deliver sufficient volumes of water up to the higher floors.

Above all, watermist systems use fewer and smaller components than traditional sprinklers. This greatly reduces the installation time needed and makes retrofitting in existing buildings much less disruptive.

No fire-protection technology without a standard

One of the most important tasks during the last years has been the development of a European Standard. On 23 December 2020 EN 14972-1:2020 was published: Fixed



◀ Marioff spray test.

Image courtesy of Marioff

firefighting systems – Water Mist Systems – Part 1: Design, Installation, Inspection and Maintenance. The document is intended to apply to watermist automatic nozzle and watermist deluge systems supplied by stand-alone or pumped systems. It covers applications and occupancies that are covered by the fire test protocols of the EN 14972 series. The member countries – among them the UK – had until 30 June 2021 to implement its publication, either by publication of an identical text or by endorsement and thus give it the status of a national standard. At the same time, they had to withdraw any conflicting national standards.

Bettina McDowell explains: ‘The EN series consists of 17 parts, parts 2 to 17 being acknowledged test protocols watermist manufacturers have to test their systems against. Parts 7 and 17 are based on the British standards BS 8489-7 and BS 8458:2015, respectively. 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.’

The fire tests are part of the concept of watermist being a performance-based technology. Any watermist system is always a bespoke system based on a large-scale fire test. The manufacturer’s DIOM manual explains how to design, install, operate and maintain the system.



◀ Watermist for inside but also outside.

Image courtesy of Friti Fire-Kill

What about the elephant in the room?

But the elephant is still in the room: traditional sprinkler systems! They have been around for more than a century, can be found in all sorts of buildings, are required by fire codes across the globe and even the public know what a sprinkler system is. But what about improvements over time? What about challenges? Or spaces and areas where sprinkler systems cannot or must not be installed? Do we really want to fight fires with masses of water when sophisticated and delicate technology is involved? Nobody would ever think of installing a sprinkler system in a server room or an intensive care unit. And the issues that insurance companies have with watermist systems are identical to the issues they have with sprinkler systems. The fact is that watermist is a mature

technology; it is proven to international standards and guidelines; and it has found its place in the firefighting world.

Events dealing with watermist

In 2022, two major events will deal with watermist. One is Fire Sprinkler International, which is organized by the European Fire Sprinkler Network (EFSN), which will take place in London on 31 May and 1 June and which for some years has been marketed as the only sprinkler and watermist event worldwide. The other event is the 21st International Water Mist Conference organized by IWMA, which will take place in Madrid on 9 and 10 November 2022.

➡ For more information, go to www.iwma.net