

Water mist's past and future (approaching top gear)

In the late 1970s, the two Swedish scientists Mats Rosander and Krister Giselsson published a lecture book entitled *The Fundamentals of Fire*. In this book there is one sentence that clearly sticks out: 'In future, a liquid, e.g. water, atomized to drops smaller than powder grains will be the most important extinguishing agent against flames indoors, so-called fine mist.' At that time, the idea to use a mist, fog or spray to fight fires had not been new. So what these two men did was they brought something back to the surface that had been neglected for a long time.

The problem then, in the late 1970s, was the timing. The French author Victor Hugo once said: 'Nothing is more powerful than an idea whose time has come!' But what if your timing is bad and you are ahead of your peers?

Back in 2015, during a seminar organized by the International Water Mist Association (IWMA), Magnus Arvidsson, fire protection engineer LTH and project leader at RISE in Sweden, said: 'The pioneers of the high-pressure water mist technology have not often been given

the credit they deserve. In actual fact, they were at least ten years ahead of the companies that we see in the market today.' Now, six years later, scientists, researchers and manufacturers have made up leeway, but there is always room for further development. This is a good approach because there is actually always room for improvement. And the fact is: the water mist sector is not the place for a we-have-always-done-it-that-way attitude.

Two events have paved the way for water mist technology: the adoption of the Montreal Protocol on substances that deplete the ozone layer, which – in the late 1980s – determined the phasing-out of halon, and the fire on the passenger ferry *Scandinavian Star*, which in April 1990 killed 158 people, nearly half of those on board. Straight after this catastrophe the scientific findings on water mist were highly sought after. Krister Giselsson founded the first water mist company – Ultra Fog (which is still in business) and in 1992 the first Ultra Fog system was installed in the ro-pax ferry *MS Stena Danica*.

'There has been a lot of water under the bridge since those days and today's water mist community looks back at nearly 30 years of struggle, abasement – especially during the first years – but also at successes and some key moments that brought with them the so vital developments,' says Bettina McDowell, general manager of IWMA. She adds: 'And nowadays, there is also a deeper understanding of the technology among those who were sceptical at first.'

One of the developments is the publication of EN 14972-1:2020 (Fixed firefighting systems – Water mist systems – Part 1: Design, installation, inspection and maintenance). This document was published on 23 December 2020. It was, so to speak, a Christmas present for everybody involved in the water mist industry. Indeed, the people who are involved and the industry that will profit from it are collectively over the moon. Alex Palle, CEO at low-pressure manufacturer VID Fire-Kill, says: 'It is fantastic to now see the result of so many years of hard work. Finally, we were able to get the EN standard for water mist in place.'

He adds: 'It has taken more than 20 years to get where we are now and that is a very long time. On the other hand, a standard that covers fire protection utilising less water than conventional solutions needs time to develop to be a good and solid standard and I believe that this is exactly what EN 14972-1 is.'

The scope of this document is to specify requirements and give recommendations for the design, installation, inspection and maintenance of all types of fixed land-based water mist systems. It is intended to apply to water mist automatic nozzle systems and water mist deluge systems supplied by stand-alone or pumped systems. It covers applications and occupancies which are covered by the fire test protocols of the EN 14972 series.

The member countries have had until 30 June 2021 to implement its publication, either by publication of an identical text or by endorsement and to thus give it the status of a national standard. At the same time, they had to withdraw the technical specification CEN/TS 14972:2011 as well as any conflicting national standards.

Standards are of course not retrospective so anything in place (planned or contractual) before publication and implementation in any specific country may remain in place. And the EN 14972 series are voluntary standards so standards like NFPA 750 can still be used.

With regards to national standards, the CEN rules say that the conflicting parts of standards are obliged to be withdrawn when the EN series are published. Parts of standards that are not covered can remain; management of this is up to the national standardization bodies. Two possibilities are writing a national foreword and/or national annexes for each of the parts and keeping what is not conflicting.

Bettina McDowell explains: 'The EN series 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 part one of the EN 14972 series published, water mist has been upgraded to the next level and the question is now: Is the publication of part one of the series

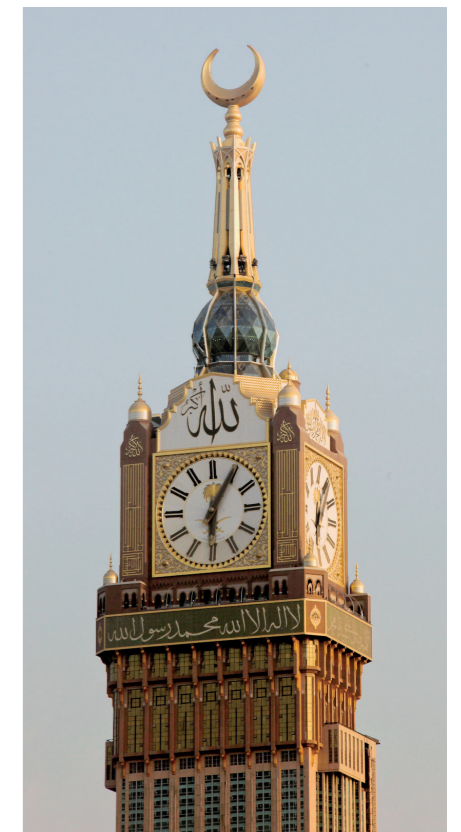
the missing link between the technology and the exponential growth of the market share? Could water mist systems actually take over the fire protection industry? In a world that is concerned with ever growing safety concerns and at the same time worried about the environmental impact of some of the suppression agents, water mist could well be the answer because only a relatively small amount of the natural resource, water, is needed. Water mist systems use less material and less space, are easy to install, retrofit and extend.

The collateral damage is also relatively small. Another challenge is the disposal of the residue after fire incidents in hazardous areas like the nuclear industry and in pharmaceutical and electronic manufacturing. When a fire breaks out in such areas this can result in the release of many different toxins and chemicals from the fuel of the fire and/or the gases. The firewater gathers these substances and has to be picked up and disposed of after a fire, which is a difficult job that becomes easier the less water there is.

Water mist systems do not harm people, the cooling effect prevents re-ignition and another advantage is of course the classes of fire that water mist can cover. Water mist ticks more boxes than other fire suppression systems, the only exception being Class D fires that involve burning metals.

Along the way, numerous experimental and scientific research programmes have been carried out regarding water mist in various fire suppression applications. And the potential efficacy of water mist fire suppression systems has been showcased in a wide range of applications all over the world. Some of them are famous like the clock tower in Mecca and La Scala in Milan, while others are less spectacular like, for example, data centres, train stations and hospitals.

One can argue that nowadays the technology stands on solid ground. Still, there is always the elephant in the room: traditional sprinkler systems, regarded by many as superior because of a more established method. Traditional sprinkler systems have been around for a century, can be found in all sorts of building types, are required by fire codes across the globe and everybody – even the broad public – know what a sprinkler system is. But, there have been few improvements since the early days.



▲ Clock tower.

So, the issue could well be that water mist will grow into a position where the professional firefighting world will look at it as equal to sprinkler systems. And one day the technology could well outperform traditional sprinkler systems. The water mist community has long put the equivalency discussion aside to, for example, focus on the standardization work. It is others that try to challenge the water mist community when in reality there is neither a challenge nor a contest. Because there is a bridge and this bridge is water. Any manufacturer involved in water-based fire suppression systems can use it easily and many have done it, although only in one direction from sprinkler systems to water mist systems. Alex Palle, CEO at VID Fire-Kill, says: 'I guess now we can stop saying that sprinklers are the conventional technology because with water mist standardized this technology is as conventional as sprinklers.' So now there is a realistic choice for those that manufacture systems and those that order them.

For more information, go to www.iwma.net

▼ Magnus Arvidson (RISE).



▼ Alex Palle.



▼ Bettina McDowell.

