



# Sustainable by design

**Bettina McDowell** suggests how watermist fits into a world that is increasingly facing the many challenges of environmental protection

**S**USTAINABILITY AND eco friendliness are part of the current zeitgeist. Humankind has an impact on nature, and all too often it is a negative one. Everyone is talking about climate change and with the need to countersteer manifest, many of those who have tried to avoid this topic in the past now either feel obliged to face up to it or are actively wanting to do so.

Some argue that living conditions and the climate have always changed, which of course is absolutely true. However, Earth Overshoot Day is coming earlier every year. So, would less actually be more?

## Some history

In the 1980s, the world acted to save the ozone layer. The news that chemicals found in many personal hygiene products had caused an ever larger hole was dramatic and spurred on the signing of the Montreal Protocol.

One of the substances which was then banned was halon, which was a chemical used amongst others as a fire suppression agent

that had done a good job: it was effective, efficient, cheap and easy to install, but had also caused ozone depletion. Regarding fire protection, the phasing out of halon left a gap that was filled by watermist technology.

## Watermist credentials

Now, what makes a watermist system a sustainable and eco friendly system? The first two obvious points here are that a watermist system uses water – indeed less of it – and that water is pure, natural, and also precious. Henrik Bygbjerg, global director of research and development, service and environmental health, safety and quality at Danfoss Fire Safety notes that, particularly in the Middle East, 'using less water means less water has to be drawn from drinking water resources'.

Water based fire extinguishing systems make up by far the largest share of the extinguishing technology sector. Watermist systems use up to 85% less water than traditional sprinkler systems and are either connected to the mains or a tank.

If they are connected to a tank, this tank clearly does not need a lot of expensive square meterage. The other option of using the mains and thus the existing infrastructure can make watermist systems attractive to home and building owners. If they choose watermist, not only does the system protect the building itself, it also increases the level of protection for life safety by attacking the fire without using harmful substances, while also using less water and reducing potential water damage.

Watermist systems and traditional sprinkler systems can only be compared to a certain degree. However, an end user looking for a water based fire protection system should be made aware of the fact that traditional sprinkler systems are fed from a huge water tank with a large amount of water sitting in it unused, sometimes for years.

A smaller tank or connection to the mains brings space savings, material savings and consequently cost savings. The same applies to other vital components such as pipes, valves and pumps. Watermist systems are quick to install and easy to retrofit, and integrate into existing buildings where users simply cannot give up the space for a tank or prefer not to do so.

In historic buildings, the integration of a fire protection system can be intricate, so the possibility of having no tank and using smaller diameter pipes can make watermist a good option. Should the need arise to extend an existing system with additional areas included in the overall fire protection concept, the

minimum required nozzle pressure can easily be reached.

On the longevity of systems, Mr Bygbjerg recommends using stainless steel in all components which will come into contact with water. He adds: 'Using stainless steel also helps moving towards circular construction and buildings as it is easier to reuse than, for example, galvanised or plastic pipes.'

Michael Bindreiter, head of global sales at Aquasys, also notes: 'The use of high quality corrosion resistant stainless steel prevents contamination, supports a high hygiene standard and the longevity of the system.'

### **Ecological disposal**

Talk of contamination and hygiene brings us straight to the next point: the challenge of disposing of the residue after fire incidents in hazardous areas located in, for example, 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.

Luciano Nigro, president at Jensen Hughes srl, explains that the firewater gathers these substances and adds: 'In hazardous areas, the extinguishing water has to be picked up and disposed of after a fire, which is a difficult job that becomes easier the less water there is. The water discharged by a watermist system is much less in quantity and therefore easier to contain and much less expensive to dispose of.'

## **Case study – Onenergy srl power plant, Italy**

HERE AND overleaf, we will look at case studies of several organisations across Europe in the industrial, retail, hospitality and research sectors that have set out to protect the environment in their different fields.

In 2016, watermist manufacturer Marioff provided the fire protection system for a machinery space within a renewable energy power plant located in Carmignano di Brenta, a small town in the province of Padua in Italy's Veneto region. Operated by Onenergy srl, the co generation plant is run on animal fats (liquid biomass) and produces 1,000 kW of electricity and 500 kWh of thermal energy.

The aim was to install a system compliant with the goal of sustainability, which provided fire safety protection that would bring positive benefits to the workforce when in operation.

It was decided to install a pre engineered, twin fluid watermist system: HI-FOG MAU (machinery space accumulator unit), which uses water and nitrogen, and is FM approved for the protection of machinery in enclosures with volumes less than 9,175ft<sup>3</sup> (260m<sup>3</sup>). A detection system is used to actuate the HI-FOG system.

Massimo Ferretti, Marioff's area sales manager, explained the installation: 'The customer was very keen to have a watermist system because it does not harm humans; because the impact on the production plant in case of an emergency would be minimal; because it has no impact on the environment; and because there are no disposal costs for the extinguishing agent, thus the system as a whole protects staff, plant and environment.' ■

## Case studies – The Green Pea, Italy; Alsik Hotel, Denmark; State Laboratory, Germany



### Green Pea, Turin

AS MORE and more buildings are being designed with the environment in mind, clients are increasingly choosing watermist systems because the technology is eco friendly. It simply does not make sense to opt for a fire protection system that is not environmentally friendly.

One such building is the Green Pea, which is a four storey, multipurpose centre in Turin, Italy, with a focus on eco friendly retail and dining. It is being built based on the principles of sustainable architecture, with minimal impact on the environment. VID Fire-Kill, together with its Italian distributor Bettati Antincendio, will contribute to the redevelopment of the building.

Alex Palle, chief executive officer of VID Fire-Kill, commented: 'Here, environmentally friendly firefighting meets the principles of sustainable architecture, as the aim is to impact the environment as little as possible.'

The Green Pea has been devised as a living structure, with wood being the ever recurring theme. The entire building is clad in wood panels and vegetation is part of the composition. Due to the natural materials used, the project requires a unique, effective fire protection strategy that will blend into the surroundings.

Since the aim was to have a low impact on the environment, the customer was on the lookout for a matching fire protection system. Mr Palle explained: 'The end customer knew that our low pressure watermist system, with its low water and power consumption plus the concealed design, was the perfect match for the mentioned requirements.'

### Alsik Hotel, Sønderborg

In early 2019, the Alsik Hotel opened in the beautiful harbour city of Sønderborg in southern Denmark. Right from the concept stage, the high rise building played a special role in a city that has made a commitment to becoming one of the most environmentally friendly locations in Denmark. Known as Project Zero, the hotel has fully embraced the goal of the local community: sustainable growth and a carbon free future.

When planning and erecting the building, the aim was to optimise the supply and use of energy, water and materials, and to ensure that the hotel is run in as environmentally friendly a way as possible.

To comply with the sustainability vision of the building and the city, all suppliers were carefully selected, with only the most energy efficient ones considered.

Danfoss Fire Safety was given the task of implementing the fire safety system for this 'green' hotel, which has a surface area of almost 25,000m<sup>2</sup>. The 2,500 nozzles that have been installed cover OH1, OH3 and OH4 applications such as offices, 190 hotel rooms, two restaurants, nine meeting rooms, a spa, fitness studios, the atrium and storage areas.

Mr Bygbjerg of Danfoss commented: 'We are extremely proud to have been chosen as the supplier of the fire protection system, and to be part of a construction project that makes a real statement in terms of expertise in clean tech solutions. In line with the sustainability vision, high pressure watermist technology for fire safety in the Alsik Hotel was the best choice, as water is a 100% environmentally friendly firefighting medium.'

### **State Laboratory, Berlin**

More than ten years ago, the State Laboratory Berlin-Brandenburg was opened. It was the first transnational state research institution in Germany to deal with a wide range of topics related to consumer protection, radiation protection, animal disease control and disaster control.

In the four storey building, 249m<sup>2</sup> of laboratories with a high level of security are protected by a modern, high pressure watermist system from Aquasys. In order to meet the special requirements of laboratory operations, the fire protection concept was implemented in close consultation with planners, authorities and the client.

During commissioning and approval of the system at the end of 2018, the functional capability was successfully tested in interaction with the fire alarm technology and was handed over to the customer. The disposal of contaminated water in case of an emergency was one of the key factors that led the customer to select a high pressure watermist system in preference to a traditional sprinkler system.

Michael Bindreiter, sales group manager at Aquasys Technik GmbH stated: 'No wonder that high pressure watermist technology has come into the focus of such applications over the last few years.'

He added: 'The prevention of corrosion in the piping, the option to use demineralised water together with high grade stainless steel and in consequence being able to lower the risk of contamination ensures that even the highest cleanliness requirements can be met.' ■

Besides this, the overall damage is reduced due to less water being discharged. An important point here is that the less water there is, the quicker it evaporates. This again means cost savings, because there is less downtime for businesses – and looking at it from the environmental perspective, we are talking about less waste and thus the possibility to salvage resources, because less infrastructure, furniture and equipment has to be replaced.

### **Cooling of fires**

Another point is the room filling effect: due to the size of the droplets, watermist is well distributed, and fills many nooks and crevices within seconds of activation – something that more languorous sprinkler droplets cannot accomplish. Watermist is permanently discharged and thus the area is continuously fed with new fine droplets.

Most of them can directly interact with the source of the fire, and all of this leads to a massive cooling effect that prevents reignition, a good shielding of heat radiation and consequently the insulation of the fire.

### **Sensitive areas**

Environmental awareness promotes the dual goals of being in harmony with and protecting the environment. A key aspect here is the protection of sensitive areas and high tech equipment under sensitive environmental conditions, while at the same time reducing the risk of contamination.

This is a constant challenge for the operators of laboratories, data centres, hospitals or semiconductor production facilities. In these surroundings, the technological advantages of a combination of watermist and the use of high quality stainless steel – especially for pipes, but also for all other components which come into contact with water – are the principal benefits of the system.

Global climate change has been identified as one of the most important – if not the most important – environmental challenges to be faced by humanity in the 21st century. In 2019, Earth Overshoot Day was on 29 July; in 2020, it was on 22 August.

The COVID-19 pandemic has caused the ecological footprint of humanity to shrink, but we must remember that real sustainability can only ever be achieved by design, not by disaster ■

**Bettina McDowell is general manager of the International Watermist Association. For more information, view page 5**