WATER MIST – APPLYING THE SCIENCE

The idea of using water mist first emerged more than 100 years ago. The idea did not take off back then, but since its second coming in the 1970s, the technology has come a long way. Due to the usage of water and reduced water consumption, the technology is an eco-friendly alternative to other fire suppression technologies. Plus, quite a few incidents have shown that water mist systems are an efficient and reliable way to protect lives and buildings.

One of many examples: On 13 August 2025 an activation in a child's bedroom in Scotland demonstrated how water mist can save lives. An electrical fire – caused by a faulty electric fuel supply – had broken out in a timber-frame home occupied by a lone parent and their dependants. The fire ignited the bed and mattress. The fire service was called at 9:13, mobilised at 9:20 and reached the scene of the fire at 9:34. By then the fire had already been contained, all occupants escaped unharmed, and the rest of the house remained protected. The system was installed by iMist™, a water mist company based in the UK.

'The safety and well-being of residents is always our top priority. The iMist system not only allowed the family to escape safely but fully extinguished the fire, saving lives and protecting property with minimal disruption,' said Alex Pollard, operations director at iMist Fire Suppression.

HIGH-PRESSURE WATER MIST IN THE 'LEONARDO DA VINCI' MUSEUM OF SCIENCE AND TECHNOLOGY IN MILAN

The Ebe schooner, displayed at the Leonardo da Vinci Museum of Science and Technology in Milan, is a rare historic wooden vessel representing irreplaceable maritime craftsmanship. As a unique cultural artefact, it requires fire protection that ensures life safety while preserving fragile, original materials and minimising risk of secondary damage.

For this project, high-pressure water mist technology was selected to meet these demanding requirements. Specifically tested for sensitive applications, the Sinorix high-pressure water mist system from Siemens provides rapid and effective fire suppression using fine water droplets discharged at high pressure. Compared to conventional water-based systems, it significantly reduces water consumption. The system activates only at the fire location, enabling targeted suppression while minimising water exposure, reducing secondary damage, and safeguarding delicate structures.

Heritage projects are typically addressed using a performance-based design approach. Unlike prescriptive solutions, this method allows fire protection strategies to be tailored to the unique characteristics of each asset while demonstrating compliance with defined fire safety objectives. As Henrik Bygbjerg, director of testing and approvals at Siemens A/S, explains: 'Fire protection strategies cannot rely on a single standard and may require application-specific considerations, unique to each project.'

Installation is equally critical in heritage environments. Sinorix systems use lightweight, thin-walled stainless-steel piping with small diameters, enabling discreet routing through confined, visually sensitive areas while minimising structural impact.

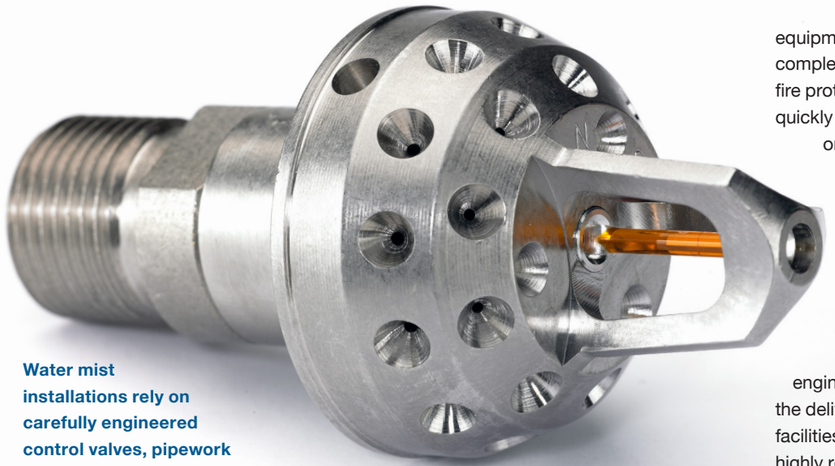
Developed in collaboration with Jensen Hughes, the Ebe schooner project demonstrates how modern fire protection solutions can effectively protect cultural heritage while preserving historical integrity.

The historic Ebe schooner at the Leonardo da Vinci Museum of Science and Technology in Milan is protected by a high-pressure water mist system designed to minimise secondary damage to fragile heritage materials.

THE GASOMETER IN BERLIN – SUSTAINABLE FIRE PROTECTION IN A LISTED STEEL STRUCTURE

Few projects combine history and the future as impressively as the Gasometer in Berlin. Built in 1913 as a gas storage tank for a power plant, it has been converted in recent years into a modern 18-storey office tower. The characteristic steel structure and appearance of the building had to be preserved during the conversion, so the listed building was given a fully glazed façade behind the historic steel framework. Additionally, the Gasometer also houses event rooms, technical floors and a car park. With a diameter of 60 metres and a height of 78 metres, the Gasometer is one of the three largest gas domes in Europe and placed the highest demands on fire protection. Exposed steel structures, a fully glazed façade and high ceilings called for a system that combined safety, aesthetics and technical feasibility. The engineering firm HHP therefore designed a VdS-approved high-pressure water mist system.

'The entire fire suppression system was planned in Revit 3D taking spray obstacles into account,' said Rüdiger Kopp, managing director at Fogtec. The building complex was equipped with a so-called automatic wet system with glass bulb nozzles. Around 5,000 nozzles and 34 section valves were installed on the 18 floors. Redundant pump units and two water tanks in a pump room measuring just 25 square metres ensured an operating time of at least 60 minutes. The effectiveness of the system was validated in fire tests in accredited fire laboratories and witnessed by France's ▸



Water mist installations rely on carefully engineered control valves, pipework and hydraulic systems.

National Centre for Prevention and Protection (Centre National de Prévention et de Protection — CNPP) and Germany's Institute for Applied Fire Safety Research (IFAB). The scenarios in the event area with a room height of 12 metres and in the car park with electric vehicles were particularly challenging. In both cases, the high-pressure water mist reduced the temperature and heat radiation to a safe level within a few minutes. In the case of the electric vehicles, the propagation of fire to neighbouring vehicles was prevented.

Thanks to the small pipe diameters, the system could be seamlessly integrated into the historic steel structure. The Gasometer thus exemplifies how modern fire protection, monument preservation and sustainability merge into a holistic solution with high-pressure water mist.

LOW-PRESSURE WATER MIST PROTECTS HYPERSCALE DATA CENTRE FACILITIES IN PARIS

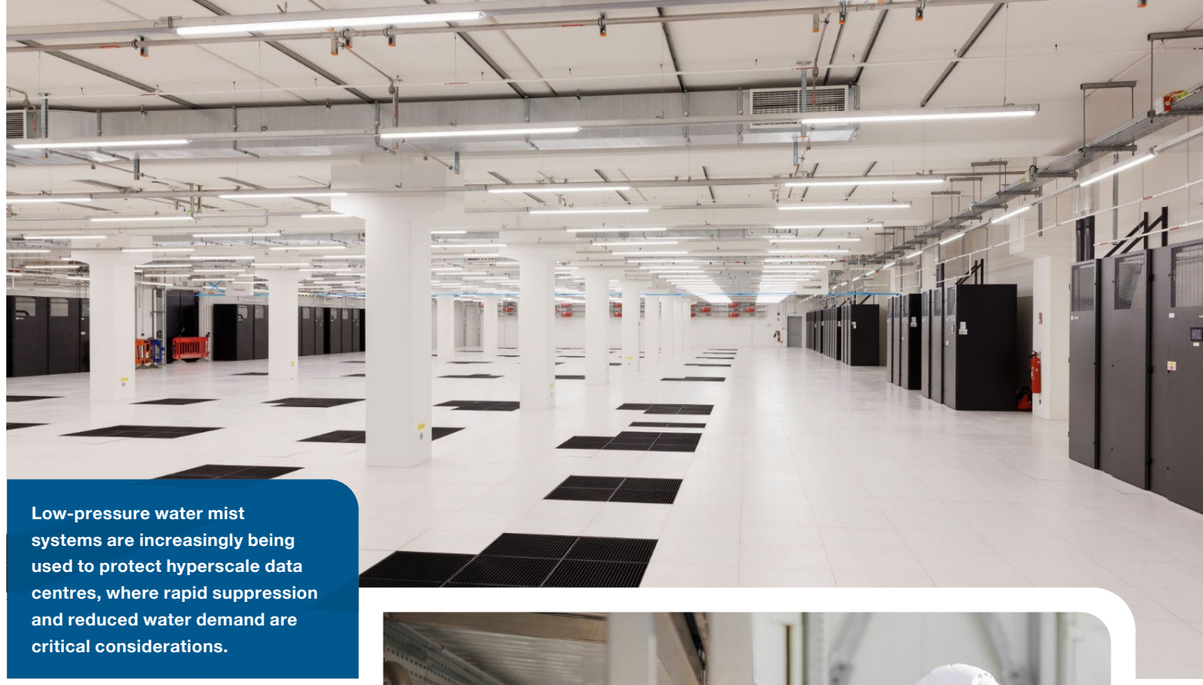
The rapid expansion of hyperscale digital infrastructure is creating new challenges for fire protection engineering. Data centres combine high-density electrical equipment, critical IT infrastructure and complex mechanical systems, requiring fire protection solutions that can respond quickly while minimising potential impact on sensitive equipment.

One example is the Paris Digital Park campus in La Courneuve, north of central Paris. Developed and operated by Digital Realty, the campus includes four facilities delivering a combined IT capacity of 76 MW. Within this development, engineering contractor Mercury led the delivery of the PAR10 and PAR11 facilities, supporting the construction of highly resilient data centre infrastructure designed to meet the growing demand for cloud computing, artificial intelligence and digital services.

The PAR10 and PAR11 buildings required a fire protection solution capable of protecting multiple operational areas, including data halls, technical rooms and generator areas. To address these requirements, a low-pressure water mist system was implemented to provide integral protection across the facilities.

The installation includes approximately 7,000 water mist nozzles and around 200 control valves integrated within the building infrastructure. The system suppresses fire primarily through rapid cooling of the fire environment, as fine water droplets absorb heat and reduce temperatures in the combustion zone.

Fine water droplets discharged at high pressure rapidly cool the fire environment while using significantly less water than conventional suppression systems.



Low-pressure water mist systems are increasingly being used to protect hyperscale data centres, where rapid suppression and reduced water demand are critical considerations.

'Compared with traditional sprinkler systems, water mist technology can significantly reduce water demand while allowing more compact piping networks. This allows for more compact on-site water reserves and drainage systems while maintaining the level of protection required for critical infrastructure environments,' explained Riccardo Cerati, global business development director at VID Firekill.

As hyperscale data centres continue to expand globally, water mist technology is increasingly considered a viable solution for protecting mission-critical digital infrastructure.

IN ANY CASE: YOU NEED TO GET IT RIGHT! – INSTALLATION OF WATER MIST SYSTEMS

'The installation of water mist fire protection systems is a highly specialised activity that must be undertaken by a competent and approved installation company,' said Lee Haines, sales director at Fireworks Fire Protection Ltd, UK. He added: 'It is imperative that the installer is an authorised partner or distributor of the original equipment manufacturer (OEM). This approval demonstrates that the installer has direct access to the OEM's technical support, system components, and up-to-date design requirements.'

Approved installers are required to have completed OEM-led training and certification. This training ensures that engineers fully understand system design principles, hydraulic calculations, component selection, commissioning requirements, and ongoing maintenance obligations. Certification provides assurance that the system will be installed in accordance with the manufacturer's tested and approved methodology.

Correct installation and commissioning by trained, OEM-approved contractors is essential to ensuring water mist systems perform as tested and certified.

Prior to any system being offered for installation, the OEM must have undertaken comprehensive fire testing at an ISO accredited fire test laboratory. These full-scale fire tests form the basis of the system's performance claims and are essential in demonstrating compliance with recognised standards. The test programme results are captured within a Design, Installation, Operation and Maintenance (DIOM) manual.

The DIOM defines the exact conditions under which the system has been proven to perform, including nozzle spacing, discharge characteristics, ceiling heights, and the presence of obstructions such as beams, ductwork, or services. Installers must strictly follow the DIOM to ensure that real-world installations replicate the tested configuration.

Correct installation by an approved and trained contractor is therefore critical to system effectiveness, regulatory compliance, and life safety.

More on water mist applications, standards, training and research on 7 & 8 October in Prague at the 25th International Water Mist Conference which is organised by the International Water Mist Association (IWMA).

For more information, go to www.iwma.net/home