

Fire protection in sensitive areas with high pressure water mist

Finding the optimal solution for the protection of high tech equipment under sensitive environmental conditions, while at the same time reducing the risk of contamination and taking care for the safety of persons in case of a fire, is a constant challenge, especially for operators of facilities such as laboratories, data centres, hospitals or semiconductor production facilities.

During the past years the high pressure water mist (HPWM) technology has been brought more strongly into focus of such organisations. It is a proven, reliable and innovative technology used for the protection of machinery equipments, different kind of buildings and important infrastructure objects. This article demonstrates how AQUASYS, a manufacturer of high pressure water mist systems accepts these challenges and offer smart system design and individual engineering solutions to satisfy clients around the world.

Facts about AQUASYS and high pressure water mist

AQUASYS is a pioneer in the development of HPWM solutions for more than 25 years and is part of a family owned group of companies with more than

50 years of experience in fluid and automation technology.

The outstanding effect of AQUASYS HPWM is based on water, which flows at high pressure through specially designed and manufactured nozzles. This process creates an extremely fine water mist expanding three-dimensionally and filling all kind of rooms, edges or facilities within seconds after activation.

The very fine water mist with a droplet size between 0,050-0,300 mm literally is spread in the room. As soon as the droplets approach the fire they evaporate due to natural thermals and the volume multiply 1,675 times!

This vaporization extract the energy of 2.3 MJ per litre of water from the fire source. At the same time the oxygen is displaced by the larger volume of the evaporated water mist. Due to the room-filling effect and the permanent feeding of new droplets, on one hand these results in a massive cooling effect, and on the other hand in a very good shielding of the heat radiation and thus an insulation of the fire.

The combination of product development, capability to execute fire tests and simulation, project and customer specific engineering, project management, component production, system installation, on-site-training as

well as service and maintenance within our company allows AQUASYS to support our clients with innovative concepts and solutions worldwide.

Less water and smart system design

The combination of the technological benefits of water mist and the use of high-quality stainless steel, especially for pipes but all other components contacting water, are the main benefits of the system. No corrosion will occur and this leads to the fact, that AQUASYS fire protection systems show a significantly lower risk of contamination. Therefore, it cope with highest cleanness requirements. Furthermore, the use of high-grade stainless steel leads to longer lifetime of the system and allows the use of demineralised water.

The AQUASYS system with high pressure water mist achieve higher efficiency and at the same time lower water consumption compared to common sprinkler systems. This leads to a smarter system design, less space requirements and cost-reducing effects due to significantly tinier water tanks, valves, pump units and reduced piping dimensions between 12 mm to 42 mm.

The system pressure of about 140 bar allows more flexibility concerning the design of the pipeline network compared to other suppression systems operating at lower pressure. This allows longer pipe distances, more curves and flexible pipe routes without worrying about pressure loss. Particularly if the system should be extended and new areas should be integrated in the fire protection system, the AQUASYS technology shows more flexibility in reaching the minimum required nozzle pressure.

Depending on the possible energy sources, ambient conditions or space, oil-free and maintenance-free pumps with electric motor Power Pack, optional with diesel- or gas-powered Power Pack solutions are available.

◀ Extensive R&D center.

Individual engineered systems

HPWM systems are individually engineered systems by each manufacturer, which also differs to common used sprinkler or deluge system. While the engineering focus on the individual client, the functional system design as well as the interfaces for activation and communication to central fire alarm systems are based on common standards, which are comparable and linked to other suppression systems.

Providing functional solutions like the supply of pre-assembled nozzle lines or special requirements for rough and sensitive condition (e.g. special supports, special and high quality material demands) the HPWM system can be perfectly integrated to the existing structures on site and reduces the installation time on site.

Different surrounding conditions (high or low temperatures, aggressive, ..), active ventilation, as well as all different kind of obstacles can also influence the system design. This require intensive coordination of all customer specific applications in advance.

Involving the engineering team, qualified with the highest level of expertise and

► Fully stainless steel components and smart design.



experiences, already at the first design stages enables AQUASYS to design and engineer smart engineered systems.

Certified and tested solutions

AQUASYS offers a support package, that includes clarifications with customer's fire marshals, approval authorities, insurance companies or independent notified body enabling a smooth progress in every project stage. Furthermore a wide range of various test certificates for

A,B,C and F fire loads as a background for designing the system are available or can be done on project specific requirements. The possibility of preparation of test specification, doing 1:1 real scale fire tests including as built mock ups and involving specific fire loads such as batteries, cables or server equipment are completing this package provided by AQUASYS.

► For more information, go to www.aquasys.at







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