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# LOW PRESSURE WATER MIST SYSTEMS: FIGHTING FIRES EFFECTIVELY AND EFFICIENTLY

Water mist is a proven fire-fighting solution onboard ship and owners are increasingly aware of the advantages of low pressure systems, writes Stein Lovskar, Commercial Development Manager, Survitec Group

For a fire to survive, it must rely on the presence of the three elements of the 'fire triangle': oxygen, heat and combustible material. The removal of any one of these elements is enough to suppress or extinguish a fire.

While traditional water sprinkler systems remove only the heat element of the triangle, water mist systems remove both the heat and oxygen elements by dispersing water through specially-designed nozzles.

The smaller the water droplet sizes are, the larger the surface area becomes per litre of water and thus the more effective the system is in rapidly reducing the temperature of a fire. To put it another way, when water is converted to steam – which is what happens to the water droplets in water mist – then a large amount of energy is taken from the fire, which results in rapid cooling.

## Low pressure vs high pressure

As a result of their proven effectiveness in fighting fires, water mist systems have become increasingly popular in shipboard applications.

First to the market were high pressure water mist solutions, but low pressure systems are increasingly preferred by owners and yards. The key reasons for this are their easier and less costly installation and maintenance.

In addition, low pressure systems have simpler piping requirements and less risk of clogging. Using a common pump unit and control system, makes it easier to operate and maintain. Furthermore, low pressure systems have lower power requirements than high pressure ones, providing a further potential saving in emergency generator costs.

All water mist systems must pass the same performance-based tests according to International Maritime Organization (IMO) requirements. As a result, there can be no difference in the extinguishing efficiency between low pressure and high pressure systems.

However, there remains a misperception that low pressure water mist systems use more water than high pressure systems. But approval data published in DNV EXCHANGE demonstrates that there is very small difference between the systems and that low pressure systems can even use less water on occasions.

## **Fire-fighting in sensitive spaces**

Owners naturally have concerns when it comes to the combination of water and electrical equipment. However, a review by Liu and Kim<sup>[1]</sup> of water mist fire suppression cites several studies showing that water mist is effective in electronic equipment applications and does not cause short circuits or other damage.

Water mist may in fact have some advantages over gas based fire suppressants due to its heat removal mechanism, which may help to prevent melting of wire insulation and other materials, and due to its non-toxic quality, which may allow uninterrupted human occupation of the compartment.

Water mist can be used in a room where equipment with an Ingress Protection (IP) rating better than IP22 is located.

Another misperception is that low pressure systems can cause more damage to electric and electronic equipment than high pressure systems. In fact, cabinets and cables may be better cooled by the larger water mist droplets.

## **Novenco Fire Fighting (NFF) XFlow<sup>®</sup> water mist system – the ultimate low pressure solution**

Since 2012, Survitec Group has supplied the NFF XFlow<sup>®</sup> water mist fire-fighting system alongside its other solutions. NFF XFlow<sup>®</sup> is a state-of-the-art, low pressure water mist system with a combination of very fine and larger droplets.

Using the patented XFlow® nozzle technology, this low pressure system can provide protection volume up to 5,000 m<sup>3</sup> – a volume which traditionally has required a high pressure system.

The system is performance-based, meaning that its operation is verified at an independent test facility to an IMO performance standard. In addition to machinery spaces, water mist fire-fighting systems can be specified for accommodation and balcony areas in the cruise and leisure yacht markets.

NFF XFlow® water mist system is tested according to multiple IMO standards. For Local Application: IMO MSC/Circ. 1387, Total Flooding: IMO MSC/Circ. 1165 (with scaling according to circ. 1385) and Accommodation: IMO Res. MSC. 265(84), replacing IMO Res. A.800 (19).

More and more leading companies have specified NFF XFlow® water mist system particularly those building high specification tonnage. For these applications, owners selected a low pressure system for its reliability, ease of operation and maintenance, low power consumption and cost effectiveness. The low power consumption in particular reduces the prioritised load requirement from the generators and lowers the capacity drain from the emergency generator.

Supported by the dedicated Survitec Group technical and operational team, NFF XFlow® water mist system provides a proven option for owners and yards seeking a highly efficient and cost effective fire-fighting solution.

*[1] A Review of water mist fire suppression technology: Part II - Application studies Liu, Z.G.; Kim, A.K. Journal of Fire Protection Engineering, v. 11, no. 1, Feb. 2001, pp. 16-42.*

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