How does water mist work?

High pressure water mist sprinkler system for fighting fires

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Topics

- What is the water mist?
- Water mist basic principle
- Performance, perceptions ad advantages
- How does water mist works – videos
- Summary
Ultra Fog: A World Leader in the Development and Application of custom Quality fire protection solutions.

**Marine Applications**
Cruise ships, Ro-Ro, Ro-Pax, tankers, naval vessels, historic ships, special purpose vessels, luxury yachts.

**Land Applications**
Hotels, commercial offices, shopping malls, schools, historic buildings, museums, archives, restaurants, construction, care homes, hospitals, power plants.

**Offshore Applications**
Machinery space, engine rooms, thruster rooms, control rooms, accommodation, spaces, turbine enclosures, galleys, deep fat fryers and ducts, paint lockers.
Typical spray pattern of ULTRA FOG Water mist nozzle
Micro droplets sprayed at high velocity to the base of the fire = **How does water mist works**

![Typical spray pattern of ULTRA FOG Water mist nozzle](image)
The effect of water mist

The very small water droplets allow the water mist to control, suppress or extinguish fires.

- Creates a cooling effect on both the flame and surrounding gases
- Absorbs radiant heat
- Reduces fire energy

...and by evaporation, reduces oxygen concentration near the fire due so that combustion can no longer be maintained.

When the water droplets evaporate, they expand in the air further depriving the fire of oxygen, effectively creating a double extinguishing attack on the fire.
Typical droplet size & distribution

Droplet size in µm at 165bar at 1m from nozzle.

Energy consumption

Temperature increase for 1 litre with 1 degree Celsius = 4,19 kJ
Transforming 1 litre (100°C) water to vapour (100°C) = 2256 kJ

Thus, energy is rapidly extracted from the fire by the enormous surface that is formed by the huge number of very small droplets.
• 48m² cabin – one nozzle – 32 l/min
• Convection
• **Automatic release – 2 million droplets per second**
• *Vapourisation – expansion - cooling*
High cooling effect of the high pressure water mist system
ULTRA FOG system in public facilities with large heights
Comparison:

Traditional Sprinkler System

ULTRA FOG Water Mist System

90% less water
1L of water turns into 1700 litres of vapour!

High Cooling Effect

Shield against heat radiation

Large expansion during vaporisation, stops/reduces oxygen to the fire.

80-90% less water than traditional sprinkler system = less damage

Only water is used

Water mist
FIRE TEST, 1 M2
POOL FIRE, WITH
HELICOPTER FUEL
Nozzles

- **Innovation** ~ is a unique stainless steel nozzle for water sprinkler systems – protected by international patents
- **Development** ~ bulb-nozzle technology that improves the ability to vent the system when installed, which reduces the periodic testing and maintenance of an installed system.

- Ultra Fog 603 Type Bulb Nozzle
- Ultra Fog 202 Type Bulb Nozzle
- Ultra Fog Type Foam Nozzle
The ULTRA FOG System – Primary Components.
Why water mist is your best choice?

- The mist developed by the performance of Ultra Fog high pressure patented nozzles has a definitive cooling effect on a fire.

- The fine mist actually “cleans” the smoke, helping to remove particles of combustion.

- Extinguishing effect of mist relative to the amount of water used is extraordinary.

- Fast extinguishing – fast automatic sprinklers with low RTI value or by detectors.

- Rapid expansion of water droplets reduces the oxygen in the fire zone.

- Risk of flash over is substantially reduced or reduced to ZERO.

- Using less water than conventional sprinklers reduces drain sizes and reduces the amount of hazardous waste generated from discharge.

- Using less water than conventional sprinklers reduces the amount of water required to be stored. Less room, less weight.

- Small stainless steel pipe dimensions result in less weight, ease of installation, and pipe networks that are easy to conceal.

- Aesthetically pleasing nozzles.

- The only wet sprinkler able to be tested while in service using Ultra Fog’s Patented Test tool.

- WATER, the ultimate green agent, environmentally friendly, people safe and readily available.

- Fire systems that have fast response are highly effective, quick and easy to put back into service.
Thank you for your attention.

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