



# How does water mist works ?

IWMC - Cracow - Poland  
15th November 2017

Bogdan Racięga  
Engineering Team Leader



High pressure water mist sprinkler system for fighting fires

Rolling Stock

Marine

Land

Offshore

## Topics

- What is the water mist ?
- Water mist basic principle
- Performance, perceptions ad advantages
- How does water mist works – videos
- Summary



High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe



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.

Rolling Stock

Marine

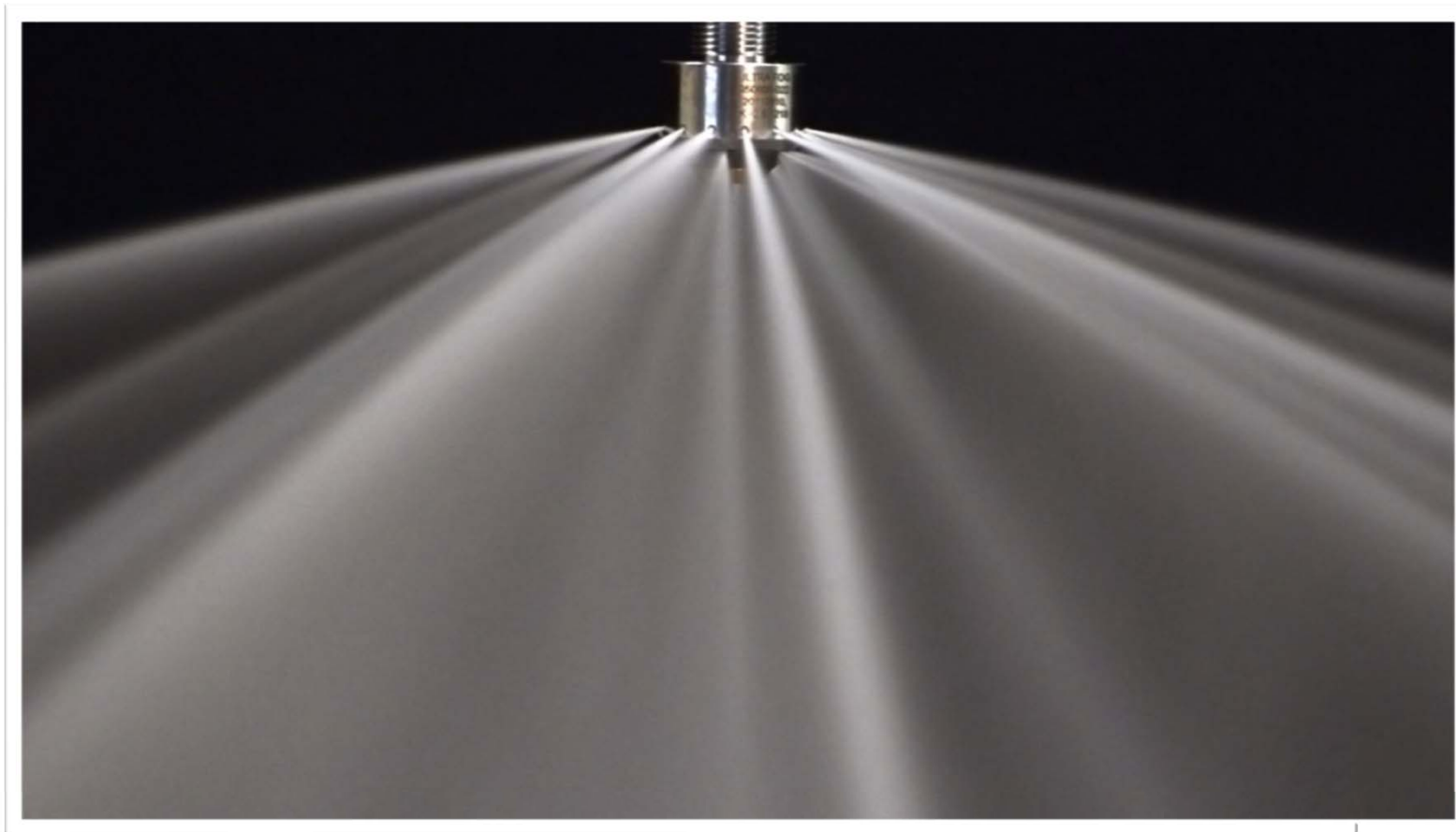
Land

Offshore

High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe



Water + high pressure + special nozzles = Water mist



• Typical spray pattern of ULTRA FOG Water mist nozzle

Rolling Stock

Marine

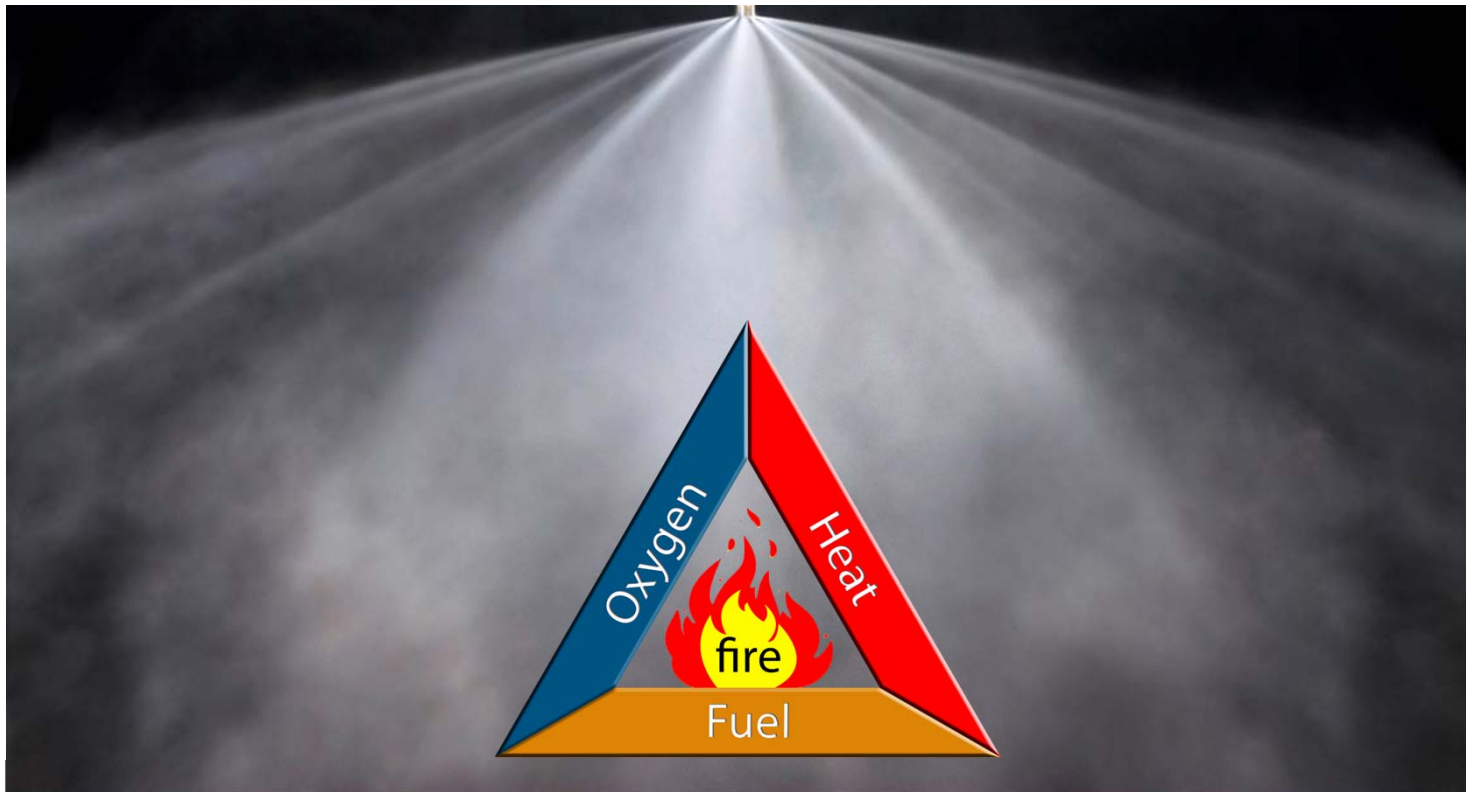
Land

Offshore

High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe



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

Rolling Stock

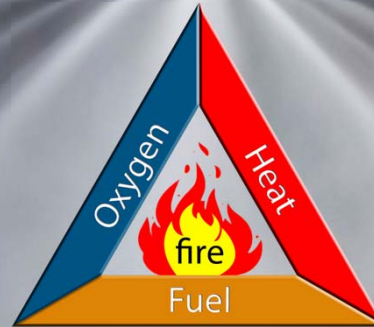
Marine

Land

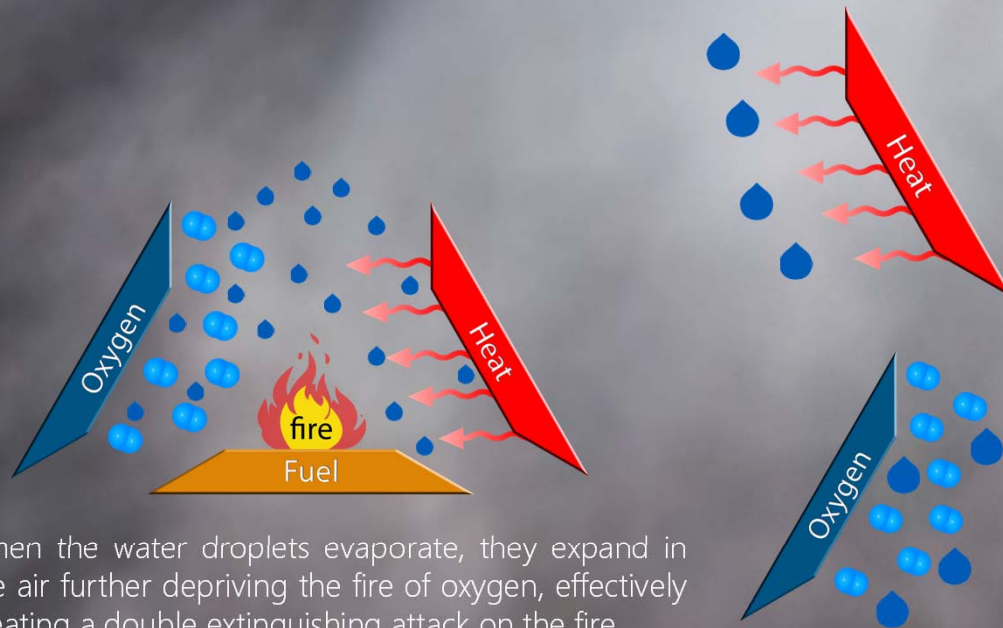
Offshore

## The effect of water mist

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



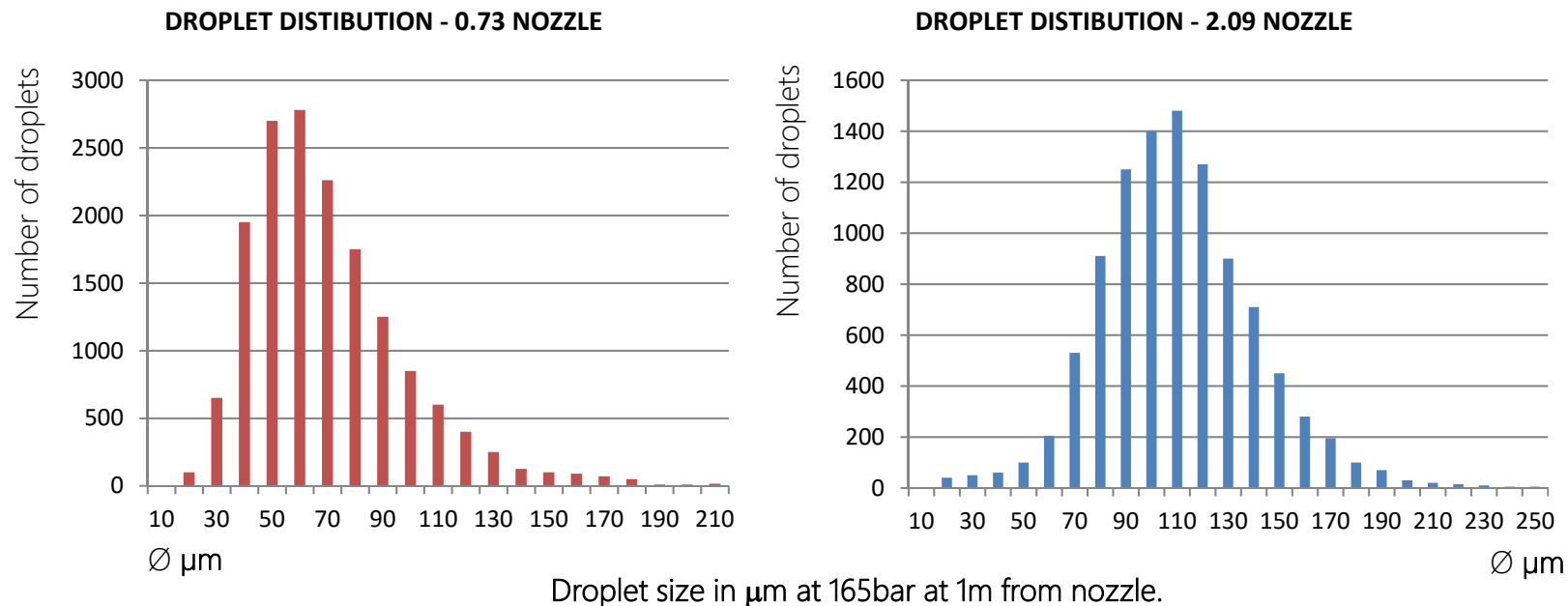
- Creates a cooling effect on both the flame and surrounding gases
- Absorbs radiant heat
- Reduces fire energy



...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



### 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.



High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe



Nozzle type 603-260-061-0



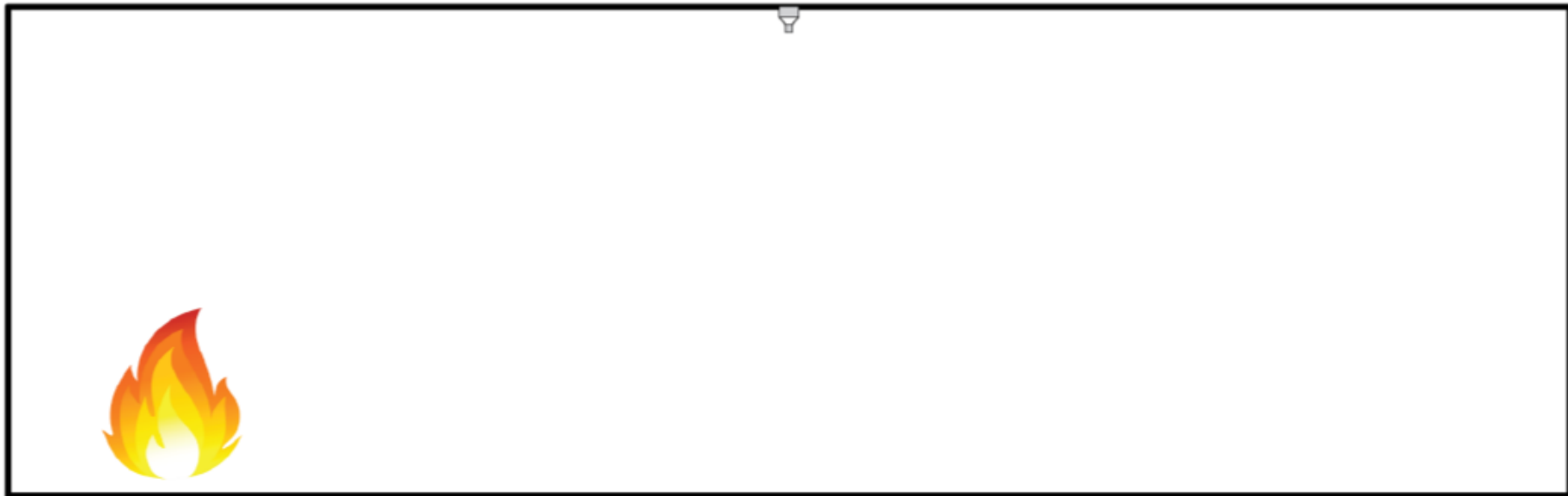
Offshore

Land

Marine



High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe



- *48m<sup>2</sup> cabin – one nozzle – 32 l/min*

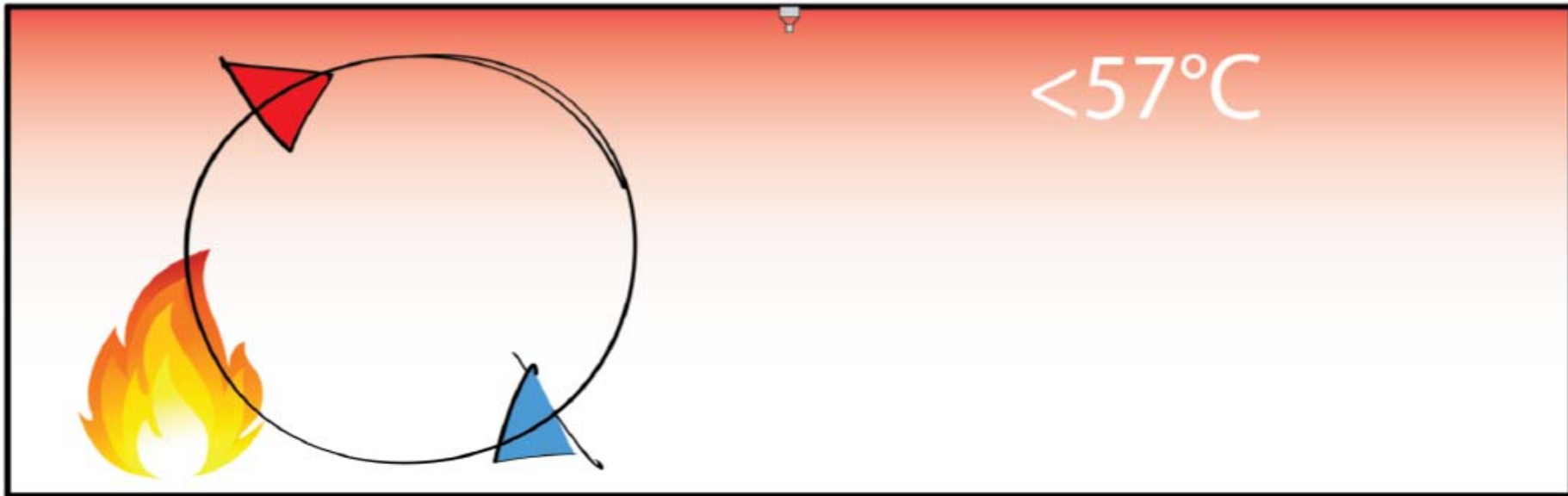
Rolling Stock

Marine

Land

Offshore

High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe



- *Convection*

Rolling Stock

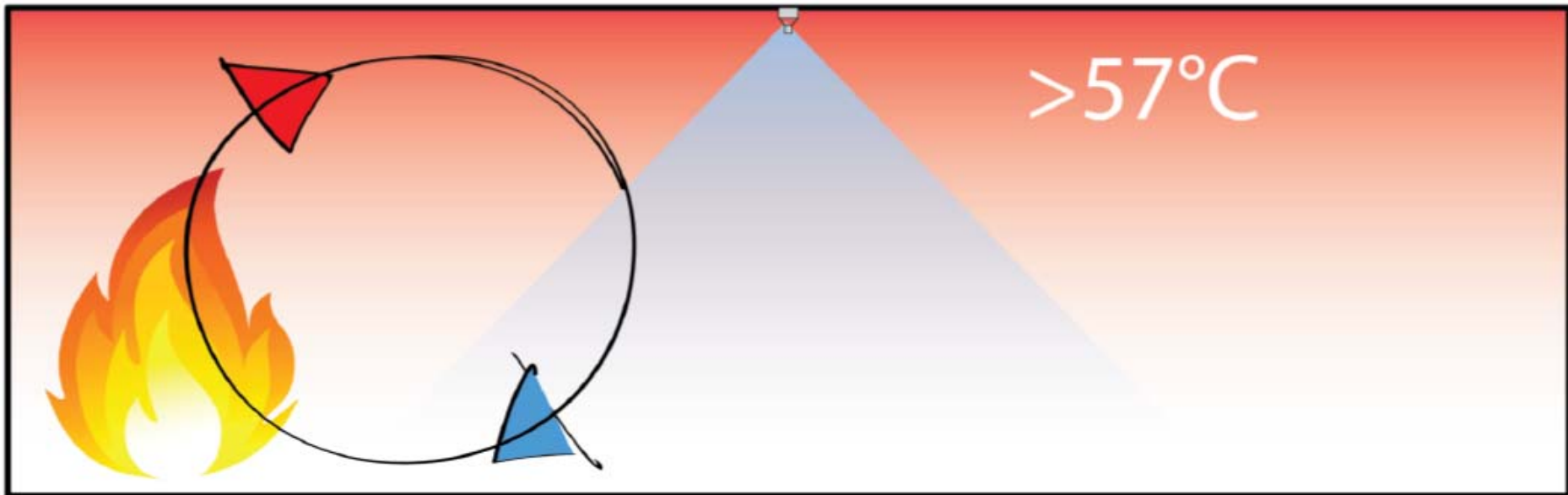
Marine

Land

Offshore

High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe

  
**ULTRA FOG**<sup>®</sup>  
FIRE EXTINGUISHING SYSTEM



- *Automatic release – 2 million droplets per second*

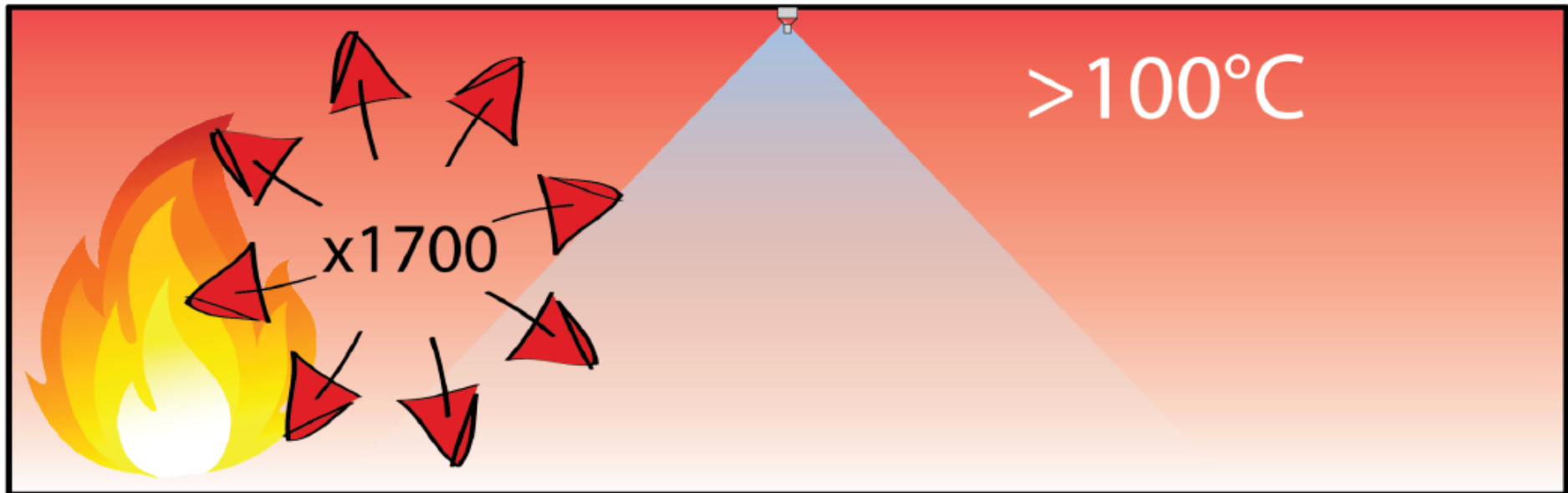
  
Rolling Stock

  
Marine

  
Land

  
Offshore

High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe



- *Vapourisation – expansion - cooling*

Rolling Stock

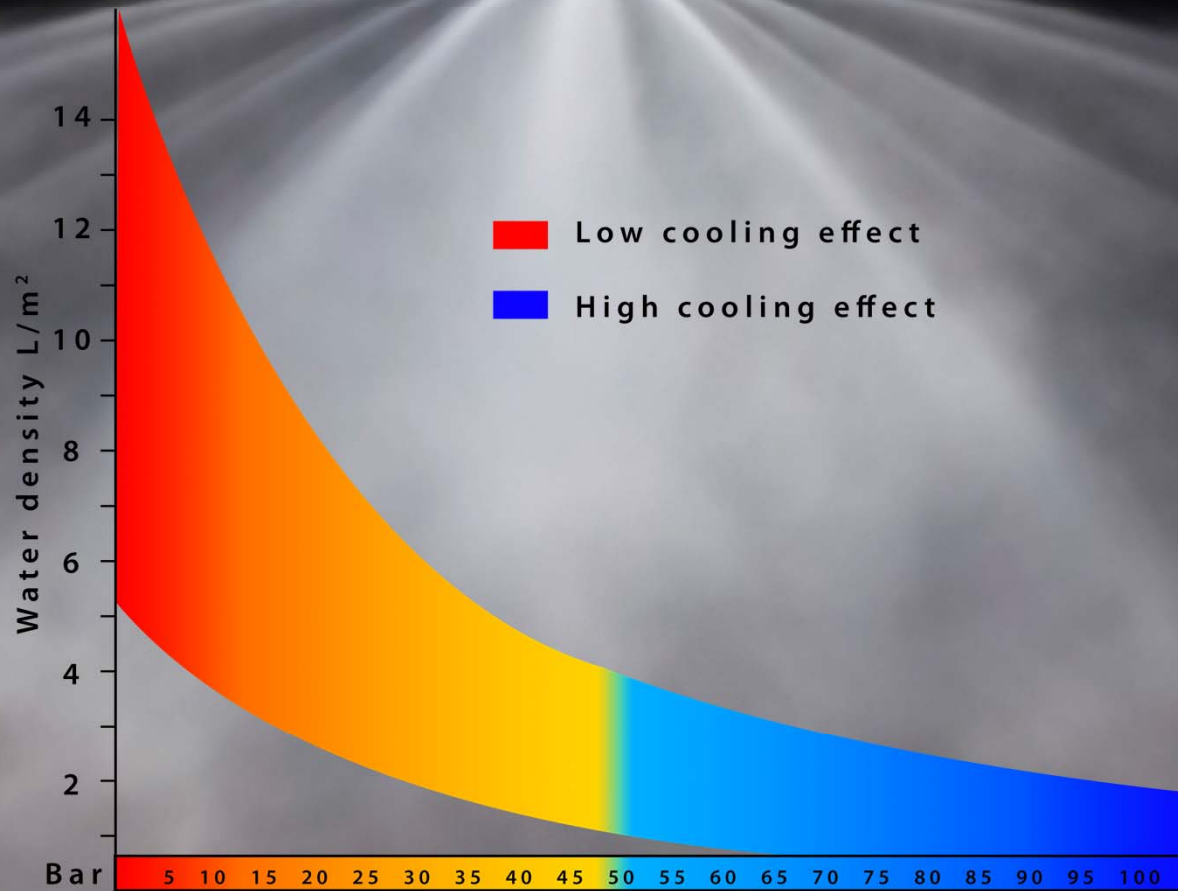
Marine

Land

Offshore

High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe

## High cooling effect of the high pressure water mist system




Rolling Stock

Marine

Land

Offshore

High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe



**ULTRA FOG system in public facilities with large heights**



Rolling Stock

Marine

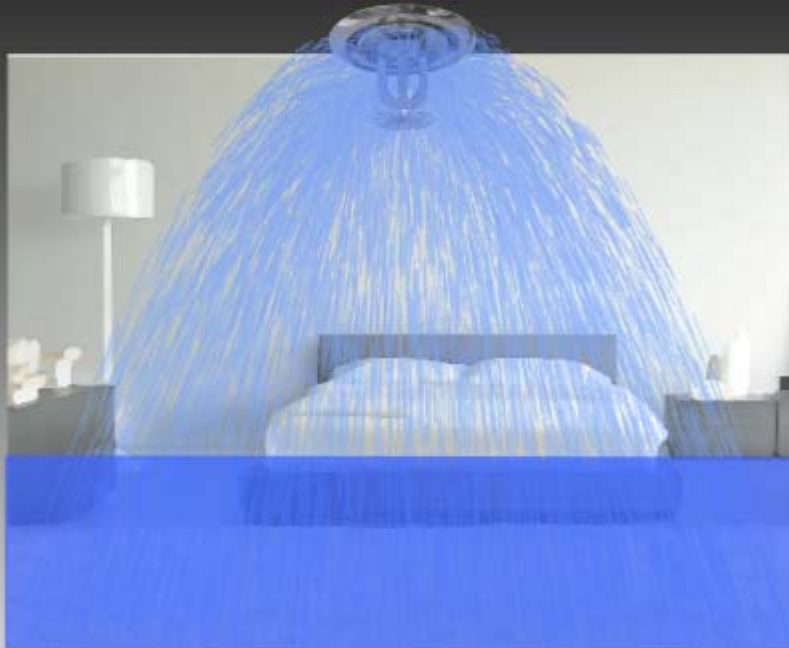
Land

Offshore

High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe

## Comparison:

### Traditional Sprinkler System

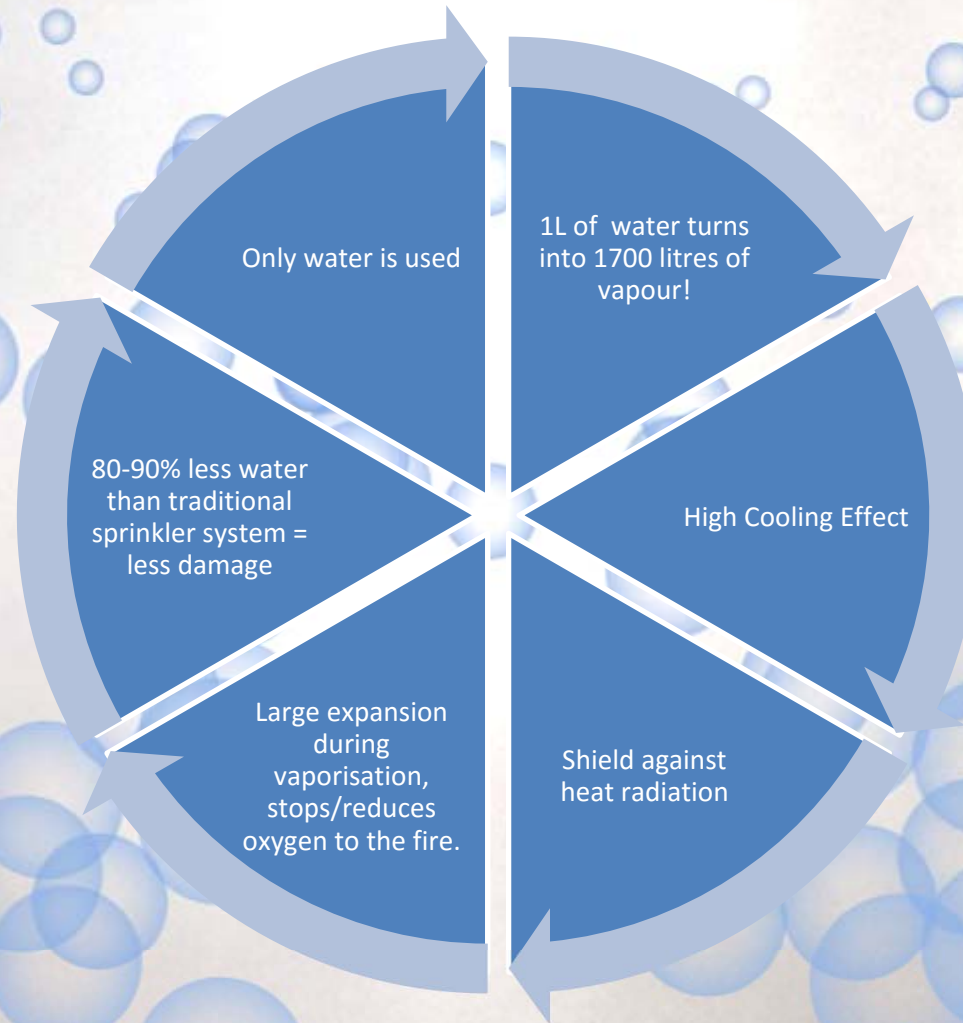


### ULTRA FOG Water Mist System



90% less water

## Water mist







FIRE TEST, 1 M2  
POOL FIRE, WITH  
HELICOPTER FUELE

## 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.





High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe

**ULTRA FOG**<sup>®</sup>  
FIRE EXTINGUISHING SYSTEM

## 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.



Rolling Stock

Marine

Land

Offshore

High pressure water mist sprinkler system for fighting fires | Reliable and efficient | Environmentally friendly and safe



# Thank you for your attention.

## **ULTRA FOG | Sweden**

Faktorvägen 17Q  
434 37 Kungsbacka  
Sweden

Telephone:  
+46 (0)31 979 870

## **ULTRA FOG | United Kingdom**

16 South Cambridge Business Park  
Babraham Road, Sawston  
Cambridge CB22 3JH  
United Kingdom

Telephone:  
+44 (0)1223 499180

**Email:** [info@ultrafog.com](mailto:info@ultrafog.com)

**Website:** [www.ultrafog.com](http://www.ultrafog.com)

All rights reserved. ULTRA FOG AB.  
ULTRA FOG reserves the right to modify or change the  
information  
or specifications in this presentation without notice.



Rolling Stock

Marine

Land

Offshore