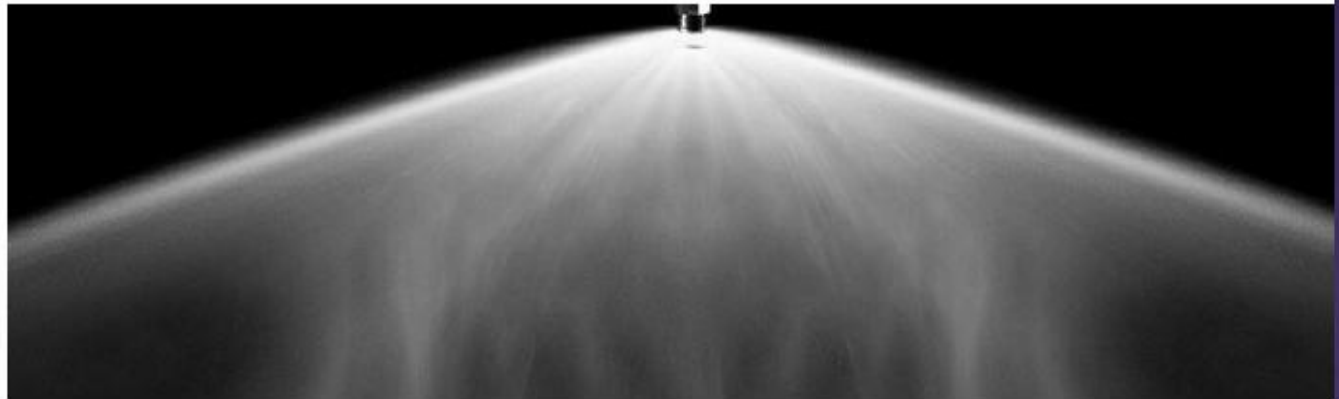


Introducing the IWMA water mist guide – a tool for the industry

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WATER MIST GUIDE



Agenda

- Background for the water mist guide
- Water mist technology
- Water mist systems classifications
- Using water mist technology
- Conclusions
- Acknowledgements

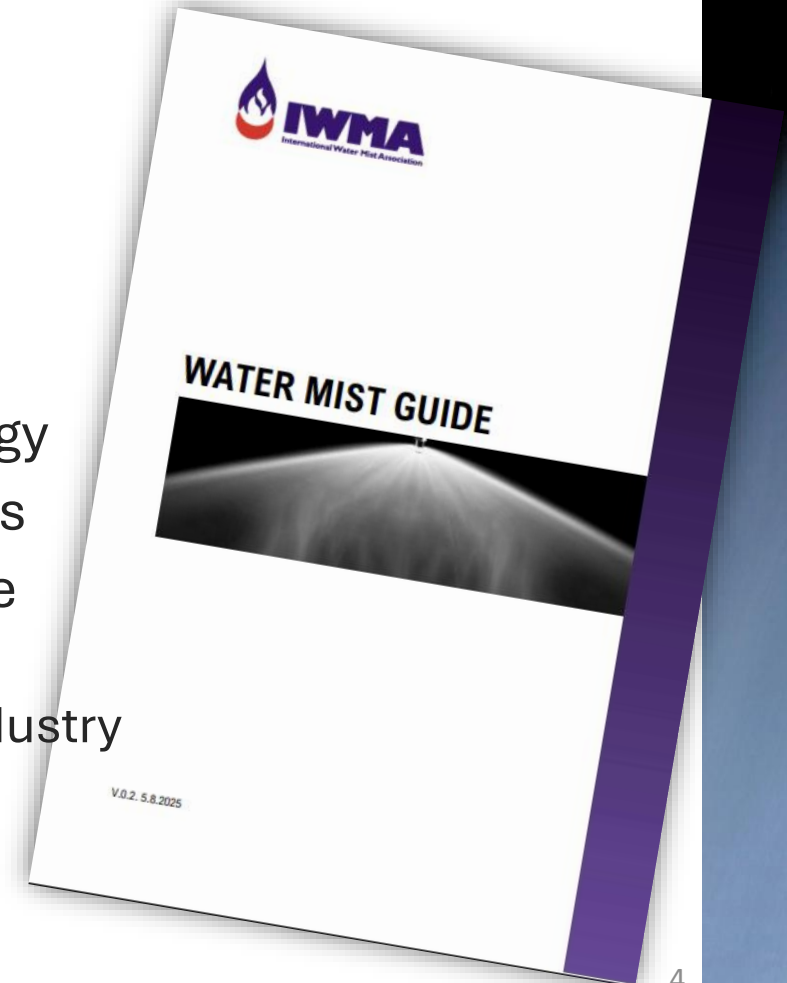


BACKGROUND

IWMA decided to write its own water mist guide

Objective

- A simple introduction document to water mist
- Complement other important documents
 - IWMA Matrix
 - “Mistconceptions”
- Define water mist and provide a short history
- Present key facts about water mist as a firefighting technology
- Explain classifications, operation principles and applications
- Summarise design, installation, operation, and maintenance standards
- Support document for consultants, designers, authorities, and industry stakeholders with practical context and training requirements





WATER MIST TECHNOLOGY

Water mist technology

Introduction - history

- Mature fire suppression technology, in use for 30+ years
- Origin: Halon replacement on ships → now dominates marine market
- Expanded to land-based applications through FM, UL, VdS, LPCB/British standard test protocols
- European standard EN 14972-1:2020+A1:2025 for design, installation, inspection and maintenance

Water mist technology

Definitions

- Droplet diameter











Principles how water mist works

- Cooling
- Oxygen displacement (water expands $\times 1700$ when converted to steam)
- Radiant heat shielding
- Wetting

Water mist technology

Efficiency vs. other systems

- Much lower water flow rate than conventional sprinklers → smaller pipes, tanks, pumps
- Faster and more flexible installation
- Can be an effective alternative to gas systems or other fire classes
- Environmental aspects
 - Smaller components / duration of materials / less water
 - CO₂ reduction

Which extinguisher for which fire?					
	Wood, paper, textiles and other carbonaceous materials.	Flammable liquids, petrols & spirits	Flammable gases (Propane, butane)	Fires involving burning metals	Cooking oils and fats. For example olive oil, or lard
Water Mist					



WATER MIST CLASSIFICATION

Water mist classification

Area protection

- Automatic nozzles discharge only near fire
- Can be zoned for sensitive/high hazard areas
- Typical: commercial and residential

Local application (object protection)

- Protects specific equipment (e.g. generators, transformers, fryers)
- Open nozzles, activated by separate detection

Volume / total flooding

- Mist fills entire compartment or enclosure
- Typical: machinery spaces

Zoned application

- Divides larger area into zones, only affected zone discharges

Water mist classification

Operating Pressure

- Europe: Low pressure ≤ 16 bar
- High pressure > 16 bar (up to 200 bar)

NFPA 750:

- Low ≤ 12 bar
- Medium $12 - < 35$ bar
- High ≥ 35 bar

Pressure Effects

- Low pressure: larger droplets, suppression mainly via cooling & wetting, but also oxygen displacement
- High pressure: finer droplets, better oxygen displacement & cooling

Water mist classification

Nozzle Types

- Automatic: heat-sensitive bulb, activates individually
- Open: no bulb, all nozzles discharge when system opens
- Electronic: activated by detectors, controlled discharge



Water Supply Methods

- Single-fluid pumped (pump-driven)
- Single-fluid pressurised (gas cylinder driven)
- Twin-fluid (water + gas mixed at pipe or nozzle)



Water mist classification

System Operation

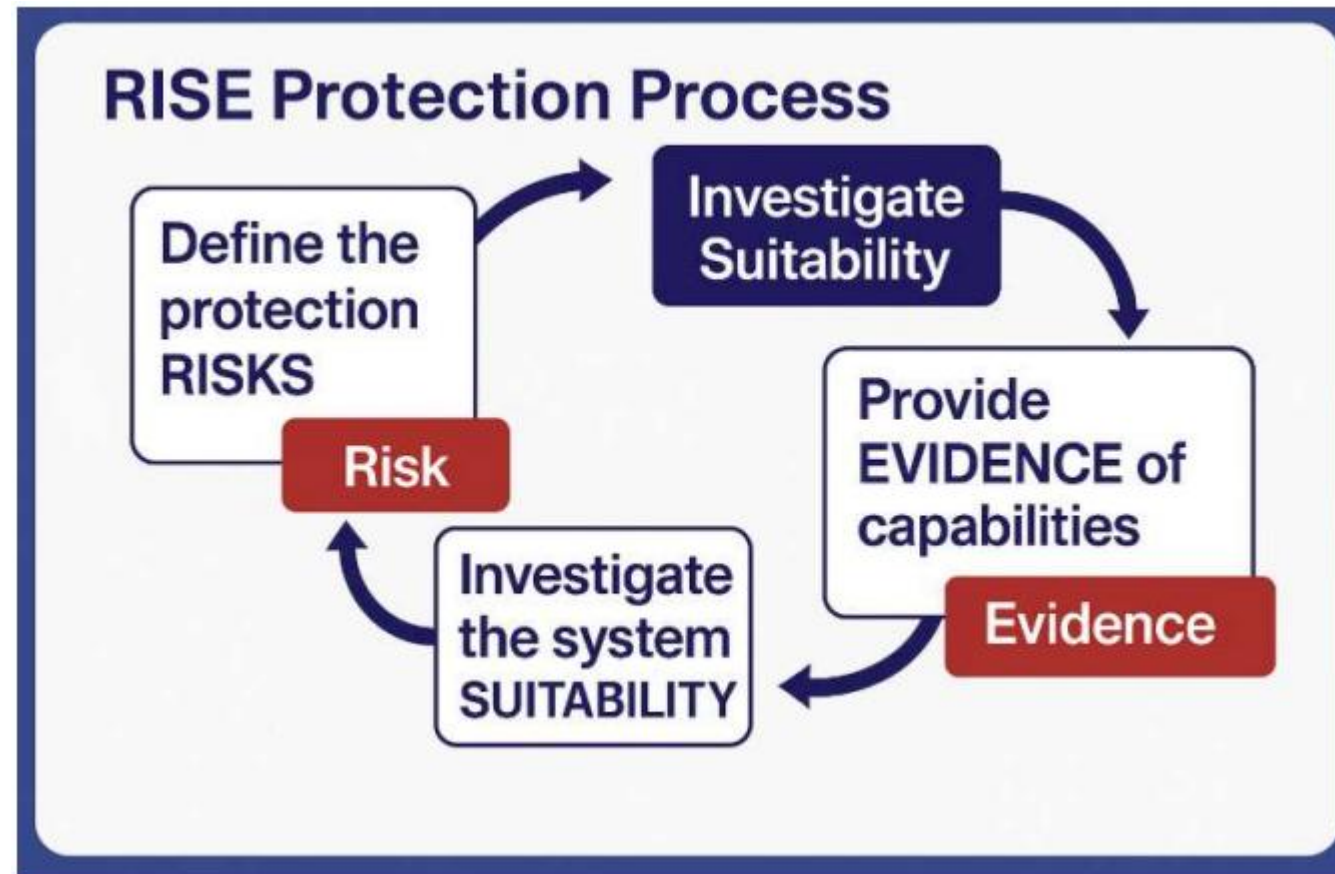
- Wet pipe (immediate discharge)
- Dry pipe (gas-filled, water released on activation)
- Deluge (all open nozzles discharge via detection system)
- Pre-action (detection + nozzle bulb)
- Electronic systems (controller-operated nozzles)

Design Types

- Engineered systems: custom, hydraulically calculated
- Pre-engineered systems: fixed parameters, specific equipment



USING WATER MIST SYSTEMS



1. Defining the protection risks to understand the specific hazards and fire scenarios to be mitigated.
2. Investigating the system suitability to ensure the selected water mist system matches the identified risks and environmental conditions.
3. Providing evidence of capabilities by validating the system's performance through testing, certifications, and real-world references.

Using water mist systems

Choosing the standard

- EN 14972 series, FM, UL, VdS, LPCB/British standards for fire testing (land-based)
- EN 17450 series, FM, UL, VdS, LPCB/British standards for component testing
- IMO standards (marine)
- Test protocols define area, volume, and fire load covered
- Limitations: ventilation, obstructions, occupancy factors

Competence & Training

- Manufacturer provides DIOM manual, conduct training courses
- Designers and installers must be trained & authorised
- IWMA Matrix is a useful tool listing relevant fire test protocols

Using water mist systems

Applications

- Buildings
 - Commercial: high-rises, hospitals, hotels, museums, archives, offices, data centres, car parks (Class A, EN 14972-2/3/4/5/6/7/10)
 - Residential: houses, apartment buildings, care homes, student housing (Class A, EN 14972-17 ($\leq 45\text{m}$ height), also EN 14972-3/4/7 for wider coverage)
- Industrial
 - Machinery spaces, turbines, generators, transformers (Class B, EN 14972-8/9/14/15)
 - Deep fat fryers (Class F, EN 14972-12/16)
 - Cable tunnels (EN 14972-11)
- Marine
 - IMO A800 / MSC.265 – cabins, corridors, public spaces
 - MSC/Circ.1165 – total flooding in machinery spaces
 - MSC/Circ.1387 – local application in machinery spaces
 - MSC/Circ.1430 – Ro-Ro and special category spaces

Using water mist systems

DIOM Manual

- Must include: system type, objectives, limits, components, test results, approvals, design rules, installation, O&M

Approvals & Certification

- Based on full-scale performance fire tests + component tests
- Third-party certification = higher credibility & reliability

System Selection Requirements

- Suitable for fire load
- Training by the manufacturer - Properly designed, installed & commissioned
- Maintained for readiness
- Communicate with stakeholders: building control, fire authority, insurers, owners, classification bodies

Lifecycle Requirements

- Commissioning: pressure test certificates, hand-over documentation available for inspection
- Maintenance: weekly–annual checks, remote monitoring, DIOM manual available with spare parts

A black and white photograph of a water mist spray. A small nozzle at the top center emits a wide, fan-shaped spray of fine water droplets that fills the lower two-thirds of the frame. The droplets are illuminated, creating a bright, hazy effect against a dark background.

CONCLUSIONS

Conclusions

- The IWMA water mist guide provides a clear and accessible overview of water mist technology , together with
 - Standard Matrix
 - “Mistconceptions”
- Explains how water mist differs from sprinklers and gas systems
- Summarises applications, classifications, and standards
- Supports consultants, designers, authorities, and industry stakeholders with practical context and training requirements
- Reinforces IWMA’s role in promoting safe, sustainable, efficient and reliable fire protection



ACKNOWLEDGEMENTS

Sprinkler acknowledgement

– especially for Class A fires

- Sprinklers have been around for a long time – proven efficient and reliable fire suppression
- Lots of work has been done to influence building authorities to require automatic fire suppression systems in their building codes – saving lives and property, and therefore society, for huge losses
- Many water mist companies exist because of the markets sprinklers have opened
- The bar has been set – prove as effective and reliable performance
- Nobody benefits from messing up the stellar track record built over a long period of time

Sprinklers vs. water mist

- Both: water through pipes, pressure, and nozzles
- Sprinklers: flow rate requirements defined in standards
- Water Mist: performance defined by large-scale fire testing (documented in fire test reports from accredited fire labs and described in the DIOM manuals)
- Most water mist test protocols for protecting lives and buildings are basing pass/fail requirements on results achieved by sprinkler - efficiency
- Test protocols for critical components are also based on sprinkler - reliability
- Water mist standards require large-scale fire testing + component testing
- .
- Does water mist also deserve some acknowledgment?

Water mist technology



Analysing over 4,000 fire incidents in England (2018–2024), the data from the [#UKMinistry](#) of Housing, Communities and Local Government shows [#watermist](#) systems have controlled fires in 95.3% of cases and extinguished them in 58.6% — compared to 90.7% and 27.6%, respectively, for sprinklers. In residential settings, both systems performed near-identical [#extinguishmentrates](#) (around 37%) and [#control rates](#) of 95.8% for mist and 91.4% for sprinklers. While extinguishment is not the primary design goal of most suppression systems — mist or sprinklers — these figures offer useful insights into their [#realeffectiveness](#).

Acknowledgements

From a market perspective

- Working towards the same goals – saving lives, buildings, objects
- In Europe and elsewhere, there is focus on reducing greenhouse gas emissions
- By optimizing solutions, the likelihood for more countries to require suppression systems in buildings in their building codes will increase
 - Making the overall market much larger
 - Saving more lives, buildings and objects
- Experts employed by large sprinkler companies have made big contributions in writing water mist standards and test protocols
- Many of you have a sprinkler background – you are here learning about mist – this is great progress!

Løp og kjøp!

(Run and buy)...actually the guide is free.

Download it, link it to your website, use it!

It's a tool for the industry, not a sales brochure.

Thank you for your attention!