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Water Mist: State-of-the Art and the Way Ahead

SP Fire Research AS Norway
Water Mist – State-of-the-art and the way ahead

- Significant developed technology during the last 25 years
- IWMA has aided the acceptance of water mist systems in industry, marine applications and in building industry
- Main applications
- Advantages and disadvantages of the technology
- Standardization
- The way ahead
Significant developed technology during the last 125 years?
IWMA has aided the acceptance of water mist systems in industry, marine applications and in building industry

- Common acceptance of water mist systems is achieved in many parts of the world
- Due to the differences between systems, no prescriptive standards have been written.
- Still there is a lack of knowledge of how systems can be documented and accepted by Authorities Having Jurisdiction
- IWMA has been instrumental in the work to revise the present CEN TS 14972
- Many of the large international manufacturers of firefighting equipment have developed water mist systems or acquired existing watermist producers
- In the future, IWMA should be the leading voice to open for acceptance of water mist systems in applications where its peculiarity is important, as a fully accepted alternative to other accepted firefighting systems
Main applications

Much of the work with standards has been concentrated on equivalent systems, like the sprinkler equivalent systems and the replacement of Halon systems.
• Some applications based on successful testing are:
  • Turbine enclosure protection
  • Protection of heritage buildings, museums, libraries and collections
  • Road and rail tunnels
  • Aircraft and hangar protection
  • Industrial fryers (deep fat fryers)
  • Cable tunnels
  • Computer rooms
  • Local liquid fire sources

Tunnels and subways
Advantages and disadvantages of the technology

![Equilibrium conditions for different fire suppression agents.](image)

**Advantages**

- Water mist has a very good cooling ability, leading to favourable effect on fires
- Water mist is not harmful to humans or the environment
- Water mist do not produce toxic or irritating substances when released, even in fire situations
- Water mist produces the inert gas Water vapour (steam) when heated

**Disadvantages**

- Water vapour can not exist in inerting concentration at normal ambient temperature
- Water may lead to secondary damage to objects and buildings by wetting
Critical oxygen concentration for extinguishment with water mist

![Graph showing critical oxygen concentration vs. temperature (Celsius)].

- **Oxygen concentration (vol%)**
- **Temperature (Celsius)**

- **Legend**:
  - ▢ Extinguished
  - ▲ Not extinguished
  - Purple line: Extinguishing limit

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**Note:** The graph illustrates the critical oxygen concentration for extinguishment at various temperatures. The data points indicate the oxygen concentration required for extinguishment at different temperatures. The purple line represents the extinguishing limit, above which extinguishment is not possible.
Standardization

- The structure of the European standardization of Water mist is changed, from being a sub-group of the Working group for Sprinklers and water spraying systems (CEN TC 191) – to a WG10 Water mist systems
- Reference is made to Joachim Böke’s presentation
IWMA’s role:

Be the voice of the watermist industry in a much more coordinated way than today
• Provide basic information to the community on water mist technology
• Launch and coordinate scientifically based test protocols where it is lacking
• By conferences and seminars world-wide spread the knowledge about watermist technology to the advisers and end users
IWMA should develop into an organization with more focus on the promotion of water mist into the society.

- IWMA should concentrate on the common good for the industry
- Manufacturers should stand together in promotion of the technology and in new applications, irrespective of possible deviating interests on a short term
- The water mist industry should not stop being innovative:
  - Introduce the most advanced and reliable detection technology to activate the systems
  - Investigate how to combine sprinkler and gas technology to improve the effect of water mist systems
  - Invest into research on improved reliability of systems