



Water Mist in Buildings: Typical challenges in real world applications

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Agenda



- Acceptance Criteria
 - Challenges for insurers and other parties
 - Information required for evaluation/acceptability
- Challenges and Restrictions to Acceptability
 - By design parameters
 - By test data
- Real World Design Challenges

Zurich Acceptance Criteria



- *Acceptance of fixed fire protection systems is based upon selecting a system (or equipment) that is:
Listed, approved, or certified by a recognised testing laboratory (e.g. UL/BRE) for its intended purpose*
- *Designed, installed, and maintained in accordance with acceptable published codes or standards (e.g. NFPA/EN/BS) addressing the intended purpose*
- *Designed, installed, and maintained in accordance with manufacturer's literature*
- *Where a system does not have an appropriate listing or is not covered by an applicable code or standard we have no basis upon which to accept the system.*

NFPA 750



- Scope. This standard contains the minimum requirements for the design, installation, maintenance, and testing of water mist fire protection systems.
- This standard does not provide definitive fire performance criteria, nor does it offer specific guidance on how to design a system to control, suppress, or extinguish a fire.
- Reliance is placed on the procurement and installation of listed water mist equipment or systems that have demonstrated performance in fire tests as part of a listing process.

Challenges and Restrictions



- Water Mist is a bespoke solution which requires performance testing to demonstrate capability for individual risks, applications or situations.
- Installation standards are manufacturer specific for proven applications
- Water mist design and components are not interchangeable
- Application specific solutions may not offer flexibility for change
- Application specific solutions may not be suitable for complete property protection

FPA RISC Authority Questionnaire (UK)



- Intended as a tool to gather evidence to scrutinise the suitability of a water mist system.
- Developed and used by major insurers to evaluate proposals
- Zurich, ACE, Allianz, Aviva, AXA, HDI Gerling, Liberty Mutual, QBE, RSA, Tokio Marine & Travellers
- www.thefpa.co.uk

Water Mist Questionnaire: Building Protection

To be completed at the design and proposal stage of suppression system planning

Issued by: Ins. Co./Trade Ass/AHU name in here

NOTE:
Completion of this form neither guarantees system performance nor system acceptance by Ins. Co. / Trade Ass. / AHU.

Water Mist is a form of active fire protection that, like all extinguishing technologies, can be effective in the protection of certain, but not all, risks.

In the absence of a published British Standard or European Standard with scope relevant to the protection of buildings or contents with this type of system¹, the questions herein are intended to elicit information that could be useful in providing evidence of the "equivalence" of such systems to alternatives where published and recognised national standards do exist.

If requested to do so, please complete one of these forms for each building to be protected by water mist system(s). This form is to be used to capture and record some of the data required to support a claim of "equivalence" and to provide evidence of sound engineering practice. Do not use this form for local application systems (a separate form is available for these systems).

¹ BS (Draft for Development) documents issued by BSI (British Standards Institution) are not to be regarded as British Standards; TS (Technical Specifications) issued by CEN (European Committee for Standardization) are not to be regarded as European Standards.

Form IQ 1
Version 1.0 April 2011

RISC Authority

Challenges - Are tests realistic?

Reference: <http://www.brebookshop.com/details.jsp?id=326685>

VdS 'Office Test' (Germany)



- The VdS office test could not be replicated by the BRE and produced inconsistent results.

BRE 'Office Test' (UK)



- BRE developed their own test protocol, benchmarked against sprinklers.
- EN 12845 - 5mm over 72m²
(US = 0.12 gpm over 775sq ft)

BRE Results - Cause for concern?

- In all 48 fire tests were completed using both low and high pressure water mist from various companies
- Only one water mist test considered satisfactory.
 - Low pressure water mist on a 2.5m x 2.5m (8' x 8') nozzle spacing.
- Both low and high pressure water mist unsuccessful at 3m x 3m (10'x10') and 4m x 4m (13'x13') spacing, irrespective of the ceiling height.



Strengths and Weaknesses in area protection scenarios



Strengths

- Enclosed environments
- Environmental cooling

Limitations

- Ventilated spaces
- High ceiling heights

Let's consider this for today's market



- Let's look at some typical Light Hazard/Ordinary Hazard Occupancies
 - Offices
 - Schools
 - Hospitals

Effective for schools or offices?



- Traditional style construction
- Traditional layout
- Traditional fire load



Do tests actually reflect reality?

- ETFE roofs with open ventilation
- Timber construction



Construction Challenges



New build challenges



External Canopies



Ceiling features



Open Cell Ceilings

- With Sprinklers



- A mist nozzle



Design solutions for building features

- No requirement for manufacturers to provide solutions in design manual for common issues encountered in premises
 - Ductwork and cable trays
 - Deep beams and bay construction
 - Light wells
 - Open areas between floors



Compromised by human nature !

- The delivery that just arrived
- We had a clear out this week
- It's not ours..... Etc.



In summary



- Water mist may be acceptable where proven by suitable and realistic fire tests that reflect the risk to be protected and the risk or features should not change
- Only then can a water mist system act effectively as intended
- Some common features of most premises require consideration in design requirements for each manufacturers design guide
- Can **all** areas of a building be protection from one manufacturer's system?
- It's apparent that not all water mist systems are considered equal
- True sprinkler system equivalency is not realistic

As I said last year –

if water mist was equivalent to sprinklers,
it would be called a sprinkler system

**Thank You,
Any Questions?**