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 RISCAuthority 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
Challenges - Are tests realistic?


**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 manufacturer's 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?