An Overview of the draft BS Systems
- Codes of Practice for Design & Installation

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Why a UK standards for watermist?

- CEN document a TS
- CEN agenda did not address UK needs and concerns
Why DDs?

- Drafts for Development
- Provisional
- Allows information and experience to obtained
- Review after 2 years
Joint Working Group members

- FSH18/2 + FSH18/6
- FIA
- BAFSA
- FPA
- Insurers
- LPCB
- FM
- JWG1 - CEN
- JWG2 – Domestic & Residential
- JWG3 Commercial & Industrial
Typical Domestic /Residential Watermist applications

- **Domestic:**
  - Single family dwellings (domestic – max room : 8x4)
- **Residential:**
  - < 20m height, max room: 8 x 4.
  - Multi family dwellings
  - Homes of Multiple Occupancy
  - Care Homes
Typical Commercial / Industrial Watermist applications

- Turbines & Generators
- Plant & Machinery
- Process and Printing
- Public spaces – shops, offices
- Food industry – fryers
- IT facilities
Features of Watermist Systems

- Automatic- thermally actuated Frangible bulb nozzle
- Open Nozzle
- separate detection/actuation
- Wet pipe
- Volume protection
- Dry Pipe
- Local application
- Pre-Action
Design process

- Risk assess – potential fire hazard
- Fire test - simulating hazard
- Fire test – design parameters
DD8458

FOR WATERMIST FIRE SUPPRESSION SYSTEMS
FOR RESIDENTIAL AND DOMESTIC OCCUPANCIES
Domestic & Residential
Fire tests
A.1 Requirements

Residential and domestic nozzles in sealed watermist systems shall be capable of suppressing the test fires for a discharge duration of 10 minutes for domestic premises or 30 minutes for residential premises, measured from nozzle operation, when tested in accordance with this Annex.

Temperatures shall be limited to the values indicated in Table A.1. The third nozzle, external to the room, shall not operate.
## Table A.1 — Fire test maximum temperatures

<table>
<thead>
<tr>
<th>Thermocouple location</th>
<th>Maximum allowable temperature °C</th>
</tr>
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<tbody>
<tr>
<td>75 mm below the underside of the ceiling</td>
<td>320</td>
</tr>
<tr>
<td>1.6 m above the floor</td>
<td>95</td>
</tr>
<tr>
<td>1.6 m above the floor</td>
<td>55 (for not more than any 120 s interval)</td>
</tr>
<tr>
<td>Ceiling temperature – 6.5 mm above the underside of the ceiling</td>
<td>260</td>
</tr>
</tbody>
</table>
Domestic & Residential System design per fire tests

- Max. & Min. heights
- Max. & Min. nozzle spacing
- Max. & Min. distance from walls
- Distance from obstructions
- Distance from ceiling
- Max. & Min. Pressures & flows
- Additives?
System design

• Extent of watermist system protection

• Watermist system protection should be provided in all parts of the dwelling, with the permitted exception of:

• a) bathrooms fitted with a door and with a floor area of less than 5m2

• b) cupboards and pantries fitted with doors and with a floor area of less than 2m2 and

• c) non-communicating, attached buildings such as garages, boiler houses, etc.

• d) crawl spaces.

• Loft spaces and lift motor rooms require protection
Domestic & Residential Piping & hydraulics

- All systems fully hydraulically calculated
- (Hazen-Williams or Darcy Weisbach)
- Stainless steel
- Copper,
- Galvanised steel (with strainer upstream of nozzles)
- Fire rated plastic pipe (approved for use in fire protection systems)
- Hydrotest: 1.5 times max working pressure for 1 hr.
Domestic & Residential Water supplies - cylinders

Key:
1. Flow switch to alarm
2. Gauge
3. Pressure switch
4. Manual isolation valve
5. System drain valve
6. Regulator
7. Inert gas drain valve
8. Water
9. Inert gas
10. Water cylinder bank

Symbols:
- #: Stop valve
- -: Pressure relief valve
- ℃: Nozzle

Tyco
Fire & Integrated Solutions
Domestic & Residential water supplies -pump

Key
1. System drain valve
2. Gauge
3. Flow switch to alarm
4. Pressure switch
5. Drain and test valve
6. Control panel
7. Town mains supply
8. Isolation valve
9. Fire pump set
10. Backflow prevention device

Fire pump
Stop valve
Nozzle
Strainer
Non-return valve
Domestic & Residential water supplies – pump + tank

Key
1. Float valve
2. System drain valve
3. Gauge
4. Flow switch to alarm
5. Level switch
6. Pressure switch
7. Drain and test valve
8. Control panel
9. Isolation valve
10. Water tank
11. Fire pump set
12. Fire pump
13. Stop valve
14. Nozzle
15. Strainer
16. Non-return valve
Domestic & Residential water supplies-duration

• The water discharge duration should be as follows.

• 1) For systems in domestic premises, the duration should be at least 10 minutes and the system should meet the pass criteria established in the approval tests for the total time of the discharge duration.

• 2) For systems in residential premises, the duration should be at least 30 minutes and the system should meet the pass criteria established in the approval tests for the total time of the discharge duration.
Domestic & Residential water supplies- capacity

- The system should be capable of providing pressures and flow rates
- to permit all the watermist nozzles in the room concerned
- to operate simultaneously at not less than the nozzle pressure given
- by the pass criteria determined by the test in Annex A,
DD 8489

Fixed fire protection systems – Commercial and industrial watermist systems –

Part 1: Code of practice for design and installation
Fire tests
Commercial & Industrial

- Part 4 - FIRE TESTS FOR WATERMIST SYSTEMS
  - For protection of local applications.
- Part 5 - FIRE TESTS FOR WATERMIST SYSTEMS
  - For protection of combustion turbines and machinery spaces ≤ 80 m³
- Part 6 - FIRE TESTS FOR WATERMIST SYSTEMS
  - For protection of industrial oil cookers
- Part 7 - FIRE TESTS FOR WATERMIST SYSTEMS
  - For protection of low hazard occupancies.
Commercial & Industrial System design per fire tests

- Max. & Min. heights
- Max. & Min. nozzle spacing
- Max. & Min. distance from walls
- Distance from obstructions
- Distance from ceiling
- Max. & Min. Pressures & flows
- Additives?
Commercial & Industrial - Discharge duration

Extinguishing –
twice time to extinguish & prevent re-ignition

Suppression – automatic nozzles
> 30 minutes
Commercial & Industrial - Water supplies

- Extinguishing:
  - Twice time to extinguish with Max. no. of nozzles from tests.
- Suppression – automatic nozzles:
  - > 30 minutes with greater of:
    - Twice the number of operating nozzles from tests. OR
    - Flow to most favourable 72 m² (OH1) or 144m² (OH2)
- Tanks > 30% total requirement with sufficient infill capacity.
Commercial & Industrial Water supplies

- Dedicated stored pressure cylinder systems
- Dedicated pumps and tanks.
- Pump drivers 110% of pump demand.
- Elec – inlet side main switch - 150% full load current.
- Diesel
- Automatic
Commercial & Industrial Piping & hydraulics

- All systems fully hydraulically calculated
- (Darcy Weisbach – medium & high pressure systems)
- 316Stainless Steel
- Copper
- Zinc coated steel (with strainer upstream of nozzle
- Cpvc or plastic tested for watermist system use.
- Hydrotest: 1.5 times max working pressure for 2 hrs.
Where do we go from here?

- DD8458 – Domestic & Residential – published
- DD8489 – Commercial & Industrial - Final text agreement - FSH18
- BSI Publish
- BSI JWG – input to CEN
Thankyou !!