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

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Chair: BSI Watermist Joint Working Group

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Why a UK standards for watermist?

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

Why DDs?

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- 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

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- 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

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

Features of Watermist Systems

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

Design process

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

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DD8458

FOR WATERMIST FIRE SUPPRESSION SYSTEMS

FOR RESIDENTIAL AND DOMESTIC OCCUPANCIES

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Domestic & Residential
Fire tests

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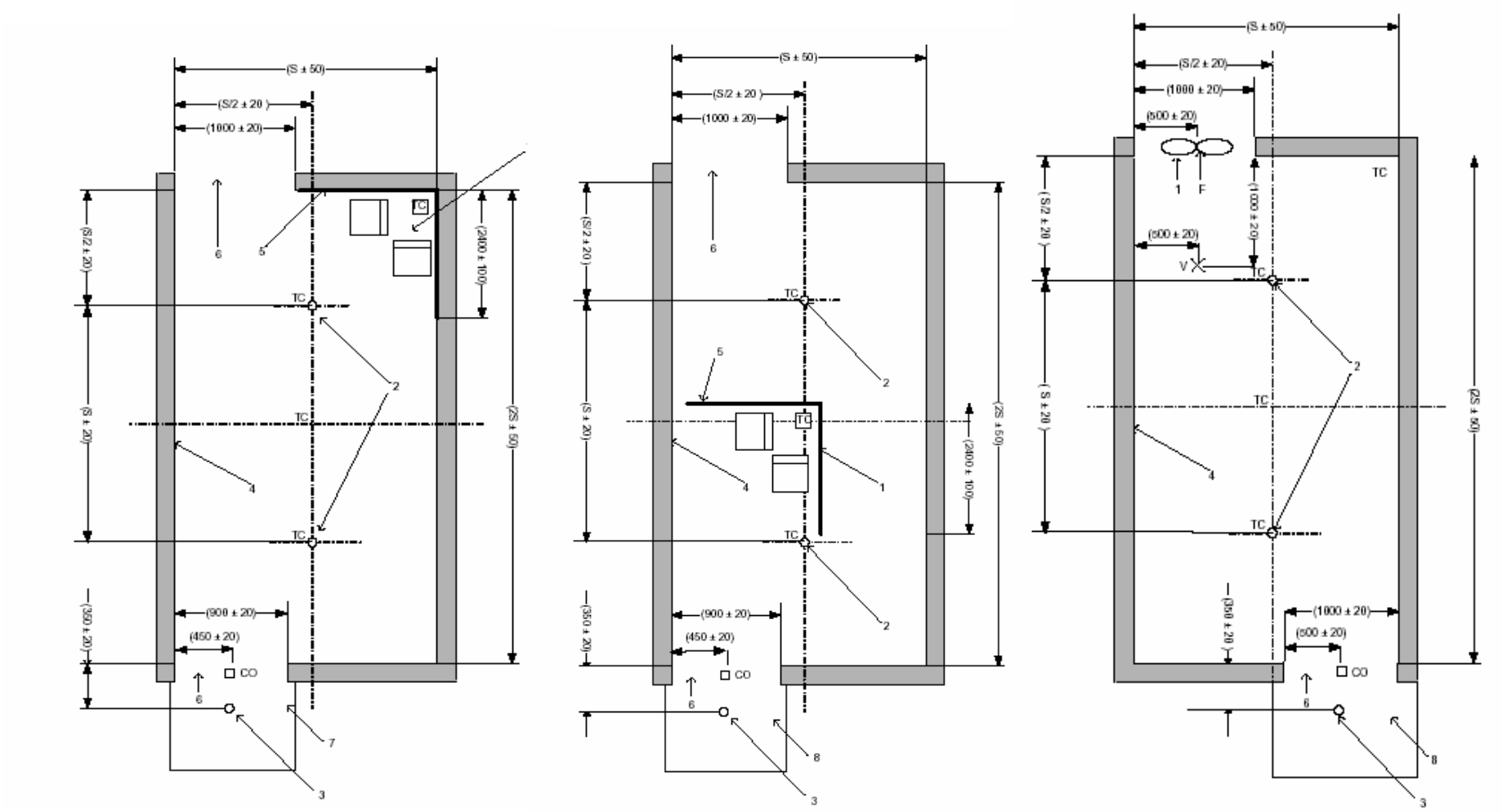

Domestic & Residential Fire tests –Annex A

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- 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.

Domestic & Residential
Fire tests –Annex A

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Table A.1 — Fire test maximum temperatures
Thermocouple location Maximum allowable temperature
℃

Thermocouple location	Maximum allowable temperature °C
75 mm below the underside of the ceiling	320
1.6 m above the floor	95
1.6 m above the floor	55 (for not more than any 120 s interval)
Ceiling temperature – 6.5 mm above the underside of the ceiling	260

Domestic & Residential System design per fire tests

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- 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

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- ***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

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- 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

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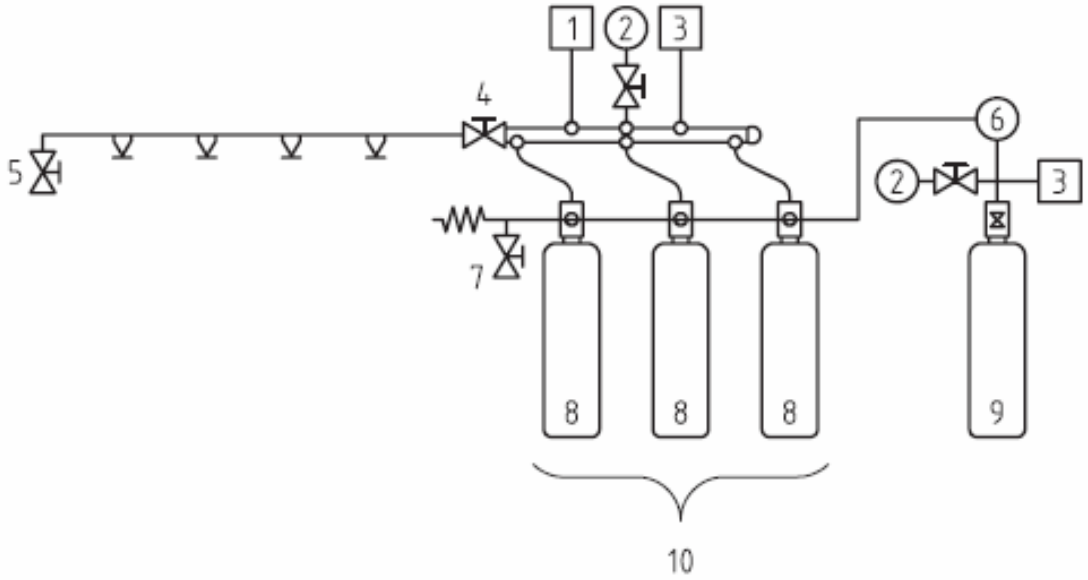

Key

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

Domestic & Residential water supplies -pump

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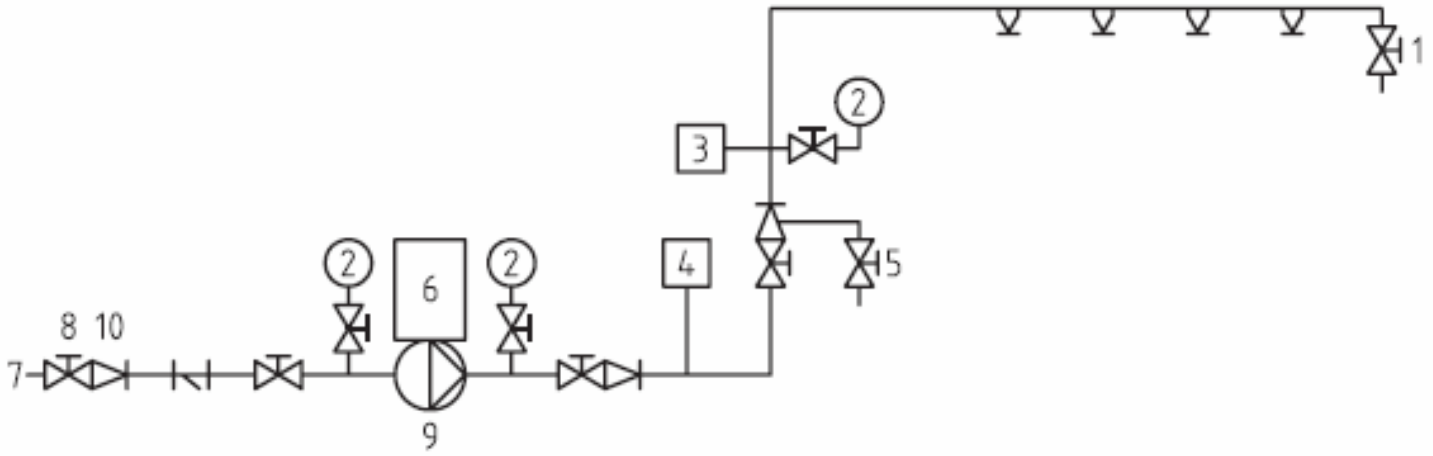

Key

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

Domestic & Residential water supplies –pump + tank

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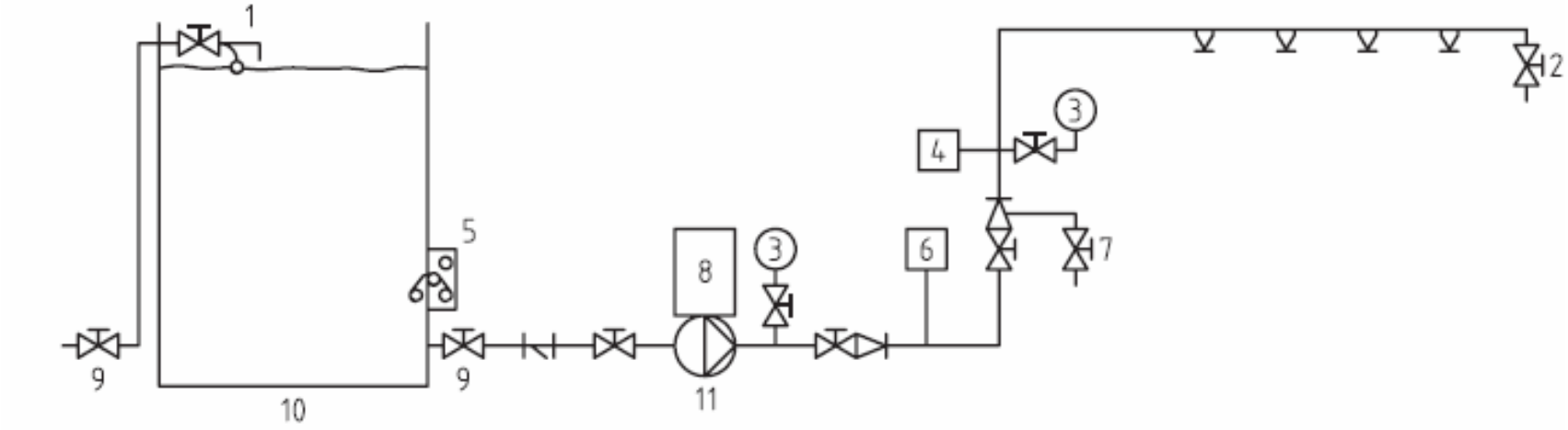

Key

1	Float valve	9	Isolation valve
2	System drain valve	10	Water tank
3	Gauge	11	Fire pump set
4	Flow switch to alarm		Fire pump
5	Level switch		Stop valve
6	Pressure switch		Nozzle
7	Drain and test valve		Strainer
8	Control panel		Non-return valve

Domestic & Residential water supplies-duration

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- 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

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- 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,

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DD 8489

Fixed fire protection systems – Commercial and industrial watermist systems –

Part 1: Code of practice for design and installation

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Fire tests
Commercial & Industrial

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- 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

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- 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

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Commercial & Industrial - Water supplies

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- **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 m^2 (OH1) or 144m^2 (OH2)**
- **Tanks > 30% total requirement with sufficient infill capacity.**

Commercial & Industrial Water supplies

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- 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

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- 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?

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

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