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TEST CODE SHEET

1. TYPE OF TEST(S)

Dimensional.

2. WATER REGULATIONS REQUIREMENTS FOR FITTINGSSchedule 2

15-(1) every water system shall contain an adequate device or devices for preventing backflow of fluid from any appliance, fitting or process from occurring.

3. BRITISH STANDARDS OR WATER SPECIFICATION, DEEMED TO SATISFY WATER REGULATIONS REQUIREMENTS

3.1 Fittings with 'kitemarks' which are deemed to satisfy the requirements of regulations are listed in the directory.

4. TEST PROCEDURE

4.1 Tests applicable to the following:-

TYPE AF AIR GAPS - CIRCULAR (RESTRICTED)

Devices for the prevention of contamination by backflow.

(A) TYPE AF AIR GAPS – CIRCULAR (RESTRICTED) (Derived from PrEN 13077)TEST METHOD**i. SCOPE**

This procedure specifies the characteristics of type AF air gaps with circular overflow (restricted) for nominal flowrates not exceeding 3 m/s. Air gaps that comply with the requirements of this procedure are devices for protection of potable water installations from pollution. In addition to factory assembled products this procedure includes requirements for site constructed air gaps.

This is a performance standard for 'AF' air gaps. Materials of construction must be fit for the purpose and application to ensure compliance with this procedure during normal working use.

ii. DEFINITIONS

For the purpose of this procedure the following definitions apply.

ii.i Air Gap(s) with Circular Overflow (Restricted) Family 'AF'.

The AF air gap is a permanent and vertical distance between the lowest point of the feed orifice and the critical water level, or the top level of the overflow pipe.

The overflow shall be capable of draining the maximum inflow of water in a positive pressure fault condition.

ii.ii Spill over Level

The level at which water will start to overflow the receiving vessel with all outlet closed.

ii.iii Maximum Level

the highest water level (H) reached above the spillover level under positive pressure fault condition with all outlets closed.

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ii.iv Critical Water Level

The level (h) above the spill-over level two seconds after closing the water inlet, starting from the maximum level.

ii.v Internal Diameter 'D' of Feed Pipe (Bore)

Diameter 'D' (mm) Is the maximum internal diameter found within the last metre of the supply pipe or the DN of the inlet connection.

ii.v.i Splash

When maintaining the maximum flow rate at the normal operational water level, should contact be observed between the upstream components and the liquid in the receiving vessel due to splashing, foaming or turbulence the air gap should be increased to a point where no contact is observed.

ii.vii Graphic Symbol

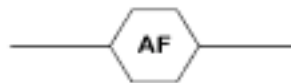


FIG 1

iii. DESIGNATION

The air gap is designated by:

- the reference to this standard.
- its Family, its Type.
- the DN of the feed pipe.

example - air gap Family A Type AF DN15 TSN AA-01

iv. MATERIALS

iv.i Materials choice

The manufacturer shall state the type of materials chosen in his technical and commercial documents.

The surface condition of materials in contact with water shall be chosen to be the least inclined to scale.

The materials used upstream and including the atmospheric outlet opening must comply with the relevant Standards, quality requirements and criteria for drinking water installations, BS6920 (i.e. may not release substances in concentration which can be harmful to the users of the drinking water installation).

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The choice of other material is discretionary but shall be suitable for the intended use of the appliance (temperature, corrosion, scale, etc).

There are no special requirements concerning the materials used downstream of the atmospheric outlet opening provided they do not have any harmful effect on the upstream part.

v. DESIGN

v.i General

The protection assembly comprises four parts integral with one another:

- a water inlet device.
- a receiving vessel (container).
- an overflow.
- an air break to drain

v.ii Water Inlet Device

- v.ii.i Every float-operated valve or other device which controls the inflow of water to a receiving vessel shall be securely and rigidly fixed to that vessel.
- v.ii.ii Every feed pipe supplying water to such a valve assembly or other device shall be fixed in its position to prevent it from moving or buckling.
- v.ii.iii The inlet device shall not come into contact in any way with a product from downstream, whether owing to backflow, bending or deformation of the assembly, (i.e. should always be above 'H').

v.iii Overflow Arrangements

- v.iii.i Circular overflows (restricted) shall be capable of draining off the maximum inlet flow.
- v.iii.ii The area of the minimum cross section of the overflow pipe throughout its length, shall be equal to four times the inlet pipe cross sectional area.
- v.iii.iii All circular overflow arrangements must ensure an air gap before any connection to a drainage system. An air gap or tun-dish must be provided.

NOTE: The length of the overflow before the air gap or tun-dish to drain must not be of such a length that it will cause the air gap 'AF' to be violated. All air gap or tun-dish arrangements shall be visible.

5. ACCEPTANCE CRITERIA

5.1 Air Gap Distance

For air gaps 'AF' the critical water level shall be established and the air gap distance 'A' measured from the lowest point of the water inlet to the critical water level.

$$\text{Air gap AF} \geq 2D \text{ but not less than } 20 \text{ mm.}$$

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5.2 Single supply

(1) **Test** - 'h' is determined by measurement of the depth water above the spillover level of the overflow two seconds after the inflow, equal to $Q = 0.14D^2$ in litres per minute, has stopped or a dynamic pressure of 10 bar has stopped if the flow rate 'Q' cannot be achieved where 'D' is the bore of the inlet (see ii.v) and with all outlets closed, based on a velocity of 3 m/s, or the maximum recommended flow rate for manufactured appliances when the rate is > 'Q'.

(2) **Measurement** – by measurement of the air gap 'A' from the lowest point of the water inlet device and the uppermost point of the overflow outlet bore.

5.3 Multiple Supply

In the case of multiple feed pipes to a single vessel having a circular overflow (restricted), the distance of the air gaps for the potable supply (fluid 1) shall be 'A' above the critical water level, for distance 'A' (see 5.1).

Where $A \geq 2 \times$ the total sum of all inlet bore diameters and no feed orifice shall be less than distance 'A' determined for the largest bore diameter of the feed pipes. The critical water level shall be determined with all feed pipes discharging and having an individual inflow calculated at $Q = 0.14D^2$.

Potable water inlets must terminate at a higher level than non potable inlets and never closer than 2D measured horizontally and vertically downward.

5.4 Backflow / Back Pressure

If the receiving vessel can be subject to positive pressure backflow it is important that the inlet orifice is positioned so that it cannot be contaminated by the ascending / returning backflow fluid.

5.5 Verification

Verification can be achieved by test or by measurement.

Procedure for verification by test [see 5.2 (1) and 5.3].

- Close all outlets.
- Identify 'D'.
- Calculate 'Q'.
- Apply flow rate 'Q' and maintain maximum water level.
- Note contact with inlet device outlet.
- Stop flow rate 'Q'.
- After 2 seconds establish level 'h'.
- Measure air gap between level 'h' and the lowest point of the feed orifice.

Requirement

- No contact between the water level and the inlet device.
- The air gap 'A' shall be $\geq 2D$ and never less than 20mm.

Procedure for verification by measurement [see 5.2 (2)].

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Circular overflow (Restricted)

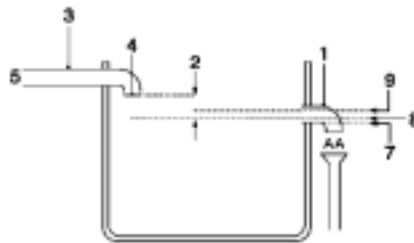


FIG 2

1. Warning /Overflow
2. Air Gap (A)
3. Feed Pipe
4. Feed Orifice
5. Internal Diameter of Feed Pipe (Bore)
7. Spillover Level
8. Critical Water Level (h)
9. Maximum Level