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BRITISH STANDARD

BS EN
14623:2005

Devices to prevent pollution by backflow of potable water — Air gaps with minimum circular overflow (verified by test or measurement) — Family A, type G

The European Standard EN 14623:2005 has the status of a British Standard

ICS 13.060.20; 91.140.60

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The UK participation in its preparation was entrusted by Technical Committee B/504, Water supply, to Subcommittee B/504/14, Backflow prevention, which has the responsibility to:

— aid enquirers to understand the text;

— present to the responsible international/European committee any enquiries on the interpretation, or proposals for change, and keep UK interests informed;

— monitor related international and European developments and promulgate them in the UK.

A list of organizations represented on this subcommittee can be obtained on request to its secretary.

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Summary of pages

This document comprises a front cover, an inside front cover, the EN title page, pages 2 to 10, an inside back cover and a back cover.

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

EN 14623

May 2005

ICS 13.060.20; 91.140.60

English version

Devices to prevent pollution by backflow of potable water - Air gaps with minimum circular overflow (verified by test or measurement) - Family A, type G

Dispositifs de protection contre la pollution de l'eau potable par retour - Surverse avec trop plein (définie par essai de dépression) - Famille A, type G

Sicherungseinrichtungen zum Schutz des Trinkwassers gegen Verschmutzung durch Rückfließen - Freier Auslauf mit kreisförmigem Überlauf mit Mindestdurchmesser (Nachweis durch Prüfung oder Messung) - Familie A, Typ G

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Foreword

This European Standard (EN 14623:2005) has been prepared by Technical Committee CEN/TC 164 "Water supply", the secretariat of which is held by AFNOR.

This European Standard shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by November 2005, and conflicting national standards shall be withdrawn at the latest by November 2005.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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Introduction

In respect of potential adverse effects on the quality of water intended for human consumption, caused by the product covered by this European Standard:

a) this European Standard provides no information as to whether the produce may be used without restriction in any of the Member state of the EU or EFTA;

b) it should be noted that, while awaiting the adoption of verifiable European criteria, existing national regulations concerning the use and/or the characteristics of this product remain in force.

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1 Scope

This European Standard specifies the characteristics and the requirements of air gaps with overflow, family A, type G for nominal flow velocity not exceeding 3 m/s. Air gaps are devices for protection of potable water in water installations from pollution. This European Standard applies to air gaps in factory assembled products and to constructed air gaps in situ, and defines the physicochemical characteristics of materials of construction used for the purpose and application to ensure compliance with this document during normal working use.

2 Normative references

The following referenced documents are indispensable for the application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 1717:2000, *Protection against pollution of potable water in water installations and general requirements of devices to prevent pollution by backflow*.

3 Terms and definitions

For the purposes of this European Standard, the terms and definitions of EN 1717:2000 and the following apply.

3.1
air gap with overflow family A, type G
permanent and vertical distance between the lowest point of the feed orifice and the critical water level having an overflow capable of draining the maximum inflow of water under fault condition

NOTE See Figure 1 for the design principle.

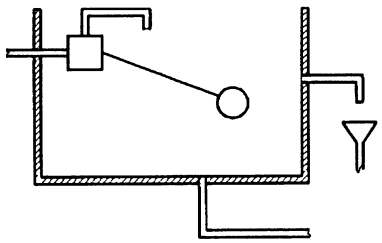

Figure 1 — Design principle

3.2
spillover level
level at which water will start to overflow the receiving vessel with all outlets closed

3.3
critical water level
physical or piezometric level of liquid reached in any part of the appliance 2 s after closing the water inlet starting from the maximum fault level

3.4
dimension '*h*'
height between the spillover level and the critical level

3.5
maximum operational level
in an open system the level that will be reached in normal operation (as defined by the manufacturer)

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3.6
maximum level
highest water level '*H*' reached above the spillover level under positive pressure fault condition with all outlets closed

3.7
splashing (requirements for protection)
when maintaining the maximum flow rate at the maximum level if a contact is observed between the upstream component and the liquid in the receiving vessel due to splashing, foaming or turbulence, the air gap shall be increased to a point where no contact is observed

3.8
diameter of feed pipe (Bore '*D*')
diameter '*D*' is the maximum internal diameter within the last metre of the supply pipe or the DN of the inlet connection

4 Designation

An air gap with overflow family A, type G is designated by:

— name;

— reference to this European Standard;

— denomination (see 3.8 DN or *D*);

— family and type.

Example for a designation of an air gap with minimum circular overflow (verified by test or measurement) Family A (A), type G (G), DN 15

Air gap, EN 14623, Family A, Type G, DN 15

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5 Symbolization

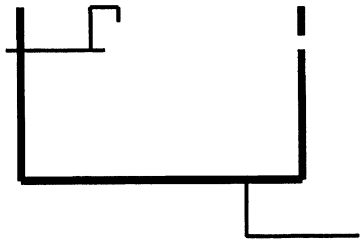


Figure 2 — Graphic symbol

6 Materials

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

The materials used in water installations, including the materials of protection units in contact with drinking water, shall satisfy the European standards and national acceptance criteria and/or national restrictions for use currently in force in EU and EFTA.

They shall be compatible with each other, with the water supplied and with the fluids or substances that can come into contact with them.

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

7 Requirements

7.1 General

The protection assembly comprises four parts:

— water inlet device;

— receiving vessel (container);

— overflow;

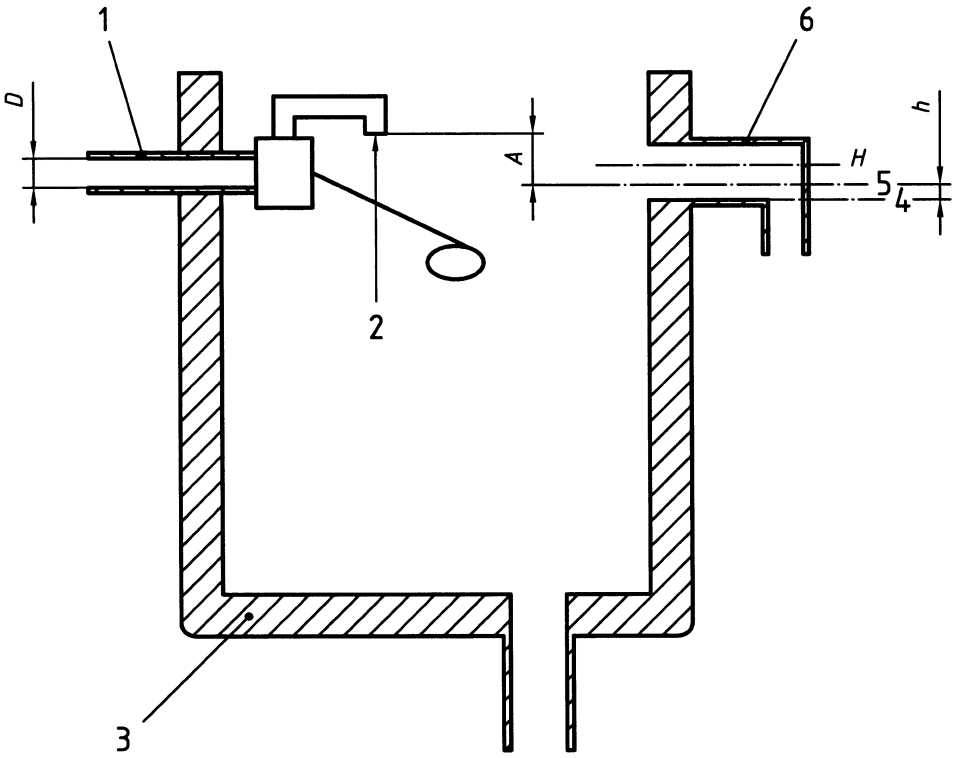
— air break to drain.

7.2 Water inlet device

Every feed pipe, float-operated valve or other device which controls the inflow of water to a receiving vessel shall be securely and rigidly fixed to maintain air gap.

The outlet of the inlet device shall not come into contact in any way with a product from downstream, and will always be above the maximum level '*H*' (see Figure 3).

Adjustable or dismantleable joints are not permitted below the maximum operational level. Submerged supply pipes shall be made from corrosion resistant materials and be pressure tested as part of the inlet device.



Key
1 Feed pipe
2 Feed orifice
3 Receiving vessel
4 Spillover level
5 Critical level (distance *h*)
6 Overflow pipe
A Air gap (distance)
D Internal diameter of feed pipe (bore)
H Maximum level

Figure 3 — Air gaps with minimum circular overflow (verified by test or measurement) family A, type G

7.3 Overflow arrangements

The overflow arrangements shall not be less than 19 mm internal diameter.

The overflow arrangements shall include an air break prior to any connection to a drain. An air break to drain shall comply with the requirements of EN 1717, excluding W.C's.

7.4 Air gap distance

7.4.1 Single supply

For air gaps family A, type G the critical water level (*h*) shall be established and the air gap distance '*A*' measured from the lowest point of the water inlet to the critical water level (see Figure 3). For air gap distances see Table 1.

The air gap can be determined by one of the following methods:

a) *h* is determined by test measurement of the depth of water above the spillover level of the overflow 2 s after the inflow equal to $Q = 0{,}14\ D^2$ in l/min has stopped or, a dynamic pressure of 1 MPa (10 bar) has stopped if the flow rate *Q* cannot be achieved. Where *D* is the inlet bore (see 3.8) and with all outlets (except the

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overflow) closed, based on a velocity of 3 m/s, or the maximum recommended flow rate for manufactured appliances when the flow rate is higher than *Q*;

b) in the case of a pipe or valve not greater in size than 15 mm (G½), by measurement of the air gap distance '*A*' from the lowest point of the feed orifice and the centre line of the overflow pipe.

Table 1 — Air gap distance

Pipe/valve size (inch/metric)	**Distance A** (mm)
≤ DN 15 (G ½)	≥ 20 mm
≤ DN 20 (G ¾)	≥ 25 mm
> DN 22 (G ¾)	$2 \times D$

7.4.2 Multiple supplies

In the case of multiple feed pipes to a single vessel having an overflow, the distance of the air gaps for the potable water supply shall be dimension '*A*' above the critical water level. The critical water level (3.3) shall be determined with all feed pipes discharging at an individual inflow calculated at $Q = 0{,}14\ D^2$.

If the flow rate *Q* cannot be achieved, apply a dynamic pressure of 1 MPa (10 bar) on all inlets. No feed orifice shall be less than distance '*A*' above the critical water level.

For calculating air gap distance '*A*' use $A = 2 \cdot \sqrt{\sum D^2}$

7.4.3 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.

When the air gap is part of an installation which can generate positive pressure backflow it is essential that a means of limiting the flow rate to a rate which will not comprise the overflow arrangement is incorporated, i.e. non return valve fitted upstream of the pressurisation unit.

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

7.5 Verification

7.5.1 General

Verification can be achieved by test or by measurement.

7.5.2 Procedure for verification by test

See 7.4.1 (a) and 7.4.2.

a) Sequence of test

- close all outlets (except the overflow);
- identify '*D*';
- calculate *Q*;
- apply flow rate *Q* and maintain maximum water level;
- note contact with the outlet of the inlet device(s) during filling and the maximum level;

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- stop flow rate *Q*;
- after 2 s establish distance *h*;
- measure air gap between distance *h* and lowest point of the feed orifice.

b) Requirements:

- no contact between the receiving vessel fluid and the outlet of the inlet device(s);
- measured air gap shall meet the requirements of dimension '*A*' (see Table 1).

7.5.3 Procedure for verification by measurement (single supply only)

a) Sequence of measurement

- see 7.4.1 (b).

b) Requirements

- measured air gap shall meet the requirements of dimension '*A*' (see Table 1).

8 Marking (not required for site constructed products)

Each appliance incorporating an air gap with minimum circular overflow (verified by test or measurement) family A, type G shall be clearly and permanently marked and accessibly visible.

Marking shall indicate:

a) manufacturer's brand or logo;

b) letter indicating family and type of air gap;

c) denomination (DN or *D*);

d) reference to this European Standard.

Following information to be given where possible:

e) reference (type or model, etc.);

f) serial number.

9 Technical documents

The manufacturer’s documentation shall include the appropriate installation requirements to ensure the air gap is not compromised, including positive pressure backflow.

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