

Air admittance valves for drainage systems — Requirements, test methods and evaluation of conformity

The European Standard EN 12380:2002 has the status of a
British Standard

ICS 23.060.99; 91.140.80

National foreword

This British Standard is the official English language version of EN 12380:2002.

EN 12380 is a candidate “harmonized” European Standard and fully takes into account the requirements of the European Commission mandate M118 “Waste water engineering products”, given under the Construction Products Directive (89/106/EEC), and intended to lead to CE marking. The date of applicability of EN 12380 as a “harmonized” European Standard, i.e. the date after which this standard may be used for CE marking purposes, is subject to an announcement in the *Official Journal of the European Communities*.

The Commission, in consultation with Member States, has agreed a transition period for the co-existence of “harmonized” European Standards and their corresponding national standard(s). It is intended that this period will comprise a period, usually nine months, after the date of availability of the European Standard, during which any required changes to national regulations are to be made, followed by a further period, usually of 12 months, for the implementation of CE marking. At the end of this co-existence period, the national standard(s) will be withdrawn.

EN 12380 is the subject of transitional arrangements agreed under the Commission mandate. However, in the UK there are no corresponding national standards.

The UK participation in its preparation was entrusted to Technical Committee B/505, Wastewater engineering, 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 the UK interests informed;
- monitor related international and European developments and promulgate them in the UK.

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

Cross-references

The British Standards which implement international or European publications referred to in this document may be found in the BSI Catalogue under the section entitled “International Standards Correspondence Index”, or by using the “Search” facility of the *BSI Electronic Catalogue* or of British Standards Online.

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EUROPEAN STANDARD

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NORME EUROPÉENNE

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December 2002

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English version

Air admittance valves for drainage systems - Requirements, tests methods and evaluation of conformity

Clapets équilibreurs de pression pour systèmes
d'évacuation - Exigences, méthodes d'essais et évaluation
de conformité

Belüftungsventile für Entwässerungssysteme -
Anforderungen, Prüfverfahren und Konformitätsbewertung

This European Standard was approved by CEN on 23 September 2002.

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the Management Centre or to any CEN member.

This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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Foreword

This document (EN 12380:2002) has been prepared by Technical Committee CEN/TC 165 "Wastewater engineering", the secretariat of which is held by DIN.

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 June 2003, and conflicting national standards shall be withdrawn at the latest by September 2005.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports essential requirements of EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

After enquiry of the draft standards prEN 12380-1 and prEN 12380-2, CEN/TC 165 decided to move requirements on ventilating of drainage systems to EN 120562 and EN 12056-5 and continued the work with the product standard EN 12380 with the new title "*Air admittance valves for drainage systems — Requirements, tests methods and evaluation of conformity*". This document is the result of this decision.

According to the Mandate M118 "Waste Water Engineering Products", issued by the Commission to CEN within the context of the Council Directive of 21 December on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (89/106/EEC), the annex ZA was added, which shows the clauses of this European Standard addressing the provisions of the EU Directive.

Annex A is normative.

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

Introduction

The purpose of an air admittance valve is to provide a method to protect water traps in gravity drainage systems by allowing air to enter the system when a negative pressure develops in the pipework, as an alternative to the use of pipework for ventilation.

1 Scope

This European Standard establishes requirements, test methods and evaluation of conformity for air admittance valves to be used in drainage systems installed inside buildings in accordance with EN 12056-2 and EN 12056-5.

It specifies the performance requirements of air admittance valves and how to test them to demonstrate compliance with this standard.

2 Normative references

This European Standard incorporates by dated or undated reference, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 681-1, *Elastomeric seals — Material requirements for pipe joint seals used in water and drainage applications — Part 1: Vulcanized rubber.*

EN 681-2, *Elastomeric seals — Material requirements for pipe joints seals used in water and drainage applications — Part 2: Thermoplastic elastomers.*

EN 681-3, *Elastomeric seals — Material requirements for pipe joints seals used in water and drainage applications — Part 3: Cellular materials of vulcanized rubber.*

EN 681-4, *Elastomeric seals - Materials requirements for pipe joint seals used in water and drainage applications - Part 4: Cast polyurethane sealing elements.*

EN 877, *Cast iron pipes and fittings, their joints and accessories for the evacuation of water from buildings — Requirements, test methods and quality assurance.*

EN 1123-1, *Pipes and fittings of longitudinally welded hot-dip galvanized steel pipes with spigot and socket for wastewater systems — Part 1: Requirements, testing, quality control.*

EN 1123-2, *Pipes and fittings of longitudinally welded hot-dip galvanized steel pipes with spigot and socket for wastewater systems — Part 2: Dimensions.*

EN 1124-1, *Pipes and fittings of longitudinally welded stainless steel pipes with spigot and socket for wastewater systems — Part 1: Requirements, testing, quality control.*

EN 1124-2, *Pipes and fittings of longitudinally welded stainless steel pipes with spigot and socket for wastewater systems — Part 2: System S — Dimensions.*

EN 1124-3, *Pipes and fittings of longitudinally welded stainless steel pipes with spigot and socket for wastewater systems — Part 3: System X — Dimensions.*

EN 12380:2002 (E)

EN 1329-1, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system.*

ENV 1329-2, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Unplasticized poly(vinyl chloride) (PVC-U) - Part 2: Guidance for the assessment of conformity.*

EN 1451-1, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Polypropylene (PP) — Part 1: Specifications for pipes, fittings and the system.*

ENV 1451-2, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Polypropylene (PP) - Part 2: Guidance for the assessment of conformity.*

EN 1453-1, *Plastics piping systems with structured-wall pipes for soil and waste discharge (low and high temperature) inside buildings — Unplasticized poly(vinyl chloride) (PVC-U) — Part 1: Specifications for pipes, fittings and the system.*

ENV 1453-2, *Plastics piping systems with structured wall pipes for soil and waste discharge (low and high temperature) inside buildings - Unplasticized poly(vinyl chloride) (PVC-U) - Part 2: Guidance for the assessment of conformity.*

EN 1455-1, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Acrylonitrile-butadiene-styrene (ABS) — Part 1: Specifications for pipes, fittings and the system.*

ENV 1455-2, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Acrylonitrile-butadiene-styrene (ABS) - Part 2: Guidance for the assessment of conformity.*

EN 1519-1, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Polyethylene (PE) — Part 1: Specifications for pipes, fittings and the system.*

ENV 1519-2, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Polyethylene (PE) - Part 2: Guidance for the assessment of conformity.*

EN 1565-1, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Styrene-copolymer blends (SAN+PVC) — Part 1: Specifications for pipes, fittings and the system.*

ENV 1565-2, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Styrene copolymer blends (SAN+PVC) - Part 2: Guidance for the assessment of conformity.*

EN 1566-1, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure — Chlorinated poly(vinyl chloride) (PVC-C) — Part 1: Specifications for pipes, fittings and the system.*

ENV 1566-2, *Plastics piping systems for soil and waste discharge (low and high temperature) within the building structure - Chlorinated poly(vinyl chloride) (PVC-C) - Part 2: Guidance for the assessment of conformity.*

EN 12056-2, *Gravity drainage systems inside buildings — Part 2: Sanitary pipework, layout and calculation.*

EN 12056-5, *Gravity drainage systems inside buildings — Part 5: Installation and testing, instructions for operation, maintenance and use.*

EN 12763, *Fibre-cement pipes and fittings for discharge systems for buildings — Dimensions and technical terms of delivery.*

3 Terms, definitions and symbols

For the purposes of this European Standard, the following terms and definitions apply.

3.1 Terms and definitions

3.1.1

air admittance valve

AAV

component fitted to an inside drainage system allowing air to enter the drainage pipework system, but not allowing foul air out

3.1.2

determined airflow capacity

lowest flowrate of an air admittance valve while producing a pressure of (-250 ± 10) Pa at the manometer tapping

NOTE Airflow capacity is expressed in litres per second

3.1.3

opening pressure

value of the pressure at the instant of opening of the air admittance valve

3.2 Symbols

Symbol for air admittance valve used in this European Standard:



NOTE The arrows designate the direction of airflow.

4 Types of air admittance valves

Air admittance valves are designated according to their operating temperature range and location with respect to connected appliances according to Table 1.

Table 1 — Operating conditions and designation of air admittance valves

Determining factor	Range/Position	Designation
Permitted to be located below flood level of connected appliances	Yes	A
	No	B
Temperature	$-20\text{ °C to }+60\text{ °C}$	I
	$0\text{ °C to }+60\text{ °C}$	II
	$0\text{ °C to }+20\text{ °C}$	III

EXAMPLE 1 A valve that is permitted to be located below an appliance's flood level and operate in air temperatures of 0 °C to $+60\text{ °C}$ would be designated an 'A II' air admittance valve.

EXAMPLE 2 A valve that is not permitted to be fitted below an appliance's flood level and can only operate in air temperatures of 0 °C to $+20\text{ °C}$ would be designated a 'B III' air admittance valve.

NOTE Designation I valves are intended for use where the ambient temperature at the point of installation is below freezing for days.

5 Requirements

5.1 General

All air admittance valves shall be airtight when closed and function reliably within the specified temperature ranges when installed according to the manufacturer's instructions.

5.2 Connections

The connections of all air admittance valves shall conform to the relevant standards for the products to which the connection is to be made. These standards include: EN 877, EN 1123, EN 1124, EN 1329, EN 1451-1, ENV 1451-2, EN 1453-1, ENV 1451-2, EN 1455-1, ENV 1455-2, EN 1519-1, ENV 1519-2, EN 1565-1, ENV 1565-2, EN 1566-1, ENV 1566-2, and EN 12763. The sealing material shall conform to EN 681-1 to EN 681-4.

5.3 Airtightness

An assembly of an air admittance valve fitted to a pipe, in accordance with the manufacturer's instructions, shall be airtight when tested according to the airtightness test (see 6.3).

5.4 Durability

Air admittance valves shall withstand normal handling. They are considered to fulfil this requirement if they pass the drop test (see 6.2).

Air admittance valves shall have a satisfactory service life. An air admittance valve will be considered to have sufficient service life when it passes the endurance and temperature test (see 6.4).

5.5 Effectiveness

When determined in accordance with the airflow capacity test (see 6.5), the airflow capacity shall be not less than the nominal capacity claimed by the manufacturer.

When tested according to 6.5, air admittance valves shall be open when a constant pressure of -150_{10}^0 Pa is applied to the inside of the valve.

Designation I valves shall be tested in accordance with 6.6.

6 Test methods

Air admittance valves shall be installed for testing, where appropriate, in accordance with the manufacturer's instructions and subjected to, and pass, the following tests in order of listing:

- 1) drop;
- 2) air tightness at 30 Pa, 500 Pa and 10 000 Pa;
- 3) endurance and temperature test;
- 4) opening characteristic and airflow capacity test;
- 5) where required, a test for effectiveness at temperatures below zero.

NOTE Test methods and criteria vary for different designation valves.

6.1 General procedure

If the air admittance valve to be tested is to be supplied with any adaptors that in some circumstances the manufacturer recommends should be fitted, e.g. a size reducer, the air admittance valve shall be tested both with and without each of the adaptors or combination of adaptors in tests 6.3 and 6.4. The valves shall be mounted within 5° of vertical and fitted complete with any insulation or fly screen etc. supplied with the valve.

Testing, unless otherwise specified in the individual test methods, shall be carried out at a temperature of 20^{+10}_{-5} °C.

The results of the testing shall be reported as shown in annex A.

6.1.1 Sampling for tests

Three samples of each type, and variations of each type, shall be chosen at random and each valve subjected to the drop test, air tightness test, and opening characteristic and air flow capacity test. Valve variations will include: adapter devices for different size pipes, insulation covers, fly-screens or any other removable or optional feature that could affect an aspect of the valve's performance.

6.1.2 Test methods

The apparatus drawings in this European Standard are suggested diagrammatic means of testing the valves. Other apparatus may be used providing the results are comparable and no less accurate. In cases of dispute the methods and apparatus specified in this European Standard shall be used.

6.2 Drop test

6.2.1 Method

Valves with removable insulation shall be tested without the insulation in position. The test shall be carried out as follows over a concrete surface as shown in Figure 1:

- a) ensure that the surface is clean;
- b) hold the air admittance valve with its lowest point $1^{+0,02}_0$ m above the concrete surface, in orientation 1 (upside down);
- c) release the air admittance valve;
- d) pick up valve, change to orientation 2 (top uppermost) and drop;
- e) pick up valve, change to orientation 3 (sideways) and drop.

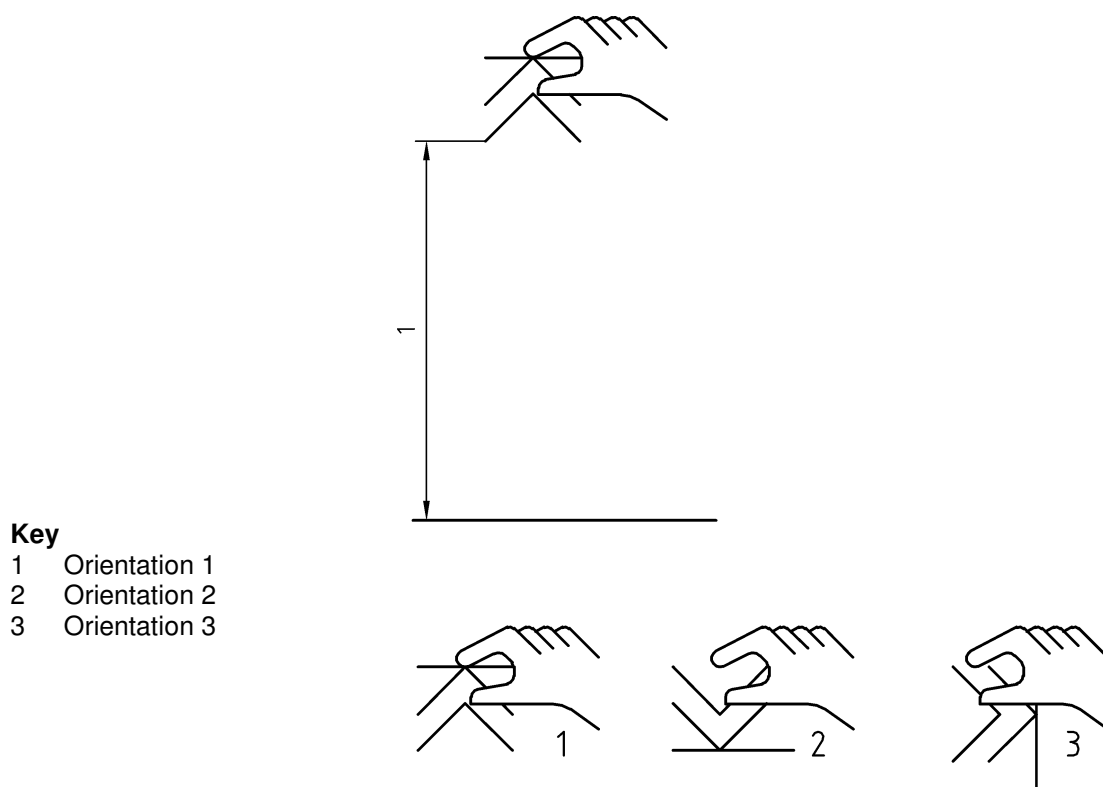


Figure 1 — Drop test — Height and valve orientation

6.2.2 Criteria

The valve shall show no signs of deformation or breakage which may affect the functioning.

6.3 Air tightness test

6.3.1 Apparatus

The test apparatus shall consist of:

- ¾ an insulated pipe of appropriate diameter, conforming to one of the standards listed in 5.2, with a length of 2,5 diameter in mm, which shall be sealed at the base;
- ¾ an air inlet valve, connected to the pipe;
- ¾ a pump;
- ¾ a manometer;
- ¾ means for attaching a plug and the air admittance valve to be tested so that it can be installed in accordance with the manufacturer's instructions;
- ¾ a suitable clamp may be required to restrain push-fit valves during testing. Such a clamp shall not deform or damage the valve or affect its performance.

6.3.2 Method

The test shall be carried out as follows:

- a) with a plug fitted check that the test apparatus, shown in Figure 2, is airtight when subject to pressure $10\,000\begin{smallmatrix} 0 \\ 100 \end{smallmatrix}$ Pa for at least 5 min;

NOTE 1 mm WC = 10 Pa.

- b) remove the plug and fit the air admittance valve as in the manufacturer's instructions;
- c) open the air inlet valve and slowly raise the pressure to $30\begin{smallmatrix} +10 \\ 0 \end{smallmatrix}$ Pa. Close the air inlet valve and record the initial pressure;
- d) record the internal pressure after 5 min;
- e) if the pressure is less than 90 % of the initial value, measured with an accuracy of $\pm 0,5$ Pa, check the apparatus is still airtight. If a leak is detected in the apparatus, rectify and repeat from c);
- f) open the air inlet valve and slowly raise the pressure to $500\begin{smallmatrix} +10 \\ 0 \end{smallmatrix}$ Pa. Close the air inlet valve and record the set pressure;
- g) record the internal pressure after 5 min;
- h) if the pressure is less than 90 % of the set value, measured with an accuracy of $\pm 0,5$ Pa, check the apparatus is still airtight. If a leak is detected in the apparatus, rectify and repeat from f);

For Designation A valves the following requirements apply in addition:

- i) if the previous test criteria are achieved, raise the pressure by opening the air inlet valve and pumping air into the apparatus until it reaches $10\,000\begin{smallmatrix} 0 \\ 100 \end{smallmatrix}$ Pa. Close the valve and record the set pressure;
- j) after five minutes record the internal pressure;
- k) if the pressure is less than 90 % of the set value, measured with an accuracy of $\pm 0,5$ Pa, check the apparatus is still airtight using a soap solution and inspecting for air bubbles. If a leak is detected in the apparatus, rectify and repeat from i).

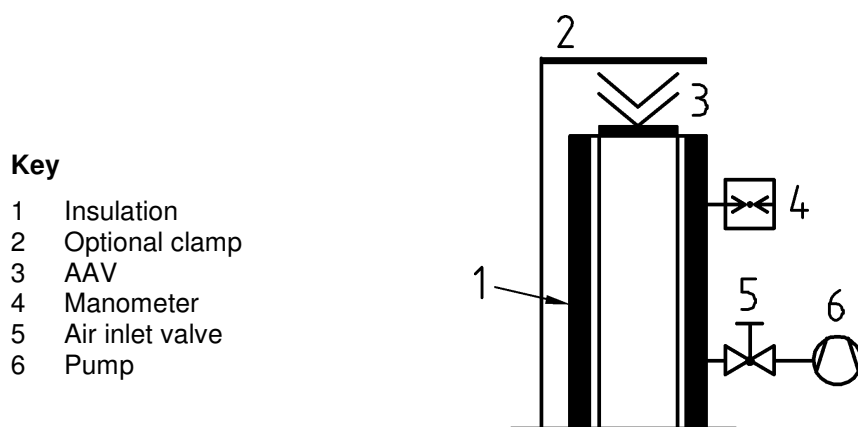


Figure 2 — Airtightness test apparatus

6.3.3 Criteria

6.3.3.1 Designation A valves

The pressures recorded after 5 min in 6.3.2 d), 6.3.2 g) and 6.3.2 j) shall not be less than 90 % of the initial recorded pressures.

6.3.3.2 Designation B valves

The pressures recorded in 6.3.2 d) and 6.3.2 g) shall not be less than 90 % of the initial recorded pressures.

6.4 Endurance and temperature test

6.4.1 Apparatus

The test apparatus shall consist of:

- ¾ a mechanism which can be operated within two temperature environments. The mechanism comprises a tube, fitted with an electric fan at one end,
- ¾ a means of diverting airflow at the other end and a connection for the air admittance valve to be tested so that it can be installed in accordance with the manufacturer's instructions.
- ¾ temperature and pressure measuring devices and cycle recording means;
- ¾ an atmospheric vent may be required to ensure that the air admittance valve closes and that the applied suction is within the specified limits.

An example of suitable apparatus is shown in Figure 3.

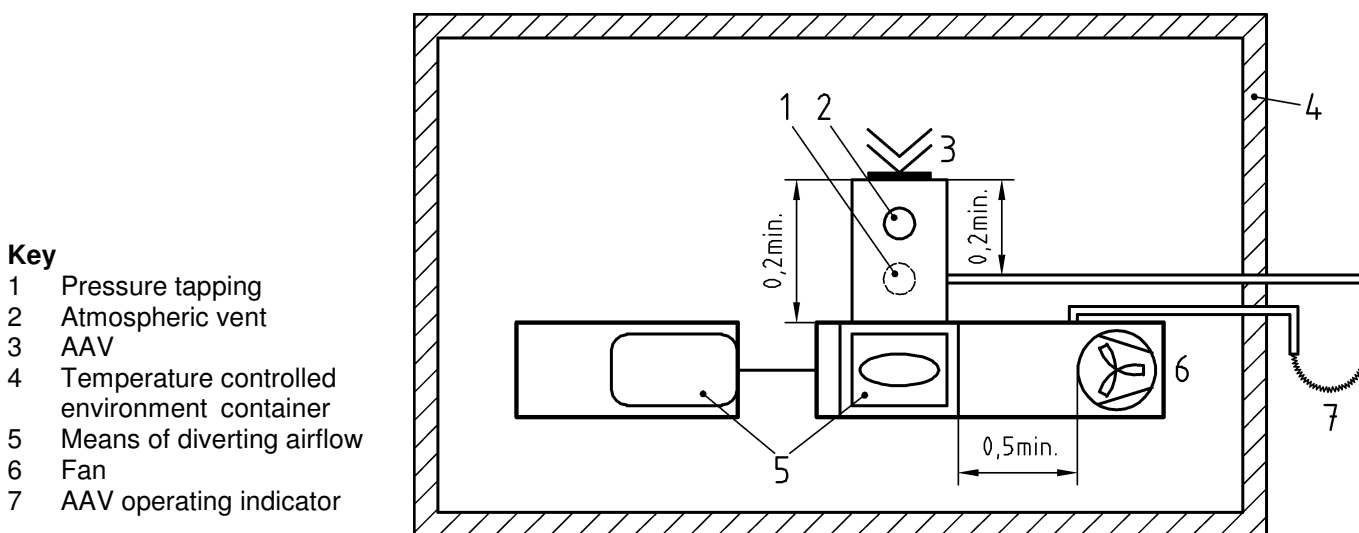
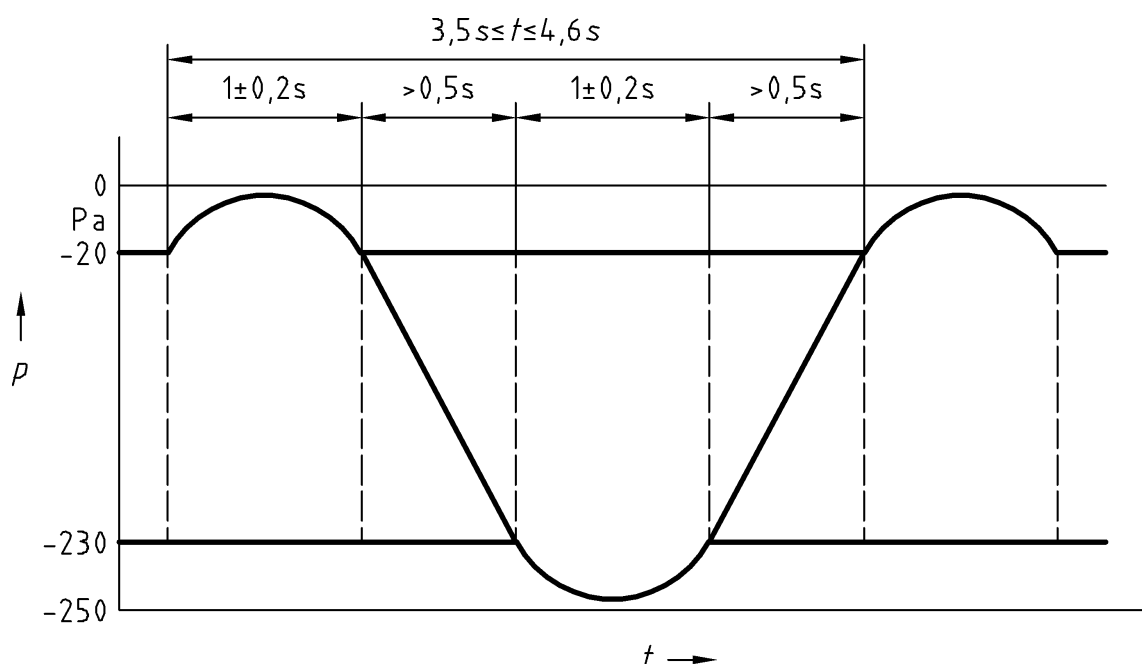


Figure 3 — Endurance test apparatus

NOTE The airflow diverting actuator does not have to be housed within the controlled environment container.

The means of diverting airflow shall open and close the air admittance valve (15 ± 2) times per minute and result in the specified pressure/time function shown in Figure 4.

The two temperature environments used for Designation II and III valves are, in sequence, $(20 \pm 5) \text{ }^\circ\text{C}$ and $(60 \pm 2) \text{ }^\circ\text{C}$. Designation III valves shall only be subjected to $(20 \pm 5) \text{ }^\circ\text{C}$.



Key

p Pressure in Pa
t Time in s

Figure 4 — Endurance test pressure/time curve

6.4.2 Method

When supplied with an insulating cap, the cap shall be installed on the air admittance valve.

6.4.2.1 Designation I and II Valves

The test shall be carried out on only one valve.

The air admittance valve and test apparatus shall be placed, and operated, in an environment where the ambient air is maintained at $(20 \pm 5) \text{ }^\circ\text{C}$ for a period of $16 \text{ h} \pm 5 \text{ min}$.

- Upon completion of this test, conduct the airtightness test (see 6.3) again.
- The air admittance valve and test apparatus shall be placed, and operated, in an environment where the ambient air is maintained at $(60 \pm 2) \text{ }^\circ\text{C}$ for a period of $8 \text{ h} \pm 5 \text{ min}$.
- Upon completion of this test, conduct the airtightness test (see 6.3) again.

For designation I valves the test in accordance with 6.6 shall be carried out.

6.4.2.2 Designation III Valves

The test shall be carried out on only one valve.

- The air admittance valve and test apparatus shall be placed, and operated, in an environment where the ambient air is maintained at $(20 \pm 5) \text{ }^\circ\text{C}$ for a period of $24 \text{ h} \pm 5 \text{ min}$.

b) Upon completion of this test, conduct the airtightness test (see 6.3) again.

6.4.3 Criteria

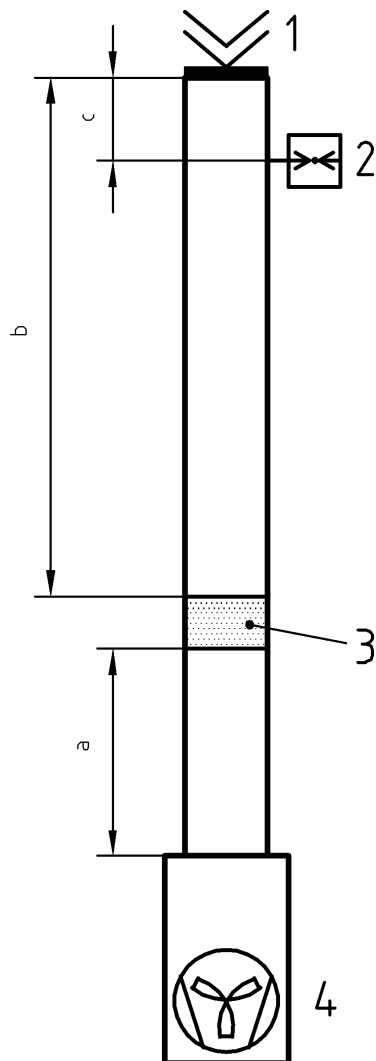
See 6.3 airtightness test and, additionally, 6.6 for designation I valves.

6.5 Opening characteristic and airflow capacity test

6.5.1 Apparatus

The test apparatus shall consist of an appropriate diameter pipe fitted with:

- ¾ a static pressure tapping connected to a manometer;
- ¾ an averaging airflow meter capable of resolving 0,1 l/s and a variable airflow rate electric fan (or equivalent means to induce an airflow down the pipe), as shown in Figure 5;
- ¾ a means of detecting the instant of opening of the air admittance valve; for example either flow visualisation by using ventilation smoke tubes or by detecting the pressure change.



- Key**
- 1 AAV
 - 2 Manometer
 - 3 Averaging air flow meter
 - 4 Fan
 - a 5 stack ID
 - b > 10 stack ID
 - c 2 stack ID

Figure 5 — Airflow test apparatus

6.5.2 Method

The test shall be carried out as follows:

- a) connect the air admittance valve to the top of the pipe, using appropriate means where necessary, in accordance with the manufacturer's instructions;
- b) start the fan, or equivalent, to create an airflow down the pipe while recording the developed static air pressure and the air flowrate;
- c) increase slowly the speed of the fan until the air admittance valve opens; the valve is considered to be open at the moment the static pressure suddenly rises;
- d) record the value of the pressure at the instant of opening, this will be designated the opening pressure;

NOTE The opening pressure is the maximum pressure measured just before the valve opens, i.e. just before the pressure rises.

- e) using the fan, or equivalent, the air flowrate shall be adjusted so that the measured pressure is (-250 ± 10) Pa;
- f) measure, and record, the mean value of the air flowrate across the pipe. The lowest mean flowrate of the three valves tested (see 6.1.1) will be designated the determined airflow capacity;
- g) reduce the air flowrate so that the measured pressure is $-150 \begin{smallmatrix} 0 \\ 10 \end{smallmatrix}$ Pa;
- h) record the mean value of any air flowrate across the pipe for the three valves.

6.5.3 Criteria

- a) The opening pressure shall be between 0 Pa and -150 Pa.
- b) The lowest of the three determined airflow capacities shall be the determined airflow capacity of the valve.
- c) With an applied suction of 150 Pa, a measurable flowrate shall be produced.

6.6 Test for effectiveness at temperatures below zero

6.6.1 Apparatus

The test apparatus shall consist of:

- ¾ a nominally 2,10 m long vertical stack of DN 110 with a nominal 1,5 m long branch of DN 110 connected at $(1,3 \pm 0,01)$ m below the top of the stack;
- ¾ a DN 110 trap at the bottom and a DN 50 trap at $(0,5 \pm 0,01)$ m above the maximum water level in the lower trap;
- ¾ a static pressure tapping (connected to a manometer) 1 m below the top of the stack;
- ¾ an insulated box within which the top of the stack is terminated;
- ¾ two temperature sensors having an accuracy of $0,2$ °C.

The horizontal pipe is fitted with an air flow meter and variable speed electric fan, or an equivalent means, to induce airflow down the stack.

The 50 mm connection is used to introduce warm water into the stack.

The box, of approximate overall dimensions 0,8 m 0,8 m 0,8 m with a removable top, is lined with 100 mm insulation inside, such that the top of the stack is (0,4 0,01) m above the insulation. A temperature measuring device is positioned within 20 mm of the AAV.

Dimensions in metres

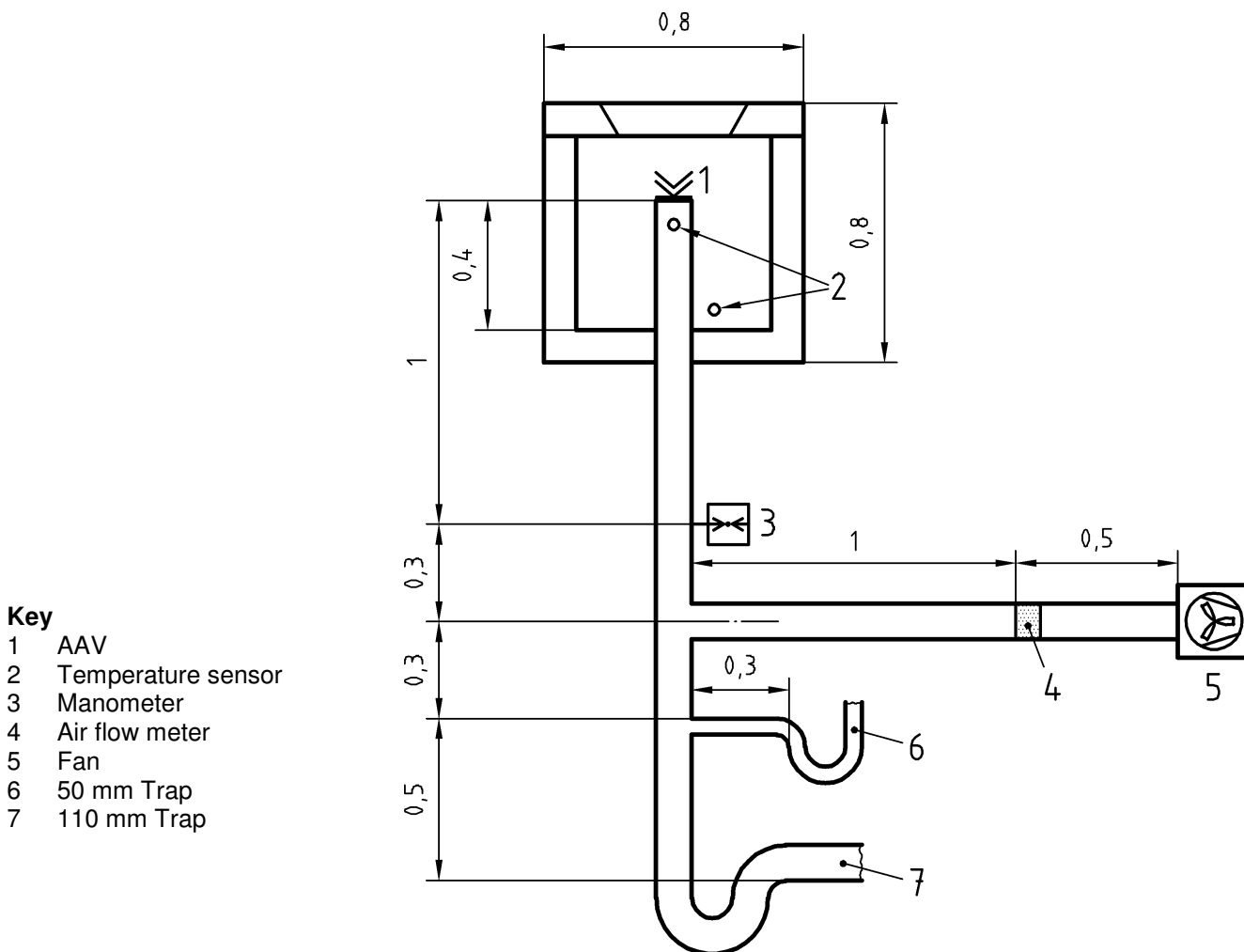


Figure 6 — Test apparatus for frost test

6.6.2 Test method

The test shall be carried out on one valve as follows:

- a) connect the AAV to the top end of the stack, using appropriate means where necessary, in accordance with the manufacturer's instructions;
- b) fit the lid on the box and open a (120 10) cm² air inlet;
- c) fill the traps with water then adjust the fan to create a pressure of (– 250 10) Pa, at the manometer;
- d) record the first airflow rate;
- e) switch off the fan close the air inlet and seal the fan's outlet;

- f) reduce the temperature inside the box;
- g) when the temperature inside the box has reached $(-20 \pm 3) ^\circ\text{C}$ run warm water at $(40 \pm 3) ^\circ\text{C}$ at the rate of (10 ± 1) litres per minute into the 50 mm trap for a period of $(5 \pm 0,5)$ min, allowing water to flow out of the lower trap;
- h) after waiting for $(1 \pm 0,1)$ h, top up the traps if required;
- i) open the air inlet and unseal the fan's outlet;
- j) adjust the fan to create a pressure of (-250 ± 10) Pa at the manometer within 30 s;
- k) record the second airflow rate.

6.6.3 Criteria

The second air flow rate shall not be less than 90 % of the first airflow rate, and the 50 mm trap shall contain more than 25 mm water.

7 Marking, labelling and packaging

Each product shall be marked as follows:

- ¾ the number of this European Standard, i.e. EN 12380;
- ¾ manufacturer's identification;
- ¾ designation of product according to Table 1;
- ¾ nominal size DN;
- ¾ last two digits of the year of manufacture.

The marking shall be easily readable without magnification. If printing is used, the colour of the printed information shall differ from the basic colouring of the product.

The marking shall be printed or formed directly on the outside of the air admittance valve in such a way that it does not initiate cracks or other types of failure and that with normal storage, weathering and processing, and the permissible method of installation and use, legibility shall be durably maintained. Alternatively, the marking may be on a permanently attached label.

The packaging shall contain the manufacturer's instructions; for application, the pipe material, the DN of the pipe, installation and use.

8 Evaluation of conformity

8.1 General

The compliance of an air admittance valve with the requirements of this European Standard shall be demonstrated by:

- ¾ initial type testing;
- ¾ factory production control by the manufacturer.

8.2 Initial type testing (type testing)

Conformity to all requirements specified in this European Standard with the tests and test procedures shall be examined, on the basis of one or more specimens of a product representative of the production. In case of significant changes in design of the product and/or in manufacturing process, the relevant type test(s) shall be repeated.

Where tests have been performed in accordance with the requirements and test methods of the EN (i.e. same product, sampling procedure, etc.), these test results may be taken into account for the purposes of initial type testing.

Complete records shall be kept by the manufacturer for at least 5 years. In case of third party control the reports shall be made available to the third party body performing the inspection.

8.3 Factory production control (internal quality control)

The manufacturer shall operate an appropriate factory production control system. For example, a system based upon EN ISO 9001 which is made specific to the requirements of this European Standard is deemed to satisfy the factory production control requirements.

Factory production control shall consist of controls and tests to be carried out at regular intervals by the manufacturer in such a way to ensure the conformity of the products with all the requirements of this European Standard during the whole period of manufacture.

The factory production control shall be documented by the manufacturer. The quality records shall include all steps of the production from receipt of raw material up to the delivery of the finished product and shall describe all elements including the procedures being applied to the surveillance of the production process and to test the characteristics of the products. The documentation shall be appropriate to the manufacturing process and kept up-to-date. The controls shall be carried out in each production plant and appropriate lists of characteristics to be controlled shall be established for the products.

Complete test reports shall be kept by the manufacturer for at least 5 years. In case of third party control, the reports shall be made available to the third party body approved for performing the inspections.

Annex A (normative)

Model test report

A test report on air admittance valve performance shall include the following information if relevant:

- 1) name and address of testing body (if relevant);
- 2) identification number of the report;
- 3) name and address of the person requesting the test (the sponsor);
- 4) method of sampling and other circumstances (date and person responsible for the sampling);
- 5) name or identification of tested object;
- 6) condition of the test specimens, environmental data during the tests (temperature, pressure etc.);
- 7) identification of the test equipment and instruments used;
- 8) any deviation from the test methods;
- 9) test results;
- 10) inaccuracy or uncertainty of the results;
- 11) date and signature.

Annex ZA (informative)

Clauses of this European Standard addressing the provisions of EU Directives

ZA.1 Scope and relevant characteristics

This European Standard has been prepared under mandate M 118 "Waste water engineering products" given to CEN by the European Commission and the European Free Trade Association.

The clauses of this European Standard shown in this annex meet the requirements of the mandate given under the EU Construction Products Directive (89/106/EEC).

Compliance with these clauses confers a presumption of fitness of the air admittance valves covered by this annex for the intended uses indicated herein; reference shall be made to the information accompanying the CE marking.

WARNING — Other requirements and other EU Directives, not affecting the fitness for intended uses, can be applicable to the air admittance valves falling within the scope of this European Standard.

NOTE 1 In addition to any specific clauses relating to dangerous substances contained in this standard, there may be other requirements applicable to the products falling within its scope (e.g. transposed European legislation and national laws, regulations and administrative provisions). In order to meet the provisions of the EU Construction Products Directive, these requirements need also to be complied with, when and where they apply.

NOTE 2 An informative database of European and national provisions on dangerous substances is available at the Construction web site on EUROPA (CREATE, accessed through <http://europa.eu.int/comm/enterprise/construction/internal/hygiene.htm>).

This annex establishes the conditions for the CE marking of the air admittance valves intended for the uses indicated in Table ZA.1 and shows the relevant clauses applicable.

The scope of this annex is defined by clause 1 of this European Standard.

Table ZA.1 — Relevant clauses

Product: Air admittance valves as covered under the scope of this standard			
Intended use: Protection of water traps in gravity drainage systems by allowing air to enter the system when a negative pressure develops in the pipework, as an alternative to the use of pipework for ventilation.			
Essential characteristics	Clauses in this standard	Mandated levels and/or classes	Notes
Airtightness	5.3	-	Watertightness is assessed by the airtightness test in 6.3. Designation A valves are evaluated at 30 Pa, 500 Pa and 10 000 Pa. Designation B valves are evaluated at 30 Pa and 500 Pa.
Durability (to withstand mechanical endurance, heat and temperatures below zero)	5.4	-	Designation I valves are evaluated at – 20 °C and 60 °C Designation II valves are evaluated at 20 °C and 60 °C. Designation III valves are evaluated at 20 °C.
Effectiveness (airflow capacity)	5.5	-	
Effectiveness (opening pressure)	5.5	-	
Effectiveness at temperatures below zero	5.5	-	To be tested only for places of use where temperatures below zero are required

The requirement on temperatures below zero is not applicable in those Member States (MSs) where there are no regulatory requirements on that characteristic for the intended use of the product. In this case, manufacturers placing their products on the market of these MSs are not obliged to determine nor declare the performance of their products with regard to this temperature. For the effectiveness at temperatures below zero, the option “No performance determined” (NPD) in the information accompanying the CE marking (see ZA.3) may be used.

ZA.2 Procedure(s) for the attestation of conformity of products

ZA.2.1 System of attestation of conformity

The system of attestation of conformity of air admittance valves indicated in Table ZA.1 in accordance with the Decision of the Commission 97/464/EC of 1997-06-27 as given in Annex III of the mandate for "Wastewater engineering products", is shown in Table ZA.2 for the indicated intended use and relevant level(s) or class(es):

Table ZA.2 — Systems of attestation of conformity

Products	Intended use(s)	Level(s) or class(es)	Attestation of conformity system
Air admittance valves	To ventilate gravity drainage systems	-	4
System 4: see CPD Annex III.2(ii), third possibility.			

The attestation of conformity of the air admittance valves in Table ZA.1 shall be based on the evaluation of conformity procedures indicated in Table ZA.3.

Table ZA.1 — Assignment of evaluation of conformity tasks for air admittance valves under system 4

Tasks		Content of the task	Evaluation of conformity clauses to apply
Tasks for the manufacturer	Factory production control (F.P.C)	Parameters related to all relevant ^a characteristics of Table ZA.1	8.3
	Initial type testing	all relevant ^a characteristics of Table ZA.1	8.2
^a “relevant” in this column relates to the fact that some characteristics of Table ZA.1 may not be assessed, depending on the intended use of the product.			

ZA.2.2 Declaration of conformity

When compliance with this annex is achieved, the manufacturer or his agent established in the EEA shall prepare and retain a declaration of conformity (EC Declaration of conformity), which entitles the manufacturer to affix the CE marking. This declaration shall include:

- ¼ name and address of the manufacturer, or his authorised representative established in the EEA, and place of production;
- ¼ description of the product (type, identification, use,...), and a copy of the information accompanying the CE marking;
- ¼ provisions to which the product conforms (e.g. annex ZA of this EN);
- ¼ particular conditions applicable to the use of the product (e.g. provisions for use under certain conditions, etc.);
- ¼ name of, and position held by, the person empowered to sign the declaration on behalf of the manufacturer or of his authorised representative.

The above mentioned declaration shall be presented in the official language or languages of the Member State in which the product is to be used.

ZA.3 CE marking and labelling

The manufacturer or his authorised representative established within the EEA is responsible for the affixing of the CE marking. The CE marking symbol to affix shall be in accordance with Directive 93/68/EC and shall be shown on the air admittance valve. In addition, the CE marking shall appear on the packaging and/or on the accompanying commercial documents, together with the following information:

- ¼ the name or the identifying mark of the manufacturer;
- ¼ the last two digits of the year in which the marking was affixed;
- ¼ the number of this European Standard (EN 12380);
- ¼ indications to identify the characteristics of the product and the intended use;
- ¼ designation according to Table 1;
- ¼ airflow capacity (l/s);
- ¼ airtightness;

- ¾ range of temperature (see Table 1);
- ¾ effectiveness at temperatures below zero.

The “No performance determined” (NPD) option may not be used where the characteristic is subject to a threshold level. Otherwise, the NPD option may be used when and where the characteristic, for a given intended use, is not subject to regulatory requirements in the Member State of destination.

An example of the information to be given on the accompanying commercial documentation is given Figure ZA.1.

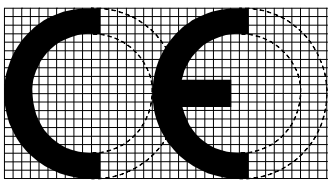
	<p><i>CE conformity marking, consisting of the “CE”-symbol given in Directive 93/68/EEC.</i></p>
<p>Any Co Ltd, PO Box 21, B-1050</p> <p>01</p>	<p><i>Name or identifying mark and registered address of the producer</i></p> <p><i>Last two digits of the year in which the marking was affixed</i></p>
<p>EN 12380</p> <p>Valve to ventilate drainage systems</p> <p>Designation: A II</p> <p>Airflow capacity: 10 l/s</p> <p>airtightness tested at: 10 kPa</p> <p>Range of temperature: 0°C to 60°C</p> <p>Effectiveness at temperatures below zero: NPD</p>	<p><i>No. of European Standard</i></p> <p><i>Description of product and information on regulated characteristics</i></p>

Figure ZA.1 — Example of CE marking information

In addition to any specific information relating to dangerous substances shown above, the product should also be accompanied, when and where required and in the appropriate form, by documentation listing any other legislation on dangerous substances for which compliance is claimed, together with any information required by that legislation.

NOTE European legislation without national derogations need not be mentioned.

Bibliography

- [1] EN ISO 9001, *Quality management systems — Requirements*.
- [2] Council Directive of 21 December 1988 on the approximation of laws, regulations and administrative provisions of the Member States relating to construction products (89/106/EEC).

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