

# Antipollution of water installations

## Technical document 045-05

Backflow preventer with atmospheric vent –  
Family D, Types A, B and C

Technical document 045-05 rev. 16  
25/07/2022

The CSTB (Centre Scientifique et Technique du Bâtiment), a public establishment supporting innovation in construction, has four key activities: research, expertise and the assessment and dissemination of knowledge, organised to meet the challenges of ecological and energy transition in the construction sector. Its field of competence covers construction materials, buildings and their integration into districts and towns.

With over 900 employees, its subsidiaries and networks of national, European and international partners, the CSTB group works for all the stakeholders in the construction sector to push forward the quality and safety of buildings.

## Modification history

Revision No.	Date	Modifications
15	01/07/2017	<p><b>Update to the document introduction and reference.</b></p> <p><b>Basic modifications:</b></p> <ul style="list-style-type: none"> <li>- Part 1 - DB devices:               <ul style="list-style-type: none"> <li>○ Chapter 2: the standard references have been supplemented and updated</li> <li>○ Paragraph 6.4 re: packaging added</li> </ul> </li> <li>- Part 2 "Manufacturer's production quality requirements" - Paragraph 2.1:               <ul style="list-style-type: none"> <li>○ DC devices: bending strength test removed</li> <li>○ Sub-paragraph concerning ISO 9001 sites removed</li> <li>○ Note on incorporating the tests during production removed</li> </ul> </li> <li>- Part 3 "Inspection procedures employed by the CSTB": extra details on admission and follow-up inspection sampling added, following paragraphs removed (types of products, inspection operations following admission and reduced inspection operations).</li> </ul>
16	25/07/2022	<ul style="list-style-type: none"> <li>- Editorial update according to the structure in force following the creation of the Technical management appendix of the NF045 reference system rev. 17.</li> </ul>

## Table of contents

<b>1</b>	<b>TECHNICAL SPECIFICATIONS</b>	<b>5</b>
<b>1A/</b>	<b>IN-LINE ANTI-VACUUM VALVES, DN8 TO DN80 - FAMILY D, TYPE A</b>	<b>5</b>
	Purpose	5
<b>1B/</b>	<b>PIPE INTERRUPTERS WITH PERMANENT ATMOSPHERIC VENT - FAMILY D TYPE C</b>	<b>5</b>
	Purpose	5
<b>1C/</b>	<b>PIPE INTERRUPTERS WITH ATMOSPHERIC VENT AND MOVING ELEMENT - FAMILY D TYPE B</b>	<b>5</b>
	Purpose	5
1	Field of application	5
2	Standard references	5
3	Terms and definitions	6
4	Nominal size	6
5	Designation	6
6	Marking and technical documents	6
<b>6.4</b>	<b>Packing/Packaging (added)</b>	<b>6</b>
7	Symbols	6
8	General design characteristics	6
<b>8.1</b>	<b>Design principle</b>	<b>6</b>
	Note: This article supplements the specifications of Article 8.1 of Standard NF EN 14452.	6
	Air inlets	6
<b>8.2</b>	<b>Fittings</b>	<b>6</b>
<b>8.3</b>	<b>Replacement of internal parts</b>	<b>6</b>
9	Physical and chemical characteristics	6
10	Characteristics and tests	6
<b>10.1</b>	<b>General</b>	<b>6</b>
<b>10.2</b>	<b>Test sequence</b>	<b>7</b>
<b>10.3</b>	<b>Visual verification</b>	<b>7</b>
<b>10.4</b>	<b>Vacuum</b>	<b>7</b>
<b>10.5</b>	<b>Flow rate/pressure loss</b>	<b>7</b>
<b>10.6</b>	<b>Bending moment, mechanical strength of the body and leaktightness</b>	<b>7</b>
<b>10.7</b>	<b>Vacuum</b>	<b>8</b>
<b>10.8</b>	<b>Endurance</b>	<b>8</b>
<b>10.9</b>	<b>Vacuum</b>	<b>8</b>
<b>10.10</b>	<b>Vacuum without membrane</b>	<b>8</b>
11	Acoustic characteristics	8
12	Presentation at delivery	8

# 1 TECHNICAL SPECIFICATIONS

## 1A/ IN-LINE ANTI-VACUUM VALVES, DN8 TO DN80 - FAMILY D, TYPE A

Standard NF EN 14451 was formally approved on 5 September 2005.

This standard is used as a technical reference system and replaces French Standard NF P 43-013.

To preserve the performance level of the products, it has been decided to add detail to and/or supplement certain chapters of this standard.

### Purpose

The purpose of this chapter is to add detail to certain paragraphs of Standard NF EN 14451 using the same paragraph numbers, and to supplement this European reference system using criteria deemed fundamental.

## 1B/ PIPE INTERRUPTERS WITH PERMANENT ATMOSPHERIC VENT - FAMILY D TYPE C

Standard NF EN 14453 was formally approved on 5 September 2005.

This standard is used as a technical reference system and replaces French Standard NF P 43-014.

To preserve the performance level of the products, it has been decided to add detail to and/or supplement certain chapters of this standard.

### Purpose

The purpose of this chapter is to add detail to certain paragraphs of Standard NF EN 14453 using the same paragraph numbers, and to supplement this European reference system using criteria deemed fundamental.

## 1C/ PIPE INTERRUPTERS WITH ATMOSPHERIC VENT AND MOVING ELEMENT - FAMILY D TYPE B

Standard NF EN 14452 was formally approved on 5 September 2005.

This standard is used as a technical reference.

### Purpose

The purpose of this chapter is to add detail to certain paragraphs of Standard NF EN 14452 using the same paragraph numbers, and to supplement this European reference system using criteria deemed fundamental.

## 1 Field of application

No modifications.

## 2 Standard references

NF EN 1267:2012, *Industrial valves – Test of flow resistance test using water as test fluid*

NF EN 1254-20 : 2021, *Copper and copper alloys – Fitting – Part 20 : Definitions, thread dimensions, test methods, reference data and additional information*

## 3 Terms and definitions

No modifications.

## 4 Nominal size

No modifications.

“Nominal size” is understood to mean “Denomination”.

## 5 Designation

No modifications.

## 6 Marking and technical documents

### 6.4 Packing/Packaging (added)

A manufacturing reference shall be included on the packaging.

## 7 Symbols

No modifications.

## 8 General design characteristics

### 8.1 Design principle

*Note: This article supplements the specifications of Article 8.1 of Standard NF EN 14452.*

#### *Air inlets*

The air inlets shall either be protected (directly, e.g. with a cap, or indirectly, e.g. with a case) or designed in such a way as to prevent them becoming blocked by deposits. The air inlet passages shall be wider than 4 mm at all points.

The air inlet closure membrane holder slits shall be at least 2 mm wide.

The minimum distance between the bottom of the air inlets and the lowest point of the water passage zone shall be 20 mm (see Figure 2 of Standard NF EN 14452).

### 8.2 Fittings

**Note:** This article supplements the specifications of **Article 8.2 of Standard NF EN 14452.**

The threaded ends of the body of the backflow preventer shall have seal seating surfaces large enough to provide a leakproof seal under pressure and to prevent damage to the seals.

Under no circumstances should the pipe sleeve impair device operation (pipe grip, etc.).

The sizing of thread connections on the pipeline must comply with the dimensional specifications of standard NF EN 1254-20.

### 8.3 Replacement of internal parts

No modifications.

## 9 Physical and chemical characteristics

No modifications.

## 10 Characteristics and tests

### 10.1 General

No modifications.



**10.7 Vacuum**

No modifications.

**10.8 Endurance**

No modifications.

**10.9 Vacuum**

No modifications.

**10.10 Vacuum without membrane**

No modifications.

**11 Acoustic characteristics**

No modifications.

**12 Presentation at delivery**

**Note:** This article has been added.

The device shall be protected against the following from the time it leaves production to the time it is installed:

- damage of any kind to the ends,
- external pollution of any kind.