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European Assessment Document for

Backwater valve kits made of plastics for insertion in gravity drainage systems



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This European Assessment Document (EAD) has been developed taking into account up-to-date technical and scientific knowledge at the time of issue and is published in accordance with the relevant provisions of Regulation (EU) 305/2011 as a basis for the preparation and issuing of European Technical Assessments (ETA).

Contents

1	Scope of the EAD	4
1.1	Description of the construction product	4
1.2	Information on the intended use(s) of the construction product	5
1.2.1	Intended use(s).....	5
1.2.2	Working life/Durability.....	5
1.3	Specific terms used in this EAD	5
1.3.1	Backwater valve kit - Anti-flooding device Type 2A	5
2	Essential characteristics and relevant assessment methods and criteria	6
2.1	Essential characteristics of the product	6
2.2	Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product	6
2.2.1	Water-tightness (including gas-tightness)	7
2.2.2	Efficiency	7
2.2.3	Durability.....	9
3	Assessment and verification of constancy of performance	10
3.1	System(s) of assessment and verification of constancy of performance to be applied	10
3.2	Tasks of the manufacturer	10
4	Reference documents	11

1 SCOPE OF THE EAD

1.1 Description of the construction product

Products in accordance with this EAD are backwater valve kits made of plastics for insertion in gravity drainage systems (named “backwater valve kits” thereafter in this EAD) as anti-flooding devices for buildings.

The backwater valve kits are inserted into the cleaning fitting of the horizontal gravity drainage through the cleanout opening (Figure 1.1.1). The cleaning fitting is not a component of the kits but is a part of the assembled system. The assembled system intends to prevent sewage from entering the building.

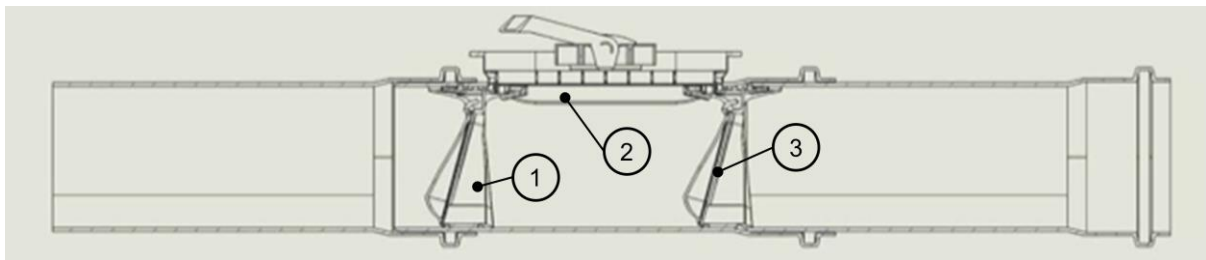


Figure 1.1.1 Backwater valve kit (1-ring-casting with flapper, 2-small flat fixing part, 3- sealing rubber)

The components of the backwater valve kits are:

Type	Components of the kits
Type 2A: (see Clause 1.3.1)	<ul style="list-style-type: none"> • Two plastic ring-casings each with flapper for automatic closure • Small flat plastic fixing part, that connects this ring castings • Sealing rubbers

The backwater valve kits (Type 2A, defined in Clause 1.3.1) are not fully covered by the harmonized European standard EN 13564-1¹.

This product is not an anti-flooding device Type 1 in terms of EN 13564-1. Anti-flooding device Type 1 requires one automatic closure device and one emergency closure device, where this emergency closure device may be combined with the automatic closure device.

The product is not a complete anti-flooding device Type 2 in terms of EN 13564-1. For anti-flooding device Type 2 it is required that the product concerns two automatic closure devices and an emergency closure device where this emergency closure device may be combined with one of automatic closure device.

The backwater valve kits when inserted into cleaning fitting are not in accordance with any further type of anti-flooding devices (Type 3, Type 4 or Type 5) defined in EN 13564-1, Clause 4.

Due to the absence of emergency closure device as part of the backwater valve kits, deviating to device Type 2 in terms of EN 13564-1, the additional assessment method for efficiency (permanent closure in case of backwater) of backwater valve kits is added.

Additionally, this product does not meet the special requirements of anti-flooding devices of types 0, 1 and 2 in accordance with EN 13564-1, Clause 6.2, in particular, where the operational closing device shall open to allow the passage of water to a depth of 70% of the internal diameter of the incoming pipe. Instead of

¹ All undated references to standards in this document are to be understood as references to the dated versions listed in chapter 4.

this requirement this EAD foresees the assessment of the maximal discharge of the product with respect to the maximal opening position of the flap and with respect to the inclination of the incoming pipe.

Concerning product packaging, transport, storage, maintenance, replacement and repair it is the responsibility of the manufacturer to undertake the appropriate measures and to advise his clients on the transport, storage, maintenance, replacement and repair of the product as he considers necessary.

It is assumed that the product will be installed in accordance with the manufacturer's instructions or (in absence of such instructions) in accordance with the usual practice of the building professionals.

Relevant manufacturer's stipulations, e.g., with regard to the intended end use conditions, having influence on the performance of the product covered by this European Assessment Document shall be considered for the determination of the performance and detailed in the ETA as long as the details of the assessment methods as laid down in this EAD are respected.

1.2 Information on the intended use(s) of the construction product

1.2.1 Intended use(s)

The backwater valve kits can be used for the horizontal gravity drainage systems of buildings in accordance with EN 12056-1, Clause 1, for domestic wastewater (with or without faecal) up to a temperature of 75°C, in accordance with EN 13564-1, Clause 5.

1.2.2 Working life/Durability

The assessment methods included or referred to in this EAD have been written based on the manufacturer's request to take into account a working life of the backwater valve kits for the intended use of 25 years when installed in the works (provided that the backwater valve kits are subject to appropriate installation (see 1.1)). These provisions are based upon the current state of the art and the available knowledge and experience (equivalent to products in accordance with EAD 180008-00-0704).

When assessing the product the intended use as foreseen by the manufacturer shall be taken into account. The real working life may be, in normal use conditions, considerably longer without major degradation affecting the basic requirements for works².

The indications given as to the working life of the construction product cannot be interpreted as a guarantee neither given by the product manufacturer or his representative nor by EOTA when drafting this EAD nor by the Technical Assessment Body issuing an ETA based on this EAD, but are regarded only as a means for expressing the expected economically reasonable working life of the product.

1.3 Specific terms used in this EAD

1.3.1 Backwater valve kit - Anti-flooding device Type 2A

Anti-flooding device Type 2A for the insertion in the horizontal gravity drainage system consists of two insertions, respectfully two automatic anti-flooding devices manufactured for the insertion in an already build in cleaning fitting. Anti-flooding device Type 2A has no emergency closure device.

² The real working life of a product incorporated in a specific works depends on the environmental conditions to which that works is subject, as well as on the particular conditions of the design, execution, use and maintenance of that works. Therefore, it cannot be excluded that in certain cases the real working life of the product may also be shorter than referred to above.

2 ESSENTIAL CHARACTERISTICS AND RELEVANT ASSESSMENT METHODS AND CRITERIA

2.1 Essential characteristics of the product

Table 2.1.1 shows how the performance of the “backwater valve kits” is assessed in relation to the essential characteristics.

Table 2.1.1 Essential characteristics of the product and methods and criteria for assessing the performance of the product in relation to those essential characteristics

No	Essential characteristic	Assessment method	Type of expression of product performance
Basic Works Requirement 3: Hygiene, health and the environment			
1	Water-tightness (including gas-tightness)	2.2.1	Description
2	Efficiency <ul style="list-style-type: none"> ▪ Self-closure (automatic closure) ▪ Self-opening ▪ Pressure tightness ▪ Channel bottom consistency ▪ Permanent-closure in case of backwater ▪ Maximum discharge 	2.2.2	Description Level
Aspects of durability			
3	Durability <ul style="list-style-type: none"> ▪ Temperature resistance ▪ Mechanical stability 	2.2.3	Description

2.2 Methods and criteria for assessing the performance of the product in relation to essential characteristics of the product

This chapter is intended to provide instructions for TABs. Therefore, the use of wordings such as “shall be stated in the ETA” or “it has to be given in the ETA” shall be understood only as such instructions for TABs on how results of assessments shall be presented in the ETA. Such wordings do not impose any obligations for the manufacturer and the TAB shall not carry out the assessment of the performance in relation to a given essential characteristic when the manufacturer does not wish to declare this performance in the Declaration of Performance.

If for any components covered by harmonised standards or European Technical Assessments the manufacturer of the component has included the performance regarding the relevant characteristic in the Declaration of Performance, retesting of that component for issuing the ETA under the current EAD is not required.

For the testing, the test specimen is incorporated in an assembled system consisting of the cleaning fitting with installed backwater valve kit. In the ETA the cleaning fitting shall be defined by the following parameters: DN in accordance with EN 12056-2, Clause 6.2.1 and dimensions of opening of the cleaning fitting part as defined in EN 1123-2, Clause 5.9.

2.2.1 Water-tightness (including gas-tightness)

Purpose of the assessment

In accordance with EN 13564-1, Clause 6.2 the assembled system including the covers shall be watertight, means no leakage shall occur.

Assessment method

The backwater valve kit inserted in the cleaning fitting shall be tested in accordance with EN 13564-2, Clause 3.3, applying the test procedure for anti-flooding device Type 2. The flaps shall be removed.

Expression of results

In accordance with EN 13564-1 the backwater valve kits are water-tight if the requirements for water-tightness are met. Then it shall be stated in the ETA: "Water-tight and Gas-tight".

If the requirements in accordance with EN 13564-1, Clause 6.2 are not met in ETA it shall be stated: "Not water-tight and not gas-tight".

2.2.2 Efficiency

Purpose of the assessment

With this assessment, the efficiency of the backwater valve kits in case of self-closure, self-opening, pressure tightness, bottom consistency and permanent closure in case of backwater shall be done. Additionally, the maximum discharge with respect to different inclinations shall be assessed.

Assessment method

For the assessment of efficiency of the backwater valve kits the tests for self-closure, self-opening, pressure tightness, bottom consistency and permanent closure in case of backwater shall be done. The backwater valve kits are efficient if it satisfies all requirements for efficiency of this EAD, Clauses 2.2.2.1, 2.2.2.2, 2.2.2.3, 2.2.2.4 and 2.2.2.5. Additionally, the maximum discharge of the backwater valve kits shall be assessed in accordance with Clause 2.2.2.6.

The testing specimen shall be an assembled system consisting of the cleaning fitting with the installed backwater valve kits. For the assessment of efficiency three (3) specimens shall be tested; one specimen of them shall be tested in accordance with EN 13564-2, Clause 3.2 before being applied in this test.

For the assessment of efficiency in accordance with Clauses 2.2.2.1, 2.2.2.2, 2.2.2.3, 2.2.2.4 and 2.2.2.5 the test medium in accordance with EN 13564-2, Clause 3.4.2.2 shall be used.

Expression of results

If all requirements for efficiency in accordance with Clauses 2.2.2.1, 2.2.2.2, 2.2.2.3, 2.2.2.4 and 2.2.2.5 of this EAD are met in the ETA it shall be stated "Efficiency: Given"

If one or more requirements for efficiency in accordance with Clauses 2.2.2.1, 2.2.2.2, 2.2.2.3, 2.2.2.4 and 2.2.2.5 of this EAD are not met, in the ETA it shall be stated "Efficiency: Not given".

The maximum discharge in accordance with Clause 2.2.2.6 with respect to three different inclinations i : 0,5, 2,0 and 5,0 (cm/m) shall be stated in ETA.

2.2.2.1 Self-closure (automatic closure)

The automatic closure of the assembled system shall be tested in accordance with EN 13564-2, Clause 3.4.2 and Table 1, test cycle A of the EN 13564-2, Clause 3.4.2.4, 30 cycles.

In accordance with EN 13564-1, Clause 6.1, the backwater valve shall automatically close when backwater occurs, i.e., when or before pipe is filled, and shall allow the normal flow to reoccur when backflow ceases.

This requirement is met if the backwater valve closes during the test step 3 in accordance with EN 13564-2, Clause 3.4.2.4.

2.2.2.2 Self-opening

The self-opening of the assembled system shall be tested in accordance with EN 13564-2, Clause 3.4.2, test cycle A of the EN 13564-2, Clause 3.4.2.4, 30 cycles. This requirement is met if the backwater valve opens for each inflow during the test step 1.

The product shall be assessed in accordance with EN 13564-1, Clause 6.1, whereas the automatic closure device shall not impede the flow under low flow conditions. Therefore, it shall open when there is a depth of water on the up-stream side of 50 % of the pipe diameter or a maximum of 50 mm.

The assessment of self-opening can be conducted in conjunction with assessment in accordance with Clause 2.2.2.1 of this EAD.

2.2.2.3 Pressure tightness

The pressure tightness of the assembled system shall be tested in accordance with EN 13564-2, Clause 3.4.2 applying the test procedure for anti-flooding device Type 2.

In accordance with EN 13564-1, Clause 6.1, Paragraph 5, the leakage for each individual test cycle (A or B) shall not exceed 0,5 l.

The assessment of pressure tightness can be conducted in conjunction with assessment in accordance with Clause 2.2.2.1 of this EAD.

2.2.2.4 Channel bottom consistency

Internal surfaces of the product and steps in invert level shall meet the requirements EN 13564-1, Clause 6.1, Paragraph 3. The assessment shall be done using appropriate measurement tool with accuracy of 0,1 mm.

2.2.2.5 Permanent closure in case of backwater

The purpose of this test is the assessment of performance of the backwater valve kit defined as Type 2A in this EAD, Clause 1.3.1 due to the absence of emergency closure device as part of the backwater valve kit, as deviating to EN 13564-1, Clause 4.

The testing cases:

- The assembled system shall be tested in accordance with EN 13564-2, Clause 3.4.2.5, applying the test procedure for anti-flooding device Type 2; the first flap shall be either opened or removed, the second flap shall be closed.
- The assembled system shall be tested in accordance with EN 13564-2, Clause 3.4.2.5, applying the test procedure for anti-flooding device Type 2; the first flap shall be closed, the second opened or removed.

In accordance with EN 13564-1, Clause 6.1, Paragraph 4, during the backflow simulation it shall be observed whether the flap float upwards when the backflow occurs.

In accordance with the EN 13564-1, Clause 6.1, Paragraph 5, in connection with EN 13564-2, Clause 3.4.2.5, the leakage for each test shall not exceed 1000 cm³ during 30 min exposure to the backwater pressure, for each specimen.

2.2.2.6 Maximum discharge

Firstly, the maximum filling level for the highest opening position of the flap shall be assessed.

Secondly, based on the assessed filling height, the maximum discharge rate shall be assessed. The assessment shall be done based on tabulated values in accordance with EN 12056-2, Annex B, Table B.1, for three different incoming pipe inclinations i : 0,5, 2,0 and 5,0 (cm/m). For particular inclinations not listed therein, the discharge shall be calculated using linear interpolation.

The maximum discharge with respect to three different inclinations i: 0,5, 2,0 and 5,0 (cm/m), and where relevant, for further additional inclinations shall be stated in ETA.

2.2.3 Durability

Purpose of the assessment

In accordance with EN 13564-1, Clause 7, the backwater valve kits are durable if the requirements for resistance to temperature and mechanical stability are met.

Assessment method

The backwater valve kits are durable EN 13564-1, Clause 7, if the requirements for resistance to temperature and mechanical stability (Clauses 2.2.3.1 and 2.2.3.2 of this EAD) are met.

The testing specimen is an assembled system consisting of the cleaning fitting as indicated in Clause 2.2 of this EAD and consequently, in the ETA, with installed backwater valve kit. For the assessment of durability three (3) specimens shall be tested. One specimen shall be tested first for the temperature resistance in accordance with Clause 2.2.3.1 before applied in this test for the mechanical stability in accordance with Clause 2.2.3.2.

Expression of results

If the requirements in accordance with EN 13564-1, Clause 7 are met, the following shall be stated in the ETA : "Durable".

If the requirements in accordance with EN 13564-1, Clause 7 are not met, the following shall be stated in ETA : "Not durable".

2.2.3.1 Temperature resistance

The assessment shall be done on an assembled system including the backwater valve kits in accordance with this EAD. The assessment shall be done in accordance with EN 13564-2, Clause 3.2.

The backwater valve kit is resistant to temperature if the requirements in accordance with EN 13564-1 Clause 5, specified requirements for Type 2 are met, meaning there are no deformation or changes in the surface that affects usability in accordance with EN 13564-2, Clause 3.2.

2.2.3.2 Mechanical stability

The assessment of mechanical stability is covered by assessment in accordance with Clause 2.2.2.1, 2.2.2.2, 2.2.2.3 and 2.2.3.1 in this EAD.

Assessment of corrosion protection is not subject of this EAD as in accordance with the product definition in Clause 1.1 the product does not contain metallic parts.

3 ASSESSMENT AND VERIFICATION OF CONSTANCY OF PERFORMANCE

3.1 System(s) of assessment and verification of constancy of performance to be applied

For the products covered by this EAD the applicable European legal act is Commission Delegated Decision (EU) 2015/1959.

The applicable AVCP system is 4.

3.2 Tasks of the manufacturer

The cornerstones of the actions to be undertaken by the manufacturer of the product in the procedure of assessment and verification of constancy of performance are laid down in Table 3.2.1.

The manufacturer (regarding the components he buys from the market with DoP) shall take into account the Declaration of Performance issued by the manufacturer of that component. No retesting is necessary.

Table 3.2.1 Control plan for the manufacturer; cornerstones

No	Subject/type of control	Test or control method	Criteria, if any	Minimum number of samples	Minimum frequency of control
Factory production control (FPC) [including testing of samples taken at the factory in accordance with a prescribed test plan]					
1	Material	Documentation of incoming materials – certificate of component	EN 13564-1, Clause 5	Laid down in control plan	Each delivery
2	Exterior inspection	Visual control of components and assembly	EN 13564-1, Clause 6.1	Laid down in control plan	Sampling inspection in the serial production or at each delivery
3	Dimensions	Measurement (details laid down in control plan)	EN 13564-1, Clause 6.1; Clause 6.2	Laid down in control plan	Each production unit ³
4	Tightness	EN 13564-2, Clause 3.4.4	EN 13564-1, Clause 6.1	Laid down in control plan	Each production unit
5	Marking	Visual control	EN 13564-1, Clause 8	Laid down in control plan	Sampling inspection in the serial production

³ The size of the production unit and the number of samples, which shall be taken from the unit, depending on the kind of the product, the raw material and the production process.

4 REFERENCE DOCUMENTS

EN 1123-2:2006+A1:2007	Pipes and fittings of longitudinally welded hot-dip galvanized steel tube with spigot and socket for waste water systems - Part 2: Dimensions
EN 12056-1:2000	Gravity drainage systems inside buildings - Part 1: General and performance requirements
EN 12056-2:2000	Gravity drainage systems inside buildings - Part 2: Sanitary pipework, layout and calculation
EN 13564-1: 2002	Anti-flooding devices for buildings - Part 1: Requirements
EN 13564-2: 2002	Anti-flooding devices for buildings - Part 2: Test methods
EAD 180008-00-0704	Trapped gully - removable - mechanical closure