

EAD 180037-00-0706

August 2020

**BACKWATER VALVE KIT
MADE OF PLASTICS
FOR INSERTION
IN GRAVITY DRAINAGE
SYSTEMS**

Adopted European Assessment Document according to
Regulation (EU) № 305/2011, Annex II 7.



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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).

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1 SCOPE OF THE EAD

1.1 Description of the construction product

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

The backwater valve kit is inserted into the cleaning fitting of the horizontal gravity drainage through the cleanout opening (Figure 1.1). The cleaning fitting is not a component of the kit but is a part of the assembled system. The assembled system intends to prevent sewage from entering the building.

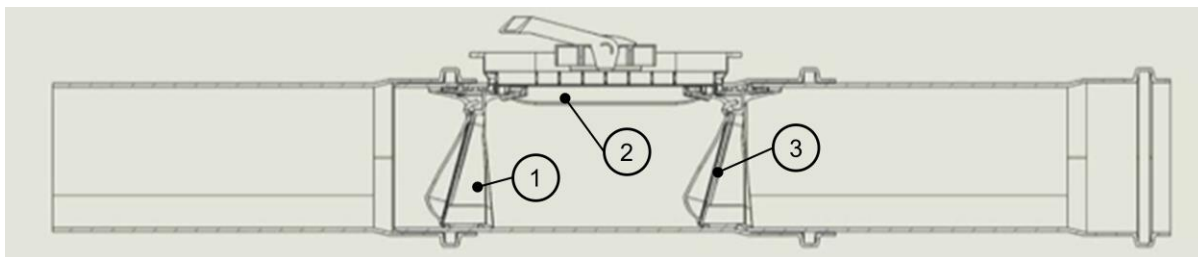


Figure 1.1 Backwater valve kit (1-ring-casting with flapper, 2-small flat fixing part, 3- sealing rubber)

The components of the backwater valve kit are:

| Product type | Components of the kit |
|-------------------------|---|
| Type 2A: (see 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 kit (Type 2A) is not fully covered by the following harmonized European standard EN 13564-1:2002¹.

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 kit when inserted into cleaning fitting is not in accordance with any type of anti-flooding device (Type 3, Type 4 or Type 5) defined in EN 13564-1 (Cl. 4).

Due to the absence of emergency closure device as part of the backwater valve kit, as deviating to device Type 2 in terms of EN 13564-1, the new assessment method for efficiency of permanent closure of backwater valve kit defined as Type 2A in this EAD (Cl. 1.3.1) in case of backwater is added.

Additionally, this product does not meet the special requirements of anti-flooding device of types 0,1 and 2 according to EN 13564-1 (Cl. 6.2) in particular, 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 this requirement

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

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 according to the manufacturer's instructions or (in absence of such instructions) according to the usual practice of the building professionals.

Relevant manufacturer's stipulations 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.

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

1.2.1 Intended use(s)

The backwater valve kit can be used for the horizontal gravity drainage systems of buildings according to EN 12056-1 (Cl.1) for domestic wastewater (with or without faecal) up to a temperature of 75°C.

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 kit for the intended use of 25 years when installed in the works (provided that the backwater valve kit is 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 according to 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 concerns 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 shows how the performance of the backwater valve kit is assessed in relation to the essential characteristics.

Table 2.1 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 ▪ Self-opening ▪ Pressure tightness ▪ Channel bottom consistency ▪ Permanent-closure in case of backwater ▪ Maximal discharge | 2.2.2 | Description Level |
| Other essential characteristics | | | |
| 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.

Testing will be limited only to the essential characteristics which the manufacturer intends to declare. 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 is defined by following parameters: DN according to EN 12056-2 (Cl.6.2.1) and dimensions of opening of the cleaning fitting part as defined in EN 1123-2 (Cl.5.9).

2.2.1 Water-tightness (including gas-tightness)

The backwater valve kit inserted in the cleaning fitting shall be tested according to EN 13564-2 (Cl. 3.3), applying the test procedure for anti-flooding device Type 2. The flaps shall be removed.

According to EN 13564-1 (Cl. 6.2) the assembled system including the covers shall be watertight, means no leakage shall occur.

According to 13564-1 the backwater valve is gas-tight if it meets the requirements for water-tightness in the ETA it shall be stated: Watertight.

If the requirements according to 13564-1 (Cl. 6.2) are not met in ETA it shall be stated: Not watertight.

2.2.2 Efficiency

For the assessment of efficiency of the backwater valve kit the tests for self-closure, self-opening, pressure tightness, bottom consistency and permanent closure in case of backwater shall be done. The backwater valve kit is efficient if it satisfies all requirements for efficiency of this EAD (Cl. 2.2.2.1, 0, 2.2.2.3, 2.2.2.4 and 2.2.2.5).

The testing specimen is an assembled system consisting of the cleaning fitting with installed backwater valve kit in it. For the assessment of efficiency test three (3) specimens shall be tested; one specimen of them must be tested according to 13564-2 (Cl. 3.2) before applied in this test.

For the assessment of efficiency according to Cl. 2.2.2.1, 2.2.2.2, 2.2.2.3, 2.2.2.4 and 2.2.2.5 the test medium according to 13564-2 (Cl. 3.4.2.2).

If all requirements for efficiency according to Cl. 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 according to Cl. 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 ETA it shall be stated Efficiency: Not given.

2.2.2.1 Self-closure (automatic closure)

The automatic closure of the assembled system shall be tested according to EN 13564-2 (Cl.3.4.2), test cycle A (EN 13564-2 Cl.3.4.2.4), 30 cycles.

According to EN 13564-1 (Cl. 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.

2.2.2.2 Self-opening

The self-opening of the assembled system shall be tested according to EN 13564-2 (Cl.3.4.2), test cycle A (EN 13564-2 Cl.3.4.2.4). This requirement is met if the backwater valve opens for each inflow during the test step 1.

The product shall be assessed according to EN 13564-1 (Cl. 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 according to Cl. 2.2.2.1 of this EAD.

2.2.2.3 Pressure tightness

The pressure tightness of the assembled system shall be tested according to EN 13564-2 (Cl.3.4.2) applying the test procedure for anti-flooding device Type 2.

According to in EN 13564-1 (Cl. 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 according to Cl.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 (Paragraph 3 of Cl. 6.1). 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 (Cl.1.3.1) due to the absence of emergency closure device as part of the backwater valve kit, as deviating to EN 13564-1 (Cl. 4).

The testing cases:

- The assembled system shall be tested according to EN 13564-2 (Cl.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 according to EN 13564-2 (Cl.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.

According to EN 13564-1 (Cl.6.1 Paragraph 4), during the backflow simulation it is to observe whether the flap float upwards when the backflow occurs.

According to the EN 13564-1, applying (Cl. 6.1 Paragraph 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 Maximal discharge

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

Secondly, based on the assessed filling height, the maximal discharge rate shall be assessed. The assessment shall be done by means of calculation, according to EN 12056-2 (Annex B) for three different incoming pipe inclinations i : 0.5, 2.0 and 5.0 (cm/m).

For each particular, assessed filling height, that is not listed in the EN 12056-2 (Annex B), the discharge shall be assessed by means calculation using linear interpolation.

The maximal discharge with respect to three different inclinations i : 0.5, 2.0 and 5.0 (cm/m) shall be stated in ETA.

2.2.3 Durability

The backwater valve kit is durable (EN 13564-1, Cl. 7) if the requirements for resistance to temperature and mechanical stability (Cl. 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 Cl. 2.2 of this EAD and consequently, in the ETA, with installed backwater valve kit in it. For the assessment of durability test three (3) specimens shall be tested. One specimen shall be tested first for the temperature resistance according to Cl. 2.2.3.1 before applied in this test for the mechanical stability Cl. 2.2.3.2.

In the ETA it shall be stated: Durable.

If the requirements are not met in ETA it shall be stated: Not durable.

2.2.3.1 Temperature resistance

The assessment is done on an assembled system including the backwater valve kit according to this EAD. The assessment shall be done according to EN 13564-2 (Cl.3.2).

The backwater valve kit is resistant to temperature if the requirements in accordance to EN 13564-1 (Cl.5, special requirement for Type 2) are met, means no deformation or changes in the surface that affects usability according to EN 13564-2 (Cl.3.2).

2.2.3.2 Mechanical stability

The assessment of mechanical stability is covered by assessment according to Cl. 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 the product definition in Cl. 1.1 does not cover 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 of 1 July 2015.

The applicable AVCP system is 4 for any use except for uses subject to regulations on reaction to fire.

The applicable AVCP system regarding reaction to fire is 1, 3 and 4, whereas for products according to this EAD system 3 applies.

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 3.1.

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 3.1 Control plan for the manufacturer; cornerstones

| No | Subject/type of control (<i>product, raw/constituent material, component - indicating characteristic concerned</i>) | Test or control method (<i>refer to 2.2 or 3.4</i>) | 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 Cl. 5 | Laid down in control plan | Each delivery |
| 2 | Exterior inspection | Visual control of components and assembly | EN 13564-1 Cl. 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 Cl. 6.1; Cl.6.2 | Laid down in control plan | Each production unit ³ |
| 4 | Tightness | EN 13564-2 Cl. 3.4.4 | EN 13564-1 Cl. 6.1 | Laid down in control plan | Each production unit |
| 5 | Marking | Visual control | EN 13564-1 Cl. 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 depend 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 13564-1: 2002 | Anti-flooding devices for buildings - Part 1: Requirements |
| EN 13564-2: 2003 | Anti-flooding devices for buildings - Part 2: Test methods |
| EN 12056-2:2000 | Gravity drainage systems inside buildings - Part 2: Sanitary pipework, layout and calculation |
| EAD 180008-00-0704: 2016 | Trapped gully - removable - mechanical closure |