



# SLOVENSKI STANDARD SIST EN 12050-4:2015

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## Črpališča odpadne vode za stavbe in zemljišča - 4. del: Nepovratni ventili za odpadno vodo s fekalijami in brez njih

Wastewater lifting plants for buildings and sites - Part 4: Non-return valves for faecal-free  
wastewater and wastewater containing faecal matter

Abwasserhebeanlagen für die Gebäude- und Grundstücksentwässerung - Teil 4:  
Rückflussverhinderer für fäkalienfreies und fäkalienhaltiges Abwasser

Stations de relevage d'effluents pour les bâtiments et terrains - Partie 4 : Dispositifs anti-  
retour pour effluents contenant ou non des matières fécales

Ta slovenski standard je istoveten z: **EN 12050-4:2015**

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### **ICS:**

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## Wastewater lifting plants for buildings and sites - Part 4: Non-return valves for faecal-free wastewater and wastewater containing faecal matter

Stations de relevage d'effluents pour les bâtiments et terrains - Partie 4 : Dispositifs anti-retour pour effluents contenant ou non des matières fécales

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This European Standard was approved by CEN on 17 January 2015.

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**CEN-CENELEC Management Centre: Avenue Marnix 17, B-1000 Brussels**

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**EN 12050-4:2015 (E)****Foreword**

This document (EN 12050-4:2015) 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of an identical text or by endorsement, at the latest by September 2015 and conflicting national standards shall be withdrawn at the latest by December 2016.

Attention is drawn to the possibility that some of the elements of this document may be the subject of patent rights. CEN [and/or CENELEC] shall not be held responsible for identifying any or all such patent rights.

This document supersedes EN 12050-4:2000.

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 the Regulation (EU) No. 305/2011.

For relationship with EU Regulation, see informative Annex ZA, which is an integral part of this document.

The standard series EN 12050 “*Wastewater lifting plants for buildings and sites*” consists of the following parts:

- Part 1: *Lifting plants for wastewater containing faecal matter*
- Part 2: *Lifting plants for faecal-free wastewater*
- Part 3: *Lifting plants for limited applications*
- Part 4: *Non-return valves for faecal-free wastewater and wastewater containing faecal matter*

The main changes with respect to the previous edition are listed below:

- a) reaction to fire added;
- b) paragraph title “Evaluation of conformity” changed to “Assessment and verification of constancy of performance – AVCP” and updated;
- c) Annex ZA updated in accordance with “Implementation of the Construction Products Regulation (CPR) in harmonized standards” (adoption of the Regulation EU No. 305/2011);
- d) editorially revised.

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

## 1 Scope

This European Standard applies to non-return valves used for faecal-free wastewater and wastewater containing faecal matter lifting plants. This Standard specifies general requirements, basic construction and testing principles together with information on materials and the relevant assessment and verification of constancy of performance.

## 2 Normative references

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

EN 12050-1:2015, *Wastewater lifting plants for buildings and sites — Part 1: Lifting plants for wastewater containing faecal matter*

EN 12050-2:2015, *Wastewater lifting plants for buildings and sites — Part 2: Lifting plants for faecal-free wastewater*

EN 12050-3:2015, *Wastewater lifting plants for buildings and sites — Part 3: Lifting plants for limited applications*

EN 13501-1, *Fire classification of construction products and building elements — Part 1: Classification using data from reaction to fire tests*

EN 13823, *Reaction to fire tests for building products - Building products excluding floorings exposed to the thermal attack by a single burning item*

EN ISO 20361, *Liquid pumps and pump units - Noise test code - Grades 2 and 3 of accuracy (ISO 20361)*

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## 3 Terms, definitions, symbols and abbreviations

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

### 3.1 Terms and definitions

#### 3.1.1

##### **non-return valve**

part of a wastewater lifting plant that prevents backflow of wastewater from the discharge pipe system which is either integrated in or a separate part of the plant

#### 3.1.2

##### **integrated non-return valve**

non-return valve which is a constructed part of the wastewater lifting plant - integrated in the plant or built in the plant by the manufacturer

#### 3.1.3

##### **backwash device**

part of the non-return valve which allows draining of the discharge pipe system and venting of the pumping device

#### 3.1.4

##### **maximum pump operating pressure**

maximum hydrostatic pressure that the pumping device is capable to create

**EN 12050-4:2015 (E)****3.2 Symbols and abbreviations****3.2.1 Symbols**

$d_i$  pipe internal diameter, in mm

$D_S$  solids ball passage, in mm

$Q$  flow rate, in l/s

$H$  discharge head, in m

$v$  flow velocity, in m/s

**3.2.2 Abbreviations**

AVCP assessment and verification of constancy of performance

DN nominal diameter

CWT classified without testing

CWFT classified without further testing

SBI single burn item

DoP declaration of performance

FPC factory production control

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**4 Materials and product characteristics****4.1 Materials**

Materials used shall be adequate to meet the demands of installation and operation. Materials shall comply with the requirements given in 4.3 and shall not release dangerous substances (see 4.8). Examples of suitable materials for the construction of non-return valves are given in Annex A (informative).

Only corrosion resistant materials or materials with a corrosion resistant protective coating shall be used.

**4.2 Mechanical resistance**

When tested in accordance with 5.2.4 no visible leakage shall appear during the test. Connections to the discharge pipe system shall resist longitudinal forces and withstand the maximum pump pressure.

**4.3 Effectiveness****4.3.1 General**

Non-return valves shall automatically prevent wastewater flowing back from the discharge pipe system when the pumping operation stops. Non-return valves shall open automatically during pumping.

When tested in accordance with 5.2.1, 5.2.2, 5.2.4 and 5.2.5 the non-return valves shall continue to operate.

**4.3.2 Connections**

Connections to the discharge pipe system shall be capable of withstanding the maximum pump pressure of the wastewater lifting plant without leakage.

Non-return valves which are put on the market as a separate component shall have pipeline connections complying with relevant pipe standards.



### 4.3.3 Solids passage

Non-return valves shall ensure that solids present in wastewater, particularly fibrous materials, cannot be retained.

The ball passage ( $D_s$ ) of a non-return valve shall be at least 80 % of the internal diameter ( $d_i$ ) of the discharge pipe minus 4 mm i.e.:

$$D_s = 0,8 \times d_i - 4 \text{ mm}$$

where:

$D_s$  is the ball passage, in millimetres;

$d_i$  is the internal diameter of the discharge pipe, in millimetres.

### 4.3.4 Cleanability

It shall be possible to clean the non-return valves, though the cleaning possibility is not necessary in case of non-return valves of DN < 80.

### 4.3.5 Nominal pressure of non-return valves

Non-return valves shall at least comply with a nominal pressure of PN 4.

## 4.4 Internal leakage

When tested in accordance with 5.2.3 no more water than specified in Table 1 shall pass through the valve.

**Table 1 — Relationship between valve size and maximum internal leakage**

| Size          | Maximum internal leakage (in litres) during the test time of 10 min |
|---------------|---|
| DN < 32       | 0,5   |
| 32 ≤ DN ≤ 100 | 1   |
| DN > 100      | 3   |

## 4.5 Reaction to fire

### 4.5.1 General

Where use of a non-return valve for faecal free wastewater and wastewater containing faecal matter is subject to national regulatory requirements on reaction to fire, its reaction to fire performance shall be considered as that of its components (i.e. material approach) and shall be declared as one of the following classes, according to EN 13501-1:

- Class A1, without the need for testing (CWT), when meeting the requirements, specified in 4.5.2, or otherwise;
- Class A1 to E, defined according to the results of testing the non-return valve's constituent material(s), according to the standard(s) referred to in EN 13501-1, as specified in 4.5.3.

**EN 12050-4:2015 (E)****4.5.2 Non-return valves classified as Class A1 without the need for testing**

The reaction to fire performance of a non-return valve for faecal free wastewater and wastewater containing faecal matter shall be declared as Class A1<sup>1)</sup> without the need for testing, provided that:

- a) each of the non-return valve's constituent materials contains not more than 1 % of homogeneously distributed organic material, by mass or volume (whichever is the most onerous); and
- b) any external coating, if applied over the surface area of the non-return valve, is made of inorganic material(s), which is/are also classified as Class A1.

**4.5.3 Non-return valves classified according to test results****4.5.3.1 Principle**

For the purpose of the reaction to fire performance of the non-return valve each of its constituent materials, including those in surface coating of the non-return valve, if any, shall be classified according to EN 13501-1 and only the lowest class of such materials shall be declared. The class of an individual constituent material shall be obtained as the result of the test method(s), relevant to this class, and as specified in the standards referred to in EN 13501-1.

NOTE A constituent material of the non-return valve is considered as one which may have a significant effect on the reaction to fire performance of such a non-return valve. According to the definitions given in EN 13501-1, this may be in the case of:

- a homogeneous non-return valve, its material, or
- a non-homogeneous non-return valve, its substantial component (i.e. a material that constitutes a significant part of such non-return valve). A layer with a mass per unit area  $\geq 1,0 \text{ kg/m}^2$  or a thickness  $\geq 1,0 \text{ mm}$  is considered to be a substantial component.

Test specimens used for the test methods applicable for this classification shall be prepared according to EN 13501-1 and to the relevant standards referred therein.

In addition, with regard to the SBI test according to EN 13823, when applied, the test specimen shall be prepared and mounted as specified in 4.5.3.2.

**4.5.3.2 Sizes and mounting of the test specimen**

The test specimen of each constituent material shall be in accordance with EN 13823 in a flat-sheet form of the following sizes:

- short wing:  $(495 \pm 5) \text{ mm} \times (1\,500 \pm 5) \text{ mm}$ ;
- long wing:  $(1\,000 \pm 5) \text{ mm} \times (1\,500 \pm 5) \text{ mm}$ .

**4.6 Durability****4.6.1 General**

Non-return valves are products of known and stable performance for defined end use applications with respect to their established durability for which experience has been accumulated over a long period of time. Durability is ensured by meeting the requirements of this standard, which represent the state of the art.

<sup>1)</sup> See Decision of the Commission 96/603/EC of 1996-10-04 (see OJEU L 267 of 1996-10-19), as twice amended by 2000/605/EC of 2000-09-26 (see OJEU L 258 of 2000-10-12) and by 2003/424/EC of 2003-06-06 (see OJEU L 144 of 2003-06-12).

For new materials the manufacturer has to take appropriate measures to verify that the non-return valve made of the new material is in accordance with the performance characteristics required by this standard.

#### 4.6.2 Durability of watertightness

Durability of watertightness is ensured by meeting the requirements according to 4.4, when tested in accordance with 5.2.3.

#### 4.6.3 Durability of effectiveness

Durability of effectiveness is ensured by meeting the requirements according to 4.3.1, when tested in accordance with 5.2.1, 5.2.2 and 5.2.5.

#### 4.6.4 Durability of mechanical resistance

Durability of mechanical resistance is ensured by meeting the requirements according to 4.2, when tested in accordance with 5.2.4.

### 4.7 Noise level

For non-return valves as a separate component, the emitted airborne noise shall be measured according to EN ISO 20361 at a flow velocity of 0,7 m/s and a shut off with a vertical water column of 2 m above the valve outlet.

The manufacturer shall declare the A-weighted emission sound pressure level (to be measured at 1 m distance from the non-return valve). Measurements shall be performed according to EN ISO 20361.

If an A-weighted emission sound pressure level is above 80 dB, the sound power level shall be determined according to EN ISO 20361 and shall be declared.

Where the manufacturer declares that the A-weighted emission sound pressure level is equal to 70 dB, although it might be smaller, the manufacturer may state "70 dB(A)".

If the manufacturer declares a lower value than 70 dB(A) the non-return valve shall be measured according to EN ISO 20361 and the corresponding test result shall be declared.

### 4.8 Dangerous substances

National regulations on dangerous substances may require verification and declaration on release, and sometimes content, when construction products covered by this standard are placed on those markets. In the absence of European harmonized test methods, verification and declaration on release/content should be done taking into account national provisions in the place of use.

## 5 Testing

### 5.1 General

Testing shall be carried out on a non-return valve that complies with the shape, dimensions and materials given in the testing documentation. The test shall demonstrate compliance with the effectiveness given in Clause 4.3. If the closure device consists of a ball, its diameter and mass shall be checked.

If the application of the non-return valves is not specified, valves shall be tested in accordance with both 5.2.1 and 5.2.2. The test has to be performed with the valves to be tested in the designated installation position.

**EN 12050-4:2015 (E)****5.2 Effectiveness testing****5.2.1 Faecal-free wastewater**

The operation of non-return valves shall be tested in accordance with EN 12050-2:2015, 5.3, or EN 12050-3:2015, 5.5, as appropriate. After testing, the non-return valves shall be examined to ensure that they remain able to operate.

**5.2.2 Wastewater containing faecal matter**

The operation of non-return valves shall be tested in accordance with EN 12050-1:2015, 5.3, or EN 12050-3:2015, 5.4. The pieces of test material shall pass through the non-return valve. After the test the non-return valve shall be opened and checked that no test material has settled.

**5.2.3 Internal leakage**

Non-return valves shall be subjected to a back pressure of 0,2 bar for 10 min using clean water.

**5.2.4 Pressure testing**

The test, in accordance with the requirements of 4.2, shall be carried out with clean water for 10 min, in closed and open condition.

Non-return valves shall be able to withstand a pressure of at least 1,5 times the nominal pressure.

**5.2.5 Testing of backwash devices**

If there is a venting device, it shall be tested that it can also be opened at a counter pressure of 1 bar without damaging the function parts.

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**6 Assessment and verification of constancy of performance - AVCP****6.1 General**

The compliance of non-return valves for faecal free wastewater and wastewater containing faecal matter with the requirements of this standard and with the performances declared by the manufacturer in the declaration of performance (DoP) shall be demonstrated by:

- determination of the product-type on the basis of type testing;
- factory production control by the manufacturer, including product assessment.

The manufacturer shall always retain the overall control and shall have the necessary means to take responsibility for the conformity of the product with its declared performance(s).

**6.2 Type testing****6.2.1 General**

All the performances related to characteristics included in this standard other than the essential characteristic shall be determined when the manufacturer intends to declare the respective performances unless the standard gives provisions for declaring them without performing tests. (e.g. use of previously existing data, CWFT and conventionally accepted performance).

Assessment previously performed in accordance with the provisions of this standard, may be taken into account provided that they were made to the same or a more rigorous test method, under the same AVCP