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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

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Denna standard ersätter SS-EN 12050-4, utgåva 1.

The European Standard EN 12050-4:2015 has the status of a Swedish Standard. This document contains the official English version of EN 12050-4:2015.

This standard supersedes the Swedish Standard SS-EN 12050-4, edition 1.

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EUROPEAN STANDARD

EN 12050-4

NORME EUROPÉENNE

EUROPÄISCHE NORM

March 2015

ICS 91.140.80

Supersedes EN 12050-4:2000

English Version

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

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

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COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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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of an identical text or by endorsement, at the latest by September 2015 and conflicting national standards shall be withdrawn at the latest by December 2016.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)*

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

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 |

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:

- a) Class A1, without the need for testing (CWT), when meeting the requirements, specified in 4.5.2, or otherwise;
- b) 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.