



# SLOVENSKI STANDARD SIST EN 12050-2:2015

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**Črpališča odpadne vode za stavbe in zemljišča - 2. del: Črpališča odpadne vode brez fekalij**

Wastewater lifting plants for buildings and sites - Part 2: Lifting plants for faecal-free wastewater

Abwasserhebeanlagen für die Gebäude- und Grundstücksentwässerung - Teil 2: Abwasserhebeanlagen für fäkalienfreies Abwasser

Stations de relevage d'effluents pour les bâtiments et terrains - Partie 2: Stations de relevage pour effluents exempts de matières fécales

**Ta slovenski standard je istoveten z: EN 12050-2:2015**

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**ICS:**

91.140.80      Drenažni sistemi      Drainage systems

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## Wastewater lifting plants for buildings and sites - Part 2: Lifting plants for faecal-free wastewater

Stations de relevage d'effluents pour les bâtiments et terrains - Partie 2 : Stations de relevage pour effluents exempts de matières fécales

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

CEN members are bound to comply with the CEN/CENELEC Internal Regulations which stipulate the conditions for giving this European Standard the status of a national standard without any alteration. Up-to-date lists and bibliographical references concerning such national standards may be obtained on application to the CEN-CENELEC Management Centre or to any CEN member.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
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**EN 12050-2:2015 (E)****Foreword**

This document (EN 12050-2:2015) 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of an identical text or by endorsement, at the latest by September 2015 and conflicting national standards shall be withdrawn at the latest by December 2016.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 12050-2:2000.

This document has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association, and supports the works basic 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:

- iTeh STANDARD PREVIEW**  
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- Part 1: *Lifting plants for wastewater containing faecal matter*
  - Part 2: *Lifting plants for faecal-free wastewater*
  - Part 3: *Lifting plants for limited applications* [SIST EN 12050-2:2015](https://standards.iteh.ai/catalog/standards/sist/8d4a2856-7549-4fde-a98d-d312395a5e7c/sist-en-12050-2-2015)
  - 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) hot water test added;
- c) paragraph title “Evaluation of conformity” changed to “Assessment and verification of constancy of performance – AVCP” and updated in accordance with “Implementation of the Construction Products Regulation (CPR) in harmonized standards”;
- d) Annex ZA updated in accordance with “Implementation of the Construction Products Regulation (CPR) in harmonized standards” (adoption of the Regulation EU No. 305/2011);
- e) 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 lifting plants for faecal-free wastewater for drainage of locations below flood level in buildings and sites to prevent any backflow of wastewater into the building. These lifting plants may be prefabricated or delivered as prefabricated kits and assembled on site. This standard specifies general requirements, basic construction and testing principles, together with information on materials and assessment and verification of constancy of performance.

Construction and testing requirements for non-return valves used in wastewater lifting plants are given in EN 12050-4.

This European Standard does not apply for pumping installations for drain and sewer systems outside buildings for pumping of municipal wastewater according to EN 752:2008, Annex F.

This European Standard applies also to lifting plants for faecal-free wastewater which are not prefabricated but composed of individual components purchased from different suppliers and put together on site.

## 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 124, *Gully tops and manhole tops for vehicular and pedestrian areas — Design requirements, type testing, marking, quality control*

EN 12056-1, *Gravity drainage systems inside buildings — Part 1: General and performance requirements*

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EN 12056-4, *Gravity drainage systems inside buildings — Part 4: Wastewater lifting plants, layout and calculation*

EN 12566-1:2000/A1:2003, *Small wastewater treatment systems for up to 50 PT — Part 1: Prefabricated septic tanks*

EN 12566-4:2007, *Small wastewater treatment systems for up to 50 PT — Part 4: Septic tanks assembled in situ from prefabricated kits*

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 60529, *Degrees of protection provided by enclosures (IP code) (IEC 60529)*

EN ISO 9906:2012, *Rotodynamic pumps — Hydraulic performance acceptance tests — Grades 1, 2 and 3 (ISO 9906:2012)*

EN ISO 20361, *Liquid pumps and pump units — Noise test code — Grade 2 and grade 3 of accuracy (ISO 20361)*

## EN 12050-2:2015 (E)

### 3 Terms, definitions, symbols and abbreviations

#### 3.1 Terms and definitions

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

##### 3.1.1

###### **domestic wastewater**

water which is contaminated by use and normally discharged from WC, showers, baths, bidets, wash basins, sinks and floor gullies

[SOURCE: EN 12056-1:2000, 3.1.2]

##### 3.1.2

###### **lifting plant for faecal-free wastewater**

device for the collection and automatic lifting of faecal-free wastewater to a height above flood level

Note 1 to entry: A non-return valve according to EN 12050-4 is a component of the plant.

##### 3.1.3

###### **collection tank for faecal-free wastewater**

unpressurized part of a faecal-free lifting plant in which the incoming wastewater is stored prior to lifting

##### 3.1.4

###### **site**

area in the proximity of the building outside buildings

Note 1 to entry: For further explanation see EN 12056-1:2002, Figure 1

##### 3.1.5

###### **useful volume**

volume in the collection tank between switch-on level and switch-off level

[SOURCE: EN 12050-1:2015, definition 3.1.5]

##### 3.1.6

###### **flood level**

maximum level to which waste water can rise within a drainage system

[SOURCE: EN 12056-1:2000, 3.1.7]

##### 3.1.7

###### **pumping device for faecal-free wastewater**

component of a faecal-free lifting plant which pumps the wastewater out of the collection tank to a height above flood level

##### 3.1.8

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

maximum hydrostatic pressure that the pumping device is capable to create

##### 3.1.9

###### **ball passage**

passage where a ball with a defined diameter can pass through without deformation

##### 3.1.10

###### **warning device**

device which gives a signal if a malfunction occurs



## 3.2 Symbols and abbreviations

### 3.2.1 Symbols

$d_i$  pipe internal diameter, 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 Material 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 of this standard and shall not release dangerous substances (see 4.10). Examples of suitable materials for the construction of wastewater lifting plants are given in Annex A (informative).

For collection tanks only corrosion resistant materials or materials with a corrosion resistant protective coating shall be used.

### 4.2 Collection tank

#### 4.2.1 Mechanical resistance

The structural stability of collection tanks shall be shown to be adequate for the place of installation. When tested according to 5.2.1 the tank shall be tight and shall not show any deformation influencing subsequent function of the lifting plant.

Where loads on the tank may be expected the load bearing capacity of the collection tank shall be shown to be adequate for the place of installation and the crushing resistance or maximum load deformation (as applicable) shall be tested and declared in accordance with appropriate standards, e.g. EN 13598-1:2011 or EN 12566-1:2000/A1:2003, Annex D.

The cover shall comply with EN 124 when applicable.

#### 4.2.2 Watertightness

Collection tanks for use inside buildings, other than inlet, outlet and vent openings, shall be closed and watertight when tested according to 5.2.

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Collection tanks for use at sites outside buildings shall be covered and watertight. The watertightness shall be tested and declared according to EN 12566-4.

**4.3 Lifting effectiveness****4.3.1 Pumping of solids**

The plant shall be capable of pumping faecal-free domestic wastewater or surface water as defined in EN 12056-1 which can contain sand particles and other solids up to 8 mm size.

When tested in accordance with 5.3 the plant shall not show damages which could affect the operation of the plant.

**4.3.2 Pipe connections**

The dimensions of inlet, discharge and ventilating connections shall permit the use of standard pipe sizes. Connections shall be flexible and shall withstand a pressure that is 1,5 times the maximum pump operating pressure without leaking.

**4.3.3 Ventilation**

The collection tank shall be adequately aerated and ventilated so that no under- or overpressure develops in the collection tank.

**4.3.4 Minimum flow rate**

When tested in accordance with 5.1.2, the flow velocity in the discharge pipework shall be at least 0,7 m/s at a manometric pressure of 0,4 bar. The minimum flow rate shall be calculated in accordance with Formula (1).

$$Q_{\min} = \frac{\pi}{4} v \times 10^{-3} \times d_i^2 \quad (1)$$

Where:

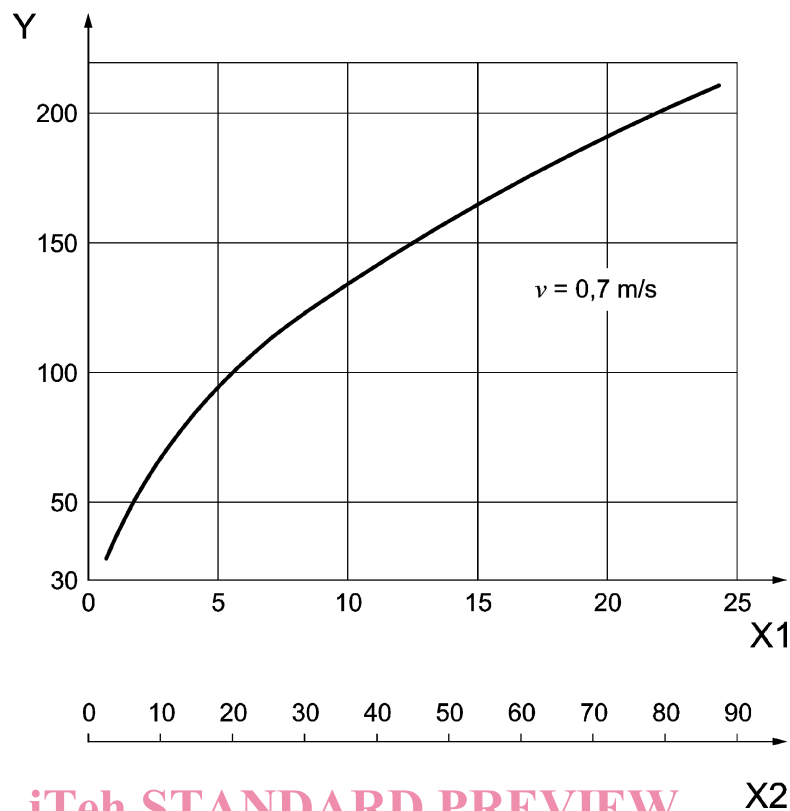
$v$  is the minimum flow velocity in the discharge pipework = 0,7 m/s;

$d_i$  is the internal diameter of the pipe in mm;

$Q_{\min}$  is the minimum flow rate in l/s.

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#### Key

Y pipe internal diameter  $d_i$  in mm

X1 flow rate  $Q$  in l/s [SIST EN 12050-2:2015](https://standards.iteh.ai/catalog/standards/sist/8d4a2856-7549-4fde-a98d-d312395a5e7c/sist-en-12050-2-2015)

X2 flow rate  $Q$  in m<sup>3</sup>/h <https://standards.iteh.ai/catalog/standards/sist/8d4a2856-7549-4fde-a98d-d312395a5e7c/sist-en-12050-2-2015>

**Figure 1 — Relationship between flow and pipe internal diameter of the discharge pipe**

#### 4.3.5 Minimum allowable solids passage of the lifting plant

There shall be a ball passage with a minimum of 10 mm through the entire lifting plant.

#### 4.3.6 Minimum size of the discharge connection

Discharge connections and non-return valves shall be at least DN 32.

#### 4.3.7 Useful volume

The useful volume of the collection tank shall be higher than the volume of the discharge pipe and in accordance with Table 1. The plant shall be calculated according to EN 12056-4.

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Table 1 — Minimum useful volume

Nominal size of discharge pipe (pressure pipe)	Volume <sup>a</sup>
> DN 50	20 l
DN 50	10 l
32 ≤ DN ≤ 40	5 l

<sup>a</sup> For connecting all appliances, layout and calculation in accordance with EN 12056-4.

#### 4.4 Control equipment

Faecal-free lifting plants shall be fitted with control equipment for automatic operation of the plant. Manual operation shall also be possible, if necessary by activating the switching device for automatic control.

#### 4.5 Electrical equipment

The electrical equipment of the plant shall comply with at least protection type IP 44 according to EN 60529.

#### 4.6 Fixing devices

Faecal-free lifting plants with a collection tank shall incorporate fixing devices to prevent rotation or floatation.

#### 4.7 Reaction to fire

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##### 4.7.1 General

Where use of a plant 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 4.7.2, or otherwise;
- b) Class A1 to E, defined according to the results of testing the plant's constituent material(s), according to the standard(s) referred to in EN 13501-1, as specified in 4.7.3 of this standard.

##### 4.7.2 Plants classified as Class A1 without the need for testing

The reaction to fire performance of a plant shall be declared as Class A1<sup>1)</sup> without the need for testing, provided that:

- a) each of the plant'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 plant, is made of inorganic material(s), which is/are also classified as Class A1.

<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).

### 4.7.3 Plants classified according to test results

#### 4.7.3.1 Principle

For the purpose of the reaction to fire performance of the plant each of its constituent materials, including those in surface coating of the plant, 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 plant is considered as one which may have a significant effect on the reaction to fire performance of such a plant. According to the definitions given in EN 13501-1, this may be in the case of:

- a homogeneous plant, its material, or
- a non-homogeneous plant, its substantial component (i.e. a material that constitutes a significant part of such plant). 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 4.7.3.2.

#### 4.7.3.2 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:  $(1\,000 \pm 5) \text{ mm} \times (1\,500 \pm 5) \text{ mm}$ .

### 4.8 Noise level

The manufacturer shall declare the A-weighted emission sound pressure level (to be measured at 1 m distance from the plant). Measurements shall be performed according to EN ISO 20361. The pump shall operate in best efficiency point during this measurement.

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 of the sound pressure level than 70 dB(A) the plant shall be measured according to EN ISO 20361 and the corresponding test result shall be declared.

### 4.9 Durability

#### 4.9.1 General

Lifting plants for faecal-free wastewater 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.