



**SLOVENSKI STANDARD**  
**SIST EN 12050-1:2001**

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Wastewater lifting plants for buildings and sites - Principles of construction and testing -  
Part 1: Lifting plants for wastewater containing faecal matter

Abwasserhebeanlagen für die Gebäude- und Grundstücksentwässerung - Bau- und  
Prüfgrundsätze - Teil 1: Fäkalienhebeanlagen

Stations de relevage d'effluents pour les bâtiments et terrains - Principes de construction  
et d'essai - Partie 1: Stations de relevage pour effluents contenant des matieres fécales

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ICS 91.140.80

English version

Wastewater lifting plants for buildings and sites - Principles of construction and testing - Part 1: Lifting plants for wastewater containing faecal matter

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Abwasserhebeanlagen für die Gebäude- und Grundstücksentwässerung - Bau- und Prüfgrundsätze - Teil 1: Fäkalienhebeanlagen

This European Standard was approved by CEN on 4 January 2001.

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This European Standard exists in three official versions (English, French, German). A version in any other language made by translation under the responsibility of a CEN member into its own language and notified to the Management Centre has the same status as the official versions.

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EUROPEAN COMMITTEE FOR STANDARDIZATION  
COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This European Standard has been prepared by Technical Committee CEN/TC 165 "Waste water 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of an identical text or by endorsement, at the latest by July 2001, and conflicting national standards shall be withdrawn at the latest by October 2002.

This is the first part of a total of four parts of the standard series EN 12050 with the following titles:

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

This European Standard has been prepared under a mandate given to CEN by the European Commission and the European Free Trade Association and supports essential requirements of EU directives.

For relationships with EU Directives, see informative Annex Z, which is an integral part of this standard.

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Czech Republic, Denmark, Finland, France, Germany, Greece, Iceland, Ireland, Italy, Luxembourg, Netherlands, Norway, Portugal, Spain, Sweden, Switzerland and the United Kingdom.

## 1 Scope

This part of this European Standard applies to lifting plants for wastewater containing faecal matter (referred to as "faecal lifting plants" in this Standard), which may also be used to deal with wastewater that does not contain faecal matter, for drainage of locations in buildings and sites **below flood level** for buildings and sites to prevent any backflow of wastewater into the building. This part of the European Standard contains general requirements, basic construction and testing principles, together with information on materials and conformity evaluation. Construction and testing requirements for non-return valves used in faecal lifting plants are given in EN 12050-4.

NOTE For pumping installations for drain and sewer systems see also EN 752-6.

## 2 Normative references

This European Standard incorporates by dated or undated reference provisions from other publications. These normative references are cited at the appropriate places in the text and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

EN 124

Gully tops and manhole tops for vehicular and pedestrian areas – Design requirements, type testing, marking, quality control

EN 752-6

Drain and sewer systems outside buildings – Part 6: Pumping installations

EN 1085:1997

Wastewater treatment – Vocabulary [SIST EN 12050-1:2001](https://standards.iteh.ai/catalog/standards/sist/156c9561-5d14-4dee-86ea-ed39fedd1c57/sist-en-12050-1-2001)

EN 12050-4

Wastewater lifting plants for buildings and sites – Principles of construction and testing – Part 4: Non-return valves for faecal-free wastewater and wastewater containing faecal matter

EN 12056-1

Gravity drainage systems inside buildings – Part 1: General and performance requirements

EN 12056-4

Gravity drainage systems inside buildings – Part 4: Wastewater lifting plants, layout and calculation

EN 12566-1

Small wastewater treatment systems for up to 50 PT - Part 1: Prefabricated septic tanks

EN 12639:2000

Liquid pumps and pump units - Noise test code - Grade 2 and grade 3 of accuracy

EN 60529

Degrees of protection provided by enclosures (IP code) (IEC 60529:1989)

ISO 9906

Rotodynamic pumps - Hydraulic performance acceptance tests - Grades 1 and 2

### 3 Terms and definitions

For the purposes of this standard, the definitions given in EN 1085:1997 and the following apply:

#### 3.1

##### **faecal lifting plant**

device for the collection and automatic lifting of wastewater, which may or may not contain faecal matter, to a height above flood level

NOTE A non-return valve according to EN 12050-4 is a component of the plant.

#### 3.2

##### **collection tank for wastewater containing faecal matter**

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

#### 3.3

##### **useful volume**

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

#### 3.4

##### **pumping device for effluent containing faecal matter**

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

#### 3.5

##### **warning device**

device which gives a signal if a malfunction occurs

#### 3.6

##### **initial testing** (type testing)

testing to demonstrate that a plant conforms to all requirements of this Standard

### 4 Requirements

#### 4.1 Control equipment

Faecal lifting plants shall be fitted with control equipment for automatic operation of the plant and with a warning device. Manual operation shall also be possible.

#### 4.2 Collection tank for wastewater containing faecal matter

Others than inlet, outlet and venting openings, collection tanks shall be closed, watertight and odour-tight.

The inside of the collection tank of a faecal lifting plant may be regarded as a zone containing potentially explosive gasses. In this respect the tank and other mechanical fittings are not subject to any particular requirements, provided that measures are taken to ensure that explosions cannot occur within the tank.

Collection tanks outside the building shall be covered (see EN 124) and watertight, their structural design shall be in accordance with EN 752-6.

#### 4.3 Manufacturer's statement

The manufacturer shall state the hydraulic performance characteristics (head and flow) according to grade 2 of ISO 9906 together with the maximum power consumption and maximum current consumption.

## 5 Construction principles

### 5.1 Pumping of solids

Faecal lifting plants shall be capable of pumping wastewater as defined in EN 12056-1 including all the solid matter usually contained in domestic waste water. They shall be designed in such a way that solid matter does not accumulate.

### 5.2 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 the maximum pump pressure without leaking.

### 5.3 Minimum dimensions of ventilating pipework

The connection of the ventilating pipework shall have a nominal diameter of at least DN 50.

### 5.4 Minimum flow velocity

The flow velocity in the discharge pipework shall be at least 0,7 m/s at the duty point. The duty point shall be calculated according to EN 12056-4. The minimum flow rate shall be calculated in accordance with equation (1).

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

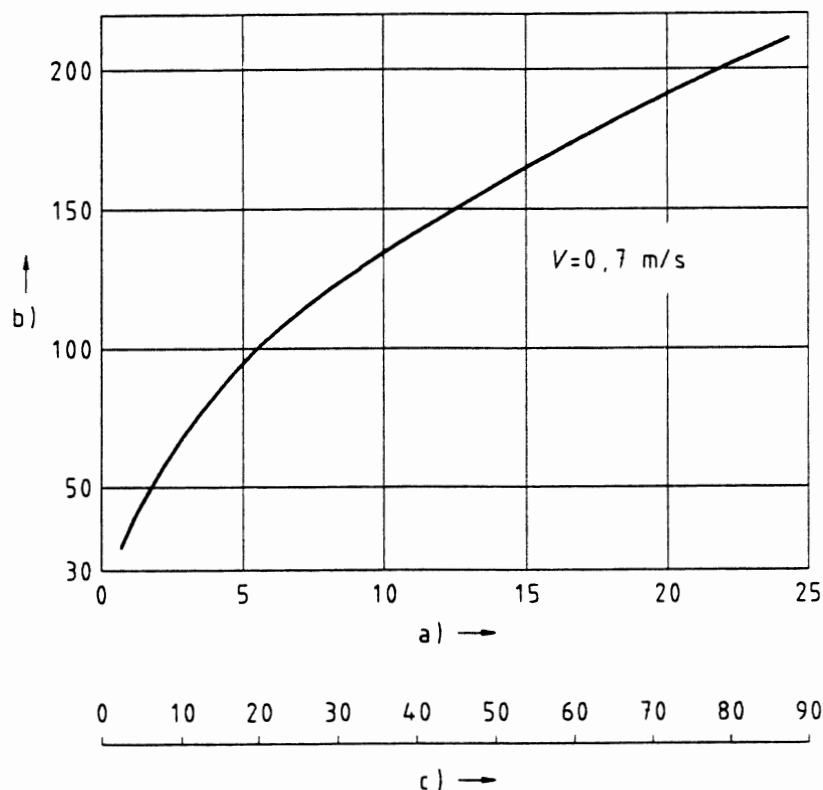
Where:

- $v$  is the minimum flow velocity in the discharge pipework = 0,7 m/s
- $d_i$  is the pipe internal diameter in mm
- $Q_{\min}$  is the minimum flow rate in l/s

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**Key**

a) Flow rate  $Q$  in l/s    b) Pipe internal diameter  $d_i$  in mm    c) Flow rate  $Q$  in  $m^3/h$

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

**5.5 Minimum passage of the plant**

The free passage in the faecal lifting plant at any point between the faecal inlet into the plant and the pumping device shall be at least 40 mm.

**5.6 Minimum size of discharge connections for non-macerating faecal lifting plants**

Discharge connections of non-macerating faecal lifting plants shall be at least DN 80. The ball passage of the non return valve shall be at least 60 mm. Where required, the discharge connection shall be at least DN 50 and the ball passage of the non return valve shall be at least 50 mm.

**5.7 Minimum size of discharge pipework for macerating faecal lifting plants**

Discharge connections, discharge pipework and non-return valves for macerating faecal lifting plants shall be at least DN 32.

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**5.8 Electrical equipment**

Where required, electrical equipment installed in effluent lifting plants shall be explosion-proof. If only the wet end of the pump is in the potentially explosive zone there is no need for explosion-proof motors. The electrical equipment of the plant shall comply with at least Protection Type IP 44 to EN 60529, even where it is located in a well ventilated space and is not subject to possible flooding.

**5.9 Fixing devices**

Faecal lifting plants shall incorporate fixing devices to prevent rotation or floatation.



## 6 Materials

Materials used shall be adequate to meet the demands of installation, operation, shall comply with the requirements of this standard and shall not release dangerous substances. Examples of suitable materials for the construction of faecal lifting plants are given in Annex B (informative). For materials where corrosion protection is necessary, such materials shall conform to the relevant corrosion protection requirements in force in the place of use of the plant.

## 7 Testing documentation and samples to be tested

For the initial testing the following documentation shall be provided:

- drawings, including information on materials used;
- operating and maintenance instructions (acceptable in manuscript form).

The initial testing shall be carried out on the wastewater lifting plant with the lowest rated performance from each series.

## 8 Testing

### 8.1 General requirements

Testing shall be carried out on a plant that complies with the shape, dimensions and materials given in the testing documentation. The test shall demonstrate compliance with the requirements of this standard. The water temperature during the test shall not exceed 35 °C.

### 8.2 Test conditions

The hydraulic and electrical characteristics supplied by the manufacturer shall be confirmed, the hydraulic characteristics in accordance with grade 2 of ISO 9906, and shall conform to this Standard. Before commencing testing, the pumping device shall be run continuously for at least 5 minutes. Testing of hydraulic and electrical characteristics shall be carried out over a period of 10 to 15 minutes. Based on the hydraulic characteristics determined by testing, compliance with the minimum flow velocity given in 5.4 shall be checked.

### 8.3 Testing for leaks

#### 8.3.1 Water pressure test

Water and odour tightness testing shall be carried out in a water-pressure test. During this test a faecal lifting plant full of water at a maximum temperature of 20°C shall withstand an overpressure of  $(0,50 \pm 0,01)$  bar for 10 minutes without any visible leakage. For watertightness only testing shall be carried out by filling the tank with water at a maximum temperature at 20°C to the level to which the water may possibly rise. 24 hours after the initial absorption period, there shall be no visible change in the water level.

#### 8.3.2 Discharge pipe connection

The connection to the discharge pipework shall be tested for 10 minutes at the maximum operating pressure of the pumping device. No visible leakage of water is permitted.

### 8.4 Lifting effectiveness of the faecal lifting plant

The lifting effectiveness of the faecal lifting plant shall be tested using the arrangement shown in Figure 2 and using a test material of new woven floor-cloths  $0,4 \text{ m} \times 0,25 \text{ m} \approx 0,1 \text{ m}^2$  with a dry weight of  $40 \text{ g} \pm 5 \text{ g}$  (cut around all sides) and stored in water for 24 hours.