



**SLOVENSKI STANDARD**  
**SIST EN 12050-2:2001**  
**01-oktober-2001**

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Wastewater lifting plants for buildings and sites - Principles of construction and testing -  
Part 2: Lifting plants for faecal-free wastewater

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

**ITeH STANDARD PREVIEW**

Stations de relevage d'effluents pour les bâtiments et terrains -Principes de construction  
et d'essai - Partie 2: Stations de relevage pour effluents exempts de matieres fécales

[SIST EN 12050-2:2001](https://standards.iteh.ai/catalog/standards/sist/4402be73-8f9a-4389-89a8-2cd59874d18f/sist-en-12050-2-2001)

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ICS 91.140.80

English version

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

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This European Standard was approved by CEN on 1 December 2000.

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 Management Centre or to any CEN member.

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  
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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 part of this European Standard for wastewater lifting plants for buildings and sites was prepared by Task Group 4 "Wastewater lifting plants" of Working Group WG 21 "Drainage systems within buildings" of CEN Technical Committee TC 165 "Wastewater engineering". Lifting plants for faecal-free wastewater described in this part of this European Standard may be used for drainage of buildings and external areas.

This is the second 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 shall be given the status of a national standard, either by publication of an identical text or by endorsement, at the latest by June 2001, and conflicting national standards shall be withdrawn at the latest by September 2002.

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 Directive(s).

For relationship with EU Directive(s), 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.

Annex A is normative. The annexes B, C and Z are informative.

## 1 Scope

This part of this European Standard applies to lifting plants for faecal-free wastewater in buildings and sites. It specifies methods for drainage of locations below flood level to prevent any backflow of wastewater into the building. This part of this 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 effluent 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

Waste water treatment – Vocabulary

prEN 12050-1: 2000

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

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

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

device for the collection and automatic lifting of faecal-free wastewater 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 faecal-free wastewater**

unpressurized part of a faecal-free 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  
[prEN 12050-1: 2000]

#### 3.4

##### **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

#### 3.5

##### **warning device**

device which gives a signal if a malfunction occurs  
[prEN 12050-1: 2000]

#### 3.6

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

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

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### 4 Requirements

#### 4.1 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.

#### 4.2 Electrical equipment

Electrical equipment shall comply with the appropriate valid IEC-Standard. If the electrical equipment is located in a well ventilated space and not subject to possible flooding, it shall comply at least with Protection Type IP 44 according to EN 60529. In spaces designed other than this, the required Protection Type according to EN 60529 depends on the means of installation.

#### 4.3 Manufacturer's statement

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

#### 4.4 Collection tank

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

### 5 Construction principles

#### 5.1 Pumping of solids

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

## 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 operating pump pressure without leaking.

## 5.3 Fixing devices

Lifting plants for faecal-free wastewater with collection tank shall incorporate fixing devices to prevent rotation or floatation.

## 5.4 Ventilation

The collection tank shall be adequately ventilated.

## 5.5 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)

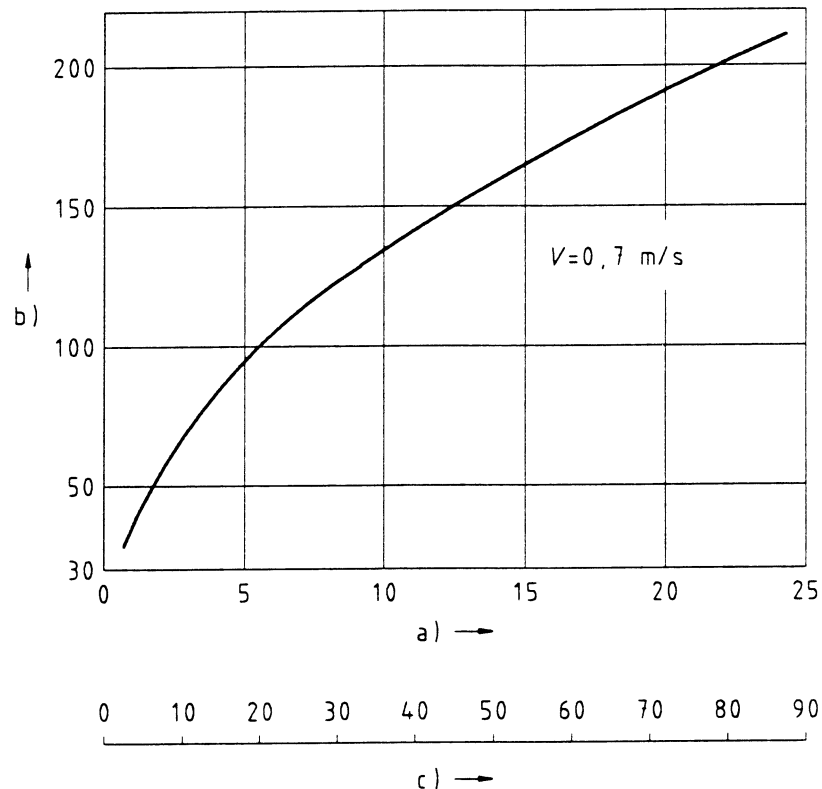
$$Q_{\min} = v \times \frac{\pi}{4} \times 10^{-3} \times d_i^2 \quad (1)$$

Where:

- $v$  is the minimum flow velocity in the discharge pipework = 0,7 m/s
- $d_i$  is the internal diameter of the pipe 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

## 5.6 Minimum allowable solids passage of the plant

There shall be a minimum 10 mm free passage through the entire plant.

## 5.7 Minimum size of discharge connections

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

## 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 wastewater 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

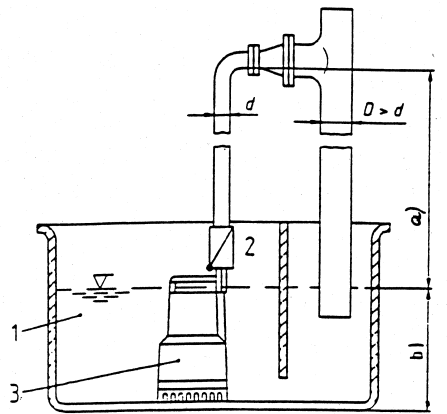
The hydraulic and electrical characteristics supplied by the manufacturer shall be confirmed, the hydraulic



characteristics in accordance with grade 2 of ISO 9906, and shall conform with this Standard. Before commencing testing, the pumping device shall be run continuously for at least 10 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 5.5 shall be checked.

### 8.3 Temperature resistance

The temperature resistance of the plant including the non-return valve shall be checked in accordance with 8.4.



#### Key

- 1 Wastewater
- 2 Non-return valve
- 3 Pumping device
- a) Static head as given by the manufacturer
- b) Switching-off level + 150 mm

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**Figure 2 - Testing arrangement**

### 8.4 Lifting effectiveness

The lifting effectiveness of the unit, including the non-return valve, shall be tested by means of the test arrangement shown in Figure 2. 100 g of quartz sand of size 0 mm to 8 mm in a uniform mixture (without any oversized particles) shall be added to each litre of water in circulation. The plant shall operate continuously for one hour without malfunction. After completion of the test there shall be no damage which could affect the operation of the plant. The test arrangements shall ensure that the solid material is continually circulated. The temperature of the water shall be between 30 °C and 35 °C.

### 8.5 Water tightness of collection tank

There shall be no visible leakage from the all-site free collection tank when completely full of water for a period of at least 10 minutes. For collection tanks not all-site free, the watertightness 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 arise. 24 hours after the initial absorption period, there shall be no visible change in the water level.

## 9 Conformity Evaluation

### 9.1 General requirements

To demonstrate conformity with this standard the products manufactured shall be subjected to the following evaluation procedures:

- initial testing of the products (type testing) according to clause 8 and A.2 of this standard;
- factory production control to be carried out by the manufacturer (internal conformity evaluation) according to 9.3 of this standard.

If third party surveillance is carried out other than required in Annex Z, due to national requirements for example, this should be carried out in accordance with Annex C (informative).