

# **SLOVENSKI STANDARD**

## **SIST EN 12566-1:2017**

**01-februar-2017**

**Nadomešča:**

**SIST EN 12566-1:2000**

**SIST EN 12566-1:2000/A1:2004**

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### **Male čistilne naprave do 50 PE - 1. del: Predizdelane greznice**

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

Kleinkläranlagen für bis zu 50 EW - Teil 1: Werkmäßig hergestellte Faulgruben

Petites installations de traitement des eaux usées pour une population totale équivalente (PTE) jusqu'à 50 habitants - Partie 1 : Fosses septiques préfabriquées

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**Ta slovenski standard je istoveten z: EN 12566-1:2016**

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#### **ICS:**

13.060.30

Odpadna voda

Sewage water

**SIST EN 12566-1:2017**

**en,fr,de**

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EUROPEAN STANDARD  
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**EN 12566-1**

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English Version

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

Petites installations de traitement des eaux usées  
jusqu'à 50 PTE - Partie 1: Fosses septiques  
préfabriquées

Kleinkläranlagen für bis zu 50 EW - Teil 1: Werkmäßig  
hergestellte Faulgruben

This European Standard was approved by CEN on 25 June 2016.

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

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## EN 12566-1:2016 (E)

## European foreword

This document (EN 12566-1:2016) 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of an identical text or by endorsement, at the latest by February 2017, and conflicting national standards shall be withdrawn at the latest by May 2018.

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 12566-1:2000.

The differences between this version and EN 12566-1:2000 are mainly editorial changes according to the Construction Product Regulation (CPR).

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 EU Directive(s).

For relationship with EU Directive(s), see informative Annex ZA, which is an integral part of this document.

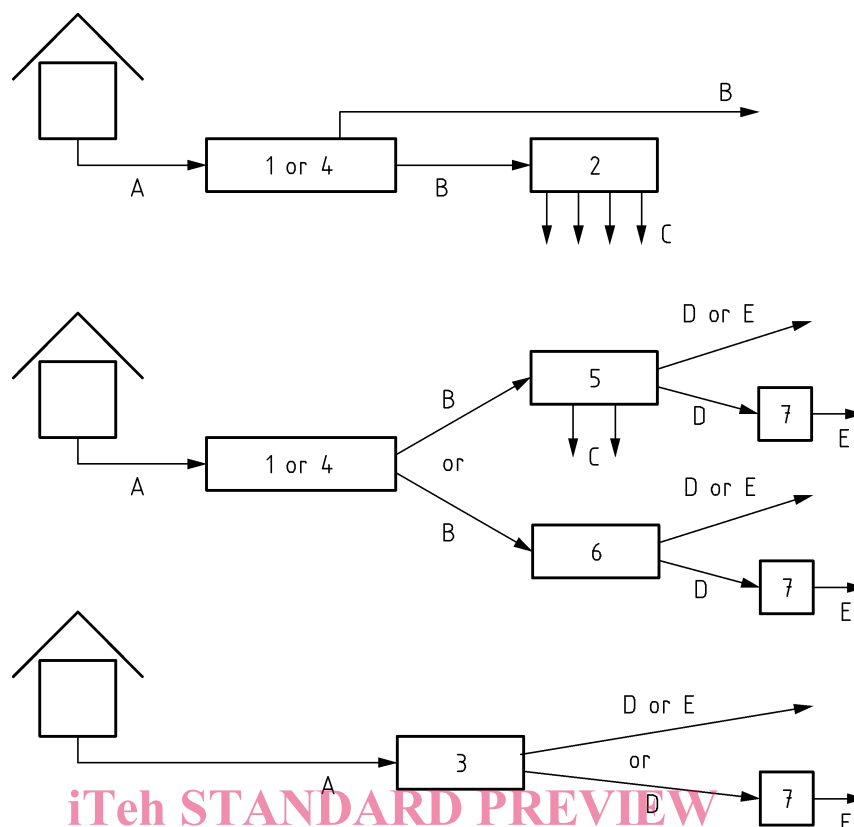
The standard series EN 12566 “Small wastewater treatment systems for up to 50 PT” contains the following parts (see Figure 1):

- *Part 1: Prefabricated septic tank (this document);*
- *Part 3: Packaged and/or site assembled domestic wastewater treatment plants;*
- *Part 4: Septic tanks assembled in situ from prefabricated kits;*
- *Part 6: Prefabricated treatment unit used for septic tank effluent;*
- *Part 7: Prefabricated tertiary treatment unit.*

For filtration systems, CEN/TC 165 decided to publish the following CEN Technical reports, which are considered as Code of practices and do not specify treatment requirements:

- *Part 2: Soil infiltration systems*
- *Part 5: Pre-treated Effluent Filtration systems*



**Key**

A	domestic wastewater	1	prefabricated septic tank
B	septic tank effluent	2	soil infiltration system
C	treated infiltrated effluent	3	packaged and/or site assembled domestic wastewater treatment plant
D	treated wastewater	4	septic tank assembled <i>in situ</i> from prefabricated kit
E	tertiary treated wastewater	5	pre-treated effluent filtration system
		6	prefabricated treatment unit used for septic tank effluent
		7	prefabricated tertiary treatment unit

National regulations may specify different arrangements between the products described in the standard series EN 12566.

**Figure 1 — Scheme related to the arrangement of the parts of EN 12566**

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.

## EN 12566-1:2016 (E)

## 1 Scope

This part of this standard specifies the requirements for prefabricated septic tanks and ancillary equipment used for the partial treatment of domestic wastewater for a population  $\leq 50$  PT. Pipes sizes, loads, watertightness, marking and quality control are specified.

The following cases are excluded:

- 1) Septic tanks receiving grey water only;
- 2) *In situ* constructed septic tanks.

## 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 12566-3:2016, *Small wastewater treatment systems up to 50 PT — Part 3: Packaged and/or site assembled domestic wastewater treatment plants*

EN 16323, *Glossary of wastewater engineering terms*

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

EN 13369, *Common rules for precast concrete products*

EN ISO 14125, *Fibre-reinforced plastic composites — Determination of flexural properties (ISO 14125)*

## 3 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 16323:2014 and the following apply.

### 3.1

#### **extension shaft**

component which, placed on the top of the septic tank, allows it to be fitted flush with the ground surface or slightly above ground surface, permits installations to be fitted below the frost line, allows accessibility and enables maintenance work to be carried out. Depending on the requirements, it may be vertical extension pieces of the installation housing, or components, which are fitted over maintenance access holes and manholes

### 3.2

#### **nominal capacity (NC)**

numerical designation of the volume of a septic tank, expressed as an integer in cubic metres

### 3.3

#### **prefabricated septic tank**

single piece factory made unit, including inlet and outlet level openings which leaves the factory completed, controlled and ready for installation

**3.4****product family**

group of products in which, for the purpose of evaluation, the selected property(s) is/are similar for all products within the group

Note 1 to entry: The definition of family takes into account at least similar shape, equipment, materials and conditions of end use and ensures the minimum hydraulic efficiency and minimum structural behaviour for all the products in the range.

Note 2 to entry: The minimum level of performance (hydraulic efficiency and structural behaviour) are given by the test carried out on one model of the family.

**4 Product characteristics****4.1 Dimensions****4.1.1 Inlets, outlets and connections**

Minimum size of nominal diameter of inlet and outlet according to the nominal capacity of equipment is:

— 100 ND  $\leq 6 \text{ m}^3$ ;

— 150 ND  $> 6 \text{ m}^3$ .

For design of outlet devices, see some examples in Annex C (informative).

**4.1.2 Ventilation**

Adequate ventilation of the septic tank and the inlet pipework shall be provided to prevent the accumulation of fermentation gases.

**4.1.3 Design Basis**

Depending on the end use, one or more of the following design criteria may need to be stated.

- a) Population load;
- b) Minimum sizing criteria including sludge storage capacity;
- c) Additional design criteria for domestic wastewater flows from sources such as hotels, restaurants or commercial premises.

**4.2 Load bearing capacity**

Test methods and values for mechanical characteristics of the materials of the tank, used for calculation of the load bearing capacity of the tank, shall be in accordance with EN 12566-3:2016, Annex D.

The septic tank shall resist the loads resulting from handling, installation and use including desludging and maintenance, for their design life.

When tested according to 5.1, the load bearing capacity of the septic tank is declared as:

- maximum allowed height of backfill (in meters);
- possibility to install the septic tank in wet or dry site, expressed as WET with the indication of the maximum height of the water table measured from the base of the septic tank or DRY.

### 4.3 Watertightness

#### 4.3.1 General

The septic tank shall meet at least one of the requirements given in 4.3.2 to 4.3.4 when tested according to the methods described in Annex A.

#### 4.3.2 Water test

When tested according to A.3, the water loss for septic tank shall be measured after 30 min. For tanks made of concrete it shall be  $\leq 0,1 \text{ l/m}^2$  of the internal wet surface of the external walls. For tanks made from plastics or other material, no leakage shall occur.

#### 4.3.3 Vacuum test

When tested according to A.3, the septic tank shall be deemed watertight when the vacuum pressure selected for the test does not deviate by more than 10 % of the selected pressure.

#### 4.3.4 Pneumatic pressure test

The septic tank is considered to be watertight when:

- tested in the conditions given in A.3.4.2 a), the pneumatic pressure selected for the test does not deviate by more than 0,5 kPa (0,005 bar) during the related test period; or
- tested in the conditions given in A.3.4.2 b), the variation of the initial pneumatic pressure (equal to 0,3 bar) is less than 3 kPa (0,03 bar) during 180 s.

### 4.4 Hydraulic efficiency

The extent to which the septic tank retains settling and floating solids, is determined by the hydraulic efficiency of the septic tank according to Clause 5.

### 4.5 Design

The inlet and outlet pipes shall be arranged to ensure that no surcharging or back-flow in the inlet pipe occurs at maximum flow rate.

### 4.6 Access

Septic tanks shall be securely covered to prevent unauthorized access and ensure operational safety.

Consideration shall be given by the design to provide an access to the inlet and/or outlet areas for routine maintenance, sampling, the removal of sludge, and cleaning.

Extension shafts and access covers shall be fit for purpose.

An opening with a dimension (i.e. width for rectangular section or diameter for circular section) of a minimum 400 mm shall be required. For an open unit, access is not required.

NOTE 1 For installation purposes of open units, there may be local regulations for maintenance access.

NOTE 2 The requirements to provide facility for the access of a person into the septic tank may depend on applicable regulations, valid in the member state for the intended end use conditions. For example, the minimum dimension of the opening for the access of a person in EN 476 is 600 mm.

The access dimensions shall be declared. Assessment of access dimension shall be carried out by a measurement with accuracy of 0,5 % of the dimension.

The septic tank shall be designed to restrict unauthorised access by one of the following means:

- a) mass of the individual covers;
- b) securing feature; or
- c) locking accessory.

Where a locking accessory or securing feature is used, it shall be designed so that the cover cannot be easily opened with objects readily accessible by children.

#### 4.7 Durability

Septic tanks shall be constructed from materials with physical characteristics and corrosion resistant properties that make them suitable for use in a wastewater environment. Septic tanks shall be designed to have a service appropriate to their intended end use.

Carbon steel septic tanks shall have a suitable coating to prevent corrosion.

#### 4.8 Reaction to fire

##### 4.8.1 General

Where use of a septic tank is subject to national regulatory requirements on reaction to fire, its reaction to fire performance shall be considered as one 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 4.8.2, or otherwise; or
- b) class, defined according to the results of testing of the material(s) used in the septic tank, according to the standard(s) referred to in EN 13501-1, as specified in 4.8.3.

NOTE In most cases Class E is considered to be sufficient as a minimum regulatory requirement for the reaction to fire performance of units used in buried (i.e. underground) applications.

Conversely, where use of such a unit is not subject to national regulatory requirements on reaction to fire, either class, determined according to a) or b) or “No Performance Determined” (NPD) may be declared.

##### 4.8.2 Septic tank classified as Class A1 without the need for testing

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

- a) each of the constituent materials that the tank of the septic tank is made of, contains not more than 1 % of homogeneously distributed organic material, by mass or volume (whichever is the most onerous); and

EXAMPLE In general, precast reinforced concrete used for septic tank may contain organic materials (e.g. admixtures, additives) if any, but their level is far below 1 %. Similarly also steel, used for the same purpose, is not used in a finely divided form. Thus, on account of their low level of combustibility and subject to the conditions set out (see Footnote 1) both materials may be considered, without testing, as class A1 materials for their reaction to fire performance.

<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).

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- b) any external coating, if applied over the surface area of the tank, is made on inorganic material(s), which is/are also classified as Class A1.

**4.8.3 Septic tank classified according to the test results**

For the purpose of the reaction to fire performance of the septic tank each of its constituent materials, including those in surface coating of the septic tank, 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.

Constituent material of the septic tank is considered as the material, which may have a significant effect on the reaction to fire performance of such unit. According to the definitions given in EN 13501-1, this may be in case of:

- homogeneous unit: its material; or
- non-homogeneous unit: its substantial component, i.e. a material that constitutes a significant part of such unit. 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.

**EXAMPLE** In general, this may be considered relevant for the septic tank where the tank is made from one or more of the following constituent materials: unplasticized polyvinylchloride (PVC-U), polyethylene (PE), glass reinforced polyester (GRP-UP), polypropylene (PP) and polydicyclopentadiene (PDCPD); or the container is made from flexible sheets (PEHD, PP, PVC, OR EPDM); with or without surface coating.

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.

**4.9 Dangerous substances**

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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.

**NOTE** An informative database covering European and national provisions on dangerous substances is available at the Construction website on EUROPA accessed through: <http://ec.europa.eu/enterprise/construction/cpd-ds/>

**5 Testing, assessment and sampling methods****5.1 Load bearing capacity****5.1.1 General**

Test methods and values for mechanical characteristics of the materials of the septic tank, used for calculation of the load bearing capacity of the septic tank, shall be in accordance with EN 12566-3:2016, Annex D.

For buried installation, the load bearing capacity of the septic tank shall be established:

- either by calculation with the knowledge of basic data for material and loads (see 5.1.2);
- or by test directly on the tank of the unit (see 5.1.3).

Where the septic tank includes watertight extension shaft, and/or the unit is installed in a water table, the relevant loads at the maximum installed depth of the unit shall be taken into account and appropriate tests or calculations made to prove the load bearing capacity of the unit.

The load bearing capacity of the septic tanks that are intended to be used only in non-buried conditions shall be assessed only by calculation.

For a unit with the container made of flexible sheets, the pit test only shall be used.

### 5.1.2 Load bearing capacity determined by calculation

#### 5.1.2.1 General

One of the following two methods may apply:

- Method 1: Indirect method usable for all materials by declaring the following parameters:
  - geometrical data of the septic tank: e.g. wall thickness, distance of ribs, shape;
  - properties of the materials and components: All parameters given in chapter durability (see 4.5 and Annex D of EN 12566-3:2016).

The manufacturer shall provide in the installation instructions the height of backfill and the maximum height of water table for installation.

- Method 2: Directly declaring the performance using the applicable Eurocode:
  - Eurocode 2 (EN 1992-1-1) for concrete (where applicable);
  - Eurocode 3 (EN 1993-1-1) for steel (where applicable).

The manufacturer shall provide the calculation results according to the relevant Eurocode in terms of height of backfill and possibility to install the septic tank in a wet or dry site with the indication of the height of the water table measured from the base of the septic tank.

NOTE Where Method 1 has been used for load bearing capacity assessment, the notified body checks dimensions of the product and properties of the material. Where Method 2 has been used the notified body validates the input data for calculation, checks the calculation and confirms the results of ITT report.

#### 5.1.2.2 Backfill loads

Calculation of backfill loads shall be carried out according to EN 12566-3:2016, 5.1.2.2.

#### 5.1.2.3 Hydrostatic loads

A vertical and a horizontal component of the hydrostatic loads shall be calculated according to EN 12566-3:2016, 5.1.2.3.

#### 5.1.2.4 Pedestrian loads

For pedestrian loads a value of 2,5 kN/m<sup>2</sup> shall be considered in calculation only when the height of the backfill (h) is less than or equal to 1 m. Over 1 m, the pedestrian loads do not need to be taken into account for calculation, as it is assumed to be negligible against other loads.

### 5.1.3 Load bearing capacity determined by testing

The load bearing capacity of the septic tank shall be established by the crushing resistance or maximum load deformation according to EN 12566-3:2016, Annex D.