



# SLOVENSKI STANDARD

## SIST EN 12566-7:2013

01-julij-2013

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### Male čistilne naprave do 50 PE - 7. del: Predizdelane terciarne čistilne enote

Small wastewater treatment systems for up to 50 PT - Part 7: Prefabricated tertiary treatment units

Kleinkläranlagen für bis zu 50 EW - Teil 7: Im Werk vorgefertigte Einheiten für eine dritte Reinigungsstufe

Petites installations de traitement des eaux usées jusqu'à 50 PTE - Partie 7: Unités de traitement tertiaire préfabriquées

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Ta slovenski standard je istoveten z: EN 12566-7:2013

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#### ICS:

13.060.30      Odpadna voda      Sewage water

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EUROPEAN STANDARD

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## Small wastewater treatment systems for up to 50 PT - Part 7: Prefabricated tertiary treatment units

Petites installations de traitement des eaux usées jusqu'à  
50 PTE - Partie 7: Unités de traitement tertiaire  
préfabriquées

Kleinkläranlagen für bis zu 50 EW - Teil 7: Vorgefertigte  
Anlagen für eine dritte Reinigungsstufe

This European Standard was approved by CEN on 1 March 2013.

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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COMITÉ EUROPÉEN DE NORMALISATION  
EUROPÄISCHES KOMITEE FÜR NORMUNG

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## Foreword

This document (EN 12566-7:2013) 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of an identical text or by endorsement, at the latest by October 2013, and conflicting national standards shall be withdrawn at the latest by October 2013.

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 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 series EN 12566, *Small wastewater treatment systems for up to 50 PT*, contains the following parts (see Figure 1):

- *Part 1: Prefabricated septic tanks;*
- *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 (this document).*

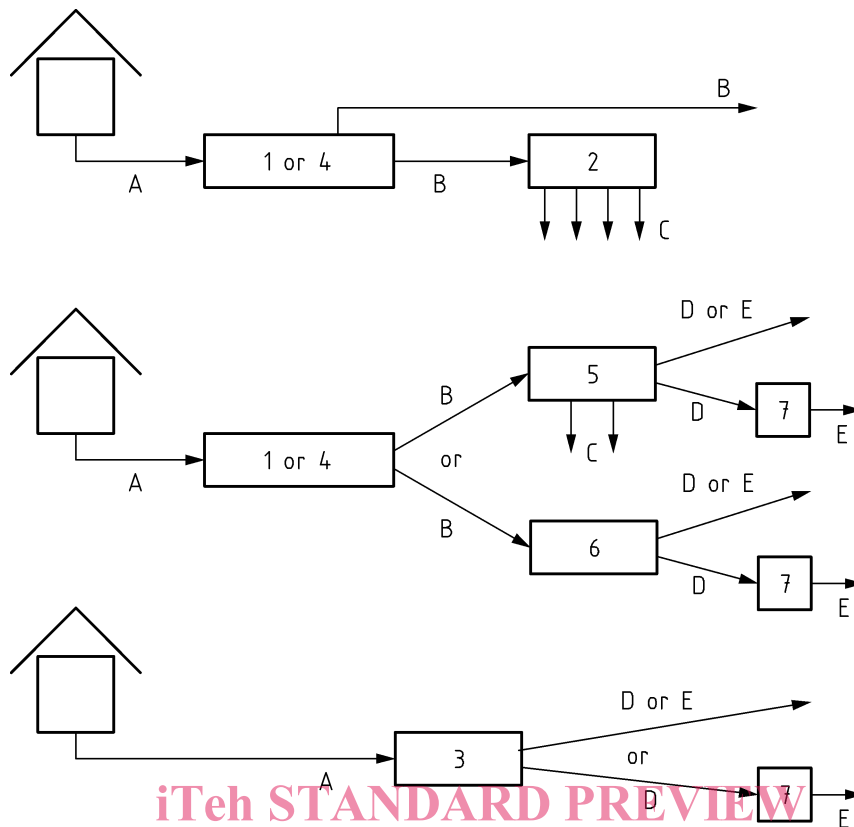
For filtration and infiltration systems, CEN/TC 165 decided to publish the following CEN Technical Reports, which are considered as code of practices and do not specify treatment requirements:

- CEN/TR 12566-2, *Small wastewater treatment systems for up to 50 PT — Part 2: Soil infiltration systems*
- CEN/TR 12566-5, *Small wastewater treatment systems for up to 50 PT — Part 5: Pre-treated Effluent Filtration systems*

This European Standard provides the general requirements for tertiary packaged and/or site assembled treatment units used for the treatment of secondary effluent.

According to the CEN-CENELEC Internal Regulations, the national standards organisations 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 12566-7:2013 (E)

**Key**

A	raw 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 in situ 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**



## 1 Scope

This European Standard specifies requirements, test methods, the marking and evaluation of conformity for a packaged and/or site assembled tertiary treatment unit for installation either separately or in a pre-existing unit (see 3.9).

It applies for tertiary treatment units that are placed on the market as complete units used for the tertiary treatment of domestic wastewater by biological, physical, chemical, electrical processes and coming from:

- a) units in accordance with EN 12566-3 or EN 12566-6;
- b) installations designed and constructed in accordance with CEN/TR 12566-5.

Equivalent secondary treated effluent may come from existing systems.

Package and/or site assembled tertiary treatment units according to this standard consist of one or more watertight tanks without any direct infiltration into the ground, made of concrete, corrosion resistant or coated steel, un-plasticised poly-vinyl chloride (PVC-U), polyethylene (PE), glass reinforced thermosetting plastics (GRP) based on polyester resin (UP) (GRP-UP), polypropylene (PP), polydicyclopentadiene (PDCPD) and flexible sheets (PEHD, PP, PVE and EPDM).

NOTE Some product covered by this standard sold without a tank could be introduced in an existing tank.

This standard applies to tertiary treatment units for use above ground (outside the building) or buried in the ground where no vehicle loads are applied to the unit.

This standard does not apply to tertiary treatment systems forming part of units covered by EN 12566-3 and EN 12566-6.

This standard does not cover the systems for micro-organism reduction.

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## 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 1085:2007, *Wastewater treatment — Vocabulary*

EN 12311-2, *Flexible sheets for waterproofing — Determination of tensile properties — Part 2: Plastic and rubber sheets for roof waterproofing*

EN 12566-3:2005+A1:2009, *Small wastewater treatment systems for up to 50 PT — Part 3: Packaged and/or site assembled domestic wastewater treatment plants*

EN 12566-6:2013, *Small wastewater treatment systems for up to 50 PT — Part 6: Prefabricated treatment units for septic tank effluent*

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

EN 14150, *Geosynthetic barriers — Determination of permeability to liquids*

EN ISO 527 (all parts), *Plastics — Determination of tensile properties (ISO 527)*

EN ISO 2555, *Plastics — Resins in the liquid state or as emulsions or dispersions — Determination of apparent viscosity by the Brookfield Test method (ISO 2555)*

**EN 12566-7:2013 (E)****3 Terms and definitions**

For the purposes of this document, the terms and definitions given in EN 12566-3:2005+A1:2009, EN 12566-6:2013, EN 1085:2007 and the following apply.

**3.1**  
**tertiary treatment**  
additional treatment process which results in further purification than that obtained by applying primary and secondary treatment

Note 1 to entry: It is recommended that the expression for the treatment, e.g. nitrogen removal, phosphorus removal, polishing effects, suspended solid removal, is used since in some case the tertiary treatment can also be integrated in the secondary treatment.

**3.2**  
**packaged unit**  
prefabricated factory-built unit

**3.3**  
**site assembled unit**  
unit composed of prefabricated components assembled on site coming from one manufacturer

**3.4**  
**biological processes**  
processes in which the treatment is mainly carried out by micro-organism activity

**3.5**  
**physical processes**  
processes in which the treatment is mainly carried out by using the physical properties of a media

**3.6**  
**chemical processes**  
processes in which the treatment is mainly carried out by the addition of chemical agents

**3.7**  
**electrical processes**  
processes in which the treatment is mainly carried out by the use of electricity

**3.8**  
**unit family**  
group of units produced by one manufacturer for which the test results for one or more characteristics from any one unit within the family are valid for all other units within this family

Note 1 to entry: The definition of family could take into account at least similar shape, equipment, materials and conditions of end use.

Note 2 to entry: The minimum level of performance is given by the test carried out on one unit of the family.

**3.9**  
**tertiary treatment retrofit unit**  
tertiary treatment unit installed within an existing package and/or site assembled domestic wastewater treatment plant in accordance with EN 12566-3, or a secondary treatment unit in accordance with EN 12566-6 or a pre-treated effluent filtration system in accordance with CEN/TR 12566-5

Note 1 to entry: Where such a retrofit unit affects the declared performance of EN 12566-3 or EN 12566-6 unit in which it is installed, then the overall unit should be tested for its conformity with the relevant standard.

**3.10**  
**nominal designation**  
appropriate values for parameters that represent the conditions for which the unit is designed by the manufacturer

## 4 Symbols and abbreviations

BOD <sub>5</sub> (or BOD <sub>7</sub> )	Biochemical oxygen demand at 5 d (or 7 d)
COD	Chemical oxygen demand
SS	Suspended solids
Total N	Total nitrogen
Total P	Total phosphorus

## 5 Nominal designation

The nominal designation of the tertiary treatment unit shall be declared as:

- the hydraulic daily flow  $Q_N$  (m<sup>3</sup>/d) in nominal conditions;
- and, for the parameters that are intended to be treated, the daily load of the unit in the nominal conditions for the declared parameters i.e. BOD<sub>5</sub> and/or BOD<sub>7</sub>, and/or COD, and/or SS, and/or total phosphorus, and/or total nitrogen expressed in kg/d.

EXAMPLE 1,4 m<sup>3</sup>/d and 0,02 kg/d of total phosphorus.

## 6 Requirements iTeh STANDARD PREVIEW (standards.iteh.ai)

### 6.1 Design

#### 6.1.1 General

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Tertiary treatment units shall be designed to be structurally stable with the expected loads for the intended use. In addition, the units shall be durable, watertight and corrosion resistant.

Where electrical, mechanical or hydraulic malfunction of the unit could lead to any failure, it shall be provided with an alarm to indicate such failure. The functionality of the alarm shall be verified as referenced in Table A.2.

#### 6.1.2 Overall dimensions

The overall dimensions of the prefabricated tertiary treatment unit (i.e. height, width, length, diameters, etc.) shall be measured and declared together with a tolerance.

Assessment of overall dimensions shall be done by measurement with accuracy of  $\pm 0,5$  % of the dimension.

#### 6.1.3 Inlets, outlets, internal pipework and connections

The nominal diameters for inlet and outlet pipework of the prefabricated tertiary treatment unit shall be declared in the technical documentation. The hydraulic design of the unit, the internal pipework and the connections shall ensure that no accidental back-flows, blockage or surcharging occur during normal operation of the plant.

Inlet and outlet pipes shall be compatible with standardised pipe systems.

Assessment of inlets, outlets, internal pipework and connections shall be done by measurement with accuracy of  $\pm 0,5$  % of the dimension.

**EN 12566-7:2013 (E)****6.1.4 Access**

The prefabricated tertiary treatment unit shall be designed to restrict unauthorised access (e.g. locking mechanism).

The design of the unit shall provide access to allow routine maintenance sampling, removal of sludge (where applicable), cleaning and maintenance. An opening with a dimension (i.e. length for rectangular section or diameter for circular section) of a minimum 400 mm shall be required. For open unit, access is not required.

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

The requirements to provide facility for the access of a person into the prefabricated tertiary treatment unit 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.

Extension shafts, where applicable, and access covers of the prefabricated tertiary treatment unit shall be designed to be fit for purpose.

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

**6.2 Load bearing capacity****6.2.1 General**

For units not including a tank, load bearing capacity assessment is not required.

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 12566-3:2005+A1:2009, Annex C.

The prefabricated tertiary treatment units shall resist the loads resulting from handling, installation and use including desludging and maintenance, for their design life.

For buried installation, the load bearing capacity of the prefabricated tertiary treatment unit (i.e. of the tank of this unit) shall be established:

- either by calculation with the knowledge of basic data for material and loads (see 6.2.2);
- or by test directly on the tank of the unit (see 6.2.3).

Where the prefabricated tertiary treatment unit 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 is declared as:

- maximum allowed height of backfill (m);
- possibility to install the unit in water table or not, expressed as WET with the indication of the maximum height of watertable measured from the base of the unit or DRY.

The load bearing capacity of prefabricated tertiary treatment units 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.

## 6.2.2 Load bearing capacity determined by calculation

### 6.2.2.1 General

One of the following two methods may apply:

a) Method 1: Indirect method usable for all materials by declaring the following parameters:

- 1) geometrical data of the unit: e.g. wall thickness, distance of ribs, shape...
- 2) properties of the materials and components: all parameters given in chapter durability (6.6).

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

b) Method 2: Directly declaring the performance using the applicable Eurocode:

- 1) Eurocode 2 for concrete (where applicable),
- 2) Eurocode 3 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 plant in a wet or dry site with the indication of the height of the water table measured from the base of the plant.

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.

### 6.2.2.2 Backfill loads

Calculation of backfill loads shall be carried out according to EN 12566-3:2005+A1:2009, 6.2.1.2.

### 6.2.2.3 Hydrostatic loads

A vertical and a horizontal component of the hydrostatic loads shall be calculated according to EN 12566-3:2005+A1:2009, 6.2.1.3.

### 6.2.2.4 Pedestrian loads

For pedestrian loads a value of  $2,5 \text{ N/m}^2$  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.

## 6.2.3 Load bearing capacity determined by testing

The load bearing capacity of the prefabricated tertiary treatment unit shall be established by the crushing resistance or maximum load deformation according to EN 12566-3:2005+A1:2009, Annex C.

The test results shall ensure that the load bearing capacity under the declared load is ensured.

- Crushing resistance test (EN 12566-3:2005+A1:2009, C.2 and C.3): the declared load shall be lower or equal to the failure load divided by a factor of minimum 1,6.
- Vacuum test for GPR unit (EN 12566-3:2005+A1:2009, C.5): the unit shall withstand the external pressure for the declared load multiplied by a factor of minimum 1,5.

NOTE In Formula (C.2) of EN 12566-3:2005+A1:2009,  $L$  is the load in kPa (the greater of the vertical or horizontal load due to backfill and hydrostatic load).