



SLOVENSKI STANDARD

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SIST EN 12566-6:2013

Male čistilne naprave do 50 PE - 6. del: Predizdelane enote za čiščenje odpadne vode iz greznic

Small wastewater treatment systems for up to 50 PT - Part 6: Prefabricated treatment units for septic tank effluent

Kleinkläranlagen für bis zu 50 EW - Teil 6: Vorgefertigte Anlagen für die weitergehende Behandlung des aus Faulgruben ablaufenden Schmutzwassers

Petites installations de traitement des eaux usées pour une population totale équivalente (PTE) jusqu'à 50 habitants - Partie 6: Unités préfabriquées de traitement des effluents de fosses septiques

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ICS:

13.060.30 Odpadna voda Sewage water

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Small wastewater treatment systems for up to 50 PT - Part 6: Prefabricated treatment units for septic tank effluent

Petites installations de traitement des eaux usées
jusqu'à 50 PTE - Partie 6: Unités préfabriquées de
traitement des effluents de fosses septiques

Kleinkläranlagen für bis zu 50 EW - Teil 6:
Vorgefertigte Bauteile für die weitergehende
Behandlung des aus Faulgruben ablaufenden
Abwassers

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.

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 CEN-CENELEC Management Centre has the same status as the official versions.

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European foreword

This document (EN 12566-6:2016) 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of an identical text or by endorsement, at the latest by February 2017, and conflicting national standards shall be withdrawn at the latest by May 2018.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 12566-6:2013.

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.

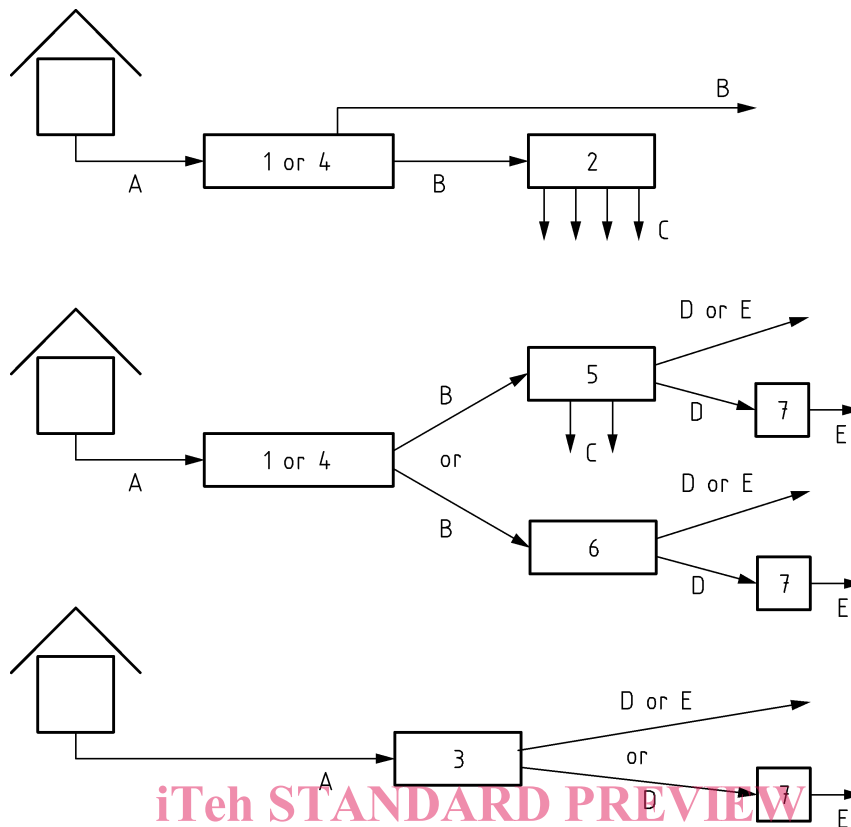
The differences between this version and EN 12566-6:2013 are mainly editorial changes according to the Construction Product Regulation (CPR) and declaration of power consumption and desludging during treatment efficiency test. (standards.iteh.ai)

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 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 units for septic tank effluent (this document);*
- *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 or CEN/TR 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.

1 Scope

This European Standard specifies requirements, test methods, evaluation of conformity and marking for prefabricated secondary treatment units used for the treatment of effluent from septic tanks according to EN 12566-1 or EN 12566-4 in small wastewater treatment systems for up to 50 PT.

NOTE Equivalent septic effluent may come from existing septic tanks.

It applies to the prefabricated secondary treatment unit, where all its components are packaged or site-assembled and placed on the market as a kit by one manufacturer.

The prefabricated secondary treatment unit consists of one or more tanks made of concrete, steel, unplasticised polyvinylchloride (PVC-U), polyethylene (PE), glass reinforced polyester (GRP-UP), polypropylene (PP), polydicyclopentadiene (PDCPD) or container made of flexible sheets (HDPE, PP, PVC, EPDM). Other components specified by the manufacturer, such as pipes, pumps and filter material will be considered as part of the unit.

This European Standard establishes the performance of the prefabricated secondary treatment units needed to verify their suitability for the end use conditions for which the test methods are specified.

This European Standard applies for the packaged and/or site assembled secondary treatment units for use on the top of the ground (outside the building) or buried in the ground where no vehicle loads are applied to the unit.

This European Standard does not cover:

- non watertight secondary treatment units with direct infiltration into the ground;
- retrofit kits (see definition in 3.1.7).

2 Normative references

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The following referenced documents, in whole or in part, are normatively referenced in this document and are indispensable for its application of this document. For dated references, only the edition cited applies. For undated references, the latest edition of the referenced document (including any amendments) applies.

EN 16323:2014, *Glossary of wastewater engineering terms*

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

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

EN 12566-4, *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*

3 Terms, definitions, symbols, units and abbreviated terms

3.1 Terms and definitions

For the purposes of this document, the terms and definitions given in EN 12566-3:2016 and EN 16323:2014 and the following apply.

EN 12566-6:2016 (E)**3.1.1****packaged secondary treatment unit**

prefabricated factory-built unit which treats septic tank effluent to a declared quality

3.1.2**site assembled secondary treatment unit**

unit supplied by one manufacturer composed of prefabricated components, assembled on site, which treats septic tank effluent to a declared quality

3.1.3**open unit**

prefabricated unit where there is no cover

3.1.4**nominal designation**

expressed as an integer giving the maximum number of population equivalent appropriate to the plant

3.1.5**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.

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3.1.6**wastewater treatment system**

combination of units (e.g. septic tank) and/or products (e.g. pipes, pumps) required for the construction of wastewater treatment plant according to Figure 1

3.1.7**retrofit kit**

set of components that are provided by a single manufacturer for installation within an existing septic tank

3.1.8**flexible sheet**

flexible impermeable liner

3.2 Symbols and abbreviated terms

The following symbols and abbreviations are used in this standard:

BOD ₅	(or Biochemical oxygen demand at 5 days (or 7 days)
BOD ₇)	
COD	Chemical oxygen demand
KN	Kjeldahl nitrogen
NH ₄ -N	Ammonium nitrogen

SS	Suspended solids
TOC	Total organic carbon
PP	Polypropylene
PDCPD	Polydicyclopentadiene
HDPE	High Density Polyethylene
PVC	Polyvinyl Chloride
EPDM	Ethylene Propylene Diene Monomer

4 Products characteristics

4.1 Design

4.1.1 General

Prefabricated secondary treatment units for septic tank effluent 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. Scaling rules, which ensure that the test results for one or more characteristics from any one unit within the family are valid for all other units within this family, shall be defined.

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.1.

Design of the unit should take into consideration appropriate safety requirements for construction, installation, operation and maintenance.

4.1.2 Overall dimensions

The overall dimensions of the prefabricated secondary 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.

4.1.3 Inlets, outlets, internal pipework and connections

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

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

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

4.1.4 Access

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. 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.

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NOTE 2 The requirements to provide facility for the access of a person into the prefabricated secondary 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 secondary treatment unit shall be designed to be fit for purpose.

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 prefabricated secondary treatment unit shall be designed to restrict unauthorized 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.

4.2 Load bearing capacity

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 12566-3:2016, Annex D.

The prefabricated secondary treatment units shall be able to withstand the loads resulting from handling, installation and use including desludging and maintenance, for its design life.

When tested according to 5.1, 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 or DRY, respectively.

4.3 Secondary treatment efficiency**4.3.1 General**

For the purpose of determination of the secondary treatment efficiency, the prefabricated secondary treatment unit shall be tested according to Annex A.

4.3.2 Secondary treatment efficiency ratio

The prefabricated secondary treatment unit shall demonstrate compliance with the declared performance. This performance shall be expressed and declared in terms of secondary treatment efficiency ratios on COD, BOD, SS concentration and nitrogen parameters and total phosphorus together with:

- the tested COD, BOD and SS influent daily load;
- or characteristics (hydraulic efficiency, nominal capacity, etc.) of the septic tank used during the test expressed according to EN 12566-1 or EN 12566-4.

The secondary treatment efficiency ratios on COD, BOD and, SS shall be given in the documentation.

When requested, nitrogen parameters and total phosphorus shall be analysed during the test. In this case related secondary treatment efficiency ratios shall also be declared.

Each secondary treatment efficiency ratio shall be calculated according to 5.2.

Any secondary treatment efficiency ratio (R_{ST}) declared for a given daily load shall not be greater than the mean value of the secondary treatment efficiency ratio obtained during the test made according to Annex A. In addition, another way of expression of the efficiency may be used for BOD, COD and suspended solid.

The secondary treatment efficiency ratios obtained do not automatically mean that the regulatory requirements on effluent qualities in a given place are met. A calculation should be made to indicate the final effluent qualities which will be compared to the requirements valid in the place of intended use of the unit. These ratios are laboratory determined but may not always be obtained when a unit is installed on a user site.

In addition, the number of desludging procedures carried out during the test according to Annex A, shall be declared. The declared value for desludging frequency shall be higher or equal to the measured value during the test.

4.3.3 Microorganism reduction

When the microorganism reduction of the prefabricated secondary treatment unit is to be declared, the results of the tests (i.e. influent and effluent values) shall be expressed and declared in unit (i.e. cfu/100 ml or MPN/100 ml). The reduction shall be expressed in logarithmic unit. All results shall be given in a specific document as described in Annex B.

The recorded microorganism reduction does not automatically mean that the regulatory requirements on effluent qualities in a given Member state are met. It should be compared to the requirements valid in the place of intended use. The microorganism reduction may not always be obtained when the unit is operating in practice.

4.4 Watertightness

When tested according to EN 12566-3:2016, Annex A, the prefabricated secondary treatment units for septic tank effluent shall meet the watertightness requirements of EN 12566-3:2016, 4.4.

4.5 Power consumption

Where applicable, the power consumption of the unit shall be declared.

It shall be measured during the test described in Annex A and shall be expressed as the consumption for the normal operating conditions (nominal sequences of the test) in kWh/d.

The declared power consumption value shall be higher or equal to the measured value during the test in A.2.4.5.

Assessment of power consumption shall be done by measurement with accuracy of $\pm 5\%$ of the result.

4.6 Durability

4.6.1 General

The prefabricated secondary treatment units for septic tank effluent, including all their internal components, shall be manufactured from materials that make them, from the durability aspects, suitable for use in a domestic wastewater environment.

Materials of the other components of the unit (i.e. filter material, pump, etc.) shall be in accordance with the specifications given by the manufacturer to the material/component supplier.

EN 12566-6:2016 (E)**4.6.2 Concrete, steel, PVC-U, PE, GRP, PDCPD and flexible sheets**

For concrete, steel, PVC-U, PE, GRP, PDCPD tank and flexible sheets (i.e. the parent material and the coatings, where relevant) the material shall comply with EN 12566-3:2016, 4.5.2 to 4.5.9, as appropriate.

4.7 Reaction to fire**4.7.1 General**

Where use of a prefabricated secondary treatment unit 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 4.7.2, or otherwise; or
- b) class, defined according to the results of testing of the material(s) used in the unit, according to the standard(s) referred to in EN 13501-1, as specified in 4.7.3.

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.

4.7.2 Units classified as Class A1 without the need for testing

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

- a) each of the constituent materials that the tank of the unit 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 prefabricated secondary treatment unit may contain organic materials (e.g. admixtures, additives) if any, but their level is far below 1 %. Similarly, 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 Note 1 to entry:) both materials may be considered, without testing, as class A1 materials for their reaction to fire performance.

- b) any external coating, if applied over the surface area of the tank, is made on inorganic material(s) with thickness $\geq 1,0$ mm or mass per unit area $\geq 1,0$ kg/m², which is/are also classified as Class A1.

4.7.3 Units classified according to the test results

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

¹⁾ 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).

NOTE A constituent material of the unit 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 unit where the tank is made from one or more of the following constituent materials: unplasticised polyvinylchloride (PVC-U), polyethylene (PE), glass reinforced polyester (GRP-UP), polypropylene (PP) and polydicyclopentadiene (PDCPD); or the container is made from flexible sheets (HDPE, 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.

4.8 Dangerous substances

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, assessing and sampling methods

5.1 Load bearing capacity

5.1.1 Generals

For buried installation, the load bearing capacity of the prefabricated secondary 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 5.1.2);
- or by test directly on the tank component of the unit (see 5.1.3).

Where the prefabricated secondary treatment unit includes a 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 prefabricated secondary 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.

5.1.2 Load bearing capacity determined by calculation

5.1.2.1 General

The calculation shall be made based on an empty tank buried underground.