



SLOVENSKI STANDARD

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Male čistilne naprave do 50 PE - 3. del: Predizdelane in/ali na mestu postavitev sestavljene čistilne naprave za gospodinjsko odpadno vodo

Small wastewater treatment systems for up to 50 PT - Part 3: Packaged and/or site assembled domestic wastewater treatment plants

Kleinkläranlagen für bis zu 50 EW - Teil 3: Vorgefertigte und/oder vor Ort montierte Anlagen zur Behandlung von häuslichem Schmutzwasser

Petites installations de traitement des eaux usées pour une population totale équivalente (PTE) jusqu'à 50 habitants - Partie 3 Stations d'épuration des eaux usées domestiques prêtes à l'emploi et/ou assemblées sur site

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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 3: Packaged and/or site assembled domestic wastewater treatment plants

Petites installations de traitement des eaux usées
jusqu'à 50 PTE - Partie 3: Stations d'épuration des eaux
usées domestiques fabriquées en usine et/ou
assemblées sur site

Kleinkläranlagen für bis zu 50 EW - Teil 3:
Vorgefertigte und/oder vor Ort montierte Anlagen zur
Behandlung von häuslichem Schmutzwasser

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 COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
EUROPÄISCHES KOMITEE FÜR NORMUNG

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

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EN 12566-3:2016 (E)**European foreword**

This document (EN 12566-3:2016) 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 12566-3:2005+A2:2013.

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.

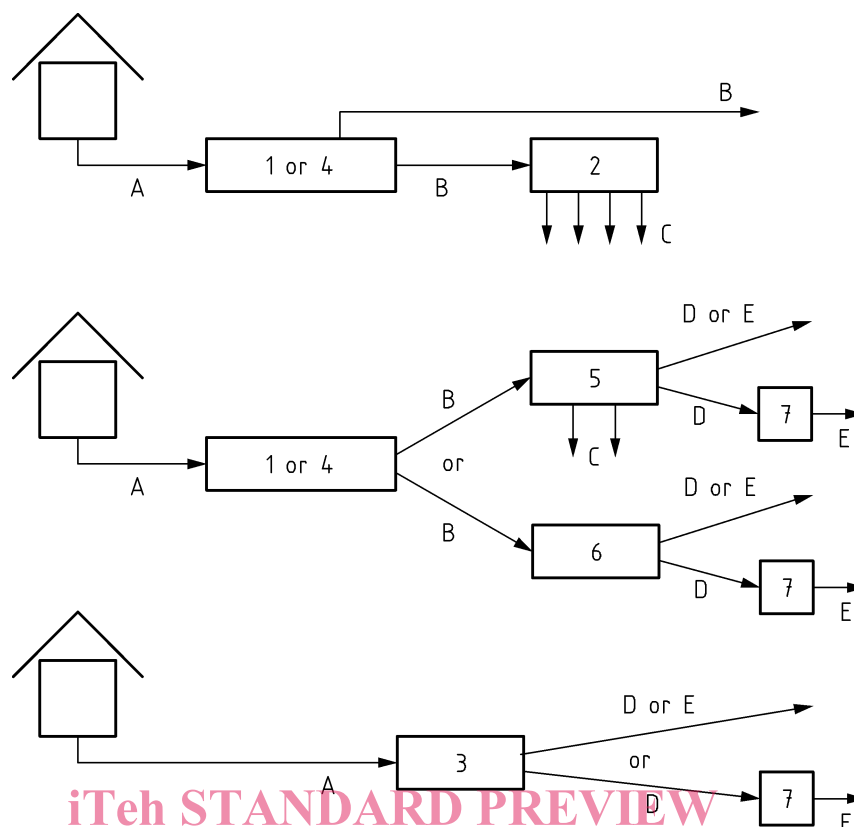
The differences between this version and EN 12566-3:2005+A2:2013 are mainly editorial changes according to the Construction Product Regulation (CPR) and declaration of power consumption and desludging during treatment efficiency test.

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 (this document);*
- *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 12566-3:2016 (E)**1 Scope**

This European Standard specifies requirements, test methods, the marking and evaluation of conformity for packaged and/or site assembled domestic wastewater treatment plants (including guest houses and businesses) used for populations up to 50 inhabitants. Small wastewater treatment plants according to this European Standard are used for the treatment of domestic wastewater.

It covers plants made of concrete, steel, PVC-U, Polyethylene (PE), Polypropylene (PP), Glass Reinforced Polyester (GRP-UP), Polydicyclopentadiene (PDCPD), PVC and EPDM.

The test methods specified in this European Standard establish the performance of the plant, needed to verify its suitability for the end use (see 5.2).

This European Standard applies to small wastewater treatment plants for use buried in the ground where no vehicle loads are applied to the product.

This European Standard applies to plants where all prefabricated components are factory or site-assembled by one manufacturer and which are tested as a whole.

NOTE In some countries, domestic wastewater treatment plants are followed by other systems to conform to national regulations.

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 206, *Concrete — Specification, performance, production and conformity*

EN 580, *Plastics piping systems — Unplasticized poly(vinyl chloride) (PVC-U) pipes — Test method for the resistance to dichloromethane at a specified temperature (DCMT)*

EN 727, *Plastics piping and ducting systems — Thermoplastics pipes and fittings — Determination of Vicat softening temperature (VST)*

EN 858-1, *Separator systems for light liquids (e.g. oil and petrol) — Part 1: Principles of product design, performance and testing, marking and quality control*

EN 976-1:1997, *Underground tanks of glass-reinforced plastics (GRP) — Horizontal cylindrical tanks for the non-pressure storage of liquid petroleum based fuels — Part 1: Requirements and test methods for single wall tanks*

EN 978:1997, *Underground tanks of glass-reinforced plastics (GRP) — Determination of factor alpha and factor beta*

EN 1905, *Plastics piping systems — Unplasticized poly(vinyl chloride) (PVC-U) pipes, fittings and material — Method for assessment of the PVC content based on total chlorine content*

EN 10088-1, *Stainless steels — Part 1: List of stainless steels*

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

EN 13369, *Common rules for precast concrete products*

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 16323:2014, *Glossary of wastewater engineering terms*

EN ISO 178, *Plastics — Determination of flexural properties (ISO 178)*

EN ISO 179 (all parts), *Plastics — Determination of Charpy impact properties (ISO 179, all parts)*

EN ISO 527-2, *Plastics — Determination of tensile properties — Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2)*

EN ISO 899-2, *Plastics — Determination of creep behaviour — Part 2: Flexural creep by three-point loading (ISO 899-2)*

EN ISO 1133-1:2011, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 1: Standard method (ISO 1133-1:2011)*

EN ISO 1133-2, *Plastics — Determination of the melt mass-flow rate (MFR) and melt volume-flow rate (MVR) of thermoplastics — Part 2: Method for materials sensitive to time-temperature history and/or moisture (ISO 1133-2)*

EN ISO 1183 (all parts), *Plastics — Methods for determining the density and relative density of non-cellular plastics (ISO 1183, all parts)*

EN ISO 2505:2005, *Thermoplastics pipes — Longitudinal reversion — Test method and parameters (ISO 2505:2005)*

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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 ISO 9967, *Thermoplastics pipes — Determination of creep ratio (ISO 9967)*

EN ISO 9969, *Thermoplastics pipes — Determination of ring stiffness (ISO 9969)*

EN ISO 13229, *Thermoplastics piping systems for non-pressure applications — Unplasticized poly(vinyl chloride) (PVC-U) pipes and fittings — Determination of the viscosity number and K-value (ISO 13229)*

EN ISO 14125:1998, *Fibre-reinforced plastic composites — Determination of flexural properties (ISO 14125:1998)*

3 Terms, definitions, symbols and abbreviated terms

3.1 Terms and definitions

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

3.1.1

end use

condition in which a plant is normally installed

EN 12566-3:2016 (E)**3.1.2****laboratory**

body capable of testing a domestic wastewater treatment plant under controlled conditions

3.1.3**packaged domestic wastewater treatment plant**

prefabricated factory-built wastewater treatment installation which accepts domestic wastewater and treats it to a declared quality

3.1.4**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.

3.1.5**site assembled domestic wastewater treatment plant**

unit composed of prefabricated components assembled on one site by one manufacturer, which accepts domestic wastewater and treats it to a declared quality

3.1.6**extension shaft**

component(s) which, when placed on the top of the plant, allow access from or slightly above the ground surface

Note 1 to entry: It permits accessibility and maintenance work.

Note 2 to entry: It may be either a vertical extension piece of the tank, or components, which are fitted only over certain points for example to allow maintenance or observation.

3.1.7**nominal designation**

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

3.2 Symbols and abbreviated terms

BOD ₅ (or BOD ₇)	Biochemical oxygen demand at 5 or 7 days
SS	Suspended solids
KN	Kjeldahl Nitrogen
NH ₄ -N	Ammonium nitrogen
COD	Chemical oxygen demand
PE	Polyethylene
PVC-U	Unplasticized Polyvinyl Chloride

GRP	Glass reinforced plastic
PP	Polypropylene
PDCPD	Polydicyclopentadiene
HDPE	High Density Polyethylene
PVC	Polyvinyl Chloride
EPDM	Ethylene Propylene Diene Monomer
PT	Population total
P	Phosphorus
MFR	Melt mass-flow rate
QN	Nominal hydraulic flow

4 Product characteristics

4.1 Design

4.1.1 General

Plants shall be structurally stable, durable, watertight and corrosion resistant.

Raw wastewater shall not discharge to an open surface product.

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 B.2.

4.1.2 Inlets, outlets, internal pipework and connections

The minimum internal diameter of inlet and outlet pipes for gravity flow is specified below:

- 100 mm for nominal hydraulic daily flow $\leq 4 \text{ m}^3/\text{d}$;
- 150 mm for nominal hydraulic daily flow $> 4 \text{ m}^3/\text{d}$.

The hydraulic design of the equipment, the internal pipework and connections shall ensure that no back-flows, blockage or surcharging occur during normal operation.

Inlet and outlet pipes shall be compatible with pipe systems in accordance with European Standards.

4.1.3 Access

The design shall provide access to the inlet and outlet areas; this access may allow routine maintenance sampling, removal of sludge, cleaning and maintenance.

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.

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NOTE 2 The requirements to provide facility for the access of a person into the plant 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 plant 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.

4.1.4 Sizing basis

Rules and units (per inhabitant, BOD, SS...) to be used for the determination of the population load are given by national regulations.

Depending on the end use, one or more of the following design criteria shall be taken into consideration:

- a) population load;
- b) minimum and maximum daily loading that a plant can accept;
- c) minimum volume criteria;
- d) additional design criteria for domestic wastewater flows from sources such as hotels, restaurants or commercial premises. These additional design criteria are chosen according to the national codes of practice and/or regulations valid in the country of use of the plant.

The manufacturer shall declare the desludging frequency.

4.1.5 Overall dimensions

The overall dimensions of the plant (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.

4.2 Load bearing capacity

The small wastewater treatment plant 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 small wastewater treatment plant is declared as:

- maximum allowed height of backfill (in meters);
- possibility to install the plant 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 plant or DRY.

4.3 Treatment efficiency

The plant shall demonstrate compliance with the wastewater treatment efficiency performances and the related operational data declared by the manufacturer, when tested according to Annex B.

The manufacturer's declaration shall be expressed in terms of the treatment efficiency ratios on COD, BOD, SS, nitrogen parameters and total phosphorus in relation to the tested organic daily load as indicated in B.4. The calculation method is provided in 5.2.

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

EXAMPLE Minimum and maximum concentrations of the effluent and the influent.

The ratios obtained do not automatically mean that the regulatory requirements on effluent qualities in a given country are met. A calculation should be made to indicate the final effluent qualities that should be compared to the requirements valid in the place of use.

These ratios may not always be obtained when the plant is operating in practice.

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

Where required, i.e. by national regulations, parameters described in B.2.4 shall be declared.

4.4 Watertightness

4.4.1 General

The plant shall meet at least one of the requirements given in 4.4.2 to 4.4.4 when tested according to the methods described in Annex A.

4.4.2 Water test

When tested according to A.2, the water loss for plants shall be measured after 30 min. For tanks made of concrete it shall be $\leq 0,1$ l/m² of the internal wet surface of the external walls. For tanks made from plastics or other material, no leakage shall occur.

4.4.3 Vacuum test

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

4.4.4 Pneumatic pressure test

The plant is considered to be watertight when:

- tested in the conditions given in A.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.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.