



SLOVENSKI STANDARD
SIST EN 1825-1:2004

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Grease separators - Part 1: Principles of design, performance and testing, marking and quality control

Abscheideranlagen für Fette - Teil 1: Bau-, Funktions- und Prüfgrundsätze, Kennzeichnung und Güteüberwachung

Séparateurs a graisses - Partie 1 : Principes pour la conception, les performances et les essais, le marquage et la maîtrise de la qualité

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13.060.99	Drugi standardi v zvezi s kakovostjo vode	Other standards related to water quality
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English version

Grease separators - Part 1: Principles of design, performance and testing, marking and quality control

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This European Standard was approved by CEN on 1 July 2004.

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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 Central Secretariat has the same status as the official versions.

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Foreword

This document (EN 1825-1:2004) 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of an identical text or by endorsement, at the latest by March 2005, and conflicting national standards shall be withdrawn at the latest by March 2005.

This is the first part of the two part standard for grease separators. Part 2 gives guidelines for selection, installation, operation and maintenance of grease separators.

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

According to the CEN/CENELEC Internal Regulations, the national standards organizations of the following countries are bound to implement this European Standard: Austria, Belgium, Cyprus, Czech Republic, Denmark, Estonia, Finland, France, Germany, Greece, Hungary, Iceland, Ireland, Italy, Latvia, Lithuania, Luxembourg, Malta, Netherlands, Norway, Poland, Portugal, Slovakia, Slovenia, Spain, Sweden, Switzerland and United Kingdom.

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1 Scope

This standard specifies definitions, nominal sizes, principles of design, performance requirements, marking, testing and quality control for grease separators.

This standard applies to separators for the separation of greases and oils of vegetable and animal origin from wastewater by means of gravity and without any external energy.

This standard does not cover grease separators intended to treat domestic wastewater from kitchen areas of single family dwellings, where the separator has a nominal size less than 1.

The standard is not applicable for the separation of light liquids, e.g. petrol, fuel and heating oil, and does not cover the treatment of wastewater exclusively containing stable emulsions of greases and oils.

The standard does not cover the use of biological means (bacteria and enzymes).

2 Normative references

The following referenced documents are indispensable for the 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 124:1994, *Gully tops and manhole tops for vehicular and pedestrian areas – Design requirements, type testing, marking, quality control.*

EN 206-1, *Concrete – Part 1: Specification, performance, production and conformity.*

EN 288-2, *Specification and approval of welding procedures for metallic materials – Part 2: Welding procedure specification for arc welding.*

EN 295-3, *Vitrified clay pipes and fittings and pipe joints for drains and sewers – Part 3: Test methods.*

EN 476, *General requirements for components used in discharge pipes, drains and sewers for gravity systems.*

EN 681-1, *Elastomeric seals – Material requirements for pipe joint seals used in water and drainage applications – Part 1: Vulcanised rubber.*

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, *Underground tanks of glass-reinforced plastics (GRP) – Determination of factor α and factor β .*

EN 1253-4, *Gullies for buildings – Part 4: Access covers.*

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

EN 10088-2, *Stainless steels – Part 2: Technical delivery conditions for sheet/plate and strip for general purposes.*

EN 10088-3, *Stainless steels – Part 3: Technical delivery conditions for semi-finished products, bars, rods and sections for general purposes.*

EN 12350-1, *Testing fresh concrete - Part 1: Sampling.*

EN 12390-2, *Testing hardened concrete - Part 2: Making and curing specimens for strength tests.*

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

EN ISO 178, *Plastics – Determination of flexural properties (ISO 178:2001)*

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EN ISO 180, *Plastic – Determination of Izod impact strength (ISO 180:2000).*

EN ISO 291, *Plastics - Standard atmospheres for conditioning and testing.*

EN ISO 527-2, *Plastics – Determination of tensile properties – Part 2: Test conditions for moulding and extrusion plastics (ISO 527-2:1993 including Corr 1:1994).*

EN ISO 527-4, *Plastics - Determination of tensile properties - Part 4: Test conditions for isotropic and orthotropic fibre-reinforced plastic composites (ISO 527-4:1997).*

EN ISO 1172, *Textile–glass–reinforced plastics – Prepregs, moulding compounds and laminates – Determination of the textile – glass and mineral – filler content – Calcination methods (ISO 1172:1996).*

EN ISO 1514, *Paints and varnishes – Standard panels for testing (ISO 1514:1993).*

EN ISO 1518, *Paints and varnishes – Scratch test (ISO 1518:1992).*

EN ISO 2409, *Paints and varnishes – Cross-cut test (ISO 2409:1992).*

EN ISO 2808, *Paints and varnishes – Determination of film thickness (ISO 2808:1997).*

EN ISO 2812-1, *Paints and varnishes – Determination of resistance to liquids – Part 1: General methods (ISO 2812-1:1993).*

EN ISO 2815, *Paints and varnishes – Buchholz indentation test (ISO 2815:2003).*

EN ISO 4624, *Paints and varnishes – Pull-off test for adhesion (ISO 4624:2002).*

EN ISO 4628-2, *Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 2: Assessment of degree of blistering (ISO 4628-2:2003).*

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EN ISO 4628-3, *Paints and varnishes - Evaluation of degradation of coatings - Designation of quantity and size of defects, and of intensity of uniform changes in appearance - Part 3: Assessment of degree of rusting (ISO 4628-3:2003).*

EN ISO 7253, *Paints and varnishes - Determination of resistance to neutral salt spray (fog) (ISO 7253:1996)*

EN ISO 8501-1, *Preparation of steel substrates before application of paints and related products – Visual assessment of surface cleanliness – Part 1: Rust grades and preparation grades of uncoated steel substrates and of steel substrates after overall removal of previous coatings (ISO 8501-1:1988).*

EN ISO 9377-2, *Water quality – Determination of hydrocarbon oil index – Part 2: Method using solvent extraction and gas chromatography (ISO 9377-2:2000).*

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

EN ISO 15607, *Specification and qualification of welding procedures for metallic materials - General rules (ISO 15607:2003)*

EN ISO 15614-1, *Specification and qualification of welding procedures for metallic materials - Welding procedure test - Part 1: Arc and gas welding of steels and arc welding of nickel and nickel alloys (ISO 15614-1:2004).*

ENV 10080, *Steel for reinforcement of concrete weldable ribbed reinforcing steel B 500 – Technical delivery conditions for bars, coils and welded fabric.*

ISO 48, *Rubber vulcanized or thermoplastic – Determination of hardness (hardness between 10 IRHD and 100 IRHD).*

ISO 185, *Grey cast iron – Classification.*

ISO 630, *Structural steels – Plates, wide flats, bars, sections and profiles.*

ISO 877, *Plastics – Methods of exposure to direct weathering, to weathering using glass-filtered daylight, and to intensified weathering by daylight using Fresnel mirrors.*

ISO 1083, *Spheroidal graphite cast irons – Classification.*

ISO 1133, *Plastics – Determination of the melt mass-flow rate (MFR) and the melt volume-flow rate (MVR) of thermoplastics.*

ISO 1183-1:2004 *Plastics -- Methods for determining the density of non-cellular plastics -- Part 1: Immersion method, liquid pycnometer method and titration method*

ISO 1183-2:2004 *Plastics -- Methods for determining the density of non-cellular plastics -- Part 2: Density gradient column method (available in English only)*

ISO 1521, *Paints and varnishes – Determination of resistance to water – Water immersion method.*

ISO 1817, *Rubber vulcanized – Determination of the effect of liquids.*

ISO 1920, *Concrete tests – Dimensions tolerances and applicability of test specimens.*

ISO 3755, *Cast carbon steels for general engineering purposes.*

ISO 4012, *Concrete – Determination of compressive strength of test specimens.*

ISO 6272, *Paints and varnishes – Falling-weight test.*

ISO 8217, *Petroleum products – Fuels (class F) – Specifications of marine fuels.*

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3 Terms and definitions

For the purposes of this document, the following terms and definitions apply. See also Figures 1 and 2.

3.1

grease

substances of vegetable and/or animal origin, of a density less than $0,95 \text{ g/cm}^3$, which are partially or totally insoluble in water and saponifiable

3.2

influent

wastewater, containing grease, with the exception of wastewater containing faeces (sanitary wastewater) which enters the grease separator

3.3

grease separator

a unit or assembly of units to separate grease from wastewater and retain the separated grease within the unit, normally comprising a sludge trap, a grease separation chamber and, if necessary, a sampling point

3.4

grease separation chamber

part of a grease separator for the separation of grease from influent, in such a way that, due to the difference in density between the substance to be separated and the carrying liquid, and the reduction in flow velocity, the grease particles are separated from the wastewater by flotation

3.5

grease separation zone

part of the grease separation chamber, in which the grease is separated, comprising the effective filled volume and the grease collection chamber

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3.6

grease collection area

top part of the grease separation chamber, where the separated grease is retained

3.7

sludge trap

part of the grease separator where material settles, i.e. sludge, silt and grit, and which can be a separate unit or constructed with the grease separation chamber as a combined unit

3.8

extension shaft

component used to extend an opening in the separator system to finished level thereby permitting access for inspection and maintenance purposes

3.9

sampling point

part of the grease separator situated downstream of the separation process where samples can be taken of the wastewater discharged from the separator

3.10

nominal size (NS)

number, without units, approximately equivalent to the maximum effluent flow rate in litres per second from the separator when tested in accordance with 8.5.1

3.11

maximum operational liquid level

highest level of liquid and grease at the flow, corresponding to the nominal size, with the grease collection area filled

3.12**automatic warning device**

device to warn of excessive depth of grease or wastewater or low level condition

3.13**coating/lining**

a protective layer on a separator component

4 Nominal sizes

The preferred nominal sizes of grease separators are: 1, 2, 4, 7, 10, 15, 20 and 25.

Other nominal sizes are permissible.

5 Requirements**5.1 General**

Grease separators and their separate components shall be in accordance with material requirements specified in 5.2.

5.2 Materials

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5.2.1 General

Grease separators may be constructed from:

- unreinforced concrete, fibre-reinforced concrete, reinforced concrete;
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- metallic materials: cast iron, stainless steel, steel;
- plastics materials: glass fibre reinforced plastics, polyethylene;
- vitrified clay.

Any other materials used in the construction of a grease separator shall meet all the relevant requirements of this standard.

5.2.2 Concrete

The concrete shall comply with the minimum compressive strength class C 35/45 in accordance with EN 206-1.

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5.2.3 Metallic materials

a) The production, quality and testing of the metallic materials listed below shall be in accordance with the following standards:

Flake graphite cast iron	ISO 185	Reinforcing steel ENV 10080
Spheroidal graphite cast irons	ISO 1083	Stainless steel EN 10088-1
		EN 10088-2
		EN 10088-3
Cast steel	ISO 3755	
Rolled steel	ISO 630	

b) Additional requirements for metallic materials

Stainless steel

For good general corrosion resistance and stability against intercrystalline corrosion effects of the various steels listed in the EN 10088-1, EN 10088-2 and EN 10088-3, only austenitic steels of minimum quality X6 CrNi 1810 shall be used.

Welding of steel

The requirements given in EN ISO 15607, EN 288-2 and EN ISO 15614-1 shall apply.

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5.2.4 Plastics materials

a) Glass fibre reinforced plastics

The laminate shall be constructed using resins, reinforcement materials, processing agents and other materials in accordance with EN 976-1:1997, clause 3.

b) Polyethylene

1) The requirements for moulding and fabricating polyethylene are as follows:

Polyethylene for rotational moulding:

- The density shall not be less than 935 kg/m^3 when measured in accordance with ISO 1183.
- The melt mass-flow rate under a nominal load of 21,6 N and a temperature of $190 \text{ }^\circ\text{C}$, shall be between 1,0 g/10 min and 5,0 g/10 min measured in accordance with ISO 1133.

Polyethylene for blow moulding:

- The density shall not be less than 945 kg/m^3 when measured in accordance with ISO 1183.
- The melt mass-flow rate under a nominal load of 50 N and a temperature of $190 \text{ }^\circ\text{C}$, shall be between 0,3 g/10 min and 1,0 g/10 min measured in accordance with ISO 1133.

Polyethylene for injection moulding:

- The density shall not be less than 945 kg/m^3 when measured in accordance with ISO 1183.
- The melt mass-flow rate under a nominal load of 50 N and a temperature of $190 \text{ }^\circ\text{C}$, shall be between 0,3 g/10min and 1,0 g/10 min, measured in accordance with ISO 1133.

Polyethylene for butt-weld-sheet assembly

- The density shall not be less than 950 kg/m^3 when measured in accordance with ISO 1183.
- The melt mass-flow rate under a nominal load of 50 N and a temperature of $190 \text{ }^\circ\text{C}$, shall be between 0,3 g/10 min and 1,0 g/10 min, measured in accordance with ISO 1133.

2) Additional requirements

Tensile strength:

The tensile properties, when determined in accordance with EN ISO 527-2 (using a testing speed of 100 mm/min) shall be as follows:

Polyethylene for rotational moulding:

- Tensile stress at yield shall be greater than 15 MPa.
- Tensile strain at yield shall be less than 25 %.
- Tensile strain at break shall be greater than 200 %.

Polyethylene for blow moulding, injection moulding and butt-weld-sheet assembly:

- Tensile stress at yield shall be greater than 21 MPa.
- Tensile strain at yield shall be less than 25 %.
- Tensile strain at break shall be greater than 200 %.

U.V. stability:

- When exposed to U.V. radiation of $3,5 \text{ GJ}/(\text{m}^2 \cdot \text{a})$ in accordance with ISO 877, the mechanical properties shall not decrease more than 50 %.

5.2.5 Vitrified clay

Suitable clays shall be used, fired to vitrification and of a such a quality and homogeneity that the final product is in accordance with this standard. Finished products shall be sound and free from such defects as would impair their function when in service. Visual defects, such as missing glaze, unevenness and slight surface damage are acceptable, providing that the impermeability and durability of the products are not affected. Products may be glazed or unglazed on the interior and/or exterior. When glazed they shall also be glazed on the jointing surfaces of the pipe connections. Products may be surface treated after firing.

Products may be completed by fixing parts together. Fabricated test specimens shall not fracture through the adhesive nor at the adhesive/clay interface under a bending tensile stress of 5 N/mm² after full curing when made and tested in accordance with EN 295-3.

5.2.6 Sealing materials

For grease separators, only elastomers (rubber) or permanent elastic sealing materials shall be used. Cement mortar and similar sealing cements or compounds shall not be used.

Rubber seals shall comply with the requirements of EN 681-1, type WC, and their hardness for joints shall not be less than 40 IRHD in accordance with ISO 48.

5.2.7 Coatings/linings

5.2.7.1 General

If there are coatings/linings applied to the surfaces of the grease separators for protection against the effects of the influent (for internal surfaces), and ground conditions (for external surfaces), they shall be in accordance with the following requirements.

5.2.7.2 Technical documentation

The supplier of the coating materials shall provide full technical documentation to ensure that:

- a) the complete and correct identification and application of the material supplied, and
- b) the possibility and limitations of a repair to the coating

are determined.

5.2.7.3 Preparation, application and curing

5.2.7.3.1 Surface preparation

Rolled steel surfaces shall be grit blasted to achieve a degree of cleanliness of at least Sa 2,5 and the roughness profile, Ra, shall be between 10 μm and 20 μm in accordance with EN ISO 8501-1.

Concrete surfaces shall be rough, clean and free from cement skin prior to coating. This can be achieved by grit blasting with non-metallic abrasives, flame blasting or by using pressurized water devices.

5.2.7.3.2 Application and curing

The application and curing shall be carried out in accordance with the supplier's written instructions.

5.2.7.4 Properties

- a) Dry film thickness – to be stated by the manufacturer of the separator system.
- NOTE A minimum thickness can be required by national procedures and/or regulations.
- b) Adhesion – at least 6 N/mm² on steel and at least 2 N/mm² on concrete in accordance with EN ISO 4624.
- c) Impact resistance – at least 4 Nm in accordance with ISO 6272.
- d) Scratch resistance – at least 50 N in accordance with EN ISO 1518.
- e) Porosity – the coating shall have no pores when tested in accordance with 8.1.4.2.5.

5.2.8 Chemical resistance

5.2.8.1 Internal surfaces

5.2.8.1.1 General

All materials referred to in 5.2 shall be resistant to animal and vegetable grease and decomposing products, to reactive salts, high temperature, detergents and their decomposing products or protected accordingly. When tested in accordance with 8.2 the following requirements shall be met.

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5.2.8.1.2 Concrete

When uncoated and/or coated concrete is tested in accordance with 8.2.1, it shall comply with the requirements given in 5.2.2.

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5.2.8.1.3 Plastics materials

The test specimens from the test in 8.2.1 and 8.2.2 shall retain the following tensile strength, flexural strength, modulus of elasticity and Izod impact resistance, when compared with the control specimen:

- at least 80 % for glass reinforced plastics;
- at least 70 % for polyethylene.

5.2.8.1.4 Sealing materials

When sealing materials others than those in 5.2.6 tested in accordance with 8.2.3, the test pieces shall not show any signs which may affect their fitness for use.

5.2.8.1.5 Coatings

When tested in accordance with 8.2.4 the following requirements shall be met:

- Degree of blistering : no worse than degree 2, class 2 gradation in accordance with EN ISO 4628-2.
- Degree of rusting : Re0 in accordance with EN ISO 4628-3.
- Width of coating detachment : not greater than 1 mm along the surface scratch in accordance with EN ISO 1518.
- Degree of Buchholz : not more than 50 % indentation in accordance with EN ISO 2815.