# SLOVENSKI STANDARD
# SIST EN 1825-2:2002

**01-december-2002**

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**Loļevalnik maġļobï 2. del: Izbor nazivne velikosti, vgradnja, delovanje in vzdrģevanje**

Grease separators - Part 2: Selection of nominal size, installation, operation and maintenance

Abscheideranlagen für Fette - Teil 2: Wahl der Nenngröße, Einbau, Betrieb und Wartung

Installations de séparation de graisses - Partie 2: Choix des tailles nominales, installation, service et entretien

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EUROPEAN STANDARD

NORME EUROPÉENNE

EUROPÄISCHE NORM

# EN 1825-2

February 2002

ICS 13.060.30

English version

# Grease separators - Part 2: Selection of nominal size, installation, operation and maintenance

Installations de séparation de graisses - Partie 2: Choix des tailles nominales, installation, service et entretien

Abscheideranlagen für Fette - Teil 2: Wahl der Nenngröße, Einbau, Betrieb und Wartung

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EUROPEAN COMMITTEE FOR STANDARDIZATION
COMITÉ EUROPÉEN DE NORMALISATION
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# Foreword

This document EN 1825-2:2002 has been prepared by Technical Committee CEN/TC 165 "Wastewater 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of an identical text or by endorsement, at the latest by August 2002, and conflicting national standards shall be withdrawn at the latest by June 2004.

When pollution control requires the treatment of pollutants other than light liquids, additional measures might be necessary.

It is the second part of a two part standard for grease separators. Part 1 gives principles of design, performance and testing, marking and quality control of grease separators.

Annex A is normative. The annexes B, C and D are informative.

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

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## 1 Scope

This European Standard provides guidance on the selection of nominal sizes, installation, operation and maintenance of grease separators manufactured in accordance with prEN 1825-1.

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This standard does not apply to wastewater containing light liquids, e.g. grease or oils of mineral origin, and does not include treating stable emulsions of grease or oil in water.

The standard does not cover the use of biological additives (bacteria, enzymes).

## 2 Normative references

This European Standard incorporates by dated or undated references, provisions from other publications. These normative references are cited at the appropriate places in the text, and the publications are listed hereafter. For dated references, subsequent amendments to or revisions of any of these publications apply to this European Standard only when incorporated in it by amendment or revision. For undated references the latest edition of the publication referred to applies (including amendments).

prEN 1825-1:2000, *Grease separators — Part 1: Principles of design, performance and testing, marking and quality control.*

EN 12056-2, *Gravity drainage systems inside buildings — Part 2: Sanitary pipework, layout and calculation.*

## 3 Terms and definitions

For the purposes of this European Standard the terms and definitions given in prEN 1825-1 and EN 12056-2 and the following apply.

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**3.1**
**selection of the nominal size**
determination of the appropriate nominal size of the grease separation chamber for a specific case, based on amount and type of influent

## 4 Application

Grease separators shall be used wherever it is necessary to separate greases and oils of vegetable and animal origin from wastewater, such as in trade or industrial plants/establishments, e.g.

- commercial kitchens and large catering establishments, e.g. in inns, hotels, motorways service stations, canteens;
- grilling, roasting and frying facilities;
- food distribution points (with returnable crockery);
- butcher's shops, with or without slaughtering facilities;
- meat and sausage factories, with or without slaughtering facilities;
- abattoirs;
- poultry slaughterers;
- tripe preparation plants;
- animal rendering plants;
- bone and glue boiling plants;
- soap and stearine factories;
- oil mills;
- vegetable oil refineries;
- margarine factories;
- pickling plants;
- fast-food preparation plants;
- chip and crisp producers;
- peanut roasting plants.

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Wastewater containing a considerable proportion of grease in a non-separable form (i.e. emulsified) from applications such as dairy, cheese making and fish processing, or from distribution points having only dish washing facilities, or from "wet waste compactors", will only be effectively treated in grease separators under certain conditions. The wastewater may require further treatment.

Applications where the discharged wastewater contains solids that are quick to purify (e.g. the fish industry) do not require a sludge trap, but the grease separator shall be fitted with a strainer or screening device fitted on the inlet side to retain coarse solids. Any retained solids should be removed and the separator thoroughly flushed with clean water before operational intervals to prevent putrefaction.

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# 5 Nominal size

For the preferred nominal sizes (NS) see clause 4 of prEN 1825-1:2000.

Multiple separators of the same nominal size may be connected in parallel with the flow split equally between each separator.

# 6 Selection of the nominal size

## 6.1 General

The selection of the nominal sizes shall be based on the nature and quantity of wastewater to be treated taking into account:

— maximum flow rate of wastewater;

— maximum temperature of the wastewater;

— density of grease/oils to be separated;

— influence of cleansing and rinsing agents.

If a grease storage capacity greater than 40 · NS in litres is required, e.g. when more than the usual amount of grease is expected, the following options may be used:

1) using a larger nominal size separator than calculated or

2) creating grease storage capacity outside the separator or

3) emptying the separator more frequently than usually.

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Where no specific sizing method is offered by a regulatory authority, then the nominal size of the separator shall be determined from the following formula:

$$\mathrm{NS} = Q_s f_t f_d f_r \qquad (1)$$

where

NS is the calculated nominal size of the separator;

$Q_S$ is the maximum flow rate of wastewater, entering the separator in litres per second;

$f_t$ is the impedient factor for the temperature of influent;

$f_d$ is the density factor for the relevant grease/oil;

$f_r$ is the impedient factor for the influence of cleansing and rinsing agents.

After calculation select the next higher preferred nominal size in accordance with clause 4 of prEN 1825-1:2000.

## 6.2 Determination of the specific values

### 6.2.1 Maximum flow rate of wastewater

The maximum flow rate of wastewater $Q_S$ shall be determined by:

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a) measurement, or

b) calculation based upon catering equipment discharging into the grease separator, or

c) calculation based upon the type of establishment discharging into the grease separator, or

d) special calculation for individual cases, if acceptable by the regulatory authority.

Where data is available to determine $Q_S$ by b) or c), and the designer is unsure of the most appropriate option of use, it is recommended that the higher of the flow rates determined from both calculations is used.

### 6.2.2 Temperature factor $f_t$

High wastewater temperature reduces the efficiency of grease separators. Temperature factors $f_t$ are given in Table 1.

**Table 1 — Temperature factor $f_t$**

| Temperature of wastewater at inlet<br>°C | Temperature factor $f_t$ |
|---|---|
| ≤ 60 | 1,0 |
| always or occasionally > 60 | 1,3 |

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### 6.2.3 Density factor $f_d$

A density factor $f_d$ = 1,0 shall be used for wastewater discharged from kitchens, abattoirs and meat and fish processing plants.

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When the nature of grease/oil is well known, the density coefficient may be taken from Figure 1, where $f_d$ is plotted for a range of different grease and oil densities.

For grease/oil densities > 0,94 g/cm$^3$, a density factor of 1,5 shall be used.

Densities of different fats and oils are given in annex B.

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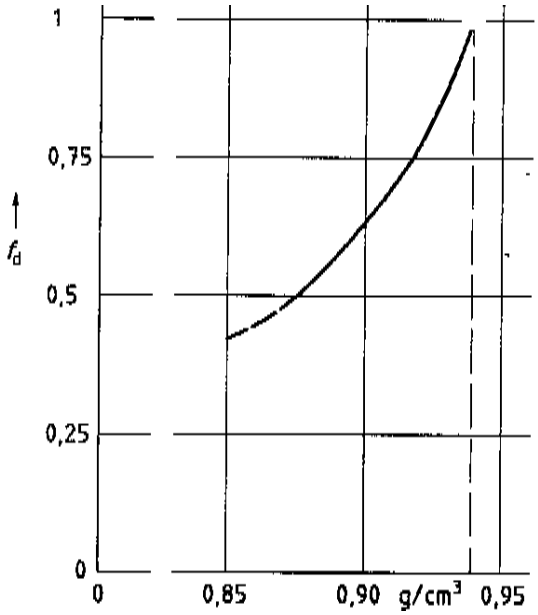



**Figure 1 — Relation between $f_d$ and density**

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### 6.2.4 Detergent and rinsing agent factor $f_r$

Detergents, including dishwasher powders and rinsing agents, should carefully be selected and used sparingly. They shall not impair the separating effect as far as possible and not form stable emulsions where they are used upstream of a separator. A detergent and rinsing agent coefficient shall be chosen from Table 2.

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**Table 2 — Detergent and rinsing agent coefficient $f_r$**

| Use of detergent and rinsing agents | Detergent and rinsing agent coefficient $f_r$ |
|---|---|
| Never used | 1,0 |
| Occasionally or always used | 1,3 |
| Special cases, e.g. hospitals | ≥ 1,5 |

National and local regulations may limit the use of certain detergents, rinsing agents and solvents.

## 6.3 Special cases

For industrial plants such as abattoirs and wholesale butchers, the grease separator nominal size NS should be selected on the basis of site specific investigation.

## 6.4 Determination of sludge trap volume

The sludge trap volume shall be at least 100 · NS in litres but for abattoirs and similar plants a volume of at least 200 · NS in litres is recommended.

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# 7 Installation

## 7.1 Limitations

Only wastewater containing organic grease and oils shall be discharged to a grease separator. In particular, the following shall not be discharged to a grease separator:

— wastewater containing faeces ("black" water);

— rainwater;

— wastewater containing light liquids, e.g. grease or oil of mineral origin.

## 7.2 Place of installation

Grease separators should be installed close to the sources of wastewater but should not be sited in unventilated rooms, roads, car parks or storage areas. To prevent odour and fly nuisance, separators should not be sited close to habitable buildings, especially to opening windows and air intakes. They shall be easily accessible to cleaning vehicles. Specific operational and structural conditions may require the separator to be remotely located from the source of wastewater.

Separators should be installed in such a way to prevent frost damage, and allow all parts requiring regular maintenance to be easily accessible at all times.

Where necessary, manhole covers on separators shall be supported so that the load imposed on the separator does not exceed its design strength.

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## 7.3 Drainage to and from the separator

Where no specific local regulations exist, grease separators shall be connected to the drains and sewers as follows:

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The wastewater to the grease separator shall be gravity fed. If the static water level in the grease separator is lower than the flood level (see EN 752-1), then the effluent from the separator shall be discharged to the drainage system using a wastewater lifting plant.

Pipelines upstream of the separator shall be laid at a minimum gradient of 2 % (1 : 50) to prevent an accumulation of grease. Where for structural and/or operational reasons, this is not possible, and/or longer pipe runs are required, appropriate measures shall be taken to prevent grease accumulation or deposition (see annex D).

The transition from vertical to horizontal pipes shall be made by using two 45° bends between which a piece of pipe, at least 250 mm long, shall be placed, or by using equivalent long-radius bend. This shall be followed by a stilling section that has a length, in millimetres, equal to at least 10 times the nominal size of the supply pipe and shall be placed upstream of the separator.

Local regulations may limit the temperature of wastewater at the point of connection to the public sewerage system.

Discharge points, e.g. floor drains, shall have traps, which, where necessary, include sediment buckets which can be removed for cleaning purposes.

The use of sludge traps with an inlet from above, e.g. through a grating, is not permitted.

## 7.4 Ventilation

Pipelines connected to grease separators (upstream and downstream) shall be adequately ventilated. The discharge pipe to the separator shall be provided with a stack vent and branch ventilating pipes shall be connected to all upstream branch pipes more than 5 m long.

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Where the nearest vent is further than 10 m upstream of the grease separator, the supply pipe shall be fitted with an additional vent pipe, terminating as close as possible to the separator.

## 8 Operation, inspection and maintenance

Grease separators should be inspected, emptied and cleaned regularly. Attention is drawn to the need to comply with national or local regulations for the disposal of waste.

The frequency of inspection, emptying and cleaning should be determined with regard to the grease and sludge storage capacity of the separator and in accordance with operational experience. Unless otherwise specified, separators should be emptied, cleaned and refilled with clean water at least once a month and, preferably, every two weeks.

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