

wavin**Labko****wavin****Labko**

November 2007

EuroREK® Grease Separators**Wavin-Labko in brief**

Wavin-Labko Ltd is a Finnish company with over 40 years' experience in developing, manufacturing and marketing of measurement devices and various plastic products.

The range of our plastic products can be divided in three main groups:

Separator systems cover the purification of oily and greasy wastewater. These separator solutions meet the various special needs of business and services construction. Stormwater treatment in traffic and industrial areas with the large flow rates is ecologically managed using the Bypass System. All separator systems are equipped with the essential alarm and monitoring devices.

Wastewater treatment and processing in rural areas is managed with the best possible wastewater system suitable for each specific case. Most complex of these systems are the biological-chemical processing plants, which are suitable for processing the wastewater from small settlements, too.

In the fields of Building&Installation and Civils&Infrastructure, the solutions of Wavin Group cover widely the different needs of both new and renovating construction.

In the field of measurement devices we are specialized in level instruments and alarm devices, automation and identification, and in web-based solutions of data transfer.

Wavin-Labko Ltd is a part of international Wavin Group, which is the leader in the European market for plastic pipe systems. Wavin Group has a presence in 27 European countries.



Wavin-Labko Ltd reserves the rights to alterations without prior notice. Due to policy of continuous improvement in R&D, technical specifications may change. Installation shall always be made as documented in manufacturer's instructions.

EuroREK® Grease Separators

FOR GREASY
WASTEWATER
TREATMENT

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Reliable solutions**Separators and tanks**

EuroREK® Grease Separators

The development of the EuroREK grease separators benefits from Wavin-Labko's experience in manufacturing separators for over 40 years. The separators of Wavin-Labko are manufactured in Finland, they are reliable and easy-to-install systems, including the separator, maintenance shaft and alarm system. The grease separator systems by Wavin-Labko ensure undisturbed functioning of indoor sewerage.

All grease separators by Wavin-Labko have a monitoring and alarm system as a standard equipment, which indicates the filling of the grease storage space, and the possible high level. The measurement and alarm devices are also developed and manufactured by Wavin-Labko.

Alarm information can be forwarded via Labcom communication unit to the emptying company.

Reliable products for various purposes

The EuroREK separators work reliably, as they do not contain any moving parts. Thus, the service interval is long and performance very reliable. The same high quality can be ensured by every single product.

EuroREK Omega separators and the EuroREK Slim NS2 grease separator system are made of strong, durable and recyclable PE plastic. Thanks to the material, the separators are light to transport and quick to install.

EuroREK NS2...35 separators are made of reinforced plastic. The separators EuroREK NS15...35 installed underground are manufactured using a computer operated winding machine. The separators have strength properties far superior e.g. to those laminated by hand. The reinforced plastic is corrosion proof, and its superior chemical resistance cannot even be compared e.g. with concrete tanks.

Tested models

Wastewater emission is controlled more and more strictly by increasingly stringent legislation. Wavin-Labko is ready to comply with the new requirements, having developed a series of grease separators, which have passed tests according to the EN 1825 standard defining the flow rate and purification efficiency. In these tests the grease separator must gain a content less than 25 mg/l in the outgoing wastewater. The tightness and mechanical strength of the maintenance shafts against the ground pressure is guaranteed by tests according to the EN standard.



Pages 4-5



EuroREK Omega grease separators

- NS2, NS4, NS7 ja NS10
- NS2 S, NS4 S, NS7 S ja NS10 S

Pages 6-7



EuroREK grease separators

- NS15, NS20, NS25 ja NS35

Pages 8-9



EuroREK Slim grease separator system

- NS2

Page 9



Determining nominal size of grease separator

See also our web pages www.wavin-labko.fi

Page 10



EuroREK grease separator accessories

- EuroHUK 600 maintenance shafts
- Cover and frame sets
- IMUBOX connection box

Page 11



Alarm devices and data transfer

- SET-2000 grease alarm
- SandSET-1000 sludge alarm
- Labcom 200 communication unit
- LabkoNet system

www.wavin-labko.fi



Web pages present e.g.

- Presentation of determining the nominal size
- Product images (AutoCAD and PDF)
- Instructions for installation, operation and maintenance
- Accessories
- EN test reports and approvals

Application

Restaurants, bars, grills, hotel kitchens, canteens

Industrial kitchens, catering activities, food industry, fish processing, abattoirs

Small restaurants, grills, bars, fast-food stands, grocery stores

Installation

- Underground
- indoor beneath floor

- Underground

- Indoor above floor

EuroREK Omega® Grease Separators

EuroREK Omega grease separators present Wavin-Labko's newest know-how in the field of separators. The separators are made of solid and recyclable PE plastic, and they are light to transport and quick to install.

On the bottom of the EuroREK Omega grease separator there is the space for solids. The ball-shaped tank makes complete emptying possible. Grease - being lighter than water - floats on the surface.

EuroREK Omega® S for indoor installation

EuroREK Omega S is a model for indoor use installed beneath the floor. Its maintenance shaft is a fixed part of the separator, contributing to a low installation depth. This allows the house sewer to be installed in a minimum depth of 500 mm from the floor surface.

Tested efficiency

VTT, Technical Research Centre of Finland, has tested the EuroREK omega grease separators, and verified that they meet all the measure requirements concerning the nominal size in the grease separator

standard EN 1825. With this procedure we want to ensure that the grease separators function reliably by the announced measurement flow, and that the purification efficiency meets the requirements of the standard.

EuroHUK 600 maintenance shaft and SET-2000 grease alarm

As required in the EN standard, watertight EuroHUK 600 maintenance shafts are used with EuroREK Omega grease separators. A suitable cover set is the floating cast iron cover and frame set. When separators are installed in inner yards or other areas covered from wind, a gas-tight cover and frame set is recommended. EuroREK Omega separators are equipped with SET-2000 grease alarm, which indicates an alarm when the grease storage space reaches its maximum, or when a backwater is caused, e.g. by a sewer blockage. (Further information p. 10-11).

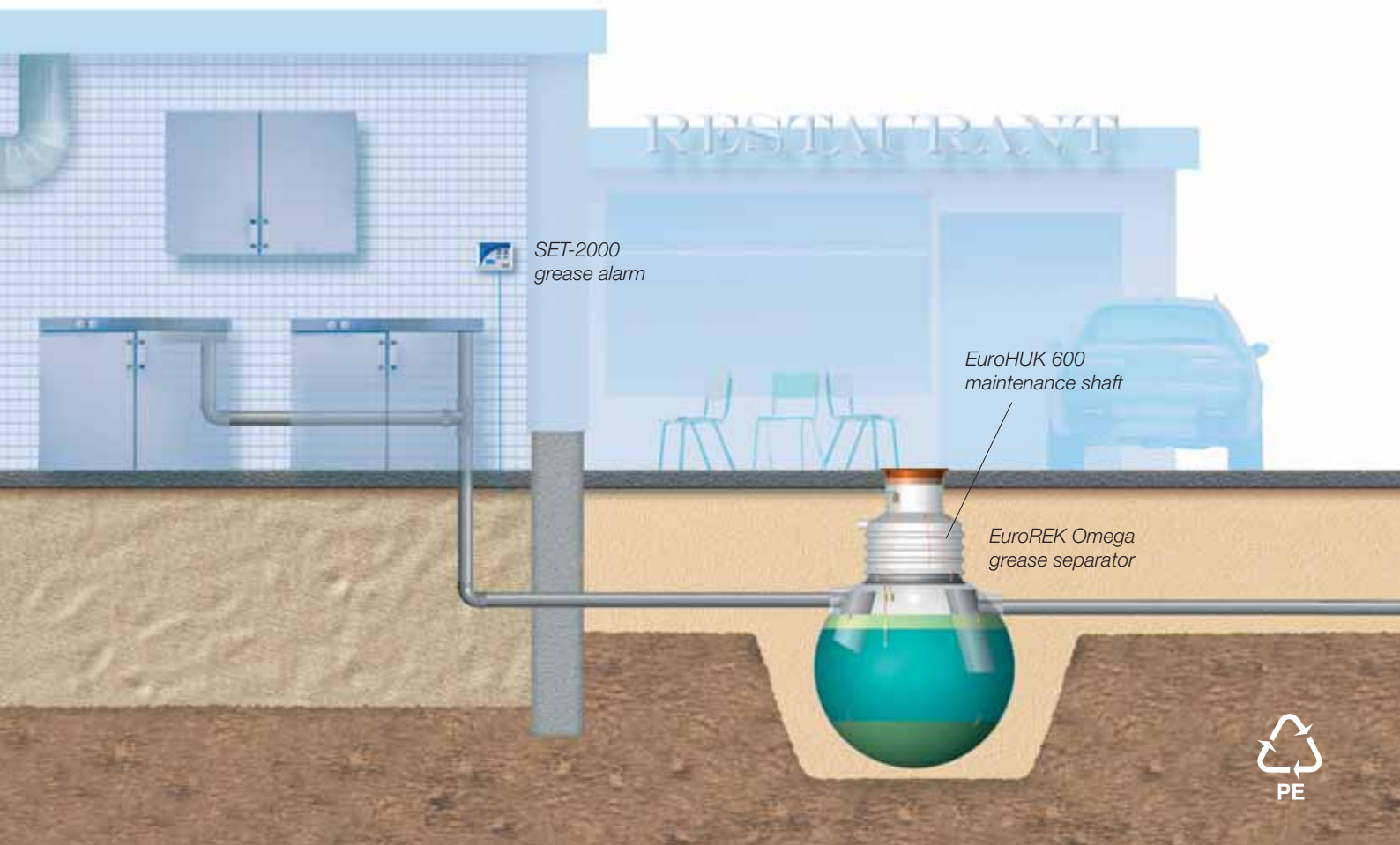
Advantages

- Meets the requirements of the grease separator standard EN 1825
- Alarm system as a standard
- Watertight maintenance shaft
- Ball-shape tank is strong and allows easy and complete emptying
- Light to transport, easy and quick to install
- Long life span

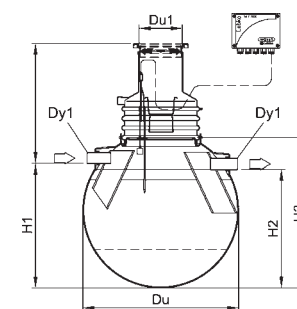
Applications

EuroREK Omega grease separators can be used e.g. in:

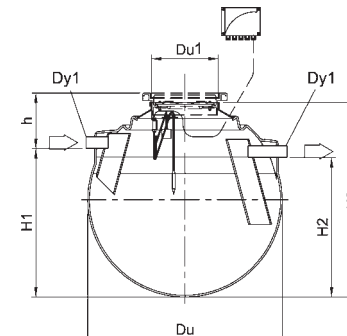
- Restaurants
- Bars
- Grills
- Hotel kitchens
- Canteens
- Farm abattoirs



EuroREK Omega grease separators



EuroREK Omega S grease separators



Legend:

- Du = outer diameter
- Du1 = diameter of the maintenance shaft/cover
- Du2 = tank diameter
- Dy = diameter of the ventilation pipe (accessory)
- Dy1/Du2 = diameter of the combining pipe DN
- H1/H2/H3/H4 = height
- L/L1 = length
- W = width
- h = installation depth
- V = effective volume
- V_{grease} = grease storage volume
- V_{solids} = sludge storage volume

Separator size	Maximum flow l/s	Du mm	Du1 mm	Dy1 mm	H1 mm	H2 mm	H3 mm	h* mm	V l	V _{grease} l	V _{solids} l	Weight kg
NS2	2	1750	600	110	1300	1210	1660	2040	165	400	160	160
NS4	4	1750	600	110	1300	1210	1660	2040	165	400	160	160
NS7	7	2170	600	160	1730	1640	2100	4180	400	1000	250	250
NS10	10	2170	600	160	1730	1640	2100	4180	400	1000	250	250

* see installation depth h at EuroHUK 600 table, page 10

SET-2000 grease alarm as a standard

A suitable cover set is the floating cast iron cover and frame set D600. We recommend a gas-tight cover and frame set.

Separator size	Maximum flow l/s	Du mm	Du1 mm	Dy1 mm	H1 mm	H2 mm	H3 mm	h* min.	h* max.	V l	V _{grease} l	V _{solids} l	Weight kg
NS2 S	2	1750	600	110	1340	1250	2250	500	1000	2040	165	400	175
NS4 S	4	1750	600	110	1340	1250	2250	500	1000	2040	165	400	175
NS7 S	7	2170	600	160	1750	1660	2750	550	1050	4180	400	1000	265
NS10 S	10	2170	600	160	1750	1660	2750	550	1050	4180	400	1000	265

*Maintenance shaft can be cut according to the desired installation depth

SET-2000 grease alarm as a standard

A suitable cover set is the floating cast iron cover and frame set D600. We recommend a gas-tight cover and frame set.

EuroREK® NS15...35 Grease Separators

EuroREK NS15...35 grease separators meet official regulations as well as EN standards. Greasy wastewater is directed into a separate in-built section for separating solids and sludge, where the particles heavier than water are collected on the bottom of the tank. From the sludge separation section the water flows into the grease separation section, where grease, lighter than water, floats on the water surface. Both sections are equipped with a separate maintenance shaft, what makes emptying easier.

The separators for underground installation are manufactured of reinforced plastic with a computer controlled winding machine. The separators are corrosion proof, and their strength properties are superior e.g. to those laminated by hand.

Separators exceeding the nominal size NS35 are dimensioned and manufactured according to the specific needs.

EuroHUK 600 maintenance shafts and SET-2000 grease alarm

EuroREK NS15...35 grease separators are equipped with two watertight EuroHUK 600 maintenance shafts. A suitable cover set is the floating cast iron cover and frame set. When installed in inner yards or other areas covered from wind, a gas-tight cover and frame set is recommended.

EuroREK NS15...35 separators are equipped with SET-2000 grease alarm, which indicates an alarm when the grease storage space reaches its maximum, or when a backwater is caused, e.g. by a sewer blockage. Available as an accessory, there is the SandSET-1000 sludge alarm to monitor the sludge storage space. (Further information p. 10-11).

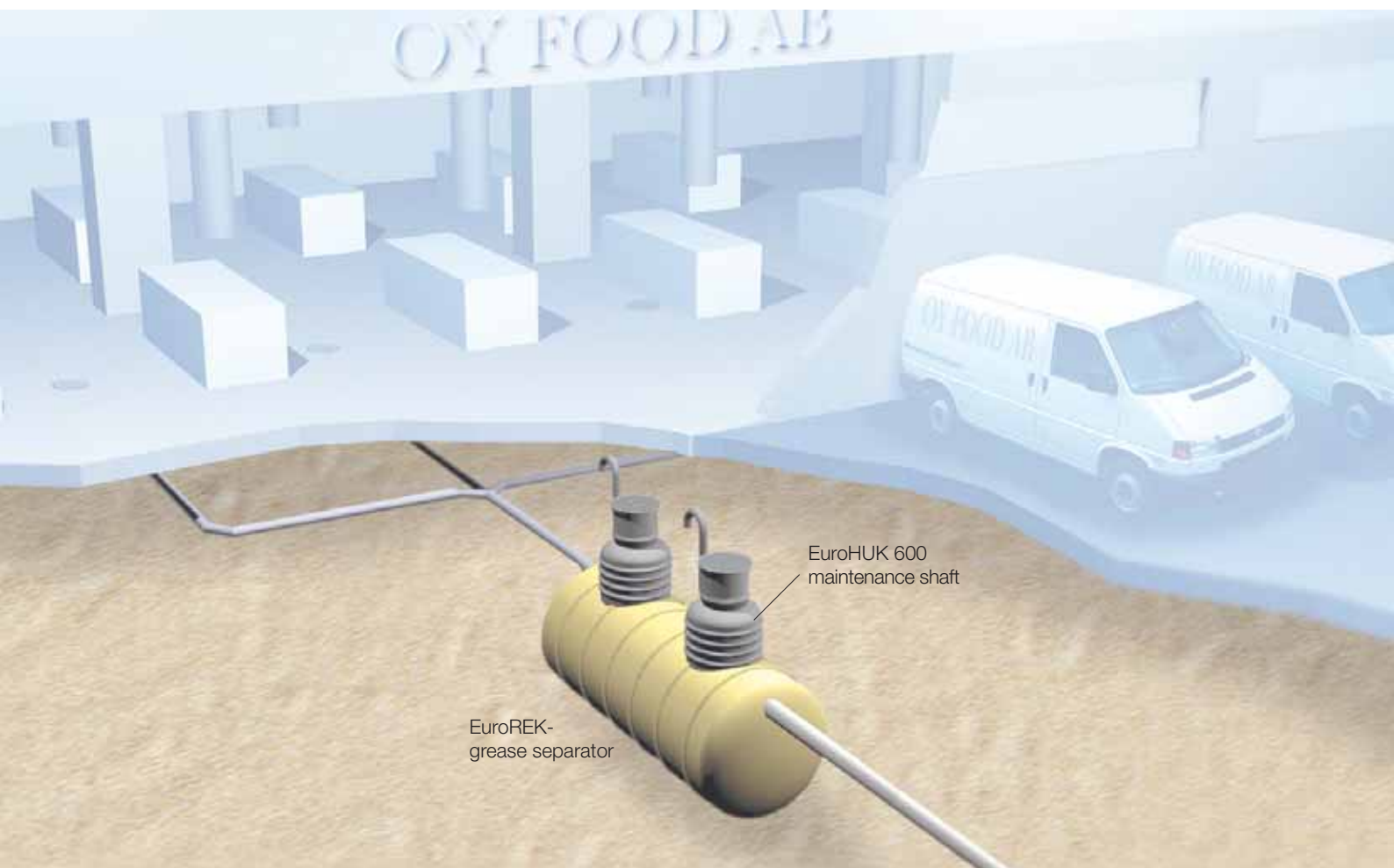
Advantages

- Meets the requirements of the grease separator standard EN 1825
- Alarm system as a standard
- Solids separated in a separate section
- Watertight maintenance shaft
- Durable and long life span
- Easy and quick to install

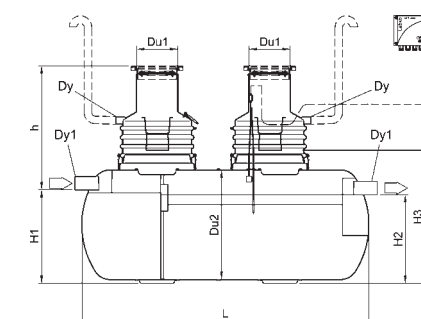
Applications

EuroREK NS15...35 grease separators can be used e.g. in:

- Industrial kitchens
- Catering activities
- Food industry
- Fish processing
- Abattoirs



EuroREK grease separators



Legend, see p. 5.

Separator size	Maximum flow l/s	Du1 mm	Du2 mm	Dy mm	Dy1 mm	H1 mm	H2 mm	H3 mm	L mm	h* mm	V l	Vgrease l	Vsolids l	Weight kg
NS15	15	600/600	1600	110	200	1370	1300	1950	4200	5380	830	1650	455	
NS20	20	600/600	1600	110	200	1370	1300	1950	6500	7170	1000	2160	660	
NS25	25	600/600	2200	110	200	1970	1900	2550	5100	13820	1400	2630	880	
NS35	35	600/600	2200	110	315	1820	1750	2550	6400	15450	1500	3520	1120	

* see installation depth h at EuroHUK 600 table, page 10.

SET-2000 grease alarm as a standard
Larger separator sizes according to specific case

EuroREK® Slim NS2 Grease Separator System



EuroREK Slim NS2 system includes separate sludge and grease separators. Greasy wastewater is first directed into a sludge trap, which collects solids and other particles heavier than water on the bottom of the separator tank. From the sludge trap the water flows into the grease separator, where grease, lighter than water, floats on the water surface. EuroREK Slim NS2 is made of strong and durable PE plastic.

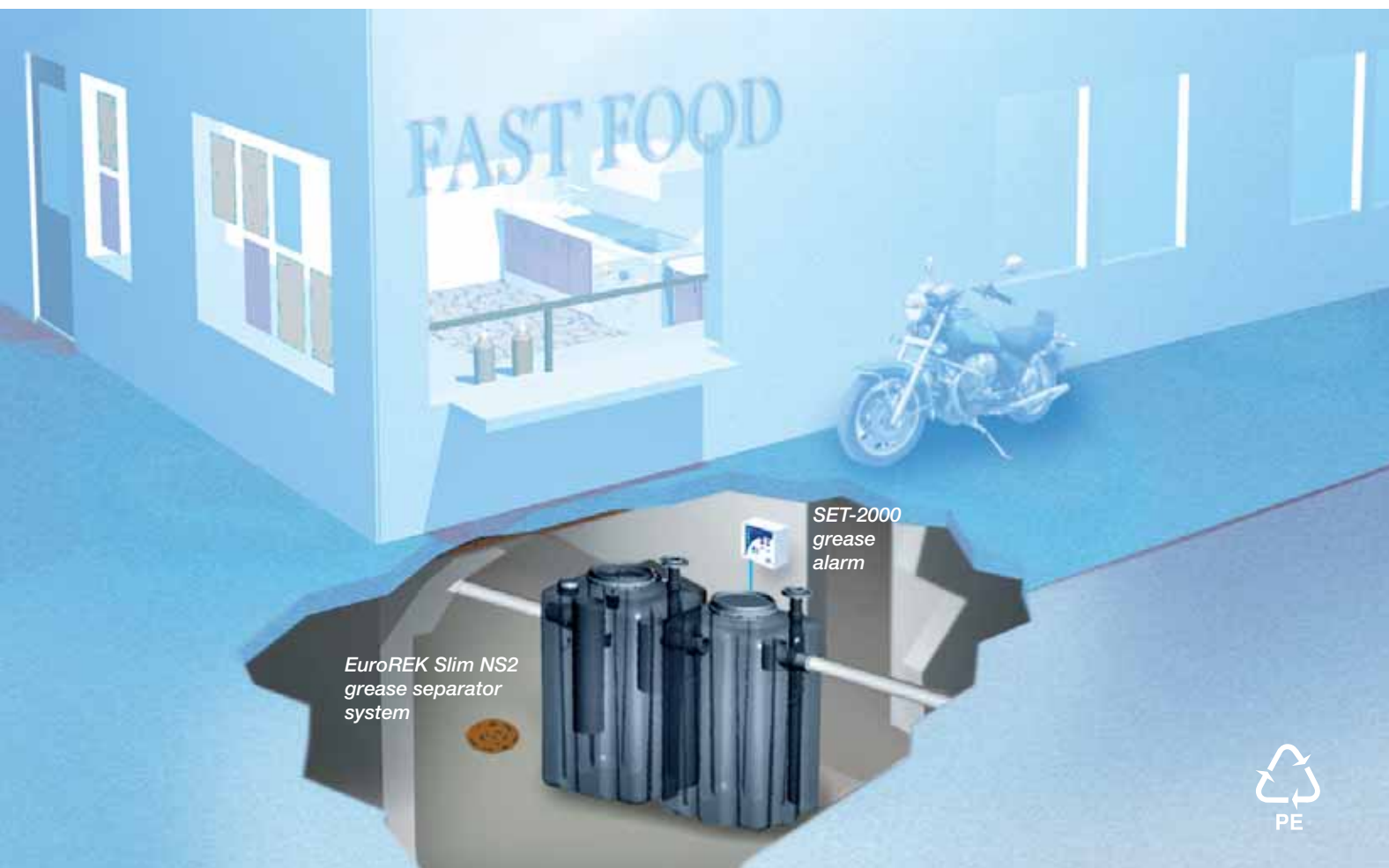
EuroREK Slim separators are designed for indoor installation, to be installed on the floor. They are suitable for both new establishments and those being renovated. The separators are light to carry, and their narrow shape makes it easy to move them e.g. through a cellar door.

All EuroREK slim models come with threaded plastic lids, which are easily opened, and through which the maintenance and emptying procedures are easily carried out.

EuroREK Slim separators can also be emptied outside the building by using a special connection box, IMUBOX, available as an accessory, and extra drainage pipes. (For further information on IMUBOX connection box, see p.10).

SET-2000 grease alarm

EuroREK Slim separator models are equipped with SET-2000 grease alarm, which monitors the separator performance. (Further information on p. 11).



Advantages

- Meets the requirements of the grease separator standard EN 1825
- Alarm system as a standard
- Durable and long life span
- Small size allows light and easy transportation and installation

Applications

- EuroREK Slim grease separators can be used e.g. in:
- Restaurants and bars
 - Grills
 - Fast-food stands
 - Grocery stores

Determining nominal size of grease separator

Determining nominal size of grease separator Standard EN1825 divides grease separators into their nominal sizes (NS). The nominal size of the grease separator is determined according to the nature and quantity of wastewater to be treated on the site. Calculation takes into account the maximum flow rate of wastewater, the temperature of the wastewater, the density of grease to be separated, and the cleansing and rinsing agents

Nominal size of the grease separator is determined from the equation 1:

$$(1) \quad NS = Q_s \cdot f_t \cdot f_d \cdot f_r$$

- NS** = nominal size of the separator
- Q_s** = maximum flow rate of wastewater (dm³/s)
- f_t** = impediment factor for the temperature of influent
- f_d** = density factor for grease
- f_r** = impediment factor for the influence of cleansing and rinsing agents

After calculation, choose nearest larger nominal size of the separator. The sludge trap volume of the grease separator (I) should be at least 100 * NS. In abattoirs and other establishments with high sludge quantities, the sludge trap volume should be 200 * NS.

Determination of maximum flow rate

The maximum flow rate of wastewater Q_s shall be determined by:

- Measurement (e.g. renovation sites)
- Calculation based upon equipment, where maximum flow rate equals to the actual flow rate from the water outlets and the equipment, or
- Calculation based upon the type of establishment, where the maximum flow rate is calculated from the equation 2:

$$(2) \quad Q_s = V \cdot F / (3600 \cdot t)$$

- Q_s** = maximum flow rate of wastewater (dm³/s)
- V** = average wastewater volume per day (dm³)
- F** = peak flow coefficient from table 1
- t** = average duration of operation each day

The average wastewater volume per day (V) can be determined by measurement of the water consumption. Where this data is not available, the wastewater volume can be determined by calculation:

- Using the number of the meals produced in the kitchen per day and the data from table 1, volume of wastewater used/meal (V_m), or
- In abattoirs and meat processing plants, using the quantity of meat products per day and wastewater used/meat product kilogram (V_p). For further information, consult our web pages.

For a more detailed presentation on determination of the nominal size, consult our web pages.

Table 1. Wastewater volume per meal (V_m) and peak flow coefficient (F) in different kitchens.

Kitchen	wastewater volume/meal, V _m dm ³ /qty	Peak flow coefficient F
Hotel		
Restaurant		
Hospital		
Large catering establishment		
Factory and office canteens		

Figure 1 presents an example of calculation of the grease separator nominal flow, based upon type of establishment. Compared to the result of the calculation, nearest larger nominal size is chosen.

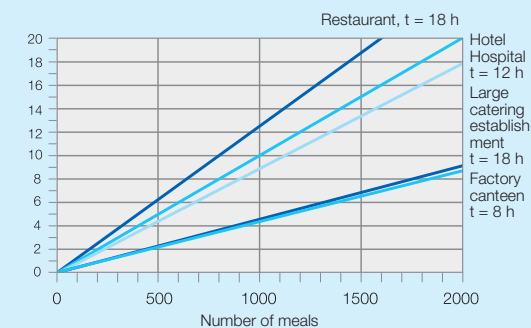


Figure 1. An example of the nominal flow rate of a kitchen's grease separator, calculation based on the type of establishment. Operating time is used as parameter.

Detergent and rinsing agent factor f_r = 1,3, excluding hospital, where f_r = 1,5. Temperature and density factors f_t = f_d = 1.

Example

Determining the nominal size of a grease separator in a hotel kitchen

Basic data: Operating time of the kitchen 20h/d, meals produced 600/d, detergents used ⇒ f_r=1,3 Wastewater temperature < 60° C ⇒ f_t = 1 Wastewater from kitchen ⇒ f_d = 1

Grease separator

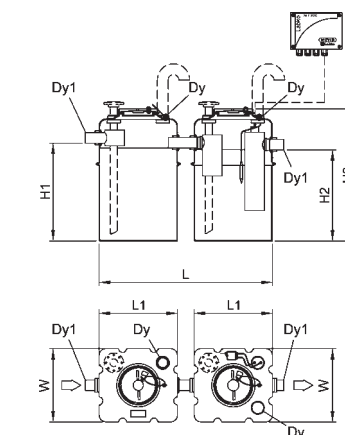
Maximum flow rate calculated from the equation 2:

$$Q_s = M \cdot V_m \cdot f_r / (3600 \cdot t) \Rightarrow Q_s = 600 \cdot 100 \cdot 5 / (3600 \cdot 20) = 4,2 \text{ dm}^3/\text{s}$$

Nominal size is calculated from the equation 1: NS = 4,2 * 1 * 1 * 1,3 = 5,46

Nearest larger nominal size NS7 is chosen.

EuroREK Slim NS2 grease separator system



Legend on p. 5.

Separator size	Maximum flow l/s	Dy mm	Dy1 mm	H1 mm	H2 mm	H3 mm	L mm	L1 mm	W mm	V _{grease} l	V _{solids} l	Weight kg	
NS2	2	110	110	1000	930	1370	min. 1800	800	750	480	80	570	58+62

SET-2000 grease alarm as a standard

EuroHUK® 600 Maintenance Shafts

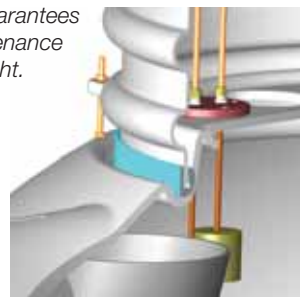
EuroHUK 600 maintenance shafts provide a watertight solution for servicing the grease separators in compliance with the EN 1825 standard. The EuroHUK maintenance shaft is selected according to the installation depth of the separator. The collar of the maintenance shaft can be shortened to adjust the installation depth precisely according to each specific need.



Due to the light structure, the installation of the maintenance shaft is fast. The maintenance shafts are spacious, and except for the lowest model, all the shafts have steps inside to ease maintenance. A special-shaped gasket, which is delivered with the maintenance shaft, guarantees that the separator and the shaft are compatible, and that their junction is tight.

Floating cast iron cover and frame sets are available as accessories for the EuroHUK 600 maintenance shafts. In addition, gas-tight cover and frame sets are available, with locked, gas-tight inner cover.

A special-shaped gasket guarantees the maintenance shaft is tight.



IMUBOX Connection Box

IMUBOX, installed outside the establishment, allows fast coupling for the truck emptying a EuroREK separator installed inside the building. In this case, separate suction pipes, available as accessory, are installed on the separators.

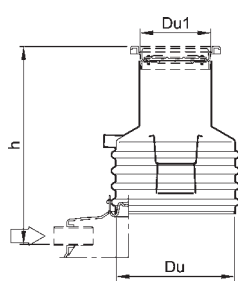
IMUBOX connection box includes a ball-shaped acid-proof jaw connector (ø 88,9), and a hot galvanized cover with gasket (SFS 4428). Double IMUBOX, with two jaw connectors, allows the emptying of both sludge and grease storage space.

IMUBOX is made of stainless steel. In addition to the locking cover, IMUBOX has a mounting flange, which provides smooth installation.



Double IMUBOX-connection box

EuroHUK 600 maintenance shaft



Legend on p. 5.

EuroHUK 600 maintenance shaft	Du	Du1	h	Weight
	mm	mm	mm	kg
9-13	1000	600	900-1300	22
13-17	1000	600	1300-1700	38
17-21	1000	600	1700-2100	56
21-25	1000	600	2100-2500	80

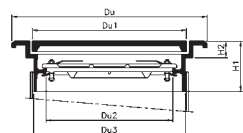
Legend for cover and frame sets
 Du = outer diameter of frame
 Du1 = outer diameter of cover
 Du2 = clear opening of frame
 Du3 = outer diameter of lower part of frame
 H1/H2 = height

Frame with inner cover	Du	Du1	Du2	Du3	H1	H2	Frame weight
	mm	mm	mm	mm	mm	mm	kg
	760	600	495	590	200	65	60

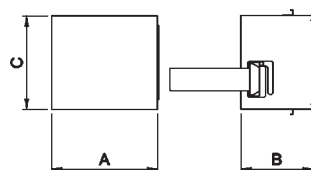
Cast iron cover D600	Weight (kg)
A15 (1,5 tn)	30
C250 (25 tn)	55
D400 (40 tn)	67

Gas tight inner cover	A (width)	B (depth)	C (height)
Connection box IMUBOX	380	290	240
Double IMUBOX	420	290	380

Gas tight cover



IMUBOX connection box



Alarm Devices and Remote Monitoring

Alarm systems monitoring the functioning of the separators

The separators of Wavin-Labko are equipped with SET-2000 alarm units. Thickness of the grease layer is automatically and accurately monitored, and an alarm is given if the grease storage space is full, or if the water surface level rises e.g. due to a blockage. Grease alarm probes can be easily lifted up from the separator for cleaning.

SandSET-1000 is available as an accessory. It indicates an alarm when the sludge storage space of the grease separator should be emptied.

The alarm can be transmitted directly to the user's house automation system or with the Labcom communication unit to a GSM phone. Furthermore, the alarm can be transmitted via LabkoNet server to those who find the information is essential. When the separators are remotely monitored, timely emptying of the grease and sludge storage space is made possible, and thus the environmental risks are minimized and costs are lowered.



SandSET-1000 sludge alarm device
 Indicates an alarm when the sludge storage space is full. The timely desludging reduces unnecessary emptying and guarantees the smooth operation of the grease separator.



SET-2000 grease alarm
 Gives an alarm if the grease storage space is full, or if the water surface level rises, e.g. due to a possible blockage.

Labcom 200 communication unit
 A data transfer unit designed for transmitting measurement and alarm data.

LabkoNet server
 Collects the alarms and adapts their information to be sent further either as a short message or as an e-mail.

LabkoNet service
 LabkoNet server collects and logs data in the Internet and it is applicable with different user names and passwords to meet different needs. Among other things, the service provides reports as printouts.

E-mail
 LabkoNet can also send the alarm as an e-mail message.

Look at live demo

www.labkonet.com

Data Transfer and LabkoNet®

Labcom 200 communication unit transfers the alarm directly to the recipient

Labcom 200 sends alarms and measurement data as GSM short messages either directly to the user's own mobile phone or via LabkoNet system. The LabkoNet system makes sure the information is delivered to the user, for the server also controls the functioning of the communication unit.

LabkoNet system is an easy and reliable way of transferring and controlling the alarm data

Introducing and using the LabkoNet system is easy; no separate software is needed. Only an Internet connection, Labcom 200 communication unit, gauges and alarm devices are needed. In addition to the separator alarms, e.g. storage tank level gauging can be connected with the LabkoNet.

For further information on LabkoNet and its possibilities, visit www.labkonet.com

GSM short messages

The alarm can be transmitted to the user's GSM either directly with Labcom 200 communication unit or via LabkoNet server.