



## Grease seperators

In freestanding installation or for installation underground



Made in Germany

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## Fields of application of Grease separators

Grease separator systems have to be installed in all businesses in which greasy sewage water occurs and is drained. These include, above all, restaurants, hotels, large-scale catering kitchens, butcher shops and meat-processing businesses. Grease separator systems are required for the protection of the sewerage system and the relief of sewage treatment plants. The “polluter pays principle” requires that animal and vegetable oils and fats are directly separated, retained and properly disposed of at the place where they occur. That is why particular discharge conditions (threshold values) have to be complied with when discharging waste water. In the course of rising environmental awareness, the significance and recycling of separated greases and settling sediments have been considerably increasing for a long time.



## Grease separators in freestanding installation

### Reasons

- Old building renovations
- Changes of use of existing buildings
- No open spaces for underground installation due to high density of buildings
- Installation within close proximity of the place where wastewater occurs (DIN EN 1825-2)

### Installation space

- Separated, dry and frost-free
- Possibly equipped with floor drainage or pump sump
- To be equipped with aeration and ventilation
- Level installation surface
- Free gradient for waste water from the kitchen to the separator inflow of at least 1:50.

Remark: Otherwise waste water would have to be lifted (pumped). During pumping, grease and waste water are intensively mixed and emulsions can occur. That way, separation is made more difficult and threshold value violations are possible.

Note: In case of non-achievement of the necessary gradient to the separator inflow, the disadvantage of intensive mixing of grease and waste water can be virtually eliminated by using a special lifting unit with a displacement pump. Other lifting units must not be upstream to grease separator systems, because otherwise it can come to swirls and the separation process can be substantially affected.

### Back water

- If a grease separator system is installed below the locally specified flood level, a sewage lifting unit must be installed downstream according to DIN EN 12056. In commercial businesses, it must be executed with a standby pump or a double system.





# Type overview

## Grease separators in freestanding installation

- Grease separators made of polyethylene for installation in frost-free places
- Compact construction in oval shape
- According to DIN EN 1825 without separation wall between sludge collector and separator chamber
- Connections for inlet and outlet, suitable for PE-HD pipe
- Odour-free inspection covers
- Round inspection glass, sampling equipment, filling device and extraction system optionally available

Type	NS 2
Item number	14319
Inlet and outlet	DN 100
Weight	60 kg
Sludge collector	214 l
Grease reservoir quantity	181 l



Type	NS 4
Item number	14321
Inlet and outlet	DN 100
Weight	70 kg
Sludge collector	360 l
Grease reservoir quantity	181 l



Type	NS 7	NS 10
Item number	14326	14328
Inlet and outlet	DN 150	DN 150
Weight	260 kg	295 kg
Sludge collector	714 l	1001 l
Grease reservoir quantity	409 l	409 l



### Why are the grease separators manufactured from polyethylene (PE)?

- low thermal conductivity
- easy handling
- disposal-friendly, wax-like surface
- easy post-processing on site
- high resistance against chemical influences
- no emergence of toxic gases during welding
- electrically insulating

# Grease separator with flushing and disposal equipment



Our grease separators can be supplied complete with flushing and disposal facility. It includes a pump with macerators of type ZFS, the spray bar in the grease separator chamber, the complete piping and the control unit for manual operation of the pump (incl. dry-running protection).

During the disposal process, the grease separator is at first partly emptied. The grease layer breaks down and is mixed by the pump and spray bar in the grease separator chamber. The occurred emulsion is subsequently pumped off and the grease separator chamber is filled with about 1/3 fresh water. The mixing and pumping-off process is carried out again repeated several times, if required. After the disposal or cleaning of the grease separator chamber has taken place, the grease separator is filled with fresh water and operational again.

# Lifting units for use behind grease separators

## Model range SWH-F 500\*:

- Grease-resistant tank and pump technology made of plastic (no corrosion)
- Double sealing by a mechanical seal and shaft seal
- Maintenance-friendly due to external check valve
- Temporarily up to 90°C media temperature

P <sub>2</sub>	130 to 430 W
Q <sub>max</sub>	11.0 m <sup>3</sup> /h
H <sub>max</sub>	11.0 m
Pressure outlet	GA 1 1/4"
Grain size	10 to 30 mm
Weight	21.5 to 33 kg
Inlet connections	3 x DN 100, G1 1/2"



\*according to DIN 4040-100, only version with 30 mm free passage can be used behind grease separators



## Mobile small grease separators

Special grease separators are used for applications where equipment cannot be installed fixed, such as mobile food stalls or dishwashers. It may be connected only one commercial dishwasher with a minimum washing time of 1.5 minutes at a changing time of 1/2 minute. The rinse water consumption of the commercial dishwasher may be maximal 5 litres. Apart from the dishwasher connection, one equipment at the maximum is allowed for pre-washing the dishes (for short-term operation).

Drainage of the mobile grease separator must take place daily by means of skimming. The skimmed grease has to be collected and properly disposed of. Cleaning of the tank must be carried out once a week.

### Grease separator NS 0.5

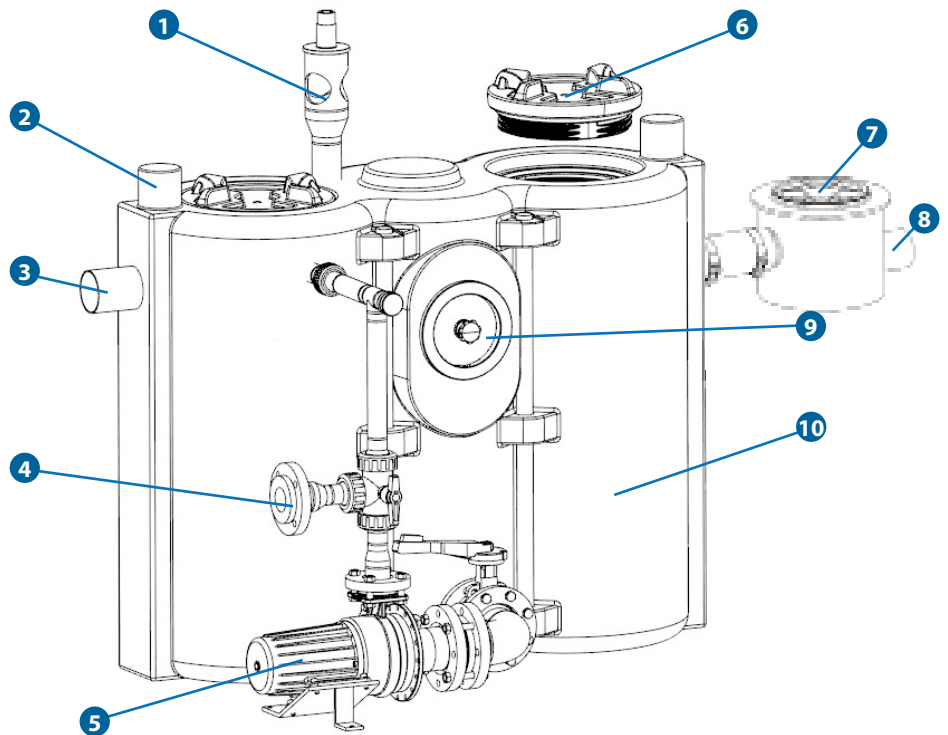
- Grease separators made of polyethylene for installation in frost-free places for mobile flushing equipment
- for mobile usage wherever fixed installation is not possible

Inlet and outlet	DN 50
Dimensions	390 x 350 x 391 mm
Weight	4 kg
Sludge collector	8 l
Total volume	24 l



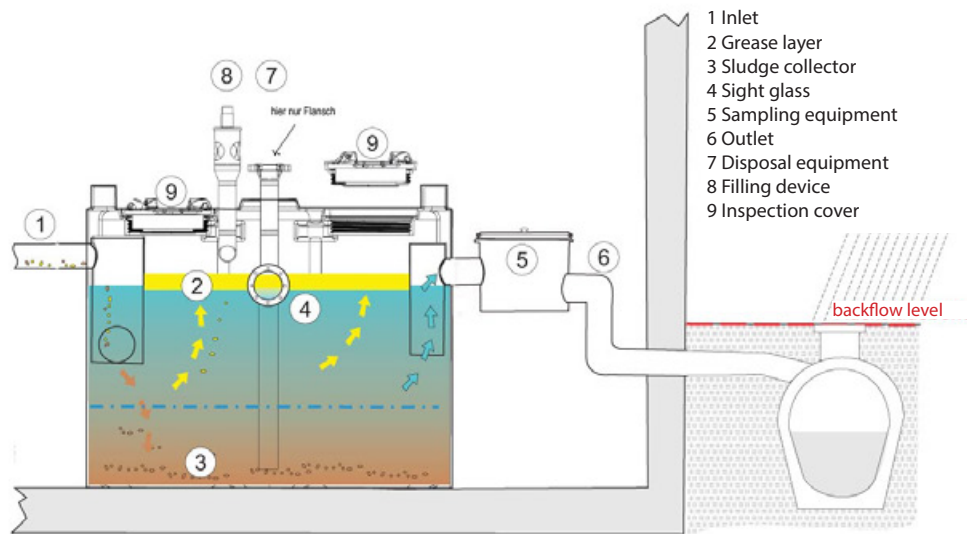
# Grease separator in detail

- 1 Filling device
- 2 Aeration and ventilation DN 100 compatible with PE-HD pipe
- 3 Inlet DN 100 compatible with PE-HD pipe
- 4 Disposal connection
- 5 Flushing and disposal pump Type ZFS 70 or ZFS 71
- 6 Inspection cover odour-proof made of PE
- 7 Sampling equipment DN 100 / DN 150
- 8 Outlet DN 100 compatible with PE-HD pipe
- 9 Sight glass with wiper
- 10 Tank made of corrosion-resistant PE





# Operating principle of grease separators



## General

Both grease separators for free-standing installation as well as for installation underground operate in principle according to the two-tier structure consisting of sludge collector (separation of heavy materials) and grease separator (rising lightweight materials), whereby waste water contents are separated exclusively by means of gravity. Here one talks about “directly separable materials”.

## Sludge collector

The sludge collector serves to store the separated settling sediments. These are normally food leftovers which decompose between the disposal intervals. According to DIN EN 1825, the sludge collector size is calculated from NS (nominal size) x 100 l.

## Grease separator chamber

The actual separation of oils and greases from the waste water takes place in the grease separator chamber. That is due to their low density towards water, oils and greases float on top of it. Because of this, a steadily growing grease layer occurs which is held back between the inlet and outlet set. The size of the grease collection chamber is defined by the formula: NS x 40 l. According to data sheet ATV-M 167, the grease layer thickness in the separator shall be maximal 160 mm.

## Disposal

Excerpt from DIN EN 1825-2 / Item 8:

- Separator systems for greases should regularly maintained, drained and cleaned. It is pointed out to the necessity of complying with national or local provisions for waste disposal.
- Intervals for maintenance, drainage and cleaning have to be specified taking into account the storage capacity of grease separators and sludge collector as well as the operating experiences.
- Unless otherwise required, sludge collectors and separators should be drained, cleaned and refilled with water once per month, preferably biweekly.



Due to their construction, gravity grease separator systems can only hold back the freely separable oils and greases. However, in practice, a part of the grease is not separable. Here one talks about emulsions which occur wherever cleaning agents are used. The use of biological agents (bacteria, enzymes) for so-called self-cleaning is not described in DIN EN 1825-2.



## Grease separator in the ground

If it is already certain that a grease separator has to be installed when planning a whole object, installation in the ground should be preferred. As a rule, disposal is easier and more uncomplicated and can be possibly carried out faster. Due to installation in the open, bad odour is normally more unproblematic for the environment. However, there are the following preconditions for installation underground:

- For example between kitchen and grease separator, there should be short distances, that is short wastewater lines according to DIN EN 1825-2 ("arrangement within close proximity of the place where wastewater occurs"). According to experiences made, line lengths between 10 and 15 m are uncritical. With this line length, wastewater cooling, grease deposits on the pipework and blockages occurring through this can be mostly prevented.
- The sewage pipes must be installed frost-proof and, if necessary, be equipped with trace heaters in case of longer line lengths. (Also see DIN EN 1825-2, Appendix D)
- Sewage pipes have to be installed in a sufficient gradient of at least 2 % according to DIN EN 1825.

### in green areas

- odour-proof covers (cover of class A 15 is sufficient)
- a strong place for the disposal vehicle is recommended

### Driveways

- Installation should be outside the area which is frequently accessed
- odour-proof, bolted covers of load class B 125 are mostly sufficient
- installation in the direct road acc. to class D 400 has to be provided odour-free and bolted

### Inner courtyards

- basically possible. However, due to potentially bad odours, these are critical installation points during operation and disposal.  
Note: Due to opening the shaft cover, unpleasant odour can escape freely during disposal. This is even intensified due to whirling up during the suction process

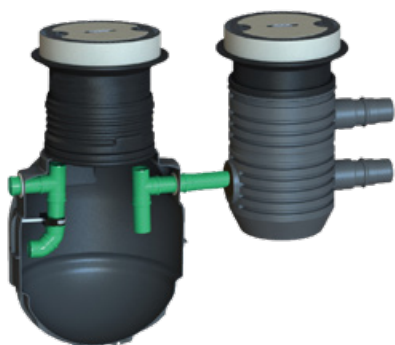
### Planning proposal:

- Equipment with so-called direct suction
- Suction line made of PE-HD pressure pipe at least PN 6 - DN 65
- The cover is not opened until rinsing via the disposal chute
- Installing suction line in the ground
- in case of disposal with direct suction, the cover can be remain closed
- unpleasant odour is partly sucked when emptying

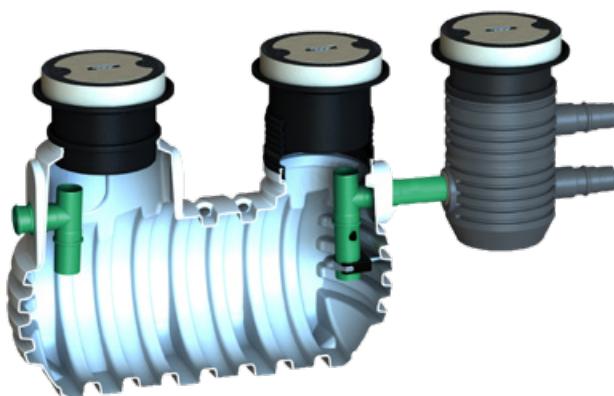
## Type overview

### Grease separators for installation underground

- Seamless plastic container made from one piece
- All mounting parts made of plastic
- Low maintenance costs due to internal surfaces which can be easily cleaned
- According to DIN EN 1825 without separation wall between sludge collector and separator chamber
- Connections for inlet and outlet, suitable for PE-HD pipe
- Accessible by passenger car and / or truck
- Sampling shaft and extraction system optionally available



Type (NS, [l/s])	NS 2 - 200 -2	NS 4 -500
Item number	21761	21762
Inlet and outlet	DN 110	DN 110
Weight	35 kg	67 kg
Sludge collector	200 l	500 l
Grease reservoir quantity	200 l	300 l



Type (NS, [l/s])	NS 7 -700	NS 10 - 1500	NS 15 -1500
Item number	21763	21764	21765
Inlet and outlet	DN 160	DN 200	DN 200
Weight	185 kg	240 kg	240 kg
Sludge collector	700 l	1500 l	1500 l
Grease reservoir quantity	350 l	600 l	600 l

\*Figures with external sampling shaft (see accessories)



## Dimensioning and design

Basically, there are 2 type of calculating the nominal size (NS) of grease separators. Grease separators are measured either by kitchen appliances (cooking pot, kitchen sink, dishwashers, tilting frying pans et cetera) and discharge valves or the number of food portions.

Of course, we are pleased to consult you personally as well. Our competent and kind technical consultants are pleased to be available for answering on the phone all your questions around grease separator technology. We offer you solutions for **customised systems** and specific requirements.

Rule of thumb for calculating the nominal size:

Nominal size	Food portions per day
NS 2	50 to 200
NS 4	200 to 400
NS 7	400 to 700
NS 10	700 to 1,000

\*The rule of thumb does not replace the dimensioning according to DIN-EN 1825-2



# Calculation of grease separator systems according to DIN EN 1825-2

## By kitchen appliances and outlet valves

m	Appliances	Number n	qi (l/s)	Sum (n x qi)	Simultaneity factor Zi (n)					Qs /l/s (n x qi) x Zi (m)
					1 pc	2 pcs	3 pcs	4 pcs	> 5 pcs	
1	Cooking pot outlet 25 mm		x 1.0		0.45	0.31	0.25	0.21	0.20	l/s
2	Cooking pot outlet 50 mm		x 2.0		0.45	0.31	0.25	0.21	0.20	l/s
3	Tilting cooking pot outlet 70 mm		x 1.0		0.45	0.31	0.25	0.21	0.20	l/s
4	Tilting cooking pot outlet 100 mm		x 3.0		0.45	0.31	0.25	0.21	0.20	l/s
5	Kitchen sink with odour closure 40 mm		x 0.8		0.45	0.31	0.25	0.21	0.20	l/s
6	Kitchen sink with odour closure 50 mm		x 1.5		0.45	0.31	0.25	0.21	0.20	l/s
7	Kitchen sink without odour closure 40 mm		x 2.5		0.45	0.31	0.25	0.21	0.20	l/s
8	Kitchen sink without odour closure 50 mm		x 4.0		0.45	0.31	0.25	0.21	0.20	l/s
9	Dishwasher		x 2.0		0.60	0.50	0.40	0.34	0.30	l/s
10	Tilting frying pan		x 1.0		0.45	0.31	0.25	0.21	0.20	l/s
11	Frying pan		x 0.1		0.45	0.31	0.25	0.21	0.20	l/s
12	High pressure / steam jet cleaning system		x 2.0		0.45	0.31	0.25	0.21	0.20	l/s
13	Peeling tool		x 1.5		0.45	0.31	0.25	0.21	0.20	l/s
14	Vegetable washing equipment Outlet valves Nominal diameter according to ISO 228-1		x 2.0		0.45	0.31	0.25	0.21	0.20	l/s
15	DN 15 R ½		x 0.5		0.45	0.31	0.25	0.21	0.20	l/s
16	DN 20 R ¾		x 1.0		0.45	0.31	0.25	0.21	0.20	l/s
17	DN 25 R 1		x 1.7		0.45	0.31	0.25	0.21	0.20	l/s

Sum Qs \_\_\_\_\_ l/s

## Difficulty factors

Density (fd)	up to 0.94 - fd = 1 / over 0.94 - fd = 1.5
Inlet temperature (ft)	up to 60° - ft = 1 / over 60° - ft = 1.3
Cleaning agent (fr)	no - fr = 1 / yes - fr = 1.3 / hospitals fr = 1.5

Nominal size (NS) = Qs x fd x ft x fr = \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ l/s

### Commercial kitchens, sizing provisions by food portions

Commercial Kitchen operations	M = Meals (quantity) monthly average of daily produced, warm food portions	VM = operational quantity of water per warm food portion	F = Peak load factor depending on operating conditions	t = daily operating hours in which the separator is applied with waste water	QS = max. waste water inflow
Hotel kitchen	_____ Meals / day	x 100 l =	x 5 (peak factor)	= $\frac{\text{_____ Litre}}{\text{_____ OH x 3,600 s}}$	= _____ l/s
Speciality restaurant	_____ Meals / day	x 50 l =	x 8.5 (peak factor)	= $\frac{\text{_____ Litre}}{\text{_____ OH x 3,600 s}}$	= _____ l/s
Works canteen / canteen	_____ Meals / day	x 5 l =	x 20 (peak factor)	= $\frac{\text{_____ Litre}}{\text{_____ OH x 3,600 s}}$	= _____ l/s
Hospital	_____ Meals / day	x 20 l =	x 13 (peak factor)	= $\frac{\text{_____ Litre}}{\text{_____ OH x 3,600 s}}$	= _____ l/s
Full time canteen kitchen	_____ Meals / day	x 10 l =	x 22 (peak factor)	= $\frac{\text{_____ Litre}}{\text{_____ OH x 3,600 s}}$	= _____ l/s

### Difficulty factors

Density (fd)	up to 0.94 - fd = 1 / over 0.94 - fd = 1.5
Inlet temperature (ft)	up to 60° - ft = 1 / over 60° - ft = 1.3
Cleaning agent (fr)	no - fr = 1 / yes - fr = 1.3 / hospitals fr = 1.5

**Nominal size (NS) = Qs x fd x ft x fr = \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_ x \_\_\_\_\_ = \_\_\_\_\_ l/s**



# Accessories

Designation	Item number	Figure
<b>Accessories for grease separators in freestanding installation</b>		
Sampling equipment DN 100 (up to NS 4)	16899	
Sampling equipment DN 150 (from NS 7)	14334	
Sight glass	16898	
Extraction system DN 65	16900	
Filling device G1 (up to NS 4)	16901	
Filling device G1 ½ (from NS 7)	14314	
Flushing and disposal equipment	20384	
Flushing and disposal pump	20369	
Control system for flushing and disposal pump	22207	
Grease layer thickness measuring device	17365	
<b>Accessories for grease separator for installation underground</b>		
Dome assembly for passenger vehicle for grease separator	21766	
Dome assembly for truck for grease separator	21767	
Dome assembly for passenger vehicle for sampling shaft	22015	
Dome assembly for truck for sampling shaft	22016	
Sampling shaft DN 110	21768	
Sampling shaft DN 160	21774	
Sampling shaft DN 200	21775	
Intermediate piece 300 with NBR profile seal	22023	
Intermediate piece 500 with NBR profile seal, only for NS2 and NS4	22024	
Extraction system DN 65 NS 2-200, NS 4-500	22003	
Extraction system DN 65 NS 7-700, NS 10-1500, NS 15-1500	22004	
Grease layer thickness measuring device	22211	



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