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Services	Description	Art.-no.
1. On-site advice by a technical consultant	<ul style="list-style-type: none"> <li>■ Appointments arranged with planning engineers, building company and owner</li> <li>■ Technical advice in dimensioning and selecting separator systems, planning advice</li> <li>■ Provision of planning documents and aids</li> </ul>	
2. Dimensioning and selection of separator systems	<ul style="list-style-type: none"> <li>■ Manual calculation of the appropriate nominal size (NS) with the aid of the TECE dimensioning questionnaire (grease separators, starch separators, light liquid separators)</li> <li>■ Automatic calculation of the appropriate nominal size (NS) with the aid of the TECE calculation software (grease separator systems)</li> <li>■ Assistance in selecting the optimum system type, design, material option and design form for the individual situation and customer requirements</li> </ul>	
3. Putting into operation and initial instruction	<ul style="list-style-type: none"> <li>■ Putting into operation</li> <li>■ Check of proper installation, plumbing connections, electrical installation and electrical switching functions, check of functioning</li> <li>■ Handover of operating instructions, operating log and instruction</li> </ul>	329 00 64
4. Complete installation on site, putting into operation and initial instruction	<ul style="list-style-type: none"> <li>■ Complete installation of multi-component separator systems at designated location</li> <li>■ Putting into operation of a fully functioning separator system (check of functioning, filling with water, check of water-tightness etc.)</li> <li>■ Handover of operating instructions, operating log and instruction</li> </ul>	329 00 65
5. On-site welding of the separator system	<ul style="list-style-type: none"> <li>■ Delivery of individual system components</li> <li>■ On-site welding of the separator system</li> <li>■ Putting into operation of a fully functioning separator system (check of functioning, filling with water, check of water-tightness etc.)</li> </ul>	
6. Service and maintenance	<p><i>The grease separator system is to be serviced <b>yearly</b>, in accordance with manufacturer' specifications, by <b>competent personnel</b><sup>1</sup>.</i></p> <ul style="list-style-type: none"> <li>■ Grease separator system is to be emptied completely and cleaned, condition and functioning to be inspected</li> </ul>	
7. General inspection	<p><i>Prior to being put into operation, and in regular five-year intervals thereafter, grease separator systems are to be inspected by <b>qualified personnel</b><sup>2</sup> to ensure that they are in proper operating condition and being operated properly.</i></p> <ul style="list-style-type: none"> <li>■ Grease separator system is to be emptied completely and cleaned, condition and functioning to be inspected by qualified personnel</li> </ul>	

**Definitions:** 1) **Competent personnel:** Persons employed by the operator or authorised third parties are to be regarded as «competent» who, as a result of training, knowledge or experience gained in practice, are able to ensure that they are able to carry out in a competent manner evaluations or inspections in the particular area of speciality. TECE also offers training in these skills; refer to Training / seminars TECE.

2) **Qualified personnel:** Personnel employed by organizations that are independent of the operator as well as technical experts or other institutions are termed «qualified» if they possess the necessary expert knowledge for operating, maintaining and inspecting separator systems.



DIN EN 1825-2, par. 4  
Conditions for use

«Separator systems for greases must always be used when greases and oils originating from plants or animals must be retained from sewage. This applies to commercial and industrial operations, e.g. to commercial kitchens, ...»

**Operations for which installation is mandatory (acc. to DIN EN 1825-2, par. 4)**



Commercial and industrial operations that discharge wastewater to the public sewage system must implement suitable pre-treatment systems to ensure that materials and liquids causing environmentally harmful or bothersome vapours or odours do not corrode building materials and drainage systems or disrupt operations by entering plumbing. This means that grease separator systems complying with DIN EN 1825 must as a rule be installed in any commercial operation where wastewater containing grease collects. This is to ensure that greases and oils originating from animals or plants are kept out of wastewater.

- Commercial kitchens and restaurant kitchens, e.g. in hotels, restaurants, motorway restaurants, cafeterias, canteens etc.
- Grills, broiling and frying kitchens
- Food distribution points where dishes are returned
- Butcher shops with or without slaughtering facilities
- Meat and sausage plants with or without slaughtering facilities
- Slaughterhouses
- Poultry slaughterhouses
- Animal carcass disposal plants
- Bone and glue factories
- Soap and stearin factories
- Intestine preparation plants
- Oil mills
- Edible oil refineries
- Margarine factories
- Tinned food factories
- Pre-cooked foods manufacturers
- Manufacturers of chips and crisps
- Peanut roasting plants

**Operations subject to special requirements (acc. to DIN EN 1825-2, par. 4) – limitations of use**

Fish processing plants	In systems where the incoming wastewater contains suspended matter that rots quickly, no sludge trap is to be connected upstream from the grease separator. Yet when a grease separator is used in such cases, a strainer basket or strainer system must be connected in front of it in order to hold back bulky materials. All retained solids should be removed regularly, and the grease separator should be emptied and rinsed thoroughly with fresh water during downtime so as to prevent organic decay.
Dairies, cheese factories, fish processing plants, catering businesses with only dishwashing, kitchen waste processing plants	Only under certain conditions can wastewater with a large share of non-separable fats or oils (i.e. emulsified) be effectively treated in grease separator systems (based on the gravity principle). Additional (more extensive) wastewater treatment may be required.
Meat processing plants, slaughterhouses and meat products factories with slaughtering as well as other operations with a large amount of sludge	A dual sludge trap must be installed in operations where a large amount of sludge results.

### Why must grease separator systems be employed?



DIN 1986-100, par. 6.2.2.  
Separator systems for greases

«For operations in which wastewater containing grease occurs, separator systems for greases must be dimensioned, installed and maintained according to DIN EN 1825 and DIN 4040-100.»

Municipal sewage  
drainage regulation  
(example)

«Materials which disrupt, hinder or impair operation of the drainage system ... may not be drained into or fed into the public sewage drainage system, ... This applies in particular to ... wastewater from industrial or commercial operations ... containing floating greases or oils ...»

### Oils and greases impair the functioning of drainage systems



Grease deposits in piping

According to a study carried out by the German Environmental Foundation (Deutsche Bundesstiftung für Umwelt, DBU, Osnabrück), the proportional amount of greases in wastewater, i.e. wastewater grease content, has continued to increase since 1992. Greases and oils form deposits on sewage pipes, lifting and pumping stations, where they can cause serious problems and damage as a result of blocked pipes and depositing of aggressive fatty acids.

#### Greases and oils in wastewater are often the cause of serious water damage, unwanted downtime and costly repairs!

##### The reasons:

- The greases and oils originating from plants and animals that are contained in wastewater deposit on the cold walls of piping. As grease deposits, it forms an incrustation that reduces the cross-sectional diameter of piping, eventually leading to pipe blockage.
- The longer greases and oils remain deposited in drainage systems, the greater the likelihood of oxidation reactions as well as biochemical processes that break down fatty acids. This may lead on the one hand to very unpleasant and bothersome odours, while, beyond this, materials used in the drainage system that are not resistant to fatty acids will be corroded by these highly aggressive substances.



Grease deposits in lifting and pumping stations

### Oils and greases reduce the effectiveness of sewage treatment plants



Many sewage treatment plants are increasingly hindered in their effectiveness by the formation of bulking and floating sludge or foam. Formation is favoured directly or indirectly by lipophilic substances as these are converted to fatty acids.

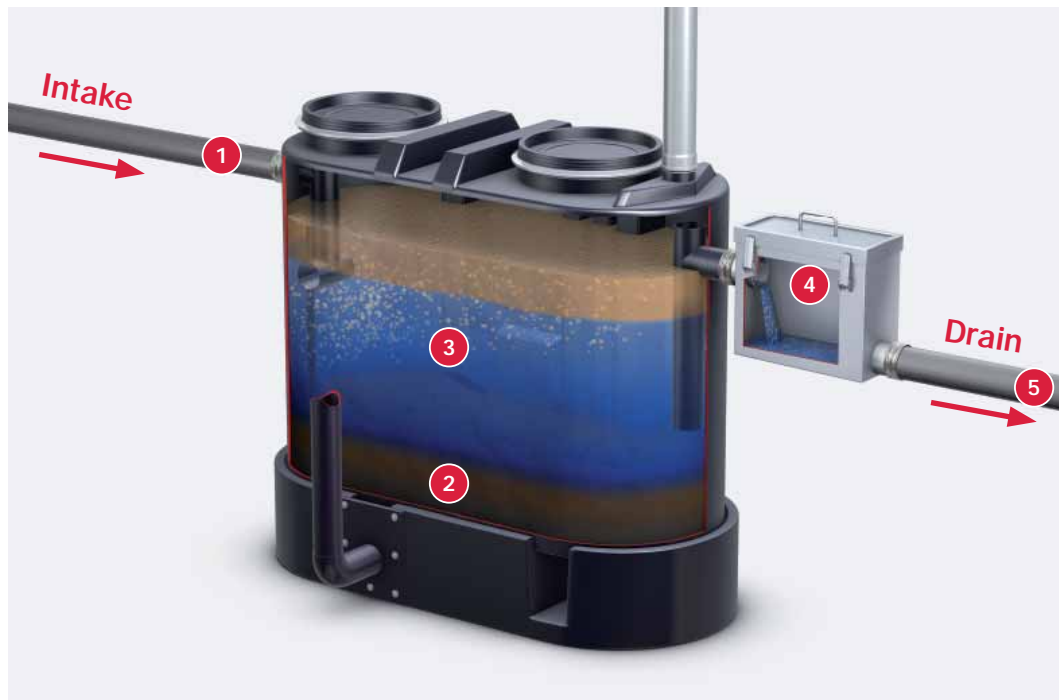
In addition to this, organic greases and oils present in wastewater result in moistening of activated sludge, which in turn is a barrier to the free exchange of oxygen among bacteria.

In organic sewage treatment plants, it takes a relatively long time for lipophilic substances to be broken down. Overly high fat concentrations in intake pipes feeding the sludge digestion tank result in foam being formed in the tank. This foam, being stiff, does not settle well, and this greatly limits the purification capacity of the sewage treatment plant.

A grease separation system complying with DIN EN 1825 (without a separate sludge trap and grease separator) consists basically of a

sludge trap (2), a grease separation chamber (3) and a sampling device (5).

### How a grease separator system complying with DIN EN 1825 works (without a separate sludge trap and grease separator)



#### 1 Intake

Only sewage from kitchen areas (from floor drains, drainage gutters, sinks, dishwashing sinks, dishwashers, pots and pans for cooking), from which organic greases and oils need to be retained, may be drained into a grease separator system.

**Sewage containing faeces (dirty water), rain water and sewage containing light mineral liquids may not be drained into such a system.**

#### 3 Grease separation chamber

Actual physical separation of oils and greases from sewage takes place in the grease separation chamber. This is done utilizing the gravity principle: i.e. due to their lower density, the separable oil and grease components float on the surface of the water. An increasingly heavy layer of grease thus forms on the surface of the sewage, and this layer is retained between the intake and drainage pipes of the system.

#### 5 Drain to public sewage system

#### 2 Sludge trap

The sludge trap collects separated suspended matter, including food residues, bones, sludge and similar material.

It may be connected as a separate unit in front of the grease separator or be designed as a single combined unit with the grease separator.

#### 4 Sampling device

DIN 40401-100 item 5.5.1 specifies that a sampling and inspection device is to be built into the drain of the grease separator, at a point before treated water is reintroduced to wastewater.

## Technical Information How grease separator systems work acc. to DIN EN 1825 (without separate sludge trap and grease separator) / acc. to DIN EN 4040-100 (with separate sludge trap and grease separator)

Grease separator systems generally work purely on the basis of physics, utilizing the gravity principle (grease and solids or sludge are separated through differing densities). In other words, heavy substances contained

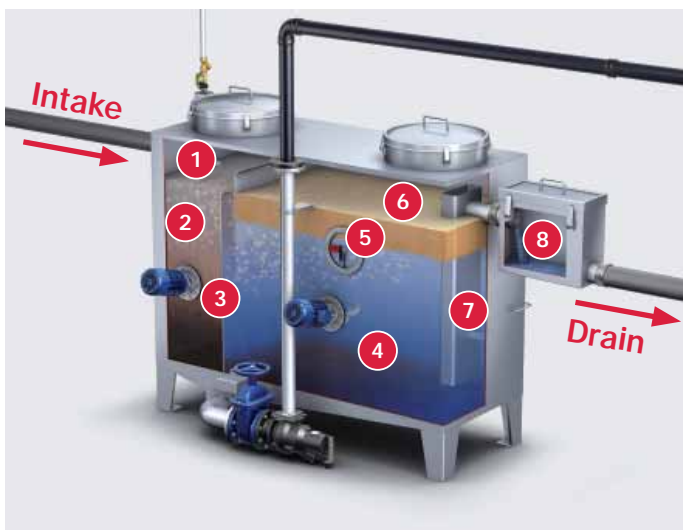
in sewage, such as solids, sink to the bottom while light ones, such as organic greases and oils, rise to the surface within the grease separation chamber, where they collect until final disposal.

### How a grease separator system complying with DIN EN 1825 works (without a separate sludge trap and grease separator)



- |   |  |
|---|--|
| 1 | Calming device                                       |
| 2 | Sludge trap  |
| 3 | Grease separation chamber                            |
| 4 | Accumulated grease layer                             |
| 5 | Immersion pipe for draining water (clean wastewater) |
| 6 | Sampling device according to DIN 4040-100            |

### How a grease separator system complying with DIN EN 4040-100 works (with a separate sludge trap and grease separator)



- |   |  |
|---|--|
| 1 | Calming device                                       |
| 2 | Sludge trap  |
| 3 | Partition  |
| 4 | Grease separation chamber                            |
| 5 | Inspection glass for grease layer thickness          |
| 6 | Accumulated grease layer                             |
| 7 | Immersion pipe for draining water (clean wastewater) |
| 8 | Sampling device according to DIN 4040-100            |

Suggested installation of TECEbasika – BASIC grease separator system (free standing)



1	TECEbasika – BASIC grease separator system (free standing)
2	Venting pipe
3	Suction hose from disposal vehicle
4	Sampling device
5	TECEbasika-Duo lifting unit

Description of functioning

In order to empty the **TECEbasika – BASIC** grease separator system, the container lids, fastened by tension locks, are removed first. The container is then emptied, with the entire contents of the grease separator being removed by a suction hose connected to the disposal vehicle.

**As the container is being emptied, with the lid open, it is impossible to avoid heavy odours in the area of installation.**

After emptying, the grease separator system must be completely cleaned and then filled to overflowing with fresh water.

Cleaning is done in regular intervals by way of the maintenance openings. According to DIN 4010-100, par. 12.2 grease separator systems must be emptied completely and cleaned at least once a month but preferably every two weeks.

- For service and maintenance, refer to page 164
- For general inspection, refer to page 164

Materials / nominal sizes

V4A stainless steel	
Rectangular design:	NS 1
HDPE plastic	
Round design:	NS 1, 2, 4, 7, 10, 15, 20, 25
Oval design:	NS 2, 4, 7

Selection advice / information

- The BASIC model is a cost-effective solution that complies with all of the requirements placed by the DIN EN 1825-1 standard. On the other hand, this system design provides no disposal convenience.

Recommended for the following operations / locations:

- Where heavy odours during disposal make no difference
- Where introducing the suction hose from the disposal vehicle poses no problem

Accessories

- **Accessory parts** for greater convenience or for meeting applicable standards requirements, such as automatic filling devices, inspection glass for grease layer thickness, sampling device etc. refer to Accessories pages 118 - 124. TECEbasika lifting units, refer to section 9

Advantages

- Cost-effective solution
- Designs in two or three parts (with round model) make installation easy
- Highly resistant to aggressive fatty acids, no corrosion
- Easy to clean thanks to a wax-like surface (HDPE)
- Use of V4A stainless steel ensures compliance with applicable hygiene regulations

## Suggested installation of TECEbasika – BASIC grease separator system (underground)



- |   |  |
|---|--|
| 1 | <b>TECEbasika – BASIC</b><br>grease separator system (underground) |
| 2 | Shaft for sampling   |

## Description of functioning

In order to empty the **TECEbasika – BASIC** grease separator system, the concrete-filled cast iron covers, which are bolted on, are opened first. The container is emptied, with the entire contents of the grease separator being removed by a suction hose connected to the disposal vehicle.

**During emptying, with the covers open, strong odours are unavoidable, yet with few exceptions this generally poses no problem in open areas outdoors.**

After emptying, the grease separator system must be completely cleaned and, after being emptied completely, filled to overflowing with fresh water.

Cleaning is done in regular intervals by way of the maintenance openings. According to DIN 4010-100, par. 12.2 grease separator systems must be emptied completely and cleaned at least once a month but preferably every two weeks.

- For service and maintenance, refer to page 164
- For general inspection, refer to page 164

## Materials / nominal sizes

**HDPE plastic**

- Special solutions > NS 10 as a dual system including distribution facility (upon request)

## Selection advice / information

- The BASIC model is a cost-effective solution that complies with all of the requirements placed by the DIN EN 1825-1 standard.
- In order to avoid pipe blockage caused by grease deposits, ensure that there is only a short distance between the wastewater collection points and the grease separator (DIN EN 1825-2)
- Drain pipes must be installed at a frost-free depth or supplementary pipe heating systems installed if required
- The covers must be bolted down odour-tight

## Accessories

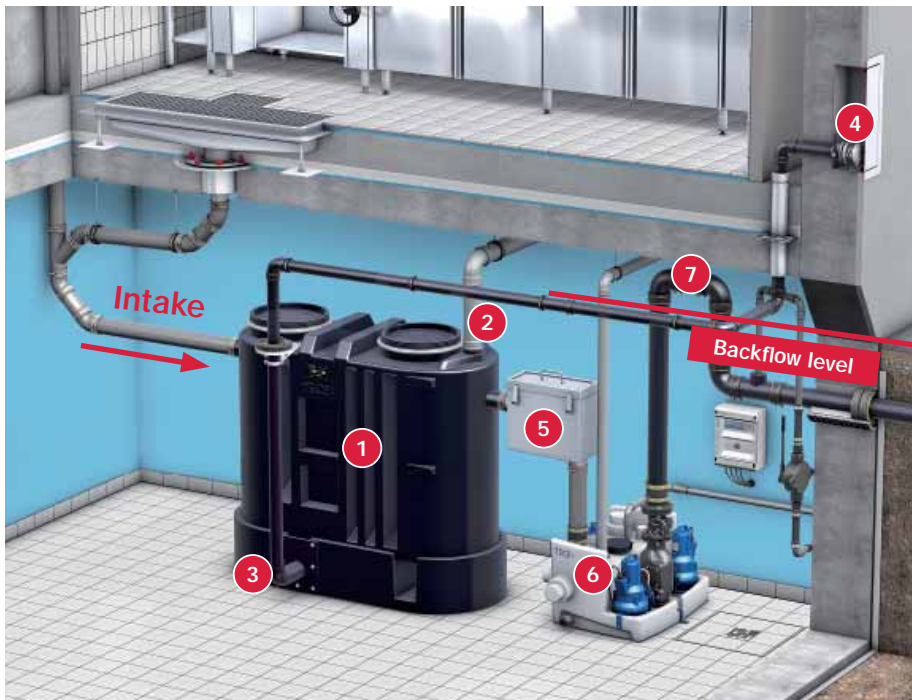
- **Accessory parts** for greater convenience or for meeting applicable standards requirements, such as shaft for sampling etc. refer to Accessories pages 138 - 140.

## Advantages

- Cost-effective solution
- Disposal, generally done outdoors, is problem-free, i.e. there are no annoying odours inside the building
- No additional basement area required
- Highly resistant to aggressive fatty acids, no corrosion
- Easy to clean thanks to a wax-like surface (HDPE)
- Vehicles of up to load class D 400 (40 t) can drive over it



Suggested installation of the TECEbasika – CLASSIC grease separator system



1	TECEbasika – CLASSIC grease separator system (free standing)
2	Venting pipe
3	Permanently mounted suction pipe for removing grease separator contents by suction
4	Attachment coupling (Storz-B coupling) for the suction hose of the disposal vehicle (suction pump)
5	Sampling device
6	TECEbasika-Duo lifting unit
7	Backflow loop

Description of functioning

The **TECEbasika – CLASSIC** grease separator system is emptied using a permanently mounted suction pipe. Container covers thus do not have to be removed for emptying.

**The entire contents of the grease separator are removed by suction, odour-free; the suction pump of the disposal vehicle is connected directly to the attachment coupling mounted on the building wall.**

After emptying, the grease separator system must be completely cleaned and filled once again with fresh water.

Cleaning is done in regular intervals by way of the maintenance openings. According to DIN 4010-100, par. 12.2 grease separator systems must be emptied completely and cleaned at least once a month but preferably every two weeks.

- For service and maintenance, refer to page 164
- For general inspection, refer to page 164

Materials / nominal sizes

V4A stainless steel	
Round design:	NS 1, 2, 4, 7, 10
Oval design:	NS 2, 4
Rectangular design:	NS 2, 4, 7, 10, 15, 20, 25

HDPE plastic	
Round design:	NS 1, 2, 4, 7, 10, 15, 20, 25
Oval design:	NS 2, 4, 7

- Special solutions: separate sludge trap or a dual system including distribution facility (upon request)

Selection advice / information

- The CLASSIC model allows odour-free disposal of grease separator contents. We therefore recommend this type of system for situations where either annoying odours are intolerable or flexible disposal hoses cannot be laid inside the building.
- With the installation of a filling device, the grease separator system can be replenished with no odours – without having to open the container lid

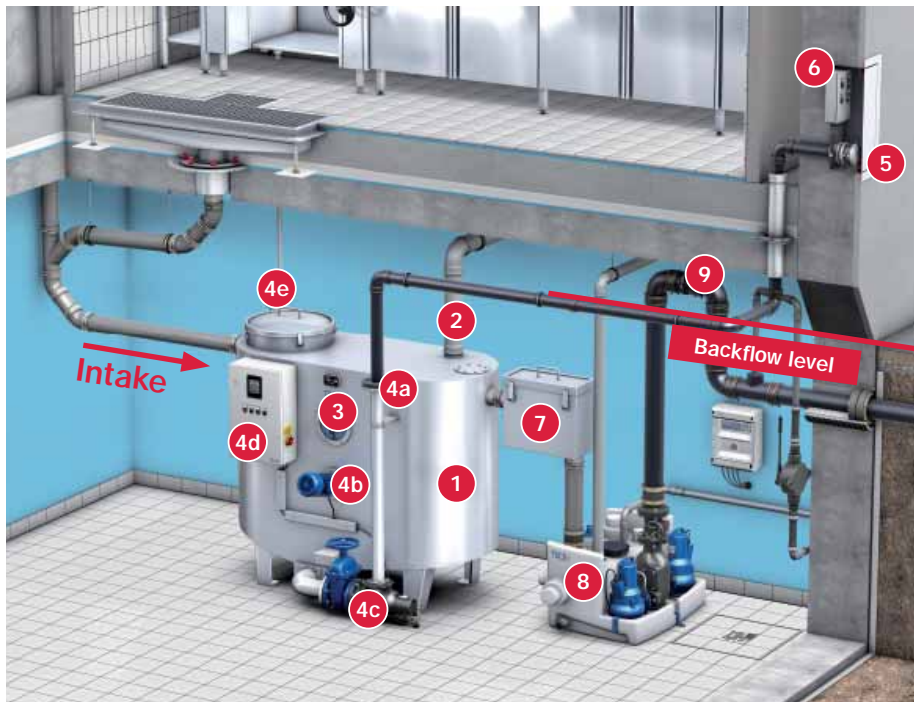
Accessories

- **Accessory parts** for greater convenience or for meeting applicable standards requirements, such as automatic filling devices, inspection glass for grease layer thickness, sampling device etc. refer to Accessories pages 118 - 124. TECEbasika lifting unit, refer to section 9

Advantages

- No annoying odours during emptying thanks to the suction pipe
- Designs in two or three parts (with round model) make installation easy
- Highly resistant to aggressive fatty acids, no corrosion
- Easy to clean thanks to a wax-like surface (HDPE)

## Suggested installation of the TECEbasika – PREMIUM grease separator system



1	TECEbasika – PREMIUM grease separator system (free standing)
2	Venting pipe
3	Inspection glass for grease layer thickness
4	<b>Semi-automatic disposal and cleaning and refilling devices:</b> consisting of a permanently mounted disposal pipe (a), agitator (b), disposal pump (c), control cabinet (d), filling connector (e)
5	Attachment coupling (Storz-B coupling) for disposal vehicle
6	Remote control (accessory)
7	Sampling device
8	TECEbasika-Duo lifting unit
9	Backflow loop

## Description of functioning

The **fully automatic TECEbasika – PREMIUM with manual control** is a convenient grease separator system offering the decisive advantage of fully automatic, odour-free emptying and cleaning. Individual process steps are activated manually in sequence and performed fully automatically.

**Separator contents are pumped, directly and with no residues, into the disposal vehicle by way of the permanently mounted disposal pipe. In addition, only one person is required for emptying when the remote control is employed (accessory).**

When the solenoid valve is installed on the filling connector (accessory), completely automatic refilling of the grease separator system with fresh water takes place following emptying.

Cleaning is done in regular intervals by way of the maintenance openings. According to DIN 4010-100, par. 12.2 grease separator systems must be emptied completely and cleaned at least once a month but preferably every two weeks.

■ For service and maintenance, refer to page 164

■ For general inspection, refer to page 164

## Materials / nominal sizes

## V4A stainless steel

Round design: NS 1, 2, 4, 7, 10

Oval design: NS 2, 4

Rectangular design: NS 2, 4, 7, 10, 15, 20, 25

## HDPE plastic

Round design: NS 1, 2, 4, 7, 10, 15, 20, 25

Oval design: NS 2, 4, 7

■ Special solutions: separate sludge trap or a dual system including distribution facility (upon request)

## Selection advice / information

The PREMIUM model allows odour-free disposal, cleaning and refilling of the grease separator system. We recommend this type of system for situations where annoying odours during emptying and cleaning are intolerable and where convenience and saving time are important considerations.

■ We highly recommend installation of the solenoid valve on the filling connection to enable fully automatic refilling of the system following emptying.

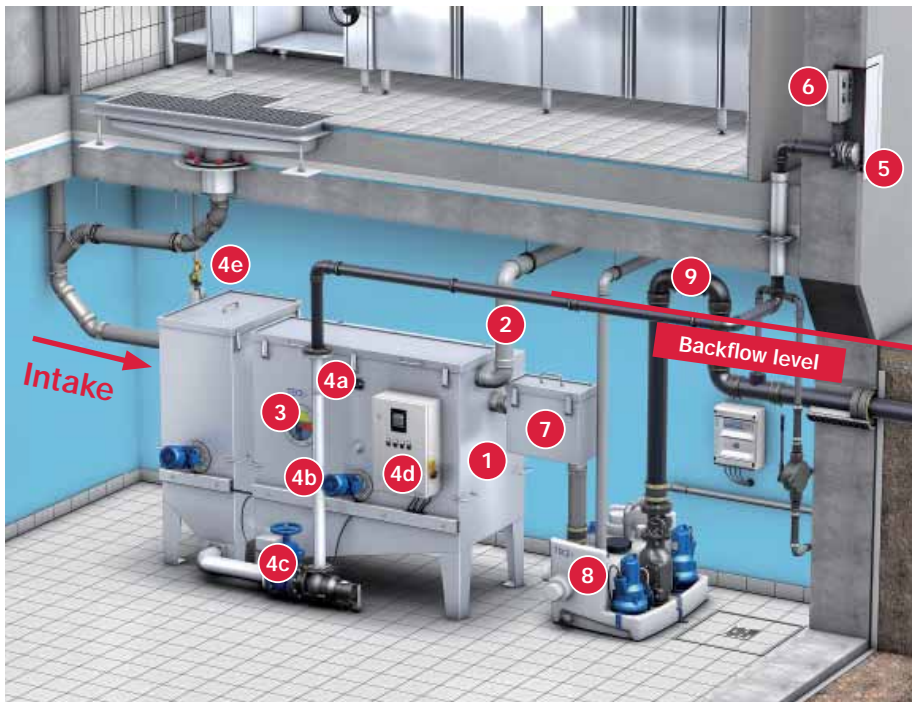
## Accessories

■ **Accessory parts** for greater convenience or for meeting applicable standards requirements, such as indicator lamp, solenoid valve for the filling device, remote control, sampling device etc., refer to Accessories pages 118 - 122 and page 127. TECEbasika lifting units, refer to section

## Advantages

- Fully automatic, odour-free disposal and cleaning
- Emptying, without residues, of separator contents
- Designs in two or three parts (with round model) make installation easy
- Saves time and expense for emptying
- Easy to clean thanks to a wax-like surface (HDPE)

**Suggested installation of the TECEbasika – PREMIUM Plus grease separator system**



- |   |   |
|---|---|
| 1 | TECEbasika – PREMIUM Plus<br><b>grease separator system</b> (free standing)   |
| 2 | Venting pipe  |
| 3 | Inspection glass for grease layer thickness   |
| 4 | <b>Fully automatic disposal and cleaning and refilling devices:</b><br>consisting of a permanently mounted disposal pipe (a), agitator (b), disposal pump (c), control cabinet (d), filling connector with solenoid valve (e) |
| 5 | Attachment coupling (Storz-B coupling) for disposal vehicle   |
| 6 | Remote control (accessory)  |
| 7 | Sampling device   |
| 8 | TECEbasika-Duo lifting unit   |
| 9 | Backflow loop   |

**Description of functioning**

The **fully automatic TECEbasika – PREMIUM Plus with program control** is a convenient grease separator system offering the decisive advantage of fully automatic, odour-free emptying and cleaning. Individual process steps are activated by a program in sequence and performed fully automatically.

**Separator contents are pumped, directly and with no residues, into the disposal vehicle by way of the permanently mounted disposal pipe. In addition, only one person is required for emptying when the remote control is employed (accessory).**

Following emptying, the grease separator system is replenished with fresh water fully automatically.

Cleaning is done in regular intervals by way of the maintenance openings. According to DIN 4010-100, par. 12.2 grease separator systems must be emptied completely and cleaned at least once a month but preferably every two weeks.

■ For service and maintenance, refer to page 164

■ For general inspection, refer to page 164

**Materials / nominal sizes**

V4A stainless steel	
Round design:	NS 1, 2, 4, 7, 10
Oval design:	NS 2, 4
Rectangular design:	NS 2, 4, 7, 10, 15, 20, 25

HDPE plastic	
Round design:	NS 1, 2, 4, 7, 10, 15, 20, 25
Oval design:	NS 2, 4, 7

■ Special solutions: separate sludge trap or a dual system including distribution facility (upon request)

**Selection advice / information**

The PREMIUM Plus model allows odour-free disposal, cleaning and refilling of the grease separator system. We recommend this type of system for situations where annoying odours during emptying and cleaning are intolerable and where convenience and saving time are important considerations.

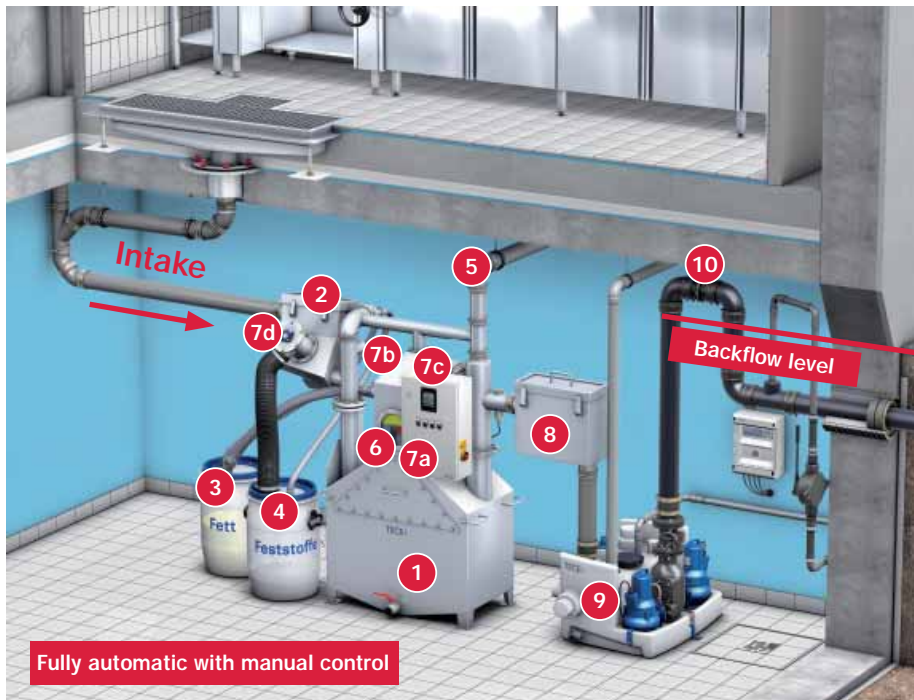
**Accessories**

■ **Accessory parts** for greater convenience or for meeting applicable standards requirements, such as indicator lamp, remote control, sampling device etc., refer to Accessories pages 118 - 122 and page 128.  
TECEbasika lifting units, refer to section 9

**Advantages**

- Fully automatic, odour-free disposal, cleaning and refilling of the grease separator system
- Emptying, without residues, of separator contents
- Designs in two or three parts (with round model) make installation easy
- Saves time and expense for emptying
- Easy to clean thanks to a wax-like surface (HDPE)

## Suggested installation of the TECEbasika – PRAKTIKA grease separator system



1	<b>TECEbasika – PRAKTIKA</b> grease separator system (free standing)
2	Intake filter with sieve and <i>fully automatic worm extruder</i>
3	Grease collector
4	Solids collector
5	Venting pipe
6	Inspection glass for grease layer thickness
7	<b>Semi-automatic disposal device:</b> consisting of a control cabinet (a), 2-way ball valve for grease disposal (b), integrated heating unit (c), fully automatic feed screw for conveying solids to the collector (d)
8	Sampling device
9	TECEbasika-Duo lifting unit
10	Backflow loop

## Description of functioning

The **fully automatic TECEbasika – PRAKTIKA with manual control** is a grease separator system offering the decisive advantage of both ecologically and economically sound operation.

First bulky solids are held back by the slot screen built into the intake filter and then disposed of fully automatically by way of the feed screw, which continuously conveys the material into the solids collector. Greases are disposed of regularly by simply manually opening the 2-way ball valve for long enough until no further grease is discharged. A built-in, fully automatic heating unit underneath the grease layer ensures that grease continues to flow. Upon disposal, grease is emptied into a transparent 60-litre collector. Once a collector is full, it can be replaced quickly and easily by means of the quick-action lock.

Cleaning is done in regular intervals by way of the maintenance openings.

- For service and maintenance, refer to page 164
- For general inspection, refer to page 164

## Selection advice / information

- The PRAKTIKA model allows separate, odour-free disposal of greases and solids. We recommend this type of system in situations where the necessary operating staff are always available to regularly discharge grease and exchange collectors.
- Operating and disposal costs are low, ensuring refund of investment costs within a short period
- Regional waste disposal entities or used grease recycling plants ensure environmentally compatible disposal of collected greases and solids

## Accessories

- **Accessories** for greater convenience, such as indicator lamp for signalling errors, automatic backwashing of intake filter, sampling device etc, refer to Accessories pages 188 - 122 and pages 129 and 130. TECEbasika lifting units, refer to section

## Materials / nominal sizes

## V4A stainless steel

- **Standard model with normal intake height NS 2, 4, 7, 10, 15, 20, 25**
- **Special solution with low intake height NS 2, 4, 7, 10, 15, 20**
- Special solutions and dual systems upon request

## HDPE plastic

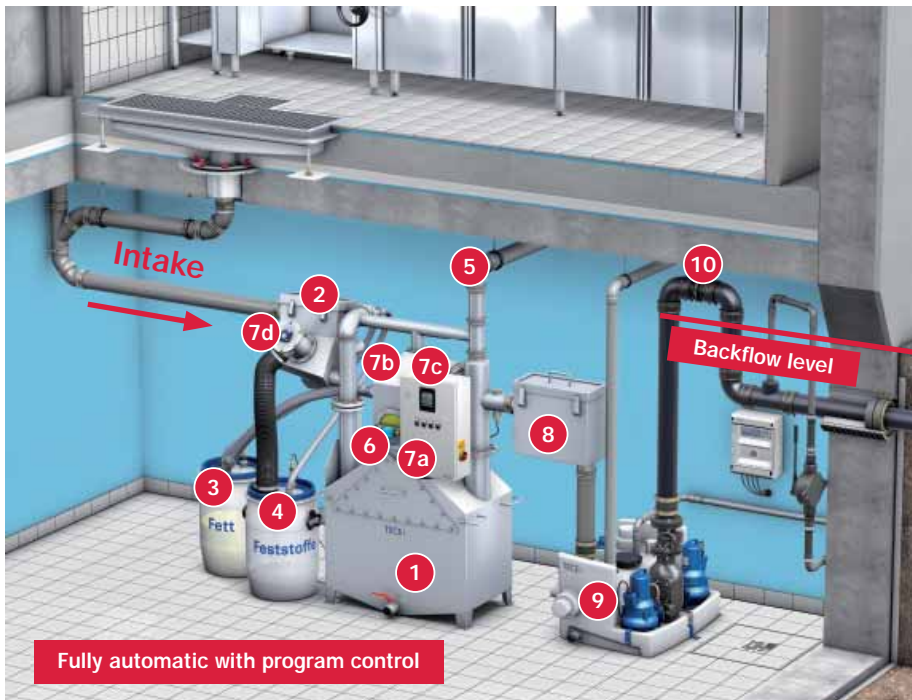
- **Special solutions upon request, TECEbasika – OPTIMA**

- Special solutions: separate sludge trap or a dual system including distribution facility (upon request)

## Advantages

- Separate disposal of grease and solids
  - ▶ Recycling is possible, provides extra ecological benefit
- Great savings in disposal costs (disposal of greases and solids)
  - ▶ Economic benefit as only 10 % of separator contents require disposal and no fresh water is needed for refilling or cleaning at first
- May be combined with a wet waste disposal system

Suggested installation of the TECEbasika – PRAKTIKA Plus grease separator system



1	TECEbasika – PRAKTIKA Plus <b>grease separator system</b> (free standing)
2	Intake filter with sieve and <i>fully automatic worm extruder</i>
3	Grease collector
4	Solids collector
5	Venting pipe
6	Inspection glass for grease layer thickness with grease sensor
7	<b>Fully automatic disposal device:</b> consisting of a control cabinet (a), 2-way ball valve for grease disposal (b), integrated heating unit (c), fully automatic feed screw for conveying solids to the collector (d)
8	Sampling device
9	TECEbasika-Duo lifting unit
10	Backflow loop

Description of functioning

The **fully automatic TECEbasika – PRAKTIKA Plus with program control** is a grease separator system offering the decisive advantage of both ecologically and economically sound operation.

First bulky solids are held back by the slot screen built into the intake filter and then disposed of fully automatically by way of the feed screw, which continuously conveys the material into the solids collector. Grease disposal is performed fully automatically as needed by a 2-way ball valve with electrical drive and controlled by a sensor mounted on the inspection glass for grease layer thickness. A built-in, fully automatic heating unit underneath the grease layer ensures that grease continues to flow. Upon disposal, grease is emptied into a transparent 60-litre collector. A level sensor on each collector monitors the fluid level. Collectors are exchanged quickly and easily thanks to quick-action locks.

Cleaning is done in regular intervals by way of the maintenance openings.

- For service and maintenance, refer to page 164
- For general inspection, refer to page 164

Materials / nominal sizes

V4A stainless steel

- **Standard model with normal intake height NS 2, 4, 7, 10, 15, 20, 25**
- **Special solution with low intake height NS 2, 4, 7, 10, 15, 20**
- Special solutions and dual systems upon request

Selection advice / information

- The PRAKTIKA Plus model allows fully automatic, separate, odour-free disposal of greases and solids. We recommend this type of system for locations where the necessary staff are available for exchanging collectors
- Operating and disposal costs are low, ensuring refund of investment costs within a short period
- Regional waste disposal entities or used grease recycling plants ensure environmentally compatible disposal of collected greases and solids

Accessories

- **Accessories** for greater convenience, such as indicator lamp for signalling errors, automatic backwashing of intake filter, sampling device etc, refer to Accessories pages 188 - 122 and pages 129 and 130. TECEbasika lifting units, refer to section

Advantages

- Greater convenience through a fully automatic system with program control
- Separate disposal of grease and solids
  - ▶ Optional recycling provides ecological benefits
- Great savings in disposal costs (disposal of greases and solids)
  - ▶ Economic benefit as only 10 % of separator contents require disposal and no fresh water is needed for refilling or cleaning at first
- May be combined with a wet waste disposal system

### Grease separator systems made of V4A stainless steel / HDPE plastic - oval design

#### Oval design



#### Transport into the installation area



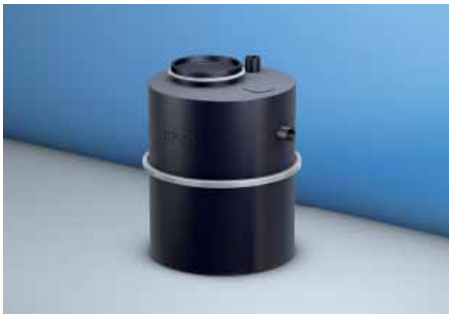
#### Area of use / advantages of the design shape

Narrow form with a maximum width of 760 mm and rounded edges on the intake and drains for narrow access corridors and doorways

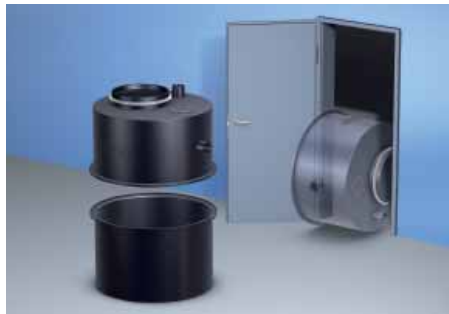
- ▶ Cost-effective solution: no on-site welding required
- ▶ Savings in terms of time: no time required for dismantling and installation
- ▶ Refer to the specific chart for transport dimensions  
**Max. component size**

### Grease separator system made of V4A stainless steel / HDPE plastic - round design

#### Round design



#### Transport into the installation area



#### Area of use / advantages of the design shape

Round grease separator may be divided into (two or three) components for particularly narrow access corridors

- ▶ Cost-effective solution: no on-site welding required
- ▶ Quick and easy dismantling / individual components mounted using tension rings with sealing rings – ensures a permanently watertight coupling
- ▶ Refer to the specific chart for transport dimensions  
**Max. component size**

### Grease separator system made of V4A stainless steel – rectangular design shape with separate sludge trap

#### Rectangular design shape with separate sludge trap



#### Transport into the installation area



#### Area of use / advantages of the design shape

Two individual containers allow easy transport through narrow doorways and access corridors

- ▶ Sludge trap and grease separator can be separated at the installation location, providing flexible installation options in small, narrow rooms

### Grease separator system made of V4A stainless steel / HDPE plastic – on-site welding upon request

#### On-site welding



#### Transport into the installation area



#### Area of use / advantages of the design shape

Even when access to the installation area is extremely challenging (e.g. an elevator shaft) and none of the aforementioned solutions is feasible, we are able to supply a number of individual components and weld and install them on site, offering a practicable solution. After mounting, a suitable test of watertightness is performed.

**Material**

High-density polyethylene thermoplastic (HDPE) offers optimum material properties:

- ✓ Smooth Surface
- ✓ Highly secure against fracturing
- ✓ Low weight
- ✓ Ideal for welding

**Highly stable chemical composition**

Highly stable against aggressive fatty acids

**Maintenance**

Easy-to-clean, wax-like surface

**Installation**

- ✓ Low weight makes transport easy
- ✓ Round design shape can be divided into components for easy access to rooms



**Recycling**

Environmentally friendly, recyclable material

**Installation**

Ideal for welding: allows later alterations, on-site welding

**Working life**

- No danger of corrosion!
- ✓ E.g. resulting from contact corrosion or condensation
- ✓ Long working life

**Material**

Premium quality V4A stainless steel (material grade 1.4571), corrosion-resistant, even at welding seams due to additional titanium stabilization

**Strength**

High mechanical strength against aggressive fatty acids

**Temperature-resistant**

- ✓ Highly temperature-resistant
- ✓ Good heat transfer qualities, effluent temperature decreases rapidly

**Highly stable chemical composition**

Highly resistant against organic solvents

**Hygiene**

Optimum hygiene properties

**Fire protection**



No fire load or hazard

**Design / shape**

- ✓ Neat appearance
- ✓ Variety of designs: oval, round, rectangular – allows installation in line with needs
- ✓ Round design shape can be divided into components for easy access to rooms



Check list / standards requirements

<p><b>Intake limitations</b></p> 	<p>Only sewage from kitchen areas (from floor drains, drainage gutters, sinks, dishwashing sinks, dishwashers, pots and pans for cooking), may be drained into a grease separator system.</p> <ul style="list-style-type: none"> <li>■ <b>Sewage containing faeces</b> (dirty water)</li> <li>■ <b>Rain water</b></li> <li>■ <b>Sewage containing light mineral liquids</b></li> </ul> <p><b>may not be drained into such a system.</b></p>
<p><b>Limitations of use</b> DIN EN 1825-2, par. 4 DIN 4040-100, parr. 10, 1</p> 	<ul style="list-style-type: none"> <li>■ Materials that could have negative effects on the grease separator system may not be introduced; these include bulky and solid materials that have been reduced in size as well as the contents of effluents from wet waste disposal plants.</li> <li>■ Laundry and dishwashing detergents, cleaners, disinfectants and other cleaning aids introduced to waste water must be easily separable and must not form stable emulsions. Detergents and cleaners should not contain or release any chloride.             <ul style="list-style-type: none"> <li>▶ <i>For more information on using and selecting easily separable detergents, refer to the information sheet «Industrial dishwashing and the environment» («Gewerbliches Geschirrspülen &amp; Umwelt») issued by the German Association of Dishwasher Manufacturers in Hagen (www.vgg-online.de).</i></li> </ul> </li> <li>■ The intentional use of biologically active substances, such as bacteria or products containing enzymes, for conversion of greases or oils or for «self-cleaning» is prohibited!</li> <li>■ In systems where the incoming wastewater contains suspended matter that rots quickly (e.g. in the fish industry), no sludge trap is to be connected upstream from the grease separator. Yet, when a grease separator is used in such cases, a strainer basket or strainer system must be connected in front of it in order to hold back bulky materials. All retained solids should be removed regularly, and the grease separator should be emptied and rinsed thoroughly with fresh water during downtime so as to prevent organic decay.</li> <li>■ Wastewater containing a large share of non-separable greases or oils (i.e. emulsified; e.g. in dairies, cheese factories, fish processing plants, catering businesses with only dishwashing, kitchen waste processing plants) can be effectively treated by grease separator systems only under certain conditions. Additional (more extensive) wastewater treatment may be required.             <ul style="list-style-type: none"> <li>▶ <i>TECE offers suitable solutions for more extensive wastewater treatment, refer to pages 114 - 115</i></li> </ul> </li> </ul>

### Check list / standards requirements

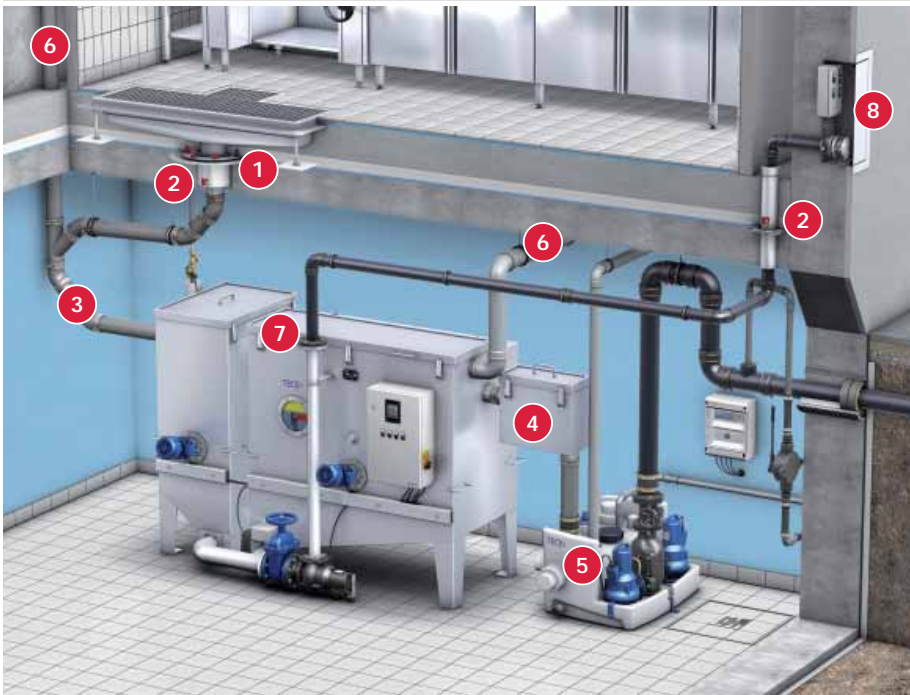
#### Installation site DIN EN 1825-2, 7.2

- Grease separator systems should generally be installed as closely as possible to wastewater collection points (short pipe lengths feeding wastewater to the grease separator avoid grease deposits in piping).
- Installation in unventilated rooms or in traffic or storage areas or rooms or near lounge areas, windows or ventilation openings is to be avoided if at all possible in order to preclude unpleasant, annoying odours.
- In particular in situations where grease separator systems are installed in frost-proof rooms without permanently installed disposal pipes, the installation site must be able to be conveniently reached by a cleaning vehicle. This is so that the suction hose used for disposal may be introduced immediately from the outside through a light shaft or window and the grease and sludge containers may be removed with as little effort as possible (i.e. no long corridors, stairs etc.). Care needs to be taken with grease separator systems including a permanently installed disposal pipe so that the disposal hose coupling, outside of the building if at all possible, is easily accessible for the disposal vehicle.
- When set up in buildings or installed underground, care needs to be taken that the area is frost-free.
- Inside buildings, the grease separator system must be set up on a level surface, contacting the surface at every point, levelled horizontally and giving attention to stability (e.g. floor load capacity).
- Room height must be selected so that the interior of the grease separator system is easily accessible at all times by way of the container lid.
- The room where it is installed should have a floor drain and be able to be illuminated adequately.
- In order to be able to refill and clean the grease separating system after disposal, a water outlet should be located in the same room or nearby. The same applies to the required electrical outlets.

#### Transport access

- When selecting the installation area and a suitable grease separator system, be sure to note available options for bringing the system into the room through existing doors (doorway width), stairwells etc. Narrow corridors often make for unpleasant surprises when bringing in the system.
  - ▶ *TECE offers suitable TECEbasika grease separator systems as two- or three-part models, allowing the system to first be dismantled into individual components before being brought to the installation site and then be safely reassembled at the site. The option of on-site welding exists for special cases, refer to page 154*

Check list / standards requirements



1	Drainage points
2	Fire stop – ceiling
3	Intake pipe
4	Facility for sampling
5	Drain pipe, backflow protection / lifting unit
6	Ventilation
7	Disposal pipe
8	Disposal coupling for pump vehicle

Illustration: TECEbasika – PREMIUM Plus grease separator system, NS 4

**1. Drainage points**  
 DIN EN 1825-2, 7.3

- Drainage points, such as floor drains, must as a rule be fitted with odour traps and, if required, sludge buckets that may be easily removed for cleaning.
  - ▶ Refer to suitable TECEdrain stainless steel floor and ceiling drains
- Wastewater must be fed to the grease separator system through a free drop.
  - ▶ In cases where this is not possible, we recommend using our TECEbasika rotary lobe pump lifting unit, especially designed for this purpose. Wastewater may not be fed in using a normal lifting unit based on a centrifugal pump, since this would add too much flow energy and make it more difficult to separate grease and oil.

**2. Fire protection**  
 State building code  
 Special building code  
 Guideline for pipe systems



- When specific fire protection requirements to buildings of a special type and use apply (such as hotels), or in accordance with requirements placed by state building codes (LBO), fire stops are mandatory in cases where pipes or floor drains are installed in ceilings or walls that must comply with a certain fire protection class.
 

**Note:**  
 Please observe the special requirements applying to fire stops as included in the applicable guideline for pipe systems (LAR).

  - ▶ Refer to suitable TECEdrain-FireStop stainless steel or cast iron fire protection drains. These comply with fire protection requirements as tested based on DIN 4102-11 (rating of fire stops in the grades R 30 to R 120).

### Check list / standards requirements

#### 3. Intake pipe – prevention of grease deposits

DIN EN 1825-2, 7.3

DIN EN 1825-2, appendix D



- Intake pipes for grease separator systems must be resistant against fatty acids and have an incline of at least 2 % (1:50) in order to prevent any grease deposits in the pipes.

If this requirement cannot be met, whether due to reasons of construction, in special cases or where it is not possible because of long intake pipes, suitable measures are to be taken (such as a supplementary pipe heater; cf. DIN EN 1825-2, appendix D) to prevent any grease deposits in the intake pipe.

- Connections between drop pipes and horizontal pipes are to be made using two 45 ° bends and an intermediate piece at least 250 mm in length. After this a suitable calming section (with a length of at least ten times the nominal diameter, in millimetres, of the grease separator intake coupling; e.g. for DN 150: 150 x 10 = 1500 mm calming section) must be provided.

#### 4. Sampling

DIN 4040-100, 5.5.1 / 5.5.2



- A device for sampling the «purified» wastewater and for inspecting the wastewater pipe downstream must be built in immediately at the drain of the grease separator system. The sampling device must be freely accessible and designed in such a manner that only wastewater which has flown through the grease separator system is removed for sampling.

In order to ensure proper sampling as well as to test the water-tightness of the grease separator system, a difference of at least 160 mm must be provided between the levels of the intake and drain pipes of the sampling device / shaft for sampling. Only in exceptional cases, i.e. when there is too little drop or due to reasons of space or cost, does this requirement not have to be met, in which case however the difference in levels must be at least 30 mm.

- ▶ Refer to suitable TECEbasika sampling devices / shafts for sampling for grease separator systems complying with DIN 4040-100.

#### 5. Connection to the sewage system and backflow protection

DIN EN 1825-2, 7.3

DIN EN 12056-1, 5.5.3

DIN 1986-100, 7.4.3



- When the calm water surface of the grease separator system lies below the backwater level (as a rule, the height of the upper edge of the curbstone of the street, unless defined otherwise, see also DIN EN 752-1), the system must be drained by a downstream lifting unit. In the additional case of drainage systems requiring uninterrupted feed of wastewater during normal operation (as is the case with grease separator systems), a dual lifting system (in accordance with DIN EN 12050-1/2) must be provided.

#### Note:

The backflow loop is to be installed in such a way that the pipe bottom is above the backflow level.

- ▶ Refer to suitable TECEbasika-Duo lifting units

- Official requirements may limit the temperature of wastewater at the point where it drains into the sewage system.

Check list / standards requirements

**6. Ventilation**

**DIN EN 1825-2, 7.4**



- Intake and drain pipes connected to grease separator systems must be adequately vented. To this end, the intake pipe must be installed as a ventilation pipe up to the roof and all connecting pipes longer than 5 m must be vented separately. Intake pipes longer than 10 m (without a separate vented connecting pipe) must be provided with a ventilation pipe directly in front of the grease separator system.

## Check list / standards requirements

<p><b>Disposal</b>          ■ At least once a month and preferably every two weeks  <b>DIN 4040-100, 12.2</b></p>	<p>■ Grease separator systems must be emptied completely and cleaned at least once a month and preferably every two weeks.</p> <p>Afterward the system must be replenished with water complying with local intake water regulations, i.e. with drinking water, service water (rainwater) or treated wastewater from the grease separator system.</p>
<p><b>Maintenance and repairs</b>          ■ yearly  <b>DIN 4040-100, 12.3</b></p>	<p>■ The grease separator system must be serviced once a year according to manufacturer's specifications by <b>competent personnel</b><sup>1</sup>.</p> <p><i><sup>1</sup> <b>Competent personnel:</b> Persons employed by the operator or authorised third parties are to be regarded as «competent» who, as a result of training, knowledge or experience gained in practice, are able to ensure that they are able to carry out in a competent manner evaluations or inspections in the particular area of speciality. TECE also offers training in these skills; refer to Training / seminars TECE</i></p>
<p><b>General inspection</b>          ■ When put into service and in regular intervals (five years)  <b>DIN 4040-100, 12.4</b></p>	<p>■ Before being put into service and in regular, five-year intervals thereafter, the grease separation system must be emptied completely and cleaned and then inspected by <b>qualified personnel</b><sup>2</sup> to ensure that it is in good condition and working properly.</p> <p>During the inspection, these items and others are subject to examination in greater detail: dimensioning of the grease separator system; mechanical condition; the manner in which the intake, drain and ventilation pipes are installed; completeness of the operating log; proof of proper disposal; and any necessary permits and documents.</p> <p>► TECE offers a suitable general inspection (when initially put into service) by <b>qualified personnel</b><sup>2</sup> as a service.</p> <p><i><sup>2</sup> <b>Qualified:</b> Personnel employed by organizations that are independent of the operator as well as technical experts or other institutions are termed «qualified» if they possess the necessary expert knowledge for operating, maintaining and inspecting separator systems.</i></p>
<p><b>Operating log</b>  <b>DIN 4040-100, 12.5</b></p>	<p>■ An operating log must be kept for every grease separator system.          The following information must be entered into the log regularly:</p> <ul style="list-style-type: none"> <li>– Checks by operator's personnel</li> <li>– Maintenance</li> <li>– Remedying of any defects that are ascertained</li> <li>– Inspections</li> <li>– Disposal measures</li> </ul> <p>The operating log must be retained by the operator of the system and presented upon demand to locally responsible authorities.</p> <p>► TECE supplies an operating log for grease separator systems, along with installation, operating and maintenance manuals, free of charge with the system.</p>

A) Project details and source of information

1 Inquiry by:

Company:
Contact person:
Phone:
Fax:
E-mail:

Information / details were recorded as follows:

<input type="radio"/> On-site appointment with:	<input type="radio"/> Information by phone from:
---	--

2 General specifications:

<b>Building project / building:</b>		<b>Planning:</b> (company stamp)	
<input type="radio"/> To be newly built	<input type="radio"/> Improvement, installation in an existing building	 	
Location:		Company:	
Owner:		Contact person:	
Phone:		Phone:	
Fax:		Fax:	
E-mail:		E-mail:	
<b>Specialized retailer:</b> (company stamp)		<b>Building company:</b> (company stamp)	
Company:		Company:	
Contact person:		Contact person:	
Phone:		Phone:	
Fax:		Fax:	
E-mail:		E-mail:	

## B) Recording of wastewater type and intake conditions

## 3 Type of operation

 Food services Commercial kitchen open all day Hospital kitchen Company kitchen, cafeteria, canteen Specialty restaurant Hotel kitchen Chinese restaurant Slaughtering and meat processing operation Meat and sausage plant with slaughtering facilities Meat and sausage plant without slaughtering facilities Butcher shop / meat processor with slaughtering facilities Butcher shop / meat processor without slaughtering facilities Poultry slaughterhouse Supermarket meat counter with processing Industrial oil and grease processing operations Edible oil refinery Margarine factory Soap and stearin factories Bone and glue factories Animal carcass disposal plant Pre-cooked foods manufacturer Manufacturer of chips and crisps Peanut roasting plant Tinned food factory Fish processing plant Mobile use Vending vehicle Mobile dishwasher Party tent

## 4 Substances contained in wastewater

 Solids, e.g. leftover food, bones Suspended matter that rots quickly,  
e.g. from fish processing plants Oils and greasesDescription:  
\_\_\_\_\_Density \_\_\_\_\_ g/cm<sup>3</sup> Continuously \_\_\_\_ l/week  Occasionally \_\_\_\_\_ l/week Peak loads \_\_\_\_ l/week Dishwashing detergent and cleaners Wastewater contains other materials  
\_\_\_\_\_

## 5 Wastewater intake conditions

## In accordance with regional wastewater regulations

 Residual fat content (low-volatility lipophilic substances)

Max. \_\_\_\_\_ mg/l (according to DEV analysis procedure) H56

Max. \_\_\_\_\_ mg/l (according to DIN 38409-H17)

 Max. permissible wastewater intake temperature:

Max. \_\_\_\_\_ °C

 COD (CSB): Max. \_\_\_\_\_ mg/l BOD (BSB): Max. \_\_\_\_\_ mg/l pH value from \_\_\_\_\_ to \_\_\_\_\_Are technical staff, e.g. building manager, available  
during operating hours? Yes No



C) Calculation of maximum sewage flow rate  $Q_s$  in l/s

1. According to number and type of kitchen appliances and plug valves
2. According to number of meals served in commercial kitchens
3. According to meat processing plants and daily meat product and sausage production

**6.1**  $Q_s$  – According to number and type of kitchen appliances and plug valves

$Q_s =$  \_\_\_\_\_ l/s

Kitchen appliance	$q_i$ Maximum amount of sewage draining from appliance $i$ in l/s	$n$ Qty.	$Z_i(n)$ Concurrency factor of the individual appliance $i$ in dependence of $n$					Calculation* of amount of sewage actually draining from each appliance $Q_s = q_i \times n \times Z_i(n)$	$Q_s$ in l/s
			$n = 1$	$n = 2$	$n = 3$	$n = 4$	$n = 5$		
Cooking pot drain $\varnothing$ 25 mm	1.0		0.45	0.31	0.25	0.21	0.20		
Cooking pot drain $\varnothing$ 50 mm	2.0		0.45	0.31	0.25	0.21	0.20		
Cooking pot drain $\varnothing$ 70 mm	1.0		0.45	0.31	0.25	0.21	0.20		
Cooking pot drain $\varnothing$ 100 mm	3.0		0.45	0.31	0.25	0.21	0.20		
Sink <b>with</b> odour trap $\varnothing$ 40 mm	0.8		0.45	0.31	0.25	0.21	0.20		
Sink <b>with</b> odour trap $\varnothing$ 50 mm	1.5		0.45	0.31	0.25	0.21	0.20		
Sink <b>without</b> odour trap $\varnothing$ 40 mm	2.5		0.45	0.31	0.25	0.21	0.20		
Sink <b>without</b> odour trap $\varnothing$ 50 mm	4.0		0.45	0.31	0.25	0.21	0.20		
Dishwashing machine	2.0		0.60	0.45	0.40	0.34	0.30		
Tilting frying pan	1.0		0.45	0.31	0.25	0.21	0.20		
Frying pan	0.1		0.45	0.31	0.25	0.21	0.20		
High-pressure and steam-spray cleaning device	2.0		0.45	0.31	0.25	0.21	0.20		
Peeling device	1.5		0.45	0.31	0.25	0.21	0.20		
Vegetable washing machine	2.0		0.45	0.31	0.25	0.21	0.20		
Plug valve DN 15 R 1/2	0.5		0.45	0.31	0.25	0.21	0.20		
Plug valve DN 20 R 3/4	1.0		0.45	0.31	0.25	0.21	0.20		
Plug valve DN 25 R 1	1.7		0.45	0.31	0.25	0.21	0.20		
<b>Total <math>Q_s</math></b> (sum of individual sewage drain flow rates $Q_{s(i)}$ )									

\* Example ( $Q_s = q_i \times n \times Z_i(n)$ )

1 cooking pot drain  $\varnothing$  50 mm  
 $Q_s = 1 \times 1 \times 0.45 = 0.45$  l/s

3 sinks with odour trap  $\varnothing$  50 mm  
 $Q_s = 1.5 \times 3 \times 0.25 = 1.125$  l

6.2  $Q_S$  – According to number of meals served in commercial kitchens

$Q_S =$  I/s

Type of commercial kitchen service	$M_M$ : Monthly average of warm servings produced daily	$V_M$ : (litres) Sewage volume per warm serving for specific operation	F: Peak load factor	t: (hours) Number of operating hours daily when sewage is produced	Calculation: $Q_S = \frac{M_M \times V_M \times F}{t \times 3600s}$	$Q_S$ in l/s Maximum sewage drain flow rate
Hotel kitchen	_____	100 l	5	_____	_____ / t x 3600s	_____
Specialty restaurant	_____	50 l	8,5	_____	_____ / t x 3600s	_____
Company kitchen / cafeteria / canteen	_____	5 l	20	_____	_____ / t x 3600s	_____
Hospital kitchen	_____	20 l	13	_____	_____ / t x 3600s	_____
Commercial kitchen open all day	_____	10 l	22	_____	_____ / t x 3600s	_____

6.3  $Q_S$  – According to daily meat product production

$Q_S =$  I/s

Size of the meat processing plant <small>*1 LU = livestock unit = 1 cow = 2.5 pigs</small>	$M_p$ : Daily meat product production in kg (if no figures are available, $M_p$ can be assumed as 100 kg / LU)	$V_p$ : (litres) Sewage volume per kg meat product produced at specific operation	F: Peak load factor	t: (hours) Number of operating hours daily when sewage is produced	Calculation: $Q_S = \frac{M_p \times V_p \times F}{t \times 3600s}$	$Q_S$ in l/s Maximum sewage drain flow rate
Small (up to 5 LU*/week)	_____ kg/day	20 l	30	_____	_____ / t x 3600s	_____
Medium (up to 10 LU*/week)	_____ kg/day	15 l	35	_____	_____ / t x 3600s	_____
Large (up to 40 LU*/week)	_____ kg/day	10 l	40	_____	_____ / t x 3600s	_____

7 Difficulty factor

Difficulty factor	Description	Difficulty factor according to DIN EN 1825-2
<b>Difficulty factor Density <math>f_d</math></b> for predominant greases and oils	In calculating the density factor $f_d$ , the density of predominant greases and oils must be considered. With sewage from commercial kitchens, restaurants, slaughterhouses and / or meat processing plants and fish processing plants, a density factor $f_d = 1$ is to be used.	<input type="radio"/> $f_d = 1.0$ <input type="radio"/> $f_d = 1.5$ : for greases / oils with density $> 0.94 \text{ g/cm}^3$ (e.g. ricin oil, lanolin, wax, resin oil, beef tallow)
<b>Difficulty factor Temperature <math>f_t</math></b> for higher wastewater intake temperature	Higher sewage temperatures impair separator effectiveness and should therefore be avoided. The influence of temperature must be taken into consideration by selecting an appropriate difficulty factor.	<input type="radio"/> $f_t = 1.0$ : at sewage temperature $\leq 60^\circ\text{C}$ <input type="radio"/> $f_t = 1.3$ : at sewage temperature $> 60^\circ\text{C}$ (continuous or occasional)
<b>Difficulty factor Density <math>f_r</math></b> for the influence of dis- hwashing detergents and cleaners	Dishwashing detergents and cleaners impair separator effectiveness. The effect of these substances and in particular the amounts used vary considerably. Local regulations may impose limitations on the use of certain dishwashing detergents and cleaners.	<input type="radio"/> $f_r = 1.0$ : when <u>no</u> dishwashing detergent or cleaner is used <input type="radio"/> $f_r = 1.3$ : when dishwashing detergent or cleaner is used <input type="radio"/> $f_r = 1.5$ : in special cases, e.g. in hospitals

8 Calculation of nominal size NS for grease separators

NS =

$$\boxed{\text{NS}} = \boxed{Q_s} \times \boxed{f_d} \times \boxed{f_t} \times \boxed{f_r}$$

According to DIN EN 1825-1, section 4, after calculating the value, always the next higher nominal size must be selected.  
Preferred nominal sizes for grease separator systems are: **1, 2, 4, 7, 10, 15, 20, 25, 30**.  
Above NS 25, dual systems arranged in parallel may be installed (e.g. NS 30 = 2 x NS 15).

9 Calculation of sludge trap volume

SF<sub>VOL</sub> = Litres

- Sludge trap volume must be at least **100 x NS in litres**.
- At slaughterhouses and similar operations, sludge trap volume must be calculated at a minimum of **200 x NS in litres**.
- Where sewage containing suspended matter that rots quickly is fed into a grease separator system (e.g. sewage occurring in the fish industry), no sludge trap may be connected upstream from the separator in order to prevent decomposition in wastewater. In such cases, solids must be retained by a strainer basket or strainer system connected upstream.
- A dual sludge trap must be installed in operations where a large amount of sludge results.
- Special cases: refer to page 144

Selected grease separator system: Item. no.

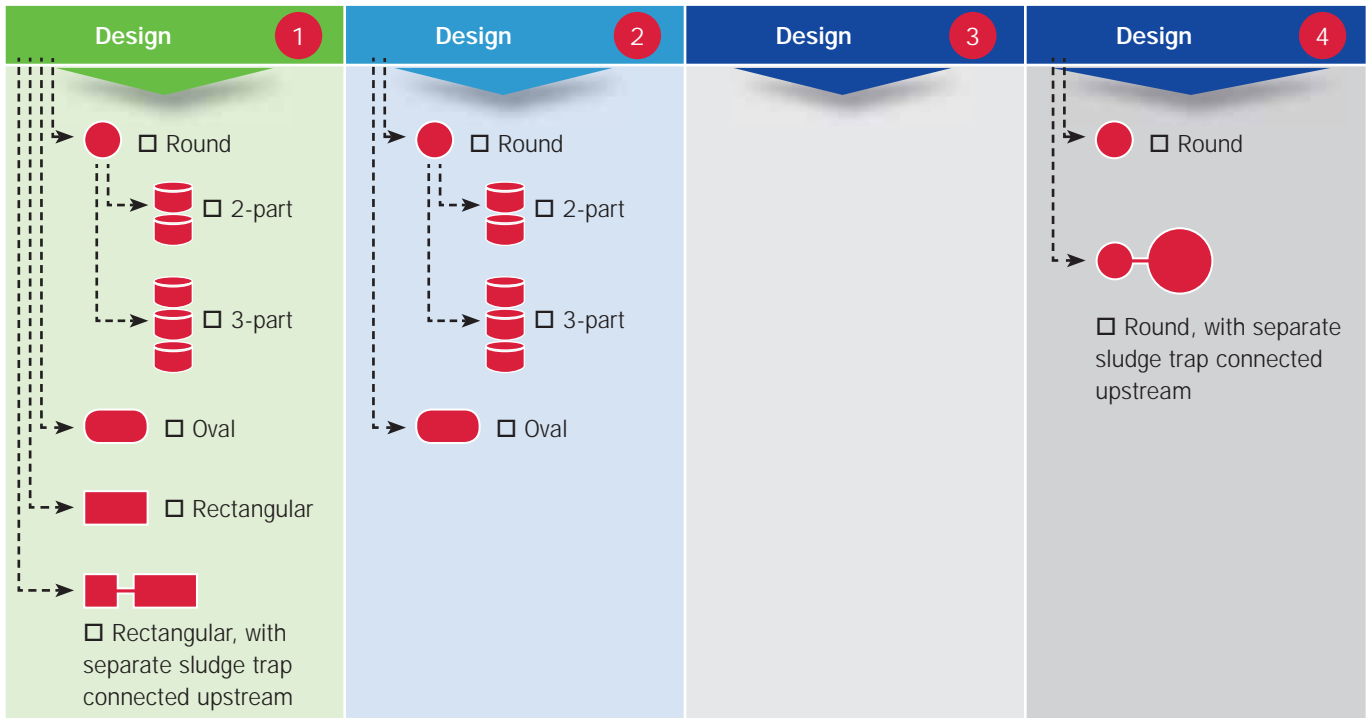
Accessories	Item. no.

## 10 Selection of the right grease separator system with accessories (1)

Location of installation of the grease separator system				
Free-standing installation in frost-protected rooms		Underground installation		
Type of disposal		Type of disposal		
<input type="checkbox"/> <b>Complete disposal of separator contents</b> (100 % of material for disposal: consisting of wastewater, grease and sludge)		<input type="checkbox"/> <b>Partial disposal of grease and sludge</b> (ecological and economic solution ▶ approx. 10% of material for disposal, consisting of grease and sludge)		
<input type="checkbox"/> <b>Complete disposal of separator contents</b> (100% of material for disposal: consisting of wastewater, grease and sludge)				
Selection of material		Selection of material		
V4A stainless steel	HDPE plastic	V4A stainless steel	HDPE plastic	
Model / type:	Model / type:	Model / type:	Model / type:	
refer to pages 52 - 75	refer to pages 8 - 39	refer to pages 42 - 51	refer to pages 40 - 41	
<input type="checkbox"/> <b>CLASSIC</b> (with suction pipe)  <input type="checkbox"/> <b>PREMIUM</b> (fully automatic with manual control)  <input type="checkbox"/> <b>PREMIUM Plus</b> (fully automatic with program control)	<input type="checkbox"/> <b>BASIC</b>  <input type="checkbox"/> <b>CLASSIC</b> (with suction pipe)  <input type="checkbox"/> <b>PREMIUM</b> (fully automatic with manual control)  <input type="checkbox"/> <b>PREMIUM Plus</b> (fully automatic with program control)	<input type="checkbox"/> <b>PRAKTIKA</b> (separate disposal of grease and solids, fully automatic with manual control)  <input type="checkbox"/> <b>PRAKTIKA Plus</b> (separate disposal of grease and solids, fully automatic with program control)	<input type="checkbox"/> <b>BASIC</b>  <b>Specifications:</b> Intake depth _____ mm <i>(from the surface upper edge of property to the intake pipe bottom on the grease separator)</i>  <b>Important notes:</b> <input type="checkbox"/> Intake depth > 1200 mm upon request <input type="checkbox"/> Consider frost-free depth <input type="checkbox"/> Consider backflow level ▶ Lifting unit?	
<b>Specifications:</b> <input type="checkbox"/> Stairs (note: upper edge of stair step to ceiling) <input type="checkbox"/> Corridor <input type="checkbox"/> Passage (e.g. doorway) Most narrow point to be passed on the way to installation area:  Height _____ mm x width _____ mm		Refer to pages 44 - 45/ 48 - 49 <input type="checkbox"/> Standard construction height	Refer to pages 46 - 47/ 50 - 51 <input type="checkbox"/> Low standard construction height	<input type="checkbox"/> <b>Load class B 125</b> Cars up to 12.5 t may drive over  <input type="checkbox"/> <b>Load class D 400</b> Trucks up to 40 t may drive over
Design	Design	Design	Design	

Designs: refer to page 171

10 Selection of the right grease separator system with accessories (2)



Gewählte Fettabscheideranlage:  Art.-Nr.

General accessories 1	General accessories 2	General accessories 3	General accessories 4
<i>refer to pages 116 - 131</i>	<i>refer to pages 116 - 131</i>	<i>refer to pages 116 - 131</i>	<i>refer to pages 138 - 140</i>
<ul style="list-style-type: none"> <li><input type="checkbox"/> Sampling device</li> <li><input type="checkbox"/> Large-mesh basket</li> <li><input type="checkbox"/> Lifting unit</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Sampling device</li> <li><input type="checkbox"/> Large-mesh basket</li> <li><input type="checkbox"/> Lifting unit</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Sampling device</li> <li><input type="checkbox"/> Lifting unit</li> </ul>	<ul style="list-style-type: none"> <li><input type="checkbox"/> Sampling device</li> <li><input type="checkbox"/> Lifting unit in shaft</li> </ul>
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____
<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____	<input type="checkbox"/> _____



## Germany

Building	Type of system / NS
Dorint Resort Hotel / Baltic Sea bathing resort Binz	PRAKTIKA Plus NS 4
Tropical Islands / Krausnick-Groß Wasserburg	PREMIUM Plus NS 25
Quelle, Leipzig	PREMIUM Plus NS 20
Allianz Private Krankenversicherung	PRAKTIKA Plus NS 20, with automatic alternating feed
Cafeteria of Munich Technical University	PREMIUM Plus NS 20 with upstream sludge trap
MAREDO Steakhouse, Dresden	PREMIUM Plus NS 7, HDPE
Hotel Bayrischer Hof, Munich	PRAKTIKA NS 20 / Duo rotary lobe pump lifting unit
Hotel Friedberger Warte, Frankfurt on Main	PREMIUM NS 4, HDPE / LUGAN wastewater post-treatment
Tafelhaus, Bremen	PREMIUM Plus NS 7, HDPE
Havana Lounge, Bremen	PREMIUM Plus NS 7, HDPE / Duo rotary lobe pump lifting unit NS 4
Seehotel, Rottach-Egern	PRAKTIKA Plus NS 20

## Austria

Building	Type of system / NS
Aqua Dome, Längenfeld	PRAKTIKA NS 4
Palais Coburg, Vienna	PREMIUM Plus NS 7, HDPE oval design
Bergrestaurant Pardatschgrad, Ischgl	PRAKTIKA NS 15
Rosshütte, Seefeld	PRAKTIKA NS 15

## Benelux

Building	Type of system / NS
European Parliament / Rijswijk	PRAKTIKA Plus NS 2
EU Parliament, Brussels	PRAKTIKA Plus NS 20
SuperDrecksKäscht, Colmar-Berg	PRAKTIKA Plus NS 7



Stadthalle Wuppertal



Seehotel Rottach-Egern



Hotel Friedberger Warte, Frankfurt on Main



Bergrestaurant Pardatschgrad, Ischgl

## Greece

Building	Type of system / NS
Grand Ressor, Laconissi	PREMIUM Plus NS 40 with upstream sludge trap
Hilton Hotel, Athens	PREMIUM Plus NS 50 with upstream sludge trap
Music Hall, Athens	PREMIUM Plus NS 15 with upstream sludge trap
Hotel Grand Bretagne, Athens	PREMIUM Plus NS 14 with upstream sludge trap

## Portugal

Building	Type of system / NS
Police Station, Lisbon	PREMIUM Plus NS 10 with upstream sludge trap
Hotel Sofitel and Resort, Villamoura	PRAKTIKA NS 8 (2 x NS 4), special system

## Additional reference systems

on request

A) Project details and source of information

1 Inquiry by:

Company:
Contact person:
Phone:
Fax:
E-mail:

Information / details were recorded as follows:

<input type="radio"/> On-site appointment with:	<input type="radio"/> Information by phone from:
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2 General specifications:

<b>Building project / building:</b>		<b>Planning:</b> (company stamp)	
<input type="radio"/> To be newly built		<input type="radio"/> Improvement, installation in an existing building	
Location:		Company:	
Owner:		Contact person:	
Phone:		Phone:	
Fax:		Fax:	
E-mail:		E-mail:	
<b>Specialized retailer:</b> (company stamp)		<b>Building company:</b> (company stamp)	
Company:		Company:	
Contact person:		Contact person:	
Phone:		Phone:	
Fax:		Fax:	
E-mail:		E-mail:	

**B) Dimensioning options**

- 3.1 According to the weight of potato peelings  
 3.2 According to sewage drain flow rate or flow-through volume  
 3.3 According to the number of warm meals

**3.1 Dimensioning according to the weight of potato peelings**

Weight of peelings kg/day	NS
200 kg/day	0,5
500 kg/day	1,0
1,000 kg/day	2,0
1,500 kg/day	3,0

**3.2 Dimensioning according to sewage drain flow rate**

Sewage drain flow rate or flow-through volume in l/s	NS
0.5 l/s	0,5
1.0 l/s	1,0
2.0 l/s	2,0
3.0 l/s	3,0

**3.3 Dimensioning according to the number of warm meals**

Number of warm meals/day	NS
approx. 800 meals/day	0,5
approx. 2,200 meals/day	1,0
approx. 4,500 meals/day	2,0
approx. 7,500 meals/day	3,0

NS =

Methods of preparation and eating habits have changed. The results from this dimensioning procedure should be verified in individual cases to ensure that the size of the starch separator system has not been estimated too large. In the past it was assumed that almost 2/3 of all meals in Germany included potatoes as a side dish.

**C) Planning information**

- According to DIN EN 12056-1, par. 4, all materials that could interfere with the effectiveness of the public sewage system or have been prohibited by responsible officials must be prevented from entering the system.
- Standard DIN 1986-100, par. 6.2.4., remaining in effect, requires a starch separator to be installed in operations where wastewater containing starches is produced.
- No comparable DIN standard for starch separator systems has been issued to date. The TECE factory standard (former Basika factory standard) is therefore offered as an aid in planning.

**Note:**

- Reliable functioning of a starch separator system can only be guaranteed when emptied regularly (i.e. establishing the suitable point in time for disposal with the aid of the inspection glass for starch layer thickness) and maintenance is performed regularly. The same maintenance and disposal intervals (regulations) apply here as to grease separator systems; refer to page 164.



4 Selection of the right starch separator system with accessories

1. Installation site	<input type="checkbox"/> Free-standing installation in frost-protected rooms	<input type="checkbox"/> Underground installation
2. Material	<input type="checkbox"/> V4A stainless steel (1.4571 material) <input type="checkbox"/> HDPE plastic	<input type="checkbox"/> HDPE plastic
3. Model / type	<input type="checkbox"/> <b>CLASSIC</b> (with suction pipe) <input type="checkbox"/> <b>PREMIUM Plus</b> (fully automatic with program control)  <b>Multi-part model:</b> <input type="checkbox"/> Two-part design (with round design shape only) <input type="checkbox"/> Three-part design (with round design shape only)	<input type="checkbox"/> <b>BASIC</b>  <input type="checkbox"/> <b>Intake depth</b> _____ mm (from the surface upper edge of property to the intake pipe bottom on the starch separator)  <b>Note:</b> <input checked="" type="checkbox"/> Consider frost-free depth <input checked="" type="checkbox"/> Consider backflow level ▶ Lifting unit <input type="checkbox"/> <b>B 125 load class</b> (Cars up to 12.5 t may drive over) <input type="checkbox"/> <b>D 400 load class</b> (trucks up to 40.0 t may drive over)
4. Design shape	<input type="checkbox"/> Round <input type="checkbox"/> Oval <input type="checkbox"/> Rectangular (with V4A stainless steel only)	<input type="checkbox"/> Round
5. Special items	<input type="checkbox"/> _____	<input type="checkbox"/> Installation depth / intake depth > 1200 mm
6. Accessories	<input type="checkbox"/> Sampling device <input type="checkbox"/> Starch layer thickness inspection glass <input type="checkbox"/> Large-mesh basket <input type="checkbox"/> Filling device <input type="checkbox"/> Lifting unit <input type="checkbox"/> _____	<input type="checkbox"/> Shaft for sampling <input type="checkbox"/> Lifting unit in shaft
7. Transport into the installation area	<b>Transport route</b> <input type="checkbox"/> Stairs (note: upper edge of stair step to ceiling) <input type="checkbox"/> Corridor <input type="checkbox"/> Passage (e.g. doorway) Most narrow point to be passed on the way to installation area:  Height _____ mm x width _____ mm  or diameter Ø _____ mm  <input type="checkbox"/> Installation room:  Length _____ mm x width _____ mm x height _____ mm Provide a technical drawing on another sheet if necessary	<input type="checkbox"/> Property accessible by truck  <input type="checkbox"/> Other limitations  _____  _____  _____  _____

Selected starch separator system: Item. no.

Accessories	Item. no.

### Why must light liquid separator systems be employed?

#### Separator systems for light liquids DIN 1986-100, par. 6.2.3

«If mineral oils or light liquids, and in particular such that are a fire hazard or may form an explosive atmosphere, are able to enter the sewage system, separator systems for light liquids complying with DIN EN 858 and 1999-100 must be employed downstream from the drainage points and dimensioned, installed and maintained in accordance with DIN EN 858.»

### Operations for which installation is mandatory (acc. to DIN EN 858 / DIN 1986-100)



- Filling stations
- (Automated) car wash facilities
- Parking areas
- Car repair garages
- Mineral oil storage areas
- Wreckers
- Engine washing facilities
- Power stations

#### Separator systems for light liquids DIN 1986-100, par. 6.2.3

- Drains of surface areas where motor vehicles are washed, serviced or filled must be connected to light liquid separator systems
- Water collected from drains of surfaces where motor vehicles are only parked may be drained without connection to a light liquid separator system as long as the water or wastewater laws of the particular state do not stipulate otherwise

Planning information

<p><b>Current standards</b></p>	<ul style="list-style-type: none"> <li>■ <b>DIN EN 858-1</b> (Separator systems for light liquids)</li> <li>■ <b>DIN EN 858-2</b> (Separator systems for light liquids: Selection of nominal size, installation, operation and maintenance)</li> <li>■ <b>DIN 1999-100</b> (Separator systems for light liquids: Requirements for employing separator systems in accordance with DIN EN 858-1 / DIN EN 858-2) replaces the former standard DIN 1999, Part 1 – 6 which expired as of 31/8/2006</li> <li>■ <b>DIN 1986-100</b> (Drainage systems for buildings and property: Supplementary regulations to DIN EN 752 and DIN EN 12056)</li> <li>■ <b>DIN EN 124</b> (Gully tops and manhole covers for vehicular and pedestrian areas, construction principles, type inspection and labelling)</li> <li>■ <b>DIN EN 4034-1</b> (Pre-fabricated concrete and reinforced concrete shafts: shafts for sewage canals and pipes laid underground)</li> <li>■ <b>DIN 1988-4</b> (Technical regulations for drinking water installations (TRWI); protection of drinking water, preservation of drinking water quality; technical regulations of DVGW)n DIN 1986-30 (Drainage systems for buildings and property – maintenance)</li> <li>■ <b>DWA-Merkblatt-M 115-2</b> (Indirect drainage of non-household wastewater – requirements)</li> <li>■ <b>ATV- Merkblatt M 167</b> (Separator and backflow prevention systems in property drainage – installation and operation)</li> </ul>
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What innovations are included in DIN EN 858-2 (issued 02-2005) and DIN EN 858-2 (issued 10-2003)?

<p><b>Innovations</b></p>	<ul style="list-style-type: none"> <li>■ Manufacturers themselves are able certify conformance of a building product to the minimum requirements of the European standard and document this by the use of the CE marking. <b>Note:</b> <i>The CE marking is neither a quality marking nor a safety marking and by no means a «license». It does not provide assurance of any particular properties when used.</i> <b>TECE, a member of GET, meets the quality guidelines defined by this professional association, e.g. third-party monitoring by an independent inspection institution.</b></li> <li>■ Structures may be made of plastic, concrete, reinforced concrete or metallic materials and built-in parts of steel or plastic.</li> <li>■ Regulations regarding third-party monitoring, fire protection, tightness and statics certificates are not included and these matters thus fall under the standards for the individual states. These regulations have been defined for Germany in the new DIN 1999-100 «supplementary standard»:</li> <li>■ The tightness of the entire separator system, including the shaft construction, must be ensured</li> <li>■ Tests of functioning must be performed by a certified inspection institution</li> <li>■ The structure must comply with statics requirements for the required traffic and soil loads</li> <li>■ Intake and drain outlets within the separator must be manufactured from non-flammable materials and ensure that fires do not spread</li> </ul> <p>► <b>Recommendation:</b> In order to safeguard against any liability claims, we recommend that you ensure compliance with the high standards in force up to now by applying DIN EN 858 only in connection with DIN 1999-100.</p>
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Dimensioning in accordance with DIN EN 858 for class I and II light liquid separators

<p><b>Dimensioning</b></p>	<p>TECE will perform upon request dimensioning of light liquid separator systems in accordance with standards. Please contact us. We will be happy to provide you with our TECE Dimensioning Questionnaire for Light Liquid Separator Systems.</p>
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## Installation information (refer also to DIN EN 858 and ATV-Merkblatt M 167)

<b>Intake limitations</b> <b>DIN EN 858-2, 5.1</b> 	<p>Light liquid separator systems may only be used in drainage systems in which separation of light liquids (of mineral origin) from sewage and retention in separators is required.</p> <p>They may not be built into drainage and sewage systems for domestic sewage. Drain water from surfaces where light liquids do not collect, such as roofs and courtyards, should not be fed into light liquid separator systems.</p>
<b>Operating conditions</b> <b>DIN 1999-100, 14.2</b> 	<p>■ Stable emulsions must not be fed into light liquid separator systems.</p> <p>When cleaning oil-contaminated surfaces, stable emulsions are not generally expected to form at a drain point if the following conditions are met:</p> <ul style="list-style-type: none"> <li>▶ The water pressure used in cleaning procedures does not exceed 60 bar</li> <li>▶ The water temperature for cleaning procedures does not exceed 60 °C</li> <li>▶ The cleaners employed are easily separable (form only temporarily stable emulsions)</li> <li>▶ Cleaners that are compatible with each other are used</li> </ul>
<b>Drain points / intake and drain connections</b> <b>DIN 858-1, 5.5.1</b> <b>DIN 1999-100, 5.4</b>	<p>■ Please note that drains to be connected to a light liquid separator must not include an odour trap!</p> <p>■ To enable water-tightness to be tested later on, particularly in the case of separators installed underground, intake and drain areas must be designed so as to be very easily accessible and sealed.</p>
<b>Sealants</b> <b>DIN 858-1, 6.2.5</b>	<p>■ Only elastomers or permanently elastic sealants may be used for light liquid separator systems. The use of cement mortar or cement products is not permitted.</p>
<b>Automatic warning devices</b> <b>DIN 858-2, 5.3</b>	<p>■ «Electrical warning devices for light liquids and other electrical equipment housed in the separator must be suitable for operation in zone 0 (hazardous area).»</p>
<b>Fire protection</b> <b>DIN 1999-100, 7</b>	<p>■ Light liquid separator systems must be designed in such a manner that, in the event of fire within the separator, the spread of fire to the intake and drain pipes is reliably prevented and separator contents do not escape.</p>

Check list / standards requirements	
<p><b>Disposal</b> DIN 1999-100, 14.5</p>	<ul style="list-style-type: none"> <li>■ Disposal of the light liquid retained in the separator must take place no later than when 80 % of the maximum container storage capacity has been reached.</li> <li>■ Disposal of sludge trap contents must take place no later than when 50 % of the sludge trap volume has been filled.</li> <li>■ The operator of the system must ensure that disposal is carried out only by an authorized waste disposal company.</li> </ul>
<p><b>Maintenance and checks by operator's personnel</b>  <ul style="list-style-type: none"> <li>■ Maintenance semi-annually</li> <li>■ Internal checks monthly</li> </ul>                     DIN 1999-100, 14.4                      DIN 1999-100, 14.3</p>	<ul style="list-style-type: none"> <li>■ The light liquid separator system must be serviced twice a year according to manufacturer's specifications by <b>competent</b><sup>1)</sup> personnel. Proper functioning is to be checked monthly by the operator's own staff.</li> </ul> <p><i><sup>1)</sup> <b>Competent personnel:</b> Persons employed by the operator or authorized third parties are to be regarded as «competent» who, as a result of training, knowledge or experience gained in practice, are able to ensure that they are able to carry out in a competent manner evaluations or inspections in the particular area of speciality. TECE also offers training in these skills; refer to Training / seminars TECE</i></p>
<p><b>General inspection</b>  <ul style="list-style-type: none"> <li>■ At commissioning and in regular intervals (five years)</li> </ul>                     DIN 1999-100, 14.6</p>	<ul style="list-style-type: none"> <li>■ Prior to commissioning and in regular, five-year intervals thereafter, the grease separation system must be emptied completely and cleaned and then inspected by qualified <b>personnel</b><sup>2)</sup> to ensure that it is in proper operating condition and working properly.</li> </ul> <p>During the inspection, these items and others are subject to examination in greater detail: dimensioning of the separator system; mechanical condition; the manner in which the intake, drain and ventilation pipes are installed; completeness of the operating log; proof of proper disposal; and any necessary permits and documents.</p> <p>► TECE offers a suitable general inspection (during initial commissioning of free-standing systems) by qualified <b>personnel</b><sup>2)</sup> as a service.</p> <p><i><sup>2)</sup> <b>Qualified personnel:</b> Personnel employed by organizations that are independent of the operator as well as technical experts or other institutions are termed «qualified» if they possess the necessary expert knowledge for operating, maintaining and inspecting separator systems.</i></p>
<p><b>Operating log</b> DIN 1999-100, 14.7</p>	<ul style="list-style-type: none"> <li>■ An operating log must be kept for every light liquids separator system. The following information must be entered into the log regularly:                             <ul style="list-style-type: none"> <li>– Checks by operator's personnel</li> <li>– Maintenance</li> <li>– Remediying of any defects that are ascertained</li> <li>– Inspections</li> <li>– Disposal measures</li> </ul> </li> </ul> <p>The operating log must be retained by the operator of the system and presented upon demand to locally responsible authorities.</p> <p>► TECE supplies an operating log for grease separator systems, along with installation, operating and maintenance manuals, free of charge with the system.</p>

