

# Wastewater Treatment Solutions

QUALITY MADE IN GERMANY

Wastewater Treatment Systems Septic Tanks Infiltration Separators

IRL 960514 A45

# Water is our element

#### Solutions to your challenges

GRAF offers an extensive range of products for water resource management. At GRAF, global challenges such as water protection meet the brand quality of "Made In Germany". We provide the solutions to your challenges.

# Global network of sales partners and production facilities!

Sales partners in more than 80 countries help us develop solutions suited to local markets and deliver the customer support needed locally.

The manufacturing process is essential for a top-quality product. GRAF masters the production of plastic products at the highest quality level and with the most modern machines.

#### Three strong wastewater technology brands

Every GRAF wastewater product benefits from the experience gained from over 1,000,000 satisfied users and the quality of our established brands in wastewater treatment.

# Fast responses, even when special solutions are needed

Our products are exported around the globe. Intelligent logistics and sufficient stock levels ensure first-class availability of standard solutions, as well as for customised rainwater solutions.

#### Plastic – clear benefits over concrete

Concrete tanks are at risk of corrosion through constant contact with wastewater and may require expensive refurbishment. Tanks made of plastic do not react with wastewater and are therefore a durable and reliable solution. Also, because of their low weight, plastic tanks can be installed without heavy equipment. This means that they can be easily transported and installed in locations that are difficult to access.





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BNOROCK www.biorock.com





# FOR A GREENER PLANET

Find out what GRAF does in the field of recycling and energy efficient manufacturing

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#### Our oneLines structure

Our oneLines portfolio offers wastewater solutions for single & multiple households, holiday lets, hotels, camping sites, offices as well as larger housing developments & commercial developments.

Our extensive range of Cesspools, Septic tanks, Anaerobic treatment systems and fully biological SBR treatment solutions is completed with oneSepa separators.

We focus on wastewater treatment systems utilising GRAF underground tanks with one unified concept. Special solutions such as retrofitting kits for concrete tanks from 1 – 10,000 inhabitants, container treatment plants and much more are offered through our competence center at the company

KLARO GmbH.





#### www.graf.info

- Installation instructions
- Dimensional drawings
- Accreditations
- Declarations of conformity



A complete range of compact and non-electric residential wastewater treatment plants is offered through BIOROCK.

#### Symbols in the catalogue



Suitable for pedestrian loading



Suitable for vehicle loading



Lorry-bearing

# Proven worldwide: **GRAF** wastewater treatment systems



30 inhabitants (Switzerland)





0 inhabitants (Bulgaria



64 inhabitants (Panama)

# You need a wastewater treatment plant?

We will help you to understand what needs to be considered!

#### Wastewater regulation

#### Northern Ireland

In Northern Ireland it is a legal requirement under Article 7 of the Water Order (NI), to obtain the consent of the Department of Agriculture, Environment and Rural Affairs to make a discharge of sewage effluent from a house or another premises, to a waterway or to the underground stratum.

There are 2 options for off mains discharge:

- 1. Discharge to a Soakaway (percolation area) with a treatment plant achieving 95 % reduction in BOD
- 2. Where available, discharge to a watercourse after a treatment plant capable of achieving a BOD reduction of 97.5 %. The reduction is based on the EN 12566-3 standards for wastewater disposal

#### Republic of Ireland

In the Republic of Ireland planning permission from the local authority is required prior to installation or replacement of a septic tank or wastewater treatment plant. Prior to submitting a planning application, a Site Characterisation report is carried out by a qualified and insured Site Assessor, they perform percolation tests on the site which determines the suitability of the site to dispose of the wastewater

It also determines the system requirements (septic tank of wastewater treatment plant) and the percolation area (type & size) this is carried out in accordance with EPA code of practice for Domestic Wastewater treatment 2021. All septic tank and wastewater treatment plants supplied in Ireland must conform with EN 12566, Part H of the Building Regulations and NSAI S.R.66.





#### ( Any questions? Please contact us.

+353 935 1765 info@grafireland.ie

# **Dundrum House Hotel & Golf Club**

up to 862 PE (129,300 l/day)



# Project data

#### Project

Dundrum House Hotel & Golf Club Dundrum, Co.Tipperary

#### Application

Wastewater treatment

#### Produkt

oneAdvanced commercial & sand filters

#### Population equivalent 862 PE

New on-site wastewater treatment system for Dundrum hotel & golf club.

This project involves designing and implementing a wastewater treatment system tailored for Dundrum House Hotel and its associated facilities, including a function room, golf course, driving range, and clubhouse with bar and restaurant. The system is required to manage a daily hydraulic load of 129.3 m<sup>3</sup> and a daily organic load of 45.53kg, serving a capa-

city of 862 population equivalent (PE).

The effluent treatment must meet

(20mg/l), COD (90mg/l), SS (5mg/l),

NH4N (5mg/l), TN (15mg/l), and TP

(2mg/l).

stringent discharge standards: BOD5

oneAdvanced 862PE Custom Wastewater Treatment Plant with various components to ensure efficient operation:

• Effluent buffer tank with forward feed pumps.

agreement.

• Twin-packaged sand filters with a 6500litre backwash tank and twin pumps.

Treated effluent will be discharged

into an adjacent river under a licensing

The proposed solution features a GRAF

- Ferric dosing system.
- WebMonitor and GSM alarms for remote management and alerts.
- A control building (4m x 3m steel shed) for housing control panels and related infrastructure.





# Housing development

up to 75 PE (11,250 I/day)



#### Project Housing development Ballylickey, Co.Cork

Application Wastewater treatment

Produkt oneAdvanced commercial

Population equivalent 75 PE

New on-site wastewater treatment system for a housing development in Co.Cork

This project involved the design and implementation of a new on-site wastewater treatment system for a housing development comprising 13 houses in Co. Cork. The new system was required to replace an existing one that failed to meet the required effluent discharge standards.

The new wastewater treatment solution was engineered to meet stricter effluent quality requirements, with discharge standards of 20mg/L BOD, 30mg/L SS, and 20mg/L ammonia.





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8



The upgraded system includes:

- An external cabinet housing the treatment controls.
- WebMonitor telemetry for real-time monitoring and system management.
- A pump station to ensure efficient wastewater handling.
- Connection to the existing percolation area, reducing the need for additional infrastructure.
- This comprehensive solution ensures that treated effluent complies with all local regulatory standards, providing a reliable and sustainable wastewater treatment system for the development.





# one**Solution**

- > oneTechnology (SBR) how does it work?
- > one**2clean** / one**2clean**Xtra
- > How does SBR technology work?
- > one**Advanced**
- > System comparison
- > KLARO**MAX**
- > KLAROcontainers





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# oneTechnology (SBR) - how does it work?



Ordinary treatment plants require several chambers or even tanks to purify the water properly. This makes a system big and complex.

one**Technology** SBR wastewater treatment systems clean incoming wastewater over a number of cycles (in different sequences). Fewer chambers and tanks are requested.

GRAF chambers achieve a cleaning performance of up to 99%. In this respect the GRAF one**2clean**/one**2clean**Xtra systems far surpass legal minimum requirements.

#### Why use the one Technology SBR system?

- Outstanding cleaning performance Even during load fluctuations and underload
- Excellent value for money
- One tank solutions are extremely space-saving
- Produces odourless and clear treated water
- Ideal for high nutrient removal requirements
- Can be adapted to nearly every request thanks to our +modules

# Aeration phase







The wastewater arrives directly in the biological zone without the need for pumping processes. Aeration of the entire container leads to immediate wastewater activation. The microorganisms begin the biological cleaning process without delay.

unit, the activated sludge sinks to the bottom. A clear water zone develops in the upper part of the tank.

#### one2clean/one2cleanXtra the clever way to produce clear water

Our systems up to 70 PE are ideal for making the most of limited space and where high nutrient removal is required.

#### one2clean/one2cleanXtra is odourless

The entire volume of wastewater is activated with oxygen. The system produces an odourless, clear treated water for extraction to soakaway or waterway.





#### Clear water discharging phase





The treated clear water is extracted from the system and the cleaning process can begin once more.

#### one**2clean /** one**2clean**Xtra already meets the needs of tomorrow

The wastewater treatment systems can achieve sustainable discharge values with an efficiency factor of up to 99 %! This offers high investment security even if legal requirements become stricter.

# one2clean/one2cleanXtra

up to 70 PE (10,500 l/day)

# **Components and Benefits**

#### As much technology as necessary, as little technology as possible.

Over the past few years, wastewater treatment systems have experienced impressive technological developments. Today, they are high-tech products equipped with sophisticated controls and various pumps, sensors and valves. Yet this is often of detriment of product reliability. A reliable wastewater disposal system no longer needs to be complicated. one2clean is an advanced development of the proven SBR wastewater treatment technology, with considerable benefits in terms of operating costs and safety.

#### Why use the one2clean system?

- Excellent cleaning performance Even during load fluctuations and underload
- Great value for money
- Double sludge storage volume
- Low sludge removal



Wastewater treatment system one2clean smart and simple! **GRAF TV** www.graf.info/v524

Efficiency factor of up to 99 %



Conventional wastewater treatment systems





V Minimal power consumption



GRAF)

#### Covers

- ✓ Adjustible in height
- Inclinable up to 5°
- Enables flush ground installation ✓ Discreet cover
- Reduction of installation cost

#### Wastewater tank

- State-of-the-art manufacturing for maximum stability ✓ 100 % watertight and corrosion-
- resistant
- Self-anchoring saves installation costs
- car parks)
- enviromentally friendly investment

#### Installation kit

- ✓ Only one clear water lifter Rugged clear water lifter manufactured in one seamless part
- Simple maintenance via an integrated, self-cleaning sampling container
- ✓ No electrical part in the tank
- ✓ Fast installation ✓ Saves installation costs
- ✓ Keeps service costs to a minimum

#### one2clean/one2cleanXtra control cabinets

- ✓ Simple handling thanks to micro-processor control
- Energy-saving
- Extremely quiet
- Incredible cost saving due to very low power consumption
- ✓ System can be easily adjusted if required which will reduce costs for the technician





Allows small corrections of height on-site

Can be mounted in groundwater

✓ Unique fit accuracy of components

✓ Up to 12t load bearing enables flexible choice of installation location (for example

Tank made of 100 % recycled material,









one**2clean** 



one**2clean**Xtra

The GRAF modular system >> page 46

GRAF

# one 2clean wastewater solutions

3 - 19 PE (450 - 2,850 l/day)



#### One-tank system one2clean

Inhabitants [max.]	Max. daily flow [l/d]	Max. organic load [kg BOD5/d]	Total volume [l]	Volume [l]	Length* [mm]	Width* [mm]	Height [mm]	Weight [kg]
4 - 5	750	0.30	3,750	3,750	2280	1755	1880	150
6 - 7	1,050	0.42	4,800	4,800	2280	1985	2110	185
8 - 9	1,350	0.54	6,500	6,500	2390	2190	2390	220
10 – 12	1,800	0,72	8,500	8,500	3500	2040	2375	450
13 – 15	2,250	0,90	10,000	10,000	3520	2240	2575	550
16 – 19	2,850	1,14	13,000	13,000	4000	2420	2755	695

Scope of supply: Carat S underground tank, tank dome, telescopic dome shaft 600, one2clean system pack (>> page 46 - the GRAF modular system). Scope of supply for Inhabitants 12/15/19: Carat XL underground tank, tank dome mini, telescopic dome shaft 600, fukky ore-fitted, incl. indoor control cabinet. Please order the air hoses separately (>> page 19). \*Total measurement

#### Technical data

one2	clean
EN 12566-3 / SR	R66:2015 to 50PE
fully biological SB	R lifting technology
19 inhabitar	nts   2,850 l/d
1 – 2 p	er year
B16A (provide	d by customer)
230 V AC ± 20	%, 50 Hz / 60 Hz
10 to	95 %
94.8 %	41 mg/l
98.1 %	7 mg/l
96.6 %	14 mg/l
98.3 %	0.5 mg/l
87.0 %	7.9 mg/l
	one2 EN 12566-3 / SF fully biological SB 19 inhabitar 1 - 2 p B16A (provide 230 V AC ± 20 10 to 94.8 % 98.1 % 96.6 % 98.3 % 87.0 %

Results of practical testing undertaken by the Prüfinstitut für Abwassertechnik (Testing Institute for Wastewater Technology), Aachen



#### Q WEBCODE G5104

#### one**2clean**



# Accessories for one2clean





The image shows the Outdoor plastic cabinet S for 3 - 18 inhabitants

#### Technical data

For air compressors	LA 60-80 / XP60-80, HP 100-200
Upstream fuse	B16A (provided by customer)
Voltage supply	230 V AC ± 20 %, 50 Hz
IP	IP44
Relative air humidity	10 to 95 %
Temperature range	-25°C to +50°C
Total weight	7 kg (15.4 lbs)
Connecting line	via two-pin earthed plug



#### Carbonator Carbon infeed Order no. 107872

#### Benefits

✓ Regardless of system – suitable for other treatment plants (one2clean compatible)

RAF

Outdoor plastic cabinet S

For 3 – 18 inhabitants (up to 2,850 l/d)

Flexible application of the proven one**2clean** control cabinet in a plastic

Edge seal for complete sealing over

High corrosion protection for the

Order no. 107990

outdoor column Weather-resistant plastic

the ground

electrical parts ✓ Good value for money Easy assembly

No foundation necessary

Benefits

- ✓ Individual adjustment of the dosage
- Low power consumption
- ✓ Fast installation
- ✓ Simple operation

The Carbonator was especially designed to keep wastewater treatment systems with seasonal inflow stable and working correctly, e.g. in holiday homes. The additional Carbonator module automatically feeds the systems with nutrients that keep the microorganisms alive when there is no wastewater inflow.

#### Sludge removal kit

for one**2clean** Order no. 106670

#### Benefits

Removes sludge to guarantee a continuous treatment performace ✓ Keeps sufficient sludge neccessary for cleaning process Helps to avoid damaging internal components whilst emptying





#### Odour-tight empty pipe seal DN110 for systems compatible with SBR-hose packages up to 28 PE

- Ensures no air, humidity or gas escapes from conduit pipe
- No need for PU seals
- Clean and professional solution
- Order no. 107887

#### SBR hose package

For one2clean (one-tank systems) Includes: 1 x Ø 19 mm and 1 x Ø 13 mm PVC hose; colour-coded Length: 10 m Order no. 107686 Length: 20 m Order no. 107688

Other SBR-hoses on request







Tank dome Micro

- Weight: 7 kg (15,43 lbs)
- Including green lid
- For shallow excavation • Earth cover only 90 mm

Order no. 371009



## one2cleanXtrawastewater solutions

up to 70 PE (up to 10,500 l/day)



#### Accessories





Order no. 107321 pedestrian

Order no. 107561 vehicle load



#### Filling granulate for Outdoor plastic cabinet L Prevents soil moisture from rising into the cabinet. 1 bag required; 50 l bag Order no. 107607

#### System one2cleanXtra in the Carat XL/XXL underground tank

Inhabitants [max.]	Volume [litre]	Max. daily flow [l/d]	Max. organic load [kg/BOD₅/d]	Required air hoses [quantity x Ø mm]	Length* [m]	Width* [m]	Order no.
12	8,500	1,800	0,72	1 x 13, 1 x 19	3.50	2.04	105336
15	10,000	2,250	0,90	1 x 13, 1 x 19	3.52	2.24	105337
19	13,000	2,850	1,14	1 x 13, 1 x 19	4.00	2.42	105338
24	16,000	3,600	1,44	2 x 19	4.66	2.50	105339
32	22,000	4,800	1,92	2 x 19	6.15	2.50	105340
45	32,000	6,750	2,70	2 x 19	8.53	2.50	105341
50	38,000	7,500	3,00	2 x 19	10.01	2.50	105342
60	44,000	9,000	3,60	5 x 19	11.50	2.50	105368
70	48,000	10,500	4,20	5 x 25	12.40	2.50	105369

Scope of supply: Carat XL/XXL underground tank, tank domes maxi, telescopic dome shafts 600, fully pre-fitted technology and indoor control cabinet and sludge removal kit. Air hoses are not included and must be ordered separately. \*Total measurements

#### Technical data

System	one <b>2cl</b>	ean Xtra	
System conformity	EN 12566-3 / SR	66:2015 to 50PE	
Purifying technology	fully biological SBF	R lifting technology	
One-tank systems available up to	70 inhabitan	ts   10,500 l/d	
Maintenance interval	1 – 2 p	er year	
Upstream fuse	B16A (provide	d by customer)	
Voltage supply	230 V AC ± 20 9	%, 50 Hz / 60 Hz	
Relative air humidity	10 to 95 %		
Parameter			
COD (chemical oxygen demand)	94.8 %	41 mg/l	

COD (chemical oxygen demand)	94.8 %	
BOD <sub>5</sub> (biochemical oxygen demand)	98.1 %	
SS (suspended solids)	96.6 %	
NH4-N (ammoniacal nitrogen)	98.3 %	
Ntotal (total Nitrogen)	87.0 %	

Results of practical testing undertaken by the Prüfinstitut für Abwassertechnik (Testing Institute for Wastewater Technology), Aachen



#### Q WEBCODE G5126

#### Additional +modules

+H	Hygiene modules
<b>+R</b>	Remote transmission modules
+ <b>P</b>	Phosphate removal module
+ <b>C</b>	Carbon infeed module
>> p	age 31

41 mg/l	
7 mg/l	
14 mg/l	
0.5 mg/l	
7.9 mg/l	



# How does SBR technology work?



- Especially suited to commercial use because of pre-treatment chamber
- ✓ Outstanding cleaning performance even during load fluctuations and underload e.g holiday houses
- Excellent value for money due to minimal power consumption
- ✓ Only a small tank volume required
- Can be adapted to every request thanks to our +modules



#### Aeration phase

The actual biological cleaning by microorganisms now takes place in the SBR tank. Short aeration and rest phases alternate in a controlled cleaning process. The so-called activated sludge can now develop with millions of micro-organisms and clean the water thoroughly.

X

the live sludge sinks to the bottom of the system. This allows a clarified water zone to form at the top of the SBR tank.



Function of the SBR wastewater treatment system GRAF TV www.graf.info/v512

# oneAdvanced wastewater solutions

10 - 28 PE (1,500 - 4,200 l/day)



#### one**Advanced**

Inhabitants [max.]	Max. daily flow [l/d]	Max. organic load [kg BOD5/d]	Total volume [l]	Primary treatment [capacity in l]	SBR tank [capacity in l]	Length* [mm]	Width* [mm]	Height [mm]	Weight [kg]
8 - 10	1,500	0.60	4,800	-	4,800	2280	1985	2110	185
10 - 14	2,100	0.84	6,500	-	6,500	2390	2190	2390	220
12 – 16	2,400	0.96	7,500	1 x 3,750	1 x 3,750	2280	1755	1880	150
16 - 21	3,300	1.32	9,600	1 x 4,800	1 x 4,800	5160	1985	2430	185
20 - 28	4,200	1.68	13,000	1 x 6,500	1 x 6,500	5380	2190	2710	220

Scope of supply: Carat S underground tanks, tank domes, telescopic dome shafts 600, oneAdvanced system pack (>> page 46 – the GRAF modular system). Please order the air hoses separately (>> page 30). \*Total measurement

#### Technical data

one <b>Advanced</b>
EN 12566-3/SR66:2015
fully biological SBR lifting t
90 inhabitants   13,5
1 – 4 per year

#### Parameter

COD (chemical oxygen demand)	91.9 %	51 mg/l
BOD5 (biochemical oxygen demand)	95.9 %	12 mg/l
SS (suspended solids)	94.4 %	20 mg/l
NH4-N (ammoniacal nitrogen)	65.6 %	12 mg/l
Ntotal (total Nitrogen)	62.0 %	21.1 mg/l
Ptotal (with +P Modul)	94.4 %	0.4 mg/l
eColi+H (with +H Modul)	99.9 %	99.9 %

Results of practical testing undertaken by the Prüfinstitut für Abwassertechnik (Testing Institute for Wastewater Technology), Aachen



#### Q WEBCODE G5114

Accessories

>> page 30

Additional +modules >> page 31

2015 to 50PE fting technology 13,500 l/d year



## oneAdvanced wastewater solutions

up to 1000 PE (150,000 l/day)



#### oneAdvanced system in the Carat XL/XXL underground tank

Inhabitants [max.]	Max. daily flow [l/d]	Max. organic load [kg BOD5/d]	Primary treatment [capacity in l]	SBR tank [capacity in l]	Required air hoses [quantity x Ø mm]	Length* [m]	Width* [m]	Order no.
38	5,700	2,28	1 x 8,500	1 x 8,500	3 x 13, 1 x 19			107755
46	6,900	2,76	1 x 10,000	1 x 10,000	3 x 13, 1 x 19			107756
50	9,000	3,60	1 x 13,000	1 x 13,000	3 x 19, 1 x 25			105346
75	11,250	4,50	1 x 16,000	1 x 16,000	3 x 19, 1 x 25	9.90	2.50	106125
100	15,000	6,00	1 x 22,000	1 x 22,000	5 x 19	12.90	2.50	106404
125	18,750	7,50	1 x 26,000	1 x 26,000	5 x 25	16.20	2.50	106126
150	22,500	9,00	1 x 32,000	1 x 32,000	6 x 25	17.70	2.50	106106
175	26,250	10,50	1 x 38,000	1 x 38,000	6 x 25	21.60	2.50	105220
200	30,000	12,00	2 x 22,000	2 x 22,000	10 x 25	26.40	2.50	106970
220	33,000	13,20	1 x 44,000	1 x 44,000	9 x 25	23.50	2.50	105221
250	37,500	15,00	1 x 32,000 1 x 16,000	2 x 26,000	10 x 25	30.50	2.50	106049
275	41,250	16,50	1 x 52,000	2 x 32,000	12 x 25	13.30	8.70	105222
300	45,000	18,00	1 x 52,000	2 x 32,000	12 x 25	13.30	8.70	106050
350	52,500	21,00	3 x 22,000	2 x 38,000	12 x 25	19.90	5.60	106492
400	60,000	24,00	2 x 26,000	2 x 44,000	18 x 25	21.40	5.60	105266
500	75,000	30,00	3 x 22,000	4 x 26,000	24 x 25	27.50	5.60	105224
600	90,000	36,00	3 x 26,000	4 x 32,000	24 x 25	16.20	11.80	105225
700	105,000	42,00	1 x 42,000 2 x 32,000	4 x 38,000	24 x 25	27.50	5.60	105226
800	120,000	48,00	1 x 38,000 3 x 22,000	3 x 54,000	30 x 25	26.20	8.70	105227
900	135,000	54,00	1 x 54,000 3 x 22,000	3 x 54,000	30 x 25	29.10	8.70	105228
1,000	150,000	60.00	1 x 54,000 3 x 22,000	6 x 38,000	36 x 25	30.50	8.70	105229

Scope of supply: Carat XL / XXL underground tank, tank domes maxi, telescopic dome shafts 600, factory pre-fitted technology and control cabinet for indoor fitting. The air hoses from the underground tanks to the control panel are not included. \*Total measurements

#### Q WEBCODE G5114

#### Technical data

System	one <b>Advar</b>
System conformity	EN 12566-3 / SR66:
Purifying technology	fully biological SBR lif
Multi-tank systems available up to	1,000 inhabitants
Maintenance interval	3 – 4 per y



#### nced

5:2015 to 50PE ifting technology 5 | 150,000 l/d year

#### Accessories

>> page 30

Additional +modules >> page 31

# **Outdoor Cabinets**

for oneAdvanced / one2cleanXtra



#### Outdoor plastic cabinet M

- Easy access for the maintenance fitter
- Function checking is simple as the control unit is located immediately next to the system
- Ideal solution for large distances from the house (> 20 m)
- Flexible use of the proven GRAF Indoor PP control cabinet in the Outdoor plastic cabinet M (size 3 – 28 inhabitants)
- Lockable housing in sturdy, weatherresistant plastic Integrated double power socket for easy

maintenance

• No foundation necessary

#### Outdoor plastic cabinet L

- Easy access for the maintenance fitter
- Maintenance engineer
- Function checking is simple as the control unit is located immediately next to the system
- Lockable housing (simultaneous locking) in sturdy, weather-resistant plastic
- Hose connections colour-coded
  - No foundation necessary





#### Outdoor steel cabinet L\* Outdoor steel cabinet XL\*

- Particularly robust design of powder coated steel sheet (1.5 mm / 0.005")
- Spray proof (IP 44)
- Lockable housing
- Hose connections colour-coded

- - Spray proof (IP 44)
  - Lockable housing
  - Hose connections colour-coded

Technical	data

Inhahitanta	For 3 – 28 inhabitants	For 32 – 46 inhabitants	For 42 – 60 inhabitants	For 60 – 175 inhabitants	For 200 – 1,000 inhabitants
Innabilants	(up to 4,200 l/d)	(up to 6,900 l/d)	(up to 9,000 l/d)	(up to 9,000 l/d)	(up to 150,000 l/d)
For air compressors	LA 80, XP 80, HP 100 - 200	DT 4.16	2 x HP 200	R30-MD, R40-MD, KDT 3.80	KDT 3.100, 3.140
Upstream fuse	B16A (provided by customer)	B16A (provided by customer)	B16A (provided by customer)	B16A (provided by customer)	B16A (provided by customer)
Voltage supply	230 V AC ± 20 %, 50 Hz	230 V AC ± 20 %, 50 Hz	230 V AC ± 20 %, 50 Hz	380 VAC, 3~, 50 Hz	380 VAC, 3~, 50 Hz
IP	IP44	IP 44	IP 44	IP 44	IP 44
Relative air humidity	10 to 95 %	10 to 95 %	10 to 95 %	10 to 95 %	10 to 95 %
Temperature range	-25°C to +50°C	-25°C to +50°C	-25°C to +50°C	-25°C to +50°C	-25°C to +50°C
Total weight	10 kg (22 lbs)	-	100 kg	140 kg	210 kg
Connecting line	via two-pin earthed plug	via two-pin earthed plug	via two-pin earthed plug	via four-pin earthed plug	via four-pin earthed plug
Air compressor	230 V	230 V	230 V	380 V	380 V
Stepped motors	24 V	24 V	24 V	24 V	24 V
Outdoor surfaces	Plastic	Plastic	Steel sheet 1.5 mm, powder coated	Steel sheet 1.5 mm, powder coated	Steel sheet 1.5 mm, powder coated
Lock	Cam lock	Espagnolette lock (simultaneous locking), pivoted lever, lock incl. profile half cylinder	Espagnolette lock (simultaneous locking), pivoted lever, lock incl. profile half cylinder	Espagnolette lock (simultaneous locking), pivoted lever lock incl. profile half cylinder	Espagnolette lock (simultaneous locking), pivoted lever lock incl. profile half cylinder
Dimensions (W x H x D)	450 x 1420 x 400 mm	480 x 1750 x 340 mm	800 x 880 x 675 mm	1140 x 1080 x 720 mm	2000 x 1100 x 900 mm
Order No.	106589	On request	On request	On request	On request

#### Accessories

**Cooling ventilation fan for Outdoor Plastic cabinet M** Order no. 105954

Warning lamp for Outdoor plastic cabinet M Order no. 105955



Filling granulate for Outdoor plastic cabinet L Prevents soil moisture from rising into the cabinet. 1 bag required; 50 l bag Order no. 107607



Outdoor air intake filter For air compressor R30-MD and R40-MD Order no. 105379







• Particularly robust design of powder coated steel sheet (1.5 mm / 0.005")

#### Outdoor steel cabinet XXL\*

- Particularly robust design of powder coated steel sheet (1.5 mm / 0.005")
- Spray proof (IP 44)
- Lockable housing
- Hose connections colour-coded

\* Solid foundation must be provided on-site.

## Accessories for oneAdvanced / one2cleanXtra

# Available +modules

Odour-tight empty pipe seal DN110 for systems compatible with SBR-hose packages up to 28 PE

107887

- Ensures no air, humidity or gas escapes from conduit pipe
- No need for PU seals
- Clean and professional solution



#### SBR hose package

For 3 – 19 PE (one-tank systems) Includes: 1 x Ø 19 mm and 1 x Ø 13 mm PVC hose; colour-coded

Length: 10 m	107686
Length: 20 m	107688
Other SBR-hoses	on request

#### SBR hose package

For 10 – 28 PE Includes: 1 x Ø 19 mm and 3 x Ø 13 mm PVC hose; colour-coded

Length: 10 m	107190
Length: 20 m	107192
Other SBR-hoses	on request

teres.	-	 
		 -
8-9-1		

Extention 300 mm

To achieve earth covering of up to 1,5 m

371003



Fixing plate for canister Convenient positioning of the precipitant canister inside the on request tank dome (maxi tank dome requiered)

Sampling point, indoor For one**2clean**Xtra up to 32 PE For one**Advanced** up to 60 PE

107170





+D	<b>Denitrification module</b> The +D module for denitrification (removal of nitrogen) resul satisfying very strict requirements. The GRAF systems thereb parameters of inorganic nitrogen compounds) of less than 2
+ <b>P</b>	Phosphate removal module Phosphate in water results in a massive build-up of algae. The GRAF +P module ensures the safe removal of phosphate great water quality.
+ <b>C</b>	Carbon infeed module Solution for weekend homes The addition of carbon as a nutrient allows the purification p and prevents the biology from dying off.
+0	<b>Pump-operated outlet module</b> Lifts the clear water when the outlet pipe is lower than the w
+ <b>B</b>	Module buffer pump for short-term peak loads Only suitable for one <b>Advanced</b>
+ <b>R</b>	<b>Remote transmission modules</b> Remote monitoring allows error messages to be transmitted and operating data to be queried by text message. Conven treatment system controled by mobile network or LAN is a
	Greater efficiency
	Greater operating reliability     Optimized convice intervals
	Greater customer benefit thanks to monitoring service
	<ul> <li>Low-cost remote diagnosis in the event of a fault without to come on site</li> </ul>
+	<b>Hygiene module - Disinfection</b> Disinfection using the +H module (by chlor or UV) satisfies purity requirements for a GRAF wastewater treatment syst and microorganisms. The clarified water therefore complie Directive.
	• Easy to operate
	Maintenance-friendly thanks to easy-to-remove module     Sitted in deventment shaft
	Fitted in downstream shart     Controllable chloring dosing for chlor module
	• Controllable chlorine dosing for chlor module

- in downstream installed storage or collection tanks for the re-use of wastewater. • Patented, simple and valve-free setup with automatic gravitationally driven backwash for minimal maintenance requirements
- Certified performance according to EN 12566-7
- Prefabricated plug and play system guarantees minimal work for piping and installation on site
- Robust UV- and waterproof housing with lock for outside installation

\* For systems up to 50 PE



Order no.

Its in the clarified water quality on request by attain a Ntotal value (total 25 mg/l. 105958\* and therefore 105946\* process to continue on request ater course. 107406 ed to mobile phones ient remote wastewater also possible. on request the service fitter having even the most stringent of tem. It reliably kills off germs es with the EU Bathing Water on request variations, the GRAF sand ification performance of on system reduces suspended solids, COD and BOD of the secondary clarified effluent and may also serve to prevent debris 106389

# Polishing filter

Low pressure network pipe kits

# **Tertiary filter**

GRAF Ireland offer complete pipe kits for pump discharge pressurised pipe networks, also known as pumped distribution systems.

The low pressure networks work by distributing the pumped discharge from a sewage treatment plant or a septic tank through a series of small diameter pipes that are pre drilled with small holes to allow the water to drain from the pipes, as per the EPA code of practice. The low pressure network is placed on a 300 mm stone bed covered with geotextile over suitable soil sub layers. A minimum of 300 mm of topsoil is then placed on top of the geotextile. Low pressure networks are needed due to difficult site conditions for example, high water table, insufficient subsoil depth and poor soil percolation. Graf offer the full kit including rising main, non-return valves, distribution pipes, flush valves and geotextile and full installation can be provided by the Graf specialist team. In case of strict effluent quality requirements or high influent load variations, the GRAF tertiary filter modules (Sand filter module or E-Chlorination module) are recommended to enhance and stabilize the purification performance of your sewage treatment system.







#### Comparison – polishing filter

Treatment plant for a 4 Bedroom house requires with

#### a soil polishing filter



#### Sand filter

- ✓ Self cleaning and nearly no maintenance
- Requires only ½ m² footprint of your garden
- Less installation time
- Less costs

The self cleaning dual media filtration system reduces suspended solids, COD and BOD of the secondary clarified effluent additional and may also serve to prevent debris in downstream installed storage or collection tanks for the reuse of wastewater. Patented, simple and valve-free setup with automatic gravitationally driven backwash for minimal maintenance requirements.

- Easy to operate
- Patented
- Simple and valve-free setup with automatic gravitationally driven backwash for minimal maintenance requirements
- Requires only 1 m<sup>2</sup> space

<ul> <li>Treatment efficiency</li> </ul>	:
COD	29,7 %
BOD5	47,7 %
SS	64,2 %

• Certified to EN12566: part 7







#### **E-Chlorination**

Enables flush ground installation

- ✓ Your garden will not be affected at all
- Controllable chlorine dosing
- ✓ Fulfilles future requierments of EPA

Disinfection using the +H module by chlor satisfies even the most stringent of purity requirements for a GRAF wastewater treatment system. It reliably kills off germs and microorganisms. The clarified water therefore complies with the EU Bathing Water Directive.

- Easy to operate
- Maintenance-friendly thanks to easy-to-remove module
- Fitted in downstream shaft
- Treatment efficiency:

	-
COD	11,7 %
BOD5	24,1 %
SS	41,4 %
Ammonia	14,4 %
E. coli	99,9 %
Faecal coliforms	99,9 %
Total coliforms	99,9 %

• Certified to EN12566: part 7





	TOPSELLER	PREMIUM	PREMIUM
System	one <b>2clean</b>	one <b>2clean</b> Xtra	one <b>Advanced</b>
Example applications	domestic & small commercial	single houses, townhouses, small communities	domestic & commercial (hotels, companies, small communities), for projects with higher demands on nutrients removal
Page	14	14	24
System conformity	EN 12566-3 / SR66:2015 to 50PE	EN 12566-3 / SR66:2015 to 50PE	EN 12566-3 / SR66:2015 to 50PE
Purifying technology	fully biological SBR lifting technology	fully biological SBR lifting technology	fully biological SBR lifting technology
One-tank systems available up to	19 inhabitants 2,850 l/d	70 inhabitants 10,500 l/d	14 inhabitants 2,100 l/d
Multitank systems available up to	-	-	1000 inhabitants 150,000 l/d
Maintenance interval	1 – 2 per year	1 – 2 per year	1 – 4 per year
Control			
Holiday / economy mode (underload detection)	_	•	•
+R Remote transmission controlled by GSM or LAN	-	0	0
+P Phosphate removal	_	0	0
+C Carbon infeed		0	0
+H Hygiene package (Disinfection)	_	0	0
+D Removal of nitrogen	•	•	0
+B Buffer pump for short-term peak loads		_	0
+O Outlet with clear water pump		0	0
Control power failure recognition	_	•	•
Temperature sensor to protect against overheating	_	•	•
Logbook function	•	•	•
USB-Slot for display size an logging		•	•
Outdoor control cabinet for installing control unit outdoors	0	0	0
Annual power consumption	358 kWh (5 inhabitants   750 l/d)	289 kWh (5 inhabitants   750 l/d)	289 kWh (5 inhabitants   750 l/d)

#### Parameter cleaning performance

COD (chemical oxygen demand)	94.8 %	94.8 %	91.9 %
BOD5 (biochemical oxygen demand)	98.1%	98.1 %	95.9 %
SS (suspended solids)	96.6 %	96.6 %	94.4 %
NH4-N (ammoniacal nitrogen)	98.3 %	98.3 %	65.6 %
Ntotal (total nitrogen)	87.0 %	87.0 %	62.0 %
P <sub>total</sub> (with +P Modul)	-	95.1 %	94.5 %
eColi (with +H Modul)	-	99.9 %	99.9 %
Results of practical testing undertaken by the Prüfinstitut für Abwassertechnik			

Results of practical testing undertaken by the Prüfinstitut für Abwassertechn (Testing Institute for Wastewater Technology), Aachen



# KLARO**MAX**

Retrofitting systems for concrete tanks from 1,000 PE (150,000 I/d) upwards

## KLARO**container**

Containerized wastewater treatment plant



#### KLARO**MAX** Customised solution for the efficient treatment of large volumes of wastewater

Specially designed for applications with a daily wastewater volume of 150 m<sup>3</sup> or more per day, the KLARO MAX wastewater treatment plant is a reliable solution for a wide variety of locations worldwide.

Our systems are characterised by their impressive performance and versatility. The KLARO MAX wastewater treatment technology is designed to be very safe and robust, and is also extremely flexible when it comes to adapting to the specific requirements of a wide range of applications. From industrial plants to municipal facilities – KLARO MAX sets new standards in wastewater treatment. The efficiency of KLARO MAX is the result of state-of-the-art technology and many

years of experience in the development of wastewater treatment plants. We also offer the option of further optimising the system with various additional modules to meet the individual requirements of our partners.

- Robust technology
- Individual planning Energy-efficient
- treatment process
- Reliable safty principle



Example: Two-line system from 5,000 PE

Q WEBCODE G5206

#### KLARO**container** The intelligent mobile wastewater solution

KLAROcontainer is the mobile wastewater treatment plant in the standard 20 feet or 40 feet container. The plant was designed to be easily assembled and disassembled (plug-andplay principle). This makes the container plant particularly suitable for temporary use. It can be used in a wide variety of areas, such as traveling construction sites, worker camps, quarries or production sites with many workers. It is also suitable for remote locations such as research, tourist or military camps. Due to the installation in the container, the technology is optimally protected against all weather conditions and additionally easy to transport.

KLAROcontainer is a fully biological wastewater treatment plant that operates according to the proven KLARO SBR concept.

- Easy to transport (standard 20 ft container)
- Refabricated and expandable construction
- Quick assembly and disassembly (plug-and-play)
- Low power consumption (13 kWh/d – 20 ft container)
- Designed for 15 m<sup>3</sup> (20 ft container) per day resp. 34,5 m<sup>3</sup> (40 ft)
- Modularly expandable for larger wastewater volumes



Q WEBCODE G5116





# one**Zero**

# > Septic tank



Page 40

# Septic Tank



#### Who needs septic tanks?

Septic tanks are still the most common treatment systems being used for private houses worldwide.

Floating and removable material is extracted from domestic wastewater in mechanical wastewater tanks. This is purely mechanical cleaning. GRAF offers a versitile range of septic tank solutions. GRAF tanks can be upgraded to fully-biological treatment plants or rainwater harvesting systems.

#### Benefits

- ✓ Stability tested according to European standard (DIN EN 12566-1)
- Fast tank fitting with profile seal and fast connectors
- ✓ Tanks can be used for rainwater harvesting systems after thorough cleaning
- ✓ Low weight: can also be installed in difficult local conditions without a crane
- Low maintenance: maintenance or cleaning work can be performed through the shafts
- ✓ Tanks can be used as rainwater harvesting systems after thorough cleaning



www.graf.info/v513

#### EN 12566-3/SR66:2015 to 50PE Hydraulic efficiency 99.9 %

CE-compliant Septic tanks

#### Accessories

Inspection end DN200 For Carat S 4,800 l and 6,500 l Order no. 340527



\*Refer to the installation instructions for

#### Technical data

System	Septic ta
Example applications	Domestic & con (single houses / small
Page	40
System conformity	PIA
Purifying technology	Mechanical sep
Maintenance interval	1 time per



#### Carat S Three chambers / Two chambers / One chamber

Inhabitants [max]	Total volume [l]	Capacity [l]	Length [mm]	Width [mm]	Height [mm]	Weight [kg]
2	2,700	2,700	2080	1565	2010	145
9	3,750	3,750	2280	1755	2200	175
15	4,800	4,800	2280	1985	2430	220
27	6,500	6,500	2390	2190	2710	260

Scope of supply: Carat S underground tank with baffle. Also available without baffle as a one-chamber wastewater tank. (>> page 48 - suitable covers >> page 50 - different baffle position)



#### Q WEBCODE G5504

nk

nmercial communities)

paration year

The GRAF modular system

>> page 46



# one**Tank**

- > Carat S Underground Tank
- > The GRAF Modular System
- > Carat XL
- > Carat XXL



Page 44 Page 46 Page 52 Page 53

# Carat S Underground Tank

#### Benefits

- ✓ Unrivalled fitting accuracy
- ✓ Ribbed tank base
- Steady in groundwater thanks to extremely stable constructionthanks to its extremely stable construction
- Very high stability thanks to modern production methods
- ✓ Made of 100 % recycling material
- Easy to transport, 5 9 tanks per pallet
- ✓ Up to 36 complete wastewater systems or 45 wastewater tanks per lorry







#### Flush with ground level

- Unique fit accuracy of the components
- Suitable for vehicle loading (when combined with the adequate telescopic dome shaft)
- Numerous seals to effectively stop dirt getting into the tank
- The height of the telescopic tank dome can be smoothly adjusted
- The telescopic tank dome can additionally be inclined by 5° to suit the local conditions
- Impact-resistant





#### Easy and safe assembly





Telescopic dome shaft 600 car suitable for vehicles

#### Additional +modules >> page 47



Assembly of Carat S underground tank

GRAF TV www.graf.info/v507





The GRAF Modular System

Choose your system from four different modulars









one**2clean**Xtra 3 – 18 PE



one**Advanced** 10 – 1,000 PE





#### Carat S underground tank Suitable for vehicle loading

Size 2,700 - 6,500 litres. Designed to be used in conjunction with the vehicle loading telescopic tank dome. The access dome is designed in accordance with DIN testing.





#### Dimensions

Volume [l]	Width B [mm]	Length L [mm]	Height H [mm]	Height H <sup>tot</sup> [mm]	Height of tank dome Ht [mm]	Inner Ø of tank dome [mm]	Weight [kg]	Order no.
2,700	1565	2080	1400	2010	610	650 – 800	120	372024
(700 US gal.)	(61.6")	(81.9")	(55.1")	(79.1")	(24.0")	(25.6 – 31.5")	(265 lbs)	
3,750	1755	2280	1590	2200	610	650 – 800	150	372025
(1,000 US gal.)	(69.1")	(89.8'')	(62.6")	(86.6")	(24.0")	(25.6 – 31.5")	(331 lbs)	
4,800	1985	2280	1820	2430	610	650 – 800	185	372026
(1,250 US gal.)	(78.2")	(89.8")	(71.6")	(95.7")	(24.0")	(25.6 – 31.5")	(408 lbs)	
6,500	2190	2390	2100	2710	610	650 – 800	220	372027
(1,700 US gal.)	(86.2")	(94.1")	(82.7")	(106.7")	(24.0")	(25.6 – 31.5")	(485 lbs)	

#### Technical data

Max. earth covering (without groundwater vehicle loading)	1500 mm (59.1")
Max. vehicle weight	12 to (26456 lbs)
Earth covering required for vehicle loading	800 – 1500 mm (31.5 – 59.1")
Groundwater stability	Up to tank equator
Earth covering required for groundwater stability	800 – 1500 mm (31.5 – 59.1")
Connection	DN110 / DN160 / DN200 on top



Illustration shows 4,800 litre tank with telescopic dome shaft 600 for pedestrian loading

#### Q WEBCODE G5305





## Carat S Underground Tank

Choose your tank domes and covers



#### Tank dome Micro

- Weight: 7 kg (15,43 lbs)
- Including green lid
- For shallow excavation
- Earth cover only 90 mm Order no. 371009



Tank dome Mini • Weight: 11 kg (24 lbs) • For especially flat installation • Incl. 3 edge seals • For systems up to 2 tanks Order no. 371041





• With PP lid

#### Extension

- Weight: 6 kg (13 lbs)
- The earth covering can be raised 300 mm using the extension

Order no. 371003



• Weight: 9 kg (19 lbs)

plus 140 – 340 mm (5.51 – 13.4") earth

tank surface

Order no. 371010

covering

#### Telescopic dome shaft 600 Mini Telescopic dome shaft 600 Maxi

- With PP lid
- Suitable for pedestrian loading • Suitable for pedestrian loading
  - Weight: 15 kg (33 lbs)

Tank dome Maxi

(loading capacity)

Incl. 5 edge seals

Order no. 371040

• Weight: 15 kg (33 lbs)

• For large earth coverings

• For multi tank systems ≥ 4 tanks

- Adjustable earth covering across upper • Adjustable earth covering across upper tank surface
  - plus 140 440 mm (5.51 17.3") earth covering

Order no. 371011



#### Telescopic dome shaft 600 cast iron

- Suitable for vehicle loading with childproof cast iron cover up to 3.5 t (7716 lbs)
- Weight: 55 kg (121 lbs)
- Adjustable earth covering across upper tank surface
- plus 140 440 mm (5.51 17.3") earth covering
- Order no. 371020



#### Telescopic dome shaft 600 universal

- Weight: 11 kg (24 lbs)
  - - tank surface • For commercially available cast iron

covers (to be provided on site) plus 140 - 440 mm (5.51 - 17.3") earth





Tank dome Micro



Tank dome Mini



Tank dome Maxi





suitable for vehicles

Telescopic dome shaft 600 Mini suitable for pedestrian loading





• Suitable for vehicle/ lorry-bearing

 Cover to be provided on site Adjustable earth covering across upper

- Telescopic dome shaft 600 car
- Suitable for vehicle loading with childproof plastic lid cover up to 3.5 t (7716 lbs)
- Weight: 22,5 kg (50 lbs)
- Adjustable earth covering across upper tank surface
- Perfect fitting accuracy
- Corrosion free, childproof plastic cover

plus 140 mm – 440 mm (5.51 – 17.3") earth covering

Order no. 371052

Telescopic dome shaft 600 cast iron



Telescopic dome shaft 600 car suitable for vehicles



Carat S Underground Tank Choose your system pack

The baffle separates the Carat S underground tank into two or three chambers as desired. It consists of two halves and is simple to insert when assembling the second tank half of the Carat S. A profile seal provides reliable and permanent separation of the chambers. The Carat S underground tank with baffle is ready for use as a multichamber tank. This can then be expanded by means of a system pack to create a wastewater treatment system (>> page 46). The system pack is simply fitted to the baffle and the control unit is installed in the house - and the wastewater treatment system is ready to go.





Flexible baffle positions









Examples of different baffle positions.

#### Baffle for Carat S tank

Volume [l]	pcs/pal	Positions	Weight [kg]	Order no.
2,700 (700 US gal.)	9	1/2	20 (44 lbs)	375067
2,700 (700 US gal.)	9	1/3	20 (44 lbs)	375077
3,750 (1,000 US gal.)	7	1/2	25 (55 lbs)	375025
3,750 (1,000 US gal.)	7	1/3	25 (55 lbs)	375080
4,800 (1,250 US gal.)	5	several positions	35 (77 lbs)	375026
6,500 (1,700 US gal.)	5	several positions	45 (99 lbs)	375027



The system pack one2clean/one2cleanXtra (>> page 14) works according to the SBR air lift pump process. T his requires a wastewater tank with a scum baffle.

Scope of supply: control cabinet with air compressor for indoor mounting, one2clean/one2cleanXtra system pack comprising air lift pumps and tube diffuser. Air hose not included.

System pack oneAdvanced

The system pack oneAdvanced (>> page 24) works according to the SBR air lift pump process. This requires a wastewater tank with two chambers.

Scope of supply: control cabinet with air compressor for indoor mounting, oneAdvanced system pack comprising air lift pumps and disk diffuser. Air hose not included.

#### Accessories

SBR hose package for 3 – 19 PE (one <b>2clean</b> and one <b>2clean</b> Xtra <b>one-tank-system)</b> Includes: 1 x Ø 19 mm and 1 x Ø 13 mm PVC hose; colour-coded		<b>SBR hose package for 10 – 28 PE</b> (one <b>Advanced)</b> Includes: 1 x Ø 19 mm; 3 x Ø 13 mm, PVC hose; colour-coded	
10 m	Order no. 107686	10 m	Order no. 107190
20 m	Order no. 107688	20 m	Order no. 107192

GDAE
GRAD

Inhabitants [max.]	Tank volume [l]	one <b>2clean</b> [ <b>Order no.]</b>	one <b>2clean</b> Xtra [Order no.]
One tank system			
3	2,700	106850	106413
5	3,750	106851	106414
7	4,800	106852	106415
9	6,500	106853	106416

#### Two tank system

7	2 x 2,700	106854	—
10	2 x 3,750	106855	—
14	2 x 4,800	106856	—
18	2 x 6,500	106857	—

Inhabitants [max.]	Tank volume [l]	System packs [Order no.]
10	4,800	106572
14	6,500	106841
16	2 x 3,750	106847
22	2 x 4,800	106931
28	2 x 6,500	106943
32	4 x 3,750	106949
44	4 x 4,800	106952
50	4 x 6,500	106955
60	4 x 6,500	372710
90	5 x 6,500	372711

# Carat XL Underground Tank

up to 13,000 litres



# Carat XXL Underground Tank

(ZIM

up to 52,000 litres

Dimensions							
Volume [l]	S Width W [mm]	Length L [mm]	Height H [mm]	Height H <sup>tot</sup> [mm]	Height of dome shaft Ht [mm]	Indoor Ø of dome shaft [mm]	Weigh [kg]
16,000	2500	4590	2550	3160	610	650	770
22,000*	2500	6230	2550	3160	610	650	1025
26,000*	2500	7200	2550	3160	610	650	1125
32,000*	2500	8440	2550	3160	610	650	1405
36,000*	2500	9410	2550	3160	610	650	1500
42,000*	2500	10680	2550	3160	610	650	1795
46,000*	2500	11650	2550	3160	610	650	1890
52,000*	2500	12920	2550	3160	610	650	2185
56,000*	2500	13890	2550	3160	610	650	2280
	2500	15160	2550	3160	610	650	2580
62,000*					610	650	2670
62,000* 66,000*	2500	16130	2550	3160	610	650	2070
62,000* 66,000* 72,000*	2500 2500	16130 17400	2550 2550	3160 3160	610	650	2965

#### Dimensions

Volume [l]	Width B [mm]	Length L [mm]	Height H [mm]	Height H <sub>tot</sub> [mm]	Height of dome shaft Ht [mm]	Indoor Ø of dome shaft [mm]	Weight [kg]
8,500	2040	3500	2085	2695	610	650	380
10,000	2240	3520	2285	2895	610	650	455
13,000	2420	4000	2470	3080	610	650	600

#### Technical data

Max. earth covering (without groundwater vehicle loading)	2000 mm (6' 6.7")
Max. axle load	3.5 to (7716 lbs) with 2.2 to cast iron cover, 12 to (26456 lbs) with telescopic dome shaft 600 lorry
Max. total weight	12 to (26456 lbs)
Earth covering required for vehicle loading	800 mm – 2000 mm (31.5" – 6' 6.7")
Groundwater stability	up to middle of tank
Earth covering required for groundwater stability	800 mm – 1800 mm (31.5" – 5' 10.9")
Connection	5 x DN160 (6") + 2 x DN200 (8") (on top)





DN315 connection on end face on request





Ø of haft ]	Weight [kg]	
	770	
	1025	
	1125	





# one**Sepa**

- > System at a glance
- > one**Sepa** Grease
- > one**Sepa** Oil



Page 56 Page 58 Page 66

## oneSepa separators

System at a glance



#### oneSepa separator systems

One of the biggest dangers for water is pollution from mineral liquids (such as petrol, oil, grease, ...). Just a single drop of petrol is enough to pollute 1 m<sup>3</sup> of pure water.

To prevent environmental damage caused by the uncontrolled discharge of oil contaminated surface water runoff, effective and safe methods of separation technology must be used everywhere where light liquids come into contact with water.

With the light fluid separator oneSepa Oil – as well as the grease separator oneSepa Grease – GRAF offers sophisticated separation systems.

# Where to use which separator?

oneSepa Grease is the perfect add on for GRAF treatment plants. When a kitchen (restaurant) is connected to a fully biological treatment, a grease separator should be installed in front of the system.

oneSepa Oil is the ideal solution for Stormwater water management systems. If rainwater from gas stations, car washes or car parks feeds into a drainage or attenuation system (e.g. GRAF EcoBloc), a Light fluid separator is recommended.

#### Plastic – clear benefits over concrete

Because of their low weight, separtors made of plastic can be installed without heavy equipment. This allows easy transport and installation even in places that are difficult to access.

#### Ready for connection

All the components of GRAF separators are pre-fitted ready for connection, allowing time to be saved during on-site installation.

# Maximum water pollution control

Pure, clean water is one of the essential things in life, yet it's exposed to a large number of pollutants. One of the greatest hazards is contamination with light mineral liquids. A single drop of petrol is enough to contaminate one cubic metre of water.

GRAF separators offer maximum safety and protect the environment. The focus is of course in compliance with stipulated limit values.

#### Tested safety – with approval

GRAF separators are made of particularly robust and tough plastic. The fact that it is sealed up to the ground surface is a major advantage of plastic as a material.

#### No need to refurbish

Since they come into constant contact with highly aggressive wastewaters, concrete separators are at risk of corrosion and may require expensive refurbishment. Plastic separators, on the other hand, have smooth inner surfaces that will not corrode.







# System overview oneSepa Grease

#### Areas of application

Grease separators are needed wherever water is contaminated with fats and oils of natural origin. This concerns for example the following operations:

- Kitchen facilities and industrial kitchens (restaurants, hotels, etc.)
- Food distribution points with returnable dishes
- Meat and sausage processing plants (e.g. slaughterhouses, butcheries)
- Oil processing plants (e.g. oil mills)

Two tank domes

inspection.

• Plants for the production of ready meals

From size NS4, GRAF grease separators have two tank domes. Inlet and outlet are therefore easily accessible for easier

#### Sizing

Separator systems are classified by NS (nominal size). The choice of nominal size for the separator is specified in Part 2 of EN 1825. Furthermore, the requirements of the respective competent authority must be observed. A free calculation service for sizing according to EN 1825 is available on request.

#### Functional principle

A grease separator system works according to the physical principle of gravity. This means that heavy components in the wastewater, such as sludge, can settle at the bottom of the tank. In contrast, light components such as fats and oils rise to the surface of the water.

#### **Benefits**

- Low weight of the tank means no need for heavy equipment, compared to concrete systems
- Easy transport and installation, even in places that are difficult to access
- System is delivered pre-fitted
- Smooth and corrosion-free inner surfaces thanks to high-quality plastic



#### Flexible tank dome:

- Sealed up to the ground surface
- Easy adjustment to the ground surface thanks to telescopic/tiltable dome shaft
- Compatible with standard cast iron rings and covers





>> page 34

# one**Sepa Grease Saphir**

NS 1-4

# Installation dimensions



#### Scope of supply 1 Saphir tank 2 Pre-assembled components of grease separator

#### Not included in the scope of supply:

**3** Telescopic dome shaft separator >> page 64

4 Cast iron for grease separator



Saphir grease separator with Outdoor sampling shaft

>> page 64



Dimensions including 115 mm height for a manhole cover and frame

NS [l/s]	Connection [DN]	h⊧ [mm]	dinfl [mm]	dinfl2 [mm]	h <sub>tot</sub> [mm]	EC [mm]	Ø [mm]	Weight [kg]
1	110	835	800 - 980	870 - 1050	1620 – 1800	700 – 1200	1125	41
2	110	835	800 - 980	870 – 1050	1620 – 1800	700 – 1200	1125	41
2	110	1050	860 - 1040	930 – 1110	1900 - 2080	700 – 1200	1155	70
2	110	1050	860 - 1040	930 – 1110	1900 - 2080	700 – 1200	1155	70
2	110	1375	870 - 1070	940 - 1140	2220 - 2400	700 – 1200	1155	100
4	110	1375	870 - 1070	940 - 1140	2220 - 2400	700 – 1200	1155	100

#### one**Sepa Grease Saphir**

NS [l/s]	Connection [DN]	Grease [litres]	Sludge [litres]	Total [litres]	Order no. <sup>1)</sup>
1	110	200	200	500	108000
2	110	200	200	500	108001
2	110	300	200	730	108002
2	110	200	400	730	108003
2	110	300	500	1.025	108004
4	110	300	500	1.025	108005

Effectiveness tested by TÜV Rheinland according to EN 1825. 1) Telescopic dome shaft and cover not included

#### Technical data

Max. earth covering:	1200 mm
Max. axle load:	10 t (in conjunction with a load distribution plate)
Max. vehicle weight:	60 t (in conjunction with a load distribution plate)
Required earth covering for trafficability:	700 – 1200 mm above tank shoulder
Groundwater stability:	500 l, 730 l immersion depth max. 430 mm, 1,025 l immersion depth max. 550 mm
Required earth covering with groundwater installation:	700 – 1200 mm above tank shoulder
Connection:	DN 110

#### Q WEBCODE G5605

CE

EN 1825

Accessories

>> page 64





# one**Sepa Grease Diamant**

Installation dimensions

NS 4 – 15







**CE** EN 1825

Diamant grease separator with Outdoor sampling shaft >> page 64

Q WEBCODE G5606



NS [l/s]	Connection [DN]	h⊧ [mm]	dinfi [mm]	dinfl2 [mm]	h <sub>tot</sub> [mm]	EC [mm]	Ø [mm]	Weight [kg]
4	160	1080	880 - 1060	950 - 1130	1960 - 2240	700 – 910	1150	165
7	160	1080	880 - 1060	950 – 1130	1960 - 2240	700 – 910	1150	165
10	200	1280	930 - 1110	1000 - 1180	2210 - 2390	700 – 910	1400	250
15	200	1280	930 - 1110	1000 - 1180	2210 - 2390	700 – 910	1400	250

Dimensions including 115 mm height for a manhole cover and frame

#### one**Sepa Grease Diamant**

NS [l/s]	Connection [DN]	Grease [litres]	Sludge [litres]	Total [litres]	Order no.1)
4	160	350	700	2.070	108006
7	160	350	700	2.070	108007
10	200	600	1.500	3.160	108008
15	200	600	1.500	3.160	108009

Effectiveness tested by TÜV Rheinland according to EN 1825. 1) Telescopic dome shaft and cover not included

#### Technical data

Max. earth covering:	910 mm
Max. axle load:	10 t (in conjunction with a load distribution plate)
Max. vehicle weight:	60 t (in conjunction with a load distribution plate)
Required earth covering for trafficability:	700 – 910 mm above tank shoulder
Groundwater stability:	Type 2 2,070 l immersion depth max. 575 mm Type 3 3,160 l immersion depth max. 700 mm
Required earth covering with groundwater installation:	700 – 910 mm above tank shoulder
Connection:	DN 160 / DN 200

Looking for a larger separator solution? Enquire about our EcoPrimo products which can handle approx. up to 400 l/s





# Accessories for oneSepa Grease

#### Covers

Covers for one Sepa Grease, screwed, with inscription "Separator/Separador/Séparateur/Separatorer"

Cover	Ø [mm]	Height H [mm]	Effective height [mm]	Weight [kg]	Order no.
Extention Length 400 mm	600	400	300	6	371039
Extention Length 1100 mm	600	1210	1000	22	371061
1 Telescopic dome shaft, separators	855	460	340	11	107974





#### Dome structure

- Including NBR lip seals for smooth connection
- Sealed up to the ground surface
- Easy adjustment to the ground surface thanks to telescopic/tilting dome shaft
- Can be driven over by cars or trucks
- Infinitely adjustable earth covering across upper tank surface, tilts 5° (ideal for asphalt surfaces)

#### Height adjustable and tiltable

The dome structures can be adjusted in height and inclination (up to 5%), allowing greater flexibility during installation.

> Please note: A load-distributing is required to permanently ensure trafficability for cars and trucks. Further information can be found our installation instructions.



#### External sampling shaft

The separator systems can be extended with an external sampling point. The sampling shaft is connected downstream from the separator tank. In addition to taking wastewater samples in accordance with the regulations, it is also used to check and maintain the system.

#### Scope of supply

1 Sampling shaft

#### Not included in the scope of supply:

**2** Telescopic dome shaft, separators 3 Cast iron cover

Connection [DN]	Ø [mm]	Order no.
160	600	107975
200	600	107982

#### Installation dimensions

h⊧ [mm]	h₅ [mm]	dinfi [mm]	h <sub>tot</sub> [mm]	
285	1000	975 - 1155	1260 - 1440	
260	1000	1000 - 1180	1260 - 1440	

Dimensions including 105 mm height for a manhole cover and frame

Warning system Typ 1 Grease film thickness, incl. 10 m cable (other cable lengths on request) Order no. 106513

Warning system connection set Incl. wall duct, seal, drill hole on the tank on the desired side Order no. 106869



with NBR seal, for separator Order no. 106515

Wall duct













Warning system Type 2 Visual and acoustic warning when the grease film thickness is reached or is overflowing, incl. 5 m cable (other cable lengths on request) Order no. 106514

# System overview oneSepa Oil

Procedure and structure

#### Areas of application

A light fluid separator is needed wherever water is contaminated with petrol, mineral oils or greases. This concerns for example the following operations:

- Petrol stations
- Car washes
- Garages
- Large/public parking areas (if required by the authorities)

#### Sizing

Separator systems are classified by NS (nominal size). The choice of nominal size for the separator is specified in Part 2 of EN 858. Furthermore, the requirements of the respective competent authority must be observed. A free calculation service for sizing according to EN 858 is available on request.

> Separation efficiency\* Class  $I \leq 5 \text{ mg/l residual oil}$ Class II ≤ 100 mg/l residual oil \*under test conditions

#### **Benefits**

- Undemanding, low-waste maintenance of the coalescence unit
- ✓ Stainless steel mesh for coalescence until (systems ≥6 ) can be easily removed and cleaned
- Small internal sampling point pin available (saves additional cost of an external sampling shaft)
- Low weight of the tank means no need for heavy equipment, compared to concrete systems
- System is delivered pre-fitted
- Smooth and corrosion-free inner surfaces thanks to high-quality plastic

#### Functional principle

A light fluid separator system works according to the physical principle of gravity. This means that heavy components in the wastewater, such as sludge and sand, can settle in the optional sludge trap and / or in the sludge trap integrated in the separator. In contrast, light components such as fats and oils rise to the surface of the water. An optional coalescence unit improves the separation efficiency of a light fluid separator.



Low weight

# Inlet

#### Class II and Class I

The Class II system is the basic version of the light fluid separators. Due to the amount of oil they store, the separators are designed so that they can also be used at petrol stations with high-performance fuel pumps.

The Class I separator is a coalescence separator. It features an additional coalescence unit that enables a much higher degree of separation.

Oil collection area

Separation area

Oil and fat rise to the surface Sludge sinks to the bottom

Sludge reservoir 22222

#### Self-acting closing unit

The float of this unit ensures that when the maximum storage volume of the light fluid is reached, the outlet is closed and thus any fluid is retained in the separator.

#### oneSepa oil as an add on for

>> www.graf.info/ stormwater-management









Video light fluid separator

GRAF TV www.graf.info/v519

#### What does a coalescence unit do?



In addition to large oil droplets that can be easily separated, very small oil droplets also occur in a light fluid separator. Large oil droplets have a high difference in density to water, these rise. Small oil droplets have a small difference in density to water, these remain under the water surface.



To allow these small oil droplets to rise, the Class I light fluid separator features a coalescence unit where the small oil droplets can collect.



If enough small oil droplets have collected on the coalescence unit, large oil drops will be formed there. These rise and can be separated.

Petrol, oils

# one**Sepa Oil Saphir**

NS 3–6

# Installation dimensions





NS [l/s]	Connection [DN]	h⊧ [mm]	dinfl [mm]	h <sub>tot</sub> [mm]	EC [mm]	Ø [mm]	Weight [kg]
3	160	1000	905 - 1105	1905 - 2105	700 – 1200	1155	80
3	160	1320	910 - 1110	2230 - 2430	700 – 1200	1155	110
6	160	1000	905 - 1105	1905 - 2105	700 – 1200	1155	80
6	160	1320	910 – 1110	2230 - 2430	700 – 1200	1155	110

Dimensions including 115 mm height for a manhole cover and frame

Accessories

>> page 72

Q WEBCODE G5607

#### one**Sepa Oil Saphir**

NS [l/s]	Connection [DN]	Light fluid [litres]	Sludge [litres]	Total [litres]	Order no. Class II	Order no. Class I
3	160	300	300	770	108100	108101
3	160	500	400	1.100	108102	108103
3	160	300	600	1.080	108104	108105
6	160	300	600	1.080	108106	108107

#### Technical data

1200 mm
10 t (in conjunction with a load distribution plate)
60 t (in conjunction with a load distribution plate)
700 – 1200 mm above tank shoulder
700 l immersion depth max. 430 mm, 1,080 l; 1,100 l immersion depth max. 550 mm
700 – 1200 mm above tank shoulder
DN 160



# Installation dimensions

one**Sepa Oil Diamant** 

NS 6 – 15

#### Class II fuel separator



#### Scope of supply

1 Diamant tank incl. 1 extension piece as tank dome

2 Pre-assembled components of light fluid separator

Not included in the scope of supply: 3 Telescopic dome shaft separator

- >> page 72
- 4 Cast iron for light fluid separator
  5 Indoor sampling connection point
  > see below



Q WEBCODE G5608

CE

EN 858-2

#### one**Sepa Oil Diamant**

NS [l/s]	Connection [DN]	Light fluid [litres]	Sludge [litres]	Total [litres]	Order no. Class II	Order no. Class l
6	160	500	1.300	2.210	108108	108109
10	160	500	1.300	2.210	108110	108111
10	200	660	2.000	3.330	108112	108113
15	200	660	2.000	3.330	108114	108115

#### Technical data

Max. earth covering:	910 mm
Max. axle load:	10 t (in conjunction with a load distribution plate)
Max. vehicle weight:	60 t (in conjunction with a load distribution plate)
Required earth covering for trafficability:	700 – 910 mm above tank shoulder
Groundwater stability:	2,210 l immersion depth max. 575 mm 3,330 l immersion depth max. 700 mm
Required earth covering with groundwater installation:	700 – 910 mm above tank shoulder
Connection:	DN 160 / DN 200



NS [l/s]	Connection [DN]	h⊧ [mm]	dinfl [mm]	h <sub>tot</sub> [mm]	EC [mm]	Ø [mm]	Weight [kg]
6	160	1090	790 - 1080	1880 - 2170	700 – 910	1150	165
10	160	1090	790 – 1080	1880 - 2170	700 – 910	1150	165
10	200	1280	855 - 1145	2135 - 2425	700 – 910	1400	250
15	200	1280	855 - 1145	2135 - 2425	700 – 910	1400	250

Dimensions including 115 mm height for a manhole cover and frame

Looking for a larger separator solution? Enquire about our EcoPrimo products which can handle approx. up to 400 l/s





# Accessories for oneSepa Oil

#### Covers

Covers for oneSepa Oil with inscription "Separator/Separador/Séparateur/Separatorer"

Cover	Ø [mm]	Height H [mm]	Effective height [mm]	Weight [kg]	Order no.
Extention Length 400 mm	600	400	300	6	371039
Extention Length 1100 mm	600	1210	1000	22	371061
1 Telescopic dome shaft, separators	855	460	340	11	107974





#### Dome structure

- Including NBR lip seals for smooth Connection
- Sealed up to the ground surface
- Easy adjustment to the ground surface thanks to telescopic/tilting dome shaft
- Can be driven over by cars or trucks
- Infinitely adjustable earth covering across upper tank surface, tilts 5° (ideal for asphalt surfaces)

#### Height adjustable and tiltable

The dome structures can be adjusted in height and inclination (up to 5%), allowing greater flexibility during installation.

> Please note: A load-distributing is required to permanently ensure trafficability for cars and trucks. Further information can be found our installation instructions.



#### Outdoor sampling shaft

The separator systems can be extended with an outdoor sampling point. The sampling shaft is connected downstream from the separator tank. In addition to taking wastewater samples in accordance with the regulations, it is also used to check and maintain the system.

#### Scope of supply

1 sampling shaft

#### Not included in the scope of supply:

**2** Telescopic dome shaft, separators

3 Cas	t iron	cove
-------	--------	------

#### Installation dimensions

	hɛ [mm]	h₅ [mm]	dinfl [mm]	htot [mm]	
	285	1000	975 - 1155	1260 - 1440	
	260	1000	1000 - 1180	1260 - 1440	
_					

Dimensions including 105 mm height for a manhole cover and frame

# Maintenance kit



The maintenance kit for separator systems contains everything you need to carry out the monthly self-checks. Order no. 106619

Warning system connection set Incl. wall duct, seal, drill hole on the tank on the desired side Order no. 106869

Wall duct with NBR seal, for separator Order no. 106515









Warning sensors Incl. 10 m cable Type 1:



Oil film thickness alarm Order no. 107964

Type 2: Build-up alarm Order no. 107965

Type 3: Oil film thickness and build-up alarm Order no. 107966

# Installation dimensions

# Optional sludge trap one Sepa Oil





#### Scope of supply

1 Saphir or Diamant tank with preassembled components, sludge trap



Picture shows Saphir tank incl. extension piece as tank dome

#### Not included in the scope of supply:

2 Extension piece as tank dome

3 Telescopic dome shaft, separators4 Cast iron for light fluid separators



Picture shows Diamant tank incl. 1 extension piece as tank dome



Volume [litres]	Connection [DN]	h₌ [mm]	Ø [mm]	Weight [kg]	dinfl [mm]	h <sub>tot</sub> [mm]	EC [mm]
1.000	160	1325	1155	110	905 - 1105	2230 - 2430	700 – 1200
2.100	160	1110	1150	165	800 - 1060	1880 - 2170	700 – 910
3.200	160	1360	1400	240	800 - 1060	2160 - 2420	700 – 910
4.600	160	1650	1700	370	800 - 1060	2455 - 2715	700 – 910
2.100	200	1090	1150	165	820 - 1080	1880 - 2170	700 – 910
3.200	200	1340	1400	240	820 - 1080	2160 - 2420	700 – 910
4.600	200	1630	1700	370	820 - 1080	2455 - 2715	700 – 910

Dimensions including 115 mm height for a manhole cover and frame

#### Accessories

>> page 72

#### Saphir/Diamant sludge trap

Volume [litres]	Length [mm]	Width [mm]	Height [mm]	Weight [kg]	Order no. [DN160 connection]	Order no. [DN200 connection]
1.000	1160	1160	1670	110	107969	-
2.100	2450	1150	1660	165	107970	107992
3.200	2450	1400	1900	240	107971	107993
4.600	2450	1700	2200	370	107972	107994





# 

Climate change. Our world is currently facing huge challenges. In these trying times, the world needs good role models. Or rather: initiators that are not only preaching sustainability, but put it into practice. Just as we at GRAF are already making an important contribution. After all, it is not only our solutions for rainwater management and other applications related to our water that are thoroughly suistainable, but also the plastic we use to make our products.

For example, we turn short-lived food packaging into EcoBloc infiltration modules, with a lifespan that spans generations. In this way, we can make our cities a little safer against increasing heavy rainfalls. Or rainwater tanks allow us to water our gardens with a clear conscience even during hot spells. Along the way, recycling saves us about 100,000 tonnes of CO2 every year, which is almost as much as the emissions of over 60,000 cars.

By the way, we recycle our products ourselves. Our raw materials competence centre makes us unique. It is our heart and soul, containing not only all of our innovative power, but also our lifeblood. For a better world for us all – for a greener planet.





for a greener planet









# The GRAF recycling cycle



Recyclate at quality level of primary plastic

### This is us

The whole world is talking about sustainability. For us, it has long been a natural part of our DNA. We recognized the potential of rainwater early on: "Rainwater is free" was one of our first campaigns back in the 1970s. Rain barrels were produced in our family business as early as 1974. The first underground tanks for rainwater harvesting followed just four years later. GRAF rain barrels have been made from recycled material since 1980. By the way, rainwater is still free of charge. But in times of climate change, drought and heavy rain, sustainable water management is much more than that: it is a valuable contribution to our future.

## For this we stand



75 % share of recycling material

 $\mathbf{CO}_2$ 

100.000 TONNES  $CO_2$  savings every year as much as more than 60,000 cars emit



**Recycling material** FREE FROM POLLUTANTS

Products FULLY RECYCLABLE





For further information see: www.graf.info/en-ie/sustainability





Further details on infiltration, can be found in our catalogue "Environmentally friendly solutions".

Information on all products and systems in this brochure is subject to changes and errors.

Pictures and photographs are approximate only. The applicable technical documentation for the products shall control, which we will be happy to

All offers, deliveries and services are subject to our general terms and conditions, which we will also be happy to send you.

#### GRAF worldwide please visit www.graf.info/en-ie

**GRAF** Ireland **Environmental Ltd** Co Galway

H54 RD78 T: 00353 9351765 info@grafireland.ie





Image shows EcoPrimo (pre-filtration for stormwater systems)

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STORMWATER MANAGEMENT

**SEPARATORS** 

WASTEWATER TREATMENT SOLUTIONS



GRAF

11.1

2.3.3