

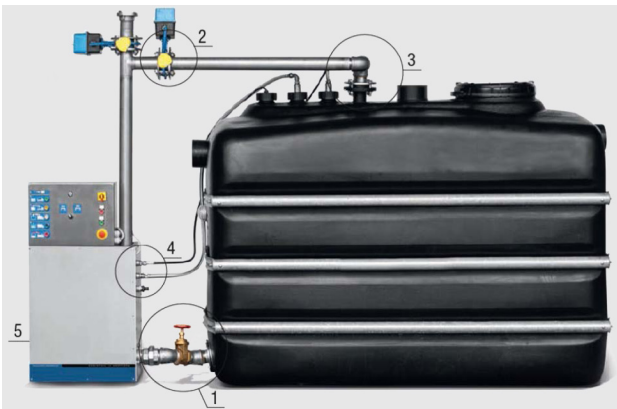
| ECOGREASE-A

**HIGH EFFICIENT GREASE SEPARATION.
THE CLEAR CHOICE FOR CLEAN WATER.**

PRODUCT OVERVIEW
INSTALLATION MANUAL
OPERATION & MAINTENANCE

“75% OF THE SEWER SYSTEMS IN THE UNITED STATES WORK AT ONLY HALF CAPACITY BECAUSE OF GREASE CLOGS... LOCAL GOVERNMENTS ALREADY SPEND \$25 BILLION PER YEAR TO KEEP THE SEWERS RUNNING.”

The Wall Street Journal - June 4, 2001



Government regulators continue to impose and enforce stricter local and national water-quality regulations. Current grease separation via outside grease trap/grease interceptor systems is inefficient, time consuming and costly.

The ecoGrease Interceptor finally offers the food industry a high efficient method of controlling the accumulation of grease. The system is easy to use, easy to monitor and will save restaurants, food service providers, food processing facilities AND taxpayers valuable resources.

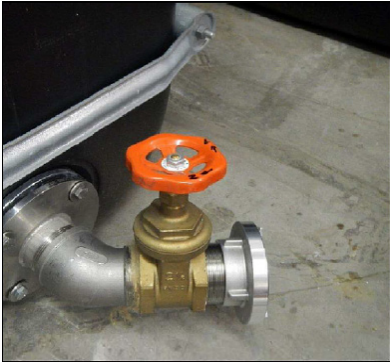
ecoGrease-a The clear choice for clean water.

Designed to exceed removal efficiencies <25ppm!

The ecoGrease system separates liquid, coagulating animal and vegetable fat and grease from water prior to discharge into septic or municipally owned sewers.

For the first time, a grease separation technology will allow the consultant, plumber or end user to not only size the system strictly by flow-rate, but also achieve specific effluent removal efficiencies for these pollutants!

VIRTUALLY ELIMINATES GREASE IN SEWER SYSTEMS MAKING THIS PRODUCT A MUST FOR INSTITUTIONAL KITCHENS, RESTAURANTS AND FOOD PROCESSING FACILITIES.



Easy to maintain!

The integrated sight glass enables accurate monitoring of accumulated grease levels which determines appropriate disposal intervals.

Easy to clean!

System can be connected to a suction line. Vacuum trucks then simply attach and pump at grade. Saves up to 50% in annual service cost.



Extremely reliable!

Uses no external energy supply or electrical parts - only grease resistant HDPE and high grade stainless steel components.

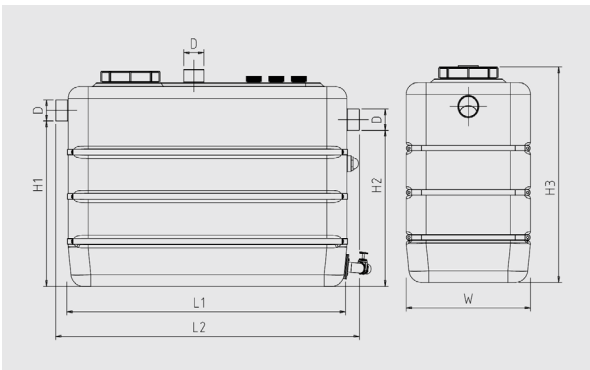
High separation efficiency!

Uses no external energy supply or electrical parts - only grease resistant HDPE and high grade stainless steel components.

Simple Installation!

Smaller units weigh under 100 pounds and can be easily moved by two people.

ECOGREASE-A MODEL SIZES



ecoGrease-a offers a full range of above ground grease interceptors.

The following models are available:

Item no.	Item	Total Volume	Grit/Sludge Capacity	Grease Capacity	Inlet/Outlet Pipe Size	D	L1	L2	H1	H2	H3	W	Weight
		[l]	[l]	[l]	[l]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[mm]	[kg]
100939	ecoGrease-a NS04	960	400	200	DN100	110	1400	1600	1070	1000	1400	720	60
100940	ecoGrease-a NS07	1680	780	300	DN150	160	2070	2270	1260	1190	1690	720	110
100941	ecoGrease-a NS10	2500	1200	480	DN150	160	2230	2430	1250	1180	1650	995	165

WORKING PRINCIPLE

The EcoGrease separation system is according to the German DIN 4040 part 1. It separates solid and liquid organic fat and grease from water due to gravity.

EcoGrease separation systems have to be used whenever fat and grease of organic origin have to be removed from water before entering the sewage system.

Fields of application

- Food companies (kitchens, restaurants, hotels,...)
- Grill-roast and frying kitchen
- Butchers shops
- Sausage and meat factories
- Slaughter houses
- Poultry butcher's shop
- Animal utilization
- Soap factories
- Oil mills
- Eatable oil refinery
- Margarine factories
- Tinning factories
- Ready-to-serve meal production
- Peanuts roasters
- Chips production

Water coming from kitchens, restaurants, slaughter houses, ect. is usually contaminated with fat or grease of organic origin. Generally the waste water has an average temperature of above 30 °C. That means, that all organic fat and grease components are in their liquid form when entering the separator.

In an upstream grit trap, solid particles having a larger specific gravity than water (1 g/cm³) are separated as sediments.

Free grease and fat droplets being large enough to rise to the water surface due to the Buoyant Force establish an oil film on the water surface. When entering the second chamber, the wastewater has already been cooled down below 30 °C. The process of hardening is initiated and solid agglomerates are floating on the water surface.

The efficiency of separation strongly depends on:

- Retention time of the wastewater in the separator
- Difference in the specific gravity of water and grease
- Diameter of grease particles
- Temperature of wastewater
- Stability of emulsions (amount of cleaning agents)

Emulsified grease consists of very small droplets having an average diameter below 20 µm. These droplets form stable emulsions, because the intermolecular forces are larger than buoyancy. Detergents, cleaning agents and very fine sludge particles can enhance this phenomenon.

Even extended retention times will not lead to a separation of grease and water. Stable emulsions can only be broken by chemical and electrochemical methods (emulsion breakers, electroflocculation).

Physical principles

The theory of fat and grease separation is based on the interplay of buoyancy of grease particles and the horizontal flow velocity through the separator. Three different forces are applied on a grease particle in water:

Gravity Force:

The gravity force is dependent of the diameter (radius) of the particle and its density:

$$F_B = \frac{4}{3} \pi r^3 \rho_1 g$$

Buoyant Force:

Buoyancy is equivalent of the weight of the water the grease particle replaces.

The Buoyant Force is therefore the basis of all gravity-separation techniques.

$$F_B = \frac{4}{3} \pi r^3 \rho_1 g$$

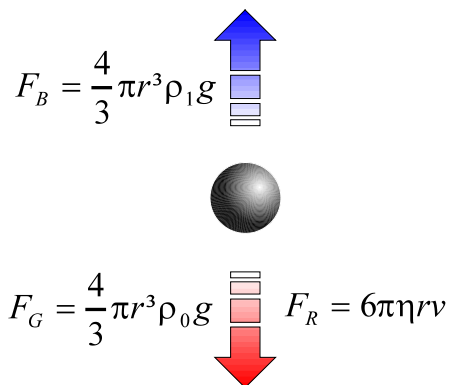
Friction Force:

Friction Force of a rising particle is dependent of its velocity and size and of the viscosity of the water.

$$F_R = 6\pi\eta r v$$

Equalizing these forces is leading to Stoke's Law:

$$\frac{4}{3} \pi r^3 \rho_1 g = \frac{4}{3} \pi r^3 \rho_0 g + 6\pi\eta r v$$



$$v_v = \frac{g(\rho_1 - \rho_0)D^2}{18\mu} \quad \leftarrow \text{STOKE's LAW}$$

v_v vertical velocity of particle with diameter D [cm/s]

g acceleration due to gravity [981 cm/s²]

ρ_0 specific gravity of water at a certain temperature [g/cm³]

ρ_1 specific gravity of grease at a certain temperature [g/cm³]

D diameter of grease particle [cm]

μ absolute viscosity of water at a certain temperature in Poise

The vertical velocity of a particle is strongly dependent of its size. Droplets below 150 μm in diameter cannot be separated.

The horizontal velocity of wastewater through separator can be calculated by dividing the flow rate by the surface of the separator.

$$v_H = \frac{Q}{A}$$

[m/h]

flow rate [m³/h]

surface of separator [m²]

ECOGREASE-A PPDP & PPDP HYDRO

ecoGrease-a PPDP Manual- or Auto-proportioning (mixing) & Disposal Pumping System offers a manual & automatic waste disposal solution uses just a single pump to operate.

HYDRO - equipped with High Pressure Water Cleaning Device for cleaning interior wall surface from grease build-up.

Options for selection:

- PPDP Manual
- PPDP Auto
- PPDP HYDRO Manual
- PPDP HYDRO Auto

Picture features the PPDP Hydro

Auto:

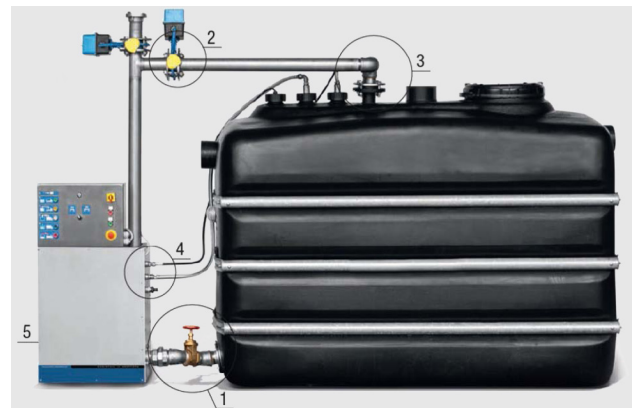
1. Disposal pipe outlet with valve for on-site vacuum pipe and connection to PPDP.
2. Control valves for directing the pump discharge flow for mixing and disposing of waste water in Auto feature.
3. Pipe connection for waste mixing.
4. Entries for level sensor cable & pressure.
5. Enclosure for Disposal Pump & High Pressure Control Panel fitted above the enclosure.

Connection:

- Power supply: 3x400V, 50Hz, 16A
- Potential free contact for external fault.
- Control cable for remote site.
- Refilling & cleaning water connection G3/4".

Sytem:

- Automated Plug & Play System with fixed mounted control.
- Disposal pipe with 2.5" B-coupling.
- Proportioning / Disposal pump: $P1 = 2.6 \text{ kW}$, $Q_{\text{max}} = 70 \text{ m}^3/\text{h}$, $H = 3\text{m to } 15\text{m}$ operating head (consulting required for higher head pump)
- Refilling Unit
- High Pressure Pump: 150 bar, 600 l/hr
- Rotary high pressure cleaning nozzle





SCHLÜSSELBAUER 
ECOTECHNIC

Illustrations may differ from the original.
Version 07/2022: Subject to errors, technical changes and typographical errors.

SCHLÜSSELBAUER Ecotechnic GmbH & Co KG
A-4673 Gaspoltshofen, Hörbach 4
Tel. +43 7735 7320-0
support@ecotechnic.at | ecotechnic.at