

ISEA

**The Sustainable Solution
for Wastewater Treatment**

GCC



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Systems and Solutions for wastewater and rainwater treatment

The treatment of domestic, commercial, or industrial wastewater has grown into an issue of paramount importance, both in terms of protecting people and the environment they inhabit and in terms of ever-stricter limits of acceptability of the relevant regulatory framework. ISEA provides total assistance from the first approach to the problem up to the final solution satisfying most customers' needs.

Water treatment and management contribute to preventing pollution of the water table and soil. ISEA offers a complete range of systems for the treatment and management of wastewater. The treatment systems can be installed in civil, industrial, and commercial buildings.

ISEA solutions to treat wastewater, greywater, and blackwater, from buildings include grease separators, septic tanks, Imhoff tanks, activated sludge, or percolating filter treatment systems.

For more than ten years, ISEA has been offering its engineering solutions in wastewater treatment to the market, from the concept to manufacturing, installation, and maintenance.

Initially specialized in 5 to 28 E.I. and 28 to 100 EI modules, the company has constantly enlarged its portfolio to comply with market needs, and mainly to perform on petrol installations and agglomerations up to 3000 E.I. Thanks to its experience, ISEA developed two types of highly efficient installations for effluent treatment, based on the concept of activated sludge system.



Pre-treatment Solutions

Pre-treatment units play a crucial role in safeguarding civil water sewers and wastewater treatment plants. ISEA offers different solutions adapted to various applications and capacities.

Grease traps are used for the pre-treatment of civil greywater (from kitchens, washing machines, washbasins, showers, etc.) before it is conveyed into the public sewer from a suitable treatment plant (activated sludge, sub-irrigation, percolating filter plant, etc.). Grease is separated using a physical process of removing all substances whose specific weight is lower than the wastewater's, i.e., the kind of substances typically found in wastewater produced by kitchens, restaurants, or canteens. Separation of sand and inert matter is also a physical process but consists of the evacuation of

all the substances whose specific weight is higher than water. Grease needs to be removed as it can have severe harmful consequences during subsequent treatment, such as during the aerobic biological process, anaerobic digestion, settling, or lifting process.

Imhoff septic tanks are commonly used for the pre-treatment of domestic and commercial sewage (from toilets) before it is conveyed into the public sewer or upstream from a suitable treatment plant. The fecal material is separated using a physical process of decanting all substances whose specific weight is higher than the wastewater. This process is fundamental, as it helps to improve wastewater quality before it is conveyed to the proper sanitation treatment.



Family Grease Trap 50 (Under Sink)

Application	Size	Capacity	Material
Pre-treatment of wastewater from kitchens	0,1l/sec	48 l	PE



Family Grease Trap

Application	Size	Capacity	Material
Pre-treatment of wastewater from kitchens & washing machines	0,4 - 8 l/sec	169-4.035 l	PE with PVC inlet & outlet pipe section



Grease Trap Elliptic

Application	Size	Capacity	Material
Pre-treatment of wastewater from kitchens & washing machines	1 - 2 l/sec	417-800 l	PE with PVC or PP inlet & PVC outlet pipe section



Public Grease Trap

Application	Size	Capacity	Material
Pre-treatment of wastewater from kitchens & canteens	10 - 14 l/sec	6.096-8.350l	PE with PVC inlet & outlet pipe section



Bio Top HT Imhoff Tank

Application	No. of users served	Capacity
Treatment of domestic & commercial wastewater	5 - 50 E.I.	1.100 - 9.498 l



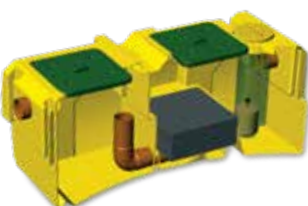
Bio Top Maxi Imhoff Tank

Application	No. of users served
Pre-treatment of urban effluents	80 - 200 E.I.



OIL TRAP: Oil and Hydrocarbon Separator Class 2

Application	Flow Rate
Treatment of runoff from outside areas, garages, surfaces associated with industrial or artisan manufacturing, car parks or car washes	0.5 - 30 l/s



OTTO PE Oil and Hydrocarbon Separator Class 1

Application	Flow Rate
Pre-treatment of wastewater from downpipes and runoff from forecourts, garages and machine shops	1.5 - 6.0 l/s



Wastewater Treatment Units

ISEA offers 4 different filtering systems for the treatment of wastewater.

These systems can be complemented with pre or post-treatments to improve overall treatment efficiency, depending on the properties of the wastewater and type of final destination.

Activated Sludge Systems

The treatment process is biological and relies on aerobic bacteria, which feed off the organic content of the incoming wastewater.

Activated sludge systems are split into:

- Aeration zone where the air is injected into the sewage by several fine bubble air diffuses (ISEA patented) feed by a micro-perforated EPDM diaphragm compressor to maintain the growth of bacteria.
- Settling zone, where the larger sludge floc separates from the effluent flows and partly recycled in the aeration section. Surface water is evacuated with hydraulic flux through the outfall. Settling of solids in wastewater coming from the aeration zone occurs after reaching a special still zone inside the unit.

These systems can be complemented with pre or post-treatments to improve overall treatment efficiency, depending on the properties of the wastewater and type of final destination.

Activated sludge systems are particularly suitable for small and medium-sized communities as they offer the following advantages:

- Very high effluent quality standard
- Consistent effluent properties
- Accessible facilities
- Simple to run and maintain
- Low electricity consumption
- High adaptability to different types of grounds.

Percolating Filter Systems

The percolating filter systems, anaerobic or aerobic, is suitable for treating domestic and commercial wastewater. The percolating filter completes the sewage treatment; it is filled with polypropylene media featuring a high specific surface area to encourage the growth of the bacterial population responsible for purifying the wastewater to be discharged to a suitable destination.

The organic Imhoff located upstream of the percolator filter carries out a pre-treatment of black waste by carrying out the first removal of BOD and suspended solids, thus lightening the organic load entering the percolator filter and avoiding phenomena of clogging.

Subsequently, the percolator, suitably filled with polypropylene elements, mineralizes through the biological process at the expense of the adhesive biomass, organic pollutants. The sizing of the percolator filters is done based on mass balance.

Subsurface-Flow Reed Bed Systems

Subsurface-flow reed bed systems are used for domestic and commercial wastewater that does not run into the public sewer or a surface water body.

Wastewater entering the system is distributed inside several beds, each containing a suitable number of plants. The treatment process exploits the soil's evapotranspiration properties, both directly and through the plants, and absorbs the wastewater's organic content through the plants' own root system. The only water leaving the system is rainwater, which only occurs when there is a storm. Said water is nonetheless deemed to be sufficiently diluted and hence can be discharged through the system's overflow pipe or returned upstream by a suitable recirculation pump station, thus ensuring that absolutely no

wastewater is allowed to leave the system.

These systems can be complemented with pretreatments to improve overall treatment efficiency, depending on the influent properties.

Subsurface flow systems are particularly suitable for small and medium-sized communities as they bring the following advantages:

- treatment process simplified
- very high effluent quality standard achieved and problem of effluent discharge eliminated
- simple to run and maintain
- zero electricity consumption
- option of extending the system over time without hefty investments, producing a system that is extremely easy to run.

Biofiltration Systems

Biofiltration systems use micro-organisms that remain attached in one spot. The advantages of these applications lie in the greater resistance of the biomass (micro-organisms), in the "solid" phase, to toxic agents, heat shock, inadequate or discontinuous feeding, and the lower energy consumption required for the associated aeration. They are particularly suitable when dealing with surfactants and nitrogen.

This is why ISEA created a technological solution that takes the adsorbing power of activated carbon, namely its ability to purify, and teamed it with the adsorbing, self-cleaning ability of micro-organisms.

The result is a biological biofiltration wastewater treatment system called ECOWASH in which the bacterial decontaminating action is supplemented by the chemical and adsorbing action of the activated carbon. The system stands out from other wastewater biofilters precisely because the medium on which the bacteria develop is entirely made up of special activated carbon.



Activated sludge system: SUPER PLUS

Application	No. of users served
Non-collective treatment of domestic wastewater, from one housing unit (around 5 person) up to 25 users. High effluent quality for discharge into surface water body	5 - 25 E.I.



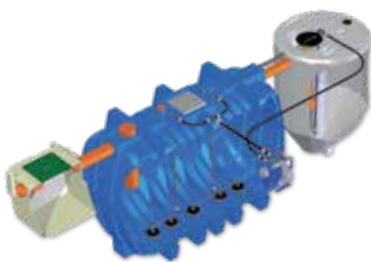
Activated sludge system: SUPER PLUS MIX

Application	No. of users served
Non-collective treatment of domestic wastewater, from one housing unit (around 5 person) up to 30 users. Recommended in specific cases when kitchen and WC wastewater are mixed; high effluent quality for discharge into surface water body	5 - 30 E.I.



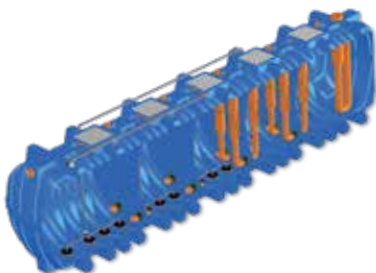
Activated sludge system: COMPACT

Application	No. of users served
Non-collective treatment of domestic wastewater, intended to serve from 32 up to 45 users. High effluent quality for discharge into surface water body.	32- 60 E.I.



Activated sludge system: POLI 1

Application	No. of users served
Treatment of domestic wastewater, sanitation within small settlements, up to 200 users. High purification efficiency allowing the discharge onto land.	50 - 200 E.I.



Activated sludge system: POLI MAXI

Application	No. of users served
Treatment of domestic wastewater within small settlements, up to 300 users. High purification efficiency allowing the discharge onto land.	130 - 300 E.I.



Anaerobic percolating filter: ANAPACKAGE

Application	No. of users served
Treatment of domestic and commercial wastewater	5-100



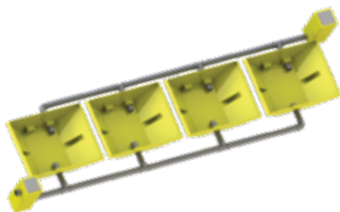
Aerobic percolating filter: PACKAGE

Application	No. of users served
Treatment of domestic and commercial wastewater	5 - 100



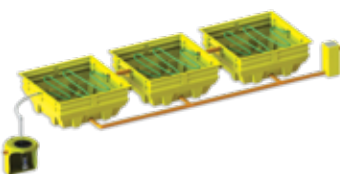
Subsurface-flow Reed bed system: COUNTRY

Application	No. of users served
Treatment of domestic and commercial wastewater for discharge onto land	2 -100



Subsurface-flow Reed bed system: COUNTRY MAXI

Application	No. of users served
Treatment of domestic and commercial wastewater for discharge onto land	2 -100



Subsurface-flow Reed bed system: COUNTRY VERTICAL FLOW

Application	No. of users served
Treatment of domestic and commercial wastewater for discharge onto land	2 -100



Biofiltration system: ECOWASH

Application	Flow rate
Car wash	1,5-5 m3/h

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