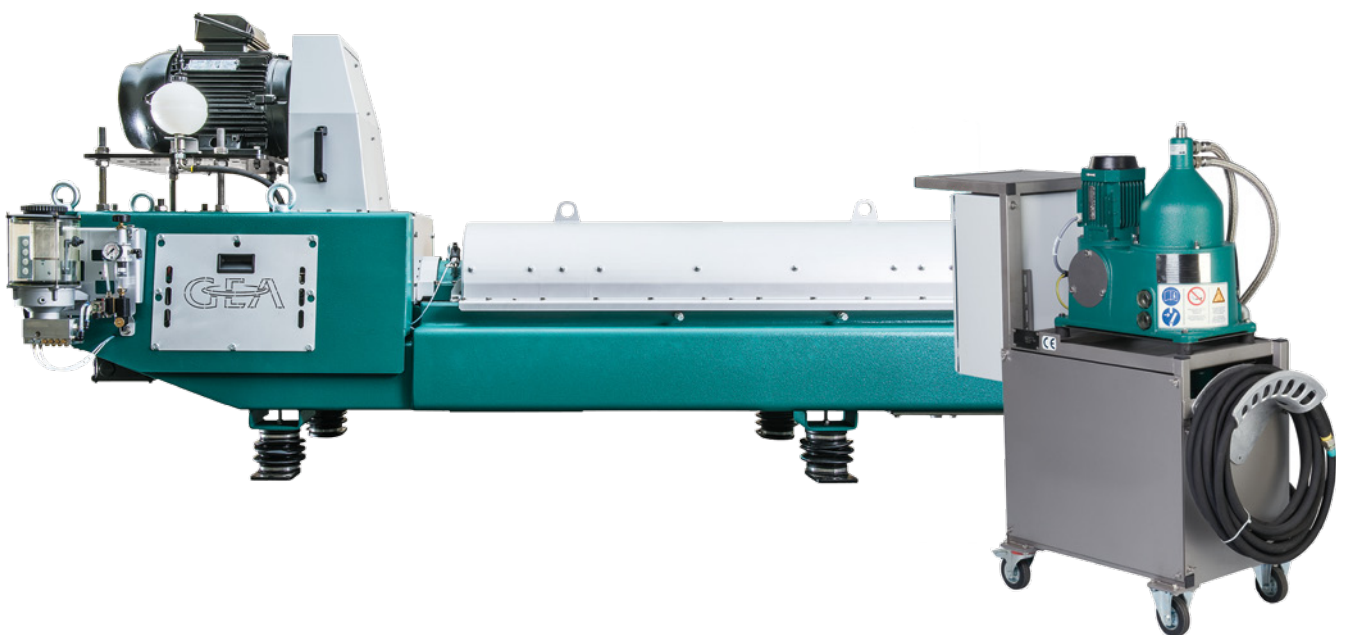




Industrial Fluids

Separation technology solutions from GEA Westfalia Separator for the treatment of fluids in industrial applications

Ready-to-connect
compact unit with
separator for efficient
treatment of
industrial fluids



Increase Performance and Reduce Costs – Using Mechanical Separation Technology

GEA Westfalia Separator Group is the world's leading company for mechanical separation technology. Comprehensive expertise enables the Business Line Oil & Gas to offer their customers process solutions which set the worldwide standard for economy, efficiency and sustained environmental protection in the treatment of industrial fluids.

Plant operators always focus on how these jobs can be managed efficiently and with minimum impact on the environment for the least possible cost. The same applies to the treatment of industrial fluids such as mineral oils, cooling lubricants and wash liquids. Here, the aim is to increase the service life of these fluids, reduce wear on tools, prepare workpieces for further finishing and thus relieve strain on budgets by reducing the need for resources and avoiding waste materials.

GEA Westfalia Separator Group responds to these challenges with high-performance separators and decanters, convincing machines in both economic and ecological terms.

Resource-saving treatment systems demand made-to-measure solutions

With the experience from numerous systems installed and the proven power of this technology leader to innovate in mechanical separation technology, we plan and manufacture customized solutions for our customers.

Focus – cost efficiency

Treatment systems from GEA Westfalia Separator Group are designed to achieve maximum separation performances for minimum footprint and energy requirement. Performance capability is optimized by GEA Westfalia Separator **serve&care** – the original manufacturer service. Customized service agreements secure a high level of availability of plants and improve process reliability, so binding budgets can be drawn up and unplanned shutdowns avoided. This supports our customers' efforts to achieve absolute cost control.

As far as the integration of treatment systems in plants and processes is concerned, GEA Westfalia Separator Group offers you a variety of solutions for every purpose.

In addition, both stationary and mobile systems are available, so that whether you are a municipal facility or an industrial company, you have the maximum flexibility with regard to different application locations.

Modular compact units/skid units are available for treating industrial fluids – these are flexible and individually adaptable. The “plug and play” design of the mobile unit means it can be connected up immediately once it is in situ and, in addition to a decanter or separator, it already includes all the necessary components

Treatment of industrial fluids

- Treatment of metalworking coolants and wash liquids
- Cleaning and dewatering of lube oil, hydraulic oil and diesel oil
- Treatment of waste oil, used emulsion, MARPOL oil and oily water

Quality right down to the smallest detail

The treatment technology integrated in production ensures that raw materials and valuable substances are recovered. It furthermore ensures a considerable extension to bath lives and a significant reduction in the volume of residual sludges. Depending on the operation and on requirements, cleaning and dewatering systems are available in a performance range from 200 l/h to 8000 m³ per day. To ensure a permanently high level of utilization throughout the entire lifetime of the systems, GEA Westfalia Separator Group uses high-alloy stainless steel for all parts in contact with the product. A stable grey cast iron housing, highprecision bearings and vibration-damping suspension ensure quiet running despite the powerful forces generated.

For You, They Will Go Through Thick ...

High-performance decanters from GEA Westfalia Separator reliably perform continuous solid-liquid separation or solid-liquid-liquid separation in a wide variety of scenarios and ensure optimum processes and process results.

If the solids content in the suspension to be processed is particularly high, then decanter centrifuges from GEA Westfalia Separator Group are used. They work with a horizontal scroll and ensure a high clarification performance and maximum dewatering, but they are also suitable for the separation of liquids with simultaneous removal of solids. The main requirements in this respect include a high bowl speed, a powerful drive for the scroll and a scroll speed which automatically adapts to the solids loading in the feed.

Decanter designs

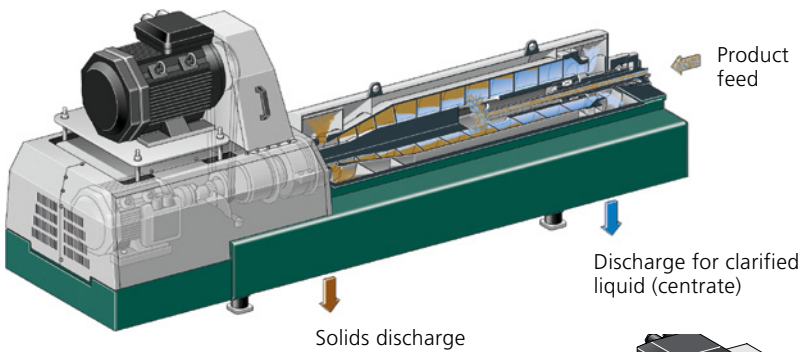
Clarifying decanters (2-phase decanters) or separating decanters (3-phase decanters) are integrated in the process depending on the application.

Clarifying decanters are used to separate solids out of a suspension to obtain a virtually solids-free, clarified liquid.

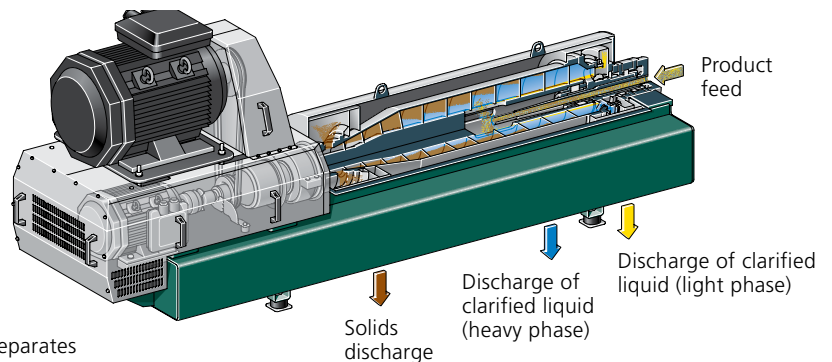
A special feature of these decanters is the patented GEA Westfalia Separator **varipond®** system. This innovative system makes it possible to set the concentration of the concentrated solids to a constant value automatically and to maintain it exactly.

Separating decanters from GEA Westfalia Separator Group separate two chemically immiscible liquids with simultaneous separation of the solids. The decanters are also available as gas-tight design to ATEX specifications and designed for systems with overpressure specifically for operation in explosion-proof zones.

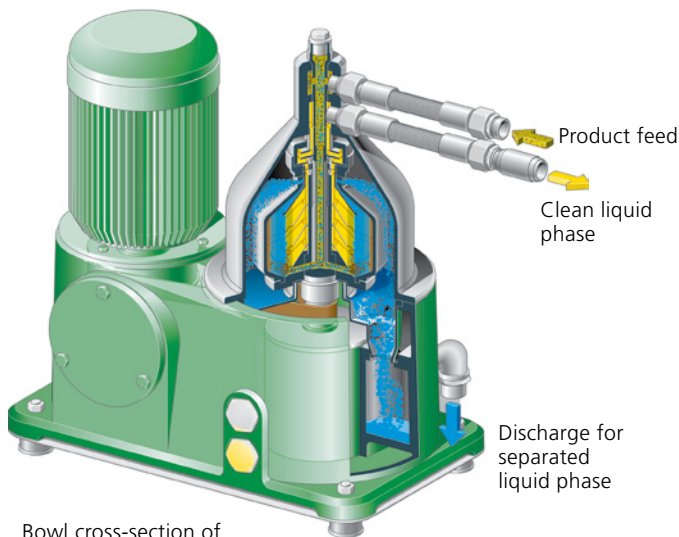
Applications include treating waste oil, oily waste water, oily sludge or coal tar. It is possible to install a self-cleaning separator downstream to polish the liquid phases.



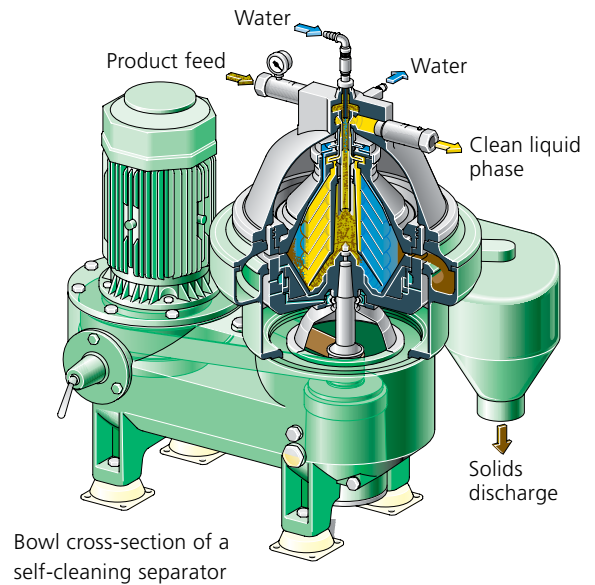
The 2-phase decanter from GEA Westfalia Separator Group specifically for the requirements of sludge deoiling



The 3-phase decanter separates oil, solids and water in a single step.



Bowl cross-section of a solid-wall separator



Bowl cross-section of a self-cleaning separator

Separators

... and Thin

Separators from GEA Westfalia Separator are the right choice for treating liquids or liquid-mixtures with a low solids content.

Centrifugal separation technology with separators nowadays performs key functions in:

- Solid-liquid separation
- Solid-liquid-liquid separation

Separators from GEA Westfalia Separator Group are designed especially for liquid-based applications. They use centrifugal force to separate solids from liquids. They are equally as effective at separating liquid mixtures at the same time as removing solids.

Separator designs

- Manual cleaning (solid-wall) separators for clarifying and separating liquids with a low solids content. Solids are removed manually.
- Self-cleaning disk separators for clarification and separation processes. Solids ejection takes place automatically in the form of partial or total ejections.

Applications range from the recycling of metal-working lubricants or industrial wash liquids to the treatment of oil-based fluids such as lube, hydraulic or waste oils.

The following characteristics apply to all GEA Westfalia Separator Group decanters and separators:

- Maximum productivity
- High-quality materials
- Small footprint
- High degree of operating reliability, availability and low wear
- Less manpower required
- Simple to operate
- Low operating costs
- Wide variety of potential applications
- Ease of maintenance

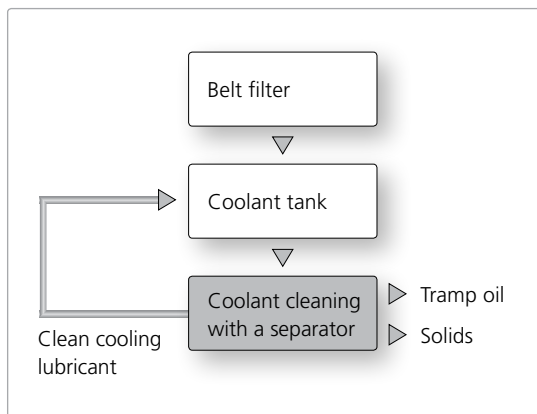
Increases Service Lives up to Five Times – Perfectly Simple

Separators from GEA Westfalia Separator are easy to integrate in the production process. They increase the service lives of industrial fluids, reduce unplanned machine shutdowns and ensure hygienic production conditions.

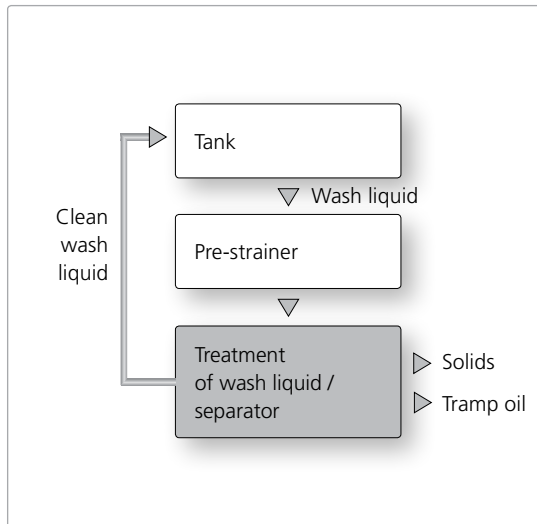
Cooling lubricants must regularly be rid of solid contaminants and tramp oil to maintain their properties. The earlier and more reliably this is done, the more consistently unplanned machine shutdowns and unhygienic production conditions can be avoided. The separators can be directly integrated in production to ensure smooth processing by means of early partial stream purification. The finest solids and tramp oil are separated off in one single step, thus achieving a four- to fivefold increase in the service life of the cooling lubricants used. Machine downtimes are reduced to a minimum. The product conditions are hygienic, and the reduction of the liquid volumes to be disposed of additionally improves the economic balance.

Remove tramp oil reliably from wash liquids

Separators from GEA Westfalia Separator Group also have an optimum effect in the treatment of industrial wash liquids. To maintain the optimum cleaning effect and ensure continuity of production, entrained particles and tramp oils must be separated out early. Separators from GEA Westfalia Separator Group separate these undesired constituents in the course of the production process. The treatment system convinces by its constantly high cleaning efficiency and a substantially reduced washing lye consumption. The service life of the washing liquid is significantly increased. Tool wear is reduced at the same time, whilst the quality of the machined work pieces increases.



Coolant cleaning in a bypass to the circulation system



Clean wash liquids are a key criterion for a high end product quality of components in the automotive industry.

All the benefits at a glance:

- Four to five times longer service lives for industrial fluids
- Higher machine availability
- Constant production conditions
- Drastic reduction of liquid disposal volumes
- Reduced disposal costs
- Improved working conditions due to minimization of health risks such as skin irritation or respiratory diseases, for example
- Reduced wear on components and tools
- Higher surface quality of workpieces for further processing





Treatment of lube oil and hydraulic oil

Our Separators Are Nitpickers Here: They Can Remove Metal Particles Down to 1 μm

Continuous treatment of lube and hydraulic oil is recommended to reliably prevent corrosion, blockages and system malfunctions.

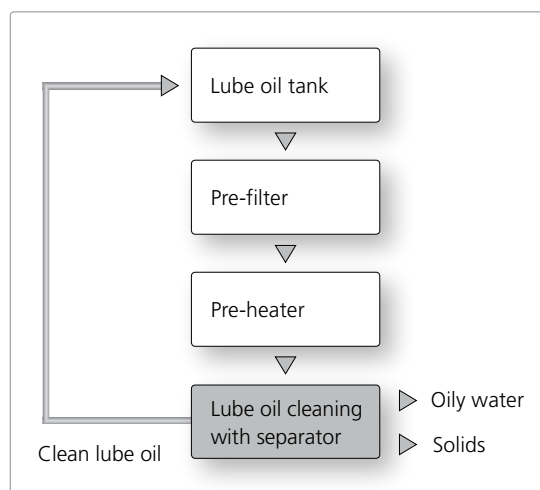
Water and particles of dirt need to be continuously removed from lubricating and hydraulic oils because entrained foreign materials may lead to corrosion, blockages and system malfunctions. If centrifugal separation technology from GEA Westfalia Separator Group

is used in the bypass to the circulation system, the purified oil ensures permanently smooth operation. The separators are capable of reliably removing metal particles down to 1 μm – about the size of a bacterium. Due to the lower density difference compared to water, organic particles are separated in orders of magnitude down to 5 μm . The water remaining in the oil after separation comes to less than 0.1 percent by volume, in other words, over 99.9 percent by volume are pure lubricating or hydraulic oil.

The use of a separator allows the oil to be cleaned more efficiently and quickly than it is possible with a conventional sedimentation tank, for example. The steel and paper industry thus benefits from longer service lives for bearings, higher machine availability and reduced purchase and disposal costs for oil.

All the benefits at a glance:

- Extended oil change intervals
- Higher productivity
- Considerable cost savings



Lube oil treatment in the bypass to the circulation system

High-Performance Engines Forgive Many Things – but not Poor Diesel Fuel

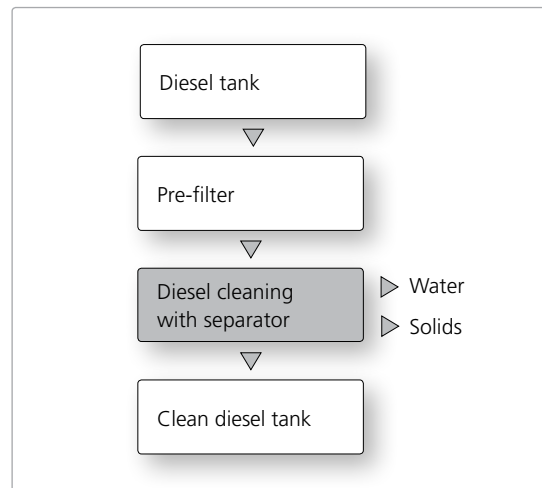
Separators from GEA Westfalia Separator are so compact and mobile that they can be used in even the remotest regions. They remove condensation and particles of dirt from contaminated diesel fuel so effectively that modern engines always achieve their maximum performance.

Diesel is the most important engine fuel – not only in industry, but also in agriculture. However, its quality is not always the same. Difficult transport and storage conditions frequently result in the fuel becoming contaminated with condensation and particles of dirt which can cause considerable damage to modern high-performance engines. The solution is to treat the diesel fuel with special separators from GEA Westfalia Separator Group. Their small size makes them easy to transport, so they can be used in even the most remote regions.

In Eastern Europe, especially, only poorer-quality fuels are often available. This presents a significant risk to common-rail diesel engines in Western imports. This is a particularly serious problem in the agricultural sector, where large-scale agricultural operations are increasingly working with tractors and machines from Western Europe. The manufacturers of vehicles and engines are therefore tending more and more to offer agricultural customers mobile separators from GEA Westfalia Separator Group with their own products. This gives farms the option of removing impurities from the diesel oil immediately it is delivered from the tanker and then storing the cleaned diesel. Alternatively, the contaminated diesel is first stored in a buffer tank and then pumped into a clean tank later via the separator. The treatment of diesel oil ensures a longer service life for the engines, lower operating costs and reduced consumption of filter components.

All the benefits at a glance:

- Longer engine life
- Reduced operating costs
- Reduced consumption of filter components



Diesel oil cleaning



Making the Best of It: Valuable Fuel

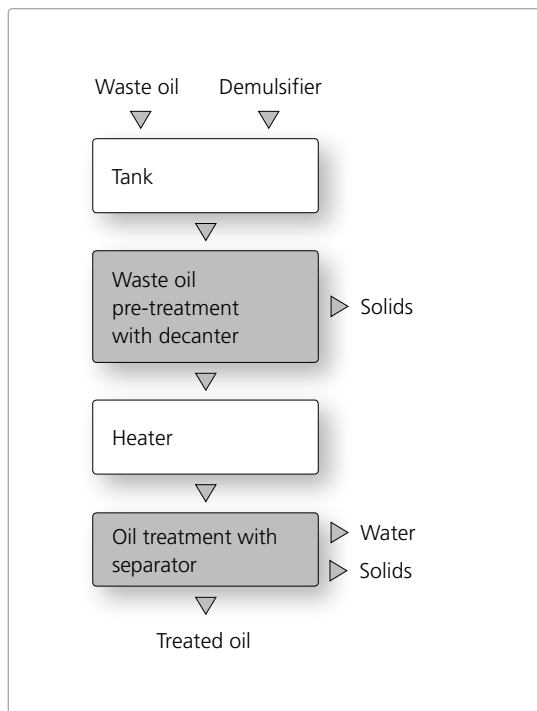
Treating waste oil with centrifuges from GEA Westfalia Separator turns it into a valuable resource. The treated oil can be used as a high calorific value secondary fuel in the cement industry, for example, or as a base oil for the production of lubricants. This not only saves valuable primary energies, but also cuts costs.

The quantity of waste oil which has to be stored, transported and disposed of increases with every oil change. This waste oil generates significant costs, especially in branches of industry which work with a large number of machines. An intelligent solution to this problem is to treat the waste oil using GEA Westfalia Separator Group centrifugal separation technology. The differing origin and composition of the waste oil mean that its content of water, oil and solids varies. GEA Westfalia Separator Group provides suitable solutions to these different requirements with its high-performance decanter centrifuges and separators. Decanters are used above all when there is a particularly high solids content.

In a second stage, a self-cleaning separator can be installed downstream to polish the valuable liquid phase and separate efficiently the finest solids and water. The high degree of separation allows an oil to be separated which no longer needs to be disposed of at a charge but which can be sold as a base oil for power generation, for example. This cleaned waste oil is in demand as a fuel in the cement industry and in metallurgical works. The waste water created during the process no longer contains oil and can be disposed of with minimum impact on the environment.

All the benefits at a glance:

- Recovery of a valuable oil which can be used either as a base oil to make lubricants or as a secondary raw material in industrial furnaces
- Saves fossil raw materials
- Reduced disposal quantities and costs
- Environmentally-friendly concept



Waste oil treatment



Turnkey container solution from GEA Westfalia Separator Group for efficient waste oil treatment

Residual Oil Content Less Than 5 ppm: That's as Good as Pure Water

GEA Westfalia Separator has many years' experience of treating bilgewater on ships. The process developed is also ideal for use on land to treat oily water – coming from tank wash or bilges, for example.

Oily water results from sea and cooling water, fuel and lube oil leaks, drainages from settling and sludge tanks, effluents from various cleaning processes and soot and dirt particles. To treat oily water, GEA Westfalia Separator Group uses a system which has been successful in treating bilgewater on land or on board for many years. Under normal feed conditions, the residual oil content in the clean water drain is 10 to 12 ppm. Supplementary aggregates allow the oil content to be reduced to below 5 ppm. This creates effectively pure water which can be returned to the natural water circuit. No high-cost disposal is required.

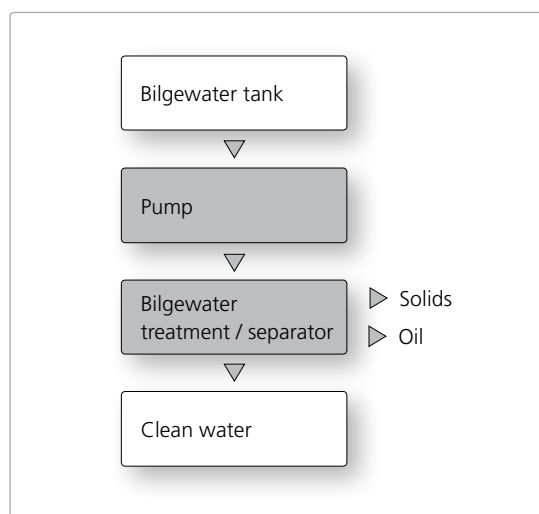
Maximum effect for minimum effort

A further economic benefit is in the recovery of valuable energy resources. The oil recycled from the separation process can be re-used as fuel oil, for example. Recovered lube oil can be used as a fuel to generate heat.

The system is also self-cleaning, so no additional staff is required. Alternative methods on the other hand, such as static separation by sedimentation tank or filtration for example, require either cost-intensive, periodic manual cleaning or replacement of filter elements. Chemicals are also frequently required as well – these are not only costly, but can also damage the environment.

All the benefits at a glance:

- Residual oil content below 15 ppm (with supplementary aggregates < 5 ppm)
- Lower disposal volumes and disposal costs
- Environmentally-friendly concept



Treatment of bilgewater

There's Still a Lot of Energy in There – Get It Out!

Disposal companies in ports benefit from an efficient treatment which turns a waste product into a sought-after raw material.



MARPOL oils comprise all oils that are produced as a waste product during ship operation. This largely involves bilgewater or tank wash water which is contaminated with oil and may therefore not be put into the sea. There are special collection facilities for disposal of MARPOL oil that are available to all ships who call at a port. Companies involved in the disposal process have efficient treatment technology available from GEA Westfalia Separator Group.

Separated oils with a high calorific value

In the first stage, a decanter is used to separate the MARPOL oil into the constituents oil, water and solids. Depending on the product, the solids content can generally be reduced to less than 0.2 percent and the content of free water to less than

1 percent. A separator downstream then separates the finest solids and the residual water. The separated oil can be sold at a profit as a fuel with a high calorific value. There are then no high disposal costs. Depending on requirements, the water phase is treated further in a waste water plant or can be returned straight to the environment.

All the benefits at a glance:

- High separation efficiency protects the environment
- Fuel with a high calorific value is obtained
- Clean water can be returned to the environment



serv&care – Proactive Service for Optimum Reliability on-site

The proactive, risk-free services of serv&care optimize operating reliability and permanent availability of the drive systems.

Safety first: this is precisely what the service concept serv&care stands for.

Customers not only benefit from traditional services such as inspection, maintenance, original spare parts and repair work provided by the original manufacturer; they also benefit from proactive solutions which avoid risk, e.g. online and offline monitoring with GEA Westfalia Separator wewatch®. These preventive services are the best pre-condition for a smooth operation.

Enhanced process efficiency also follows from maximum operating reliability and machine availability. Accompanying modernization or upgrading to state-of-the-art technology also offer the option of boosting performance as required.

Training provided on site or in the modern training centre of GEA Westfalia Separator Group ensures that the plant operator's employees receive training in the proper handling of the high-tech installations. This provides additional safety.

Authorized workshops worldwide

And if problems occasionally occur or if a spare part is required at short notice, the specialists are able to attend to the ships quickly. This is ensured by a global network with more than 50 sales and service companies. Authorized workshops are able to service every location in the world at short notice.



serv&care

serv&care accordingly makes for maximum operating reliability, machine availability, process efficiency and budget security. And these benefits are provided throughout the entire life cycle of the entire installation.

Service from the original manufacturer:

- Service engineers quickly on site
- Extensive service network
- Risk avoidance through service provided by the original manufacturer
- Proactive solutions
- Upgrading to boost performance
- Crew training

In addition to traditional services such as maintenance or repair, serv&care also provides solutions which avoid risk and with which the installation availability can be proactively assured.



We live our values.

Excellence • Passion • Integrity • Responsibility • GEA-versity

GEA Group is a global engineering company with multi-billion euro sales and operations in more than 50 countries. Founded in 1881, the company is one of the largest providers of innovative equipment and process technology. GEA Group is listed in the STOXX® Europe 600 Index.

GEA Mechanical Equipment

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