

*Liquids to Value*



# The New Decanter Generation Westfalia Separator® **ecoforce**

Born to run





» Westfalia Separator® ec  
born to run



The logo for 'ecoforce' is displayed in a white, sans-serif font. The 'e' is lowercase and followed by 'coforce' in all lowercase. To the right of the text are three curved lines of varying lengths, suggesting motion or sound waves.

enter the future of mechanical separation

## Manages Everything, Needs Little, Lasts Forever

Westfalia Separator® **ecoforce** is convincing in its outstanding performance data and separation efficiency, topmost availability, identical construction of all model sizes, flexible equipment possibilities and special implemented service.

This newly developed generation of decanters has been re-designed from the bottom up to suit current customer requirements, starting with all model sizes being of identical design. If you know one, you know them all, making things much easier for operating and maintenance staff. It also has a long-term positive impact on the availability of spare parts.

The uniform concept involves a “modular” principle, allowing its engineering to be adapted to a customer’s application-specific requirements even more simply and precisely than ever. Subsequent modifications are also possible: the intelligent design means that individual components are easy and quick to replace.

Decanters from GEA Westfalia Separator Group are well-known for their high separation efficiency and first-class throughput capacities. In this respect, decanters of Westfalia Separator® **ecoforce** remain true to themselves. Applications which make high demands on material and machine engineering, in particular, require robust machines which carry out their tasks reliably. The new decanter series has been set up for these tasks consistently by means of constructively new features.

Our Original Manufacturer Service system, Westfalia Separator® **directcare**, was integrated specifically for this new range of decanters to ensure maximum availability of systems. Never before have customer expectations and requests for improvement been implemented more comprehensively than they have in this case, in the form of optional services which can be secured by contract. Westfalia Separator® **ecoforce** is a customized system which is economic for the user and can moreover be planned in advance.

# Westfalia Separator® **ecoforce** –

## This is New

Uniform design from small to large, modular concept, drive concept and service contracts for farsighted transparent cost planning – the entire decanter program of GEA Westfalia Separator Group has been completely revised and simplified.

The identical design for all sizes is the most distinct feature. Once you have learnt to install, operate and service a decanter of the Westfalia Separator® **ecoforce** family, this know-how can be transferred to other model sizes effortlessly. The identical appearance may be the most striking new feature of the new decanter, but the actual revolution is in the underlying concept of the modular design.

Never before has a decanter generation been developed for use in all applications at the same time. Already the first developer's line was based on a complete catalogue of variants for the individual assembly groups. A basic construction was achieved, which meets all sorts of requirements from innumerable different applications, and on the basis of which the individual assembly groups can be combined freely. This fact produces considerable advantages for the customer. On the one hand, the decanters can be set up precisely for the requirements of every application. The individual component parts can be supplied very quickly as fewer different parts have to be warehoused, thus the entire fleet of Westfalia Separator® **ecoforce** makes do with seven different gears only, for example. Moreover, as the individual parts are being used in many different applications, the customer can be sure that they have proved their worth. And, last but not least, the decanters can be modified subsequently very easily and quickly on account of the modular design.

In addition, the entire drive unit including gear has been re-designed completely. Not only is it an in-house construction of GEA Westfalia Separator Group, the gears are manufactured in-house and are put through their paces on the in-house gear test bay in the centrifugal field as well.

The new type of gears covers a differential speed range of between 1 to 70 rev./min. with small modifications only. Thus, Westfalia Separator® **summation** drive can be employed for the entire range of applications. Thus, an identically high maximum speed torque is available for the entire range. In addition, the gear unit is no longer located in the product area of the decanter. Moreover, Westfalia Separator® **summation** drive feeds in power only. Energy must not be circulated to be recovered again with a lot of effort. Energy losses as they occur in other solutions with backdrive are a thing of the past. This also means that all additional electrical components used for energy recovery are no longer required. Belt drives which circulate power have disappeared as well. On account of the high efficiency of the drive, energy costs are saved.

Together with the “hardware”, thus the decanter, GEA Westfalia Separator Group offers service level agreements which provide maximum safety to the operator. Not only with respect to permanent operation of the machine, but also with respect to the height of costs. Within the framework of Westfalia Separator® **directcare**, the customer can choose between three different service level agreements. They can be configured freely as a matter of principle; the idea of the modular set-up has been applied here as well. Whether full service at a fixed price or basic module: as required, the customer can choose a degree of service which meets his demands best.

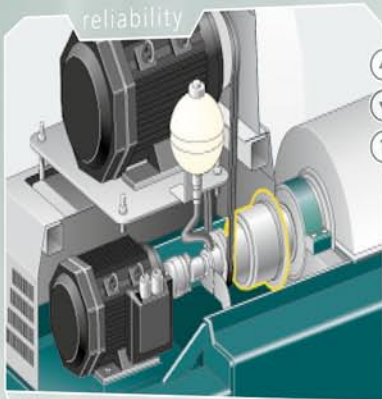


# new generation

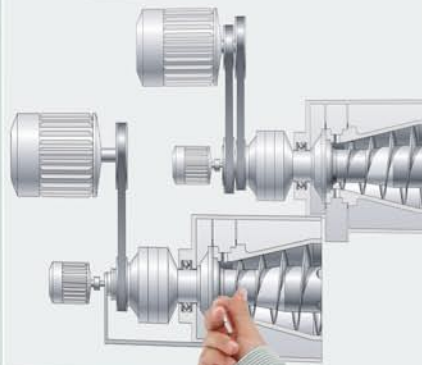
performance



reliability



flexibility



efficiency



availability



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# » high-performance decanters for highest efficiency

✓ high speed



✓ deep pond

✓ highly efficient drive concept

✓ Westfalia Separator® **summationdrive**



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## Some Features just Run in the Family: One for Outstanding Separation Efficiency and Throughput

Decanters from GEA Westfalia Separator Group are renowned for their high degree of separation efficiency and maximum throughput capacities – in that respect decanters from the Westfalia Separator® **ecoforce** range remain true to themselves.

But above and beyond that, changes to the design of individual components, the use of simulation software, new developments in materials technology and the modified drive concept have enabled us to improve separation precision and throughput still further.

This has been achieved by improving rotor geometry and drive technology. The high rotor speeds which can be achieved as a result ensure maximum separation precision and increased throughputs. Improved flow characteristics in the bowl also make an important contribution here, with a super-deep pond design and optimized distributor for careful acceleration when the product is fed in. Last but not least, the drive concept, too, plays a central role, with the key concept here being scroll torque. The newly developed, extremely flexible Westfalia Separator® **summation**drive ensures maximum separation efficiency by automatically adapting the high-torque drive to the feed conditions prevailing in the decanter.

The result is a differential speed which is always set to the optimum, meaning that the decanter is permanently close to the process technology optimum. A unique characteristic feature of the new drive: the Westfalia Separator® **summation**drive always provides the full torque across the entire differential speed range, thus power drops are a thing of the past.

- High speeds for maximum separation precision and even further improved throughput.
- Super-deep pond means optimized flow characteristics. Optimized flow behavior due to extreme pond depth: the maximum pond depth possible depends on the values required for factors, such as dewatering, washing, classification and/or purification of liquids.
- Optimally set differential speed at all times.
- Full torque at all times, thus full performance at all times.

# Reliable and Rugged, One for Continuous Duty

The gears, bearings, lubricants, materials, steels and production of Westfalia Separator® **ecoforce** scrolls and bowls are designed for continuous heavy duty.

It is precisely applications with heavy demands on material and engineering which require rugged machines to perform their jobs reliably. Novel design features of this new range of decanters ensure that this objective is consistently met.

The basic design has been changed: unlike previous generations, all Westfalia Separator® **ecoforce** decanters are provided with external gears. This segregates the product space from the drive space, which is particularly advantageous for hot-running applications, as gears are much less exposed to high product temperatures, with a positive impact on service life.

The lubrication concepts are also adapted to the respective requirements and are geared consistently to long service life: grease lubrication of the bearing is contained in the module. In case of higher demands on machine and material for hot operation, at high speeds and also in the food industry, bowl and scroll bearings are supplied with oil lubrication without exception. On the larger decanters, oil lubrication of the bowl bearings is provided as standard, irrespective of the requirements of the respective application. The gear is likewise without exception supplied via oil lubrication.

High-quality protection from wear significantly increases the service life of components in contact with the product – for example anything from computer-controlled (and thus accurate) hard-facing of the hardened metal cladding to tiles for the scroll.

The latest computer simulation software was used to design the frame so that it has maximum dynamic stability even at high bowl speeds.

It goes without saying that only high-quality stainless steels are used for all parts in contact with the product.

- External gears.
- Oil lubrication of all bearings for exacting demands.
- High-quality protection against wear.
- High degree of dynamic stability.
- Use of high-quality stainless steels.

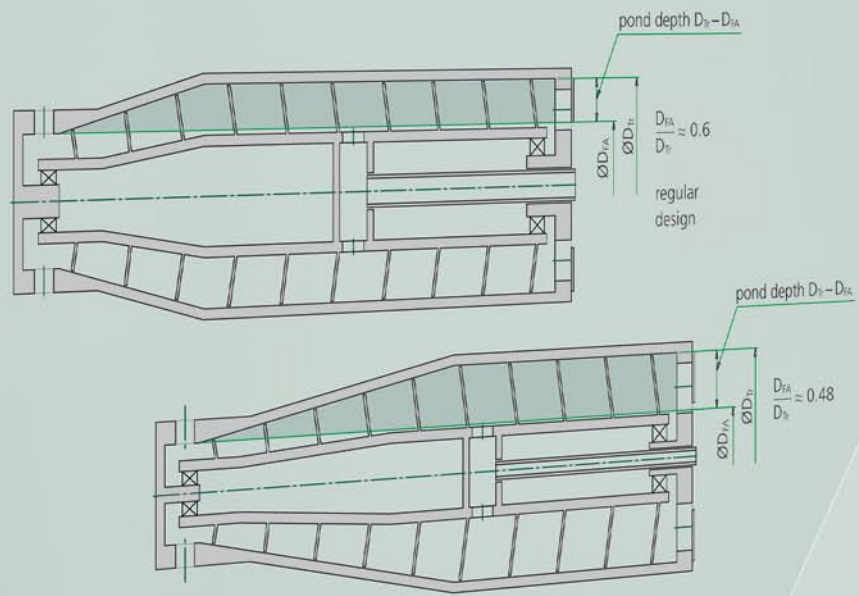
# rugged and more reliable



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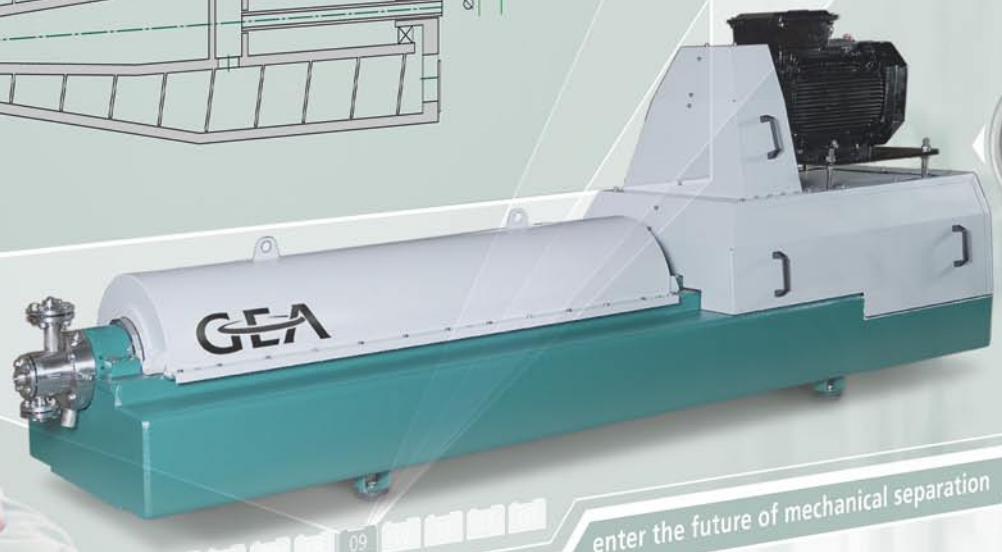


# » deep pond design



▲ deep pond design for higher DS  
▼ extraction at same bowl diameter  
?

Information



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09

# One for Maximum Energy Efficiency

No more excessive dimensions: Westfalia Separator® **ecoforce** can be tailored precisely to the quantities of your processes. Features such as the Westfalia Separator® **summationdrive** and the new rotor geometry make a permanent contribution to energy efficiency.

The high-torque Westfalia Separator® **summationdrive** always makes the optimum differential speed available, with only power – to be specific, only the power actually required at any particular point – being fed in at all shafts. Intelligent kinematics combine or “sum” the outputs of both motors and then transfer this accurately to bowl and scroll. Energy feedback is always accompanied by transmission losses due to the real efficiencies of components such as frequency converter, motor and generator. Such transmission losses do not occur with the Westfalia Separator® **summationdrive** which results in energy savings of up to 10 percent compared to other drives. This drive consequently does not need additional electrical components for energy recycling or belt drives which circulate power.

Apart from the site space saved, the load on the shaft is reduced and costs are reduced by lower energy losses. The discharge power for the clarified liquid represents a further source of energy consumption of the decanter. This factor can amount to up to 50 percent of the total energy requirement of the decanter. Through the application of “energy jets”, specially shaped weir plates with an integrated deflection of the flow, the energy requirement of the decanter can be reduced by up to 10 percent. The function of the energy jets is based on the principle of the Pelton turbine.

Through diverting the flow against the direction of rotation of the decanter, the jets generate an additional pulse which drives the bowl.

Rotor geometry is important, too: bowls in super-deep pond design ensure even higher energy efficiency in addition to an extremely high degree of clarification. The value for the deep pond is defined by the ratio of the diameter of the solids discharged to the internal diameter of the bowl.

GEA Westfalia Separator Group designed the new family of decanters with a deep pond design, with the result that optimized flow characteristics are achieved in the bowl, clarification is improved and there is less loss to friction when liquids are discharged. The bottom line is a reduction of up to 30 percent in specific energy consumption.

- Customized decanter sizes.
- Westfalia Separator® **summationdrive** with optimized power flow.
- Super-deep pond design.
- Significant reduction in specific energy consumption of up to 30 percent.

# One for the Future: Westfalia Separator® **ecoforce**™

Never before has a decanter generation been developed for use in all applications at the same time. Already the first developer's line was based on a complete catalogue of variants for the individual assembly groups. A basic construction was achieved, which meets all sorts of requirements from innumerable different applications, and on the basis of which the individual assembly groups can be combined freely.

The Westfalia Separator® **summation** drive with large differential speed ranges and rapid conversion options, simple conversion from 2-phase to 3-phase separation or upgrades for sanitary operations, gear sizes or bowl designs – simple “adaptation” is part of the concept of this new range of decanters.

Planetary gears in three torque sizes per machine type allow decanters to be adapted easily to modified process conditions or torque requirements. The uniform construction of all sizes of decanter allows them all to be converted rapidly.

The intelligent design of the Westfalia Separator® **summation** drive means the new generation of decanters has a drive concept with a broad control range for differential speed right from the outset. This ensures that the decanter is always operating at the theoretical optimum. However, should a different differential speed range be required subsequently – because the machine is to be used in a different process, for example – the drive is very easy to convert because the gears do not need to be replaced in the process.

The patented Westfalia Separator® **varipond** system allows the level of liquid in the bowl to be controlled quickly and automatically without any assembly steps and with the machine running, achieving a consistent concentration of discharged material, even if feed conditions fluctuate.

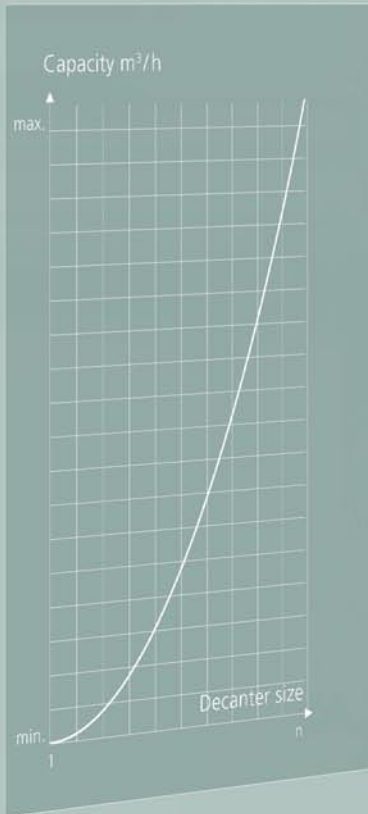
The new Westfalia Separator® **ecoforce** can also be changed quickly and easily from open to closed discharge of the liquid phase or from a 2-phase to a 3-phase version, likewise thanks to the modular principle.

Modern control software makes it easier for operating staff to deal safely with all phases of production. At the same time, the measurement and control systems are ready to be flexibly adapted to advances in technology and thus to produce at optimum levels in the long term.

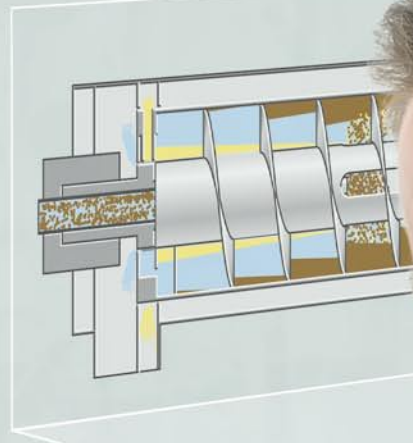
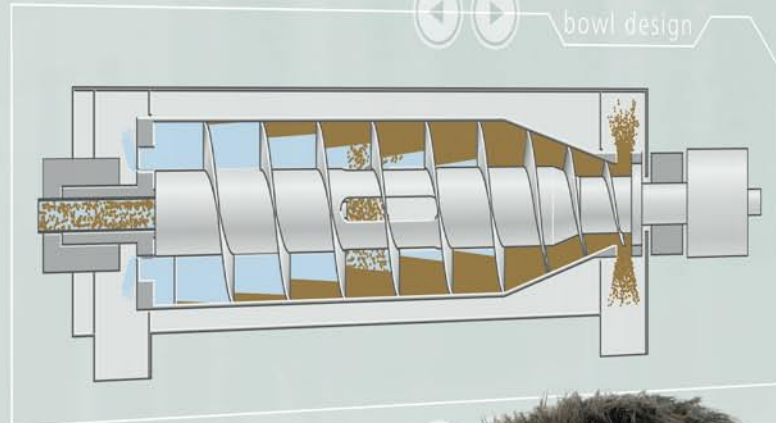
- Modular principle: right from the beginning, a catalogue of variants takes all sorts of requirements from innumerable different applications into consideration.
- Module variants can be freely combined with each other, and thus permit subsequent modification.
- Reduction of complexity.
- Three gear sizes per machine type.
- Gears do not have to be replaced if the machine is converted to a different differential speed control range.
- Easy adaptation of machine set-up to changed process conditions.

# engineering excellence

decanter size : capacity



bowl design



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» maximum availability,  
full budget certainty

with Westfalia Separator® **directcare**,  
GEA Westfalia Separator Group offers  
tools targeting three central purposes:

- availability
- cost control
- efficiency



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# Service Already Included: One for Maximum Availability with Westfalia Separator® **directcare**

Westfalia Separator® **directcare** supplements every new-generation decanter with services to suit requirements. For the most exacting demands, proactive services such as Westfalia Separator® **wewatch**® online condition monitoring ensure permanent availability throughout the entire lifecycle, with costs completely under control.

The concept of supplying decanters plus service was designed from the outset to secure machine availability and thus your investment in the long term. Westfalia Separator® **directcare** offers packages which combine a technological leading edge with every commercial requirement. Whether you want full service at a fixed price or basic modules, you can select the service level which corresponds most closely to your needs depending on your requirements. The aim of this new concept is to make sure that all the technical and economic benefits of the new range of Westfalia Separator® **ecoforce** decanters remain in full use to suit the customer throughout their entire service lives. At the same time, lifetime costs including full service costs can be reliably calculated right from the outset.

## **Online monitoring – Westfalia Separator® wewatch®**

Whether you are monitoring vibrations, temperatures, the condition of bearings, torque, current consumption or throughput, continuous proactive monitoring and diagnosis of trend values and current values in the systems using Westfalia Separator® **wewatch**® is the recommended solution for customers who want permanent maximum convenience and security. This is linked to reliable avoidance of unplanned machine stoppages, a high degree of system reliability and optimum planning of maintenance and modernization measures. Condition monitoring is the step to take towards continuous, proactive servicing and thus towards forward-looking and condition-based maintenance.

## **Optimum integration**

The advice and support of Reliability Consultants forms the basis for optimum usage of existing systems and the best possible integration of new process lines. With empirical values gained from over 5000 systems installed all over the world and the latest analysis tools, we will collaborate with you in working out a service concept perfectly customized to your requirements. The recommended solution has both a mechanical and a commercial basis, and always focuses on whichever optimum can be achieved.

Whichever service level you select, Westfalia Separator® **directcare** will always ensure that you receive the comprehensively certified service quality and expertise of the original manufacturer. Our close-knit, worldwide network of authorized workshops set up especially for the purpose means you can rely on local support. Backed up by a highly-qualified service team and a comprehensive service portfolio, we reliably and consistently provide the following services to the state of the art and for maximum customer benefit:

- Qualified service advice.
- Technical customer service.
- Original spare parts.
- Extensive training options.
- Authorized workshops.
- Conversion/upgrading of existing systems.
- Condition monitoring.
- Comprehensive exchange program for wear parts.
- Service level agreements.

- Beverage Technology
- Dairy Technology
- Renewable Resources
- Chemical/Pharmaceutical Technology
- Marine
- Energy
- Oil & Gas
- Environmental Technology
- Engineering
- Second Hand Machinery
- Original Manufacturer Service

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