Innovative systems partner
MAHLE Industriefiltration develops and produces high-end industrial filters for all applications—since 1962. The company is a leading manufacturer and is integrated in the MAHLE Group, which is one of the top 3 systems suppliers in the areas of combustion engines and engine periphery.

In fluid technology, we offer our customers filter materials with exceptional properties, pioneering processes, and a modular filter and equipment range to ensure optimum prevention from pollution of hydraulic systems and lubricating liquids. Our filters, equipment, and systems for the dust filtration of air and other gases increase productivity and contribute to product reclamation and increased environmental protection and safety at work. In the filtration of liquids, pastes, and similar substances, our patented automatic filters enable optimized production processes as well as highly efficient and economic non-stop operation—with automatic cleaning and disposal procedures.

With extensive experience and continuous development of materials and production technologies, we are the innovative development and systems partner for our customers worldwide: for better, more efficient, and cleaner solutions.

Systems expertise for maritime operations
Our years of experience with complex systems and a wide range of applications has made us an innovative development and systems partner for maritime operations, in demand around the globe. Now we have significantly expanded our capabilities and are steering a clear course into the future.
With our innovative **NFV products**, we provide comprehensive, custom-tailored solutions, especially for maritime operations and liquid treatment with mechanical **filtration and separation** processes: from oil separation, fuel and oil treatment, to ballast water, process water, wastewater, and cooling water treatment.

The **AKO product range** additionally extends our product range with simplex, duplex and backflushing filters for the **filtration** of all types of fluids in maritime operations—from fuels to lubricants to seawater.

**Your advantages**
- Complete product portfolio, from standard items to customer-specific solutions
- All products and services from a single source, from development to production
- Worldwide distribution and service structure, local contact partner
- Modern logistics for fast availability
- Reliability, flexibility, and first-class quality
- All locations are certified to ISO 9001:2000
In maritime operations, MAHLE systems stand for uncompromisingly clean performance.

**Water treatment**
- Bilge water oil separation
- Ballast water treatment
- Process/cooling water
- Oil-in-water monitor

**All around the engine**
- Fuel treatment systems
- Fuel filters
- Lubricant treatment systems
- Lubricant filters
- Crankcase ventilation
- Inlet air filters

**Hydraulics and lubrication**
- Hydraulic filters for steering gear
- Transmission fluid filters
- Filters for deck hydraulics
- Turbidity sensors
- Filter water separators
- Oil treatment systems for stern tube seals

**Pipework, transfer and circulation systems**
- Screen basket, simplex, and duplex filters

G  Transmission
HM Main engine
T  Tank (bunker or daily tank)
MAHLE has a range of certified systems and equipment for water treatment and purification in maritime operations. They operate most efficiently and economically, improve operational reliability, and make an important contribution to environmental protection.

**Water protection: bilge water oil separation**
Modern bilge water oil separation systems from NFV make an excellent contribution to worldwide water protection. For every type of ship, flexible equipment modules can be implemented in custom dimensions. Our bilge water oil separators (MPEB—multiphase demulsifier) with mechanical phase separation, emulsion breaking, and membrane technology clean bilge water so efficiently that they meet both today’s and tomorrow’s most stringent civil and military limits and protective regulations.

**No chance for foreign organisms: ballast water treatment**
To protect the maritime ecosystem, new international regulations require that ballast water must be as free as possible of microfauna, plankton, germs, and other viable organisms. NFV provides a compact and individually designed ballast water treatment system (OPS), which achieves the required cleanliness in an energy-efficient manner, without chemicals.

**Unclouded performance: water treatment**
MAHLE automatic filters with many different filtration principles and special cleaning systems are used to clean all kinds of waters—for instance, in the treatment of grey and black water.

For all types and sizes of **process and cooling water circuits**, MAHLE provides efficient treatment technologies, such as seawater filters, oil separators for cooling water and condensate, and the Vario automatic filter series.

For **service and waste water treatment**, MAHLE provides pretreatment and posttreatment aggregates, as well as membrane flotation, sterilization and metering units, membrane and activated carbon filters.

For all oil-in-water applications, as well as for suds and cooling lubricant emulsions, our **mechanical demulsifiers** achieve the highest cleanliness classes.

**Immediately detects oil: oil-in-water monitor**
Our efficient oil-in-water monitor detects the slightest oil impurity in water and establishes the prerequisites for operational reliability and efficient environmental protection.
Our **fuel care and treatment systems** ensure low-maintenance, trouble-free operations for drive engines over the longest possible time period. In their construction, quality, and design, MAHLE solutions are tuned to a wide range of application areas.

**Fuel treatment systems for clean power**
NFV fuel treatment systems for fuels and oils can be used with any medium distillate, such as diesel oil, light heating oil, marine diesel oil (MDO), and also lubricating oil. They provide the most efficient and economical solutions for typical impurities in these media (solid and suspended particles, sediments, and rust, as well as water).

**For better performance: fuel filters**
We develop optimal technological solutions for large engines. For high filter capacity especially in fuel systems, we provide, for example, duplex filters with patented one-hand changeover, as well as a modular filter system for fine-range filtration. The compact MAHLE Vario automatic filter system can be ideally adapted to the requirements of large diesel engines and gas turbines. The AKO-COM filter series, compatible with heavy oils, allows filtration of heavy oil in viscosity classes IF 700 to 10 μm absolute. MAHLE fuel filters are approved by various classification agencies—for uninterrupted operation of engines and turbines.

**For everything to run well: lubricant treatment systems**
MAHLE offers a range of capable systems for the filtration and care of engine oils. Our oil treatment systems, which achieve water separation levels below the mandatory directives, serve either for the continuous treatment of the medium in the reserve tank or for point-of-use cleaning before the drive aggregates. The systems can be combined with additional units and allow optimal adaptation to the individual on-board requirements.

Filters with patented segment cleaning from the Vario modular system are used for treatment and filtration of engine oils.

---

**ALL AROUND THE ENGINE**

**FULL SPEED AHEAD**
Pure cleanliness: lubricant filters
For 24h unmonitored operations—while maintaining the required limit levels—filter systems are available in all performance classes and grain sizes that a modern maritime operation requires for 2- and 4-cycle engines. Lubricant treatment determines to a great degree the service life of the systems as well as pollutant emissions. We provide optimal solutions with our special product program. This is achieved with the use of our duplex filters in full flow for smaller engines, or as an indicator filter behind the special MAHLE automatic filters. Optimal filtration of flow volumes for the largest two-cycle engines can be performed reliably and the separation efficiency of the separators is dependably monitored and supported. This is achieved through the use of oil treatment systems and special automatic filters, or with the optimal combination of both systems.

Retention of oil mist: crankcase ventilation
Efficient solutions have been developed at MAHLE for crankcase ventilation. The oil aerosols are separated from blow-by gases as a liquid. The gases are reintroduced into the engine intake system.

For clean air: inlet air filters
MAHLE inlet air filters continuously supply compressors, vacuum pumps, combustion engines, and turbines with clean intake air. State-of-the-art filter elements allow low flow resistance and high dust collection capacity. Inlet silencers also reduce noise levels, if desired.

For higher dust exposure, the patented multijet nozzles provide the ability to clean filter cartridges during operations, saving compressed air at low noise levels. This results in compact filter systems with optimal service life.
Longer service life, greater operational reliability, lower maintenance requirements, and resource savings—the performance of our systems pays for itself. We have a decade of technical expertise in the care, cleaning, and filtration of hydraulic and lubricating fluids and actuation oils. We are one of the leading global manufacturers for filter systems, equipment, and accessories in fluid technology.

**For optimal function: hydraulic filters for steering gears**  
Solid and liquid impurities in hydraulic systems, such as steering gear hydraulics, cause wear, abrasion, and corrosion and have a negative effect on the physical-chemical properties of the hydraulic fluid. MAHLE filters reduce particle contamination in hydraulic and lubricating systems to the level required for their purity class, under the typical international standards ISO 4406/1999 and NAS 1638, thus ensuring the functionality of modern hydraulic systems.

**Very economical: transmission fluid filters**  
Ready for use around the clock, with no interruption in operations. This significant factor, among others, sets our duplex filters apart and thus allows high-efficiency performance, long service life, and low flow resistance, even at high viscosities. Thanks to their systems technology, our Vario series filters can be adapted to nearly any application and reduce extensive oil cleaning, while saving space and costs.

**For smooth operations: deck hydraulics**  
For any installation site and function, we provide suction filters, pressure filters, duplex filters, return-line filters, external loop filters, air breathers, filter units and elements for all pressure levels, as well as accessories and service units.

**Fast reaction: water identification**  
With the MAHLE turbidity sensor, water entry into a system can be detected quickly and reliably. It can be effectively applied in hydraulic and fuel systems, where the risk of contamination by water exists.
Purity law: filter water separators
The coalescer filter was developed for the retention of free water from oils and fuels. It works without absorption media, simply and inexpensively: Specifically arranged special filter materials collect the small water droplets that float in the fluid and separate them.

Oil treatment for stern pipe seals
Our oil treatment can be used for any medium distillate and also reliably separates water and other typical impurities from the medium to be treated with filter coalescer elements. Our NFV systems are laid out vertically or horizontally, depending on the requirements and available space on the ship, and thus allow space-saving, highly efficient, and low-maintenance filtration and water separation.
PERFECT PROTECTION FOR
SYSTEM RELIABILITY
Perfect protection: screen basket filters
One of the main causes of problems and loss of operations is still dirt, which leads to premature component wear. MAHLE provides screen basket filters for prevention, a cost-effective method to protect pipework or the treatment and maintenance of fluids. Screen basket filters are available as simplex or duplex filters and are suitable for the use of all types of fluids, due to their mature design. They are equipped with cleanable metal filter elements, which combine ease of service and cleaning with high durability and long service life.

Pipes clear: simplex filters
Simplex filters are the introduction to the product range, which is oriented toward cost reduction and user-friendliness. The housing of the simplex filter is available in different sizes, while the screen basket filter element always sees flow from inside to outside. When the permissible contamination level has been reached, the filtration operation is interrupted, the filter is opened, and the screen basket is removed and cleaned off with water or steam. The differential pressure rating of our simplex and duplex filter inserts of up to 5 bar, which is still achieved by only a few manufacturers of screen basket filters, allows us to use the filters specifically under the most challenging conditions. In this context, it is advantageous that the simplex as well as the duplex filters can be provided in an optional heated version, whereby they can also be used in fuel circuits.

Consistent cleanliness: duplex filters
The efficiency and economy of systems is ensured to a large extent by their continuous usability. MAHLE duplex filters are equipped with two filter vessels, which allow non-stop operation of the filter and consistent cleanliness of the media to be cleaned. When the maximum contamination level is reached, flow is switched to the other filter vessel without interruption, and the filter that is not in use can be cleaned. In addition to efficiency, constant cleaning of the media promotes the protection of the pipework as well as the transfer and circulation systems, and reduces the repair costs for the pipework system due to corrosion or deposits.
On all seas, we ensure trouble-free, economical maritime operations. With powerful systems, high standards under all important international norms, customer-friendly spare part service, and a well-attuned team. We provide personnel training in professional operation and maintenance, and our service technicians are on site around the globe for commissioning and maintenance.

**Your specialists for custom filtration and separation**
Optimal technical and economical design of systems requires experienced specialists who know their way around complex maritime operations. We consider the ship as a complete system, starting with sources of contamination, and take into consideration a great deal of information, data, facts, and system parameters, in order to optimally adapt our technology to your requirements.

**MAHLE Service**
Our worldwide recognition as a high-quality systems provider for filtration and separation systems, especially in maritime operations, is backed up by our global service network. In addition to qualified personnel for commissioning and maintenance, we also keep in stock spare parts in the accustomed high quality, around the world. This gives us a good feeling and ensures the efficient operation of your fleet.

**The result: worldwide trust**
The leading manufacturers of ship engines, the shipyards of the world—they all have used our systems for decades for reliable protection of engines and oceans. In order to live up to this trust in the future as well, we are increasing our research and development activities with the construction of a new applications and customer center for separation technology in Hamburg, Germany. MAHLE is sending a clear signal that our customers can continue to expect—and receive—renewed expertise, innovation, and service from a single source.
PROTECTING THE WORLD’S OCEANS
WITH CHEMICAL-FREE BALLAST WATER TREATMENT
“Stowaways” in ballast water – an international problem

Almost 90% of the commodities traded worldwide are transported by ship, and that figure is steadily rising. Ballast water tanks give vessels stability and the necessary draught required for cost-effective operations. Ballast tanks are filled with sea water, fresh water and a mixture of the two, pumped in from the world’s oceans and discharged again as required. Every year, around 12 billion tons of ballast water are used, water that contains countless “stowaways”. Every time a ship takes in ballast water, it also involuntarily takes in masses of tiny aquatic organisms and distributes these on the world’s waterways. Although a large proportion of the microorganisms, such as bacteria and viruses, do not survive being transferred in the ballast tanks, a sufficiently large number of organisms are released when the ballast tanks are emptied. Once these invasive species (fish, small invertebrates, worms, bacteria, viruses and other microbes) settle in their new habitat, they can potentially cause considerable ecological and economic damage. In extreme cases, they can become a hazard for humans.

IMO regulations demand ballast water treatment

In order to halt the unintentional spread of organisms through ballast water, the International Marine Organization (IMO) is establishing a convention which will in future regulate how ballast water is treated. The “International Convention for the Control and Management of Ship’s Ballast Water and Sediments” will be legally binding from 2009, and from 2016 for new vessels. After a period of transition, during which the D1 and D2 regulations will apply, the convention will become compulsory for all international ocean-going vessels. The interim regulations are the D1 Ballast Water Exchange Standard and the D2 Ballast Water Performance Standard. The D1 standard, which depends on the ships’ ballast water capacity and when the keel was laid, will eventually expire and only the D2 standard will apply. To ensure compliance with the convention, the entire global fleet will gradually be fitted or retrofitted with ballast water treatment systems.

Ocean Protection System OPS: simple, efficient, cost-effective

The ballast water is treated as it enters the ship’s tanks. The challenge here is to ensure that all organisms, and particularly the very small ones, are rendered completely unviable. MAHLE Industriefiltration’s NFV ballast water system OPS uses a combined method which is based on three precisely coordinated system phases: the first and second phases filter extremely finely and the third phase uses low-pressure UV radiation to kill or deactivate even the tiniest microorganisms.

The Ocean Protection System OPS makes ballast water management simple, fast and very cost-effective. The low-maintenance technology needs only a very small space to deliver excellent results.
1st stage:
High-performance pre-filter

The self-cleaning automatic pre-treatment filter is a versatile, self-cleaning, low-maintenance filter unit for removing particulate impurities from highly contaminated water and process water. It works even at low operating pressures and has only low pressure losses during high flow rates. The system’s other main features include simple and robust design, and a very small footprint.

The concentrate rinse flows of the two pre-treatment phases – automatic pre-filter and automatic backflushing filter – are continuously pumped overboard on site, meaning that there is no hazard of spreading microorganisms.

2nd stage:
Continuous filtration

The ballast water is then cleaned with the aid of an automatic backflushing filter, which removes more particles. Standard solutions achieve flow rates of up to 2500 m$^3$/h. Compared with conventional filters, the automatic filter has the considerable advantage of providing continuous filtration if required.

The combined pre-treatment has the advantage over a simple filter solution of allowing large volume streams to be treated. The highly effective pre-separation means that the subsequent phases only have to filter out the very smallest remaining particles and organisms.
Ocean Protection System OPS: perfect ballast water treatment

At first a self-cleaning automatic pre-filter (1) is used in the mechanical treatment followed by an automatic backflushing filter (2).

The physical treatment operates with a low-pressure UV radiation unit (3).

3rd stage: Efficient UV sterilisation

The ballast water treated in the first phase contains only very low levels of suspended solids, thus ensuring that the low-pressure UV rays can penetrate sufficiently for maximum efficiency. The UV light hits the microorganisms in the water and damages their DNA. The DNA is damaged in such a way that the organism can no longer replicate and is thus rendered harmless.

The low-pressure radiation units in the OPS emit most of their light in the 254 nm range, which is in the spectral range of maximum germicidal effectiveness. In contrast, other methods generate a broadband spectrum which is mainly outside the relevant spectral range.

The great advantage of UV sterilisation, which is widely used in drinking water treatment, is that the process dependably destroys even the tiniest organisms without needing chemical additives which would require subsequent removal. Chemical methods use chlorine or chlorine dioxide to deactivate the organisms. Both substances require dedicated storage facilities on board, they must be handled by specially trained staff and the ballast water needs to be treated before it can be discharged.
MAHLE Industriefiltration develops and builds advanced filtration and separation technology for use in a wide range of industrial applications and in power plants, civil and military ship-building.

The company is part of the MAHLE Group, one of the top 30 automotive suppliers globally and the world market leader for combustion engine components, systems and peripherals.

NFV and AKO products are used in the following applications:
- Bilge water deoiling
- Ballast water treatment
- Cooling lubricant and detergent processing
- Industrial waste water cleaning
- Separation systems (petrochem. industry)
- Oil and fuel treatment for engines, turbines and gears; heavy oil filtration
- Protection of hydraulic units, pipe lines, transfer and circulation systems

### BALLAST WATER MANAGEMENT
HIGHLY EFFICIENT IN ALL CONDITIONS

**Key OPS product features**

**Effective filtration**
The two-phase pre-treatment is efficient, low maintenance and can be configured for large flow volumes.

**Energy-efficient UV sterilisation**
The special, powerful low-pressure radiation units emit dependably at 254 nm and are highly energy efficient to operate.

**No chemicals required**
The OPS system works without chemical additives. This means that there are no disinfectant residues in the water and it avoids the risk of over-dosages. No special storage or handling is required, and the system can be used with existing pipe and tank systems without the risk of problems occurring.

**Modular design**
The system offers a wide array of options and configurations: it can be operated as a compact, container-housed unit or can be flexibly, modularly adapted to the vessel’s design and layout.

**Tried and tested system components – dependable operation**
The OPS ballast water treatment system is based on established components used in waste water treatment. This guarantees low-maintenance, dependable operation on board.

Ocean Protection System OPS: the efficient and cost-effective solution for ballast water treatment – designed by MAHLE Industriefiltration.

OPS® is a trademark owned by MAHLE Industriefiltration. The company reserves the right to make changes at any time without prior notice.
TECHNICAL INFORMATION

Ocean Protection System OPS

MAHLE Industrial Filtration is protecting the world’s oceans with their chemical-free NFV Ballast Water Treatment OPS.

“Stowaways” in ballast water – an international problem

Almost 90% of the commodities traded worldwide are transported by ship, and that figure is steadily rising. Ballast water tanks give vessels stability and the necessary draught required for cost-effective operations. Ballast tanks are filled with sea water, fresh water and a mixture of the two, pumped in from the world’s oceans and discharged again as required. Every year, around 12 billion tons of ballast water are used, water that contains countless “stowaways”. Every time a ship takes in ballast water, it also involuntarily takes in masses of tiny aquatic organisms and distributes these on the world's waterways. Although a large proportion of the microorganisms, such as bacteria and viruses, do not survive being transferred in the ballast tanks, a sufficiently large number of organisms are released when the ballast tanks are emptied. Once these invasive species (fish, small invertebrates, worms, bacteria, viruses and other microbes) settle in their new habitat, they can potentially cause considerable ecological and economic damage. In extreme cases, they can become a hazard for humans.

Ocean Protection System OPS: simple, efficient, cost-effective

The ballast water is treated as it enters the ship's tanks. The challenge here is to ensure that all organisms, and particularly the very small ones, are rendered completely unviable. MAHLE Industriefiltration's NFV ballast water system OPS uses a combined method which is based on three precisely coordinated
System phases: the first and second phases filter extremely fine solids and marine life and the third phase uses low-pressure UV radiation to kill or deactivate even the tiniest microorganisms. The Ocean Protection System (OPS) makes ballast water management simple, fast and very cost-effective. The low-maintenance technology needs only a very small space to deliver excellent results. Furthermore, the system works environmentally friendly without any chemicals, it can be used with the existing ballast water pumps and the power consumption is very low.

Overview of the system

The OPS is a three-stage ballast water treatment system. The system works as an in-line system during uptake and discharge of ballast water. During uptake the first step of treatment is a pre-filtration for separating particles larger than 200 µm, followed by a second filtration for separating particles larger than 50 µm. With this pre-treatment most parts of sediments are removed from the ballast water. The sludge from the self-cleaning process will be discharged at the same place where it was taken on board. The uptake treatment finishes by disinfection via ultraviolet light. Figure 1 shows the principle operations (flow chart). During discharge only the UV disinfection is in operation, while the other stages are bypassed.

Functionality of the Ocean Protection System (OPS)

The ballasting process starts and the medium flows axially against the first filter stage. Filtration takes place from the inside to the outside of the filter element and the cleaned medium leaves the filter through the radially-mounted outlet flange. When the filter element reaches a defined differential pressure (the filter element is packed with solids) an axially slidable disc moves up and down during the reversible flow by the help of a pneumatic cylinder within the filter element. All operating conditions are monitored by the control unit. After passing the first filter stage the medium flows into the second filter stage: an automatic self-cleaning screen filter designed specifically for ballast water treatment application. The filter is offering a high level of compliance within the IMO’s D-2
standard as well as an efficient solution for filtering sea water containing large quantities of dirt. The filtration process creates differential pressure across the screen which rises as the “cake” enlarges, until a predetermined value is reached (normally 0.5 bar) to activate the flushing process. In cases of low operating pressures and generated suction forces not reaching the required minimum level, a small suction pump is added to the flush line to assist the cleaning process. This is a reliable and inexpensive addition to the system, enabling the filter to operate under extremely low pressures of only 1.2 bar. This low operating pressure is crucial, in particular for retrofit’s, because the low operating pressure meets the parameters of existing ballast water pumps and therefore save costs and potential reconstruction.

Further advantages are:

- due to anti-corrosion coating, the operating time of the filter is extended
- the system is a fully automatic self-cleaning system, which efficiently handles heavy dirt load in raw water
- filtered water is continuously supplied during the self-cleaning process
- the second filter stage generates very low costs per cubic meter of filtered water

After the fine filtration of the medium it becomes treated by ultraviolet light. The ultraviolet light is a natural component of the electromagnetic spectrum. One of the most effective disinfecting wavelength and the one most often used for disinfection is at 254 nm. The ultraviolet light necessary for disinfection is generated in low pressure-high output amalgam lamps. Each lamp is housed and protected against water pressure by a special quartz sleeve. A watertight quartz tube surrounds each lamp. The ballast water to be disinfected is turbulently conducted through the reactor chamber. The gas plasma generated in the lamp emits light with a primary wave length of 253.7 nm. This intensive ultraviolet light reaches organisms in the water and impacts directly on their DNA. By changing the DNA the cell division of the organism is interrupted – it can no longer reproduce itself. With this technology it is
possible to kill or inactivate harmful microorganisms in water, without adding chemicals, without harmful side effects, inexpensively, highly efficient, and reliable.

UV disinfection is an entirely physical process. Microorganisms such as plankton, viruses, yeast that are exposed to the effective UVC radiation are inactivated within seconds. UV disinfection of wastewater has become an accepted alternative to chemical methods of disinfection for secondary and tertiary quality wastewater. Reportedly there are over 1,000 UV systems are in operation throughout North America, Europe, and Asia. The many advantages over chlorination result in a continued increase in interest and use of ultraviolet light as a disinfectant. The disinfection by UV requires no chemicals and therefore causes neither corrosion problems, reaction tanks or secondary pumps, risk of overdosage, need of special storage or handling, nor environmental problems. The de-ballasted water remains alive and enables further organisms to life in the water. Furthermore it retains its natural flavour and smell without any by-products that might endanger health. In addition to that, UV reactors require minimum operation costs, due to low power consumption and little maintenance by maximum operating safety (Figure 2).

The treated ballast water becomes stored in the ballast tanks during the journey. The de-ballasting process bypasses the two filter stages and the medium flows prior to discharge only through the UV reactors to assure absolute accordance to the IMO regulations.

Due to its modular design, the NFV ballast water treatment system OPS offer a wide array of options and configurations: it can be operated as a compact, container-housed unit or adapted to the vessel's design and layout

**Current situation**
The OPS successfully passed the pre-evaluation test, which has been accomplished according to the original IMO test scenario. The test has been conducted at NIOZ (Royal Netherlands Institute for Sea Research) test facility in Texel (Netherlands).
All results are considerably below the IMO specifications according to the IMO guideline D2.

All necessary documents are handed in to the BSH (Bundesamt für Seeschifffahrt und Hydrographie, Germany).

MAHLE Industriefiltration received the approval to start with the official land-based test series at Texel in March 2009 (Figure 3). The tests could be completed successfully mid of June 2009. All official test results were considerably below the IMO specifications again. The official sea-based tests are scheduled to follow the land-based test at Texel. Therefore we are in negotiations with different ship owners in order to use their ships for the test.

We anticipate the marketability of our OPS for the beginning of 2010. This includes all necessary approvals, etc

Company
MAHLE Industriefiltration GmbH is part of the MAHLE Group, one of the world’s 30 largest automotive suppliers, and is a global supplier of innovative, top quality industrial filters. MAHLE Industriefiltration consists of two product brands NFV and AKO.

For almost 50 years, NFV products have been reliable systems for shipping companies in the field of deoiling, membrane filtration and fuel treatment. Our products help our partners to successfully balance economy and ecology. By focusing our maritime and petrochemical activities in the new Hamburg facility, we are able to concentrate research, planning and production in one site. MAHLE Industriefiltration provides with the NFV and AKO products a wide range of customized and highly efficient filtration and separation systems for a wide variety of applications: from bilge water separation over ballast water treatment to engine maintenance, the protection of hydraulic systems and pipelines, transfer and circulation systems. This comprehensive portfolio is rounded off by customer support services precisely tailored to customers’ needs. Ten of the world’s top 15 shipping companies and the world’s three largest shipyards as well as several navies around the world (e.g. German, Turkish, Russian and U.S. Navy) equip their ships with our environmentally friendly, high quality
systems, placing their trust in the outstanding operating security of NFV-systems. The NFV-products have been the German Navy’s partner of choice for deoiling, membrane filtration and fuel treatment systems for over 30 years.

The MAHLE Group is among the top 30 automotive suppliers globally and is the world market leader for combustion engine components, systems and peripherals. MAHLE employs approximately 45,000 employees in over 100 production plants and eight research and development centers. In 2008, MAHLE generated sales in excess of EUR 5 billion (USD 7.3 billion).

Hamburg, 06/2009

Figure 1:
Figure 2:
For further questions please contact:
MAHLE Industriefiltration GmbH
Christian Küchlin
Tarpenring 31 - 33
22419 Hamburg

Phone: +49 (0) 40/53 00 40-24180
Fax: +49 (0) 40/53 00 40-24192
christian.kuechlin@mahle.com
www.mahle-industrialfiltration.com

Press releases and picture services for downloading:
www.mahle-industrialfiltration\news and press