

Marinfloc is committed to working towards the global goals, and we want to inspire and involve others to join in.

In 2015, world leaders agreed to 17 Global Goals. These goals have the power to create a better world by 2030, by ending poverty, fighting inequality, and addressing the urgency of climate change. Guided by the goals, it is now up to all of us, governments, businesses, civil society, and the general public to work together to build a better future for everyone.

Affordable and clean energy - Our current reliance on fossil fuels is unsustainable and harmful to the environment, mandating a shift in how we create and consume energy. On our site in Varekil, Marinfloc has placed solar panels on our new office building. With a total capacity of 34 kW and 950 standard solar hours per year in Varekil, we will create about 31.000 kWh per year. We export surplus energy to the grid when we don't consume it ourselves. Because sunshine is sparse in Sweden during the winter, solar panels will not be sufficient, but the power we buy comes from approved renewable sources.

Responsible consumption and **production** – Our planet has provided us with an abundance of natural resources. Yet, we have not utilized them responsibly and currently consume far beyond what our planet can provide. In addition to the work we do today, Marinfloc will continue new options to use and produce in sustainable ways that will reverse the harm that we have inflicted on the planet. We are and will continue to focus on greener materials and transportation, as well as less travel, as we try to reduce our own carbon footprint.

Life below water - Conserve and sustainably use the oceans, seas, and marine resources for sustainable development. Healthy oceans and seas are essential to our existence. They cover 70 percent of our planet, and we rely on them for food, energy and water. Yet, we have managed to do tremendous damage to these precious resources. We must protect them by eliminating pollution and overfishing and immediately start to responsibly manage and protect all marine life around the world. This goal goes hand in hand with our vision "a clean sea". By producing water treatment systems, these prevent harmful substances from polluting the sea.

Life on land - A flourishing life on land is the foundation for our life on this planet. We are all part of the planet's ecosystem and we have caused severe damage to it through

deforestation, loss of natural habitats and land degradation. Marinfloc has constructed a meadow in the northwest corner of our property in Varekil instead of cutting it as a lawn. The first year has been dominated by various grass species, but several flowers have bloomed – attracting butterflies, bees and other insects. The meadow is a long-term project and is cut by a mower beam and scythe, and the vegetation is removed to avoid fertilization. This will increase the number of flowers eventually.



EGR Bleed-off Water Treatment

Air emission regulations are driving the development of primary engine technologies and secondary exhaust emissions reduction systems. The reduction of NO_v emissions at the source and the treatment of exhaust gas after combustion are the most common technologies utilized to meet the IMO Tier III standard. NO, can be reduced by Selective Catalytic Reduction (SCR) or Exhaust Gas Recirculation (EGR). SCR uses urea that reacts onto a catalyst and EGR reduces NO, by redirecting exhaust to the engine air intake.

Exhaust gas recirculation (EGR) is a process that redirects a portion of the exhaust gases (roughly 30-40%) to the engine's intake side and then back into the cylinders. The recirculated exhaust gases reduce the amount of oxygen (O₂) in the incoming air while increasing the amount of carbon dioxide (CO₂). The peak combustion temperature drops dramatically as a result of the lower O content and higher specific heat from CO₃ in the combustion air, resulting in lower NO_x formation. To prevent corrosion of the combustion chamber components and the EGR system components, the recirculated exhaust gases must be cleaned and cooled before being re-introduced into the engine's air inlet system. The degree of cleaning is determined by the sulphur content of the fuel used. The recirculated exhaust gas is cleaned and cooled using fresh water. The combustion process produces condensate which must be drained from the EGR unit and treated before overboard discharge.

NO,

*NO*_v is a generic term for nitrogen oxides. NO, is generated in the combustion process of a diesel engine and contribute to the formation of smog, acid rain and eutrophication. NO is regulated in MARPOL Annex VI, and an engine installed on a new constructed ship must comply with the Tier III NO, standard when operating in the European and North American Emission Control Areas. NO, can be reduced either by Selective Catalytic Reduction – SCR or Exhaust Gas Recirculation – EGR.

EGR Bleed-off water

Water is used to cool and clean the EGR gas, and the volume will increase due to the condensation of water generated in the combustion process. The surplus water will overfill or bleed off to an EGR bleed-off tank. The amount of bleed-off water and level of contamination depends on the engine size, load, and air humidity. The recirculated water will absorb particles from the exhaust gas, dissolved as suspended solids in the water and the bleed-off needs to be treated to below 15 ppm and measured by an MEPC.107(49) approved oil content meter prior to discharge overboard. Bleed-off water is governed by the IMO Guideline MEPC.307(73), 2018 Guidelines for the Discharge of Exhaust Gas Recirculation (EGR) Bleed-off Water.

Marinfloc Exhaust Gas Water Treatment System (WTS)

Marinfloc's Exhaust Gas Water Treatment System (WTS) is compatible with both MAN-ES EGR and WinGD iCER setups.

Building on years of industry experience, we utilize the proven Marinfloc flocculation process. This approach not only provides crews with essential tools but also guarantees costeffective operations and pristine water release. Constructed with resilient stainless steel, our system promises enduring performance. Moreover, for the convenience of your dedicated crews, we've incorporated digital functionalities for efficient documentation.

For ships powered by MAN-ES engines, there's an added advantage. The Marinfloc WTS can either be chosen as a standalone or upgraded to double up as a bilge water separator.



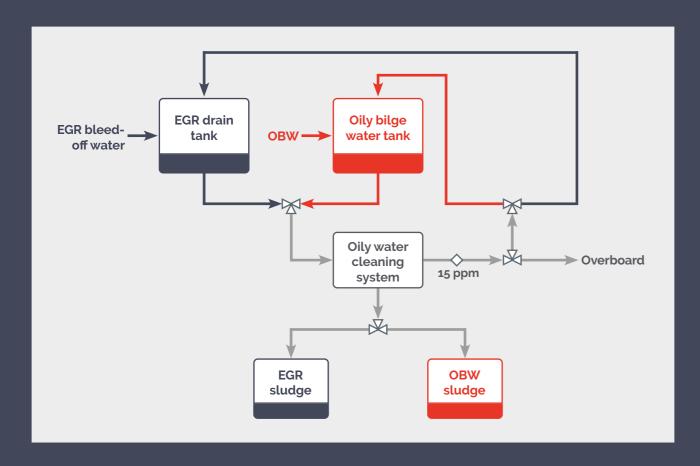
Choosing Marinfloc means you're not just achieving industry norms; you're pioneering in eco-compliance. Amplify efficiency, curtail emissions, and navigate towards a more sustainable maritime horizon.

- · Utilizes flocculation technology, eliminating the need for cartridge filters and centrifuges.
- Approved for both MAN-ES and WinGD iCER
- Efficient energy use for minimized carbon footprints
- Seamless integration with WhiteBox® for combined bilge water treatment
- Cost-effective in operation
- Stainless steel material
- · Proudly manufactured in Sweden

Combined EGR and Bilge Water Treatment System

A combined treatment system for EGR bleed-off water and bilge water is a convenient installation to minimize the cost of equipment, installation and operation related to the discharge of bilge water and EGR bleed-off water. Bilge water and EGR bleed-off water belong to different MARPOL Annexes and must hence be kept segregated, and there must be separate holding tanks and sludge tanks. The system segregation valves prohibit mixing of the two,

including the generated sludge from the treatment process. The class approved automated switch-over sequence with interlocks is controlled by the system automation. From the control panel, the operator can easily select which waste stream to treat. The Whitebox® will control and record the system vital discharge parameters and segregate the amount of discharged bilge water and EGR bleed-off water for separate record keeping as required.



Process description

The CD-unit can take suction from either the EGR bleed-off tank or the Bilge water holding tank.

Three three-way valves connected to a selector switch secure that the waste streams are not mixed.

The EGR bleed-off water is collected in a bleed-off water drain tank with a soot trap. The tank should be equipped with heating coils to heat the water to 40-55 °C. Alternatively, a heat exhanger is mounted

prior to the treatment unit. A solid sensor in the tank will detect solidification of soot. The system must have segregated sludge tanks as per the MARPOL requirements. The wastewater is treated overboard through a Whitebox® by the CD unit and all vital system data such as tank levels, valve positions, oil content, discharged volume etc. is recorded and logged in the Whitebox® recorder.

Key benefits

for the ship owner



- Lower capital expenditures as there is no need to procure a separate bilge water separator
- Lower operational expenditures less classification costs, spares, consumables and documentation
- More available space onboard for improved cargo capacity
- One high-end separator for two waste streams means no need for budgetary trade-offs for new building projects

for the **ship yard**



- **Lower capital expenditures** as there is no need to procure a separate bilge water separator
- Simplified installation with just one unit to set up
- Lower cost for commissioning with our streamlined solution
- Enjoy substantial **50% savings on documentation**

for the engine maker



- High-quality water treatment ensures compliance with the stringent environmental regulations
- Elevate your offerings with our industry-leading system, turning it into a unique selling point that sets you apart from competitors
- Avoid customer frustration resulting from equipment standstill challenges with a continuously operating unit
- Experience 50% savings on training, service, and spare parts with a combined unit

Bilge Water

Not just oil in water

No other waste stream on a ship is as closely linked to million-dollar fines and imprisonment as bilge water (engine room generated wastewater). The term "magic pipe" is well-known among marine engineers, and many have seen them in action because they are still commonly used on ships. We believe that the reason for this isn't a lack of knowledge or trust, but rather a lack of appropriate tools to handle day-to-day operations.

Bilge water isn't just limited to oil and water; anything brought into the engine room can end up in it. This cocktail contains washing chemicals, rust, sewage leaks, boiler water chemicals, lubrication, and hydraulic oil, foaming liquids, CIP-fluids, grey water leaks, metals, soot, bacteria, dust, and other contaminants. This variation creates a most difficult challenge for marine engineers as conventional static separators are only designed to treat bilge water consisting mostly of marine fuel oil and water. The gap between design and reality leads to inefficiency, which is why the majority of ships violating Annex I regulations can be traced back to simpler types of separators.

Flocculation

Flocculation is a water treatment process in which solids come together to form larger clusters, or flocs, which are then removed from the water. This process can occur naturally or with the assistance of chemical agents. It is a common method of wastewater treatment and drinking water purification. The process of flocculation is chemical in nature. It entails sequentially adding chemicals to the wastewater and allowing tiny solid particles to aggregate into a larger particle that can be separated from water. The treatment of

Solid particles suspended in wastewater are negatively charged. A coagulant, such as aluminum chloride, is added to the wastewater. The negatively charged solid particles suspended in the water are neutralized by the positively charged coagulant molecules. The neutralization of these particles allows them to flocculate together into a larger particle. A polymer chemical is added to the wastewater once flocs begin to form. Polymers link the flocculant from micro to macro flocculant, increasing the mass of particles clumping together. This chemical also binds the collected mass together, preventing it from dissolving even when the water is slightly agitated.

Dissolved air flotation

wastewater by flocculation is done in stages.

Dissolved air flotation (DAF) is a water treatment method that removes suspended particles such as oil or sediments from wastewaters or other liquids. The separation is accomplished by dissolving air under pressure in the water or wastewater and then releasing the air at atmospheric pressure in a flotation tank. The released air forms tiny bubbles that cling to the suspended matter, causing it to float to the surface where it can be removed

This technique is widely used in land based industrial wastewater treatment units for oil refineries, paper mills, general water treatment plants, and other industrial facilities.



Water being fed to the DAF tank is often (but not always) dosed with a flocculant to bind the particles into bigger clusters.

Marinfloc Oily Water Separator

Developed to meet onboard conditions

The CD unit is a dissolved air flotation and flocculation unit that treats bilge water to below 5 ppm. The technology enables treatment of bilge water of various composition as the operator can adjust the dosage to the current conditions at hand. It was developed onboard ships not simply to fulfil the MARPOL requirements but to meet onboard conditions.

Key benefits

- · Flocculation technology: no cartridge filters nor centrifuges required
- · Adjustable to the ship's specific bilge water composition
- · 5 ppm type approved
- Low energy consumption for low carbon footprints
- · Can be integrated with the Whitebox®
- · Low operational cost

The treatment process

The process can be divided in five stages: Oil separation, Aeration, Flocculation, Flotation and Filtration.

- 1. Oil separation. Free oil floats on water and is separated in the oil descaler by gravity to the sludge tank.
- 2. Aeration. Air is dissolved in the water under pressure.
- 3. Flocculation. Flocculation chemicals are added and coagulate emulsions, chemicals, and particles to flocs.
- 4. Flotation. The dissolved air from the aeration process is released into the flocs that are lifted to the top of the flotation tank and removed to the sludge tank.
- 5. Filtration. The clean water from the flocculation process is filtered to 0-5 ppm before being discharged overboard.

Capacity range between 0.25 and 5.0 m³ per hour.





TD Pre-treatment

The Marinfloc TD Pre-treatment system is a fully automatic emulsion breaking bilge water cleaning system based on the technology of flocculation from the Marinfloc Oily Water Separator TD model. The TD Pre-treatment will remove emulsified contaminants and suspended solids and feed the clean water to the existing Oily Water Separator (OWS) to achieve 15 ppm. It will also significantly cut your existing filter cost, making the return on investment to as little as one year.

Key benefits

- · Complements the existing OWS to continuously achieve less than 15 ppm
- Considerably cuts the current operational costs
- No need to update the IOPP-certificate
- Plug and play installation
- No training needed for operation
- Minimal maintenance and spares
- · No additional tanks needed
- Space efficient

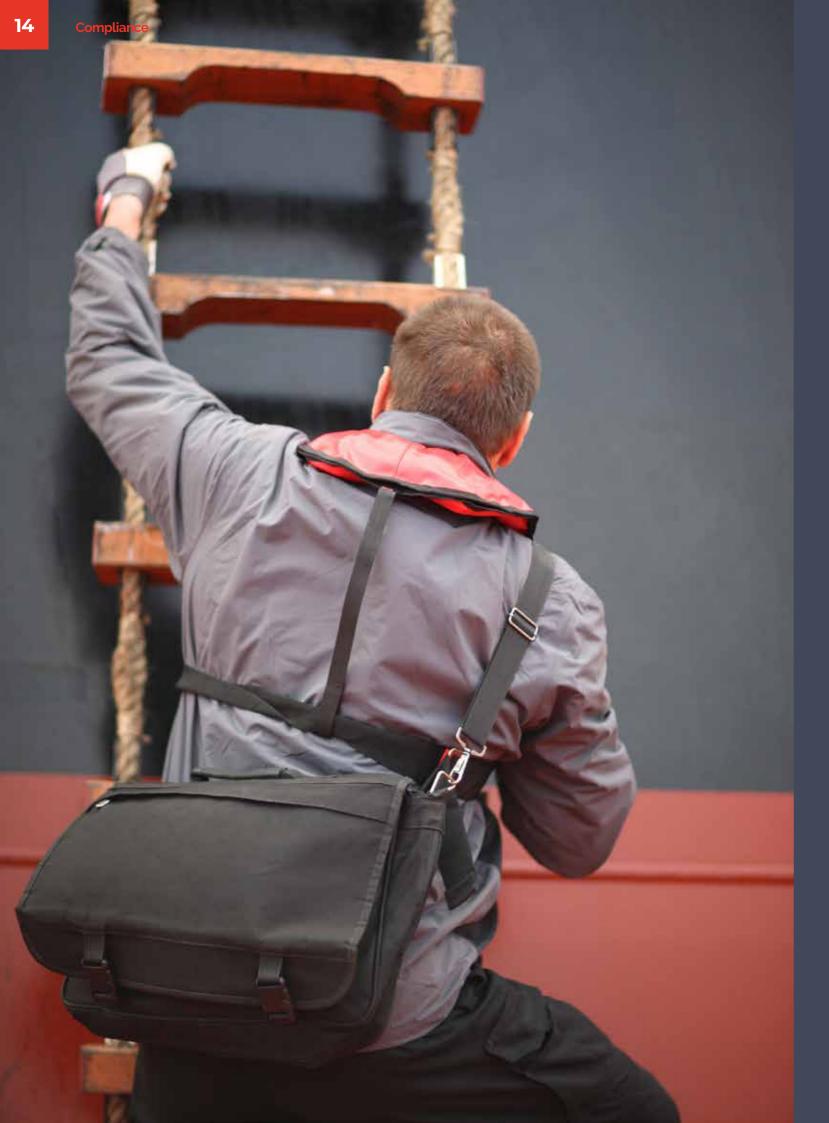


CD Pre-treatment

Just as the TD Pre-treatment, our CD Pre-treatment system is an emulsion breaking unit to be installed upstream of the existing Oily Water Separator to help it reach the discharge limit. It is a fully automatic system based on the emulsion breaking technology of flocculation and dissolved air flotation directly derived from the patented Marinfloc Oily Water Separator CD model.

- Supports the existing OWS to continuously achieve less than 15 ppm
- Considerably cuts the current operational costs
- · Can be upgraded to an approved MEPC.107(49) unit
- No need to update the IOPP-certificate
- Plug and play installation
- · Minimal maintenance and spares
- · No additional tanks needed
- Space efficient





Compliance

Compliance means obeying the law. Ethics is the intent to observe the spirit of the law, and the expressed intent to do what is right. The effects of unethical behavior on a shipping company and its personnel, both on land and at sea, can be catastrophic. Million-dollar fines, lengthy probation periods, and costly environmental compliance procedures is a consequence of not being compliant. Magic pipes do unfortunately not belong to the past. Recent incidents in the United States have highlighted the need for a well-implemented bilge management program as well as adequate environmental compliance programs.

The US regulation with the whistle blower's protection act, false statements act, Sarbanes-Oxley act of 2002 (obstruction of justice), witness tampering, Act to Prevent pollution by ships and more, enables the Department of Justice to prosecute individuals and shipping companies for violations also committed outside US waters. Prioritizing bilge water compliance is important to protect your crew and the company and has proven to be a smart business decision. Marinfloc has over 25 years of expertise solving the challenges associated with bilge water and understands how to limit the risks for noncompliance.

Oil Content Meters

OCMs are used to monitor bilge water oil content, also known as 15 ppm bilge alarm.



High ppm and alarms are frequently blamed on oil content meters. "There is no oil in this water" a disgruntled engineer laboring with the bilge water discharge could say. ppm stands for part per million and the meters are designed to detect oil content levels at these extremely low concentrations. It's a popular misperception that water with a 100-ppm oil concentration will have a sheen on the surface. Emulsified oil leaves no sheen on the water's surface, and it's hard to tell how much oil is in a sample by looking at it. Sure, the OCM will alarm for rust and dust at some point, however the source of high oil content reading is found upstream. Operators should address the underlying issue rather than the symptoms. Instead of condemning the meter, operators should accept this situation and instead consult the OWS manufacturer if the water cannot be treated to meet acceptable levels.

Emulsions

An emulsion is a combination of two liquids that are typically immiscible due to liquid-liquid phase separation.

Already in MEPC.60(33), it was stated that gravimetrical separators could not be expected to clean emulsified bilge water to a satisfactory level Still today, a majority of OWS on the market are based on gravimetrical separation and filtration. This has created a discrepancy between products just fulfilling MEPC test standards and real shipboard conditions.

Emulsions cannot be separated gravimetrically, and filters often fail to preserve performance in shipboard conditions beyond the 120 minutes required for MEPC.107(49) certifications. The IMO standard has failed to replicate shipboard conditions, which has led to an industry of basic and cheap separators that however require frequent filter maintenance and baby sitting.

Magic Pipe

A magic pipe is a surreptitious modification to a ship's oily water separator or other wastehandling equipment that allows waste liquids to be discharged in violation of maritime pollution regulations.

Such modifications to equipment may allow hundreds of thousands liters of contaminated water to be discharged untreated, resulting in widespread pollution of marine waters. To discharge untreated wastewater directly into the sea, a pipe can be improvised aboard ship using available hoses and pumps. Magic pipe cases frequently involve the falsification of records, as ships are required to keep documentation of waste and its treatment. These cases usually result in hefty fines for shipping companies and even prison sentences for crew members. The pipe is dubbed "magic" because it bypasses the ship's bilge water separator directly overboard. As a result, the bilge water "magically disappears". The use of magic pipes continues to this day, as do efforts to improve bilge water treatment in order to eliminate the need for these shortcuts.

Whitebox®

The Marinfloc Whitebox® is a failsafe overboard discharge monitoring and control unit. It is installed between the oily water separator and the overboard valve. It prevents non-compliant discharge of bilge water and helps to protect the crew from accusations.

All vital discharge data is recorded and linked to the vessel's GPS; the Whitebox® houses all necessary monitoring and control equipment for the overboard discharge. A digital recorder stores all critical data such as oil content, valve settings, flow via the oil content monitor and overboard flow, door open/closed, vessel position, and time.

- Has evolved over 20 years
- The original
- Ready for the digitalized future
- · Ocean Guardian integration option



Ocean Guardian

Environmental operations planning

As the maritime industry continues toward the goal of sustainable operations, the need to develop an innovative solution to address the increasingly complex global environmental compliance requirements led to the creation of Ocean Guardian. Launched in 2017, Ocean Guardian was developed by our US retailer, Total Marine Solutions, a worldwide leader in MARPOL compliant environmental solutions. Ocean Guardian matches a vessel's GPS location to a proprietary global regulatory database. Ocean Guardian removes the guesswork from compliance by providing data on demand for baselines, applicable regulatory guidelines, and discharge notifications. Verified and vetted by a third-party maritime law firm, we call this 'assurance beyond compliance' – knowing, not guessing.

Today's complex regulatory environment makes it increasingly difficult for crew members to rely on often outdated hard-copy manuals. Failure to have the latest regulations on hand can lead to accidental discharge, which in turn can lead to fines and reputational harm. Ocean Guardian simplifies environmental operations, providing key decision-making data at your fingertips.

Key benefits

Data on demand

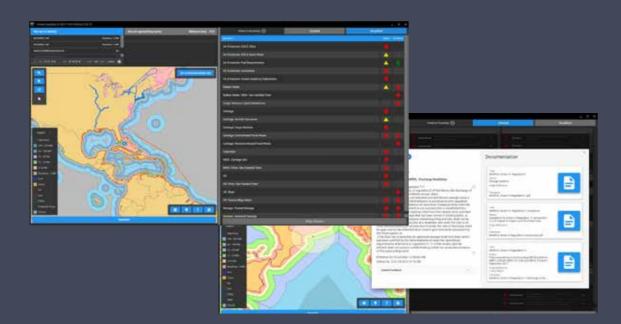
Immediate access to our global regulatory database, vessel location and real-time updates.

Verified and vetted database

Verified and vetted database of international, national, regional, port and company regulations.

Discharge guidance

Simple red, yellow, green discharge guidance provides at-a-glance understanding of permissible discharge across waste streams.





Environmental operations planning

Brings voyage planning and environmental operations together to simplify compliance and enhance workflow efficiencies.

Easy to integrate

Easily integrates with existing on board systems and operations.

Fleet operations

Fleet wide visibility in real-time, enhancing operations, workflow and capacity shore side and on the vessel.

Alarms and notifications

Enabled alarms and notifications can help prevent accidental discharge and notify operators of changing discharge zones.

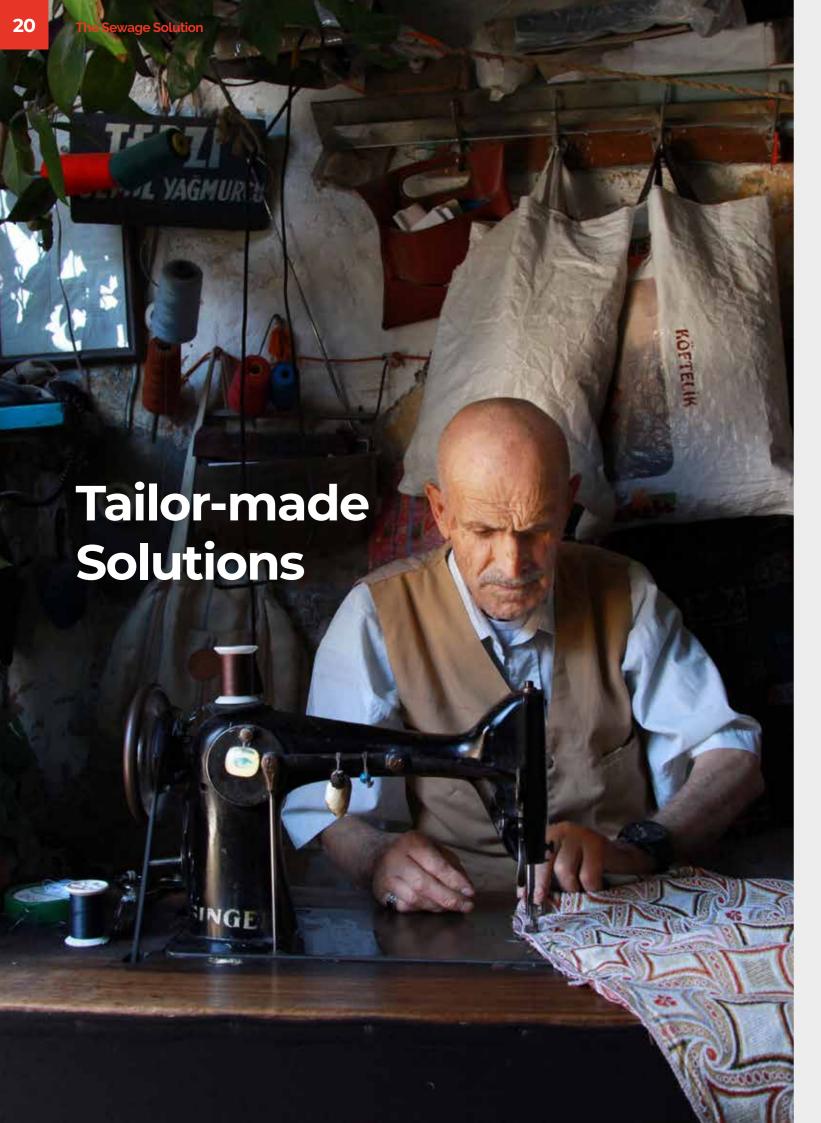
Rules portal

Client accessible rules portal can be customized to include company or vessel specific guidance.

Configurable and customizable

User interface is easily configurable to meet company and operator needs.





Marinfloc Advanced Sewage Treatment System

Vessels differ in design, number of persons onboard, tank arrangement, trading area, age etc. As the conditions differ from ship to ship, the ideal treatment system solution also differs from ship to ship. Marinfloc has specialized in making the most out of what is at hand onboard to tailor a system that optimizes the use of tanks, space and existing system components. If something can be reused or converted, it is the most cost-effective, time-efficient, and environmentally friendly way to go. Sometimes, tanks can be reused, repaired or converted; sometimes, we need to construct new. The crew are the vessel experts, and we are the experts in sewage treatment. We love to come onboard and work with the crew to find the ideal design together.

We provide tailor-made solutions to make the most out of your vessel.

- Baltic Sea approved as per MEPC.227(64) §4.2
- · Tailored solutions to get the most out of your vessel
- Reduction of physical footprint using hull tanks to save space in the engine room
- Reduction in environmental footprint by treating both black and grey water
- Designed for retrofits



As of June 1, 2021, all passenger ships must comply with the latest MEPC addendum for sewage discharge in the Baltic Sea. In addition to the present discharge parameters, the new set of standards requires additional treatment of phosphorus and nitrogen.

For the majority of new ships, this meant little or no modification because their equipment had already been prepared for this new set of rules. However, for the older vessels, this meant either making a big investment or risking losing business by not sailing to the Baltics. Due to the importance of this destination, not travelling the Baltic is not an option for most operators, resulting in a significant demand for sewage treatment conversions.

Like most other environmental retrofits, a sewage treatment upgrade is complicated since there are no quick fixes nor short cuts. Sewage treatment, and particularly nitrogen removal, is accomplished in a multi-step process, therefore there is no simple upgrade so the vessel must typically construct a whole new system.

Recognizing the necessity for substantial rebuildings, the limitation of available space onboard and the related costs for existing ships, the Marinfloc Neptumatic Sewage treatment system is designed for retrofits. The ASTS unit can be easily dissembled and assembled again in place. The bioreactor can be a part of the vessel hull tanks to maximize the use of available space and bioreactor volume. The entire treatment system is tailored to make the most of the conditions

at hand.

The system flexibility even enables retrofitting of an almost 100-year-old tall ship that needs to prepare for world-wide operations including Baltic Sea Compliance. The small footprint of the ASTS unit, utilization of existing tanks and the possibility for on-site assembly are key features for vessels where hull penetrations are not possible.



Total organic load contribution

Black water (sewage) actually contributes by only 25-30% of the total organic load. Grey water contributes by 70-75% but is not regulated by IMO. We strongly encourage to also include grey water in the regulations.



Marinfloc Neptumatic Sewage Treatment System

Marinfloc ASTS unit

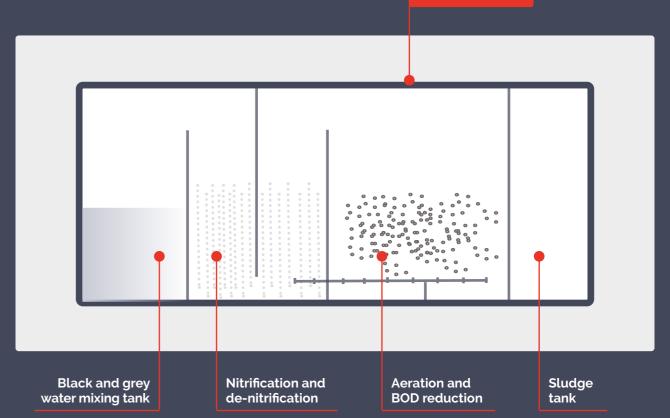
The Neptumatic Advanced Sewage Treatment System (ASTS) can be divided in Mechanical separation, Biological decomposition, Chemical flocculation, Forced flotation, Filtration and Sterilization.

Black and grey water is mixed in a hull tank. The bioreactor can be hull-integrated or standalone depending on the individual conditions onboard. This is where BOD and nitrogen is reduced. The mechanical screen will separate coarse material and the ASTS treatment unit will remove suspended solids and phosphorus in the flocculation process. The forced flotation process will separate sludge from the water, and after the water has been filtered in the last stage, UV light neutralizes bacteria and virus.

Step 1: Mechanical Separation

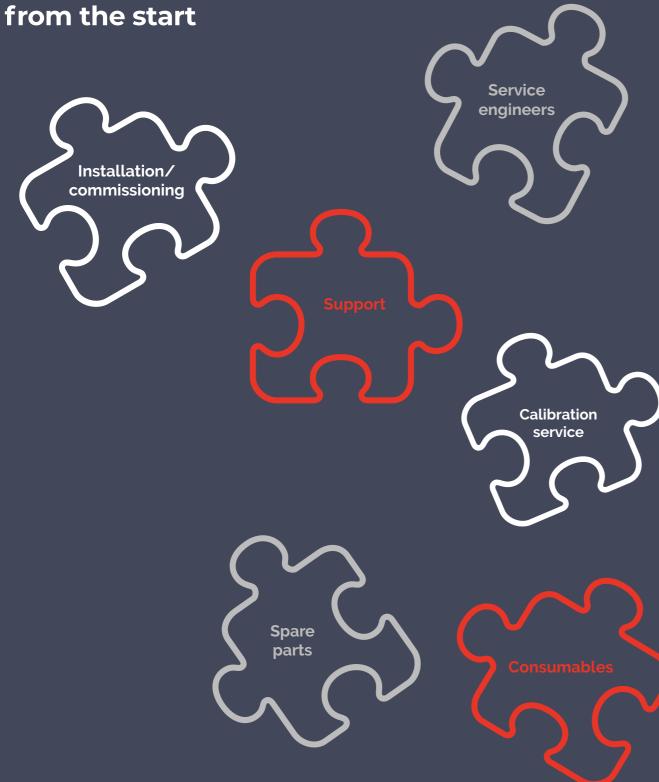


Step 2: Bioreactor



Marinfloc Service & Support

We support every part of the value chain



Lifetime service and support – worldwide

Marinfloc provides a range of service solutions, including support and commissioning.

Our support organization is available to you by phone and email for any problems you might encounter for your continuous operation. If necessary, the expert assistance can also provide you with missing or lost documentation to support regulatory compliance, thus reducing the risk of penalties or sanctions.

We have a range of highly qualified service engineers available for personal attendance who can visit your vessel anywhere in the world or travel with it between destinations while it is in operation.

Our service locations with engineers and assistance are spread out across the globe and cover all major time zones, ensuring prompt and skilled support for every demand 365 days a year.

Calibration services at your disposal

We are here to help you maintain calibration compliance for your IMO regulated equipment.

We have a 24-hour turnaround commitment for our calibration services and have authorized service stations worldwide. Get in touch with us and discuss your needs, we help many clients in planning calibration needs to ensure compliance.



28

Original spare part supply – anytime, anywhere

We are fully committed to ensure that your Marinfloc equipment(s) operates efficiently over the years to come. We supply daily a complex worldwide network of vessels and agents to meet their demands for spares and consumables.

An average of 95% of our requests are cleared and shipped within 24 hours. With over 1,000 sqm of warehouse, 75,000 parts always in stock, we are committed to help your running the equipment(s) as designed and minimize any downtime.

In addition, our dedication and expertise has served many clients design successful maintenance plans with the aim of preventing failure, downtime, or inefficient performance.



SAFE

SAFE – Marinfloc lifetime service and support package for your whole system: annual service engineer attendance, original spare parts including warranty, discounts on purchases and lifetime support.

One of the numerous solutions we provide for your convenience is our SAFE service package, which ensures that your vessel operates in accordance with relevant authorities' requirements and company policies. SAFE presents you the tools to get cleaned water overboard.

With SAFE, we agree on a compliance solution tailored to your vessel's specific needs. We ensure that you have access to all necessary service, assistance, facts, and knowledge 24 hours a day, 365 days a year. SAFE allows you to control your OPEX, optimize your equipment, minimize maintenance costs, enable extended warranty options, and ensure access to valuable data.

SAFE remote service capabilities enable our specialized global support teams to be available for you 24 hours a day, 365 days a year, to eliminate the risk of unplanned stops in operation.



MARS

MARS - Marinfloc Alert Report and Support is an online portal that supplies our customers with valuable real-time data of the equipment operation - at all times.

MARS provides you with an instant overview of vessel operation, fleet view and possible action needed to be taken, based on real-time information from the vessels. Instead of getting a report on old news, the crew and the company can act upon information in real-time. By having MARS connected to the fleet, it is possible to compare the bilge operations between different vessels. This will enable the onboard bilge handling to be optimized and streamlined in accordance with established company policies.



MARS complies with all current cyber security rules and regulations and provides you with accurate data that can be further analyzed or exported into a useful pdf report for distribution to relevant parties.

Visit our webpage to get the latest feature list.



25 years in the name of clean water

Bilge water: different points of view

On February 1st, 2021, we celebrated our 25th anniversary. During this period of time, we made a lot of good friends, but we also met other people who, strangely enough, didn't like us that much. One incident that comes to mind is when a gentleman claimed that we were the ones who invented the bilge water problem. He emphasized the point that, prior to Marinfloc, bilge water was hardly discussed. Why waste effort when all separators functioned identically, and no one came close to cutting it? We later learned that he had discovered a new perspective. The days of playing the "there is no solution on the market" card, in his opinion, were over. The days of blissful ignorance where long gone. We love to invent; it's in our DNA and it shows in everything we do, but we can't claim to have invented the bilge water problem; we did, however, come up with a solution.

All good stories start with a beginning

Marinfloc has been a catalyst for green technology and inspired innovation in the marine industry since the invention of the first oily water separator. However, the story begins years before Peter Lanzén and Benny Carlson put pen to paper and established the corporation. The year is 1988, Rick Astley wasn't going to give you up and neither was the Swedish Green Party, which became the first new party to join parliament in 70 years. In 1988, Sweden also had one of the country's worst marine animal extinctions catastrophes in history where a significant portion of the seal population died made headlines, sparking an already emerging green movement. Because seals are marine animals, the focus of attention was immediately turned to shipping as the source of the problem. It was eventually discovered that this tragic event was caused by a virus. However, there was a silver lining in that this occurrence raised new environmental awareness in the marine industry.

Wind of change

In the early 1990s, some shipowners began to implement new, ecologically friendly company

policies, including the landing of all waste generated onboard their vessels. That might not seem like a big deal in 2022, but remember that 30 years ago, most waste was thrown or pumped overboard. Discharging untreated water overboard was never permitted, yet it was common practice due to a lack of technology and an outdated mindset. Bilge water is made up of 99 % water and 1 % oil, yet the amounts of bilge water can be substantial. Despite the low oil concentration in untreated water, there was no viable separation technique for the maritime market that could remedy the problem. Pumping all bilge water to shore, on the other hand, was - and still is - expensive, therefore, it became necessary to look into how this could be done more efficiently.

The Marinfloc story begins

While the shipping industry struggled to locate functional equipment from several suppliers, Stena Line, a Swedish shipowner, decided they needed to go elsewhere. Rather than scouring the globe for a solution, they assigned two of their own engineers to the task. Peter and Benny had spent many years as expert mariners dealing with malfunctioning equipment on various ships. Knowing this, they were persuaded that the answer lay inland rather than at sea knowing that municipal water treatment facilities needed to take into consideration both efficiency and cost but also the quality of the effluent water. They soon discovered that most plants around the world used a technique known as flocculation, where a salt solution is used to collect and gather oil, chemicals, and other impurities so they can be easily separated and collected. Based on these findings, they began experimenting in a small test facility, where flocculation became a key component of the solution. The test equipment was expanded to the first prototype and installed onboard the RoPax vessel Stena Danica. During the first year, the solution ended up saving USD 100,000.

Type approval and certification

A second prototype was put on a sister ship shortly after, and the equipment was type approved by the Swedish Maritime Administration and the classification society Det Norske Veritas in 1994 under the name MARINFLOC. More units were installed as word got out that there was an Oily Water Separator that actually functioned. The demand for this functional technology grew in 1996, and Peter and Benny established their firm and began working full-time on developing and selling the equipment. This was the beginning of Marinfloc's success story. Marinfloc has been developing environmentally friendly water treatment systems for ships and offshore installations since that day.



service@marinfloc.com



support@marinfloc.com





Ш

www.marinfloc.com