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How much will your BWM system cost?



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The right BWM system can make a difference.



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Is your BWM system flexible enough?

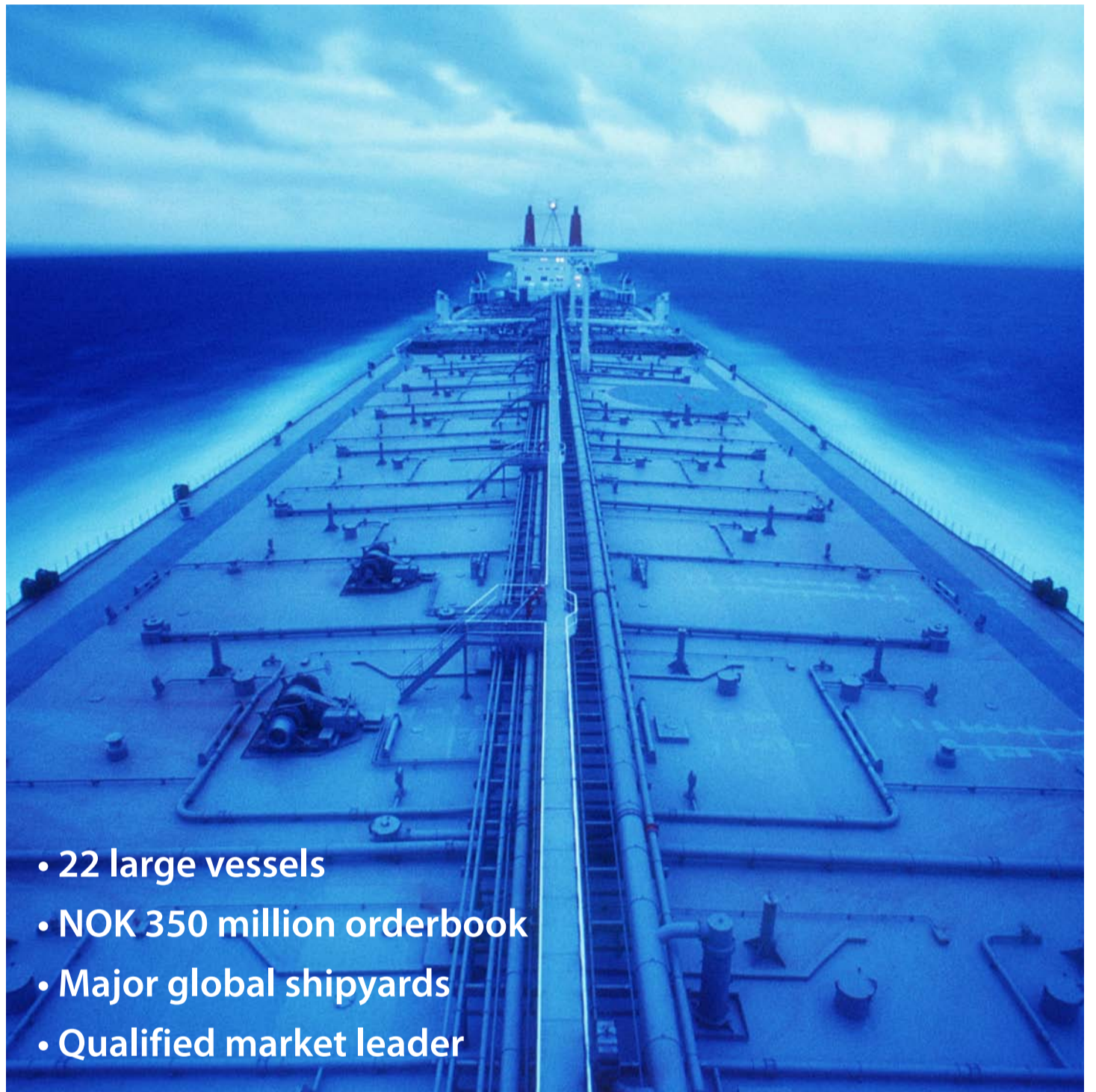


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SUPERsaturate your ballast tank



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- 22 large vessels
- NOK 350 million orderbook
- Major global shipyards
- Qualified market leader

Taking a lion's share of the large vessel BWM system market

OceanSaver has signed more major ballast water management (BWM) system contracts than any other supplier. Backed by BWM system orders for 22 large vessels, valued at NOK 350 Million, OceanSaver is now focussing on successful, quality deliveries to major shipyards worldwide.

Shipowners are acting on IMO's International Convention for the Control and Management of Ship's Ballast Water and Sediments which takes effect from 2012 for new vessels.

"We are witnessing an increased interest by shipowners. The market has accepted OceanSaver technology and we are taking the lion's share of the large vessel segment, mainly the tanker, gas and bulk carrier segment," said Stein Foss, CEO, OceanSaver.

OceanSaver's first commercial contract was the first of its kind within the large ship segment and signified a major breakthrough for IMO's BWM Convention, as well as for the company.

"Recent and potential orders position us as the market's foremost provider of BWM systems. We estimate the overall BWM market to be about USD 35 billion from 2010 to 2020," said Foss.

OceanSaver's defined goals include being the leading BWM system supplier within selected tonnage. The large vessel market represents 20% of the total number of ships worldwide, but approximately 40% of the total value of the BWM market.

"Having a market potential of some USD 12

billion within our target segment alone, we expect rapid and sustainable growth over the next years," says Foss.

OceanSaver's hybrid treatment approach is a combination of filtration, cavitation, supersaturation (oxygen removal) and disinfection. It does not contain or use any substance that poses a risk to the marine environment, but offers simple and effective operations and control and has demonstrated compliance to the newly adopted performance standards for ballast tank coating schemes.

"We have a robust and suitable ballast water management system for shipboard environments and offer unique flexibility related to installation. The corrosion benefits looks very promising compared with competing technologies and the system is an optimal solution for marine applications," says Foss.

OceanSaver meets one of the strictest and most complex compliance procedures of the International Maritime Organisation and other approval authorities. In addition, it has the potential to meet the California Performance Standards, governing ballast water management requirements for vessels over 300 gross registered tons.

With type approval certificates in their pocket and a stream of orders rolling in, OceanSaver is now focussing on successful commercialisation, manufacturing and logistics in order to meet the demand and to assure quality in its deliveries to clients worldwide.

"We have established a strong global network of highly capable sales- and service agents and secured production capacity to accommodate significant orders this year and in years to come," concludes Foss.



The market has accepted OceanSaver technology and we are taking the lion's share of the large vessel segment, mainly the tanker, gas and bulk carrier segment.

Stein Foss, CEO, OceanSaver

Flow capacity. Footprint. Technology.

How much will your BWM system cost?

One of the key questions both for the ship owners and system suppliers is the pricing of ballast water management systems.

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The key technical features of a BWM system with respect to ballast water treatment are the flow capacity, footprint, overall size of the system and costs, the latter comprising capital expenditure costs and operating expenditure.

“Choosing the best organization, processes, technology and equipment creates the best long-term BWM system solution. There are a number of BWM systems on the market, but the majority lack well-proven technology components and systems testing,” said Tor Atle Eiken, director of sales at OceanSaver.

“Choosing easy to maintain, reliable and approved BWM system components and parts, minimizes the risk of high after-service equipment maintenance, upgrades and lack of compliance,” he said. Capital costs associated to purchasing a system with a pump capacity of 200-250 m³/h range from USD 175,000 to 600,000. Larger systems with a pump capacity of around 2000 m³/h range from USD 650,000 to USD 2M.

OceanSaver’s BWM system is designed and its components engineered to operate the lifetime of any commercial vessel.

“The end price largely depends on flow, footprint and shipboard conditions. The footprint increases proportionately with flow capacity,” says Eiken.

He says: “OceanSaver is constantly raising the bar to create added-value through supplying highest-quality materials chosen for functionality. The majority of our contracts are won due to TCO, environmental excellence and compliance.”

He warns that some BWM systems may cost more than anticipated.

“Some prices quoted by suppliers should be regarded as tentative. Some systems and products offered by competitors are still under development and the price, to a certain degree, is determined by the marketplace.”

According to Eiken, OceanSaver has spent more time engineering, perfecting and testing its system than any of its less-focused competitors.

“We give a firm price and quality performance. Ship owners rely on OceanSaver to deliver systems that offer a high level of consistency. Downtime, parts failure and environmental disasters are expensive,” said Eiken.



OceanSaver’s BWM system is designed and component engineered to operate the lifetime of any commercial vessel.

MORE or LESS ballast tank corrosion: The right BWM system can make a difference

Each stage of a vessel’s coating lifetime has unique issues; design, new building, maintenance in service and refurbishment. The underlying corrosion driving factors, from a corrosion-engineering point of view, are similar throughout all these stages.

Did you know:

- A BWM system will change the conditions for which coating systems are designed
- A BWM system can contain oxidation processes causing breakdown of coating systems
- A BWM system can accelerate the rate of corruptions caused by a coating defect

Ship’s ballast tanks may present premature failure of their protective coating systems, which may lead to rapid corrosion of unprotected steel, making repair extremely difficult and costly.

“The standard of coating applications in newbuildings has been a major focus in recent international regulations and also throughout the development of OceanSaver’s BWM system,” says Leif Erik Caspersen, Area Sales Manager, OceanSaver.

Reduced corrosion

OceanSaver is one of the few ballast water management systems verified to be “Compliant with the intentions of the Performance Standard for Protective Coatings” (PSPC). PSPC aims to improve safety at sea by avoiding

the effects of corrosion, thus enhancing the structural integrity of the vessels as a whole. In specific terms, this involves a target of 15-year useful coating life for ballast tanks classified as being in good condition.

Corrosion engineers and coating system experts at DNV and Safinah, a UK coating consultancy firm, completed thorough coating assessment and corrosion tests using the OceanSaver ballast water management system. Two full scale 12 and 15 months of different ballast tank coatings of well known brands revealed that OceanSaver prevents creep corrosion and has a beneficial effect reducing sacrificial anode consumption.

By combining IMO PSPC with a OceanSaver BWT system, ship owners can expect extended ballast tank lifespan beyond 15 years.

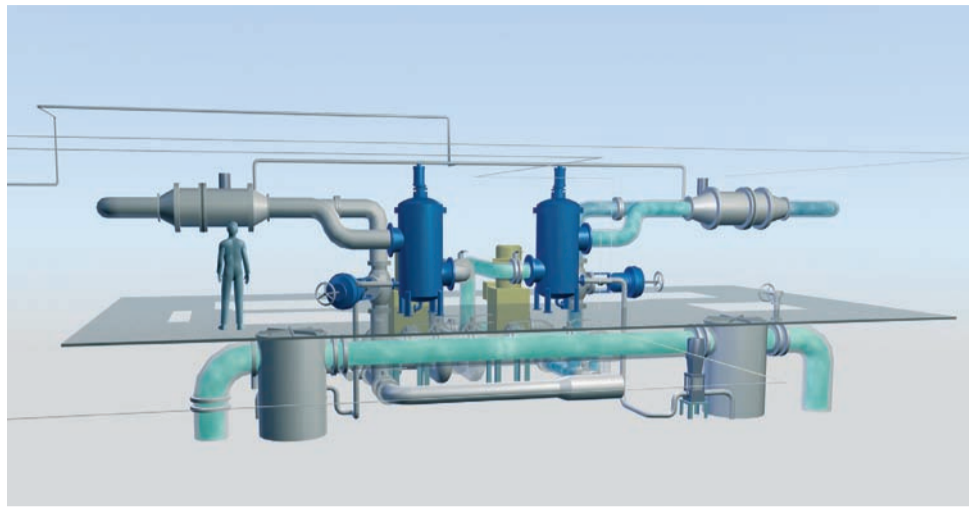
“With proper maintenance of the coating systems (according to PSPC) combined with OceanSaver, the coating system may potentially last the vessels lifetime,” says Caspersen.

OceanSaver stands out among ballast water management systems for its commitment to protecting ballast tank coatings, demonstrating its performance and undertaking tests. As a result, ships installed with OceanSaver equipment will see lower expenses, and less frequent service related to ballast tank repairs.



Reducing ballast tank corrosion has been a major focus in OceanSaver’s technology.

From Suezmax to Ultra VLCCs: Is your BWM system flexible enough?



Most BWM technologies available are designed for medium to low-capacity systems. Few existing technologies are suitable for larger vessels or complex tonnage, such as tankers, chemical carriers or gas carriers. Further, some BWM systems grow exponentially in size as the ballast volume and pump capacity increases.

The big status – BWM Convention ratification

To date, 26 countries, representing 24.44% of the world merchant shipping tonnage have ratified the Ballast Water Management Convention.

The BWM Convention was adopted in 2004 and will enter into force 12 months after ratification by 30 states, representing at least 35% of world merchant shipping tonnage.

Croatia has acceded to the BWM Convention by depositing its instruments of ratification with IMO on 29 June 2010. The accession by Croatia brings the total number of parties to the Convention to 26 and with this, the BWM Convention has moved one step closer to its entry into force. It is widely expected that a number of other countries are very close to their accession to the Convention prior to 2011.

"At this point, only a few EU states have ratified the Convention. The EU has initiated a coordinated process aiming for full EU ratification within 2011. With a number of other states working on ratification, this Convention will undoubtedly be ratified in 2011 and enter into force one year later," says Aage Bjorn Andersen, Director of Research and Development, OceanSaver.

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OceanSaver is more flexible than most others, designing its systems as much as possible around the capabilities normally required on board a ship.

With only two components needing to be aligned with the ballast water pipeline, the system can be installed where it fits onboard. There is no linear growth in terms of space and cost.

The system can technically handle any capacity from 40 to 10,000 cubic meters (metric tons) or more of ballast water per hour without any delay in ballasting operations.

The system is most suitable for medium sized tonnage and upwards (e.g. capacities from and above 1,000 cubic meters).

On both newbuildings and retrofits, the OceanSaver is easier to install in terms of finding space, both in absolute terms and in terms of components' locations.

OceanSaver's DNV Type Approval includes virtually no limit on capacity, as the system's modular design increases capacity by duplication, highly applicable for larger tonnage.

OceanSaver: Compliant for gas hazardous areas



Hazardous Areas representing the potential of risk of explosion or fire due to presence of vapour, fuels or other hazardous substances sets strict equipment requirements.

For oil tankers and chemical carriers with liquid products having a flash point not exceeding 60°C, all electrical equipment must be based in a non-hazardous area, or must be certified as safe for use in a hazardous area.

Ballast water from ballast tanks adjacent to cargo tanks in which liquids with flash point not exceed 60°C is present is not allowed to be led to the engine room because of risk of leakage of flammable gases. Following the same reasoning, it is not allowed to take ballast water from such ballast tanks into gas safe rooms on deck.

"Quality systems have become more and more an integral part of hazardous area equipment manufacturing. OceanSaver has applied various criteria to ensure the continued compliance of equipment to its certified design," says Stein Foss, CEO, OceanSaver.

He says: "Thorough testing and securing certification of our BWM system, we have streamlined the risk assessment process for our customers."

Most BWM systems receive electrical power from the treatment plant. In most ships, a full plant installation, in alignment with the ballast water pipeline, is required. However, this configuration does not meet safety requirements, and cannot be approved for tanker pump rooms and other gas hazardous areas.

OceanSaver is a fully, unlimited approved solution for ships with gas hazardous areas.

"One of our key advantages is Ex Approval. OceanSaver's unique design features an Approval in Principle for gas hazardous areas – issued by DNV – which is incorporated into the Type Approval," says Foss.

Management of environmental risks during ballast water operations means compliance with national and international environmental regulations can be achieved without compromising safety. Major shipyards and owners recognize the necessity of a well-documented and gas hazardous proven BWM system, adds Foss.

One of our key advantages is Ex Approval. OceanSaver's unique design features an Approval in Principle for gas hazardous areas – issued by DNV – which is incorporated into the Type Approval.

Stein Foss, CEO, OceanSaver

SUPERsaturate your ballast tank

– no dangerous chemicals or additives



The core of OceanSaver's natural ballast water treatment system is Applied Cavitation – simply, bursting bubbles inwardly.

OceanSaver's BWM system applies a hybrid treatment approach comprised of a combination of filtration, cavitation, supersaturation (oxygen removal) and disinfection.

Unwanted organisms are neutralized by the cavitation process, which creates powerful intensive implosion pressure pulses that harness and destroy organisms and bacteria.

"Manipulation of water flow characteristics causing intense and powerful pulsed shock-waves combined with the effects of oxygen removal, supersaturation and disinfection, grants tremendous high termination-rates," says Aage Bjorn Andersen, Director – Research and Development, OceanSaver.

Subsequent to the cavitation process, nitrogen supersaturation and disinfection of the water permanently neutralizes any remaining organisms and prevents re-growth during the vessels voyage.

"Many organisms in seawater depend on oxygen. Even those that do not depend on oxygen struggle to reproduce in oxygen-poor water. Nitrogen supersaturation cuts ballast water oxygen levels thus preventing organic growth during a voyage," says Andersen.

In addition to eliminating organisms and re-growth, supersaturation efficiently reduces the level of oxygen naturally dissolved in the seawater - a main vector for corrosion and oxidizing of ballast tank coatings.

"This effect is documented, in general, and in OceanSaver's system, specifically, by third-party ballast tank coatings experts," says Andersen.

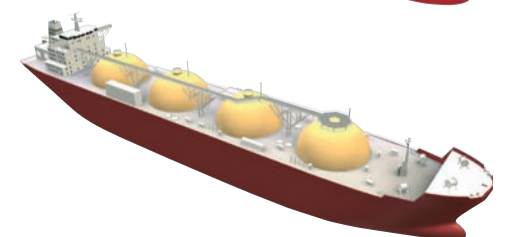
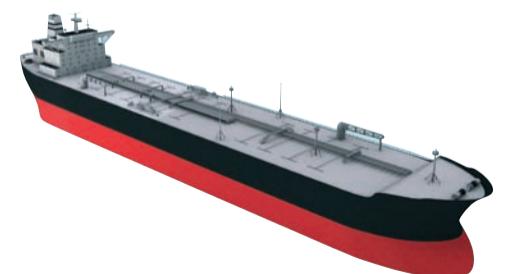
Large vessels: No problem

OceanSaver has clearly defined goals, which include being the leading BWM system supplier within the large tonnage segment.

Large vessels represent approximately 20% of the total number of ships worldwide and the operational demands of large ships stretch the ballasting and de-ballasting capacity of most BWM systems in the market.

The challenge for traditional water treatment technologies is to adapt to the shipboard environment with its very high flow and low-pressure pumps, limited space and harsh conditions such as vibrations, pitching and rolling.

DNV completed studies of the OceanSaver ballast water management system to gauge its suitability on oil tankers, gas carriers, chemical tankers and bulk carriers, in terms of interfacing with ballast water handling, locations, onboard power, equipment sharing and ballasting procedures. The results were unanimous: OceanSaver is suitable for installation on all of the vessel types.



C3T Sub Unit:

Some technologies are just better



Natural, simple and effective solutions

- C3T Sub Unit is the heart of OceanSaver's Ballast Water Management System*
- Featuring Hydro Dynamic Cavitation technology, C3T releases pressure pulses at up to 1000 bar
- In one split second, the Sub Unit bursts 100,000 bubbles and destroys millions of harmful organisms and bacteria – no dangerous chemicals or additives
- C3T: A natural, simple and effective Ballast Water Management System solution
- OceanSaver: Some technologies are just better



* C3T Sub Unit is patented OceanSaver technology. OceanSaver's BWM system applies a hybrid treatment approach comprised of a combination of filtration, cavitation, supersaturation (oxygen removal) and disinfection. In addition to eliminating organisms and regrowth, supersaturation efficiently reduces the level of oxygen naturally dissolved in the seawater, greatly reducing additional corrosion and oxidizing of ballast tank coatings.

OceanSaver Orderbook:

- 20 VLCC
- 2 Suezmax
- 4 PCTC
- 6 shipsets (PCTC and/or LNG)

OceanSaver
Your Natural Advantage

www.oceansaver.com