

# DESMI Ocean Guard A/S

- ballast water treatment systems



Innovation  
based on  
proven technology

innovation

## DESMI Ocean Guard A/S is in the process of developing IMO approved Ballast Water Treatment Systems

Focus points for DESMI Ocean Guard:

- Able to fulfill IMO and coming US requirements for removal of living organisms in all water conditions
- Very low power consumption
- No adding of chemicals or other substances
- Systems that can be operated by marine engineers
- No residues will be formed when passing the DESMI Ocean Guard Ballast Water Treatment System
- Reliable system with long intervals between inspections



DESMI Ocean Guard A/S is dedicated to developing Ballast Water Treatment Systems. The company is formed by three Danish companies: A. P. Møller – Maersk, Skjølstrup & Grønborg (UltraAqua) and DESMI. Each of the three parent companies contributes with valuable information for developing systems which not only perform from an engineering point

of view, but also perform from a practical, shipboard point of view. Developing systems which fulfill the IMO and coming US requirements is of course a must. At the same time it is also important for DESMI Ocean Guard to develop systems which can work under normal operational conditions and be operated and maintained by marine engineers.

## Operation of DESMI Ocean Guard Ballast Water Treatment System

### Ballast mode in new buildings:

The ballast water passes the fine filtration prior to the ballast water pumps. After the ballast water pumps the ozone is injected into the water stream. Then the ballast water passes the UV step giving the main and final treatment. Any excess ozone in the ballast water will be transformed into free radicals having a lifetime of nanoseconds.

### Ballast mode in retrofit installations:

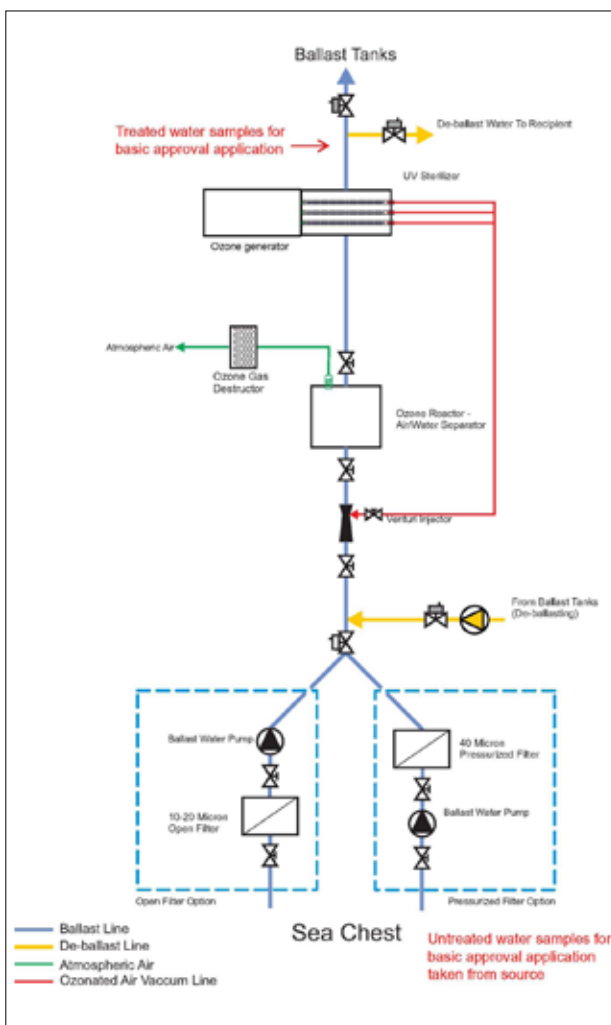
From the sea chest the water is pumped through the filter, has the ozone injected and then passes the UV-step. Any excess ozone in the ballast water will be transformed into free radicals having a lifetime of nanoseconds.

### De-ballast mode in new buildings:

From the ballast tanks the water will go to the ballast water pumps, have the ozone injected, pass the UV treatment and then leave the vessel.

### De-ballast mode in retrofit installations:

From the ballast tanks the water will go to the ballast water pumps, have the ozone injected, pass the UV treatment and then leave the vessel.



The concept used in DESMI Ocean Guard Ballast Water Treatment System:

The main ballast water treatment step is UV radiation. DESMI Ocean Guard has evaluated that in most situations the UV treatment step will be sufficient. However, there will be situations where extremely colored waters could cause problems. To be sure that all water conditions can be treated effectively DESMI Ocean Guard Ballast Water Treatment System injects ozone into the ballast water as well.

The ozone generation in DESMI Ocean Guard Ballast Water Treatment Systems patent pending. Further it is ensured that no ozone will enter the ballast tanks. A combination of UV and ozone is commonly accepted as the most efficient way of removing living organisms in water.

## Technical Information

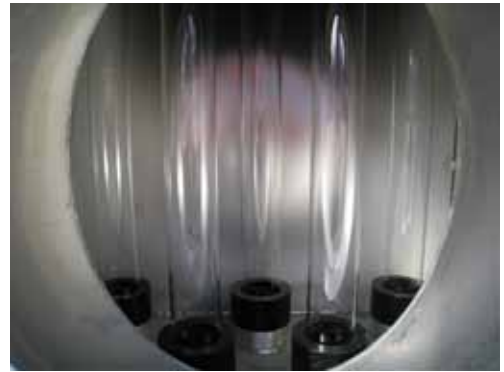
*Specially designed LPUV lamps are used for the following reasons:*

- Giving approx. 37 % UV output compared to 15 % UV output for MPUV lamps (saving energy)
- Having more lamps makes it possible to engage only the required amount of lamps depending on water quality (saving energy)
- Low surface temperature of the LPUV lamps ensures that only mechanical cleaning of the lamps is required (no chemicals used for cleaning)

*Estimated power consumption when using two different filter types:*

- 2 x 300 m<sup>3</sup>/h ballast water flow with 40 µm filter: 40 kW
- 2 x 300 m<sup>3</sup>/h ballast water flow with 20 µm filter: 25 kW
- 2 x 1500 m<sup>3</sup>/h ballast water flow with 40 µm filter: 270 kW
- 2 x 1500 m<sup>3</sup>/h ballast water flow with 20 µm filter: 170 kW

The 20 µm filtration mode is designed for installation in new buildings. The 40 µm filtration mode is designed for retrofit installation.



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DESMI Ocean Guard concept is under development, Application for Basic Approval has been submitted to IMO. According to the planned schedule our system will be fully commercial in July 2011.

For further information please feel free to contact us!