



CleanBallast Ballast Water Treatment

RWO  VEOLIA

Efficient even at higher
sediment loads



WATER TECHNOLOGIES

An established technology to rely on

RWO's CleanBallast® system is one of the very few ballast water treatment technologies that can withstand the uncertainties of the future. Its two-stage treatment principle consists of proven filtration technology combined with our advanced electrochemical disinfection – and guarantees a rapid and reliable handling of ballast water.

Designed for and tested under real-life conditions, it has passed several examinations and is **certified by** the most important societies. The system is part RWO's **Total Water Management** offer.

These include:

- > Federal Maritime and Hydrographic Agency (BSH Germany)
- > Russian Maritime Register of Shipping (RMRS)
- > Product Design Assessment by Germanischer Lloyd (GL)
- > Acceptance as Alternate Management System (AMS) by USCG

Your key benefits

- > Efficient and high ballast water production even at higher sediment loads
- > Easy, automatic operation, requiring no special tools or training
- > Proven DiskFilter technology (> 8,000 references)
- > No flow interruption during backflush and low pressure loss

CleanBallast®

How it works

RWO's modular CleanBallast technology reliably removes organisms, sediments and suspended solids in just two steps:

1 FILTRATION

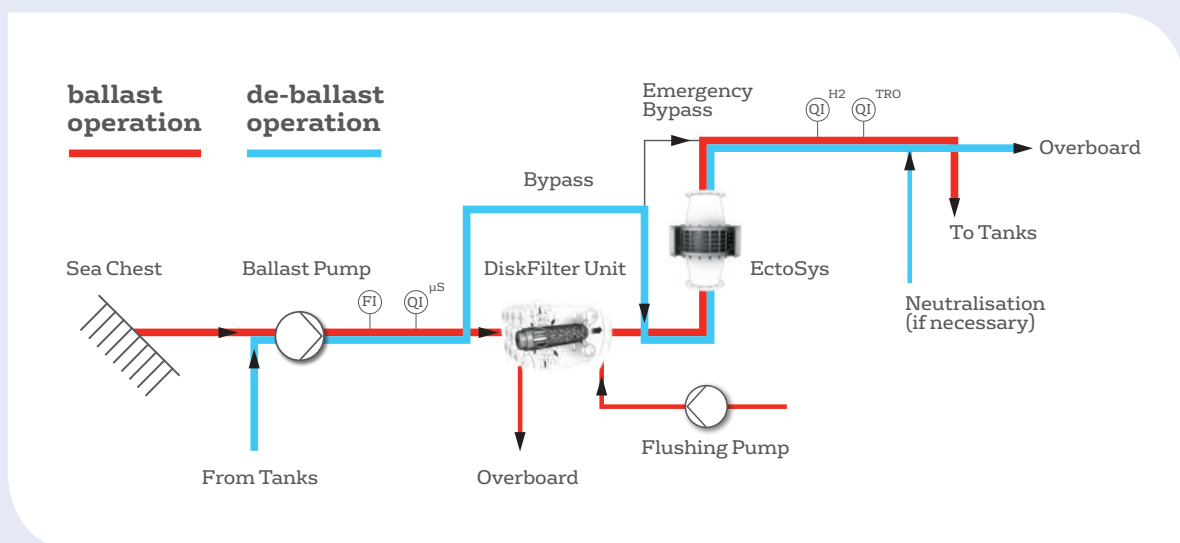
In a first filtration step, particles, sediment and organisms are extracted when taking in ballast water. Depending on your choice this is performed by the reliable DiskFilter in-depth filtration or by a tried-and-tested screen filter with a considerably smaller footprint compared to the DiskFilter-technology.

2 DISINFECTION

In a second step, the advanced electrochemical disinfection unit EctoSys® efficiently eliminates the remaining smaller organisms and bacteria before the water reaches the ballast water tanks.

3 AVOID REGROWTH

During the ship's voyage to the next port of call, a renewed growth of organisms in the ballast water tank may occur. To assure a constant quality of the discharged water, the CleanBallast system is used during de-ballasting, whereby the Filtration is bypassed and only EctoSys® disinfection is required.

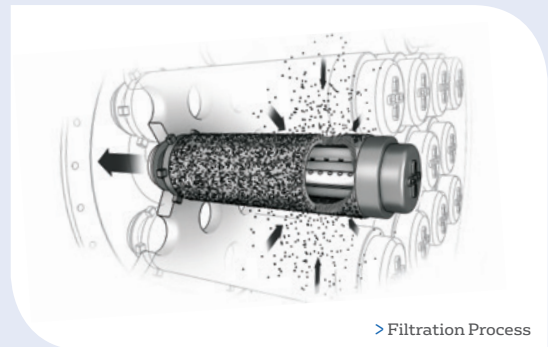


The RWO Disk Filter solution

Advanced mechanical separation

Filtration process

During ballast water uptake, the raw ballast water is pumped into the DiskFilters which operate in parallel. Each DiskFilter is equipped with a series of grooved filter discs, which are stacked on spines. While filtered water passes through the discs, particles, fibres, algae etc., are retained on the outside surface of the discs and in the grooves.

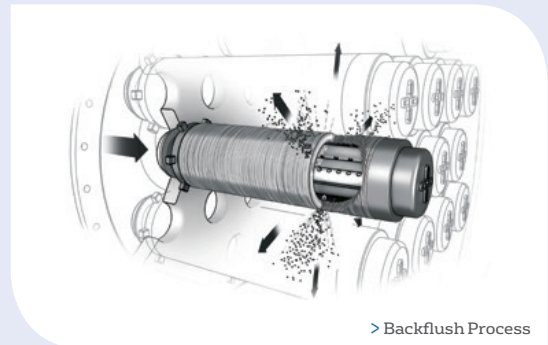


> Filtration Process

Backflush process

When a predefined differential pressure is reached, the fully-automatic backflushing mode starts and the spring that compresses the discs is automatically released.

Flushing water then flows from inside the filter spines to the outside, which causes the discs to spin and guarantees a very effective backwashing of the filter in only a few seconds.



> Backflush Process

CleanBallast[®] TECHNICAL DETAILS

Power Consumption

min. 0.014 kWh/m³ · max. 0.07 kWh/m³

Pressure drop clean system <0.7 bar

System capacities 150 – 3,750 m³/h

The RWO Screen Filter Option

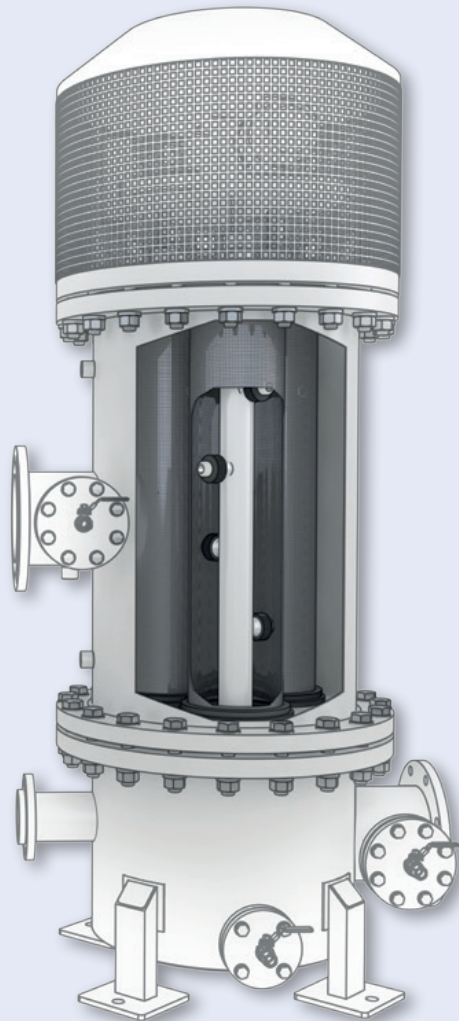
Finest filtration for your retrofit

RWO's Screen Filter solution is based on a self-cleaning multi-screen filter and is a real alternative to the proven DiskFilter. The new technology consists of on a multi screen design combined with a suction scanning mechanism and demands a much lower footprint compared to the proven DiskFilter.

With the new screen filter RWO offers a reliable option especially for retrofit projects, where space is limited and additional conditions have to be considered in the planning process. The **advantages** are:

ADVANTAGES

- > Reduced footprint
- > Reduced pipework
- > Less power demand
- > Excellent effluent results

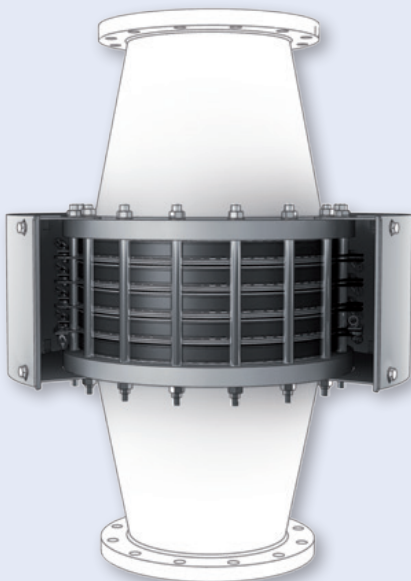


Advanced electrolysis disinfection

The EctoSys® solution

The EctoSys® disinfection technology is an extremely efficient and robust system **working both in seawater and low salinity water**. Thereby it differs greatly from standard chlorine electrolysis.

By applying electricity to the special electrodes arranged in the cell, they produce very short-living and reactive hydroxyl (OH) radicals* **directly in the piping** which eliminate bacteria and organisms.



These radicals have the highest oxidation potential (2,8 mV vs. 1,36 V for Chlorine) and thus a very high disinfection efficiency. Due to their short lifetime they are not causing any corrosion of downstream piping and coatings.

ADVANTAGES

- > Low power consumption
0.006 – 0.06 kWh/m³
- > Working in low salinity water
- > Minimum footprint
< 1 m² per 500 m³/h
- > No contact time required, no chemicals inside the tanks
- > Safe for the crew and the vessel
- > No increase of corrosion

* OH radicals are extremely reactive and have the highest oxidation potential, resulting in instant reaction and at the same time no increase of corrosion.

Your partner for Total Water Management – for 35 years



German know-how and quality

Active in this global business since 1975, the RWO **Total Water Management** offer is developed and manufactured today in Bremen, Germany.

Working in an ISO 9001:2008 controlled environment, we cover all water management applications to be found on ships and offshore rigs. RWO is the leading supplier of Oily Water Separators for any type of ship worldwide.

RWO ADVANTAGES AT A GLANCE

- > High quality in every aspect
- > Get your water management solution from the market leader in OWS
- > It's all about your business and tailor made services secure your success

Resourcing the world

SALES

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