When it comes to selecting a ballast water treatment (BWT) system, you will want to deal with a company that has a thorough understanding of the shipping industry.

Cathelco has been serving customers in the maritime sector for over 50 years, establishing a worldwide reputation for product reliability and service support.

Our global agent network means that you are assured of first class support during evaluation, installation and throughout the life of the system.

The Cathelco BWT system is based on a combination of filtration and UV technology, well established processes which are effective against a broad range of marine organisms. This approach does not involve the use of chemicals, an important factor in ensuring that there is nothing harmful to the ocean environment and no chemical handling on board the ship.

Although the main components (filtration and UV technology) are well established, the system incorporates a number of innovative features including an advanced UVT sensor and unique ball cleaning device.

These features - and many others - set the system apart from its competitors in terms of CAPEX and OPEX which significantly reduces the overall cost of ownership.

How the system works

Cathelco BWT units are available with capacities from 50m3/hr to 2,400 m3/hr or up to 1,200 m³/hr per single system.

During uptake the sea water passes through the filtration unit where the larger organisms and sediments are removed. At regular intervals the retained material is automatically back-flushed and discharged at the original ballasting site, with a very minimal reduction of the ballast water flow during the back flushing process.

The sea water continues to UV treatment where smaller organisms, bacteria and pathogens are rendered harmless before the water passes to the ballast tanks.

During ballast discharge the seawater bypasses the filter unit and goes directly to the UV chambers where it is treated before the water passes to the ballast tanks.

For effective disinfection, it is important that the contact time between the water and the light source is optimised as it passes through the UV chambers.

UV technology with innovative features

Although UV technology has been with us for many years, Cathelco’s achievements in developing a system which exploits its full potential for ballast water treatment.

For effective disinfection, it is important that the contact time between the water and the light source is optimised as it passes through the UV chambers.

Through computer analysis, Cathelco engineers have produced pipework that sends the water on a unique trajectory as it enters the chambers. The water flows in a ‘helix’ exposing the maximum surface area to the UV lamps. This increases the efficiency of the process by bringing more of the seawater in direct contact with the UV light source.

‘Helix’ maximises exposure to UV light

UVT Sensors

The amount of turbidity (suspended solids) in the seawater has a direct effect on the efficiency of the UV treatment process.

For this reason, the Cathelco BWT system constantly measures the UV transmittance of the water in front of the UV chamber, allowing for automatic adjustments to differing water qualities.

An optical sensor measures the UV transmittance of the water and sends a signal to the central control panel. This automatically adjusts the power level to the UV lamp, ensuring that the flow is thoroughly treated whatever the condition of the seawater entering the chamber.

In addition, this ensures optimum power usage and extends the life of the lamps.

UV intensity meters

Each UV chamber is equipped with light intensity meters which measure the performance of the lamps. This enables the condition of the UV lamps to be monitored, indicating when replacement or refurbishment is necessary.

Unique ball cleaning system

Cathelco have developed an innovative ball cleaning system for the UV chambers, ensuring that the surface of the quartz tubes is kept free from any biological residue.

When the cleaning cycle is automatically initiated, the UV chambers are isolated from the rest of the BWT system by valves. A separate pump is activated enabling specialised foam balls to be introduced into the reactor line from a reservoir. These hit the surface of the quartz UV sleeve, gently polishing away any residue that may have collected as well as cleaning the inside of the chamber.

At the end of the cycle the foam balls are automatically reclaimed, the cleaning system is isolated and the main system is ready for the next ballast water operation.

- Efficient cleaning of quartz sleeves and reflective surfaces to optimise UV lamp performance.
- Avoids the use of cleaning chemicals.
- Eliminates damage to the sleeves caused by mechanical cleaning methods.
- No moving parts inside the UV reactor.

Filters

Cathelco offer the choice of two types of filters to remove larger organisms and particles from the ballast water.

The filter units are available in capacities from 50m3/hr to 1,200 m³/hr with 40 micron screen mesh. Automatic back flushing keeps the filters clean, ensuring that they operate at maximum flow rates. Another important feature is that they can continuously filter ballast water during the self cleaning process.

In the case of larger filters, the units come with an in-built filter lid lifting device eliminating the need for block and tackle, thereby minimising the maintenance footprint.

- Twin UV lamps in each chamber to render organisms, bacteria and pathogens harmless.
- Water travels in ‘helix’ to maximise exposure.
- Available for single installation or in series via manifolds.
- Automatic self cleaning system for lamps and internal surfaces of UV chamber to mitigate corrosion and optimise the efficiency of the UV radiation.
- No moving parts inside the UV reactor.

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A scalable system for all sizes of ships

The Cathelco BWT system is based on a flexible, modular design which can be reconfigured to suit confined machinery spaces. The units are available with capacities from 50 m³/hr hour to 2,400 m³/hr or up to 1,200 m³/hr per single system.

200 m³/hr system

Control System

The control system can be accessed in a number of ways according to the size of the vessel and customer preferences.

- Touch screen interface located on the control panel.
- Remote control interface, allowing access to the control panel from a more convenient location.
- Fully integrated with the ship’s computer systems with mimic screens using part of the vessel’s management system.

The central control panel constantly monitors and controls the various aspects of the system including ballasting, de-ballasting and by-pass modes.

Another major function is monitoring the ‘health’ of the system by checking the performance of the filters, UV chambers and initiating the cleaning cycles.

All data is automatically logged in compliance with IMO requirements.

UV Lamp Refurbishment Service

Cathelco will operate a unique UV lamp refurbishment service. During the routine maintenance, the lamp can be removed as a single assembly. This is simplified by only having one electrical connection which enables the unit to be easily withdrawn without the risk of damaging the lamp. The complete unit is then returned to the manufacturers who check its serviceable life and refurbish it before re-issue. This results in significant cost savings when lamps are exchanged. It also means that the lamps are used to their fullest extent and eventually disposed of in an environmentally friendly way.