

Ballast Water Management System
Purestream™

Atlantium's Purestream™ Delivers a Complete Environmentally Friendly Ballast Water Solution

Built on nearly two decades of expertise in the global water disinfection and treatment market, Atlantium Technologies' proprietary UV-based ballast water management system (BWMS), Purestream™, is making waves in the maritime industry by enhancing waterway biosecurity.

As a global leader who is committed to delivering effective, environmentally friendly UV solutions, Atlantium has leveraged its technical know-how and proven ability to deliver a disruptive best-in-class UV-based solution developed to meet the IMO D-2 standard and the USCG Ballast Water Discharge Standard (BWDS).

Shortly after introducing Purestream BWMS, Atlantium successfully completed the land-based validation and the environmental testing of the technology in accordance with the IMO's BWMS Code and the USCG CFR 162.060. In January 2020, the Purestream system entered the final shipboard testing phase of the validation process when it was installed onboard a 3,854 TEU container vessel — Zim Qingdao to acquire IMO and USCG type approval.



Purestream™ UV-based ballast water management system delivers shipowners a complete, validated solution.

Atlantium has successfully completed all testing required for submittal to the IMO Type approval and has one short test remaining to complete before submitting the application for the USCG approval.

Competitive Edge

As more stringent ballast water regulations continue to emerge, more companies are facing challenges in meeting compliance requirements. In addition, shipowners are faced with the complex task of evaluating the many different BWMS available on the market which are often based on significantly different technologies each with their own advantages and limitations. Moreover, these systems are to be installed on different types of vessels with various operational profiles, resulting in a combined matrix of vessel/operator requirements and BWMS features/limitations.

With so many different BWMS available on the market, what makes Purestream BWMS unique?

Unlike chemical-based treatment solutions such as electrochlorination and chemical injection, Purestream is a non-chemical, UV-based BWMS solution that doesn't require additional equipment to mitigate the risk of hazardous substance and byproducts management. Because there is no need to store a neutralizing chemical on board, the system boasts a small footprint which makes it ideal for both new and retrofit projects.

In addition, Purestream is suitable for treatment on all water types and temperatures and is not limited by salinity or heating requirements unlike competitive systems. As a result, there is no limitation on ship operation that would require the vessel to take on additional sea water volume before entering lakes or rivers, or alternatively store salt and a mixing tank on board.

While the advantages of UV-based BWMS are clear, not all UV-based systems are created equal.

Unlike other UV-based ballast water systems available on the market, Purestream is the only UV-based BWMS technology capable of treating ballast water to meet the BWDS with a single pass. Atlantium's proprietary One-pass™ approach requires operation of the technology only during ballasting, there are no requirements for operation during de-ballasting. This unique attribute of Atlantium's technology reduces its overall power consumption by 50% when compared to traditional UV-based BWMS that must treat during the ballasting and de-ballasting steps to ensure a discharge effluent that is in regulatory compliance. The one-pass approach is available for IMO and seawater applications.

Furthermore, for the USCG, Purestream is the only UV-based technology to demonstrate its efficacy at the minimum retention time (≤ 24 -hours). This ensures that ship owners and operators can benefit from effective and proven treatment of their total ballast capacity within 24 hours or less; reducing limitations on the ship's operation. This is the lowest tested and validated retention time of any BWMS technology.

For both the IMO and USCG, the Purestream technology is effective even under the worst water conditions that include UV transmittance (UVT) levels as low as 40% UVT. This operational advantage reduces the risk of non-treatment to shipowners and provides them with a solution despite less than favorable water quality conditions.

Another advantage of Purestream is its flexible design which allows for modular or skid-based installation. The modular design includes the ballast filter, system components and the vertical-mounted UV unit that are installed in the space-constrained engine room as separate pieces.

Finally, the system's real-time dose monitoring and advanced control system continuously adjusts the flow based on the actual dose and UVT levels. This innovative approach to system control enables Purestream to treat higher flowrates compared to competitive technologies which often employ a step approach toward operation (e.g., 100%, 50% and 0%).

Beyond the Technology

Testing and validation - Revisions to the BWMS type approval testing will require that as of 2021 all installed units pass biological tests during the BWMS commissioning process to demonstrate the ability of the system to meet the regulated levels. However, recent reports have shown that 21% of installed BWMS fail to meet D-2 requirements. This worrying trend demonstrates the challenges faced by shipowners when selecting the right BWMS and stresses the importance of partnering with a BWMS manufacturer who can deliver a robust ballast water treatment solution that is properly designed and integrated into the vessel, while also being a credible water treatment expert who can design fail-proof water treatment systems.

Technical know-how - Unlike most companies in the market, Atlantium is unique in its ability to develop, validate, integrate and apply a proven UV-based BWMS. Its knowledgeable team can help optimize operations by guiding engineering firms in the proper installation and operation of the ballast system. From system specification and integration to working with engineering firms to achieve correct installation to providing reliable maintenance and support globally, Atlantium ensures that shipowners and operators receive a complete and proven ballast water solution.