EnviroCare

MicroMist™ Marine Scrubbers

Advanced Ship Scrubber Technology

Improving Your Bottom Line

EnviroCare International

EnviroCare International, with headquarters in California, designs and manufactures pollution control systems across a wide range of maritime, industrial, and municipal applications for clients worldwide. Spanning a successful history of more then 30 years and more than 1000 installations, each of our systems have been custom engineered and fabricated to meet the specifications of our clients and their individual applications.

We offer advanced solutions for meeting the increasingly stringent maritime pollution control standards including, IMO, EPA, CARB, and other maritime regulations. Through continuous research and development, we are expanding our product line with innovative technologies to meet current, future, and the ever-increasing pollution control regulatory climate.

EnviroCare established MicroMist Marine as a specialized division, dedicated to providing advanced technology scrubbers to help ship owners and operators lower CAPEX, while improving their ship's financial bottom line. Applying the technology and experience of EnviroCare, MicroMist Marine applies next generation, proven, innovative technologies focused upon safe, reliable operations. EnviroCare offers the potential for significant impact on improving your ship's financial performance.

Scrubber Technology Leader

While aiming for similar goals, not all scrubber technologies are the same. Our customers are challenged to evaluate capital expenditures, operating costs, life cycle costs, and the business cases for how best to meet the short, medium, and long term environmental regulations. A properly engineered and fabricated ship scrubber offers much more than simply a major piece of equipment to keep the regulators happy. Let EnviroCare demonstrate how to minimize upfront investment, while lowering your day-to-day OPEX and total life cycle cost.

MicroMist Marine Scrubber Technology

2017 is a turning point in the marine scrubber business. EnviroCare International (ECI) and its marine-industry collaboration partners have been developing a better technical solution for marine scrubbers. We were asked by ship owners to develop a new technology scrubber that would lower overall costs by avoiding the need to burn expensive, ultra low sulfur distillate fuels, while also providing a future-proof technology that will address upcoming regulations.

Based on ship owner feedback, we developed MicroMist Marine, a new family of technologically advanced ship scrubber systems. We offer scalable scrubber solutions that are designed for each vessel class, while maintaining the same underlying scrubber technology pioneered by ECI over the last 36 years. ECI are the scrubber experts. We pride ourselves on meeting and exceeding market requirements.

Applying a customized approach to configuring the MicroMist Marine scrubbers, we create economical designs that address all required maritime environmental regulations. While current regulations mainly focus on NOx and SO2, MicroMist Marine scrubbers can also address particulate matter, sulfate, and visible plumes. Our scrubbers are compatible with all current shipboard systems, and include built-in automation for plug and play operational monitoring.

EnviroCare has recently completed testing of the MicroMist Marine scrubber on a diesel engine using high-sulfur distillate fuel to demonstrate SO2 compliance and significant particulate reduction. This includes industry-leading reduction of sulfur, sulfate particulate, and PM2.5.

The EnviroCare MicroMist Marine scrubber results show that:

- Total sulfur emissions, including both SO2 and sulfate particulate, on engines burning highsulfur fuels are easily reduced to emission levels below uncontrolled engines burning either 0.1% or 0.5% sulfur fuel.

- PM2.5 emissions on engines burning high-sulfur fuels can be reduced to levels below uncontrolled engines burning either 0.1% or 0.5% sulfur fuel

MicroMist Marine Scrubber Capabilities

Quench Stage

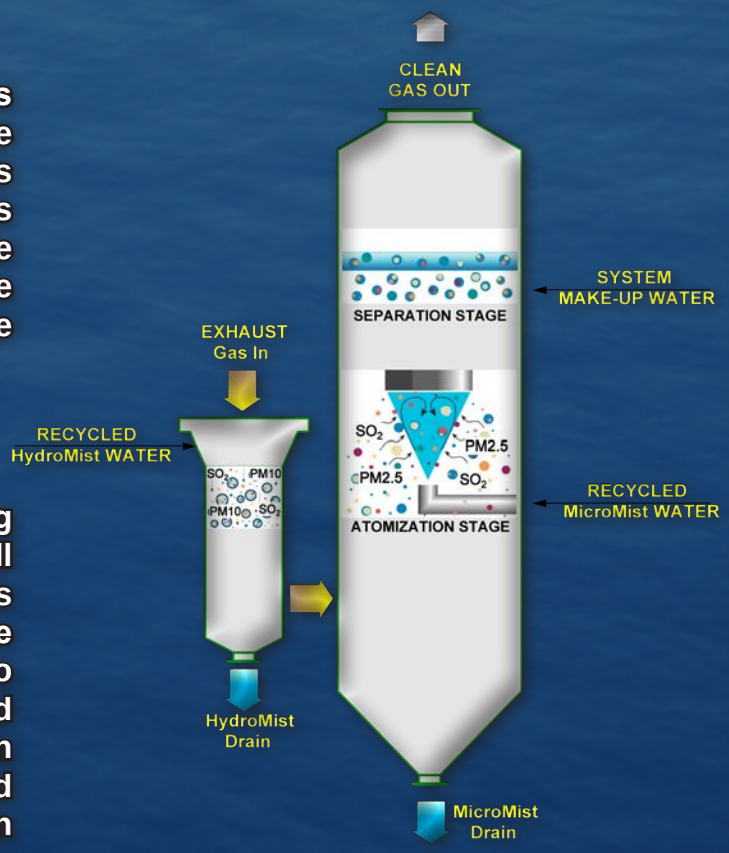
Gases are quenched to saturation, eliminating the bulk of the large particulates. Recycling of alkali solution significantly reduces acid gases including SO_2.

Atomization Stage

Aerosols and particulates are induced into negative pressure flow fields formed by unique HydroMist™ nozzles. Atomization provides a large surface area for liquid-to-gas contact; improving SO_2 absorption. Optimum scrubber droplet size is generated for submicron particulate collection.

Jet Venturi Stage

A highly efficient Jet Venturi stage removes remaining acid gases while removing large particulate and some submicron particulates generating a draft at the same time. This option is available for customers who require visible plume reduction without any pressure loss in the scrubber or back pressure on the engine.



MicroMist Venturi (MMV) Stage

Ultra efficient MMV stage removes remaining acid gases while removing virtually all particulates including submicron particulates with ultra high efficiencies. This is the choice for ship owners and operators who want to completely eliminate a visible plume and provide the ultimate pollution control solution that will meet current IMO regulations and expected, more stringent particulate limits in the future.

Separation Stage

High efficiency separator stage removes dirty droplets with collected particulates from the exhaust gases.

Mercury Reduction & SO_2 Polishing Stage

Using novel Sorbent Polymer Composite (SPC) materials, EnviroCare can include mercury reduction and SO_2 polishing capabilities with reduced water consumption as part of the scrubber design. This low pressure drop stage optimizes fuel flexibility and provides scrubber options tailored to special requirements.

Some factors we consider when helping you develop your business case and ideal scrubber configuration:

- Ports and ECA's the ship will be calling over its expected life. Do any of these have low alkaline, fresh, or brackish water?
- Expected operating profile, proportion of time the ship will be operating at near full power and partial power, and low power, including port times
- Engines, boilers, incinerators that need to be considered
- Space requirements for expanding the engine exhaust system to include the scrubber and any exhaust bypasses
- Estimated weight and size of the scrubber
- Possible need for bypass valve and silencer
- Expected back pressure over a range of loads
- Exhaust fan requirements, if required
- Wash water process and flow requirements over the range of operating power
- Electrical loads and power supply requirements for the ship
- Automation and monitoring equipment
- Interactions with other ship systems
- Fuels, sulfur levels, expected scrubbing performance, operating parameters
- Estimates for the operating cost of the scrubber and expected maintenance costs
- Documentation requirements
- Project management
- Certification steps
- Training requirements
- Routine Maintenance

We can apply our scrubber expertise to address any challenge and help you manage the commercial, technical and regulatory risks. Our scrubber solutions include assessing the impact of a compliance strategy, shortlisting options, validating an investment decision, advising on specifications, and assisting you to measure and interpret emissions data.

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