



SeaSOx DUAL/MULTI FILTRATION FOR MARITIME APPLICATIONS

ANDRITZ SeaSOx – CLEANER AIR
FOR A CLEANER ENVIRONMENT

COPYRIGHT: EXMAGINA

The start of the year 2020 has seen regulations on emissions in the shipping and maritime industries getting tighter and tighter. Now is the right time to look for the most flexible options when ensuring your shipping fleet is compliant with new global regulations.

International technology group ANDRITZ has a long and successful history of supplying plants and equipment to many different industries, including major hydropower, pulp and paper, metalworking and steel production facilities all around the globe. One of ANDRITZ's speci-

alist areas is the design and manufacture of emission control technology, providing state-of-the-art systems in the area of exhaust gas cleaning solutions and air pollution control.

ANDRITZ

ENGINEERED SUCCESS

SeaSOx Dual/Multi Filtration – the flexible solution for exhaust gas cleaning

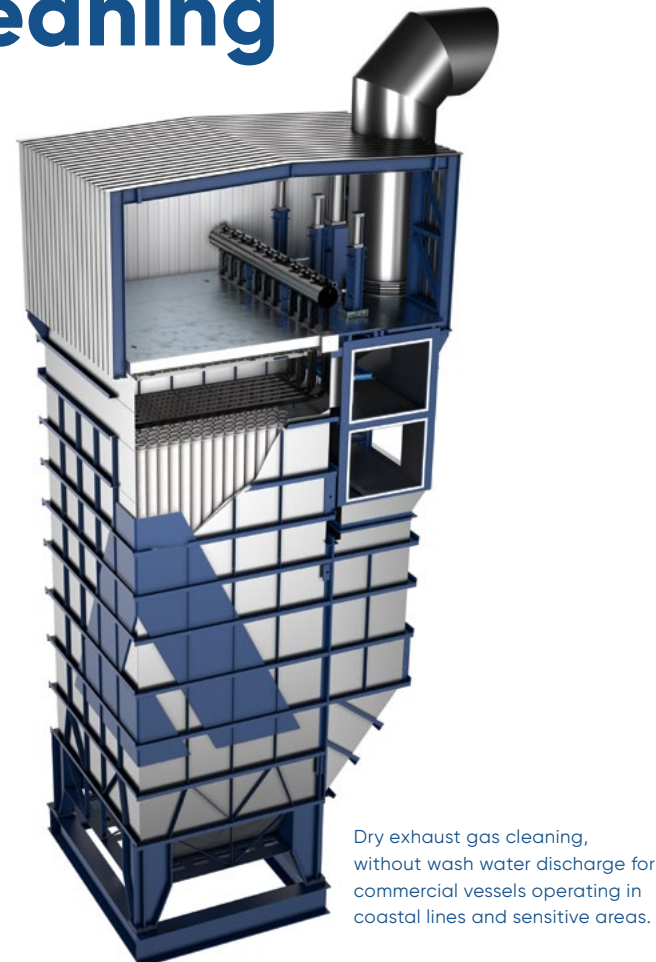
ANDRITZ supplies complete solutions for emission control to the maritime industry. Its exhaust gas cleaning systems (EGCS) includes scrubber and all ancillary equipment consisting of pumps and filters, as well as instrumentation and electrical equipment, wash water treatment, integration engineering, emission monitoring, valves and dampers, supervision, and after sales service.

ANDRITZ is the only company that supplies two completely flexible system solutions for cleaning exhaust gas, SeaSOx Scrubber (the common and well know wet scrubbing) and SeaSOx Dual/Multi Filtration. Tailormade solutions cover all possible options and combinations, including Open Loop – Hybrid Ready, Hybrid, Closed Loop, with square or round footprint, and for inline and bypass operations. The ANDRITZ systems also have the smallest scrubbers when it comes to inline solutions. Closed loop operation is possible with all types and levels of caustic media, including NaOH, MgO, Mg(OH)₂, Na₂CO₃, and NaHCO₃.

The EGCSs from ANDRITZ can be installed on all types of ships, including new-build or on existing vessels by retrofitting.

ANDRITZ provides a unique, complete Dual/Multi Filtration EGCS solution for the maritime industry. The scope of supply includes filter bags, silos, automation, integration engineering, emission monitoring, residue transport system, sealing air fans, exhaust gas dampers, valves, piping, engineering supervision, commissioning, and aftersales service.

ANDRITZ's Dual Filtration exhaust gas cleaning system has been certified by DNVGL with a MED-G certificate, the first of its kind worldwide. Based on a proven technology, that has been used for decades on land-based projects, the filtration exhaust gas cleaning system has been adapted for maritime applications. The technology uses sodium bicarbonate as absorbent for the removal of SO₂ and SO₃. As well as SOx, all kinds of particles like dust, soot (black carbon), ultrafine, and respirable particulates will be removed to the highest extent (more than 99.9%). The next step in ANDRITZ's ongoing technology developments includes the removal



Dry exhaust gas cleaning, without wash water discharge for commercial vessels operating in coastal lines and sensitive areas.

of NOx, making the system future-proof when it comes to more stringent emission requirements for shipping.

EASE OF INSTALLATION AND LOW RUNNING COSTS

ANDRITZ has designed its filtration exhaust gas cleaning systems with convenience and simplicity of installation and operation. With no dry dock necessary for installation and no need for modification of the sea chest, as well as easily available grades of steel for the construction of the system, it means installation time is shortened, and the costs are kept to a minimum. Added to this, there are no large seawater pumps or discharge outlets needed, as well as no additional sea water piping. The system also has a low electric power consumption.

When it comes to operation, the elimination of wash water discharge means there is no limitation for the use of the technology in sensitive areas and harbors.

In terms of maintenance activities, the chambers are easy to access to check filter bags and other internals.

ANDRITZ supplies standardized solutions for filtration exhaust gas cleaning systems based on modular filter chambers. The size of the system can be adapted by the installation of a certain number of chambers as well as the length of the filter bags. Therefore, the size of the whole system can easily be adapted according to local space availabilities. The filter bags are made of high-temperature resistant material, specially treated to be able to handle sticky residues from marine engines without clogging.

SeaSOx DUAL/MULTI FILTRATION

- Low CAPEX, with minimal installation disruption
- No dry dock needed
- SO₂ removal to 0.1 or 0.5% S possible
- Low pressure drop
- No waste water
- No plume due to hot process
- No harmful sorbents
- Additional particulate removal higher than 99.9%
- No pumps, wastewater treatment equipment, heat exchangers, sea water filters, tanks or sea water piping to be installed
- Multiple inlets possible

ANDRITZ is a six billion Euro business with approximately 28,000 employees worldwide, and manufacturing facilities all around the world in countries including Austria, China, Finland, and Hungary. With more than 35 years experience in the exhaust gas cleaning industry and with hundreds of references in many industries globally, ANDRITZ's first scrubber installations to the maritime industry are now operating successfully on vessels around the world.

Successful installation of an ANDRITZ SeaSOx Dual Filtration system on La Méridionale's ship in France

In 2019, the first SeaSOx Dual Filtration system was installed on the passenger and car ferry Piana, which is operated by La Méridionale in the south of France. The ship has an output of 9.4 MW for each main engine and 1.3 MW per generator. The vessel is equipped with a total of four main engines and two generators on board. One main engine and one generator are connected to the SeaSOx Dual Filtration system. The system has been fully functional since May 2019.

Detailed emission measurements were carried out by CERTAM in October 2019. The results exceeded the expectations by far. The measurements proved particulate reduction in mass of more than 99.9% for PM1, PM2.5 and PM10 as well as reduction in number of more than 99.9% for PM1. SO₂ emission was proved to be well below 4.3 ppmSO₂/%CO₂. ANDRITZ received the MED G certificate from DNV GL after successful testing on June 28th 2019.





CONTACT US

AUSTRIA

ANDRITZ AG

p: +43 316 5 01 2895

SeaSOx@andritz.com

INDIA

ANDRITZ Technology Pvt. Ltd.

p: +91 11 4912 1765

SeaSOx@andritz.com

CHINA

ANDRITZ Environmental Engineering
(Shanghai) Co. Ltd.

p: +86 21 3122 2190

SeaSOx@andritz.com

ANDRITZ.COM/SEASOX



All data, information, statements, photographs and graphic illustrations in this brochure are without any obligation and raise no liabilities to or form part of any sales contracts of ANDRITZ AG or any affiliates for equipment and/or systems referred to herein. © ANDRITZ AG 2020. All rights reserved. No part of this copyrighted work may be reproduced, modified or distributed in any form or by any means, or stored in any database or retrieval system, without the prior written permission of ANDRITZ AG or its affiliates. Any such unauthorized use for any purpose is a violation of the relevant copyright laws. ANDRITZ AG, Stattegger Strasse 18, 8045 Graz, Austria. Due to legal considerations, we must inform you that ANDRITZ AG processes your data for the purposes of informing you about the ANDRITZ GROUP and its activities. Find out more details about our data privacy declaration and your rights under the data protection legislation on our website: andritz.com/privacy. SeaSOxdry Leaflet 03/20 EN