

ENERGY
ENVIRONMENT
ECONOMY

WÄRTSILÄ SO_x REDUCERS – SCRUBBER SYSTEM



ENVIRONMENTAL EFFICIENCY

The Wärtsilä SO_x reducer scrubber system is an efficient and cost-effective alternative to the use of low sulphur fuel for reducing SO_x emissions from ships. Wärtsilä is also the first manufacturer to get a marine SO_x scrubber certificate (issued by DNV and GL), proving that this technology works well for marine installations.

LOW ENVIRONMENTAL IMPACT WITH CLOSED-LOOP SYSTEM

The SO_x reducer is based on a closed-loop fresh water scrubber to which NaOH is added in order to neutralize SO_x emissions.

The closed-loop system features cleaning of the small bleed-off extracted from the loop, and thereby fulfils all quality and monitoring requirements stipulated by the IMO. Clean effluents can safely be discharged overboard

with no harm to the environment. If operation in zero discharge mode is requested, the effluent can be led to a holding tank for scheduled and periodical discharge.

SCRUBBERS FOR ALL SHIP TYPES

With increasingly stringent IMO and EU regulations, SO_x scrubbing is an increasingly attractive way of minimising operational costs by using HFO in an environmentally friendly way.

The Wärtsilä SO_x reducer system complies with the new IMO guidelines for cleaning the exhaust emissions from all 2- and 4-stroke engines and oil-fired boilers, in retrofits and newbuilds.

The SO_x reducer is suitable for both newbuilds and retrofits. Retrofitting the vessel, regardless of engine make, with a SO_x reducer system brings multiple benefits and prepares your vessel for both future competitiveness and international legislation. Being a turn-key solution, the SO_x reducer

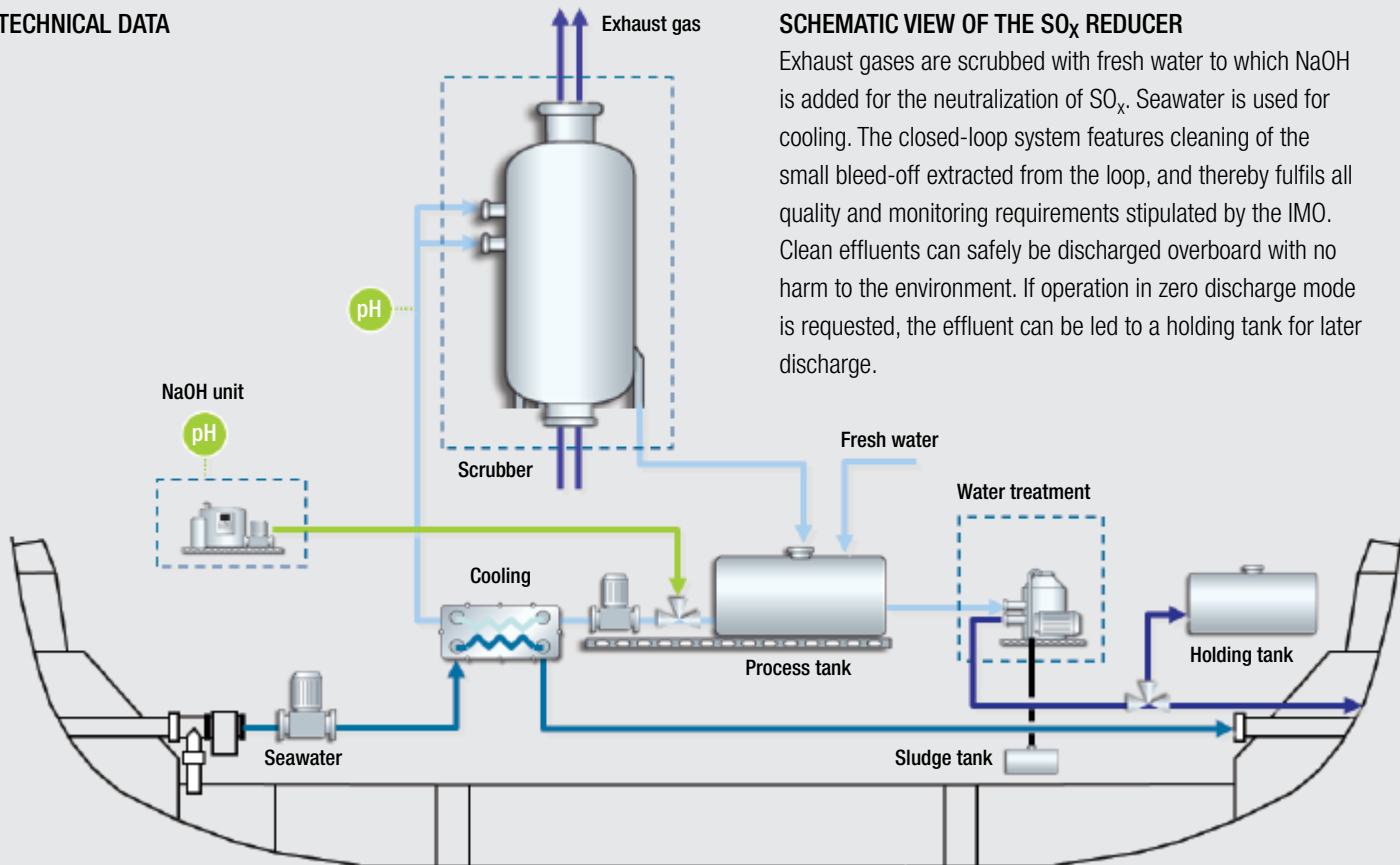
PRODUCT AT A GLANCE

The Wärtsilä SO_x reducer is a highly efficient abatement solution for eliminating sulphur emissions, including particulate matter (30-60% reduction). A closed-loop system enables zero water discharge in enclosed areas. The SO_x reducer meets present and future emission requirements and has been designed according to IMO Resolution MEPC.184(59), July 2009, Guidelines for Exhaust Gas Cleaning Systems.

installation includes onboard modifications and fine-tuning of the system. Choosing the Wärtsilä SO_x reducer system gives you access to components and worldwide lifecycle support through our global service network.

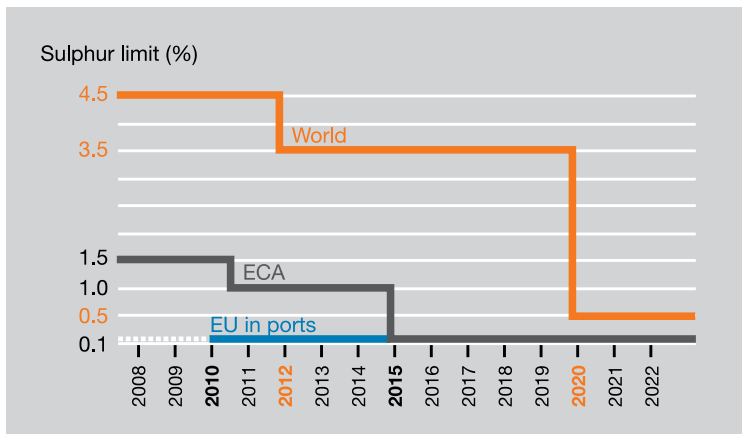

WÄRTSILÄ

TECHNICAL DATA



SCHEMATIC VIEW OF THE SO_x REDUCER

Exhaust gases are scrubbed with fresh water to which NaOH is added for the neutralization of SO_x. Seawater is used for cooling. The closed-loop system features cleaning of the small bleed-off extracted from the loop, and thereby fulfils all quality and monitoring requirements stipulated by the IMO. Clean effluents can safely be discharged overboard with no harm to the environment. If operation in zero discharge mode is requested, the effluent can be led to a holding tank for later discharge.



FUEL SULPHUR LIMITS

The diagram to the left shows the future sulphur limits set by the IMO and the EU. IMO regulations are based on SO_x Emission Control Areas with more stringent criteria and global sulphur limits. On 1 July 2010, the SOX ECA maximum fuel sulphur limit will be tightened from 1.5% to 1.0% where it will remain until 1 January 2015 when the sulphur limit in SOX ECA will be further tightened to 0.1%. In 2010 the fuel sulphur limit in EU ports will be 0.1%.

GLOBAL RESTRICTIONS

In global operation outside the SECA area, drastic savings are evident in 2020. Already from 2012 savings are possible when using cheaper HFO with higher sulphur content than the global limit 3.5%, where available.

SO_x EMISSION CONTROL AREAS

In SO_x Emission Control Areas (SECA) the cost savings will increase with time as the price premium for low-sulphur fuel oil is expected to rise with the enforcement of new sulphur limits. In 2015, when the limit of sulphur in fuel is decreased to 0.1% in SECA areas, the cost savings will be substantial with ROI often in the range of 1–3 years, and for large installations, even less.

EU IN PORTS

In EU ports significant savings can be achieved from 1 January 2010 when ships scheduled to be at berth for more than two hours are not allowed to use a fuel containing more than 0.1% sulphur. The restriction applies for both engines and fuel-oil fired boilers. Here, a SOX scrubbing system can be used as a viable alternative.

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