
AEC
MARITIME
SOx SCRUBBING
MADE SIMPLE

WE MAKE IT EASY FOR SHIP OWNERS

Most scrubbers are complex, use filters and require lots of energy. Not ours. An AEC scrubbing system works with any engine. It's maintenance free, fuel efficient and easy to use. Your crew can learn to operate it in a four hour training session.

AEC Maritime offers a simple all-in-one solution that cools gases, removes sulphur and eliminates particulates at the same time. In the open tower structure there are no moving parts, no filters, no change of a polluted packed bed. Consequently, there is a low back pressure.

CLEAN AIR AND LOWER COSTS

AEC Maritime offers the greenest scrubbing technology available. Our technology reduces sulphur emissions by 99%, has the lowest CO_2 footprint and costs less to operate. How much less? Our system requires 0.5% of engine power while the closest competitor requires 1.5% or three times as much. When you consider the miles travelled, your savings can be significant.

PROVEN AND OPERATIONAL

AEC Maritime delivers a proven technology. Our installed scrubber systems comply with the IMO Marpol standards. The AEC scrubbing system has been approved and certified.

AEC is a scrubbing specialist. Our experience includes extensive research on reducing emissions and odors. In the last 20 years, we have created and implemented over 2300 land based scrubber systems. We are an experienced company that can handle all your scrubbing challenges.

AEC Maritime installed a scrubber in the existing funnel.

HOW OUR SCRUBBER WORKS

An AEC scrubber is always tailor-made. The size depends of the maximum capacity of your engine, keeping the lowest energy consumption and lowest back pressure in mind. If space is limited, we can adjust the scrubber size.

OPERATION

From the bottom of the scrubber, exhaust gases are led through the scrubber to the top. The process water is fed into the top of the scrubber through nozzles. This results in an equally divided spray.

Three processes take place in the open tower structure.

1. COOLING

Exhaust gases are cooled until the optimal temperature is reached.

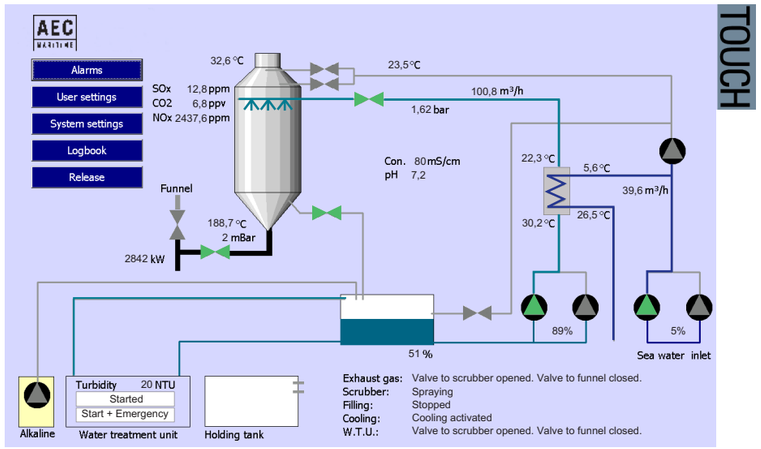
2. REMOVAL OF THE PARTICLES

The seawater droplets grow when they travel from top to bottom. All particles are removed.

3. REMOVAL OF THE SULPHUR

The sulphur in the exhaust gases dissolves in the process water and binds with the NaOH as a salt. The clean exhaust gases exit the scrubber, removed from sulphur and particles, through a demister.

OUR CLOSED LOOP SYSTEM:



1. SCRUBBER

The scrubber has an open tower structure without any filters. There are no moving parts and there is no need for a bypass. If needed, the scrubber can run dry.

2. CIRCULATION TANK

In the circulation tank the process water is mixed and prepared for the scrubber. The circulation tank is made of lightweight polypropylene, which is corrosion free.

3. WASH WATER CIRCULATION

The supply lines and return lines are made from certified Glassfiber Reinforced Epoxy. This material is lightweight and also corrosion free. The redundant executed pumps are equipped with frequency converters.

4. COOLING SYSTEM

A heat exchanger is installed to cool down the process water to optimize the process. Seawater is taken from the ship's main supply. The redundant executed pumps are equipped with frequency converters.

5. FILLING AND DEMISTER CLEANING

To start up the closed loop system, seawater is pumped into the circulation tank. The same pump is used to clean the top of the demister. This process is automatically controlled without interference of personnel.

6. NaOH

To keep the PH level neutral, caustic soda is added just before the entrance of the circulation tank for an optimal mixture. This process is automatically controlled without interference of personnel.

7. WATER CLEANING SYSTEM

The process water constantly runs through a wash water treatment unit. This is where the particles are separated from the process water. The remaining sludge can be stored and discharged in port.

8. AUTOMATION AND CONTROL SYSTEM

The whole scrubber system is constantly measured and controlled. Once switched on, the scrubber runs automatically. The scrubber is constantly adjusted to keep energy consumption level low and the process water in balance with respect to SOx, PH, concentration of PAH and turbidity.

AEC MARITIME

THREE SCRUBBER SOLUTIONS

AEC Maritime offers closed loop, open loop and hybrid scrubber solutions. In each solution the PH, turbidity and concentration of PAH are measured in accordance with MARPOL Annex VI resolution MEPC.184 (59).

OPEN LOOP

In an open loop system, outgoing exhaust gases are washed with seawater in the scrubber. The seawater is discharged directly into the sea through a process water treatment system. An open loop requires the least investment and has lower operating costs.

CLOSED LOOP

In a closed loop system, outgoing exhaust gases are washed with process water in the scrubber. The process water is continuously re-circulated. A closed loop can operate anywhere but has higher operating costs.

HYBRID

In a hybrid system, you can switch between an open loop and closed loop system. The process water can be discharged directly into the sea or continuously re-circulated. A hybrid can run open loop when allowed and closed loop when required.

Satisfied customer

"We are impressed with the AEC approach and the simplicity of their system. Their technology works without filters so there is no polluting packed bed. AEC Maritime has made clever use of their 20 years' experience within scrubber technology."

- Fini Alsted Hansen, Technical Superintendent Fleet Management-Scandlines.

WHICH SCRUBBER WORKS FOR YOU?

AEC Maritime can outfit your ship with a closed loop, open loop or hybrid system.

TURNKEY SOLUTIONS

AEC Maritime can provide an all-inclusive turnkey retrofit solution: tailored designs, engineering, manufacturing, installation, commissioning and start-up of scrubbers and after-sales service. We do all this with the help and support of

DAMEN who represents our SOx scrubbers exclusively for the retrofit market.

WORLDWIDE SOLUTIONS

Together with our partners DAMEN green solutions and the VDL group we can offer world-wide, comprehensive and cost effective one-stop-shop retrofit solutions.

Either as a single turnkey project or as a step by step process – whichever best fits your operation and schedule.

Installation of our SOx scrubber system can be done at one of the DAMEN shipyards conveniently located worldwide. DAMEN can also install or supervise at a location of your choice or even during operation.

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