

*The case for Exhaust Gas
Cleaning Systems to meet 2020
Rules*

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CLEAN SHIPPING ALLIANCE 2020

What is the CSA2020?

- UK-registered not-for-profit organisation which represents 37 leading shipowners, operators, charterers and energy brokers, advocating for the wider acceptance of EGCS technology;
- To support and educate the public and policy makers concerning the availability and use of Open-loop Exhaust Gas Cleaning Systems that are environmentally effective and economically feasible; and encourage on-time implementation of regulation 14.1.3 of MARPOL Annex VI.
- The Alliance will advocate a rational operating environment for Open-Loop Exhaust Gas Cleaning Systems and provide a strong advocate for those companies working to reduce marine exhaust gas emissions.

- An Exhaust Gas Cleaning System (EGCS), or commonly known as a 'SCRUBBER';
- After-combustion treatment device that removes most of the sulphur from the exhaust gasses (from 3.50% down to at least 0.50% S m/m) by using the natural alkalinity of sea water (in open-loop systems), or a neutralizing agent such as caustic soda or magnesium hydroxide (in closed-loop systems);

- Vessels fitted with scrubbers spend most of their time in international waters, where they normally produce much less SO_x than compliant fuel (< 0.5%)
- In addition to removal of over 98% of sulfur from air emissions scrubbers also significantly reduce levels of particulates, including PAHs and black carbon
- Scrubber washwater has a negligible impact on the ocean environment, as confirmed by multiple recent studies
- In some respects scrubbers provide a higher quality of air emissions than 0.1% compliant fuel, and higher quality in all respects than 0.5% compliant fuel

HOW CAN SCRUBBERS HELP ?

Scrubbers can capture and remove...

- ✓ UP TO 99% OF SULPHUR DIOXIDE
- ✓ UP TO 94% OF PARTICULATE MATTER
- ✓ UP TO 60% OF BLACK CARBON
- ✓ SIGNIFICANT AMOUNTS OF PAH

...from ship's exhaust gases!



DID YOU KNOW? **CLEANSHIPING ALLIANCE 2020**

“If the sulfate in the sea were spread out as an even layer, the total ocean area of the world would be covered by a **5-foot thick** layer of sulfate.

If all the sulfur in all the known oil and coal reserves were added to this layer, the thickness would only increase by the thickness of a **sheet of paper.**”

Source: Nyman and Tokerud (1991)



Conclusion ...

- ✓ Removing the sulphur compounds from the exhaust gas reduces the potential of the formation of acid rain and the impact on humans and other living organisms;
- ✓ Taking sulphur from the air and putting it into the ocean should not be seen as a concern because this is an inevitable process that happens naturally anyways;
- ✓ Open loop scrubbing is nothing new and has been used for years by coastal power stations and refineries;
- ✓ Scrubbers do a fantastic job in improving local air quality. The removal of up to 99% of SO_x, up to 94% of PM and up to 60% of BC, means the risks to human health and the corresponding burden on public health services are drastically reduced.

Conclusion ...

- ✓ Removal of BC slows down ice melt, which would ultimately contribute to rising sea levels.
- ✓ From an air quality point of view, operating a ship on HSFO in combination with a scrubber produces cleaner air emissions than operating on LSFO or MGO. Less refining also means less GHG emissions associated with HSFO vs MGO.
- ✓ In respect to water quality, the Japanese Government MLIT released the results of their own independent study which revealed that scrubber washwater does not pose any threat to the marine environment either in the short- or long-term, and takes into account both PAHs and heavy metals in their assessments of any accumulation effect.

www.cleanshippingalliance2020.org

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