

Caring for the blue sky and clean seas



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## Light weight scrubber

The equipment causes a very small reduction in cargo capacity, as the space requirements are optimised.

The small and lightweight Langh Tech scrubber can replace the silencer. The scrubber and water treatment units are designed for both retrofit installations as well as new buildings.

## BackfromBlack

The developed scrubber system is recognized also by European Union; a project led by Langh Group has been granted EU support.

The project is called Back from Black - Study and deployment of the affordable scrubber retro fitting technology for SME shipowners. The abbreviation – Back from Black – symbolizes the blue sky when ships' exhaust gases are cleaned.

The objective of the Global Project is to create, demonstrate, deploy and disseminate an economic and environmentally viable technology which will help to comply with the new sulphur regulations for maritime transport. This new technology will enable shipowners to retain their competitiveness when operating ships in the SECA.



**Co-financed by the European Union**  
Connecting Europe Facility



*Langh Tech is one of the Langh companies, which include ship owning Langh Ship, Industrial and Ship Cleaning Services Hans Langh and Langh Cargo Solutions, that leases and sells steel carriage- and bulk containers. The knowledge for water purification originates from the industrial cleaning company.*

# Unique hybrid scrubbers



## SOx removal

Langh Tech designs and produces scrubbers for SOx removal from exhaust gases and water treatment units for closed loop scrubbers.

## Proven reliability

The first full scale installation has been in use since May 2013. The scrubber system has a proven track record of reliable performance even in the Baltic winter and ice conditions.

## True hybrid scrubber

This unique water treatment method enables continuous closed loop operation causing only a minimal amount of sludge and hence reducing waste removal costs. The efficiency of the water treatment method is recognised throughout the shipping industry from cargo ship owners to cruise ship operators.

The closed loop process is based on wet scrubbing with fresh water and using sodium hydroxide (NaOH) for neutralising sulphur. In open loop mode sea water is used in the exhaust gas washing process.

## Compatible water treatment unit

The water treatment units can be delivered also in combination with other scrubber manufacturers' systems.

In addition to component delivery, Langh Tech takes care of commissioning and offers installation supervision, crew training and after-sales services.



During the water treatment process practically all water is separated from the residues and therefore the waste that need to be disposed of is highly concentrated - bringing savings in waste disposal costs. Here pictured a sample of waste showing the solid consistence of it.

### Performance figures

NaOH consumption l/h	5-6 liters x MW x S%
Energy consumption closed loop	15 kWh/Engine MWh
Energy consumption open loop	8kWh/Engine MWh
Fresh water consumption	40 liters/MWh
Sludge formation	0.5 kg/MWh
Water cleaning capacity	0.2 m <sup>3</sup> /MWh
Cleaned effluent back to process	0.08 m <sup>3</sup> /MWh
Cleaned effluent to sea	0.12 m <sup>3</sup> /MWh
Back pressure	Max. 150 mmWc