

Headway has established more than **120** sales/after-sales service stations in **56** countries and regions around the world.



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**OceanGuard<sup>®</sup>**  
**EXHAUST GAS CLEANING SYSTEM**

**HEADWAY TECHNOLOGY GROUP CO., LTD.**



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# ABOUT US

Headway is a high-tech enterprise with the purpose of scientific and technological innovation, dedicated into providing low carbon solutions and technical service worldwide. Headway owns independent R&D center and production base in Qingdao, China.

Headway established independent R&D centers and manufacturing facilities. The BWMS manufacturing facility has an annual production capacity of 1,000 sets. With branches in Shanghai, Singapore, Japan and Greece, 15 agencies in Guangzhou, Dalian, Zhoushan, and more than 120 service/technical support stations in 56 countries and regions, Headway built a comprehensive global service network.

Headway's product portfolio includes 3 segments: Carbon Neutralization, Water Treatment and Smart Shipping, which are all developed under the long adherent R&D ideology of "Be Innovative, Stay Excelsior".

Headway is willing to continue the cooperation with global partners based on mutual trust and benefit, to embrace the future of green shipping and sustainable development, pioneer in decarbonization strategy, zero-emission shipping and marine environmental protection.



# INTERNATIONAL CONVENTION



### Emission Control Timeline:

- 2008: 4.5% Globally, Less than 1.5% in SOx ECA;
- 2012: 3.5% Globally, Less than 1.0% in SOx ECA;
- 2015: Less than 0.1% in SOx ECA;
- 2020: Less than 0.5% Globally.

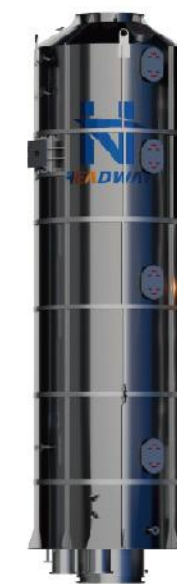
# SCRUBBER TYPES



L Type Scrubber



U Type Scrubber (Round Inlet)



I Type Scrubber



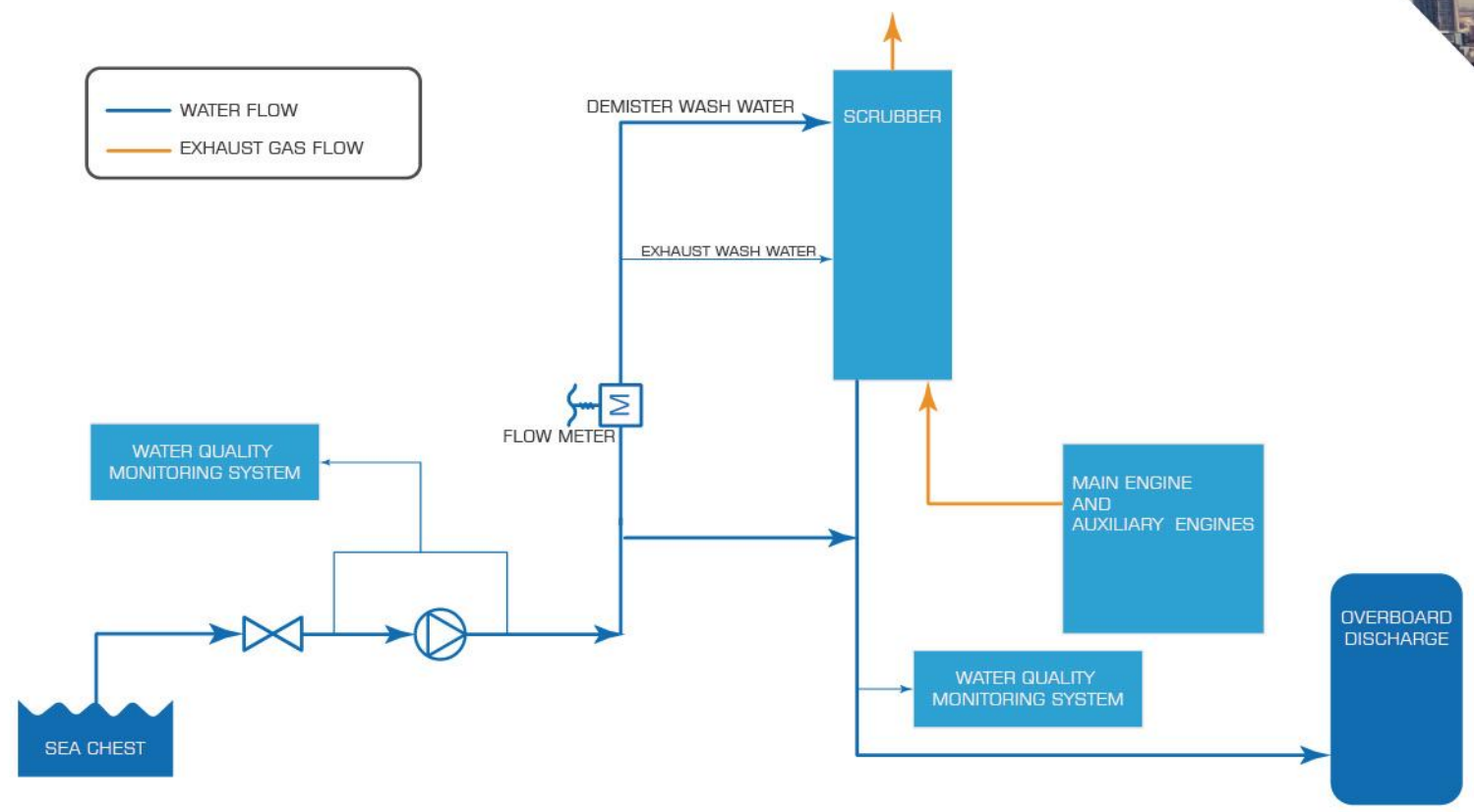
U Type Scrubber (Square Inlet)

# OPEN LOOP

## DIAGRAM OF OPEN LOOP SYSTEM



Schematic Diagram of OceanGuard® Exhaust Gas Cleaning System (OPEN LOOP)

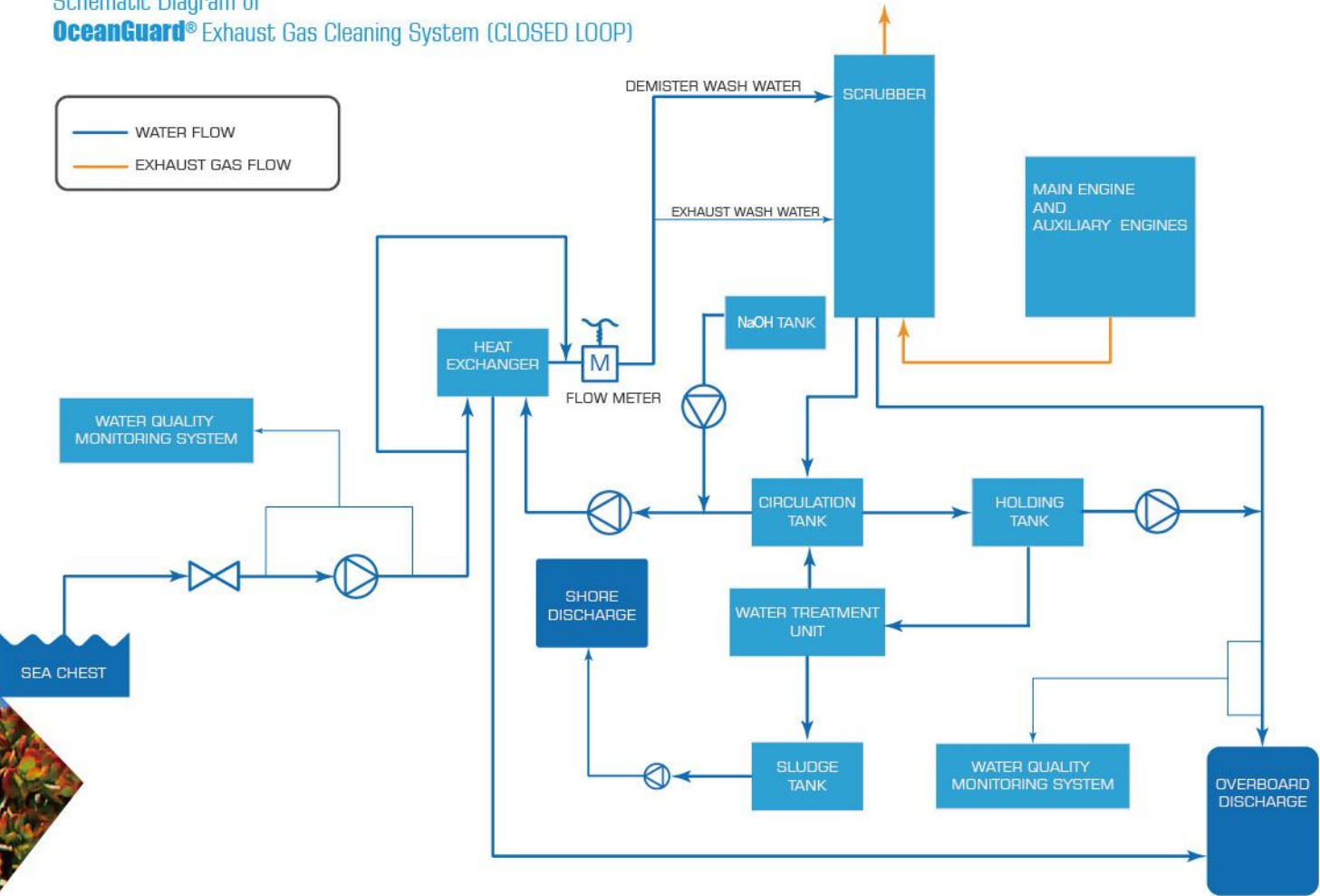




# DIAGRAM OF CLOSED LOOP/HYBRID SYSTEM



Schematic Diagram of OceanGuard® Exhaust Gas Cleaning System (CLOSED LOOP)



CLOSED LOOP & HYBRID 08

## R&D TEAM



Headway's professional EGCS R&D team, comprised of 6 divisions, delivers comprehensive solutions encompassing specification calculation, regulation, plan approval, scrubber design, pipeline design, electrical design, and commissioning.

### Specification Calculation



*Oversee the calculation and optimization of EGCS specifications.*

- Inspection of data provided by the shipowner;
- Composition of Calculation of Specific EGCS based on the information;
- Coordination of all design specification for further application;
- Composition of EGCS Technical Manual.

### Regulation



*Oversee the documents to send to Class for inspection along with the explanation of regulations;*

- Inspection of the format and contents of all documents sent to the Class for approval;
- Collection and cross-training of latest regulations released by Classification Societies;
- Composition of SOx Emission Plan and EGCS Specification.

### Commissioning



*Oversee the commissioning, troubleshooting and repair of EGCS.*

- Composition of all documents for troubleshooting, tests, commissioning, sea trial and operation;
- All after-sales service and communication with suppliers.





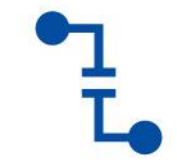
## Structure Design



*Oversee the structure design and optimization of the scrubbers.*

- Design of the scrubber structure;
- Detail design and manufacturing plan of the scrubber;
- All drawings for Class approval;
- Component selection of scrubber according to the Calculation of Specific EGCS.

## Installation



*Oversee the design and optimization of pipelines for EGCS.*

- The design and optimization of the pipeline of Calculation of Specific EGCS;
- Selection of components for the EGCS pipeline;
- Supervision of the design of retrofitting on the pipeline, discharging point, etc.;
- Supervision of the 3D scanning.

## Electrical Design



*Oversee the logic design, electrical design and optimization of those designs.*

- Logic design and electrical design of EGCS based on the relevant document;
- Documents on Electrical Design, Alarm Points, BOM and Electrical systems;
- Supervision of all electrical works during retrofitting;
- Selection of components related to electrical control and monitoring.



## ADVANTAGES



### PROMPT DELIVERY

The delivery time can be adjusted according to customer's requirements



### TURN-KEY SOLUTIONS

One-stop, Turn-key solution including Design, Prefabrication and installation



### DISCHARGE-FREE

Discharge-free technology for Closed-Loop/Hybrid EGCS



### LOWER OPEX

No-Packing Layer design brings lower OPEX and CAPEX



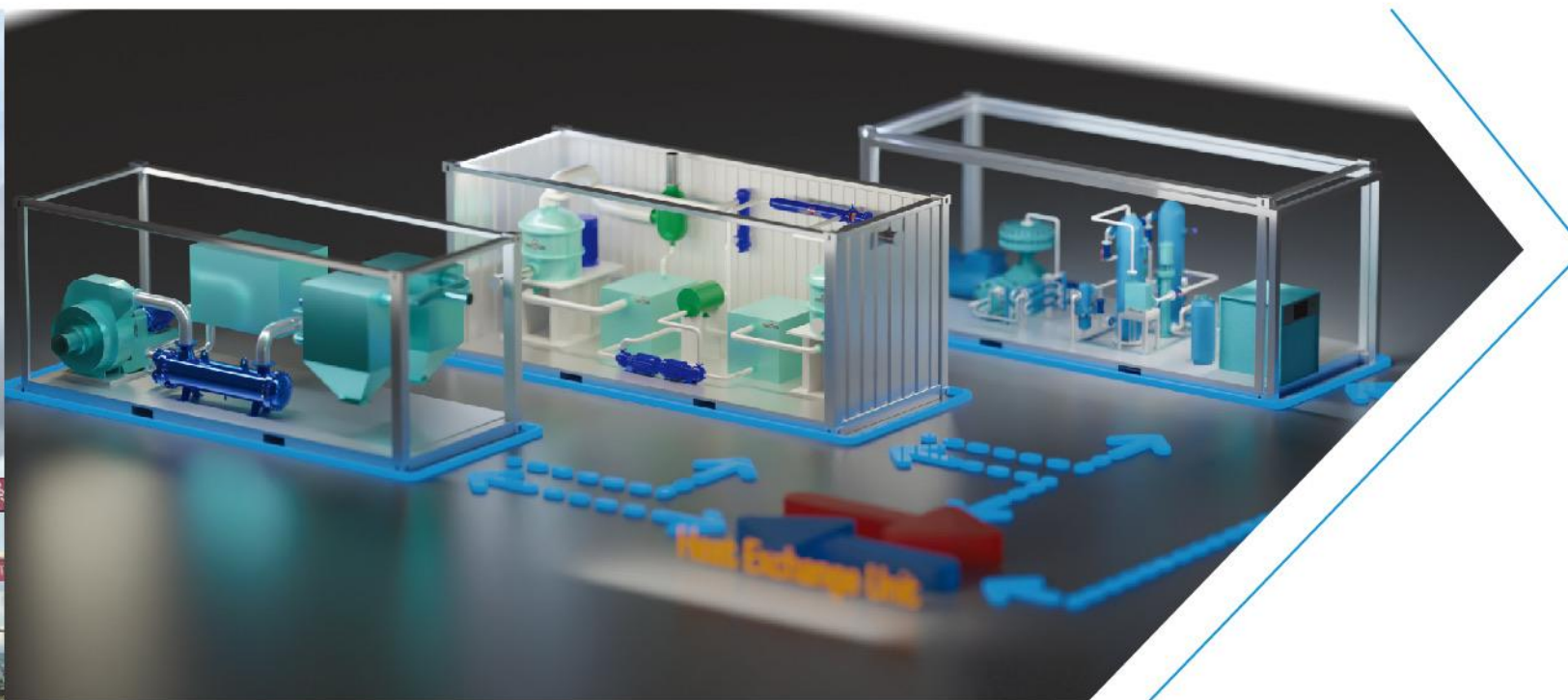
## RETROFITTING DESIGN



OceanGuard® EGCS integrated the end to end process including 3D scanning, Design, Pipe Prefabrication, Manufacturing, Installation, Commissioning, and Technical Support, to provide the customer a "One-Stop", "Turn-key" solution. Headway's service can effectively prevent any potential loss caused by the design deviation or temporary change during installation.

With the seamless integration of "Design, Prefabrication and Installation", Headway coordinates all relevant parties of the project.

## ONBOARD CARBON CAPTURE SYSTEM



OceanGuard® Onboard Carbon Capture System adopts Headway's self-developed high-efficiency decarbonizer and high-speed centrifugal decarbonization technology. Enhanced by the modular design, OceanGuard® OCCS can be flexibly arranged onboard the ship, Bringing 40% less power consumption and 25% less fuel cost when installed with OceanGuard® EGCS.