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Alfa Laval secures order for the world's first marine boiler system for ammonia waste incineration

Alfa Laval announces a milestone in maritime decarbonization with an order for the world's first marine boiler system designed for the safe incineration of ammonia emissions. Confirmed for a fleet of four ammonia dual-fuel vessels, this innovation is part of a joint development project with industry frontrunners and is set for delivery in 2027-2028.

A first-of-its-kind innovation for ammonia-powered ships

As the shipping industry transitions to alternative fuels, ammonia is emerging as a key zero-carbon fuel. However, its safe application onboard requires advanced technologies to manage its unique properties, including toxicity and the need for careful handling of purge gas and other waste gases.

As a frontrunner in enabling ammonia as a marine fuel, Alfa Laval has achieved a significant milestone by securing an order to deliver the world's first marine boiler system designed to function as an Ammonia Release Mitigation System (ARMS) for the safe incineration of ammonia wastes. The system will be installed on four 45,000 cubic meter (cbm) multi-gas carriers for the global commodities company Trafigura and designed to transport LPG and ammonia.

The advanced boiler system is part of a joint development project involving key industry players, including engine designer WinGD and shipyard HD Hyundai Mipo in South Korea for vessel construction.

"Our efforts with alternative fuels demonstrate that Alfa Laval is not just adapting to the shift toward these fuels, but is actively shaping it through our technological expertise and vast experience in marine equipment," says **Anders Lindmark**, Business Unit President Heat & Gas Systems, Alfa Laval. "Following our successful innovations with fuels like LNG and methanol systems, we are proud to once again drive the industry with this pioneering boiler system for incineration of ammonia that combines environmental responsibility with operational efficiency and safety."

"The landmark project brings together key industry players to advance ammonia as a viable marine fuel. Alfa Laval's innovative boiler technology, designed to operate as ARMS, tackles one of the critical technical hurdles impeding the wider adoption of ammonia, while prioritizing the safety of the environment and crew," said **Andrea Olivi**, Global Head of Shipping, Trafigura. "Trafigura is pleased to be working with companies like Alfa Laval that are developing solutions to decarbonize the maritime industry."

A multi-purpose solution for ammonia-powered vessels

Designed to go beyond conventional steam generation, the system will efficiently incinerate gaseous ammonia and ammonia-nitrogen mixtures produced by ammonia dual-fuel engines, fuel supply systems and other equipment onboard. This multi-functionality allows shipowners to reduce costs and save valuable space by minimizing the need for additional equipment while effectively managing waste and byproducts.



“By extending the functionality of the boiler system to handle ammonia emissions, we are enabling shipowners to achieve substantial savings in both costs and space,” says **Stig Person**, Head of R&D, Business Unit Heat & Gas Systems, Alfa Laval. “Our system eliminates the need for separate equipment to manage ammonia purge emissions, boil-off gas, and tank emptying operations, streamlining vessel design while enhancing safety.”

“The first commercial deployment of the ammonia-incinerating boiler system will serve as a model for future vessels, demonstrating that ammonia can be used safely while optimizing vessel design and operational efficiency. The space and weight savings achieved through this integrated approach provide tangible benefits for shipyards and ultimately for vessel operators,” says **Dong-jin Lee**, Head of the Initial Design Division and the Detailed Design Division at HD Hyundai Mipo.

Proven expertise in multi-fuel technology

Alfa Laval has been at the forefront of developing solutions for alternative fuels, leveraging decades of expertise in fuel-handling technology. The company has successfully pioneered combustion systems for LNG and methanol-powered vessels, demonstrating its ability to adapt to the changing energy landscape.

The journey with ammonia boiler began in 2021 with internal studies and concept designs, followed by lab-scale combustion tests since 2022. Tests at scale have been initiated since 2024 in Alfa Laval Test & Training Centre in Aalborg, Denmark, paving the way for the commercialization of its ammonia combustion technology. This extensive research and development positions Alfa Laval to address the technical challenges associated with ammonia as a marine fuel, ensuring both safety and operational efficiency.

“The innovative system, a result of extensive research and technological advancements, proves our ability to provide cutting-edge solutions that enable shipowners to transition to ammonia safely,” says **David Jung**, Business Development Manager, Alfa Laval. “These vessels will be among the first to demonstrate a fully integrated boiler system for ammonia waste incineration, positioning Alfa Laval as the frontrunner in ammonia combustion technology for marine boiler applications.”

Visit the marine equipment and solutions for ammonia as fuel page:

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For more information, please visit the Alfa Laval Marine webpage:

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Editor's notes

This is Alfa Laval

The ability to make the most of what we have is more important than ever. Together with our customers, we're innovating the industries that society depends on and creating lasting positive impact. We're set on helping billions of people to get the energy, food, and clean water they need. And, at the same time, we're decarbonizing the marine fleet that's the backbone of global trade.

We pioneer technologies and solutions that free our customers to unlock the true potential of resources. As our customers' businesses grow stronger, the goal of a truly sustainable world edges closer. The company is committed to optimizing processes, creating responsible growth, and driving progress to support customers in achieving their business goals and sustainability targets. Together, we're pioneering positive impact.

Alfa Laval was founded 140 years ago, has customers in 100 countries, employs more than 22,300 people, and annual sales were SEK 66.6 billion (5.8 BEUR) in 2024. The company is listed on Nasdaq Stockholm.

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