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## Shell signs agreement with Alfa Laval to develop a Gas Combustion Unit (GCU) for hydrogen boil-off gas

**Shell International Trading and Shipping Company Limited has signed a memorandum of understanding (MOU) with Alfa Laval regarding the development of a new Gas Combustion Unit (GCU) for use on liquid hydrogen carriers. By paving the way for the safe transport of hydrogen by sea, the project is an important step on the path to global decarbonization.**

### **Crucial safety for zero-carbon fuel**

Under the MOU, Alfa Laval will develop a system to safely combust hydrogen boil-off gas (BOG) from a vessel's storage tank, as part of a new liquid hydrogen carrier. Because the venting of cargo is restricted, a GCU offers a means of controlling tank pressure/temperature when the BOG poses safety risks beyond the tank's design conditions.

"Renewable hydrogen will likely be a key fuel in tomorrow's decarbonization mix, but accessibility will determine its impact," says Carl Henrikson, General Manager of Shipping Technology, Shell. "By enabling safe ocean transport of liquid hydrogen, we can help speed up the global transition to clean energy and Shell's target to become a net-zero emissions energy business by 2050. Alfa Laval shares our ambition and is our choice of partner."

"We are proud to support Shell in developing a marine infrastructure for hydrogen," says David Jung, Business Development Manager, Alfa Laval. "Global hydrogen demand is expected to grow many times larger than it is today, and liquid hydrogen carriers at sea will be a vital link in the world's decarbonized fuel chain."

### **Unique experience in marine gas combustion**

As the leader in gas combustion on LNG carriers, Alfa Laval has insights and technology that will act as a springboard. The design of the new GCU system for hydrogen will be based on the existing Alfa Laval GCU for LNG. More than 200 of these units have been installed in just over a decade, and an additional 100 units have been ordered during 2022. The challenges in hydrogen combustion, however, are significantly greater than those involved with LNG.

"With its boiling point of  $-253^{\circ}\text{C}$ , hydrogen is expected to have a higher boil-off rate than methane, which will make having a GCU or similar means of BOG handling crucial on hydrogen carriers," says David Jung. "In addition, hydrogen is light, highly flammable and easy ignitable. Safety will be paramount when transporting it on board, so there are critical safety considerations when designing the GCU system."

Alfa Laval will design and engineer the new GCU for hydrogen with the aim of receiving an approval in principle (AIP) from an IACS classification society. Once the AIP is achieved, a GCU prototype will be built for testing and type approval.

To learn more about the existing Alfa Laval GCU and Alfa Laval's approach to the fuel transition, please visit: [www.alfalaval.com/marine](http://www.alfalaval.com/marine)

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**Editor's notes**

**This is Alfa Laval**

Alfa Laval is a world leader in heat transfer, centrifugal separation and fluid handling, and is active in the areas of Energy, Marine, and Food & Water, offering its expertise, products, and service to a wide range of industries in some 100 countries. The company is committed to optimizing processes, creating responsible growth, and driving progress to support customers in achieving their business goals and sustainability targets.

Alfa Laval's innovative technologies are dedicated to purifying, refining, and reusing materials, promoting more responsible use of natural resources. They contribute to improved energy efficiency and heat recovery, better water treatment, and reduced emissions. Thereby, Alfa Laval is not only accelerating success for its customers, but also for people and the planet. Making the world better, every day.

Alfa Laval has 17,900 employees. Annual sales in 2021 were SEK 40.9 billion (approx. EUR 4 billion). The company is listed on Nasdaq Stockholm.

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