

## 3M and HD Hyundai KSOE to collaborate on joint research project to help insulate liquid hydrogen storage tanks

ST. PAUL, Minn., March 7, 2024 /[PRNewswire](#)/ -- 3M and HD Hyundai Korea Shipbuilding & Marine Engineering (KSOE) have signed a joint research project agreement to develop large liquid hydrogen storage tanks using [Glass Bubbles](#) from 3M – a high-strength, low-density hollow glass microsphere. The collaborative research will focus on developing a high-performance vacuum insulation system for liquified hydrogen storage and transportation.

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*3M and HD Hyundai will conduct a joint research project to develop large liquid hydrogen storage tanks.*

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"We are honored to conduct joint research with 3M on insulation materials for hydrogen storage tanks," said Kim Sung-jun, CEO of HD Korea Shipbuilding & Marine Engineering.

Hydrogen technology is a major factor for the future of clean energy, but the success of storing and transporting liquid hydrogen is key to its viability. Hydrogen needs to be transported as a liquid and not a gas, because it can be reduced to 1/800<sup>th</sup> the volume. However, hydrogen is liquefied at a very low temperature of minus 253 degrees Celsius, so a high-performance insulation system for the tanks and the main materials involved are critical.

"Through this agreement, we hope to successfully build a technology collaboration system that can lead the world in the field of liquified hydrogen storage and transportation," said Dr. Kwang pil Jang, President of the Future Technology Research Institute. "We are very excited to collaborate with 3M, which currently produces one of the highest performing insulation products in the world. HD KSOE will surely lead the future hydrogen society through synergy with 3M based on the global top technology we have accumulated so far."

A signing ceremony was held at the 2024 Consumer Electronics Show (CES) and was attended by Kim Sung-jun and Kwang pil Jang, along with 3M's Advanced Materials Division president Brian Coleman and global lab director Patrick Fischer.

"This collaboration is a major step forward in the pursuit of making hydrogen technologies available at scale," said Coleman. "3M's glass bubbles offer significant advantages over traditional cryogenic insulation materials when it comes to thermal efficiency and durability. We're thrilled to lend our expertise and world-class materials science in the hydrogen value chain."

Under the agreement, the two companies will collaborate on insulation and construction workability evaluations, demonstrations, and classification approvals for the application of 3M's Glass Bubbles to HD HHI's advanced thermal insulation system for hydrogen storage tanks. Through this, the two companies hope to capture the initial volume of orders for high-value-added ships based on ultra-gap technologies in the rapidly approaching hydrogen society and further strengthen the competitiveness of the domestic shipbuilding industry.

[Learn more about 3M solutions in the hydrogen economy](#)

### **About 3M**

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### **About HD Korea Shipbuilding & Offshore Engineering (HD KSOE)**

HD Korea Shipbuilding & Offshore Engineering (HD KSOE) is the intermediate holding company of HD Hyundai's marine sector, one of South Korea's largest heavy industries conglomerates engaging in shipbuilding, heavy equipment, and energy businesses. Founded in 1972 and headquartered in the Republic of Korea, HD KSOE aims to become a technology-oriented company in the shipbuilding & offshore business equipped with world-class R&D and engineering capabilities. As the world's largest shipbuilder, it is leading the global market with its competitiveness in innovation and R&D, focusing on projects on shipbuilding, offshore engineering, naval shipbuilding, marine engine, marine system solutions and more. With over 50 years of experience in the industry, it is especially known for its great expertise in ship design and construction, including those on ammonia carriers, liquid carbon dioxide carriers, and ships designed for low carbon fuels.

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