# PRESS RELEASE

# World-First Type Approval and Factory Acceptance Testing for Ammonia-Fuelled Two-Stroke Engine

**WINTERTHUR, SWITZERLAND, (24 February 2026)**

Swiss marine power company WinGD has achieved a major milestone on the path to zero-carbon shipping with the completion of both Type Approval Testing (TAT) and Factory Acceptance Testing (FAT) of their ammonia-fuelled two-stroke marine engine. Both test programmes were completed in January 2026, with testing of the X52DF-A-1.0 engine carried out at the HD Hyundai Heavy Industries' Engine & Machinery (HHI-EMD) facility in South Korea, witnessed by classification society Lloyd's Register (LR), together with representatives from all major classification societies, under the supervision of EXMAR.

The testing programmes took place on a 52-bore engine to be installed on a 46,000m³ LPG/ammonia carrier on order for EXMAR. The vessels in the series are set to become the first ammonia-fuelled gas carriers to enter commercial service, marking a significant milestone for the shipping industry's decarbonisation efforts.

Sotiris Topaloglou, Global Head of Testing & Validation at WinGD, said: "Completing Type Approval Testing and Factory Acceptance Testing with our joint development partner HHI-EMD represents a major technical milestone in the development of ammonia-fuelled two-stroke propulsion. As first movers, we are addressing a completely new fuel landscape, where safety, control and system integration are paramount. We have developed an engine that has been well proven to be safe and efficient by tackling, one by one, all the technical challenges we faced.

"Demonstrating the world's first TAT for an ammonia-fuelled two-stroke engine with strong results demonstrates that ammonia propulsion can meet the highest standards of reliability, performance and safety expected by the industry for commercial marine application."

Throughout a rigorous multi-year development and testing process, excellent performance has been demonstrated. Emissions data from the X-DF-A engine has impressed with NOx emissions during ammonia operation well below those generated during diesel use. Excellent results have also been recorded for emissions of $N_2O$, with a negligible contribution to the overall greenhouse gas emissions footprint.

Confidence in ammonia as a future marine fuel continues to grow, with WinGD securing an early orderbook of around 30 X-DF-A engines across multiple vessel segments, including gas and bulk carriers, tankers and container vessels. This momentum reflects growing confidence across the maritime value chain as engine technology, ship design and operational frameworks progress in parallel. The successful completion of testing also demonstrates the manufacturing and testing expertise behind the programme.

Minho Kang, Head of Marine Engine & Machinery Technical Section at HHI-EMD, said

“By successfully completing the world’s first Type Approval Testing and Factory Acceptance Testing, processes that require a high level of precision throughout both manufacturing and testing, HD Hyundai Heavy Industries has demonstrated its technological leadership in the next-generation eco-friendly marine engine market. We will continue to lead the decarbonisation of maritime transport by delivering high-quality, environmentally friendly marine engines.”

Kristof Coppé, Director Fleet Operations & Technical Business Development at EXMAR added, “These successful tests represent a key milestone in EXMAR’s development of ammonia as a marine fuel, a journey that began in 2021. Drawing on more than 40 years of experience in transporting ammonia as cargo, EXMAR has been able to critically assess both the engine design and the test program, with particular attention to the safety considerations associated with using a toxic cargo as fuel.
EXMAR now looks ahead to the next phase, which will involve sea trials on ammonia fuel. These trials will have to validate the seamless integration and performance of all onboard systems. Preparations are currently underway, with the trials scheduled to take place in the coming months.”

With the first delivered engines approaching service following a robust, safety-focused development process, now fully validated through both TAT and FAT, WinGD’s X-DF-A platform offers shipowners a real choice as they navigate evolving regulatory and market demands on the path to net zero emissions. Design optimisation undertaken throughout the development and testing programme will be applied across the vessel series, supporting consistent performance, safety and operational reliability as the ships enter service.

The X-DF-A engine features high-pressure ammonia injection supplemented by a low, targeted pilot fuel dose of around five per cent at full load. The engine delivers load handling, dynamic response and fuel efficiency on par with WinGD’s equivalent diesel-fuelled X-Engines in both ammonia and diesel operating modes.

**ENDS**

## Notes to editors

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## WinGD in brief

WinGD advances the decarbonisation of marine transportation through sustainable energy systems using the most advanced technologies in emissions reduction, fuel efficiency, hybridisation and digital optimisation. With their two-stroke low-speed engines at the heart of the power equation, WinGD sets the industry standard for reliability, safety, efficiency, and environmental design - supported by Global Service by WinGD, which delivers tailored 24X7 lifecycle engine support through Swiss engineering excellence, dependable maintenance, rapid global response, and genuine parts to keep engines performing at their best.

Headquartered in Winterthur, Switzerland since its origin as the Sulzer Diesel Engine business in 1893, today it is powering the transformation to a sustainable future.
Follow WinGD on LinkedIn for the latest news and updates

## About EXMAR

EXMAR is a provider of floating solutions for the operation, transportation and transformation of gas.
EXMAR's mission is to leverage generations of shipowning, shipbuilding, maritime infrastructure and project execution for an improved energy future
EXMAR designs, builds, owns, leases and operates specialized floating maritime infrastructure for this purpose as well as aiming for the highest standards in performing commercial, technical, quality assurance and administrative management for the entire maritime energy industry.

For more information visit: www.exmar.com
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