

13 June 2023

## WinGD enhances fuel-flexible efficiency with Variable Compression Ratio

Swiss marine power company WinGD has introduced a core engine technology that for the first time eliminates the need for ship operators to compromise on optimal combustion when using multiple fuels. Variable Compression Ratio (VCR), jointly developed with Mitsui E&S DU Co (MESDU), will be installed on a vessel powered by an X62DF engine and then rolled out across selected engines of the X-DF engine portfolio.

An engine's compression ratio is usually a fixed parameter, playing a direct role in power and fuel efficiency. Because fuels have different ideal compression ratios, in dual-fuel engines designers have had to select which fuel to optimise for. With VCR, the engine adjusts to each fuel's optimal compression, improving fuel efficiency for operators who want the flexibility to choose between diesel, LNG or bio- or e-fuel equivalents depending on availability and cost.

Marcel Ott, General Manager Application Engineering, WinGD, said: "VCR finally brings compression without compromise to marine dual-fuel engines. This breakthrough, the result of several years of work with MESDU, comes at a crucial time in the maritime industry as operators increasingly look for the ability to switch between fuels without sacrificing power, efficiency or emissions."

In trials on a 6X72DF test engine at MESDU's facilities in Japan, VCR reduced fuel consumption and CO<sub>2</sub> emissions by 6% when running on diesel mode. Although the engine had previously been optimised for gas mode, improvements were also evident when using LNG, with fuel consumption and emissions reduced by 3%. The improvement was achieved because the engine was originally configured to a compression ratio that favoured LNG while still offering good diesel performance. With VCR, this compromise is no longer required.

As well as optimising compression ratios for different fuels, VCR can also benefit engines operating under different ambient conditions and intake air compositions, such as when using exhaust gas recirculation. This makes it a critical advance as shipping adopts the new fuels and technologies that will allow it to reach decarbonisation targets.

Compression ratio is altered by changing the piston position to adjust combustion chamber volume. The simple mechanical configuration has no impact on engine footprint or installation requirements. VCR can also be adjusted for part load operation, meaning relatively larger savings can be achieved at the low speeds that operators may consider to further reduce their emissions.

WinGD plans to introduce VCR as an option for its X72DF, X62DF and short-stroke X62DF-S engines, with retrofit packages available after the technology is introduced for newbuilds. A wider portfolio roll out will be considered based on market demand.

**ENDS...**

## Media Contact:

Anna Garcia  
Director of Corporate Responsibility & Communications  
E-mail: [anna.garcia@wingd.com](mailto:anna.garcia@wingd.com)  
Tel.: +41 52 264 8844

## 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, backed by a global network of service and support. 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.

WinGD is a CSSC Group company.

For more information visit: [www.wingd.com](http://www.wingd.com)