



World Record Dual-Fuel Engines Ordered by Leading American Shipping Company

LNG-capable ME-GI units to power newbuilding container ships

Matson Navigation Company, Inc. – a subsidiary of Matson, Inc., a leading U.S. carrier in the Pacific Ocean – has placed an order for two 3,600 TEU container ships, powered by two MAN B&W 7S90ME-GI dual-fuel engines. The deal includes an option for three further vessels.

The engines are the largest dual-fuel engines ever ordered in terms of power output with each engine developing a massive 42,700 kW. The ME-GI engines and pertaining systems will be manufactured by MAN Diesel Turbo's licensee, Hyundai, and will be able to use HFO, MDO or LNG as fuel.

MAN Diesel & Turbo reports that the 7S90ME-GI uses the Diesel cycle to maintain high efficiency, with no need for any derating. The company also states that the engines by virtue of its diesel operating principle will have negligible methane slip and no need for restrictive load ramps or other knock-preventing measures. MAN Diesel and Turbo view the order as yet another significant step in the adoption of its dual-fuel technology by the marine market.

Mature, versatile technology

Ole Grøne, Senior Vice President Low-Speed Sales and Promotions, MAN Diesel & Turbo, said: "The ME-GI has a number of inherent characteristics that we feel give it a decided advantage in the market. Primarily, it is a Diesel engine in contrast to the other dual- or triple-fuel engines on the market, which are Otto engines. Simply put, engines that operate according to the Diesel principle have a higher efficiency and power concentration than those following the Otto principle. Furthermore, in the light of after-treatment, a Diesel engine's performance can benefit from NO_x control, both in regard to fuel and gas, and within both Tier II and Tier III areas."

Grøne stressed, that a high focus has been put on the safeness of MAN Diesel & Turbo's dual-fuel gas technology and said: "Due to compact, double-wall, gas-fuel pipes in the engine room and on the engine, the gas volume at any point in time within the engine is kept to a minimum, ensuring complete safety."

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The new container ships will be constructed by Aker Philadelphia Shipyard, the leading U.S. commercial shipyard, and are scheduled for delivery in the third and fourth quarters of 2018.

Matson reports that the 850-foot long vessels will be the largest Jones Act containerships ever constructed and are designed to operate at speeds in excess of 23 knots. Importantly, the ships will also be able to navigate safely into some of Hawaii's smaller ports.

The company also states that the new vessels will incorporate a number of 'green ship technology' features such as a fuel-efficient hull design, dual-fuel engines, environmentally safe double-hull fuel tanks and freshwater ballast systems. "These state-of-the-art advancements are important to Hawaii as a means to reduce fuel consumption, resulting in significant emission reductions over time in our home trade," Matt Cox, president and CEO, Matson said.

The ME-GI engine

The ME-GI engine represents the culmination of many years' work. Depending on relative price and availability, as well as environmental considerations, the ME-GI engine gives shipowners and operators the option of using either HFO or gas – predominantly natural gas. An ME-LGI counterpart is being developed to use LPG and methanol.

Mitsui became the second MAN Diesel & Turbo two-stroke licensee to demonstrate the ME-GI concept after Hyundai did so in Korea in November 2012. Shortly afterwards, TOTE – another American shipping company – ordered two 8L70ME-GI engines to power two 3,100 TEU newbuilding container ships, with an option for three additional vessels. That announcement represented the first commercial order for the engine type, officially designated as ME-C-GI (M-type, Electronically Controlled, GI for Gas Injection) in the MAN Diesel & Turbo low-speed portfolio.

The following month, MAN Diesel & Turbo was able to confirm the successful introduction of the ME-GI to the market with the announcement of another order when Teekay LNG Partners L.P. (Teekay LNG), an offshoot of Teekay Corporation, the international shipping group, placed an order for two LNG carriers powered by 2 x 2



5G70ME-GI engines, including an option for three further ships. This order has now been increased to 4 vessels with 5 options.

MAN Diesel & Turbo sees significant opportunities arising for gas-fuelled tonnage as fuel prices rise and modern exhaust-emission limits tighten. Indeed, research indicates that the ME-GI engine delivers significant reductions in CO₂, NO_x and SO_x emissions. Furthermore, the ME-GI engine has no methane slip and is therefore the most environmentally friendly technology available.

MAN Diesel & Turbo predicts a broad, potential market for its ME-GI engine. As such, the ME-GI engine represents a highly efficient, flexible, propulsion-plant solution.

About Matson

Founded in 1882, Matson is a leading U.S. carrier in the Pacific, linking the islands of Hawaii, Guam, Micronesia and select South Pacific islands to the U.S. mainland as well as operating a premium, expedited service between China and Southern California. The company's fleet of 18 vessels includes containerships, combination container and roll-on/roll-off ships and custom-designed barges.

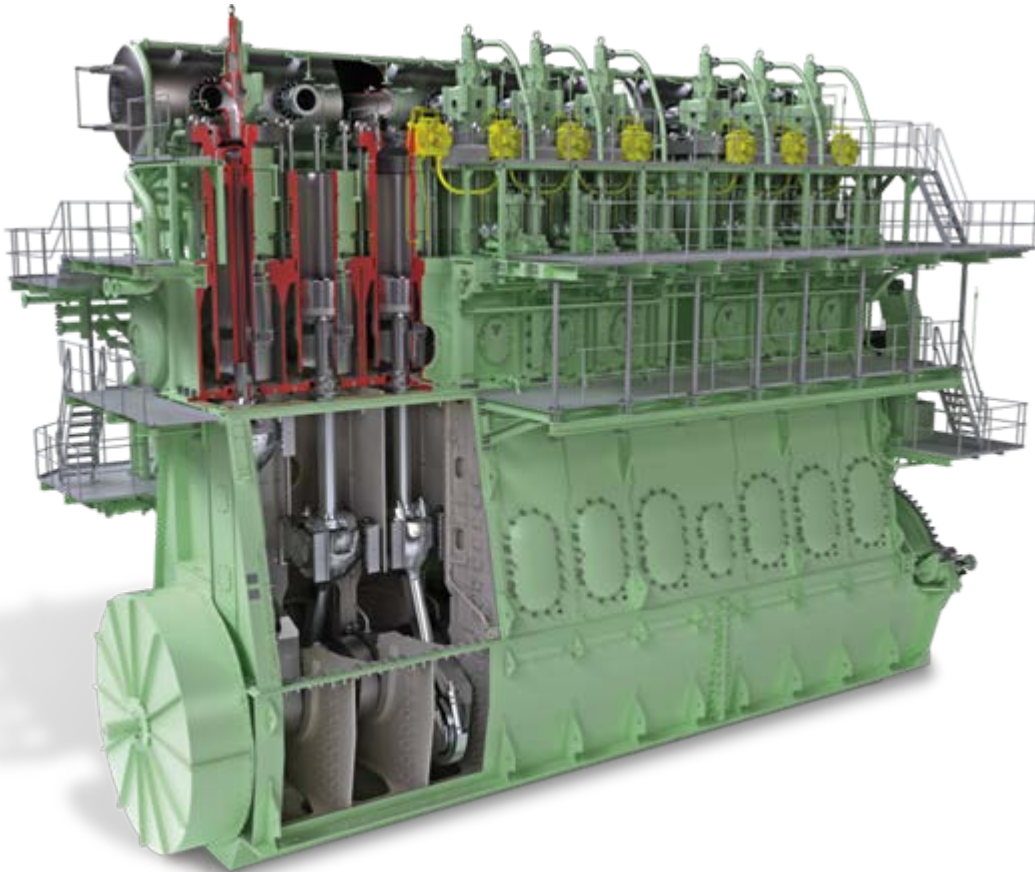


Illustration of an MAN B&W S90ME-GI engine. MAN Diesel & Turbo's ME-GI engines use the diesel cycle to maintain high efficiency to avoid the severe derating, large ethane slip, temperature and fuel-quality derating and load ramps of other systems

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Graphical rendering of one of the proposed Matson container newbuildings (copyright Matson)

About MAN Diesel & Turbo

MAN Diesel & Turbo SE, based in Augsburg, Germany, is the world's leading provider of large-bore diesel engines and turbomachinery for marine and stationary applications. It designs two-stroke and four-stroke engines that are manufactured both by the company and by its licensees. The engines have power outputs ranging from 450 kW to 87 MW. MAN Diesel & Turbo also designs and manufactures gas turbines of up to 50 MW, steam turbines of up to 150 MW and compressors with volume flows of up to 1.5 million m³/h and pressures of up to 1,000 bar. The product range is rounded off by turbochargers, CP propellers, gas engines and chemical reactors. MAN Diesel & Turbo's range of goods includes complete marine propulsion systems, turbomachinery units for the oil & gas as well as the process industries and turnkey power plants. Customers receive worldwide after-sales services marketed under the MAN PrimeServ brand. The company employs around 14,000 staff at more than 100 international sites, primarily in Germany, Denmark, France, Switzerland, the Czech Republic, India and China. MAN Diesel & Turbo is a company of the Power Engineering business area of MAN SE.

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