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## New Dual-Fuel Engine Launched at SMM

### MAN 49/60 engine family revealed at Hamburg trade fair has clear pathways to long-term emissions compliance

MAN Energy Solutions has announced the launch of its MAN 49/60DF engine type at the SMM trade fair in Hamburg. The latest addition to its four-stroke engine portfolio, the dual-fuel engine is capable of running on LNG, diesel and HFO as well as a number of more sustainable fuels including biofuel blends and synthetic natural gas. MAN Energy Solutions states that it sets a benchmark in terms of fuel efficiency within four-stroke engines – both in gas and diesel modes – and therefore minimises fuel costs.

Wayne Jones OBE, Member of the Executive Board – Global Sales & After Sales – MAN Energy Solutions, said: “Dual-fuel engines are the ticket to the maritime energy transition. As we enter a new era of decarbonisation, the 49/60DF is a great, new choice for vessel owners that have ambitious, emission-reduction targets on their agenda. In essence, it offers full fuel-flexibility to operators who can then choose from the various decarbonisation paths that open up as new fuels make their way into the marine industry.”

Marita Krems, Head of Four-Stroke Marine & License, MAN Energy Solutions, said: “The MAN 49/60DF is making its debut at a time where – while the number of LNG projects is still growing – alternative fuels like methanol, ammonia and hydrogen are continuing their rise, albeit with none having established market dominance as of yet. Increasingly, it is crucial for new vessels to be driven by engines that provide options for emission compliance over the vessel’s lifetime. Fuel flexibility and efficiency are the key features. In this respect, the 49/60DF distinguishes itself by offering a number of various emission paths. It also has a level of efficiency that ensures best fuel costs in many applications, especially within the cruise, RoPax, RoRo, dredger, and LNG carrier segments.”

The 49/60DF is already available for order and is based on the new 49/60 engine platform that features MAN’s latest technologies, including two-stage turbocharging, second-generation common-rail fuel injection, SaCoS5000 automation system and MAN’s next generation Adaptive Combustion Control ACC 2.0 that automatically sets combustion to optimum levels. The engine also retains existing MAN technologies such as the gas-injection system, pilot-fuel-oil system and MAN SCR (Selective Catalytic Reduction) system.

### Multiple compliance paths

The 49/60 can start in gas mode where it complies with IMO Tier III without secondary measures. In diesel mode, it complies with Tier III combined with MAN’s SCR system.

Soot emissions are halved in diesel mode due to MAN’s new common rail system 2.2, while the 49/60DF’s methane emissions also drastically reduced in gas mode

compared to its predecessor. The engine's benchmark efficiency and fuel-flexible design offers multiple paths to emission compliancy leading up to 2050, as per the current Fuel EU draft.

MAN Energy Solutions plans to introduce a pure diesel engine based on the 49/60 platform in 2023 that will inherently be retrofit-ready for running on methanol and LNG should the demand arise at a later stage.

For more information on the engine: [www.man-es.com/man-49-60](http://www.man-es.com/man-49-60)

<b>MAN 49/60DF specifications</b>	
<b>Bore/stroke (mm)</b>	490/600
<b>Cylinder distance (mm)</b>	L: 820; V: 980
<b>Cylinder configuration</b>	6L, 7L, 8L, 9L, 10L, 12V, 14V
<b>rpm (min<sup>-1</sup>)</b>	600
<b>Power output per cyl. (kW<sub>m</sub>)</b>	1,300
<b>Power range (kW<sub>m</sub>)</b>	L: 7,800 - 13,000; V: 15,600 - 18,200
<b>Marine applications</b>	DM (CPP), DE (constant and variable speed)
<b>SFC in gas mode (kJ/kWh) @ 85% load</b>	<b>6.990</b>  (8L, 10L: 7.010)
<b>SFOC in diesel mode (g/kWh) 85% load</b>	<b>171,0</b>  (8L, 10L: 172,0)
<b>Emissions</b>	gas mode: IMO Tier III; diesel mode: IMO Tier II without SCR, Tier III with SCR



*The MAN 49/60DF engine introduced at SMM*

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MAN Energy Solutions enables its customers to achieve sustainable value creation in the transition towards a carbon neutral future. Addressing tomorrow's challenges within the marine, energy and industrial sectors, we improve efficiency and performance at a systemic level. Leading the way in advanced engineering for more than 250 years, we provide a unique portfolio of technologies. Headquartered in Germany, MAN Energy Solutions employs some 14,000 people at over 120 sites globally. Our after-sales brand, MAN PrimeServ, offers a vast network of service centres to our customers all over the world.