Press Release
MAN Truck & Bus

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SMM: MAN Engines presents solution for meeting IMO Tier III in work boats

Modular exhaust gas aftertreatment with catalytic converter; flexible solution for IMO Tier III as well as US EPA Tier 4 with an optimum space utilization; high packaging density and lightweight

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MAN Engines will present its solution for meeting the IMO Tier III and US EPA Tier 4 emission standards for commercial use at the SMM in Hamburg: the modular exhaust gas aftertreatment system (EAT). The system sets itself apart with a high level of flexibility and the fact that it is extremely compact, which is ideal in order to meet the various engine room specifications associated with commercial shipping applications. The modular EAT makes a wide range of installation configurations possible as the individual SCR (Selective Catalytic Reduction) components can be positioned differently. Because of this, a flexible system integration, tailored to your specific requirements, can be provided. “By minimizing the system down to just a few components, it stays compact, regardless of its configuration. Thus the system always proves itself as the optimal solution for our customers, even when to be installed in tight engine rooms”, explains Claus Benzler, Head of Marine MAN Engines.

However, it’s not just flexibility and compactness that the basically maintenance-free exhaust gas aftertreatment system has to offer – it is extremely lightweight, too. This is also due to the fact that it has fewer components.

The centerpiece of the SCR is a catalytic converter which helps to reduce the nitrogen oxides (NOx) in the emissions. In order to do so, a 32.5 percent aqueous urea solution (AdBlue©) is dosed in a SCR mixer and then injected continuously and directly into the exhaust tract. The solution then reacts with the nitrogen oxides and converts them into water (H_2O) and harmless nitrogen (N_2). This method of SCR injection does not involve compressed

air, saving again more space, reducing the technical complexity and installation space required for this already extremely flexible system.

In other words, the MAN Engines modular exhaust gas aftertreatment system is a modern SCR-only system, which does without exhaust gas recirculation as well as bulky and heavy components like diesel particulate filters and oxidation catalytic converters. This saves additional costs and makes the system less complex as a whole.

Together with the optimized combustion of MAN engines, the SCR catalytic converter meets the requirements of both emission levels IMO Tier III and the US EPA Tier 4. Using the SCR means that specific fuel consumption was additionally reduced by up to 8% per engine while still maintaining the same power. Needless to say that MAN Engines are already known for their impressive fuel efficiency in the industry. Thereby the engineers at MAN Engines achieved to develop an efficient, simple and lightweight exhaust gas aftertreatment system that remains robust and versatile.

The foundation of the system is a result of the expertise at MAN Truck & Bus AG, which has successfully been using SCR systems in the group's own trucks in high-volume production since 2006. Furthermore, MAN Engines also benefits from the experience of fitting and installing after exhaust treatment systems gained in the agricultural and industrial sectors. Here the technology has been used since 2015 for in-line and V-engines. Also the SCR system is currently proving its practicality in field trials for commercial work boat applications.

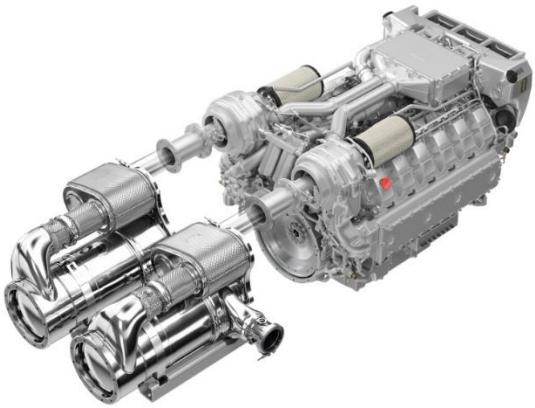
As a result, the engines from MAN Engines for work boats are already equipped to meet the IMO Tier III (within NOx ECA North Sea ECA & Baltic Sea ECA) emission standard, which will be mandatory from 2021 on. This standard stipulates a reduction in nitrogen oxides (NOx), depending on the engine’s maximum operating speed, by around 70 percent compared to its predecessor, IMO Tier II. Instead of the 7.7 g/kWh permitted previously, only 2.0 g/kWh will be allowed in the future.

At last year’s International Boat Show in New Orleans, LA, MAN launched its SCR system, optimized for work boats and designed to meet the US Tier 4 emissions standard. This standard permits a nitrogen oxide limit value of 1.8 g/kWh and 0.04 g/kWh for particulate emissions, and has been in effect since October 1st, 2017 for all US-flagged commercial vessels with an output of more than 600 kW (816 hp) per engine. This equates to a reduction in nitrogen oxides of almost 68 percent compared to the previous US Tier 3.

With its 12-cylinder engines, MAN Engines currently offers a consistent range of outputs from 551 to 1,066 kW for the US Tier 4 emissions standard

and up to 1,213 kW for the IMO Tier III emissions standard. This portfolio will be continuously expanded to include other power outputs.

MAN Engines will be showcasing its SCR system at the SMM outdor booth # A4.FG10, located between Hall A3 and A4 from September 4th – 7th, 2018. A D2862 12-cylinder engine packaged with a SCR unit will be on display in the atrium, booth # A1.13.



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The modular exhaust gas aftertreatment system from MAN Engines is compact and meets the requirements of both the IMO Tier III and US EPA Tier 4 emissions standards.

	NO_x (g/kWh)	PM (g/kWh)	HC (g/kWh)	effective from
IMO Tier III (n ≥ 2000 rpm)	**2,00**	**-**	**-**	**1. Jan. 2021 within NOx ECA North Sea ECA & Baltic Sea ECA***
US EPA Tier 4 (Commercial > 600kW & < 1400kW)	**1,80**	**0,04**	**0,19**	**1. Oct. 2017**

*** 01.01.2016: North American ECA & US Caribbean ECA**

Sources: IMO Resolution MEPC.176(58) (Revised MARPOL Annex VI); EPA 40 CFR Part 1042

Overview of the emission standards