



The Unique Digital Airless Multipoint® SCR Technology

Ships are one of the biggest NOx sources in the world. NOx emissions from ships cause pollution over land and cause eutrophication of the seas. DANSK TEKNOLOGI has developed a SCR system with Digital Airless Multipoint® urea injection that reduces NOx emission from marine engines. The Danish Navy wants to be ahead of regulations and have ordered the first NOx reduction system for the patrol vessel, P525.



Next generation technology

During the past 2 years DANSK TEKNOLOGI has developed a unique SCR system for NOx-reduction on marine engines. The system is based on Digital Airless Multipoint® injection of urea into a catalytic titaniumoxide converter.

Launch customer is THE DANISH NAVY/ Danish Defence Acquisition and Logistics Organisation (DALO) who has ordered 2 systems to be manufactured and erected on the 2 main engines on a patrol vessel of the Diana class. The systems were installed and commissioned end of October 2009.

Fulfilling IMO requirements of 2016

The NOx-reduction is up to 90%. The vessel fulfils the IMO requirements of 2016 and on.

Airless technology

The airless technology was originally developed for use on heavy trucks and busses, and is the preferred technology for the next generation of vehicles. The heart of the system is derived from the innovative Digital Dosing pump technology that DANSK TEKNOLOGI has developed for GRUNDFOS. Based on this unique knowledge, a SCR system suited especially for marine engines has been developed.

DANSK TEKNOLOGI started testing the airless injection technology 4 years ago by retrofitting a complete SCR system

on four MAN-trucks owned by THE DANISH ARMY/ DALO.

Since then the technology has been extensively tested by leading truck engine manufacturers.

SCR system for marine engines

Based on this development, DANSK TEKNOLOGI has taken the technology one step further and developed a complete SCR system for marine engines. During the development period, DANSK TEKNOLOGI has had a close cooperation with DALO, and a full size prototype system has been successfully tested at the naval base in Korsør.

Unique benefits

The Digital Airless Multipoint® technology gives high precision urea injection, high NOx-reduction, no need for compressed air, no need for a mixer and a very compact size. This again means that the complete SCR system takes up the same space as the traditional silencer, which it substitutes.

The developed SCR system is based on a modular concept and can be adapted to any engine running on marine diesel oil.

The system is fully developed and ready for production and installation on a wide variety of vessels, e.g. on main engines on ferries, tug boats, river boats and drilling rigs as well as auxiliary engines on container ships, bulk carriers and tankers.

How the technology works

A mixture of urea and deionised water, known as AdBlue, is sprayed into the exhaust gases. The heat of the exhaust system transforms urea into ammonia which reacts with the nitrogen oxides in a catalytic converter, converting them into harmless nitrogen and water vapour.

Project facts:

- Installation on Danish Navy patrol vessel, P525
- 4 stroke MTU engine 2040 kW (2 engines on each ship)
- NOx-reduction up to 90%
- Vessel fulfils IMO 2016 requirements
- Catalyst volume 1744 l (16 elements)
- Urea consumption max 42 l/h
- Dosing temperature 315-520°C
- Fuel: Marine Gasoil S<0,035-0,2% (350-2000ppm)
- Project partners: THE DANISH NAVY/ Danish Defence Acquisition and Logistics Organisation and DANSK TEKNOLOGI

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