Cat SCR System • Product Benefits

The Cat SCR System solution was designed by Caterpillar® especially for MaK medium-speed engines to meet future IMO Tier III emission requirements. Installation and operation of the Cat SCR System is a sustainable solution to reduce NOx emissions without sacrificing the typical MaK marine engine efficiency, durability, and reliability that our customers are used to trust. The service- and maintenance-friendly design, remote condition monitoring and diagnostic capabilities, as well as our unmatched global product support respond to the industry’s desire to lower operational costs and downtime beyond today's standards.

**Cat SCR System key features and benefits:**

- Complete marine certification service solution
- NOx reduction solution consisting of SCR chamber, mixing tube, urine injection system and dosing cabinet
- One-touch pre-sale optional available
- One-stop IMO Tier III solution
- IMO Tier III parent engine certification (scheme A), no certification in the vessel necessary
- Common control and monitoring of engine and SCR System for reliable and safe operation which maximizes work load and fuel efficiency
- United development of SCR System and engine calibration for optimized performance
- Application and installation support for every market and ship type
- Excellent serving capability due to strong Caterpillar dealer network
- Corresponding maintenance schedules of SCR System and engine for optimized operational availability
- Reduced development of SCR System and engine calibration for optimized performance
- Excellent service capability due to strong Caterpillar dealer network

**Standard scope of supply:**

- Reactor housing with Velostat
- Mixing tube with urine injection lance
- NOx, temperature and pressure sensors
- Urine dosing cabinet with G3M and closed loop function
- Set of flanges
- Scheme A certificate IMO Tier III

**Optional scope of supply:**

- Urine pump skid
  - for transfer of urine from storage tank to dosing unit
  - MCS certified
- Wiring kit
  - for ease of installation
  - for connecting dosing unit, mixing tube and reactor
  - for connecting plugs, cable and junction box
- Mixing tube, urine injection system and dosing cabinet

**A sustainable solution to reduce NOx emissions!**

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**The Power You Need.**

The Cat and MaK™ brands of Caterpillar Marine offer premier high- and medium-speed propulsion, auxiliary, and generator set solutions, as well as optional dual-fuel, diesel-electric, and hybrid marine configurations. With the launch of Caterpillar Propulsion our comprehensive and evolving product line grants customers one source for the most extensive engine power range available. Complete propulsion systems, control gear, pumps, marinised and architect thrusters, and controls. Cat and MaK products and technologies are proven reliable and are built to last in all marine applications, demonstrating superior productivity and the lowest lifecycle cost.

The Cat Global Dealer Network, more than 1,200 global service locations strong, ensures that you’ll have local expertise, highly-trained technicians, rapid parts delivery, and the proper equipment and services to keep you sailing— anytime, anywhere.

Construction, test, procure, finance through Cat Financial helps you make Cat and MaK power a reality. With our knowledge of customer needs, local markets and legal and regulatory requirements, we’ve been providing tailored financing solutions and exceeding expectations since our start in 1986.

For more information and to find your local dealer, please visit our website: www.cat.com/marines

Visit Cat Financial at: www.CatPowerFinance.com

**Built for it.**

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**Subject to change without notice**

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Caterpillar Marine is committed to sustainability. This document printed on PEFC certificated paper.
Emissions and Legislation

The upcoming global and local regulations concerning exhaust gas emissions for medium-speed marine diesel engines will be more stringent. While fulfilling IMO Tier II exhaust gas emissions are possible with engine-integrated solutions, IMO Tier III compliance will be achieved with exhaust gas after treatment solutions.

Regional initiatives from environmentally friendly governments are already in effect with incentives helping ship owners to invest in NOx emission reduction technology.

Cat SCR System for medium-speed engines is part of Caterpillar Marine environmental friendly strategy. The Cat SCR System is also available as a retrofit package.

When the IMO Tier III regulations go into effect in 2016, they will limit NOx exhaust gas emissions by about 75% in comparison to IMO Tier II. Outside of the NECA IMO Tier II will remain valid. IMO Tier III will be valid for newly built vessels only.

During the last years, IMO Tier III regulations have become more stringent. The upcoming global NOx Emissions Control Areas (NECA) regulations will be more stringent, too. The NECA regulations lower the permissible NOx emissions in NECA by about 75% in comparison to IMO Tier II. Details of the IMO Tier III regulations will be subject to change without further notice.

To avoid deposit buildup and ensure an optimal operation of the SCR module, the exhaust gas temperature has to be regulated to the operating conditions for each application.

To avoid excessive SO3 formation and catalyst aging, the mixing tube and SCR housing including counter flanges are easily installed into the exhaust system. The dosing cabinet controls urea injection and communicates with the engine control and monitoring system to ensure safe operation of the SCR and engine. A urea pump skid to supply urea from the main tank to the dosing cabinet is available. All pipes and harnesses need to be supplied by the customer.

Wiring harness kits are available for easy connections between system components. For further details refer to the “Cat IMO Tier III SCR A&I Guide”.

Technical data

Design

The Cat SCR System consists of the following key components necessary to support an engine arrangement for emissions compliance.

- Dosing cabinet
- Urea pump skid
- Urea storage tank
- Urea dosing system
- SCR housing
- Counter flanges
- Connecting pipe
- Counter flanges (optional)
- Desub-connection
- Urea storage tank (yard supply)
- Urea pump skid (optional)
- Urea dosing system (yard supply)
- SCR housing (yard supply)
- Counter flanges (yard supply)

The Cat SCR System is based on selective catalytic reduction technology. It uses urea as the reduction agent to transform NOx to N2 and CO2. Inside the SCR module, the NOx reacts with the exhaust gas to produce CO2 and N2. The exhaust gas stream is drawn into the diesel exhaust fluid (DEF), which is sprayed into the exhaust stream with the aid of a pump skid. The DEF is injected into the exhaust gas stream to reduce NOx emissions.

The Cat SCR System is also available as a retrofit package for engines that are not yet compliant with IMO Tier III regulations.

To avoid high gas temperatures, the exhaust gas stream is cooled down before entering the SCR module. This ensures optimal performance and reduced wear on the catalyst.

The Cat SCR System is designed to meet the requirements of the IMO Tier III regulations and is capable of reducing NOx emissions by about 75% in comparison to IMO Tier II.

The Cat SCR System can be installed on new or existing engines. The installation process is straightforward and can be completed within a few weeks. The system is also compatible with different engine manufacturers, allowing for easy integration into existing engine designs.

The Cat SCR System is a cost-effective solution for meeting the stringent NOx reduction requirements set by the IMO Tier III regulations. It can be installed on both new and existing engines, offering a flexible solution for meeting emission standards.

For further information, please contact your local Caterpillar dealer for availability.

**Please consult your local dealer for availability.**