

Emitec technologies for upcoming emission control legislation for construction equipment

**EU Stage IIIB with continuous particle filter *or* SCR from Emitec
EU Stage IV SCRi combination system with integrated particle filter**

- **Maintenance-free particle filter**
- **NO_x reduction with SCR**
- **AdBlue dosing system for construction equipment**

From 2011 construction machines will have to meet a soot particle limit (PM) of 0.025 g/kWh as specified by EU stage IIIB. This represents a reduction of at least 87% compared to stage IIIA. At the same time nitrogen oxide (NO_x) emissions will be limited to 3.3 g/kWh for engines up to 130 kWh and to 2.0 g/kWh for higher-performance engines, a reduction of 50% compared to stage IIIA.

While it is possible to meet the requirements of stage IIIA with engine-based measures alone, technology for stage IIIB will also include exhaust gas aftertreatment with catalysts and/or particulate filters. Engine-based reduction of nitrogen oxide emissions requires technologies such as exhaust gas recirculation and has a negative effect on fuel consumption. However, excellent combustion with minimum particulate emissions produces higher NO_x levels that than have to be reduced in the exhaust stream to below the permissible limit using SCR (selective catalytic reduction) systems with the reducing agent AdBlue.

Emitec Gesellschaft für Emissionstechnologie mbH, Lohmar, the specialist for exhaust aftertreatment and world leader in metal catalyst substrates, supplies optimum components and systems for both emission reduction methods.

In engines with between 56 and 130 kW of power the nitrogen oxide limit can safely be met through engine-based measures. The particulate emissions from these engines typically have to be reduced by approx. 40 – 60%. Emitec has developed the PM-METALIT, a continuously regenerating particulate filter, which has proven itself in serial production cars and trucks over many years. Thanks to its compact size it can be integrated in the silencer close to the engine. The filter has been designed to be maintenance-free for the service life of the machine. The robust all-metal construction is ideally suited for use in agricultural applications.

Press enquiries:

Emitec Gesellschaft für Emissionstechnologie mbH
Hauptstraße 128
D-53797 Lohmar
www.emitec.com

Press Office:

Rainer Schäferdiek
Tel.: +49 (0) 2246 109-311
Fax: +49 (0) 2246 109-109
Email: rainer.schaeferdiek@emitec.com

For engines > 130 kW the SCR system represents a practical solution to optimum fuel consumption and compliance with the lower permissible NO_x emissions specified by stage IIIB. Highly effective Emitec metal substrate catalysts are available in a number of different geometries, allowing them to be installed inside the engine bay for unrestricted driver visibility and machine working range.

Emitec developed a complete AdBlue dosing system for SCR consisting of an AdBlue tank, a delivery pump, a control valve, an injection unit and an electronic control system with associated sensors and pipes. The system can operate autonomously, that is, independently from the engine management system. This makes the dosing system well suited for serial and retrofit applications.

In 2014 the emission control requirements for engines > 56 kW will be tightened further with EU Stage IV, the permitted NO_x emission will be 90% lower and must not exceed 0.4 g/kWh. To meet this requirement combination aftertreatment systems consisting of a diesel particulate filter and a SCR catalyst are currently being developed. Emitec is presenting such systems, integrated in modern machinery, at its stand at bauma 2010. A continuously operating, maintenance-free PM-METALIT particulate filter is integrated in the SCRi[®] system. The filter not only reduces particulates but also uniformly blends the exhaust gas with the AdBlue and generates ammonia by completely evaporating the injected solution. The prepared exhaust gas ensures the optimum operation of the SCR catalyst. The use of highly efficient, structured Emitec metal catalysts results in a compact design, allowing the system to be installed in the engine compartment of construction machines. The SCRi[®] system is well suited for future serial applications in new machines and equipment and for retrofit applications.

Engine Power	2007	2008	2009	2010	2011	2012	2013	2014	2015	2016
P < 19 kW	No limits									
19 ≤ P < 37	US: NO _x + HC = 2.5 / PM = 0.4 EU: NO _x + HC = 7.5 / PM = 0.3									
37 ≤ P < 66	NO _x = 7.0 / PM = 0.4		US: NO _x = 4.7 / PM = 0.3 EU: NO _x = 4.7 / PM = 0.4				US: NO _x 4.7 PM 0.02 EU: NO _x 4.7 PM 0.025			
66 ≤ P < 76			US: NO _x = 4.7 / PM = 0.3 EU: NO _x = 4.7 / PM = 0.4				US: NO _x 4.7 PM 0.02 EU: NO _x 4.7 PM 0.025		NO _x 0.4 PM 0.02 NO _x 0.4 PM 0.025	
76 ≤ P < 130	US: NO _x = 4.0 / PM = 0.3 EU: NO _x = 4.0 / PM = 0.3						NO _x 3.4 PM 0.02 NO _x 3.3 PM 0.025		NO _x 0.4 PM 0.02 NO _x 0.4 PM 0.025	
130 ≤ P < 660	US: NO _x + HC = 4.0 / PM = 0.2 EU: NO _x + HC = 4.0 / PM = 0.3						US: NO _x 2.0 PM 0.02 EU: NO _x 2.0 PM 0.025		NO _x 0.4 PM 0.02 NO _x 0.4 PM 0.025	

ULSD (<15ppm) →

 EU Stage III B/ Tier 4 Interim

 EU Stage IV/ Tier 4

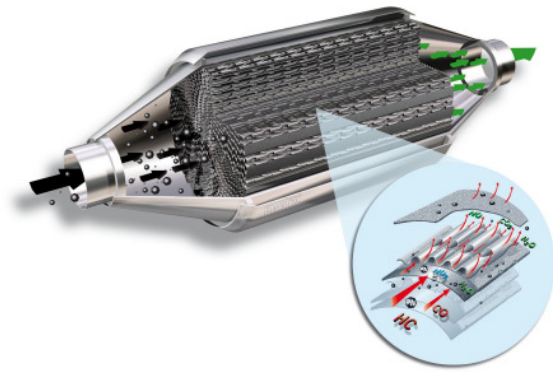
Emissions Legislation for NRMM

Press enquiries:

Emitec Gesellschaft für Emissionstechnologie mbH
Hauptstraße 128
D-53797 Lohmar
www.emitec.com

Press Office:

Rainer Schäferdiek
Tel.: +49 (0) 2246 109-311
Fax: +49 (0) 2246 109-109
Email: rainer.schaeferdiek@emitec.com



PM-METALIT Diesel Particulate Filter



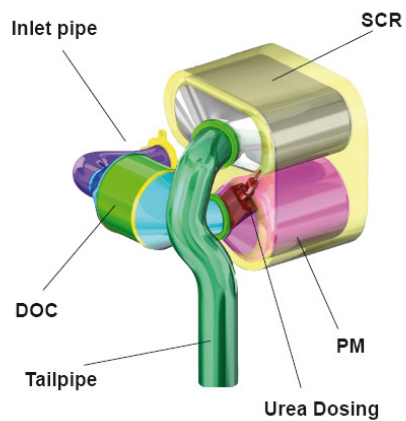
AdBlue Dosing Module

Press enquiries:

Emitec Gesellschaft für Emissionstechnologie mbH
Hauptstraße 128
D-53797 Lohmar
www.emitec.com

Press Office:

Rainer Schäferdiek
Tel.: +49 (0) 2246 109-311
Fax: +49 (0) 2246 109-109
Email: rainer.schaeferdiek@emitec.com



SCRi-System



Press enquiries:

Emitec Gesellschaft für Emissionstechnologie mbH
Hauptstraße 128
D-53797 Lohmar
www.emitec.com

Press Office:

Rainer Schäferdiek
Tel.: +49 (0) 2246 109-311
Fax: +49 (0) 2246 109-109
Email: rainer.schaeferdiek@emitec.com