

Proventia DEF Mixing Unit eliminates urea deposits

Stage 3B/Tier 4 interim limits mean that the NO_x amount in the exhaust gas of engines over 130 kW must be under 2 g/kWh and the PM amount may not exceed 0.025/0.02 g/kWh. In practice these limits cannot be reached without exhaust gas after treatment systems. Proventia, the Finnish emission control company, has chosen its own role in meeting the Stage 3 B/Tier 4 interim requirements by providing its SCR knowledge and integrating expertise to engine manufacturers and OEMs.



Stage III B/ Tier 4i SCR system for Valtra T-series tractors

ARE UREA DEPOSITS IN EXHAUST PIPES A PROBLEM?

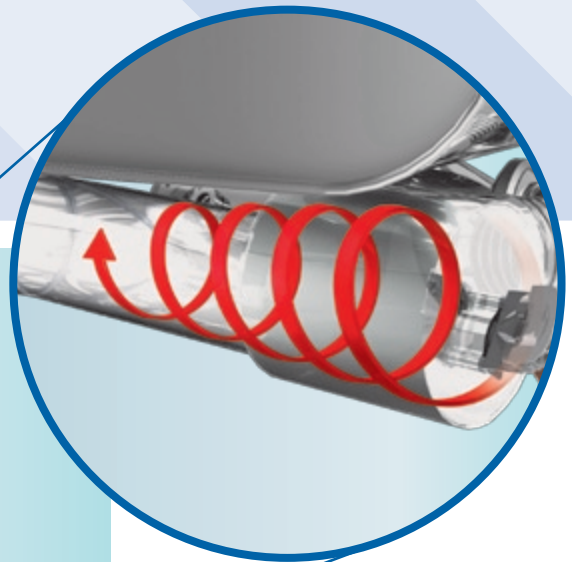
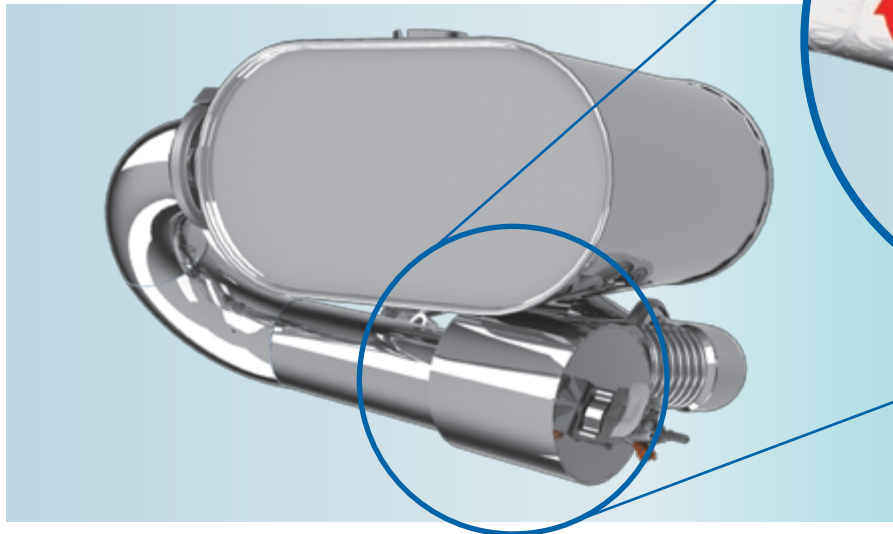
It is a known fact that when an SCR process uses DEF (diesel exhaust fluid), it can cause urea deposit issues in exhaust pipes, especially in non-road applications using airless DEF injectors. With airless urea dozers DEF spray droplets are larger in diameter, which might lead to wall wetting and film formation on exhaust pipe inner surfaces, causing deposits when the local temperatures are very low. Urea deposit problems have become frequent and critical, considering that Stage 3B/Tier 4i regulations require cold and hot NRTC cycles.

THE SOLUTION: PROVENTIA DEF MIXING UNIT

Solving urea deposit problems for machine manufacturers requires the expertise of an emission control specialist. Proventia has developed a Proventia DEF Mixing Unit (patent pending), to avoid wall wetting and to evenly distribute NH₃ in the shortest possible pipe length. Proventia has done a great deal of deposit research; we have developed a test cycle that simulates the real life conditions in the worst case. In just a few hours it is possible to determine where deposit formation will take place and then make corrective actions in design.



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Proventia DEF Mixing Unit keeps the pipelines of your SCR system clean by delivering even NH_3 distribution within the exhaust gas

Keeping pipelines clean

Proventia has extensively tested its DEF mixing technology in worst case conditions with no sign of wall wetting or urea deposit. Proventia DEF Mixing Unit delivers even NH_3 distribution ($\gamma \rightarrow 0.95$) and improves the overall performance of the SCR. The same technology is also suitable for Tier 4 final exhaust systems, where the NO_x reduction target is $\rightarrow 95\%$. Proventia DEF Mixing Unit helps water evaporation from DEF and ensures optimal reactions with Ammonia with no unwanted side effects.

Proventia DEF Mixing Unit is suitable to be used with all urea dozers to achieve even NH_3 distribution within the exhaust gas. The greatest benefit is experienced with airless injectors, which have rather large SMD (Sauter mean Diameter) and when the injection must start at low temperatures.

SMART TAILORING CONCEPT FOR OEMS

Proventia's role is to design, engineer, test and supply exhaust system solutions for the various machine manufacturer applications based on the engine manufacturer's concept and certified components and specifications. The fact is that standard, certified SCR components will function properly with only a few end-use applications. Most applications require tailoring of the complete system in order to function properly with the machines. Various operating conditions may cause unexpected emission problems resulting in the need for an emission control specialist.

The Proventia DEF Mixing Unit is not only a simple device that solves the urea deposit problem; our engineers have developed a flexible concept and agile product development practices for the benefit of our customers. This means that the Proventia DEF Mixing Unit can be quickly tailored to various applications, engine sizes and operating environments.



CASE: EXPERIENCED SYSTEM INTEGRATOR

AGCO Sisu Power has chosen Proventia as their approved vendor with regard to Stage 3B and Tier 4 interim solutions in machines and vehicles using AGCO Sisu Power diesel engines.

Proventia has also developed and supplied exhaust systems for mining machine manufacturers for a good decade with success.

Proventia – the emission control specialist from A to Z

DESIGN SERVICES

Our in-house engineering department designs complete emission control systems to seamlessly fulfill the engine and the application requirements.

TESTING SERVICES

Extensive field and laboratory testing is an important part of our product development. Testing ensures the quality, durability and reliable performance of the products.

CLOSE TO CLIENT MANUFACTURING

Proventia's flexible manufacturing concept ensures efficient and low-cost manufacturing and supply of the complete system, components and spare parts for every customer.