

Here we spotlight the AGCO SISU POWER engine factory in Finland and the R&D team's work on emission technology

CLEAN POWER, CLEAN ENVIRONMENT

Engines for the majority of Massey Ferguson tractors are manufactured at the AGCO SISU POWER plant at Nokia in southwest Finland. It was here that engineers developed the cutting-edge e3 Selective Catalytic Reduction (SCR) engine technology now featuring on some of the latest MF tractors and combines.

The Nokia factory is a leader in emission technology and makes multi-million dollar investments in research and development every year.

The current e3 SCR engines meet Stage 3A emission limits and, with minimal modifications, will meet the next Stage 3B emission regulations scheduled for 2011 for tractors over 176hp. AGCO SISU POWER is committed to the use of e3 SCR technology in order to achieve Stage 4 emission levels which come into force in 2014. These demand a 97% reduction in both Nitrous Oxides (NOx) and Particulate Matter (PM) compared to non-regulated engines.

"Working in close collaboration with Bosch, one of the most trusted names in the development and manufacture of fuel injection systems, we were the first in the world to choose the SCR route for tractor applications," says Mauno Ylivakeri, Director



One of the latest developments from AGCO SISU POWER is a 7-cylinder engine.

Engineering, AGCO SISU POWER. "It provides the best benefits in terms of lowest fuel consumption and increased overall efficiency."

The SCR system injects a metered amount of AdBlue® (an aqueous urea solution) into the downstream exhaust. AdBlue® works with the exhaust heat to form a chemical reaction that converts the nitrogen oxides into harmless nitrogen gas and water vapour. The AdBlue® is carried in a separate tank and consumed at a rate of around 2-3% AdBlue®/diesel in present Stage 3A technology.

"One of the greatest benefits of SCR is that it allows our engineers to concentrate on optimising combustion and efficiency in the cylinder with the minimum amount of particulates - without having to worry about the gas emissions since the exhaust is cleaned after it leaves the engine," adds Mauno. "As a result, the engines perform better, run quieter, stay cooler, last longer and there is no need for complex diesel particulate filters." Tests have shown over 10% fuel savings when using the e3 SCR engine

Employing some 700 people, the AGCO SISU POWER factory is a state-of-

the-art manufacturing facility and produces some 30,000 units a year. Following major investment, the entire production process has been completely updated in recent years.

The total site extends to 10 hectares including a covered floor area for the production halls of some 3 hectares. Advanced flexible production technology has been designed to manufacture all strategic components in-house. Around one hundred industrial robots with integrated functions together with a highly-skilled workforce are focused on high quality output and optimum productivity.

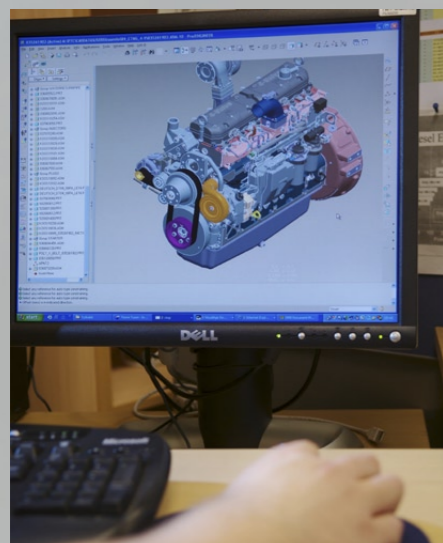
The core engine is assembled on a fully-automated line by robots and further customised and dressed by trained technicians to meet a variety of application requirements. Engines are conveyed via AGVs (automated guided vehicles) from the assembly line to the test area.

In addition to focusing on the development and production of environmentally-friendly engines with excellent fuel economy, the company is also committed to environment-friendly production processes. The environmental management system meets ISO 14001 standards and administrative

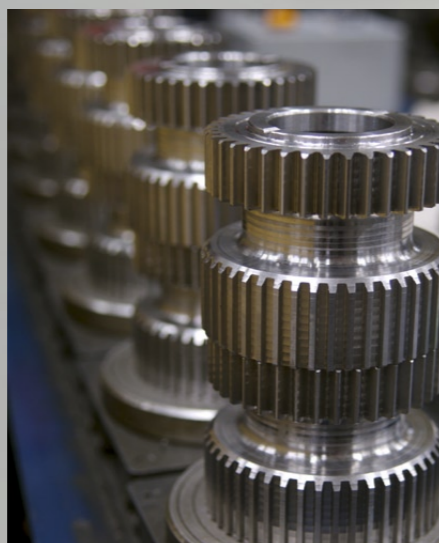
functions are managed according to ISO 9001. Both are certified and regularly audited by Det Norske Veritas (DNV) – the global independent foundation for risk management.

While diesel fuel will be the standard for the foreseeable future, alternative fuels are also a priority for the factory's design team.

"We have already approved the first generation of biodiesel in all our non-SCR technology engines, while the second generation of this energy source (made from biomass) has been approved for the latest SCR engines," says Mauno. "We are also working on dual fuelled engines – a mixture of diesel and ethanol – for which the main customers will be sugar cane farms. This dual fuel principle also offers some possibility to use gaseous fuels for tractor applications in the future."



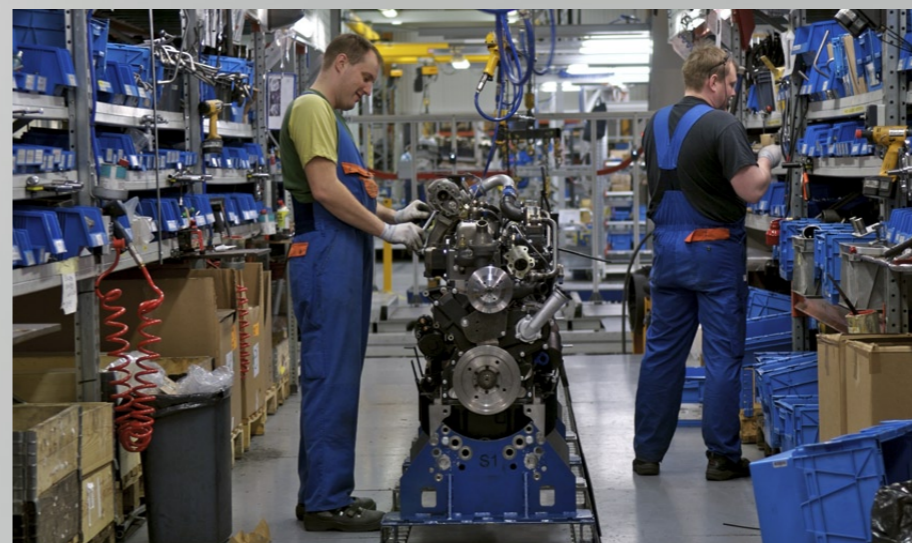
In the design office – on-screen 3D model of an engine.



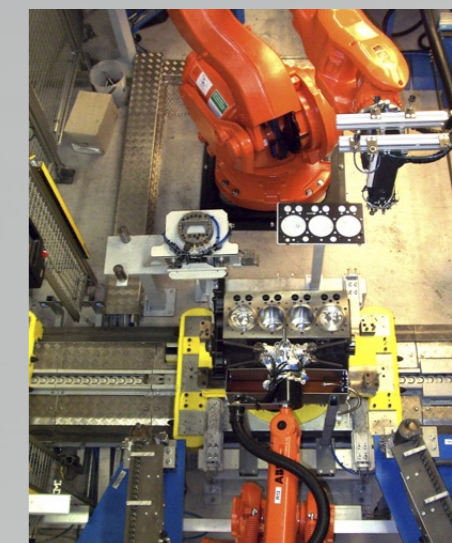
Precision-machined gears.



Technician fitting valve covers.



Technician completing turbocharger assembly.



Head gasket and cylinder head assembly.