



Mercedes-Benz



Media Release

SECOND GENERATION BIOFUEL FROM CLARIANT AND HALTERMANN

Mercedes-Benz puts renewable fuel on the road

- **sunliquid®20 with 20 % ethanol from straw: high-quality fuel for optimal driving performance**
- **Straw-based cellulosic ethanol guarantees significant reductions in CO₂ emissions without competing with food production**

Muttenz, January 29, 2014 – A fuel of the future is being introduced to the streets in a fleet test launched by the joined forces of Clariant, Haltermann, and Mercedes-Benz. The Clariant sunliquid® process converts wheat straw into cellulosic ethanol. The company Haltermann then mixes the cellulosic ethanol with conventional fuel components to form the new fuel. The production of cellulosic ethanol is virtually CO₂-neutral, saving almost 100 % of CO₂ emissions when compared to gasoline. sunliquid®20 is 20 % cellulosic ethanol, i.e. the well-to-wheel comparison shows reductions in greenhouse gas emissions of around 20 percent with consistent engine power. There is no competition with food production or for agricultural acreage. A high octane number (RON) of over 100 guarantees optimal efficiency.

“Cellulosic ethanol is a genuinely sustainable and advanced biofuel of the latest generation. It is produced in Germany from agricultural residues. The fleet test will demonstrate that the fuel is ready for market and technically compatible with in series vehicles at a blending rate of 20 % with super gasoline. This shows that second generation biofuels based on agricultural residues are now technologically ready and available, not only in production but in application as well,” says Professor Andre Koltermann, Head of Group Biotechnology at Clariant. “We are excited to be able to realize this pioneering project with two such distinguished partners. It confirms that our sunliquid® process is the right way to go. The technology can now be implemented across the board - for which we need the right conditions.”

“Our main task is to shape solutions for sustainable mobility of the future. We see great potential in second generation biofuels with regards to sustainability and reduction of greenhouse gases. Petrol with 20 % ethanol can already be used easily in our latest Mercedes-Benz BlueDIRECT petrol engines. This offers ideal potential for best efficiency and high greenhouse gas savings,” explains Peter Lueckert, Director for Engine, Powertrain, and Fuel Injection at Daimler AG.

“This is yet more evidence that Germany is a technology pioneer in research and development for sustainable special fuels. As a specialties company and research partner of the industry we are delighted to be able to produce a fuel with such excellent specifications and environmental characteristics that is, as tests show, compatible with existing engines and infrastructure,” emphasizes Dr. Uwe Nickel, CEO of H·C·S Group (Haltermann Carless Solutions).



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Over the next twelve months, test fleet vehicles can be refilled with the new fuel at a specially equipped gas station on the Mercedes-Benz site in Stuttgart-Untertürkheim. The cellulosic ethanol comes from Clariant's sunliquid® demonstration plant in Straubing, where approximately 4 500 tons of agricultural residues such as grain or corn straw are converted into cellulosic ethanol each year. At the Haltermann plant in Hamburg the bioethanol is mixed with selected components to form the innovative fuel, the specifications of which reflect potential European E20 fuel quality.



Mercedes-Benz fleet at Clariant's sunliquid® demonstration plant for production of cellulosic ethanol from agricultural residues. (Photos: Clariant/Rötzer.)

SUNLIQUID® IS A REGISTERED TRADEMARK OF CLARIANT.

About Clariant

Clariant is a globally leading specialty chemicals company, based in Muttenz near Basel/Switzerland. On December 31, 2012 the company employed a total workforce of 21,202. In the financial year 2012, Clariant recorded sales of CHF 6.038 billion for its continuing businesses. The company reports in four business areas: Care Chemicals, Catalysis & Energy, Natural Resources, and Plastics & Coatings. Clariant's corporate strategy is based on four pillars: managing businesses for profitability, research & development and innovation, growth in emerging markets, and repositioning of the portfolio.

www.clariant.com

sunliquid® is an innovative biotechnological method for manufacturing cellulose from agricultural residues such as cereal straw and corn stover or sugarcane bagasse. During the fully integrated process, highly optimized, feedstock-specific biocatalysts split cellulose and hemicellulose into fermentable sugars with high yields under stable process conditions. The process-integrated production of biocatalysts offers flexibility and reduces production costs. In the next step, an optimized fermentation organism allows both C5 and C6 sugars to be converted into ethanol, thus increasing the ethanol yield by around 50 percent. An innovative purification process developed by Clariant is instrumental in enabling all the energy required for the process to be derived from the insoluble residue lignin. The resulting cellulosic ethanol saves around 95 percent of CO2 emissions when compared to fossil gasoline. Since July 2012, Clariant has been operating a demonstration plant in Straubing, which produces up to 1,000 metric tons of cellulosic ethanol from around 4,500 metric tons of raw material every year. The total volume of the project in Straubing amounts to around EUR 28 million, comprising investment of around EUR 16 million and concomitant research of nearly EUR 12 million. The Bavarian government and the German Federal Ministry of Education and Research (BMBF) each contributed around EUR 5 million to this and other related research projects.

www.sunliquid.com



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About Daimler

Daimler AG is one of the world's most successful automotive companies. With its divisions Mercedes-Benz Cars, Daimler Trucks, Mercedes-Benz Vans, Daimler Buses and Daimler Financial Services, the Daimler Group is one of the biggest producers of premium cars and the world's biggest manufacturer of commercial vehicles with a global reach. Daimler Financial Services provides financing, leasing, fleet management, insurances, and innovative mobility services.

The company's founders, Gottlieb Daimler and Carl Benz, made history with the invention of the automobile in the year 1886. As a pioneer of automotive engineering, Daimler continues to shape the future of mobility today: The Group's focus is on innovative and green technologies as well as on safe and superior automobiles that appeal to and fascinate its customers. For many years now, Daimler has been investing continually in the development of alternative drive systems with the goal of making emission-free driving possible in the long term. In addition to vehicles with hybrid drive, Daimler now has the broadest range of locally emission-free electric vehicles powered by batteries and fuel cells. This is just one example of how Daimler willingly accepts the challenge of meeting its responsibility towards society and the environment. Daimler sells its vehicles and services in nearly all the countries of the world and has production facilities on five continents. Its current brand portfolio includes, in addition to the world's most valuable premium automotive brand, Mercedes-Benz, the brands smart, Freightliner, Western Star, BharatBenz, Fuso, Setra and Thomas Built Buses. The company is listed on the stock exchanges of Frankfurt and Stuttgart (stock exchange symbol DAI). In 2012, the Group sold 2.2 million vehicles and employed a workforce of 275,000 people; revenue totaled € 114.3 billion and EBIT amounted to € 8.6 billion.

www.daimler.com

About Haltermann

The company was founded as Johann Haltermann Mineralöl AG more than 100 years ago in Hamburg. Today Haltermann is one of the leading suppliers of high purity refinery chemicals used in the automotive, pharmaceutical and cosmetics industries, the printing, laboratory chemical and electronics industries, and in plastics processing. Haltermann is an established brand in testing and specialty fuels for the automotive industry, for hydrocarbons used in pharmaceuticals and electronics, and for high purity pentanes, which are used as blowing agents in the production of polyurethane foams. The company is a prize-winning specialist in the production and testing of new fuels. In this segment it is an independent market leader in Europe.

www.haltermann.com

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