

MBE2—a global revolution in ethanol production by MAHLE

Jundiaí, February 15, 2018 – A new product launched by MAHLE has the potential to revolutionize the ethanol industry at a global level. MBE2 (MAHLE Bioethanol 2) is a solution that increases the production of ethanol by a minimum of 10% without the need to increase the area of planted sugarcane.

The latest in fuels

The use of biofuels in internal combustion engines is an important alternative to significantly reduce CO₂ emissions—one of the gases responsible for the greenhouse effect. Ethanol is thus used in countries all over the world as a strategic fuel. In Brazil and the U.S., for example, a large fleet of vehicles is powered by ethanol at concentrations of 100% and 85%, respectively. In addition, countries are increasingly using a blend of ethanol and gasoline in proportions that vary between 10% and 30% to increase the fuel's octane rating.

This is a definitive trend as a higher octane rating of the blend enables the ethanol to perfectly meet the challenges of new, more energy-efficient and explosion-proof combustion engines that require high-octane fuels.

As a measure of the global market potential of this renewable, sustainable, and environmentally friendly fuel in the next few years, China—with its massive consumption capacity—announced that it will begin using a gasoline mixture that contains 10% ethanol across the entire country. Along the same lines, the U.S. is evaluating an increase in its current blend of 10% ethanol to between 25 and 30%.

The use of ethanol is a quick alternative to address full-cycle CO₂ emissions because it uses existing infrastructure. In combination with vehicle electrification and other advanced propulsion technologies, such as fuel cells, it will assist in reducing future greenhouse gas emissions responsible for global warming.

Until electrical energy is largely produced from renewable sources and electric vehicles are manufactured exclusively ethanol will continue to play a vital role. Thus, for Brazil, one important path forward is the efficient use of ethanol, even in hybrid vehicles.

The development of MBE2

MBE2 was developed at the MAHLE Tech Center in Jundiai, São Paulo (one of the 16 R&D centers of the MAHLE Group in the world), based on the concepts of a third-party patent and together with their collaboration. MAHLE also gained access to the rights to explore the ethanol-production technology on a global scale. The intensive four-year development began in a dedicated laboratory created by MAHLE, and included a two-year pilot project followed by a period of industrial-sized operations carried out in an ethanol power plant in the region of Sertãozinho, São Paulo.

Fermentation—the process that must be perfected in the plants

As everyone knows, both first-generation ethanol produced using different cultures—notably sugarcane—and second-generation ethanol produced from biomass are derived from fermentation using yeast. To innovate the fermentation process, which is the bottleneck in ethanol plants, MBE2 consists of a system inside the fermenters that uses equipment to control the process as well as proprietary software. The system stimulates biochemical reactions, which results in a larger production of ethanol at a low operational cost.

Numbers speak for themselves

MBE2 is a much cheaper alternative to increase production both in terms of the investment and operational cost. It contributes to the plant's results and to sustainability because it does not require an increase in the planted area and significantly reduces greenhouse gases.

The market and the future

This technology can be applied to any raw material and the production of any sugarcane- or biomass-based biofuel, such as that from corn, which is largely used in the U.S. The increase in revenue is yet to be determined. The potential in the Brazilian and global markets depends on economic and political situations.

For more information, please contact the Investor Relations department of MAHLE Metal Leve via e-mail at relacoes.investidores@br.mahle.com.

About MAHLE

MAHLE is a leading international development partner and supplier to the automotive industry as well as a pioneer for the mobility of the future. The MAHLE Group is committed to making transportation more efficient, more environmentally friendly, and more comfortable by continuously optimizing the combustion engine, driving forward the use of alternative fuels, and laying the foundation for the worldwide introduction of e-mobility. The group's product portfolio addresses all the crucial issues relating to the powertrain and air conditioning technology—both for drives with combustion engines and for e-mobility. MAHLE products are fitted in at least every second vehicle worldwide. Components and systems from MAHLE are also used off the road—in stationary applications, for mobile machinery, rail transport, as well as marine applications.

In 2016, the group generated sales of approximately EUR 12.3 billion with about 77,000 employees and is represented in 34 countries with 170 production locations. At 16 major development centers in Germany, Great Britain, Luxembourg, Spain, Slovenia, the USA, Brazil, Japan, China, and India, 6,000 development engineers and technicians are working on innovative solutions for the mobility of the future.