

MAHLE makes fuel cells mobile

- MAHLE bundles fuel cell expertise in agile structure
- Fuel cell project house acts as a central contact point across all systems related to fuel cells

Stuttgart/Germany, August 08, 2019 – The companies that are defining the mobility of the future must respond quickly to changing conditions. This is the only way to bring new technologies to economic viability and series production readiness. MAHLE is facing this challenge by creating agile internal structures and bundling the expertise of various development fields in one fuel cell project house. This is a place where all fuel cell topics come together.

The importance of an overall system perspective for the safety and competitiveness of fuel cell vehicles can be illustrated by simulating the dynamics of fuel cells in interplay with battery size or by the reciprocal development of ion exchangers and heat exchangers. The air pathway, also known as the cathode air system, is one of the central systems in the periphery of the fuel cell. The relationships and interactions are complex and can only be predicted through elaborate simulations.

The team at the fuel cell project house analyzes the results and defines the design of the peripheral components, which leads to a cost-optimized vehicle. MAHLE is transferring expertise from a wide variety of research and development areas of conventional mobility to the fuel cell project house, enabling thermal, air, and liquid management and filtration to work together purposefully.

Another example of close interaction among various development centers is the joint development of heat exchangers and ion exchangers. This is where our technical expertise in the areas of thermal management and filtration comes together. The

coolant used to cool fuel cell stacks must be deionized so that it loses its electrical conductivity. If it were conductive, then not only could explosive gas form, but undesired and dangerous currents could be discharged. The deionized cooling medium flows through the bipolar plates of the fuel cell to cool it. The deionized cooling medium is highly reactive, however, and corrodes components that come into contact with it, so this must be avoided. For this reason, MAHLE passivates the heat exchanger and makes it resistant to leaching ions. This produces a durable cooling system and reduces the load on the ion exchanger, ensuring high-voltage safety under all conditions.

The exhaust air pathway in the fuel cell vehicle also requires extensive expertise. An intelligent system for water disposal ensures that water disposal occurs only at high speeds. This prevents water from freezing in awkward locations, such as in parking garages or inner cities. The water that is discharged at high speeds is atomized. This functional integration is typical of the development of engine components as an overall system at MAHLE, combining expertise from the areas of engine peripherals, flow simulation, and filtration.

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 2018, the group generated sales of approximately EUR 12.6 billion with more than 79,000 employees and is represented in more than 30 countries with 160 production locations. At 16 major research and development centers in Germany, Great Britain, Luxembourg, Spain, Slovenia, the USA, Brazil, Japan, China, and India, more than 6,100 development engineers and technicians are working on innovative solutions for the mobility of the future.

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