

Press release

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Fast, inexpensive, flexible—MAHLE introduces new modular filter concept for the fuel cell

- New standardized air filters reduce development times and costs of fuel cell applications
- Fuel cells reliably protected against harmful gases and particles, resulting in minimal use of expensive catalysts
- New approach brings suitability of fuel cell technology for the mass market a significant step closer
- Hydrogen and fuel cells are important elements of MAHLE’s development work toward CO₂-neutral mobility

MAHLE has developed two standardized air filter solutions for fuel cells. Thanks to this new modular approach, MAHLE is able to significantly reduce development times and costs, with developers now having direct access to a fully developed “off-the-shelf” component instead of having to design individual solutions for each vehicle. The new MAHLE air filters for cells with an output of 25–50 kW or 80–120 kW reliably protect fuel cells from harmful gases and particles, ensuring the operation of the fuel cell over the entire service life of a vehicle and minimizing the use of expensive catalysts. With this new approach, MAHLE is bringing the suitability of fuel cell technology for the mass market a significant step closer. Hydrogen and therefore fuel cells themselves are important elements of MAHLE’s development work toward CO₂-neutral mobility.



Standardized and reliable: The new MAHLE fuel cell filters lower development times and costs in fuel cell application development.

“MAHLE has extensive expertise in air filtration, which we’re now benefiting from in the development and production of reliable filter solutions for fuel cell vehicles,” explains Dr. Martin Berger, head of Corporate Research and Advanced Engineering at MAHLE. “By making the design of the air tract simpler, faster, and cheaper with our new standardized approach, we’re bringing the suitability of this future technology for the mass market a significant step closer.”

Protection for highly sensitive cells minimizes manufacturing costs

Fuel cells contain platinum as a catalyst. It is used to convert hydrogen and oxygen into water, with the energy generated in the reaction being released in the form of electrical energy. The fewer harmful gases entering the cell, the less platinum is needed to ensure that it remains operational over the service life of the vehicle. Platinum is rare and expensive, so using efficient filters to increase the degree of purity of the supply air means lower manufacturing costs.

In order to reliably protect fuel cells and thus make them attractive to the consumer from a price perspective, MAHLE relies on a highly effective filter medium consisting of several layers: a substrate material ensures mechanical stability, while a particulate filter layer blocks 99.9 percent of unwanted particles. A molecular layer prevents ammonia from entering the fuel cell, an activated carbon layer absorbs unwanted hydrocarbons, and an additional, specially impregnated activated carbon layer stops sulfur dioxide, hydrogen sulfide, and nitrogen oxides from reaching the cell.

Modular approach for fuel cells components

MAHLE uses its holistic systems competence in thermal and air management, power electronics, and filtration to support the development of vehicles with fuel cell drives that are suitable for large-scale production. The focus here is on lower systems costs coupled with higher operational safety. MAHLE is developing a fuel cell systems portfolio featuring a modular approach based on its current range of components. The group is thereby helping to reduce technological barriers and improve the suitability of vehicles with fuel cell drives for the mass market.

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About MAHLE

MAHLE is a leading international development partner and supplier to the automotive industry. The technology group is committed to playing an active role in transforming the mobility of the future by further optimizing the combustion engine, driving forward the use of alternative fuels, and laying the foundation for the worldwide introduction of e-mobility and other alternative drives, such as fuel cells. The group's product portfolio addresses all the crucial aspects of the powertrain and air conditioning technology.

In 2019, MAHLE generated sales of approximately EUR 12.0 billion and is represented in over 30 countries with more than 77,000 employees in 160 production locations and 16 major research and development centers.