

# Press release

---

Stuttgart, August 13, 2024

## Modeled on nature: New MAHLE fan for e-vehicles

- New component for fuel cell and electric vehicles halves fan noise on average
- Bionic fan is based upon an AI-optimized design found in nature: the wings of an owl, one of the quietest birds
- 10 percent higher efficiency and 10 percent less weight than conventional fans
- Scalable power range enables usage in passenger cars through to commercial vehicles
- MAHLE makes electrification more attractive and efficient
- Fan will be a world first at the IAA Transportation 2024 in Hanover
- MAHLE to present further innovations under the motto “Technological diversity”

**MAHLE is presenting a world first at the IAA Transportation 2024 in Hanover: a bionic high-performance fan which makes commercial vehicles significantly quieter. The fan was developed for particularly demanding fuel cell and battery electric vehicles. When optimizing its ventilation blades with the use of AI, the MAHLE engineers took inspiration from the wings of an owl: One of the quietest birds in the world, the owl’s plumage has a noise-reducing effect. The bionic fan blades can reduce the fan noise of a truck by up to 4 dB(A) – this is equal to more than halving the sound output. This significant reduction solves another challenge for e-mobility: loud fan noise, which can be disturbing both at full load as well as when charging the vehicle at night, whether in residential areas or during resting times at service stations. The fan is also significantly more efficient than conventional designs, thanks to 10 percent better performance and a 10 percent lighter design. MAHLE also enables the use of its new bionic fan in passenger cars. The company is presenting the product to the public for the first time at the IAA Transportation. The commercial vehicle trade fair is set to take place in Hanover (Germany) from September 17–22, 2024.**

“We learn from nature: It inspires us in many areas! We have already seen success with our bionic battery cooling plate, a technology which helped us significantly while optimizing our fan,” said Dr. Uli Christian Blessing, Head of Development Thermal Management at MAHLE. “With the help of AI, we analyzed the characteristic features of bats, swordfish, and many other inspirations from

nature. We finally ended up with the owl, the silent hunter, as the main template for our new fan.”

The design of the fan blades was modeled on owl wings and feathers. This minimizes noise turbulence and makes the fan much more quiet and efficient. “One can imagine the sound reduction power of our fan to be like that of turning off one of the speakers on a stereo system,” Blessing said.

It is particularly in noise-sensitive areas that the new bionic high-performance fan shows its strength. During fast charging of vehicles, for example, reduced noise levels increase comfort for drivers and area residents alike. MAHLE offers the fan in a broad power range from 300 watts to 35 kW. This enables its use in small electric passenger cars all the way through to large, particularly temperature-sensitive fuel cell trucks. The first prototypes are already being trialed by various passenger car and commercial vehicle manufacturers.

“With this new product, MAHLE continues to pave the way for the electrification of mobility – and contributes to make it more attractive for customers,” said Blessing.

To save even more weight, MAHLE also developed the fan cover and carrier in accordance with bionic principles. As a result, both components are more than 10 percent lighter, and have increased structural integrity.

Electrification and thermal management, i.e., heating and cooling, are closely interwoven. Efficient electrification is not possible without efficient thermal management. MAHLE is one of the few global suppliers active in both fields, where it leverages its excellent expertise to develop technical solutions for all drives.

## **MAHLE at the IAA Transportation 2024**

Visitors to the IAA Transportation in Hanover this September can get a closer look at the fan. It is part of an exhibit ensemble representing the systemic MAHLE approach to a fuel cell truck. Together with a fully functional fuel cell, it consists of fuel cell peripherals, thermal management (fan and battery cooling) and a heavy-duty electric axle. The e-axle is a demonstrator within which MAHLE has compactly integrated two of its SCT electric motors (for a total output of 520 kW) as well as a complete liquid management system. All these products have been developed, tested, and are ready for serial production. With this exhibit, the technology firm is demonstrating both its systems expertise as well as the readiness of its innovations for volume production.

In another premiere, MAHLE is showcasing its new evaporative cooling system for fuel cell vehicles. This system generates up to 50 kW higher cooling capacity in the same amount of space. This makes it possible to decrease fan usage –

and thereby reduce hydrogen consumption by up to 1.5 percent. For hydrogen engines, MAHLE has developed a Power Cell Unit (H<sub>2</sub>-PCU) to ensure the robust and problem-free operation of this climate-neutral drive.

This year, the theme of the MAHLE presence in Hall 12 of the Hanover Exhibition Center is technological diversity.

**Note:** The press release and images are available in the MAHLE newsroom:

<https://newsroom.mahle.com/press/de/>.

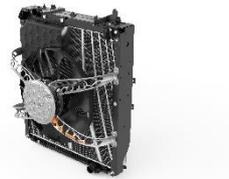
Image copyright: MAHLE



Inspired by owls: At the IAA Transportation, MAHLE is introducing its new bionic fan for highly-demanding fuel cell and battery-electric vehicles.



The design of the fan blades was modeled on owl wings and feathers.



MAHLE also developed the fan cover and carrier according to bionic principles, saving weight and increasing structural integrity in the process.



Dr. Uli Blessing, Head of Development Thermal Management at MAHLE

**Contact persons for MAHLE communications:**

Kerstin Cynthia Lau

Head of Media Relations

Phone: +49 711 501-13185

E-mail: [kerstin.cynthia.lau@mahle.com](mailto:kerstin.cynthia.lau@mahle.com)

Manuela Hoehne

Director Communications and Public Relations

Phone: +49 711 501-12506

E-Mail: [manuela.hoehne@mahle.com](mailto:manuela.hoehne@mahle.com)

---

**About MAHLE**

MAHLE is a leading international development partner and supplier to the automotive industry with customers in both passenger car and commercial vehicle sectors. Founded in 1920, the technology group is working on the climate-neutral mobility of tomorrow, with a focus on the strategic areas of electrification and thermal management as well as further technologies to reduce carbon emissions, such as fuel cells or highly efficient, clean combustion engines that also run on renewable fuels, such as hydrogen. Today, one in every two vehicles globally is equipped with MAHLE components.

MAHLE generated sales of almost EUR 13 billion in 2023. Employing more than 72,000 people at 148 production locations and 11 technology centers, the company is represented in 29 countries. (Last revised: December 31, 2023)

#weshapefuturemobility

