PRESS RELEASE

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Ricardo completes the development of novel, rare earth and copper free, electric propulsion motor

Ricardo has designed, tested and delivered a motor prototype that eliminates the need for rare earth elements and cooper required in typical electric motors

Ricardo, a global strategic, environmental and engineering consulting company, has designed, developed and tested a prototype electric propulsion module, Alumotor, an innovative rare earth metal free synchronous reluctance motor.

Alumotor was delivered within the Innovate UK's funded consortium led by Ricardo, to support sustainable mobility. It addresses issues related to the environmental impact of materials for electric motors.

Alumotor offers a low cost, robust, sustainable alternative to conventional copper wound permanent magnet machines. This synchronous reluctance motor is free from rare earth metals and critical raw materials, such as cobalt. It uses aluminium hairpin windings, and the machine is oil cooled to generate a power output of 214kW and maximum efficiency greater than 92%, making it suitable for light commercial vehicles and off-highway applications with full scalability to suit other applications.

Dr Dragica Kostic-Perovic, Ricardo Chief Engineer responsible for the Alumotor project, said: "We are excited to be at the forefront of testing aluminium hairpin windings, and are achieving strong performance data that will support future go-to-market activities. This is a significant development, showing true innovation, and supports our reputation as experts in the design and development of future sustainable technologies.

Use of critical raw materials are of growing concern due to their environmental and social impacts. Ricardo's experts work across the entire value chain to minimise the impact the use of such materials have including in policy and strategy, product design and circular economy applications.

The project was showcased at the Materials and Manufacturing Showcase 2025 in London, organised by UKRI, where the team had the opportunity to talk about the UK sustainable supply chain aspect and display the unit.

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About Ricardo

Ricardo plc is a global strategic, environmental, and engineering consulting company, listed on the London Stock Exchange. With over 100 years of engineering excellence and employing close to 3,000 employees in more than 20 countries, we provide exceptional levels of expertise in delivering innovative cross-sector sustainable outcomes to support energy transition and scarce resources, environmental services together with safe and smart mobility. Our global team of consultants, environmental specialists, engineers and scientists support our customers to solve the most complex and dynamic challenges to help achieve a safe and sustainable world. Visit: www.ricardo.com

About Alumotor

Alumotor project has been partially funded by the UK Innovation Fund and involves a consortium of partners, Ricardo, Aspire Engineering, Brandauer, Warwick Manufacturing Group, Phoenix Scientific and Global Technologies Racing.

Note to editor

A Synchronous Reluctance Motor is similarly robust as an induction motor but comes at a lower cost and is free from permanent magnets. The difference is that it operates using reluctance (think of magnetic resistance), where the rotor aligns to the stator magnetic field.

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