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PRESS RELEASE

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Ricardo EV battery technology nominated for innovation award

High power battery packs and ultra-fast charging solutions for electric vehicles which have been developed collaboratively by Ricardo with M&I Materials Ltd and Warwick Manufacturing Group at University of Warwick, have been nominated for The Engineer magazine's 2020 Collaborate to Innovate award for the automotive sector

The technology – known as i-CoBat, which stands for Immersion Cooled Battery Packs – leverages Ricardo's expertise in hybrid and electric vehicle (EV) thermal management and performance. Using immersion cooling to provide high heat transfer and efficiently managing temperature spikes, the technology provides innovative thermal solutions for ultra-fast charging and high power battery packs.

As automakers look to innovative technology solutions to help bring electric vehicles to market sooner, and to accelerate the adoption of hybrid and electric vehicles by consumers, the i-CoBat technology offers manufacturers four key benefits.

First, the thermal performance is class-leading: within each battery pack, the temperature of each cell is largely consistent, with less than a 3 degree Celsius variation between cells during fast charging. A significant benefit of this thermal management is to

extend battery pack life by approximately 8 percent, reducing both environmental impact and cost. Secondly, the battery pack has a lightweight design which creates weight and cost savings from the overall vehicle, thanks to partial immersion cooling of the cells, and bus bar cooling. Thirdly, the battery pack has been designed specifically for volume manufacture, enabling products to be brought to market sooner. Finally and crucially, the battery pack offers a robust safety benefit: its unique design incorporating the use of dielectric fluid will reduce the possibility of thermal runway which is one of the biggest safety issues for electric and hybrid vehicles – the design has been thoroughly validated through abuse testing.

Adrian Greaney, Ricardo director – technology and digital said: “We are honoured to have been nominated for this award with our collaboration partners. Ricardo is renowned for developing innovative technology solutions which improve efficiency and performance and drive cost out of electrification for global manufacturers.

“i-CoBat showcases Ricardo’s world-leading expertise in thermal management, technology integration and design for manufacture. It has been designed, built, tested and validated to provide OEMs with EV battery technology that can increase product efficiency and performance, reduce time, cost and risk with no compromise on quality and safety.”

The winners of The Engineer’s 2020 Collaborate to Innovate awards will be announced in early 2021.

During November 2020, Ricardo will be showcasing the i-CoBat technology at:

- *10 November - Automotive World free webinar on* ***Innovative battery thermal management: reducing total battery cost and improving safety and charging time*** *https://mobex.io/webinars/innovative-battery-thermal-management-reducing-total-battery-cost-and-improving-safety-and-charging-time/*
- *10-12 November – The Battery Show Europe and EV Tech Digital Days https://www.thebatteryshow.com/en/home.html*

- *11-12 November - Institution of Mechanical Engineers' conference International EV Batteries 2020: cost effective engineering for hybrid and electric vehicles https://events.imeche.org/ViewEvent?code=CMP7017*
- *16-29 November – International Congress: SIA Powertrain & Energy 2020 https://www.sia.fr/evenements/193-sia-powertrain-energy-rouen-2020*
- *18-19 November - Cenex-Low Carbon Vehicle show https://www.cenex-lcv.co.uk/virtual-exhibition*

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NOTES TO EDITORS:

Ricardo plc is a global, world-class, multi-industry consultancy for engineering, technology, project innovation and strategy. Our people are committed to providing outstanding value through quality engineering solutions focused on high efficiency, low emission, class-leading product innovation and robust strategic implementation. With a century of delivering excellence and value through technology, our client list includes the world's major transportation original equipment manufacturers, supply chain organizations, energy companies, financial institutions and governments. Guided by our corporate values of respect, integrity, creativity & innovation and passion, we enable our customers to achieve sustainable growth and commercial success. Ricardo is listed in the FTSE4Good Index, which identifies global companies that demonstrate strong environmental, social and governance (ESG) practices. For more information, visit www.ricardo.com.

About *The Engineer's* Collaborate To Innovate awards (C2I). Now in its fifth year, the awards were established to uncover and celebrate great examples of technology-led engineering collaboration across a range of different disciplines and sectors. The awards have regularly uncovered a fresh pipeline of innovations, showcasing the UK's strength and breadth in cross-disciplinary collaboration, and providing plenty of reasons to optimistic about the future of UK engineering.

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