Archer Materials
Technology

Archer Materials Limited (ACN: 123 993 233)
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ASX Announcement (ASX: **AXE**) 29 October 2025

Silicon Biochip meets performance and clinical requirements

Highlights

- Initial data from the IMEC collaboration show that Archer's blood potassium graphene Biochip can be successfully built on silicon, which de-risks the Biochip supply chain, reduces unit cost, and accelerates the pathway to manufacture and commercialisation.
- Results are from the first of three types of devices fabricated at IMEC and subsequently functionalised and tested using Archer's proprietary methods.
- The first silicon-based devices achieved potassium sensing accuracy of ±0.3 mM, matching both Archer's graphene gFET results and the CLIA clinical standard, with faster readout times.
- Archer's IP and engineering has fostered strong platform flexibility across graphene and silicon for the Biochip.
- These initial results also allow Archer and IMEC to begin planning a larger-scope project in 2026 for a silicon-based potassium Biochip and potassium sensor product aimed at point-of-care and at-home diagnostic applications.

Archer Materials Limited ("Archer", the "Company", "ASX: AXE"), a quantum technology company developing advanced semiconductor chips for quantum technology and medical diagnostics, has delivered successful results from the first stage of the silicon Biochip project.

Archer has partnered with IMEC, which showed that the silicon devices meet blood potassium accuracy requirements.

Archer and IMEC achieved a potassium sensing accuracy of ±0.3 mM, matching both its latest graphene field effect transistor (gFET) performance and the clinical CLIA standard. This is the first major step in accelerating development and commercialisation for the lead application of Archer's Biochip platform.

These silicon devices achieve this accuracy with faster readout times than the current scheme used on the gFET Biochip, demonstrating strong potential for a high-performance, scalable, and clinically compliant biosensor platform.

IMEC has fabricated three distinct types of Biochip-based sensor devices using its well-established wafer-scale silicon wafer processing technology. These chips are subsequently modified, functionalised, and tested using Archer's proprietary methods to assess their potassium-sensing performance. In addition, to equivalent accuracy to gFET Biochip devices and the CLIA testing requirements, the silicon devices had shorter conditioning and stabilisation times, performing in around 30 minutes, which is a significant improvement in current lab testing of the gFET devices.

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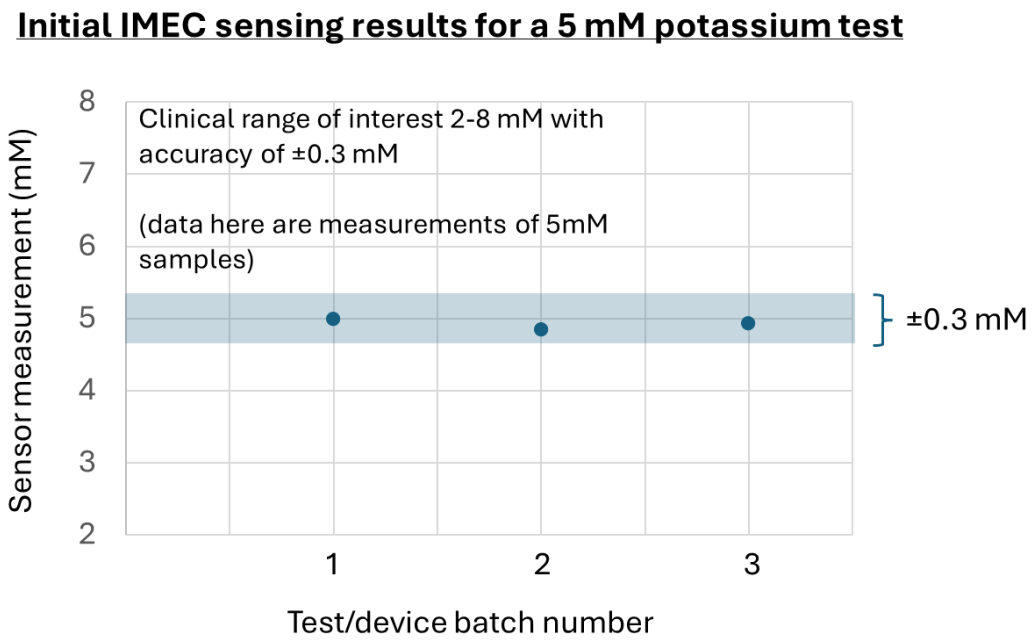

Image 1: Example data from the IMEC devices is shown below for three batches of the first type of silicon Biochip devices. The functionalisation and measurement protocols used for this work are those developed this year by Archer.

What does this mean?

These outcomes represent important progress on two major fronts. First, these results show that Archer's blood potassium Biochip sensor can be built around a silicon platform, thus de-risking Archer's Biochip supply chain, reducing final sensor cost, and allowing acceleration of the Biochip development towards market. Second, the engineering and IP development around the functionalisation (added layers and processes to make the Biochip gFET into a sensor) of graphene-based devices has been successfully leveraged and can be transferred to a silicon platform.

The progress achieved with IMEC, together with ongoing development efforts across Archer's partnerships, shows that the Company is on track to finalise a working prototype and progress toward clinical trials during 2026 and into 2027. These collaborative outcomes reinforce Archer's momentum in advancing its Biochip technology toward commercial readiness and clinical validation.

Next steps

Archer will now begin planning the regulatory approvals pathway and undertake a major productisation project with IMEC for 2026, focused on potassium sensing for chronic kidney disease. This initiative aims to deliver a silicon-based potassium Biochip and sensor designed for both point-of-care and at-home diagnostic.

In the remaining months of the current feasibility project, Archer and IMEC will focus on refining device processing and measurement techniques to further validate the silicon Biochip performance. The teams will also complete and test two additional silicon Biochip types, enhancing measurement precision and speed. These results will provide critical input to define the productisation pathway toward a fully integrated sensor system.

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Commenting on the Biochip progress, Dr Simon Ruffell, CEO of Archer, said,

"The progress from the initial work with IMEC marks an important milestone for Archer's Biochip program. Demonstrating that our technology can be built using silicon, rather than graphene, significantly broadens our manufacturing options and strengthens our path to commercialisation.

By leveraging IMEC's world-class silicon fabrication capabilities alongside Archer's proprietary sensor functionalisation methods, we're now positioned to develop a scalable, cost-effective, and clinically relevant biosensor platform. This achievement opens the door to accelerating product development and expanding our future applications in point-of-care and at-home diagnostics."

The Board of Archer authorised this announcement to be given to ASX.

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About Archer

Archer is a next-generation quantum technology company building advanced semiconductor devices for quantum computing, quantum sensing, and medical diagnostics. Its carbon-based platform is designed to integrate with existing semiconductor manufacturing processes, allowing Archer to build a scalable pathway to commercial quantum applications in global markets. www.archerx.com.au

About IMEC

IMEC is a world-leading, independent research and innovation centre in nanoelectronics and digital technologies. Headquartered in Leuven, Belgium, IMEC conducts research in advanced semiconductor and system scaling, silicon photonics, artificial intelligence, and other areas. It collaborates with industry leaders, startups, and academia to accelerate innovation in various sectors like health, mobility, and energy.
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