Archer Materials Limited (ACN: 123 993 233)
Lot Fourteen, Frome Road, Adelaide SA 5000
www.archerx.com.au

ASX Announcement (ASX: **AXE**) 16 April 2025

# Q3 FY25 Activities Report and Appendix 4C

For the quarter ended 31 March 2025.

## Key Highlights

- Improved the electron spin lifetime and sample-to-sample repeatability and uniformity for its manufacturable quantum carbon film.
- Achieved a key step towards qubit control by observing the strong coupling of spin states of the Company's novel carbon-based spin material to a superconducting resonator.
- Began the transition toward the testing of human blood on its Biochip.
- Continued to build its IP portfolio by being granted a US patent for the Biochip to protect its IP rights in the US.
- Signed an agreement with Hylid Diagnostics Inc to jointly develop an integrated prototype cartridge system that will measure potassium for the testing of chronic kidney disease.
- Appointed Dr Simon Ruffell to the position of CEO to help drive the commercial pathway of the $^{12}$CQ quantum project and the Biochip.
- Has maintained its strong cash position to fund activities with $15.6 million and no debt to fund R&D and commercial activities.

Archer Materials Limited ("Archer", the "Company", "ASX: AXE"), a semiconductor company advancing the quantum computing and medical diagnostics industries, provides its Quarterly Activities Report and Appendix 4C for the quarter ended 31 March 2025 ("Quarter").

**Commenting on Q3 FY25 activities, Greg English, Executive Chairman of Archer, said**

"Archer has made solid progress during the quarter on control for its $^{12}$CQ quantum project and the at-home testing for chronic kidney disease for the Biochip.

"The quantum team was able to test, simulate, and design a new resonator circuit to help them observe spin states, with the clarity of spin detection beating expectations. The control of the $^{12}$CQ quantum project ties into readout, so our quantum device can both have the output and input capabilities for quantum data.

"The Biochip team's work to get the gEFT device to test human blood samples compliments what Archer will be doing with Hylid's team in building integrated prototype cartridge system for at-home blood testing of chronic kidney disease. Archer, through the assistance of Hylid, will look towards engaging with the relevant regulatory agencies in North America and setting up clinical trials of the cartridge system.

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"During the quarter, we were also delighted to appoint Dr. Simon Ruffell as CEO. Simon brings valuable leadership and expertise to guide the 12CQ quantum project and the Biochip towards successful commercialisation. His expertise will be instrumental in shaping the next phase of our journey."

## Technology development and commercialisation activities

### Quantum Technologies

$^{12}$CQ Project

During the quarter, the $^{12}$CQ Quantum project improved the electron spin lifetime of its novel manufacturable quantum carbon film to 800 ns (nanosecond), up from 385 ns, and the films' reproducibility from sample to sample. The improved electron spin lifetimes and the sample to sample repeatability is an important development achieved by Archer, as it moves closer to realising devices like qubits and magnetic sensors.

Spin lifetimes of 800 ns were demonstrated under certain synthesis conditions, although some work is required to reproduce this on silicon (or other) substrates for chips. It is equally important to increase the spin lifetime and film reproducibility. For example, increasing towards 1 microsecond at room temperature allows better functionality for the control and readout (the reading of the output of quantum information) of qubits on the device.

The spin lifetimes have been verified on nanoislands of the films, showing no significant change of electron spin lifetime when patterning from bulk films to nanoscale dots, down to a size of 150 nanometres.

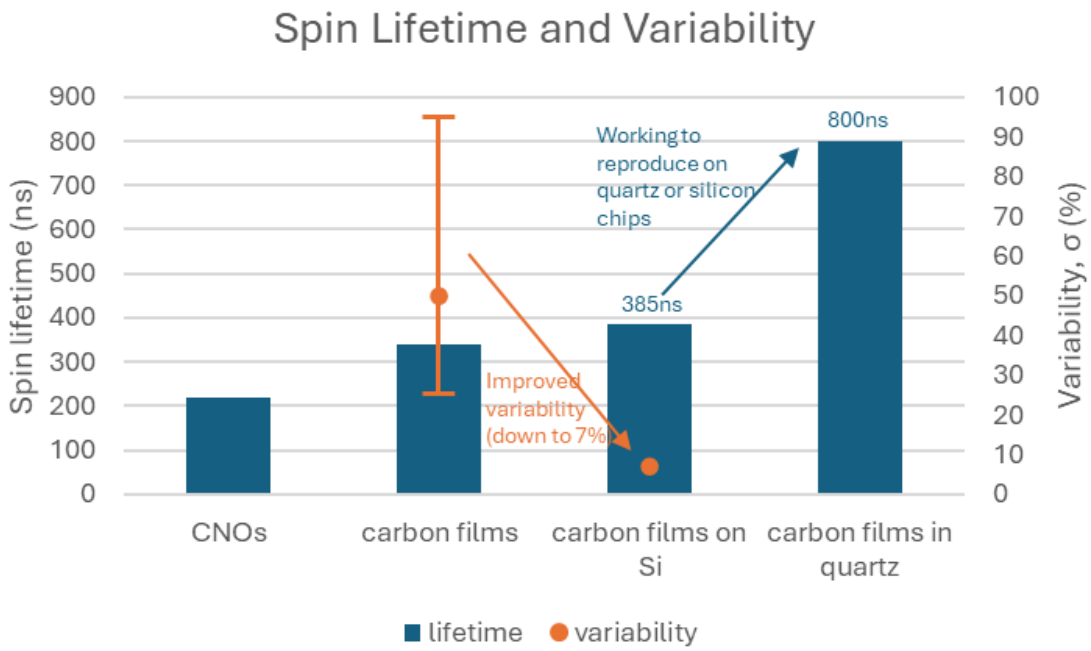


**Image 1**. Electron spin-lifetime has been increased to 800 ns under certain conditions. Work is in progress to repeat this to increase from 385 to 800 ns on chips. Significant improvements have been made on uniformity. Variability has been driven down from >25% to ~7%.

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In February Archer announced that it had achieved a key step towards qubit control (the input of data into the quantum device), by observing the strong coupling of spin states of the Company's novel carbon-based spin material to a superconducting resonator.

The team did this by creating a new resonator circuit design, with the result that the spin detection measurement exceeded expectations. The Company plans to utilise this resonator design to deliver microwave pulses for the precise control of individual qubits, which is essential for entangling and computational operations on a quantum computer.

Previous generations of superconducting resonators were unable to detect the spin of the quantum material. Interactive design optimisation, simulation, and testing by the Archer team resulted in the new resonator circuit design, with the clarity of the spin detection measurement exceeding expectations.

This work complements Archer's readout technology (the output of data from the quantum device) and leads to the next stage of the $^{12}$CQ project, developing the Company's initial results to demonstrate readout and control feasibility.

TMR Sensors

We are continuing to advance our commercial engagement efforts, with a focus on identifying high-value application areas and aligning the TMR sensor development with specific market needs. Our team has held a number of technical discussions, which have provided valuable insights into potential integration pathways, performance requirements, and deployment scenarios. These engagements are informing both our TMR sensor product refinement and broader commercial strategy.

While formal collaboration agreements have not yet been executed, management is beginning to see clearer signals around where our TMR sensor technology can create differentiated value, and we are tailoring our messaging, technical collateral, and product roadmap accordingly. These efforts are essential to ensuring that when we do move toward partnerships, we are doing so with a well-aligned and market-ready offering.

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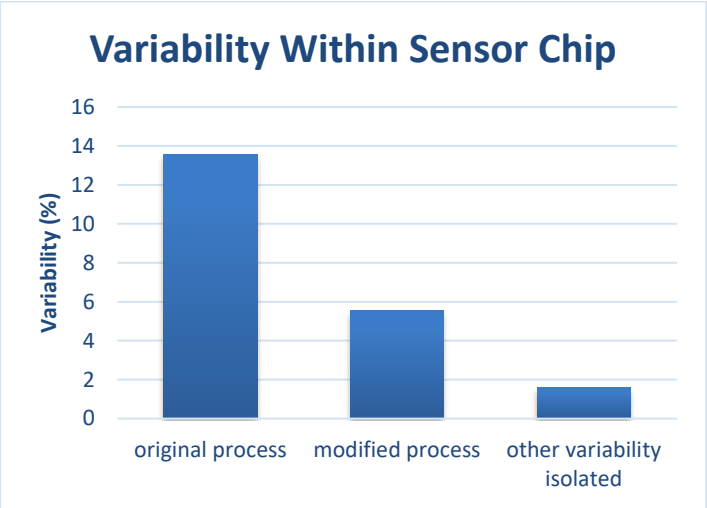
## Biochip

During the quarter, Archer improved the accuracy of potassium detection for the Biochip's at-home testing of chronic kidney disease. This work has led to a significant decrease from 15% to 1.5% in on-chip device variability. By reducing variability to 1.5%. This will allow for the transition of testing its Biochip technology on human blood samples, before integrating it into a first prototype cartridge system, targeted towards the end of 2025. The Company expects that, subject to regulatory feedback, it will commence clinical trials for potassium detection using the Biochip in 2026.



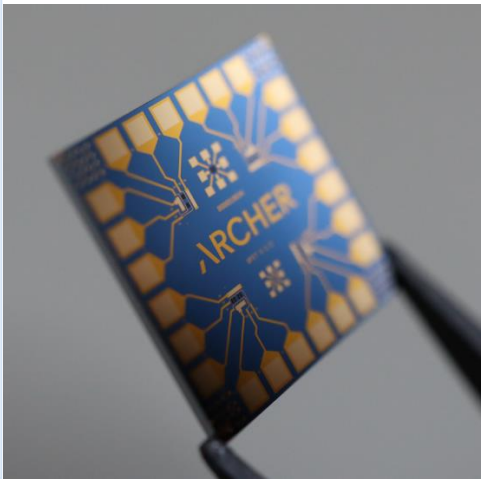




**Image 2.** The chart shows the variability of response to mM/l concentrations of potassium of gFET devices on a chip. The photograph shows Archer's sensor test chip. These chips contain several gFETs (barely visible). The liquid (currently mock samples, but later blood) is transferred to the chip in micro-litre volumes and the individual gFET responses are read.

The Company was able to build out its Biochip's IP portfolio by being granted a US patent for the Biochip to protect its IP rights. The US patent reflects the development of the biosensing chip for graphene complexes and their compositions that can be used in biomolecular sensing. Archer believes that this development work will be significant in the success of the Biochip. The US is also a key market for Archer for the testing of chronic kidney disease.

Archer also entered a partnership with Canadian medical device company, Hylid Diagnostics Inc, to develop the potassium measurement product for the testing of chronic kidney disease in its Biochip. Archer intends to use its potassium sensing technology, along with Hylid's blood haemolysis sensor technology, to develop an integrated prototype cartridge system that will meet the stringent accuracy requirements for blood potassium measurements.

Hylid specialises in affordable lab-quality sensing technology to for at-home blood testing. Hylid's first target market being chronic kidney disease in North America and Europe and it has a team of advisors in the US, Canada, and UK to help navigate regulatory processes for the relevant agencies and the setup of clinical trials.

The initial phase of this collaborative project involves Hylid developing independent haemolysis sensors that meet accuracy standards, facilitating the integration of Archer's potassium sensing chips to develop an at-home testing device.

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## Appointment of new Chief Executive Officer

Archer appointed Dr Simon Ruffell to the role of CEO during the Quarter. Dr Ruffell moves to the role of CEO from his previous position of Chief Technology Officer (CTO) at Archer. He has been with the Company since February 2024, responsible for managing and progressing both the quantum and Biochip teams and projects.

Dr Ruffell brings over 20 years of international experience working on technology projects and managing multi-functional teams, including hardware, process and software engineering teams.

Before joining Archer, Dr Ruffell was a Principal Hardware Engineering Manager at Microsoft where he led a team developing hardware for Microsoft's quantum program. Prior to Microsoft, he spent 10 years at Applied Materials (US) having various roles where he led process and hardware teams to take a new product from R&D through productisation.

## Financial and corporate update

The Company's cash balance at the end of the Quarter was $15,578,000 and has no debt.

Archer's accompanying Appendix 4C cashflow report for the Quarter includes an amount of $147,000 at item 6.1, relating to executive and non-executive director fees paid as salaries and wages.

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

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**About Archer**

Archer is a technology company that operates within the semiconductor industry. The Company is developing advanced semiconductor devices, including chips relevant to quantum computing and medical diagnostics. Archer utilises its global partnerships to develop these technologies for potential deployment and use across multiple industries. www.archerx.com.au

# Appendix 4C

## Quarterly cash flow report for entities subject to Listing Rule 4.7B

| **Name of entity** | |
|---|---|
| Archer Materials Limited | |
| **ABN** | **Quarter ended ("current quarter")** |
| 64 123 993 233 | 31 March 2025 |

| **Consolidated statement of cash flows** | | **Current quarter $A'000** | **Year to date (9 months) $A'000** |
|---|---|---|---|
| **1.** | **Cash flows from operating activities** | | |
| 1.1 | Receipts from customers | - | - |
| 1.2 | Payments for | | |
| | (a) research and development (excludes wages allocated to R&D) | (318) | (1,654) |
| | (b) product manufacturing and operating costs | - | - |
| | (c) advertising and marketing | - | - |
| | (d) leased assets | (4) | (90) |
| | (e) staff costs | (722) | (2,702) |
| | (f) administration and corporate costs | (348) | (1,028) |
| 1.3 | Dividends received (see note 3) | - | - |
| 1.4 | Interest received | 131 | 776 |
| 1.5 | Interest and other costs of finance paid | - | - |
| 1.6 | Income taxes paid | - | - |
| 1.7 | Government grants and tax incentives | - | 2,190 |
| 1.8 | Other (provide details if material) | | |
| **1.9** | **Net cash from / (used in) operating activities** | **(1,261)** | **(2,508)** |

| | | | |
|---|---|---|---|
| **2.** | **Cash flows from investing activities** | | |
| 2.1 | Payments to acquire or for: | | |
| | (a) entities | - | - |
| | (b) businesses | - | - |
| | (c) property, plant and equipment | (2) | (7) |
| | (d) investments | | |
| | (e) intellectual property | (26) | (165) |

| Consolidated statement of cash flows | | Current quarter $A'000 | Year to date (9 months) $A'000 |
|---|---|---|---|
| | (f) other non-current assets | - | - |
| 2.2 | Proceeds from disposal of: | | |
| | (a) entities | - | - |
| | (b) businesses | - | - |
| | (c) property, plant and equipment | - | 9 |
| | (d) investments | - | 39 |
| | (e) intellectual property | - | - |
| | (f) other non-current assets | - | - |
| 2.3 | Cash flows from loans to other entities | - | - |
| 2.4 | Dividends received (see note 3) | - | - |
| 2.5 | Other (provide details if material) | - | - |
| **2.6** | **Net cash from / (used in) investing activities** | **(28)** | **(124)** |

| **3.** | **Cash flows from financing activities** | | |
|---|---|---|---|
| 3.1 | Proceeds from issues of equity securities (excluding convertible debt securities) | - | - |
| 3.2 | Proceeds from issue of convertible debt securities | - | - |
| 3.3 | Proceeds from exercise of options | - | - |
| 3.4 | Transaction costs related to issues of equity securities or convertible debt securities | - | - |
| 3.5 | Proceeds from borrowings | - | - |
| 3.6 | Repayment of borrowings | - | - |
| 3.7 | Transaction costs related to loans and borrowings | - | - |
| 3.8 | Dividends paid | - | - |
| 3.9 | Other (provide details if material) | - | - |
| **3.10** | **Net cash from / (used in) financing activities** | **-** | **-** |

| **4.** | **Net increase / (decrease) in cash and cash equivalents for the period** | | |
|---|---|---|---|
| 4.1 | Cash and cash equivalents at beginning of period | 16,867 | 18,210 |
| 4.2 | Net cash from / (used in) operating activities (item 1.9 above) | (1,261) | (2,508) |
| 4.3 | Net cash from / (used in) investing activities (item 2.6 above) | (28) | (124) |

| Consolidated statement of cash flows | | Current quarter $A'000 | Year to date (9 months) $A'000 |
|---|---|---|---|
| 4.4 | Net cash from / (used in) financing activities (item 3.10 above) | - | - |
| 4.5 | Effect of movement in exchange rates on cash held | - | - |
| **4.6** | **Cash and cash equivalents at end of period** | **15,578** | **15,578** |

| 5. | Reconciliation of cash and cash equivalents at the end of the quarter (as shown in the consolidated statement of cash flows) to the related items in the accounts | Current quarter $A'000 | Previous quarter $A'000 |
|---|---|---|---|
| 5.1 | Bank balances | 3,495 | 784 |
| 5.2 | Call deposits | 12,083 | 16,083 |
| 5.3 | Bank overdrafts | - | - |
| 5.4 | Other (provide details) | - | - |
| **5.5** | **Cash and cash equivalents at end of quarter (should equal item 4.6 above)** | **15,578** | **16,867** |

| 6. | Payments to related parties of the entity and their associates | Current quarter $A'000 |
|---|---|---|
| 6.1 | Aggregate amount of payments to related parties and their associates included in item 1<br>* The above payments relate to fees and salaries paid to Directors during the quarter. | 147 |
| 6.2 | Aggregate amount of payments to related parties and their associates included in item 2 | - |

*Note: if any amounts are shown in items 6.1 or 6.2, your quarterly activity report must include a description of, and an explanation for, such payments.*

| 7. | **Financing facilities**<br>*Note: the term "facility' includes all forms of financing arrangements available to the entity.*<br>*Add notes as necessary for an understanding of the sources of finance available to the entity.* | **Total facility amount at quarter end $A'000** | **Amount drawn at quarter end $A'000** |
|---|---|---|---|
| 7.1 | Loan facilities | - | - |
| 7.2 | Credit standby arrangements | - | - |
| 7.3 | Other (please specify) | - | - |
| 7.4 | **Total financing facilities** | **-** | **-** |

| | | |
|---|---|---|
| 7.5 | **Unused financing facilities available at quarter end** | n/a |

7.6 Include in the box below a description of each facility above, including the lender, interest rate, maturity date and whether it is secured or unsecured. If any additional financing facilities have been entered into or are proposed to be entered into after quarter end, include a note providing details of those facilities as well.

n/a

| 8. | **Estimated cash available for future operating activities** | **$A'000** |
|---|---|---|
| 8.1 | Net cash from / (used in) operating activities (item 1.9) | (1,261) |
| 8.2 | Cash and cash equivalents at quarter end (item 4.6) | 15,578 |
| 8.3 | Unused finance facilities available at quarter end (item 7.5) | - |
| 8.4 | Total available funding (item 8.2 + item 8.3) | 15,578 |
| 8.5 | **Estimated quarters of funding available (item 8.4 divided by item 8.1)** | 12.35 |

*Note: if the entity has reported positive net operating cash flows in item 1.9, answer item 8.5 as "N/A". Otherwise, a figure for the estimated quarters of funding available must be included in item 8.5.*

8.6 If item 8.5 is less than 2 quarters, please provide answers to the following questions:

8.6.1 Does the entity expect that it will continue to have the current level of net operating cash flows for the time being and, if not, why not?

Answer: n/a

8.6.2 Has the entity taken any steps, or does it propose to take any steps, to raise further cash to fund its operations and, if so, what are those steps and how likely does it believe that they will be successful?

Answer: n/a

8.6.3 Does the entity expect to be able to continue its operations and to meet its business objectives and, if so, on what basis?

Answer: n/a

*Note: where item 8.5 is less than 2 quarters, all of questions 8.6.1, 8.6.2 and 8.6.3 above must be answered.*

## Compliance statement

1 This statement has been prepared in accordance with accounting standards and policies which comply with Listing Rule 19.11A.

2 This statement gives a true and fair view of the matters disclosed.

Date: ..... 16 April 2025.....

Authorised by: ..... By the Board.....
(Name of body or officer authorising release – see note 4)

**Notes**

1. This quarterly cash flow report and the accompanying activity report provide a basis for informing the market about the entity's activities for the past quarter, how they have been financed and the effect this has had on its cash position. An entity that wishes to disclose additional information over and above the minimum required under the Listing Rules is encouraged to do so.

2. If this quarterly cash flow report has been prepared in accordance with Australian Accounting Standards, the definitions in, and provisions of, *AASB 107: Statement of Cash Flows* apply to this report. If this quarterly cash flow report has been prepared in accordance with other accounting standards agreed by ASX pursuant to Listing Rule 19.11A, the corresponding equivalent standard applies to this report.

3. Dividends received may be classified either as cash flows from operating activities or cash flows from investing activities, depending on the accounting policy of the entity.

4. If this report has been authorised for release to the market by your board of directors, you can insert here: "By the board". If it has been authorised for release to the market by a committee of your board of directors, you can insert here: "By the [*name of board committee – eg Audit and Risk Committee*]". If it has been authorised for release to the market by a disclosure committee, you can insert here: "By the Disclosure Committee".

5. If this report has been authorised for release to the market by your board of directors and you wish to hold yourself out as complying with recommendation 4.2 of the ASX Corporate Governance Council's *Corporate Governance Principles and Recommendations*, the board should have received a declaration from its CEO and CFO that, in their opinion, the financial records of the entity have been properly maintained, that this report complies with the appropriate accounting standards and gives a true and fair view of the cash flows of the entity, and that their opinion has been formed on the basis of a sound system of risk management and internal control which is operating effectively.