

ASX Announcement ([ASX: AXE](#))

30 August 2022

## Archer achieves sub-10 nanometre fabrication

### Highlights

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- Archer achieves its targeted goal of sub-10 nanometre (nm) feature size fabrication, in a major tech development breakthrough for the Company.
  - Sub-10 nm fabrication capability is leading-edge in the semiconductor industry.
  - The extreme miniaturisation of electronic device feature size would potentially allow for high performance sensors on Archer's biochip.
  - The biochip is being developed in-house by Archer staff and Archer owns 100% of the biochip technology intellectual property.
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Archer Materials Limited ("Archer", the "Company", "[ASX: AXE](#)") is pleased to inform shareholders that the Company has achieved a long-term technology development goal to reliably fabricate sub-10 nanometre ("nm") biochip device components.

In April 2021, the Company announced that it had commenced nanofabrication processes with the aim of developing sub-10 nm size biochip features representing the current 'best-in-class' in the semiconductor industry<sup>†</sup> (ASX ann. [8 Apr 2021](#)). The Company expanded its access to state-of-art instruments and talent (ASX ann. [15 Mar 2022](#)) and recently made significant progress towards sub-10 nm fabrication (ASX ann. [30 May 2022](#)).

Archer has now fabricated sub-10 nm features reproducibly and reliably by developing several advanced lithographic processes on a silicon wafer in a clean-room environment. The work is a significant technical achievement and represents a technology development breakthrough for the Company.

Archer's core business is the development of advanced semiconductor technology that is underpinned by the Company's nanofabrication capabilities. Archer's sub-10 nm feature fabrication is in line with the current semiconductor industry best-in-class for chip feature sizes and provides the Company with a significant competitive advantage<sup>†</sup>.

The extreme miniaturisation would give Archer greater flexibility, capability, and higher integration density in its lithographic processes for the design and fabrication of its technologies. For example, sub-10 nm fabrication could allow for biochip device development to span a magnitude of feature sizes for a broad range of potential sensing applications.

The Company developed advanced lithography semiconductor fabrication processes to reach sub-10 nm sizes. These processes are complex, requiring precision engineering and state-of-the-art fabrication instruments to reach lateral control over feature sizes below 10 nm in chip-based devices (corresponding in this work to covering a width of approximately 50 silicon atoms on the wafer surface).

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<sup>†</sup> <https://irds.ieee.org/>

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**Commenting on achieving sub-10 nm fabrication, Archer CEO Dr Mohammad Choucair said:** “We’re developing semiconductor devices that push the boundaries of modern technology. We ambitiously set out to achieve sub-10 nm fabrication to bring Archer in-line with the feature size lithographic processing capability of leading players in the semiconductor industry.

“Achieving sub-10 nanometre fabrication of electronic device components is an excellent outcome on our path to developing Archer’s biochip technology, and one that demonstrates the world-class capabilities of our pioneering team.”

### **Further information on Archer’s biochip development**

The Company is developing a biochip that would allow droplets of biological specimens to be analysed and processed using graphene-based sensors. Archer’s biochip design principles include the micro- and nano-fabrication of integrated sensing devices in regions of a chip that work alongside other fabricated functional regions *on the same chip* to process, detect and analyse biological specimens.

Advanced lithography processes performed in a semiconductor foundry are required to fabricate and integrate various features as part of a nanoelectronic device and the work done by Archer to fabricate sub-10 nm biochip features is an important step in the potential future operation of Archer’s biochip. Smaller device features could enable smaller overall chip size, better performance, and reduced power consumption.

### **About Archer’s biochip**

Archer’s biochip is lab-on-a-chip technology the Company is developing to enable the complex detection of some of the world’s most deadly communicable diseases. The biochip development commenced in Nov 2020 (ASX ann. [5 Nov 2020](#)). Archer is currently focused on micro- and nano-fabrication of the biochip device components (ASX ann. [31 Mar 2022](#)) and combining these components with biochemical reactions to detect diseases (ASX ann. [1 Dec 2021](#)), which pose significant technological challenges to potentially commercialising lab-on-a-chip devices.

### **About Archer**

Archer is a technology company that operates within the semiconductor industry. The Company is developing and commercialising advanced semiconductor devices, including chips relevant to quantum computing and medical diagnostics.

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

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