

# Archer Materials Ltd

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## Archer Materials surges 33% on building quantum devices for qubit control

Archer Materials Ltd (ASX:AXE) (OTCMKTS:ARRXF) (FRA:38A) has surged 33% on a technological breakthrough with the building of quantum devices required for initial qubit control measurements.

This work is part of a significant phase in Archer's technology development related to the operation of the 12CQ® room-temperature quantum computing qubit processor.

Archer and the company's collaborators have rapidly developed qubit control devices 'end-to-end' using in-house expertise and local world-class facilities.

### Shares up 33%

Investors have responded positively with shares as much as 33% higher this morning to 53 cents.

Archer CEO Dr Mohammad Choucair said: "We commenced our technology development related to qubit control a few weeks ago and now the first devices have been built to perform the initial [qubit control] measurements related to Archer's 12CQ chip operation.

"We have remained on track in our development since we first commenced the [12CQ chip] project in April 2019."

### World-first

Quantum control measurements are a world-first and successful development would be early-stage validation of 12CQ chip operation.

Archer's team has built and begun testing prototype qubit control devices (ESR devices) in Sydney with collaborating institutes.

The initial prototyped ESR device has the primary benefit of providing the magnetic ultra-sensitivity to establish quantitative measurements (ie characterisation) of the quantum information residing on very few qubit material components (qubits).

**Price:** 0.5

**Market Cap:** \$112.33 m

### 1 Year Share Price Graph



October 2019 April 2020 October 2020

### Share Information

**Code:** AXE

**Listing:** ASX

**52 week High Low**  
0.815 0.11

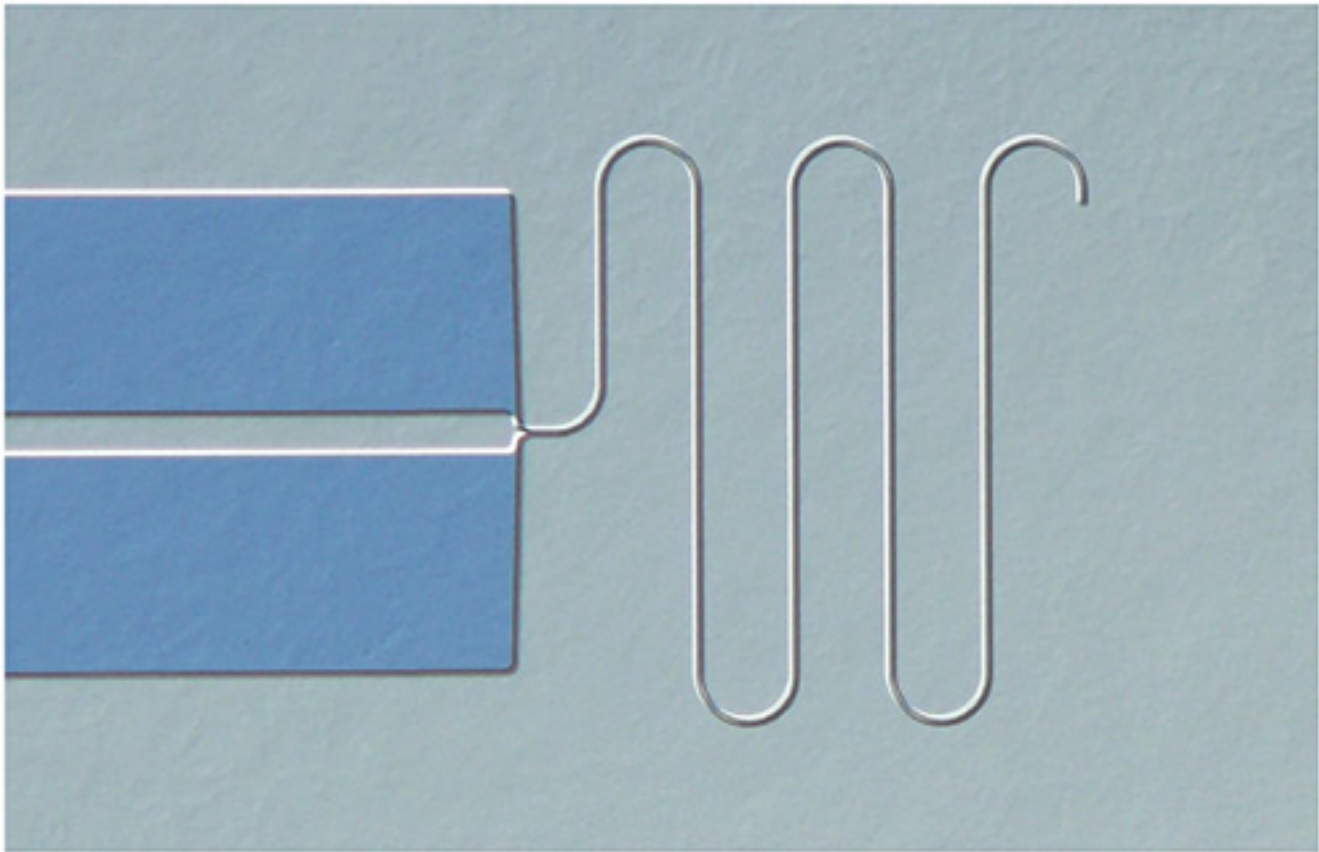
**Sector:** Hardware & electrical equipment

**Website:** archerx.com.au

### Company Synopsis:

Archer Materials Ltd (ASX:AXE) is a materials technology company developing and integrating materials in quantum computing, biotech and Li-ion batteries.

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Top High-magnification image of part of the prototype nanoscale ESR device. The full ESR device design is commercial-in-confidence.

### **Qubit control next milestone**

Choucair said: "Qubit control is explicitly our next big technological milestone.

"Over the coming months, company shareholders will expect to see a series of results that will be released to ASX by Archer that relate to qubit control - a key requirement of quantum computing processors.

"When successful, the work would be major validation, at a relatively early stage of the overall development of a quantum computing processor, of the commercial viability of the 12CQ chip."

### **Initial ESR device**

The initial ESR device design is intended to allow for qubit control measurements only at low temperatures to maximise the primary benefit, with the associated operation temperatures unrelated to Archer's qubits' demonstrated potential to operate at room temperature.

The ESR device assembly is unique and unoptimised, subject to changing functional configurations.

Achieving qubit control in few to single qubits represents a major technical milestone.

12CQ chip build is advancing, recently achieving key disruptive early-stage technology milestones in the global quantum computing economy.

Archer CEO and inventor of the 12CQ chip technology, Dr Choucair, previously demonstrated coherent control of

quantum information [measured] over bulk quantities of qubits at room temperature ie on aggregates of trillions and trillions of qubits.

However, the 12CQ chip design requires the isolation of a few to single qubits. Therefore, qubit control must be performed on isolated few to single qubits for successful operation of the 12CQ chip.

Qubit control involves componentry fabrication and prototyping of testbed devices, quantum information control measurements, quantum materials characterisation and ultimately, accessing and processing quantum information residing on individual and few qubits.

### **Scalable assembly**

Recently, as part of the company's broader technology development involving quantum measurements, which also includes qubit control, Archer demonstrated the scalable assembly of isolated single qubit arrays.

The company then directly measured single qubit conductivity, which is credible proof for addressing global quantum computing industry early-stage key success drivers related to scalability and use.

Choucair concluded: "The control measurements on the qubit material related to the 12CQ chip fabrication are a world-first, in particular for solid-state, nonoptical quantum computing systems.

"Archer is at the forefront of a global race to develop a potential solution to commercially viable [qubit processor chip] technology for the widespread use of quantum computing - technology which is at the foundation of an emerging multi-billion-dollar global industry."

### **Next steps**

12CQ is a world-first technology that Archer aims to build for quantum computing operation at room-temperature and integration onboard modern electronic devices.

The company's technology development is focused on achieving quantum control of a single qubit, which is essential for quantum information processing.

Archer will perform quantum measurements and materials characterisation at different laboratory facilities to achieve quantum control.

The control measurements will be performed in parallel to other technology development work packages, intellectual property prosecution, and commercialisation.

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