

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

6 September 2022

## Archer and GlobalFoundries to advance <sup>12</sup>CQ chip fabrication

### Highlights

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- Archer has commenced working with GlobalFoundries towards industry fabrication of its <sup>12</sup>CQ quantum chip technology.
  - GlobalFoundries is a world-leading semiconductor foundry<sup>†</sup>, providing Archer with expertise, equipment, and manufacturing processes to develop the <sup>12</sup>CQ chip.
  - Archer is the only ASX listed company and one of few players in the world developing qubit processor technology.
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Archer Materials Limited (“Archer”, the “Company”, “[ASX: AXE](#)”) is pleased to announce it will work with a world-leading semiconductor foundry, GlobalFoundries® (“GF®”) (“[NASDAQ: GFS](#)”), to advance the development of its <sup>12</sup>CQ quantum chip technology (“<sup>12</sup>CQ chip”).

Archer’s innovation aims to integrate its unique qubit material with mobile-compatible devices that are in a form suitable for industrial-scale semiconductor nanofabrication. To scale the fabrication of Archer’s <sup>12</sup>CQ chip devices and components, the Company will need to work with industrial-scale manufacturers in the global semiconductor supply chain (ASX ann. [21 Jul 2022](#)).

Archer will access the technology facilities and manufacturing processes of GlobalFoundries® to explore pathways for potential high-volume manufacturing of <sup>12</sup>CQ chip devices and components. Archer will work closely with GlobalFoundries® on device and circuit design, technology development, and high-volume chip fabrication.

Current quantum computing qubit architectures rely on custom made fabrication<sup>‡</sup>, unlike modern classical computing circuits that are manufactured in, and using, well-established industrial semiconductor facilities. Integrating qubit materials with existing industrial-scale foundries is a significant challenge in developing quantum processors.

**Commenting on the semiconductor supply-chain link with GlobalFoundries®, Archer CEO Dr Mohammad Chouair said:** “Archer is now positioned to leverage the expertise and capabilities of a tier-one semiconductor manufacturer to accelerate the development of the <sup>12</sup>CQ quantum computing chip technology.”

### Further information on Archer’s global competitive advantage and tech differentiation

The scientific breakthrough made in 2016 to realise Archer’s <sup>12</sup>CQ qubit material is available online in the peer-reviewed scientific journal [Nature Communications](#), which reports the advantages, technological trade-offs, and the technological barriers that have been overcome towards realising practical quantum computing, over several other qubit proposals. Patent information related to the <sup>12</sup>CQ chip qubit and proposed device(s) is available online, including examiner reports, through the [WIPO website](#).

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<sup>†</sup> <https://www.nasdaq.com/articles/an-overview-of-the-top-5-semiconductor-foundry-companies-2021-10-01>

<sup>‡</sup> <https://www.nature.com/articles/ncomms12232>

## About GlobalFoundries®

GlobalFoundries Inc. ("GF®") is one of the world's leading semiconductor manufacturers. GF® is redefining innovation and semiconductor manufacturing by developing and delivering feature-rich process technology solutions that provide leadership performance in pervasive high growth markets. GF® offers a unique mix of design, development, and fabrication services. With a talented and diverse workforce and an at-scale manufacturing footprint spanning the U.S., Europe and Asia, GF® is a trusted technology source to its worldwide customers. GF® is owned by Mubadala Investment Company. For more information, visit [www.gf.com](http://www.gf.com).

## About Archer

Archer is a technology company developing advanced semiconductor devices, including processor chips that are relevant to quantum computing. Archer is developing the 12CQ chip, a world-first qubit processor technology, that could potentially allow for quantum computing powered mobile devices ('QPMDs'). For more information, visit [www.archerx.com.au](http://www.archerx.com.au).

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

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