LeydenJar Releases Silyte: World's First Pure Silicon Anode Designed for the Age of Wearable AI

Enabling the wearable devices of the future - where every micrometer counts

LEIDEN, NETHERLANDS, August 28, 2025 /EINPresswire.com/ -- Devices so powerful they can operate for days without interruption, yet so light its owner barely notices them, whether it's in glasses, ring, or watch. A seamless assistant. LeydenJar launches Silyte: the world's first pure silicon anode, set to redefine the way people and technology connect.

Silyte™ is LeydenJar's silicon anode product for wearable AI devices

Silyte™ enables high energy density batteries for wearable AI

Silyte is LeydenJar's anode designed specifically to power a new generation of increasingly power-hungry electronic devices. As traditional battery materials like graphite are reaching their limits, Silyte addresses the need for new materials to fulfill the energy intensive requirements for batteries in compact, AI-enabled devices such as smartglasses, smartwatches, earbuds and smartphones.

By leveraging pure silicon, which has 10 times the capacity to store lithium compared to graphite, Silyte breaks the traditional trade-off between reducing battery size and improving performance. Freed from this limitation, Silyte unlocks the features and form-factors in consumer devices that current battery

technology cannot deliver, realizing a new generation of wearable devices that will replace a phone as a digital assistant and AI companion.

Silyte performance at a glance:
- More energy, smaller battery: +50% energy density versus conventional graphite anodes
- Durable anode design: 500+ full charge cycles without external pressure
- Fast-charging: 0 - 80% battery capacity in <12 minutes
- Ready for mass production: integrated with existing lithium-ion cell production lines

LeydenJar produces Silyte™ in their production facility in Eindhoven, The Netherlands

“Silicon anodes have long been the holy grail of battery design,” said Christian Rood, CEO of LeydenJar. “Silyte is the battery breakthrough that wearable AI has been waiting for. It’s the first pure silicon product that cell makers can use directly in existing production lines. We, and the wearable industry at large, believe silicon anodes will become the industry standard, unlocking new form factors and capabilities across all types of devices.”

Manufacturing at scale
In addition to boosting performance, LeydenJar has spent the past few years innovating in production and manufacturability of silicon anodes. As a result, today Silyte is produced in its pilot plant and will be mass-produced in its first commercial production facility from 2027 onwards. With many kilometers of anode already sent to customers worldwide, and even more used in LeydenJar’s internal R&D facilities, Silyte’s performance has been proven in a range of battery formats. As part of ongoing commercial validation projects, thousands of cells incorporating Silyte have been produced on automated lithium-ion manufacturing lines at a leading cell manufacturer using their existing equipment.

A sustainable and resilient supply chain
Made from 100% silicon, Silyte not only changes the battery performance, it also allows for a complete rethinking of the battery supply chain. By eliminating dependence on graphite mining and refining, it reduces geopolitical risk and enables a sustainable and local supply chain. Due to the wide availability of silicon, the precursor material for Silyte, and the efficient production processes of LeydenJar, a reduction of 85% in CO emissions of the anode can be realized while increasing performance.

Wearable device manufacturers benefit from the flexibility of LeydenJar’s approach, which

supplies Silyte rather than finished cells to its customer. This allows LeydenJar to collaborate with a broad ecosystem of cell manufacturers, using their knowledge and fostering innovation across device and battery designs, speeding up the adoption of silicon anodes as the material of choice.

About LeydenJar
LeydenJar develops 100% silicon anodes, achieving a world-record energy density of 1350 Wh/L (stack level) in lithium-ion batteries. Founded in 2016 as a spin-off from TNO, the Netherlands' leading independent research institute, the company is headquartered in Leiden and is expanding its production site in Eindhoven, one of Europe's foremost high-tech manufacturing hubs.

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