



LeydenJar

More Energy, Smaller Batteries

Silicon Anodes Powering Consumer Electronics

Tim Aanhane LeydenJar Business Development

Next-generation devices require next-generation batteries

Small batteries for wearable electronics

High capacity batteries for AI enabled applications

Local supply chain for sustainable product development



GRAPHITE

SILICON

10X Li storage

372 mAh/g

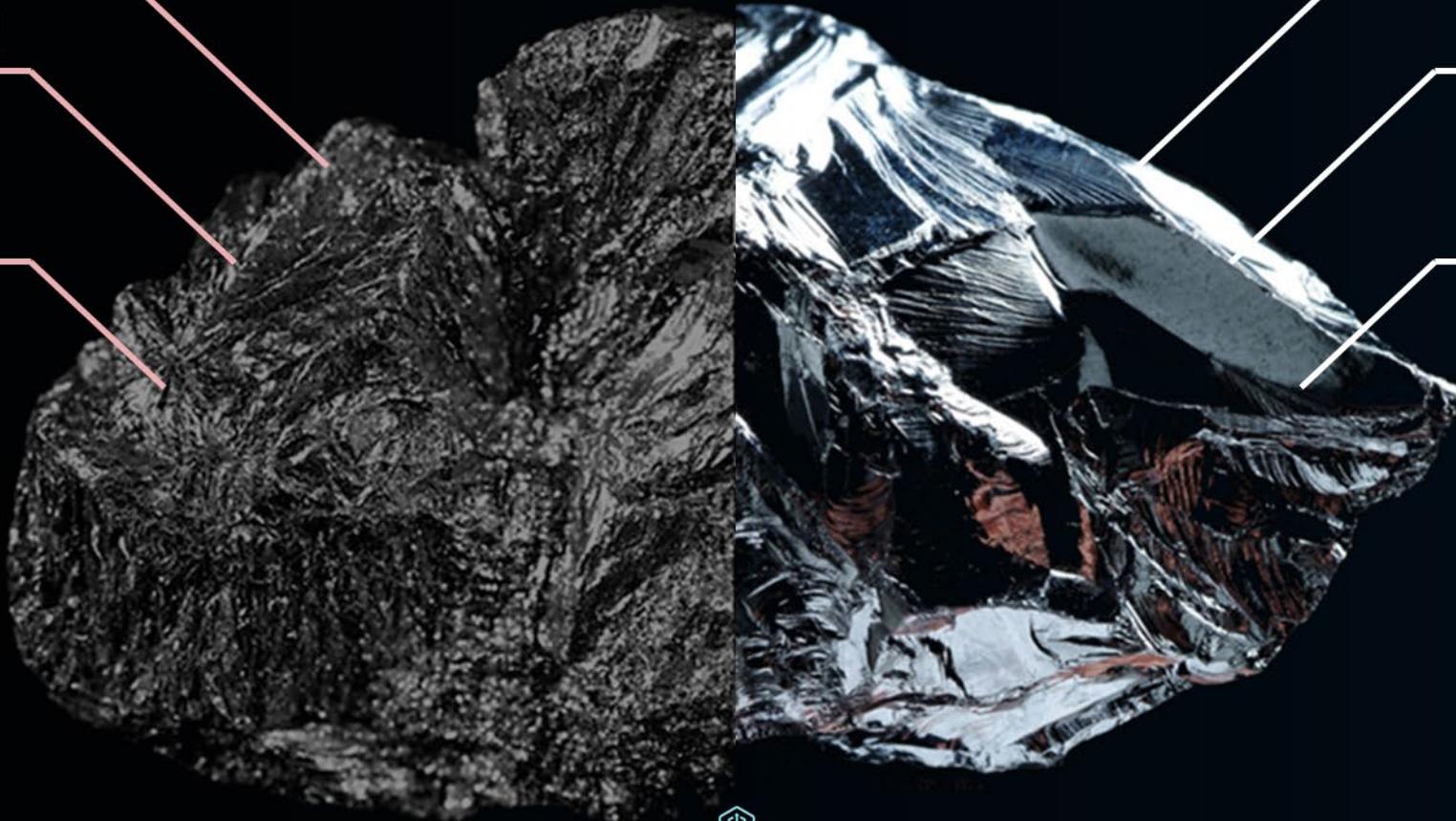
3600 mAh/g

Scarce material

Abundant

>90% by China

Mined globally



Silicon creates a reliable global supply chain for anodes



Silicon creates a reliable global supply chain for anodes



50% energy density increase with pure silicon anodes



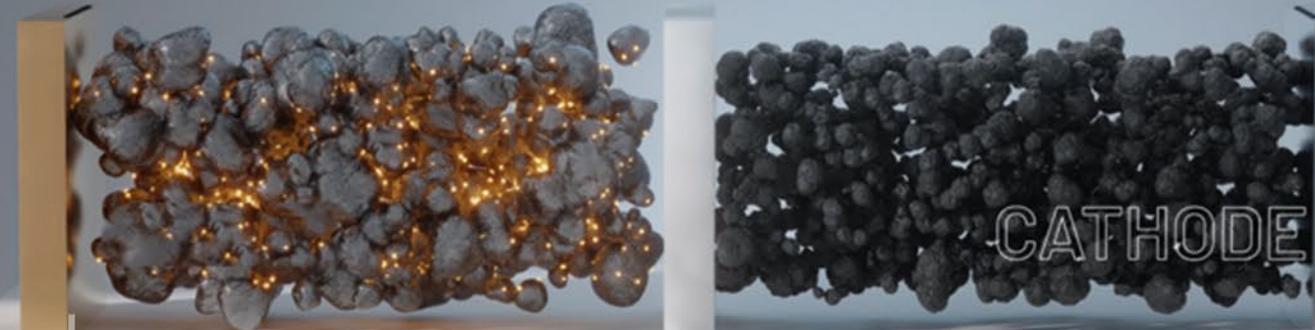
Problem

Graphite anodes are thick and limit energy density

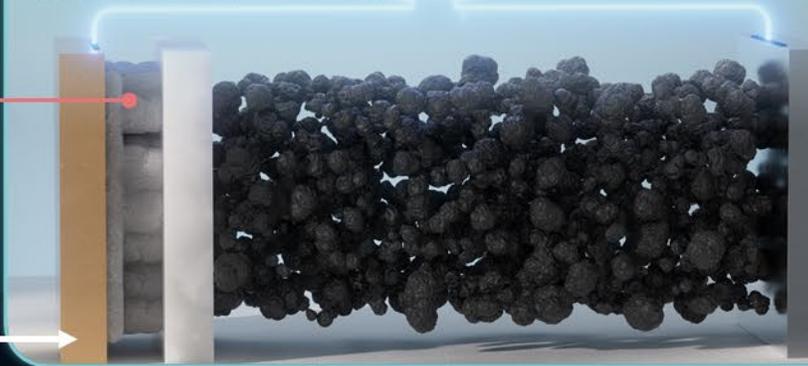
Solution

100% silicon anodes
10X Li storage for up to
10x thinner anode layers

Graphite anode



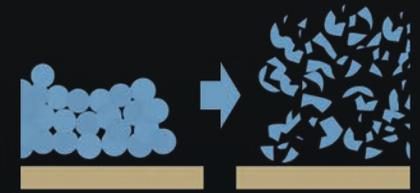
LeydenJar
100% silicon anode



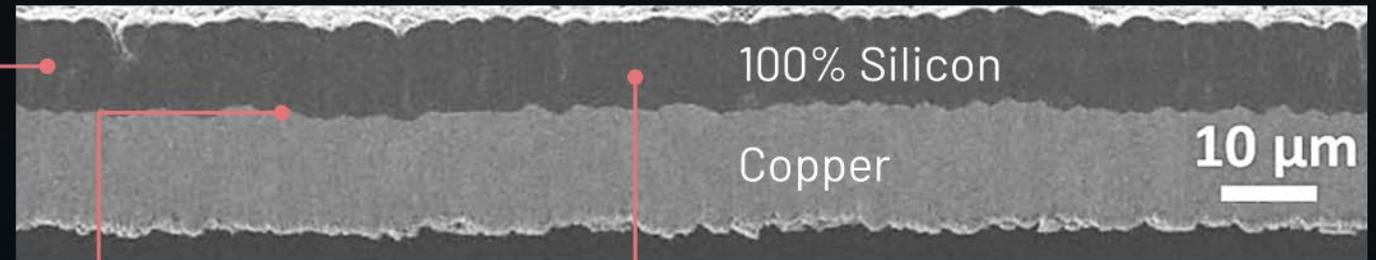
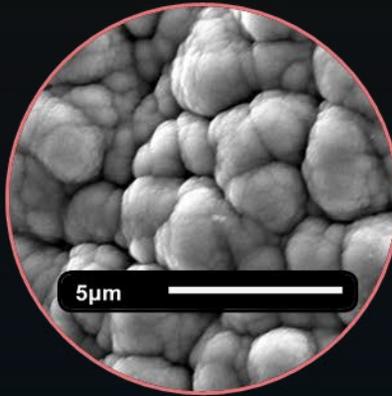
LeydenJar silicon is robust against swelling and breakage



SILICON KEY CHALLENGE: Silicon swells 300% causing anode to pulverize and delaminate

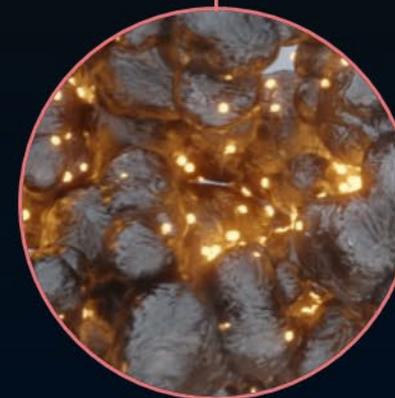
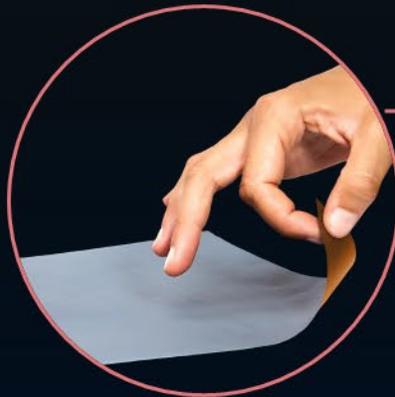


Porous structure accommodates silicon's natural expansion



Cross section SEM

Strong copper-silicon bonding prevents delamination during charge cycles



Electron superhighway allows for fast charging

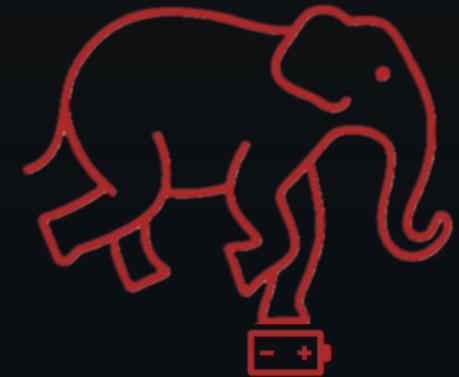
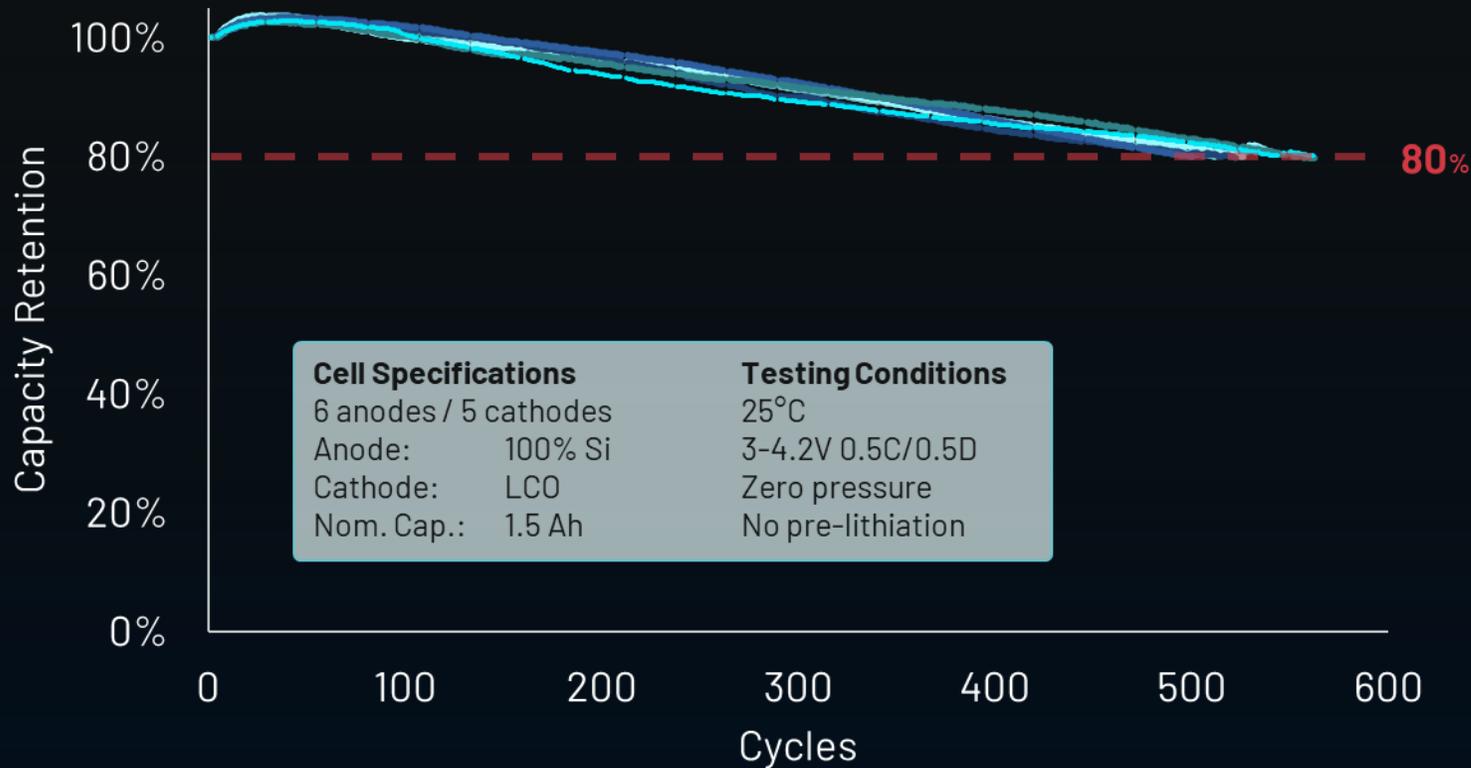




500+ cycles without pressure

500 cycles to 80% beginning of life

700 cycles to 70% beginning of life



The elephant in the room:

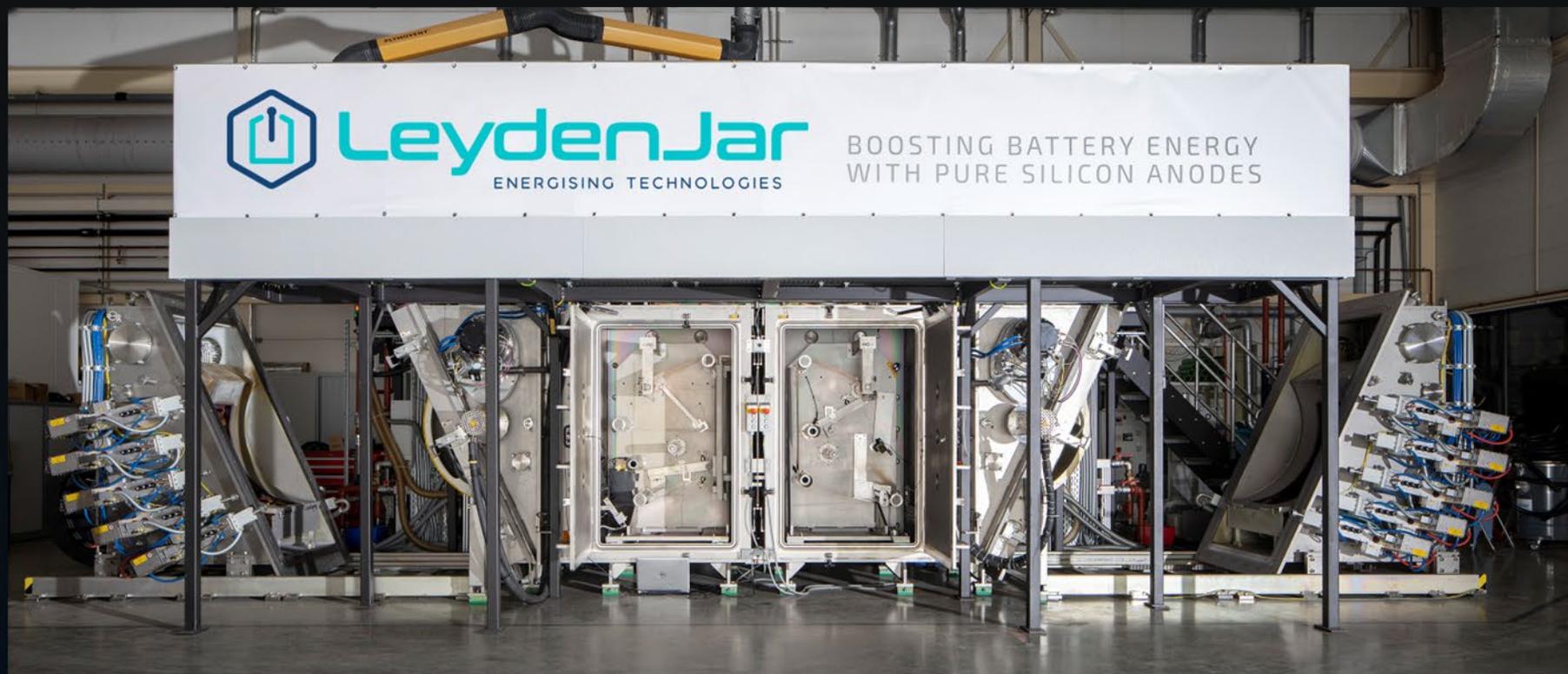
Many next-gen battery technologies need huge clamping pressure to work.

LeydenJar cells operate with zero applied pressure





Dry, roll-to-roll production: Creating unique porous structure



Inspired by established solar panel and semicon production techniques (PECVD)



1 Single process step, versus 4 for traditional anode manufacturing



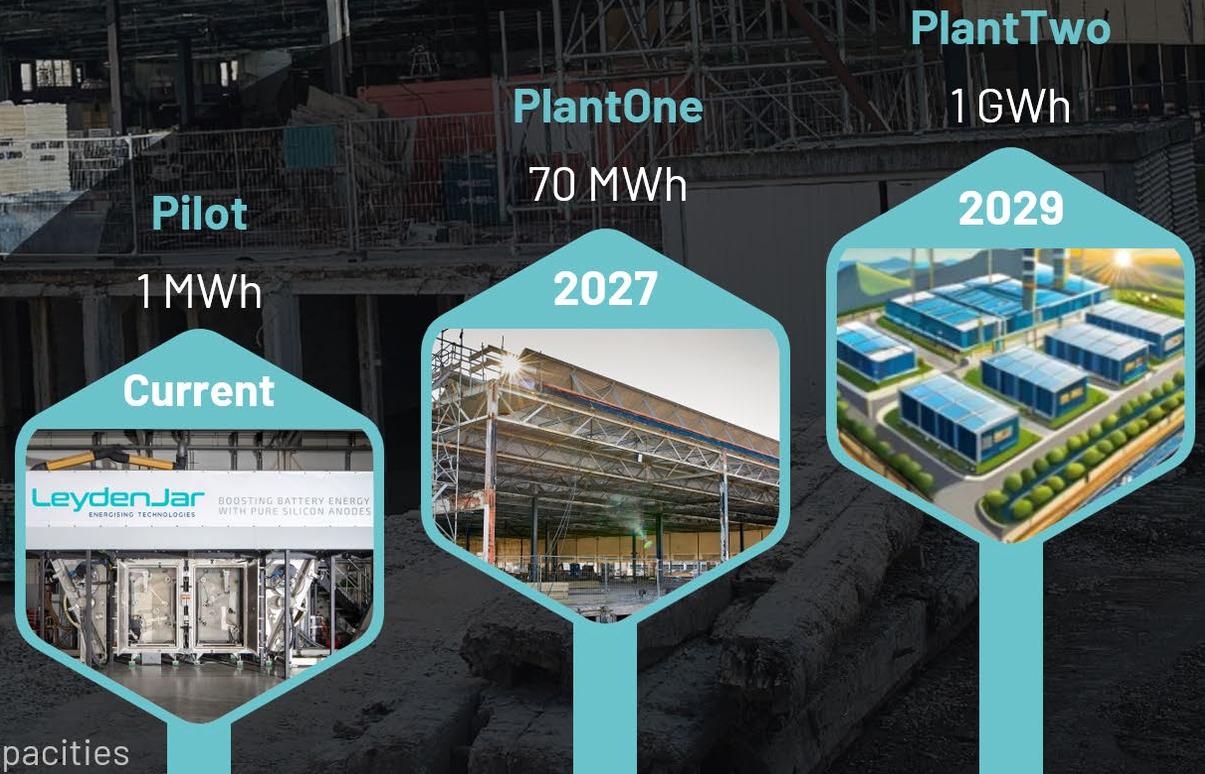
Fully patented technology



Plasma process grows silicon directly onto copper foil



Scaling mass production now PlantOne opening in 2027



Nameplate capacities

Integrates with existing Li-ion cell manufacturing



LeydenJar
Silyte™



Major partnership announced with



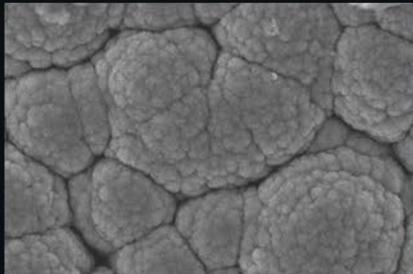
Mass market cell supplier to global tech giants
>10000 cells with LeydenJar anode in 2025



Building on proprietary knowledge and strong partnerships



PECVD equipment



Silicon **anode** production



Battery design + ML



OEMs



LeydenJar

Global cell makers

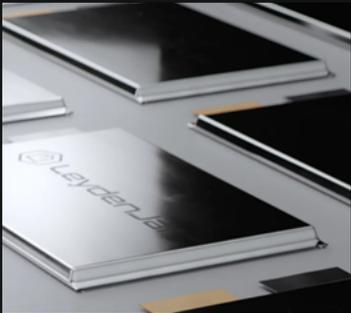


Next-gen battery tech and production in Europe



Pure silicon anode

Nano-engineered structure for ultra-high energy density



Cell performance

>500 cycles

No external pressure, low swelling



Wearables and AI-enabled devices

More energy, less volume

Onboard AI, day & night tracking

Reach out

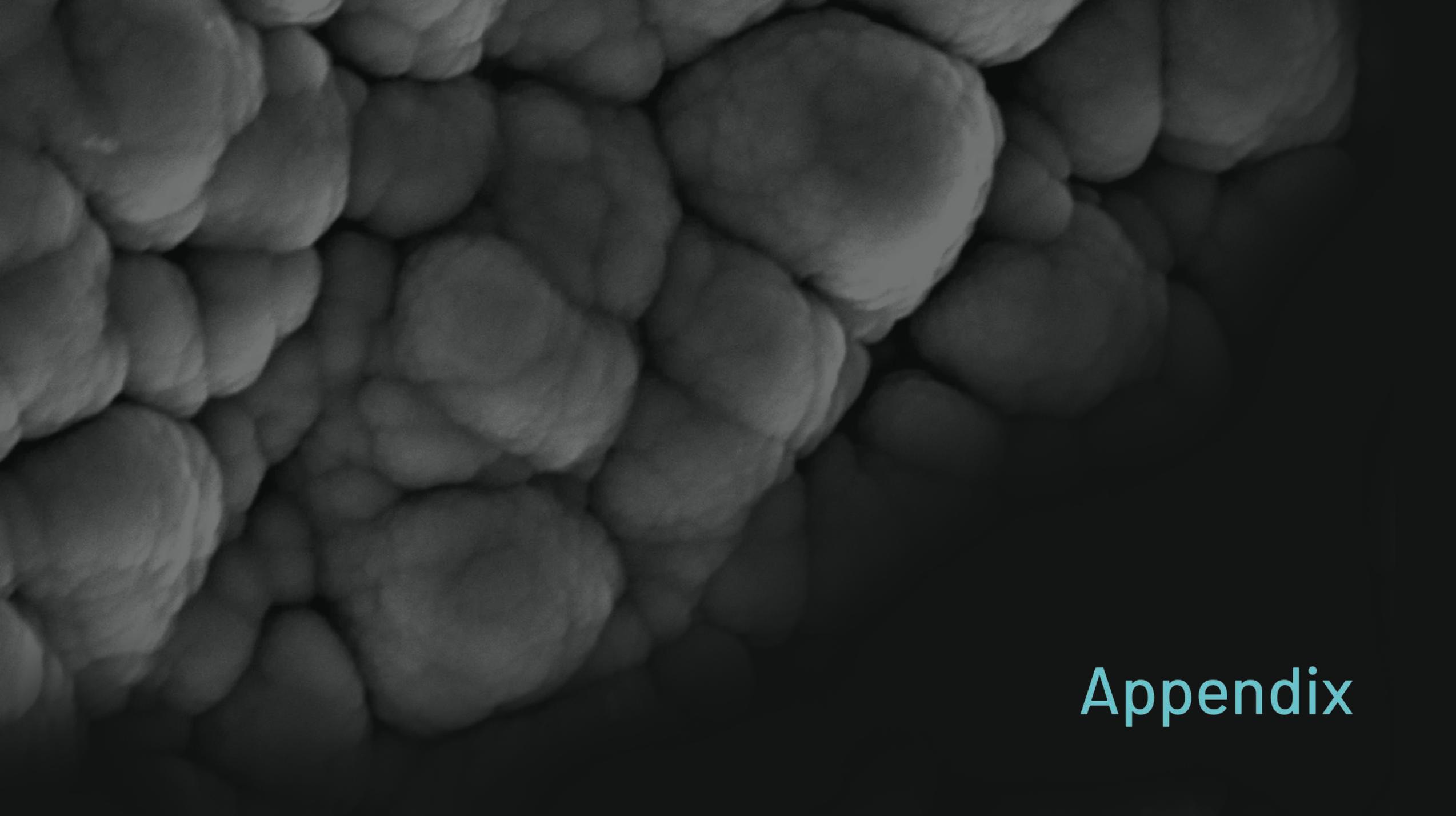


Information / Data
Product Development
Samples





LeydenJar



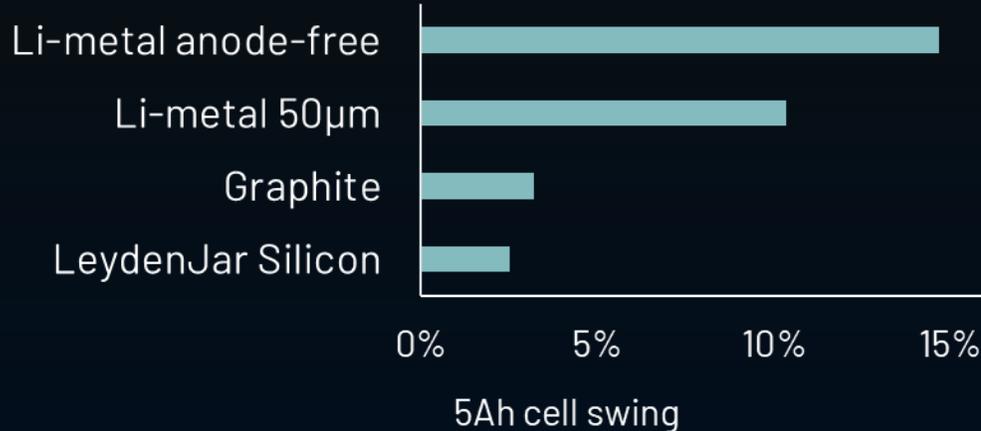
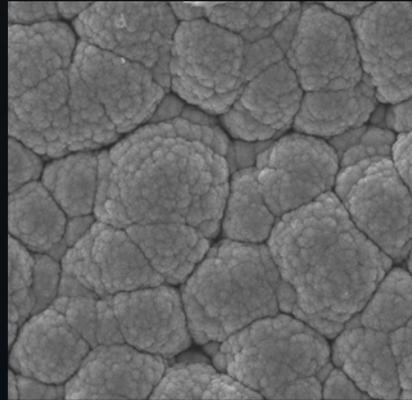
Appendix



Swelling

Swing (0-100% SOC)

LeydenJar's unique porous morphology accommodates material breathing during cycling, limiting expansion in z-direction.



Swelling (cycle 1 - EOL)

Absolute cell thickness change ~15%

Decreasing cell swelling to <10% in 2025:

- Electrolyte optimization
- Anode morphology
- Surface engineering

High temp swelling

Tailored electrolytes enable <10% gaseous swelling after long-term storage at 60°C

