

TROY TECHNICAL

ALL-SOLID-STATE BATTERIES

WEEKLY REPORT

October 10 - October 16, 2026 | Issue 2026-W41

**Interface stability, manufacturability, safety
and automotive qualification**

12

ANALYZED ARTICLES

8

PRIORITY THEMES

Issued 2026-10-16 | English edition | fixed approved cover artwork



All-Solid-State Batteries: the boundary moved from isolated claims to qualification evidence

12 English articles were reviewed independently from the Japanese edition. Ten themes are retained for management decisions.

SIGNAL 01 | TECH / PROCESS

SPEARS Batteries: NASA's Solid-State Power for Lunar Missions

NASA tested small SPEARS prototype cells in thermal vacuum. They operated from +80 C to -60 C, with reduced performance at -80 C. Survival after exposure from +100 C to -170 C is not operation at -170 C; reheating is required.

SIGNAL 02 | BUSINESS / RULES

PLAP Electrolyte: Prelithiated PU/LAGP Specs for ASSLBs

Primary-source report: Researchers have developed a rigid-flexible composite electrolyte (PLAP) using a prelithiated polyurethane matrix and LAGP fillers to overcome the trade-off between ionic conductivity and mechanical robustness.

SIGNAL 03 | BUSINESS / RULES

Greater Bay Technology: GWh-scale all-solid-state battery specs

Collected report (not independently verified): Greater Bay Technology has commissioned the industry's first gigawatt-hour-scale all-solid-state battery production line, retrofitted from existing capacity.

SIGNAL 04 | SYSTEM / ADOPTION

SOLiD Project: Scaling Solid-State Lithium-Metal Battery Production

Collected report (not independently verified): The EU-funded SOLiD project is developing a sustainable pilot-scale manufacturing process for solid-state lithium-metal batteries to increase energy density by up to 70% over lithium-ion.

DECISION

Focus this week's management attention on interface stability, manufacturability, safety and automotive qualification. Move only when the linked evidence can be reproduced under your own operating conditions.

THREE MANAGEMENT MOVES

1. Buyers: compare cell evidence under practical loading, pressure, temperature and cycle conditions.
2. Suppliers: show powder, interface and process consistency together with scale and cost.
3. Executives: track loading, pressure, interface resistance, yield, safety, capacity and timing.

EVIDENCE DISCIPLINE

FACT states what the collected English source reports. BUSINESS READ and ACTION are editorial interpretations. UNKNOWN lists information that the source file does not establish. A linked article is not treated as independent confirmation of every claim.

Five numbers or evidence anchors that require conditions

-80 C A08	SOURCE-BOUND CONDITION NASA prototype; reduced-performance operation
-170 C A08	SOURCE-BOUND CONDITION NASA exposure survival, not operation
3.8×10^{-4} A03	SOURCE-BOUND CONDITION PLAP room-temperature conductivity; S/cm
480 Wh/ kg A07 / A12	SOURCE-BOUND CONDITION Greater Bay cell claim; primary check needed
OPEN A08 / A11	SOURCE-BOUND CONDITION Application-specific temperature-dependent efficiency, reproducibility and deployment terms remain unproven. Published claims are not customer-qualified performance.

HOW TO USE THESE NUMBERS

Each value is shown with the condition stated in the collected English article. Do not compare values across different test methods, device sizes, operating temperatures or commercial stages without normalizing those conditions.

Where the value chain moved

Each stage combines one leading theme and one supporting theme. The report treats handoffs as evidence transfers, not decorative arrows.

1

Electrolyte
P01/P06

NASA tested small SPEARS prototype cells in thermal vacuum.

2

Electrode interface
P02/P07

Primary-source report: Researchers have developed a rigid-flexible composite electrolyte (PLAP) using a prelithiated polyurethane matrix and LAGP fillers to overcome the trade-off between ionic conductivity and mechanical robustness.

3

Cell process
P03/P08

Collected report (not independently verified): Greater Bay Technology has commissioned the industry's first gigawatt-hour-scale all-solid-state battery production line, retrofitted from existing capacity.

4

Validation
P04/P01

Collected report (not independently verified): The EU-funded SOLiD project is developing a sustainable pilot-scale manufacturing process for solid-state lithium-metal batteries to increase energy density by up to 70% over lithium-ion.

5

Vehicle deployment
P05/P02

Collected report (not independently verified): Researchers have developed a dendrite-sensing composite solid electrolyte (DSSE) that converts the first contact of a lithium dendrite into a macroscopic electrical signal.

EVIDENCE REQUIRED AT EACH HANDOFF

Electrolyte to Electrode interface	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.
Electrode interface to Cell process	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.
Cell process to Validation	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.
Validation to Vehicle deployment	Transfer test conditions, acceptance criteria, failure data, owner and decision date. Recheck loading, pressure, interface resistance, yield, safety, capacity and timing.

COMMON CONTROL POINT

No theme moves to a commercial commitment until a named owner has reproduced the relevant evidence and documented loading, pressure, interface resistance, yield, safety, capacity and timing.

Priority map: maturity and next decision locus



REPRODUCIBLE POSITIONING RULE
Horizontal position uses five discrete stages: Research, Prototype, Joint evaluation, Product adoption and Scale. The vertical bands classify the next decision locus: Tech / process, System / adoption, or Business / rules (including supply systems). Article-title cues take precedence; the overview is used only when the title is silent. These are categories, not impact ranks. Bubble diameter reflects the editorial score.

For legibility, scores of 18 or below use an 18-pt bubble diameter; underlying scores are unchanged.

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P01

SPEARS Batteries: NASA's Solid-State Power for Lunar Missions

A08 / A11 | Tech / process | Prototype

2026-10-14

FACT

NASA tested small SPEARS prototype cells in thermal vacuum. They operated from +80 C to -60 C, with reduced performance at -80 C. Survival after exposure from +100 C to -170 C is not operation at -170 C; reheating is required.

WHY IT MATTERS

In practical terms, SPEARS Batteries needs separate tests of duty-cycle aging and temperature-dependent efficiency before the result becomes an adoption case.

BUSINESS READ

For SPEARS Batteries, compare duty-cycle aging and temperature-dependent efficiency under the same application conditions. Request source protocols before extrapolating to customer use. This is an editorial inference.

ACTION

Within 30 days, R&D and quality should compare SPEARS Batteries on duty-cycle aging against a baseline; deliver an acceptance and stop-rule sheet.

UNKNOWN

Application-specific temperature-dependent efficiency, reproducibility and deployment terms remain unproven. Published claims are not customer-qualified performance.

EDITORIAL SCORE 17/25 | MATURITY 2/5 | DECISION LOCUS: TECH / PROCESS

P02

PLAP Electrolyte: Prelithiated PU/LAGP Specs for ASSLBs

A03 | Business / rules | Prototype

2026-10-09

FACT

Primary-source report: Researchers have developed a rigid-flexible composite electrolyte (PLAP) using a prelithiated polyurethane matrix and LAGP fillers to overcome the trade-off between ionic conductivity and mechanical robustness. The material achieves a room-temperature ionic conductivity of 3.8×10^{-4} S/cm and high capacity retention in LiFePO₄ full cells, enabling fast-charging liquid-free batteries.

WHY IT MATTERS

In practical terms, PLAP Electrolyte needs separate tests of conductivity and temperature and pressure and interface conditions before the result becomes an adoption case.

BUSINESS READ

For PLAP Electrolyte, compare conductivity and temperature and pressure and interface conditions under the same application conditions. Request source protocols before extrapolating to customer use. This is an editorial inference.

ACTION

Within 30 days, R&D and quality should compare PLAP Electrolyte on conductivity and temperature against a baseline; deliver an acceptance and stop-rule sheet.

UNKNOWN

Application-specific pressure and interface conditions, reproducibility and deployment terms remain unproven. Published claims are not customer-qualified performance.

EDITORIAL SCORE 17/25 | MATURITY 2/5 | DECISION LOCUS: BUSINESS / RULES

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P03

Greater Bay Technology: GWh-scale all-solid-state battery specs

A07 / A12 | Business / rules | Product adoption

2026-10-15

FACT

Collected report (not independently verified): Greater Bay Technology has commissioned the industry's first gigawatt-hour-scale all-solid-state battery production line, retrofitted from existing capacity. The cells are the first to be certified under the national GB/T 48093.1-2026 standard, demonstrating high thermal stability and energy densities up to 480 Wh/kg.

WHY IT MATTERS

In practical terms, Greater Bay Technology needs separate tests of stack pressure and ionic conductivity before the result becomes an adoption case.

BUSINESS READ

For Greater Bay Technology, compare stack pressure and ionic conductivity under the same application conditions. Request source protocols before extrapolating to customer use. This is an editorial inference.

ACTION

Within 30 days, R&D and quality should compare Greater Bay Technology on stack pressure against a baseline; deliver an acceptance and stop-rule sheet.

UNKNOWN

Application-specific ionic conductivity, reproducibility and deployment terms remain unproven. Confirm the original primary record.

EDITORIAL SCORE 17/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

P04

SOLiD Project: Scaling Solid-State Lithium-Metal Battery Production

A01 | System / adoption | Product adoption

2026-10-09

FACT

Collected report (not independently verified): The EU-funded SOLiD project is developing a sustainable pilot-scale manufacturing process for solid-state lithium-metal batteries to increase energy density by up to 70% over lithium-ion. By integrating dry extrusion coating and AI-driven digital twins, the project aims to move solid-state technology from the lab to industrial-scale production for electric vehicles.

WHY IT MATTERS

In practical terms, SOLiD Project needs separate tests of stack pressure and ionic conductivity before the result becomes an adoption case.

BUSINESS READ

For SOLiD Project, compare stack pressure and ionic conductivity under the same application conditions. Request source protocols before extrapolating to customer use. This is an editorial inference.

ACTION

Within 30 days, R&D and quality should compare SOLiD Project on stack pressure against a baseline; deliver an acceptance and stop-rule sheet.

UNKNOWN

Application-specific ionic conductivity, reproducibility and deployment terms remain unproven. Confirm the original primary record.

EDITORIAL SCORE 17/25 | MATURITY 4/5 | DECISION LOCUS: SYSTEM / ADOPTION

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P05

DSSE: Dendrite-Sensing Composite Solid Electrolyte Explained

A02 | Tech / process | Prototype

2026-10-12

FACT

Collected report (not independently verified):
Researchers have developed a dendrite-sensing composite solid electrolyte (DSSE) that converts the first contact of a lithium dendrite into a macroscopic electrical signal. This intrinsic sensing mechanism allows battery management systems to detect potential internal shorts before thermal runaway occurs.

WHY IT MATTERS

In practical terms, DSSE needs separate tests of conductivity and temperature and pressure and interface conditions before the result becomes an adoption case.

BUSINESS READ

For DSSE, compare conductivity and temperature and pressure and interface conditions under the same application conditions. Request source protocols before extrapolating to customer use. This is an editorial inference.

ACTION

Within 30 days, R&D and quality should compare DSSE on conductivity and temperature against a baseline; deliver an acceptance and stop-rule sheet.

UNKNOWN

Application-specific pressure and interface conditions, reproducibility and deployment terms remain unproven. Confirm the original primary record.

EDITORIAL SCORE 14/25 | MATURITY 2/5 | DECISION LOCUS: TECH / PROCESS

P06

Changan and CATL: 75 GWh battery roadmap and SSB specs

A09 | Business / rules | Product adoption

2026-10-14

FACT

Collected report (not independently verified):
Changan and CATL are expanding their joint venture to reach 75 GWh of battery production capacity and collaborate on solid-state and sodium-ion cells. The partnership includes a 5 billion yuan investment in a new facility to support Changan's NEV brands and enable vehicle ranges exceeding 1,500 km.

WHY IT MATTERS

In practical terms, Changan and CATL needs separate tests of stack pressure and ionic conductivity before the result becomes an adoption case.

BUSINESS READ

For Changan and CATL, compare stack pressure and ionic conductivity under the same application conditions. Request source protocols before extrapolating to customer use. This is an editorial inference.

ACTION

Within 30 days, R&D and quality should compare Changan and CATL on stack pressure against a baseline; deliver an acceptance and stop-rule sheet.

UNKNOWN

Application-specific ionic conductivity, reproducibility and deployment terms remain unproven. Confirm the original primary record.

EDITORIAL SCORE 17/25 | MATURITY 4/5 | DECISION LOCUS: BUSINESS / RULES

FACT is source-bound. BUSINESS READ, ACTION and UNKNOWN are explicit editorial layers.

P07

Greenway Semi-Solid-State Batteries: Specs and 2026 Roadmap

A10 | Business / rules | Research

2026-10-15

FACT

Collected report (not independently verified): Guangdong Greenway Technology has delivered semi-solid-state battery packs to off-road electric motorcycle brand Surron. The company has also completed cell-level validation for a dry-process sulfide all-solid-state battery, signaling a dual-track approach to commercialization and R&D.

WHY IT MATTERS

In practical terms, Greenway Semi-Solid-State Batteries needs separate tests of stack pressure and ionic conductivity before the result becomes an adoption case.

BUSINESS READ

For Greenway Semi-Solid-State Batteries, compare stack pressure and ionic conductivity under the same application conditions. Request source protocols before extrapolating to customer use. This is an editorial inference.

ACTION

Within 30 days, R&D and quality should compare Greenway Semi-Solid-State Batteries on stack pressure against a baseline; deliver an acceptance and stop-rule sheet.

UNKNOWN

Application-specific ionic conductivity, reproducibility and deployment terms remain unproven. Confirm the original primary record.

EDITORIAL SCORE 15/25 | MATURITY 1/5 | DECISION LOCUS: BUSINESS / RULES

P08

ProLogium Solid-State Battery: 381 Wh/kg Specs and AI Data Center Pivot

A06 | System / adoption | Scale-up

2026-10-11

FACT

Collected report (not independently verified): ProLogium has commenced mass production of its Generation 3.5 lithium-ceramic battery (LCB) at a Giga-level facility in Taiwan as of September 2, 2026. The cells achieve a gravimetric energy density of 381 Wh/kg, positioning the technology for deployment in AI data centers, aerospace, and maritime sectors.

WHY IT MATTERS

In practical terms, ProLogium Solid-State Battery needs separate tests of stack pressure and ionic conductivity before the result becomes an adoption case.

BUSINESS READ

For ProLogium Solid-State Battery, compare stack pressure and ionic conductivity under the same application conditions. Request source protocols before extrapolating to customer use. This is an editorial inference.

ACTION

Within 30 days, R&D and quality should compare ProLogium Solid-State Battery on stack pressure against a baseline; deliver an acceptance and stop-rule sheet.

UNKNOWN

Application-specific ionic conductivity, reproducibility and deployment terms remain unproven. Confirm the original primary record.

EDITORIAL SCORE 17/25 | MATURITY 5/5 | DECISION LOCUS: SYSTEM / ADOPTION

Playbook and 0-5 year roadmap

STAKEHOLDER	NOW 0-30 DAYS	NEXT 1-12 MONTHS	LATER 1-5 YEARS
Operating companies	compare cell evidence under practical loading, pressure, temperature and cycle conditions	Run production-like qualification with explicit acceptance and stop criteria.	Build a portfolio and architecture that can absorb technology and supplier changes.
Materials, equipment and technology suppliers	show powder, interface and process consistency together with scale and cost	Create shared reliability, process-window and failure-analysis data with customers.	Standardize interfaces, traceability, lifecycle support and recovery services.
Trading, investment and legal teams	Map loading, pressure, interface resistance, yield, safety, capacity and timing.	Contract for capacity, quality, change notice, liability, alternatives and exit.	Diversify regional, technical and customer concentration risk.

ROADMAP

NOW 0-30 DAYS Evidence ledger Owner: Strategy + quality Deliverable: claim, source, condition, owner	NOW 0-30 DAYS Risk screen Owner: Procurement + legal Deliverable: unknowns, alternatives, stop	NEXT 1-12 MONTHS Joint qualification Owner: R&D + supplier Deliverable: process window and failure data
NEXT 1-12 MONTHS Commercial gate Owner: Business + finance Deliverable: unit economics and capacity	LATER 1-5 YEARS Platform strategy Owner: Executive team Deliverable: portfolio and interface roadmap	LATER 1-5 YEARS Service layer Owner: Operations + channel Deliverable: monitoring, maintenance and recovery

GO / NO-GO GATES

GATE	OWNER	REQUIRED EVIDENCE	NO-GO CONDITION
G1 Evidence	Quality	Source, test conditions and reproducibility	No traceable evidence
G2 Integration	R&D	Interface, process window and failure analysis	Cannot meet system conditions
G3 Commercial	Business	Capacity, total cost, contract and alternatives	Economics or supply cannot be supported
G4 Lifecycle	Operations	Monitoring, maintenance, change notice and exit	No accountable operating plan

ANALYZED ARTICLES | ITEMS 01-12

Every title and URL is displayed in full. URLs wrap without shortening and remain clickable. A verified-reference label means the translated HTML did not retain its original source URL.

ID	FULL ARTICLE TITLE	FULL SOURCE / VERIFIED REFERENCE URL - CLICKABLE
A01	SOLiD Project: Scaling Solid-State Lithium-Metal Battery Production	https://www.innovationnewsnetwork.com/solid-scaling-european-manufacturing-of-solid-state-lithium-metal-batteries/72552/
A02	DSSE: Dendrite-Sensing Composite Solid Electrolyte Explained	https://bioengineer.org/battery-electrolyte-that-feels-dendrites-coming-before-disaster-strikes/
A03	PLAP Electrolyte: Prelithiated PU/LAGP Specs for ASSLBs	https://www.frontiersin.org/journals/chemistry/articles/10.3389/fchem.2026.1908013/full
A04	All-Solid-State Batteries: China's 2030 Roadmap and Technical Barriers	https://eu.36kr.com/en/p/4019304011976585
A05	Toyota Solid-State Batteries: Mass Production and 2027 Timeline	https://www.bangladeshist.com/toyota-solid-state-ev-battery-enters-early-mass-production-1j94
A06	ProLogium Solid-State Battery: 381 Wh/kg Specs and AI Data Center Pivot	https://tech-insider.org/prologium-381-wh-kg-solid-state-battery-ai-2026/
A07	Greater Bay Technology: GWh-scale all-solid-state battery specs	https://autonews.gasgoo.com/articles/news/greater-bay-technology-commissions-gwh-scale-all-solid-state-battery-production-line-2110549317063766016
A08	SPEARS Batteries: NASA's Solid-State Power for Lunar Missions	https://www.nasa.gov/centers-and-facilities/langley/nasa-develops-batteries-to-power-humanitys-return-to-moon/
A09	Changan and CATL: 75 GWh battery roadmap and SSB specs	https://carnewschina.com/2026/10/14/changan-and-catl-to-collaborate-on-1500-km-solid-state-cells-establish-75-gwh-battery-lines/
A10	Greenway Semi-Solid-State Batteries: Specs and 2026 Roadmap	https://www.energytrend.com/news/20261015-52290.html
A11	NASA SPEARS Battery: Lunar Solid-State Prototype Specs and Tests	https://www.energytrend.com/news/20261016-52298.html
A12	Guangzhou Greater Bay Technology: All-Solid-State Battery Specs	http://nansha.guangdong.chinadaily.com.cn/2026-10/14/c_1219372.htm

Scope: retrieving a source does not independently validate performance, cost or clinical utility. The claim ledger distinguishes announcements, papers and secondary reporting. Material published before the reporting week is continuing context, not a new event. Editorial inferences and actions are not investment or medical advice.

SolidStateBattery — Selected Articles

Date: 2026-10-18

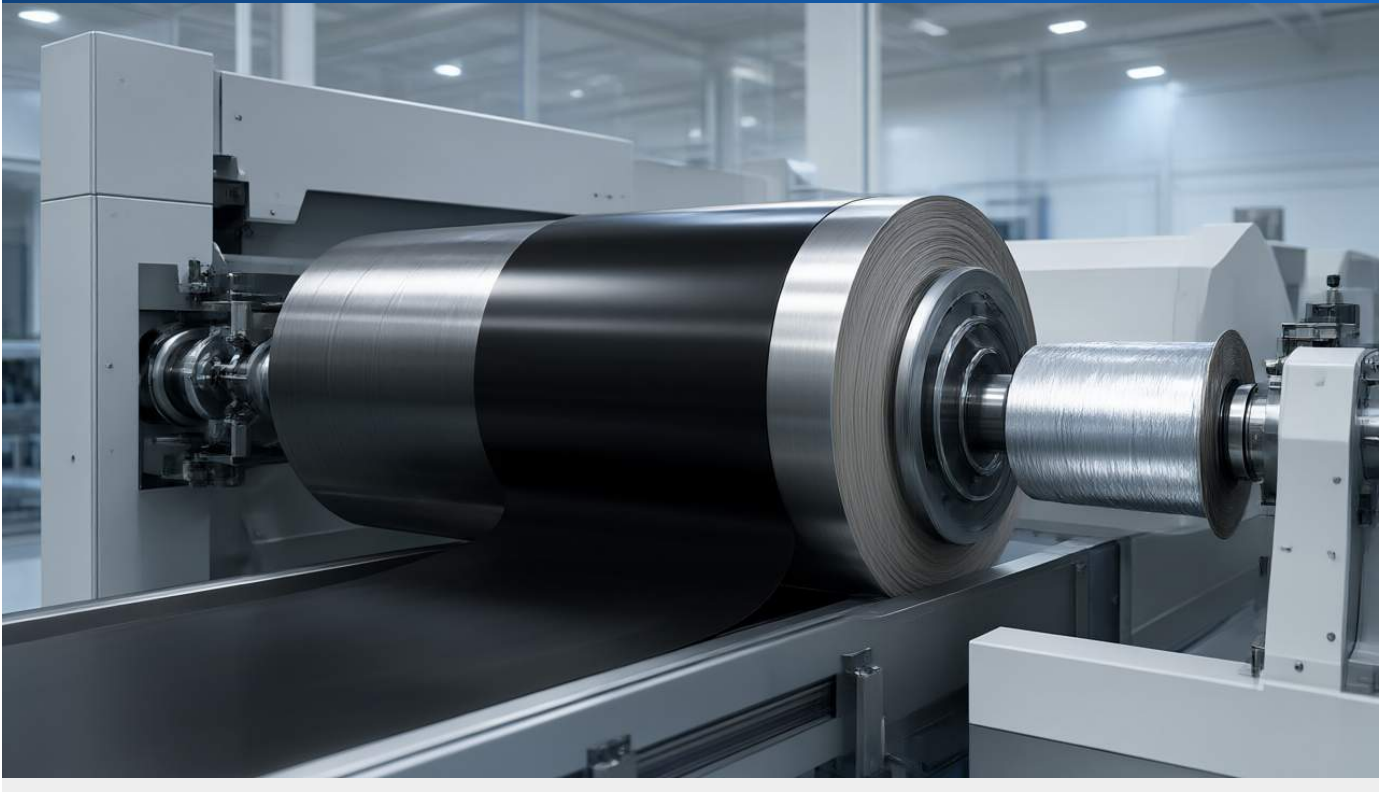
Articles: 12

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#01 SOLiD Project: Scaling Solid-State Lithium-Metal Battery Production

Published October 09, 2026 EU Research & Innovation Europe



OVERVIEW

The EU-funded SOLiD project is developing a sustainable pilot-scale manufacturing process for solid-state lithium-metal batteries to increase energy density by up to 70% over lithium-ion. By integrating dry extrusion coating and AI-driven digital twins, the project aims to move solid-state technology from the lab to industrial-scale production for electric vehicles.

Key Findings

The SOLiD project has achieved breakthroughs in electrode dry processing, polymer electrolyte formulation, and digital quality control to enable the industrial scaling of solid-state lithium-metal batteries (SSBs). A primary technical milestone is the development of PESDA, a polyester-based electrolyte formulation unveiled by mid-2025 that retains 95% of capacity after 120 cycles in prototype cells and exhibits tensile yields up to 250% before failure.

Technical Details

To eliminate toxic solvents and energy-intensive drying, SOLiD is implementing roll-to-roll (R2R) dry extrusion coating. This process blends active cathode material, polymer binder electrolyte, and conductive additives into uniform films. The use of ALD-protected NMC811 allows this dry extrusion to occur under ambient conditions, removing the requirement for a dry room.

On the anode side, the project has scaled pulsed laser deposition (PLD) to create a lithium layer thinner than 10 micrometres, topped with a protective lithium-alloy layer to prevent dendrite formation. For quality assurance, the project integrated smart inspection tools—including particle detection, optical monitoring, and electrochemical impedance spectroscopy—into a digital twin. This AI-driven system links inspection data to process control to reduce defects and improve yields.

Background & Context

Launched in September 2022, SOLiD consists of 13 partners across eight countries. The project addresses the limitations of traditional lithium-ion batteries, such as the volatility of liquid electrolytes and the reliance on cobalt. By replacing graphite with lithium metal anodes and utilizing solid polymers, these SSBs can store up to 70% more energy in the same volume while reducing fire risks and dependence on critical raw materials.

Significance & Outlook

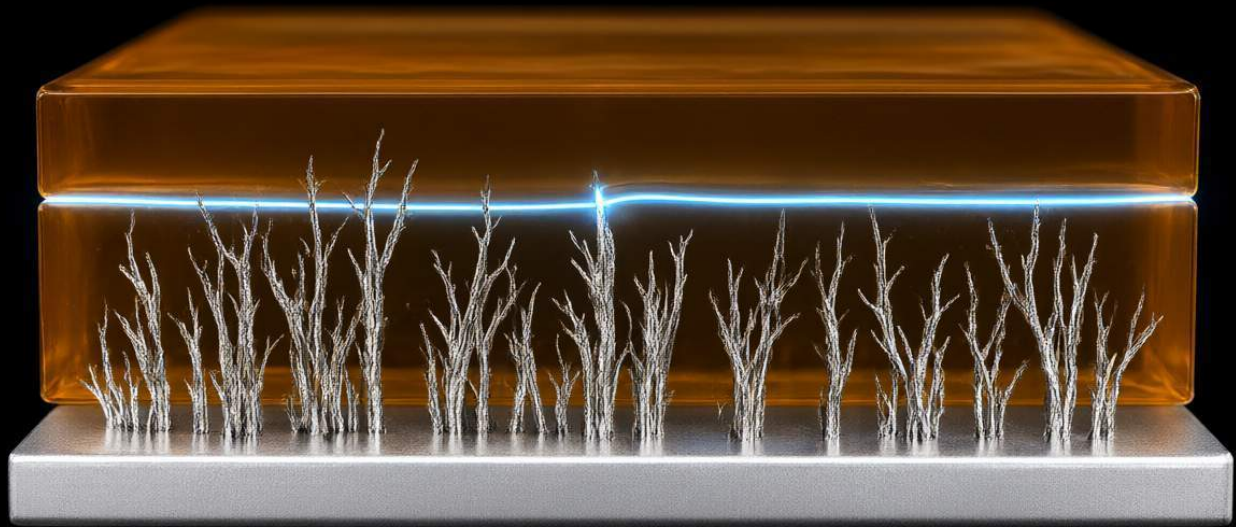
The transition to pilot-scale production is already underway, with validated roll-to-roll PLD-deposited lithium in coin cells and ALD-processed cathode materials at kilo scale. These advancements provide a roadmap for European battery sovereignty, offering a template for future gigafactories to produce safer, lighter, and more energy-efficient batteries for the EV market.

Source: <https://www.innovationnewsnetwork.com/solid-scaling-european-manufacturing-of-solid-state-lithium-metal-batteries/72552/>

Collected: October 17, 2026 | Automated Research System (AI)

#02 DSSE: Dendrite-Sensing Composite Solid Electrolyte Explained

Published October 12, 2026 BIOENGINEER.ORG USA



OVERVIEW

Researchers have developed a dendrite-sensing composite solid electrolyte (DSSE) that converts the first contact of a lithium dendrite into a macroscopic electrical signal. This intrinsic sensing mechanism allows battery management systems to detect potential internal shorts before thermal runaway occurs.

Key Findings

A research team from the Institute of Chemistry of the Chinese Academy of Sciences, the University of Chinese Academy of Sciences, and the Ningbo Institute of Materials Technology and Engineering has developed a dendrite-sensing composite solid electrolyte (DSSE). Unlike traditional methods that attempt to physically block lithium dendrites, the DSSE acts as an intrinsic sensor that detects dendrite penetration and triggers a voltage-based signal in the external circuit before a hard short circuit occurs.

Technical Details

The DSSE is a composite solid electrolyte combining inorganic ceramic ion conductors with polymer matrices to balance high ionic conductivity with interfacial compliance. The system utilizes "selective interfacial reactivity," meaning the material remains electrochemically stable during normal cycling but reacts specifically when encountered by penetrating lithium dendrites. This chemo-to-electrical transduction transforms the battery's own voltage trace into a diagnostic readout. Because commercial battery management systems already monitor cell voltage, they can recognize this specific signature to flag cells for shutdown or inspection without requiring additional internal hardware.

Background & Context

Lithium metal batteries offer higher energy density but are prone to the growth of dendrites—needle-like filaments that can bridge electrodes and cause thermal runaway. Previous detection strategies have relied on indirect signals such as pressure, temperature, gas evolution, or invasive hardware like optical fibers and flexible sensors. The DSSE approach differs by making the sensing capability intrinsic to the electrolyte's core architecture, removing the need for external components that could fail or complicate manufacturing.

Significance & Outlook

By repurposing interfacial reactivity—typically viewed as a liability—into a sensing opportunity, the researchers have created a "nervous system" for the battery cell. This paradigm shift allows for the direct detection of heterogeneous dendrite growth at the exact site of occurrence, providing a critical window for intervention to prevent catastrophic battery failure in applications such as electric vehicles, laptops, and phones.

Source: <https://bioengineer.org/battery-electrolyte-that-feels-dendrites-coming-before-disaster-strikes/>

Collected: October 17, 2026 | Automated Research System (AI)

#03 PLAP Electrolyte: Prelithiated PU/LAGP Specs for ASSLBs

Published October 09, 2026 Frontiers in Chemistry China



OVERVIEW

Researchers have developed a rigid-flexible composite electrolyte (PLAP) using a prelithiated polyurethane matrix and LAGP fillers to overcome the trade-off between ionic conductivity and mechanical robustness. The material achieves a room-temperature ionic conductivity of 3.8×10^{-4} S/cm and high capacity retention in LiFePO₄ full cells, enabling fast-charging liquid-free batteries.

Key Findings

The prelithiated PU/LAGP (PLAP) composite electrolyte achieves a room-temperature ionic conductivity of 3.8×10^{-4} S/cm. In symmetrical cell testing, the electrolyte demonstrated stable cycling for 750 hours at an ultrahigh current density of 10 mA cm⁻². When integrated into LiFePO₄(LFP)|PLAP|Li full cells, the system maintained capacity retentions of 95.7%, 91%, and 87.8% during cycles at 0.2 C, C, and 2C, respectively.

Technical Details

The PLAP electrolyte utilizes a customized soft-hard segmented architecture combining a prelithiated polyurethane (PU) matrix with Li_{1.5}Al_{0.5}Ge_{0.5}P₃O₁₂ (LAGP) fillers. This structure provides significant mechanical strength, specifically a tensile strength of 5.47 MPa and 192.4% elongation.

Computational and spectroscopic analyses indicate that terminal-group prelithiation ($-\text{OH} \rightarrow -\text{OLi}$) reduces the interfacial Li⁺ binding energy from 1.01 eV to 0.55 eV. This reduction is proposed to liberate trapped Li⁺ ions, facilitating faster ion transport. These results were validated by comparing the PLAP electrolyte against a non-prelithiated $-\text{OH}$ -terminated PU/LAGP baseline under identical formulation and testing conditions.

Background & Context

The practical deployment of all-solid-state lithium batteries (ASSLBs) has been hindered by two primary factors: the compromise between mechanical robustness and ionic conductivity, and sluggish interfacial transport caused by "ion trapping." The development of the PLAP electrolyte specifically targets these bottlenecks by integrating a rigid-flexible network with a chemical modification to the polymer matrix.

Significance & Outlook

By utilizing a prelithiation-driven design to attenuate binding energy and liberate trapped ions, this approach provides a viable pathway for the development of highly durable, fast-charging, and liquid-free all-solid-state lithium-metal batteries.

Source: <https://www.frontiersin.org/journals/chemistry/articles/10.3389/fchem.2026.1908013/full>

Collected: October 17, 2026 | Automated Research System (AI)

#04 All-Solid-State Batteries: China's 2030 Roadmap and Technical Barriers

Published October 10, 2026 36氪 China



OVERVIEW

China has integrated all-solid-state batteries into its first national-level special plan, targeting large-scale application by 2030. While semi-solid-state batteries are already entering the market, full solid-state production faces critical hurdles in interface impedance, lithium dendrites, and manufacturing costs.

Key Findings

On September 28, 2026, seven Chinese government departments, including the Ministry of Industry and Information Technology and the National Development and Reform Commission, issued the "15th Five-Year Plan for the Development of the New-Type Battery Industry" (MIIT Joint Regulation No. 220 [2026]). This plan establishes a national timetable for all-solid-state batteries to achieve initial large-scale application by 2030. Additionally, the plan sets rigid indicators for long-life lithium batteries to reach 15,000 cycles and for leading enterprises to reduce product defect rates to the PPB (parts per billion) level.

Technical Details

The transition to all-solid-state technology is currently bridged by hybrid solid-liquid (semi-solid) batteries. However, all-solid-state cells face three primary technical barriers:

- **Interface Impedance:** Interface impedance accounts for 60–80% of total impedance. High voltage on the cathode side causes electrolyte oxidation and decomposition, while lithium metal on the anode drives reduction, creating high-resistance layers.
- **Lithium Dendrites:** Maintaining contact in sulfide electrolytes requires 50–150MPa of external pressure; insufficient pressure leads to contact failure, while excessive pressure can induce dendrite penetration.
- **Manufacturing Costs:** Sulfide electrolytes react with water and oxygen to produce toxic hydrogen sulfide, requiring production line dew points below -40°C or -70°C . Equipment investment per GWh is 2–3 times higher than liquid lines. Initial all-solid-state cell costs are estimated at over 2 or 3 yuan/Wh, compared to less than 0.5 yuan/Wh for lithium iron phosphate cells.

Background & Context

Market adoption of transitional technologies is already visible. The new generation MG4 utilizes second-generation semi-solid-state batteries, and NIO began operating a 150kWh battery pack (360Wh/kg supplied by Welan New Energy) in June 2024. In contrast, Toyota and Nissan have set mass production timelines for solid-state battery vehicles in 2028. Despite these challenges, sulfide solid electrolyte costs have dropped from 20 million yuan per ton to less than 1 million yuan per ton since the start of this year, and 60Ah-class all-solid-state cells have begun rolling off pilot production lines.

Significance & Outlook

The shift from liquid to solid electrolytes removes fluidity, meaning any loss of contact on the interface film is permanent. Overcoming these scaling effects and manufacturing costs will determine the industry leaders for the next decade.

Source: <https://eu.36kr.com/en/p/4019304011976585>

Collected: October 17, 2026 | Automated Research System (AI)

#05 Toyota Solid-State Batteries: Mass Production and 2027 Timeline

Published October 10, 2026 Bangladeshist (citing Toyota) বাংলাদেশ



OVERVIEW

Toyota and Panasonic have entered early mass production of commercial solid-state EV batteries at a retooled facility in Toyota City. The technology enables a range of up to 750 miles and 10% to 80% charging in under ten minutes, targeting a global market release by late 2027.

Key Findings

Toyota has officially transitioned its commercial solid-state EV battery technology from the laboratory to the factory floor. In partnership with Panasonic, the company has stabilized the production of solid-electrolyte cells at a newly retooled facility located in Toyota City. This production milestone establishes the foundation for a new generation of electric vehicles scheduled to reach global showrooms by late 2027.

Technical Details

The shift from liquid to solid electrolytes provides significant improvements in energy density and thermal safety. Key specifications include:

- **Energy Density:** The new cells can store approximately twice the energy of lithium-ion packs of a similar size.
- **Vehicle Range:** Upcoming flagship sedans are expected to travel up to 750 miles on a single charge.
- **Charging Performance:** Using a 350-kilowatt DC fast charger, first-generation packs can charge from 10 percent to 80 percent capacity in under ten minutes.

Background & Context

Standard electric vehicles currently utilize lithium-ion batteries with liquid electrolytes to move energy between the anode and cathode. While functional, these liquid electrolytes are heavy and subject to degradation. Furthermore, they present inherent fire risks in scenarios involving severe overheating during rapid charging or if the battery casing is punctured.

Significance & Outlook

The adoption of a stable solid material as the electrolyte allows the battery to accept massive influxes of electrical current without sustaining chemical damage due to high heat resistance. By reducing charging times to a duration comparable to filling a traditional gasoline tank, Toyota addresses range anxiety, which has been a primary barrier to widespread consumer adoption of electric vehicles.

Source: <https://www.bangladeshist.com/toyota-solid-state-ev-battery-enters-early-mass-production-1j94>

Collected: October 17, 2026 | Automated Research System (AI)

#06 ProLogium Solid-State Battery: 381 Wh/kg Specs and AI Data Center Pivot

Published October 11, 2026 Tech Insider (citing ProLogium) Taiwan



OVERVIEW

ProLogium has commenced mass production of its Generation 3.5 lithium-ceramic battery (LCB) at a Giga-level facility in Taiwan as of September 2, 2026. The cells achieve a gravimetric energy density of 381 Wh/kg, positioning the technology for deployment in AI data centers, aerospace, and maritime sectors. This shift targets the critical need for high-density, non-flammable backup power to support energy-intensive GPU clusters.

Key Findings

ProLogium Technology has transitioned its market focus toward AI data centers, unmanned systems, aerospace, and maritime applications in North America, expanding beyond its original electric-vehicle customer base. This strategic pivot coincides with the start of mass production for the Generation 3.5 lithium-ceramic battery (LCB) at a Giga-level facility in Taiwan on September 2, 2026.

Technical Details

The Generation 3.5 cell is a large-format 185.4 Ah design utilizing a ceramic-based solid electrolyte to replace the flammable liquid electrolytes found in conventional lithium-ion batteries. According to third-party verification through TÜV, the cell achieves the following performance metrics:

- Gravimetric energy density: 381 Wh/kg
- Volumetric energy density: 903 Wh/L

ProLogium supports these developments with a portfolio of more than 1,100 patents covering materials, manufacturing, and solid-state battery design.

Background and Context

The push into AI infrastructure is driven by the massive power requirements of GPU clusters. AI capital expenditure for Microsoft, Meta, and Google is on pace to exceed \$725 billion in 2026. Industry leaders, including Arm CEO Rene Haas and OpenAI CEO Sam Altman, have highlighted electricity and energy infrastructure as primary bottlenecks for AI scaling. ProLogium's technology addresses these challenges by offering higher energy density, which reduces the physical footprint and weight of backup power systems.

Significance and Outlook

By replacing combustible components with ceramic electrolytes, ProLogium aims to reduce fire risks and fire-suppression costs for data center operators. If these dense cells can be installed closer to server racks than traditional battery banks, it could significantly lower real estate costs for the large-scale facilities currently being constructed by Amazon, Microsoft, and Google. While the company has prioritized the AI market, it has not yet disclosed specific contracts or delivery dates for data center customers.

Source: <https://tech-insider.org/prologium-381-wh-kg-solid-state-battery-ai-2026/>

Collected: October 17, 2026 | Automated Research System (AI)

#07 Greater Bay Technology: GWh-scale all-solid-state battery specs

Published October 15, 2026 Gasgoo China



OVERVIEW

Greater Bay Technology has commissioned the industry's first gigawatt-hour-scale all-solid-state battery production line, retrofitted from existing capacity. The cells are the first to be certified under the national GB/T 48093.1-2026 standard, demonstrating high thermal stability and energy densities up to 480 Wh/kg.

Key Findings

Greater Bay Technology has completed capacity upgrades for the mass production of all-solid-state batteries at its Nansha headquarters. The company has commissioned a gigawatt-hour-scale line that produces cells compliant with the national solid-state battery standard GB/T 48093.1-2026. According to Dong Yang, chairman of the China Automotive Power Battery Industry Innovation Alliance, these are the first solid-state batteries to roll off a mass-production line with authoritative third-party certification.

Technical Details

The batteries utilize a deep-eutectic-based composite solid electrolyte. Technical specifications and test results include:

- **Specific Energy:** Ranges from 260 to 480 Wh/kg.
- **Thermal Stability:** Third-party tests showed mass loss of less than 0.5% after being punctured and baked for six hours in a 120°C vacuum.
- **Safety Compliance:** The cells passed all safety tests under the upcoming GB 38031-2025 standard (effective July 1, 2026), including a nail-penetration test where a fully charged cell remained intact without fire or explosion.
- **Performance:** Cycle life is reported to match conventional cells, with support for stable fast charging.

Background and Context

To achieve this scale, Greater Bay Technology retrofitted and optimized portions of an existing 4 GWh liquid lithium battery line. This approach allowed the company to bridge the manufacturing gap from liquid to all-solid-state without building a new heavy-asset plant, while maintaining the flexibility to switch between the two formats. The transition from A-sample cells in April to a commissioned GWh-scale line took six months.

Significance and Outlook

The company has signed strategic pacts with Hubei Liming Lithium Industry and the Shenzhen Vertical Take-Off and Landing Aircraft Innovation Center. These partnerships are intended to accelerate the deployment of these batteries across diverse sectors, including electric vehicles, the low-altitude economy, premium energy storage, and embodied robots.

Source: <https://autonews.gasgoo.com/articles/news/greater-bay-technology-commissions-gwh-scale-all-solid-state-battery-production-line-2110549317063766016>

Collected: October 17, 2026 | Automated Research System (AI)

#08 SPEARS Batteries: NASA's Solid-State Power for Lunar Missions

Published October 14, 2026 NASA USA



OVERVIEW

NASA is developing SPEARS (Solid Power for Extreme Environment Adaptability and Resilience in Space) batteries to enable sustained human presence on the Moon. By replacing liquid electrolytes with solid ceramic or polymer materials, these batteries can survive temperatures as low as minus 274 F (minus 170 C) and operate down to minus 80 C.

Key Findings

NASA researchers have successfully demonstrated prototype battery cells that operate in extreme thermal environments. During thermal vacuum testing at the Langley Research Center, cells functioned well up to 176 F (80 C) and down to minus 76 F (minus 60 C), with slightly reduced performance observed down to minus 80 C. Crucially, the batteries sustained no damage after exposure to temperature swings ranging from 212 F (100 C) to minus 274 F (minus 170 C).

Technical Details

The SPEARS project addresses the failure points of traditional lithium-ion batteries, which rely on liquid electrolytes that freeze in extreme cold, evaporate in a vacuum, or fail at high temperatures. SPEARS utilizes a solid ceramic- or polymer-based electrolyte, providing several technical advantages:

- **Thermal Resilience:** The solid electrolyte does not freeze, allowing the battery to survive the brutal cold of the Moon's South Pole, where temperatures drop to minus 328 F (minus 200 C).
- **Operational Recovery:** While the batteries do not function at minus 274 F, they can be brought back to operational temperature using small heaters, reducing the need for heavy, continuous thermal management systems.
- **Chemical Tunability:** By varying electrode materials, the chemistry can be tuned for specific requirements such as energy, power, or durability depending on the application.

Background and Context

Led by the Glenn Research Center and supported by the Langley and Ames Research Centers, the SPEARS project began in 2026. It is funded through the Advanced Research and Technology division of the Research and Technology Mission Directorate. The project is currently focused on technology development, with Ames developing flight hardware, including electronics and test boards, to prepare for spaceflight testing.

Significance and Outlook

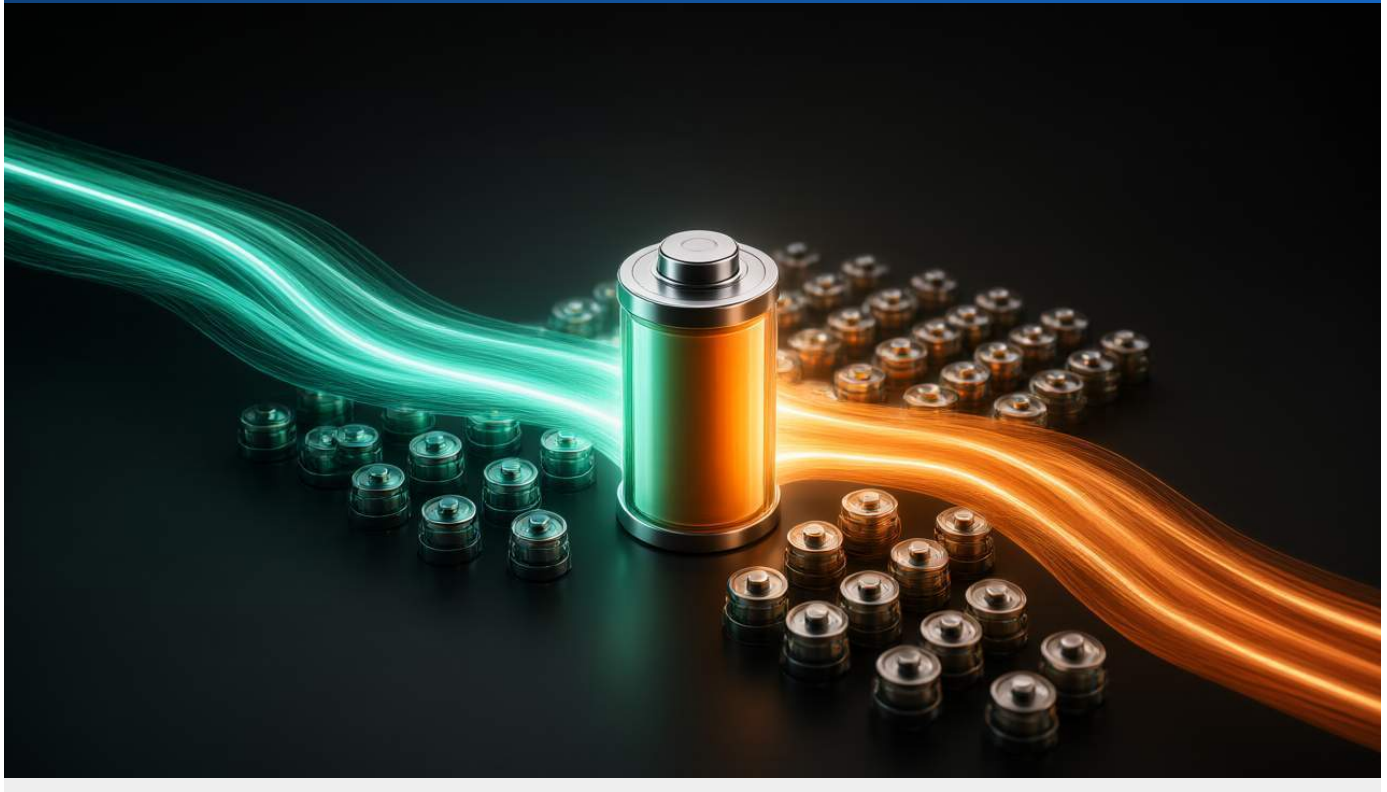
These batteries are critical for the Artemis campaign, powering everything from astronaut emergency kits and long-duration scientific instruments to rovers exploring dark lunar craters. Beyond space, the technology has potential spin-off applications for Earth-based portable power supplies, including automobiles, drones, and communication devices.

Source: <https://www.nasa.gov/centers-and-facilities/langley/nasa-develops-batteries-to-power-humanitys-return-to-moon/>

Collected: October 17, 2026 | Automated Research System (AI)

#09 Changan and CATL: 75 GWh battery roadmap and SSB specs

Published October 14, 2026 Car News China (citing Changan) China



OVERVIEW

Changan and CATL are expanding their joint venture to reach 75 GWh of battery production capacity and collaborate on solid-state and sodium-ion cells. The partnership includes a 5 billion yuan investment in a new facility to support Changan's NEV brands and enable vehicle ranges exceeding 1,500 km.

Key Findings

Changan and CATL are deepening their partnership by expanding joint battery production capacity to 75 GWh. This expansion involves a 5 billion yuan (~750 million USD) investment to establish a 700,000-square-meter facility located in a high-tech zone between Chongqing City and Sichuan Province. The new site is scheduled to begin operations in 2027, aiming to add 25 GWh of capacity within three years to complement the existing 50 GWh capacity of the CATL-Changan joint venture.

Technical Details

The collaboration focuses on solid-state batteries (SSBs) and sodium-ion cells. Changan is specifically developing "Golden Bell" (Jinzhongzhao) cells with the following specifications:

- **Energy Density:** 400 Wh/kg.
- **Range and Life:** Enables EV ranges over 1,500 km, with cell degradation remaining unnoticeable for at least 600,000 km and a life exceeding 5,000 cycles.
- **Charging:** Supports 6C charging, allowing a 30-80% charge in 9 minutes.
- **Safety:** Claimed to be 70% safer than rivals via "AI remote diagnosis technology."

The roadmap for Golden Bell cells targets vehicle road tests in 2026 and commercial production in 2027.

Background & Context

The CATL-Changan joint venture, established in 2023, currently supplies cells to Changan's NEV brands, including Avatr, Deepal, and Nevo. Beyond batteries, Changan has expressed commitment to humanoid robots and China's "low-altitude economy."

Significance & Outlook

This strategic move aims to reduce production costs for Changan, which reports earning only 68 yuan (10 USD) per car. By securing cheap in-house cells through the JV, Changan intends to mitigate the high acquisition costs of battery packs. The expansion is expected to generate annual revenue of 10 billion yuan (~1.5 billion USD), create 2,500 jobs, and contribute 300 million yuan (~45 million USD) in local tax revenue.

Source: <https://carnewschina.com/2026/10/14/changan-and-catl-to-collaborate-on-1500-km-solid-state-cells-establish-75-gwh-battery-lines/>

Collected: October 17, 2026 | Automated Research System (AI)

#10 Greenway Semi-Solid-State Batteries: Specs and 2026 Roadmap

Published October 15, 2026 Energytrend China



OVERVIEW

Guangdong Greenway Technology has delivered semi-solid-state battery packs to off-road electric motorcycle brand Surron. The company has also completed cell-level validation for a dry-process sulfide all-solid-state battery, signaling a dual-track approach to commercialization and R&D.

Key Findings

On October 14, Guangdong Greenway Technology (Greenway) held an inaugural delivery ceremony for semi-solid-state (solid-liquid hybrid) battery packs destined for electric off-road motorcycles from Chongqing Qiulong Technology (Surrón).

Simultaneously, Greenway confirmed that its proprietary dry-process all-electrode sulfide all-solid-state battery has completed cell-level validation.

Technical Details

The semi-solid-state solution is based on automotive-grade pouch cell technology modified with LATP (lithium aluminum titanium phosphate) oxide electrolyte. This system utilizes a hybrid "reduced liquid electrolyte + solid electrolyte separator membrane" to optimize existing high-power battery chemistry. At the cell level, the LATP-based large cylindrical cells feature a 34145 all-tab (tabless) design and a composite cathode, providing a single-cell capacity of 16 to 16.5 Ah. This architecture is designed to improve safety, low-temperature discharge capacity, and high-temperature cycling stability.

Regarding the all-solid-state pipeline, the dry-electrode sulfide battery retained nearly 99% capacity after 500 cycles at a 0.5C rate, operating under an external stack pressure of less than 10 MPa. Greenway is also pursuing parallel polymer and halide technical routes.

Background & Context

Greenway is an established PACK supplier for brands including Surrón and Talaria. The company is expanding its global footprint in the electric motorcycle segment; battery systems co-developed with VinFast began shipments in July 2026, while deliveries for Spiro commenced in the first quarter of 2026. To support these advancements, R&D expenditure grew by 21% year-on-year in H1 2026, focusing on sodium-ion batteries, high-voltage platforms, and modular BMS technologies.

Significance & Outlook

The company's financial performance reflects this growth, with H1 2026 operating revenue reaching 1.755 billion RMB, a 30.48% year-on-year increase. Net profit attributable to shareholders rose 101.24% to 72.4826 million RMB. These results underscore Greenway's strategic transition from liquid electrolytes toward a diversified solid-state portfolio across multiple chemical pathways.

Source: <https://www.energytrend.com/news/20261015-52290.html>

Collected: October 17, 2026 | Automated Research System (AI)

#11 NASA SPEARS Battery: Lunar Solid-State Prototype Specs and Tests

Published October 16, 2026 Energytrend USA



OVERVIEW

NASA has successfully completed thermal vacuum testing on solid-state battery prototypes capable of operating at -80°C . These batteries sustained no damage across a temperature range of -170°C to 100°C , reducing the reliance on heavy thermal management systems for lunar missions.

Key Findings

NASA has verified that its solid-state battery prototypes can operate at temperatures as low as -80°C , although performance is reduced at this limit. During thermal vacuum testing conducted at the Langley Research Center, the prototypes demonstrated stable operation between -60°C and 80°C and remained undamaged after exposure to extreme temperature fluctuations ranging from -170°C to 100°C .

Technical Details

The project, titled SPEARS (Solid Power for Extreme Environment Adaptability and Resilience in Space), is led by the Glenn Research Center. The batteries utilize ceramic or polymer-based solid-state electrolytes to overcome the limitations of traditional lithium-ion batteries. While liquid electrolytes in conventional batteries can freeze in extreme cold or volatilize in vacuum and high-temperature environments, the solid-state electrolytes used in SPEARS avoid these issues.

Despite these advantages, the batteries cannot operate directly at extreme low temperatures and require small heating devices to restore them to a suitable operating temperature.

Background and Context

The lunar South Pole presents a severe environment where nighttime temperatures can drop to approximately -200°C . Current spacecraft and lunar facilities require extensive continuous insulation and thermal management systems to protect power sources from these diurnal temperature differences. The SPEARS project aims to mitigate these requirements to lower the overall weight and cost of lunar infrastructure.

Significance and Outlook

The technology is intended to power scientific exploration equipment, astronaut emergency power supplies, and lunar rovers, ultimately extending mission operation times. SPEARS remains in the research and development stage. Moving forward, the Ames Research Center will develop related electronic equipment and test circuit boards for subsequent space environment testing. NASA also anticipates that this solid-state battery technology may eventually be applied to drones, communication equipment, and automobiles.

Source: <https://www.energytrend.com/news/20261016-52298.html>

Collected: October 17, 2026 | Automated Research System (AI)

#12 Guangzhou Greater Bay Technology: All-Solid-State Battery Specs

Published October 14, 2026 chinadaily.com.cn China



OVERVIEW

Guangzhou Greater Bay Technology has commenced mass production of China's first all-solid-state battery cell to meet the national standard released in August. The cells feature energy densities between 260 and 480 Wh/kg and are targeted for high-end EVs, the low-altitude economy, and energy storage.

Key Findings

Guangzhou Greater Bay Technology has officially rolled off the production line of the first all-solid-state battery cell in China that complies with the newly released national standard. The cell has passed authoritative testing conducted by the China Automotive Battery Research Institute Co. The company has signed strategic cooperation agreements to commercialize the technology across several sectors, including high-end electric motorcycles, computing power centers, high-end energy storage, and the low-altitude economy.

Technical Details

The all-solid-state battery cells exhibit the following technical specifications and characteristics:

- **Energy Density:** Ranges from 260 to 480 Wh/kg.
- **Performance:** Supports stable fast charging with a cycle life comparable to conventional batteries.
- **Manufacturing Path:** The company utilized deep eutectic-based composite solid electrolytes. This approach allowed for high compatibility with existing lithium battery production lines.
- **Production Scaling:** Mass production was achieved by performing targeted modifications and process optimizations on a 4 GWh production line to transition from liquid to all-solid-state manufacturing.

Background & Context

The production facility is located in the Nansha district of Guangzhou, a hub for intelligent network companies, vehicle manufacturers, and battery storage firms. According to Dong Yang, chairman of the China Automotive Battery Innovation Alliance, most solid-state batteries in China currently remain at the laboratory sample stage, making this mass production a significant step.

Significance & Outlook

Pei Feng, co-founder and president of Guangzhou Greater Bay Technology, notes that global demand for power batteries is expected to reach 3 TWh by 2030, with China projected to hold 70 percent of that market share. Within this landscape, all-solid-state batteries are expected to exceed 100 GWh by 2030. The use of deep eutectic-based composite solid electrolytes is viewed as a unique technological path that may encourage further research and application across the broader battery sector.

Source: http://nansha.guangdong.chinadaily.com.cn/2026-10/14/c_1219372.htm

Collected: October 17, 2026 | Automated Research System (AI)