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xEV

BATTERY TECHNOLOGY INNOVATION

SUMMIT USA | DETROIT | 19 NOVEMBER 2025

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1 DAY TECHNICAL AGENDA

40+ EXPERT SPEAKERS

40+ EXHIBIT SHOWCASES

400+ GLOBAL ATTENDEES

NORTH AMERICA's PREMIER TECHNICAL GATHERING OF EV BATTERY TECHNOLOGY ENGINEERS, EXPERTS AND INNOVATORS

WeAutomotive Group produce and organize some of the (EV) sectors leading conferences, summits, and exhibitions globally. What makes our events unique is the committed OEM support and a participation, that in turn ensures unparalleled attendance from all the majors from across the entire world. No similar event format in the (EV) sector has such an extensive OEM participation.

This years agenda has been diligently researched and curated with our partnering OEMs; Ford, General Motors, Stellantis, Lucid, Rivian, Toyota, Tesla, Polestar, NIO, Volkswagen and Hyundai to ensure it address the most pertinent current challenges and key investment areas. This level of detail is part of our pioneering approach to content and ensures that we attract the highest level of attendees.

xEV Advanced Battery Technology Innovation (BATTECH_USA) each year delivers an unparalleled technical-conference agenda and networking engagement – in a welcoming, and uniquely personable environment.

Attendees can expect an extensive display of groundbreaking technologies and solutions across a wide spectrum of categories. From advanced battery thermal management systems and cutting-edge battery design and integration techniques to intelligent battery management systems and state-of-the-art battery safety measures, this showcase covers it all. Explore the latest in battery components, pack assembly, and materials, including adhesives, sealing, and bonding technologies. Discover innovations in BEV architectures, sustainable lightweight solutions, and second-life opportunities. Dive into the future with beyond Li-ion and solid-state batteries, and gain insights into testing solutions, recycling, and fast charging technologies.

Additionally, this years exhibitor showcase will feature advancements in renewable energy systems, simulation and modeling, and electrification of off-road vehicles. With exhibitors presenting the latest in advanced engineering, technology solutions, and integration of electric systems, 2025's showcase is a must-attend for anyone looking to stay at the forefront of the dynamic and rapidly evolving battery industry.

The electric vehicle (EV) battery technology sector is witnessing a rapid evolution, driven by numerous groundbreaking advancements and opportunities. At the forefront are innovations in battery chemistry, where Lithium-Sulfur (Li-S) and Lithium-Air (Li-Air) batteries promise significantly higher energy densities compared to traditional lithium-ion batteries. These advancements could potentially double the range of EVs, making them more practical for long-distance travel. Additionally, solid-state batteries, which utilize solid electrolytes instead of liquid ones, offer enhanced safety, higher energy density, and faster charging times.

Energy density improvements are also crucial, with silicon anodes replacing graphite to significantly increase energy capacity, thereby extending driving ranges. High-nickel cathodes, which reduce cobalt content while increasing nickel, enhance energy density and reduce costs, making EVs more affordable.

Thermal management innovations are critical for maintaining battery performance and safety. Advanced cooling systems, including immersion cooling and phase change materials, are being developed to manage heat effectively.

Moreover, new materials and designs aimed at preventing thermal runaway events improve the overall safety of EV batteries.

Fast charging capabilities are another area of significant progress. High-voltage charging systems (such as 800V systems) drastically reduce charging times, while optimized charging protocols and advanced algorithms manage thermal and electrical loads during fast charging, ensuring batteries can handle rapid energy input without degrading.

Recycling and second-life applications are vital for sustainability. Innovations in recycling technologies aim to efficiently recover valuable materials like lithium, cobalt, and nickel. Additionally, repurposing EV batteries for use in energy storage systems once they are no longer viable for vehicle use contributes to a circular economy, extending the usefulness of battery materials.

Integration with vehicle systems is being enhanced through advanced Battery Management Systems (BMS), which monitor, control, and ensure the safety of battery packs. Wireless BMS technology eliminates the need for internal wiring, reducing weight and complexity while improving reliability. Predictive analytics, utilizing AI and machine learning, is another key advancement, allowing for better prediction of battery performance and maintenance needs, ultimately optimizing battery lifespan and performance.

Solid-state batteries continue to be a major focus, offering enhanced safety by reducing the risk of leaks and fires associated with liquid electrolytes. These batteries also promise longer life cycles due to reduced degradation over time.

Advanced manufacturing techniques, such as 3D printing and automation with robotics, are enhancing production efficiency and precision in battery assembly. These methods help optimize battery design and reduce manufacturing costs.

Sustainable materials are increasingly important, with the development of bio-based electrolytes and recyclable, non-toxic materials aimed at reducing the environmental footprint of battery production and disposal.

Emerging technologies like quantum batteries and graphene batteries hold the potential to further revolutionize the sector. Quantum batteries promise more efficient and faster charging, while graphene batteries offer improved conductivity and energy density, leading to longer-lasting batteries with quicker charge times.

These innovative areas are collectively driving the rapid evolution of EV battery technology, making electric vehicles more efficient, affordable, and environmentally friendly. The continuous advancements in this sector are crucial for the widespread adoption of electric mobility and the transition towards a more sustainable future.

You are invited to join us and over 400 automotive engineers involved in the design and implementation of digital production solutions and production data management, at **North America's largest technical conference and exhibition** for automotive smart manufacturing professionals – where experts will engage during a series of case study presentations, interactive panels, and unparalleled networking opportunities.

CONFERENCE TOPICS

- Next-Generation Cloud Architecture
- Battery Pack Design & Materials
- Sustainability In Battery Materials and Recycling
- AI And Machine Learning In Battery Technology
- AI-Powered Automated Inspection Systems For Batteries
- Joining Technologies & Solutions for Battery Systems
- Advancements In Battery Pack Design And Integration
- Battery Data And Diagnostics
- Cell-to-Pack And Alternative Battery Configurations
- Battery Data And Diagnostics
- Advanced 3D Modeling And Simulation For Battery Design
- Cybersecurity In Battery Technology And Manufacturing
- Battery Thermal Management Systems
- Innovations In Battery Assembly Processes
- AI-Powered Automated Inspection Systems For Batteries
- Cloud-Based Battery Management Systems
- Innovations In Fast Charging Technology

AGENDA 2025

19 NOVEMBER 2025 | USA
DETROIT, MI

08:00

Chair's Opening Remarks

08:20

Beyond the Subsidy: Building Durable U.S. Battery Manufacturing After the IRA

TBA: John Warner, PhD, Chief Customer Officer, American Battery Solutions

The IRA catalyzed a once-in-a-generation buildout—but incentives alone don't guarantee competitiveness. This talk maps the post-IRA operating playbook: how to localize the stack (materials › cells › packs) with cost, yield, and compliance as first principles; how to structure supply for domestic-content and FEOC restrictions; and how global players are re-cutting JV, tolling, and contract-manufacturing strategies to survive beyond headline subsidies. We'll translate policy into plant-floor decisions—energy contracts, automation, scrap recovery, recycled content, and workforce upskilling—and show the metrics that matter: $/kWh trajectory, OEE/yield curves, ramp risk, and resilience to supply and policy shocks.

- A practical localization blueprint: which value-chain steps to on-shore first for maximum $/kWh impact and risk reduction.
- Compliance-by-design: organizing procurement and contracts to meet domestic-content and restricted-entity rules without gridlocking ops.
- The manufacturing math: dialing OEE, first-pass yield, and scrap recovery to offset declining incentives.
- How to de-risk ramps: phased capacity adds, pilot-to-gigascale transfer, and vendor/tooling strategies that keep schedule and quality intact.

08:40

Beyond Chemistry: GM's System-Level Strategy for EV Batteries

TBA: Kurt Kelty, VP Battery, Propulsion & Sustainability, General Motors

GM is building an end-to-end battery strategy—technology, manufacturing, and supply chain—that supports scale, cost competitiveness, and resilient delivery over the next decade. The session willl outline how GM evaluates and invests in emerging cell chemistries and pack architectures, where in-house capabilities (cell/module/pack engineering, BMS, manufacturing process, validation) create leverage, and how partnerships and regionalized supply chains de-risk volume.

- How GM prioritizes chemistry, architecture, and manufacturing bets (and when to insource vs. partner).
- How domestic/ally-based supply chains map to cost, risk, and policy incentives.
- A practical view of safety-by-design (propagation, isolation, diagnostics) embedded from cell to vehicle.
- How GM links sustainability metrics (recycled content, energy mix, EOL pathways) to product and business goals.

09:00

Making All-Solid-State Safe, Fast, and Scalable

TBA: Minghong Liu, PhD, Battery Research Engineer, Ford Motor Company

Lithium iron phosphate (LFP) promises cost and safety advantages, but marrying it with solid electrolytes is not a copy-paste of liquid-electrolyte playbooks. This talk examines what it really takes to build LFP all-solid-state batteries (ASSBs) with credible rate capability, cycle life, and manufacturability.

We dissect cathode–electrolyte interface chemistry (sulfide vs. oxide vs. hybrid polymer), ion/electron percolation in composite cathodes, stack pressure and temperature effects, and how coatings, carbon architecture, and binders shift the transport and stability landscape. We'll map processing routes (dry vs. slurry, calendering, porosity targets) to areal loading and current density, then close with a pragmatic view on anode choices (Li-metal vs. graphite-based), safety margins, and scale-up constraints.

- Interface engineering: How coatings and surface treatments stabilize LFP against sulfide/oxide solid electrolytes and suppress parasitic reactions.
- Rate capability levers: Designing composite cathodes for balanced ionic/electronic percolation, carbon distribution, and low contact resistance.
- Process–performance links: How pressure, temperature, porosity, and calendering affect areal capacity, impedance, and mechanical integrity.
- Anode strategy: Trade-offs between Li-metal and intercalation anodes under stack pressure and limited lithium inventory.
- Scale & safety: Practical pathways to thicker electrodes, defect control, and abuse tolerance in LFP-ASSB cells

09:20

How Stellantis Brings New Battery Tech to High-Volume Reality

TBA: Oliver Gross, MASc, SME Energy Storage & Conversion, Advanced Propulsion Technology, Stellantis

Carrie Okma, Head of Li-ion Modules & Cell Product Release & Validation Center, Stellantis

Breakthroughs don't win until they survive the factory. This session details Stellantis' playbook for translating promising cell/module technologies into stable, certifiable, cost-competitive products at scale. Oliver Gross covers the front-end funnel—technology scouting, TRL>MRL progression, design rules, and early risk burn-down. Carrie Okma unpacks the industrialization path—DV/PV validation, PPAP, reliability growth, line qualification, yield & OEE control, and change management. Together, they show how performance and cost targets are held without compromising safety, quality, or launch timing—including how data, digital validation, and supplier readiness gates keep programs on track.

- A stage-gate blueprint from concept to SOP: TRL/MRL criteria, design-for-manufacturability, and "stop/go" evidence.
- How to balance performance, cost, and risk using KPI guardrails: $/kWh, energy density, yield/OEE, warranty risk.
- The validation ladder (cell › module › pack › vehicle) that compresses time yet protects quality.
- Supplier & material readiness gates (APQP/PPAP) and change-control that won't reset certification.
- Using data & digital (DoE, ROMs, Power-HIL, analytics) to de-risk fast charge, TRP, and lifetime.

09:40

From Plug-and-Charge to Field-Issue Reproduction: EVSE Interoperability in the Wild

Intertek (with ACM, Michigan)

Intertek powers the EV Charging & Interoperability Testbed at the American Center for Mobility (ACM) in Michigan—a production-like environment to de-risk charger–vehicle handshakes across hardware, software, and networks. This talk shows how real chargers, CPO backends, and diverse EVs are used to validate ISO 15118 / Plug&Charge, OCPP integrations, payment/roaming flows, and to reproduce field issues at lab speed. We'll unpack the test matrix (DC fast/AC, high-power, 1,500 V pathways), share examples of fault injection and certificate lifecycle tests, and explain how findings translate into firmware updates, certification evidence, and improved uptime in the field.

- How an interoperability testbed condenses months of public-site debugging into repeatable test cycles.
- Practical ISO 15118 / Plug&Charge validation: certificate provisioning, contract handling, and failure modes.
- Building a defensible test plan that spans EV/EVSE variants, back-ends (OCPP), and edge cases (timeouts, dropouts).
- How to turn results into certification evidence and field fixes with Intertek's EVSE testing toolchain.

10:00

Maximizing Li-ion Battery Safety: Strategies for Enhanced Performance & Reliability

Parker Lord

Safety isn't a single material or test—it's a systems stack. Parker LORD will share a practical playbook for improving thermal runaway mitigation, electrical isolation, vibration robustness, and long-term reliability at cell, module, and pack levels. The talk compares gap fillers vs. potting/encapsulation, explores adhesive and sealant architectures that maintain pack integrity under abuse, and shows how TIM/contact management and damping reduce hot spots and mechanical stress that precipitate failures.

- How to select and integrate TIMs, gap fillers, potting/encapsulants, and structural adhesives to reduce thermal and mechanical failure modes.
- Designing seams, gaskets, and feedthrough seals to block hot-gas bypass and liquid ingress.
- Methods to improve contact resistance stability and plate flatness for reliable heat paths during fast charge.
- Using damping and compliant bonds to protect cells/modules from vibration and shock without compromising serviceability.
- A validation checklist linking materials choices to TRP, dielectric, vibration, and corrosion requirements.

10:20

Thermal Strategies for Faster Charging, Range & Propagation Prevention

NeoGraf Solutions

Fast-charge, long range, and safety live on the same thermal stack. NeoGraf will show how anisotropic graphite heat spreaders, engineered TIMs, and graphite-based barrier layers reshape heat paths to: (1) lower peak cell temperatures during DC fast-charge, (2) tighten ΔT across modules for range and life, and (3) delay/contain thermal runaway propagation (TRP) without excessive mass or Z-height. The talk covers coupling graphite sheets with cold plates and TIMs, edge sealing to block hot-gas bypass, and design rules for prismatic, cylindrical (2170/4680), and pouch architectures. We'll close with validation data (IR/thermocouples, heater-induced TR surrogates, pressure/vent-gas exposure) and a playbook to take designs from prototype to line speed.

- How anisotropic graphite redistributes hot-spots in fast-charge and reduces pump power demands on the plate.
- Selecting graphite TIMs vs. filled polymers to stabilize contact resistance under compression/aging.
- Using graphite barrier stacks and edge treatments to improve propagation delay without killing cooling performance.
- Integration rules with plates, manifolds, and enclosure ribs to maintain flatness and serviceability.
- A validation checklist linking materials choices to ΔT, Tmax, leak paths, and TRP metrics.

10:40

Lightweight Potting & Encapsulation Compounds for Thermal Management

Elkem

Silicone potting and encapsulation can both stabilize heat paths and delay thermal-runaway propagation (TRP)—but mass, cure energy, and serviceability often get in the way. Elkem presents a production-ready approach to lightweight silicone foams and encapsulants (including RTF-type syntactic foams) that achieve ΔT reduction and TRP delay at low areal mass, with snap/low-temp cures to protect electronics and shrink takt. We'll cover chemistry selection, expansion control, and bead/volume design for cylindrical, prismatic, and pouch modules; integration with CIPG/FIPG sealing; and a validation playbook spanning heater-induced TR, cone calorimetry (HRR), vibration/thermal cycling, and IP ingress correlation. Elkem will share field learnings from large EV deployments and how simulation + test loops speed adoption.

- How low-density silicone foams/encapsulants cut mass while maintaining thermal insulation and TRP performance.
- Process window design: material conditioning, meter-mix ratios, expansion factor, cure profiles (snap/dual-cure) that hold flatness and takt.
- Pairing potting with CIPG/FIPG to block hot-gas bypass at seams/penetrations—without killing serviceability.
- A correlation ladder: CFD/CHT › module coupons › sub-pack › pack; evidence sets that stand up in safety reviews.
- Cost & sustainability levers: fewer parts/fasteners, lower cure energy, and pathways toward silicone circularity.

11:00

Morning Networking Break

11:40

How to Translate Enclosure Mass Savings into Pack-Level Energy Density and Range Gains without Sacrificing Safety

Constellium presents the outcomes of its ALIVE (ALuminium Intensive Vehicle Enclosures) program: production-feasible aluminium battery enclosures achieving 12–35% weight reduction versus existing OEM aluminium and steel designs, while meeting crash, stiffness, sealing, and manufacturability targets.

The talk unpacks the design choices, HSA6/HCA6 high-strength extrusion alloys, joining strategies, and manufacturing concepts that cut mass, lower part count and assembly time, and create a modular path from prototype to scale. The work—delivered with OEM and academic partners—demonstrates a route to cost-efficient, scalable BEV enclosures that also support thermal and safety performance.

- Design rules for extrusion-dominant enclosures (alloy choices, gauges, ribbing, corner strategies, sealing paths).
- A playbook for scalable manufacturing cells that de-risk supply chains and cost at volume.
- Where are the trade-offs between weight savings and thermal propagation shielding, and how were they mitigated?
- Joining strategy choices for serviceability and repair vs. manufacturing takt.
- Path to regionalization (UK/US/EU) and recycling loops for enclosure scrap/EOLE packs.

12:00

Harnessing Laser Welding for Stronger, Lighter Aluminum Cooling Plates

AdvanTech

High-power fiber-laser welding is changing how EV battery cold plates are built—enabling thinner cover sheets, tighter channel geometries, and leak-tight seams without the mass and process complexity of brazing. In this talk, AdvanTech walks through a production-ready approach to laser-welded aluminum cooling plates: from alloy selection (5xxx/6xxx) and surface prep through scanner-based "wobble" strategies that stabilize the keyhole, reduce porosity, and minimize distortion/warpage for plate flatness. We'll compare weld morphologies for serpentine vs. pin-fin channel layouts, show how to hold burst pressure and helium-leak targets while trimming grams, and share inline QC methods (emission monitoring, thermography, pressure decay) that keep yield high at takt.

- Weight & cost levers: How laser welding enables thinner gauges and simplified stackups versus vacuum brazing—while maintaining stiffness, flatness, and leak-tightness.
- Process window design: Power/speed/spot size/wobble frequency settings to balance penetration, heat input, and distortion on common Al alloys.
- Hermeticity & durability: Designing joint geometries and bead placements that meet leak-rate, burst, vibration, and thermal-cycling requirements.
- Quality at line speed: Inline monitoring (PD/PM, coaxial cameras, pyrometry) and automated leak testing to control variability in high-mix programs.
- Corrosion & reliability: Surface prep, post-weld treatments, and coolant compatibility considerations for long-life operation.

12:20

Cell-to-Cell Thermal Runaway Containment in High-Energy Packs

AIS

A materials-systems approach to fire protection and thermal-runaway propagation (TRP) shielding at cell, module, and pack level. We'll compare ceramic/mica laminates, aerogel blankets, intumescent layers, and low-k structural composites, and show how to stack them for time-to-ignition delay, heat-flux attenuation, and surface temperature control—without unacceptable mass or packaging penalties.

The talk walks through design-for-integration (seams, fasteners, penetrations), validation workflows (cell-heater induced TR, cone calorimetry, burst/fire exposure), and manufacturability (die-cutting, formed covers, adhesive systems) to move from prototype concepts to production packs.

- Designing TRP barriers: Selecting and stacking materials (aerogel / ceramic / intumescent / foil) to hit propagation-delay and surface-temp targets.
- Integrating shields without mass creep: How to keep areal density (kg/m²) and Z-height in check while preserving serviceability.
- Seams & penetrations: Gaskets, edge treatments, and fastener isolation that prevent hot-gas bypass and flame egress.
- Validation & QA: Representative TR induction methods, cone calorimetry for HRR, heater-pad and vent-gas exposure, plus EOL leak/fit checks.
- System trade-offs: Fire performance vs. cooling efficiency, NVH, corrosion, and recyclability.

12:40

Accelerating Pack Simulations with Engineering-Focused 3D Multiphysics CFD

AVL

Battery programs don't need prettier meshes—they need faster, defensible decisions. This talk shows how AVL's engineering-focused 3D multiphysics CFD workflow compresses cycle time from CAD › mesh › solve › design choice for pack thermal design and safety. We'll cover conjugate heat transfer (CHT) for plates, channels, and TIMs; electro-thermal coupling at cell/module/pack scale; and targeted abuse scenarios (hot-spot, fast charge, heater-induced TR surrogates). You'll see automated CAD healing & meshing, robust pressure-drop/flow balancing for coolant plates, and reduced-order models (ROMs)/surrogates for rapid trade-offs across duty cycles and ambient conditions. We close with a validation playbook that links CFD to rig and vehicle tests—so simulation becomes production-grade evidence, not artwork.

- How to set up pack-level CHT with reliable plate flatness/TIM/contact modeling and stable solver settings.
- Methods to balance flow uniformly across complex cooling networks and quantify pressure-drop vs. pump power.
- Building ROMs/surrogates from high-fidelity CFD to evaluate thousands of scenarios (drive cycles, fast-charge, ambient extremes).
- Practical electro-thermal co-simulation to capture cell heat generation and aging impacts on thermal limits.
- A validation & correlation checklist that turns CFD into certifiable evidence.

13:00

How Foam Selection and Processing (polyurethane/ silicone chemistries, expansion factor, density) Influence Propagation Delay and Outer-Skin Temperature

bdtronic

Foam encapsulation inside battery modules is emerging as a practical lever to delay or prevent thermal runaway propagation (TRP) while improving pack robustness. This talk details production-ready approach to meter-mix-dispense and formed-in-place foam processes: material preparation, mixing ratios, expansion control, bead geometry, and cure kinetics tailored for cylindrical, prismatic, and pouch modules.

We'll show how correctly processed foams fill inter-cell voids, damp gas/pressure spikes, and cut heat flux pathways—all while staying inside takt, flatness, and serviceability constraints. The session closes with an industrial validation playbook (heater-induced TR surrogates, cone calorimetry, ΔT/Δp mapping) and end-of-line QA that scales from pilot to high-volume.

- How foam selection and processing (polyurethane/silicone chemistries, expansion factor, density) influence propagation delay and outer-skin temperature.
- Dispensing fundamentals for repeatable results: material conditioning, meter-mix accuracy, bead placement strategies, and cure control at takt.
- Integrating foams with CIPG/FIPG sealing to block hot-gas bypass at module edges and penetrations.
- A validation & QA checklist linking foam processing to TRP metrics (ΔT, HRR, leak paths) and manufacturability KPIs.

13:20

Maximizing Efficiency & Unlocking Battery System Performance While Driving Down Pack Cost

SIKA

Performance and cost move together when bonding, sealing, and thermal coupling are engineered as one system. In this talk, SIKA shows how next-gen structural adhesives, gap-filling TIMs, FIPG/CIPG seals, and foams can reduce pack mass and parts count, shorten takt, and boost durability—without compromising safety. We'll cover dual-cure and snap-cure cycles for faster assembly, low-viscosity/high-conductivity TIMs to lower ΔR_th and hot spots, and design-for-disassembly options that protect serviceability and recycling. Case data illustrates ΔT reductions, leak-rate improvements, bond durability, and the concrete cost levers: fewer fasteners, less machining, simpler fixtures, and inline QA that cuts rework.

- How to pick and combine adhesives, TIMs, and seals to improve heat paths, stiffness, and dielectric safety while removing parts and weight.
- Cure strategy selection (1-part vs 2-part, dual-cure UV/moisture, snap-cure, low-temp cures) to compress takt and energy use.
- Designing CIPG/FIPG patterns and bead geometries that hit IP ingress and hot-gas bypass targets at minimal areal mass.
- Setting inline metering/vision/traceability to stabilize quality and reduce scrap.
- Trade-offs for serviceability & recyclability (release-on-command, cut lines, removable seals).

13:40

Network Lunch Break

14:40

Approaches for Fast-Charge Thermal Control

ONE Our Next Energy

Higher energy density, faster charge rates, and tighter packaging have made pack thermal management a first-order design constraint. ONE shares recent learning from pack programs spanning prismatic and cylindrical formats: closing the gap between CFD and rig, designing for uniform flow and contact resistance control, and containing thermal events without sacrificing mass or manufacturability.

We'll compare plate architectures and manifolds for maldistribution control, discuss fast-charge transients and plate flatness/TIM behavior under load, and highlight how reduced-order models (ROMs) plus data from on-road/bench tests accelerate design iteration.

- Practical methods to balance flow and minimize ΔT across modules while controlling pump power.
- How to model and manage contact resistances/TIM so analysis matches hardware.
- Approaches for fast-charge thermal control (transient limits, pre-conditioning, soak/restart).
- Strategies to mitigate propagation risk while preserving cooling performance and serviceability.
- How to leverage ROMs + test data to speed decisions from concept to DV/PV.

15:00

3D Deep-Learning to Break the Trade-off: Heat Exchanger Optimization

Neural Concept

Conventional CFD/DoE workflows force tough trade-offs between pressure drop, thermal performance, and manufacturability. Neural Concept shows how 3D deep-learning surrogates trained on high-fidelity simulation data can search orders of magnitude more design variants—discovering channel topologies and manifold layouts that push the Pareto front outward instead of sliding along it. The talk covers building robust surrogate models from limited data, physics-aware constraints (min. feature size, wall thickness, printable geometries), and rapid multi-objective optimization that balances ΔT uniformity, heat-transfer coefficient, and ΔP/pump power. Attendees will see case studies on cold plates and compact HX cores, including geometry proposals generated in seconds, then validated in CFD and on test rigs.

- How to train reliable 3D DL surrogates from CFD/CHT datasets and avoid overfitting.
- Setting manufacturing constraints (CNC, brazed plate, AM) directly in the optimizer.
- Turning multi-objective targets (ΔT, HTC, ΔP, mass) into a navigable Pareto map for fast decisions.
- A closed loop: AI propose > CFD verify > test correlate, with guardrails for engineering sign-off.
- Practical speedups: reducing concept cycles from weeks to hours without losing physics fidelity.

15:20

Software-Defined Batteries: An AI BMS for Real-World EVs

Modern BMS design is shifting from "measure & protect" to a model-driven, data-rich control system that unlocks fast charge, longer life, and higher safety margins—at lower cost. This session unpacks a production-ready BMS stack spanning hybrid physics/ML state estimation (SOC, SOH, SOP), degradation-aware charge control to avoid lithium plating, thermal-electrochemical coupling for hotspot management, and cell balancing strategies tuned for high-power 800 V packs and cell-to-pack architectures. We'll cover wired vs. wireless BMS, functional safety (ISO 26262, ASIL-D), cybersecurity (ISO 21434), and compliance touchpoints (UNECE R100 / GTR 20 interfaces). Closing out: a validation playbook using Power-HIL, cell emulators, and fault-injection to correlate models from lab to road—and a roadmap for OTA-updatable algorithms with fleet feedback.

- How to build hybrid state estimators (equivalent-circuit + data-driven) that stay accurate across temperature, aging, and rate.
- Designing degradation-aware fast-charge: plating risk metrics, pre-conditioning, and charge-profile adaptation in real time.
- Balancing strategies (top/bottom/active) for 2170/4680/prismatic/pouch and for cell-to-pack layouts.
- Safety architecture: contactor/pre-charge logic, HVIL, isolation monitoring, early TR detection (voltage/pressure/acoustic/off-gas).
- Verification at speed: SIL/MIL/HIL, golden-drive cycles, and scenario-based testing that reproduces field failures.
- How to operate an OTA-capable BMS with versioning, rollback, and data governance.

15:40

Continuous Pack Engineering: Real-Time Cell Decisions, Faster Design Loops

TBA: VOLTAIQ

Cell chemistries, suppliers, and specs are moving targets. Successful programs aren't "designed once"—they're continuously engineered. This talk shows how to replace waterfall gating with a closed-loop pack engineering system that couples market-aware cell selection, rapid qualification, and in-the-loop analytics. We'll cover how to stand up a digital thread from incoming COAs and formation data > cell bench > module rig > pack/end-of-line, and how to use that thread to re-score cells in real time, adapt thermal/BMS limits, and protect yield. Attendees will see practical patterns for parallel design/validation, supplier variability management, and decision dashboards that turn weeks of back-and-forth into same-day choices.

- How to build a cell-to-pack digital thread that keeps specs, test data, and limits synchronized across teams.
- A rapid cell triage workflow: screening, abuse surrogates, and go/no-go criteria tied to pack KPIs (ΔT, SOP/SOH, cost).
- Methods to model supplier drift and re-parameterize BMS/thermal limits without restarting DV/PV.
- Patterns for parallel validation (cell bench > module rig > pack EOL) that shrink design loops.
- How to deploy analytics dashboards for live decisions on cell swaps, derates, and fast-charge envelopes.

16:00

How OEMs Accelerate Architecture Research & Definition While Optimizing Power, Range, Reliability, And Cost

Anthony Giesey, Senior VP, Evonomy Group

EV architectures now move on quarter-by-quarter cycles. This session shows how leading OEMs compress research › definition › evidence using a model-based backbone, supplier-in-the-loop testing, and data products that tie every decision to power, range, reliability, and cost. We'll walk a repeatable pipeline: translate market and regulatory targets into measurable system requirements; run multi-objective trade studies across battery size/chemistry, 400–900 V powertrain choices, thermal loop options, charging envelopes; and validate with digital twins plus rig data so freezes happen on evidence—not hope. Attendees leave with patterns that cut months from architecture sprints while safeguarding performance and business KPIs.

- Build a requirements › model › test › decision loop that shortens architecture definition.
- Set up trade-space models linking $ / kWh, Wh/mi, kW, ΔT limits, weight, and BOM.
- Use reduced-order models & digital twins to quantify range and fast-charge impacts before tooling.
- Stand up supplier-in-the-loop evaluations (inverters, e-axles, batteries, thermal subsystems) with pass/fail gates.
- Govern freezes with an evidence pack: performance, reliability growth, cost, and risk register.

16:20

Afternoon Networking Break

17:00

How to Map Spec-Driven Leak Limits to the correct method at Cell, Module, Plate, and Pack Levels

Zeltwanger

As packs get denser and sealing architectures more complex, traditional pressure-decay checks struggle with cycle time, temperature drift, and micro-leak sensitivity. We will discuss a production-ready toolkit that raises defect detection while cutting false fails and takt time for cells, modules, cooling plates, and full packs. Compare vacuum pressure-decay, differential pressure with reference volumes, mass-flow, and helium tracer-gas methods (sniffer, accumulation, vacuum chamber) and show how to pick the right method per leak path (coolant circuit, vent valve, feedthrough, seam). You'll see compensation models for thermal/barometric effects, smart fixturing that stabilizes test volumes, and closed-loop helium recovery. We close with a validation playbook (gage R&R, correlation to IP ingress and road-load) and digital traceability for audit-ready records.

- How to map spec-driven leak limits (e.g., 10^{-3} – 10^{-5} mbar·L/s) to the correct method at cell, module, plate, and pack levels.
- When differential pressure beats classic pressure-decay—especially for large, compliant pack volumes.
- Using helium vacuum vs. helium accumulation/sniffer: sensitivity, takt, and cost trade-offs; gas recovery options.
- Practical drift killers: temperature stabilization, barometric compensation, and fixturing/volume control.
- Building an audit-proof quality chain: gage R&R, golden leaks, calibration cadence, and data retention aligned to PPAP/ASPICE.

17:20

Joint Design & Stack-Ups: Minimum/Maximum Sheet Gauges; Cast Rib/Landing Design; Edge Distances; Tolerance and Hole-Quality Assumptions

ARNOLD

Battery packs push thin-gauge, multi-material stacks that must be watertight, vibration-robust, and serviceable—without adding mass or cost. This session shows how Flowform® (flow-drill forming screws) and PIAS® (pierce/captive nuts) create high-strength, sealed joints in aluminum and steel without pre-tapped bosses or weld nuts. We'll cover stack-up rules for castings, extrusions, and sheets; seal strategies (under-head coatings, sealing washers, CIPG/FIPG interfaces); galvanic isolation options; and in-line process control (speed/force windows, torque-angle monitoring, camera/AOI). Attendees walk away with validated design rules that hit IP67/IP6K9K ingress, helium-leak and torsional/vibration targets—while preserving rework paths and service access.

- When to choose Flowform® vs. PIAS® in thin sheets, castings, and mixed-material stacks to eliminate pilot holes and weld nuts.
- How to design sealed joints (under-head sealants, sealing washers, CIPG landings) that meet ingress and leak requirements.
- Tactics to control galvanic corrosion and maintain electrical isolation around HV components.
- Process windowing for robust installation: spindle speed/force, torque-angle, and real-time OK/NOK logic at takt.
- Validation workflow: leak, vibration, thermal cycling, and corrosion tests tied to pack-level KPIs.

17:40

OpenAir Plasma Surface Activation for Battery Assembly

Plasmatreat

Adhesives, CIPG/FIPG seals, coatings and electrical contacts only perform as well as the top microns of the surface. Plasmatreat shows how Openair-Plasma® (atmospheric, dry, inline) boosts surface energy and cleans metals, foils, and polymers to enable primer-free bonding, reliable sealing, and robust contacting in cell, module, and pack assembly—without wet chemicals or chamber tools. The talk covers integration at takt with robot heads, process windows for activation on Al/steel/plastics, and when to add PlasmaPlus® functional nanocoatings (e.g., AntiCorr®) for corrosion-resistant housings. Case data from 2025 demos illustrates uplift in adhesion, leak integrity, and durability—and how to document results for audits and PPAP.

- How atmospheric plasma replaces primers/solvents and stabilizes adhesion and CIPG bead wet-out on mixed materials.
- Setting activation recipes for aluminum, coated steels, and polymers; inline robot integration and QA.
- When to apply PlasmaPlus® AntiCorr® coatings for enclosure corrosion protection and sealing reliability.
- Using plasma for contact cleaning (busbars, tabs) and cell-to-cell bonding prep to improve electrical and mechanical performance.
- How to create evidence packs (surface energy, peel/shear, leak/IP, durability) that survive supplier and regulator scrutiny.

18:00

From "No-Hole" to Helium-Tight: Fastening Architectures for EV Battery Packs

STANLEY Engineered Fastening

Mixed-material, thin-gauge battery packs demand joints that are strong, serviceable, and leak-tight—without killing takt or mass. STANLEY walks through a recent North American launch where a pack moved to 350+ localized fasteners across aluminum and steel structures. The team compares no-hole Tucker® stud welding (for helium-tight seams), self-piercing rivets (SPR), POP® rivet nuts, and threaded solutions—showing selection rules by stack-up, corrosion pair, and sealing path. You'll see how joint validation, tool selection, and supplier-in-the-loop run-offs were orchestrated to meet domestic-content constraints and pass helium/IP ingress and durability targets at scale.

- Method-selection matrix for studs/SPR/rivets/threads by stack-up, access, and sealing requirements.
- How no-hole stud welding supports helium-tight battery enclosures and prevents hot-gas bypass around fasteners.
- Joint designs and coatings that control galvanic corrosion and maintain electrical isolation in HV zones.
- Inline quality: torque-angle signatures, vision/AOI for seal presence, and traceable records for audits.
- How to meet domestic-content rules while keeping takt and cost on target.

18:20

Primerless Fire Protection for Packs: Therm Coatings + Nano-Porous Insulation

Evonik

Propagation risk is won or lost at the enclosure. Evonik presents a production-ready stack that pairs TEGO® Therm heat-protective, fire-resistant coatings on housings with AEROSIL®/AEROXIDE® nano-porous fillers in lightweight insulation layers to delay/contain thermal events—without heavy mass penalties. We'll cover coating architectures that target UL 94 V-0 behavior, thermal flux reduction, and outer-skin temperature limits; how to integrate low-k silica/alumina fillers into potting, foams, gaskets, and barrier mats; and validation workflows (heater-induced TR, cone calorimetry, surface-temp mapping, IP/helium correlation). Outcome: a materials-and-process playbook that raises safety margins while protecting takt and serviceability.

- How fire-resistant coatings on lids/bases lower heat flux and external flame risk during TR events (design + test targets).
- Specifying AEROSIL®/AEROXIDE® for low-density insulation stacks (k, areal mass, thickness) and where they outperform conventional fillers.
- Integration with CIPG/FIPG and fastener seams to prevent hot-gas bypass; compatibility with PU/silicone foams and potting.
- A validation ladder linking materials choices to TRP delay, HRR, outer-skin Tmax, and ingress metrics used in certification.

18:40

Chair's Closing Remarks

19:00

All Attendee Drinks Reception

ATTENDEES BY COMPANY 2024

Alelion, **Amazon**, Andreas Stihl, **Automotive Cells Company**, AVL, **Banner Batterien Oesterreich,** BMZ, BrightVolt, **Caterpillar, Cellforce,** China Euro Vehicle Technology, **Clarios,** CUSTOMCELLS, **Daimler, East Penn, ENOVIX,** Exide Technologies, EVE, **EVONOMY Group,** Factorial Energy, **Farasis Energy, Ford,** Forsee Power, **FREYR, General Motors,** GS Yuasa, Hankook, Hino Motors, **Hitachi, Honda,** HOPPECKE Batterien, **Hyundai,** InoBat Auto, KTM, LG Energy Solutions, **Litens Automotive,** Log9, **Lotus**, LytEn, MAGNA STEYR, MAHLE, **Mazda, Mercedes-Benz, Natrion,** NingDe Amperex Technology, **Nissan,** Northvolt, Nyobolt, **Panasonic, Porsche, QuantumScape, Renata, Renault,** Rimac Automobili, **Robert Bosch, Rolls Royce,** SAFT, Sakuu, **Samsung SDI, Scania,** Sebang Global Battery, **Siemens Mobility**, Sion Power, **Sionic Energy, SK, Skeleton Technologies,** Solid Power, **Stellantis, StoreDot, Toshiba, Toyota,** Traton, **Volkswagen, Volvo,** Yanmar, **Zeta Energy & more.**

ATTENDEES BY JOB TITLE 2024

Chief Engineer – Battery Electric & Plug-In Hybrid Vehicles, Chief Engineer – Electrified Propulsion System, **Chief Engineer – Electrical System,** Head of EV Engineering Systems, **Head of Vehicle Electrification Technology,** Head of Hybrid and EV Battery System, **Chief Scientist - Energy and Systems,** Head of Vehicle Architecture, **Head of Systems and Control Engineering,** Electrification Project Engineer, **Head of Research, Materials and Manufacturing,** Group Product Director Hybrid and Electric Systems, **Lead Engineer, Electrical Systems Engineering,** Lead Engineer, Electrified Powertrain, **Head of Body Structures/ Body in White,** Battery Electric Vehicle Global Lead Engineer, **Global Battery Systems Engineering, Battery Research Engineer,** Technical Manager – Innovation Management, **Chief Engineer & Technical Leader – Energy Storage & Systems**

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- Networking breaks, coffee and snacks. Hot buffet luncheon
- Afternoon coffee break including soft drinks & snacks
- All attendee evening drinks reception – open bar

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