PALO ALTO | 29 MAY 2025

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xEV / HEV BATTERY THERMAL MANAGEMENT

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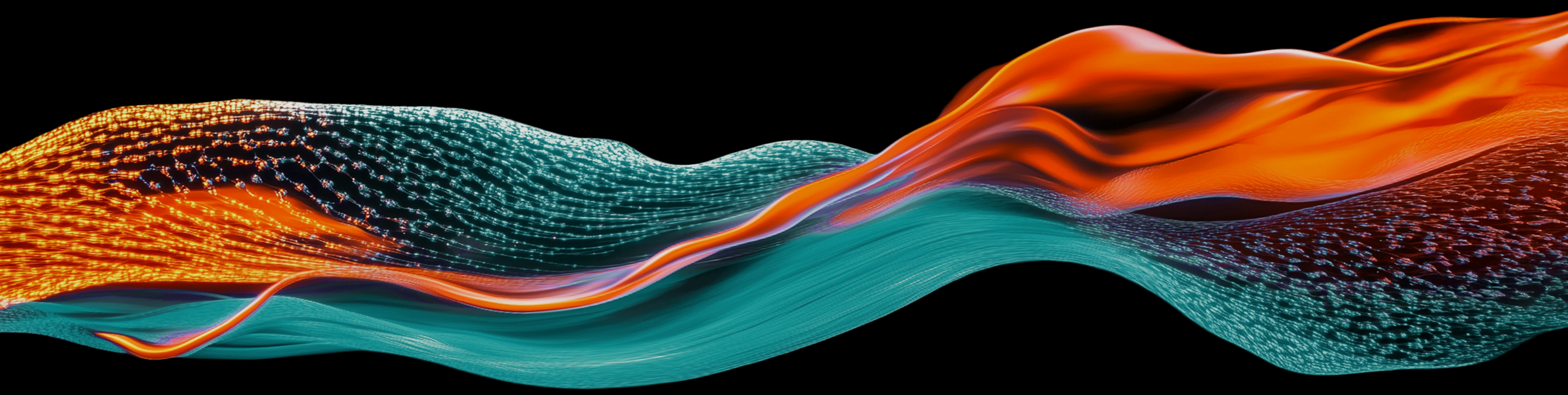

1 DAY TECHNICAL FOCUS | **40+** SPEAKERS | **60+** EXHIBITORS | **400+** DELEGATES

FULL-SYSTEM INTEGRATION: UNLOCKING SAFE, COST-EFFECTIVE, AND SCALABLE THERMAL MANAGEMENT FOR NEXT-GEN EV PLATFORMS

The West Coast's Leading Annual Technical Conference & Exhibition Showcasing Next-Generation Battery Thermal Management Innovation

Welcome to the **7th Annual xEV Battery Thermal Management USA 2025** – Palo Alto, California the premier technical summit advancing battery thermal engineering and full-system thermal integration for next-generation electric vehicles.

This highly targeted, OEM-led event brings together over 500 senior-level BEV engineers, system architects, and R&D leaders to explore real-world challenges and practical innovations in high-performance, high-efficiency battery system design.

The agenda has been meticulously developed in collaboration with automakers, tier-one suppliers, and advanced technology providers to reflect the latest technical priorities across the industry.

Full-System Thermal Integration – Optimizing cell, pack, and vehicle-level temperature control

Advanced Cooling Architectures – From integrated cooling loops to thermal energy harvesting

Predictive Thermal Management – Leveraging smart controls, AI, and digital twins

Megawatt Charging Compatibility – Managing thermal loads under extreme power densities

Structural Battery Packs & Cell-to-Pack Innovation – Improving safety, packaging, and energy density

This isn't just another conference — it's a solutions-driven engineering summit, designed to accelerate technical collaboration and showcase the technologies shaping the future of electrification.

On the exhibition floor, see live demonstrations and explore cutting-edge materials, systems, and software solutions from leading suppliers and emerging disruptors.

With the electrification landscape evolving at record pace, BTM USA is where battery and thermal innovation converge — offering exclusive insight into the next generation of safe, scalable, and cost-effective EV system

CONFERENCE TOPICS

Full-System Thermal Integration: Unlocking Safe, Fast, and Scalable Energy Management for Next-Gen xEV Platforms

Next-Generation Battery Architectures: Engineering for Energy Density, Safety, and Performance

Advancements in Battery Pack Design and Integration

Battery Thermal Management Systems: Beyond Cooling to Full-System Optimization

Scaling Battery Swapping for xEVs: Overcoming Thermal Management and Grid Integration Challenges

Rethinking Thermal Management: Integrated Protection and Performance for BMS Electronics

Innovations in Battery Assembly Processes: Advanced Manufacturing for Performance and Reliability

Sustainability in Battery Materials and Recycling: Circular Economy Strategies for Next-Gen Batteries

Battery Data and Diagnostics: Standardization and Predictive Analytics for System Optimization

AI and Machine Learning in Battery Technology: Driving Intelligent Optimization and Performance Gains

Holistic Integration: How Standardized Coolant Modules Are Transforming EV Thermal Systems

Cybersecurity in Battery Technology and Manufacturing

Innovations in Fast Charging Technology: Scaling Up for High-Power Charging

Bridging Cell-Level Data with System-Level Insights: A New Path for Battery Thermal Management

Immersion Cooling as a Paradigm Shift in High-Power BTM for Extreme Duty Applications

Optimizing EV Battery Design with Digital Twins

Advanced 3D Modeling and Simulation for Battery Design

Smarter Heat Management: How Integrated Systems and PCMs Are Reshaping EV Performance

Beyond Lithium-Ion: Addressing the Unique Thermal Challenges of Solid-State Batteries

Pushing the Boundaries of Battery Systems with Data-Driven, Temperature-Controlled Charging and Power Delivery

Unifying Innovation: Integrating Safety, Efficiency, and Scalability in xEV Battery Thermal Management

08:00 | Chair's Opening Remarks

Brian Engle, *Chairman, NAATBatt international; SAE Fellow; Chair,* ***SAE Battery Standards Steering Committee***

08:20

One Megawatt Plus (1MW+) DC Fast Charging

Nathan Saliga, *VP Engineering,* ***ONE | Our Next Energy***

As OEMs and charging infrastructure providers push toward ultra-fast DC charging rates—exceeding 1 megawatt—thermal management becomes a critical bottleneck in battery system design. This session provides a deep technical dive into the thermal, electrical, and safety challenges introduced by next-generation high-power charging protocols, and explores how battery packs, cells, and cooling architectures must evolve to accommodate these extreme duty cycles.

- How thermal architecture must evolve for 1MW+ ultra-fast charging
- Where conventional cooling solutions fall short—and what's next
- How to balance extreme charge rates with durability and safety
- Strategies for pack design, control systems, and predictive modeling at high C-rates

08:40 | Panel

Next-Generation Battery Chemistries: Key Battery Chemistries & Their Thermal Management Challenges

Moderator: ***Sama Aghniaey,*** *PhD, Founder & Managing Director,* ***The Battery Saloon***

(LMB) ***Ting Cai****, Senior Battery Control Algorithum Engineer,* ***(Stealth)***

(LFP) ***Nathan Saliga,*** *VP Engineering,* ***ONE | Our Next Energy***

(Solid State) ***Asma Sharafi,*** *CEO,* ***PowerCo.***

(Na-Ion) ***Erica Wiener,*** *PhD – Physical Scientist,* ***U.S. Department of Transportation, PHMSA***

Jonathan Scharf, *Founder and CEO,* ***Scharf Energy Consulting LLC***

Sitanshu Pandya, *Lead Research Engineer - Battery Design,* ***Tesla***

(Li-S Battery) ***Celina Mikolajczak,*** *Chief Battery Technical Officer,* ***Lyten .tbc***

(Na-Ion) ***Cameron Dales,*** *Co-founder,* ***Peak Energy .tbc***

(Si Anode) ***Gene Berdichevsky,*** *CEO,* ***Sila Nanotechnologies .tbc***

(Na-Ion) ***Colin Wessells,*** *Founder & CTO,* ***Natrion .tbc***

Robert Liu, *Senior Vice President,* ***Sanhua Automotive USA .tbc***

Manufacturers are exploring high-energy-density, safer, and more cost-effective alternatives to traditional lithium-ion batteries. However, each new chemistry presents unique thermal management challenges, that require advanced cooling strategies, new material interfaces, and optimized battery system integration.
This session provides a technical deep dive into the latest solid-state, lithium-sulfur, sodium-ion, and high-nickel batteries, focusing on their thermal properties, heat dissipation challenges, and innovations in cooling systems.

- Lithium Iron Phosphate (LFP) – A Safer, Cooler Alternative
- High-Nickel NMC (Nickel Manganese Cobalt) – The Range Extending Powerhouse
- Solid-State Batteries – High-Energy Density with New Thermal Complexities
- Sodium-Ion Batteries – A Cost-Effective, Thermally Stable Alternative
- Lithium-Sulfur Batteries – High Energy, High Thermal Risks
- Nickel-Cobalt-Aluminum (NCA) – High-Performance, High-Risk Chemistry

09:00

Engineering Immersion Cooling Systems for Next-Generation EV Batteries: Key Choices, Challenges And Opportunities

Dr. Volker Null, *Technology Manager Thermal & Dielectric Fluids,* ***Shell***

Widespread adoption remains hindered by complex engineering and material challenges; but are there opportunities to reduce cost and complexity in a shift to immersive cooling solutions for EV?
A deep technical dive into the design, material selection, and thermal optimization of immersion cooling systems for battery packs, exploring the fluid-cell interactions, weight impact, battery cost, safety, lifetime and circularity considerations that factor into the potential to integrate this technology successfully at scale.

- Assess advanced liquid cooling concepts, choices and trade-offs
- Explore fluid dynamics, durability and compatibility
- Analyze battery performance, lifetime and cost considerations
- Evaluate safety and abuse testing across cylindrical, prismatic and pouch modules
- Consider vehicle systems integration and circularity potential

09:20

Designing For Safety: Leveraging Holistic Systems Simulation to Optimize Battery Thermal Management and Mitigate Thermal Runaway Propagation

Gautham Ramchandran, *Solutions Consultant,* ***Gamma Technologies***

Explore how advanced holistic simulation techniques are integrated into early-stage design and validation to proactively address thermal risks. How multi-physics modeling, covering electrochemical, thermal, fluid, and structural domains, provide predictive insights into thermal propagation behavior and the effectiveness of containment or mitigation strategies. Learn how to use digital twin frameworks to evaluate material choices, cell spacing, coolant flow paths, and venting strategies—before physical testing—reducing both cost and time-to-market.

- Understand how predictive modeling can be applied to simulate thermal runaway scenarios across various battery chemistries and configurations.
- Learn how to couple CFD, FEM, and electrochemical models to enhance the accuracy of thermal risk forecasting in battery systems.
- Gain insights into the integration of real-world abuse testing data into digital simulation environments to improve model reliability and validation.
- Explore how simulation-driven design can optimize battery pack architecture, including cell spacing, cooling pathways, and thermal barrier placement for enhanced safety.
- Examine real-world case studies demonstrating the successful application of holistic systems simulation to prevent thermal runaway propagation in high-energy battery packs.

09:40

Enhancing EV Battery Component Performance with Dielectric Powder Coatings: Manufacturing, Application Challenges, and Sustainability Benefits

Lynette Drumm, *Business Development Manager,* ***Akzo Nobel Powder Coatings***

As EV batteries grow more compact and powerful, ensuring high-performance electrical insulation, thermal stability, and sustainability becomes increasingly complex. Manufacturers must balance safety, durability, and cost-efficiency in demanding, high-voltage environments.
This session dives into how epoxy-based dielectric powder coatings meet these challenges — offering reliable insulation, robust performance, and greener processing. Learn how they're made, how they're applied, and why they're becoming essential in next-gen EV battery systems

- Understand the role of dielectric powder coatings in improving insulation, safety, and durability of EV battery components.
- Explore common challenges in applying coatings to complex battery geometries and how to overcome them.
- Learn about the epoxy resin manufacturing process and how resin properties impact performance in high-voltage environments.
- Identify which EV battery components are ideal candidates for powder coating technologies.
- Discover how powder coatings contribute to sustainable and cost-effective EV battery system design.

10:00 | MORNING BREAK

10:40

Advanced Long-Chain Polyamides for Thermal Management and High-Voltage Applications in BEVs

Christian Kochanek, *Business Development Manager,* ***Evonik***

Managing high temperatures, compact packaging, and reliable insulation in high-voltage environments remains a core challenge in BEV development. As systems grow more powerful, engineers must balance thermal performance, electrical safety, and material efficiency.
This session explores how long-chain polyamides (LCPAs) and multi-layer tubing technologies are advancing thermal management and high-voltage insulation. Key topics include material performance at up to 1000 V and 125°C, compliance with flame retardancy standards,

and strategies to meet evolving demands in busbar and conductor design while minimizing environmental impact.

- Understand the critical thermal and electrical insulation requirements in BEV power systems.
- Explore how long-chain polyamides enhance thermal performance, voltage resistance, and flame retardancy.
- Learn about multi-layer tubing technologies and their advantages over traditional single-layer materials.
- Discuss design strategies to meet performance, safety, and sustainability targets simultaneously.
- Examine approaches to reducing the carbon footprint of polymer materials through renewable and recycled inputs.

11:00

Navigating New Hurdles: UN 38.3 Compliance & Emerging Battery Classifications

Rich Byczek,** Global Technical Director Transportation Technologies, **Intertek

UN 38.3 is the core classification testing for all Lithium Battery chemistries for global shipping requirements. As chemistries, constructions and packaging have advanced to more safely transport lithium batteries, a need for further classification of these batteries has been identified.
This discussion highlights the latest current dangerous goods testing requirements and outlines the future expected battery classifications. These new testing requirements will rely heavily of Thermal Propagation testing compared with current testing regimes.

- Understand the current scope of UN 38.3 testing and its role in lithium battery transportation compliance.
- Identify the challenges posed by evolving battery chemistries, constructions, and packaging in meeting regulatory requirements.
- Gain insight into the new battery classifications under development and their potential impact on shipping and logistics.
- Explore the increasing role of Thermal Propagation testing in future compliance standards.
- Learn about the expected timelines and implementation strategies for upcoming classification and testing changes.
- Discuss best practices for manufacturers and shippers to prepare for evolving regulations and mitigate risks.

11:20

Cutting Costs with CFD: Virtual Optimization of Battery Thermal Management Systems

Prof. Jinyong Kim,** Assistant Professor | Director of Renewable Engine Analysis Lab Department of Mechanical Engineering, **Hanyang University ERICA

This session will begin with a brief overview of the key factors that contribute to the overall cost of battery packs. Then, the session will demonstrate how computational fluid dynamics (CFD) modeling provides a powerful tool for reducing the overall cost of manufacturing battery thermal management system. By enabling precise simulation of complex thermal runaway propagation at cell, module, and pack levels, CFD models allow engineers to optimize battery thermal management system designs virtually. This approach minimizes the need for expensive and time-consuming physical prototyping and testing, accelerates the development cycle, and helps prevent costly safety failures or recalls in the field, directly contributing to a lower manufacturing cost for highly safe battery systems.

- Overview of CFD models incorporating internal cell thermal abuse, gas venting, and external gas combustion.
- Utilization of tools like Ansys Fluent and PyFluent for efficient and detailed thermal runaway analysis.
- Analysis of the effectiveness of thermal management components (e.g., thermal pads, cooling plates) in preventing or delaying thermal propagation.
- Insights gained from validation against experimental data, including ARC tests and module/pack-level thermal runaway tests.
- Discussion on how comprehensive safety analysis through simulation, considering both internal cell reactions and external gas combustion, leads to more robust and less expensive safety solutions.

11:40

Revolutionizing EV Battery Cooling: Adaptive, Flexible, And Without Gap Fillers

Sebastian Ulbricht,** Head of Business Development North America, **Miba Battery Systems

Miba Battery Systems is the pioneer in re-thinking high-performance battery cooling. Unlike conventional rigid cooling plates or heat sinks, flexible thermal management systems avoid adhesives and use customizable, light-weight and shape-adaptive materials and designs to provide efficient heat dissipation across diverse battery pack configurations.

- Understand Flexible Cooling Principles & Applications – Explore how adaptable liquid cooling systems accommodate various battery cell types and configurations.
- Enhance Battery Performance & Longevity – Assess the role of uniform cooling in improving efficiency, lifespan, and fast-charging capabilities under diverse conditions.
- Evaluate Design & Integration Considerations – Examine the impact of flexible cooling on battery pack architecture, weight reduction, and manufacturing workflows.
- Improve Safety & Reliability – Identify how advanced cooling solutions mitigate thermal runaway risks and enhance overall vehicle safety.
- Analyze Environmental & Economic Benefits – Consider energy efficiency gains, material reductions, and cost-saving opportunities for manufacturers adopting flexible cooling technologies.

12:00

Integrated Thermal Management for EV Electronics: Ensuring Battery Efficiency and System Longevity

Azita Soleymani,** Ph.D. CTO, **Heat-Sync

Inverters, onboard chargers, and DC-DC converters generate substantial heat that, if not properly managed, can reduce battery efficiency, shorten component lifespan, and introduce safety risks. This session provides a technical analysis of the latest innovations in thermal management for high-voltage power electronics, focusing on thermal optimization for inverters, onboard chargers, and DC-DC converters, and their direct impact on battery performance, charging efficiency, and EV safety.

- Optimize inverter heat management to improve battery efficiency and longevity.
- Enhance SiC & GaN cooling for next-gen power electronics.
- Prevent thermal cycling failures in solder joints, PCBs, and TIMs.
- Solve onboard charger overheating in compact designs.
- Compare liquid, air, and hybrid cooling for high-power systems.
- Integrate power electronics and battery cooling for efficiency.
- Prevent high-voltage failures like arcing and dielectric breakdown.
- Improve heat dissipation with advanced TIMs in inverters and converters.

12:20 | OEM Customer Panel

System Level Integration: Optimizing Thermal Strategies for Next-Gen EVs

Nathan Saliga,** VP Engineering, **ONE | Our Next Energy

Nipun Mittal,** Senior Battery Systems Engineer, **Lucid Motors

Puneet Valecha,** Senior Battery Cell Engineer, Modeling, **Rivian

Wesley Thibault,** Chief Engineer-Global Traction Battery, **Ford Motor Company

Yuhang Chen,** Battery Module and Pack Development, **(Stealth/OEM)

Kevin Matthews,** Sr Staff Mechanical Engineer, **Tesla

Alen Antony,** Battery Mechanical Engineer, **Monarch Tractor

As EVs continue to evolve, battery thermal management systems (BTMS) must keep pace with increasing performance demands, rapid charging needs, and stringent safety requirements. This panel brings together top OEMs to discuss the latest advancements in BTMS, including the dominance of liquid cooling, the integration of AI-driven predictive controls, and the shift towards modular, lightweight designs.
Panelists will explore the role of smart thermal management, hybrid active-passive cooling strategies, and the use of cutting-edge materials to enhance efficiency and reliability. They will also address the growing need for sustainability in thermal management, including energy recovery and eco-friendly solutions.
With increasing market demand and regulatory pressures, automakers must balance cost, performance, and safety while preparing for future innovations. This session will provide a comprehensive outlook on where BTMS is headed and the strategic considerations for OEMs looking to lead in next-generation EV technology.

- Optimizing Cooling Strategies – Understand the growing dominance of liquid cooling and hybrid systems in enhancing battery safety, lifespan, and performance.
- AI-Driven Thermal Management – Explore how machine learning and predictive analytics are revolutionizing BTMS efficiency and safety.
- Integration & Modularity – Learn how OEMs are consolidating thermal management components to reduce weight, improve efficiency, and streamline supply chains.
- Sustainability & Energy Recovery – Discover the latest trends in sustainable BTMS, including thermoelectric energy recovery and eco-friendly materials.
- Future Challenges & Innovations – Gain insights into upcoming advancements such as additive manufacturing, nanoengineering, and smart self-adaptive thermal management solutions.

13:00 | LUNCH BREAK

14:00

Material Approaches for Bare Metal Adhesion in Battery Adhesives

Tom Clark, *Principal Investigator,* ***DuPont***

The use of adhesives within the battery pack allows for process simplification, cost optimization and parts consolidation during the assembly process. To facilitate these advantages, adhesives can be formulated for strong, durable bonding to untreated metals, and with high electrical resistivity that allows for the elimination of dielectric layers. This informative presentation will cover:

- Characteristics and challenges of bonding to untreated metals
- Rigid and elastic adhesives that demonstrate high performance on untreated metal substrates
- Cure kinetics that consider optimal open and handling times

14:20

The Possible Connection: Aluminum Plastic Direct Joined Heat Exchangers for EVs

Jesko Thomass, *Product Development Manager,* ***Erwin Quarader Inc.***

The era of utilizing outdated technology from combustion engine vehicles for electric vehicle thermal management has come to an end. Modern heat exchangers must be designed to be lightweight and adaptable to minimize CO2 emissions and enhance energy efficiency. This presentation provides a technical overview of the feasibility of composites between aluminum and plastic, and how MPDB® technology facilitates the development of highly flexible, scalable, and cost-effective heat exchangers.

- Grasp the fundamentals of the bonding connection between metals and plastics and understand its efficacy.
  Discover innovative design possibilities through the application of plastic injection molding for heat exchangers.
- Gain insights into the challenges encountered during the design phase and learn why virtual validation is crucial for achieving enhanced durability.
- Understand the advantages of plastic in the event of a malfunction within an electric vehicle.
- Comprehend the complexities of manufacturing and explore how neural networks can address these challenges to improve the robustness of the rapid-cycle MPDB® process

14:40

Lighter, Cooler, Faster: Graphite Thermal Management for Electric Aviation & EVs

Bret Trimmer, *Applications Engineering Manager,* ***NeoGraf Solutions***

As electric aviation evolves, battery thermal management presents distinct challenges, including weight constraints, distributed battery modules, and the need for efficient cooling strategies. Unlike ground vehicles, electric aircraft cannot rely on active cooling systems in flight, necessitating lightweight, passive heat dissipation solutions.

This case study on aviation cooling strategies—such as fluid-based cooling during charging and ultra-lightweight heat spreaders in-flight—demonstrates how similar innovations can improve EV battery performance. Many in the industry only discover these solutions after experiencing critical thermal challenges—this session ensures you won't be one of them.

- Understanding Thermal Challenges in Electric Aviation & EVs: Explore how weight, charge cycles, and cooling strategies impact both aircraft and ground vehicle battery systems.
- Comparing Graphite vs. Traditional Cooling Systems: Examine how advanced graphite materials outperform metal-based and liquid cooling solutions, reducing weight and improving thermal efficiency.
- Adapting Aviation Thermal Strategies for EVs: Learn how temporary liquid cooling during charging and lightweight graphite-based heat spreaders can optimize heat dissipation in electric aircraft and be applied to next-generation EV battery designs.

15:00 | Panel

Solid-State Battery Thermal Management: Overcoming Heat Dissipation Challenges in Next-Generation EV Batteries

Moderator: ***Sama Aghniaey,*** *PhD, Founder & Managing Director,* ***The Battery Saloon***

Dr. Hui Du, *Chief Technology Officer, Co-Founder,* ***Ampcera***

Alex Kosyakov, *Founder & CEO,* ***Natrion Inc.***

(Solid State) Asma Sharafi, *CEO,* ***PowerCo.***

While solid electrolytes eliminate flammable liquid components, they introduce new heat dissipation challenges, including higher internal resistance, localized overheating, and interfacial thermal bottlenecks that can impact battery performance, longevity, and fast-charging capabilities.

- How does the absence of liquid electrolytes in solid-state batteries impact heat generation, dissipation, and overall thermal resistance compared to conventional lithium-ion batteries?
- What are the key thermal bottlenecks at solid-state battery interfaces (electrode-electrolyte, electrolyte-current collector), and how can material innovations enhance heat dissipation while maintaining electrical insulation?
- Given the higher internal resistance of solid electrolytes, what cooling strategies—such as phase change materials, immersion cooling, or integrated heat sinks—are most effective for thermal regulation in EV applications?
- How do solid-state batteries handle fast charging from a thermal perspective, and what design modifications or temperature regulation techniques can enable safer and faster charging without accelerating degradation?
- What challenges do scalability and manufacturing introduce in maintaining uniform thermal properties across large-format solid-state battery cells and packs, and how can advanced production techniques improve thermal performance?
- While solid-state batteries eliminate liquid electrolyte flammability, what new thermal safety risks arise (e.g., lithium dendrites, thermal runaway mechanisms), and how should EV thermal management systems adapt?

15:40

Low Voltage & High Volume Battery Management and Zonal ECUs: A Focus on Functional Safety

Kishore Kumar Sukumar, *Hardware Functional Safety - Electrical Architecture, Product Development,* ***Rivian | Volkswagen Group Technologies***

Key methodologies and best practices for achieving safe operation of EV battery packs, emphasizing the critical role of functional safety in performance optimization, cost management, and risk mitigation.

- Challenges of using low voltage and high cell counts impact on system complexity and thermal management demands.
- How distributed control through zonal ECUs enhances system scalability and flexibility. Implications for battery pack monitoring, control, and fault isolation.
- Overview of ISO 26262 and its application to BMS and zonal control.
- Defining "safe operating area" for battery packs: voltage, current, temperature, and state-of-health monitoring.
- Designing fail-operational and fail-safe hardware architectures.
- Redundancy, diagnostics, and system-level fault tolerance in battery packs and ECUs.
- Ensuring robust data communication between battery modules and zonal ECUs.
- Software development processes aligned with functional safety standards.
- Cost benefits of early-stage functional safety integration versus post-design corrections.
- Trade-offs and optimization strategies between performance, cost, and safety.

16:00 | AFTERNOON BREAK

16:30

Smart Aluminum: Advanced Alloys for Superior Thermal and Electrical Systems

Pablo Lorenzino, *Ph.D. Global Leader Customer Application Engineering Transportation, Industry and Defense,* ***Constellium***

Maria Tzedaki, *PhD, Product Development Manager,* ***Constellium***

This abstract presents tailored alloy compositions and processing techniques to balance thermal efficiency, corrosion resistance, and mechanical strength, enabling scalability for megawatt charging systems in EVs, high-heat-flux environments in satellites, nuclear waste transportation and management, and heat-resistant semiconductor manufacturing devices. Case studies from electric vehicles (EVs), aerospace, nuclear, and semiconductors will illustrate the alloys' versatility and performance, driving advancements in system-level thermal integration for safer, more efficient, and sustainable technologies.

- Understand the development of advanced aluminum alloys for battery enclosures that improve crash protection and enhance heat dissipation in electric vehicle (EV) systems.
- Analyze the design of high-conductivity aluminum cooling plates aimed at mitigating battery thermal runaway risks in EV applications.
- Evaluate next-generation aluminum alloy solutions for busbars that optimize electrical conductivity and weight for high-voltage, high-current EV architectures, including megawatt charging systems

- Understand the relationship between alloy composition, microstructure, and thermal/electrical performance.
- Explore real-world application performance metrics in EV, aerospace, nuclear, and semiconductor sectors.
- Identify strategies for materials selection and design under extreme thermal and mechanical environments.
- Recognize the scalability challenges and solutions for industrial deployment of advanced aluminum alloys.

16:50

Battery Safety Throughout the Lifecycle: Managing Thermal & Hazard Risks from Manufacturing to End-of-Life

Erica Wiener, PhD – Physical Scientist, ***U.S. Department of Transportation, PHMSA***

This session will provide a comprehensive technical overview of thermal and safety risks associated with lithium-ion and emerging battery chemistries across the full lifecycle — from production and logistics to use, storage, and end-of-life.

PHMSA's Mission & Oversight
Gain clarity on the role of the Office of Hazardous Materials Safety within PHMSA and how it intersects with battery safety and thermal risk mitigation throughout the transportation chain.

Key Federal Battery Safety Initiatives
A look at PHMSA and U.S. DOT's ongoing research efforts and regulatory activities, including:

- Battery Logistics Integrated Safety System (BLISS): A smart, lifecycle-aware packaging solution that manages safety risks during manufacturing, transit, charging, and disposal.
- State-of-Charge Monitoring: Tools and thresholds for safe storage and transport.
- Sodium-Ion Battery Testing: New results on the performance and safety characteristics of commercial sodium-ion chemistries.
- De-Energizing Damaged or End-of-Life Packs: Technical insights into safe deactivation methods for damaged, defective, or recalled batteries.

Cross-Agency Safety Coordination
Includes updates from the National Highway Traffic Safety Administration (NHTSA) on EV incident investigations, such as the salt-water damaged EV study and upcoming regulatory frameworks.

17:10

Fractional Thermal Runaway Calorimetry (FTRC): A Breakthrough in Understanding and Mitigating Lithium-Ion Battery Thermal Events

Timothy Bogart, *Senior Managing Engineer,* ***Exponent***

Traditional thermal characterization methods lack the resolution needed to quantify how heat and energy are distributed during a failure event, making risk assessment and mitigation strategies difficult to optimize.
NASA's Fractional Thermal Runaway Calorimetry (FTRC) is an advanced analytical technique that quantifies the total thermal energy released during a runaway event and breaks it down into conduction, ejecta, and gas-phase contributions. This session provides a technical deep dive into how FTRC is revolutionizing thermal runaway analysis, enabling engineers to refine safety models, improve battery designs, and develop more effective containment and thermal management solutions.

- Understand the principles of Fractional Thermal Runaway Calorimetry (FTRC) and how it improves traditional thermal analysis methods.
- Analyze how FTRC quantifies energy pathways—conduction, ejecta, and gas release—and why these measurements are critical for designing safer battery systems.
- Learn how to apply FTRC data to enhance battery pack safety, optimize cooling strategies, and improve containment structures.
- Examine case studies on how leading battery manufacturers and researchers are using FTRC to refine their thermal management and safety protocols.
- Explore how FTRC testing supports compliance with UL 9540A, NFPA 855, and other global battery safety regulations.

17:30

Advancing Cost-Efficient Thermal Dielectric Coatings for High-Performance eBattery Manufacturing

Marlen Valverde, *Global Technical Manager ePower and Energy Storage,* ***H.B. Fuller***

A novel UV-curable Thermal Dielectric Coating that enables both performance enhancements and significant cost reductions in electric battery manufacturing processes. This presentation will introduce the material and process innovations underlying a next-generation of thermally conductive dielectric coating, that offers exceptional electrical insulation, enhanced abrasion resistance to reduce material waste, and rapid application for increased throughput.

- Mechanisms by which the coating reduces total cost of ownership through decreased capital equipment needs, shorter processing cycles, and lower defect and scrap rates.
- The novel curing chemistry strategy enabling a fast, energy-efficient UV application process.
- Demonstrated capability of uniform deposition on complex topographies and large-area substrates without compromising insulation integrity.
- Quantitative data showing improvements in current leakage prevention, especially for high-voltage and high-capacity cell configurations.

18:10

Immersion Cooling in Battery Abuse Testing: Impact of Flow Dynamics on Thermal Propagation

Swapnil S. Salvi, *Research Engineer - Battery Systems Research & Innovation,* ***Southwest Research Institute***

As immersion cooling gains attention for next-generation EV battery safety, understanding how flow rate and flow duration affect thermal runaway behavior is vital. This presentation will share key findings from recent experimental studies investigating thermal propagation suppression in immersion-cooled cylindrical cell modules under nail penetration abuse scenarios. The research highlights how prolonged cooling flow significantly delays or prevents thermal runaway propagation, whereas early cutoff can lead to ignition, vapor release, and secondary reactions. Attendees will gain insight into the complexity of immersion cooling design—why higher flow rates alone may not ensure safety, and how combining cell specific physical and electrical metrics helps evaluate test outcomes with greater reliability. The session will also emphasize the importance of testing repeatability and statistical confidence in abuse testing.

- Examine how immersion cooling flow dynamics—especially duration—affect thermal runaway suppression in lithium-ion battery modules
- Understand mass loss and multiple other factors as diagnostic indicators of abuse test severity
- Explore the role of multi-parameter data in characterizing safety performance beyond thermal measurements

18:30

Thermal-Centric Battery Assembly: Advanced Manufacturing for Heat Management and Reliability

Amit Ranjan, *Director of Engineering | Batteries & Electric Vehicle Powertrain,* ***University of Michigan***

Battery module and pack assembly is unlocking higher reliability, improved thermal control, and faster time-to-market for xEV platforms. From automation and robotics to thermal interface material integration and quality assurance techniques, this presentation will highlight key advancements shaping the future of battery assembly.

- Understand how next-gen assembly methods are enabling tighter tolerances and improved thermal pathways for enhanced heat dissipation and system reliability
- Explore integration strategies for thermal interface materials (TIMs) during high-speed manufacturing
- Learn about novel joining techniques, laser welding, and structural adhesives that support both thermal performance and mechanical strength
- Examine the role of inline inspection, vision systems, and real-time data analytics in detecting defects and reducing thermal risk
- Assess how modular, flexible production lines are improving scalability while reducing manufacturing complexity
- Discover how design-for-manufacture (DFM) and co-engineering approaches are enhancing thermal management at the pack and module level

18:50

Emerging Battery Materials and Their Thermal Safety Implications

Ting Cai, *Senior Battery Control Algorithum Engineer* ***(Stealth)***

The adoption of next-generation battery materials—including lithium-metal, silicon-dominant anodes, solid-state electrolytes, and high-voltage cathodes—is accelerating. However, these emerging chemistries introduce new and often poorly understood thermal safety risks across the cell, module, and pack levels. This session delivers a deep technical dive into the thermal behavior, failure mechanisms, and safety considerations of emerging battery materials, and examines how their integration is reshaping thermal management strategies in modern EV battery systems.

- Thermal Conductivity & Heat Generation of New Chemistries - Compare the thermal profiles of lithium-metal, silicon anodes, solid-state and hybrid electrolytes vs. conventional lithium-ion materials.
- Thermal Runaway Triggers & Propagation Risk - Understand how high-voltage cathodes and reactive interfaces influence thermal runaway initiation and propagation under abuse

conditions.

- Failure Mode Analysis -Review case studies and experimental data illustrating degradation pathways, gas generation, and cell swelling in novel chemistries under fast-charging and high-load scenarios.
- Impacts on Cooling Design - Explore how lower thermal conductivity, increased reactivity, and unique failure signatures demand rethinking of BTM strategies, heat sinks, and sensor placement.
- Material Engineering for Safer Cells - Examine advanced separators, flame-retardant additives, and coatings designed to mitigate thermal risk while supporting next-gen performance.
- Implications for BMS, Testing & Compliance - Learn how battery management systems and validation protocols must evolve to accommodate the complexities of future chemistries and ensure regulatory alignment (e.g. UL 9540A, IEC 62660-2).

19:10

Software-Defined Thermal Management: BMS, Power Electronics, & HVAC Coordination

Raghaavendra Satyanaryan, *Director Battery Systems Engineering,* ***ex-Nikola Corportion***

Automotive OEMs and battery manufacturers have identified software as a major challenge, as next-generation thermal management systems must go beyond passive cooling and integrate AI-driven, real-time predictive control strategies.

- Understand how software-driven algorithms dynamically manage coolant flow, fan speeds, and compressor activation to maintain optimal battery temperature, efficiency, and safety.
- Explore machine learning models that analyze real-time sensor data to detect early signs of thermal issues, preventing battery degradation, overheating, and failures.
- Learn how software-based thermal mapping and intelligent charge distribution prevent localized overheating, improve cooling efficiency, and extend battery lifespan in high-power charging scenarios.
- Examine how BMS, power electronics, HVAC, and regenerative heat recovery systems coordinate through software-defined thermal control to improve energy efficiency and prevent thermal conflicts.
- Understand how ISO 26262-compliant software validation ensures thermal management reliability, and explore cybersecurity strategies to prevent malicious interference or software failures.
- Learn how remote software updates enhance battery thermal control strategies, improving charging performance, efficiency, and system safety over time.

19:30

Design Considerations and Process Variations: Impact on Internal Cell Resistance and System-Level Thermal Management

Sitanshu Pandya, *Lead Research Engineer - Battery Design,* ***Tesla***

The internal resistance of a battery cell plays a critical role in determining not only its electrical performance but also its thermal behavior. Small variances arising from design choices or manufacturing processes can compound at the system level, affecting thermal management strategies, reliability, and overall performance. This technical session will explore how internal resistance is influenced by design and process factors, and how these variations impact the thermal management of battery systems in electric vehicles (EVs).

- Design Considerations Influencing Internal Resistance: Electrode material selection, coating thickness, and porosity.Current collector design and impact on contact resistance.Cell format (pouch, prismatic, cylindrical) and its effect on resistance pathways.
- Process Variations and Manufacturing Impacts:Effects of material inconsistencies, calendaring, and electrode drying variations. Tolerances in assembly leading to contact resistance changes.Process control strategies to minimize resistance variability.
- System-Level Implications:How non-uniform internal resistance across a pack leads to localized heating. Thermal runaway risks stemming from high-resistance cells. Challenges in cooling system design to accommodate variability.
- Thermal Management Strategies: Designing thermal management systems for resistance variability. Real-time monitoring and adaptive thermal control. Cell-to-pack integration approaches that mitigate the effects of resistance variation.
- Modeling and Simulation:Predictive modeling of resistance impact on pack temperature profiles. Coupled electro-thermal simulation tools to guide design decisions.

19:50

Thermal Design Implications for Battery Recycling: Managing Diverse Chemistries, Formats & Safety at End-of-Life

Derek Ramsell, *Founder & CEO,* ***Battery Metals, Inc.***

This session will explore the intersection of battery thermal management and end-of-life strategies, focusing on how pack design, BMS configuration, and thermal management elements influence disassembly, safety, and material recovery.

Key discussion points will include the impact of pack-level thermal architecture on recyclability, the role of BMS data in optimizing second-life and recycling pathways, and how thermal barriers, adhesives, and module configurations either hinder or enable efficient end-of-life processing. The session will also spotlight emerging recovery technologies and standardization practices that support a sustainable, thermally-aware circular economy.

- Assess how pack architecture and thermal interfaces (e.g. adhesives, insulators, cooling plates) affect the ease and safety of disassembly and recycling.
- Explore the role of BMS data and diagnostics in tracking battery health and thermal history to inform end-of-life decisions.
- Understand the unique challenges of recycling batteries with different chemistries (LFP, NMC, solid-state, NiMH).
- Learn how modular design, automation, and labeling support thermal risk reduction and disassembly efficiency.
- Examine advanced material recovery processes that consider thermal degradation effects on cathode and electrolyte reuse.
- Discuss strategies for cross-industry collaboration to align recycling infrastructure with thermal design innovation across the battery lifecycle.

20:10

Thermal Management in Hybrid-Electric Aircraft: Tackling High C-Rate Demands and Aviation-Specific Constraints

Tushar Verma, *Lead Battery Engineer,* ***Heart Aerospace***

The high C-rate demands of a 30-seat hybrid-electric aircraft introduce significant thermal management challenges that go beyond those seen in ground-based EVs. In aviation, even small variances in cell internal resistance, discharge capacity, or thermal abuse behavior can lead to outsized effects on vehicle-level performance and safety characteristics. This session explores the thermal complexity of battery systems designed for independent propulsion assist in hybrid-electric flight, with a focus on managing transient loads during takeoff, climb, and landing.

- Peak Load Heat Generation: Understanding the impact of high discharge rates on pack temperatures and thermal gradients during critical flight phases.
- Design Trade-Offs: Evaluating on-board vs. ground-based cooling strategies under strict space and mass budgets.
- Safety-Critical Design: Implementing thermal runaway mitigation techniques and fire-resistant containment.
- Environmental Extremes: Designing for robust operation across high-altitude, arctic, and hot-climate conditions through adaptive thermal control.
- Charging Demands: Reviewing possible methods of pre-conditioning and thermal management of battery packs during megawatt-scale charging operations.

20:30

All Attendee Garden Party & Buffet

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Battery Technologists, Leading & Emerging OEMs, Cell manufacturers, Pack Integrators:

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THOUGHT LEADERSHIP

Position your company as a thought leader by sharing your latest innovations, insights and best practices on the electric vehicle battery recycling stage. Demonstrate your expertise through presentations, panel discussions and technical workshops to establish your company as an innovative industry leader.

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Showcase your brand to a highly targeted audience of battery manufacturers, OEMs, Tier 1 suppliers and recycling professionals from across the e-mobility sector. Enhance your visibility with prominent logo placement, booth displays, and speaking opportunities within the electric vehicle battery recycling community.

NETWORKING OPPORTUNITIES

Build meaningful connections and collaborations with leading experts, decision-makers and potential customers invested in e-mobility, sustainability and circular economy. The conference provides ample networking opportunities, including dedicated networking breaks, receptions and meeting with key stakeholders.

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ATTENDEE JOB TITLE CROSS SECTION 2025

Chief Engineer, Chief Scientists, **Head of Research,** Thermal Management – Battery Systems, **Vice President Battery Cell Process & Manufacturing Engineering,** Electrochemist, Advanced Battery Cell Engineering, **Materials and Manufacturing,** Battery Module Thermal Management, **Simulation engineer/ HV Battery thermal management,** Director High Voltage Battery Systems, **Battery Management Systems Engineer,** Director Battery Pack Design and Thermal Management, **Chief Engineer,** Battery Systems Management Engineer, Sr. Adv. Battery Modeling Engineer, **Sr. Staff Battery Cell Engineer,** Senior Project Manager, **Battery Cell ManufacturingFluids and Thermal Management,** R&D Engineers, **Thermal Management Lead Engineers,** Electrified Powertrains, Battery Research and Systems Engineers, **HV Battery Design and Testing,** Chief Engineer, **Thermal Management HV Components, Thermal Management Modules Battery Electrical Vehicles,** Battery Management Systems (BMS) Designer, **Battery Management Systems (BMS) Engineer,** Chief Technology Officer, Senior Mechanical Engineer, **Materials Engineer,** Powertrain Project Management, **Senior Thermal Multi-Physics Engineer,** Energy Storage Systems (ESS) Safety Engineer, **Technical Specialist,** Hardware Engineering, Director Product Manager, **Director of Advanced Thermal Systems and Technology,** Battery Safety Engineer, **Senior Battery Technology Engineer,** Director – Manufacturing Engineering, **Senior Cell Engineer,** Lead Engineer Thermal Management System, **Thermal Management Research Engineer,** Projecthouse Thermal Management Modules, **Head of EV Battery Systems,** Thermal CFD Engineer, Predictive Thermal Management High-Voltage Battery, **Senior Engineer – Virtual Design Development and Verification, Electrification Battery Thermal, Technical Lead – Thermal Management,** Analyst – Battery Thermal Management, **Team Leader – Battery Modeling and Diagnostic,** R&D (Battery Thermal System), Thermal Management CAE Engineer, **Senior Manager- Battery Thermal Simulations,** Battery Packs – Electrical, **Mechanical Thermal components Team Leader,** HV Battery Cell Vent Management Supervisor, Senior Director, **Battery Storage,** Platform Battery Thermal Management Process engineering, **Director Thermal Management HV-Battery,** Director Battery System Product & Platform Management, **EV-Battery Production and Production Planning,** Thermal Systems Architecture Engineering, **Thermal Simulation Lead,** Director of Battery Cell and Module Technology

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EARLY BIRD RATE
OEM RATE $700

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

EARLY BIRD RATE
SUPPLIER RATE $1,000

- Prices include food & beverages, morning breakfast & coffee
- 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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