BATTERY TECHNOLOGY
LEADING THE CHARGE IN ENERGY STORAGE NEWS AND INSIGHTS

THERMAL-MANAGEMENT SYSTEMS: KEY TO EV BATTERY SAFETY & EFFICIENCY.

Experts from L&L Products discuss the importance of thermal-management systems for EV batteries in commercial vehicles, highlighting innovative solutions for safety and efficiency.

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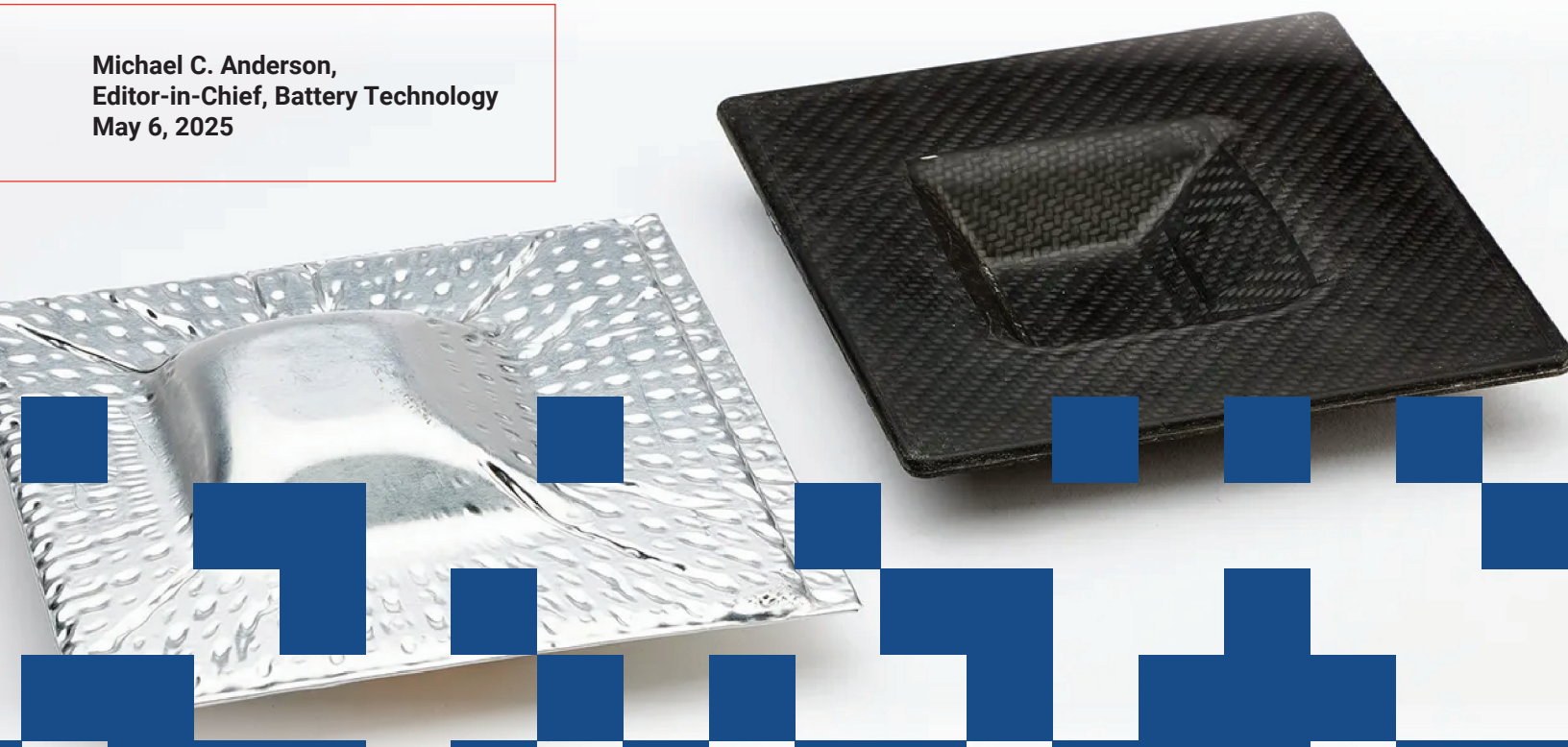

L&L Products

As the push for energy-efficient and sustainable solutions in the commercial vehicle industry continues, thermal-management systems are a vital piece of the puzzle.

The market for thermal-management systems is growing rapidly due to increased development and adoption of fully battery-powered and hybrid electric vehicles. The market size for these thermal-management systems is expected to reach $7.3 billion by 2030 – up from $3.2 billion in 2023.

With rapid development of high-capacity batteries and harsh environments at play in many areas of the world, OEMs are under increased pressure to provide thermal-management systems that ensure batteries are operating at safe and optimal temperatures while improving range.

To learn about recent innovations at the heart of thermal-management solutions for batteries, we reached out to experts from L&L Products, a nearly 70-year-old materials science and advanced engineering company. L&L Business Development Manager Manuel Grimme and Engineering Manager Kyle Royston responded by email.

How important are thermal-management systems and battery insulation in today's market?

L&L Products Business Development Manager Manuel Grimme:
They're crucial – especially with all the innovation happening in the world of battery development. Thermal management and insulation systems ensure batteries operate at optimal temperatures and perform as efficiently as possible.

Our lightweight fiber-based solutions help ensure that the batteries are operating at optimal temperatures for peak performance and greater range.

L&L BUSINESS DEVELOPMENT MANAGER MANUEL GRIMME

ENGINEERING MANAGER KYLE ROYSTON

Credit: L&L Products

MARKET TRENDS

What are some of the market trends that will shape the future of these systems?

Grimme:
Lightweighting continues to be a huge trend, as it helps improve battery range in EVs and fuel efficiency in hybrid and traditional ICE vehicles.

Our innovative materials and processes help manufacturers reduce the weight of the vehicle while simultaneously enhancing the strength of the parts. And in the commercial vehicle space, a lighter body also means the vehicle can carry a heavier payload.

Ultimately, OEMs require parts that are both light and strong. The L&L Reinforce family of products was created with both these goals in mind: We develop lightweight macro-composite solutions that reinforce the frame and improve crash resistance that can help protect the battery from damage.

Can you talk specifically about thermal-management solutions in the commercial vehicle space?

L&L Products Engineering Manager Kyle Royston:
Our materials play a vital role in a variety of thermal-management solutions, including rigid panels made with our thermoplastic foam and under-the-hood applications made with our fiber-based thermal material.

We work with customers to custom-engineer thermal solutions that ensure the best possible insulation and performance attributes in the commercial vehicle and automotive sectors.

CCS CROSSMEMBER WITH CBS ATTACHMENTS FOR STRUCTURAL REINFORCEMENT.

Credit: L&L Products

KEY PRODUCT FAMILIES

What are the key product families that make an impact? Can you discuss heat shields, under-floor thermal insulation, battery thermal insulation, and custom-tuned materials, for example?

Royston:
Our nonwoven fiber-based solutions deliver on all those fronts.

Our Heat Shield technology helps OEMs control the temperature of engine exhaust in ICE vehicles, which optimizes the operating temperatures of the vehicle's emission system and helps our customers in Europe achieve Euro IV and VI compliance.

We also provide under-hood and under-floor thermal insulation systems that keep the cabin temperature comfortable for drivers, passengers, and cargo. This may sound like a small task, but Euro-compliant engines run at higher temperatures due to more efficient combustion. That means it's more of a challenge to keep cabin and cargo temperatures comfortable, and our solutions do that efficiently.

L&L also provides battery thermal insulation solutions as part of the Thermal family, which are increasingly important as electric vehicle adoption grows. The benefits there are protecting the battery from extreme external temperatures in order to optimize the operating temperature and increase the range of the battery.

Custom-engineering a solution is something we do with every one of our customers – and one of L&L Products' core specialties. We work closely with each customer to ensure the solutions we provide are tailored to the unique application – from the size and location of the parts and materials to the performance of the solution as a whole. Along with our deep expertise in materials science, our advanced engineering helps us provide exceptional value to our customers in the commercial vehicle space.

IMPORTANT BUT OFTEN OVERLOOKED

What should the industry know about the materials and processes that help keep high-capacity batteries safe and efficient?

Grimme:
With all the innovations that have happened in the battery space over the past decade or so – higher energy density, longer range, faster charging, and new chemistries – sometimes the materials around the battery get overlooked.

However, the materials that protect, optimize, seal, and bond the battery are just as important. In many ways, they are as important as the battery technology itself.

Our solutions are ultimately battery-agnostic. Whether you're protecting, insulating, or optimizing the performance of a battery within a hybrid vehicle, a fully electric vehicle, or batteries with innovative internal chemistries, our materials can help optimize efficiency and safety. And we have decades of experience in these areas.

At the material level, we contribute to the overall efficiency of every vehicle. Many of our solutions bond and seal the battery without adding unwanted weight – and in many cases, they are both stronger and lighter than heavy metals.

L&L Products' materials improve the performance and durability of the vehicle and your manufacturing operations. We do that in a variety of ways, from lightweighting to optimizing battery performance to improving worker safety and simplifying production processes.

Check out the article online at:
https://www.batterytechonline.com/thermal-management/thermal-management-systems-key-to-ev-battery-safety-efficiency-in-commercial-vehicles

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