

New high voltage battery housing for lightweight e-mobility developed by Evonik and partners

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- Novel SMC materials reduce battery housing weight by ~10% while maintaining strength and high voltage performance
- Lightweight battery components deliver significant energy savings to ensure suitability for all vehicle size and class
- Evonik's new epoxy SMC - VESTALITE® S curing agent enables lightweight design and production flexibility

Contact person

Carolin Wolf
Head of Market Communications
Crosslinkers Business Line
Phone + 49 2365 49-9011
carolin.wolf@evonik.com

Responsible

Katja Marx
Head of Market Communications
Specialty Additives
Phone +49 6181 59-13831
katja.marx@evonik.com

Essen, Germany. Evonik as part of a consortium of companies, has developed a lighter and more cost-effective battery concept for e-mobility solutions. The new holistic battery system concept offers the automotive industry a safer and more energy efficient lightweight alternative to the heavier metal-based, or higher priced carbon fiber-reinforced plastics.

Although millions of electric cars and plug-in hybrids are already on the roads worldwide, there are still no generally applicable standards for the individual components. However, significant efforts are currently being made to standardize individual vehicle assemblies and establish a cross-market component standard.

Increasing the range of the vehicles by improving the storage capacity of the batteries and efficient energy recovery is currently one of the main areas of focus. In addition, reducing the weight of the individual vehicle components can also help to reduce the amount of energy required to overcome driving resistance (e.g. tire rolling, gradient, acceleration).

To this end, Evonik, Forward Engineering, LION Smart, Lorenz Kunststofftechnik and Vestaro (a joint venture of Evonik and Forward Engineering), began working together on a modular-multi-material approach at the end of 2019. Today, the partnership has developed a brand-independent, cost-effective solution that significantly reduces the weight of the battery housing by approximately 10 percent compared to other

Evonik Industries AG
Rellinghauser Straße 1-11
45128 Essen
Germany
Phone +49 201 177-01
www.evonik.com

Supervisory Board
Bernd Tönjes, Chairman
Executive Board
Christian Kullmann, Chairman
Dr. Harald Schwager, Deputy Chairman
Thomas Wessel, Ute Wolf

Registered Office is Essen
Register Court Essen Local Court
Commercial Registry B 19474

commonly used material combinations, without any loss in mechanical properties.

Developed for three different battery-sizes, 65kWh, 85 kWh and 120 kWh for use in various vehicles sizes and class, one of the key elements of the new battery concept is the glass fiber (GF)- Sheet Molding Compound (SMC) cover. Based on the high-performance epoxy curing agent VESTALITE® S from Evonik, the new SMC delivers the performance levels of the previous metal-based battery enclosures, while being significantly lighter than the current more cost-prohibitive SMC Materials.

“Battery modules and their housing has become a key area for improving the performance, efficiency and affordability of modern electric vehicles,” said Dr. Leif Ickert, Marketing Manager Composites and Adhesives, Evonik Operations GmbH & Managing Director, Vestaro GmbH. “Composite technologies provide strength and versatility, so offer a very promising solution for future battery system concepts. Our new glass fiber-reinforced SMC delivers the performance and economic benefits the automotive industry requires to push ahead with the next generation of sustainable e-mobility concepts.”

The glass-fiber-reinforced epoxy SMC has excellent mechanical properties including flexural and impact strength, and by using epoxy resin instead of the usual polyester resin, other problems often encountered during downstream processing of glass-fiber-reinforced SMC materials have been eliminated. Additionally, it meets all specifications regarding fire resistance and is easy to process even when complex geometries are demanded. The entire concept was successfully tested for suitability for series production and safety even under extreme conditions.

Additionally, consortium partner, Lorenz Kunststofftechnik has developed an established process for successfully recycling glass fiber-reinforced SMC materials – an important argument in view of the increasing sustainability requirements in the automotive industry.

For more detailed information about the new battery housing concept, images and additional quotes from the consortium's partners please visit [evonik.com/vestalite-s](https://www.evonik.com/vestalite-s).

About Evonik

Evonik is one of the world leaders in specialty chemicals. The company is active in more than 100 countries around the world and generated sales of €13.1 billion and an operating profit (adjusted EBITDA) of €2.15 billion in 2019. Evonik goes far beyond chemistry to create innovative, profitable and sustainable solutions for customers. More than 32,000 employees work together for a common purpose: We want to improve life today and tomorrow.

About Evonik Crosslinkers

The Crosslinkers Business Line offers a broad range of products and competences for coatings and adhesives, as well as for high-performance elastomers and composites. Besides products based on isophorone chemistry the portfolio contains a full toolbox of amine curing agents for ambient and heat cure applications. The products are mainly used in industrial applications due to the mechanical strength, durability, chemical resistance and excellent adhesion properties.

www.evonik.com/crosslinkers

About VESTARO GmbH

Bundling expertise in engineering and specialty chemicals, VESTARO was formed in 2017 as a joint venture of Evonik and Forward Engineering. Based in Munich, the Company supports automotive manufacturers with tailored composite-matrix systems and consulting services that help them to deliver efficient manufacturing processes and lightweight construction of vehicles.

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