

LANXESS at the International Vienna Motor Symposium

- **Large-format plastic enclosure for high-voltage batteries in electric vehicles**
- **Lightweight, highly mechanically loaded carriers for battery components**
- **Tank liners for high-pressure hydrogen storage systems for fuel cell vehicles**
- **Cylinder head cover made from polyamide 6 instead of polyamide 66**

Cologne, April 12, 2022 – At this year’s International Vienna Motor Symposium (April 27–29), LANXESS will be showcasing numerous concepts and applications for climate-friendly drive technologies. The International Vienna Motor Symposium is regarded as one of the world’s leading events of its kind and is attended by decision-makers from the global automotive industry. “Our material development focuses on components for high-voltage batteries in electric powertrains and for the charging infrastructure of electromobility. We are also working on materials for fuel-cell technology and advanced driver assistance systems,” says Julian Haspel, who heads the e-Powertrain team in the High Performance Materials (HPM) business unit of the specialty chemicals company. “At an organizational level, we are aligned with the needs of the global automotive industry so that we can support external partners at all stages in the development of components for new drive technologies with specially customized services.” The LANXESS booth will also focus on how polyamide 6 can replace the far more expensive polyamide 66 in key applications of combustion engines without any compromise in performance.

Development of large plastic battery enclosure progresses

One event highlight from LANXESS will be the large plastic enclosure for high-voltage batteries in electric vehicles. Developed in collaboration with Kautex Textron as a near-series technology demonstrator, LANXESS was responsible for the material and Kautex

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for component and process development. The geometrically complex lightweight component is around 1.40 meters long and wide, does not contain any metallic reinforcing elements, and weighs somewhere in the medium two-figure kilogram range. It is manufactured in a single-stage compression molding process with a compound based on the polyamide 6 compound Durethan B24CMH2.0 and does not require any further rework. Crash-relevant areas are specially reinforced with inserts made from the continuous-fiber-reinforced thermoplastic composite Tepex dynalite. As demonstrated in simulations, the component geometry fulfills a range of important standard loading cases such as for Eigenfrequency or “crush behavior”, whereby the resistance of a battery housing to slow deformation loading is tested. “The most important real-life component tests will be completed by the time the International Vienna Motor Symposium opens, which means that we can discuss the results with visitors to our booth,” says Haspel.

Permanently clamped

Tepex is also ideal for constructing lightweight and load bearing carriers for vehicle batteries. One good example of this is a curved holder for a battery that provides a backup supply of electricity to the “Intelligent Drive” highly automated driver assistance system in the Mercedes-Benz S-Class in the event of a power failure. This electrically insulating and corrosion-resistant composite part is around 40% lighter than a metal equivalent. Due to its production using the hybrid molding process, numerous functions such as holders and fastening elements can be integrated directly in the component, which helps to cut costs. “Our composite does not suffer creep under high permanent stresses, which is why the holder can keep the battery in place by clamping alone,” says Haspel.

Polyamide for high-pressure hydrogen tanks

LANXESS has expanded its material development expertise to include high-pressure tanks for storing hydrogen. “We successfully transferred our knowhow in the area of series-produced tank liners for natural-gas-powered cars to high-pressure tanks for fuel-cell

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technology,” says Haspel. With Durethan BC550Z DUSXBL, LANXESS can offer a polyamide 6 compound that, compared to other plastics, acts as an excellent barrier against hydrogen and offers outstanding low-temperature toughness. The material shows extremely strong pinch-off seams in extrusion blow molding. Thanks to the high melt stiffness of the compound, even large truck tank liners with lengths of two meters or more can be blow-molded. When welding injection-molded tank halves, the compound forms joining seams with high strength. LANXESS will be showcasing a prototype liner at the International Vienna Motor Symposium.

Switchover during ongoing series production

One example of how LANXESS has successfully substituted polyamide 66 with polyamide 6 can be seen in the cylinder head covers for a passenger car made by a Chinese automotive manufacturer. The switchover was implemented during ongoing series production. “The Durethan BKV35H2.0 component fulfills all the most important tests and is extremely stable in response to heat, engine oil, and blow-by gases. Not only that, but compared with the former material, it is also low-warpage and exhibits superior surface properties,” says Haspel. Another decisive factor for the use of the compound was that LANXESS can supply it reliably through backward integration with glass fibers and polymer raw materials.

You can find more detailed information about LANXESS’s material and technology solutions for the field of new mobility at <https://e-mobility.lanxess.com/>.

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The large plastic enclosure for high-voltage batteries in electric vehicles was developed in collaboration with Kautex Textron as a near-series technology demonstrator. LANXESS was responsible for the material and Kautex for component and process development.

Photo: Kautex Textron

LANXESS is a leading specialty chemicals company with sales of EUR 7.6 billion in 2021. The company currently has about 14,900 employees in 33 countries. The core business of LANXESS is the development, manufacturing and marketing of chemical intermediates, additives, specialty chemicals and plastics. LANXESS is listed in the leading sustainability indices Dow Jones Sustainability Index (DJSI World and Europe) and FTSE4Good.

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