

LANXESS launches new PBT compound for battery components in electric cars

Extremely low warpage and particularly high flame retardance

- **Joint material development with HELLA**
- **Complies with VDA 278 and LV 124**
- **Just two-and-a-half years from the idea to use in full-scale production**

Cologne – Specialty chemicals company LANXESS has developed a new compound called Pocan AF4130 in collaboration with HELLA KGaA Hueck & Co., based in Lippstadt, Germany. It serves as a housing material for a battery management unit (BMU) and two cell monitoring units (CMU). The blend of polybutylene terephthalate (PBT) and acrylic ester-styrene-acrylonitrile (ASA) contains 30 percent by weight glass fibers and a halogen-based flame retardance package. “The particular advantages of the material are its extremely low warpage and shrinkage, combined with its high flame retardance. We see great potential for application in precision components for vehicle battery systems,” says Marc Marbach, head of Sales Segments E&E in the LANXESS High Performance Materials (HPM) business unit. It took just two-and-a-half years to go from the initial idea to extensive testing and finally to use in full-scale production.

HELLA fabricates the BMU and CMUs for a German manufacturer of battery systems for motor vehicles. The very flat devices currently are used in the lithium-ion battery system of a German compact car.

Low tolerances

The housings of the BMU and CMUs have large, flat surfaces as well as complex geometries along the edges and on the inside. Thanks to

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their innovative design, they can be injection molded cost-effectively as single components. The contact pins for the connectors must not bend when the housings are mounted on the printed circuit boards. The tolerances for the spacing between the connector mounts and the cut-outs for the pins are therefore extremely close. "This is precisely where the outstanding dimensional stability of our blend Pocan AF4130 pays off," explains Marbach.

UL 94 5VA- and UL f1-listed

As required for this application, the material achieves the best classification of V-0 (0.75 millimeters) in UL 94 fire testing by the U.S. testing organization Underwriters Laboratories Inc. It further is listed on the UL Yellow Card with a good classification of UL 94 5VA (1.5 millimeters). The material is destined for the injection molding of flame-retardant housing components. It additionally has been given a UL f1 listing for use in outdoor applications involving exposure to UV light and water. "Our compound thus has a good chance of also being used for electrical components such as photovoltaic plugs and sockets," says Marbach.

Low volatile and condensable emissions

Surfaces made of this thermoplastic are very low-emission, as demonstrated by thermal desorption analyses conducted by LANXESS in accordance with VDA 278 (German Association of the Automotive Industry). "It is therefore also suitable for many motor vehicle applications requiring very low volatile and condensable emissions, such as components for the automotive interior," says Marbach.

Good resistance to common battery electrolytes

The blend is highly resistant to typical media used in motor vehicles, such as fuels, oils, cleansers and car care products, as proven in extensive media storage tests conducted by LANXESS for HELLA in

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accordance with the supply specification LV 124, used by many automotive manufacturers. It also displays good resistance to an electrolyte widely used in lithium-ion batteries. The corresponding test was additionally conducted under load in compliance with DIN EN 22088-3. "No cracks were evident in the samples even after 1,000 hours of exposure," explains Marbach.

Comprehensive HiAnt services

LANXESS provided HELLA with extensive support in developing the housing components. These services are part of its HiAnt customer service package. For example, HPM delivered suggestions for optimal component design, provided all the characteristic material data required for the computer-aided design of the housing parts to meet expected loads and for the mold flow analyses, and supported the initial injection molding trials. The specialty chemicals company further determined the blend's halogenide content for HELLA by means of ion chromatography and conducted odor testing to VDA 270.

LANXESS is a leading specialty chemicals company with sales of EUR 7.7 billion in 2016 and about 19,200 employees in 25 countries. The company is currently represented at 75 production sites worldwide. The core business of LANXESS is the development, manufacturing and marketing of chemical intermediates, additives, specialty chemicals and plastics. Through ARLANXEO, the joint venture with Saudi Aramco, LANXESS is also a leading supplier of synthetic rubber. LANXESS is listed in the leading sustainability indices Dow Jones Sustainability Index (DJSI World) and FTSE4Good.

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Picture



Two cell monitoring units and one battery management unit are fabricated from Pocan AF4130. The PBT+ASA displays extremely low warpage and very high flame retardance for use as a housing material. Photo: HELLA

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