News Release

Lightweight bracket for firm clamping

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- **New battery bracket with thermoplastic composite design made from LANXESS' Tepex**
- **High strength under sustained dynamic stress**
- **Functional integration means less work required for installation and logistics**
- **No risk of short circuit, unlike metal alternatives**

Cologne, November 29, 2021 – The Tepex continuous-fiber-reinforced thermoplastic composites from LANXESS are also ideal for the production of structural components that form part of driver assistance systems. One such example is a bracket for a battery that supplies electricity to the highly automated driver assistance system "Intelligent Drive" in the Mercedes-Benz S-Class in the event of a sudden power failure. The bow-shaped bracket is made by Poeppelmann Kunststoff-Technik GmbH & Co. KG located in Lohne, Germany, on the basis of the polypropylene-based Tepex dynalite 104-RGUD600(4)/47%. The manufacturing method is a two-stage process combining forming (draping) of the composite with injection molding. "The composite design means that the finished product can be as much as 40 percent lighter than a version made from metal," says Joachim Schrapp, an expert in lightweight design at Poeppelmann. "The injection molding step also enables functions to be integrated that not only make it much easier to install the bracket but also cut down on the logistical workload. All this has a beneficial effect on manufacturing costs."

Optimized distribution of forces

The bracket's job is to hold the battery – which weighs around 10 kilograms – firmly in place in the rear compartment of the vehicle by clamping alone, even when subjected to the considerable acceleration forces that occur in a collision. The bracket is designed to ensure that most of the forces are transferred from the points of application via the continuous glass fibers of the composite material. This makes the most of the excellent strength and stiffness provided by the Tepex blank. "The advantage of our composite is that unlike

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fiber-reinforced injection-molded compounds, for example, it does not suffer creep under high sustained stresses and therefore does not deform. This ensures that the battery is held in place permanently," says Philipp Maas, sales & project manager for Tepex at LANXESS. The blank also boasts a high degree of fatigue strength, which ensures that the material does not become brittle and crack over time as a result of frequent or heavy vibrations such as those caused by potholes.

Control units clipped in

The functions integrated in the bracket during the injection molding stage include guides for cables as well as mounts and fasteners for two control units. Schrapp: "These two pieces of equipment are simply clipped into place during installation, so you don't have to spend time screwing them in."

A strong material bond

The polypropylene matrix of the Tepex material is reinforced with four layers of continuous glass fibers, most of them arranged in one direction. The injection-molded compound, which is reinforced with short glass fibers, is also polypropylene-based. "Since the bonding matrix and the injection-molded material match, this creates a very strong bond between them. Coupled with the high specific stiffness of the composite, this leads to gains in both strength and stiffness," says Maas.

Corrosion-resistant and electrically insulating

Another benefit of the composite semi-finished product is that it is resistant to corrosion, which makes transportation and storage easier than would be the case for metal coils. The electrical characteristics of the structural material also play a key role. "It is electrically insulating to the body and the metal components of the battery, which significantly reduces the risk of short circuits. A component made from metal, however, would require additional measures to protect against short circuits," says Schrapp.

More detailed information about LANXESS products and technologies for the field of new mobility are available at https://lanxess.com/en/Products-and-Solutions/Focus-Topics/E-Mobility.

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Images

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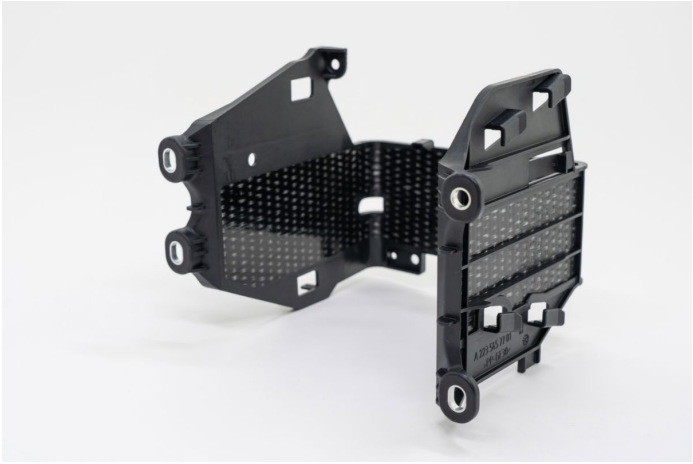

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Photo: LANXESS

The bracket is designed to ensure that most of the forces are transferred from the points of application via the continuous glass fibers of the composite material.
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