

Truck component carrier made from LANXESS polyamide receives GKV/TecPart Innovation Award

- **Joint development with system supplier and truck manufacturer**
- **Replaces DLFT-based (Direct Long Fiber Thermoplastic) composite design**
- **Comprehensive process and structural simulations allow for lightweight injection-molded part**
- **No need for heavy and expensive metal inserts**

Cologne, October 19, 2022 – A truck component carrier made from a LANXESS polyamide 6 compound has won the 2022 GKV/TecPart Innovation Award presented by Verband Technische Kunststoffprodukte e.V. The structural component was developed jointly by BBP Kunststoffwerk Marbach Baier, LANXESS and a major German commercial vehicle manufacturer. “Our material and our comprehensive process and structural simulations have helped to ensure that the carrier does not have to be reinforced with heavy and expensive metal inserts, in contrast to a DLFT composite design variant based on polypropylene. As a result, the component is around 35 percent lighter and much cheaper to manufacture,” says Dr. Matthias Theunissen, an expert in lightweight design in plastics application development at LANXESS. The Innovation Award ceremony was traditionally held during the K plastics trade show in Düsseldorf on October 19, 2022.

Dynamically highly loaded structural component

The component carrier is used in multiple truck models and takes the form of a trough with a cover. It is fastened to just four points at the center of the truck’s ladder frame and performs a number of tasks. For example, it holds two batteries weighing 75 kilograms each, as well as three compressed-air tanks, each of which tips the scales at around 7 kilograms. The structural component is exposed to considerable acceleration forces over a vehicle service life of approximately 1.2 million kilometers. These dynamic forces plus the

LANXESS AG

Contact:
Michael Fahrig
Corporate Communications
Spokesperson Trade & Technical
Press
50569 Köln
Germany

Phone: +49 221 8885-5041
michael.fahrig@lanxess.com

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high weight of the entire assembly and the small number of fastening points mean that it is subject to significant mechanical loads.

Pooled expertise in process and structural simulation

To obviate the need for costly metal reinforcement, BBP and LANXESS worked together to devise concept ideas for a purely injection-molded component that would be capable of withstanding the high dynamic loads. In addition to design proposals, LANXESS contributed its expertise in simulations for structural component design. One particular challenge along the way was fastening the component to just a few points on the ladder frame and designing these fastenings to be capable of bearing the necessary loads. “When we were making the calculations, we had the benefit of being able to draw on our extensive process expertise in matters of injection molding. For example, we used a process simulation to determine how the short glass fibers orient themselves locally during injection molding, which leads to direction-dependent mechanical component properties. We then fed the data from that into the structural simulation, which helped to make precise predictions about the mechanical behavior of the component and, in turn, to optimize it,” says Frank Lutter, CAE specialist at LANXESS. Injection-molding the carrier offers a number of advantages over DLFT-based manufacturing. For example, fiber orientation, wall thickness and warpage are all easier to reproduce. Production also lends itself better to automation, and cycle times are shorter and more efficient. The material used is the Durethan BKV35H2.0 901510 polyamide 6 compound, reinforced with 35 weight percent short glass fibers.

You can find more detailed information about the products and technologies from LANXESS for the field of New Mobility at <https://lanxess.com/en/Products-and-Brands/Focus-Topics/LANXESS-e-Mobility>.

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Contact: Michael Fahrig
Corporate Communications
Spokesperson Trade & Technical
Press
50569 Köln
Germany

Phone: +49 221 8885-5041
michael.fahrig@lanxess.com

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Image



LANXESS AG

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Corporate Communications
Spokesperson Trade & Technical
Press
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Photo: BBP Kunststoffwerk Marbach Baier

News Release

LANXESS is a leading specialty chemicals company with sales of EUR 6.1 billion in 2021. The company currently has about 13,200 employees in 33 countries. The core business of LANXESS is the development, manufacturing and marketing of chemical intermediates, additives and consumer protection products. LANXESS is listed in the leading sustainability indices Dow Jones Sustainability Index (DJSI World and Europe) and FTSE4Good.

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