

### **LANXESS: New halogen-free, flame-retardant PBT compound for high-voltage connectors**

- **Flame-retardant and hydrolysis stabilized**
- **Electrical properties hardly dependent on temperature and moisture**
- **High level of volume resistance, dielectric strength and tracking resistance**
- **Enormous potential for use in electromobility**

**Cologne, June 21, 2022** – In the powertrain or battery of electric vehicles, as well as in the charging infrastructure of electromobility, plastic components are often exposed to high temperatures along with very strong currents and high voltages. Plastic connectors, for example, must remain electrically insulating under these conditions and must not allow tracking to occur. For these high-voltage connectors, LANXESS has tailored a new PBT (polybutylene terephthalate) compound that is halogen-free flame-retardant and hydrolysis-stabilized. “One strength of the structural material is that its outstanding electrical properties are hardly dependent on temperature and moisture in the typical operating conditions of high-voltage connectors. It can be used at temperatures of up to 150 °C,” explains Dr. Bernhard Helbich, Technical Marketing Manager Key Accounts at LANXESS’ High Performance Materials business unit.

#### **Highest insulation class CTI A 600**

The compound is a first representative of the new Pocan BFN HR product range and is characterized by a high level of volume resistance and dielectric strength. For example, the latter is well over 30 kilovolts per millimeter at temperatures of up to 140 °C (IEC 62431-1). In the CTI test (Comparative Tracking Index, IEC 60112), the material achieves CTI A 600, the highest class possible according to the standard. This makes it highly tracking-resistant, which reduces the risk of short circuits and defects caused by creepage currents and caters to the growing need for miniaturized connectors. “But it can also be used at voltages higher than 600 V. The connector

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design for direct current systems can be optimized for up to 1,500 V in accordance with the design guidelines of the standard IEC 60664 / VDE 0110-1," says Helbich. The tracking resistance of the compound also hardly diminishes after long-term thermal aging at 120 °C or after climate testing.

### **Hydrolysis-resistant and flame-retardant**

The material, which is reinforced with 25 percent by weight of glass fibers, is very stable to hydrolysis. In specimen tests based on the stringent SAE/USCAR-2 Rev. 6 long-term hydrolysis tests of the US Society of Automotive Engineers (SAE), it achieved Class 3 – a good rating. Its good flame-retardant properties are demonstrated by the fact that it passed the UL 94 flammability test of the US testing institute Underwriters Laboratories Inc. with the excellent classification V-0 with a test specimen thickness of 0.75 millimeters. With its mechanical properties, the structural material meets the common requirements that are set for high-voltage connectors.

### **Bright colors and permanently color-stable**

The compound can also be colored in bright colors, such as orange. This color is increasingly being used in electric vehicles to identify live, plastic-encased components. "Our material and the colorants used remain permanently color-stable in high operating temperatures so that the identification is not lost," explains Helbich. LANXESS wants to have the thermoplastic listed under "All Colors" on the Yellow Card by UL. "In doing so, we will save the processor from the time-consuming UL certification process if they were to color the plastic themselves," explains Helbich. "They can simply use the compound that we have colored and thus reduce costs," he adds.

Beyond high-voltage connectors, Helbich sees even more possible applications for the new Pocan BFN HR product range in electromobility and in the manufacturing of miniaturized electrical and electronic assemblies: "We are thinking, for example, of miniature connectors, miniature circuit breakers, terminal blocks, and other similar applications," he says.

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### HiAnt – service that pays off for the customer

LANXESS supports manufacturers of components for electromobility with comprehensive HiAnt services. These include, for example, customer-specific material optimization and joint concept development for component design. Experts from the specialty chemicals company use the latest computer-aided engineering (CAE) methods to calculate the mechanical and thermal properties of components. Tests on the finished part can be carried out in the company's part testing center. LANXESS specialists are also on hand to provide advice and support during the start of series production.

More detailed information about LANXESS' product portfolio for electromobility can be found at <https://lanxess.com/en/Products-and-Solutions/Focus-Topics/LANXESS-e-Mobility>.

All news releases from LANXESS regarding K 2022 are available at <https://lanxess.com/K2022/Press>.

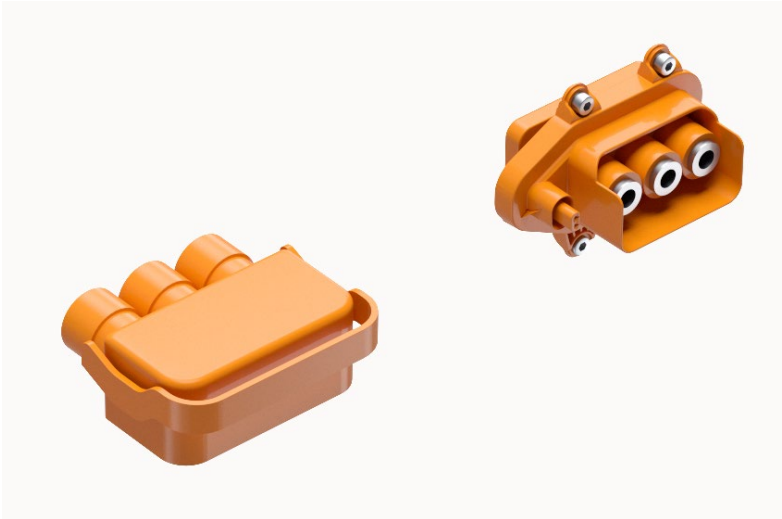
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Images



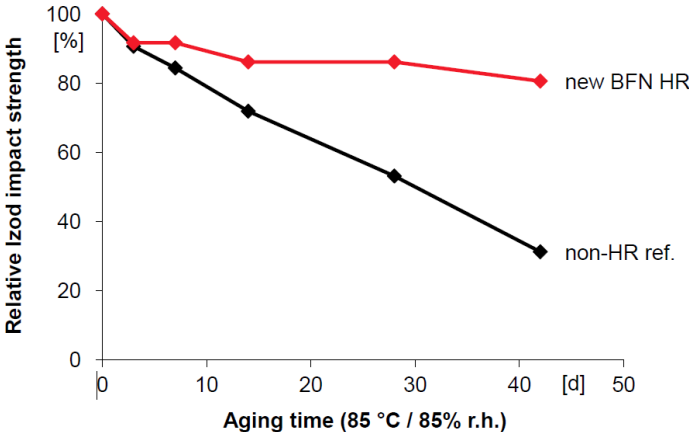
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One potential application for the new PBT compound is high-voltage connectors.

Photo: LANXESS



The hydrolysis resistance of the new halogen-free flame-retardant Pocan BFN HR is outstanding.

Photo: LANXESS

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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