

Customized polyamides and polyesters for new forms of mobility

Orange-colored compounds for high voltage components in electric vehicles

- **Material variants with high thermal color stability**
- **Excellent electrical characteristics**
- **Yellow Card listing saves molders time-consuming certification**

Cologne – The use of the color orange to identify live, plastic-sheathed components is becoming well-established in electric vehicles, but it is a challenge to develop orange compounds that exhibit high color stability over the long term. LANXESS has now succeeded in doing just this. The specialty chemicals company offers a wide range of orange-colored polyamide and polybutylene terephthalate (PBT) compounds for precisely these kinds of high-voltage applications. The products will be colored in the highly vivid RAL 2003 (LANXESS color code 200849) tone. Another color variant is almost ready to be introduced. The compounds will be available both in a standard formulation and with thermal stabilization, which will help to improve color stability when the component is exposed to heat.

“We want to provide a Yellow Card listing from the US testing organization Underwriters Laboratories for all the compounds we offer, which means that the molders will not have to color the product themselves nor to undergo the time-consuming UL certification process. They can deploy the compounds instantly, which helps to cut costs,” said Julian Haspel, manager of the e-Powertrain team, which has recently been established in the LANXESS High Performance Materials (HPM) business unit.

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Comprehensive tests for color stability during thermal aging

The standard versions of the compounds still exhibit sufficiently high color stability after 1,000 aging hours at 130°C. “The thermally stabilized material settings even have the potential to withstand 1,000 hours at 150°C without the orange color changing significantly,” explained Haspel.

High-strength structural material for structural components

Among the first product types to feature the new color are the glass-fiber-reinforced, halogen-free flame-retardant polyamide 6 compounds Durethan BKV20FN01, BKV30FN04 and BKV45FN04. A special feature here is the Durethan BKV45FN04, which is 45 percent glass-fiber-reinforced yet still easy-flowing. It passes the UL 94 flammability test with the top classification V-0 with a test specimen thickness of 0.4 millimeters. “Its high stiffness and strength make the material ideal for not only structural components in the battery such as cell frames and end plates, but also large, high-voltage connectors requiring high mechanical stability,” said Haspel. The compound is also characterized by high tracking resistance at high electrical voltages. This also applies to the two other polyamide variants. For example, orange-colored Durethan BKV30FN04 has a CTI value (comparative tracking index, IEC 60112) of 600.

Durethan BG30XH3.0 remains the perfect choice for exceptionally low-warpage structural plastic. It has been reinforced with a mixture of glass fibers and glass microbeads. The H3.0 thermal stabilization is copper- and halide-free, which prevents electrical corrosion in the vicinity of live metal parts.

Hydrolysis-stabilized PBT with outstanding flame resistance

The hydrolysis-stabilized, glass-fiber-reinforced PBT compound Pocan BF4232HR is also part of the new product series. In the color orange, it also achieves V-0 classification in the UL 94 flammability

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test with a test specimen thickness of as little as 0.4 millimeters. The high hydrolysis resistance is demonstrated in the long-term test SAE/USCAR-2 Rev. 5 of the American Society of Automotive Engineers (SAE), which was designed specially for plug connectors. Haspel: "Our PBT fulfilled requirements up to Class 5, the strictest variant of this test."

LANXESS will continue to expand its range of orange-colored compounds. "We develop application-specific, customized material variants in accordance with market requirements," said Haspel.

Development focus: new mobility

At HPM, the new compounds form part of a development focus on new forms of mobility. In addition to halogen-free flame-retardant polyamides, whose additive packages are specially designed for electromobility applications, HPM also offers, for example, highly heat-conductive polyamide 6 versions and electromagnetically shielding compounds.

LANXESS is a leading specialty chemicals company with sales of EUR 7.2 billion in 2018. The company currently has about 15,500 employees in 33 countries and is represented at 60 production sites worldwide. 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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Image



Among the new orange-colored polyamide compounds, Durethan BKV45FN04 stands out. The polyamide 6 exhibits high stiffness and strength and is very flame retardant. Photo: LANXESS AG