

New polyamides from LANXESS for the thermal management of devices

### **Thermally conductive, impact-resistant and easy to process**

- **Good strain characteristics**
- **Improved flowability**
- **Reduced tool wear**

**Cologne** – The worldwide demand for plastics for the thermal management of devices is growing all the time. This can be attributed to a number of factors, including the trend toward electromobility, the increasing digitalization of everyday life through smart home systems and the miniaturization of electrical and electronic components. This is why specialty chemicals company LANXESS has developed Durethan TC (Thermally Conductive), a range of thermally conductive polyamide compounds that will soon include two new products. The two polyamide 6 compounds will be available under the names Durethan BTC67ZH3.0EF (currently available as Durethan TP430-004) and Durethan BTC77ZH3.0EF (currently available as Durethan TP430-003). At K 2019, the international trade show for plastics and rubber taking place in Düsseldorf from October 16 to 23, LANXESS will be showcasing these innovative compounds. “Both plastics are characterized by their significantly higher impact resistance and greater strain capability in tensile and bending tests than the other materials in our TC product range. This makes them ideal for components that require high impact resistance or feature fasteners such as snap fits,” says Dr. Elisabeth Gau, a Durethan product development expert at LANXESS. Potential applications include connectors with snap fits, heat sinks, heat exchangers and mounting plates for electronic components.

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### Isotropically thermally conductive

The new compounds are filled with 67- or 77-percent-by-weight inorganic, functional filler with high thermal conductivity. Their thermal conductivity is nearly isotropic – that is, virtually the same in all directions. In the direction of flow, this is 1.1 or 1.8 watts per meter and Kelvin (Nanoflash process). Both materials are optimized with regard to their flowability due to their high filler content (EasyFlow). This means that Durethan BTC77ZH3.0EF flows much more easily than Durethan BTC75H3.0EF, which has already become established in series production applications, and that Durethan BTC67ZH3.0EF flows better than Durethan BTC65H3.0EF. “They enable thinner wall thicknesses and more complex component geometries,” says Gau. As demonstrated in tests conducted by the LANXESS technical center, they are also much less abrasive and, in turn, gentler on tools during processing.

### High elongation at break

In addition to toughness (in its conditioned state, for example, Durethan BTC67ZH3.0EF is around five times more impact-resistant than Durethan BTC65H3.0EF), the materials also feature other impressive mechanical properties. The elongation at break of Durethan BTC77ZH3.0EF in its conditioned state, for example, is more than double that of Durethan BTC75H3.0EF, which is filled with 75-percent-by-weight thermally conductive mineral. “This means that the material can absorb more energy during deformation, which in turn prevents the component from breaking so quickly under load,” says Gau.

### Further expansion of the product range

LANXESS is further expanding its range of thermally conductive polyamide 6 types. Durethan BTC965FM30, for example, was recently launched on the market. The halogen-free, flame-retardant compound combines outstanding flame-retardant properties, light

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reflection and tracking resistance with high thermal conductivity. In the direction of flow, its thermal conductivity is 2.5 W/m·K. In flammability tests conducted in compliance with US standard UL 94 (Underwriters Laboratories Inc.), the easy-flowing material achieves the top classification of V-0 (0.75 mm). The high tracking resistance is demonstrated by its CTI A value of 600 V (Comparative Tracking Index, IEC 60112). Gau: "It has huge potential for use in components for batteries in electric vehicles as well as plugs, heat sinks, heat exchangers and mounting plates for power electronics."

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LANXESS is a leading specialty chemicals company with sales of EUR 7.2 billion in 2018. The company currently has about 15,400 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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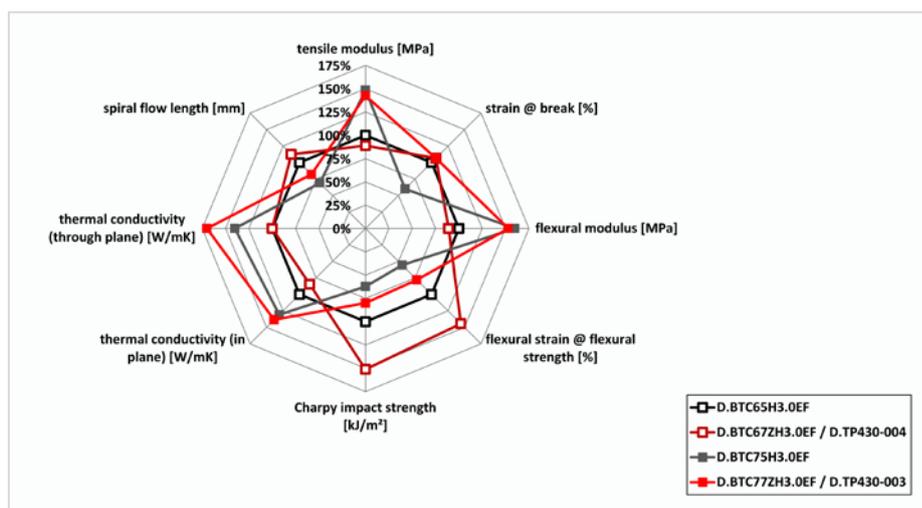
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## Image



The properties of thermally conductive polyamide 6 compounds by way of comparison (freshly molded): Durethan BTC67ZH3.0EF and BTC77ZH3.0EF – the latest-generation Durethan TC products – are characterized by high impact resistance, elongation at break and flowability. Photo: LANXESS AG