News Release

LANXESS offers continuous-fiber-reinforced thermoplastic composites with recycled polycarbonate

Turning water bottles into laptop covers

- **Sustainable contribution to circular economy**
- **Mechanical properties and processing characteristics match those of a new product**
- **Alternative to magnesium die-casting**
- **Variant with recycled carbon fibers also available**

Cologne – LANXESS sees pioneering recycling concepts as the key to boosting its competitiveness with sustainable materials from closed material cycles. The most recent example of this approach is a new product range that the LANXESS subsidiary Bond-Laminates is currently developing for its Tepex-branded continuous-fiber-reinforced thermoplastic composites. Half of the matrix for the new semi-finished products consists of recyclates originating from the recycling of reusable polycarbonate water bottles. “Our primary target application for these products includes laptop covers and housings for smartphones, tablets, e-books, and cellphones,” says Dr. Dirk Bonefeld, head of Marketing & Sales Consumer Electronics, Sports and Industry at Bond-Laminates.

Strong demand in IT and communication technology

With this latest innovation, LANXESS is responding to strong demand in the IT and communication technology industry for sustainable material solutions. Bonefeld: “With these new composites, we are also offering this industry a robust, lightweight, and easy-to-process alternative to energy-intensive magnesium die-casting.” With a share of around one third of global consumption, the IT and communication technology industry – along with the household appliance and electrical and electronics industry – has for many years been the biggest buyer of polycarbonate.

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First product in mass production

The new product range is derived from Tepex dynalite, which is used in the mass production of high-strength structural components. The first, already in series production used material variant comprises a core made from glass-fiber fabric and top layers made from carbon continuous-fiber fabric. A second material type, which is about to be used in the series production of laptop covers, has been developed that contains not only a matrix made from recycled polycarbonate, but also a randomly oriented fiber core made from carbon-fiber recyclate.

Excellent mechanical properties and high flame resistance

Bonefeld: “Both of these developments involving recycled materials exhibit outstanding mechanical properties. At 530 megapascals and 45 gigapascals, for example, the flexural strength and stiffness are at least as good as any new product already on the market. The processing characteristics are also identical.” Thanks to halogen-free flame protection, both products pass the UL 94 flame-retardant test from US testing institute Underwriters Laboratories Inc. with the best classification of V-0 with wall thicknesses from 0.4 millimeters.

High degree of purity and transparency

Large, reusable water bottles are manufactured using high-purity and high-transparency polycarbonate that is approved for use in products that come into contact with food. “Our recycled materials also benefit from this outstanding characteristics profile. The high degree of transparency is perfect for producing visible components, for example, with the highly regular arrangement of the continuous fibers making for a highly aesthetic decorative element,” says Bonefeld. “This is why we can easily imagine these new product types being used for decorative structural components in sporting goods or automotive components. In fact, we have received more and more inquiries from the sporting goods industry about recycled materials.”

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Bio-based fiber and matrix systems under development

Bond-Laminates is working hard on adding additional sustainable fiber-reinforced composites to its material portfolio. One focal point here is the use of recycled material from other post-industrial or post-consumer waste to manufacture the Tepex thermoplastic matrix. “We are also continuing to develop bio-based fiber and matrix systems and fully recycled carbon fibers.”

The broad product portfolio of Bond-Laminates will be showcased at the JEC World in Paris-Nord Villepinte (Exhibition Center, hall 5, stand N33) from 12th to 14th of May.

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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 15,500 employees in 33 countries and is represented at 58 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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Information for editors:
All LANXESS news releases and their accompanying photos can be found at http://press.lanxess.com. Recent photos of the Board of Management and other LANXESS image material are available at http://photos.lanxess.com.

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Image

Fifty percent of the matrix for the new semi-finished products consists of recyclates originating from the recycling of reusable polycarbonate water bottles. The primary target application for these products includes laptop covers and housings for smartphones, tablets, e-books, and cellphones. Photo: LANXESS AG