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Covestro at JEC World 2020

Composites for economical lightweight construction

Large portfolio of material solutions and processes

High strength combined with low weight and efficient production – thanks to this combination of properties, composites are becoming increasingly popular. In recent years, Covestro has developed a wide range of thermoplastic polycarbonate and thermoset polyurethane composites and has become a leading supplier for such technologies. A number of film formers and crosslinkers for fiber sizing complete the range.

During the JEC World 2020 trade fair in Paris from March 3-5, Covestro will be presenting innovative and sustainable material solutions for various industries at Booth K6 in Hall 5. One important application is lightweight and robust components for vehicles that reduce fuel consumption and CO_2 emissions or increase the range of electric cars. With such products, Covestro is also contributing to the fulfillment of the UN goals for sustainable development (UN-SDGs).

In cooperation with customers and partners and through own developments, the range of applications for Covestro composites has again been expanded in comparison to the previous year. The range extends from pultruded profiles and facade mounting elements to large rotor blades for wind turbines, miniaturized electronic components and sports articles produced in large quantities with short cycle times.

Robust, lightweight, aesthetic – thermoplastic composites in focus
Covestro has developed a new composite technology that facilitates the industrial-scale production of particularly thin, lightweight, high-strength yet aesthetic parts. It is based on Continuous Fiber-Reinforced Thermoplastic Polymers (CFRTP) and is marketed under the name Maezio™. Thermoplastics like polycarbonate are used as substrate material, and carbon or glass fibers are used for reinforcement.

One current example of an application is the redesigned wheels of the ES8 and ES6 SUVs of the Chinese electric car start-up NIO. At the K 2019 plastics trade fair, Covestro presented decorative wheel blades made of CFRTP composites with which the wheels can be optionally equipped. The benefits mentioned above, including aesthetics, play an important role here.

Another project is the design of an ultra-thin but very robust table as part of a new car interior concept, which Covestro developed together with partners and presented at K 2019. The table requires minimal design space and impresses with its high aesthetic and surface finish.

In addition to the innovative thermoplastic composites, Covestro is also presenting a particle foam made of expanded polycarbonate (EPC) at the JEC World 2020, which is characterised by very good mechanical properties over a wide temperature range, excellent impact strength and good fire protection. The material can be used in high-quality lightweight construction applications and is also recyclable.

High-strength, effective, durable – focus on thermoset composites
Polyurethane (PU) composites have also long been one of Covestro's core competencies. Together with partners along the value chain, the company is pushing ahead with the development of industrial production of these composites using the effective pultrusion process.

The highly reactive and aromatic PU matrix Baydur® PUL is noted in various applications by outstanding mechanical properties and good wetting of the reinforcing glass or carbon fibers. At the JEC World 2020, Covestro will be exhibiting an example of a chassis component for light commercial vehicles developed and manufactured by Carbon Truck & Trailer GmbH using pultrusion.

The same material can be used to produce profiles for the lower part of the battery box of electric vehicles, for example. These profiles show their highest strength in the longitudinal direction and hold battery modules securely in shape, as has been proven in standard industrial tests for side impact protection. At the

same time, the components can be produced efficiently and cost-effectively and can be easily combined with other materials.

The aliphatic PU system Desmocomp® AP is particularly recommended for outdoor pultrusion applications due to its unique UV and weather resistance. One of Covestro's customers, Fisco GmbH, has used it to produce pultruded mounting elements for exterior facades that are not only weather-resistant but also inherently flame-retardant and mechanically robust. In addition to these elements, Fisco GmbH is able to fulfill the strict thermal efficiency requirements of this application. This property combination is well achieved with Covestros matrix material Desmocomp®.

Efficient production of rotor blades

The expansion of renewable energies, especially wind power, plays a decisive role in effective climate protection. More intensive use in this area will require more cost-effective production of wind turbines with even longer rotors and thus even greater power output.

A polyurethane resin developed by Covestro allows lighter, longer and more robust rotor blades than the established systems used so far. This is the finding of a recent study by WINDnovation Engineering Solutions GmbH, a leading company in rotor blade design. In combination with glass fiber mats and an efficient vacuum infusion process, the resin can be used to achieve short cycle times in production and thus achieve significant cost savings.

PU dispersions to optimize the sizing of fiber reinforcement

Covestro's wide range of products exhibited at the JEC World 2020 also includes aqueous PU dispersions. They are used as film formers and crosslinkers in the formulation of sizings for glass, carbon, basalt, natural or other types of fibers. Baybond®, the front-runner in the fiber sizing portfolio, is highly suitable for both thermoplastic and thermoset matrixes.

About Covestro:

With 2018 sales of EUR 14.6 billion, Covestro is among the world’s largest polymer companies. Business activities are focused on the manufacture of high-tech polymer materials and the development of innovative solutions for products used in many areas of daily life. The main segments served are the automotive, construction, wood processing and furniture, and electrical and electronics industries. Other sectors include sports and leisure, cosmetics, health and the chemical industry itself. Covestro has 30 production sites worldwide and employs approximately 16,800 people (calculated as full-time equivalents) at the end of 2018.

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