

Press Release



Leverkusen,
July 2, 2019

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5G – key technology for the networked world

- **Covestro develops material solutions for infrastructure and smartphones**
- **Cooperation with Deutsche Telekom and Umeå Institute of Design**

5G is the latest generation of mobile communications and was developed to respond to private demand and the economic environment of 2020 and beyond. 5G will become the basis for a fully mobile and networked society; it is a key technology for the digitalization of all areas of life and the economy. The new technology enables close networking of devices such as cell phones, tablets, vehicles, household appliances, industrial plants and many others to form an Internet of Things (IoT).

With the installation of 5G, the demand for base stations, active antenna units (AAU) and other equipment will increase dramatically. [Covestro](#) is developing innovative and sustainable material solutions and contributing to a smart infrastructure, including sensor technologies and a digital communication environment. The company is cooperating closely with [Deutsche Telekom](#) and the [Umeå Institute of Design](#). Covestro will present some prototypes at [K 2019](#). The project is part of the company's comprehensive digitalization strategy. Together with its partners, the company is committed to achieving Goals 9 (Innovation and Infrastructure) and 11 (Sustainable Cities) of the UN's Sustainable Development Goals.

New telecommunications infrastructure

Polycarbonates and their blends have proven themselves in a wide range of electrical and electronic applications and, thanks to their outstanding properties, should also be the materials of choice for 5G technology: "They are mechanically robust, lightweight, transparent to radio frequencies and suitable for injection molding," explains Fabian Grote, who is a core member of the global 5G team at Covestro. Some grades also show good weather resistance



or thermal conductivity or are suitable for two-component injection molding and laser direct structuring (LDS).

To increase public acceptance of an expanded network of antennas and base stations, Covestro is working with students from the renowned Umeå Institute of Design and Deutsche Telekom to seamlessly integrate these technical facilities into the cities of the future. The project includes the development of attractive base stations, their color matching and surface structuring. Düsseldorf served as a reference city for the project.

Flexibility in antenna design

In this project Covestro will enter this market in a hypothetical scenario with its own product range. The actual product is the outer sheath of a third-party antenna, which is designed to adapt to specific environments by either fitting in or protruding from it, depending on the environment and population density. This is where the best potential can be exploited with products that deliver the technical requirements and either integrate or reinforce the character of a city with a 5G network. "At K 2019, we will be showing a series of technical and design prototypes for small cells in the frequency range of 3.5 GHz and 28 GHz," says Grote.

When 5G technology progresses to higher frequency, e.g. the millimeter wave band, signal transmittance could become a design challenge. "We can help our customers to enjoy more design freedom while ensuring the 5G data transmittance performance with state-of-art testing capabilities in a broad frequency range of up to 50 GHz under a variety of environmental conditions, all in our Asia Pacific Innovation Center in Shanghai," says Nan Hu, Global Head of Electronics at the Polycarbonates Segment of Covestro.

New film solution for 5G smartphones

5G technology, with its high transfer rates, will also have a significant impact on smartphone design. The antennas for 5G technology require more space. That is just one reason why metal solutions used to date for the back of devices will in future be replaced by ceramics, glass or plastics.

A Makrofol® SR multilayer film solution with acrylic top layer combined with a new manufacturing process results in mobile phone back covers that look like glass but are not fragile. "The film laminate can be formed in three dimensions, and the film solution also meets the requirements for transmission at high radio frequencies with wavelengths in the millimeter range," explains Echol Zhao, Head of Specialty Films Greater China at Covestro.

This crystal clear, 3D formable and 5G compatible film material is specifically engineered for optimal design freedom for mobile phone brands to create



fashionable mobile phones using decoration technologies such as UV patterning and non-conductive vacuum metallization (NCVM). More than 50 percent of the mobile phone market in China is currently switching to such multi-layer PC/PMMA film solutions – a sign of a promising future for the coming 5G era.

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.

This press release is available for download from the Covestro press server at www.covestro.com. A photo is available there for download as well. Please acknowledge the source of any pictures used.

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