

Press Release



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New Makrolon® DQ product range for diffusers of LED lights

Higher transmission and luminous efficacy

- **Short cycle times thanks to good flowability**
- **Listing on UL Yellow Card**
- **Spotlight topic at the LpS Symposium in Bregenz**

Components of LED lighting elements (light emitting diodes) - such as lenses, diffusers, reflectors or heat sinks - are an important growth field for polycarbonate. [Covestro](#), a leading global manufacturer of this transparent, tough and heat-resistant thermoplastic, will once again be exhibiting at this year's LpS (LED professional Symposium +Expo) from September 24-26, in Bregenz. LED applications in lighting will be in the limelight at this trade event.

The highlight of the presentation will be the new Makrolon® DQ (Diffusion Quality) product range, which is tailor-made for large diffusers of LED lamps and lights. The first representatives of the product range are the Makrolon® DQ5122, DQ5142 and DQ5162. "Compared with standard diffuser types of polycarbonate, the three materials exhibit up to ten percent higher light transmission with the same diffuser effect. This gives manufacturers of LED lighting elements the opportunity to significantly increase either the brightness or the luminous efficacy and thus the energy efficiency of their lights," explains Dr. Fabian Grote, expert for LED applications in the Polycarbonates segment at Covestro.

Skipping a generation of LEDs

In the lighting industry, the rule of thumb is that with every new LED generation, the luminous efficacy (lumen per watt) improves by around five percent, but the prices for the corresponding LEDs are initially usually around 20 percent higher. "Our new product range has the potential to skip one LED generation in terms of luminous efficacy without this being reflected in significantly higher LED prices,"



Grote continues. At the same time, the new product range is characterized by excellent processability. The three construction materials, for example, are as easy-flowing as or even more easy-flowing than the Makrolon[®] 2207 and 2407 grades developed for diffusers. This translates into short cycle times. In addition, complex component geometries can be injection molded without difficulty. The new compounds have already proven their suitability for series production: The replacement of Makrolon[®] 2207 with Makrolon[®] DQ5122 in the manufacture of a diffuser for an LED light, for example, resulted in a six percent higher luminous efficacy with comparable economic processing.

Tailor-made for three half-value angles

The half value angle (DIN 58161) provides information on the strength of the diffusion of a material. It corresponds to the angle of incidence at which the luminous intensity has dropped to half the luminous intensity of the light transmitted straight ahead by the test specimen. The greater the half-value angle, the greater the light diffusion. Makrolon[®] DQ5122, DQ5142 and DQ5162 are optimized for half value angles of about 19°, 43° and 56°, respectively. "With these three angles, we meet typical requirements for LED light diffusion," explains Grote.

All three new materials, with their mechanical, rheological, thermal and fire characteristics, have Yellow Card classification from Underwriters Laboratories Inc. (UL) in the United States. Potential applications include, among others, ceiling and tri-proof or diffuser lights that must be waterproof, dustproof, impact-resistant and corrosion-resistant at the same time. There is great potential for use, for example, with lamps that are highly resistant to vandalism and must have an IK impact resistance of over 6.

New highly transparent polycarbonates

Covestro will also be focusing on the new UV-stabilized and highly transparent polycarbonates Makrolon[®] LED5102, LED5202 and LED5302 at LpS. Thanks to their high transmittance of 90 percent and their permanently good heat and light resistance, they are ideal for manufacturing lenses and optics. Grote: "With otherwise comparable properties, the three materials show differences in their flow behavior to give the designer and fabricator more leeway in the mechanical design of the component in question."

LpS will take place from 24th to 26th September 2019 in the Festspielhaus Bregenz. Covestro will be exhibiting there at stand B219-21.

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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