

## Makrolon® TC Polycarbonate Portfolio

Bumper to bumper, inside and out, Covestro is driving automotive innovation forward with polycarbonate materials that enable automakers to design today for the passengers of tomorrow. With materials that look good, perform well and meet safety and cost requirements, Covestro positions automotive OEMs for the road ahead.

Autonomous driving ... battery technology ... artificial intelligence ... sensor technology ... connectivity and infotainment systems ... the automotive industry is undergoing a digital transformation like never before. But there is a price to pay for this smart functionality: increased heat generation and weight from electronics. Thermally conductive materials can help automakers beat the heat and reduce component weight, giving them the freedom to incorporate the latest electronics technologies that enable all these new user experiences.

With the Makrolon<sup>®</sup> TC polycarbonate portfolio from Covestro, automakers can add more electronics—not more weight. These high-performance materials are a solution for heat management of LED luminaires, display panels and other electronics applications. With Makrolon<sup>®</sup> TC polycarbonate it is possible to mold heat sinks directly into the electronic module wall or luminaires' reflector saving significant weight over aluminum heat sinks. System cost is optimized by reducing the number of components and decreased manufacturing complexity. In-mold assembly of electronics is also an option.

Beyond high-quality materials, Covestro provides customers with valuable technical expertise including assistance throughout the part design and manufacturing process. Our experts help designers and engineers from concept to commercialization. Whether it's material selection, designing a mold cooling system, calculating snap fit dimensions or analyzing a complex assembly, we have tools and experts that help simplify the process.



Makrolon® TC polycarbonate provides manufacturers and designers with a cost-effective material solution for heat management that is lighter and uses less manufacturing steps. This amorphous material offers considerable advantages over aluminum and other thermally conductive plastics, including high dimensional accuracy and low distortion tendency, excellent dimensional stability over a broad temperature range and long-term service temperature. Replacing the aluminum in select heat sink applications can enable up to 25 percent cost savings, a weight reduction of up to 40 percent, and a simplified, integrated luminaire design with high dimensional stability.

## **Design Considerations**

Orthotropic Thermal Conductivity Modeling



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Orthotropic Thermal Conductivity Modeling



10W LED Lamp



**High Bay Light** 



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