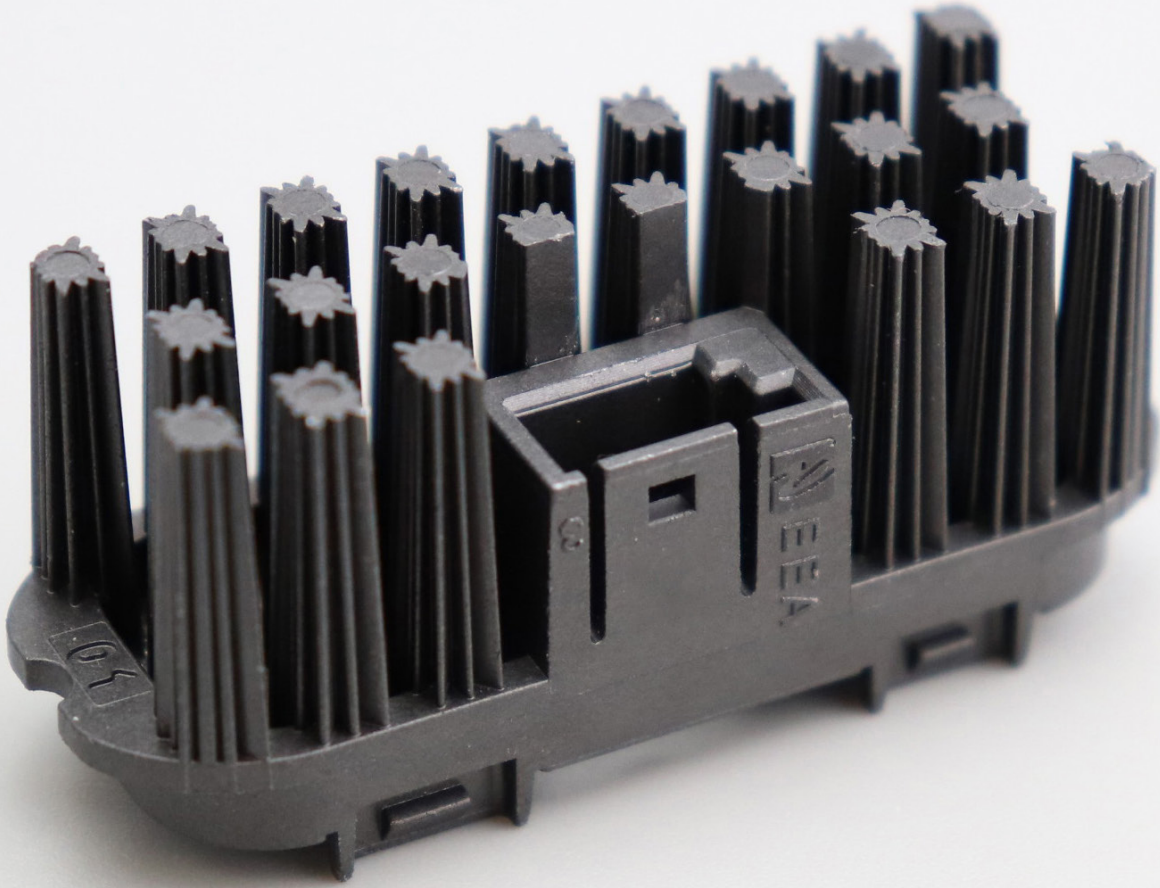
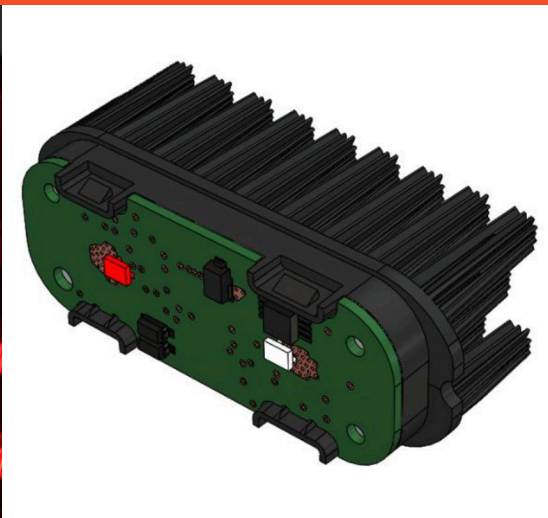


Challenge Accepted.

# Shine Bright. THERMALLY CONDUCTIVE THERMOPLASTICS REDUCE WEIGHT IN VEHICLE LIGHT HEAT SINKS



 **AVIENT™**      » CASE STUDY: THERMA-TECH™ THERMALLY CONDUCTIVE FORMULATIONS





# THERMALLY CONDUCTIVE THERMOPLASTICS REDUCE WEIGHT AND DISSIPATE HEAT

## THE CHALLENGE

Elausa Electronics specializes in the design and manufacture of electronic components for industrial and automotive industries, working in close collaboration with many automotive OEMs and Tier 1 companies for electronics and lighting applications.

Elausa approached Avient looking for an aluminum replacement for heat sinks in vehicle fog and rear lights. By replacing aluminum with a thermoplastic, Elausa was looking to reduce cost, part weight and improve ease of manufacturing, all while maintaining an equivalent level of thermal conductivity and ensuring comparable performance.

Heat sinks are used in light modules to help absorb and disperse excess heat, preventing damage to materials and increasing the longevity of the module. Traditionally aluminum or zinc aluminum alloys (Zamak) are used for heat sinks due to their high thermal conductivity, which was also the case at Elausa. However, compared with engineered thermoplastics, these materials have a relatively high density, are more complicated and energy intense to process, and may suffer from corrosion.

## THE SOLUTION

Avient worked with Elausa to develop a thermoplastic solution to suit their requirements and Therma-Tech™ Thermally Conductive Formulations were chosen as a potential fit. Therma-Tech formulations offer similar heat transfer, dissipation, and cooling capabilities to metals, when heat is transmitted into air. This combined with the design freedom, weight reduction, and cost advantages of thermoplastics, opens up the possibility to use them for metal replacement.

Switching materials from a metal to a polymer carries large and potentially costly risks in terms of both performance and production, so Avient Design was consulted to help alleviate these concerns.

An award-winning group of highly experienced industrial designers, design engineers and prototyping technicians, Avient Design helps customers with all aspects of new product development, from concept to production. Equipped with the necessary simulation software and a broad database of Avient's Specialty Engineered Materials, Avient Design is able to evaluate a part's performance in a given Avient thermoplastic. This ensures that the material and part design performs as required, before anything goes into production.

Collaborating with Elausa on this project, Avient Design re-designed the heat sink to increase its surface area, before simulating its thermal performance to ensure it met the required specification. They also provided mold fill evaluations to evaluate the best injection parameter set up to process Therma-Tech in the respective mold.

## THE IMPACT

Optimizing the part design for Therma-Tech thermoplastics and simulating its temperature distribution and thermal dissipation confirmed its thermal performance would be similar or slightly better compared to the metal originally used. As a result, Elausa replaced Zamak with Therma-Tech thermoplastics, significantly reducing part weight from 38g to 9g. Next to lower density, design optimization for the use of thermally conductive materials is key for the weight and cost saving that our Avient Design specialists provide as an additional service to our customers.

In using a thermoplastic, Elausa has been able to simplify manufacturing, now injection molding the complex heat sink in a single step, saving production time and increasing capacity. Due to the success of this project, the new, lighter heat sink made from Therma-Tech conductive thermoplastics has been rolled out across multiple vehicle models.

**Interested in learning more about thermally conductive thermoplastics? Contact us at +1.844.4AVIENT or visit [www.avient.com](http://www.avient.com).**