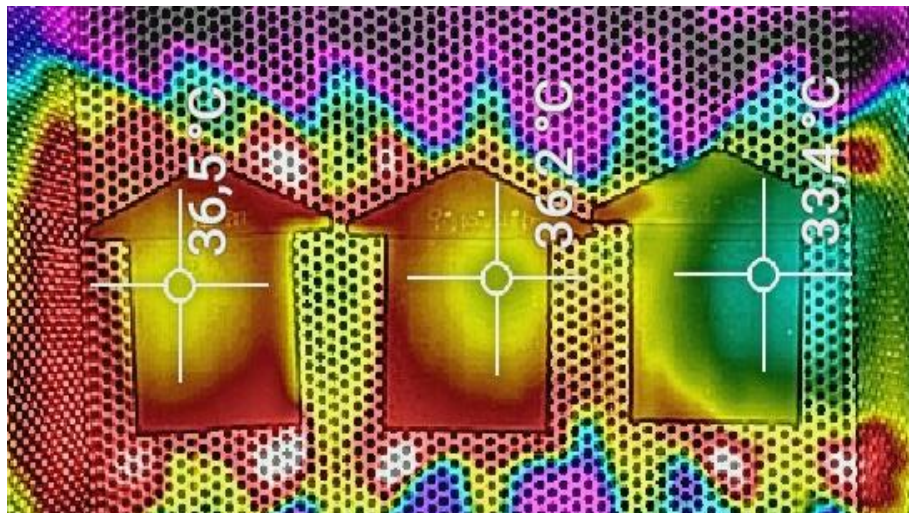


## ADVANCED THERMAL CONDUCTIVE POLYMERS FOR LED LIGHTING AND APPLICATIONS WHERE THERMAL DISSIPATION IS REQUIRED.



Demand for conductive plastics in thermal management applications continues to rise. An overheating of devices generated by smaller and more powerful electronic components open the need of more efficient thermal control. Main applications which require higher thermal conductivity are LED lighting, automotive, electronic packaging and areas where good heat dissipation, low thermal expansion and light weight are needed. Polymers reinforced with fillers, either ceramics or carbon derivatives, are becoming more common in producing high performance polymers for these applications. Heat generated from the LED's must be dissipated properly in order to ensure a full potential working and long life time. Nowadays, designers are opting to use thermally conductive plastics to substitute aluminum due to their advantages as weight reduction, more cost efficient production and improved functional integration of complex geometries.

Always looking for solutions driven by innovation and market demand, REPOL is involved in the *CDTI project IDI 20151219* to develop materials with a wide range of thermal conductivities. We are developing two lines of materials with PA and PC/ABS as resin base. From one side, the ones containing carbon derivative fillers, offering both thermal and electrical conductivity in black color. From the other side, materials formulated with ceramic fillers which show thermal conductivity and electrical insulation. In the last set of materials, as ceramic fillers are mostly white, we have the advantage to obtain the material in light colors giving us the opportunity to offer to our clients the product with specific thermal properties and colors required.

To reach the optimum conductivity results is essential to get a homogeneous filler distribution avoiding anisotropy of fillers in the material. To this aim, the Technical Institute *Aimplas* is collaborating with REPOL to design the most suitable screw configuration and process conditions. During the first step of the project, different ceramic and carbon derivatives fillers have been tested at different percentages obtaining a battery of compounds in a wide range of conductivities. The thermal diffusivity of materials have been measured in an external company with a MATHIS TDi



*Extrusion of material in the pilot plant of REPOL*

C-Therm technology obtaining in several samples figures of thermal conductivity through the plane up to 2-3 W/m·K. The materials are nowadays in experimental phase and prepared to be scaled up in our pilot plant. Taking into account our clients demand and needs, we are developing materials with good thermal conductivity and heat dissipation focused not only on LED heat sinks, but also on automotive and electronic applications among others.