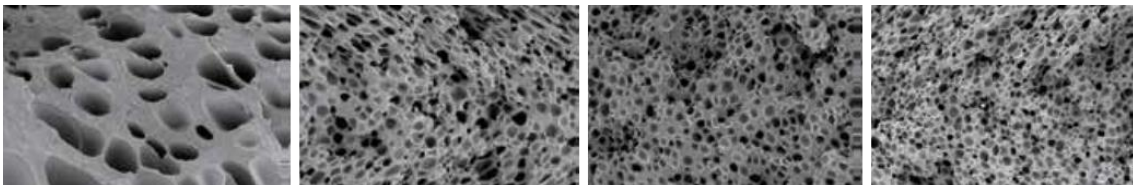
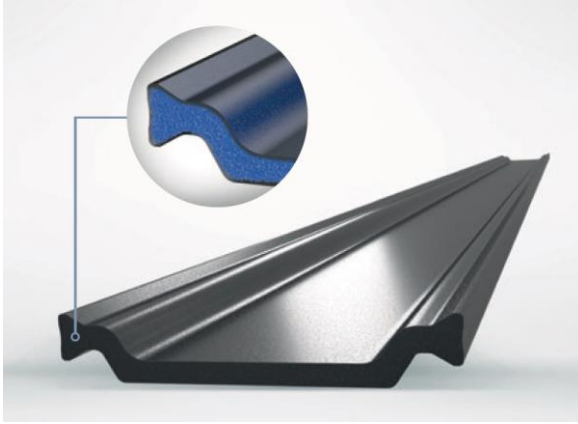


LIGHTWEIGHT MATERIALS BASED ON HIGH-TEMPERATURE FOAMED PLASTICS

Lightweight plastics are increasingly used in automotive, aerospace and construction sectors, because the use of low density materials allows to reduce the structural weight of products, reducing energy consumption and carbon footprint. One solution for lightweight in plastic engineering are polymer foaming either with physical or chemical foaming agents. Chemical foaming agents can play a key role which enables both commodity and engineering polymers to process more easily and with improved properties for injection molding and extrusion processes. The use of chemical foaming agents results in a cellular and hollow structure of polymeric materials with additional advantages as thermal/sound insulating properties and reduced weight with acceptable mechanical properties. Chemical foaming agents are divided in two families, the exothermic foaming agents (EFA) where the heat is released upon decomposition and the endothermic foaming agents (eFA) where heat is absorbed. Generally the EFA can be processed at higher temperatures, but most of them are based on azodicarbonamide (ADC) and the industry needs alternatives to this conventional exothermic foaming agents to meet European Union regulatory requirements.



REPOL has recently been working in several projects to develop lightweight materials PP-based for automotive applications in collaboration with different companies (for example ADVANSEAT project in collaboration with Grupo Antolín). Now, as a new goal, the company is involved in a *CDTI Project IDI 20160523* to extend this lightweight materials to a high performance/high processing temperature polymers, PA and blends of PCABS.



The new materials are additivated with endothermic or exothermic (ADC free) foaming agents. The process has been designed to get foaming agent decomposition during piece injection moulding. It is important to highlight that to obtain a weight reduced foamed polymer without sacrificing physical properties or appearance is needed the control of cell size obtaining a regular and homogeneous structure. To this purpose,

REPOL in collaboration with Technical Institute AIMPLAS, have tested different nucleating agents and injection moulding conditions to get the optimum results.

We are in the last stage of the project and we have reached 20% weight reduction materials with good mechanical properties. The materials development are currently at pilot scale and we are working to improve some important factors as esthetic appearance and processing of this high performance lightweight polymers.