

Development and Characterization of Green Compounds for Structural Parts

A. R. Campos¹, A. M. Cunha²

1 – PIEP, Innovation in Polymer Engineering, 4800 – 058 Guimarães, Portugal

2 - Department of Polymer Engineering (DEP) and Institute for Polymer and Composites (IPC)

University of Minho, 4800 -058 Guimarães, Portugal

It is well known that, for environmental reasons, the search for eco-friendly materials has been growing during the past two decades. Within this frame, this research work presents two different developments with both totally and partially biodegradable composites.

In the first case, corn starch powder was compounded with different percentages of alfa and pine fibers. In the second case, the compound studied was polypropylene (PP)/cork granulate. A twin screw extruder was used to compound these materials. In order to optimize the processing conditions two different set-ups were used. The compounds with corn starch powder were extruded in the presence of water and the PP/cork system was extruded in an inert environment (to avoid the thermal-oxidative conditions originated in the machine).

After pelletizing, the first group of materials was injection molded and the second was compression molded. The mechanical properties of the samples were determined and the respective morphology of the moldings was assessed with optical and scanning electron microscopy.

The obtained results reveal the potential of these composites whose mechanical performance (in terms of stiffness and strength) can be compared with the range of the polymeric systems based on high consumption thermoplastics.