

SL 2.29

## **Processing-Structure-Properties Relationship in Core-Back Overmolding of Polyolefins**

*D.B. Tchalamov, A.M. Cunha*

*IPC - Institute for Polymers and Composites, Polymer Engineering Department,  
University of Minho, Campus de Azurém, Guimarães, Portugal*

Core-back Overmolding is based on a two-component injection molding machine fitted with a special mold. The tool features two independent runner systems ending at the opposite sides of the cavity. A retractable metal side core, whose movements are controlled by a hydraulic cylinder can be introduced and withdrawn from the cavity. In this experimental work two overmolded polyolefin combinations were assessed. In the first case the same grade of PP was used both in the exterior and in the interior, while in the other instance, the inner component of the moldings was replaced by HDPE. Polarized light microscopy revealed that the exterior material had both outer and inner skin layers and the subsequently introduced interior polymer developed an ordinary skin-core microstructural pattern. The role of the processing conditions on the morphology, the microstructure and the mechanical properties was evaluated through an experimental design. The results from the performed flexural and impact tests revealed the positive influence of overall molecular orientation and improved interfacial adhesion.