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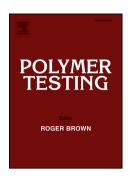
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ACCEPTED MANUSCRIPT

THE ROLE OF MICROSTRUCTURE ON THE MECHANICAL PROPERTIES
OF POLYURETHANE FOAMS CONTAINING THERMOREGULATING
MICROCAPSULES.
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Abstract
Rigid polyurethane foams with up to 50wt% of microcapsules from LDPE-EVA
containing Rubitherm®RT27 were synthesized. The influence of microcapsules on the
foams density, microstructure and mechanical resistance was studied. Cell size and
strut and wall thicknesses were analyzed by SEM. The relationships between densities
and foam microstructures with their Young's moduli and collapse stress were found by
the Gibson and Ashby formulations and the Kerner equation for mechanical properties
of composites. It was found a cell structure change from polyhedral closed-cells to
spherical or amorphous open-cells. A good agreement between the experimental and
theoretical data was observed but requiring a cell form factor. Thus, Fitting parameters
confirmed the high trend of these microcapsules to be incorporated into the foam cell
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