

Study on correlation between resin parameters and thermo-mechanical properties of LLDPE for rotomolding applications.

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The effects of Linear Low-density Polyethylene (LLDPE) resin parameters on processing, long term aging and end product performance in rotomolding application have been studied in several papers.¹⁻⁵ LLDPE resins for rotomolding are designed to have balance of density and viscosity so as to provide good stress crack resistance, good mechanical properties with high rigidity and toughness. Typical applications for rotomolding include water tanks, industrial and agricultural tanks and containers. LLDPE grades chosen for this study include one grade having higher MFI and lower density whereas other grade has relatively lower MFI and higher density. In rotomolding, higher MFI is expected to give better processability but with sacrifice on mechanical properties. The grade with lower MFI is expected to show better mechanical properties but with relatively difficult processability. This study focuses on the effect of resin parameters such as MFI and density on the thermo-mechanical and mechanical properties of LLDPE intended for rotational molding applications. Two commercial grades of LLDPE with different MFI and density combination were considered for the study. Thermo-mechanical properties such as storage and loss modulus were studied in the dynamic mechanical analysis. The changes in the mechanical properties such as tensile, flexural, izod and Gardner impact strength were evaluated. By carrying out the above study, the correlation between resin parameters, mechanical properties and processability is established.

References:

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