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EVALUATION OF POST-CONSUMER MIXED POLYOLEFINES AND THEIR INJECTION MOULDED BLENDS WITH VIRGIN POLYETHYLENE

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Abstract

Recycling of solid plastic waste composed of post-consumer mixed polyolefines (polypropylene and polyethylene) was carried out by injection moulding of secondary material streams. The materials have been characterized by melt flow index (MFI), tensile, bending and impact measurements, density and differential scanning calorimetry (DSC). The sink-float technique was used to separate the polyethylene fraction, which was then blended into virgin polyethylene at different ratios and processed anew. The mechanical and physicochemical properties were likewise determined and these results were compared to theoretical values, predicted by the law-of-mixtures. It was found that the different postconsumer mixed polyolefines were of similar quality and had comparable properties. Furthermore, it was demonstrated that the tensile and bending properties of blends consisting of recycled separated polyethylene and virgin polyethylene follow the law-of-mixtures, while the impact strength does not and is in fact strongly reduced by the presence of different phases within the injection moulded part.

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