

An investigation of the processability of natural fibre reinforced polymer composites on shallow and flat thin-walled parts by injection moulding process.

Abstract

Currently, many industries are trending towards producing products exhibit such properties as small thickness, lightweight, small dimensions, and environmental friendliness. In this project, flat or shallow thin-walled parts were designed to compare the advantages and disadvantages of lignocellulosic polymer composites (PP + 50 wt% wood) in terms of processability. This study focused on the filling, in-cavity residual stresses and warpage parameters associated with both types of thin-walled moulded parts. Thin-walled parts 0.7 mm in thickness were suitably moulded using lignocellulosic composite materials to determine the effects of filling. The analysis showed, the shallow thin-walled part is preferable in moulding lignocellulosic polymer composite material due to the low residual stress and warpage measured. The results also indicate that the shallow thin-walled part is structurally rigid, such that it can be used in applications involving small shell parts, and can be processed more economically using less material than the flat thin-walled part.

Keyword: Natural fibre reinforced polymers; shallow and flat thin-walled parts; injection moulding process