The Study of Injection Molding with Micro-features

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ABSTRACT
Injection molding can be applied to produce plastic parts with micro-features or micro-channels. Plastic parts with three different structures were selected to study the filling pattern of the polymer melt and replicating capacity of micro-structures. This research investigates the effects of three process parameters, including the mold temperature, packing pressure, injection speed, on the quality of the micro-structures with different aspect ratio. Simulation with C-Mold software and injection molding experiments were carried out in this study. Experimental results show that the mold temperature and the injection speed strongly affect the flow behavior. The replicating capacity of micro-structures is affected by the packing pressure. It was found that there is an obvious difference between the numerical and experimental results. Therefore, more efforts should be made to simulate the injection molding process with micro-channels.

Keywords: injection molding; micro-features; micro-channels

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