

# Micro Cavity Filling Behavior Studies of Polymer Materials in Micro Molding Process

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## Abstract

In recent years there has been considerable interest in the micro molding process as the trend slanting towards miniaturization. The demands on fabrication of low cost polymer micro components for various applications have increased considerably. In the micro molding process the proper filling of the micro cavity is a key step in successful molding of polymer micro components. The micro cavity filling behavior can be affected by many factors such as material property, cavity geometry, mold design, and process conditions. In the present paper micro cavity filling behavior studies have been carried out using three polymer materials: a polycarbonate (PC), a polyoxymethylene (POM), and a liquid crystal polymer (LCP). The micro component studied is a polymer cantilever which can be used for sensor and actuator applications. It has been found that the filling status of the micro cavity is closely related to the injection pressure applied during the melt injection, and the filling status generally responds to the change of process conditions in a similar manner as the part weight and injection pressure integration. Among the three polymers studied, the LCP shows the best filling properties and the injection pressure required for the POM resin is the smallest.