Observation of polypropylene (PP) melt flow on macro and micro cavities during filling phase of injection molding

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ABSTRACT
The flow of plastic melt in macro and micro parts during the filling phase of injection molding is an interesting area to discover. The visualization technique is a common method used to understand the phenomena of polymer flow in mold cavity. Various shapes and sizes were fabricated on aluminum molds embedded with Polymethyl Methacrylate (PMMA) as observation window. Electrical discharge machining (EDM) and micro mechanical machining method were employed to fabricate plastic parts shape on aluminum mold cavity. This paper focuses and discusses in detail on the Polypropylene (PP) melt flow injected using a custom made vertical injection molding machine. The PP melt flow can be clearly seen through the PMMA window and captured using high speed camera. The captured images are then compared with result from commercially available plastic injection molding software, Autodesk MoldFlow. It was found that there is good agreement for macro plastic parts but not for the micro parts. It can be concluded that, the analysis software has less capability in predicting the flow of melt plastic in micro parts.

KEYWORDS:
Flow Visualization, Micro Parts, Plastic Injection Molding

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