

Warpage analysis with straight drilled and conformal cooling channels on front panel housing by using taguchi method

Abstract

The challenging in injection molding process is to get the uniform thermal distribution on the molded parts during the cooling stage which is mainly depend on the design of the cooling channels in injection mold. Poor design of cooling channels will result a non-uniform thermal distribution which lead to a longer cycle time, differential shrinkage and warpage defects on the molded parts. In this study, the performance of conformal cooling channels compared to the straight drilled cooling channels in order to minimize the warpage on the front panel housing is evaluated. The simulation results from Autodesk Moldflow Insight (AMI) 2013 are analyzed by using Taguchi Method and Analysis of Variance (ANOVA). The analyses show that conformal cooling channels are able to improve the quality of the molded parts in term of warpage compared to the conventional straight drilled cooling channels and the results are beneficial for the molding industries which involving the precise parts.

Keywords; Analysis of Variance (ANOVA), Conformal Cooling Channel, Injection Molding Process, Straight Drilled Cooling Channels, Taguchi