Warpage optimization on ultra thin plate in three plate mold for PP, ABS & ABS+PC materials by using Taguchi method

Abstract

The parameters setting of process conditions in injection molding process is very importance to ensure the quality of molded components is controlled by minimizing of any defects such as warpage. Various injection parameters were examined and the best setting for different materials such as Polypropylene (PP), Acrylonitrile Butadiene Styrene (ABS) and Acrylonitrile Butadiene Styrene + Polycarbonate (ABS+PC) is identified which collectively affect the warpage on ultra thin plate plastic component using Taguchi and ANOVA methods. For this purpose, Autodesk Moldflow Insight (AMI) software was used to analyze the process parameters based L9 Orthogonal Array designed by Taguchi. The four parameters consist of Mold Temperature, Melt Temperature, Packing Pressure and Packing Time. The Signal to Noise (S/N) ratio method was applied in identifying the best parameter settings and to find the influence of these parameters on warpage issue. In this study, packing pressure was found to be the most significant parameter, regardless of types of material used.