International Review of Mechanical Engineering, vol. 7(3), 2013, pages 453-462

Optimization of the plastic injection molding parameters for sport equipment by using design of experiment

Abstract

This Paper, research about the defect on plastic product in injection molding process. During producing a product using injection molding process, various of defects such as warpage, weld lines, shrinkage and sink mark can be occurred. A set of Optimal setting of injection molding parameters is very important to be determined after various trials has been made, because to reduce and controlling the quality on defect of the injection molded product. The purpose of this research is to optimize warpage and shrinkage defect on material Polycarbonate (PC) thermoplastic and simulate the injection molding process using Moldflow Plastic Insight software (MPI).Optical glasses has been selected as a product to be studied and design the model by using UNIGRAPHIC NX 7.5.The approach based on Design of Experiment has been implemented to analyze and optimize the processing parameters such as mold temperature, melt temperature, packing time, packing pressure, cooling time, cooling temperature, and runner size. Experimental plans available in the form of orthogonal arrays. Software (Minitab) for automatic experiments design and analysis of results based on Design of Experiments (Taguchi Method) were used to find the best setting of injection molding plastic part.

Keywords

Plastics injection molding; Taguchi's method; Warpage and shrinkage