

Optimization of Process Parameters using DOE, RSM and GA in Plastic
Injection Molding

陳文欽, 丹尼, 傅公良

Industrial Management

Management

wenchin@chu.edu.tw

Abstract

In the past, plastic injection molding (PIM) product quality was usually measured by one single quality characteristic or by multiple quality characteristic with independent parameters one another. In this study, optimization of process parameters using design of experiment (DOE), response surface methodology (RSM), and genetic algorithm (GA) were proposed to generate the optimal process parameters settings of multiple-quality characteristics. In the first stage, significant PIM process parameters can be determined by DOE screening experiments. Then the optimal process parameter settings are obtained via computer aided engineering (CAE) simulation integrated with RSM and GA, which are taken as practically initial settings of process-related parameters. The experimental results show that the propose optimization model is very successful and can be used in industrial applications.

Keyword : Design of experiment; Response surface methodology; Genetic algorithm; Computer