

Full Factorial Design Exploration Approach for Multi-Objective Optimization on the (FDM) 3D Printed Part

Abstract

In the manufacturing industry, especially in automotive, quality, precision and productivity on the part that produces is crucial. 3D Printing technology offers a significant advantage to the manufacturer because its ability to produce complex geometry and low-cost investment risk compared with injection moulding. However, there are several issues of using this technology in mass scale and of the issue is dimensional accuracy. In this study, the application of optimisation approach which is Full Factorial Design (FFD) approach which has employed on 3D Printed bottom housing part made from Polylactic Acid (PLA) which were printed using Fused Deposition Modelling (FDM) 3D printer in order to minimise shrinkage on 3D printed parts. Based on the optimisation work, the results showed the performance of FFD approach provides a good dimensional accuracy compared to the drawing specification for the printed part. Therefore, this research provides beneficial scientific knowledge and alternative solution for the additive manufacturing process in industries application to enhance the quality of the 3D printed parts produced using FDM 3D printer machine.