

Abstract

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Effect of SLA Process Parameters on Part build Time

Additive manufacturing (AM) processes are relatively new manufacturing methods that directly produce physical parts from 3D model data by depositing a layer-upon-layer of material. Parts produced by AM processes are largely affected by the process parameters however, the knowledge needed to fully understand the effect of these parameters over the part build-time is insufficient. This study aims to investigate the effect of some parameters of the SLA process (one the AM processes) such as the hatch overcure, the part orientation, and the layer thickness on the part build-time. Design of experiments (DOE) method was used to investigate and to understand the relationships between these process parameters and the build-time. The 23 full factorial design was applied and the build-time was measured as the output response. The regression analysis and Analysis of Variance (ANOVA) techniques were conducted to the investigated SLA parameters as inputs and the part build-time as output. The results showed that the most significant factors for the part build-time are the main effect of the hatch overcure, the layer thickness, and the part orientation, consecutively.