

Print Resolution and Orientation Strategy

Fused Deposition Modeling pp 17-32 | Cite as

Chapter

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Abstract

In this chapter, a strategy for enhancing surface roughness and hardness based on the full factorial design of layer resolution and build orientation is illustrated. Layer resolution levels of 0.1 mm, 0.2 mm and 0.3 mm and build orientations of 0°, 15°, 30°, 45°, 60° and 90° were used to develop the full factorial design of experiments (DOE). Analysis of variance (ANOVA) was undertaken to determine the statistical significance of the factors to roughness and hardness properties of the printed parts. The mean interaction plots of the data were also used to study the interrelationships among the responses and the two printing parameters. The results revealed that layer resolution is the most significant parameter influencing the mean surface roughness of the PLA printed samples whereas build orientation closely influences the surface hardness as compared to the layer resolution although the ANOVA reveals that both parameters are statistically insignificant as far as hardness is concerned.

Keywords

ANOVA Build orientation Fused deposition modelling Hardness
Layer resolution Roughness

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