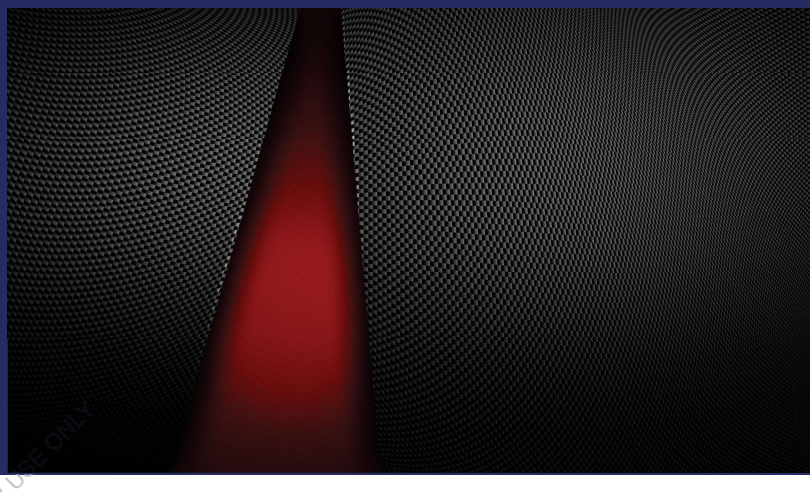
Rapid prototyping (RP) belongs to a group of techniques that are capable to build computer aided design (CAD) data into physical models. The fusion deposition modeling (FDM) is an important RP technique, using layer-by-layer deposition of extruded material, to direct the production of physical objects from CAD models.This work particularly focuses on two of such process parameters namely layer thickness of depositing material and relative thickness of carbon fiber (CF) in the composite which have been known to substantially affect the mechanical and other physical properties of products fabricated by FDM. Four such properties have been considered in this work as response variables namely tensile strength, flexural strength, impact strength and hardness of FDM part.A total of 36 different specimens have been prepared according to ASTM standards for conducting tensile, bending, impact and hardness tests. The effects of process parameters on mechanical properties have been studied using analysis of variance (ANOVA) technique. The results of the experiment revealed that addition of CF as a polylactic acid (PLA) substitute in composite raises the tensile strength compared to pure PLA.



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