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Behavior of Influencing Parameters of the Fused Deposition Modeling Process in Dissimilar Combinations: Polymer-3D Printer

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Abstract

combination with a higher cost one. The modulus of elasticity and the tensile strength of acrylonitrile butadiene styrene (ABS) and polylactic acid (PLA) polymers are determined with standardized ASTM and ISO tests considering the effect of the infill density, layer thickness and filament color. It was mainly found that the increase in layer thickness generates appreciable reductions in the modulus of elasticity and tensile strength in the range of 12–17% considering the two polymers and that the influence of the filament color produces the widest range of variation, between 3% and 19% in the mechanical properties. In the previous ranges, the highest values correspond to PLA polymer and the lowest to ABS polymer, this may be due to the difference in quality of the polymers.

Keywords

FDM **ABS and PLA polymers**

Mechanical properties **Low-cost 3D printing**

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