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Parameter Influence on Mechanical Properties of ABS; Using FDM

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Abstract

Additive manufacturing (AM), also known as solid-freeform, fast prototyping, and three-dimensional (3D) printing, is one method for creating goods from 3D model data. This cutting-edge technology has the potential to replace many existing production procedures and open up new markets for new products. The AM technology known as fused deposition modelling (FDM) is very popular. The mechanical characteristics of 3D printed goods made by FDM, however, are significantly impacted by a small range of variables. This study examines how the tensile characteristics of ABS printed using different raster angles and infill density affect the final product. Acrylonitrile butadiene styrene (ABS), a thermoplastic substance derived from petroleum, was the material employed in the study's filament. Due to its characteristics, ABS is a great material for a variety of structural applications. This study is to fabricate tensile specimens with various temperatures of 50%,75% and 100% also raster angles of 0°, 45° and 90°. The result shows that maximum ultimate tensile strength (UTS), elasticity, and yield strength were obtained at an infill density of 100% with a raster angle of 90°. Thus, infill percentage and raster angle play an important role in deciding better properties of ABS samples produced using FDM.

Keywords: FDM; ABS; 3D printing; Ttensile; Properties; Process parameter.