

**Investigation of Mechanical Properties of 3D-Printed Polylactic Acid (PLA)**

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***Abstract***

In recent years, 3D printing has contributed to developing new materials and applications, owing to its technological flexibility and distinct characteristics. Polylactic Acid (PLA) polymer samples have been produced using one of the additive manufacturing (AM) processes called fused deposition modelling (FDM). However, poor mechanical characteristics are the most prevalent problem due to the processing parameter when parts are fabricated with FDM. The research aims to study the tensile properties of PLA by varying the processing parameter. In this study, PLA material was used due to its biocompatibility properties. This research is to analyze and compare the tensile properties of 3D printed samples by varying the infill density and raster angle. The change in the circumstances has a discernible impact on the tensile strength based on varied infill densities and raster angles. The results show that infill density of 100% and 45° raster angle performs better tensile strength than 50% and 75% infill density. Hence, it can be concluded that the tensile strength of the printed samples has a noticeable effect when the processing parameters vary.

*Keywords:* Fused Deposition Modelling; 3D printing; PLA; Tensile properties.