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Impact of Process Parameters on Tensile Strength of Fused Deposition Modeling Printed Crisscross Poylactic Acid

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Abstract : Additive manufacturing gains the popularity in recent times, due to its capability to create prototype as well functional as end use product directly from CAD data without any specific requirement of tooling. Fused deposition modeling (FDM) is one of the widely used additive manufacturing techniques that are used to create functional end use part of polymer that is comparable with the injection-molded parts. FDM printed part has an application in various fields such as automobile, aerospace, medical, electronic, etc. However, application of FDM part is greatly affected by poor mechanical properties. Proper selection of the process parameter could enhance the mechanical performance of the printed part. In the present study, experimental investigation has been carried out to study the behavior of the mechanical performance of the printed part with respect to process variables. Three process variables viz. raster angle, raster width and layer height have been varied to understand its effect on tensile strength. Further, effect of process variables on fractured surface has been also investigated.

Keywords : 3D Printing, fused deposition modeling, layer height, raster angle, raster width, tensile strength
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