

Effect of Infill Density and Pattern on the Compressive Strength of Parts Produced by Polylactic Acid Filament Using Fused Deposition Modelling

Authors : G. K. Awari, Vishwajeet V. Ambade, S. W. Rajurkar

Abstract : The field of additive manufacturing is growing, and discoveries are being made. 3D printing machines are also being developed to accommodate a wider range of 3D printing materials, including plastics, metals (metal AM powders), composites, filaments, and other materials. There are numerous printing materials available for industrial additive manufacturing. Such materials have their unique characteristics, advantages, and disadvantages. In order to avoid errors in additive manufacturing, key elements such as 3D printing material type, texture, cost, printing technique and procedure, and so on must be examined. It can be complex to select the best material for a particular job. Polylactic acid (PLA) is made from sugar cane or cornstarch, both of which are renewable resources. "Black plastic" is another name for it. Because it is safe to use and print, it is frequently used in primary and secondary schools. This is also how FDM screen printing is done. PLA is simple to print because of its low warping impact. It's also possible to print it on a cold surface. When opposed to ABS, it allows for sharper edges and features to be printed. This material comes in a wide range of colours. Polylactic acid (PLA) is the most common material used in fused deposition modelling (FDM). PLA can be used to print a wide range of components, including medical implants, household items, and mechanical parts. The mechanical behaviour of the printed item is affected by variations in infill patterns that are subjected to compressive tests in the current investigation to examine their behaviour under compressive stresses.

Keywords : fused deposition modelling, polylactic acid, infill density, infill pattern, compressive strength

Conference Title : ICMAAE 2023 : International Conference on Mechanical, Automotive and Aerospace Engineering

Conference Location : Dubai, United Arab Emirates

Conference Dates : November 13-14, 2023