

Experimental and Numerical Analysis of Fibre Reinforced Polymer Matrix Composite Produced by Additive Manufacturing

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ABSTRACT

In recent years, additive manufacturing also known as 3D printing has shown extraordinary progress especially in aviation, automotive, architecture, etc. Additive manufacturing brings a new perspective for making composite materials. Composite materials are used extensively for strength and stiffness to weight ratio. Mechanical behaviour of composite materials depends on properties of matrix and fibre. This study presents numerical and experimental investigation of fibre reinforced polymer composite with different fibre combination. Tensile specimens were printed at raster orientation reinforced with continuous Kevlar, Glass and Carbon fibers. Specimens are examined by mechanical tensile test. Moreover, numerical analyses were modelled for elastic properties of fibre reinforced polymer matrix composite 3D printed specimens. Structural analysis solver (Optistruct) was used to represent the numerical modelling for different fibre reinforced type to evaluate behaviour of specimens. The aim of this study is to comparison of experimental and numerical analysis to determine the best combination of fibre reinforcement type that has better strength additive manufactured composite materials.

Keywords: Additive Manufacturing, Elastic Property, Fibre Reinforced Composite Material

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