Multi-Criteria Analysis for Design Optimization of 3D Printed Forms in Composite Laminates

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Abstract:

This paper presents a comprehensive multi-criteria analysis (MCA) approach for optimizing the design of 3D printed forms in composite laminates. The study evaluates eight different 3D printing materials based on key performance indicators such as strength, flexibility, durability, and ease of lamination. The analysis identifies PETG as the most suitable material for the production of laminate forms, considering its balance of material properties and manufacturability. Additionally, the paper explores various strategies to enhance 3D design specifically for additive manufacturing processes, with a focus on maximizing the performance of composite laminates. The findings provide valuable insights into the selection of materials and design strategies for efficient and high-quality 3D printed composite structures, offering a solid foundation for future research and industrial applications in the field of advanced manufacturing.

Keywords:

3D Printing , Composite Laminates, Design Optimization, Material Selection, Multi-Criteria Analysis.