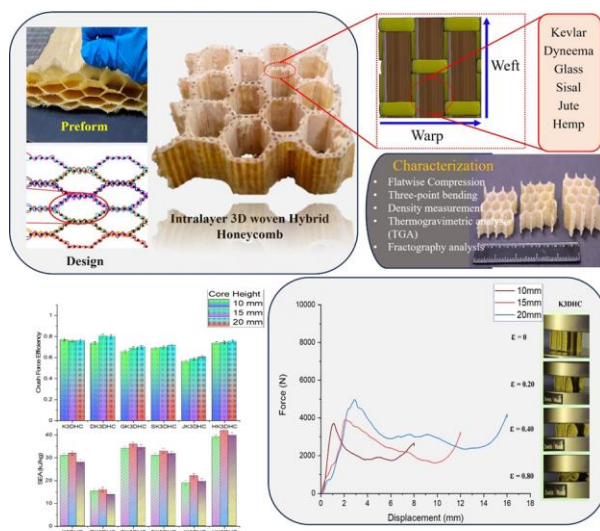


MECHANICAL PERFORMANCE OF NOVEL INTRALAYER HYBRID 3D WOVEN HONEYCOMB COMPOSITES CORE FOR LIGHTWEIGHT SANDWICH COMPOSITE

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Graphical Abstract:



Abstract: In weight-sensitive applications, the widespread use of honeycomb composites underscores the significance of enhancing their specific strength and energy absorption capacity. In this pursuit, various hybrid honeycomb structures have been developed, with a particular focus on their cell wall buckling behaviour. This study involved testing six different specimen types, incorporating intralayer hybridization with materials namely, Kevlar, Glass, Dyneema, Sisal, Hemp, and Jute. The incorporation of the intralayer hybrid technique examined various aspects of honeycomb structures, leading to improvements in mechanical performance. In addition, the effects of specific energy absorption and

crush force efficiency on the compressive and flexural strength were investigated. Among all the samples, the honeycomb core with a height of 15 mm demonstrated the highest compressive strength and specific energy absorption values. This enhancement is attributed to the synergistic effects of intralayer hybridization, emphasizing the potential for utilizing natural alternatives.

Keywords: Honeycomb composite, Intralayer Hybridisation, Lightweight composite.

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