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Investigation of Mechanical Properties of Honeycomb Sandwich Structure with Kenaf/glass Hybrid Composite

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**Abstract:**

The application of a sandwich structure made with composite facesheet and honeycomb core has increased rapidly due to high stiffness to weight ratio characteristics. There is a growing interest in using natural/synthetic hybrid composite to enhance the mechanical performance of natural fiber and reduce the environmental impact compared to synthetic materials. This study investigates the mechanical properties (tensile, edgewise compression, flexural) of the honeycomb sandwich structure with the hybrid composite facesheet, reinforced with different kenaf and glass fiber ratios. Non-hybrid kenaf and glass fiber composites were fabricated for comparison. The result showed that increasing the glass fiber ratio in a hybrid facesheet significantly improved the mechanical performance of the sandwich structure. Compared to the non-hybrid kenaf composite, the hybrid composite showed improved tensile and compression strength by up to 233% and 79%, respectively. The hybrid composite (glass/kenaf/glass) achieved 76% tensile modulus and 87% compression strength of glass fiber composite when the results were normalized. The specific flexural stiffness of the hybrid facesheet using glass fiber in the outer layer exhibited comparable performance by obtaining 89% flexural stiffness of non-hybrid glass composite sandwich structure. © 2021 Taylor & Francis