TESTING THE IMPACT AND TENSILE STRENGTH OF WOVEN COMPOSITE MATERIALS MADE FROM RAMIE AND ABAKA FIBERS WITH EPOXY RESIN MATRIX

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This study aims to determine the tensile strength and impact toughness of composite materials made from woven ramie and abaca fibers with an epoxy resin matrix. The testing was conducted to assess the mechanical performance of the resulting material, particularly in resisting tensile loads and sudden impacts. Variations in the composition of ramie and abaca fibers were applied to evaluate their influence on the mechanical properties of the composite. The specimens were produced by mixing epoxy resin with hardener and treating the fibers with a 5% NaOH solution for 120 minutes. The test results showed that the composition of 12 gr resin, 6 gr ramie fiber, and 2 gr abaca fiber (V1) yielded the highest tensile strength of 19,273 N/mm² and the highest impact energy absorption of 24,426 Joules ***or*** *0,1893 J/mm². These findings indicate that natural fiber-based composites have strong potential as eco-friendly alternative materials for lightweight structural applications in automotive and engineering sectors. Furthermore, this study can serve as an initial reference for the development of natural fiber composites with competitive mechanical performance compared to synthetic materials.*

Keywords*: composite, ramie fiber, abaca fiber, epoxy resin, tensile test, impact test, hand lay-up*