

# **Experimental Study on the Mechanical Strength of Coconut Midrib and Fiberglass Composite as an Alternative Motorcycle Fender Material**

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## **ABSTRACT**

This study was motivated by the need for alternative materials for motorcycle fenders by utilizing materials with potential as composite reinforcements. Coconut midribs are a natural material that can be used as reinforcement, while fiberglass is used to improve the mechanical properties of the composite. This study aims to determine the effect of variations in coconut midrib content on the tensile strength and impact strength of a coconut. The experimental method was employed using three variations of coconut midrib content, while the epoxy resin and fiberglass contents were kept constant. The tensile test was conducted according to ASTM D638, while the impact test was conducted according to ISO 179. The tensile test results showed values of 20.59 MPa, 30.58 MPa, and 33.68 MPa for Specimens A, B, and C, respectively. These values increased with increasing coconut midrib content. Meanwhile, the impact strength values were 8.37 kJ/m<sup>2</sup>, 7.18 kJ/m<sup>2</sup>, and 5.35 kJ/m<sup>2</sup>, respectively, indicating a decrease with increasing coconut midrib content. The decrease in impact strength is thought to be caused by the constant amounts of epoxy resin and fiberglass, which resulted in less optimal bonding with the coconut midrib surfaces and potentially led to the formation of voids. Based on the results, variations in coconut midrib content affected the mechanical properties of the composite, increasing its tensile strength while decreasing its impact strength.

**Keywords:** *Composite, Coconut Midrib, Fiberglass, Epoxy Resin, Tensile Strength, Impact Strength, Motorcycle Fender*