

# **TESTING THE BENDING STRENGTH OF WARU FIBER (HIBISCUS TILIAEUS) WITH FIBERGLASS BASED ON POLYESTER RESIN**

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## **ABSTRACT**

Natural fibers have been developed as reinforcement in composite materials, because: light, strong, environmentally friendly, and economical. The use of fiberglass for fiber ships generally uses composite materials in the form of Chopped strand mat (CSM) and Woven roving (WR) fibers as their constituents. This study replaces Woven roving with hibiscus bark fiber, judging from the results of the bending test whether it meets the 2016 BKI fiberglass standard. From the results of the tests that have been carried out, the stress value on the 0° angle orientation specimen is 181.499 N/mm<sup>2</sup>, the 45° angle is 114.976 N/mm<sup>2</sup>, and the 90° angle is 80.75 N/mm<sup>2</sup>. And for the modulus of elasticity, the value for the 0° angle orientation specimen is 5935.116 N/mm<sup>2</sup>, the 45 angle is 4752.828 N/mm<sup>2</sup>, and the 90° angle is 4619.440 N/mm<sup>2</sup>. In the 2016 BKI Fiberglass Standard Vol V, the standard value of the required bending stress is 150 N/mm<sup>2</sup> and for the standard bending value, the required elastic modulus is 6,860 N/mm<sup>2</sup>. In variations in the direction of the 0° angle, it meets the standard for the value of the bending stress with a value of 181.499 N/mm<sup>2</sup>. But on the value of the elastic modulus, there is no value that satisfies every variation in the direction of the angle. Therefore, the use of hibiscus fiber in terms of loading strength is still lacking in its elasticity value.

Keywords: hibiscus fiber, fiberglass, composite, ASTM, compressive strength.