

**ANALYSIS OF THE EFFECT OF CHANGES IN VOLUME FRACTION
AND SOAKING TIME OF NaOH ON THE TENSILE AND IMPACT TESTS
OF COMPOSITE MATERIALS MADE FROM COCONUT FIBERS**

By

Diefa Vikri A

*Study Program of Automotive Engineering, Engineering Departement of
The State Polytechnic of Jember*

ABSTRACT

Composite is a combination of two materials that results in a third, more useful material. The composite is made up of coconut fiber for strengthening and resin for binding. The NaOH alkali treatment of coir fibers removes contaminants and lignin layers from the fibers, allowing the fibers' natural characteristics to offer excellent adhesion to the resin. Hand lay up is a method of creating composites that involves pouring resin into the fiber before exerting pressure and leveling it with a brush or roll. The fiber volume fraction employed is a mix of SR-1 (40%: 60%), SR-2 (50%: 50%), SR-3 (60%: 40%), and variations in fiber immersion time 1 and 2 hours. Tensile test results with the SR-2 variation (50%:50%) have the greatest tensile strength value of 22.25 N/mm², followed by the SR-3 mixture variation (60%:40%) with a value of 20.37 N/mm², and the SR-1 mixture variation (40%:60) with a value of 19 N/mm². The impact test results with the SR-1 variation (40%:60%) had the greatest impact strength value of 0.01005 J/mm² compared to the SR-3 mixture variation (60%:40%) of 0.00970 J/mm² and the SR-2 mixture variation (50%:50) of 0.00935 J/mm². In both tensile and impact testing, fiber soaking in 5% NaOH alkali for 2 hours outperformed fiber soaking in 1 hour in both tensile and impact testing.

Keywords: *Composite, Coconut Fiber, 5% NaOH, Hand Lay Up, Tensile, Impact.*