

Effect of Variation in Coconut Coir Volume (Cocofibre) Volume as a Strengtheners in Making Composite Laminates on Tensile Strength

Muhammad Edi Purwanto
*Automotive Engineering Study Program
Engineering Department*

ABSTRACT

Composite is a material that is combined from fastener and reinforcement, the fastener in the form of a matrix and the reinforcement in the form of fiber. The quality of the composite is influenced by several factors including the mixture of matrices, fiber treatment, and calculation of fiber volume and the matrix. Specimens prepared are laminates with the addition of cement paper, and refer to ASTM D3039 for tensile testing, fiber treatment soaked for 120 minutes in a 5% NaOH solution, and the variation of the fiber percentage volume fraction is 10%, 20%, 30%, 40%, 50%, 60%, and 70%. This research continues the previous research from J. Oroh. et al, (2013) about bending strength with reference to ASTM D6110, for this study conducted on the tensile test of composite fibers to determine the tensile strength and conduct microstructure analysis on the shape of the fracture applied to natural fibers or coconut fiber. The lowest tensile test of 13.74 MPa with the percentage of fiber of 40% and 60% resin, while the highest tensile test of 23.6 MPa with the percentage of fiber of 10% and 90% resin, this is because the nature of the resin is able to provide great toughness with evenly distributed fiber. Micro analysis of fracture structures for comparison produced the highest tensile test of 10% and the lowest of 40%, namely in the pull out and delamination processes, which occurred more in percentage and 40%. The test results can be concluded that, the higher the percentage of resin in the composite causes the tensile test value is higher, and the higher the percentage of fiber causes the tensile test value to decrease.

Keywords ; Composite, resin, fiber, tensile test, and micro analysis.