THE EFFECT OF BAGASSE MIXTURE ON MECHANICAL AND PHYSICAL PROPERTIES USING POLYESTER AND VINYLESTER MATRIX

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ABSTRACT

This study aims to analyze the effect of the variation of bagasse fiber mixture on the mechanical properties and microstructure of composites using a mixture matrix of polyester and vinyl ester. The research method used is an experimental method by making composite specimens through a hand lay-up process. The variation in the fiber content of the bagasse used was 0%, 5%, 10%, 15%, and 25%, while the composition of the polyester and vinyl lester matrix was maintained at a ratio of 70:30. Material characterization was carried out through tensile testing to obtain Tensile Strength (TS), Tensile Strength at Break (TSb), Yield Strength (Sy), Yield Strain (Ey), and modulus of elasticity, as well as fracture morphology observation using Scanning Electron Microscope (SEM). The results showed that the increase in bagasse fiber content led to a decrease in TS, Sy, and EY values, with the highest TS value obtained in PV0 specimens of 32.62 MPa and the lowest in PV25 of 6.47 MPa. The 5% fiber variation provides the best TSb value and modulus of elasticity, of 3.37 MPa and 25.12 MPa, respectively. The results of SEM observations show that the addition of fiber up to 5% still produces a fairly good fiber-matrix bond, while at 25% fiber content there is porosity and uneven distribution of fibers that reduce the mechanical properties of composites.

Keywords: *Composite, Bagasse, Polyester, Vinyl Lester, Tensile Test, SEM.*