

## A COMPERATIVE PREDICTION OF THE TENSILE PROPERTIES OF SISAL FIBER REINFORCED EPOXY COMPOSITE USING VOLUME FRACTION AND MASS FRACTION MODELS

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### ABSTRACT

*This study was conducted to determine the elastic properties of unidirectional sisal epoxy composite. The composites were made using hand lay-up method and cured at room temperature. The experimental results obtained were compared with the predicted results of Krenchel volume fraction equation (KROM) and its empirically mass fraction equivalent equation (MROM). Although, it was observed that at low volume fractions the MROM predicted the tensile strength and elastic modulus of the unidirectional sisal fiber epoxy composite slightly more accurately than KROM, a statistical t-test for independent samples at 5% significance level showed that the difference in the predicted values of the models is not significant. In conclusion therefore, mass fraction models can be effectively used in the prediction of the tensile properties of a unidirectional fiber reinforced polymer composite. Its adoption would serve the practical purposes of structural material design much better than volume fraction models, avoiding difficulties in the conversion of mass fraction to volume fraction during prediction processes.*

**KEYWORDS:** Unidirectional, Natural Fiber, Polymer Resin, Volume Fraction, Mass Fraction, Property Predictions

**Received:** Oct 26, 2015; **Accepted:** Oct 31, 2015; **Published:** Nov 15, 2015; **Paper Id.:** JMMERDEC20152