

## **Correlation between flexural and compressive properties of kenaf/epoxy composite filled with mesoporous silica**

### **ABSTRACT**

This research investigates the relationship between flexural and compressive properties of kenaf/epoxy composite filled with mesoporous silica, through regression analysis. EpoxAmite® 100 Epoxy and 103 Hardener were used as matrix, modified by constant volume of silicon, different percentage of mesoporous silica, and reinforced with constant volume of kenaf mat. Three pointer bend fixture and compression test were conducted and the data were used for regression analysis. Flexural test revealed that inclusion of 5vol% mesoporous silica and 3vol% silicon into 7.2Vol% K/Ep resulted in the highest flexural strength, while the highest flexural modulus is achieved at 3vol% SiaK/Ep. Compressive strength and compressive modulus are both the highest at 1vol% SiaK/Ep-Si. Good correlations were established when kenaf is used as single independent variable to predict compressive modulus of the composites produced. On the other hand, poor correlation is obtained when silicon and mesoporous silica are used as the two independent variables in predicting flexural strength, flexural modulus, compressive strength and compressive modulus. When kenaf is included as the third independent variable (together with silicon and mesoporous silica) in predicting the four results, correlation is found to improve tremendously. However, all four multivariate regression relationships established between flexural and compressive data results in an average value ranging from 0.5 to 0.6.

**Keyword:** Compressive test; Flexural test; Natural fibre reinforced polymer; Regression analysis