

## Optimization of the Flexural Strength of Biocomposites Samples Reinforced with Resin for Engineering Applications

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**Abstract :** This study focused on the optimization of the flexural strength of bio-composite samples of palm kernel, whelks, clams, periwinkles shells and bamboo fiber reinforced with resin for engineering applications. The aim of the study was to formulate different samples of bio-composite reinforced with resin for engineering applications and to evaluate the flexural strength of the fabricated composite. The hand lay-up technique was used for the composites produced by incorporating different percentage compositions of the shells/fiber (10%, 15%, 20%, 25% and 30%) into varied proportions of epoxy resin and catalyst. The cured samples, after 24 hours, were subjected to tensile, impact, flexural and water absorption tests. The experiments were conducted using the Taguchi optimization method L25 (5x5) with five design parameters and five level combinations in Minitab 18 statistical software. The results showed that the average value of flexural was 114.87MPa when compared to the unreinforced 72.33MPa bio-composite. The study recommended that agricultural waste, like palm kernel shells, whelk shells, clams, periwinkle shells and bamboo fiber, should be converted into important engineering applications.

**Keywords :** bio-composite, resin, palm kernel shells, welk shells, periwinkle shells, bamboo fiber, Taguchi techniques and engineering application

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