

Optimization Conditions and Chemical Resistance of Areca Nut Fibre-Natural Rubber Composites

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Abstract

Composite materials are comprised of two or more materials that have different properties and the combination of a single matrix which has intermediary characteristics of the components. The Taguchi method concept of design of experiment (DOE) technique such as orthogonal array, signal-to-noise ratio (S/N), and the optimum condition were employed to study the process parameters of the areca nut fibre - natural rubber composite. This paper investigates the effect of three factors and three levels for each factors were selected as the process parameters. Experiments were selected and conducted based on the suitable orthogonal array $L_9 (3^3)$ in which the three factors were varied at three levels. After conducting the experiments, the mechanical properties (Specific gravity) of the prepared areca nut fibre-natural rubber composites were measured and (S/N) ratios were calculated. Optimum parameter values were obtained with the help of graph and the confirmation experiments were carried out, and satisfactory agreement was obtained. The areca nut fibre-rubber composites were subjected the characterization tested such as chemical resistance analysis. It is found that areca nut fibre-natural rubber composites exhibits higher chemical resistance behavior.

Key words: Taguchi method, orthogonal array, signal-to-noise ratio, optimum condition, chemical resistance

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