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## The effect of alkaline treatment on their properties of Jute fiber mat and its vinyl ester composites

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### Abstract

The untreated jute fibre mat has the affinity for the absorption of moisture, resulting in increase in wettability and the thickness of the fiber. The diameter of the weaving thread diameter is around 1.24 -1.25mm. Due to moisture the bonding between the fibers and matrix are poor and hydrophobic matrices weight is more. So it is necessary to reduce the moisture content by giving the alkali treatment solution taken as pre-treated using NaOH solution. At different exposure times 0,1,2,3,4,5,6 and 7hr dried in hot air oven temperature 100<sup>o</sup>C and kept at 2days room in temperature 30<sup>o</sup>C. The untreated and treated jute fiber mat were used as reinforcing agent of vinyl ester resin composites by vacuum bag method with a number of 4plies laminate prepared in the ratio of 60:40. The effect of the stacking sequence is in the form of unidirectional long fibers or randomly short fiber. The alkali treatment on the static mechanical properties was evaluated showing that the higher moduli in comparison to the neat resin. The strength properties, only the composite reinforced with unidirectional layers show higher strength than the plain resin. Higher concentration alkali treatment showed increased improvement of fiber mat matrix compatibility. The degree crystallinity and other properties determined by X-ray diffraction, DSC analysis SEM. By conducting all the test shows the better fiber matrix interface adhesion caused due to the fiber surface treatment by alkali.

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*Keywords:* Jute fiber mat; vinylester matrix; vacuum bag method adhesion; fiber matrix bond; statical properties; chemical properties; thermal properties.

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