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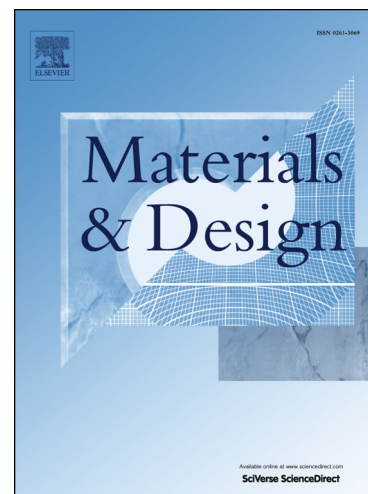
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## Study of effect of fibre volume and dimension on mechanical, thermal, and water absorption behaviour of luffa reinforced epoxy composites

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### ABSTRACT

In this work, the naturally available mat shaped luffa fibres were processed and the reinforced fibres were made in three different shapes like particles, short fibres, and mat shaped fibres. The effect of fibre dimensions, fibre volume fraction ( $0.3 - 0.5 V_f$ ) and alkaline treatment of fibres on the mechanical, thermal, and water absorption characteristics of the composites were experimentally investigated. The composites were then tested for mechanical properties such as flexural, tensile, compressive and impact strength. The test results lead to the inference that  $0.4V_f$  treated mat fibre reinforced composites acquired 13.7%, 6%, 72.43%, and 163.6% of higher tensile, compressive, flexural, and impact strength respectively, while compared with the untreated fibre reinforced composites. The thermal behaviour of the composites being investigated in an inert atmosphere revealed that the composites decomposed within the temperature range of  $341.4^\circ\text{C}$  to  $387.1^\circ\text{C}$ . Furthermore, the composites containing

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