

Fabrication, Testing and Machinability Evaluation of Glass Fiber Reinforced Epoxy Composites

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Abstract : The present paper deals with designing and fabricating an apparatus for the speedy and accurate manufacturing of fiber reinforced composite lamina of different orientation, thickness and stacking sequences for testing. Properties derived through an analytical approach are verified through measuring the elastic modulus, ultimate tensile strength, flexural modulus and flexural strength of the samples. The 0⁰ orientation ply looks stiffer compared to the 90⁰ ply. Similarly, the flexural strength of 0⁰ ply is higher than to the 90⁰ ply. Sample machinability has been studied by conducting numbers of drilling based on Taguchi Design experiments. Multi Responses (Delamination and Damage grading) is obtained using the desirability approach and optimum cutting condition (spindle speed, feed and drill diameter), at which responses are minimized is obtained thereafter. Delamination increases nonlinearly with the increase in spindle speed. Similarly, the influence of the drill diameter on delamination is higher than the spindle speed and feed rate.

Keywords : delamination, FRP composite, Taguchi design, multi response optimization

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