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Analysis of Stress Concentration of a Hybrid Composite Material with Centre Circular Hole Subjected to Tensile Loading

Authors : C. Shalini Devi

Abstract : This work describes the stress concentration in a rectangular specimen with a circular hole made up of hybrid composite material with the combination of glass/carbon with epoxy. The arrangements of cross ply lamina in the sequence of alternative carbon and glass, using carbon fiber in panel, gives more strength to the structure as the carbon properties are higher when compared to glass. Typical aircraft and automobile components are with cut-outs, and such cut-outs reduce the weight of the aircraft according to the weight reduction law and also they reduce the bulking load carrying capacity. Experimental investigations were carried out using three specimens as per ASTM D5766 and three specimens as per ASTM D3039 in the Universal Testing Machine. Stress concentration in the rectangular specimen with a hole is also analysed using FEA and comparing the results.

Keywords : composite, stress concentration, finite element analysis, tensile strength
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