

The effect of stacking sequence on tensile properties of hybrid composite materials

ABSTRACT

Hybrid composite materials have found extensive applications in many areas such as in the medical field, aerospace, automobile and in the sport industry, between others. The effect of stacking sequence of glass/carbon fibers on the tensile behavior of the hybrid composites was investigated in this paper. Five groups of hybrid composite laminates were produced using various proportions of woven E-glass/carbon fibers reinforced epoxy matrix and subjected to tensile tests. The results showed that the hybrid laminations that consist of three layers of carbon and two layers of glass provided the best tensile properties. Group D showed the maximum force results (9255.7 N) and maximum tensile stress (382.7 Mpa). For three or less number of layers in the composites, when using carbon fiber layers more than glass fiber layers, the tensile strength was found similar. Otherwise, the tensile load increased with increasing number of layers. Moreover, for the tensile force and the stress of the hybrid composite samples that consisted of three or more layers, a significant effect of the stacking sequence was noticed.

Keyword: Hybrid materials; E-glass fibers; Carbon fibers; Epoxy resin; Tensile test