**MODE-ΙΙ FRACTURE STUDIES OF CARBON FIBER**

**REINFORCED EPOXY COMPOSITES WITH FUNCTIONALISED GRAPHENE OXIDE**

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**ABSTRACT**

Carbon fiber reinforced polymer (CFRP) composites exhibits low strength in mode ΙΙ inter-laminar fracture toughness predominantly due to de-lamination between the plies under compressive along with bending stresses. Inter-laminar fracture strength of carbon fiber composites can be improved by incorporating nanofillers in the matrix so that the bonding between matrix and fiber reinforcement can be enhanced. One such kind of nanofiller that can be incorporated is functionalized graphene oxide (FGO) nano particles.

In this study matrix modified carbon fiber composites were fabricated with addition of FGO, through hand layup followed by vacuum bagging method. Graphene oxide is functionalized to enhance reactivity and to impart better bonding. The study was conducted with varying composition of FGO nanofillers viz 0.05 wt%, 0.1 wt% and 0.25 wt% with respect to the matrix. The test results of the sample exhibits significant improvement in the mode ΙΙ inter-laminar fracture toughness of the CFRP composites when compared with the baseline CFRP composite. The results clearly indicate an improvement in the strength with increase in the weight percentage of FGO nanofillers in the matrix. SEM analysis of fractured surface of the tested specimen shows an enhancement in bonding between matrix and reinforcement due to incorporation of FGO nanofillers.

*Keywords: CFRP: mode ΙΙ Interlaminar fracture toughness; functionalized graphene oxide (FGO); SEM*