Study on Dynamic Mechanical Properties of Epoxy Based Woven Fabric Glass Nano-composite Laminate with Graphene Reinforcement

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Abstract

The superior properties and flexibility of graphene expands its application to various engineering disciplines. The ultra-thin, light weight and high strength makes graphene a top priority for structural applications. In practice, while using glass woven fabric layer in fabrication to achieve desire mechanical properties the size and weight of the component was increased. In order to improve the properties of GFRP it can be combined with filler materials. Four Glass laminates of twelve layers with 0, 1, 1.5 and 3 wt.% of graphene were fabricated using hand layup and compression moulding techniques. The reinforcement of glass fiber with graphene nanoparticles is an attempt to investigate the dynamic mechanical properties such as loss modulus, loss factor, storage modulus and glass transition temperature of GFRP at different concentrations of graphene were evaluated as per ASTM standards experimentally. The influence of different composition of graphene nano composite laminate on dynamic mechanical properties was discussed in detail.

Keywords- Glass fiber, graphene, nano-composite laminate, dynamic mechanical analysis

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