**A STUDY OF ELECTROMAGNETIC INTERFERENCE SHEILDING PROPERTY OF CARBON FIBRE REINFORCED EPOXY NANOCOMPOSITES USING rGO AS FILLER MATERIAL**

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**ABSTRACT**

Carbon fibres are composed of carbon atoms having dimensional range of 5-10μm. They possess very good properties such as high chemical resistance, high tensile strength, high stiffness, low weight, low thermal expansion and high temperature tolerance. Because of these properties carbon fibre are evidently used in civil engineering, aerospace, military, motorsports and automobile industry. However, they are relatively expensive when compared to glass fibre, plastic fibre. Carbon fibres can be effectively used for making composites. The composites so fabricated using carbon fibres have very good electrical and mechanical properties.

Graphene is a hexagonal shaped 2D sheet of carbon atoms and it has got very good properties such as mechanical strength, thermal properties, and electrical properties. Thus graphene exhibits dominant electrical conductivity. Graphene oxide contains an oxygen functional group and has got many good properties that are different from that of graphene. If we are reducing graphene oxide, then these oxidized functional groups can be removed and hence we will obtain a graphene based material called as reduced graphene oxide, often abbreviated as rGO.

The project aims at fabrication of carbon fiber reinforced polymer composites to study the effect of incorporation of nanofillers on the electrical conductivity of composites. Composites are prepared using two plies of carbon fibre and the method employed is simple hand lay-up followed by vacuum bagging. The main constituents of composite include carbon fibre, epoxy, THF(Tetrahydrofuran), hardener and rGO. rGO is used as the filler material and composites are prepared with 1%, 3%, 5% and 10% of rGO. The electrical properties in terms of conductivity, permittivity, permeability are obtained using precision impedance analyzer. The total Shielding Effectiveness is deduced and compared with respect to a reference baseline composite

*Keywords: Carbon fibre reinforced epoxy nanocomposites; Reduced graphene oxide; precision impedance analyzer; Total shielding effectiveness*