

## Chemical and Physical Modification of Carbon Fiber Reinforced Polymers Based on Thermoplastic Acrylic Resin

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**Abstract :** Thanks to their excellent properties, i.e. high stiffness and strength in relation to their weight, corrosion resistance, and low thermal expansion, Carbon Fiber Reinforced Polymers (CFRPs) are a group of materials readily used in many industrial sectors, e.g. aviation, automotive, wind energy. Conventional CFRPs also have their disadvantages, namely, relatively low electrical conductivity and brittle cracking. To counteract this, a thermoplastic acrylic resin was proposed, which was further modified by the addition of organosilicon compounds and multi-walled carbon nanotubes (MWCNTs). The addition of the organosilicon compounds was aimed at improving the dispersion of the MWCNTs and obtaining good adhesion between the resin and the carbon fibre, where the MWCNTs were used as a conductive filler. In addition, during the fabrication of laminates using the infusion method, thermoplastic nonwovens doped with MWCNTs were placed between the carbon reinforcement layers to achieve a synergistic effect with an increase in electrical and mechanical properties.

**Keywords :** CFRP, acrylic resin, organosilicon compounds, mechanical properties, electrical properties

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