ACCURACY OF MECHANICAL PROPERTIES TESTING USING COMPLEMENTARY METHODS FOR GFRP

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ABSTRACT

Nowadays composite materials are used in different areas due to their superior properties compared to traditional materials. This paper presents the fabrication concept of a composite plate and experimental validation of glass fiber reinforced composite material, GFRP. In order to evaluate the material performance of the [0°/90°] reinforced composite plate, specimens were cut in three directions. According to ASTM D3039, uniaxial tensile tests were carried out and demonstrated different mechanical behaviors in the three cutting directions: longitudinal, transverse and 45°. On the basis of the results obtained after breaking the specimens, specific stress-strain characteristic curves were plotted and the standard-specific failure modes were analyzed. The results will be correlated with those obtained in DMA testing by analyzing the characteristic parameters (the complex modulus of elasticity E, the loss modulus E'', which represents the viscous component of the material and the damping or loss factor, tan δ) in the temperature range, following the dynamic behavior of GFRP after passing over the transition temperature to the glassy state.

Keywords: composite materials, tensile test, GFRP, DMA

Related Theme:

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