

Effect of Carbon Nanotube Reinforcement in Polymer Composite Plates under Static Loading

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Abstract : In the implementation of carbon nanotube reinforced polymer matrix composites in structural applications, deflection and stress analysis are important considerations. In the present study, a multi scale analysis of deflection and stress analysis of carbon nanotube (CNT) reinforced polymer composite plates is presented. A micromechanics model based on the Mori-Tanaka method is developed by introducing straight CNTs aligned in one direction. The effect of volume fraction and diameter of CNTs on plate deflection and the stresses are investigated using Classical Laminate Plate Theory (CLPT). The study is primarily conducted with the intention of observing the suitability of CNT reinforced polymer composite plates under static loading for structural applications.

Keywords : carbon nanotube, micromechanics, composite plate, multi-scale analysis, classical laminate plate theory

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