

عنوان مقاله:

On the Thermo-elastic Response of FG-CNTRC Cross-ply Laminated Plates under Temperature Loading using a New HSDT

محل انتشار:

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خلاصه مقاله:

In this paper, we present a mathematical model based on the new higher shear deformation plate theory to investigate the thermo-elastic response of carbon nanotube reinforced composites (CNTRC) cross-ply laminated plates under temperature loading. Functionally graded distributions (FG) and uniform distribution (UD) of carbon nanotube reinforcement material are examined. A higher-order deformation plate that contains only four unknowns is utilized together with the principle of virtual displacement to derive the governing equations of CNTRC cross-ply laminated plates with simply supported edge conditions. Subsequently, Navier's solution is proposed for simply supported cross-ply CNTR composite laminated plates subject to linear, nonlinear and combined variations in temperature through plate thickness. The analytical model was validated by comparing the obtained primary outcomes with those available in the literature. The numerical results of present simple analytical model are presented to show the influence of the CNT volume fraction, laminated composite structure, side to thickness and aspect ratio on the thermal stresses and deflection of the CNTRC cross-ply laminated plates.

کلمات کلیدی:

Bending, Carbon nanotube reinforced composites, laminated plates, higher-order deformation plate theory, temperature loading

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