

عنوان مقاله:

Flexural Behaviour of Nanocomposite Plate with CNT Distribution and Agglomeration Effect

محل انتشار:

مجله مکانیک سازه های پیشرفته کامپوزیت، دوره 10، شماره 1 (سال: 1402)

تعداد صفحات اصل مقاله: 14

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خلاصه مقاله:

The behavior of various CNT distributions with agglomeration effects on FG plates is investigated in this paper under static loading. Here, to model the FG plate third-order shear deformation theory has been used and a FEM code has been developed. In the current higher-order shear deformation theory, transverse shear stresses are represented by quadratic variation along the thickness direction, resulting in no need for a shear correction factor. The properties of randomly oriented nano-inclusions are estimated using the two-parameter agglomeration model of Eshelby-Mori Tanaka. Next, the present approach is implemented with the FEM by employing a C₀ continuous isoparametric Lagrangian FE model with seven nodal unknowns per node. The static response of CNT reinforced composite plate with the influence of inclusions is explored by altering the agglomeration parameters and through-thickness CNT distribution pattern. The obtained results suggest that ignoring the agglomeration effect on CNT may result in erroneous results for various static responses. Since the author could not find any results in the static response of CNT-reinforced plates with the agglomeration effect, the proposed model is validated with the results corresponding to the isotropic plate. The impact of several agglomeration phases on the static behavior of a square plate is then studied parametrically.

کلمات کلیدی:

Nanocomposite Plate, Higher Order Shear Deformation Theory, SWCNT, Agglomeration, FEM

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