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Static analysis of functionally graded plates using new non-polynomial displacement fields via Carrera Unified Formulation

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Abstract

This paper presents a static analysis of functionally graded (FG) single and sandwich plates using Carrera Unified Formulation with five new displacement fields of the non-polynomial form. In particular, trigonometric, exponential and hyperbolic displacement fields are employed. The simply supported FG single and sandwich plates are subjected to a bi-sinusoidal load. The governing equations for the static bending analysis are obtained employing the Principle of Virtual Displacement (PVD) under CUF and solved using Navier type solutions. The results show that non-polynomial thickness functions are accurate although, in a few cases, the influence of some non-polynomial terms may be detrimental.

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Analysis of plates using non-polynomial displacement fields has been developed in Refs. [33][34][35][36]. The core of the formulation is described in detail in Refs.

Laminated composite plates in contact with a bounded fluid: Free vibration analysis via unified formulation

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