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Refined theories based on non-polynomial kinematics for the thermoelastic analysis of functionally graded plates

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Abstract

This article presents an analytical solution for the thermoelastic analysis of simply supported functionally graded sandwich plates using the Carrera unified formulation, which allows the automatic implementation of various structural theories. The governing equations for plates under thermal loads are obtained using the principal of virtual displacement and solved using the Navier method. Linear and nonlinear temperature fields through the thickness are taken into account. Particular attention is focused on plate theories with nonpolynomial refined kinematics. The results of the present displacement fields are compared with the classical polynomial ones, proposed by Carrera, for several orders of expansion.

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