Allam, M.N.M., Zenkour, A.M., El-Mekawy, H.F.

Bending response of inhomogeneous fiber-reinforced viscoelastic sandwich plates

[a] Department of Mathematics, Faculty of Sciences, Mansoura University, Mansoura 35516, Egypt
[b] Department of Mathematics, Faculty of Education, Kafr El-Sheikh University, Kafr El-Sheikh 33516, Egypt
[c] Department of Mathematics, Faculty of Science, King AbdulAziz University, P.O. Box 80203, Jeddah 21589, Saudi Arabia

Abstract

The static response of an inhomogeneous fiber-reinforced viscoelastic sandwich plate is investigated by using the first-order shear deformation theory. Several types of sandwich plates are considered taking into account the symmetry of the plate and the thickness of each layer. In addition, two cases are considered depending on the viscoelastic material which are included in the core or the faces of the sandwich plates. The method of effective moduli and Illyushin's approximation method are used to solve the equations governing the bending of simply supported inhomogeneous fiber-reinforced viscoelastic sandwich plates. Numerical computations were carried out to study the effect of the time parameter on deflections and stresses at different values of the aspect ratio, side-to-thickness ratio and constitutive parameter. © 2009 Springer-Verlag.