

Title: Analysis of functionally graded sandwich plate structures with piezoelectric skins, using B-spline finite strip method

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Abstract: Functionally graded materials are composite materials wherein the composition of the constituent phases can vary in a smooth continuous way with a gradation which is function of its spatial coordinates. This characteristic proves to be an important issue as it can minimize abrupt variations of the material properties which are usually responsible for localized high values of stresses, and simultaneously providing an effective thermal barrier in specific applications. In the present work, it is studied the static and free vibration behaviour of functionally graded sandwich plate type structures, using B-spline finite strip element models based on different shear deformation theories. The effective properties of functionally graded materials are estimated according to Mori-Tanaka homogenization scheme. These sandwich structures can also consider the existence of outer skins of piezoelectric materials, thus achieving them adaptive characteristics. The performance of the models, are illustrated through a set of test cases. (C) 2012 Elsevier Ltd. All rights reserved.

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