

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

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Source: Composite Structures **Volume:** 96 **Pages:** 606-615

DOI: 10.1016/j.compstruct.2012.08.010 **Published:** Feb 2013

Document Type: Article

Language: English

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.

Author Keywords: Functionally graded plate structures; Sandwich structures; Particulate composites; Piezoelectric materials; B-spline finite strip method

KeyWords Plus: Electro-Elastic Plates; High-Order Theory; Static Analysis; Meshless Method; Deformation; Vibration; Actuators; Layers; Sensors; Design

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Funding:

Funding Agency	Grant Number
FCT	PTDC/EME-PME/120830/2010

Publisher: Elsevier SCI LTD

Publisher Address: The Boulevard, LangFord Lane, Kidlington, Oxford OX5 1GB, Oxon, England

ISSN: 0263-8223

Citation: LOJA, M. A. R.; SOARES, C. M. Mota; BARBOSA, J. I. - Analysis of functionally graded sandwich plate structures with piezoelectric skins, using B-spline finite strip method. Composite Structures. ISSN 0263-8223. Vol. 96 (2013), p. 606-615.