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Stress distribution in rotating composite structures of functionally graded solid disks

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Abstract

In this article, two composite structures of functionally graded material (FGM) solid disks are considered. The composite structures are composed of three-layer sandwich solid disks with faces made of different isotropic materials and core made of FGM. For Structure 1, the inner layer is metal and the outer layer is ceramic while the core layer is a metal-ceramic FGM. Structure 2 is composed of the same constituent materials as in Structure 1 but interchanging the metal material with the ceramic one. An accurate elastic solution for the rotating structures is given according to the boundary condition at the outer surface of the disk. Numerical results for displacement and stresses at the interfaces of the composite structure disks are presented. Additional distributions of stresses and displacement through the radial direction of the rotating structures are plotted. The effect due to many parameters on the stresses and displacement is investigated. © 2008 Elsevier B.V. All rights reserved.

Author Keywords

Functionally graded material; Rotating; Three-layer sandwich disks

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