عنوان مقاله:

Volume Fraction Optimization of 2D FGM Tube under Mechanical and Thermal Loading using Genetic Algorithm

محل انتشار:

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خلاصه مقاله:

Functionally graded materials used for high temperature engineering applications are strongly influenced by distribution of volume fraction. Therefore, using an effective material distribution in FGMs is an important fact for each purpose. In this paper, we gain optimized volume fraction distribution based on minimization of Von Misses stress instead of using conventional rule of mixtures. Researchers often consider FGMs with material properties change in one direction, while in this paper, material properties change in two dimensions r and z in cylindrical coordinates. Achieved results show that stress distribution through the 2D FGM finite length cylinder under thermo-mechanical loading using optimal volumefraction is more effective than one dimensional FGMs obtained by rule of mixtures. Finite element methods (FEM) in axisymmetric approach with graded material property in each element and genetic algorithm for optimizing constrained problem are used.

کلمات کلیدی:

2D FGM, Volume Fraction Optimization,Thick Hollow Cylinder, Genetic Algorithm

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