

عنوان مقاله:

Micromechanical FEM Modeling of Thermal Stresses in Functionally Graded Materials

محل انتشار:

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خلاصه مقاله:

The most common use of FG materials is as barrier coating against large thermal gradients. Thermal residual stresses in FG materials, if not released, may cause structural discontinuities in outer surfaces or even inside the material such as cracks, debonding, etc. In this research work, using Finite element method and micro-mechanical modeling of FG thermal barrier coatings, stresses under thermal and mechanical loadings of the same and different phases has been investigated. Also the effect of some parameters such as refinement and offsetting of particles on residual stresses are studied. The material is assumed to be CoCrAlY/ZrO₂ where the volume fraction of ZrO₂ in CoCrAlY is assumed to vary linearly. With applying appropriate boundary condition, the stress state in X-dir including the thermal residual stress at different time steps are found.

کلمات کلیدی:

FG Material(FGM)- Residual Stresses- Microscopic Modeling- Random Model- Finite Element Method

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