

عنوان مقاله:

OPTIMUM DESIGN OF FUNCTIONALLY GRADED PIEZOELECTRIC CYLINDER USING COMPLEX VARIABLES METHOD

محل انتشار:

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خلاصه مقاله:

In this study, thermo-elastic behavior of cylinder made of functionally graded piezoelectric materials (FGPM) under multi-physical fields is investigated. The mechanical, thermal and electric properties, except Poisson's ratio, are assumed to depend on variable and they are expressed as a power functions in radial direction of the cylinder using mathematical modelling. Temperature distribution is obtained using a steady-state two dimensional heat equation as a complex variables method. Stress and displacement correlations, including mechanical and thermal terms are defined based on elasticity theory. Using obtained governing equations, physical characteristics including displacement, temperature, electric potential and distribution of radial, circumferential and effective stresses are investigated graphically for a range of non-homogeneous parameters. Hence, the effect of non-homogeneity on the stresses, displacement, temperature and magnetic potential are demonstrated. Results of this investigation could be applied for optimum design of FGPM cylinder

کلمات کلیدی:

FGPM cylinder; complex variable method; static stress analysis; multi-physical fields

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