

VIBRATIONAL ANALYSIS OF NON-HOMOGENEOUS TAPERED SQUARE PLATE WITH BI-PARABOLIC TEMPERATURE VARIATIONS

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Abstract

In this paper, authors discussed a temperature-thickness coupling problem of a non-homogeneous square plate. The main aim of the present study is to analyze the free vibrations of non-homogeneous square plate with exponential varying thickness in x direction. The effect of bi-parabolic temperature variations is considered. It is assumed that density of plate material varies (due to non-homogeneity) linearly in x -direction. Also, it is assumed that Square plate is simply supported on all the four edges. By using Rayleigh Ritz method, frequency for the first two modes of vibrations of a four sided simply supported plate is calculated for different values of thermal gradient, taper constant and non-homogeneity constant. All the calculations are carried out for an alloy of aluminium i.e. Duralium, by using MATHEMATICA (software). All the results are presented in the tabular form.

Key Words : *Vibration, Square plate, Thickness, Thermal gradient, Taper Constant, Non-Homogeneous.*

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