

## Dynamic Analysis of Viscoelastic Plates with Variable Thickness

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**Abstract :** In this study, the dynamic analysis of viscoelastic plates with variable thickness is examined. The solutions of dynamic response of viscoelastic thin plates with variable thickness have been obtained by using the functional analysis method in the conjunction with the Gâteaux differential. The four-node serendipity element with four degrees of freedom such as deflection, bending, and twisting moments at each node is used. Additionally, boundary condition terms are included in the functional by using a systematic way. In viscoelastic modeling, Three-parameter Kelvin solid model is employed. The solutions obtained in the Laplace-Carson domain are transformed to the real time domain by using MDOP, Dubner & Abate, and Durbin inverse transform techniques. To test the performance of the proposed mixed finite element formulation, numerical examples are treated.

**Keywords :** dynamic analysis, inverse laplace transform techniques, mixed finite element formulation, viscoelastic plate with variable thickness

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