Thermal Buckling of Plates and Shells

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Author and Article Information

doi:10.1115/1.3120310
History: Online April 29, 2009

Abstract

This review discusses research on thermal buckling of plates and shells since the first work in the 1950s. Elastic thermal buckling of metallic as well as composite plates and shells is described. The role of material thermal properties on thickness and spatial temperature gradients is demonstrated first. Then thermal buckling and postbuckling research for plates, shallow shells and curved panels, cylindrical and conical shells is presented. Analytical, computational and experimental studies are described. Governing equations and formulas for critical buckling temperatures are presented for several practical applications. An assessment of past research is made, and future research needs are highlighted.

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Topics: Plates (structures), Buckling, Shells, Thickness, Temperature gradient, Equations, Temperature, Composite materials, Thermal properties

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