

MATERIALS AND STRUCTURES SYMPOSIUM (C2)
New Materials and Structural Concepts (4)

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EFFECTS OF STIFFENER PARAMETERS ON BUCKLING LOAD OF ADVANCED GRID
STIFFENED COMPOSITE PANELS

Abstract

Fiber reinforced composite materials possess high strength and stiffness in the fiber direction. Stiffened panels made of fiber reinforced composite materials have been used in aerospace industries for past decades. Due to light weight nature, composite panels are prone to buckling. In this study buckling load for Ortho-grid panel and Iso-grid panel is determined. Composite material used in this study is graphite/epoxy. MSC NASTRAN is used for linear buckling analysis of composite panels. The buckling loads of two panels are determined based on finite element analysis results, including; geometric dimension, thickness of the skin, number of laminae, ply stacking sequence, thickness and height of stiffener. Parametric study of grid stiffened composite panel is conducted using skin thickness, stiffener thickness and stiffener height as design variables. Conclusions drawn from these results are presented. All three buckling modes appeared and maximum buckling load is observed in skin buckling mode for Iso-grid panel.