

RANDOM RESPONSE ANALYSIS OF A TYPICAL AERO SPACEPLATE STRUCTURE

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ABSTRACT

Structural plates are used in many engineering applications that include aerospace, ship industries and defense products like pressure vessels, body of missiles etc. These plates are under go severe vibrations when dynamic loads act on them. The plate structure undergoes vibrations when it is used in many applications such as aircraft cabins, bodies of rockets and missiles. The paper aims at finding the natural frequencies of a typical plate structure that is used in a typical aero-space structure. For this purpose, plates are modeled and analyzed in FEMAP software first and then fundamental frequencies are carried out analytically on the plates to validate simulation results. This paper describes elaborately how FEMAP modal analysis is used to study the dynamic behavior (natural frequencies & mode shapes) of the plates. The modal frequency results obtained from FEMAP have been correlated with the Analytical values. Four different types of plates having different thickness and material properties have been taken for the present investigation. The simulation values of four Different combinations of plates are also correlated with analytically evaluated values.

KEYWORDS: Random Vibrations, Fundamental Frequency, Response, FEMAP