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FINITE ELEMENT ANALYSIS FOR SANDWICH BEAMS

Abstract

The area of sandwich construction has been an active field of research for more than five decades. During this period, a large number of Finite Element Models for sandwich constructions have been provided, ranging from the early sandwich membrane models to more sophisticated recent approaches. These sandwich beams can be used in any field of mechanical constructions, especially in the field of Space Technology, where in the requirement is higher for the strong and robust mechanical structures. Eg: Space Ships and Space Srafts. Especially during the past decade, the increasing demand for high – performance, light weight structures, which are rather the pre – requisites in the fields of Space Sciences and Space Technology, have stimulated a strong trend towards the development of refined models for sandwich beams, plates and shells. The main focus of the present paper is An Analysis of Recent Developments and Contemporary Trends in the Finite Element Modeling and analysis of the deformation and flexural behavior of sandwich beams.

This paper encompasses not only an overview of the state – of – the art Finite Element Analysis applied to sandwich beams, for the applications in the fields of Space Sciences and Space Technology, including the recent techniques for modeling and analysis of tapered beams, sandwich beams but also actuators, Spectral Finite Element Analysis of tapered beams, sandwich beams subjected to static, dynamic and impact loads. These impact loads and the dynamic loads are the very much experienced loads for the mechanical structures which are used in Space and also for the Transportation in Space. The development of Zig – Zag theory of hybrid sandwich beams under thermal load is which was recently proposed has been illustrated which can help us in improving the thermal stability of these beams and can help us in the effective usage of them in the mechanical structures which are used in Space.

Key Words: Sandwich Beams, Finite Element Analysis, Flexural Stiffness, Core, Facings.