

Preface

The purpose of this book is to present the vibration and acoustical behavior of typical sandwich structures subject to mechanical and/or acoustical loadings, which actually form a class of structural elements of practical importance in huge amounts of engineering applications, such as aircraft fuselage, ship and submarine hulls. The contents of this book has grown out of the research activities of the authors in the field of sound radiation/transmission of/through lightweight sandwich structures.

The book is organized into six chapters: Chapter 1 deals with the vibro-acoustic performance of rectangular multiple-panel partitions with enclosed air cavity theoretically and experimentally, which has accounted for the simply supported and clamp supported boundary conditions. Chapter 2 concerns with the transmission of external jet-noise through a uniform skin plate of aircraft cabin fuselage in the presence of external mean flow. As an extension, Chap. 3 handles with the noise radiation and transmission from/through aeroelastic skin plates of aircraft fuselage stiffened by orthogonally distributed rib-stiffeners in the presence of convected mean flow. Chapter 4 develops a theoretical model for sound transmission through all-metallic, two-dimensional, periodic sandwich structures having corrugated core. Chapter 5 focuses on the sound radiation and transmission characteristics of periodically stiffened structures. Ultimately, Chap. 6 proposes the sound radiation and transmission behaviors of periodical sandwich structures having cavity-filling fibrous sound absorptive materials.

This book is involving multidisciplinary subjects especially including combined knowledge of vibration, aeroelastics and structural acoustics, which pays much attention on showing results and conclusions, in addition to mere theoretical modelling. Therefore this book should be of considerable interest to a wide range of readers in relevant fields. It is hoped that the content of the book will find application not only as a textbook for a wide audience of engineering students, but also a general reference for researchers in the field of vibrations and acoustics.

Xi'an, China

T.J. Lu
F.X. Xin

Vibro-Acoustics of Lightweight Sandwich Structures

Lu, T.J.; Xin, F.

2014, XIII, 339 p. 140 illus., 95 illus. in color., Hardcover

ISBN: 978-3-642-55357-8