Vibro Acoustics, Volume 2, 2nd Edition
Anders Nilsson and Bilong Liu
Science Press, Beijing and Springer-Verlag Berlin Heidelberg, (2016),
Hardbound 99.00 USD, ISBN 978-3-662-47933-9

This book is a welcome addition to the library of practicing engineers and graduate students. It can be used to understand the theoretical background and, consequently, limitations of the emerging field of vibroacoustics. As the computational capacities at the hand of the day-to-day engineers are increasing, vibroacoustics, which hitherto has been dominated by scientists in major aeronautical, shipbuilders and vehicle manufacturers, is making inroads into the toolset used by acoustical engineers associated with boat builders, equipment manufacturers and designers of offshore oil and gas production facilities.

Volume 1 of the series introduced the wave theory and the behavior of beams and plates. Volume 2 builds on this foundation. The eight chapters continue after Volume 1 and start with Chapter 9.

- Chapter 9, "Hamilton's Principle and Some Other Variational Methods", discusses the variational methods such as Galerkin methods, necessary to establish the computational basis of more complex systems.
- Chapter 10, "Structural Coupling between Simple Systems", delves into the behavior of resilient mounts necessary to understand the first stage of propagation from the equipment to structure. It includes very useful results as measured insertion loss for various mounts on the foundation of a catamaran.
- Chapter 11, "Waves in Fluids", discusses the wave equation — the next step of propagation from the structure to the environment. It deals with propagation and reflection in air and water as well as acoustics in a closed room.
- Chapter 12, "Fluid Structure Interaction and Radiation of Sound", discusses the radiation from plates (fluid-loaded, excited and baffled) taking into account fluid–structure interaction.
- Chapter 13, "Sound Transmission Loss of Panels", discusses the sound transmission through the panels — starting with infinite flat panels and ending with complex structures such as ribbed plate.
- Chapter 14, "Waveguides", discusses the theory of waveguides critical to understand acoustic propagation through cars, aircrafts, trains and ships. Response from composite sandwich and honeycomb beams and plates are illustrated supplemented by experimental results from measured transmission loss of the panels.
- Chapter 15, "Random Excitation of Structures", introduces random excitation of structures concentrating on turbulent boundary layer excitation relevant to flow noise induced in ships.
- Chapter 16, "Transmission of Sound in Built-Up Structures", discusses the statistical energy analysis, the most promising numerical method available for computational prediction of noise in large structures using finite computational resources.

The book is provided with appendices dealing with "Sound Transmission Loss of Single Leaf Panels, Velocity Level of Single Leaf Panels Excited by an Acoustic Field, and Input Data for Noise Prediction on Ships" and also a listing of references with a comprehensive index.

The contents are sufficient to develop simple predictive models by engineers still lacking access to vibroacoustic software tools due to prohibitive costs. It also has a relevant set of problems and solutions in the accompanying Volume 3 of the series. It is lucidly written with just the right dose of theory and practical applications. I have enjoyed perusing this book and recommend it to anybody interested in this field.

Arindam Ghosh
Kellogg Brown Root (KBR)
Houston, TX, USA
arindam.ghosh@kbr.com