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Descrizione fisica	1 online resource (212 pages) : illustrations, graphs
Collana	Advanced Structured Materials, , 1869-8433 ; ; 88
Disciplina	624.1776
Soggetti	Mechanics Mechanics, Applied Materials science Vibration Dynamical systems Dynamics Solid Mechanics Characterization and Evaluation of Materials Vibration, Dynamical Systems, Control
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Nota di bibliografia	Includes bibliographical references.
Nota di contenuto	Introduction -- 3D equations of dynamic elasticity in orthogonal coordinates -- Exact homogeneous and inhomogeneous solutions -- Cylinder of finite length -- Spherical layer -- Truncated cone -- Plates of variable thickness -- Free vibrations of cylinders and spheres -- Asymptotic analysis of thin-walled structures -- Validation of 2D engineering theories -- Conclusions.
Sommario/riassunto	This book focuses on the justification and refinement of highly diverse approximate dynamic models for engineering structures arising in modern technology, including high-tech domains involving nano- and meta-materials. It proposes a classification for vibration spectra over a broad frequency domain and evaluates the range of validity of various existing 2D theories for thin-walled shells by comparing them with 3D benchmark solutions. The dynamic equations in 3D elasticity are applied to the analysis of harmonic vibrations in hollow bodies with

canonical shapes. New exact homogeneous and inhomogeneous solutions are derived for cylinders, spheres and cones (including spherical and conical layers), as well as for plates of variable thickness. The book includes a wealth of numerical examples, as well as refined versions of 2D dynamic formulations. Boundary value problems for hollow bodies are also addressed.
