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Titolo	Engineering Viscoelasticity [[electronic resource] /] / by Danton Gutierrez-Lemini
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Descrizione fisica	1 online resource (XV, 353 p. 130 illus.)
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Soggetti	Mechanics Mechanics, Applied Structural materials Fluid mechanics Theoretical and Applied Mechanics Solid Mechanics Structural Materials Engineering Fluid Dynamics
Lingua di pubblicazione	Inglese
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Note generali	Bibliographic Level Mode of Issuance: Monograph
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Fundamental Aspect of Viscoelastic Response -- Constitutive Equations in Hereditary Integral Form -- Constitutive Equations in Differential Operator Form -- Constitutive Equations for Steady-State Oscillations. - Structural Mechanics -- Temperature Effects.- Material Property Functions and Their Characterization -- Three Dimensional Constitutive Equations -- Isothermal Boundary-Value Problems -- Wave Propagation -- Variational Principles and Energy Theorems -- Appendix A--Mathematical Background -- Appendix B--Elements of Solid Mechanics.
Sommario/riassunto	Engineering Viscoelasticity covers all aspects of the thermo-mechanical response of viscoelastic substances that a practitioner in the field of viscoelasticity would need to design experiments, interpret test data, develop stress-strain models, perform stress analyses, design structural components, and carry out research work. The material in each chapter is developed from the elementary to the advanced, providing the background in mathematics and mechanics

that are central to understanding the subject matter being presented. The book examines how viscoelastic materials respond to the application of loads, and provides practical guidelines to use them in the design of commercial, military and industrial applications. This book also:

- Facilitates conceptual understanding by progressing in each chapter from elementary to challenging material
- Examines in detail both differential and integral constitutive equations, devoting full chapters to each type and using both forms in applications throughout the book
- Presents variational principles and energy theorems from a practical point of view, using these to develop computational tools such as the viscoelastic equivalent of the Unit-Load and the Unit-Displacement theorems
- Provides more than 50 examples, solved in detail, and complete solution guides (hints) to all assigned problems.
- Features code segments to curve-fit WLF time-temperature shift and Dirichlet-Prony functions, and a computer application to obtain the convolution inverse of Prony series.

Engineering Viscoelasticity is an ideal book for first graduate-level courses on viscoelasticity, upper-level undergraduate level courses in engineering, and practicing professionals.
