

Danton Gutierrez-Lemini

Engineering Viscoelasticity

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.

Engineering

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