1.

Record Nr.	UNINA9910139050703321
Autore	Chevalier Yvon
Titolo	Mechanical Characterization of Materials and Wave Dispersion [[electronic resource]]
Pubbl/distr/stampa	Hoboken, : Wiley, 2013
ISBN	1-118-62311-8 1-299-31519-4 0-470-39427-7
Descrizione fisica	1 online resource (671 p.)
Collana	ISTE ; ; v.79
Altri autori (Persone)	TuongJean Vinh
Disciplina	620.1/1292 620.11 620.11292
Soggetti	Dispersion -- Experiments Engineering instruments Materials -- Mechanical properties -- Experiments Structural engineering -- Materials -- Experiments Wave motion, Theory of -- Experiments Viscoelastic materials - Mechanical properties - Mathematical models Flexible structures - Vibration - Mathematical models Structural engineering - Mathematical models - Materials Wave-motion, Theory of - Mathematics Dispersion - Mathematical models Wave equation Chemical & Materials Engineering Engineering & Applied Sciences Materials Science Electronic books.
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di contenuto	Cover; Mechanics of Viscoelastic Materials and Wave Dispersion; Title Page; Copyright Page; Table of Contents; Preface; Acknowledgements; PART A. CONSTITUTIVE EQUATIONS OF MATERIALS; Chapter 1.

Elements of Anisotropic Elasticity and Complements on Previsional Calculations; 1.1. Constitutive equations in a linear elastic regime; 1.1.1. Symmetry applied to tensors sijkl and cijkl; 1.1.2. Constitutive equations under matrix form; 1.2. Technical elastic moduli; 1.2.1. Tension tests with one normal stress component ; 1.2.2. Shear test; 1.3. Real materials with special symmetries
1.3.1. Change of reference axes1.3.2. Orthotropic materials possess two orthogonal planes of symmetry; 1.3.3. Quasi-isotropic transverse (tetragonal) material; 1.3.4. Transverse isotropic materials (hexagonal system); 1.3.5. Quasi-isotropic material (cubic system); 1.3.6. Isotropic materials; 1.4. Relationship between compliance Sij and stiffness Cij for orthotropic materials; 1.5. Useful inequalities between elastic moduli; 1.5.1. Orthotropic materials; 1.5.2. Quasi-transverse isotropic materials; 1.5.3. Transverse isotropic, quasi-isotropic, and isotropic materials
1.6. Transformation of reference axes is necessary in many circumstances1.6.1. Practical examples; 1.6.2. Components of stiffness and compliance after transformation; 1.6.3. Remarks on shear elastic moduli Gii (ij = 23, 31, 12) and stiffness constants Cii (with i = 4, 5, 6); 1.6.4. The practical consequence of a transformation of reference axes; 1.7. Invariants and their applications in the evaluation of elastic constants; 1.7.1. Elastic constants versus invariants; 1.7.2. Practical utilization of invariants in the evaluation of elastic constants; 1.8. Plane elasticity
1.8.1. Expression of plane stress stiffness versus compliance matrix1. 8.2. Plane stress stiffness components versus three-dimensional stiffness components; 1.9. Elastic previsional calculations for anisotropic composite materials; 1.9.1. Long fibers regularly distributed in the matrix; 1.9.2. Stratified composite materials; 1.9.3. Reinforced fabric composite materials; 1.10. Bibliography; 1.11. Appendix; Appendix 1.A. Overview on methods used in previsional calculation of fiber-reinforced composite materials; Chapter 2. Elements of Linear Viscoelasticity
2.1. Time delay between sinusoidal stress and strain2.2. Creep and relaxation tests; 2.2.1. Creep test; 2.2.2. Relaxation test; 2.2.3. Ageing and non-ageing viscoelastic materials; 2.2.4. Viscoelastic materials with fading memory; 2.3. Mathematical formulation of linear viscoelasticity; 2.3.1. Linear system; 2.3.2. Superposition (or Boltzmann's) principle; 2.3.3. Creep function in a functional constitutive equation; 2.3.4. Relaxation function in functional constitutive equations; 2.3.5. Properties of relaxation and creep functions
2.4. Generalization of creep and relaxation functions to tridimensional constitutive equations

| Sommario/riassunto | Dynamic tests have proven to be as efficient as static tests and are often easier to use at lower frequency. Over the last 50 years, the methods of investigating dynamic properties have resulted in significant advances. This book explores dynamic testing, the methods used, and the experiments performed, placing a particular emphasis on the context of bounded medium elastodynamics.The discussion is divided into four parts. Part A focuses on the complements of continuum mechanics. Part B concerns the various types of rod vibrations: extensional, bending, and torsional. Part C is devoted to mecha |