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Nota di contenuto	Structural Components; Table of Contents; Chapter 1. Introduction; Chapter 2. Constitutive Equations; 2.1. Introduction; 2.2. Fundamental concepts; 2.2.1. Domain of elasticity; 2.2.2. Hardening; 2.2.3. Normality rules; 2.3. Unified theory of viscoplasticity; 2.3.1. General form of the constitutive law; 2.3.2. Choice of viscosity law; 2.3.3. Isotropic hardening laws; 2.3.4. Kinematic hardening laws; 2.3.5. Cyclic hardening and softening; 2.3.6. Static recovery; 2.3.7. Time-independent limit case; 2.3.8. Methods of determination 2.3.8.1. Determination of hardening laws within independent time-scheme 2.3.8.2. Determination of the viscosity law; 2.3.8.3. Determination of static recovery effects; 2.3.9. Other unified approaches; 2.4. Other types of modeling; 2.4.1. Plasticity-creep partition; 2.4.2. Methods by means of micro-macro transposition; 2.4.3. More advanced hardening laws; 2.4.4. Aging; 2.4.5. Damage; 2.5. Conclusion; 2.6. Bibliography; Chapter 3. Measurement of Elastic Constants; 3.1. Elastic constants; 3.1.1. The perfect crystal - elastic constants; 3.1.2. Isotropic solid - elastic moduli

3.1.3. From isotropic solid to real material
 3.1.4. Dynamic modulus; 3.2. Quasi-static mechanical tests; 3.2.1. Uni-axial tensile and compression tests; 3.2.2. Torsion and bending tests; 3.2.3. Hydrostatic compression tests; 3.3. Ultrasonic methods; 3.3.1. Principle; 3.3.2. Measurement error sources; 3.3.3. Measurements at high temperatures; 3.3.4. Immersion-bath ultrasound interferometry; 3.4. Resonant methods; 3.4.1. Introduction to resonant methods; 3.4.2. Various experimental methods; 3.4.3. Bar and disk tests; 3.4.4. Bending tests on foil; 3.4.5. Torsion tests; 3.4.6. Other tests
 3.5. Modulus measurements of coatings
 3.5.1. Vibratory methods; 3.5.2. Instrumented indentation; 3.6. Bibliography; Chapter 4. Tensile and Compression Tests; 4.1. Introduction; 4.2. Description of the tensile test; 4.2.1. Test piece; 4.2.2. Gripping; 4.2.3. Tensile testing machine; 4.2.3.1. Arrangements; 4.2.3.2. Stiffness; 4.3. Standard data; 4.4. Determination of constitutive equations; 4.4.1. True stress and strain; 4.4.2. Empirical expressions of the work hardening curve; 4.4.3. Necking; 4.4.3.1. Condition with no strain rate effect; 4.4.3.2. Strain rate sensitivity; 4.4.3.3. Yield drops
 4.5. Damage determination
 4.6. Compression test; 4.7. Conclusion; 4.8. Notations; 4.9. Bibliography; Chapter 5. Hardness Tests; 5.1. Introduction; 5.2. Standard hardness tests; 5.2.1. Vickers hardness tests; 5.2.2. Micro-hardness; 5.2.3. Nano-hardness (Berkovich type indenter); 5.2.4. Brinell and Rockwell ball tests; 5.3. Analytical approaches of hardness tests; 5.3.1. Identification of the modulus of elasticity (Hertz contact); 5.3.2. Identification of the yield strength (Hill's analysis); 5.4. Finite element analysis of hardness test; 5.4.1. Finite element method
 5.4.2. Effect of work-hardening amplitude

Sommario/riassunto

The mechanical tests presented in this book are essential for determining the basic properties of the materials used. Areas covered include elasticity, tensile and compression tests, hardness, endurance tests and dynamic tests.
