1. Record Nr. UNINA9910138855303321

Titolo	Damage mechanics of cementitious materials and structures [[electronic resource] /] / edited by Gilles Pijaudier-Cabot, Frederic Dufour
Pubbl/distr/stampa	London, : ISTE Hoboken, N.J., : Wiley, 2012
ISBN	1-118-56208-9 1-118-56622-X 1-118-56629-7 1-299-18896-6
Descrizione fisica	1 online resource (271 p.)
Collana	ISTE
Altri autori (Persone)	Pijaudier-CabotGilles DufourFrederic
Disciplina	620.1/36
Soggetti	Concrete - Deterioration Fracture mechanics
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Description based upon print version of record.
Nota di bibliografia	Includes bibliographical references and index.
Nota di contenuto	Cover; Damage Mechanics of Cementitious Materials and Structures; Title Page; Copyright Page; Table of Contents; Preface; Chapter 1. Bottom-Up: From Atoms to Concrete Structures; 1.1. Introduction; 1.2. A realistic molecular model for calcium-silicate hydrates; 1.2.1. Background; 1.2.2. Molecular properties of C-S-H; 1.2.3. From molecular properties to C-S-H microtexture; 1.3. Probing C-S-H microtexture by nanoindentation; 1.3.1. Does particle shape matter?; 1.3.2. Implementation for back analysis of packing density distributions 1.3.3. Functionalized properties: nanogranular origin of concrete creep1.4. Conclusions; 1.5. Bibliography; Chapter 2. Poromechanics of Saturated Isotropic Nanoporous Materials; 2.1. Introduction; 2.2. Results from molecular simulations; 2.3. Poromechanical model; 2.3.1. Nomenclature and definitions; 2.3.2. Effective pore pressure; 2.3.3. Thermodynamical equilibrium condition; 2.3.4. Constitutive equation of the effective pore pressure; 2.3.5. Effect on the volumetric strain; 2.3.6. Effect on the permeability; 2.4. Adsorption-induced swelling and permeability change in nanoporous materials

Sommario/riassunto

The book, prepared in honor of the retirement of Professor J. Mazars, provides a wide overview of continuum damage modeling applied to cementitious materials.It starts from micro-nanoscale analyses, then follows on to continuum approaches and computational issues. The final part of the book presents industry-based case studies.The contents emphasize multiscale and coupled approaches toward the serviceability and the safety of concrete structures.