

1. Record Nr.	UNINA9910807192603321
Autore	Li Zongjin <1952->
Titolo	Advanced concrete technology / / Zongjin Li
Pubbl/distr/stampa	Hoboken, NJ, : Wiley, c2011
ISBN	1-283-02527-2 9786613025272 0-470-90243-4 0-470-95006-4 0-470-90239-6
Edizione	[1st ed.]
Descrizione fisica	1 online resource (522 p.)
Disciplina	620.1/36
Soggetti	Concrete Building materials
Lingua di pubblicazione	Inglese
Formato	Materiale a stampa
Livello bibliografico	Monografia
Note generali	Includes index.
Nota di bibliografia	Includes bibliographical references at the end of each chapters and index.
Nota di contenuto	Intro -- Advanced Concrete Technology -- Contents -- Preface -- 1 Introduction to Concrete -- 1.1 Concrete Definition and Historical Development -- 1.2 Concrete as a Structural Material -- 1.3 Characteristics of Concrete -- 1.4 Types of Concrete -- 1.5 Factors Influencing Concrete Properties -- 1.6 Approaches to Study Concrete -- Discussion Topics -- References -- 2 Materials for Making Concrete -- 2.1 Aggregates -- 2.2 Cementitious Binders -- 2.3 Admixtures -- 2.4 Water -- Discussion Topics -- Problems -- References -- 3 Fresh Concrete -- 3.1 Workability of Fresh Concrete -- 3.2 Mix Design -- 3.3 Procedures for Concrete Mix Design -- 3.4 Manufacture of Concrete -- 3.5 Delivery of Concrete -- 3.6 Concrete Placing -- 3.7 Early-Age Properties of Concrete -- Discussion Topics -- Problems -- References -- 4 Structure of Concrete -- 4.1 Introduction -- 4.2 Structural Levels -- 4.3 Structure of Concrete in Nanometer Scale: C-S-H Structure -- 4.4 Transition Zone in Concrete -- 4.5 Microstructural Engineering -- Discussion Topics -- References -- 5 Hardened Concrete -- 5.1 Strengths of Hardened Concrete -- 5.2 Stress-Strain Relationship and Constitutive Equations -- 5.3 Dimensional Stability-Shrinkage and

Creep -- 5.4 Durability -- Discussion Topics -- Problems --
References -- 6 Advanced Cementitious Composites -- 6.1 Fiber-
Reinforced Cementitious Composites -- 6.2 High-Strength
Cementitious Composites -- 6.3 Polymers in Concrete -- 6.4
Shrinkage-Compensating Concrete -- 6.5 Self-Compacting Concrete
-- 6.6 Engineered Cementitious Composite -- 6.7 Tube-Reinforced
Concrete -- 6.8 High-Volume Fly Ash Concrete -- 6.9 Structural
Lightweight Concrete -- 6.10 Heavyweight Concrete -- Discussion
Topics -- Problems -- References -- 7 Concrete Fracture Mechanics --
7.1 Introduction -- 7.2 Linear Elastic Fracture Mechanics -- 7.3 The
Crack Tip Plastic Zone.
7.4 Crack Tip Opening Displacement -- 7.5 Fracture Process in
Concrete -- 7.6 Nonlinear Fracture Mechanics for Concrete -- 7.7 Two-
Parameter Fracture Model -- 7.8 Size Effect Model -- 7.9 The Fictitious
Model by Hillerborg -- 7.10 R-Curve Method for Quasi-Brittle Materials
-- Discussion Topics -- Problems -- References -- 8 Nondestructive
Testing in Concrete Engineering -- 8.1 Introduction -- 8.2 Review of
Wave Theory for a 1D Case -- 8.3 Reflected and Transmitted Waves --
8.4 Attenuation and Scattering -- 8.5 Main Commonly Used NDT-CE
Techniques -- 8.6 Noncontacting Resistivity Measurement Method --
Discussion Topics -- Problems -- References -- 9 The Future and
Development Trends of Concrete -- 9.1 Sustainability of Concrete --
9.2 Deep Understanding of the Nature of Hydration -- 9.3 Load-
Carrying Capability-Durability Unified Service Life Design Theory -- 9.4
High Toughness and Ductile Concrete -- References -- Index.

Sommario/riassunto

Over the past two decades concrete has enjoyed a renewed level of research and testing, resulting in the development of many new types of concrete. Through the use of various additives, production techniques and chemical processes, there is now a great degree of control over the properties of specific concretes for a wide range of applications. New theories, models and testing techniques have also been developed to push the envelope of concrete as a building material. There is no current textbook which brings all of these advancements together in a single volume. This book aims to bridge the g