1. Record Nr. UNINA9910827975203321

Titolo	Ultra-high performance concrete UHPC : fundamentals, design, examples / / Ekkehard Fehling [and four others] ; coverdesign, Hans Baltzer ; photo, Noclas Janberg
Pubbl/distr/stampa	Berlin, Germany : , : Ernst & Sohn, , 2014 ©2014
ISBN	3-433-60415-0 3-433-60407-X 3-433-60406-1
Edizione	[5th ed.]
Descrizione fisica	1 online resource (201 p.)
Collana	BetonKalender
Disciplina	620.136
Soggetti	Concrete Building
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	Ultra-High Performance Concrete UHPC: Fundamentals - Design - Examples; Contents; Editorial; 1 Introduction; 2 Principles for the production of UHPC; 2.1 Development; 2.2 Basic material concepts; 2.2.1 Microstructure properties; 2.2.2 Grading optimization; 2.3 Raw materials; 2.3.1 Cement; 2.3.2 Reactive admixtures; 2.3.2.1 Silica fume; 2.3.2.2 Ground granulated blast furnace slag; 2.3.3 Inert admixtures; 2.3.4 Superplasticizers; 2.3.5 Steel fibres; 2.4 Mix composition; 2.5 Mixing; 2.6 Curing and heat treatment; 2.7 Testing; 2.7.1 Fresh concrete 2.7.2 Compressive and flexural tensile strengths 3 Mechanical properties of the hardened concrete; 3.1 General; 3.2 Behaviour in compression; 3.2.1 UHPC without fibres; 3.2.2 UHPC with steel fibres; 3.2.3 Further factors affecting the compressive strength; 3.2.3.1 Geometry of test specimen and test setup; 3.2.3.2 Heat treatment; 3.3 Behaviour in tension; 3.3.1 Axial (concentric) tension loads; 3.3.2 Flexural tensile strength; 3.3.3 Derivation of axial tensile strength from compressive strength; 3.3.4 Derivation of axial tensile strength from bending tests; 3.3.5 Splitting tensile strength

3.3.6 How fibre geometry and orientation influence the behaviour of UHPC in tension 3.3.7 Converting the stress-crack width relationship into a stress-strain diagram; 3.3.8 Interaction of fibres and bar reinforcement; 3.4 Shrinkage; 3.5 Creep; 3.6 Multi-axial stresses; 3.7 Fatigue behaviour; 3.8 Dynamic actions; 3.9 Fire resistance; 3.10 UHPC with combinations of fibres ('fibre cocktails'); 4 Durability; 4.1 Microstructure; 4.2 Resistance to aggressive media; 4.3 Classification in exposure classes; 5 Design principles; 5.1 Influence of fibre distribution and fibre orientation
5.2 Analyses for the ultimate limit state 5.2.1 Safety concept; 5.2.2 Simplified stress-strain curve for design; 5.2.2.1 Compression actions; 5.2.2.2 Tension actions; 5.2.3 Design for bending and normal force; 5.2.4 Design for shear; 5.2.4.1 Tests at the University of Kassel; 5.2.4.2 Tests at RWTH Aachen University; 5.2.4.3 Tests at Delft University of Technology; 5.2.5 Punching shear; 5.2.6 Strut-and-tie models; 5.2.6.1 Load-carrying capacity of struts; 5.2.6.2 Load-carrying capacity of ties; 5.2.6.3 Load-carrying capacity of nodes; 5.2.7 Partially loaded areas; 5.2.8 Fatigue
5.3 Analyses for the serviceability limit state 5.3.1 Limiting crack widths; 5.3.2 Minimum reinforcement; 5.3.3 Calculating deformations; 6 Connections; 6.1 General; 6.2 Dry joints; 6.3 Glued joints; 6.4 Wet joints; 6.5 Grouted joints; 6.6 Adding UHPC layers to existing components to upgrade structures; 7 Projects completed; 7.1 Bridges; 7.1.1 Canada; 7.1.1.1 Bridge for pedestrians/cyclists, Sherbrooke (1997); 7.1.1.2 Glenmore/Legsby footbridge, Calgary (2007); 7.1.2 France; 7.1.2.1 Road bridge, Bourg-les-Valence; 7.1.2.2 Pont du Diable footbridge (2005)
7.1.2.3 Pont de la Chabotte road bridge

Sommario/riassunto

Selected chapters from the German concrete yearbook are now being published in the new English ""Beton-Kalender Series"" for the benefit of an international audience.Since it was founded in 1906, the Ernst & Sohn ""Beton-Kalender"" has been supporting developments in reinforced and prestressed concrete. The aim was to publish a yearbook to reflect progress in ""ferro-concrete"" structures until - as the book''s first editor, Fritz von Emperger (1862-1942), expressed it - the ""tempestuous development"" in this form of construction came to an end. However, the ""Beton-Kalender"" quickly became