

ADVANCES IN CEMENT-BASED MATERIALS

G.P.A.G. VAN ZIJL

W.P. BOSHOFF

EDITORS


 CRC Press
Taylor & Francis Group
A BALKEMA BOOK

Table of contents

Foreword	IX
ACM2009 committees	XI
Contributing institutions	XIII
<i>Advanced materials technology & processing</i>	
Controlling properties of concrete through nanotechnology <i>S.P. Shah</i>	3
Reducing the cracking potential of ultra-high performance concrete by using Super Absorbent Polymers (SAP) <i>L. Dudziak & V. Mechtcherine</i>	11
Mechanical effects of rice husk ash in ultra-high performance concretes: A matrix study <i>M.D. Stults, R. Ranade, V.C. Li & T.S. Rushing</i>	21
Smart dynamic concrete: New approach for the ready-mixed industry <i>R. Jaffer, R. Magarotto & J. Roncero</i>	29
Cracking properties of steel bar-reinforced expansive SHCC beams with chemical prestress <i>H. Takada, Y. Takahashi, Y. Yamada, Y. Asano & K. Rokugo</i>	35
Flexural creep behavior of SHCC beams with or without cracks <i>Y. Yamada, T. Hata, T. Ohata, K. Rokugo, T. Inaguma & S.-C. Lim</i>	43
<i>Mechanics of advanced cement-based materials</i>	
Size-effect in high performance concrete road pavement materials <i>E. Denneman, E.P. Kearsley & A.T. Visser</i>	53
Modified local bond stress—slip model for self-compacting concrete <i>P. Desnerck, G. De Schutter & L. Taerwe</i>	59
Pullout of microfibers from hardened cement paste <i>C. Rieger & J.G.M. van Mier</i>	67
Shear behavior of reinforced Engineered Cementitious Composites (ECC) beams <i>I. Paegle & G. Fischer</i>	75
Mechanical interaction of Engineered Cementitious Composite (ECC) reinforced with Fiber Reinforced Polymer (FRP) rebar in tensile loading <i>L.H. Larusson, G. Fischer & J. Jönsson</i>	83
Comparing the behaviour of high strength fibre reinforced and conventional reinforced concrete beams <i>E.P. Kearsley & H.F. Mostert</i>	91

Structural mechanics and applications

- Self-compacting lightweight aggregate concrete for composite slabs 99
A.-E. Bruedern, V. Mechtcherine, W. Kurz & F. Jurisch
- Influence of fibre type and content on properties of steel bar reinforced high-strength steel fibre reinforced concrete 107
K. Holschemacher & T. Mueller
- Influence of fibre content and concrete composition on properties of Self-Compacting Steel Fibre Reinforced Concrete 117
T. Mueller & K. Holschemacher
- Application of Textile-Reinforced Concrete (TRC) for structural strengthening and in prefabrication 127
M. Butler, M. Lieboldt & V. Mechtcherine
- Evaluation of mechanical behaviour of weathered textile concrete 137
S.W. Mumanya, M.G. Alexander & R.B. Tait
- Study on mechanical behavior of synthetic macrofiber reinforced concrete for tunneling application 143
A. Pineaud, J.-P. Bigas, B. Pellerin & A.P.J. Marais
- SHCC precast infill walls for seismic retrofitting 149
S.-W. Kim, S.-H. Nam, J.-H. Cha, E. Jeon & H.-D. Yun
- Improving infrastructure sustainability using nanoparticle engineered cementitious composites 155
M.D. Lepech
- Influence of pumping on the fresh properties of self-compacting concrete 165
D. Feys, G. De Schutter & R. Verhoeven

Durability mechanics of advanced cement-based materials

- Aspects of durability of strain hardening cement-based composites under imposed strain 173
F.H. Wittmann, T. Zhao, L. Tian, F. Wang & L. Wang
- Driving infrastructure sustainability with Strain Hardening Cementitious Composites (SHCC) 181
V.C. Li
- Modelling the influence of cracking on chloride ingress into Strain-Hardening Cement-based Composites (SHCC) 193
F. Altmann & V. Mechtcherine
- Physical and mechanical properties of Strain-Hardening Cement-based Composites (SHCC) after exposure to elevated temperatures 203
M.S. Magalhães, R.D. Toledo Filho & E.M.R. Fairbairn
- Determining the durability of SCC using the South African early-age Durability Index tests 209
B.G. Salvoldi, M.E. Gillmer & H. Beushausen
- Characterisation of crack distribution of Strain-Hardening Cement Composites (SHCC) under imposed strain 215
C.J. Adendorff, W.P. Boshoff & G.P.A.G. van Zijl
- Shrinkage of highly flowable cement paste reinforced with glass fiber 223
A. Sangtarashha, A. Shafteefar, N.A. Libre, M. Shekarchi & I. Mehdipour

Early age cracking and capillary pressure controlled concrete curing <i>V. Slowik & M. Schmidt</i>	229
 <i>Computational modelling of advanced cement-based materials</i>	
Finite element fracture analysis of reinforced SHCC members <i>P. Kabele</i>	237
Derivation of a multi-scale model for Strain-Hardening Cement-based Composites (SHCC) under monotonic and cyclic tensile loading <i>P. Jun, V. Mechtcherine & P. Kabele</i>	245
Two-scale modeling of transport processes in heterogeneous materials <i>J. Sýkora</i>	255
Computational modelling of Strain-Hardening Cement Composites (SHCC) <i>G.P.A. G. van Zijl</i>	263
Numerical modelling of strain hardening fibre-reinforced composites <i>J. Vorel & W.P. Boshoff</i>	271
Some pertinent observation on the behaviour of high performance concrete-steel plate interface <i>S.K. Chakrabarti</i>	279
 <i>Specifications, design guidelines and standards</i>	
Enabling the effective use of High Performance Fibre Reinforced Concrete in infrastructure <i>E.P. Kearsley & H.F. Mostert</i>	287
Towards a reliability based development program for SHCC design procedures <i>J.S. Dymond & J.V. Retief</i>	297
A model for building a design tool for ductile fibre reinforced materials <i>E. Schlagen, H. Prabowo, M.G. Sierra-Beltran & Z. Qian</i>	307
Author index	313