International Conference on Sustainable Materials, Systems and Structures (SMSS 2019)

Novel Methods for Characterization of Materials and Structures

RILEM Proceedings Pro 128, Volume 5

Rovinj, Croatia 20-22 March 2019

Editors:

Ivan Gabrijel Christian Grosse Marijan Skazlić

ISBN: 978-1-5108-9298-9

Printed from e-media with permission by:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571



Some format issues inherent in the e-media version may also appear in this print version.

Copyright© (2019) by RILEM Publications All rights reserved.

Printed with permission by Curran Associates, Inc. (2019)

For permission requests, please contact RILEM Publications at the address below.

RILEM Publications 4 avenue du Recteur Poincare 75016 Paris France

Phone: +33 1 42 24 64 46 Fax: +33 9 70 29 51 20

dg@rilem.net

Additional copies of this publication are available from:

Curran Associates, Inc. 57 Morehouse Lane Red Hook, NY 12571 USA Phone: 845-758-0400

Fax: 845-758-2633

Email: curran@proceedings.com Web: www.proceedings.com

Contents

		Pag
	Preface	XIX
	Ivan Gabrijel, Christian Grosse, Marijan Skazlić	
1	Keynote:	1
	Ultrasonic monitoring of structural concrete elements	
	Ernst Niederleithinger	
2	Standardised experimental techniques and novel micro-destructive methods for the assessment of lime mortar	12
	Loucas Kyriakou, Magdalini Theodoridou and Ioannis Ioannou	
3	Caracterization of the adhesion of fresh to early-age concrete	20
	T. Craipeau, A. Perrot, F. Toussaint and T. Lecompte	
4	Air-coupled ferroelectret ultrasonic transducers for nondestructive testing of wood in through transmission and reflection mode	28
	Konrad J. Vössing, Mate Gaal and Ernst Niederleithinger	
5	Methods of evaluating workability for concretes reinforced by different fiber types	34
	Veronica Guerini, Antonio Conforti, Giovanni Plizzari and Shiho Kawashima	
6	Cell design and characterisation of cement hydration by impedance spectroscopy	42
	Aldo F. Sosa Gallardo and John L. Provis	
7	Testing of new accelerated method for determination of chloride threshold values for corrosion initiation in reinforced concrete	51
	Søren Lundsted Poulsen and Henrik Erndahl Sørensen	
8	ASR performance testing of air entrained concrete exposed to external alkalis	59
	Karolina Gibas, Michał A. Glinicki, Mariusz Dąbrowski, Daria Jóźwiak- Niedźwiedzka, Aneta Antolik and Kinga Dziedzic	
9	A comparative study between hardened cement pastes and concrete oxygen diffusion coefficient	67
	M. Boumaaza, B. Huet, Ph. Turcry, C. Gehlen and A. Aït-Mokhtar	

10	Parameter estimation in fiber reinforced concrete	75
	Ivica Kožar, Neira Torić Malić, Silvija Mrakovčić and Danijel Simonetti	
11	Realtime readjustment of the rheological properties of SCC by an expert system	82
	Ivan Parić and Wolfgang Kusterle	
12	Monitoring modal parameters and external loads of wind turbines for remaining useful life analysis	90
	Max Botz, Georg Harhaus and Christian U. Grosse	
13	Microwave monitoring method for detecting the hydration process of concrete	98
	A. Dollase, U. Möller and L. Nietner	
14	Developing better understanding of deterioration progression in concrete bridge decks through accelerated structural evaluation	105
	Nenad Gucunski, Franklin Moon and Ali Maher	
15	Post-earthquake damage evaluation of concrete structures using ultrasonic monitoring: a proof-of concept laboratory study	112
	Ali Hafiz, Thomas Schumacher, Peter Dusicka and Ernst Niederleithinger	
16	Rheological behaviour of low-CO2 concrete mixtures	120
	Mayra T. de Grazia, Leandro F. M. Sanchez, Jose A. F. S. de Mesquita, Heitor M. Bernardo, Roberto C. de O. Romano and Rafael G. Pileggi	
17	Comparison of methods for in-situ concrete compressive strength	127
	Marijan Skazlić and Ivan Gabrijel	
18	What can drop imbibition into geomaterials tell us about their pore structure?	133
	JB. d'Espinose de Lacaillerie, C. Davy, M. Marinova-Atanassova, AM. Blanchenet, F. Lequeux, Y. Du, Q. H. Nguyen	
19	Measuring rate effects on internal damage and fracture of ultra high- performance concrete	142
	Yi Peng, Dmitry Loshkov and Eric N. Landis	
20	Roughness measurement of coarse natural aggregates by interferometry and its variability	150
	Paulo H. F. Loz. Sérgio C. Angulo and Vanderley M. John	

21	Probabilistic strength distribution of natural coarse aggregates by point load test	159
	Natalia V. Silva, Sérgio C. Angulo and Amanda A. Bastos	
22	Sulfate resistance of concrete based on CEM III with recycled and natural aggregates	168
	Vesna Bulatović, Miroslava Radeka, Mirjana Malešev, Vlastimir Radonjanin, Mirjana Laban and Ivan Lukić	
23	Characterizing the 3D mesostructure of high performance concrete by computed tomography	176
	Thorsten Leusmann, Gauravdatt Basutkar, Matteo Lunardelli and Dirk Lowke	
24	Characterization of curing of concrete based on combination of NDT techniques	185
	Evin Dzaye, Eleni Tsangouri, Geert De Schutter and Dimitrios G. Aggelis	
25	Characterization and modeling of the thermal and mechanical properties of self-compacting concrete at early ages	191
	María D. Crespo, Climent Molins and Antonio R. Marí	
26	Defect detection in concrete using principle component thermography Bojan Milovanović	201
27	An embedded yield design approach within a non-linear analysis for structural modeling of progressive collapse	209
	Mohammad El Hajj Diab, André Orcesi, Cédric Desprez and Jérémy Bleyer	
28	Nanoindentation assisted small scale tensile properties of hydrated cement and AAFA pastes	218
	Jiří Němeček, Jiří Němeček, Jitka Němečková and Jan Maňák	
29	Mechanical and microstructural evaluation of bio-based building boards – preliminary study	224
	L. Korat, V. Ducman and S. Medved	
30	A new approach to quantification of residual flexural stiffness of reinforced concrete	232
	Viktor Gribniak Aleksandr Sokolov and Arvydas Rimkus	

31	Experimental location of material inclusions in building partition models through active thermography and inverse contrast	241
	P. Noszczyk and H. Nowak	
32	The interpretation of EXAFS data with chemical reactivity in activated slag	249
	Yeonung Jeong, Sung-Hoon Kang and Juhyuk Moon	
33	Influence of the mixture composition of cementitious matrices on ultrasound investigations at early age	255
	Markus Krüger, Rok Bregar, Gheorghe Alexandru David and Joachim Juhart	
34	Evaluation of degree of hydration during ultrasonic tests from temperature measurements	264
	Ivan Gabrijel and Marijan Skazlić	
35	Thixotropic structural build-up of cement pastes at low shear rates	272
	Mareike Thiedeitz, Thomas Kränkel, Bianca Bauer and Christoph Gehlen	
36	CIRIA guide C766: an overview of the updated CIRIA C660 guidance on control of cracking in reinforced concrete structures	280
	Fragkoulis Kanavaris and Sarah Kaethner	
37	A modified pycnometer method to determine the water absorption of combined crushed concrete aggregate fractions	286
	Madumita Sadagopan, Katarina Malaga and Agnes Nagy	
38	Assessing reactivity of supplementary cementitious materials in terenary blended cements	293
	R. Snellings	