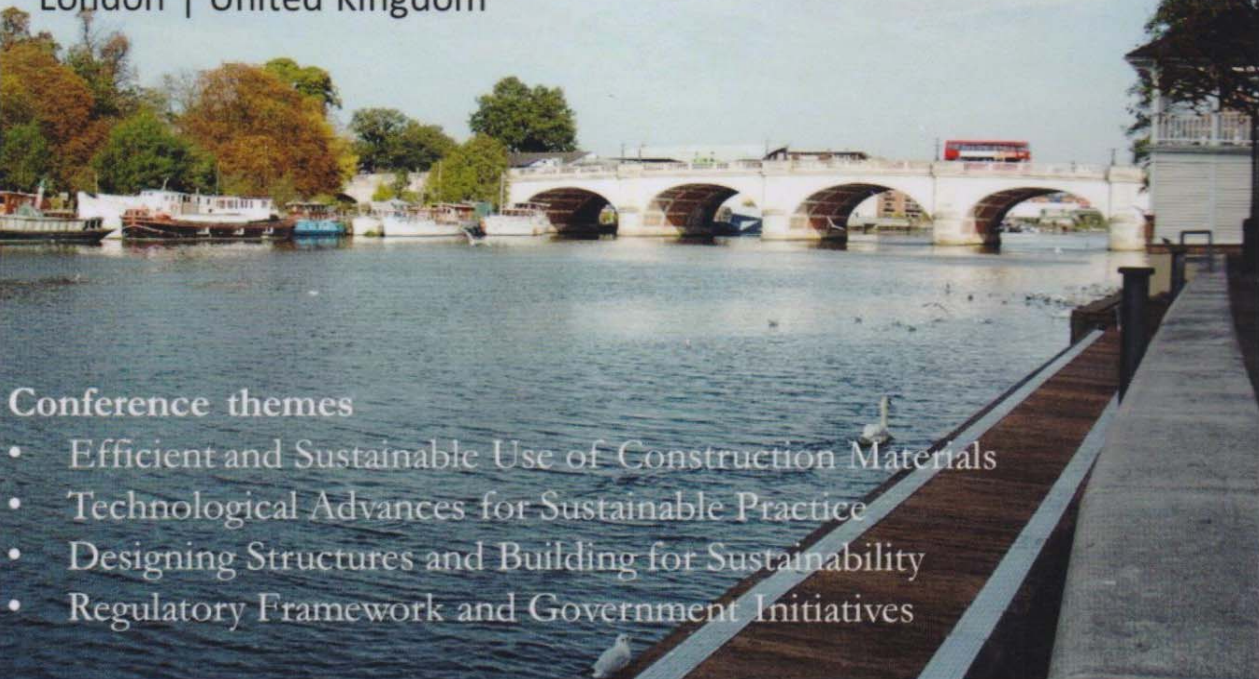


Fifth International Conference on Sustainable Construction Materials and Technologies (SCMT5)

14-17 JULY 2019

Kingston University in Partnership with Coventry University
London | United Kingdom



Conference themes

- Efficient and Sustainable Use of Construction Materials
- Technological Advances for Sustainable Practice
- Designing Structures and Building for Sustainability
- Regulatory Framework and Government Initiatives

Editors:

Eshmaiel Ganjian

Peter Claisse

Mukesh Limbachiya

Mohammadreza Bagheri

Volume 2

International scientific and technical committee

Alan Maries	UK
Ali Akbar Ramezaniapour	Iran
Antonio Nanni	USA
Antonio Telesca	Italy
Bruce W. Ramme	USA
Charles Weiss	USA
Chris Cheesman	UK
Chun Qing Li	Australia
Gai-Fei Peng	China
Harald Justnes	Norway
Hiroshi Yokota	Japan
Jamal Khatib	UK
Jean-Claude Morel	UK
John Forth	UK
Julia Stegman	UK
Kamal Khayat	USA
Konstantin Kovler	Israel
Konstantinos Papadikis	China
Marios Soutsos,	UK
Mark Tyrer	UK
Mike McGinnis	USA
Milena Marroccoli	Italy
Moncef Nehdi	Canada
Nemkumar Banthia	Canada
Orhan Canpolat	Turkey
Pietro Lura	Switzerland
Sunny Nwaubani,	South Africa
Syed Faiz Ahmad	Saudi Arabia
Theofanis Krevaiakas	China
Tony Parry	UK
Muhammad K Rahman	Saudi Arabia
Kunal Kansara	UK
Tim Ibell	UK

Organising committee

Eshmaiel Ganjian	UK
Mukesh Limbachiya	UK
Peter Claisse	UK

Award committee

Antonio Nanni	USA
Eshmaiel Ganjian	UK
Mukesh Limbachiya	UK
Nader Ghafoori	USA
Peter Claisse	UK
Syed Faiz Ahmad	Saudi Arabia
Tim Ibell	UK

IDSCMT5064	SUSTAINABLE UTILIZATION OF BIOPOLYMERS AND BIOCEMENT IN AGGREGATION OF GRANULAR MATERIALS	1
IDSCMT5065	EFFECTIVE BRIDGE MAINTENANCE BASED ON LOAD-BEARING PERFORMANCE SIMPLE EVALUATION	13
IDSCMT5066	SUSTAINABLE HIGH-PERFORMANCE CONCRETE USING METAKAOLIN ADDITIVE AND POLYMER ADMIXTURE: MECHANICAL PROPERTIES, DURABILITY AND MICROSTRUCTURE	26
IDSCMT5067	INVESTIGATION OF CARBONATION RATE COEFFICIENT IN MORTARS WITH BLAST FURNACE SLAG HIGH CONTENT	39
IDSCMT5068	INFLUENCE OF INTERFACIAL TRANSITION ZONE AT AGGREGATE SURFACE CAUSED BY BLEEDING ON PERMEABILITY	47
IDSCMT5069	SULFATE RESISTANCE OF SUSTAINABLE GEOPOLYMER MORTARS	56
IDSCMT5070	USING DIFFERENT TYPES OF AGGREGATES INCLUDING WASTE CONCRETE IN THE PRODUCTION OF GEOPOLYMER MORTARS	66
IDSCMT5071	FLY ASH BASED GEOPOLYMER COMPOSITES PARTIALLY REPLACED WITH SILICA FUME: AN EXPERIMENTAL INVESTIGATION	74
IDSCMT5072	INVESTIGATION OF THE MECHANISM ON PROGRESS FOR STRENGTH AND AIR PERMEABILITY OF CONCRETE USING C-S-H HARDENING ACCELERATOR	83
IDSCMT5073	USE OF OIL PALM BROOM FIBRES FOR ECO-FRIENDLY CONCRETE	92
IDSCMT5074	METABOLISM OF METALS FROM CO-PROCESSING OF ENERGY-FROM-WASTE AIR POLLUTION CONTROL RESIDUE IN CEMENT KILNS	107
IDSCMT5076	DEMONSTRATION OF USING LOW CARBON PRECAST CONCRETE PRODUCTS FOR AN ENERGY EFFICIENT BUILT ENVIRONMENT	128
IDSCMT5077	BRICK FINE AGGREGATE AND LADLE FURNACE SLAG AS ALTERNATIVE TO NATURAL RIVER SAND	139
IDSCMT5078	USE OF RECYCLED CONCRETE AGGREGATES IN STRUCTURAL CONCRETE	152
IDSCMT5079	REHABILITATION OF TRANSPORTATION INFRASTRUCTURE IN WEST VIRGINIA WITH FRP WRAPS	163
IDSCMT5080	LOW-ENERGY CO ₂ -ACTIVATED SELF-PULVERISING CEMENT FOR SUSTAINABLE CONCRETE CONSTRUCTION	177
IDSCMT5081	TYRES AN ENVIRONMENTALLY SUSTAINABLE RESOURCE?	187
IDSCMT5085	EFFECT OF DEGREE OF REFINING ON FLEXURAL RESPONSE OF FIBRE CEMENT BOARDS REINFORCED WITH GUADUA ANGUSTIFOLIA KUNTH BAMBOO	193

IDSCMT5086	SUSTAINABILITY PATTERNS AND TRADEOFFS THROUGH A GRAPHICAL SUSTAINABILITY INDEX	205
IDSCMT5087	ULTRALIGHT MINERAL FOAMS FOR SUSTAINABLE INSULATION APPLICATIONS	216
IDSCMT5089	INFLUENCE OF THE SAND PARTICLE SIZE ON THE BOND OF CEMENT MATRIX-ALKALI TREATED JUTE FIBERS	227
IDSCMT5090	COMPATIBILIZATION OF NATURAL FIBERS AS REINFORCEMENT OF POLYMERIC MATRICES	239
IDSCMT5091	TECHNICAL-FINANCIAL VIABILITY OF THE SUSTAINABLE GUIDELINES IMPLEMENTATION RELATED TO WATER AND ELECTRICITY FOR SCHOOLS	250
IDSCMT5096	FRACTURE TOUGHNESS EVALUATION OF FIBER-REINFORCED CONCRETE MANUFACTURED WITH SIDERURGIC AGGREGATES	262
IDSCMT5097	THE USE OF ELECTRIC ARC FURNACE SLAG IN BITUMINOUS PAVEMENTS	273
IDSCMT5098	EFFECT OF PALM FIBERS ADDITION ON ABSORPTION CHARACTERISTICS AND MECHANICAL PROPERTIES OF CONCRETE	287
IDSCMT5099	SELECTED PROPERTIES OF CONCRETE CONTAINING MUNICIPAL SOLID WASTE INCINERATION BOTTOM ASH (MSWI-BA)	305
IDSCMT5100	OPTIMISATION OF SECONDARY WASTE GYPSUM FOR MECHANICAL STABILITY IN ROAD (BASE) AND FOUNDATION	318
IDSCMT5101	PRELIMINARY STUDIES OF SUSTAINABLE CONCRETE INCORPORATING CERAMIC HYBRID BINDERS	329
IDSCMT5102	EFFECT OF PARTIAL PORTLAND CEMENT REPLACEMENT ON PROPERTIES OF FLY ASH BASED GEOPOLYMER CONCRETE	341
IDSCMT5103	ASSESSMENT OF THE EFFECTIVENESS OF BUTLER-VOLMER EQUATION TO PREDICT CORROSION RATE IN CATHODICALLY PROTECTED STRUCTURES	353
IDSCMT5104	PUSH-OUT EXPERIMENTAL EVALUATION OF PULTRUDED FRP-CONCRETE COMPOSITES	364
IDSCMT5105	THE EFFECT OF SEEDING OF SYNTHESIZED C-S-H WITH DIFFERENT C/S ON EARLY HYDRATION REACTION OF ALITE	377
IDSCMT5106	POZZOLANIC REACTIONS IN ULTRA-HIGH PERFORMANCE CONCRETE CONTAINING SILICA FUME AND FLY ASH	388
IDSCMT5107	CONSIDERATION ON APPEARANCE LIMITATIONS OF FLY ASH BLENDED WITHIN CONCRETE	396
IDSCMT5108	ENVIRONMENTAL ASSESSMENT IN THE BUILDING MATERIALS INDUSTRY: HOW ARE THE RESULTS OF LIFE-CYCLE-ASSESSMENT (LCA) FOR CONCRETE INFLUENCED BY TECHNOLOGY AND REGULATIONS?	407

Document details

< Back to results | < Previous 5 of 32 Next >









Export Download Print E-mail Save to PDF Add to List More... >

Locate full-text(opens in a new window)

Sustainable Construction Materials and Technologies
Volume 2, 2019
5th International Conference on Sustainable Construction Materials and Technologies, SCMT 2019; Kingston upon Thames; United Kingdom; 14 July 2019 through 17 July 2019; Code 149940

Fracture toughness evaluation of fiber-reinforced concrete manufactured with siderurgic aggregates.

(Conference Paper)

Ortega-López, V. ^a  Revilla-Cuesta, V. ^a  Skaf, M. ^a  Fiol, F. ^a  Santamaría, A. ^b  García-Llona, A. ^c  Piñero, I. ^c  

^aUniversity of Burgos, Calle Villadiego s/n, Burgos, 09001, Spain

^bUPV/EHU, Alameda Urquijo s/n, Bilbao, 48013, Spain

^cFundación TECNALIA Research and Innovation, Parque Tecnológico de Bizkaia., C/Geldo, ed.700, Derio-Bizkaia, E48160, Spain

Abstract View references (28)

Steel production in electric arc furnaces generates a principal waste stream in the form of Electric Arc Furnace Slag (EAFS), also known as “black slag”. The well-researched and advantageous properties of EAFS guarantee its successful use as aggregate in the manufacture of concrete (CEAFS). In contrast, fiber-reinforced concrete is widely employed, especially in concrete pavements and slabs, for improved cracking resistance and “ductile” post-cracking behavior. In this research, the toughness and ductile behavior of these fiber-reinforced CEAFS is tested with various methods, using different types of (metallic and synthetic) fibers in EAFS mixes. The metallic fiber concretes showed better results than the fiber concretes in terms of toughness, first-crack strength, limit of proportionality, and post-cracking behavior. The recycling process of EAFS makes a relevant contribution to the circular economy and therefore to global sustainability. © 2019 Institute of Electrical and Electronics Engineers Inc.. All rights reserved.

Author keywords

Cracking resistance Fiber-reinforced concrete Fracture toughness Slag

Indexed keywords

Engineering controlled terms: Aggregates Concrete aggregates Concrete products Cracks Electric arcs Electric furnace process Electric furnaces Fiber reinforced materials Fibers Fracture toughness Particulate emissions Reinforced plastics Slags Steelmaking furnaces Sustainable development

Engineering uncontrolled terms: Circular economy Cracking behavior Cracking resistance Electric arc furnace Electric arc furnace slags Fiber-reinforced concretes Global sustainability Recycling process

Engineering main heading: Reinforced concrete

Funding details

Funding sponsor	Funding number	Acronym
Eusko Jauriaritza	IT1314-19,IT781-13	
Junta de Castilla y LeÃ³n	UIC-231,BU119P17	
Ministerio de Ciencia, InnovaciÃ³n y Universidades		MCIU
European Regional Development Fund		FEDER
Ministerio de Ciencia e InnovaciÃ³n		MICINN

Funding text
The authors wish to express their gratitude to: Junta de Castilla y León (Regional Government) for funding UIC-231 through project BU119P17 partially supported by FEDER Funds; the Spanish Ministry of Science Innovation and Universities (MICINN) and European Regional Development Funds (FEDER) and, finally, the Basque Government research group (IT1314-19 and IT781-13). Moreover, we are grateful to Fundación Tecnalia Research&Innovation, Chryso, Basf, Bekaer and Hormor-Zestoa for having collaborated with the present research work.

ISSN: 25153048
Source Type: Conference Proceeding
Original language: English
Document Type: Conference Paper
Publisher: International Committee of the SCMT conferences

References (28)

View in search results format >

All Export Print E-mail Save to PDF Create bibliography

1 (2017) Steel/Statistical Yearbook . Cited 185 times . World Steel Association

Metrics View all metrics >

PlumX Metrics
Usage, Captures, Mentions,
Social Media and Citations
beyond Scopus.

Cited by 0 documents

Inform me when this document is cited in Scopus:

Set citation alert > Set citation feed >

Related documents

Performance of fiber-reinforced EAF slag concrete for use in pavements

Fuente-Alonso, J.A. , Ortega-López, V. , Skaf, M. (2017) Construction and Building Materials

Durability studies on fiber-reinforced EAF slag concrete for pavements

Ortega-López, V. , Fuente-Alonso, J.A. , Santamaría, A. (2018) Construction and Building Materials

Effect of high-alumina ladle furnace slag as cement substitution in masonry mortars

Herrero, T. , Vegas, I.J. , Santamaría, A. (2016) Construction and Building Materials

View all related documents based on references

Find more related documents in Scopus based on:

Authors > Keywords >



Figure 5. Arrangement of specimen after cracking in flexural tensile strength test

Table 6. LOP and residual tensile strength after cracking

Flexural tensile strength test EN-14651 standard		E	EM2	ES1
LOP (CMOD \leq 0.05 mm) (MPa)		6.1	6.4	6.2
Residual flexural tensile strength (MPa)	0.5 mm	-	5.5	1.5
	1.5 mm	-	5.4	1.1
	2.5 mm	-	5.1	1.1
	3.5 mm	-	4.7	1.2

4. CONCLUSIONS.

- Siderurgic concrete mixtures reinforced with either metallic or synthetic fibers showed good mechanical properties.
- The toughness and post-cracking behavior of siderurgic concretes reinforced with fibers (metallic or synthetic), evaluated under compressive and flexural tests (with and without initial notching) and with the Barcelona Method, were suitable for the use of these concretes in pavements and industrial slabs.
- The best siderurgic concrete evaluated in this study was the mixture reinforced with a volume of metallic fiber at 0.6% by volume of concrete.

ACKNOWLEDGEMENTS.

The authors wish to express their gratitude to: Junta de Castilla y León (Regional Government) for funding UIC-231 through project BU119P17 partially supported by FEDER Funds; the Spanish Ministry of Science Innovation and Universities (MICINN) and European Regional Development Funds (FEDER) and, finally, the Basque Government research group (IT1314-19 and IT781-13). Moreover, we are grateful to Fundación Tecnalia Research&Innovation, Chryso, Basf, Bekaer and Hormor-Zestoa for having collaborated with the present research work.

BIBLIOGRAPHY.