



Lecce, June 6-9, 2004

Final Program

Sunday, June 6th, 2004

Palazzo Ex Convento dei Teatini – Corso Vittorio Emanuele - Lecce

19.00 **Welcome Cocktail offered by SIKA ITALIA**

Monday, June 7th, 2004

University Campus – Via per Monteroni- Lecce

08.00-9.00 **Registration (ARCHEO desk)**

09.00-10.00 **Opening Ceremony**

10.00-10.30 **Keynote Lecture I**

"Recent Innovations in Construction Materials"

P. N. BALAGURU - (National Science Foundation - USA)

10.30-11.30 Technical Session 1A - Innovative Coatings

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|---------------|--|
| 10:30 – 10:50 | <i>Penetrability of chloride ions in concrete protected by an acrylic painting</i>
J. B. Aguiar and J. A. Dias |
| 10:50 – 11:10 | <i>Advanced synthesis of organic-inorganic nano hybrid materials for coatings</i>
F.B. Buslov, L.D. Shapovalov and O.L. Figovsky |
| 11:10 – 11:30 | <i>Electrodeposition and characterization of chromium-tungsten carbide composite coatings from trivalent chromium bath</i>
Z.Abdel Hamid, I.M. Ghayad and K.M. Ibrahim |

10.30-11.30 Technical Session 1B - Flexural and Shear Strengthening 1

- 10:30 – 10:50 *Parametric study of the material properties and sensitivity analysis of the design variables influencing the performance of FRP-retrofitted flexural members*
D. I. Kachlakev
- 10:50 – 11:10 *Strengthening of concrete constructions with externally bonded reinforcement: design concept and case studies*
D. Van Gemert, S. Ignoul and K. Brosens
- 11:10 – 11:30 *Moment failure of RC beams externally bonded with CFRP sheets bonded with organic and inorganic matrices*
H. Toutanji, Y. Zhang and L. Zhao

10.30-11.30 Technical Session 1C - Strengthening of Arches

- 10:30 – 10:50 *Non-linear behaviour and collapse of FRP reinforced masonry arches*
R. Barsotti and S. Bennati
- 10:50 – 11:10 *Collapse behaviour of FRP-reinforced masonry arches: a parametric enquire*
F. M. Fabiani, U. Ianniruberto and Z. Rinaldi
- 11:10 – 11:30 *Strengthening of masonry arches with composite materials*
S. Briccoli Bati, L. Rovero and U. Tonietti

11.30 -11.50 Coffee Break offered by ITALCEMENTI Group

11.50-13.10 Technical Session 2A - Durability 1

- 11:50 – 12:10 *First results of chloride penetration modelling in concrete exposed to marine environment at temperate climate*
M. Borsa, G.L. Guerrini, L. Sanguigno, M. Lavorgna and G. Mensitieri
- 12:10 – 12:30 *Use of non destructive testing and fracture mechanics parameters to monitor concrete deterioration due to external sulfate attack*
G. Di Pace and L. Octavio Yopez
- 12:30 – 12:50 *Determination of concrete properties of a 80 years old building with on site tests*
B.Y. Pekmezci H. Yildirim and M. Uyan
- 12:50 – 13:10 *Factors affecting the durability in service of epoxy resins employed for restoration of historical buildings*
M. Frigione, M. Lettieri and A.M. Mecchi

11.50-13.10 Technical Session 2B - Flexural and Shear Strengthening 2

- 11:50 – 12:10 *Increasing of the flexural capacity of RC beams strengthened with CFRP materials. Theoretical and experimental approach.*
L. Anania and A. Badalà
- 12:10 – 12:30 *Probabilistic analysis of the European format in FRP flexural strengthening*
G. Spitaleri and N. Totaro
- 12:30 – 12:50 *Decision support in using fibre reinforced polymer (FRP) composites in rehabilitation of concrete structures*
A. Nezamian, S. Setunge, A. Kumar and J. Fenwick
- 12:50 – 13:10 *Flexural and shear strengthening of reinforced concrete structures with FRP systems: a critical analysis of ACI and CEB-FIP design guidelines*
W. Arena, A. Marzano , O. Manni and P. Rametta

11.50-12.50 Technical Session 2C - Strengthening of Vaults and Domes

- 11:50 – 12:10 *Criteria for the restoration and consolidation of "Camorcanna" vaults with a precious intrados*
E. Quagliarini, M. D'Orazio, R. Giacchetti and A. Stazi
- 12:10 – 12:30 *Structural analysis with F.E.M. method of the elliptical dome of the sanctuary of Vicoforte*
T. Aoki, M.A. Chiorino, R. Roccati and A. Spadafora
- 12:30 – 12:50 *Strengthening of a masonry vault with GFRP laminates: S.Fermo church in Verona*
M.R. Valluzzi, F. Da Porto and C. Modena

13.10 – 14.30 Lunch offered by FICES

14.30-15.00 Keynote Lecture 2

"Behavior of Scaled Steel-Concrete Composite Girders and Steel Monopole Towers Strengthened with CFRP"
D. SCHNERCH and S. RIZKALLA - (North Carolina State University - USA)

15.00-16.20 Technical Session 3A - Durability 2

- 15:00 – 15:20 *Water absorption and drying of impregnated brick masonry*
R. Miniotaite
- 15:20 – 15:40 *Volume change and mechanical properties of OPC and GGBS mortars cured in water and sulfate solutions*
M. Uyan, B.Y. Pekmezci and H. Yildirim

- 15:40 – 16:00 *The durability of finishing layer on buildings' external walls*
R. Miniotaite
- 16.00 - 16:20 *Compatibility of repair material with tuff-stone masonries in Salerno's historic centre*
C. D. Vacchiano, P. Scarfato, L. Incarnato and D. Acierno

15.00-16.20 Technical Session 3B - Flexural and Shear Strengthening 3

- 15:00 – 15:20 *Performance evaluation of prestressed-concrete girders strengthened with P-PUT technique*
Z.S. Wu, K. Iwashita, K. Hayashi, T. Higuchi, S. Murakami, and T. Ichiryu
- 15:20 – 15:40 *Experimental behaviour of anchoring systems for active and passive strengthening of RC beams with FRP*
L. Ascione, E. Di Nardo and L. Feo
- 15:40 – 16:00 *Long-term mechanical interaction between strengthening materials and pre-existing structures*
P.G. Bocca and A. Grazzini
- 16.00 - 16:20 *Time-depending behaviour under sustained loads of RC beams externally plated with FRP laminates*
L. Ascione, V.P. Berardi and G. Mancusi

15.00-16.20 Technical Session 3C - Strengthening of Masonry Walls 1

- 15:00 – 15:20 *Comparison between FRP strengthening techniques on the out-of-plane behaviour of URM masonry walls*
N. Galati, F. Micelli, G. J. Tumialan, A. La Tegola and A. Nanni
- 15:20 – 15:40 *Structural behavior of fiber reinforced mortar with application to masonry walls*
W. Mera Ortiz and A. La Tegola
- 15:40 – 16:00 *Experimental tests on masonry walls strengthened with an innovative C-FRP sheet*
C. Faella, E. Martinelli, E. Nigro and S. Paciello
- 16.00 - 16:20 *Real scale testing of masonry walls made with natural fiber reinforced mortar*
W. Mera Ortiz and A. La Tegola

16.20-16.40 Coffee Break offered by ITALCEMENTI Group

16.40-18.00 Technical Session 4A - Innovative Materials from Recycling

- 16:40 – 17:00 *An innovative material from recycled glass to lightweight concrete*
Z. Józsa and R. Nemes
- 17:00 – 17:20 *High performance fully recycled materials for civil engineering as an alternative to landfill disposal*
E. Franzoni, S. Manzi, F. Sandrolini, and M. C. Bignozzi
- 17:20 – 17:40 *Current industry perspectives regarding use of post consumer carpets in construction*
G.C. Banik
- 17.40 - 18:00 *Demonstrating steel fibres from waste tyres as reinforcement in concrete: material characterisation*
H. Tlemat, K. Pilakoutas and K. Neocleous

16.40-18.00 Technical Session 4B - Flexural and Shear Strengthening 4

- 16:40 – 17:00 *RC Beams strengthened with CFRP laminates subjected to shear loading regime*
Bencardino F., G. Spadea and R.N. Swamy
- 17:00 – 17:20 *Retrofit of indeterminate reinforced concrete frames using fiber reinforced polymer laminates*
S. Okba, A. Abdelrahman, H. Abdellatif and H. Elkarmouty
- 17:20 – 17:40 *Non linear analysis of RC beams strengthened with FRP: theoretical-numerical comparison*
S. Coccia, U. Ianniruberto and Z. Rinaldi
- 17.40 - 18:00 *Evaluation of dynamic behaviour of EBR-FRP reinforced concrete beams*
B. Bonfiglioli, J. Ibarra Pérez and G. Pascale

16.40-17.40 Technical Session 4C - Strengthening of Masonry Walls 2

- 16:40 – 17:00 *Reinforcing of adobe structures with FRP Bars*
G. Villa Garcia, F. Ginocchio, G. Tumialan and A. Nanni
- 17:00 – 17:20 *Mechanical behaviour of natural stone masonry strengthened with FRP- Part I: experimental research*
B. De Nicolo, B. Grosso, M. Valdes
- 17:20 – 17:40 *Mechanical behaviour of natural stone masonry strengthened with FRP. Part II: verification by using a finite element method*
M.Valdes

Tuesday June 8th, 2004

University Campus – Via per Monteroni- Lecce

09.00-9.30 **Keynote Lecture 3**

"Material Structure and Mechanical Properties of Polymer Modified Concrete and Reinforcement"

H. SCHORN - (Technical University of Dresden - GERMANY)

9.30-11.10 Technical Session 5A - Innovative Cements and Concretes 1

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|---------------|--|
| 9:30 – 9:50 | <i>Influence of additions on the properties of self compacting concrete</i>
F. Colangelo, M. Marroccoli, R. Cioffi and M. Molfetta |
| 9:50 – 10:10 | <i>Fresh and hardened state properties of self-compacting lightweight aggregate fibre reinforced concrete for structural applications</i>
M. Borsa, M. Molfetta and G. L. Guerrini |
| 10:10 – 10:30 | <i>Combination of silica fume, fly ash and amorphous nano-silica in superplasticized high-performance concretes</i>
M. Collepardi, S. Collepardi. R. Troli and U. Skarp |
| 10:30 – 10:50 | <i>Influence of calcareous filler on interfacial transition zone of conventional and Self-Compacting Concretes</i>
L. Coppola, P. Zaffaroni and A. Carcagni |
| 10:50 – 11:10 | <i>Strength and shrinkage of high-performance concrete for bridge deck applications</i>
I. Ray, J. F. Davalos and J. Morris |

9.30-11.10 Technical Session 5B - Confinement

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|---------------|--|
| 9:30 – 9:50 | <i>FRP composite sheet pile walls in waterfront applications</i>
Y. Shao |
| 9:50 – 10:10 | <i>Confinement of RC columns with FRP materials: a critical comparison between ACI and CEB-FIP design guidelines</i>
R. Modarelli, O. Manni and P. Rametta |
| 10:10 – 10:30 | <i>Retrofitting of RC columns with inaccessible faces using the mechanical strengthening technique</i>
A. Al-Tuhami and M. Kamal Abdullah |
| 10:30 – 10:50 | <i>Strengthening of rectangular columns using GFRP</i>
A. Balsamo, D. Bandera and A. Prota |
| 10:50 – 11:10 | <i>Strengthening technologies for concrete and masonry columns</i>
Al. La Tegola |

9.30-11.10 Technical Session 5C - Composite Structures

- 9:30 – 9:50 *An experimental evaluation of the stiffening effect of CFRP flange reinforcement and practical end connections on the flexural response of pultruded GFRP WF-beams*
G. Turvey
- 9:50 – 10:10 *Characterisation of uni-strut connectors for pultruded fibre reinforced plastic channels*
M. Evernden, J. T. Mottram and P. Delhees
- 10:10 – 10:30 *Effect of the applied stress distribution on flexural-torsional buckling of steel and FRP thin-walled members: numerical examples*
L. De Lorenzis and A. La Tegola
- 10:30 – 10:50 *Behaviour of pultruded FRP beam-to-beam subassemblies connected by bolted web cleats*
J. T. Mottram, D. Prangley and E.S. Knudsen
- 10:50 – 11:10 *Experimental buckling's curves for GFRP columns*
A. Di Tommaso, S. Russo and G. Boscato

11.10-11.30 Coffee Break offered by ITALCEMENTI Group

11.30-12.50 Technical Session 6A - Innovative Cements and Concretes 2

- 11:30 – 11:50 *Research and development in design and application of concrete-polymer composites in Europe*
D. Van Gemert, A. Beeldens, S. Ignoul and K. Brosens
- 11:50 – 12:10 *Electrical characterization of cement reinforced with short carbon fibers*
M. Chiarello and R. Zinno
- 12:10 – 12:30 *Hybrid fibre engineered cementitious composites (ECC) for impact- and blast-resistant structures*
Z. Jing, M. Maalej and Q. S. Tong
- 12:30 – 12:50 *Polysaccharide influence on the physical and mechanical behaviour of a renovation mortar. Consequences on the crack propagation at the mortar-substrate interface*
L. Bertrand, A. Bouaffia, and S. Maximilien

11.30-12.50 Technical Session 6B - Confinement and Seismic Retrofit

- 11:30 – 11:50 *Stability of CFRP-confined columns*
L. De Lorenzis, V. Tamuzs , R. Tepfers, V. Valdmans and U. Vilks

- 11:50 – 12:10 *Capacity of beam-column joints under cyclic loading*
V. Corinaldesi and G. Moriconi
- 12:10 – 12:30 *Seismic upgrading of existing RC structures using FRP: a GLD study case*
G. Della Corte, E. Parecchia and F. M. Mazzolani
- 12:30 – 12:50 *Experimental tests and theoretical models on tuff masonry bricks and columns confined with C-FRP sheets*
C. Faella, E. Martinelli, S. Paciello and E. Nigro

11.30-13.10 Technical Session 6C - Composite and Metallic Structures

- 11:30 – 11:50 *Applications of FRP-GRC in Permanent Formwork*
G. Kim, P. Waldron and K. Pilakoutas
- 11:50 – 12:10 *Cast iron arch bridges: from construction to restoration*
V. Zerbo, L. Ceriolo and A. Di Tommaso
- 12:10 – 12:30 *Selection of CFRP systems for steelwork upgrading*
N.K. Photiou, L.C. Hollaway and M.K. Chryssanthopoulos
- 12:30 – 12:50 *Innovative solutions for the realization of historical bridges: case studies*
E. Siviero, P. Foraboschi, L. Attolico and E. Giovanetti
- 12:50 – 13:10 *Interlaminar crack propagation in curved laminated beams*
D. Bruno, R. Carpino, F. Greco, P. Lonetti

13.10-14.30 Lunch offered by ATP Pultrusion and CETMA

14.30-15.00 Keynote Lecture 4

"Analysis and Restoration of Ancient Masonry Structures: Guidelines and Examples"
P. LOURENCO - (University of Minho - PORTUGAL)

15.00-16.20 Technical Session 7A - Innovative Cements and Concretes 3

- 15:00 – 15:20 *Evaluation of the durability of textile glass fibre reinforcement in concrete*
H. Schorn, M. Schiekkel and R. Hempel
- 15:20 – 15:40 *Tensile tests to study the long-term behaviour of textile reinforced concrete*
J. Orlowsky and M. Raupach
- 15:40 – 16:00 *The interconnection between inner filaments of textile reinforcement by means of polymer modified concrete*
B. Walk-Laufer, M. Raupach, K. Dilger, S. Böhm, F. Mund, U. Dilthey and M. Schleser

16:00 – 16:20 *Long term bending tests on glass fibre reinforced concrete specimens*
H. Schorn and M. Butler

15.00-16.20 Technical Session 7B - Bond 1

15:00 – 15:20 *Optimization of FRP-concrete interface in FRP bonding technique*
H. Niu and Z. Wu

15:20 – 15:40 *Numerical analysis of the interface behaviour for FRP applications*
B. Bonfiglioli, L. Cristofori and G. Pascale

15:40 – 16:00 *Bond between FRP laminates and curved concrete substrates with anchoring composite spikes*
M.A. Aiello, L. De Lorenzis, N. Galati and A. La Tegola

16:00 – 16:20 *Bond behaviour of FRP rebars embedded in concrete*
M.A. Aiello and M. Leone

15.00-16.20 Technical Session 7C - Wood Structures

15:00 – 15:20 *Preliminary investigation on the structural behaviour of timber beams strengthened with FRP*
A. Barbieri, A. Di Tommaso and F. Focacci

15:20 – 15:40 *The effectiveness of diagonal versus vertical GFRP sheets for strengthening of timber*
S. Hay, D. Svecova and B. Bakht

15:40 – 16:00 *Flexural behaviour of glulam beams and joints reinforced with CFRP bars: theoretical analysis*
F. Micelli, V. Scialpi and A. La Tegola

16:00 – 16:20 *Wooden arch structures between the XVI and the XIX century: evolution of the analysis criteria*
E. Quagliarini

16.20-16.40 Coffee Break offered by ITALCEMENTI Group

16.40-18.00 Technical Session 8A - Durability 3

16:40 – 17:00 *Effects of different coating on the durability of thermoplastic E-Glass FRP bars*
O. Khelifi, and A. Nanni

17:00 – 17:20 *Moisture effects on elastic and viscoelastic properties of CFRP rebars and vinylester binder*
M. A. Aiello, M. Leone, A. N. Aniskevich, and O. A. Plushchik

17:20 – 17:40 *Durability of GFRP rods in water and alkaline solution*
F. Micelli and A. La Tegola

17:40 – 18:00 *Durability of GFRP-concrete bonded interfaces*
J. Jia, T. E. Boothby and C. E. Bakis

16.40-18.00 Technical Session 8B - Bond 2

16:40 – 17:00 *Numerical investigation into peeling-off caused at shear cracks of externally bonded CFRP.*
K. Klamer, D.A. Hordijk and A. De Boer

17:00 – 17:20 *Bond of CFRP strips embedded in lime mortar*
M. R. Valluzzi, D. Tinazzi and C. Modena

17:20 – 17:40 *Analysis of bond performance between CFRP sheets and calcarenite ashlar under service and ultimate conditions*
M. A. Aiello and S. M. Sciolti

17:40 – 18:00 *Brittle-failures of RC structural members strengthened with fiber reinforced polymers*
G. Camata and E. Spacone

16.40-18.00 Technical Session 8C - Construction Materials and Techniques

16:40 – 17:00 *Materials and techniques within the building know-how of central Apulia*
P. Pastore

17:00 – 17:20 *The simple "matter"*
A. Scolaro Monsù

17:20 – 17:40 *A Time-Of-Flight laser scanner for architectural applications and monitoring*
G. Gianfrate, L. Calcagnile, R. Fontana, M.C. Gambino, M. Greco, E. Pampaloni and L. Pezzati

17:40 – 18:00 *A case study on construction products innovation: self-cleaning glass*
M. Costantini and F. Cassaro

19.30 Evening Tour – Lecce: Baroque, History and Traditions

21.00 Social Dinner offered by MAPEI

Wednesday June 9th, 2004

University Campus – Via per Monteroni- Lecce

9.30-11.10 Technical Session 9A - Material Characterization

- 9:30 – 9:50 *Interface fracture and durability of GFRP- and CFRP-concrete subject to freeze-thaw and wet-dry cycling*
J. F. Davalos, D. M. Boyajian, S. Kodkani, I. Ray and P. Qiao
- 9:50 – 10:10 *Experimental investigation and analysis of non-linear creep of different thermoplastic and thermosetting composite matrices*
O. A. Plushchik and A. N. Aniskevich
- 10:10 – 10:30 *Performance evaluations of bond between special and normal concrete using a new shear tool*
J. F. Davalos, I. Ray and S. Luo
- 10:30 – 10:50 *Ultrasonic cure monitoring of thermosetting composite matrices*
F. Lionetto, M. Frigione, V.A.M. Luprano and A. Maffezzoli
- 10:50 – 11:10 *Application of artificial neural network to mode-I fatigue of interface bonds for dissimilar materials*
J. Jia and J. Davalos

9.30-10.50 Technical Session 9B - FRC and Concrete Repair

- 9:30 – 9:50 *Design considerations on the use of steel fibres from waste tyres as reinforcement in concrete*
K. Neocleous, H. Tlemat and K. Pilakoutas
- 9:50 – 10:10 *Analytical and experimental evaluation of FRC ductility*
Z. Rinaldi, A. Grimaldi, G. Galli and G. Spadea
- 10:10 – 10:30 *External unbonded reinforcement : a novel retro-fitting technique*
J. Cairns and J. Grant
- 10:30 – 10:50 *Hybrid fiber reinforced SCC for repair of reinforced concrete beams*
N. Banthia, F. Majdzadeh and S. Mindess

9.30-11.10 Technical Session 9C - Case Studies

- 9:30 – 9:50 *The restoration of the Margherita Theatre of Bari. An experimentation of yard*
M. Candela
- 9:50 – 10:10 *The use of carbon fibres in restoring the stables of the Medici Villa of Poggio at Caiano – Florence*
C. Blasi, E. Coisson and D. Ferretti
- 10:10 – 10:30 *Repair and strengthening of the reptile building of the Antwerp zoo*
S. Matthys, L. Taerwe and J. Janssens

- 10:30 – 10:50 *The structural strengthening and repair of the bridge over the Cervo river at Miagliano*
F. Giussani, M. Mapelli and F. Mola
- 10:50 – 11:10 *Assessment and repair of a RC structure damaged in a fire - case study*
V. Radonjanin, M. Malesev and R. Folic

11.10-11.30 Coffee Break offered by ITALCEMENTI Group

11.30-12.30 Closing Ceremony

Please note that bus transportation from hotels to the Conference venue and to the social events will be provided to all participants

INNOVATIVE MATERIALS AND TECHNOLOGIES FOR CONSTRUCTION AND RESTORATION 2004

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