FRP INTERNATIONAL

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Editor's Note

As we approach the start of a new year I would like to take this opportunity to reflect on Professor Burgoyne's inspirational presentation at the closing ceremony of FRPRCS-8 in Patras, Greece. Of the 311 papers contained within the FRPRCS-8 proceedings only 12 are on durability, 4 on thermal effects, 1 on economics, and 1 related to fire. However, the questions raised most by potential users relate to cost and the effects of fire on the FRP system. To ensure the success of FRP in the construction industry we must direct more attention to these issues. We should be persuading owners to change the way structures are being built *now* to avoid problems *later*. Professor Burgoyne challenged the research community to read the literature to avoid unnecessary repetition, think about the fundamental mechanics of the system, and use realistic specimen sizes and load conditions. Some of his suggested research ideas included the automation of strengthening and fabrication of reinforcing bars, the development of improved fibers, and the development of innovative uses – that is, not just as a replacement for steel.

Readers will find that this issue of *FRP International* focuses primarily on activities in Europe. To this end, I would like to acknowledge the efforts of Dr DeLorenzis for her efforts in coordinating many of the articles in this issue. As always, suggestions and contributions are welcome and may be submitted electronically to newsletter.editor@iifc-hq.org.

Finally, on behalf of the newsletter advisory board and editors, I wish everyone all the best for the new year.

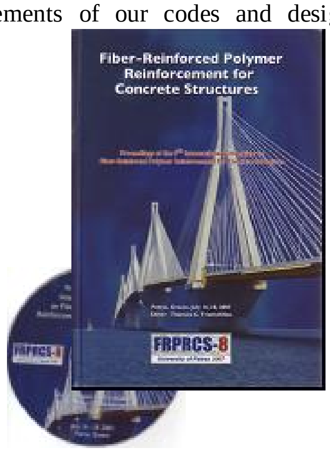
Rudolf Seracino, Editor-in-Chief
Email: newsletter.editor@iifc-hq.org

FRPRCS-8 Press Release

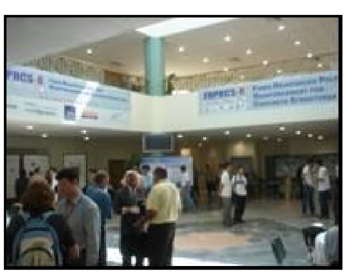
FRPRCS-8
University of Patras 2007

The 8th International Symposium on Fiber Reinforced Polymer Reinforcement for Concrete Structures (www.frprcs8.upatras.gr), held at the University of Patras, Greece, from July 16 to 18 2007, ended as an extremely successful international event. FRPRCS-8 showed how much the state-of-the-art in the field of FRP combined with concrete (and other materials, such as masonry), has advanced within a couple of decades throughout the world.

The Symposium's Proceedings (734-page hard-bound book with 2-page versions of papers + CD with full versions of papers) include a total of 311 papers from 43 countries. 150 papers from Europe, 85 from Asia and the Pacific Rim, 73 from the Americas and 3 from Africa, show the most promising areas for future research, as well as the way of necessary developments and improvements of our codes and design guidelines. 283 of these papers were scheduled and presented in 43 sessions during the Symposium by distinguished researchers and practitioners, and were attended by a truly international audience, which comprised 367 delegates from 47 countries: 221 from Europe, 79 from Asia and the Pacific Rim, 63 from the Americas and 4 from Africa.



Papers were presented in the following areas: (1) General topics and FRP materials; (2) Externally bonded FRP with emphasis on bond aspects; (3) Externally bonded FRP for flexure; (4) Externally bonded prestressed FRP for flexure; (5) Externally bonded FRP for shear; (6) Externally bonded FRP for confinement; (7) Special topics on externally bonded FRP; (8) Strengthening with near surface mounted (NSM) FRP; (9) New strengthening techniques: Mechanically fastened FRP (MF-FRP) and steel-reinforced polymers (SRP); (10) Seismic retrofitting with FRP; (11) Internal FRP reinforcement; (12) FRP prestressing tendons; (13) Durability; (14) Codes and design guidelines; (15) Field applications and case studies; (16) Hybrid FRP-concrete structures; (17) Textile reinforcement and cement-based composites; (18) Strengthening of masonry; and (19) Other topics.



For additional information contact:

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New IIFC Working Group on Education

Chairman: Dr. Luke A. Bisby, P.Eng.
Queen's University
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Overview: FRP composites are now widely recognized within the civil engineering research community. However, the level of awareness of the numerous benefits that FRP materials might offer the broader civil engineering and construction industries remains relatively low. Increased use of innovative technologies in civil engineering requires a basic understanding and awareness by all members of the profession. As such, the IIFC is taking steps to inform and educate the global civil engineering community regarding promising technologies involving the use of FRPs in construction.

Objectives: To develop strategies to attain educational and training objectives of the IIFC.

To provide guidance for the organization of workshops and/or seminars (to be offered in conjunction with the CICE conference series).

To develop Education Modules on FRP composites in construction to be used globally in undergraduate, graduate, and professional engineering curricula.

Deliverables: Targeted internationally applicable Education Modules (draft versions Fall 2008):

1. Mechanics Examples Incorporating FRPs
2. Introduction to FRP Composites for Construction
3. Introduction to FRP-Reinforced Concrete
4. Introduction to FRP-Strengthening for Infrastructure
5. Introduction to Prestressing with FRPs

Development and delivery of CICE pre-conference workshop on teaching FRP Composites for Construction at the undergraduate level (target CICE 2010).

Annual reports.

Contact Dr Bisby to join this new IIFC Working Group:
bisby@civil.queensu.ca

IIFC By-Laws on Working Groups

Section 10 of the IIFC By-Laws, reproduced below, pertains to the establishment and deliverables of Working Groups.

1. Proposals for the establishment of Working Groups in selected areas shall be submitted to the Executive Committee for approval. The proposal shall include such details as the Chairman of the Working Group, a list of members who have confirmed support, and the scope, form and frequency of activities and deliverables.

2. Working Groups shall be established when there is a genuine need and widespread interest among the members of the Institute, and shall be dissolved by the Executive Committee when it has remained basically inactive for a period of one full year.

3. The Chairman of a Working Group shall submit an annual report of activities to the Executive Committee.

IIFC Special Session at ACMA

At the recent American Composites Manufacturers Association (ACMA) Composites and Polycon Conference held in Tampa Florida, USA from October 17-19, 2007, a special session was organized under the auspices of the IIFC. At the last CICE conference in Miami in December 2006 a closer collaboration between the IIFC and the ACMA was discussed. This session represented the first in this continuing relationship. The session was organized by IIFC Vice Presidents, Vistasp Karbhari and Larry Bank. Three speakers made presentations on the State-of-the-Art of FRP to an audience of approximately 50 attendees. The speakers were, Prof. Ken Neale of the University of Sherbrooke, who discussed work in Canada, Dr. Masoud Motavalli, of EMPA, who discussed work in Europe and Dr. Iwashita of Ibaraki University, who discussed work in Japan. The session was chaired by Prof. Bank.

ACMA
American Composites Manufacturers Association

IIFC Patron and Collective Members

Patron Members

JSMS

Association for Advanced Composite Technology on Construction Field
ACC 建設用先端複合材技術協会

Collective Member

Hughes Brothers, Inc.
SINCE 1921 – SEWARD, NEBRASKA

For information on IIFC Membership:
www.iifc-hq.org/membership.html

The Polish Group of the International Institute for FRP in Construction (PG IIFC) was established in February 2007 in the Faculty of Civil Engineering, Architecture and Environmental Engineering in the Technical University of Lodz, which has been a Polish leader in research on strengthening of reinforced concrete structures with EB and NSM FRP since 1998. The PG IIFC received official patronage of the Polish Committee for Civil Engineering of the Polish Academy of Sciences (the highest Authority of Polish Science) in March 2007.

Aim and Statute

The aim of PG IIFC is to build a bridge between science and industry in the area of FRP composites in the civil engineering infrastructure and to provide a forum for all concerned with FRP to exchange advances in research, standardization, and FRP application in rehabilitation, upgrade, and new construction.

The PG IIFC is a non-profit organization and does not manage any commercial activity. It operates on the voluntary efforts of Polish IIFC members. The IIFC Constitution (*By-Laws of the International Institute for FRP in Construction*) is obligatory in the PG IIFC. Meetings will be held two to three times a year at conferences endorsed by PG IIFC coinciding with major industry events.

Proposed Activities

PG IIFC members are working towards developing the following activities:

- Organizing and supporting national and international conferences and symposiums, Working Group meetings, courses and seminars for PhD students, and workshops for civil engineers;
- promoting industry and science collaboration to solve real engineering problems;
- establishing Working Groups in selected areas;
- developing data bases on practical applications of FRP in Polish civil engineering infrastructure;
- developing data bases on Polish (and other European) FRP research projects, research grants, Master and PhD theses;
- developing Polish design recommendations and guidelines;
- publishing a PG IIFC newsletter;
- developing an international science network;
- introducing a best PhD thesis on FRP application competition to recognize achievements and promising young engineers and researchers; and
- facilitating the development of close links between FRP materials suppliers and construction companies in Poland.

PG IIFC members would like to establish a web forum open to all registered IIFC members to enable discussion on innovative FRP technologies and new alternatives for new construction.

Membership

PG IIFC currently consists of over 40 members from Polish Technical Universities (Lodz, Warsaw, Silesian, Wroclaw, Cracow, Gdansk, Lublin, Bialystok), design engineers, developers, manufactures, industrial, and commercial companies (including Sika Poland, S&P Reinforcement, MC-Bauchemie, BBR, and Mosty-Łódź).

Conferences

The Faculty of Civil Engineering, Architecture and Environmental Engineering in the Technical University of Lodz, in cooperation with the famous Polish bridge company Mosty-Łodź, under the auspices of the Lodz Division of the Polish Association of Civil Engineers and the Lodz branch of the Polish Association of Bridge Engineers, organized two national conferences on **Composite Materials in Bridge Structures**. The second conference, held on 11-12 May 2006, was very successful and confirmed the wide interest of Polish engineers in FRP application in civil engineering infrastructure. The Organizing and Scientific Committees made a decision to continue this conference as a regular international prestigious conference focusing on research, development, and application of FRP external and internal reinforcement for concrete and other structures.

PG IIFC also endorses the 6th international conference on **Advanced Models and New Concepts in Concrete and Masonry Structures**, to be held in Łódź, Poland on 9-11 June 2008. The conference addresses, among other general things, theory, practice, and new standards on topics relating to FRP applications. PG IIFC aims to organize several sessions on FRP.

For information on PG IIFC email:
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Strengthening Large Diameter PCCP Pipe with External FRP on the Aravissos Pipeline

The Aravissos Pipeline is the first project involving strengthening large diameter Prestressed Concrete Cylinder Pipe (PCCP) with FRPs in Greece and perhaps Europe. The Aravissos Pipeline, in Thessaloniki Greece, was strengthened with External Application of FRPs. The Owner of the Aravissos Pipeline is the "Thessaloniki Water Supply and Sewerage Company" ("EYATH S.A."). The typical PCCP segment of Aravissos pipeline is 6.00 m in length with 1.65 m internal diameter and 140 mm thickness. One segment was found cracked in October 2004. The crack was 2.0 m long and parallel to the pipeline axis. The crack was successfully sealed without interrupting the pipeline operation and the PCCP segment was strengthened with external application of Tyfo® SCH-41 unidirectional carbon composite system according to the design.

Cracked pipe segment.

The PCCP segment was designed for a water pressure of 8.0 bars, simulating a hydraulic hurt event according to the Owner's Specifications. Preliminary calculations were conducted according to the Tyfo® System Design Manual in order to provide the required number of layers of Tyfo® SCH-41 Carbon Composite System. A detailed Finite Element model of the PCCP segment was used for further analyses and design, simulating the pipe concrete section, the existing crack, and the required number of layers of the carbon composite system. The results for the FRP design from the detailed FEA analysis were in very good correlation with the preliminary calculations.

Steel spiral fully corroded at crack.

Before the strengthening of the pipe, sealing of the crack was required. This was quite challenging because it had to be done with the pipeline in operation and, thus, with water coming out of the crack under pressure. The repair method used was a low pressure epoxy injection. The subcontractor, Chemco Systems Europe GmbH, performed the crack sealing. The success of the crack sealing was verified by ultra-sonic testing by ReTech S.A., a company specializing in structural testing and monitoring. Water quality control was monitored during the crack sealing process in case of any adverse indication of epoxy resins presence. The laboratory of the pipeline's Owner conducted numerous chemical analyses of water samples and detected zero epoxy resin infiltration.

Crack completely sealed.

The application of the Carbon Composite System took place according to the supplier's (Fyfe Europe SA) Specifications and the Tyfo® System Quality Control Manual. The Contractor (exelKAT SA) is a certified applicator of the Composite System and has performed numerous rehabilitation projects in Greece. The FRP strengthening process followed closely the steps described in the design; special detailing was addressed at the FRPs edges and layers overlapping. Any unsound cementitious mortar coating was removed and replaced. The surface preparation was done by grinding off any irregularities, high pressure water blasting and filling cavities with the composite system's epoxy paste.

Strengthened Pipe with Tyfo SCH-41 Carbon System.

The System Quality Control Manual & ICC AC178 criteria for inspection and verification were followed. Two FRP samples for testing were prepared every work day according to the supplier's procedure. Samples were tested according to ASTM D-3039. Temperature and humidity were recorded. The project area was covered with a temporary steel framing and plastic cover sheet for protection against rain and dust. After strengthening, the pipe was covered by a layer of mortar for protection during the ground back filling.

FRP technology is a valid, efficient and cost effective technique for strengthening large diameter PCCP pipes either internally or externally. There is, no need to set down pipeline operation for external strengthening with FRP; and no need to dig out pipeline, avoiding high cost, traffic and other kind of disruptions, for internal strengthening with FRP. Design, FRP system supply, application and quality control should be assigned to specialized companies of the construction industry.

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FYFE EUROPE S.A. The FIBRWRAP COMPANY

FRPs in Restoration and Conservation (Part II)

Dr. Sue Halliwell
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network group for composites in construction
ngcc

Historic Masonry Structures

FRP exterior cornices are one of the most popular replacement materials for masonry structures. FRP can replicate the appearance of other materials; it can combine many of the degraded elements of the structure into a single, lightweight, readily-handled structural member. The material is durable; a gel coat would normally be used on the surface of the laminating resin to give UV radiation protection, weather resistance and custom matching to virtually any colour.

Masonry Arch.

Guidance is still required on strengthening elements with globally and locally curved soffits. Ideally, the applied FRP should be straight, following the tensile load path. Provided the deviations are small, local curvature or undulations can be taken out by additional thickness of the adhesive. Use of pultruded plate, rather than wet lay-up sheet laminate, is therefore appropriate in such a situation. In the case of globally concavely-curved soffits (a common occurrence in masonry structures), there is no option but to follow the curve of the soffit. The flexural strength enhancement of FRP is thus reduced due to the straightening effect in the curved system, which in some cases can lead to premature debonding. In some cases (e.g. circumferential strengthening of curved/dome type structures) it might be possible to design an FRP scheme that relies on low pre-stressing, and thus obviates the need for any adhesive bonding. Clearly there are advantages in terms of reversibility here, though the efficiency of any such scheme would need to be carefully evaluated. Prevention of local material damage would also have to be carefully assessed.

Whilst detailed guidelines on strengthening circular columns can be given with relative confidence, guidelines on strengthening columns with non-circular cross-sections require further understanding. In particular, square and rectangular columns are common in masonry structures. Although it is evident that only modest increases in axial strengthening can be achieved by wrapping rectangular columns, such increases are often sufficient.

Guidance document

1. Italian National Research Council (CNR DT200/2004). Guide for the Design and Construction of Externally Bonded FRP Systems for Strengthening Existing Structures, 2004. (English translation 2006).

Historic Concrete Structures

It is now commonplace worldwide for existing concrete structures to be strengthened using FRP materials. The techniques available for this are well documented in the literature. The major issue, however, which relates to FRP-strengthening of historic concrete structures is that of deterioration of the concrete itself. Major signs of concrete deterioration include cracking of the material, structural cracks, spalling, stains, and erosion. The above problems need attention before application of in-situ prepregs or wet-lay-up composite systems to the concrete surfaces to restore the original strength of the structural member. This can cause problems with the final aesthetics of the strengthened historic concrete structure.

Guidance document

1. Concrete Society report TR55: Design Guidance for Strengthening Concrete Structures using Fibre Composite Materials. 2nd Edition.

Historic Metallic Structures

Historic metallic structures are usually fabricated from cast iron or wrought iron, and the main concern in strengthening arises from the nature of the material from which the structure is made, due to large variations in material properties arising from the manufacturing process. As structural materials, cast iron and wrought iron have now been replaced by steel production, so there has been little research interest in these metals. However, among the existing bridges in Europe, as well as in Japan and the U.S., a considerable number of structures have been built using cast iron or wrought iron, many of which need strengthening.

Cast Iron Beam.

There are recognised methods for repairing surface defects of cast iron (e.g. epoxy grouting). If, however, structural upgrading is required, ultra high modulus carbon fibre reinforced polymers (UHM CFRP) can be used to upgrade/strengthen cast iron members and is permanently joined (adhesively bonded) to the parent material.

The advantages of it over other materials is that it has a high tensile strength (cast iron tends to have a low tensile strength), a higher stiffness than that of the parent material, and it is relatively lightweight which allows for easy joining to the structural member. In addition, it is relatively thin, thus not incurring height restrictions on bridges. A disadvantage of the UHM CFRP material is that it has a low strain to failure. The cost of the material is high, but this is offset by the relative speed and the ease of erection on site which, in turn, reduces the disruption of traffic to a minimum and reduces any closure costs of the bridge or building.

Thus, the advanced mechanical and fatigue properties, the ability to resist fire and the low thermal conductivity of CFRP materials make them an excellent candidate for repair and retrofit of metallic girder bridges. Epoxy bonding of CFRP plates to the tension flange of the girder is generally used to increase load-carrying capacity and fatigue strength. The high strength and stiffness-to-weight ratios prevent any substantial increase in dead weight. In addition, FRPs also offer high design flexibility, and their corrosion resistant properties reduce the need for regular maintenance and painting.

The main issues with the use of CFRP plates are related to the durability under various environmental conditions and to the compatibility with the metal from a structural, mechanical and configurational point of view. The final material selection is based on simultaneous consideration of both durability and performance criteria.

The issues mentioned above apply equally to steels. The steel member, which requires upgrading, or strengthening would invariably use UHM CFRP.

It must be noted from an asset owners point of view that joining the UHM CFRP to a metallic member can be reversed only with considerable effort. This method may preclude the use of CFRPs for upgrading some historic structures because of the permanent nature of the upgrade.

Guidance documents

1. ICE Design and Practice Guides. FRP Composites: Life Extension and Strengthening of Metallic Structures, 2000.
2. CIRIA Report C595: Strengthening Metallic Structures using Externally Bonded Fibre-Reinforced Polymers, 2004.
3. ISIS (Canada). Design Guidance for Strengthening Steel Structures using FRP, 2007.

Historic Timber Structures

Historic timber structures, such as covered bridges, building frames, long-span arches, roof trusses, and waterfront facilities require case-specific methods of restoration and strengthening. Deterioration of timber occurs due to environmental factors, biological agents, natural hazards and man-induced degradation.

The repair and strengthening of timber structures using traditional construction materials has always been challenging due to the directional properties of timber, dimensional changes under moisture variation, and sometimes a necessity to remove considerable amounts of the original ‘sound’ timber. In this respect bonded CFRP and GFRP materials have been used as a means to strengthen existing historic timber structures with minimal intrusion. There are two main options for this type of retrofit:

- Use of CFRP or GFRP composites as direct ‘reinforcement’ in timber. This is known as the resin repair technique.
- Removal of decayed timber, followed by splicing in of a new section of timber (a timber prosthetic). The joining method is via routered slots into which FRP members are adhesively bonded.

Timber Beam.

The key advantages for bonded composite repair and strengthening of timber are:

- *Minimal intrusion* into the existing original structure
- *Reversibility* - the repair can be removed or replaced in later years also with minimal intrusion.
- *Fire protection* due, in some cases, to the complete encasement of the FRP and resin within the timber.
- *Invisibility* - the repair can be shaped to disguise its appearance to suit that of the existing structure.

Guidance documents

1. Step 1 Timber Engineering, Netherlands, Salland De Lange, Deventer, 1995.
2. Step 2 Timber Engineering, Netherlands, Salland De Lange, Deventer, 1995.
3. Low Intrusion CONservation Systems for Timber Structures (LICONS), CRAFT Project CRAF-1999-71216, visit website: www.licons.org.

Further reading

The new NGCC technical sheet ‘TS06: FRPs in Restoration’ and workshop presentations can be downloaded from the NGCC members’ e-library on the NGCC website www.ngcc.org.uk.

See Volume 4, Issue 1 of *FRP International* for Part I of this article.

Hybrid FRP-Concrete Bridge Superstructure/Deck System

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It is a major challenge to build bridge systems that have long-term durability and low maintenance requirements. One of the possible solutions to this challenge is the use of new materials or to implement new structural systems. Fiber reinforced polymer (FRP) composites have immense potential to play an important role in solving some of the persistent problems in infrastructure applications because of their high specific strength, light weight, and durability.

A study conducted at the University at Buffalo, sponsored by the New York State Department of Transportation (NYSDOT), focused on developing efficient bridge deck and superstructure systems that take into account the combination of FRP and concrete as the main constituent materials forming the structural system. The hybrid FRP-Concrete (shown in Figure 1) consists of trapezoidal FRP cell units surrounded by an FRP outer shell forming a bridge system. A thin layer of concrete was placed in the compression zone. Concrete was confined by GFRP laminates which provide protection from environmental exposure. Moreover, the concrete layers provide enhancements to the top surface by minimizing the local deformation imparted by truck loading, and the webs of the box section were designed at an incline to reduce shear force between sections.

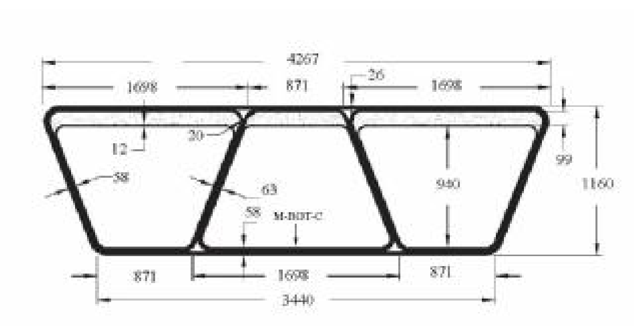


Figure 1: Cross Section of the Hybrid FRP-Concrete System.

As part of this research, comprehensive analytical and experimental studies were conducted on two scaled bridge prototypes (shown in Figure 2). The first prototype is a bridge superstructure that was designed as a simply-supported single span one-lane bridge with a span length of 18.3 m, and the second prototype was an FRP-concrete bridge deck supported on steel girders. Results from both experimental and computational analysis for both scaled prototypes have confirmed that the hybrid bridge superstructure and deck systems possess excellent structural performance. In particular, the hybrid deck represents an efficient system for replacing old and deteriorated concrete decks.

The final phase of this research is underway to evaluate the fatigue behavior, creep behavior, fatigue resistance of connectors between deck and steel girders, failure modes of the hybrid FRP-Concrete and ultimate capacity of the hybrid deck connected to steel girders by shear studs. Upon completion of this final study, the hybrid deck will be in a position for field application to replace the concrete deck.

Figure 2: Hybrid Superstructure and Deck System.

For more information or a copy of the relevant publications on this topic, contact Dr. Amjad Aref or Dr. Sreenivas Alampalli.

Organization Profile

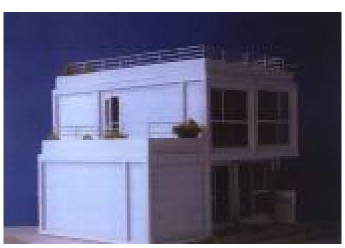
Dr Sue Halliwell, Coordinator
NetComposites Ltd

The Network Group for Composites in Construction (NGCC) represents the composites in the construction industry and unites its members in one body. Its membership covers all sectors of the industry. Activities of NGCC include dissemination of information and news, forums for collaboration and networking, and providing a central focus for those needing support within the industry. NGCC represents industry within the UK government funded Knowledge Transfer Networks (KTNs), in particular the National Composites Network (NCN), Materials UK (MatUK) and the KTN for the Modern Built Environment.

Composites (fibre reinforced polymers) continue to find effective use in a wide variety of construction applications ranging from new build structures to refurbishment and restoration projects.

Igloo
White Young Green / Intravision AS

Classroom
Saint-Gobain Vetrotex/Diespeker



Trièdre Structural Modular Forms
White Young Green/Future Systems

Their use in the UK is set to increase further over the coming decade as major opportunities arise including the 2012 Olympics, the current housing crisis and an ever aging infrastructure. Key properties such as light weight, excellent long-term durability, flexibility in design, prefabrication and fast construction process on-site will enable innovative cost-efficient structures to be developed using composite materials in both a pure form and also working synergistically with other materials to give improved performance.

NGCC changed its coordinating organization in March 2006; the head-office is now at NetComposites Ltd, Chesterfield under the direction of Dr Sue Halliwell.

e-mail: ngcc@netcomposites.com
website: www.ngcc.org.uk

Recent Publications

Books

Bank, L.C. *Composites for Construction: Structural Design with FRP Materials*. John Wiley & Sons Inc. 576 pp.

Research Theses

Hanus, J.P. "Investigation of a Deployable Military Bridge System with a Fiber Reinforced Concrete Deck" Doctor of Philosophy, University of Wisconsin-Madison, USA. 2007.
Advisor: Prof. L.C. Bank

Rasbid, R.S.M. "Shear Capacity of Fiber Reinforced Polymer Strengthened Reinforced Concrete Beams" Doctor of Philosophy, University of Adelaide, Australia. 2007.
Advisors: Prof. D.J. Oehlers & Assoc. Prof. R. Seracino

Yang, Q. "Out-of-Plane Strengthening of Unreinforced Masonry Walls Using FRP Techniques" Master of Engineering Science, University of Adelaide, Australia. 2007.
Advisors: Assoc. Prof. M.C. Griffith & Assoc. Prof. R. Seracino

Email recent publications or announcements to:
newsletter.editor@iifc-hq.com

IIFC Member Profile

Edoardo Cosenza, M.Sc, Ph.D, Eng.

Edoardo Cosenza was born and educated in Naples, Italy. He obtained his Civil Engineering degree in 1982, followed by his Ph.D. degree in Structural Design in 1986 from the University of Naples Federico II, Italy. Since 1994 he is Full Professor of Structural Design at the University of Naples Federico II. He has also held the academic position of Dean of the Engineering Faculty (17,000 students, 500 Professors and Researchers). His research interests include: FRP and innovative materials for structural engineering and conservative rehabilitation, seismic engineering, steel-concrete composite structures, and reinforced concrete structures. He has published more than 300 technical papers in these areas and has also been a speaker in more than 100 national and international congresses and workshops. Prof. Cosenza is active in code committees including Ministry of Public Works Commission for Technical Codes, Eurocode 8 Project Team, CNR Consulting Committee on building rules, and Great Risk National Committee. He was the Chairman of the Organizing Committee of the 2nd International fib Congress (Naples, 2006) and he has served or serves on the editorial boards of several national and international technical journals inlcuding ASCE Journal of Composite for Construction, fib review “Structural Concrete”, and “Costruzioni Metalliche”. He is currently Chairman of the fib Italy Group, Coordinator of the AMRA “Environmental Risk Monitoring and Analysis” District Authority Seismic Engineering Division, and Director of the Centre of Excellence “Structural Composites for Innovative Applications” at University of Naples Federico II. Prof. Cosenza is a fellow of the National Academy for Physical, Mathematical and Natural Sciences and of Accademia Pontaniana.

Calendar of Events

Conferences, Conventions, and Workshops

2007

1st Asia-Pacific Conference on FRP in Structures (APFIS 2007), Hong Kong, China, December 12-14, 2007. (APFIS 2007 is the first official Asia-Pacific regional conference of the IIFC.)
www.hku.hk/apfis07/

2008

International Composites in Construction Conference (CCC 2008), Porto, Portugal, April 16-18, 2008.
http://paginas.fe.up.pt/~ccc2008/index.htm

5th Middle East Symposium on Structural Composites for Infrastructure Applications (MESC-5), Hurghada, Egypt, May 23-25, 2008.
www.MESC5-Egypt.com

6th International Conference on Analytical Models and New Concepts in Concrete and Masonry Structures (AMCM 2008), Lodz, Poland, June 9-11, 2008.
www.amcm2008.p.lodz.pl

4th International Conference on FRP Composites in Civil Engineering (CICE 2008), Zurich, Switzerland, July 22-24, 2008. (CICE 2008 is the official conference of the IIFC.)
www.cice2008.org

5th International Conference on Advanced Composite Materials in Bridges and Structures (ACMBS-V), Winnipeg, Canada, September 22-24, 2008.
www.isiscanada.com/acmbs

2009

9th International Symposium on Fiber Reinforced Polymer Reinforcement for Concrete Structures: Current Challenges and Future Trends (FRPRCS-9), Sydney, Australia, July 13-15, 2009.
www.iceaustralia.com/frprcs9

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