

NEx Activities at the ACI Concrete Convention – Fall 2023

At the ACI Concrete Convention held from October 29 to November 2, 2023, in Boston, MA, USA, NEx presented its 2024 Business Plan to the NEx Board of Directors (BOD), signed Memorandums of Understanding (MOUs) with three organizations and two universities, and organized a technical session on “Nanocomposite Polymers in Construction Materials Technology” and a workshop on “FRP Composites in the Face of Fire: Insights from Research and Industry.” NEx also sponsored the ACI Committee 440 session on “Anchorage of Flexural Externally Bonded FRP Strengthening Systems” and the Student FRP Competition.

NEx BOD members Waleed Al-Otaibi, President; Randall W. Poston, Chair; Riyadh Shiban, Director; Antonio Nanni, Director; and Ron Burg, Director, convened for a meeting to review NEx’s 2024 Business Plan and discuss 30 new projects to be funded by the Center, as well as to evaluate the Center’s progress and its strategic growth initiatives focused on nonmetallic materials in the building and construction sector.

New MOUs were signed between NEx and the Korea Concrete Institute (KCI), Seoul, South Korea; RILEM (the International Union of Laboratories and Experts in Construction Materials, Systems and Structures), Paris, France; and the Slag Cement Association (SCA), Farmington Hills, MI, USA; as well as with The University of Alabama, Tuscaloosa, AL, USA; and Texas A&M University, College Station, TX, USA. For more information, visit www.nonmetallic.org/news-events.

The NEx session on “Nanocomposite Polymers in Construction Materials Technology” focused on the latest advancements in the field of nanopolymers and hydrocarbon-based nanocomposites. Presented topics included:

- An opening statement on NEx’s journey and accomplishments by Waleed Al-Otaibi, NEx President and Manager at Aramco, Saudi Arabia;
- A discussion on how nanotechnology is revolutionizing the world of concrete by Konstantin Sobolev, Professor, University of Wisconsin-Milwaukee, Milwaukee, WI, USA;
- New, scalable nanocomposite synthesis methods and creation of processable three-dimensional (3-D) materials composed entirely of polymer brush-grafted nanoparticles by Robert Macfarlane, Researcher, Massachusetts Institute of Technology (MIT), Cambridge, MA;
- A discussion on the preparation and characterization of nanoporous carbon integrated into cement, resulting in an electron-conducting composite material with outstanding mechanical properties and resistance to degradation by Roland Pellenq,



Speakers at the NEx session on “Nanocomposite Polymers in Construction Materials Technology” received certificates of appreciation

Director of Research, French National Centre for Scientific Research (CNRS), Paris, France;

- The importance of proper dispersions of titanium dioxide (TiO₂) nanoparticles for enhancing their photocatalytic performance in the construction and building industry by Anita Vuchkovska, Chemist, W. R. MEADOWS, INC.; and
- Fundamental experimental, theoretical, and computational studies aimed at developing a new processing method for blending polymers and nanofillers by Marilyn Minus, Professor, Northeastern University, Boston, MA.

The session concluded with a thought-provoking panel discussion on the future of nanopolymers in construction materials technology.

The NEx two-part workshop on “FRP Composites in the Face of Fire” aimed to provide a comprehensive exploration of various aspects related to fire and fiber-reinforced polymer (FRP) composites, with a focus on fire rating, fire resistance, fire endurance, and fire safety. Part 1 included the following presentations:

- Opening statement and ACI Committee 440 update by Chair Maria Lopez de Murphy, Head of Research, Modjeski and Masters, Mechanicsburg, PA, USA;
- “Code Requirements and Permissible Applications for Concrete Internally Reinforced with GFRP” by Steve Szoke, ACI Code Advocacy Engineer, Farmington Hills, MI;
- “Strategies for Enhancing Fire Performance of Concrete Structures Incorporating Fiber Reinforced Polymers” by Venkatesh Kodur, Professor, Michigan State University (MSU), East Lansing, MI;
- “Fire Performance of Concrete Structures with Internal and External FRP Reinforcement” by Mark Green, Professor, Queen’s University, Kingston, ON, Canada;
- “Highway Bridge Fire Damage Experiences and Fire Resilience Considerations for Bridges with FRP” by Steven Nolan, Structures Design Engineer, Florida Department of Transportation, Tallahassee, FL, USA; and
- “Fire Impact of Vehicle Fire Exposure on Polymer Concrete Overlays” by Shuna Ni, Assistant Professor, University of Maryland, College Park, MD, USA.

Part 2 covered the following topics:

- Opening statement and Joint ACI-TMS Committee 216 update by Chair, Kevin Mueller, Associate, Thornton Tomasetti, Chicago, IL, USA;
- “Fire Resistance of Concrete Structures Strengthened with Externally Applied FRP Reinforcement” by Tarek Alkhrdaji, Senior Vice President, Structural Technologies, Columbia, MD;
- “Experimental Investigation and Finite Element Simulation of GFRP Reinforced Concrete on Grade Slab Exposed to Fire” by Hassan Al-Khalifa, Group Leader, Civil and



A new MOU was signed between NEX and the Korea Concrete Institute (KCI)



Venkatesh Kodur from MSU presented “Strategies for Enhancing Fire Performance of Concrete Structures Incorporating Fiber Reinforced Polymers” during the NEX Workshop on “FRP Composites in the Face of Fire: Insights from Research and Industry”

- Building Systems Engineering, Saudi Aramco, Saudi Arabia;
- “State of the Art Regarding Heat and Fire Resistance of Pultruded FRP Structural Members in the AEC Industry” by Capra Williams, Graduate Student, University of Notre Dame, Notre Dame, IN, USA; and
- “Fire Safety Testing of ICF Wall Construction” by Shamim Rashid-Sumar, Senior Vice President, Codes and Standards, National Ready Mixed Concrete Association (NRMCA), Alexandria, VA, USA, and Robert Sculthorpe, Technical Specialist, Insulating Concrete Forms Manufacturers Association (ICFMA), Port Hope, ON, Canada.

Additional information on this workshop is provided in NEx *insights* published in the October 2023 issue of *Concrete International*.