Committee 544
Fiber Reinforced Concrete

Agenda
ACI 544 Main Committee Meeting,
Tuesday, October 18, 2011, 3:30 PM-6 PM
Duke Energy Convention Center,
Cincinnati, OH
Room: 201

1. CALL TO ORDER and APPROVAL OF AGENDA
2. INTRODUCTIONS
3. APPROVAL OF PREVIOUS MINUTES
4. REMARKS FROM THE CHAIR / SECRETARY
5. ANNOUNCEMENTS
6. REPORT FROM THE MEMBERSHIP SECRETARY
   • Discussion of Membership Issues
7. SUBCOMMITTEE REPORTS
8. LIAISON REPORTS
9. ANY OTHER BUSINESS / PRESENTATIONS / INFORMAL DISCUSSION OF PROJECTS
   • Review of two latest ballot results and discussion
   • Presentation of the new ACI 544-E initiative on the “Mechanical Properties of UHP-FRC” by Prof. Kay Willie, University of Connecticut.
   • Other
10. ADJOURNMENT
Appendix I:

Abstract for the presentation on the Mechanical Properties of UHP – FRC

*Kay Wille, U. Connecticut  ACI 544-E: Summary of talk on UHP-FRC*

**Ultra-High Performance Fiber Reinforced Concrete (UHP-FRC)**

*Need for a State of the Art Report on Mechanical Performance*

Ultra-high performance fiber reinforced concrete (UHP-FRC) is a cementitious composite characterized by superior mechanical properties, excellent durability performance and in comparison to other materials good strength/cost efficiency. The demand for UHP-FRC material is currently rapidly increasing in the US. UHP-FRC has the potential to enhance the deficient US infrastructure in the long term due to its low maintenance costs. Several agencies and contractors are trying to push the new material into the US market, which has been clearly demonstrated at the UHPC-workshop in NY, January 2011 organized and sponsored by the U.S. Department of Homeland Security (DHS) Science and Technology (S&T) Directorate, the National Transportation Security Center of Excellence (NTSCOE) at the University of Connecticut and the Columbia University.

Although research on UHP-FRC has been conducted for more than two decades, research efforts on UHP-FRC are still low, but increasing in the US. Most critical is the need for a state-of-the-art report on UHP-FRC to lay the basis for accelerating the application of the material. It is suggested that in coordination with the newly formed ACI committee 239: Ultra-High Performance Concrete and the North American UHPC working group such a state-of-the-art report on UHP-FRC could be developed. Upon interest ACI 544-E could emphasize the report on the mechanical properties and its modeling of UHP-FRC. This could include compressive behavior, tensile behavior including strain hardening, bending behavior, bond between rebar and matrix, and tension stiffening.

In support of the effort, state-of-the-art reports from other countries - such as France, Germany and Japan - should be thoroughly reviewed and if appropriate partly integrated in the report.

The purpose of a state-of-the-art report on the mechanical properties of UHP-FRC is to spread the existing knowledge about UHP-FRC among the research community and especially among the non-academic professionals. It is also desirable to point out the lack of knowledge and the need for further research in order to fill critical knowledge gaps and thereby accelerate its use in U.S. construction and promote a more resilient and sustainable future U.S. infrastructure.

Currently knowledge gaps include material characterization under direct tensile loading, fiber orientation dependent material behavior, long-term mechanical material properties, bond behavior between UHP-FRC and reinforcing bars, and tension stiffening behavior. Although research has been conducted on these topics the research results especially on modeling the mechanical properties may not be sufficient.

It is planned to present a short presentation on this topic during the ACI 544-E meeting in Cincinnati, OH on 10/17/2011. The presentation will introduce UHP-FRC, point out its mechanical properties and the need for a state-of-the-art report.