

Advances in Civil Engineering Materials

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Guest Editor: W. Jason Weiss

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Contributions are peer reviewed prior to publication.

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The journal publishes high-quality, original papers, including review papers and technical notes, on topics relating to the properties and performance of civil engineering materials. These are materials such as concrete, asphalt, steel, polymers and polymeric composites, and wood for use in civil and environmental engineering applications—for example, pavements, bridges, buildings (including nonstructural elements such as insulation, and roofing) and environmental systems (including water treatment). The journal core topics are characterization, physical properties, constructability, and durability of these materials. Papers may present experimental or modeling studies based on laboratory or field observations. Characterization may include chemical composition, nanostructure, and microstructure. Physical properties include, but are not limited to, strength, stiffness and fracture behavior. Constructability includes such topics as construction methods, quality control and quality assurance, life cycle analysis, and sustainability. Durability may be determined using either field performance or accelerated laboratory testing. Papers relating to sustainability of engineering materials or to the impact of materials on sustainability of engineering structures are especially encouraged.

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Overview

Special Issue on Recent Advances in The Freeze-Thaw and Scaling Behavior of Cement-Based Materials

The design of concrete mixtures that are durable when exposed to deicing salts or temperature cycles that result in freezing and thawing is a critical issue. While this topic of freeze-thaw in concrete is not new, the way that concrete mixtures are being designed for these effects is rapidly advancing. The work described in this special issue is a fresh look at the topic of freezing and thawing from five perspectives. The first papers by Mayercsik et al. and Tanesi et al. deal with the development and assessment of measurement techniques to quantify the air void systems for fresh concrete using the super air meter and hardened concrete by comparing two dimensional scans with three dimensional results from tomography. The paper by Cannon et al. evaluates the effectiveness of different surfactants on the air void system that is created. These results provide insight on both new methods for producing the air void system as well as evaluating the system rapidly. The second topic deals with the assessment of testing procedures that evaluate current test methods for concrete scaling. The papers by Hooton and Vassilev and Yi and Thomas each provide insightful suggestions on how test procedures can be developed to improve the testing and better relate the results to field observations. Driscoll and Hover provide an interesting and informative look at methods to measure a concrete's resistance to popouts. Obla et al. discuss the development of new criteria that can be used for identifying freeze-thaw resistant concrete. Monical et al. discuss the development of a new testing procedure to assess a paste's susceptibility to a reaction between certain deicing chemicals and the cementitious matrix. Hasholt et al. discuss the use of an emerging new material, super absorbent polymers, and reports on the benefits that these materials may have in improving the freeze-thaw resistance of concrete.

I sincerely thank all authors for sharing their work in this special issue on *Recent Advances in The Freeze-Thaw and Scaling Behavior of Cement-Based Materials*. My gratitude is owed to all reviewers for providing their review and insightful suggestions for these papers. I am indebted to Professor Leslie J. Struble for her help in guiding the journal and orchestrating the special issue. I am also very thankful for members of the ASTM staff, including Alyssa Conaway and Sara Welliver and the publishing group of *Advances in Civil Engineering Materials* for providing valuable assistance during the publication process. I hope this special issue will help the concrete testing and standardization community in discovery of these new developments as well as to build on the approaches in these papers as the field moves forward.

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