Heat-Air-Moisture Transport

Measurements on Building Materials

Editors

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Foreword

The First Symposium on Heat-Air-Moisture Transport: Measurements on Building Materials was held in Toronto, Ontario, Canada on 23 April 2006. ASTM Committee C-16 on Thermal Insulation served as its sponsor. The symposium chairs and co-editors of this publication were Phalguni Mukhopadhyaya and Mavinkal K. Kumaran of the National Research Council, Ottawa, ON, Canada.

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Overview

Since the inception in 1938, ASTM Committee C16 has been working on various aspects concerning the development of standards, promotion of knowledge, and stimulation of research pertaining to the heat-air-moisture transport through building materials (e.g. thermal insulation materials, products, systems, and associated coatings and coverings). During this time the committee has seen many changes and challenges in the building construction industry and invariably responded effectively to address the pressing concerns of the time.

In recent years, the building construction industry is making increased use of sophisticated computer based design tools for moisture design of building envelopes. These design tools invariably require well-defined heat-air-moisture transport properties of component building materials. The basics for heat-air-moisture transport through building materials had been researched upon for a long-time all over the world. However, there is a glaring lack of unifomity in the ways these transport processes are measured in various laboratories all over the world. The results coming out from various test methods are also presented in many different ways. This leads to a very confusing scenario for the end users of these material properties. Globally there is a great need to resolve this issue urgently so that the measured material properties are reliable, consistent and meaningful irrespective of the laboratory and personnel involved in the process.

The primary goal of the 1st symposium of "Heat-Air-Moisture Transport: Measurements on Building Materials," held in Toronto, Canada on April 23, 2006 was to provide a forum to discuss the state-of-the-art research and development activities on the measurement of heat-air-moisture transport through building materials, related to international standards. This STP presents selected peer reviewed papers from the symposium authored by renowned international experts. The STP starts with a paper that outlines the importance and necessity of reliably measured hygrothermal material properties, and the papers that follow deal with the individual material properties. Some of them identify the need for improvement in existing standards and others point towards new measurement techniques and corresponding standards.

Finally, the editors would like to acknowledge that this STP is a product of tremendous diligent efforts of many people. In particular, the editors would like to thank ASTM symposium organizing committee, all of the authors and paper reviewers who devoted their time for this endeavor. Special thanks are due to Dorothy Fitzpatrick and Timothy Brooke at ASTM for their support, timely assistance, and efficient handling of all minute details.

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