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# Building Science and the Physics of Building Enclosure Performance: 2nd Volume

STP 1635

Editors:

Daniel J. Lemieux

Jennifer Keegan



**SELECTED TECHNICAL PAPERS**  
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# Building Science and the Physics of Building Enclosure Performance: 2nd Volume

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## Foreword

THIS COMPILATION OF Selected Technical Papers, STP1635, *Building Science and the Physics of Building Enclosure Performance: 2nd Volume*, contains peer-reviewed papers that were presented at symposiums held April 24, 2022, and June 12, 2022, in Seattle, Washington, USA. The symposiums were sponsored by ASTM International Committee D08 on Roofing and Waterproofing, Committee E06 on Performance of Buildings, and Committee C16 on Thermal Insulation.

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Jennifer Keegan  
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Daniel J. Lemieux  
*Wiss, Janney, Elstner Associates, Inc.*  
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## Overview

The first ASTM International Joint Symposium on Building Science and the Physics of Building Enclosure Performance was held in Washington, DC. It was a two-part symposium that began in October 2018 with Committee E06 on Performance of Buildings and concluded in December of that year with Committee D08 on Roofing and Waterproofing.

Originally conceived as a recurring series that would be hosted by ASTM International in collaboration with similarly aligned standards development and professional interest organizations, the first symposium brought together thought leaders from across North America, the UK, Europe, and Asia to address the challenges that we continue to face with building enclosure and whole building performance.

The overwhelming success of the first symposium and the concerns that it raised relative to building performance and the contribution of our built environment to climate change led immediately to planning for the second symposium in this series, originally scheduled for 2020 in Toronto, Ontario, Canada. Sadly, for so many of us and for our co-hosts—ASTM Committee C16 on Thermal Insulation, National Research Council Canada, and the International Institute of Building Enclosure Consultants—those plans were interrupted by COVID-19 and what quickly became a global pandemic that would interrupt our lives and, in a variety of different ways, perhaps forever change the ways in which we live and work.

Today, as we gather again for the first time in over two years, we are very pleased to welcome you to the city of Seattle, home of the Second Symposium on Building Science and the Physics of Building Enclosure Performance. We recognize the difficult and often deeply personal decisions that so many of you have very likely had to make over the past two years and we truly appreciate your decision to join us for this event.

We would also like to take this opportunity to offer our sincere thanks to Frank McConnell and Steve Mawn, our respective ASTM Staff Managers for Committees D08 and E06, for their tireless patience and support. We share a common goal to encourage a more cooperative, cross-discipline and fully transparent approach to standards development at ASTM. Frank, Steve, and the ASTM Board of Directors are firm believers in that effort. This symposium and the symposia that will follow are in no small part a direct result of their insight, wisdom, and learned guidance.

Many thanks also to Kelly Dennison, Alyssa Conaway, Sara Welliver, and all of the truly dedicated, professional staff at ASTM for making this second joint



symposium possible during what has been a very challenging two years for all of us. Teamwork and a considerable amount of patience—often beyond our view and behind the curtain—came together to make it all look so easy.

And finally, a very special thanks to our speakers, authors, presenters, technical reviewers, and invited and registered guests for donating your time, interest, passion and expertise. As we have said in the past, for both Part I and Part II of this symposium, we are your students—humbled by your knowledge and grateful for your continued contributions to our industry and to the advancement of our profession. It has been a privilege to serve each of you and to serve ASTM as co-chairs of this symposium.

Symposium Chairs and STP Editors:

Jennifer Keegan, AAIA

Director

Building and Roofing Science

*GAF Materials Corporation*

Daniel J. Lemieux, FAIA, NCARB, RIBA, MRICS

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