



ASTM INTERNATIONAL  
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# Roofing Research and Standards Development

9th Volume

STP 1621

Editors:  
Sudhakar Molleti  
Walter J. Rossiter Jr.



**SELECTED TECHNICAL PAPERS**  
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## Foreword

THIS COMPILATION OF Selected Technical Papers, STP1621, *Roofing Research and Standards Development: 9th Volume*, contains peer-reviewed papers that were presented at a symposium held December 8, 2019, in Houston, Texas, USA. The symposium was sponsored by ASTM International Committee D08 on Roofing and Waterproofing.

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## Overview

Roofing technology and design have undergone major advancement in the last four decades. Roofs have a greater purpose now; apart from keeping unpleasant weather out of the building, they are shaping the livability of the buildings by serving as a platform for energy harvesting, energy efficiency, and climate adaptation. The ASTM Committee D08 on Roofing and Waterproofing, through the promotion of knowledge, stimulation of research, and development of standards, is advancing the multifaceted and modern design of roofs.

Knowledge dissemination to the roofing community has been one of the key activities of the Committee D08 that was initiated almost 30 years ago via the concept of the “Symposium Series on Roofing Research and Standards Development.” In 1986, Committee D08 hosted a technical symposium that occurred immediately following its fall task group and subcommittee meetings. That symposium, like the one described in these proceedings, was entitled *Roofing Research and Standards Development*. The 1986 participants considered the first symposium to be quite informative and successful. Acknowledging the success, the D08 leadership at that time recommended that plans be made for a follow-up symposium on the same subject. A second symposium took place in 1990, leading to the birth of the D08-sponsored symposium series that bears the same general title and survives to this day. These symposia have occurred about every four years.

A driving force behind D08’s symposium series is the tenet, “Sound standards have strong technical bases.” This symposium on *Roofing Research and Standards Development* is the ninth in the 3-decade-old series. This symposium and the papers described in the proceedings illustrate D08’s commitment to developing standards that have strong technical bases, which ultimately contributes to improved roofing performance. Proceedings in this series are: *Roofing Research and Standards Development*, STP959 (1986), *Roofing Research and Standards Development, 2nd Volume*, STP1088 (1990), *Roofing Research and Standards Development, 3rd Volume*, STP1224 (1994), *Roofing Research and Standards Development, 4th Volume*, STP1349 (1999), *Roofing Research and Standards Development, 5th Volume*, STP1451 (2003), *Roofing Research and Standards Development, 6th Volume*, STP1504 (2007), *Roofing Research and Standards Development, 7th Volume*, STP1538 (2011), and *Roofing Research and Standards Development, 8th Volume*, STP1590 (2015). Volume 1 was edited by R. A. Critchell; volumes 2 through 6 were edited by T. J. Wallace and



W. J. Rossiter, Jr.; volume 7 was edited by W. J. Rossiter, Jr.; and volume 8 was edited by W. J. Rossiter, Jr., and Sudhakar Molleti.

Committee D08 is the focal point in North America for the development of standards for low-sloped and steep roofing, and also waterproofing. The extent of its activities stretches across the typical categories of ASTM standards, including specifications, test methods, practices, and guides. Fortunately, D08 members bring a broad variety of necessary expertise and backgrounds to cover these activities. The importance of having such broad expertise today cannot be underestimated since issues addressed in D08's standards deliberations range from the practical to the fundamental. Moreover, the materials and components that comprise roofing and waterproofing systems cover a myriad of synthetic and natural materials used either alone or in combination with each other, and similarly within the systems there are different installation and attachment methods. The bottom line is that, when all D08 standards are considered collectively, their development represents an enormous effort; in contrast, taken individually, it is a tedious one. The symposia in the D08 series are just one small, yet vitally important, task supporting these standards development efforts.

Consistent with the broad range of D08 standards activities, the symposium papers assembled in these current Proceedings range from the practical to the fundamental and include:

- *The Potential Impact of Cool Roof Technologies upon Heat Wave Meteorology and Human Health in Boston and Chicago*
- *Validation of Roofing Membrane Composition by NMR: Products of Ketone-Ethylene Ester and Polyvinyl Chloride*
- *Waterproofing Applications for Floodproofing and Resiliency*
- *Overview of the IBHS Roof Aging Farm Program*
- *Does the Underlayment Matter?*
- *A Scientific Approach to Understanding Walkability and Grip to Deck of Roof Underlayment*
- *Laboratory Conditioning Methods for Asphalt Shingles*
- *Simulating the Thermal Impact of Typical Roof Penetrations*
- *Energy Resistance of Commercial Roofs*
- *The Durability of Polyolefin Polymers in Steep Slope Roofing Underlayment Materials—Part 1*
- *Effects of Moisture in Concrete Roof Decks on Vapor Retarder Adhesion*

These papers represent a significant contribution to D08's commitment to expanding the knowledge base that supports successful roof performance. From a practical point of view, the availability of data can help accelerate the standards development process as decisions can be made on fact and not opinion. In announcing this symposium, authors were informed that its primary emphasis would be on current

research and standards development work. Consistent with the title of the symposium series, in many cases, the authors have made recommendations for the development of new ASTM standards or improvement of those already issued. As co-chairs of this symposium, we hope that the D08 members will review, digest, and critique these recommendations and, as appropriate, initiate task group activities to consider them in the D08 standards development process.

As in the past, these proceedings are dedicated to the members of Committee D08 who give unselfishly of their time and energy to improve the performance of roofing and waterproofing systems. We express our sincere thanks and appreciation to those many individuals who participated in the organization and conduct of the symposium:

- *D08 Symposium Steering Committee Members:* Steve Condren, Rene Dupuis, Mark Graham, Tom Hutchinson, Jay Keating, Jennifer Keegan, Larry Meyers, Ted Michelsen, Ralph Paroli, Zach Priest, George Smith, Tom Smith, and Jim Strong. One of the primary responsibilities of the Steering Committee was the objective evaluation of the abstracts received in response to the call-for-papers issued in developing the symposium.

- *ASTM Headquarters Staff:* Alyssa Conaway, Kelly Dennison, Kathy Der-noga, and Joe Hugo. These industrious, professional ASTM staff provided for the symposium arrangements and assisted with the development of the proceedings. Their assistance and efforts are sincerely appreciated.

- *ASTM International's Selected Technical Papers (STP) Editorial Office:* Sara Welliver. She was responsible for the symposium papers, directing the reviews and editing in preparation for publication.

- *The Authors and Reviewers:* Above all, specials thanks are given to the authors and reviewers of the papers without whose outstanding efforts in writing and reviewing, respectively, the symposium and proceedings would not have been possible.

Sudhakar Molleti  
Walter J. Rossiter, Jr.  
*STP Editors*

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