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Durability of Building and Construction Sealants and Adhesives 6th Volume

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Editors:

Christopher C. White

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Foreword

THIS COMPILATION OF Selected Technical Papers, STP1604, *Durability of Building and Construction Sealants and Adhesives: 6th Volume*, contains peer-reviewed papers that were presented at a symposium held June 14–15, 2017, in Toronto, Ontario, Canada. The symposium was sponsored by ASTM International Committee C24 on Building Seals and Sealants and Subcommittee C24.01 on Terminology of Building Seals and Sealants.

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Overview

Sealant and adhesive durability is not something you think about every day; you just assume that the knowledge exists. All of the contributors to this volume—the authors, editors, reviewers, and program chairs—realize that this is in no way a settled topic. It is an active area of research.

The 17 papers contained in ASTM STP1604 were presented at the Sixth Symposium on the Durability of Building and Construction Sealants and Adhesives held on June 14–17, 2017, in Toronto, Ontario, Canada. This symposium was sponsored by ASTM Committee C24 on Building Seals and Sealants in conjunction with the 2017 June standards development meeting of the Committee.

ASTM Committee C24 has global influence on standards for building sealants used in commercial and multiuse buildings. The Committee holds the U.S. Technical Action Group to ISO 59/SC 8 Building Sealant. Developing and developed countries look to the building sealant standards written by the ASTM and ISO groups to accept as their own standards or make modifications from them.

Understanding sealant durability, and how long a sealant will perform, is critical to the built environment. Knowledge of sealant durability creates three opportunities that currently do not exist: 1) The ability to estimate residual capacity, 2) economically efficient materials selection decisions, and 3) the ability to produce and market materials with known liability. Let us address each of these in more detail.

Building owners and operators would like to know when they should replace specific material components before they fail. For example, on the cover of this volume is the IAC building in New York. This beautiful Frank Gehry–designed building features the first glass curtain wall in the world that is deformed cold. This means that the sealant is supporting not only the wind loading on the window, but a constant strain from the deformed glass unit pulling on the sealant. In some corners of the building the glass twists 150 degrees from floor to ceiling. Previous studies show that constant strain reduces the useful life of the sealant. The building owner would like to know if the building envelope will perform as specified during installation now that the building is 15 years older. Should the building owner invest in the expensive process of resealing the building or not? This decision can be supported only with detailed knowledge of the specific sealant durability, in this case the additional constraint of constant strain.

When the building was constructed initially, someone selected a sealant material. The owners really do not care which material was selected, but they do really care

that the function the material represents, keeping the building sealed, is maintained for a period. Because a detailed knowledge of the sealant durability is not currently known, it is almost impossible to choose a material that is economically efficient at keeping the building sealed for the period.

Manufacturers are constantly working to improve the formulations they would like to sell. One limiting factor is that establishing the durability, and hence the liability that new formulation represents, is a long and expensive process. This greatly limits the number of new formulations that can be brought to market. Knowledge of the sealant durability would allow innovation in new materials into the marketplace.

Facades of high rise buildings are measured in the tens of thousands of square meters or thousands of thousands of square feet. All of this built environment is negatively affected by poor sealant durability.

This book is the sixth volume concentrating on sealant durability on the international platform. The editors are greatly honored to have been able to produce such a valuable document for the building industry. It is only with the collaboration of the outstanding authors, ASTM technical staff, reviewers, and members of the international standards community. These dedicated professionals write, argue, produce, and maintain standards so that the structures from the humblest housing to the most iconic structures are safe and conformable.

The editors are humbled and grateful for the opportunity to work with such talented authors, reviewers, and ASTM staff to produce this volume of state-of-the-art papers. We trust that you will find it full of fascinating state-of-the-art research.

Dr. Christopher C. White
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STP Editors

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