ASTM International symposium

by Mark S. Graham

In December 2007, ASTM International's Technical Committee D08 on Roofing and Waterproofing held a technical symposium during its semiannual meeting. The symposium featured presentations of 11 peer-reviewed research papers that provide insight into research affecting the U.S. roofing industry.

The papers

"Artificial Roofing Slates and Shingles" provides a report of an investigation and testing of 11 artificial shake and slate products from nine manufacturers. The investigation involved hundreds of roof systems that were examined in more than 20 states.

The research concludes no test methods or programs accurately predict the durability of artificial roofing slates and shingles. The only appropriate indicator of the long-term performance of artificial roofing slates and shingles is historical durability of similar roof system products in a similar environment.

In "Investigation of the Effect of Heat on Specially Formulated Thermoplastic Polyolefin (TPO) Films by Thermogravimetry, Dynamic Mechanical Analysis, and Fourier Transform Infrared Spectroscopy," thermogravimetric analysis (TG), dynamic mechanical analysis (DMA) and Fourier transform infrared spectroscopy (FTIR) were performed before and after heat conditioning on seven specially formulated TPO film samples. The research sought to evaluate the usefulness of these techniques for evaluating TPO membranes.

This study demonstrated TG, DMA and FTIR can be valuable analysis tools for evaluating TPO films.

"Welding of Thermoplastic Roofing Membranes Subjected to Different Conditioning Procedures," features analysis of welded lap seams on two PVC, two TPO and one ketone ethylene ester single-ply membranes. Samples were heat-welded as received, after water immersion and after soiling (replicating dirt pickup) using varying defined cleaning procedures, welding temperatures and welding speeds. Lap-seam integrity was determined using T-peel testing.

The symposium featured research affecting the U.S. roofing industry

The study demonstrated welding properties of thermoplastic membranes vary—even between the same membrane types. The ideal conditions for achieving the strongest welds were different for each product. In some instances, small changes in weld temperature or weld speed dramatically affected seam strength.

This paper also introduces the concept of a minimum necessary tolerance for heat-welded seams to allow for varying field variables; however, additional research is recommended. The research concludes contractors can increase their chances of successful field seaming by working with as few products as possible to build experience and knowledge of products' welding behaviors.

"Evaluation of the Rheological Properties and Master Curve Development for Bituminous Binders Used in Roofing" and "Specification for Roofing and Industrial Asphalts Using Dynamic Shear Rheometry (DSR)" provide background data and proposed grade classifications, respectively, for using DSR testing as a basis for specifying roofing asphalts. DSR testing evaluates asphalts' fundamental engineering properties at application temperatures, as well as high-, intermediate- and low-service temperatures.

The research concludes the roofing industry would benefit by including DSR testing in ASTM D312, "Standard Specification for Asphalt Used in Roofing," which is largely limited to softening-point temperature-based classification.

Proceedings

ASTM International has published the proceedings of the symposium as Special Technical Publication 1504, "Roofing Research and Standards Development, 6th Volume."

Although all 11 papers included in the proceedings may not apply to all roofing industry sectors, individual papers will be of interest to designers, manufacturers, testing laboratories and contractors involved in the U.S. roofing industry.

To purchase the symposium proceedings, call ASTM International at (610) 832-9585 or access www.astm.org.

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For a complete list of the papers presented at ASTM International's symposium, log on to www.professionalroofing.net.