Symposium offers technical information

by **Mark S. Graham**

In December 1998, the American Society for Testing and Materials' (ASTM's) Committee D-8 on Roofing, Waterproofing and Bituminous Materials held its Fourth Symposium on Roofing Research and Standards Development. This technical symposium follows the committee's three previous technical symposia, which were held in 1986, 1990 and 1994. These symposia provide insight into current roofing industry technical research and standards development.



The following is a brief report on several papers presented during the symposium. They are published in the symposium's proceedings, titled *ASTM Special Technical Publication (STP) 1349.*

TPO membranes

"Evaluation of In-Service Thermoplastic Olefin (TPO) Roof Membranes" provides information about a five-year laboratory- and field-based investigation of TPO roof membrane performance.

The research reveals that the polyester-scrim reinforced membranes evaluated have higher tensile strength and elongation values than those with random mats of short glass fibers. Also, the research indicates the term "TPO" is somewhat vague because at least four TPO polymer types currently are in service.

The researchers recommend specific TPO types be differentiated as ASTM develops a material standard for TPO membrane sheets.

The researchers plan to provide an update and additional information about their ongoing investigation during the North American Conference on Roofing Technology, to be held Sept. 16-17 in Toronto, Ontario, Canada.

Fiber-cement shingles

"The Deteriorating Artificial Slate" provides field and laboratory information about the performances of nonasbestos fiber-cement shingles. The authors report rapid (within two to three years) deterioration in the form of extensive cracking of certain products. The researchers say this cracking is the result of layering mortar materials during a product's manufacturing, as well as petrification and ductility loss of organic fiber reinforcement.

The research suggests specific improvements to ASTM standards that may help ensure the products' long-term performances.

Asphalt shingles

"Comprehensive Research Program: Wind Resistance of Asphalt Shingles" addresses the results of the Asphalt Roofing Manufacturers Association's recently completed research program focusing on asphalt shingles' wind resistances.

The research indicates the term "TPO" is somewhat vague because at least four TPO polymer types currently are in service.

This research consists of extensive wind testing of small-scale structures and full-scale shingle test decks, as well as measurements and observations of a full-scale building. The work resulted in a scientific methodology that determines uplift pressures on shingles during various wind conditions. The researchers indicate additional research is under way to determine the pressure coefficients for various shingle types.

In addition, "Finite Element Analysis of Rack vs. Traditionally Applied Three Tab, Strip Shingles and Blister Tests of Asphalt-Glass Felt Shingles" uses finite element analysis and wind-tunnel testing to analyze asphalt shingles installed in a straight-up or "racked" application method. The authors indicate that forces on shingles installed in a racked method are up to 8 percent higher than on shingles installed traditionally.

The authors report rapid (within two to three years) deterioration in the form of extensive cracking of certain fiber-cement shingles.

The paper "On the Study of Crack-Initiation Fracture Toughness of Fiber Glass Asphalt Shingles" provides information about the use of a fracture toughness measurement to characterize fiberglass shingles' cracking resistances. The research also suggests failure in a shingle's asphalt by microcavitation may be a controlling event that leads to shingle cracking.

Proceedings

Additional papers presented at the symposium include: "Towards Standardization of Service Life Prediction of Roof Membranes," "Field Performance of Single-Ply Chlorinated Polyethylene (CPE) Roof Membranes," "Comparison of Standard and SEBS-Modified Asphalts in BUR Membranes" and "Standards for 'Oversized' and 'Severe' Hail Resistance of Elastomeric Coated Sprayed Polyurethane Foam (SPF) Roofing Systems."

For more information about the papers presented during the symposium, roofing professionals should contact ASTM's Customer Service Department at (610) 832-9585 or Web site at www.astm.org. PR

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