Analytical approach needed when comparing mod bit products

by **Mark S. Graham**

Q: *I am reviewing submittals for a project where the roofing contractor has proposed to substitute another manufacturer's modified bitumen membrane sheet for that specified. How can I compare the two products to determine the quality of the substitute material?*

A: Unfortunately, comparison of different modified bitumen membrane sheets is not as straightforward as it is with many other roofing products. This is because there is not an accepted industry standard specification for modified bitumen sheets in the United States, and most manufacturers publish little test data regarding their particular modified bitumen products. This difficulty is further complicated by the large number of modified bitumen membrane sheets available.



Currently, American Society for Testing and Materials (ASTM) D5147, "Standard Test Methods for Sampling and Testing Modified Bituminous Sheet Material," is the only recognized U.S. standard for modified bitumen sheet materials.

However, this standard is of little assistance when comparing modified bitumen membrane products. The standard is only a compilation of laboratory test methods for modified bitumen sheet materials, and does not establish minimum or maximum physical requirements, such as an ASTM material specification would do. Standard material specifications for modified bitumen membrane sheets are still under development at ASTM.

Without the existence of accepted industry standards, an analytical approach to comparing modified bitumen membrane products must be taken. While some considerations—such as sheet thickness, sheet surfacing, fire and wind-uplift ratings and guarantees—are relatively easy to determine and compare, other important considerations require more careful analysis.

Some of these considerations include:

- *Bitumen modifier.* The term "modified bitumen" is a broad, generic classification that includes several different types of sheet products that may not necessarily be comparable to each other. For example, the two most common types of asphalt modifiers, APP and SBS, provide the membrane sheet with distinctly different physical properties.

  Therefore, the comparison of membrane sheets made with different modifiers will not be any more accurate than a comparison of different types of single-ply sheets, say an EPDM sheet and a PVC sheet.
- *Reinforcement.* Most modified bitumen sheets contain reinforcement with some form of fiberglass or polyester fabric, or a combination thereof, being the most common. Because different types of reinforcement provide membrane sheets with different physical properties—fiberglass provides high tensile strength, while polyester generally provides for some elongation—only membrane sheets with similar reinforcement types should be considered for direct comparison.
- *Reinforcement placement.* While many manufacturers position their reinforcement in about the middle of the membrane sheet thickness, some manufacturers choose to place the reinforcement toward the top surface of the sheet. Reinforcement placement is known to impact the handling and installation of the sheet, and may affect the physical properties and performance of the material while in service.
- *Reinforcement weight.* Many manufacturers use similar reinforcements in their membrane sheets. However, some manufacturers choose to use lighter- or heavier-weight reinforcements—this is especially the case with polyester-reinforced membrane sheets. Because the reinforcement weight and its configuration play an important role in the physical properties of the membrane sheet, sheets with different weight reinforcements should not be considered similar.

In addition to the previously discussed considerations, a number of other important factors, including the quality of raw materials and bitumen/polymer blending, influence the performance of individual modified bitumen membrane sheets. Unfortunately, these considerations cannot be readily evaluated because of the absence of industry standards and limited technical and physical test data.

Decisions regarding the preferred modified bitumen membrane sheet type, reinforcement and physical properties need to be made on a project-by-project basis, considering the particular job conditions and the attributes of the membrane selected.

Manufacturers are encouraged to make more technical and physical test data available in their product literature and in their listing in NRCA's 1994 *Commercial Low-Slope Roofing Materials Guide* to allow specifiers, roofing contractors, building owners and other roofing professionals to make appropriate design and purchasing decisions for modified bitumen membrane products. PR

Each month in this column, Terrance R. Simmons, RRC, or Mark S. Graham, both NRCA deputy directors of technology and research, will answer readers' technical questions. If you have a specific question that you would like answered in this column, send it to Professional Roofing, *10255 W. Higgins Road, Suite 600, Rosemont, Ill. 60018-5607; or fax (708) 299-1183.*

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