Issues with TPO membranes

Some cite performance issues with TPO membranes

by Mark S. Graham

TPO MEMBRANES have experienced significant market growth since their introduction in 1993 and are widely accepted in the roofing industry. However, several organizations, including several TPO membrane manufacturers, have raised concerns regarding TPO membrane performance. If you are involved with specifying or installing TPO membranes, I encourage you to be aware of the issues raised.

Concerns

During the 2009 International Roofing Expo,® GAF Materials Corp., Wayne, N.J., conducted an educational session during which company representatives identified, based on their research, key performance indicators for TPO membranes. The research illustrated notable differences among manufacturers' product formulations and the effects these differences can have on field lap seaming and membrane weathering.

In August 2009, Carlisle SynTec Inc., Carlisle, Pa., announced it had made a formulation change to its TPO membranes several years before to provide enhanced ultraviolet and heat-aging stabilizers intended to improve long-term membrane performance.

At the December 2009 meeting of the ASTM International task group in charge of ASTM D6878, "Standard Specification for Thermoplastic Polyolefin Based Sheet Roofing," Carlisle SynTec recommended ASTM D6878 be revised to include an "extreme" heat-aging laboratory test of 275 F for 56 days. (The current heat-aging requirement in ASTM D6878 is 240 F for 670 hours, or 28 days). Carlisle SynTec contends extreme heat aging would better predict TPO membranes' abilities to withstand conditions in high-heat regions of the U.S.

In February, the Midwest Roofing Contractors Association's (MRCA's) Technical and Research Committee issued an advisory bulletin that raised a possible correlation between some reported problems with localized high-heat deterioration of TPO membranes and the information reported in GAF Materials' and Carlisle SynTec's research.

During the 2010 IRE, NRCA's Technical Operations Committee provided an overview of its laboratory testing and analysis of TPO membranes. NRCA's test results correlate with the manufacturers' and MRCA's findings, and NRCA has concluded ASTM D6878 does not adequately differentiate between TPO products currently available and is inadequate to ensure proper performance.

ASTM International

At the conclusion of Carlisle SynTec's presentation at the December 2009 ASTM International task group meeting, the task group agreed to hold a special meeting in spring 2010 to develop a revision to ASTM D6878 that would be balloted by ASTM's voting members. That meeting never took place.

At the task group's next regularly scheduled meeting in June, several task group members debated the issue raised by Carlisle SynTec at length. One membrane manufacturer provided some anecdotal information disputing an increase in the heat-aging test in ASTM D6878, and a raw material supplier indicated it had begun some comparative testing that should show the results of raising levels in the heat-aging test. This testing should be complete later this year at which time the task force indicated it would evaluate the data made available to it and develop a proposed revision to ASTM D6878 for balloting.

Closing thoughts

Although TPO roof membranes have experienced significant market growth, the concerns raised regarding TPO membrane performance need to be addressed.

These types of issues typically are best addressed within ASTM International by the process established for this purpose. However, given the delays experienced, I question whether ASTM D6878 will be properly revised anytime soon.

Until ASTM D6878 is properly revised, you should be aware of the issues raised and NRCA's concerns with the standard. I encourage you to contact TPO membrane suppliers for information specific to their products.

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