Reports of blistering are increasing

by **Mark S. Graham**

SBS-modified bitumen sheet products have been used successfully in the United States since 1975. However, during the past several years, there has been a noticeable increase in the number of reports of blistering associated with mop-applied SBS-modified bitumen roof systems.

In addition, an increase in the number of telephone calls to NRCA's Technical Services Department reporting blistering associated with mop-applied SBS-modified bitumen sheet products was noted as early as 1994. Callers typically characterized the problems as random blistering throughout large portions of roof systems (see Figure 1).

Data contained in NRCA's Project Pinpoint—a database of problem roofing jobs reported by NRCA members—reveal increases in the frequency of blistering reports for mop-applied SBS-modified bitumen sheet products from 1992 through 1998 (see Figure 2).

The ages of roof systems at the time blistering was reported range from one to 14 years old; six years old is the average age.

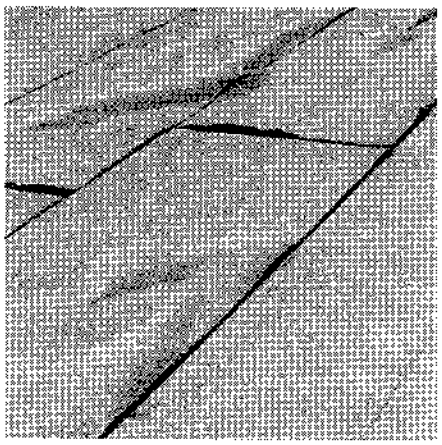


Figure 1: *Blistering of a mop-applied SBS-modified bitumen sheet.*

SBS blistering reports						
As a percent of ...	1992-1994	1995	1996	1997	1998	1999
all reports	2	3	6	7	10	7
all SBS-modified bitumen problems	31	38	40	47	76	53

Figure 2: *Data from NRCA's Project Pinpoint regarding reports of blistering in mop-applied SBS-modified bitumen sheets.*

Manufacturers typically claimed blistering probably resulted from phased application. Other possible causes of blisters, according to manufacturers, include the use of improper mopping asphalt, voids in mopping, moisture in substrates (e.g., insulation) and excessive internal building moisture.

Field investigation

An NRCA task force has evaluated a number of completed roofing projects where blistering has been reported. For each of the roof systems investigated, thorough visual inspections were conducted and numerous test cuts were taken.

From NRCA's field evaluations, it was determined that blistering typically occurred between base plies and SBS-modified bitumen cap sheets. For a majority of blisters, solid asphalt moppings were apparent and no visible foreign materials (e.g., debris) or moisture was observed. For most blisters, evidence of contact and some adhesion between the substrates and bottom sides of cap sheets at the time of installation were noted.

Manufacturers' instructions

To determine manufacturers' installation instructions, NRCA surveyed 25 manufacturers of SBS-modified bitumen cap-sheet products. It was discovered that manufacturers recommend specific asphalt mopping application temperatures that range from 390 F to 450 F (199 C to 232 C). Seventeen manufacturers recommend application at the equiviscous temperature (EVT) of the mopping asphalt; several manufacturers recommend EVT "at the point of contact." Five manufacturers provide specific recommendations for mop lead, ranging from 4 feet to 10 feet (1.2 m to 3 m).

Closing thoughts

From NRCA's field investigation and manufacturer survey, it is apparent the findings do not support manufacturers' claims that blistering typically is the result of phased application, mopping voids or substrate moisture. It also is clear there is little agreement among manufacturers regarding recommended asphalt mopping temperature, mop lead and the need to use mopping asphalt that is compatible with SBS-modified bitumen sheet products.

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