Concerns with cold-process adhesives

FM 1-29 cautions against using cold-process adhesives during summer months

by Mark S. Graham

FM GLOBAL'S Loss Prevention Data Sheet 1-29 (FM 1-29), "Roof Deck Securement and Above-Deck Roof Components," raises questions regarding the use of cold-process adhesives for roof system installations during summer. If you use cold-process adhesives, you should be aware of FM Global's concerns.

FM 1-29

In FM 1-29's Section 3.1.2.2, FM Global makes the following statement regarding the use of cold-process adhesives: "In no case should an assembly be used where it may be exposed by a tropical storm before reaching at least 50% of its ultimate strength."

FM 1-29 goes on to say roof system installations in regions prone to hurricanes, typhoons and tropical cyclones need to be completed in sufficient time to allow an adhesive to properly cure before exposure to such storms.

Although it sometimes is difficult to control installation schedules, every effort should be made to minimize the exposure. For North America, hurricane season is between June 1 and Nov. 30. The worst storms typically occur during the middle of the season.

Single-ply roof membranes adhered with contact adhesives may be near full strength within about seven days. For some adhesive types used with multilayer roof systems, a minimum of 28 days is required for curing. Depending on local conditions, material type and the number of layers, some cold-process, multiple-ply assemblies may continue to increase in strength for 60 days or more after installation.

When evaluating roofing products, FM Global's product testing and certification group, FM Approvals, allows test specimens to cure according to manufacturers' specified curing times or for a maximum of 28 days before wind-uplift testing.

FM Global recommends you consult manufacturers for information relating to the percentage of ultimate strength for specific assemblies versus cure time.

Vague information

To determine manufacturer recommendations regarding adhesive strength and curing, I reviewed product literature from a number of manufacturers who offer roof systems using cold-process adhesives. I found little guidance that would be useful to building owners, designers and roofing contractors who use cold-process adhesives in their roof system installations.

NRCA also surveyed eight roof system manufacturers who are recognized for their widespread implementation of cold-process adhesives. Six replied but provided little definitive information other than to indicate there are a number of variables—including adhesive type, quantity and number of layers, application technique, weather conditions and building conditions—that can affect adhesives' curing and bond strength development.

One guideline

Cold-process adhesives are a viable alternative for attaching roof system components. However, FM Global's valid concerns regarding adhesives' cure times and development of adequate bond strength to resist wind-uplift loads during summer storms should give you pause. Although FM Global has limited its concerns to hurricane-prone regions, the same concern also applies to much of the U.S., which routinely experiences quickly moving summer storms with high winds.

Clearly, manufacturers of cold-process adhesives and manufacturers that use cold-process adhesives as part of their roof systems need to provide building owners, designers and roofing contractors with better guidance regarding adhesives' curing and bond strength development. Perhaps FM Approvals, which most manufacturers rely on for wind-uplift testing and certification, can participate in the development of the necessary additional information.

Until manufacturers provide the necessary information, FM Approvals' guideline of allowing test specimens to cure for a maximum of 28 days before wind-uplift testing appears to offer some guidance. Although this 28-day cure time does not address all the factors encountered on rooftops, at this point, it is the only definitive guideline in the industry.

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