Hail-resistance guidelines

by **Mark S. Graham**

During the past several years, there has been considerable discussion and criticism in the roofing industry regarding the development of criteria and guidelines for roofing materials' impact resistances. In U.S. regions that are susceptible to hail, these criteria and guidelines should be of particular concern to roofing professionals—the test method used to determine roofing materials' hail resistance may not accurately reflect actual performance during hailstorms.

UL 2218

In 1996, Underwriters Laboratories (UL) Inc. published UL 2218, "Impact Resistance of Prepared Roof Covering Materials." UL 2218 is a test method intended to provide comparative data regarding the impact resistances of steep-slope, prepared roof coverings (e.g., asphalt shingles, tile).

For this test method, steel balls of varying sizes are dropped onto roof system specimens to simulate hailstones falling at peak velocity. The specimens then are visually inspected for evidence of cracking and are classified as "Class 1" through "Class 4," with "Class 4" representing the most impact-resistant materials.

Since this standard was developed, there has been considerable criticism of the test method within the roofing industry. For example, the test method evaluates new roofing materials at typical interior temperatures and does not assess weathered or aged products or the effect of quickly dropping temperatures that are characteristic of hailstorms. Also, because of the differences in composition and geometry of steel balls compared with hailstones, the test results may not be consistent with actual damage caused by hailstones.

In 1998 and 1999, UL attempted to attain recognition from the American National Standards Institute (ANSI) for UL 2218 as a recognized consensus standard. NRCA and a number of other organizations voted against UL 2218 on two ANSI ballots. In February, NRCA was notified that UL had determined it had reached a consensus on the standard despite not having adequately addressed negative ballots from six of the 40 voting participants. In March, NRCA, the Asphalt Roofing Manufacturers Association and National Association of Home Builders appealed ANSI's recognition of UL 2218. To date, UL has not yet resolved this appeal, and UL 2218 remains in effect.

TDI's implementation

The Texas Department of Insurance (TDI) has adopted a program where building owners and homeowners are eligible for reductions in residential insurance premiums for using roof systems that are classified by UL 2218. Insurance discounts of up to 35 percent of the premium amount are available under certain circumstances.

For building owners and homeowners to receive the discounts, roofing contractors must certify roof systems complying with UL 2218 have been installed. Also, the roofing products used must bear specific product labeling.

A concern with TDI's rebate program is TDI's reliance on UL 2218 to determine roof systems' impact resistances.

Residential code

In the reroofing provisions published in the *International Residential Code, 2000 Edition* (IRC), installing asphalt shingles over existing roof systems is not permitted for buildings located in areas subjected to severe hail damage. Portions of the central United States are defined by IRC as being subject to severe hail. Data derived from various sources, including UL 2218, were used in this provision.

When changes to IRC's 2003 edition were being considered, the provision limiting re-covering in regions susceptible to severe hail was removed on the basis of it not being technically justifiable. As a result, this provision will likely not appear in IRC's 2003 edition.

Closing thoughts

The need to develop credible criteria to assess roof systems' impact resistances is recognized particularly for use in regions where severe hailstorms are frequent. However, the criteria that currently exist for such assessments, including UL 2218, are not technically sound or recognized within the industry.

Until credible, technically sound criteria are developed and recognized in the United States, roofing material manufacturers, roof system designers and contractors should be careful not to misrepresent roof system performance during hailstorms. Although specific roofing materials and products may comply with existing test methods and guidelines intended to address severe hail, these may not be indicative of actual performances during hailstorms.

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