



Designing for hail resistance

Did you know FM Global has updated its hail design guidance?

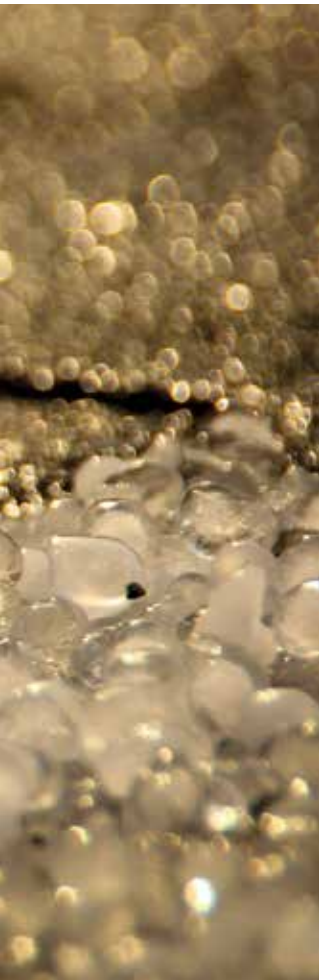
by Mark S. Graham

In March, property and building loss insurer FM Global updated its Property Loss Prevention Data Sheet 1-34, “Hail Damage” (FM 1-34). If you work on buildings insured by FM Global, you should be aware of its latest hail-resistance guidelines and the effects they may have on roof system selection and design.

FM 1-34

FM 1-34 provides loss-prevention guidelines to minimize the potential for hail damage to buildings, roof-mounted equipment and other outdoor equipment. FM Global intends FM 1-34 and its other Property Loss Prevention Data Sheets to apply to its insured buildings. However, some designers use the Property Loss Prevention Data Sheets as design guidelines for buildings (and roof systems) other than those insured by FM Global.

FM Global contends hailstorms are a widespread hazard affecting many areas of the world that can severely damage buildings’ roof systems, rooftop HVAC units and skylights. Cooling towers and exposed glass and plastic components of outdoor equipment also can be



damaged. Providing hail-resistant exterior building components and equipment can reduce this hazard's impact.

The previous edition of FM 1-34 was published in October 2014. Since then, FM Approvals developed and published a new hail-resistance test method, "Test Procedure, Test Method for Determining the Susceptibility to Hail Damage of Roof Coverings." This test method is incorporated into a December 2016 update to FM 4470, "Approval Standard for Single-Ply, Polymer-Modified Bitumen Sheet, Built-Up Roof (BUR) and Liquid Applied Roof Assemblies for use in Class 1 and Noncombustible

Roof Deck Construction." FM Approvals' new hail-resistance test method and FM 4470 include a new very severe hail (VSH) approval classification.

Changes

The most notable change in FM 1-34 is the implementation of the VSH approval classification into hail-resistance design guidelines.

FM 1-34 divides the continental U.S. into three hail zones: moderate hail (MH), severe hail (SH) and VSH hazard areas. A hailstorm hazard map for the contiguous U.S. is provided. The map's SH and VSH hazard areas

significantly are expanded from FM 1-34's previous edition. FM Global indicates the new map is based on relative hail sizes during a 15-year mean recurrence interval.

Based on the map, the VSH hazard area consists of Kansas, Nebraska, Oklahoma and South Dakota; a large portion of Texas; and portions of Arkansas, Colorado, Iowa, Minnesota, Missouri, Montana, New Mexico, North Dakota and Wyoming.

The SH hazard region extends from Colorado, Montana, New Mexico and Wyoming east to the Carolinas, Florida panhandle, Georgia, Indiana, Kentucky, Minnesota and Wisconsin.

The MH hazard area makes up the remaining areas of the contiguous U.S. not categorized as either SH or VSH hazard regions.

In the VSH hazard region, FM Global recommends single-ply and polymer-modified bitumen membrane roof systems have an FM Approvals' VSH approval classification. FM Global considers built-up membrane and metal panel roof systems having an SH approval classification and asphalt shingle

and clay tile roof systems complying with FM Approvals' Class 4 to be acceptable where VSH roof systems are unavailable.

In the SH hazard region, FM Global recommends using any roof system having an MH, SH or VSH approval classification or complying with FM Approvals' Class 2, 3 or 4.

Concrete paver and aggregate-ballasted roof systems are acceptable in all hail hazard regions.

FM 1-34 also includes hazard zone-specific

design recommendations for FM Approvals-approved impact-resistant skylights or use of hail guards or mesh covers. Hail guards or mesh covers also are recommended for rooftop HVAC units and other rooftop equipment vulnerable to hail damage.

Design

Complying with FM Global's latest hail-resistance guidelines can affect roof system selection and design, particularly in the VSH hazard region.

I recently performed a query using FM Approvals' RoofNav application (www.RoofNav.com) and found there are 948,121 FM Approvals-

approved roof assemblies having an MH or higher approval classification. Of these, 937,291 roof assemblies have an SH approval classification. Only 258 roof assemblies have a VSH approval classification.

Also, FM 1-34 indicates there are no skylights available with a VSH approval classification.

Roof system designers should be aware whether FM Global's hail-resistance guidelines apply to their specific projects, and, if so, they should clearly specify hail-resistant roof systems and rooftop components.

FM 1-34 and FM Global's other Property Loss Prevention Data Sheets are accessible at www.FMGlobalDataSheets.com. 🌐📄🔍

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For an article related to this topic, see "Understanding FM VSH," December 2017 issue.

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