



## Global Risk Solutions

# Preventing Hail Damage to Roofs and Roof Mounted Equipment

Hail is a form of precipitation that occurs when updrafts in thunderstorms carry raindrops upward into extremely cold areas of the atmosphere where they freeze into ice. Hail can cause billions of dollars of damage to structures, equipment, crops and livestock. Preparation is the key to protecting your business from the damages of hail and the high winds that often accompany these storms.

### Risk and loss potential

In the referenced IBHS disaster safety document they report that Verisk (a data analytics company) reported 9 million hail claims for \$54 billion in 2000-2013.

Hail damage to roofs can occur when hail stones are larger than 1". Roof damage falls under two categories:

- **Functional damage** affects roof performance and should be repaired promptly, since diminished performance can lead over time to water damage, mold, or rot.
- **Cosmetic damage** affects the appearance but not the function of the roof.

### Hail Activity in the United States

Average number of hail reports per 100 square miles  
2003-2012 reports of hail 1" or larger

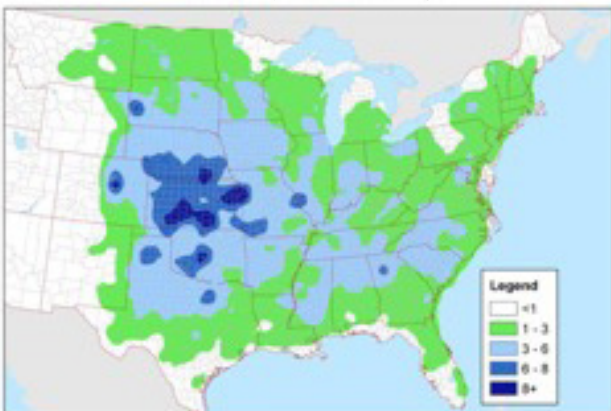


Photo provided by Insurance Institute for Business and Home Safety.

Roof mounted equipment is also subject to hail damage:

- Roof-mounted units—condenser coils and fan blades
- Air-cooled chiller—condenser coils and fan blades
- Cooling towers—fan blades and fill media
- Upright/vertical heat exchangers—coils
- Make-up air unit/air handler—exhaust vents
- Rooftop—exhaust fans
- Ductwork - denting or collapse

### Risk solutions

#### Protecting the roof

To protect your roof, the design should meet Underwriter's Laboratories, Inc. UL Standard 2218, "Impact Standard for Impact Resistance of Prepared Roof Covering Materials" for the expected hail exposure for the region. UL standard 2218 has four classifications for hail protection with class 4, the highest for regions with severe hail exposures. Regular roof inspections should be done to assure that the roof's integrity is maintained. Plastic skylights are subject to becoming brittle from UV exposure and may need replacement or guarding. Skylight guards should be designed for the application and securely attached.



## Protecting roof mounted equipment

New equipment should be designed for the expected hail exposure in a region. Hail guards should be purchased and installed with all new equipment if available. Existing equipment should have guards retrofitted to the manufacturer's specifications. In general:

- Guards should be installed and serviced only by qualified personnel, whether for new installation or retrofitting.
- Guards should not be placed directly against fins.
- Guards should be fastened securely to prevent movement during high-wind events.
- Guards should be monitored for any reduction in airflow to minimize compressor failure.
- Guards should be kept clean and free of debris.
- Hail guard netting/filter screens are engineered for proper air movement and should not be substituted with window screens or mesh not specifically designed for this use.

## Protecting other building features

Lightweight siding such as plastic or aluminum that is easily dented or penetrated by hail should be avoided. Consideration should be given to replacing lightweight siding with hail resistant construction.

Signs, awnings, canopies, and ground mounted equipment are also subject to hail damage and should be designed and installed to meet the expected hail exposure of the region.

## Personal protection

The IBHS has these reminders to reduce the chance of injury to people:

### In an automobile

- Stop driving. If you see a safe place close-by (like inside a garage, under a highway overpass or under a service station awning), drive to it as soon as you can. Make sure you pull completely off the highway.
- Do NOT leave the vehicle until it stops hailing.
- Stay away from car windows. Cover your eyes with something, like a piece of clothing. If possible, get onto the floor facedown or lie down on the seat with your back to the windows.
- Put very small children under you and cover their eyes.

### In a building

- Stay inside until the hail stops.
- Stay away from windows.
- Account for all family members, building occupants, pets, etc.
- Do not go outside for any reason.
- To avoid the danger of electrocution from lightning, avoid using phones and electrical appliances during a severe storm.

### Outside

- Seek shelter immediately. If you can't find something to protect your entire body, find something to protect your head.
- Stay out of culverts and lowland areas that may suddenly fill with water.
- Seeking shelter under trees should be a last resort. It is common during severe storms for trees to lose branches.

**If you have any questions please contact QBE risk solutions at [assistance@us.qbe.com](mailto:assistance@us.qbe.com) or 888.560.2635.**

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### References

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IBHS - Insurance Institute for Business and Home Safety - <https://disastersafety.org/hail/reduce-hail-damage-to-businesses/> and <https://disastersafety.org/>  
Factory Mutual - *FM Global Property Loss Prevention Data Sheet 1-34 - Hail Damage* at <https://www.fmglobal.com/search-results?query=hail%20damage>  
QBE North America Global Risk Solutions - <http://www.globalrisksolutions.com/>

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