Insurance Institute for Business & Home Safety®

Hail Guards: Protection for Roof-Mounted HVAC Equipment

Just like a roof itself, roof-mounted heating ventilation and air-conditioning (HVAC) equipment can be severely damaged by hail, leading to energy loss and potential business downtime. Sometimes, the damage associated with a single hailstorm can cost a business much more than protecting the equipment in the first place. And in some facilities, the cost of downtime and lost productivity can be more devastating than the repairs or replacement of the equipment. Equipment commonly impacted by hail includes:



- **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

EXAMPLES OF HAIL DAMAGE



HVAC Fin and Coil Damage

Photos courtesy of Air Solution Company.

HAIL GUARDS CAN PROTECT YOUR INVESTMENT

A cost-effective way to reduce damage is to add "hail guards" to roof-mounted HVAC equipment. Hail guards are specially designed protection systems that cover outdoor equipment components while allowing for adequate airflow. Although there are no standardized tests to compare the performance of specific hail guard systems, several common system designs seem to offer protection in many hailstorm scenarios.

Commonly, coil-based hail guard systems have an aluminum frame with a ½-in. by 1-in. woven mesh of galvanized wire or louvered panels. Guard brackets are held in place by screws that are mounted to an interior framing structure, allowing for easy removal for equipment servicing and maintenance. Semi-rigid composite material configured in either a "lattice" or "square" pattern is another cost-effective after-market solution for protecting the condenser coils.

Another effective method for protecting coils and cooling tower fill is using hail guard netting/ intake filter screens. This system consists of an integrated galvanized framing system and a heavy-duty fiber-reinforced filter screen. These screens are designed to be very strong and durable for high volume/velocity HVAC equipment. Filter screens are available with or without the galvanized hail guard feature and can be used separately on all air-cooled chillers, condenser units, air handling units, louvers and cooling towers for airborne debris management. These systems help keep coils free of debris and maintain the overall system performance.

Depending on the manufacturer, hail guards can be UV protected, rot resistant, weather resistant, and abrasion and corrosion resistant.







Rooftop Hail Guards

Photos above courtesy of Air Solution Company.



Hail Guard Netting

RETROFIT GUARDS

While some hail guards are installed as part of a new equipment system, sometimes the hail guard is an optional feature that may be purchased at a later date for easy installation. It is also possible to retrofit existing equipment units. When determining if a retrofit is feasible, contact the roof-mounted equipment manufacturer to see if the current unit can be retrofitted. Due to the complexity and age of each individual unit, a representative may have to visit your site to take measurements before pricing and productions, or they will provide an easy tool that can be used to take measurements to provide to the manufacturer.

INSTALLATION AND MAINTENANCE CONCERNS

- 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.

CONCLUSION

While there are no standardized tests to compare the performance of hail guard systems, for businesses located in regions where hail is common, they are a prudent investment to reduce damage to critical roof-mounted HVAC equipment. Proper installation and maintenance is critical to making this investment pay off for your business.

IBHS is a nonprofit applied research and communications organization dedicated to reducing property losses due to natural and man-made disasters by building stronger, more resilient communities.

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