



## **Jack Frost can build ice dams right over your head**

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"A man's home is his castle," goes the adage. In his attempt to protect this castle from threats from the outside world, modern man will do some bizarre and even crazy things.

One of the prime members of this bizarre and crazy category is the futile and sometimes dangerous attempt by homeowners to prevent or reduce water and structural damage to their homes. This event usually occurs after roofs become laden with heavy ice and snow during the winter. Experience shows that such last ditch efforts to protect property are often too little and too late. They can also be a threat to the homeowner's well-being.

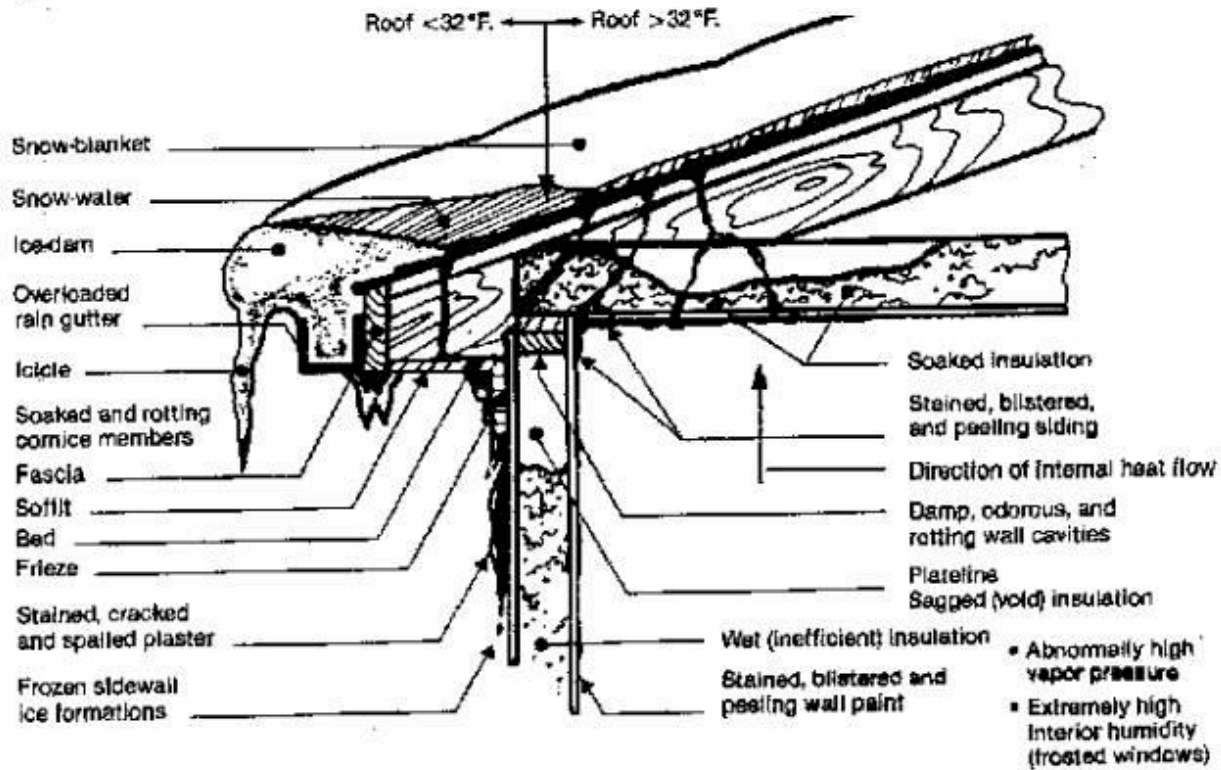
Despite this, over zealous homeowners blindly obsessed with defending their "castle" continue year after year to attack these rooftop glaciers with an arsenal of household weapons that would have left General George S. Patton's celebrated Third Army running for cover. These include, but are not limited to, ice picks, hammers, chisels, pickaxes, blow dryers, space heaters, shovels and brooms, garden hoses connected to household water heaters, and even panty hose stuffed with rock salt.

These household warriors, while brave and well intentioned, often don't do themselves or their homes any good. Ventures onto slippery roofs in cold weather can exact a heavy toll in the form of bruises, broken bones and other serious injuries. Moreover, a homeowner armed with an ice pick or pickaxe has been known to cause more damage than if the roof had been left alone in the first place.

That's not to say that homeowners who opt to stay off the roof and pray that it doesn't collapse or leak under the strain of heavy ice and snow will escape unscathed. Far from it. Although they may be spared the physical pain and suffering of their more adventuresome counterparts, they often are faced with cracking walls and ceilings and water gushers when the ice and snow on the roof begin to melt.

The only permanent solution to this dilemma, according to housing experts, is for homeowners to initiate improvements in the insulation and ventilation of the attic space below the roof before Old Man Winter is again upon them. This type of improvement, besides helping to keep the home dry and comfortable, has the added bonus of reducing home heating and cooling cost, a goal near and dear to the heart of most homeowners.

**Figure 1.** This sketch of the ice-dam problem identifies both the ice-dam and its damages. Of course, all the damages illustrated may or may not occur at any one instance.

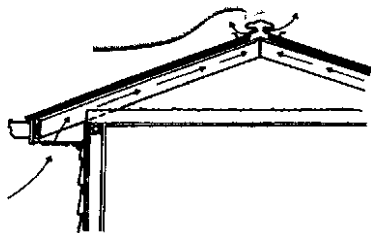


Source: Agricultural Extension Service, University of Minnesota

### What causes ice dams?

Ice dams are formed when attic heat moves upward to the roof and melts the bottom layer of snow and ice. The water runs downward under the snow until it reaches the cooler roof eaves or gutters, where it refreezes and forms an ice buildup or ice dam. As the roof surface, warmed by attic heat, continues to melt the snow on the shingles, a pool of water accumulates under the snow blanket behind the ice dam. This snow-water backs up under the shingles and causes subsequent damage to rafters, insulation, walls and ceilings (see Figure 1).

**Figure 2.** Movement of air when there is adequate insulation and ventilation.



Source: Agricultural Extension Service, University of Minnesota

It's ironic that concern for energy conservation in the construction of new homes and the renovation of older homes has contributed in some cases to this problem by creating "hot attics" that produce ice dams and the potential of damage from snow-water.

This was not generally a problem with typical American homes built before the 1930s. The relatively steep-pitched roofs of these structures in combination with open or spaced wooden shingles provided a well-ventilated attic and little chance for ice or snow buildup. These older homes, however, usually had little or no insulation in ceilings or walls, since they were built in the days of cheap energy.

Efforts in the last two decades to save energy have resulted in the development of various codes and standards for insulation and ventilation in new and renovated homes. Because these standards often represent minimum requirements, warm or even hot attics are an undesirable characteristic of many American homes. This makes homes in the snow belt extremely vulnerable to damage from rooftop glaciers.

### How to avoid rooftop woes

To prevent ice dams and subsequent roof damage, housing authorities recommend keeping the roof cool. The most efficient way to accomplish this is to install adequate insulation in the attic floor and provide for continuous ventilation of the attic air. Ideally, the attic air should be only five to ten degrees warmer than the outside air, although up to 15 degrees warmer is acceptable.

According to Dr. Lewis T. Hendricks, a university of Minnesota professor and extension specialist in the Department of Forest Products, homeowners need to insulate room ceilings far more than customary to minimize heat loss and attic temperatures, and ventilate profusely at all eaves and ridges to produce a natural flow of air to sweep out the warmed attic air. The overall goal of proper ventilation is to have a sweep of cooler outside air enter through the soffit and move along the ridge rafters to exit through a ridge vent near the peak of the house (see Figure 2). The combination of adequate insulation and ventilation is the key to keeping the attic cool, Dr. Hendricks says, and one without the other will not get the job done.

How much insulation is needed? The University of Minnesota recommends that homes in areas prone to ice damage have about 10 to 12 inches of insulation, or an "R-value" of 38. R-value is a number that tells how much resistance the insulation presents to heat flowing through it. The higher the R-value, the better the insulation.

Just as important as the R-value is how and where the insulation is installed. Particular attention should be given to ceiling insulation, which often is interrupted by recessed ceiling fixtures, uninsulated chimneys, vents from the bathroom, kitchen or clothes dryer; and other warm exhaust equipment. All of these ceiling interruptions should be wrapped with insulation, except for chimney and furnace flues, which should not be insulated before consulting with local building authorities.

Homeowners installing insulation or ventilation equipment themselves should take great care to make sure it is done correctly. They need to make sure that insulation material does not block any ventilation path. To aid them in their efforts, many insulation companies and other businesses selling insulation materials offer a variety of devices to ventilate attic air in the home.

Those opting to hire someone to do this type of home improvement need to find a reputable contractor to perform the work. The U.S. Department of Housing and Urban Development (HUD) suggests the homeowner consult several organizations before making a choice. Among these are the local chapter of the National Association of Home Builders of the U.S., a local banker if money is being borrowed to make the home improvement, and local government agencies. HUD also suggests checking with the local Better Business Bureau for information about contractors under consideration. Another good way to find a reputable contractor or find out about one's work is to ask friends, neighbors and relatives that have had dealings with the firm.

### **What if the unthinkable happens?**

What can the homeowner do if the unthinkable happens, and the ceiling or walls begin to leak or bulge from the water buildup before the necessary work is done to prevent such a crisis? Firstly the homeowner should stay off the roof. The chances are the damage already has been done, and going on the roof exposes the homeowner to the possibility of serious injury. Besides, many attempts to clear ice and snow from the roof have resulted in further damage to the roof. One step the homeowner can take without having to go outside is to puncture small holes in the plaster or drywall to relieve the pressure caused by the water before the entire area collapses. After placing buckets to catch the water that will most likely flow from these punctures, the homeowner should notify his or her insurance agent of the damage and determine how the policy applies to the situation.

### **What will insurance pay for?**

Whether homeowner's insurance pays to repair damage caused by the buildup of ice and snow on the roof depends on the type of coverage purchased by the homeowner. The standard homeowner's insurance policies, H.O. 1, H.O. 2, H.O. 3, H.O. 4, and H.O. 6 vary widely. For example, H.O. 3, which many homeowners have, would cover the roof damage from snow and ice buildup and any damage to

ceilings, walls, paint, wallpaper, wall-to-wall carpeting or any other structure being insured. However; most insurers will not pay H.O. 3 policyholders for damage to furniture or personal property resulting from these conditions. To obtain this coverage, the homeowner should purchase an H.O. 15 endorsement to the policy.

An H.O. 2 policy, one of the less expensive policies, would cover winter damage if the roof actually collapses under the weight of heavy snow and ice. But most insurers will not pay structural damage and damage to personal property caused by snow-water backing up under the shingles and leaking through the ceiling and walls, although they will cover structural damage caused by plumbing, heating or air conditioning systems.

The H.O. 4 and H.O. 6 policies, designed for renters and condominium owners respectively, provide the same coverage as the H.O. 2, but only on the contents of the insured dwelling. Like the H.O. 2, these policies usually do not pay for damage to personal property caused by ice and snow. The H.O. 1, the least expensive homeowner's policy, does not cover structural or water damage caused by ice and snow.

### **How much insurance is enough?**

Under a standard policy, experts recommend the homeowner obtain coverage equal to at least 80 percent of the full replacement cost of the building. This will assure sufficient compensation to pay for damage to any part of the home caused by the perils named in the policy. The home-owner, however, should understand that if the home is totally destroyed, any coverage less than 100 percent of the full replacement cost of the structure would pay only for that percentage of rebuilding costs. For example, 80 percent coverage on a house with a replacement cost of \$120,000 would pay only \$96,000 toward its rebuilding. Although it is highly unlikely that damage caused by severe winter weather would ever result in a total loss, this is not the case with some other perils, such as fire.