

# Icicles & Ice Damming

## The Problem

The root cause of big icicles and ice dams is typically heat being lost into your attic—and generally by poor or missing insulation and air leakage from your house into your attic. In the winter, this warms the roof and causes the snow to melt faster than it normally would. The melting snow then moves down the roof slope until it reaches the cold overhang, where it refreezes. The process forms icicles and can actually create a dam that eventually forces the water to back up under the shingles and sometimes into the ceiling or wall inside the home. In addition to roof and water damage, ice dams can cause structural decay and rot or cause mold and mildew to form in attics and on wall surfaces. The icicles themselves can do damage to your home—or seriously injure people—



Heat escaping through air leaks and poor insulation can warm your roof, melt snow, and lead to ice on your roof.

when they fall.

Roof ice, icicles, and ice dams can result in:

- Structural or property damage—and serious injury—from falling ice.
- A leaking roof (height of leak depends on extent of ice dam).
- Wet, ineffective insulation.
- Stained or cracked plaster or drywall.
- Rotting wood and timber.



Big icicles themselves, like those shown here, are obvious signs that you're at risk.



But snow melt patterns can also indicate a problem of too much

## The Solution

Fortunately, you can dramatically reduce damage from ice damming by sealing the holes connecting your heated living space and the attic, as well as properly insulating your attic. There are different techniques to stop air leaking through recessed lights, leaky heating ducts, attic access doors, and plumbing and electrical penetrations. Sealing these leaks keeps warm air in your house where it belongs. Together, with adequate levels of insulation, this greatly reduces the chance of ice damming and large icicles. You do NOT just want to add more insulation before sealing the air leaks—this can actually create additional problems that can also damage your roof.

You cannot eliminate icicles completely. Small icicles

are normal. And some roof architecture—especially big valleys draining to a small corner—are especially challenging. But if you have long icicles or thick heavy ice you should act quickly to prevent damage. (And this means preventing the ice from forming in the first place, not risk life, limb, and your roof trying to chip off ice that's there.)

Do it right. Find the important leakage points and seal them up. Then add a lot of insulation. And afterwards, as with any time you change the way your house works, have your combustion appliances tested to make sure they're operating safely and efficiently.

An added benefit to this, of course, is you'll save energy, save money, and be more comfortable in your home, too!



Small icicles are normal. And under some conditions even the best insulated homes can form ice. If large icicles are a recurrent problem, however, the underlying problem should be addressed.

*Icicles and roof ice can be created by a variety of weather and architectural conditions. Ice cannot be completely eliminated. However, proper air-sealing and insulation can greatly reduce the likelihood it will occur and minimize the chance of ice damage.*

## Note

**Some degree of roof ice is unavoidable. And in some cases even well-insulated homes can form ice.**

Roof ice is formed when melting snow on the roof—possible when the roof deck is warmer than 32 degrees—refreezes at the eaves. The roof deck temperature is determined not just by heat escaping from the house, but also by the outdoor temperature, the depth of snow on the roof (snow acts as an insulator), and by wind and sun exposure, among other factors. It can be impacted by chimneys, roof ventilation,

roof color, and kitchen and bath exhaust among other building related causes.

In short, icicles and roof ice can be created by a variety of weather and architectural conditions. Ice formation cannot be completely eliminated under all conditions.

However, proper-air-sealing and insulation, in conjunction with ventilation where appropriate, can greatly reduce the chance it can occur and minimize the chance of ice damage.

## Do's and Don'ts

Do not climb up on your roof and hack or chip away at ice. This is very dangerous. And there's substantial risk of roof damage.

Generally, you do not want to hack away at ice unless there is the risk of injury from falling ice. Trying to remove ice often damages your roof and other parts of your home.

While you can rake snow off the roof—it's generally a short-term fix and shouldn't replace addressing heat loss. You can do it yourself by buying a snow rake, or hire someone to do it for you after a particularly heavy snowfall. However, be careful—the weight of snow falling off the roof can be dangerous. And just shoveling the snow off the first two or three feet of the roof won't prevent the problem. Snow

further up the roof can melt down and create dams.

Heat tape can help. However it not only costs as much as \$600 to buy, it must then be installed and can be very expensive to run. You're essentially paying to heat your roof. This should not be considered as an alternative to reducing heat loss into the attic.

In the short-term, filling a nylon stocking with calcium chloride and running it up the roof right where ice is forming can create a channel allowing melt water to run off rather than back up into your house.

## For More Information

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