

# Ice Dams and Attic Condensation



While stopping a leak or repairing a washing machine hose down in the basement might be fairly straightforward, ice dams and attic condensation, two forms of water damage typical to cold climate homes, are a little more complicated and a little trickier to fix. And since many homeowners aren't frequent visitors to their own attics in the frigid winter months, water damage on the top floor might catch you off guard.

What are ice dams? What causes attic condensation? And if you've got either, what can you do?

## Ice dams

When the temperature in your attic is above freezing, snow on the roof will likely melt. When the snowmelt runs down the roof and hits the colder eaves, it refreezes.

If this cycle repeats over several days, the freezing snowmelt builds up and forms a dam of ice, behind which water pools up into large puddles, or 'ponds'. The ponding water can then back up under the roof covering and leak into the attic or along exterior walls.

The right weather conditions for ice dams are usually when outside air temperatures are in the low 20s (°F) for several days with several inches of snow on the roof.

## Attic condensation

Condensation of water vapor on cold surfaces in attics can cause wood to rot, which can lead to costly repairs.

Condensation typically occurs when warm, moist air migrates or is directed into the attic from living spaces below. Research indicates unusually high humidity in the home's living spaces is strongly associated with attic condensation problems.

## Prevention

Building codes have some requirements that attempt to prevent the problems of ice dams and attic condensation. But codes don't address all the issues, and many houses are built without following building codes. First and foremost, it's your builder or designer's job to understand the relationship of humidity and air movement when designing and constructing the house so these problems don't occur.

Nevertheless, there's more you can do. Here are a few simple steps that can help prevent ice dams and condensation in your attic:

- Bathroom and kitchen exhaust fans, as well as dryer vents, should never be discharged into the attic space, always discharge outside. You may have an adequately ventilated attic, but this won't matter if the bathroom exhaust fan dumps warm moist air directly into the attic space. This will result in condensed water vapor freezing onto cold attic

- materials, which will eventually thaw creating wet attic materials resulting in damage in the attic and inside the home.
- Minimize ceiling mounted fixtures below the attic that create the need for holes in the drywall or plaster ceiling. Properly seal ceiling penetrations to make them airtight, taking care to follow manufacturer clearance requirements for flues, chimneys, and recessed light fixtures.
  - Research shows keeping the attic air temperature below freezing when the outside air temperature is in the low 20s can reduce the occurrence of ice dams. Proper attic ventilation is key to keeping the attic cool, while adequate and properly installed insulation is key to keeping your house warm. It is critical to keep soffit vents free from obstructions to allow the natural flow of cool outside air into the attic space to replace the warmer attic air that rises and flows outside ridge and/or roof vents. This flow of air will keep the attic cool and free of moisture build-up.
  - Consult a professional for the best way to avoid ice dams and water damage in your home.

## What not to do

While it might be tempting to try a quick-fix to break up that ice dam, don't get too eager; not only is it dangerous on your roof, but you can also cause a lot of damage, especially in the colder months. Here are some things to keep in mind:

- Do not routinely remove snow from the roof or attempt to "chip away" the ice of an ice dam. It will likely lead to shingle damage.
- Do not install large mechanical equipment or water heaters in attics, especially in cold climates. Not only do they present an unwelcome fire hazard, but they'll also increase the temperature in your attic.
- Do not routinely use salt or calcium chloride to melt snow on a roof. These chemicals are very corrosive and can shorten the life of metal gutters, downspouts, and flashings. Runoff that contains high concentrations of these chemicals can damage nearby grass and plants.

## What to do

- Follow up with your new home or home-improvement contractor to be sure that insulation in the attic space is adequate for your location.
- Verify soffit and roof or ridge venting exists for all roof planes and that soffit vents are neither blocked by attic insulation nor covered by newly installed maintenance free finishes outside the home.
- Verify all penetrations, access panels, and electrical fixtures are properly sealed and insulated to prevent heat and moisture from entering the attic space, while maintaining manufacturer's required clearances.
- Verify all exhaust fans and dryer vents are discharged to the outside.
- Keep gutters clean of leaves and other debris. This will not necessarily prevent ice dams, but clean gutters can help drain ice melt away as it makes its way to the gutters during a thaw.
- Follow up a short-term ice dam remedy with determining and fixing the actual cause to your ice dam problem. Consult a trusted and competent professional.

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