

## Understanding Ice Dams: Causes and Prevention

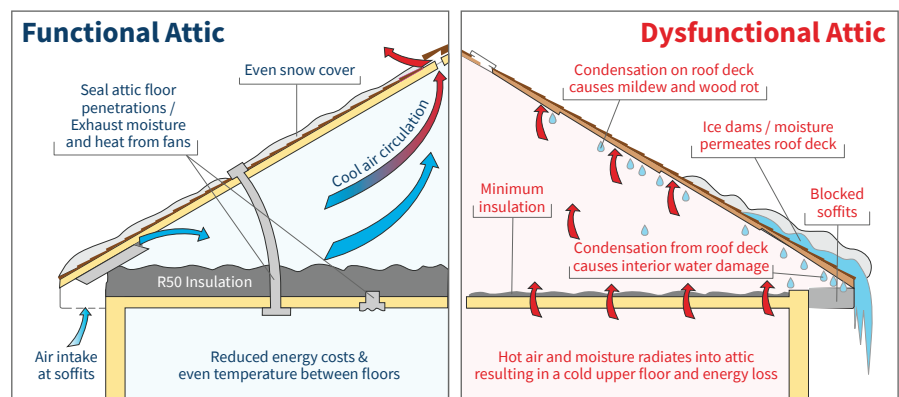
During winter, home and building owners in our northern climate zones are concerned about heavy snowfall on their roofs for two major reasons:

- Increased roof loading
- Ice dam formation

Ice dams not only concentrate snow and ice loads at the eave, but can also contribute to water leakage into buildings. Unaddressed water leakage can cause structural deterioration and may not stop until the snow and ice is removed from the roof.

### How Do Ice Dams Form?

Ice dams form when heat loss through the roof melts snow on the roof. The meltwater flows to the cold eave overhang where it refreezes. This ongoing process causes ice to build up and create a dam, eventually preventing upslope meltwater from draining off the roof. If proper ice dam protection is not provided, ponded water can back up under the roofing system and cause building leaks. Gutters also contribute to ice dams when meltwater freezes in a cold gutter and prevents additional meltwater from draining off the roof.



### Preventing Ice Dams

Stopping ice dams is simple, in principle: Just keep the entire roof the same temperature as the eaves. You do that by increasing attic ventilation, adding insulation, and sealing off every possible air leak that might warm the underside of the roof. By taking care of these trouble spots, you should get the upper-hand on preventing ice dam formation – and use less heat energy.

## Ventilate Roof Eaves and Ridge

A ridge vent paired with continuous soffit vents circulates cold air under the entire roof. Both ridge and soffit vents should have the same size openings and provide at least 1 square foot of opening for every 300 square feet of attic floor. Place air pathway baffles at the eaves to maintain a clear path for the airflow entering through the soffit vents. Ensure that ridge venting will not become blocked by snow accumulation.

## Insulate and Seal the Attic Hatch Access

An unsealed attic hatch, or a whole-house fan louver vent opening, are massive openings for heat to escape into the attic space. Cover them with weatherstripped caps made from foil-faced foam board held together with aluminum tape – the type used by HVAC contractors.

## Exhaust to the Outside

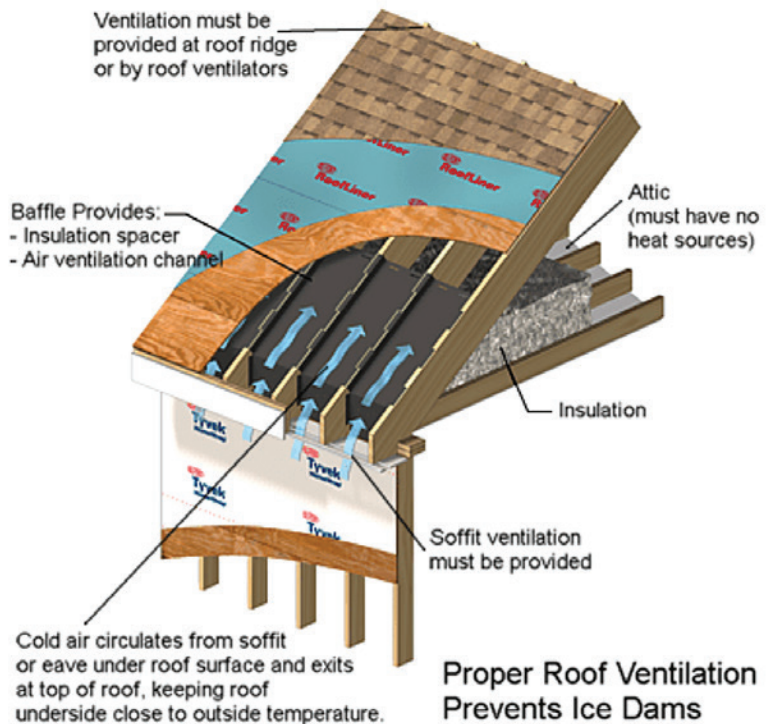
Make sure that the ducts connected to the kitchen, bathrooms, and dryer vents all lead outdoors through either the roof or walls, but never through the soffit. These exhaust systems may have to be moved or extended in areas of high snow fall.

## Add Additional Attic Insulation

More insulation on the attic floor keeps the heat where it belongs. To find out how much insulation your attic needs, check with your local building department. Hint: if your attic insulation is currently less than 12" thick, you most likely need to add additional insulation. Don't forget to check the insulation in and around knee wall spaces, if used in your attic structure.

## Install Sealed-Can Ceiling Lights

Old-style recessed lights give off great plumes of heat and cannot be insulated without creating a potential fire hazard. Replace them with sealed "IC" ceiling light fixtures, which can then be covered by the attic insulation.



## Flash Around Chimneys

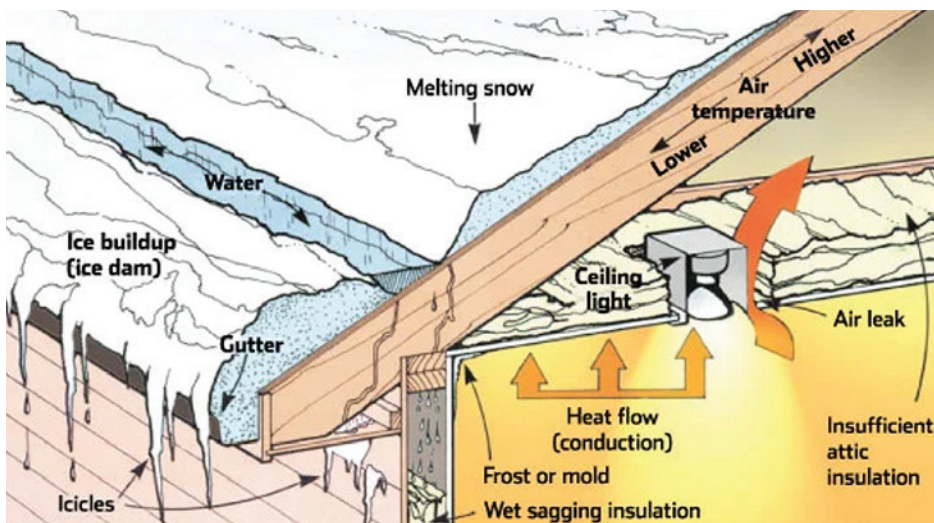
Bridge the gap between chimney and house framing with L-shaped steel flashing held in place with unbroken beads of a rated fire-stop sealant. Using a canned spray foam or insulation is not fire safe for this use, unless specifically noted for use as a fire-stop material.

## Seal and Insulate Ducts

Spread fiber-reinforced mastic on HVAC duct joints and exhaust ducts. Cover them entirely with foil-faced fiberglass used to wrap ducting – usually rated at R5 to R6 insulation value.

## Caulk All Ceiling Penetrations

Seal around electrical cables and vent pipes where they pass through framing with a fire-stop rated sealant. Also, search for any spots where light shines up from below – or where the insulation is stained by black streaks caused by dirt flowing from passing air leakage from the conditioned living space below.



Source: University of Minnesota Extension

## Immediate and Long-Term Ice Dam Control Plans

### First, take immediate action:

- Remove snow from the roof. This eliminates one of the ingredients necessary for ice dam formation.
- A “roof rake” and/or push broom can be used to remove snow, but take care not to damage the roof surface.

### Address Long-Term Actions:

- Number 1: make your ceiling air tight so no warm, moist air can flow from the house into the attic space.
- After sealing air leakage paths between the house and attic space, take action to increase the insulation thickness in the attic rafter space.
- Reference the **DECRA Product Knowledge** topic on **Attic Ventilation** – as it provides additional informative tips to prevent ice dams via adequate attic ventilation flow. Access via the DECRA website: [www.DECRA.com](http://www.DECRA.com).

## Can Your Roof Carry Additional Snow Load?

Immediate and long-term actions will increase the snow load that your roof has to carry because the snow will no longer melt due to a warm roof sheathing underside.

If your house is built to current building codes, there should not be a structural problem. Roofs, like the rest of the home, should be designed to withstand expected snow loads for your region.

If you are not sure about your structural snow load capability, contact an architectural engineering firm in your area. A professional structural engineer can evaluate your home's structure and address your questions regarding roof load capacity.

## When Installing a New Roof

Use a self-adhering membrane specific for ice and water protection. When installed correctly, ice and water membrane protection applied to the roof sheathing prior to installing your roof system can control leakage, but does not prevent ice dams from forming. The membrane must be detailed properly at critical areas – e.g., eaves, valleys, and dormer rising walls, as well as extend far enough above the eave area, and extending up further by at least 24” beyond the interior wall position – by horizontal measure.

## Hire an Energy Professional

Weatherization contractors are professionals who can deal with the heat transfer problem that creates ice dams.

- The contractor you hire can conduct a blower door test to evaluate how airtight your ceiling is (as well as window and door weatherstrip performance and wall penetrations). They also may use an infrared camera to find places in the ceiling where there is excessive heat loss.
- Do not repair interior damage until ceilings and walls are dry.
- Interior repair should be done together with correcting the heat loss problem that created the ice dam, or the damage will occur again.

## Warning:

- Anyone on the roof during the winter or performing work on the roof from below risks injury and may cause damage to the roof and house.
- It is important to contact professionals to carry out this job.
- Whenever a house is tightened up, ventilation systems, exhausting devices, and combustion devices must have enough air to operate safely and effectively.

## Summary

Contact your DECRA representative to learn how DECRA metal roofs provide additional insulation properties to help prevent ice dam formation, reduce summer solar heat gain – amongst other benefits including Lifetime Limited Warranty coverage.