



## Addressing ice damming

Ice dams are the ridge of ice that builds up on roof eaves. They are a common wintertime problem for Wisconsin residents and they cause costly structural damage to houses every year. The shelf of ice and the icicles hanging from the gutters are obvious to the homeowner, but what isn't so apparent are the causes of the ice dam.

### WHAT CAUSES ICE DAMS?

Ice dams need three things to form:

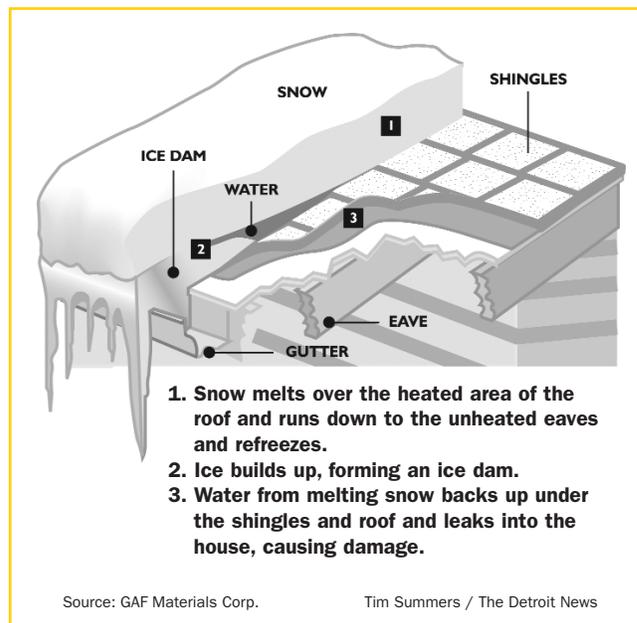
1. Snow.
2. Heat to melt the snow.
3. Cold to refreeze the melted snow into solid ice.

Wisconsin's winter weather generally supplies the snow and cold. As little as one or two inches of snow accumulation on a roof, followed by sub-freezing temperatures, are needed to allow ice dams to form.

The heat to melt the snow comes from warm air inside the house or apartment building leaking into the attic and warming the roof. The melting snow runs down the roof until it reaches the cold roof edge where it refreezes. Ice builds up along the eaves, forming a dam that can force water back up under the shingles and even into the ceiling or wall inside the house. The results of these ice dams include water-stained ceilings and walls, peeling paint and damaged plaster, damaged shingles, and sagging gutters.

### How does warm air get into the cold attic?

Inadequate or incomplete insulation is an obvious reason why an attic may not be cold. However, even if the attic is adequately insulated, warm air leaking through hidden pathways can cut the effectiveness of the insulation by 30 to 70 percent. Warm air finds many pathways leading from the heated space into the attic. These pathways are called *attic bypasses*. Fiberglass or cellulose insulation slows air movement, but they won't stop it.



Anything that penetrates the attic is a potential pathway. Some common attic bypasses include:

- Vent stack (the upper portion of the plumbing waste pipe through which gases and odors escape).
- Attic entry (hatch doors, pull-down stairs, or stairways).
- Chaseways (where chimneys, garbage chutes, etc. go between floors and attic).
- Heating ducts (where ducts go through the attic).
- Shared walls between apartments.

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Other common, but less obvious, bypasses include:

- Places where electrical wires, electrical boxes, and fan housings penetrate into the attic.
- Improperly vented bathroom fans and/or kitchen range hood fans (vented into the attic rather than outside).
- Ceiling light and/or ceiling fan fixtures.
- Dropped ceilings (above kitchen cabinets, bathtubs or closets, or the slanted ceiling above a stairwell).
- Gaps at the top of interior walls.
- Knee walls (short walls between the ceiling and floor, common in story-and-a-half houses).

### HOW TO PREVENT ICE DAMS

The first step in preventing ice dams is to ensure you have adequate attic insulation (at least R-38) and to find and seal the places where air leaks into the attic. It is more difficult to reach attic bypasses once construction is complete. Sealing these bypasses is essential to keeping the roof cold and preventing ice dams. Adequate roof ventilation is also important.

Remodeling or repair projects, such as replacing the roof or siding, offer opportunities for sealing air leaks and upgrading insulation. Because the repair or remodeling project provides access to enclosed spaces that would otherwise be hard to reach, sealing air leaks and upgrading insulation should be incorporated into the project.

The most effective way of preventing ice dams is to stop them from forming in the first place. Finding and sealing the air leaks that cause ice dams is a big task. For help, contact a consultant partnering with Home Performance with ENERGY STAR®. These consultants are experts in diagnosing and solving difficult problems like ice dams. To learn more about the Home Performance with ENERGY STAR Program, contact Focus on Energy.

Preventing ice dams will save you money in the long run because your roof will last longer. Addressing air leaks also ensures that your insulation can work effectively, thereby making your home more comfortable, safe, durable, and energy efficient.

### DEALING WITH ICE DAMS

Once a house or apartment building has ice dams, the short-term solutions have the potential to damage the roof and/or injure the homeowner. Working on or below a roof during winter is dangerous. Chopping the ice or using a roof rake to remove the snow can damage the roof. If you have ice buildup along the roof edge, call a roofing professional to take care of it.

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### The U.S. Environmental Protection Agency

Visit this page to view a variety of tips and analysis tools that will help you increase your home's energy efficiency. **energystar.gov/homeimprovement**

### Minnesota Department of Commerce

Learn from a series of Energy Guides on ice dams, attic bypasses, home moisture, indoor ventilation, and more. These guides are available on the internet from the Minnesota Department of Commerce, Energy Information Center. **state.mn.us**

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