

Ask Jon Eakes

WHAT CAN I DO ABOUT ICE FORMATION ON THE EDGE OF THE ROOF?

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Recent research from Canada Mortgage and Housing Corporation has pointed out new priorities for solving ice dam problems. Common practice for years has been to address ice dams with more ventilation. It was when this practice wasn't working very well that the researchers took a closer look at what is happening in attics with ice on the roof. First, if there is no snow pack, there will probably be no ice - except in the case of freezing rain, which sticks to just about everything. A heavy snow pack is a requirement for ice. This snow is the source of water to make the ice and the snow pack itself acts as insulation, allowing heat from the attic to melt the bottom of the snow pack on a day that is slightly below freezing outdoors. When it is really cold, nothing melts and there is no ice creation. When heat from the attic manages to melt the bottom of the snow pack, this melt water runs down the roof until it reaches the eaves, that part of the roof that sticks out beyond the walls. Since beneath this area of the roof there is no heat source, the outdoor temperature prevails and the water turns to ice, either dripping off the edge into icicles or building up on the edge of the roof as a pile of ice that we call an ice-dam. Why do we call it a dam? Because new water coming down the roof gets stuck behind it and creates a reservoir of water. This water can now rise high enough to flow back up behind the shingles and find its way into the house. So ventilation is supposed to keep the underside of the roof frozen by letting cold outdoor air flow under it from the soffits to the ridge vents. But the reality is that in complicated houses with dormers, skylights and several roof junctions, this ventilation air is not very efficient at keeping the entire roof cold. Many non-complicated houses simply have the soffit ventilation blocked, or have insulation touching the roof at several places, allowing these places to rise above freezing and melt the snow. But the recent research from CMHC has shown that there are sources of heat from the house that are commonly so great, that even good ventilation often cannot keep the snow from thawing, especially on a mild winter day where it is just barely below freezing outdoors. The primary offender is not a lack of insulation, but air leakage from the house below. Cracks and openings from the warm house below are usually the primary cause of ice dams on the roof. Pinpointing this problem has even created a whole new trade of people who seal the roofs below attics with spray-on polyurethane foam - the new Air Sealing industry. Once you have done your best to air seal the electrical ceiling fixtures, the plumbing stack, the chimneys, the electrical wires, the plumbing pipes and the attic hatch to name a few, then you should take a look at the insulation. The objective here is to have as much as possible, but none that touches the underside of the roof deck. It is especially important that it is evenly placed all over the attic so that there are not hidden gaping holes where heat can rise right up from the ceiling drywall below. Last, but still critically important is to have continuous ventilation that flows under every square inch of the roof deck. You don't need power fans or turbines, in fact in our climate they can cause more problems than they purport to solve. Well distributed passive ventilation will remove the small amount of heat that you have not stopped with air sealing and insulation. That stops ice dams. Unfortunately not all roofs were designed to allow all of this, especially in the small space just above the outer walls. But air sealing the top of the outer walls, and perhaps adding some insulation in the room below, like a decorative foam insulation strip or molding can reduce the heat loss enough to stop the ice formation. Check other entries in this database for "Ice Dams" for more insights to solving, or avoiding this problem.Â

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