

Sealing the Attic to Combat Condensation, Mould and Mildew, Rotten Wood and Ice-Damming

Moisture-related problems in your attic can lead to premature roof failure as well as health and comfort problems. In today's column we'll explain why sealing the attic – not just adding more insulation and ventilation – can improve the durability, energy efficiency and comfort of your house.

Body copy:

As we all know, warm air rises. In your house, this means that warm air, as it travels, picks up moisture from humidifiers, people, bathrooms, laundries and cooking in the living space of the house. In most homes, it is far too easy for this warm moist air to get into the attic, where it can condense on cold surfaces and cause a host of moisture-related problems.

Many people think this can be prevented by adding more ventilation in the attic. This is not necessarily so. In its publication “Attic Ventilation, Moisture and Ice Dams”, the Canada Mortgage and Housing Corporation states:

“The usual response to a wet attic is to increase attic ventilation. This is the wrong approach. In some cases, adding ventilation will actually pull more moist house air up into the attic and make the problem worse. The best way to fix a wet attic is to stop air movement from the house.”

Haphazard renovations often make the problems worse. Examples include insulating the attic without sealing the attic floor, locating ducts in the attic, not venting exhaust fans to the outside, installing recessed light fixtures and other ‘improvements’ that increase relative humidity in the living space.

The problems

Attic condensation, buckled shingles, mould and mildew occur when attics get wet in the winter from warm air rising through the ceiling and condensing on cold surfaces, especially wood. As the wood gets wet, it expands. In the spring, the attic gets warm and the wood dries and contracts. This constant process loosens nails and causes shingles to buckle.

Ice damming may also happen when warm air rises into the attic, or if ducts in the attic are poorly insulated and/or not sealed. Heat from these sources causes snow on the roof to thaw. As the melted snow reaches the colder soffit area, it may refreeze, creating a dam which causes the water underneath to back up under the shingles.

Mould and mildew can cause serious health problems, particularly affecting pregnant women, infants, the elderly and those with allergies or respiratory diseases such as asthma or weakened immune systems. Mould also leads to rotten wood and premature roof failure.

The solution

The goal is to stop warm moist air getting into the attic. This will provide the added benefit of keeping the air you pay to heat where you want it – in the living space of the house. It's a big project, and you might want to hire a reliable contractor with experience in air sealing. For the serious do-it-yourselfer, here's a list of areas in your attic that will require insulation and/or sealing:

- Attic hatch
- Ventilation – passive roof vents, gable vents, ridge venting, power vents, whirlybirds, soffit and styro vents
- Heating and air conditioning ducts – connections and insulation – boot penetrations
- Chimneys
- Plumbing stacks
- Wire penetrations
- Top plates
- Dropped ceilings (over showers) and bulkheads

- Exhaust fans – ducted to exterior, insulated and sealed
- Light fixtures and potlights
- Knee walls and access hatches
- Pipe penetrations
- Shafts (behind showers)
- Party walls
- Skylights

In the living space, you'll need to seal the vertical air paths leading to the attic, including:

- Ceiling and wall fixtures
- Electrical receptacles
- Plumbing penetrations and access hatches
- Cold air return
- Bulkheads
- Exhaust fan perimeters
- Common walls
- Range hoods
- Plumbing stacks (in basement)
- Baseboards

Sealing the attic is a big project, but when you look at the benefits - extended roof life, prevention of mould growth, improved comfort and lower energy bills - it's a project well worth doing. In our upcoming columns, we'll cover the how-to details of some of the elements.

