Condensation a common problem

Condensation on windows is a common occurrence in many Canadian homes. But if the condensation is persistent and long-lasting, it may be a sign of too much moisture in your home.

The source of this moisture should be determined. It may be generated by activities inside the home, or it may be entering the home from the exterior. Whatever the source, this condition can contribute to serious problems in your home.

If you typically have a heavy layer of moisture on the inside surface of double-glazed windows, do a quick survey of the outside structure of your home to ensure that water is not entering the home through cracks or open joints. You should also check the basement foundation for signs of dampness, and the attic area for leaks in the roof.

While condensation may be caused by any of the above situations, in modern homes it is more likely a sign of high levels of humidity generated indoors. Mould or mildew in areas where temperatures are low and air circulation is poor (such as closets and corners) is another indicator.

Regardless of whether condensation is a result of moisture being generated from inside or outside the home, excessive amounts can cause rotting of wood window frames, sills and trim. In extreme cases, the building's structural materials and insulation can be damaged.

Interior-generated moisture

Condensation occurs naturally when warm, moist air meets a cold surface. During winter, the warm air of a heated home holds moisture in the form of water vapour. When the air comes into contact with a cooler surface, like a window or uninsulated wall, it is chilled. As the air cools, the excess moisture condenses out as a liquid or frost, depending on the temperature of the cool surface.

The amount of moisture in your home's air (its humidity level) is therefore crucial. Maintaining an appropriate humidity level can often seem like a balancing act: too little moisture can result in dry, scratchy throats and static electricity, while too much moisture can lead to condensation problems.

Logically, the first step in remedying interior-generated condensation problems is to reduce the amount of moisture produced in your home. Normal activities such as bathing, cooking, doing laundry, watering plants and breathing can contribute up to 20 L of water a day to the air in a home. Fortunately, a number of simple measures can be taken to reduce this moisture production:

- Lower the humidifier setting on your furnace (if comfort will allow, turn it off completely) and limit the use of portable humidifiers and vaporizers.
- Ensure your clothes dryer is vented to the outside (never to the attic) and avoid hanging clothes to dry inside during the winter.
- Use the vents in your kitchen and bathrooms and make sure they are vented to the outside. Keep your pots and pans tightly lidded when cooking.
- Avoid storing or drying large quantities of firewood inside your house.
- Ensure that your basement is well drained and damp-proofed. If your home has a crawl space or cellar with an earth floor, cover it with a 0.15 mm sheet of polyethylene to prevent the earth's moisture from entering the air. Open your crawl space vents each spring and close them in the fall.

If condensation problems persist after you have reduced moisture production, you may want to consider increasing your home's ventilation. Measures can be as simple as opening a few select windows a crack and using bathroom and kitchen exhaust fans when bathing or cooking. At the more costly end of the scale, you can install a complete mechanical ventilation system, including a heat recovery ventilator that warms incoming fresh air by extracting heat from outgoing stale air.

Windows are the most obvious indicator of condensation problems but they are not necessarily the most serious. Moisture build-up in wall spaces and attics can compromise the effectiveness of insulation and may cause rotting of the building structure.

To ensure that warm, moist air is not escaping into wall spaces or the attic, seal all areas where air leakage is possible. Ideally, a continuous air-vapour barrier should also be installed and sealed at all edges.

Special care should be given to sealing areas where moisture is routinely produced, such as the kitchen and bathrooms. Upper-storey ceilings should also receive close attention. In addition to sealing the air leaks, cover these ceilings with a few coats of oil-based paint, spar varnish or a latex vapour barrier paint to help impede the passage of moisture from the living space into the attic.

All air sealing should take place from *inside* the house and air-vapour barriers should be installed on the *warm* side of the insulation. This will allow moist interior air that does make its way into the wall spaces or attic to pass through to the outside.

Exterior-generated moisture

If you have determined that condensation problems in your home are caused by moisture entering from the outside, you should take steps to remedy the situation to prevent structural damage.

For example, a leaky roof can contribute significantly to moisture buildup in your attic. To combat the problem, seal the leaks and make sure your attic vents are in working order. Install baffles if insulation is blocking soffit vents.

The basement can also be a problem area for moisture production, especially if the foundation walls are prone to dampness. You can direct water away from the house by installing eavestroughs and sloping the ground appropriately. If the dampness persists, it may be necessary to excavate around the exterior of the foundation walls in order to repair any cracks, and treat the portion of the walls below ground with a waterproofing chemical or asphalt emulsion. Before backfilling, the drainage tiles should be checked to ensure that they are in good condition.

Structural deficiencies may also allow water or moist air to enter your home from the outside. In addition to looking for cracks and open joints in exterior walls and the roof, make sure the flashing is doing its job effectively.