Condensation & Humidity

Following the replacement of doors or windows, you will sometimes notice an increase in the condensation on the glass of these new doors and windows. The fact that this condensation did not appear before the replacement leads you to believe that the product or the installation may be the cause.

In fact, the increased air tightness of your new doors or windows is partly to explain for this change. The humidity present in the ambient air, which in the past had been able to escape, is now kept inside. Therefore, we must understand the exact cause of this condensation in order to take appropriate action to reduce or even eliminate it. It is for this reason that we have prepared this informative document, putting together all the pertinent information and objectives on the subject. We hope that you will find this document useful.

What is condensation?

Condensation will form on windows when the temperature of the surface of the glass (glazing), sash or frame is lower than that of the humid air surrounding it. The water vapour in the air changes to liquid when it comes into contact with these cold surfaces. Condensation appears most often around the edges of the glass since this is where cold air is most likely to infiltrate.
If your windows are subject to condensation, you should know that your windows and their installation are probably not at fault.

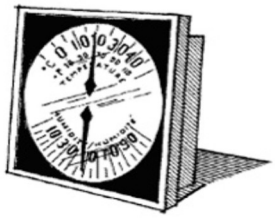
Rather, it is the level of humidity in the house that is the cause, and it is important that you learn how to control it. Even if you buy the best windows and they are correctly installed, they will end up showing condensation if the level of humidity is too high.
By humidity, we mean the quantity of water vapour present in the air. You and the members of your family, and even your pets, produce water vapour by breathing in and out. Even your indoor plants produce water vapour. We add even more of it to the interior air through our daily activities, such as preparing meals, taking showers or baths, and washing clothes or dishes.

Furthermore, water vapour contained in the soil can infiltrate your home through the basement or crawl space.

Diagnosing a humidity problem

Does your home have a humidity problem? Don't worry. There is an easy, inexpensive way to measure the level of humidity in your home. What you need is an instrument called a **hygrometer**. This instrument will indicate whether the air in your home is too humid or not humid enough. This will allow you to determine if specific measures are necessary and, if so, what these measures should be.

HYGROMÈTRES MÉCANIQUES



HYGROMÈTRES ÉLECTRONIQUES

Relative humidity

Humidity is usually measured in terms of relative humidity (RH). RH is a percentage that indicates the quantity of water vapour in the air relative to the maximum quantity of water that ambient air could contain at that temperature. When air, at a given temperature, holds all the water vapour that it can possibly hold, it has a RH of 100%. If the level of humidity exceeds 100%, water vapour begins to condense. If the air only contains half the humidity that it could contain, then the RH is 50%. Since warm air can contain more water vapour than cold air, the RH of a sample of air will vary with changes in temperature, even if the actual amount of water vapour in the ambient air remains constant. For example, if the ambient air gets colder, the RH will climb.

Buying a hygrometer

Two types of hygrometers are best suited to domestic requirements: mechanical hygrometers and electronic hygrometers. Either type will perform adequately in most homes provided they are calibrated and used correctly. Hardware stores, department stores, building material suppliers and electronics stores often sell hygrometers. In fact, you can usually find hygrometers wherever indoor thermometers are sold. Hygrometers and thermometers are often combined into a single piece of equipment.

Using your hygrometer

Your hygrometer will show the relative humidity (RH) in your house. Although the RH will not be exactly the same throughout your home, one hygrometer per house is usually sufficient. You should place it where the humidity symptoms are most obvious, in the room that you are most concerned about, or where your family spends the most time. Because hygrometers are small, they can be moved around in your house from time to time.

Don’t place your hygrometer near a radiator, a heat register or a chimney, or in any other location where it could be affected by direct heat. Remember that a hygrometer does not produce instant results. It may take up to two hours to provide a stable reading in a new location or to adjust to sudden changes in relative humidity.

Figure 2 Types of hygrometers

Controlling the relative humidity of indoor air

If there are signs of excess humidity in your home, increase the ventilation. If you only experience this problem once or twice a year, you can alleviate it or regulate it by avoiding the use of humidifiers in cold weather, by leaving the blinds open to favour air circulation, and by using the exhaust fan over the stove or in the bathroom.

When is humidity a problem?

We need humidity for our comfort and health. But too much or too little humidity can produce all sorts of difficulties for the occupants (see Table 1).

	Too much humidity	Too little humidity
Typical symptoms	• Condensation on windows • Wet stains on walls and ceilings • Mouldy bathroom • Musty smells • Allergic reactions	• Chapped skin and lips • Scratchy nose and throat • Breathing problems • Static and sparks • Problems with electronic equipment
Long-term effects	• Damage to the house and its contents • Ongoing allergies • Other health problems	• Continuing discomfort • Damage to furniture and other items

How do you know if you have too much or too little humidity?

Experts have developed rules of thumb to help homeowners make decisions regarding humidity levels in their homes. These limits should be used as guides only. Acceptable or comfortable humidity levels will actually vary from season to season, from house to house, and even between rooms in the same house. To prevent window condensation during the heating season, the recommended indoor RH is 20 to 40%, depending on the external temperature.

Exterior temperature	Recommended maximum interior relative humidity at an interior temperature of 21°C (70°F)
-29°C (-20°F)	20 %
-24°C (-10°F)	25 %
-18°C (0°F)	30 %
-12°C (10°F)	35 %
-7°C (20°F)	40 %

Source: Canadian Mortgage and Housing Corporation (CMHC)

Humidity reduction tips

Disconnect humidifiers that are either fixed to your heating system or are portable. Make sure that the clothes dryer is vented to the outside. Use bathroom and kitchen fans that vent to the outside when bathing or cooking. If you have a crawl space under your house, cover the beaten earth with 0.15 mm (6 mil) polyethylene.

The crawl space may have to be ventilated during the summer. Store your firewood outside. If you have a mechanical ventilation system, make sure that it is working properly and that it is turned on.

Taking action

Humidity can be controlled. If the relative humidity in your home is too high, you can reduce it; if it is too low, you can increase it. In summer, you can reduce house humidity levels by the use of a dehumidifier or by running an air conditioner.

In winter, a house that is too humid usually has some high moisture sources (for example, a damp basement, roof leaks, many plants). Deal with these problems first. If high humidity persists, you may need to make simple changes in your family's habits, such as remembering to open or close doors or windows. You can also run the exhaust fans in your kitchen or in your bathrooms to remove excess humidity.

If your humidity levels are low, consider the use of a humidifier. Humidifiers — both stand-alone humidifiers and humidifiers attached to your furnace — will increase indoor RH levels. However, you should be aware that humidifiers can be a source of excessive moisture and, consequently, condensation.

In summary

Humidity levels in your home can be too high or too low. In either case, problems can result. A hygrometer can provide the information you need to determine whether you have a humidity problem, but it must be accurate to be useful. If you have a humidity problem, it can usually be controlled.