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CONDENSATION INFORMATION PACKAGE

A GUIDE FOR UNDERSTANDING & FIXING INTERIOR MOISTURE PROBLEMS

WHAT IS CONDENSATION?

Condensation will often occur during colder weather when the moist air inside the home comes into contact with cooler surfaces. The moisture in the air can condense to form water droplets or even frost. The risk of condensation increases as the weather gets colder and/or the inside humidity rises.

For windows, doors and skylights, condensation can form:

- On the glass
- On the frames and sashes
- Near the weather seals
- On the walls around a skylight
- Between the glass panes if the seal is broken

WHAT CAUSES CONDENSATION?

Condensation occurs on cold surfaces when the following three conditions happen at the same time:

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Too much moisture in the air

Inadequate indoor-outdoor air exchange (known as "ventilation")
The availability of cold surfaces upon which moisture in the air can condense.

Moisture is continually being released inside every home: 10 to 50 litres (2 to 10 gallons) every day. In a heating season lasting 200 days, when windows and doors are typically closed up, 2,000 to 10,000 litres (400 to 2,000 gallons) of moisture can be trapped inside.

Too much moisture in the air may come from:

· Showers, washing dishes and clothes, cooking, aquariums, standing water, people, pets and plants

- Drying laundry indoors
- Improperly venting clothes dryers
- Damp basements
- Improperly set humidifiers
- Humid outdoor air

Inadequate ventilation may be caused by:

· No bathroom exhaust fans, outside-ducted kitchen range hoods, air exchanger or heat recovery ventilator to vent moist air from the home

- Broken or disconnected exhaust fans, ventilation system
- Exhaust fans not being operated because they are too noisy or ineffective

· Covering up heat sources (hot air registers, baseboard heaters) with furniture to obstruct air flow
· No circulation of air within the home and the rooms in the home
· Interior window accessories (curtains, blinds, valances) blocking off air from circulating around the window

Cold surfaces may be due to:

- Very cold weather outside
- Inadequate heat or insufficient heat provided to areas of the home (floor vents or baseboard heaters blocked by furniture, spare bedroom heat blocked off if the room is not used regularly, an unheated basement)

· **Wide swings in inside temperature (thermostat setbacks, uneven heat distribution from use of wood stoves, unheated or poorly heated rooms)**
· Poor local air circulation within a room due to furnishings such as beds against exterior walls
· Older, leaky windows

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CONTROLLING MOISTURE AROUND THE HOME

Here are some tips you can follow to help prevent moisture damage to your home:

Outside the Home

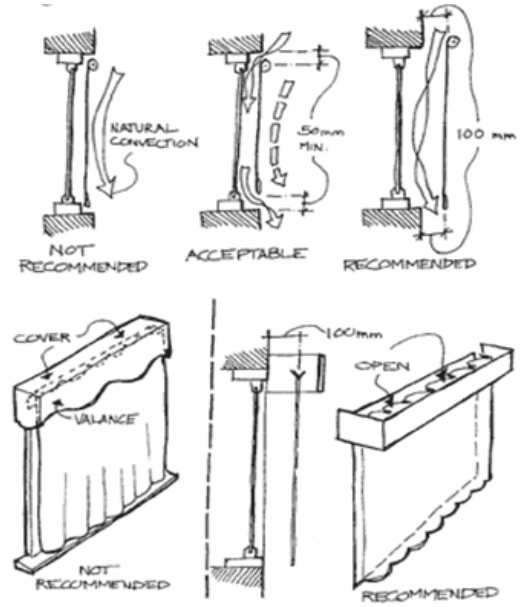
1. Keep flowerbeds or landscaping at least six inches away from the top of the foundation. Placing soil near or above the top of the foundation allows moisture to come into direct contact with the structure of the building.

2. Ensure that land adjacent to the foundation slopes away from the home so that rainwater and snow melt will run away from the foundation.

3. Clear eavestroughs of debris regularly and extend downspouts so that water is directed away from the home. Water flow can erode the ground near the foundation and create depressions where water collects. Standing water near the foundation can force its way into the basement.

4. Fix the caulking around windows and doors and on the roof if it becomes cracked or separated.

5. Have your roof inspected regularly to ensure shingles, flashing and chimney caps are in place and sealed properly.



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Inside the Home

1. In the winter, keep the relative humidity in your home in the range of 30-40%. Relative humidity levels can be measured with a hygrometer. Lower humidity levels may affect your health and because things made of wood to shrink. Excess humidity can cause condensation on windows and damage the surrounding walls. When using a humidifier, follow the manufacturers' instructions.

2. In the summer, dehumidify the basement to avoid condensation buildup on the cool foundation walls. Relative humidity levels should not exceed 60%.

3. Repair leaky pipes and fixtures immediately. Clean and completely dry any areas that are dampened or wet within 48 hours.

4. Store organic materials such as newspapers and clothes away from cool, damp areas. Keep storage areas tidy so that air circulates freely.

5. Try not to produce too much humidity. Indoor hot tubs, plants, showers and cooking without lids are major sources of water vapour. They will add to your indoor air and need to be ventilated accordingly.

6. Never vent your clothes dryer inside your home. If you have a gas or propane fired dryer you may also be venting carbon monoxide inside your home.

7. Investigate and identify musty smells and odours. They are often an indicator that there is a hidden moisture problem.

8. Avoid drying firewood in the house. A cord of wood can release more than 270 litres (60 gallons) of water.

9. Opening windows in your home for a short time will rid the windows of condensation. This will allow the dryer cold air to circulate inside the home while the moist warm air escapes.

If the signs of excessive humidity persist, you should increase the ventilation of your house. When the frequency of condensation is low (once or twice during the winter), you can reduce or eliminate the problem by briefly opening two windows located on opposite walls or by turning on the kitchen or bathroom exhaust fan. If the frequency of condensation is unacceptable, you should install a controlled mechanical ventilation system. Systems incorporating a heat recovery unit and relative humidity control are preferred.

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WHAT IS RELATIVE HUMIDITY?

The amount of water vapour/moisture present in the air expressed as a percentage of the amount needed for saturation at the same temperature. It is often called "relative humidity" or "RH" for short. RH is important because it provides a way to assess moisture conditions and condensation risks in a home.

Key points about relative humidity:

· Relative humidity in a home can be measured with a hygrometer, which is an inexpensive gauge that looks like a thermometer.
· RH measurements run from 10% to 100% and provide an indicator of how much moisture is in the air relative to what it can hold. Dry air has lower RH readings and moist air has higher.

RELATIVE HUMIDITY GUIDE

Here is a quick guide to appropriate humidity levels:

OUTSIDE AIR TEMPERATURE	RELATIVE HUMIDITY
-28°C or below	Not over 15%
-28°C to -23°C	Not over 20%
-23°C to -17°C	Not over 25%
-17°C to -12°C	Not over 30%
-12°C to -6°C	Not over 35%
-6°C to 4°C	Not over 40%
OUTSIDE AIR TEMPERATURE	RELATIVE HUMIDITY
-20°F or below	Not over 15%
-20°F to -10°F	Not over 20%
-10°F to 0°F	Not over 25%
0°F to 10°F	Not over 30%
10°F to 20°F	Not over 35%
20°F to 40°F	Not over 40%

If you've determined your humidity is too low or too high, you should know what problems could arise and how you can manage the humidity in your home.

Humidity too low:

Low humidity or lack of moisture means the air in your house will be dry. Without proper moisture, you open yourself up to all of the pains that come with dry air: dry nose and throat, dry skin and increased risk of catching a cold. Dryness can also impact your home. Low humidity can damage wood and drywall, causing your wood floors to shrink and even causing pianos to go out of tune.

Humidity levels are easily increased by using a humidifier. Humidifiers must be kept clean, changing filters regularly according to the manufacturers' instructions. Make sure you purchase a humidifier that will cover the amount of square feet necessary for the area it will be used in your home and one that holds plenty of water - you don't want to be constantly refilling it.

Humidity too high:

When the humidity is too high in your home, that increased moisture can stain ceilings and walls, peel paint and wallpaper and provide a nasty breeding ground for mold, rot and insects such as termites and cockroaches. Basements are notorious for having higher humidity levels, as are bathrooms, kitchens and laundry rooms. Bedrooms and rooms closer to these areas will have a higher humidity level than ones further away.

Newer, energy-efficient homes tend to fall victim to high humidity more often. Because these homes are built to seal up tight and prevent energy loss from heating and cooling, the

home also seals in a lot of moisture, which in turn causes condensation on your windows.

WHAT ARE SEAL FAILURES?

In double or triple pane windows, there is a seal around the perimeter of the windows to ensure an air-tight fit. In between the panes of glass is often a gas-fill for insulation such as argon gas.

The window seals lock the gas in to help create a barrier that blocks outside temperatures from entering your home. As a result, you'll stay cooler in the summer and warmer in the winter.

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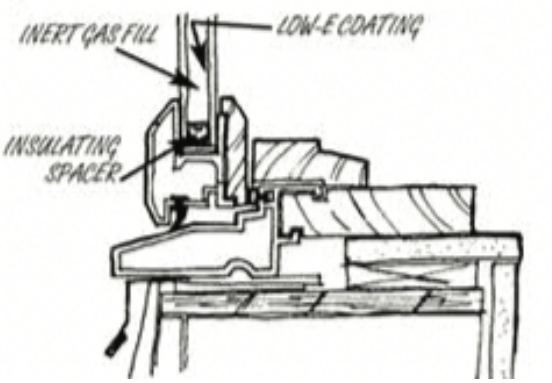
MOISTURE BETWEEN THE GLASS

If you find condensation between the two layers of glass, this is an indication of one of two problems:

1. On larger windows, there is an opportunity for the glass surfaces to touch. Where this is the case, the condensation pattern is a ring or circle in the centre of the window.

2. In other instances, condensation between the panes is a result of a failure in the seal that separates the panes of glass.

In both instances, the product is usually covered under the manufacturers' warranty.



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FREQUENTLY ASKED QUESTIONS

Q: **ARE MY WINDOWS DEFECTIVE?**

A: Defective windows do not cause condensation. Because glass has a lower surface temperature than any other surface in your home, your windows will be the first place that you notice condensation. Some degree of condensation will always be a natural occurrence with your windows.

Q: **I HAVE A NEW HOME. WHY IS THERE SO MUCH CONDENSATION ON MY WINDOWS?**

A: During the construction of a new home, there is a tremendous amount of moisture introduced into the atmosphere that takes time to dry out. As the cement foundation cures, moisture is emitted into the atmosphere. The wood components used in framing contain moisture as do drywall joint compound and paint. All of these add moisture to the home. Usually the moisture introduced will dissipate after the first heating season but this process can take up to two years in extreme cases.

Q: **WHY DO I HAVE CONDENSATION ONLY ON THE EXTERIOR PANE OF MY WINDOWS?**

A: The windows you have purchased are also very energy efficient. The same condition that causes condensation on the interior can in some cases happen on the exterior. This is a temporary condition that will disappear.

Q: **THE COMPONENTS SURROUNDING THE GLASS IN MY WINDOWS ARE BLACK. WHAT IS CAUSING THIS?**

A: The black substance is mold. Mold spores grow on moist surfaces. This is a clear indication that the RH level in your home is excessive and that increased ventilation is necessary. Mold spores will appear on the windows first but that does not necessarily mean that this is the only place they are growing. If the moisture concerns are not resolved, mold growth can become a more serious invisible concern.

Q: **HOW CAN I REMOVE MOLD FROM MY WINDOWS?**

A: Mold is a living, growing entity that needs to be killed to stop its growth. A 50/50 water and bleach mixture can be used to kill the mold spores. Mold growth on wood components can be killed the same way but once the water/bleach concentration has dried, a light sanding of the wood surfaces should restore the original appearance. Be sure to seal any exposed wood surfaces as soon as possible as raw wood will absorb moisture very quickly.