



The first cold day of autumn hits. The windows fog up and water drips down the glass. This is not an indication that your windows are failing. The moisture on the glass is condensation, a natural phenomenon that in most cases can be easily eliminated. Condensation occurs when excess humidity in the air releases onto cool surfaces. The glass in windows and patio doors usually provides a visible, cooler surface that shows the first signs of condensation.

INTRODUCTION

New Windows in New Homes

Homes built today are more energy efficient and substantially more air-tight than homes built just a few years ago. As a result, there is less exchange with outside air (saving energy, but increasing interior humidity). Because interior humidity levels tend to rise, you may now notice condensation in your new home that you never experienced in your older home.

Replacement Windows in Older Homes

Older homes with newly installed windows may experience condensation due to an increase in energy efficiency. Old windows

allowed significant air exchange with the outside, allowing the inside air to dry out. New windows are installed in an airtight manner, trapping humid air inside.

Contributions to Humidity

Family lifestyle has a large impact on humidity levels. Cooking, long showers or baths, saunas, spas, and washing clothes all contribute to humidity levels. Variations in these and other moisture-generating activities often result in one neighbor experiencing condensation and another not.

INTERIOR CONDENSATION

High interior humidity can lead to structural damage to your home (e.g. wood decay) and health hazards (e.g. mold growth). Because these effects frequently occur unseen in the wall cavity, the visible sign of condensation on glass is a good clue that humidity levels are too high. Condensation on the interior surface of glass is almost always due to high levels of interior humidity. Therefore, it is important to control interior humidity. Use a hygrometer (an instrument that measures relative humidity in the air) to monitor indoor humidity levels. The following chart indicates the humidity level at which interior condensation may occur for different outside temperatures. As shown in the chart, when the outside temperature gets colder, a lower interior humidity level is needed to prevent condensation.

Outside Air Temperature	Inside Humidity at Which Condensation Occurs
20°	Over 35%
0°	Over 25%
-20°	Over 15%

The values in this chart are based on winter conditions of 70° indoor temperature with 15 mph outdoor winds and double-glazed windows.

Control Interior Condensation

- Consider installing dual-paned, insulating glass (IG). IG units tolerate more indoor humidity before “fogging up” than single-pane glass units. For further protection, consider Low-E (a coating on glass that reduces radiant heat-loss and the passage of ultraviolet rays).
- Raise the average temperature of the house one or two degrees. Depending on many conditions, this can greatly reduce condensation.
- Open window blinds for air circulation. Closed blinds trap warm air in the space between the glass pane and blinds. This air cools and releases moisture in the form of condensation. Blinds should be hung at least 4" away from the window glass.
- Use a ceiling fan to circulate warm room air toward windows.
- Relocate heat vents beneath windows and patio doors.
- Do not block heat vents with furniture or other objects. The placement of these vents promotes proper air circulation throughout the house. Air circulation helps dry moisture in the air and also distributes heat more efficiently.
- For unoccupied and unheated rooms, keep interior doors open. This promotes proper air circulation throughout the house.

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Control Interior Condensation Cont.

- Vent all appliances to the outdoors. For example, if a dryer is vented into the attic or basement, all the moisture from drying wet clothes is released into the house.
- Run exhaust fans in kitchens and bathrooms.
- Make sure all vent ducts are clear of lint and other obstructions.
- Turn humidifiers down as the temperature outside gets colder (if used for medical purposes, consult a doctor).
- Be sure humidistat is located within the living space and not at the furnace outside of the heated part of the house.
- Use a dehumidifier.

- Don't dry firewood inside.
- Have an air exchange system added to your heating system.

Causes of Temporary Condensation

- Building materials in new construction contribute many gallons of moisture to the interior air and it often takes at least one year for all of the moisture to escape.
- During the first few weeks of heating during the cold season, condensation can be a problem due to the release of moisture absorbed inside the house throughout the humid summer.
- Quick temperature changes during the heating or cooling season can contribute to higher levels of condensation.

EXTERIOR CONDENSATION

When the temperature of the exterior surface of the glass is cooled below the dew point of the outside air, moisture forms on the exterior side of the glass. Then, as the glass temperature rises above the dew point, the moisture evaporates back into the air.

Three main conditions promote exterior condensation:

- High outdoor humidity
- Very limited or no wind
- Clear night sky

Control Exterior Condensation

- Close window coverings to reduce cooling of the glass by air-conditioning.
- Remove or trim outside shrubbery near glass to promote air circulation.

EFFECTS OF CONDENSATION ON SPECIFIC PRODUCTS

WOOD WINDOWS & PATIO DOORS

If condensation occurs over time, moisture may penetrate wood, leading to wood decay. To help prevent wood decay, keep windows and patio doors finished or painted (refer to Finishing and Refinishing document at www.jeld-wen.com/resources) and follow the suggestions in this document to reduce humidity.

VINYL WINDOWS & PATIO DOORS

Vinyl windows and patio doors have a "weep" system designed to drain water to the exterior. If this weep system is not draining properly, moisture may enter the surrounding wood structure and cause water damage. Clean dirt and debris from weep holes with a thin piece of wire.

ALUMINUM WINDOWS & PATIO DOORS

Aluminum is especially subject to condensation because of its ability to transfer heat. The temperature of aluminum will quickly change to the air temperature around it. The colder the outside temperature, the colder the aluminum frame and the more likely condensation will occur.

SUMMARY

Condensation is a natural phenomenon that can occur on exterior and interior glass surfaces. In nearly all cases, it is not the result of a defective window or patio door. Steps should be taken to reduce humidity with proper air circulation. If condensation persists after following the guidelines suggested in this document, contact a qualified heating and air conditioning professional. Condensation between glass panes is a different problem. If moisture is still present after cleaning the interior and exterior sides of the glass, seal failure (when the seal between two panes of an insulating glass unit has broken) between the glass panes could be the cause.

CONTACT US

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