

Why Even High-Efficiency Windows Can Get Condensation

Condensation on windows does *not* mean your windows are defective.

In most cases, it means there is more moisture in the air inside your home than the glass surface can handle under current weather conditions.

What is condensation?

Condensation happens when **warm, moist air comes into contact with a cooler surface**. When air cools, it cannot hold as much moisture, so excess water vapor turns into visible water droplets. This is the same process that causes moisture to form on a cold glass in summer.

Why do windows show condensation first?

Windows are often the **coldest visible surface** in a home, especially during winter. As a result, condensation shows up on glass before it becomes visible elsewhere—even though moisture may also be accumulating inside walls, attics, or insulation.

Windows are indicators, not the cause.

Why can condensation occur on *high-efficiency* windows?

Modern high-performance windows are designed to:

- Reduce air leakage
- Improve insulation
- Keep indoor temperatures more stable

These are all *good* things. However, they also mean that **indoor moisture has fewer ways to escape**.

Everyday living adds a surprising amount of moisture to the air:

- Cooking and dishwashing
- Showers and baths
- Laundry
- Normal breathing and perspiration

In a well-sealed home, that moisture builds up unless it is actively removed through ventilation or humidity control.

Older homes

In older homes, original windows were often **leakier**. While inefficient, that air leakage allowed moisture to escape naturally.

When new, energy-efficient windows are installed:

- Drafts are reduced
- Comfort improves
- Energy use drops

But the home may now **retain more moisture than before**. Condensation that never appeared with old windows can suddenly become visible—not because the new windows are worse, but because they are sealing the home as intended.

New or newer homes

Newer homes are already tightly sealed with modern insulation, vapor barriers, and construction methods. When high-efficiency windows are added:

- Indoor humidity management becomes essential
- Mechanical ventilation (bath fans, range hoods, fresh-air systems) plays a larger role

In both cases, condensation is usually a **humidity balance issue**, not a window quality issue.

Indoor humidity matters more than the window

As outdoor temperatures drop, **safe indoor humidity levels must also drop** to prevent condensation.

Simple Winter Humidity Guide

Outside Temperature	Recommended Indoor Humidity
-30°C or colder	Max 15%
-20°C to -10°C	Max 20%
-10°C to 0°C	Max 25%
0°C to 10°C	Max 30%
10°C to 20°C	Max 35%
Above 20°C	Up to 40%

Maintaining higher humidity than recommended during cold weather significantly increases the likelihood of condensation.

Interior vs. exterior condensation

- **Interior condensation** (inside surface): Usually caused by high indoor humidity
- **Exterior condensation** (outside surface): Can occur on very efficient glass and is often a sign of good insulation; it is harmless and temporary
- **Condensation between panes:** May indicate a sealed glass unit failure and should be inspected

What you can do

The most effective solution is **humidity control**, not window replacement:

- Use bathroom and kitchen exhaust fans consistently
- Ensure dryers and gas appliances vent outdoors
- Open blinds or drapes slightly to allow warm air to circulate against the glass
- Maintain steady indoor temperatures
- Use a hygrometer to monitor humidity
- Consider a dehumidifier or fresh-air system if needed

Bottom line

Condensation is a **building-science issue, not a window defect.**

High-efficiency windows often *reveal* moisture problems that were already present but previously hidden. Addressing indoor humidity protects not only your windows, but your entire home.