

# CONDENSATION IN HIGH-PERFORMANCE HOMES

## Condensation Diagnostic Checklist

A Practical Tool for Architects, Builders, and Project Teams

Before assuming a window or glass issue, work through the following checklist. In nearly every case, condensation reveals itself here first.

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### 1. Identify the Moisture Location

- Moisture on interior glass surface (room-side)
- Moisture on exterior glass surface
- Moisture between panes (possible sealed unit failure)

If moisture is between panes, this is a glass seal issue.  
If moisture is on surfaces, continue—this is an environmental condition.

### 2. Confirm Interior Relative Humidity

- Measure actual interior RH (not estimated)
- Compare RH to exterior temperature conditions
- Review humidification system settings, if present
- Confirm homeowner understands seasonal RH targets

High-performance homes often require lower winter RH than occupants expect.

### **3. Review HVAC and Ventilation Strategy**

- Is the home mechanically ventilated (HRV / ERV / induced air)?
- Is ventilation balanced, commissioned, and operational?
- Are exhaust zones (kitchens, baths, spas) adequately managed?
- Are HVAC setpoints extreme or inconsistent?

Airtight homes do not self-regulate moisture. Ventilation must do that work intentionally.

### **4. Evaluate Envelope Airtightness and Airflow**

- Has the home been blower-door tested?
- Are there zones of stagnant air near large glazed areas?
- Is interior air circulating across glass surfaces?
- Are furnishings or detailing restricting airflow at windows?

### **5. Assess Glass and Coating Specifications**

- Confirm glazing type (double / triple)
- Identify low-emissivity coating locations
- Review whether coating strategy aligns with climate and HVAC design
- Confirm glass meets code and performance intent

Higher thermal performance can shift where condensation appears—it does not eliminate physics.

### **6. Review Frame Design and Thermal Separation**

- Are window and door systems fully thermally broken?
- Are thermal breaks continuous through corners and interfaces?
- Are materials appropriate for the climate and exposure?
- Are expectations aligned with the limits of each material?

## 7. Inspect Installation and Surrounding Construction

- Is insulation continuous around the opening?
- Are there thermal bridges at structure-to-frame interfaces?
- Are air and vapor barriers properly tied into the window system?
- Were installation details executed as designed?

Even the best system can be compromised by poor continuity.

## 8. Consider Orientation and Environmental Exposure

- Identify elevation(s) with highest condensation occurrence
- Review solar exposure and shading strategy
- Account for rapid day/night temperature swings
- Assess proximity to water, pools, or coastal conditions

## 9. Align Expectations with Reality

- Has seasonal condensation behavior been discussed with the client?
- Are occupants educated on system operation?
- Is condensation being treated as a performance signal, not a defect?
- Has an envelope consultant reviewed risk holistically?

## Final Diagnostic Principle

If the checklist points to **humidity, airflow, temperature imbalance, or envelope continuity**, the issue is environmental—not fenestration failure.

Windows do not create condensation. They reveal it.