



**RENEWAL**  
by **ANDERSEN**

FULL-SERVICE WINDOW & DOOR REPLACEMENT

**UNDERSTANDING  
CONDENSATION**

# Are My Windows to Blame?

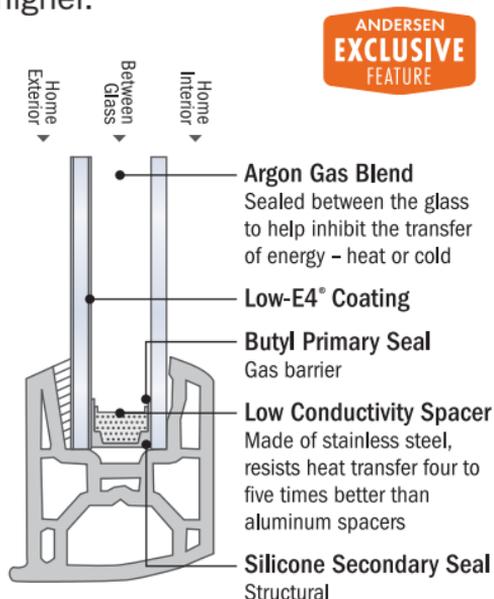
Windows do not cause condensation and, at the same time, can't eliminate condensation. Your windows are alerting you to excess humidity trapped in your home, telling you when you need to reduce the moisture level.

Renewal by Andersen® windows are energy efficient and help provide a tight barrier between the temperature and conditions of the exterior of your home from that of the inside.

## The Role of a Window

Tighter modern windows help reduce air leaks, which limit ventilation and trap moisture. But tight windows also help reduce heating costs and limit drafts. Modern windows with special glass may even reduce condensation problems because the glass temperature remains higher.

If your old windows were drafty, those cracks did more than just let in the wind – they allowed excess moisture to escape outdoors. Your new windows are better insulated, so indoor humidity can't escape.





## **The moisture that suddenly appears**

in cold weather on the interior or exterior of window and patio door glass can block the view, drip, or freeze on the glass. It can be an annoyance.

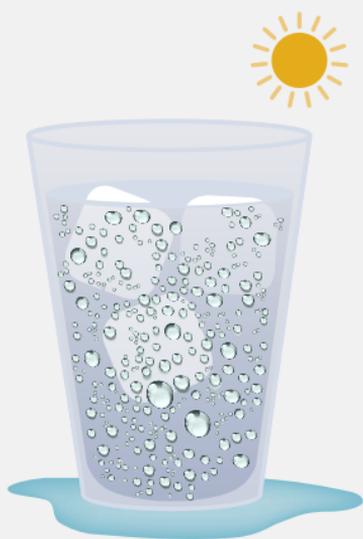
While it may seem natural to blame the windows or doors, interior condensation is really an indication of excess humidity in the home.

Exterior condensation, on the other hand, is a form of dew; the glass simply provides a surface on which moisture can condense.



## What Is Condensation?

Condensation appears when warm, moist air comes into contact with cooler surfaces, like your window glass on a cold, winter day. That's true with even the best-performing windows.



Although condensation is most common during winter, it can occur whenever warm, moist air encounters a cold surface. That's why your iced tea glass sweats during the summer. The glass is cold and condensation forms when warmer, moist air comes into contact with it.

## Diagnosing Excess Humidity

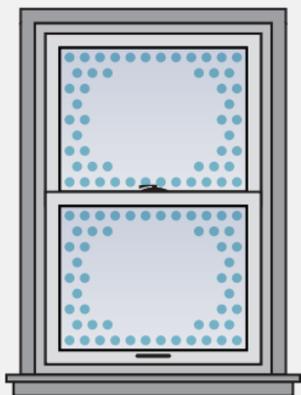
The important thing to realize is that if humidity is causing window condensation, it may also be causing problems elsewhere in the home.

### **SIGNS OF TOO MUCH MOISTURE**

- Sweating pipes
- Musty odors
- A damp feeling
- Cracking, peeling, or blistering paint on the interior or exterior
- Warped wooden surfaces
- Staining or discoloration of interior surfaces
- Mold or mildew on surfaces

## Indoor Humidity's Effect on Condensation

Excessive humidity is the cause of most window condensation. As the outside temperature drops, the window glass temperature also drops. When moist air comes into contact with the cold, glass pane, the moisture condenses and forms water droplets.



Determining when the condensation will occur and preventing it depends on the energy efficiency of the window, the relative indoor humidity of the home, and the exterior and interior temperature.

## Sources of Indoor Moisture

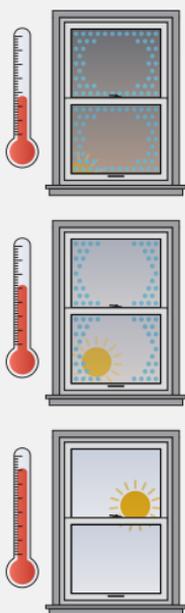
Everyday living generates a surprising amount of indoor moisture. Cooking three meals a day adds eight or ten cups of water into the air. Each shower contributes another cup. Every activity that uses water adds moisture.

Regardless of its cause, the moisture's source doesn't have to be where the condensation occurs. Vapor pressure can actually force moisture through plaster, wood, brick, and cement.



# Managing Exterior Moisture

Condensation on the outside of a window is the same as dew on



your lawn. It occurs mostly during the spring and fall, when there are cooler nights and warmer days. It is usually an indicator of energy-efficient windows, since it means the outside pane is thoroughly insulated from the heat indoors.

ENGINEERED WITH  
**FIBREX**<sup>®</sup>  
MATERIAL

While wood and fiberglass windows may require regular maintenance to combat the effects of condensation, Renewal by Andersen<sup>®</sup> replacement windows are made with Fibrex<sup>®</sup> material, a revolutionary composite that provides exceptional resistance to rot and fungal growth.<sup>1</sup>

## Sources:

- ASHRAE Handbook of Fundamentals 1999  
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and Air-Conditioning Engineers, Inc.  
(ASHRAE)  
1791 Tullie Circle NE  
Atlanta, GA 30329  
[www.ashrae.org](http://www.ashrae.org)
- Builders Guide  
Energy and Environmental Building  
Association (EEBA)  
6520 Edenvale Boulevard, Suite 112  
Eden Prairie, MN 55346  
[www.eeba.org](http://www.eeba.org)
- Building Science Corporation  
70 Main Street  
Westford, MA 01886  
[www.buildingscience.com](http://www.buildingscience.com)
- Cold Climate Housing Center  
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3433 Broadway Street NE, Suite 150  
Minneapolis, MN 55413
- University of Minnesota  
Department of Environmental Health  
and Safety  
Minneapolis, MN 55455  
[www.dehs.umn.edu](http://www.dehs.umn.edu)
- Window & Door Manufacturers Association  
(WDMA)  
1400 East Touhy Avenue, Suite 470  
Des Plaines, IL 60018  
[www.wdma.com](http://www.wdma.com)
- Environmental Health and Engineering  
180 Wells Avenue, Suite 200  
Newton, MA 02459
- Cardinal IG  
12301 Whitewater Drive  
Minnetonka, MN 55343
- How to Save Money by Insulating Your Home  
Federal Energy Administration  
c/o Department of Energy  
James Forrestal Building  
1000 Independence Avenue SE  
Washington, DC 20585
- Michaud, Cooley, Erickson and Associates,  
Inc., Consulting Engineers  
333 S 7th Street, Suite 1200  
Minneapolis, MN 55402
- Moisture Condensation (University of Illinois  
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Building Research Council  
1 E Saint Mary's Road  
Champaign, IL 61820
- National Fenestration Rating Council (NFRC)  
8484 Georgia Avenue, Suite 20  
Silver Spring, MD 20910  
[www.nfrc.org](http://www.nfrc.org)
- Efficient Windows Collaborative (EWC)  
Alliance to Save Energy  
1850 M Street NW, Suite 600  
Washington, DC 20036  
[www.efficientwindows.org](http://www.efficientwindows.org)
- Energy Star Programs  
United States DOE and EPA  
[www.energystar.gov](http://www.energystar.gov)

<sup>1</sup>See Renewal by Andersen<sup>®</sup> Products and Installation Transferable Limited Warranty for details.

# Tips for Reducing Humidity in the Home

Vent all gas appliances, such as clothes dryers and exhaust fans, to the outside.

Cover the earth in the crawl space with a good vapor barrier.

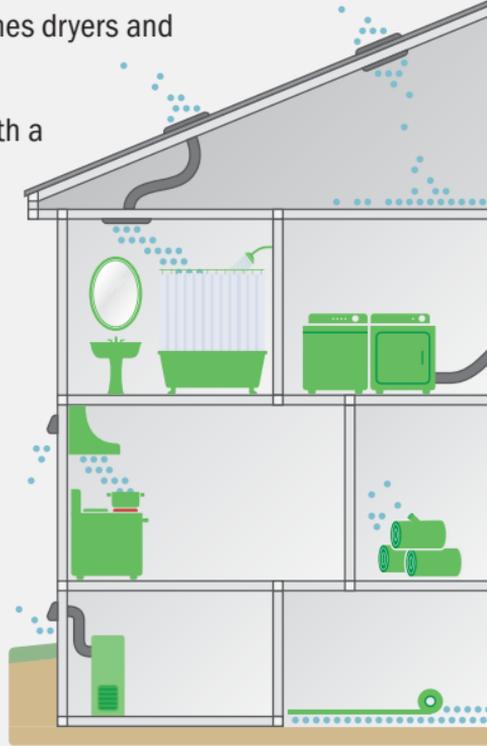
Run an over-the-range exhaust fan when you cook.

Avoid storing firewood indoors.

Ventilate your attic and crawl space.

While bathing, run a bathroom exhaust fan until the mirror is clear.

If you have a forced-air furnace, contact your heating and air-conditioning specialist for guidance in ensuring your home is properly ventilated.



## Measuring Indoor Humidity



You can use humidity-measuring instruments called hygrometers, inexpensive tools that can be purchased at most hardware stores. Many of today's new programmable thermostats also include controls for humidifiers and dehumidifiers. Remember that humidity levels quoted in weather reports indicate outdoor humidity. They have little bearing on your home's humidity level.

Outside Air Temperature (°F)	20° to 40°	10° to 20°	0° to 10°	-10° to 0°	-20° to -10°	below -20°
Maximum Recommended Indoor Humidity Level	up to 40%	up to 35%	up to 30%	up to 25%	up to 20%	up to 15%

Based on engineering studies at 70° F, conducted at the University of Minnesota Laboratories.

Humidity levels above these are not recommended unless special provisions are taken in building construction.

If higher relative humidity levels are required because of special interior environmental conditions, the window manufacturer should be consulted.

# Window and Door Replacement from a Company You Can Trust™

**Don't just take our word for it.** Renewal by Andersen has long been committed to environmentally responsible products and manufacturing methods. Our efforts have been acknowledged by leading organizations with some of the most rigorous standards in the United States.



## Questions?

**We're here to help.** Please contact your local Renewal by Andersen retailer.



**RENEWAL**  
**by ANDERSEN**  
FULL-SERVICE WINDOW & DOOR REPLACEMENT

The Better Way to a Better Window®