



CONDENSATION

Questions & Answers



WHAT IS CONDENSATION?

Condensation is the fog that suddenly appears in cold weather on the glass of windows and sliding doors. It can block out the view, drip on the floor, freeze on glass...it's annoying. It's natural to blame the windows, but you shouldn't.

WHAT CAUSES WINDOW CONDENSATION?



Window condensation is the result of excess humidity in your home. The glass in your window only provides a cold surface on which humidity can visibly condense. The fog on your windows is a form of condensation; so is the water that forms on the outside of a glass of iced tea in the summer and on the bathroom mirrors and walls after someone takes a hot shower. Condensation usually occurs first on windows because glass surfaces have the lowest temperature of any of the interior surfaces in the house. When the warm moist air comes into contact with the cooler glass surfaces, the moisture condenses.



Quick Fact #1

More water vapor in the air means a higher indoor humidity. High indoor humidity means condensation.

The important thing is, your foggy windows and sliding doors are trying to tell you to reduce indoor humidity before it causes hidden costly problems elsewhere in your home. Problems like peeling paint, rotting wood, buckling floors, insulation deterioration, mildew, even moisture spots on ceilings and walls.

Quick Fact #2

Foggy windows and sliding doors are the indicators, the warning signs, that humidity could be damaging your home.

HOW CAN MY HOME HAVE INDOOR HUMIDITY?

Humidity is a vapor, or moisture, in the air. All air contains a certain amount of moisture, even indoors.

Quick Fact #3

It's very simple. If objectionable condensation occurs on the inside surface on the windows, the humidity level in your home is too high.



WHERE DOES THE MOISTURE COME FROM?

There are many things that generate indoor moisture; humidifiers, heating systems, even plants. Cooking three meals a day adds four or five pints of water to the air. Each shower contributes 1/2 pint. In fact, every activity that uses water (like dishwashing, mopping floors, doing laundry, etc.) adds moisture to the air.



HOW MUCH INDOOR HUMIDITY IS TOO MUCH?

The householder can use the windows as a guide to the proper humidity level with the house.

To avoid excessive condensation, the following winter humidities are recommended in the house:

<u>Outside Temp.</u>	<u>Inside Relative Humidity</u>
-20°F	15 to 20%
-10°F	15 to 20%
0°F	20 to 25%
+10°F	25 to 30%
+20°F	30 to 35%

(The indoor humidity can be checked with a sling psychrometer or a humistat.)



WILL REDUCING THE HUMIDITY IN MY HOME DURING WINTER HELP CONTROL CONDENSATION?

Eliminate the excessive humidity, and you will eliminate most...possibly all...of the condensation.

HOW CAN I REDUCE THE HUMIDITY IN MY HOME?

- ✓ Control the sources of moisture and increase ventilation.
- ✓ As a temporary solution to an acute problem, open a window in each room for just a few minutes. Opening windows allows the stale, humid air to escape, and fresh dry air to enter. After a shower, for example, open the bathroom window, or turn on the exhaust fan, so steam can go outside instead of remaining in the home.
- ✓ Vent all gas burners, clothes dryers, etc. to the outdoors. Install kitchen and bathroom exhaust fans. If there are a large number of plants in the house during winter, concentrate them in one sunny room and avoid over-watering.
- ✓ Keep basements as dry as possible by waterproofing floors and walls. Run a dehumidifier if necessary. Make sure attic vents are open and unobstructed.
- ✓ Opening the windows slightly throughout the house for a brief time each day will go far toward allowing humid air to escape and drier air to enter. The heat loss will be minimal.
- ✓ Installation of storm windows will often relieve condensation on the prime house windows by keeping the interior glass warmer.



DOES CONDENSATION OCCUR MORE OFTEN IN PARTICULAR CLIMATES OR PARTICULAR TYPES OF HOMES?

Absolutely! Condensation is more apt to occur in climates where the average January temperature is 35°F or colder because there will be greater extremes between indoor and outdoor temperatures affecting the glass surfaces in the home.



During the first year after construction or remodeling, it is likely a house will have more condensation present because of the massive amount of moisture in the building materials used. Building materials need about one year to dry out, so excessive condensation can be expected in the first heating season. Even after the first year, if the humidity level is too high, condensation may still be a problem because today's homes are much "tighter" (in the interests of energy efficiency) than older homes. New materials and techniques in weatherstripping, insulation, vapor barriers, etc., which are intended to keep out cold air, also lock moisture inside. As a result, moisture created by bathrooms, kitchens, laundries, and occupants no longer flows to the outside, unless mechanically ventilated.

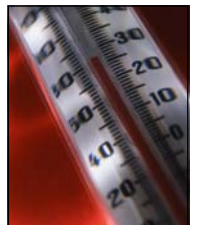
ARE THERE ANY CASES WHERE WINDOW CONDENSATION IS ONLY TEMPORARY?

Yes, there are primarily three.

- ✓ New construction or remodeling
- ✓ The beginning of each heating season
- ✓ Quick changes in temperature



Wood, plaster, cement, and other building materials used in new construction and remodeling produce a great deal of moisture. When the heating season begins, there may be a certain amount of temporary condensation. During the humid summer, your house will have absorbed some moisture. After the first few weeks of heating it will dry out, and you'll have fewer condensation troubles. Sharp, quick drops in temperature can also create temporary condensation problems during the heating season.



Quick Fact #4 *During the Summer and Fall, all parts of a house pick up moisture from damp air. In the Fall, when the windows are closed and heat is turned on, this moisture will pass into the air of the house and for a week or two there is likely to be condensation.*



WHY, IF MY OLD WINDOWS DID NOT HAVE CONDENSATION, DO MY NEW WINDOWS HAVE IT NOW?

One of the reasons you probably replaced your old windows was because they were drafty, and when the wind wasn't blowing in, those slight cracks allowed the excessive humidity within your house to escape to the outdoors. Now that your windows are tight, that excess humidity that is in your house is unable to escape, and therefore, it is showing itself on the glass. Again, this is your first indication that you have too much humidity in your home.

YOU SAY I SHOULD HAVE LESS HUMIDITY, BUT I HAVE BEEN TOLD THAT MORE HUMIDITY IS HEALTHIER.

At one time, it was believed that humidifiers helped people stay healthy during the winter months. Recent tests have shown that for usually healthy people, this is not the case. In fact, humidifiers may actually cause health problems. Additionally, the Association of Home Appliance Manufacturers makes no medical claims for humidifiers, because an Association spokesman said, "We do not have evidence of medical benefits", However, the Association said "Manufacturers do maintain the humidifiers help plants and furniture only".



DOES THE AMOUNT OF CONDENSATION DEPEND ON THE TYPE OF WINDOW?

Sometimes. Recessed windows, like bay or bow windows usually experience more condensation than other window styles. This is because air circulation around those window types is usually more restricted, and since they hang away from the insulated house wall, bays & bows could be a few degrees cooler in temperature.



Quick Fact #5 *Insulate under the seat and head of bay and bow units to reduce excessive condensation. As a secondary measure, place a common electric fan near the window to produce air circulation.*



DO DRAPES AND WINDOW SHADES CAUSE WINDOW CONDENSATION?

Drapes and other window coverings don't cause window condensation, but they can contribute to the problem by restricting the flow of warm room air over the glass surface. Therefore, condensation is more apt to occur when drapes are closed and shades are pulled down. Today's heavily insulated drapes and tighter shades can contribute to the problem even more.

REMEMBER: WINDOWS DO NOT CAUSE CONDENSATION...

therefore, there cannot be a window which will eliminate condensation. However, certain materials used in the manufacture of windows will be more condensation free than others.

THE FOLLOWING SOURCES WERE USED:

**The Condensation Problem - - - Here are the Causes and Cures.* Canadian Builder, Vol. XIII, No. 7.

**Condensation Problems in your House: Prevention and Solution.* U.S. Dept. of Agriculture Forest Service, *Agriculture Information Bulletin No. 373

Technical Bulletin #1. Ethyl Corporation

**The Condensation Answer Book.* Andersen.



The Better Business Bureau (412-456-2720) has a telephone message system on home remodeling, construction, and maintenance. The following is a transcript of recording #421, entitled **Condensation on Windows**.

Condensation is visible evidence of excessive moisture in the air. It may appear as water, frost, or ice on the room surface of windows and doors. The warmer the air, the more water the air can hold, which means that the air in the center of any given room will hold more water than the air adjacent to the window or door walls, since this area is always cooler. When the warm, moisture-laden air moves toward the cooler window or door wall, it becomes cooler and cannot hold the moisture it held when it was warmer. Therefore, the moisture is dropped and appears as water on the glass and frames of windows and doors. This occurs more frequently during the winter months because of the extreme difference between the inside and outside temperatures. If you wish to avoid condensation during the winter months, when the average outdoor temperature drops to 35 degrees or less, it would be wise to maintain a 25-30% relative indoor humidity.

Ventilation is a very effective way to remove excessive moisture from the air, which is why old, poorly insulated houses with single glazed windows, often times do not have condensation problems. This is because the air is changed by infiltration around the windows, doors, vents, and other openings. Newer homes, which are constructed to meet current insulation standards and energy-conservation requirements, or older homes, which have been newly insulated through the addition of attic and basement insulation and installation of primed windows with dual or triple glazed glass, are now so airtight that they present a new problem.

All homes will, on occasion, have temporary condensation which is the result of one of three occurrences.

1. **New construction or remodeling:** Building materials contain a great deal of moisture. As soon as the heat is turned on, this moisture will flow out into the air and settle on windows, etc. This will usually disappear following the first heating season.
2. **Humid summers:** During humid summers, houses absorb moisture. This will be apparent during the first few weeks of heating. Then the house should dry out.
3. **Temperature change:** Sharp, quick and sudden drops in temperature, especially during the heating season, will create temporary condensation problems.

If you have an existing moisture or condensation problem, do not count on correcting it merely by installing new windows. An insulated window should help relieve the situation.

YOU MUST REMEMBER: Windows do not cause condensation. Therefore, windows cannot cure condensation.

