



**SCHERER
BROS.
LUMBER CO.**

www.schererbros.com
612-379-9633

Preventing Window Condensation

Excessive household moisture is the leading cause of window condensation or “sweating windows” and is a frequent climate-related complaint in the Midwest. Generally speaking, it is not a sign of defective windows or improper installation, but rather it is a symptom of a moisture imbalance in your home.

Home moisture problem symptoms include window condensation, wood rot, damp insulation, roof ice build-up, damp walls, mold or mildew build-up and odors, blistering or bubbling paint. If you have any of these symptoms, check the following guide for possible causes and solutions.

SOURCES, CAUSES AND SOLUTIONS

Windows

Check inside the window edges for cracks or breaks in the glass seal — usually covered under the most limited warranties. Also, check for proper caulking around the outside frame and a square fit on the inside of the window frame or back of the vapor barrier.

Ventilation

Poor ventilation traps moisture in the home. Improper air exchange does not allow adequate dry outside airflow into the home. Check all attic vents and crawl space vents to ensure they are open, unobstructed and of adequate size. One way to improve indoor air quality and reduce interior humidity is by installing an air-to-air heat exchanger. This minimizes the heat loss that occurs when venting indoor air to the outside. Consider these ventilation tips:

- Use direct-vent furnaces and appliances. Install bath and kitchen fans to exhaust at the rim joist instead of the roof. This will eliminate condensation running down into the fan.
- Always install an outside vent for the clothes dryer. Never use a heat saver to direct clothes dryer air into the house. Check the seal around dryer hose and wall vent.
- Never block fresh air intakes for the sake of reducing heat loss. And never pressurize the house. The pressure inside the house should be slightly less than outside. This will prevent moist air migrating into the walls where it can soak insulation and cause damage.

Circulation

The air cools off quicker, condenses faster when it is motionless. Use ceiling fans or some other type of portable fan to keep the air circulating. Drapes, window blinds, and interior shutters all restrict air movement and will increase the amount of condensation occurring on the windows. Consider leaving window treatments open when you go to bed at night. Check exterior roof or soffit air vents for dust, leaves, or other obstructions that can clog or block air-flow.

Excessive household moisture is the leading cause of window condensation or “sweating windows”... Generally speaking, it is not a sign of defective windows or improper installation, but rather it is a symptom of a moisture imbalance in your home.

Air-Vapor Barriers

Poorly installed or missing air-vapor barriers may show up as stained siding or discolored sheathing. Inspect the coldest side of your home for these signs. If you have a basement, check the rim joists of your home to see if air-vapor barriers are present. If they are not, consider installing them.

Insulation

Check attic and basement crawl space insulation for fit and excessive moisture symptoms. Discolored insulation is a sign of excessive moisture. Check outlets for proper insulation. Check outside window frame for appropriate fit and insulation cracks or leaks. In closets that have a high moisture level, install louvered doors for better air circulation. Certain window types, angle bay or bow windows experience more condensation than other models. It's because of restricted air movement, the fact that they hang out away from the house and because they are the coldest visible surfaces in your home. Insulating between the window head and platform and between the seat and platform can help, as can using a small electric fan nearby to increase circulation.

Domestic Activities

Review the number of high moisture activities that you regularly do in your home. See the moisture source chart. Consider reducing some of those activities during the coldest days of the season. Use existing exhaust fans in the bathroom and kitchen longer than average to vent the moist air. Open a window or door for a couple of minutes to let in drier air immediately following heavy moisture appliance usage.

New Construction and Remodeling

During the construction phase and for two years following, increase ventilation and circulation. You may find you will have to dehumidify your home during the first year.

Heating and Cooling Plants

Drain air conditioning condensation to the sewer system or the outdoors, not the crawl space.

Humidifiers

If you have a furnace humidifier, use it conservatively or not at all.

Firewood

Never store more than a few days worth of firewood in your home. Wood releases immense amounts of moisture into your home and can cause a significant moisture imbalance.

How can such an imbalance happen in a new home?

Easy. Today's construction methods produce a much tighter, more energy-efficient home. Tighter homes keep more air and moisture in and therefore need proper ventilation to help control the amount of moist air in the home. Today's homeowners also need to understand how condensation problems occur and what they can do to control the amount of moisture they put into the air in their home.

Window condensation occurs when warm moist air comes into contact with the colder glass surface. That's because cold air holds less moisture than warm air. So, the colder the surface, the less moisture

it takes to show up as condensation. When air cools to the point where it can no longer hold the water in vapor form, then it condenses to a visible droplet form. That “point of condensation” is called the “dewpoint.”

So, window condensation or any other home moisture problem is a combination of indoor moisture content and air temperature.

...window condensation or any other home moisture problem is a combination of indoor moisture content and air temperature.

Sweating windows are an indicator or a symptom of too much moisture for the temperature. Of course, some days are so cold that condensation is unavoidable - your energy-efficient windows have limited insulating ability. Today's technology can only keep the glass so warm, and you can only do so much to keep the humidity in your home low and still comfortable. Even so, there are many things you can do to control excessive home moisture and window condensation - and some are very, very simple.

The first step is to identify the sources of moisture in your home correctly. Just about any regular household activity releases moisture into the air. Cooking, taking showers, having plants, doing the laundry, ironing, running your furnace, burning unseasoned wood in your fireplace, all add water vapor.

Here is a list of common moisture sources and the moisture they can produce (in pints):

- Bathing = .012
- Showering = 0.52 every 5 minutes
- Drying clothes (non-vented) = 4.68-6.18/load
- Kerosene space heater = 7.6 pints/gal. burned
- Cooking breakfast (family of 4) = 0.35[+ .58 for gas]
- Cooking lunch (family of 4) = 0.53 [+ .68 for gas]
- Cooking dinner (family of 4) = 1.22 [+ 1.58 for gas]
- Washing breakfast dishes = 0.21
- Washing lunch dishes = 0.16
- Washing dinner dishes = 0.68
- Firewood indoors = 400 to 800 (for 6 months)
- Floor mopping = 0.03/sq. foot
- Gas range pilot light (each) = 0.37 or less/day
- House plants (5-7) = 0.86 to 0.96/day
- Humidifiers = 2.08/hour average
- Respiration and perspiration (family of 4) = 0.44 /hour
- Evaporation from materials, seasonal and new construction = 6.33 to 16.91/day
- Ground moisture migration = 0 to 105/day
- Seasonal high outdoor humidity = 64 to 249/day

Seasonal changes and rapid decreases in temperature can also cause temporary condensation problems. But they should disappear in a few weeks or months. As well, the lumber and concrete used in new construction contain a great deal of moisture. When the heating season starts, so does the flow of moisture out of those materials.

Many factors affect the point at which moisture will condense on glass: glass thickness, dead air spacing, glazing method, special coatings such as Low 'E', fillers, sash thickness, orientation to the sun, and there are many more.

Therefore, instead of offering a definitive “condensation table” to try and cover all of these factors, we are providing an example to follow as a guide. This example is based on several industry standards used in testing window performance. Please note that in most cases window manufacturers will use the temperature at the center of the glass (generally the warmest point) in condensation calculations. We, however, will use the “interface,” the coldest spot on the window located immediately above the bottom rail, as a measuring point. This will show why condensation starts at the edges of your window

and show just how low humidity in the home must be to control condensation during particularly cold temperatures.

Given these standard parameters:

- 0° fahrenheit outside temperature
- 70° fahrenheit inside temperature
- 15 mph wind speed

At the "Interface" of sash and glass (the weakest point of heat conservation) condensation forms at 18% to 20% relative humidity depending on glass type.

Wait a minute. Shouldn't we be adding some moisture to the air during those dry winter months for health and comfort? No. There is little or no data to support the belief that humidifiers make a healthier home. In most cases, there is no need for humidifiers. In fact, says C.W. Smith, director of the Housing Research Foundation, of the Southwest Research Institute, San Antonio:

"In the more tightly built modern homes the moisture given off by showers, laundry equipment, cooking and by the occupants themselves puts more humidity into the air than is needed and there is little likelihood that the humidity level would ever become so low as to be harmful or irritating."

High humidity, however, can significantly contribute to the deterioration of a house and the discomfort of the occupants. So what is recommended? Homeowners should manage their indoor climate by reducing moisture levels in their home as outdoor temperatures get colder.