

Condensation

Understanding Condensation in the Home

by Christopher Burk, technical product manager, Simonton Windows

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What do houseplants, a boiling pot of pasta on the stove, and a hot steaming shower have in common? They all add moisture to the home's interior. And, while some humidity in the home is good, excessive moisture can be uncomfortable.

Most window manufacturers get calls from homeowners on a regular basis that are concerned that their windows are "sweating" or leaking either inside or outside the home because they see moisture on the glass. In reality, that's simply not the case. While condensation may collect on the interior or exterior of energy-efficient windows, this indicates the units are really doing its job by helping serve as a barrier in the home.

As an architect dealing with consumer questions, you may receive inquiries over time regarding why you're specifying different glass packages. Or, you may get the call months after someone has moved into their new home to complain about sweaty windows. Rest easy. There's a simply way to explain condensation to homeowners to calm their concerns.

First of all, make sure your clients understand that windows do not cause condensation, they simply prevent the moisture in the home from

escaping to the outside. If the inside glass surface on double- or triple-glazed windows show excessive moisture, you can tell your clients that they most likely have moisture throughout their entire home, including collecting on their walls and ceilings. This means they should take steps to reduce the humidity level in the home by using exhaust fans and dehumidifiers.

Where Does Condensation Come From?

Many people are surprised to learn how much water vapor they create themselves on a daily basis. According to the 1988 report, *Moisture Sources Associated with Potential Damage in Cold Climate Housing*, a family of four can add a half pint of water vapor every hour to the home just through normal breathing and perspiration. And, if someone in the home takes a five-minute shower, they can produce another half pint of water vapor. Even the simple act of cooking dinner on a gas stove can produce two and a half pints of water vapor.

Basically, invisible water vapor is everywhere in the home. The key is for homeowners to monitor the levels of moisture in their homes and then take steps to manage the humidity levels.

What Can a Homeowner do to Help Reduce Condensation?

Water vapor is part of our lives and our homes. To help control the amount of condensation in the home, experts recommend the following tips that you can share with your colleagues and clients:

- Use kitchen and bathroom exhaust fans.
- If you have a humidifier, set it to the correct outside temperature.
- If your home is overly humid, or if you have a damp basement, use a dehumidifier.
- Properly vent clothes dryers, gas appliances, and stoves.
- Open a window in the bathroom to bring in natural ventilation.

- Make sure your attic, basement, and crawl spaces are well ventilated and free from obstructions.
- Open curtains and blinds to allow more air circulation around your windows.
- Store firewood outside. According to the Chimney Safety Institute of America, freshly-cut wood can consist of up to 45% water, which adds water vapor to the home. Even well-seasoned firewood generally has 20% to 25% moisture content.

Worrisome Windows

Homeowners with the most cause for concern are those with older, less efficient windows. People need to remember that windows are just like any other major part of the home. They wear out over time and need to be replaced. If a homeowner has windows with air leaks, that don't close properly, or are failing to act as a solid barrier to the environment, then it's time for them to consider replacing these older units with energy-efficient windows.

What else can you do to help homeowners understand about condensation and windows? Make sure you explain to them the difference between condensation on the glass and between the glass panes of the window. If they are seeing moisture, fogging, or cloudiness between the panes of glass in a window, this is a strong indication that the seal of the window has failed and it's time to replace that specific window. In operable window units, a failed seal can often be corrected by simply replacing the sash. However, seal failure reduces energy efficiency and the unit will not work as effectively to help homeowners keep energy bills low and enjoy comfortable living in their home. While condensation on the interior or exterior of the glass is manageable, moisture between the glass needs swift attention by homeowners.

The good news is that there are several free consumer booklets on how to know when it's time to replace windows, energy efficiency of windows and selecting windows for a new home.

Condensation Resistant Factor (CRF) Tool

One extremely useful tool for architects and builders is the Condensation Resistance Factor (CRF) Tool, which is intended to provide general guidance on suggesting a minimum CRF based on a project-specific set of environmental conditions.

According to the American Architectural Manufacturers Association (AAMA), while not an absolute value, the CRF is a rating number obtained under specified test conditions to allow a relative comparison of the condensation performance of the product. The CRF provides a comparative rating of similar products of the same configuration and permit the determination of the conditions beyond which an objectionable amount of condensation may occur.

AAMA experts point out that condensation in the field can result from many variables including thermal conductivity of surrounding building construction, the type of interior and exterior trim used on a project, humidification control, and the method of heat distribution on the interior of the home. Certain construction elements will also impact the degree of condensation that windows are exposed to over time, including the type of wall construction and materials used along with locations of thermal barriers in the product with respect to the wall cavity.

Even the simple activities in the home of open and closed drapes during daylight hours can affect the condensation found over time in and around window units. Solar radiation and orientation can also play a factor. For more information and calculations used to determine the CRF rating, visit the AAMA web site at <http://aamanet.org/crftcalculator>.

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