

Replacing Windows? Ask About Condensation Resistance.

Most people know about the National Fenestration Rating Council (NFRC) rating system and label that shows consumers how a window performs in several areas, such as, thermal insulation, solar heat gain, visible light transfer and air leakage. What most people don't know is that the NFRC also rates a window's condensation resistance (CR). While, the U-Factor, which rates thermal insulation or how well a window prevents heat from escaping, is most important. For cold climate like Illinois, another important rating, maybe CR. Since this rating is optional for manufacturers to include on their [Energy Star label](#), it may not be available, however it is important to consider when purchasing new or replacement windows.

Condensation on your windows can be worse in winter when the outside temperature is below the dew point of the indoor air. Water or frost appears when warm moist air comes in contact with colder dry air.

Maybe your windows have a single pane of glass, which provides no insulation. Since condensation is more likely to form on cold surfaces than warm surfaces, there are water droplets or ice on the glass. If this describes your windows, be aware that upgrading your windows to today's technologies will make a significant difference.



Early double-pane wood windows with aluminum spacers can experience condensation. The aluminum spacer separating the two panes of glass is very conductive, thereby transferring in the cold from the outside. Spacers are located around the glass edges and so conduct heat from the inside pane to the outside pane. The area where the wood meets the glass can develop condensation, freeze, thaw, and eventually rot the wood.

Today's windows are engineered differently. Frankly, the most important part of the window to resist condensation is that spacer that keeps the panes of glass apart and seals in the gas. Today's spacers are made of less conductive stainless steel, U-shaped tin steel, and foam polymers. Low-E and gas filled glass panes reduce temperature transfer between the inside and outside. Add the frame, to this list of improved materials, and you essentially have the features that are measured in the NFRC U-factor ratings. The NFRC recognizes three parts to a window: the center-of-glass, the edge-of-glass, and the frame. The lower the U-factor, the better the window is at keeping heat in - particularly important during winter's heating season.

Some condensation is expected and can result from any number of variables, including a homeowner's lifestyle. Dryers that are not vented to the outside, gas cooking without using the vent, room humidifiers or forgetting a boiling teapot, our lifestyle choices all contribute.

However, sloppy, wet, sweaty windows are unsightly and left unchecked, the constant moisture can lead to serious damage of the windows, window coverings and walls.

If you're in the market for replacement windows remember to ask about the features that contribute to condensation resistance. For example, our colder climate makes aluminum frames a poor choice, but if you must have this for your modern home make sure the window you choose has thermal breaks. Second, opt for Low-E and argon or krypton gas fills between double or triple panes. Third, ask about warm-edge spacers, which are no-metal or spacers made of less conductive metals.

With so many window choices out there, it would be nice to have a simple rating system, like the U-factor to compare windows for condensation resistance. The NFRC and others, have attempted to articulate a common measurement for manufacturer's to use, which is called the CR scale of 1-100, with a higher number representing more resistance to the formation of condensation. A single pane wood window might have a rating of 15, while a triple-pane wood window may achieve a rating of 75. A cold climate, like Illinois, ideally would opt for a rating over 50.

So why aren't window manufacturer's required to include the CR rating on their windows? In a nutshell, while it's a valuable metric to obtain, there are still multiple ways to measure condensation resistance and limitations to either rating method. It may come back to the homeowner's lifestyle choices contributing to indoor condensation. For example, shades, curtains, and blinds tend to reduce the amount of airflow across the window. This allows the window to cool and increase the likelihood of condensation.

Woodland Windows and Doors have done the research about condensation resistance and have discovered that a single rating probably isn't a particularly useful number. However, selecting new or replacement windows that reduce the relative risk that you will have condensation is a very worthwhile pursuit. If you need to maintain a higher interior humidity during the winter months, for health or comfort reasons, you want to pay attention to the edge-of-glass details. Or maybe you just want to be sure you understand the important features and specifications of the windows you buy.