



BLOG

The Home Inspector

(http://www.startribune.com/variety/homegarden/blogs/Reuben_Saltzman/)

How to control window condensation during deep freeze

By Reuben Saltzman | JANUARY 31, 2019 — 5:38AM

This is a re-blog by guest author Ryan Carey, of My 3 Quotes (<http://getmy3quotes.com/>).

Condensation can turn wood windows black and make a mess of window sills. It's a very common occurrence here in Minnesota. The typical homeowner goes online to read numerous articles about how they must be doing something wrong with their humidity levels to experience so much condensation. In some cases, they have condensation forming, freezing, and melting all over the wood. They consider adding air exchangers (<http://www.structuretech1.com/2009/12/hrvs-part-1-of-3-why-houses-need-them-what-they-do/>) with humidity control, throwing all plants out of the house, and telling the family to cut down on showering, cooking, and breathing.



(http://www.structuretech1.com/wp-content/uploads/2015/03/20150107_1433511.jpg)

Studies show a typical family of 4 releases around 2.5 gallons of water per day into the air of their house. However, most of those families can't imagine cutting down on winter humidity levels when the house already seems bone dry. Your skin is cracking around the knuckles, lips are chapped, and giving your kid a kiss goodnight can cause a static spark so loud that it nearly gives the dog a heart attack. Yet there is still condensation on the windows? Why is this happening? In this

post, we will talk about the causes and effects of window condensation, as well as strategies to prevent it from happening.

Why Does Condensation Happen?



(<http://www.structuretech1.com/wp->

[content/uploads/2015/03/20140519_1814271.jpg](http://www.structuretech1.com/wp-content/uploads/2015/03/20140519_1814271.jpg))

OK, so here's the science of it: when the temperature of your glass drops below the dew point of the air inside your house, condensation starts to appear on your window glass. The dew point is the temperature at which the air is fully saturated with water vapor. Dew points in the 50s and lower 60s are pretty comfortable, but imagine how easy it is for the interior glass temperature to get well below that on a cold night in MN.

The bottom line is that there are only two variables to window condensation: indoor humidity and window temperature. To prevent condensation, these need to be controlled. Let's talk about how to do that.

Control humidity

Indoor humidity can be lowered by doing all of those things that I listed at the beginning of this post. Reuben listed a bunch of ways to lower indoor humidity levels in his blog post on [siding stains \(http://www.structuretech1.com/2014/11/qa-siding-stains-why-do-houses-cry/\)](http://www.structuretech1.com/2014/11/qa-siding-stains-why-do-houses-cry/), all of which apply to this situation. Here they are, word for word:

The most obvious "no-duh" thing would be to turn off your whole-house humidifier (<http://www.structuretech1.com/2009/01/whole-house-humidifiers-harm-houses/>) if you have one. A few other ways to lower indoor humidity levels are:

- Install [timers \(http://www.homedepot.com/p/Defiant-6-4-Amp-4-Hour-In-Wall-Digital-Countdown-Timer-with-No-Neutral-Wire-CFL-and-LED-49816/203678183?N=c334#\)](http://www.homedepot.com/p/Defiant-6-4-Amp-4-Hour-In-Wall-Digital-Countdown-Timer-with-No-Neutral-Wire-CFL-and-LED-49816/203678183?N=c334#) on your bathroom exhaust fans that will run the fans for an hour at a time, and use the fans.
- Install bathroom exhaust fans in bathrooms that are used for showers or bathing if not present.
- If the kitchen hood fan exhausts to the exterior, use it while cooking.
- If you have too many plants (or weeds) in your home, fix that.

- *If you have a crawl space with no vapor barrier, fix that. Crawl spaces with dirt floors are major contributors to indoor humidity.*
- *If your home doesn't have a ventilation strategy, add one. To understand what that means, please read this excellent article by [Allison Bailes](http://www.energyvanguard.com/allison-bailes-energy-vanguard-story/) (<http://www.energyvanguard.com/allison-bailes-energy-vanguard-story/>) at the Journal of Light Construction web site: [Choosing a Whole House Ventilation Strategy](http://www.jlconline.com/ventilation/choosing-a-whole-house-ventilation-strategy_o.aspx?dfpzone=general) (http://www.jlconline.com/ventilation/choosing-a-whole-house-ventilation-strategy_o.aspx?dfpzone=general).*
- *Read the article linked to above. Seriously. This will make the rest of this blog post make more sense.*

To monitor indoor humidity levels, buy an indoor humidity monitor (http://www.jlconline.com/ventilation/choosing-a-whole-house-ventilation-strategy_o.aspx?dfpzone=general) and put it in the upper level of your home. Unfortunately, keeping indoor humidity levels low enough to completely avoid condensation at windows can lead to a very uncomfortable home. There are charts that have easy recommendations for avoiding condensation: 20 degrees outside? Lower house humidity to 40%. 0 degrees outside? Lower house humidity level to 30%. -20 degrees outside? Lower house humidity level to 15%! The Mojave Desert has a daytime humidity level that ranges from 10%-30%. Doesn't that sound comfortable? Absolutely, if you're a gecko.



(http://www.structuretech1.com/wp-content/uploads/2015/03/20150104_0825021.jpg)

Thankfully, we don't have sustained temps in -20's here in Minnesota all that often, so keeping your humidity level in the 30% range is usually enough to prevent condensation, but again, that's a pretty dry house. I'm guilty of having humidifiers going in my daughters' rooms nearly all winter as they struggle through one winter sickness to the next. Of course, that results in some condensation, as shown in the picture at right. However, I have vinyl windows so the condensation I get doesn't hurt the product, and there is less condensation because of the foam spacer and upgraded glass.

Control window temperature

To help keep your windows warmer during the winter, don't close your blinds all the way to the bottom at night; you need warm air to wash over the windows to help keep them at a reasonable temperature. During the day, keep the blinds open. Even taking the screens off of crank-out windows helps a little to allow heat to reach the glass. That's about all you can do to keep the interior surface of your windows warmer, short of replacing them.

Here's a video summarizing all of the above: <https://youtu.be/1bBF-KlueI4> (<https://youtu.be/1bBF-KlueI4>)



Other strategies

If you're not willing or able to control the above-listed variables enough to prevent window condensation, consider using a temporary window insulator kit from 3M (http://solutions.3m.com/wps/portal/3M/en_US/NAHomeEnergy/Home/Products/~3M-Indoor-Window-Insulator-Kit-2-Windows?N=7579606+3294348365+3294529207&rt=rud). These are usually quite effective at reducing condensation because they basically add another layer to your window on the inside of

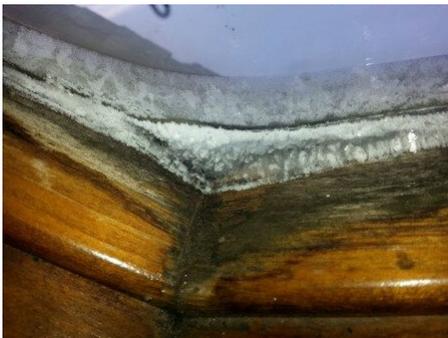
the home.



<http://www.structuretech1.com/wp-content/uploads/2015/03/3M-Window-Insulator-Kit.jpg>

If you don't like any of these ideas, consider replacement windows. If your home was built in the '70s, '80s, or '90s, you may have the unfortunate combination of a tightly sealed house and double-pane pine windows with aluminum spacers between the two panes of glass. If you've read the rest of my [window series](#)

<http://www.structuretech1.com/category/window-replacements/>, you know how I feel about aluminum spacers and real wood windows. The aluminum spacer that runs along the perimeter of the glass conducts the cold from the outside pane to the inside pane, making the glass surface even colder. Since none of the double pane windows from that era had new glass technology like Low E coating and argon gas available, the aluminum spacer gets nearly as cold as the outside temperature which causes more condensation (and sometimes freezing) on the inside piece of glass. The condensation forms on the coldest part of the glass, which tends to be the bottom edge where it meets the wood. Bottom corners are the coldest, with aluminum spacers meeting and helping to create the condensation "smile" that lifts up higher at those corners.



http://www.structuretech1.com/wp-content/uploads/2015/03/20150109_1038351-e1425224971424.jpg

The windows from the '60s and earlier were made of hardwood or old-growth pine, which holds up much better to moisture than the soft pine used in windows today.

Even if you use real wood again on the interior, today's glass packs with multiple layers of Low E coating and argon gas are more effective and keep the inside glass at a higher temperature, resulting in less condensation and lower energy costs. Regardless, no window can completely eliminate condensation, so I encourage customers to go vinyl, composite, or fiberglass on the interior when getting new windows since those won't be hurt by water. Any spot where the glass meets soft pine makes me nervous about maintenance issues, even with today's glass. That is also why non-wood windows have longer warranties than their real wood counterparts.

Some people may choose wood if they didn't have a previous condensation problem with the old windows. However, I've seen times when homeowners get condensation for the first time with new windows because the old windows were so drafty. The new windows are better at trapping air, which means fewer air changes per hour, which means a more humid house and a new problem. New houses are built so tight that they often have condensation on the windows, and the construction process can add to that when the newer studs and other wood components temporarily release moisture into the air.

Conclusion

The good news for those of you with the deteriorating wood windows is that you can minimize the damage by controlling humidity and following these tips. The bad news is many people don't want to follow these tips, myself included. Some people want to close their blinds, use humidifiers for the kids, and keep their house at a humidity level that doesn't cause their skin to crack. If you are one of those people, your wood windows are probably turning black. Staying on top of it year to year with sanding and re-varnishing the area where the glass meets the wood can certainly help. People have also bleached them at times to get some of the mold out. In the end, it depends on your own threshold for humidity levels, and whether or not you can continue on with the wood windows or get them replaced with something more moisture-friendly.

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Reuben Saltzman is a second-generation home inspector with a passion for his work. Naturally, this blog is all about home inspections and home-related topics in the Twin Cities metro area. In addition to working at Structure Tech (<http://www.structuretech1.com>), he is also a licensed Truth-In-Sale of Housing Evaluator in Minneapolis, Saint Paul and several other cities.