



DRY AND CLEAR

**How to eliminate
wintertime window
condensation and
breathe healthier**

Does condensation build up on the inside of your windows during the heating season? Does water run down the glass, forming ice and triggering mold growth. If it does, you're not alone.

Winter window condensation is a growing problem in regions that get cold winters and its root has a surprising origin. As homes are sealed better against air leakage, natural ventilation to the outdoors is reduced. As a result, indoor air becomes much more likely to contain damaging levels of moisture during winter. If your windows sweat enough during the heating season to require periodic wiping with a towel, then you've got a problem. And this problem goes beyond ruined window frame finishes and obvious mold growth on window sills. It includes the very real potential for

decay occurring within wall cavities and attics, too. Window condensation can also be a sign of low indoor air quality that affects your health. All this is why you should do something.

Where the Water Comes From

When warm, moist indoor air meets the cooler surfaces of windows during winter, condensation develops on the glass. It's the same thing that happens on the outside of a drinking glass filled with a cold beverage on a hot summer day. Flaws in your home's vapour barrier (and there are bound to be some in every home) can allow warm moist air to seep into internal wall cavities, condensing there as it did on your windows, creating a perfect breeding ground for hidden molds, fungus and other nasties. Breathing, cooking, showering and drying



clothes all release huge amounts of moisture into the air. In the good old days, this moisture would make its way outside through all the cracks that were once common around windows and doors. That's why old, leaky, drafty houses are often so dry during winter, with no window condensation at all. And while today's tighter homes mean lower energy bills, they also demand that we intentionally provide some sort of fresh air to vent off all that water vapour. Boosting home ventilation is the key to solving the window condensation problem, and there are three ways to do it.

Three Tactics for Drying Your Windows

Tactic#1:

Open windows a little and use exhaust fans consistently.



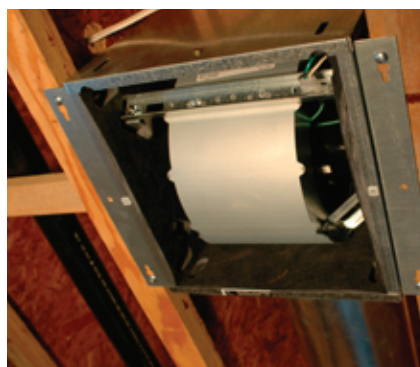
This approach is all about using what you have to best advantage. Yes, opening windows in winter will cost you more in heat, but it still may be the cheapest way to solve your moisture problem, especially in a small home. Bathroom exhaust fans, in particular, should be used during every shower or bath

and for at least 15 minutes afterwards. Dryers that vent indoors spew massive amounts of moisture into your home. Proper outdoor venting of your dryer could solve the whole problem for you if it's not directing air outside now.

“Interior condensation in winter is a problem in itself, but it’s also a warning of poor indoor air quality.”

Tactic#2:

Install exhaust fans in high-moisture areas.



Give this a try if condensation isn't too bad, but not completely solved by opening more windows and running your existing fans. Just be careful what you install. The world has more than enough cheap, loud, irritating exhaust fans. Expect to pay at least \$200

for a good unit, and consider installing it with a variable speed control. The ability to dial fan speed up or down is an advantage. Some people get great results with a quiet exhaust fan running slowly all the time. Units like this are almost silent, but they move enough air to make a difference.

Tactic#3: Install a heat recovery ventilator (HRV).



Although this option costs \$2000 to \$2500 installed, it will fix your wet window problem once and for all. It will also retain most of the heat that you'd normally lose through open windows and out of exhaust fans. In fact, HRV's are

so effective and energy efficient that they're now required by code for new houses in some jurisdictions. HRV's incorporate fan ventilation with a built-in heat exchanger that typically extracts 75% to 85% of the heat out of stale indoor air before exhausting it outdoors. This saved heat is then transferred to a fresh stream of air coming into your home from outside.

Will an HRV work in a home that has no ducts to distribute the fresh air? I wondered the same thing back in 1993. After failing to find anyone who would give me a definitive answer, I went ahead and installed my own HRV in a second-story storage area in my sweaty-windowed home, with one stale air intake pipe going through the floor to draw air from the level below, and one fresh air outlet leading into the second story room just outside the storage area. The result has been excellent performance, despite no air ducts. Having the inlet and outlet on separate floors forces house-wide circulation. Even in single-story homes, by strategically locating your HRV in the basement (perhaps with a small amount of ducting) you can expect excellent performance and dry windows.

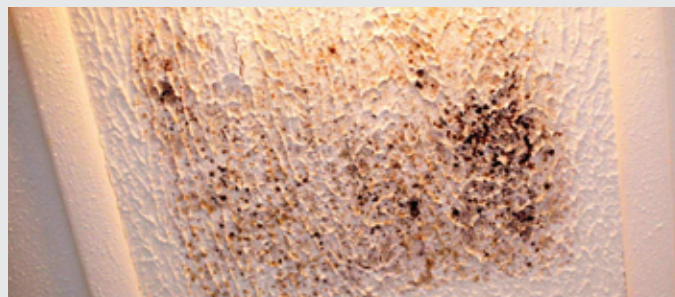
Before you go ahead and commit to an HRV, check on a few things first. Is the humidifier on your furnace turned off? No point in adding more moisture to the air if you've already got too much. Shutting off the humidifier may solve your wet window problem once and for all, and do it cheaply. Also, if your current windows have only one pane of glass, they may still sweat even with an HRV on your side. With such low insulation properties, the glass surface will remain a potent source of condensation because it gets so very cold.

One More Thing

The greater the insulation value of windows you have, the higher the indoor humidity you can have in your house without condensation forming. Triple pane windows, for instance, are much less likely to form condensation than double-pane, all else being equal. Also understand that replacement windows that are merely better sealing than you've got, without offering a higher insulation value, can actually cause increased window condensation because they reduce air leakage and natural ventilation.

“Low indoor air quality is the single most common hidden source of illness in climates with a heating season.”

Indoor Air Quality: A True Story



In the winter of 2013, I visited a friend and noticed mold stains on the ceiling of her house. That's the actual ceiling to the right.

“Isn't that terrible?”, she admitted, as she saw me looking up. “There's mold all over this plan. I wish the landlord would do something.”

As it turns out, the landlord had done something. A heat recovery ventilator (HRV) had been installed when the house was built in the 1980s, but without instructions on how to use it, my friend never turned it on in the 12 years she'd been living there. She didn't know how. Lack of ventilation in this tight house drove indoor humidity levels sky-high during winter, resulting in condensation and mold growth. Besides an unusually high incidence of cough's in the family, my friend's 13 year-old son had always suffered from chronic asthma ever since he was a baby.

“Does his asthma get worse in winter?”, I asked. “Yes, it always does.”

“How about your windows?” Do they steam up with condensation?”

“Yes, all the time. When the weather gets cold you can't even see out of the windows.”

Everything I heard pointed to a classic example of mold contamination and poor indoor air quality during winter. Very poor. That's why I suggested the installation of an HRV, but a quick look at her home showed that she already had one. All she had to do was hit the button and dial the humidity knob down to about the 30% level. Within hours of doing that, windows became clear. Over the course of the winter, mold stopped growing in the house and 12 years of doctors visits, drug treatments and asthma attacks stopped. The HRV made all the difference. This always makes me wonder how many kids are sick these days because their house makes them that way. It shouldn't happen.

Frequently Asked Questions

New Windows, More Water?

Q: *I just had new windows installed in my place and they form more condensation than the old ones did. What went wrong?*

A: Nothing. Those new windows of yours are actually sealing better than the old ones did. They're holding in more of your heated air, along with the moisture it contains. Take steps to reduce indoor humidity levels and your window condensation will decrease. There's no need to go crazy, though. A little condensation around the edges of windows causes no problems.

HRV Doesn't Work!

Q: *I have a heat recovery ventilator (HRV) but my windows still get wet. What should I do?*

A: I've never seen a properly sized and operated HRV fail to completely dry out a wet-windowed house. Assuming the unit has been installed properly, a common problem is setting the fan on too low a speed, or not running the HRV often enough each day. Some HRVs have a humidistat control that turns the unit on only if humidity levels rise to a certain level. Trying turning the humidity dial down and see if this helps. HRVs can also stop working if their internal filters are clogged.

Damp Bathroom

Q: *I use the exhaust fan in my bathroom, but there's still lots of moisture on the window. The ceiling is black and moldy, too. What can I do?*

A: You need to leave your bathroom fan on for at least 15 minutes after a shower to keep moisture under control. It's also very likely that your exhaust fan is too small to function properly. Many bathroom fans are. Try operating your fan for longer periods of time after a shower. Try 30 minutes and see if this helps. If not, consider having a bigger fan installed. Most bathroom exhaust fans move 80 cubic feet per minute of air. Upgrade to one that moves twice that amount and you'll see a big difference.

Ice on New Windows

Q: *Why does ice form on my new windows? I just had them installed and I'm really disappointed.*

A: Ice often forms on decent windows during very cold weather when indoor humidity levels are too high. Lower the indoor humidity levels and your ice problem will disappear.

Dehumidifier for Drier Windows?

Q: *Can't I just use a dehumidifier to dry out my wet windows in winter?*

“An HRV is just as effective at boosting indoor air quality during the summer cooling season as it is during the winter heating season.”

A: No, and there are two reasons why. First, no dehumidifier can get your household humidity levels low enough to dry out windows in winter. You could run that thing constantly and it will only help, not eliminate the problem. And second, even if the dehumidifier dried your windows, you'd still have stale indoor air. Wet windows are not just a problem in themselves, but they also indicate low indoor air quality. There's no substitute for fresh air, either coming in through a window or through an HRV.

HRV and a Too-Dry House

Q: *I had an HRV installed and my house is way too dry. What can I do to stop the nose bleeds and keep my windows dry?*

A: In a word, compromise. Any decent HRV has the power to make your home too dry. Trouble is, the level of humidity required for comfortable living is often higher than required to keep windows dry. In practice, a little bit of window condensation during the coldest weather and a small amount of dryness-related discomfort is the best you can get. Windows with greater insulation levels in the glass will allow for higher room humidity levels without condensation, and more comfortable wintertime living.

Condensation Between Window Panes

Q: *Will an HRV get rid of the condensation between window panes in my house?*

A: No. Condensation between window panes indicates a failure of the air seal between pieces of glass. Services do exist for drying out and resealing windows like this. Replacing the glass is another solution.

HRV Electricity Use

Q: *Does an HRV use a lot of electricity? My utility bills are sky high.*

A: Typical HRVs use about 100 to 300 watts of power. At electricity costs of 20 cents per kilowatt hour, that works out to about a dollar a day or less assuming 24 hour-a-day operation.



Steve Maxwell is a home improvement coach who has been helping people succeed with their homes since 1988. Visit Steve online at BaileyLineRoad.com to learn, be entertained and win great prizes.