

# Moisture Condensation

## Understanding condensation

Condensation is the conversion of vapor to liquid. It occurs when the air becomes saturated with moisture and releases it in the form of water. It is recognized by the wet mist that sometimes clouds the interior glass on your home's windows.

This may also be the first warning sign that your home is retaining too much moisture elsewhere. And even if your house doesn't actually feel damp, that excess moisture could be doing damage in unseen places.

## What causes the excess moisture?

The air around us contains water vapor (humidity), and we add more water vapor to it by normal breathing, perspiration, cooking, cleaning, and showering. When the air becomes saturated with excess humidity, it dispels the moisture by condensing it back into water. This is what shows up on your window's glass.

## Why does condensation occur mainly in the winter?

Condensation occurs more often during cooler weather because a greater temperature difference exists between the warm interior of your home and the colder outdoors.

Warm air carries larger amounts of water than cold air. When warm, moisture-laden indoor air contacts a cool surface, such as a window pane, the moisture in the air forms condensation on that cooler surface.

The chart to the right shows inside humidity levels needed to avoid condensation.



Outside air temp.	Inside humidity
< -20°F	15% - 20%
-20°F - -10°F	20% - 25%
-10°F - 0°F	25% - 30%
0°F - 10°F	30% - 35%
10°F - 20°F	35% - 40%

*Based on engineering studies at 70°F indoor air temperature.*

# Fighting condensation

## Help your house breathe easier

Because you can't stop all sources of moisture in your house, ventilation is also very important. Your home needs to breathe to fight condensation. Remember that cold air can hold less water vapor than warm air, so in the winter the air outside is often "drier" than the heated air in your home. Therefore, by allowing moist inside air to escape and dry outdoor air to enter, you can reduce your home's humidity level.

You can take these steps to help ventilate your home:

- Run kitchen and bathroom exhaust fans more often during the winter to expel hot moist air.
- Open a window in each room a few minutes daily to keep air circulated.
- Keep window drapes, blinds and shades open, allowing warm air to circulate around the glass.
- Keep attic louvers open, because hot air rises and can be released to the outside.
- Open basement vents and crawl space vents to release moisture to the outside, reducing dampness under your house.
- Make sure your clothes dryer and gas appliances properly vent moisture-laden air to the outside.
- Install a fresh air intake on your furnace.

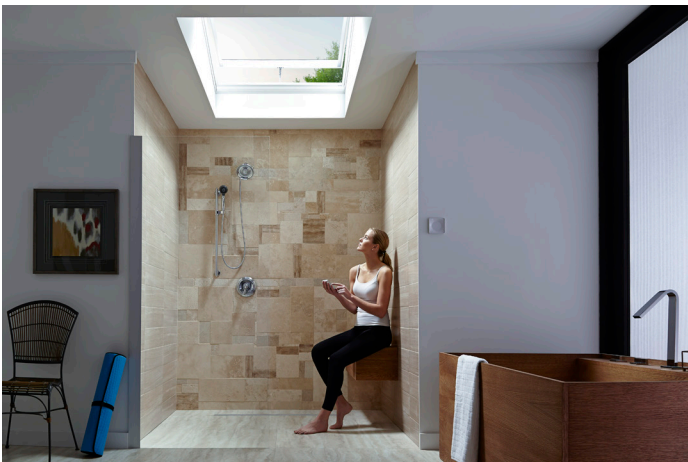
## What to look for:

- Mildew on walls, window seals, and baseboards
- Peeling or bubbling exterior paint
- Deteriorating attic and wall insulation
- Damaged floor tiles and deteriorating furniture
- Rotting of structural wood between outside walls

## Stopping excess moisture

Condensation is a moisture problem, and to fight it you need to limit the amount of water vapor in your home. Start by eliminating sources that contribute to excess humidity. Install double-paned insulated windows and doors with energy efficient Low-E glazings that help keep interior glass panes warmer.

- Double-pane your current windows by adding exterior storm panels.
- Install HVAC vents below windows to help warm the interior glass.
- Take shorter showers to reduce the indoor moisture.
- Cook with lids on your pots to reduce the moisture that is put into the air.
- Run ceiling fans to keep warm air from rising to the ceiling to help prevent condensation on roof windows and skylights.
- If your basement is concrete, provide drainage where ground water could be building up.
- Run a dehumidifier during winter months and damp weather.



## How installing skylights can help

Ventilation is a big step in the fight against condensation. That's why VELUX builds roof windows and skylights with several exclusive features that can help your house breathe easier.

### Ventilation

VELUX roof windows and ventilation skylights can be opened with manual or electric controls to release the warm, moist air within a home.

### Wood sash and frame helps insulation

All VELUX roof windows and skylights are constructed with quality wood, not metal or vinyl. Wood is an excellent natural insulator because it does not conduct heat like metal or vinyl.

### Energy efficient glass

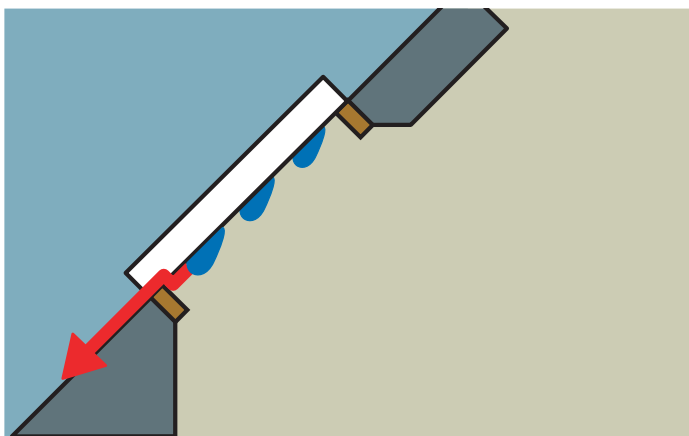
All standard VELUX roof windows and skylights come with Low-E insulated glass. Low-E keeps the interior glass pane warmer to lessen the chance of condensation forming.

### Warm edge technology

VELUX insulated glass panes use technology and materials that keep the edges warmer to resist the formation of condensation.

### Gasket system drains condensation

Should condensation occur, our skylights are even equipped with an exclusive gasket system that aids drainage of condensation to the outside.



## Maintenance tips

Before leaving the factory, all VELUX roof windows and skylights are treated with a temporary water-based fungicide and bactericide. After installation they should be given further coats of a good quality paint or wood varnish at regular intervals.

If, however, condensation has been a problem, some discoloration or mold growth may have occurred and although the strength of the timber is unaffected, the result can be unsightly.

### Removing wood mildew

1. The mold must be killed using a sterilizing agent. Scrape off any surface mold, then clean the area with a solution of 1 part household bleach diluted in 10 parts water.
2. Rinse well with clean water. When thoroughly dry, rub down wood with medium sandpaper. Repeat steps 1 and 2 until mold is removed.
3. Finally, coat with a proprietary clear wood preservative and then finish with paint or wood finish as desired.



## More information:

### Building Research Council:

University of Illinois at Urbana-Champaign  
(800) 336-0616

Circular Series Index No. F6.2 on  
"Moisture Condensation" (Vol. 13, No. 1)

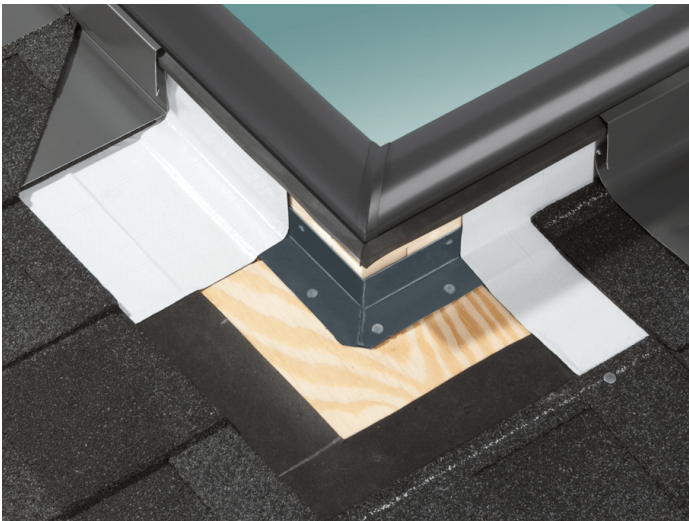
### American Society for Testing and Materials

Trechsel, Heinz R. 1994

Moisture Control in Buildings  
ASTM manual series: MNL 18

This brochure is produced solely as an aid to owners of VELUX roof windows and skylights who may be experiencing condensation problems. VELUX America LLC. cannot, however, accept responsibility for these problems, the accuracy of any statement, or the failure of remedial action.





*Installing roofing underlayment between the skylight frame and roofing material will help prevent condensation on the cladding and flashing.*

## When a leak isn't a leak!

Condensation can form on more than just glass. In some cases, the installer neglects to use roofing felt and insulation between the frame of the unit and the rough opening. This allows warm, moist air to escape from the room and come into contact with the underside of the flashing and/or cladding. The resulting condensation will drip back into the room between the frame and rough opening, giving the appearance of a leak. Having the roofer or installer add felt and insulation between the frame and rough opening should prevent this problem.



## Condensation and skylights

Condensation is usually more noticeable on skylights because warm, moist air rises to the ceiling. The problem, however, usually isn't the skylight. It's the excess moisture in the room. Condensation is more prevalent in new homes. After a few years, new homes tend to dry out and have fewer moisture problems. Eliminating excess moisture by using a dehumidifier and providing adequate ventilation and air circulation will go a long way in preventing condensation.



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