



# Condensation Guide



## Why does condensation form?

Cold houses are usually damp houses; nearly a third of New Zealand homes are damp. Humans produce moisture through basic activities like cooking, bathing—and breathing. Water-saturated air causes condensation as it comes into contact with a cooler surface.

New Zealanders are all too familiar with heavy condensation on the inside of window frames and/or glass, that can run down the panes to pool on window sills. It is most common in the colder months because the difference in the exterior and interior temperatures is greater.

“The vapour condenses and settles first on colder, non-absorbent surfaces, such as glass. Moisture can be harder to see on other surfaces, but still penetrates carpets, fabrics and any other absorbent surface, often making them feel cold and damp”

## Where does the moisture come from?

Although windows may seem like the culprit because that is where the water droplets can be seen, they are not actually the cause of condensation. Condensation is due to the daily activities of you and your family within your home. Household activities affect the average moisture added to the indoor air. A four-person home could produce around 11 litres of moisture through breathing in just a 24 hour period.



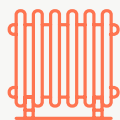
Clothes Washing  
500 mL/day



Showers & Baths  
1.5 litres/day per person



Dishes  
1.0 litres/day



Gas Heater  
(unflued)  
1.0 litre/hour



Breathing  
20 mL/hour  
per person



Cooking  
3.0 Litres/day



Clothes Drying  
(unvented)  
5.0 litres per load



Pot plants  
as much as  
you give them





## Condensation in new homes

If your house is new or recently renovated, there's probably excess moisture in some of the construction materials that needs to dry out. For example, a newly laid concrete floor has around 120 L of water/m<sup>3</sup> that needs to dry from the slab. This may take a few months but you can speed up the process with heating and ventilation.

Moisture levels are also determined by your geographical location and climate, as humidity levels vary across New Zealand. If the moisture generated within the home needs to be reduced, condensation issues may be present even with high performance thermal windows.

## How to reduce condensation

### Top tips:

- Eliminate avoidable moisture - dry washing outdoors rather than indoors.
- Extract moisture by using extraction fans (vented externally) in the kitchen, bathrooms and laundry.
- Air out the home regularly - open doors & windows to create a cross draft, or use a ventilation system.
- Keep the home warm - insulation and heating improve ventilation effectiveness



### Reduce moisture inside

Portable dehumidifiers are one way to reduce moisture and condensation during the Winter months. They are small units designed to pull moisture out of the air before it has a chance to condensate on windows and surfaces. Bathrooms, laundries and kitchens are where the most moisture is generated, these rooms should have extraction fans with vents to the outside. The humidity level in your home should be around 40-50%



### Increase Ventilation

Ventilation is described as the number of air changes per hour and the recommendation is for around 1/3 to 1/2 of the volume of air in a house to be replaced every hour. Houses built after 2000 are more airtight than older homes, where 'air-leaky' construction contributed to ventilation. One simple way to reduce window condensation is to open windows in your home for a short time every day. This creates a through-draft which releases the damp, stale air and allows fresh air to circulate through the home - some suggest around 15-20 minutes a day is sufficient to improve indoor air quality.



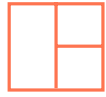
### Improved Insulation

For improving the thermal properties of your windows, choose double glazing + LowE which works to increase the internal glass surface temperature and reduces the likelihood of condensation on the inner glass surface.

## Key facts about moisture and condensation



Indoor moisture and condensation is caused by the activities in the home such as cooking, showering and breathing.



Windows do not cause condensation.



Given the right conditions, condensation will form on any surface. That dampness could be right through your home.



High humidity can promote mould growth and deterioration in the home. The humidity level in your home should be around 40-50%



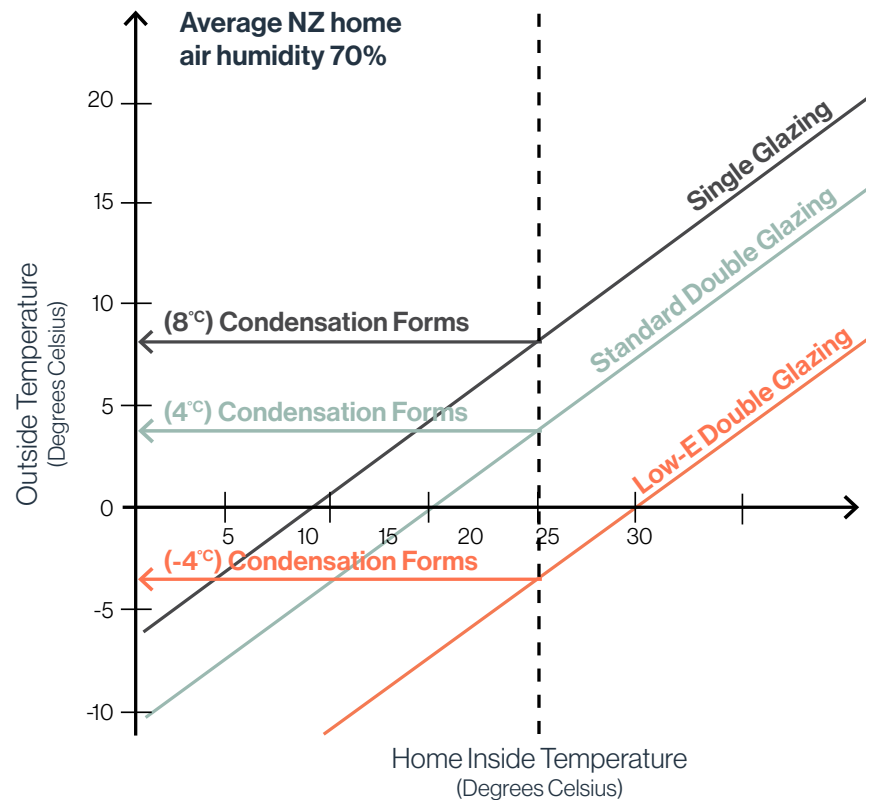
Adequate ventilation, dehumidifiers, and double glazing help reduce condensation



## Predicted dew point and condensation

The surface temperature at which condensation begins to form is called the “Dew Point”. Relative Humidity is a measure of the water content of the air at a given temperature. Many domestic activities, such as cooking and washing, will liberate water vapour and increase the relative humidity and thus the occurrence of condensation. The onset of condensation on the interior glass surface can be controlled either by reducing the humidity, thereby lowering the dew point, or by raising the inside glass surface temperature.

The use of Low-E glass and/or Argon Gas further enhances the U Value performance, making the inner glass warmer, and thus reducing condensation.



## Further Reading

Dealing with internal moisture ([BRANZ Build 156 Article October 2016](#))

Combating Internal Moisture ([BRANZ Build 151 Article December 2015](#))

New Homes Dripping ([BRANZ Build 151 Article December 2015](#))



17 Fitzgerald Lane, Hawera 4673  
Taranaki

+64 6 272 9080

[enquiries@unowindows.co.nz](mailto:enquiries@unowindows.co.nz)

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