



Condensation

Condensation in homes explained



Introduction

Condensation is the process where water vapor becomes liquid.

Condensation happens one of two ways: Either the air is cooled to its dew point or it becomes saturated with water vapor that it cannot hold any more water.

Dew Point

Dew point is the temperature at which condensation happens. (Dew is simply condensed water in the atmosphere.) Air temperatures can reach or fall below the dew point naturally, as they often do at night. That's why lawns, cars, and houses are often coated with water droplets in the morning.

Condensation can also produce water droplets on the outside of soda cans or glasses of cold water. When warm air hits the cold surface, it reaches its dew point and condenses. This leaves droplets of water on the glass or can.

When a pocket of air becomes full of water vapor, clouds form. The point at which condensation starts can be easily viewed in cumulus clouds, which have flat bottoms. Those flat bottoms are where vapor begins to condense into water droplets.

Saturation

Clouds are simply masses of water droplets in the atmosphere. Molecules in water vapor are far apart from one another. As more water vapor collects in clouds, they can become saturated with water vapor. Saturated clouds cannot hold any more water vapor. When clouds are saturated with water vapor, the density, or closeness, of the molecules increases. The vapor condenses and becomes rain.

Cold air holds less water vapor than warm air. This is why warm climates are often more humid than cold ones: Water vapor remains in the air instead of condensing into rain. Cold climates are more likely to have rain, because water vapor condenses more easily there.

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Condensation in homes explained

Condensation forms inside homes because the warm air inside a home can hold more moisture than cool air outside and when this warm moist air meets a cold surface (such as a window or frame), it condensates.

Older homes that are more “leaky” are better able to naturally ventilate this moist air through gaps in the building fabric. Unfortunately, this also take the heat with it.

During a renovation, if the building fabric is better sealed, this air is better kept within the building envelope which is a good thing for improving efficiency in terms of heating/cooling, but also means that there is less fresh air venting through the house and means moisture tends to stay in the envelope.

Other than reducing the indoor temperature, which is not ideal in winter, here’s what you can do to create a very comfortable and efficient home that doesn’t have severe condensation:

- Reduce cold surfaces in the house by using energy efficient doors and window with good double or triple glazing

Try to dry the air out by reducing the humidity. Here are some examples:

- Use extraction fans while cooking (boiling water, even boiling the kettle), showering, using a tumble dryer etc. and even keep this on for 10-15 minutes afterwards to try get as much of that moisture out as possible
- If hanging clothes/towels/sheets to dry inside, try and keep this in one room with the door closed and ventilate where possible (i.e. keep a window ajar) to avoid the moisture travelling around the entire house
- Use a dehumidifier to actively reduce the humidity within the air
- If exercising in the home, try to ventilate the room



What do condensation problems look like?

Generally condensation problems are relatively easy to diagnose and detect. If you notice any of these signs then as a 'rule of thumb' you likely have a problem with condensation:

- Water droplets on windows or walls
- Decaying window frames, particularly stained & wet corners
- Damp walls causing peeling wallpaper
- Musty/damp smells around the property
- Black mould on walls, curtains, carpets, bathroom tiles and window sills
- Water droplets on felt and timber in the loft possibly leading to rot:

Many people wake up in a morning and open the curtains to see streaming windows, especially in the winter, this is usually a sign that you have an underlying problem that needs to be fixed. It is one of the most troublesome, recurring problems that we have all experienced and its presence can have a debilitating effect on the owners of the property.

Consequences of Condensation

The possible consequences of condensation formation within the building structure and subsequent high humidity environment created can include the following:

- **Health Risks:** Unseen mould growth behind wall linings and external cladding can be a health risk to the occupants, particularly the young or elderly. Detection and rectification can be difficult as well as costly due to the unseen nature of this problem.
- **Visual Deterioration:** Deflection or staining of plasterboard linings as a result of moisture trapped behind the linings can cause ugly stains and swelling and water droplets on internal walls – this is an obvious sign of moisture ingress or entrapment.
- **Structural Decay:** Moisture becoming entrapped within the structure can result in long term corrosion of external walls, metal structures, timber rot, loosening of nails as timber swells, and cladding rot or swelling which can result in costly rectification work.
- **Energy Efficiency:** A reduction in the buildings energy efficiency can occur due to moisture saturation of the insulation, which can result in loss of thermal performance.

Condensation is also a major issue for landlords and tenants it often means a continuous cycle of repair. Furthermore, poor ventilation can also affect tenants with asthma and other respiratory conditions. By installing an effective ventilation solution you are improving the quality of air and so reducing asthma triggers.

In addition to improving the health of those who live in affected properties, the rewards for successfully solving condensation problems, or preventing these recurring problems are enormous - not only in maintenance costs but also in the freeing up of housing maintenance personnel who annually return to the same dwelling to deal with the same recurring problems.

Ventilating Condensation

The best solution for condensation is to prevent condensation and the best prevention is proper ventilation, in order to vent condensation your home needs to have an adequate air flow and kept at a good temperature. When a room gets to a certain temperature, humidity gathers creating moisture in the air. If this excess moisture is not ventilated it will cause condensation.

To naturally ventilate your property you can open the windows, however this is not a realistic option as you don't want to leave your windows open all day for security reasons or even all year because of weather conditions.

You can help prevent condensation by doing things like, wiping down windows and window sills, putting lids on pots and pans when cooking and not overfilling cupboards and wardrobes as this restricts the movement of air. However, ultimately, if your home is poorly ventilated condensation will still build up.



References

- ¹ <https://www.nationalgeographic.org/encyclopedia/condensation/> (accessed 17 November 2021).
- ² Provided by G-Lux Builders
- ³ <https://www.envirovent.com/help-and-advice/why-ventilate/condensation-problems/> (accessed 17 November 2021).

All information provided correct as of November 2021