

A Quick Guide to Ventilation in the Home

Houses today are significantly more air tight than they were a few decades ago. This is even true for very old Victorian properties, as these properties are unlikely to be exactly as they were when first built. Closing off chimneys, putting in plastic framed windows with rubber seals, painting walls with modern paints, these all contribute to much greater air tightness.

Many rooms in the average house do not have an obvious way for fresh air to come in. And fresh air is very important. You need fresh air to: 1) maintain a healthy level of Relative Humidity (RH), and 2) to get rid of the products of combustion (gas cookers, candles) as well as CO2 produced by occupants and pets (and plants!).

Relative Humidity (RH)

Relative Humidity is the degree to which the air is saturated with water, expressed as a percentage, at a given temperature. So air with an RH of 80% at 21 degrees Celsius, is already at 80% of its water carrying capacity. There is an inverse relationship between temperature and RH. Lowering temperature raises RH, as colder air is less able to hold moisture.

This matters, because if this 80% RH is a reading from room air, if it hits any surface in the room at just under 18c (such as a window pane or cold area of wall), you will see condensation. Furthermore, allowing the temperature to simply drop below 18c in this same room (e.g. by turning off the heating) will produce generalised condensation everywhere as the air hits 100% RH. This is the same process by which morning dew forms on grass as temperatures drop overnight.

High Relative Humidity on its own is not a bad thing. Many tropical countries are naturally very humid. However, it can increase the risk of mould and condensation, and a host of problems to the building fabric through the process above.

The need for an active ventilation strategy

It is important that houses are made as air tight as possible, to improve energy efficiency and running costs. However, the majority of houses are already too air tight to simply rely on passive ventilation. This is because a passive ventilation system (or natural ventilation as it is often called) relies on the inherent leakiness of a property in combination with how strong the winds are (the primary force driving ventilation in these types of homes).

Recommended Active Ventilation Strategies

Energy Recovery Ventilation/ Mechanical Ventilation With Heat Recovery (MVHR)

This is the gold standard in active ventilation. Heat from air being exhausted from the home is used to pre-heat fresh air that is entering. However, it is very expensive to install, and will not be suitable for all homes on technical grounds.

Demand Driven Mechanical Extract Ventilation

This involves having passive vents in bedrooms and living rooms, plus extractor fans to pull this air through door undercuts via the rest of the house. An ideal system will adjust the actual ventilation rate automatically based on Air Quality Readings. This is the cheaper alternative to MVHR and will be suitable for a wider range of homes.

The Case for Air Quality Monitors

Whatever your chosen ventilation strategy (and there are more systems than listed above), it is important to acquire an Air Quality Monitor. This is because it is impossible to determine if your ventilation strategy is effective (or excessive) without being able to monitor Relative Humidity and CO2.



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