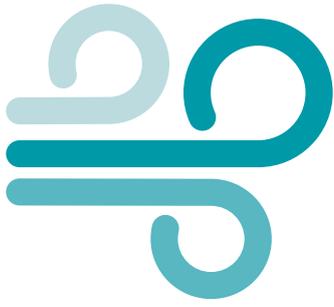




Everything else is just plasterboard

Is your home bad for your health?

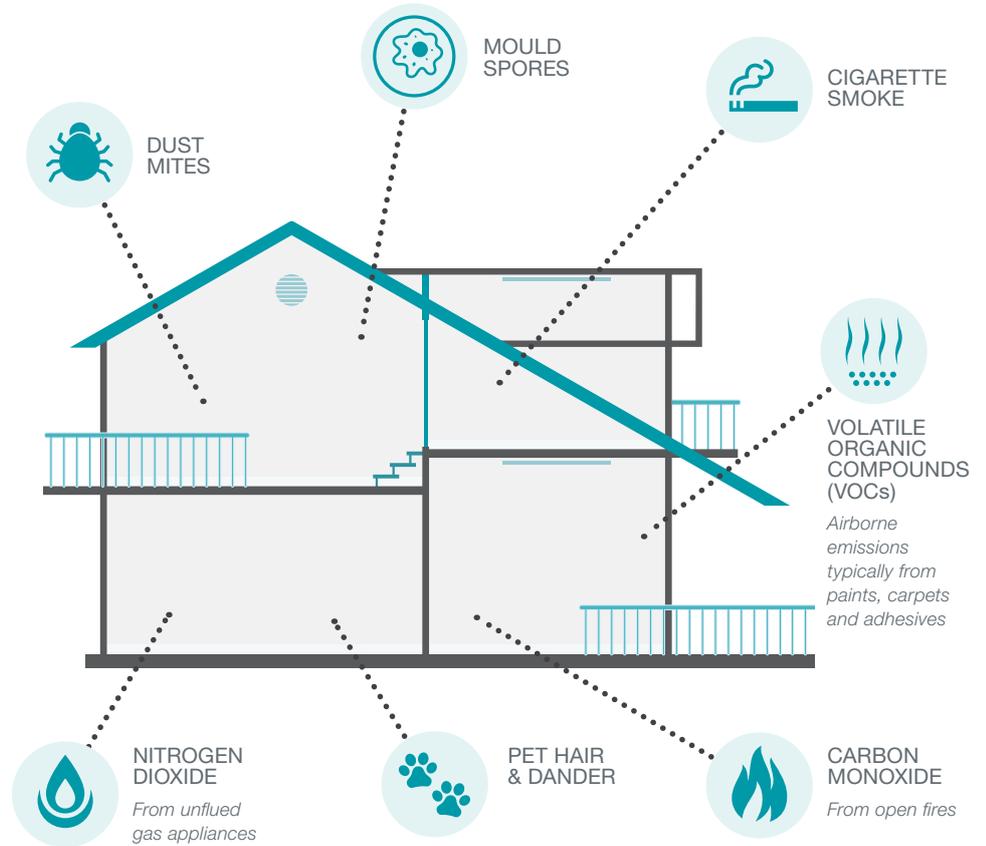
The air inside your home could pose a much bigger threat to your health than outdoor air.



Indoor air quality and health

The air in any home contains a range of pollutants in varying concentrations. Typically these include:

Given that Australians spend around **90% of their time indoors**¹, the quality of the air that we breathe in our homes and workplaces is of major importance. However, **pollutants in indoor air typically occur more frequently and at higher concentrations than in outside air**² and today's homes, which tend to be more airtight and built with materials that can contribute to indoor air pollution, may not be helping. This combination of factors can have a significant effect on our health. But there are some things that can be done to ensure your home is at its healthiest.



These can be responsible for significant health problems.



There are around 2.3 million asthmatics in Australia who are sensitive to a range of pollutants including mould, VOCs and dust mite allergens. These common pollutants are asthma triggers that can cause the airways to become narrow and inflamed – leading to asthma symptoms.³

In fact, exposure to mould allergens has been found to cause asthma in people who are genetically predisposed to it.⁴ Infants and children are also vulnerable to respiratory illnesses associated with Nitrogen Dioxide, cigarette smoke and dust mites.

Mould is a major concern

Internationally, there is an increasing focus on the impact of mould on occupant health. The World Health Organisation (WHO) has published guidelines for controlling dampness and mould in buildings and the US Environmental Protection Agency EPA also provides extensive information on mould control in homes.^{5, 6}

The WHO review concludes that the most important effects of moisture and mould in buildings are increased instance of respiratory symptoms, allergies and asthma and other disturbances of the immune system.⁵

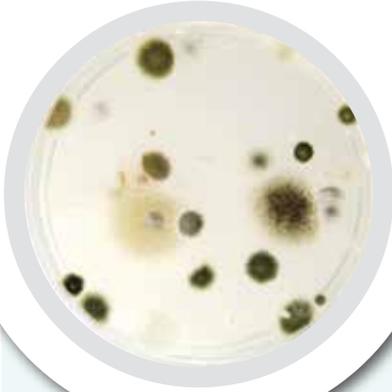
It recommends that the most important way to avoid these adverse health effects is the prevention (or minimisation) of persistent dampness and microbial growth on interior surfaces and in building structures.⁵

Breakthrough independent research conducted for CSR Gyprock® into mould in Australian homes uncovered some astounding statistics:⁷

35% of Australian households surveyed had experienced mould in their homes

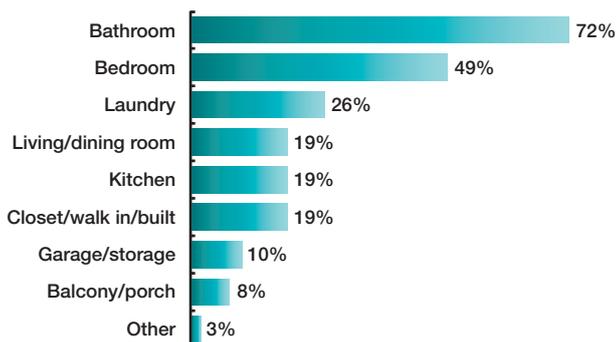
82% of these, who were also looking at purchasing a new home or renovating in the next 12 months, expressed concern about the presence of mould

51% felt that it may have contributed to health issues within the home, in particular allergies, asthma and other respiratory problems

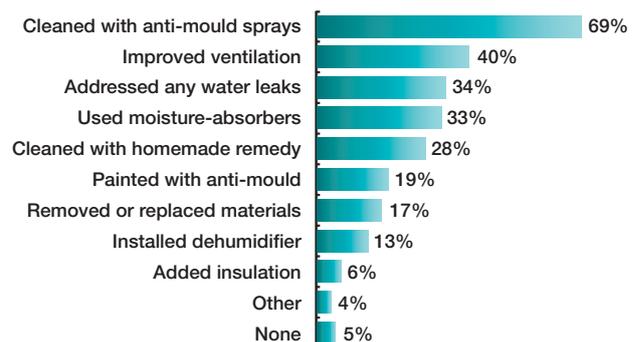


35%
of households have experienced mould

Areas of home affected (rooms)



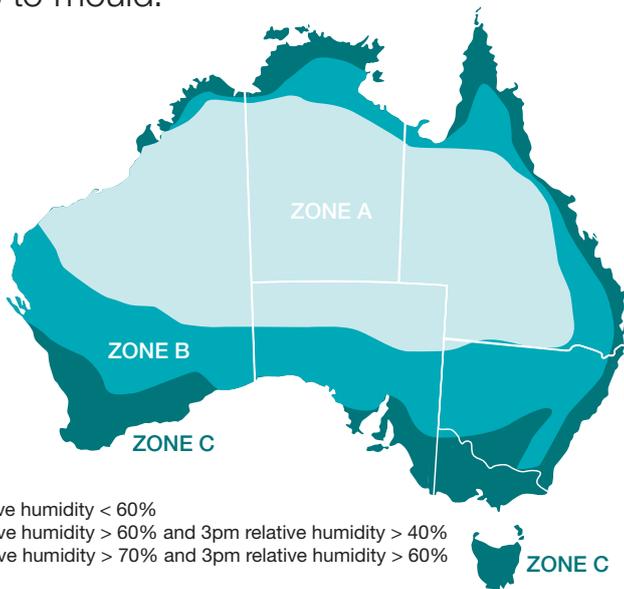
Efforts taken to remedy issues



Humidity is a key cause

Mould requires 70 to 90% humidity to thrive, which is common in the coastal regions where the majority of Australia's population lives. This level of **humidity not only encourages mould**, it is also **conducive to the growth and development of dust mites**.⁸

Indoor humidity levels reflect the atmospheric conditions together with moisture created by occupants' activities within the home which means that any home may be susceptible to mould.



ZONE A – 9am relative humidity < 60%
ZONE B – 9am relative humidity > 60% and 3pm relative humidity > 40%
ZONE C – 9am relative humidity > 70% and 3pm relative humidity > 60%

Source: ABCB¹⁰

Activities within the home also contribute greatly to humidity levels in particular:

- Moisture in bathrooms and laundries that can permeate throughout the house
- Unflued gas appliances
- Steam from cooking
- Occupants' breath and perspiration



An adult's breath and perspiration creates around **1.25 LITRES** of moisture per day⁹



Moisture can also enter a home through leakage, condensation in the wall cavity and damp ground conditions under suspended timber floors. This can lead to mould growth in areas that can't be seen but can still impact on air quality.



Are modern homes better or worse?

Data on ventilation rates in Australian buildings is limited but indicates ventilation rates have become lower in residential buildings constructed in recent years.² This is substantially due to increased energy efficiency standards which partly rely on better air tightness of homes.

The National Construction Code (NCC) includes requirements for ventilation and air movement mainly through specifying the size of openable windows and doors that must be included in the building design, only resulting in better ventilation when they are open. Planned updates to the NCC include ventilation in external wall cavities to reduce the risk of condensation.

While indoor/outdoor flow and larger open plan living spaces are easier to ventilate naturally, other trends which impact on indoor air quality include:

- Smaller bedrooms and bathrooms which are susceptible to poor ventilation and moisture build up
- Increased use of engineered timber structural members, flooring and cabinetry with high levels of adhesives and varnishes which can emit VOCs
- Split system air conditioning which effectively recycles the existing air rather than introducing fresh air



What can home buyers, builders and renovators do?

The keys to improving indoor air quality are:

- Awareness and choice of materials with reduced emissions or products that actively inhibit or absorb pollutants
- Improved ventilation to remove pollutants and reduce humidity
- Controlling indoor temperature to reduce the risk of condensation

Choosing better materials

It is important to consider what the effect of your material choices may be on the indoor air quality:

- Be aware of the types of materials which can add to the level of pollutants in the air and choose better alternatives such as low VOC paints, plasterboard and flooring
- Locally manufactured timber composites used in flooring and cabinetry are more likely to have lower VOC emissions than imported alternatives
- Look for the Sensitive Choice® logo. The National Asthma Council Australia's Sensitive Choice® Program identifies products that have been assessed as better choices which may benefit people with asthma and/or allergies and improve occupant health and wellbeing. A list of Sensitive Choice® products is available on their website: sensitivechoice.com
- Some products, such as Gyprock Sensitive™ plasterboard with its mould resistant additive, actively work to reduce the risk of mould growth on the walls and ceilings and in the cavities of your home



Sensitive Choice® is a community service program created by the National Asthma Council Australia to identify products that are a better choice, contribute to improved air quality and help reduce allergic reactions. The program is of particular value to the millions of Australians and New Zealanders with asthma and the one in three who have allergies.

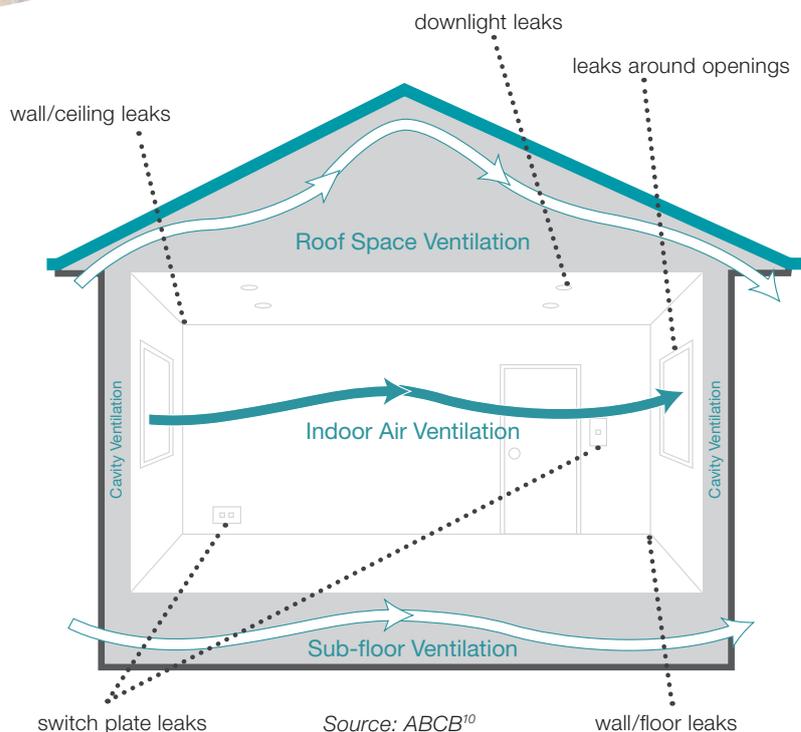
To help homeowners and builders identify asthma and allergy-aware products, approved products can display the Sensitive Choice® symbol on their packaging. You'll find that reassuring blue butterfly on hundreds of products – from bedding to paint, from cleaning agents to carpets, from air purifiers and vacuum cleaners to insulation and Gyprock® plasterboard.



Improving Ventilation

An international survey of indoor air quality recommends complete replacement of the air in a dwelling at least every two hours.¹¹ This means that outside air should flush out the indoor volume no less than twelve times in every 24 hours.

In most homes, around 50% of this recommended rate occurs incidentally through gaps in the building fabric so active ventilation is required to make up the difference.



When choosing active ventilation

- Select natural ventilation or air conditioning systems that introduce fresh air over split systems
- Consider mechanical ventilation in areas with potentially poor airflow

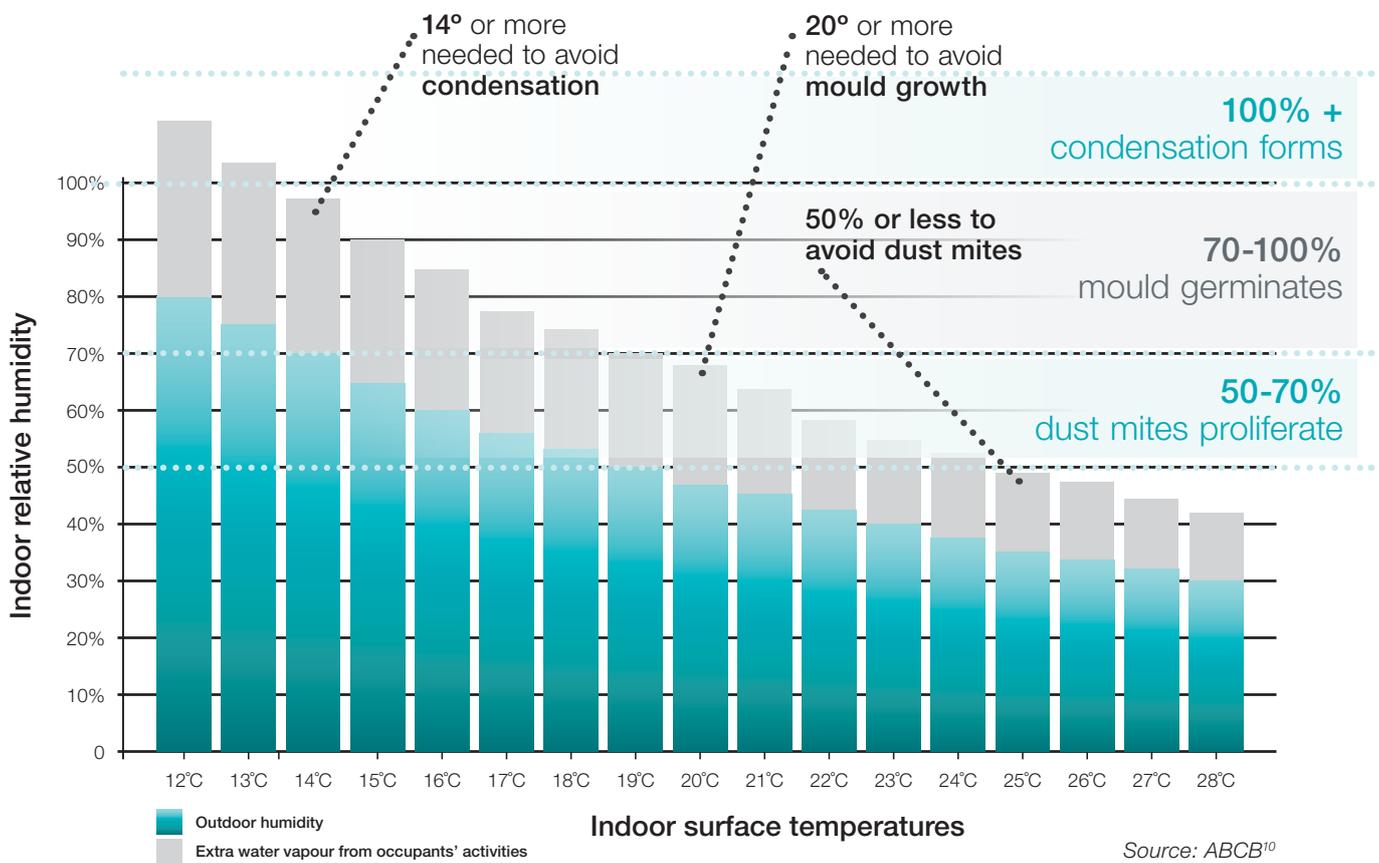
Controlling indoor temperature

Indoor temperature also has a major impact on condensation and mould growth.

As external humidity is brought into the home with fresh air, it is difficult to manage humidity levels indoors by ventilation alone. Temperature control by active or passive heating is also required to manage humidity to levels that inhibit condensation and allergens.

The graph below shows the benefits of controllable heating.

The bars show the combined effects of outdoor humidity (aqua) plus the additional humidity due to the occupants' activities (grey). As the indoor temperature increases the relative humidity decreases. A constant minimum indoor temperature of 20 degrees is required to inhibit the growth of mould on interior surfaces. In most parts of Australia, significant energy use would be required to achieve this outside of the summer months.



1. National Research Council, 1981
2. Indoor Air Quality, Stephen K Brown CSIRO, 1997
3. National Asthma Council website, What is Asthma?
4. Asthma Australia website, Does Mould Cause Asthma?
5. Guidelines for indoor air quality: dampness and mould, WHO, 2009
6. A brief guide to mold moisture and your home, EPA 2010
7. Mould Research Study: Prepared by Australia Online Research for CSR Gyprock, 2014
8. Water balance and humidity requirements of house dust mites, Arlian L G 1992
9. S.C. Hite and JL Bray, Research in Home Humidity Control. Research Series No. 106, The Engineering Experiment Station, Purdue University, Urbana, November 1948.
10. Condensation in Buildings Handbook, ABCB 2014
11. National House Building Council, UK, 2009

More information:

For more information about Gyprock Sensitive and other Gyprock® products, visit www.gyprock.com.au or call 1300 306 556

Sensitive Choice® – www.sensitivechoice.com

National Asthma Council Australia – www.nationalasthma.org.au

Asthma Australia – www.asthmaaustralia.org.au

World Health Organisation – www.who.int

Australian Building Codes Board – www.ABCB.gov.au

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