



BRADFORD WHITE PAPER

Moisture management in residential building projects

A guide for Architects & Builders

A well-ventilated home is a healthy home, so it is important to manage moisture in new builds.

OVERVIEW

With moisture problems on the increase in Australia, the onus is on architects and builders to ensure they put preventative measures in place in new builds that will encourage ventilation, prevent dampness and manage condensation.

While moisture can impact on a new building's aesthetics, especially in the form of unsightly mould or mildew, it worryingly can also have lasting long-term effects on the health of a home's inhabitants.

Putting appropriate moisture management measures in place at the time of design and construction is the most cost-effective, efficient and healthy way to deal with moisture in residential building projects.

Recent changes to the National Construction Code (NCC) mean that architects need to be educated on best-practice solutions as well as the installation of moisture management products.



Where does moisture come from in the home?

Moisture in the home comes from a variety of sources including wet areas such as bathrooms & laundries, cooking, and of course breathing.

This creates an environment inside the home with a higher moisture content and higher vapour pressure than the outside environment which forces, or 'drives' the air outward. Heating or cooling the home can further increase this pressure and vapour 'drive'.

This vapour 'drive' forces warm or cold air into contact with the building structure where good

energy efficiency insulation practices can create a temperature difference large enough to allow condensation formation.

Condensation results when warm air contacts a cold surface and releases excess moisture that it is unable to retain at the lower temperature. This is why heated, cooled and well insulated homes can accumulate condensation if appropriate measures are not included to manage vapour control.

Different types of moisture issues

Moisture issues in homes result from many causes, including rising damp; external water ingress; or condensation. Each issue needs a different response, and often different trades to control them.

Improper drainage can also cause an issue in houses, resulting in water vapour and condensation being present because of high humidity, or water due to flooding.

For new builds, the first step is to ensure that there is sufficient ventilation throughout the house – including under floors – to reduce the risk of mould, mildew and the associated problems. Best practice design principles such as appropriate window location, elevation and site positioning should also be considered, especially for south-facing buildings and wet areas such as bathrooms and laundries.

Additional considerations include vapour permeable construction wraps such as **Enviroseal™ Wall Wraps**, which add layers of protection to shield your home from water-related weather damage, allow vapour to escape to prevent mould or rot, and minimise hot and cold draughts entering the home.

It is also important to note that, while homeowners and consumers usually focus on mould, especially black mould, fungal spores are just the visual manifestation of deeper issues, such as leaks, rotting timber, structural problems, even termites.

Just because you can't see it, doesn't mean it's not there.



Why moisture management matters

Moisture problems in Australian homes are on the increase, according to **Renew Magazine**. Quoting the Building Physics Forum at the University of Wollongong in 2018, the magazine reported that younger participants were advised to consider a specialisation in mould management to get ahead of the demand!

And, again, it's not just about aesthetics. Mould and moisture in the home have been long proven to have a detrimental affect on the health of those living in the home, particularly with regards to respiratory conditions such as asthma.

A **long-term study** conducted by the University of Melbourne found that the overall risk of active asthma was increased by 26% in those who had visible mould in the home in the last 12 months.

The study also found that the more rooms in the house affected by mould, the greater the risk of active asthma. In other words, there was evidence that the "dose" of mould influenced the risk of active asthma.

An article in **The Conversation** estimates the health cost (measured in **disability-adjusted life years**) due to respiratory and cardiovascular disease attributed to mouldy or damp housing as about three times the cost attributable to sugary drinks in Australia. Damp, cold and mouldy housing generates a substantial health burden and could be an easy target for public health prevention strategies. The article claimed that these housing conditions stand alongside many of the classic risk factors such as diet, smoking and obesity.



Moisture and structural integrity

The demand for compliant energy efficiency in our homes has put increasing pressure on our ability to control and manage moisture in residential builds, especially in combination with insulation.

All cavities need to be able to dry completely. Otherwise, when moisture accumulates within the cold side of the wall cavity, it can saturate the insulation material, ultimately causing structural problems. Additionally, with many new builds using

larger windows, expanses of glass can also put additional pressure on the wall insulation.

Water and condensation can compromise structural integrity if not managed correctly. Water from saturated soil can cause foundation support issues, increasing the likelihood of structural instability. Condensation within stud wall cavities can cause timber frames to rot; steel frames to rust.

Managing moisture

Walls and ceilings need to incorporate vapour permeability properties into the structure to allow the flow of water vapour from inside the home to pass through the building materials before condensing to water (condensation) safely on the outside of the building frame, whilst preventing the entry of liquid water from the outside. Vapour permeable wall wraps reduce the risk of condensation formation inside the building frame, allowing your home to breathe.

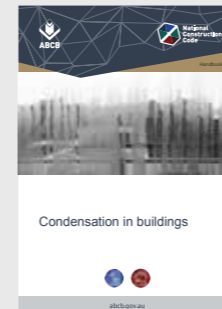
One of the practical reasons why builders sark a wall or roof is to provide the structure's envelope with a Protective Second Skin. The first generation of sarking using low insulation values were not made using vapour permeable fabrics, and today that skin needs to do more.

This means construction membranes need to be a water barrier to prevent wind-driven rain gaining access to the building's water-sensitive materials (such as wood and insulation), provide an air barrier to prevent cold draughts and act as a vapour permeable between the interior and exterior of a building.

The 2019 building code is based on 6-star energy rating, which recommends vapour-permeable membrane in Climate zones 6, 7 and 8 to allow the moisture to leave the fabric.

These membranes also allow construction to continue if the builders wish to rely on the wall wraps to advance the construction regardless of weather delays.

National Construction Code (NCC) handbook



The Australian Building Codes Board (ABCB) has developed a handbook in response to the issues of condensation and moisture management.

This non-mandatory handbook is intended to assist architects, designers and builders in the assessment and the management of the risk of condensation and its consequences. It should be read in conjunction with the BCA provisions relating to condensation, damp and weatherproofing, and energy efficiency for all classes of buildings.

The Condensation in Buildings Handbook assists in understanding the condensation requirements and provisions within the National Construction Code (NCC).

These requirements should be assessed in combination with the relevant climate zone of the project, ranging from Zone 1 (warm-humid or tropical climates) through Zones 2-5 (temperate or hot-Dry inland climates); to Zones 6-8 (cold climates). Each zone will need different products to manage moisture in walls, with Zone 1 needing a vapour barriers of Class 1 or 2; Zones 2-5 needing Class 2, 3 or 4; and Zones 6-8 needing vapour permeable Class 3 or 4, as required.

About Bradford Enviroseal™ RW wall wrap

Bradford's Enviroseal™ RW is a light-wall classified vapour permeable wall wrap designed for use in residential timber and steel frame wall construction. It is a durable and lightweight textile membrane, designed to allow moisture to escape the inside of the home.

Enviroseal™ RW is fully compliant to NCC 2019 Condensation guidelines. A Class 4 vapour permeable, air and water barrier membrane.



About Bradford Insulation

As experts in the field of insulation and moisture management, the Bradford team is available for advice and technical support for architects, designers and builders looking to incorporate best-practice insulation and moisture management methods.

As the experts in building insulation and moisture management they can assist with:

- project-specific support
- value engineering challenges
- specification documentation
- system design detailing
- product installation and certification

Call our team on
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