

MOULD IN NEW BUILDINGS

The following images are from a range of brand new and less than two year old homes. The issues are caused by the natural drying out process of a new home followed by additional moisture & humidity created by occupants.

The specifications to these homes are similar but the common denominator is that these large volume housing groups have opted *not* to ventilate the roof void.



Natural drying out process - The concrete slab on an average sized new home will contain around 1000 litres of water which will take around 4-6 months to completely dry out. Add to that 250 litres of paint along with the wet trades (Tiling and Gib-Stopping) and you have a mass of accumulated moisture/humidity. This will rise into the unventilated roof void where it cannot escape resulting in the images shown.



The image below was taken on a brand new home prior to the new home owners moving in. Consequently, the moisture levels are created solely by the drying out process without the aid of additional occupation-generated moisture.

This was a winter build which would have increased the likelihood of additional moisture from saturated frames prior to being wrapped. Again the moisture has accumulated in the unventilated roof void and become trapped when the ceiling lining and insulation is applied.



Mould Species - The common mould species found in these situations are Penicillium and/or Cladosporium. Both species are non-toxic but still high in sporulation and capable of triggering respiratory related allergens.



Cladosporium will establish on timber and membranes with a moisture reading of 15-20%.

Biodet Laboratory states:

Penicillium species are common environmental isolates and are often found on damp building materials. These fungi may contribute to high spore levels in the air resulting in allergic reactions in sensitive people, and many of the species may cause infections in immunocompromised individuals.

Cladosporium species are common air-borne contaminants particularly in outdoor air. They are commonly found on outdoor claddings, particularly timber and will also grow superficially on indoor surfaces that have a moisture level between 15 and 20%, often in response to slightly elevated moisture levels such as condensation.

The main effect of the fungus is disfigurement of the surface that the fungus is growing on. Mycotoxin production is generally not associated with this species but the ability to sporulate heavily and have buoyant easily dispersed spores makes this an important fungal airway allergen.”



All of these case studies were moisture & humidity tested over several months confirming that the trapped moisture could not be naturally reduced below 15% without the further aid of passive roof ventilation.

This case study resulted in total chemical decontamination of the roof void, installation of retrospective roof ventilation and further testing to resolve the issue.

It would have cost less than half of this amount to ventilate the roof during the build process.

Moisture/humidity created by occupants

Humidity is naturally created by human activity. This is caused simply by the way we live including cooking, showers, baths, washing appliances, tumble driers and simply breathing. Unlike the USA, Canada, UK and most of Europe, we do not provide a vapour barrier between our wall/ceiling linings and the thermal envelope. Consequently, basic physics tells us that warm air rises allowing it to filter into the unventilated roof void.

The image below illustrates a two year old home with abundant and active mould growth. This was assessed during the summer months when environmental moisture levels are at a minimum hence indicating that continued occupational generated moisture levels are not capable of ever being reduced below 15% without the additional aid of roof ventilation.



Summary - The NZBC currently states that roof ventilation is optional. We know the majority of architects are aware of this and we also know that most group housing companies are aware of it but many have chosen to avoid it until it is mandatory. This has been recognised by BRANZ and NZMRM with pending changes to the metal roofing COP.

We treat our client reports as strictly confidential for obvious reasons but we can safely state that the problem is more widespread than you may think. Many of the large volume home builders have engaged our services for multiple failures showing we have a generic design problem.

You can identify the specification from the images so we now know what is failing.

Regardless of the roof cladding type, metal, shingle or concrete, it is the membrane which is preventing the roof from breathing. Regardless of the membrane type, vapour permeable or otherwise, none of them provide *enough* ventilation to resolve the issue as tried, tested and proven overseas for several decades.

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