LOWER MOISTURE AND SAY GOODBYE TO MOULD

Mould requires high relative humidities to grow. Reduce a building's indoor relative humidity and you stop mould growth.

By Alide Elkink, Freelance Technical Writer, Wellington

Mould sources are everywhere, and mould will grow anywhere the moment conditions are right. In buildings, the moment the relative humidity at the surface of materials is high enough, mould will appear. Preventing high indoor humidities is the key to control mould growth.

Reduce relative humidity

Humidity refers to the amount of moisture in the air. This amount depends on the air temperature – warm air can hold more moisture than cold air so when the air temperature falls, the amount of moisture the air can hold also falls.

Relative humidity is expressed as a percentage and is the ratio of water vapour in the air to the total amount of water vapour the air can contain at a particular temperature. If air is cooled, its relative humidity rises, so the relative humidity of air close to a cold surface is higher than in the rest of the room. If the relative humidity close to a cold surface rises above 80%, mould growth commences.

Improve ventilation

High indoor moisture levels may be the result of poor ventilation, particularly in bathrooms and kitchens, from wet activities such as clothes washing and drying or from the use of unflued gas heaters.

One way to reduce high indoor moisture levels is through ventilation – removing indoor air and bringing drier outside air indoors. Outdoor air temperature is generally lower than the indoor air temperature, so it will have a lower moisture content. As the air temperature increases, the relative humidity will be reduced and it will be able to hold more moisture.

An open window will provide ventilation, but if this is not enough, a mechanical air extraction system should be installed to remove moisture at the source. This may be an extractor fan in the bathroom or a rangehood in the kitchen. Ventilation of clothes dryers should always be directly to the outside, and if clothes must be dried inside, a window or preferably two to achieve a cross-draught should be opened.

Avoid unflued gas heaters

Some activities that generate moisture internally should be avoided altogether, such as using an unflued gas heater. One of the primary products of combustion is water, and an unflued gas heater will release 2 kg of moisture indoors for every 1 kg of gas used. Running a dehumidifier beside an unflued gas heater to remove moisture makes no sense.

Make the house warmer

Mould growth will also be inhibited if the internal environment is kept warm thereby maintaining a lower relative humidity and preventing condensation. Insulating spaces that are heated helps retain the heat, warms up cold surfaces and provides a more comfortable environment for occupants to live in.

Case study: mould on wall and ceiling surfaces

A single-storey house with a brick veneer exterior on timber framing, a concrete floor slab and a corrugated, galvanised long-run steel roof with wide eaves suffered repeatedly from mould on the ceiling and upper walls of the bathroom and an adjacent bedroom. The mould occurred at the perimeter walls and was most prevalent during the colder, winter months.

The first step to determine the cause was to find out whether the moisture was from an internal or an external source. Investigation of the roof revealed that it was sound and there was clearly no water ingress through leakage. In addition, the soffit lining was continuous to the timber wall framing, closing off the cavity between the brick veneer and the framing at the top of the wall – damp air from a wall cavity entering a roof space is a common cause of ceiling mould.

THE PROBLEM

During investigation of the roof space for signs of leaks, it was noticed that the ceiling insulation stopped short of the external wall so that a section of ceiling approximately 600 mm wide was uninsulated (see Figure 1).

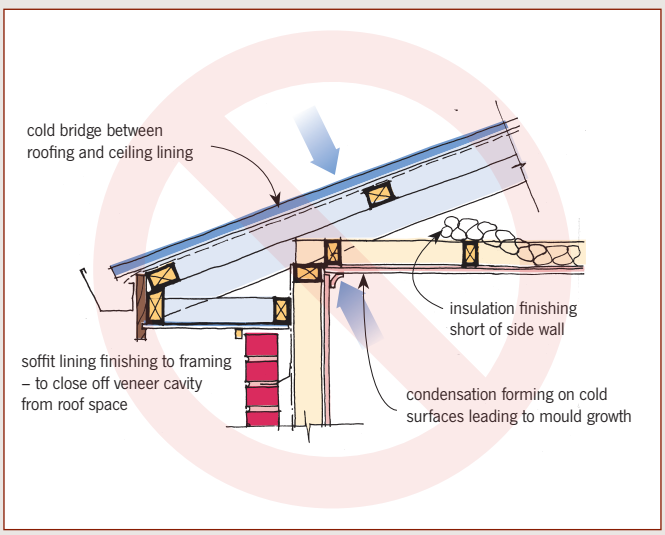

Figure 1: The cause of mould on the walls and ceiling – lack of insulation.

This absence of insulation along the edge of the ceiling in the roof space was causing a cold bridge to the exterior, which, in turn, resulted in condensation on the surfaces of the ceilings and the upper walls of the bathroom and bedroom. The bathroom was more badly affected due to the higher levels of moisture produced from showering and bathing and the fact that the window was seldom opened.

THE SOLUTION

- Insulation was added to the roof space to fully cover the area where it was missing and, where possible, it was carried onto the top plates (although it is essential to leave a minimum 25 mm air gap between the insulation and the roofing underlay). See Figure 2.
- An extractor fan was installed in the bathroom so moisture generated could be removed.
- Security locks were installed to the windows of the bathroom and the bedroom so they could be left open safely during the day.

Remember...

Low relative humidities are the key to preventing mould growth, and three factors are required to keep moisture levels down: ventilation, heating and insulation. They work together by:

- ventilating to remove moisture
- heating to lower the relative humidity and warm surfaces
- insulating to maintain warmer internal surfaces and reduce condensation.

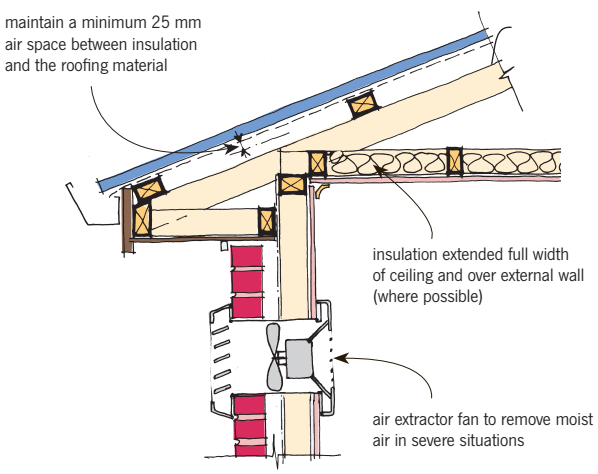

Figure 2: The cure – better insulation and improved ventilation.