

MOULD CAUSATION, PREVENTION AND REMEDIATION

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IDENTIFYING MOULD

Mould, fungus, fungi, mildew, mold and toxic black mould are all different names for the visible growth of fungus in an environment. Despite having many different names, the cause of mould growth is always the same – moisture or dampness in a place where it should not normally be, resulting in mould being able to grow. It can be incredibly unsightly, and can also produce musty, mouldy odours – both of which can be very off-putting and an annoyance for those using or working in an affected area, and sometimes have adverse effects on health. Mould can be particularly troublesome in northern Australia in the wet season and in the cooler parts of the country in the winter.

Mould growth often can be seen in a room as a colourful growth spreading across a wall or ceiling, or on furniture, carpets or clothing. Mould is often coloured – usually black, green or pink, but some kinds are white or pale and cannot easily be seen. The absence of visible mould does not always mean that there is not a mould issue.

Although the sometimes colourful fungi are often the most visible sign of a moisture and dampness problem, there are usually other microbes present in a damp area too, such as bacteria and dust mites, and these can also cause adverse health effects in occupants of the area, and can damage furniture, paint, wall coverings and even structural elements of the building.

WHAT CAUSES MOULD?

The growth of fungi and mould cannot happen unless there is a source of water or moisture for it to use. Just like most living things, a fungus or mould needs a source of food and a source of water to grow and survive. Fungi do not need large amounts of nutrients to survive and thrive – they can grow on any organic matter, even the most unexpected sources, such as the glue behind wallpaper, on soap scum and dust, in cleaning product residue and they can even use the paint from walls as a nutrient source. They grow very well on organic materials such as wood, leather, cotton, paper, wallpaper, cardboard, rugs, carpets and curtains, especially as these materials absorb moisture too. Fungi can survive with such low levels of nutrients that they can even grow on the light layer of dust on glass windows if condensation occurs to provide moisture.

The water and moisture that allow the mould to grow can come from several sources, and, to eradicate mould, these sources of water should be removed. Water leaks from potable water, flooding and rainwater leaks through roofs are an obvious source of water for mould to grow. High humidity in the air can also be a cause. Water ingress can cause flooding of an area, which is usually easily noticeable and can be identified and dealt with quickly, or water ingress can be smaller leaks that continue slowly for some time and may not be immediately noticeable – but which allow sufficient moisture to infiltrate and area to allow mould to grow. Other less well known sources of water that can lead to mould growth are condensation onto cold surfaces, steam from cooking and tumble dryers and lack of ventilation within a space. Water can also enter the building through walls if they do not have adequate waterproof coatings, and from rising dampness. Defective vapour seals and insulation, lack of air tightness for the building and thermal bridging can all have an impact on the potential for mould growth.

MOULD PREVENTION

Obviously, prevention of mould growth is better than trying to fix the problem once it has occurred. Noticing sources of moisture, condensation and steam and removing them before they cause an issue is very important. In very humid areas, dehumidifiers or air conditioning preconditioners may need to be installed to reduce humidity in the air inside the building. Ineffective design of air conditioning or ineffective cleaning of the system can lead to contamination inside an air conditioning system, which will require specialist cleaning and remediation. If water has flooded into an area, then the water should be removed if it is safe to do so, and the area cleaned as soon as possible to help prevent mould growth. There are 3 main categories of water, and each has different risks associated with it.

MOULD AND THE VARIOUS WATER CATEGORIES

Floods of water from the potable (scheme) water supply or from rain water are the cleanest (category 1), and as long as these are cleaned up quickly and the area dried well, using wet vacuums, carpet dryers, dehumidifiers and fans, then the growth of mould can usually be avoided. As long as the area is dried fully within 72 hours of the spill then the issue should usually be resolved without mould growth occurring.

Grey water (Category 2)– water from washing machines or from showers for example, is drinking water that has been used and so has some nutrients present but is not dangerously dirty or contaminated with pathogens and dangerous bacteria. If a flood from this source occurs, again it should be cleaned as soon as possible. The use of the water for washing either clothes or people will have added nutrients to it (detergents, dirt, organic matter and small amounts of debris), that will allow fungi and bacteria to start to grow quickly. Cleaning and disinfection of the area along with drying the area quickly will help to prevent mould becoming established. If attended to quickly, then often most of the area can be remediated without having to disposed of carpets and other soft furnishings (depending on the severity and source of the spill). If a Category 2 spill is left unattended to for even a short time, mould and bacterial growth can begin and the spill may need to be reclassified as a Category 3 spill due to the additional risk created by the delay.



If the spill is black water (Category 3) – which is sewage, toilet water contaminated with human waste and floodwaters, then specialist help should always be sought, as these spills can have serious health implications for those using or working in the area. There may also be impacts on areas such as food preparation areas if a sewage spill is present. In most states, it is a legal requirement that a black water spill must also be notified to the local Environmental Health Department as soon as possible (usually within a few hours of it occurring), and the Environmental Health Officer or other experienced investigator can provide advice on cleaning a spill properly, any other action that is required to remediate the spill, and on what activities can still take place in the potentially contaminated area. Post remediation checks may also be required after a black water spill to ensure the area is safe for reoccupation.

DAMAGE CAUSED BY MOULD

The growth of fungus on a wall or on other building materials in a property is not just unsightly, but it can cause damage to the area where it is growing. A fungus grows by sending out hyphae, which grow like microscopic roots into and through the surface that it is growing on. This can cause damage such as pitting on metal surfaces, crumbling in wood, plaster and paint and damage to fabric and leather. Severe infestations can also damage structural timbers and other structural elements. The water damage that always occurs hand in hand with mould damage can lead to corrosion on metal structures.

Once the fungus is established, it then produces spores, which are usually brightly coloured – often black or shades of green. As the spores of fungi are designed to survive in very difficult growing conditions (spores are usually resistant to sunlight and to drying), they are very tough, and can be difficult to kill and remove, and spread easily.

THE HEALTH IMPACTS OF MOULD

The presence of mould in a building can have health effects for some of those in contact with it, or in the same room as a mould affected area. For most people, exposure to a small amount of mould does not have a serious health effects – it depends upon the person exposed, and if they have allergies or other health problems. The most commonly seen health effects are allergy type symptoms, such as sneezing, wheezing, coughing and sore eyes and a sore throat. These symptoms usually disappear once the person affected moves away from the mouldy area to fresh air, or to another room or away from work where mould is not present. For those people with asthma, exposure to mould can trigger an asthma attack, or make an existing attack worse, and so people with asthma should avoid mould affected areas. For a person with other health issues, such as an immune system that is not functioning properly, exposure to fungus can be more of a problem, and can result in serious illness. Exposure to large amounts of mould will usually cause at least allergic type symptoms in most people who are exposed, and PPE should always be worn if a very contaminated area must be entered.

MOULD TESTING AND REMEDIATION

Often the first priority for anyone who becomes aware of mould in a room, is to remove the visible area of mould. This should only be attempted with very small areas of mould, as removal of large areas of mould requires specialist knowledge, products and tools. For large areas, a mould specialist may be required to inspect the area, followed by a specialist mould removal and remediation company to carry out the removal safely. The source of the moisture causing the mould growth should always be investigated and removed along with the mould.

Removal of small areas of mould (less than 1 metre square) can be done in several ways, but it will not be effective for long if the underlying sources of the moisture are not fixed at the same time. If the mould is removed and the source of moisture is not fixed, then regardless of the amount of cleaning chemicals used on the mouldy area, the mould will come back. General maintenance contractors or plumbing contractors will have to be involved in rectifying any leaks or moisture issues to properly fix a mould issue, as well as the area being cleaned.

Often, cleaning with products such as bleach and vinegar are mentioned as being effective against mould. Commercial spray on anti mould products are also available, but some of these are not effective at all, and usually only act to remove the staining from the mould so that it can no longer be seen. This is not a long term fix for the issue.

Warm soapy water and scrubbing is the recommended method for removing mould. Soapy water is not only effective but has very few potential health and safety issues for the person carrying out the cleaning. Soapy water, or even a cream cleanser (such as Jif or Diversey R7) aids in this by dissolving any dirt around the fungus and loosening the hold of the fungus on the surface that it is growing on. Both bleach and vinegar can also be effective at removing and killing mould, but must be used in the proper way, or they will not work well. Bleach should be used with great care, as the bleach itself can produce respiratory effects in those using it, such as wheezing and coughing, and triggering of asthma attacks. If mould removal has been attempted previously, bleach can also react with any products remaining on the mould patch and create toxic by-products. With any product used, it is the scrubbing and wiping of the area to physically remove the mould from the surface that is the most important aspect of cleaning, along with fixing and removing the source of moisture.

It is very important to note that when using bleach or vinegar, that they must be diluted with water. Bleach should always be diluted following the instructions provided on the for that particular brand and strength; vinegar can be diluted at a rate of 70 - 80% vinegar and 20-30% clean water. Diluting the products to the correct level allows them to be taken up into the fungus cell and kill it more effectively. Sometimes, even if the fungus has been removed or killed using scrubbing or a vinegar product, then a coloured stain will remain on the cleaned surface. This can be then be washed well with water to remove any remaining cleaning products, and then bleached with a chlorine bleach or similar product to remove the stain once the fungus has been killed. It is very important that any previous cleaning chemicals are thoroughly removed from the surface before bleaching, to ensure that bleach does not react with leftover cleaning products, as this can cause toxic chlorine to be produced. The SDS of any product(s) used for cleaning mould should always be consulted prior to using to ensure that any personal protective equipment needed is used. The SDS should also be checked prior to use to ensure that the products being used do not interact with each other in a dangerous way.

The Western Australian Health Department has excellent guidelines for treating small areas of mould in the home and workplace and include advice on how to deal with spills and floods too.

For small areas of mould on a hard surface, the guidelines recommend that a face mask (a P2 mask for example), safety glasses/goggles and gloves are worn while dealing with a mouldy area. Doors to the area should be closed to prevent mould spores spreading to other parts of the building, and windows opened if possible, to provide ventilation. The air conditioning should not be run while cleaning is taking place. The mouldy area and an area 50cm around the mouldy area should be scrubbed with soapy water to remove the mould, then the area wiped clean with soapy water on a cloth. This should be done working from the edge of the mould patch to the centre, to avoid spreading mould spores over a larger area than is already affected. If staining is present, then a bleach solution can be used to help remove staining and make the appearance of the areas better. The area should then be dried as best as possible to remove moisture and help prevent regrowth of the mould. Any sources of moisture should be fixed to prevent a re-occurrence of the mould growth.

If carpets and curtains or other materials that are very absorbent are badly affected by mould, these often cannot be cleaned effectively, and they may need to be disposed of. Small areas of mould can be removed by machine washing for fabrics or extraction cleaning for carpets, but the staining that mould may cause can make these items unusable. Adding eucalyptus oil to the wash can help combat 'musty' type odours.

Large areas of mould, or those where the water source is not known will usually require investigation by a mould specialist prior to remediation, to best establish a proper scope of works for safe and effective removal and rectification. The cleaning may need to be carried out by a specialist remediation company, usually due to the PPE required to carry out the task safely, and to prevent spread of mould spores to other parts of the property. These areas may also need inspection after cleaning to confirm that the remediation has been effective, especially after a sewage or other black water spill. After a spill where black water has been involved, then inspection by an Environmental Health Officer may be required before the area can be brought back in to use. Decontamination of the air conditioning system may also be required after remediation or after a large area of mould has been present, as the ducting may become contaminated.

As the removal of mould can be a labour intensive and sometimes expensive process, and the presence of mould can impact greatly on occupant enjoyment of a property and sometime on health, it is best to prevent mould growth from happening in the first place. A good knowledge of the causes of mould growth – for example broken extraction fans causing steam build up in bathrooms and kitchens, leaks in pipes, rising damp, condensation on cold surfaces caused by inadequate insulation – along with an easy system of reporting faults and leaks in a workplace when they are small so that they can be fixed quickly, go a long way to prevent mould issues from occurring.

References:


WA Health Department Guidelines for Managing Mould and Dampness Related Public Health Risks in Buildings. WA Department of Health 2015

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