Indoor Air Quality – Moulds and Fungi

Why does mould grow in homes or buildings?

How is anthrax contracted?

Moulds and fungi are found in nature and are necessary for the breakdown of leaves, wood and other plant debris. These micro-organisms can enter a building directly or by their spores being carried in by the air. In a home or building, moulds and fungi are usually found growing on wood, drywall (plaster/gypsum/Sheetrock®), upholstery, fabric, wallpaper, drapery, ceiling tiles, and carpeting.

The key factor is moisture because moulds and fungi need it to grow. As a result, moulds and fungi are most often found in basements, kitchens and bathrooms.

In modern buildings, moisture may be present as the result of:

- Flooding.
- Leaks in the roof/basement or plumbing
- Sealed buildings that do not allow excess moisture to escape.
- Sources such as cooking facilities, showers, bathtubs, etc.
- Excess humidity.

What are some types of mould?

While it is interesting to be able to identify what type of mould may be growing in the building, it is not necessary to identify the type(s) present. The Regulators states that all moulds should be treated the same in terms of health risk and removal.

Some of the more common types of mould found in buildings include:

- Stachybotrys chartarum (also known as Stachybotrys atra, or black mould)
- Aspergillus sp.
- Penicillium sp.
- Fusarium sp.
- Trichoderma sp.
- Memnoniella sp.

- Cladosporum sp.
- Alternaria sp.

How do moulds contribute to health problems?

The presence of mould does not always mean that health problems will occur. However, for some people the inhalation of the mould, fragments of the moulds, or spores can lead to health problems or make certain health conditions worse.

In addition, many of these moulds make “mycotoxins”. Mycotoxins are metabolites or by-products from the moulds that have been identified as being toxic to humans. These toxins can lead to allergic or respiratory problems.

In general, the most commonly reported symptoms include:

- Eye, nose, and throat irritation.
- Cough or congestion.
- Aggravation of asthma.
- Fatigue.
- Headaches.
- Difficulty concentrating.

Moulds can also exacerbate (make worse) the symptoms of allergies including wheezing, chest tightness, shortness of breath as well as nasal congestion and eye irritation. People who are immuno-suppressed, or recovering from surgery are usually more susceptible to health problems from moulds.

What can I do to prevent mould contamination?

Moulds can grow almost everywhere and on any substance when moisture is present. Thus, the best method of prevention is to reduce the amount of moisture.

First, determine the source of the moisture, and eliminate the problem.

Keep the relative humidity between 30% and 50%. To accomplish this goal, prevention measures include:

- Vent showers and other moisture generating sources directly to the outside.
- Control humidity with air conditioners and/or dehumidifiers*.
- Use exhaust fans when cooking, dishwashing, or laundering (especially in the food service or laundry areas) or when cleaning large areas.
- Insulate cold surfaces to prevent condensation on piping, windows, exterior walls, roofs and floors where possible.
- Keep the building and the heating, ventilation and air conditioning (HVAC) systems in good repair.
- Clean up any floods or spills immediately (within 24-48 hours). See below for more information on cleaning, etc.
- For floors and carpets, remove spots or stains immediately. Reduce the amount of water used when cleaning carpets as much as possible.
- Do not install carpet around fountains, sinks, bathtubs, showers or directly on top of concrete floors that are prone to leaks or frequent condensation.

* It is important to remember that when using air conditioners and dehumidifiers to keep them in good condition. Empty any water collectors regularly so this

water does not contribute to the moisture problem! If you use humidifiers, make sure that they are cleaned regularly.

What should I look for during an inspection?

A visual inspection is the most reliable method of identifying mould problems. The most common signs of water damage will be discolouration and staining. Moulds will most often appear as dark spots, stains or patches.

While conducting the inspection, be sure to look at, in, or under the following places:

- Ceiling tiles.
- Walls including plaster, wallpaper, and condition of drywall (Sheetrock®, gypsum wall board).
- Cardboard or paper.
- Floors.
- Window sills.
- Insulation.
- Carpet.
- Furniture (condition of fabric, upholstery, etc.).
- If possible, look behind duct work and walls (a mirror will help).

Also look for standing water – puddles of water around and under sinks, tubs, drip pans for dehumidifiers, air conditioners, and refrigerators that can be contributing to the moisture in the building and provide conditions where mould can grow.

Note that Health Canada, “in accord with other public health organizations, does not recommend testing the air for mould. An air test does not provide information on health and does not address the cause of mould damage in the house. You also do not need to know the type of mould present in order to remove it.“

Monitoring devices are available which can measure the moisture level of drywall, wood, etc. These devices will help indicate whether or not moisture levels exist that would promote the growth of mould.

How should I clean up the mould?

Always find out why moisture was present and fix the underlying problem. In general, once mould has been discovered, it is recommended that porous materials such as dry wall, ceiling tiles, fabric, books, paper, cardboard, etc. be thrown out and replaced rather than cleaned whenever possible. It may be necessary to throw away carpets, cushions, furnishings, mattresses, pillows, stuffed toys or bedding that cannot be properly cleaned. Non-porous materials such as metal, glass, hard plastic and semi-porous materials such as wood and concrete can be cleaned and reused (if structurally sound).

Cleaning should be done using soap or detergent. Do not generate dust while cleaning. Use a High-Efficiency Particulate Air (HEPA) filter when vacuuming.

How to clean the mould depends of the size or extent of the damage. Before beginning any clean up, ensure that people doing the work have received appropriate training, including how to use respiratory protection.

The following are general steps to help deal with mould issues. You may need to call a professional or contractor with experience dealing with moisture issues and mould. When dealing with mould in homes, most people can generally clean a small or moderate area themselves with soap and water. If the area is large or if the mould reappears after you have cleaned it, consider hiring professional help.

Small Isolated Areas (1-3 patches of mould, each less than 1 square metre/10 square feet) (e.g., ceiling tiles, small areas on walls):

- Use respiratory protection (e.g., N-95 disposable respirator) as well as rubber gloves and eye protection.
- Remove any materials, where possible, that will be difficult to clean afterwards or seal/cover with plastic sheeting and tape to prevent the spread of dust and mould particles.
- Clean or mist surfaces with dilute soap or detergent solution. A damp cloth with baking soda may also work. Do not let the drywall get too wet.
- Avoid creating dusts.

While the clean-up is being done, the area should only be used by those involved in the clean-up.

For medium sized areas (more than 3 patches of mould or if patches are between 1-3 square metres/ 10-32 square feet):

- Use, at minimum, a disposable N-95 respirator as well as glove and eye protection. A half-face or full-face air purifying respirator (APRs) equipped with P100 filter cartridges, or high-efficiency particulate air filter (HEPA) respirator will provide a higher level of protection.
- The work area should be unoccupied (except for those directly involved in the clean-up).
- Seal floors, pathways, ventilation and other openings with plastic sheeting. It may be necessary to shut down the HVAC to properly seal vents.
- Dust suppression methods such as misting the surface lightly before cleaning is recommended.
- Clean the area with water and soap or detergent.
- Area should be dry and free of any visible contamination when the work is completed.

For larger areas or areas of high contamination (greater than 3 square metres/32 square feet):

While large remediation projects should be done by trained professionals, some good work practices include:

- Persons working in this situation have appropriate training in disposal and removal the biological contamination.
- Use a full face high-efficiency particulate air filter (HEPA) respirator, full-face air purifying respirator (APRs) equipped with P100 filter cartridges, or a full-face, powered air purifying respirator (PAPR), as appropriate, plus appropriate glove and eye protection.
- Wear disposable protective clothes such as coveralls, head cover and shoes.
- Isolate the area from the rest of the working space with plastic sheeting and by sealing ventilation ducts and other openings. Shut down the HVAC to properly seal vents.

- Use an exhaust fan with a HEPA filter to create a negative pressure in the space.
- The work area should be unoccupied (except for those directly involved in the clean-up).
- Use procedures that include dust suppression methods.
- Discarded materials should be sealed in plastic bags for disposal. HEPA vacuum or wipe the sides of the bags before carrying outside of the sealed area.
- The contained area, as well as the entrance to it, should be HEPA vacuumed and cleaned with a detergent solution. Workers should remove disposable clothing to prevent tracking of mould-containing dusts outside of the work area.

If the contamination is in the Heating, Ventilation and Air Conditioning (HVAC) system:

- Small amounts of contamination can be cleaned as above for small surface areas. Large scale contaminations should be handled by trained professionals.
- The HVAC system should be turned off during cleaning.
- All areas should be dried before the system is turned on again.
- Biocide products are available for various HVAC components such as condensation pans and cooling coils. Check with the manufacture for specifications and for handling instructions.
- The work area should be HEPA vacuumed and cleaned with a detergent solution.

Precautions:

- The use of chemical disinfectants such as chlorine (bleach) for remedial purposes is not recommended.
- The use of chemical disinfectants can pose health concerns for people in occupied spaces of the building.
- Vacuuming may increase exposure to mould and spores by making them airborne. Central vacuums that exhaust to the outside, or those equipped with high-efficiency particulate air filters (HEPA) will minimize this exposure.
- No special requirements are necessary for the disposal of mouldy materials although it is recommended that the materials be sealed in plastic bags if possible.