

Preventing and Removing Mould Growth After a Flood

Excerpted from Guidelines on Assessment and Remediation of Fungi in Indoor Environments, New York City Department of Health and Mental Hygiene, November 2008 located at <http://www.nyc.gov/html/doh/downloads/pdf/epi/epi-mold-guidelines.pdf>

Introduction

Fungi (mould) are present almost everywhere. In an indoor environment hundreds of different kinds of mould are able to grow wherever there is moisture and an organic substrate (food source). They can grow on building and other materials, including: the paper on gypsum wallboard (drywall); ceiling tiles; wood products; paint; wallpaper; carpeting; some furnishings; books/papers; clothes; and other fabrics. Mould can also grow on moist, dirty surfaces such as concrete, fiberglass insulation, and ceramic tiles. It is neither possible nor warranted to eliminate the presence of all indoor fungal spores and fragments; however, mould growth indoors can and should be prevented and removed if present.

Prompt remediation of mould-damaged materials and infrastructure repair should be the primary response to mould growth in buildings.

The simplest, most expedient remediation that properly and safely removes mould growth from buildings should be used. Extensive mould growth poses more difficult problems that should be addressed on a case-by-case basis in consultation with an appropriate building or environmental health professional.

Visual Inspection

A visual inspection is the most important initial step in identifying a possible mould problem and in determining remedial strategies. The extent of any water damage and mould growth should be visually assessed and the affected building materials identified. A visual inspection should also include observations of hidden areas where damages may be present, such as crawl spaces, attics, and behind wallboard. Carpet backing and padding, wallpaper, wooden moldings (e.g. baseboards), insulation and other materials that are suspected of hiding mould growth should also be assessed. Ceiling tiles, paper-covered gypsum wallboard (drywall), structural wood, and other cellulose containing surfaces should be given careful attention during a visual inspection. Ventilation systems should be visually checked for damp conditions and/or mould growth on system components such as filters, insulation, and coils/fins, as well as for overall cleanliness.

Equipment such as a moisture meter or infrared camera (to detect moisture in building materials) or a borescope (to view spaces in ductwork or behind walls) may be helpful in identifying hidden sources of mould growth, the extent of water damage, and in determining if the water source is active.

Using personal protective equipment such as gloves and respiratory protection (e.g. N-95 disposable respirator) should be considered if assessment work might disturb mould. Efforts should also be made to minimize the generation and migration of any dust and mould.

Environmental Sampling

Environmental sampling is not usually necessary to proceed with remediation of visually identified mould growth or water-damaged materials. Decisions about appropriate remediation strategies can generally be made on the basis of a thorough visual inspection.

Cleaning Methods

Non-porous materials (e.g. metals, glass, and hard plastics) can almost always be cleaned. Semi-porous and porous structural materials, such as wood and concrete can be cleaned if they are structurally sound. Porous materials, such as ceiling tiles and insulation, and wallboards (with more than a small area of mould growth) should be removed and discarded. Wallboard should be cleaned or removed at least six inches beyond visually assessed mould growth (including hidden areas, see Visual Inspection) or wet or water-damaged areas. A professional restoration consultant should be contacted to restore valuable items that have been damaged. **Cleaning should be done using a soap or detergent solution. Use the gentlest cleaning method that effectively removes the mould to limit dust generation.** All materials to be reused should be dry and visibly free from mould. Consideration should also be given to cleaning surfaces and materials adjacent to areas of mould growth for settled spores and fungal fragments. A vacuum equipped with a High-Efficiency Particulate Air (HEPA) filter could also be used to clean these adjacent areas.

Disinfectants are seldom needed to perform an effective remediation because removal of fungal growth remains the most effective way to prevent exposure. Disinfectant use is recommended when addressing certain specific concerns such as mould growth resulting from sewage waters. If disinfectants are considered necessary, additional measures to protect workers and occupants may also be required.

Restoring Treated Spaces

After completing mould remediation and correcting moisture problems, building materials that were removed should be replaced and brought to an intact and finished condition. The use of new building materials that do not promote mould growth should be considered. Anti-microbial paints are usually unnecessary after proper mould remediation. They should not be used in lieu of mould removal and proper moisture control, but may be useful in areas that are reasonably expected to be subject to moisture.

Small Isolated Areas (less than 10 square feet) – e.g. ceiling tiles, small areas on walls

- (a) Remediation can be conducted by trained building maintenance staff. Such persons should receive training on proper cleaning methods, personal protection, and potential health hazards associated with mould exposure.
- (b) Respiratory protection (e.g., N-95 disposable respirator) is recommended. Gloves and eye protection should also be worn.
- (c) The work area should be unoccupied.
- (d) If work may impact difficult-to-clean surfaces or items (e.g. carpeting, electronic equipment), the floor of the work area, egress pathways, and other identified materials/belongings should be removed or covered with plastic sheeting and sealed with tape before remediation.
- (e) Efforts should be made to reduce dust generation. Dust suppression methods particularly during any cutting or resurfacing of materials are highly recommended. Methods to consider include: cleaning or gently misting surfaces with a dilute soap or detergent solution prior to removal; the use of High-Efficiency Particulate Air (HEPA) vacuum-shrouded tools; or using a vacuum equipped with a HEPA filter at the point of dust generation. Work practices that create excessive dust should be avoided.
- (f) Mouldy materials that can be cleaned should be cleaned using a soap or detergent solution. Materials that cannot be cleaned should be removed from the building in sealed plastic bags. Plastic sheeting should be discarded after use. There are no special requirements for the disposal of mouldy materials.
- (g) The work area and areas used by workers for egress should be HEPA-vacuumed (a vacuum equipped with a High-Efficiency Particulate Air filter) or cleaned with a damp cloth and/or mop and a soap or detergent solution.
- (h) All areas should be left dry and visibly free from mould, dust, and debris.

Medium-Sized Isolated Areas (10 – 100 square feet)

- (a) Remediation can be conducted by trained building maintenance staff. Such persons should receive training on proper cleaning methods, personal protection, and potential health hazards associated with mould exposure.
- (b) Respiratory protection (e.g., N-95 disposable respirator) is recommended. Gloves and eye protection should also be worn.

- (c) The work area should be unoccupied.
- (d) Cover the floor, egress pathways, and items left in the work area with plastic sheeting and seal with tape before remediation.
- (e) Seal ventilation ducts/grills and other openings in the work area with plastic sheeting. The HVAC system servicing this area may need to be shut down to properly seal vents.
- (f) Efforts should be made to reduce dust generation. Dust suppression methods particularly during any cutting or resurfacing of materials are highly recommended. Methods to consider include: cleaning or gently misting surfaces with a dilute soap or detergent solution prior to removal; the use of High-Efficiency Particulate Air (HEPA) vacuum-shrouded tools; or using a vacuum equipped with a HEPA filter at the point of dust generation. Work practices that create excessive dust should be avoided.
- (g) Mouldy materials that can be cleaned should be cleaned using a soap or detergent solution. Materials that cannot be cleaned should be removed from the building in sealed plastic bags. Plastic sheeting should be discarded after use. There are no special requirements for disposal of mouldy materials.
- (h) The work area and areas used by workers for egress should be HEPA-vacuumed and cleaned with a damp cloth and/or mop and a soap or detergent solution.
- (i) All areas should be left dry and visibly free from mould, dust, and debris.

Large Areas (greater than 100 square feet in a contiguous area) – e.g. on separate walls in a single room. Properly trained and equipped mould remediation workers should conduct the remediation. The following procedures are recommended:

- (a) Personnel trained in the handling of mould-damaged materials equipped with:
 - i. A minimum of half-face elastomeric respirators with P-100 filters
 - ii. Full body coveralls with head and foot coverings
 - iii. Gloves and eye protection
- (b) Containment of the affected area:
 - i. The HVAC system servicing this area should be shut down during remediation.

- ii. Isolation of the work area using plastic sheeting sealed with duct tape. Furnishings should be removed from the area. Ventilation ducts/grills, any other openings, and remaining fixtures/furnishings should be covered with plastic sheeting sealed with duct tape.
- iii. Consider using an exhaust fan equipped with a HEPA filter to generate negative pressurization.
- iv. Consider using airlocks and a clean changing room.
- v. Egress pathways should also be covered if a clean changing room is not used.

(c) The work area should be unoccupied.

(d) Efforts should be made to reduce dust generation. Dust suppression methods particularly during any cutting or resurfacing of materials are highly recommended. Methods to consider include: cleaning or gently misting surfaces with a dilute soap or detergent solution prior to removal; the use of High-Efficiency Particulate Air (HEPA) vacuum-shrouded tools; or using a vacuum equipped with a HEPA filter at the point of dust generation. Work practices that create excessive dust should be avoided.

(e) Mouldy materials, that can be cleaned, should be cleaned using a soap or detergent solution. Materials that cannot be cleaned should be removed from the building in sealed plastic bags. The outside of the bags should be cleaned with a damp cloth and a soap or detergent solution or HEPA-vacuumed in the work area (or clean changing room) prior to their transport to unaffected areas of the building. There are no special requirements for the disposal of mouldy materials.

(f) Before leaving isolated areas, workers should remove disposable clothing to prevent the tracking of mould-containing dusts outside of the work area.

(g) The work area and egress pathways (and clean changing room if present) should be HEPA-vacuumed and cleaned with a damp cloth and/or mop with a soap or detergent solution and be visibly clean prior to the removal of isolation barriers. Plastic sheeting should be discarded after use.

(h) All areas should be left dry and visibly free from mould, dust, and debris.

Preventing and Cleaning Mould Growth

Mould (mildew) is a fungus that can grow inside building on wet or damp surfaces. Mould can cause allergic reactions, trigger asthma attacks, or cause other health problems in some people.

Mould needs water or moisture to grow. Stop indoor mould growth by fixing leaks, drying damp or wet areas and controlling humidity.

PREVENT MOULD GROWTH

Fix Water Problems Immediately

- Correct water leaks.
- Dry any and all water-damaged items or areas.

Control Moisture Sources

- In bathrooms without windows, check that bathroom fans or exhaust vents are working.
- In bathrooms with windows, check that the window can be opened.
- Use a dehumidifier to lower humidity levels in basements.

CHECK THE SIZE OF THE AREA WITH MOULD GROWTH AND WATER DAMAGE

- Look for hidden mould and water damage
- If the amount of mould observed covers a large area (more than 100 square feet), or is difficult to get to, you may need professional help.
- If there is less than 100 square feet of mould growth, trained building staff should be able to do the cleanup job.

FOLLOW THE PROPER STEPS TO CLEAN MOULD GROWTH

- Tell people living or working in the building about the plan to clean the mould growth.
- Tenants and others should leave the work area before cleaning begins.
- Cover or remove difficult-to-clean surfaces or items (e.g. carpeting, electronics) from the work area before cleaning begins.
- Use safety goggles, gloves, and a disposable respirator when removing mould growth.
- Clean mould growth with soap or a detergent, and water.
- Remove and throw away porous materials (e.g. ceiling tiles, insulation) with mould growth on them.
- Dispose of any plastic sheeting, mouldy materials, and used sponges or rags in sealed heavy duty plastic bags.
- Always fix water problems immediately. If the mould returns quickly or spreads, you may have an ongoing water problem.

If more than 10 square feet of mould growth is present also:

- Cover the floor in the work area with plastic sheeting.
- Cover entry and exit pathways with plastic sheeting.
- Seal any ventilation ducts with plastic sheeting.
- Mop and/or HEPA-vacuum the work area and pathways.

CLEAN MOULD GROWTH WITH PROPER SUPPLIES

- Soap or detergent
- Disposable rags/sponges and scrub brush
- Buckets
- Heavy-duty plastic garbage bags
- Protective gear (e.g. goggles, rubber gloves, N95 respirator) Dry any and all water-damaged items or areas.

For more information, please contact your nearest Environmental Public Health office.

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Calgary Main Office 403-943-2295
Lethbridge Main Office 403-388-6689
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