

Mold Hazards during Disaster Cleanup

Flood and water damage inside buildings after disasters contribute to the growth of mold. Remediation of mold-contaminated building materials can be done safely.

What is Mold and Why is it Hazardous?

Mold is a type of fungi. Most molds reproduce by forming spores which are released into the air. When spores land on a suitable moist surface they begin to grow, can penetrate porous materials and release chemicals. Most molds are harmless but some can cause infections, allergy symptoms and produce toxins. Infections are rare in healthy individuals and the effect of toxins is still not well understood. Nevertheless, mold remediation is often necessary to return working spaces to a safe condition and make them suitable for occupancy.

Mold Clean-up Plan

The most important requirement is to control the source of moisture. Next, survey the types of materials and the size of the area involved. This may become important in determining the strategy for remediation and worker protection. Materials that cannot be dried and fully cleaned are removed using methods that minimize occupant exposure to spores. Mold remediation often involves construction activities.

Note: Drying can involve the use of fans, blowers and/or dehumidifiers. However, the more humid the air, the less effective the blowers will be.

Note: It is often more cost-effective to remove and replace the building materials than to dry and clean mold-contaminated materials.

Types of Building Materials: Porous (water absorbing), Non-porous, or Semi-porous

Non-porous materials (e.g., metal, glass, hard plastics, etc.) can be dried out, fully cleaned and reused. Clean hard and non-porous materials using a detergent. Surfaces can be rinsed with a disinfectant made of ½ cup liquid household bleach mixed into one gallon of water (**Caution:** DO NOT mix bleach with cleaning products that contain ammonia).

Semi-porous materials (e.g., wood and concrete) can be cleaned if they are structurally sound.

Porous materials (e.g., drywall, carpets, insulation, ceiling tile, etc.) are different because mold

penetrates into them making it very difficult to fully clean. As a general rule, if a porous material has been wet for over 48 hours it is best to remove and replace.

How Big an Area is Involved in Mold Remediation?

Small Areas of Mold Remediation (i.e., < 30 ft.²)

As a general rule, small areas of water damage require less control when remediating.

- The work area should be unoccupied; removing people from adjacent spaces is not necessary but is recommended for infants, persons recovering from surgery, immune suppressed people, or people with asthma, hypersensitivity pneumonitis and severe allergies.
- Containment of the work area is not necessary.
- Cover surfaces in the work area that could become contaminated with secured plastic sheets to contain dust and debris, and prevent further contamination.

Large Areas of Mold Remediation (i.e., 30-100 ft.²)

- The work area and areas directly adjacent to it should be unoccupied.
- Cover surfaces in the work area and adjacent areas that could become contaminated with secured plastic sheets to contain spores, dust and debris to prevent further contamination.
- Seal ventilation ducts/grills in the work area and areas directly adjacent with plastic sheeting.
- If remediation procedures are expected to generate a lot of dust (e.g., abrasive cleaning of contaminated surfaces, demolition of plaster walls) or the visible concentration of mold is heavy (i.e., blanket versus patchy coverage) follow the extensive contamination procedures below.

Extensive and Visible Mold Contamination

- Develop a suitable mold remediation plan. The plan should address: work area isolation, the use of exhaust fans with high-efficiency particulate air (HEPA) filtration, and the design of airlocks/decontamination room.

- Consult with industrial hygienists or other environmental health and safety professionals with experience performing mold remediation before beginning this level of remediation.

How to Protect Workers during Mold Remediation

Worker protection uses engineering controls, work practices and personal protective equipment (PPE) during mold remediation. Inhalation is the route of exposure of most concern to cleanup workers.

Engineering Controls

- Re-wetting materials with a mist of water to suppress spores, dust and debris.
- Wrap and seal the items that will be discarded in plastic bags or sheets to reduce the spread of spores.
- Provide natural or local exhaust ventilation during all cleaning steps.

Work Practices

- Do not eat, drink, or smoke in work areas.
- Avoid breathing dusts.
- After an area has been cleaned and is completely dry, vacuum the area with a HEPA vacuum. HEPA vacuums are also recommended for cleaning up dust that may have settled on surfaces outside the work area.
- The work area and areas used by remediation workers for egress should be cleaned with a damp cloth or mop and a detergent solution. Set up a decontamination area.
- Leave the area clean, dry and free of visible debris.
- After working, wash thoroughly, including hair, scalp and nails.

Personal Protective Equipment (PPE)

- Respirators:
 - For areas smaller than 100 ft.²; use an approved respirator, at a minimum, either a half-face or full-face N, R, or P-95 respirator.
 - For areas greater than 100 ft.², areas where mold is heavy (blanket coverage rather than patchy), or areas where substantial dust is generated during cleaning or debris removal (e.g., abrasives are used to clean surfaces); use an approved respirator, at a minimum, either a half-face or full-face N, R, or P-100 respirator.
 - Charcoal-impregnated filters may be used for odors.
- Non-vented goggles.
- Long gloves made of material that will protect workers from chemicals used for surface cleaning.
- Protective clothing (e.g., disposable coveralls) to prevent contamination and skin contact with mold and chemicals. For areas greater than 100 ft.², ensure that protective clothing covers entire body including head and feet.

Additional Information

Visit OSHA's Safety and Health Topics webpage on Mold at:

www.osha.gov/SLTC/molds/index.html

New York City Department of Health and Mental Hygiene Guidelines on Assessment and Remediation of Fungi in Indoor Environments:
www.nyc.gov/html/doh/html/epi/moldrpt1.shtml

This fact sheet creates no new legal obligations. It contains recommendations as well as descriptions of OSHA safety and health standards. By law, employers must comply with safety and health standards and regulations and provide their employees with workplaces free from recognized hazards likely to cause death or serious physical harm. The recommendations provide additional information intended to assist employers in providing safe and healthful workplaces. This information will be made available to sensory-impaired individuals upon request. The voice phone is (202) 693-1999; teletypewriter (TTY) number: (877) 889-5627.

For assistance, contact us. We can help. It's confidential.



U.S. Department of Labor
www.osha.gov (800) 321-OSHA (6742)