

# Mold

## Hiring a Mold Remediation Contractor

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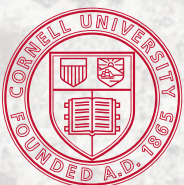
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**Hurricanes, floods and extended disaster evacuations can result in extensive mold growth in many homes at the same time – creating a cleanup crisis. Everyone with a water-damaged home faces similar challenges, since mold must be remediated before repairs can begin. This process can be hazardous because of potential health effects of exposure to mold, bacteria, other contaminants and damaged structures.**

**Although there is no such thing as “toxic mold,” some molds are toxigenic, that is, they can produce and contain toxins. People react differently to the presence of mold—some may have no adverse health reaction to airborne mold spores, while others may experience severe illness from low-level exposure.**



Cornell University



# Contractors

Hiring a qualified contractor for mold remediation in homes typically is not required and generally is not covered by homeowners insurance, but this varies by state and insurer, so be sure to check your policy. In any case, hiring a well-trained, professional mold remediation contractor usually is safer and more effective than a do-it-yourself approach because of the use of specialized equipment and industry protocols.

When conducting cleanup, you should follow safety precautions carefully to reduce exposure to mold. These include the use of protective clothing, an appropriate respirator, eye protection and procedures that minimize the release and spread of mold spores.

Check with your state or local government's contractor licensing, registration or certification agency to see if there are specific provisions for mold remediation contractors. In states that license mold remediation contractors, there typically are certain educational and insurance requirements that the contractor must meet. Where this is not the case, look for professional mold remediation professionals certified by organizations such as The Restoration Industry Association ([www.restorationindustry.org](http://www.restorationindustry.org)), the Institute of Inspection, Cleaning and Restoration Certification ([www.certifiedcleaners.org](http://www.certifiedcleaners.org)) or the American Council for Accredited Certification ([www.acac.org](http://www.acac.org)).

A mold remediation professional should follow procedures of a nationally recognized industry protocol and use specialized equipment. "Recommended Steps for Mold Cleanup in Flooded Homes" (next page) is included to provide you with an awareness of basic recommended remediation steps and restoration suggestions to help you achieve as safe and effective a remediation job as you can secure.

## The Contract

The following points should be included in a contract with a mold remediator:<sup>1</sup>

- Diagram or survey that details square feet, rooms, or sections of the area in which remediation will be done.
- Specific amount of time it will take to complete the remediation work.
- Itemized list of materials (e.g., lumber, wallboard, carpet and padding, paint) required to complete the remediation.
- Who (homeowner or contractor) will provide the renovation materials.
- How the contaminated materials will be handled and whether the homeowner or contractor will remove debris from the site.
- Detailed warranties of work and guarantees on remediation.
- Cleanup procedures and products to be used as well as a cost breakdown and total price cap.

Obtain at least three estimates before signing a contract. Ask for proof of education or training sessions on mold remediation and check with the education or training firms specified to determine that the contractor has actually completed the program or certification. Ask for references from clients for whom the contractors have performed mold remediation work.

# Removing Mold

Remediation professionals remove mold using a variety of methods depending on the size and complexity of the contamination as well as the technology available to the contractor. A widely followed remediation protocol is the Environmental Protection Agency's *Mold Remediation in Schools and Commercial Buildings*, available online at [www.epa.gov/mold](http://www.epa.gov/mold). The basic methods and principles are a good guide for professional remediation of any building, including homes, so it's a good idea to review this document.

Another commonly relied-upon set of containment guidelines are those developed by the New York City Department of Health.<sup>2</sup> The guidelines outline four levels of contamination based on the size of the infected area and a fifth for contaminated HVAC systems.<sup>3</sup>

- **Level 1 (10 sq. ft. or less):** remediation usually involves cleaning and salvaging non-porous materials with a detergent solution and removing non-salvageable contaminated porous materials.
- **Level 2 (10–30 sq. ft.):** same steps as Level 1, plus covering working areas in plastic and tape before remediation and using a High-Efficiency Particulate Air (HEPA) filter before restoration begins.
- **Levels 3 (30–100 sq. ft.) and 4 (over 100 sq. ft.):** involve specialized techniques for removing hazardous materials.
- **Level 5:** used for contaminated HVAC systems.

The primary standard of care for the professional mold remediation industry is the Institute of Inspection, Cleaning and Restoration Certification's S520 Standard and Reference Guide for Professional Mold Remediation. It is a national consensus-based procedural standard and reference guide for the remediation of mold-damaged structures and contents. The standard is periodically revised and based upon remediation and restoration principles, academic research and practical experience with water damage restoration and mold remediation challenges.<sup>7</sup>

Mold remediation specialists typically use containment barriers, air pressurization machines, high capacity dehumidifiers, commercial HEPA vacuums and air filters, strong disposal bags, cleaners, biocides (disinfectants), full personal protective equipment and other specialized materials.<sup>4</sup> Safety precautions are essential in mold remediation to prevent exposure to and spread of hazards. All workers should wear fitted goggles, gloves, disposable protective clothing and a professionally fitted respirator.

Various techniques used by professionals to remediate mold include, but are not limited to, removal and disposal of moldy materials; cleaning restorable materials by damp wiping with a cleaning solution and HEPA vacuuming; cleaning with detergent and bleach solution; gamma ray irradiation; steam cleaning; blasting with sodium bicarbonate (baking soda); or tenting the building and filling with chlorine dioxide gas to kill mold without gutting or discarding materials. The mold remediation standard and guidelines cited above recommend moldy material removal and cleaning methods designed to contain and safely remove both live and dead mold, since exposure to dead mold fragments and spores can have the same health effects as live mold. It is not clear to what extent other methods remove the risks posed by the residue of dead

mold, chemical reactions, long-term effects on building materials or increased release of spores into the air during treatment.

Increased consumer awareness of the hazards and difficulty of mold remediation and the new technological developments in the cleaning and restoration industry has led to an increasing number of companies in the field. The variety of choices can make it difficult for consumers to be confident the remediation firm they hire will be worth the investment. It is wise for consumers to review recognized guidelines, ask about the risks and limitations of new or alternative methods and determine specific indicators for effectiveness or “clearance.” Some remediation firms offer air sampling to compare indoor to outdoor spore counts before after the remediation to demonstrate effectiveness or “clearance.”



## Recommended Steps for Mold Cleanup in Flooded Homes<sup>6</sup>

### 1. Wear protective gear.

- Use gloves, goggles, and a respirator rated N-95 or higher.

### 2. Isolate work area and ventilate to outdoors.

- Seal off moldy areas from the rest of the building to prevent contamination from spore releases.
- Open windows and place a portable fan in one window, blowing toward the outside, to draw mold spores outdoors.
- Turn off central air systems.
- Tape plastic over air grilles.
- Drape plastic in stairwells if other floors are dry and clean.

### 3. Remove and dispose of moldy, porous materials in plastic bags if possible.

- Remove and discard flooded carpeting, upholstery, fabrics, and mattresses.
- Clean, disinfect, and dry valuable items outside the home to attempt to salvage them.
- Never reuse flooded padding.
- Remove all wet, fibrous insulation.
- Remove and discard heavily moldy paper-faced drywall and other paper or particle board products.
- If materials were exposed to floodwater or sewage, disinfect after cleaning. If using household bleach, follow label recommendations or mix ½ cup bleach with 1 gallon of water to disinfect bleach-tolerant materials. Use less corrosive products on noncolorfast materials, fine woods and metals (including air-conditioning systems). Common alternatives include alcohols, phenolics and hydrogen peroxide.

### 4. Clean and sanitize.

- Remove molds, don't just kill them, because dead mold spores can have the same health effects as live spores.
- Mold can be effectively removed from non-porous materials such as hard plastic, concrete, glass, metal, and solid wood. Real plaster and some paneling on walls with no insulation may be cleanable.
- Follow directions carefully when using disinfectants; avoid mixing bleach with ammonia and acids.
- Remove any sediment, hosing opened cavities if necessary.

- Wash dirty or moldy materials with non-phosphate all-purpose cleaners. Rough surfaces may need to be scrubbed. Avoid using pressure washers, which may force water into materials.
- If possible, use a HEPA-filtered vacuum to remove mold residue.
- Disinfect wall cavities and other materials with ½–1 cup bleach to 1 gallon of water solution after cleaning. Use less corrosive solutions on materials that may be damaged by bleach, including air-conditioning systems. Other disinfectants include alcohols, phenolics, and hydrogen peroxide.

### 5. Use borate treatments.

- Apply to wood to resist mold, termites, and decay.
- The penetrating type is more expensive, but it offers better protection.

### 6. Flush air.

- Open windows and use fans to remove lingering spores.

### 7. Speed dry.

- Close windows and use fans, air conditioners or heaters, and dehumidifiers to dry wet materials as quickly as possible.
- Keep windows open if electricity is off.

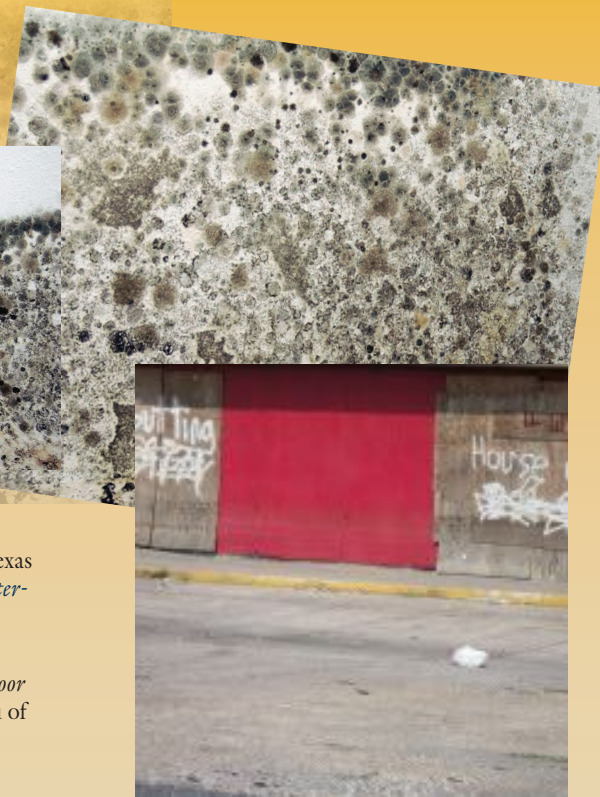
### 8. Be alert for mold.

- Mold can reappear in two to three days. If it does, repeat cleaning process and use speed drying equipment and moisture meters if available.

### 9. Do not attempt restoration until all materials have dried completely.

### 10. Restore using flood-resistant materials.

- If possible, use closed-cell spray foam insulation in walls, or rigid foam insulating sheathing that does not absorb water.
- Choose solid wood or water-resistant composite materials.
- Elevate wiring and equipment.
- Consider removable, cleanable wainscoting or paneling.
- Use paperless drywall.
- Use restorable flooring such as ceramic tile, solid wood, or stained concrete.



**ENDNOTES**

- 1 Rennie, D. L. *Selecting Mold Remediation Contractors*. Texas A&M University System. <http://texasbhelp.tamu.edu/011-disaster-by-stage/recovery/ER-027-Selecting-Mold-Remediation-Contractors.php> (retrieved 12/2/05).
- 2 *Guidelines on Assessment and Remediation of Fungi in Indoor Environments*. New York City Department of Health, Bureau of Environmental and Occupational Disease Epidemiology, <http://home2.nyc.gov/html/doh/html/epi/moldrpt1.shtml> (retrieved 6/7/06).
- 3 Sumpano, L. V. *et al. A Proactive Approach to Indoor Mold*. Alabama Association of Realtors. [www.realtor.org/letterlw.nsf/23e5e39594c064ee852564ae004fa010/49e133bf827ff63386256bdd0066ecda/\\$FILE/Mold%20Paper%20rwh%20rev%202-27.doc](http://www.realtor.org/letterlw.nsf/23e5e39594c064ee852564ae004fa010/49e133bf827ff63386256bdd0066ecda/$FILE/Mold%20Paper%20rwh%20rev%202-27.doc) (retrieved 6/7/06).
- 4 Wilson, S. *et al.* "Investigation into Techniques for Cleaning Mold-Contaminated Home Contents." *Journal of Occupational and Environmental Hygiene* 1(7): 442-447. July 2004. [http://taylorandfrancis.metapress.com/\(dneylvznmj22jco55y5ghxc45\)/app/home/contribution.asp?referrer=parent&backto=issue,9,13;journal,25,31;linkingpublicationresults,1:110614,1](http://taylorandfrancis.metapress.com/(dneylvznmj22jco55y5ghxc45)/app/home/contribution.asp?referrer=parent&backto=issue,9,13;journal,25,31;linkingpublicationresults,1:110614,1) (retrieved 6/7/06).
- 5 *Mold Remediation in Schools and Commercial Buildings*, EPA. [www.moldlaw.info/pdf/181274\\_1.pdf](http://www.moldlaw.info/pdf/181274_1.pdf) (retrieved 6/7/06).
- 6 The complete version, created by Claudette Hanks Reichel, is in "Mold Removal Guidelines for Your Flooded Home," available at [www.lsuagcenter.com](http://www.lsuagcenter.com).
- 7 BSR-IICRC S520 Mold Remediation Standard and Reference Guide for Professional Mold Remediation, IICRC. <http://www.iicrc.org/standards/iicrc-s520> (retrieved 11/4/13).

**Remember:**

Hire only Louisiana state licensed or registered contractors. Commercial projects over \$50,000 and construction of new single family homes require a state license. Home improvement or remodeling over \$1,500 requires state registration. Hazardous materials or mold remediation over \$1.00 requires a state license. Always verify a contractor License or registration number by calling 1-800-256-1392 or visit [www.lslbc.louisiana.gov](http://www.lslbc.louisiana.gov) for an online searchable listing by type of contractor and location.

It's also wise to insist on a written contract but don't sign anything until you understand all the terms of your contract. Pay no more than 10% up front, don't let payments get ahead of work completed, and don't make the final payment until you are satisfied with the job. Never pay cash! Keep a record of all payments and a job file of all papers relating to the project.

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