



Colorado Department  
of Public Health  
and Environment

# Colorado Department of Public Health and Environment

## *Mold Information Sheet*

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### **ABOUT MOLD**

#### **What are Molds?**

Molds are simple, microscopic organisms, present virtually everywhere, indoors and outdoors. Molds, along with mushrooms and yeasts, are *fungi* and are needed to break down dead material and recycle nutrients in the environment. For molds to grow and reproduce, they need only a food source – any organic material, such as leaves, wood, paper, or dirt— and moisture. Because molds grow by digesting the organic material, they gradually destroy whatever they grow on. Mold growth on surfaces can often be seen in the form of discoloration, frequently green, gray, brown, or black but also white and other colors. Molds release countless tiny, lightweight spores, which travel through the air. Some of the most common indoor molds are *Cladosporium*, *Penicillium*, *Aspergillus*, and *Alternaria*.

#### **Can mold become a problem in my home?**

Molds will grow and multiply whenever conditions are right— when sufficient moisture is available and when organic material is present. Be on the lookout in your home for common sources of indoor moisture that may lead to mold problems:

- Flooding
- Leaky roofs
- Sprinkler spray hitting the house
- Plumbing leaks
- Overflow from sinks or sewers
- Damp basement or crawl space
- Steam from shower or cooking
- Humidifiers
- Wet clothes drying indoors or clothes dryers exhausting indoors

Warping floors and discoloration of walls and ceilings can be indications of moisture problems.

Condensation on windows or walls is also an important indication, but it can sometimes be caused by an indoor combustion problem. Have fuel-burning appliances routinely inspected by your local utility or a professional heating contractor.

#### **Should I be concerned about mold in my home?**

Yes, if indoor mold contamination is extensive, it can cause very high and persistent airborne spore exposures. Persons exposed to high spore levels can become sensitized and develop allergies to the mold or other health problems. Mold growth can damage your furnishings, such as carpets, sofas and cabinets. Clothes and shoes in damp closets can become soiled. In time, unchecked mold growth can cause serious damage to the structural elements in your home.

## **HEALTH EFFECTS**

### **How am I exposed to indoor molds?**

Everyone is exposed to some mold on a daily basis without evident harm. It is common to find mold spores in the air inside homes, and most of the airborne spores found indoors come from outdoor sources. Mold spores primarily cause health problems when they are present in large numbers and people inhale many of them. This occurs primarily when there is active mold growth within a home, office or school where people live or work. People can also be exposed to mold by touching contaminated materials and by eating contaminated foods.

### **What symptoms are commonly seen with mold exposure?**

Molds may produce health effects through inflammation, allergy, or infection. Allergic reactions are most common following mold exposure. Typical symptoms that mold-exposed persons report (alone or in combination) include:

- Respiratory problems, such as wheezing, difficulty breathing and shortness of breath
- Nasal and sinus congestion
- Eye irritation (burning, watery, or reddened eyes)
- Dry, hacking cough
- Nose or throat irritation
- Skin rashes or irritation

### **How much mold can make me sick?**

It depends. For some people, a relatively small number of mold spores can trigger an asthma attack or lead to other health problems. For other persons, symptoms may occur only when exposure levels are much higher. Nonetheless, indoor mold growth is unsanitary and undesirable. Basically, if you can see or smell mold inside your home, take steps to identify and eliminate the excess moisture and to cleanup and remove the mold.

To be prudent, infants less than one year of age should not be exposed to chronically moldy, water damaged environments.

### **Are some molds more hazardous than others?**

Allergic persons vary in their sensitivities to mold, both as to the amount and the types to which they react. In addition to their allergic properties, some indoor molds, such as *Fusarium*, *Trichoderma*, and *Stachybotrys*, may produce compounds that have toxic properties, which are called mycotoxins. Mycotoxins are not always produced, and whether a mold produces mycotoxins while growing in a building depends on what the mold is growing on, conditions such as temperature, pH, humidity or other unknown factors. When mycotoxins are present, they occur in both living and dead mold spores and may be present in materials that have become contaminated with molds. While *Stachybotrys* is growing, a wet slime layer covers its spores, preventing them from becoming airborne. However, when the mold dies and dries up, air currents or physical handling can cause spores to become airborne.

At present there is no environmental test to determine whether *Stachybotrys* growth found in buildings is producing toxins. There is also no blood or urine test that can establish if an individual has been exposed to *Stachybotrys chartarum* spores or its toxins.

### **Who is at greater risk when exposed to mold?**

Exposure to mold is not healthy for anyone inside buildings. Therefore, it is always best to identify and correct high moisture conditions quickly before mold grows and health problems develop.

Some people may have more severe symptoms or become ill more rapidly than others:

- Individuals with existing respiratory conditions, such as allergies, chemical sensitivities, or asthma.

- Persons with weakened immune systems, such as people with HIV infection, cancer chemotherapy patients, and others with chronic diseases.
- Infants and young children.
- The elderly.

### **Will my health or my child's health be affected, and should we see a physician?**

If you believe that you or your children have symptoms that you suspect are caused by exposure to mold, you should see a physician. Keep in mind that many symptoms associated with mold exposure may also be caused by many other illnesses. You should tell your physician about the symptoms and about when, how, and for how long you think you or your children were exposed.

### **DETECTION OF MOLD**

#### **How can I tell if I have mold in my house?**

You may suspect that you have mold if you see discolored patches, cottony or speckled growth on walls or furniture or if you smell an earthy or musty odor. Evidence of past or ongoing water damage should also trigger more thorough inspection. You may find mold growth underneath water-damaged surfaces or behind walls, floors or ceilings.

#### **Should I test my home for mold?**

The Colorado Department of Public Health and Environment does not recommend testing as a first step to determine if you have a mold problem. Reliable air sampling for mold can be expensive and requires expertise and equipment that is not available to the general public. Owners of individual private homes and apartments generally will need to pay a contractor to carry out such sampling, because insurance companies and public health agencies seldom provide this service. Mold inspection and cleanup is usually considered a housekeeping task that is the responsibility of homeowner or landlord, as are roof and plumbing repairs, house cleaning, and yard maintenance.

Another reason the health department does not recommend testing for mold contamination is that there are few available standards for judging what is an acceptable quantity of mold. In all locations, there is some level of airborne mold outdoors. If sampling is carried out in a home, an outdoor air sample also must be collected at the same time as the indoor samples, to provide a baseline measurement. Because individual susceptibility varies so greatly, sampling is at best a general guide.

The simplest way to deal with a suspicion of mold contamination is: **If you can see or smell mold, you likely have a problem and should take the steps outlined below.** Mold growth is likely to recur unless the source of moisture that is allowing mold to grow is removed and the contaminated area is cleaned.

### **GENERAL CLEAN-UP PROCEDURES**

The following is intended as an overview for homeowners or apartment dwellers. We recommend that you consult EPA and other documents listed in the useful publications section.

#### **Elements of the Clean-up Procedures**

- Identify and eliminate sources of moisture.
- Identify and assess the magnitude and area of mold contamination.
- Clean and dry moldy areas – use containment of affected areas.
- Bag and dispose of all material that may have moldy residues, such as rags, paper, leaves, and debris.

## **Assessing the Size of a Mold Contamination Problem**

There will be a significant difference in the approach used for a small mold problem – total area affected is less than 10 square feet – and a large contamination problem – more than 100 square feet. In the case of a relatively small area, the homeowner or maintenance staff, using personal protective equipment, can handle the clean-up. However, for cases of large areas, it is advisable that an experienced, professional contractor be used.

A list of contractors can be located at [www.cdphe.state.co.us/ap/IAQhom.asp](http://www.cdphe.state.co.us/ap/IAQhom.asp). The Colorado Department of Public Health and Environment does not accredit, certify, recommend or endorse the listed contractors; their credibility can be checked at the following websites: [www.acgih.org](http://www.acgih.org), [www.aiha.org](http://www.aiha.org) and [www.ascr.org](http://www.ascr.org).

## **Can mold cleaning-up activities be hazardous to my health?**

Yes. During the cleaning process, you may be exposed to mold, strong detergents, and disinfectants. Spore counts may be 10 to 1000 times higher than background levels when mold-contaminated materials are disturbed.

Take steps to protect your and your family's health during cleanup:

- When handling or cleaning moldy materials, it is important to use a respirator to protect yourself from inhaling airborne spores.

Respirators can be purchased from hardware stores; select one that is effective for particle removal (sometimes referred to as an N-95 particulate respirator). However, respirators that remove particles will not protect you from fumes (from cleaning materials). Minimize exposure when using bleach or other disinfectants by ensuring good ventilation of the area.

- Wear protective clothing that is easily cleaned or discarded.
- Use rubber gloves.
- Try cleaning a test area first. If you feel that this activity adversely affected your health, you should consider paying a licensed contractor or other experienced professional to carry out the work.
- Ask family members or bystanders to leave areas that are being cleaned.
- Work for short time periods and rest in a location with fresh air.
- Air out your house well during and after the work.

**Never use equipment with a gasoline engine indoors, such as the engine on a water pump, pressure washer or generator, as you could expose your family to toxic levels of carbon monoxide.**

## **Removal of Moldy Materials**

Clean up should begin after the moisture source is fixed and excess water has been removed. Wear gloves when handling moldy materials.

- Discard porous materials, such as ceiling tiles, sheetrock, carpeting, and wood products.
- Bag and discard moldy items; if properly enclosed, items can be disposed with household trash.
- Dry affected areas for 2 or 3 days.

Because spores are more easily released when moldy materials dry out, it is advisable to remove moldy items as soon as possible. If there was flooding, sheetrock should be removed to a level above the high-water mark. Visually inspect the wall interior and remove any mold-contaminated materials.

## **What can I save? What should I toss?**

You should discard moldy items that are porous and from which it will be difficult to remove mold completely, including paper, rags, wallboard, rotten wood, carpet, drapes, and upholstered furniture. Contaminated carpet is often difficult to thoroughly clean, especially when the backing and/or padding have become moldy. Solid materials – glass, plastic, and metal – can generally be kept after they are thoroughly cleaned.

## Clean-up

When attempting to clean less porous items, the first step is to remove as much mold as possible. A cleaning detergent is effective for this purpose. Wear gloves, mask and eye protection when doing this cleanup.

- Use non-ammonia soap or detergent, or a commercial cleaner, in hot water, and scrub the entire area that is affected by the mold.
- Use a stiff brush or cleaning pad on cement-block walls or other uneven surfaces.
- Rinse cleaned items with water and dry thoroughly. A wet/dry vacuum cleaner is helpful for removing water and cleaning items.

## Disinfection of Contaminated Materials

Disinfecting agents can be toxic for humans, not just molds. They should be used only when necessary and should be handled with caution. Disinfectants are intended to be applied to thoroughly cleaned materials and are used to ensure most microorganisms have been killed.

Removal of mold growth from nonporous materials usually is sufficient. Wear gloves, mask and eye protection when using disinfectants

- After thoroughly cleaning and rinsing contaminated materials, a solution of 10 percent household bleach (1 cup bleach per gallon of water) can be used as a disinfectant.
- **Using bleach straight from the bottle is actually LESS effective than diluted bleach.**
- Keep the disinfectant on the treated material for the prescribed time before rinsing or drying, typically 10 minutes is recommended for a bleach solution.
- **Bleach fumes can irritate the eyes, nose, and throat. Make sure working areas are well ventilated.**
- Properly collect and dispose extra disinfectant and runoff.
- **Never mix bleach with ammonia; toxic fumes may be produced.**

## Can air ducts become contaminated with mold?

Yes. Air duct systems can become contaminated with mold. Duct systems may be constructed of bare sheet metal, sheet metal with fibrous glass insulation on the exterior, or sheet metal with an internal fibrous glass liner, or they may be made entirely of fibrous glass. Bare sheet metal systems and sheet metal with exterior fibrous glass insulation can be cleaned and disinfected. If water damaged, ductwork made of sheet metal with an internal fibrous glass liner or made entirely of fibrous glass will often need to be removed and discarded. Ductwork in difficult-to-reach locations may have to be abandoned. If you have other questions, contact an air duct cleaning professional or licensed contractor.

## Can ozone air cleaners help remove indoor mold or reduce odors?

The Colorado Department of Public Health and Environment strongly recommends that you NOT use an ozone air cleaner in any occupied space. Ozone is a strong oxidizing agent that is used to eliminate odors. However, ozone is a known lung irritant. Ozone generators have been shown to sometimes produce indoor levels above the safe limit. It has been shown that ozone is not effective in controlling molds and other microbial contamination, even at concentrations far above safe health levels. Also, ozone may damage materials in the home, for example, cause rubber items to become brittle.

## How can I prevent indoor mold problems in my home?

Inspect your home regularly for the indications and sources of indoor moisture and mold listed on Page 1. Take steps to eliminate sources of water as quickly as possible. If a leak or flooding occurs, it is essential to act *quickly*:

- Stop the source of leak or flooding.
- Remove excess water with mops or wet vacuum.
- Whenever possible, move wet items to a dry and well ventilated area or outside to expedite drying. Move rugs and pull up areas of wet carpet as soon as possible.
- Open closet and cabinet doors and move furniture away from walls to increase circulation.
- Run portable fans to increase air circulation. Do NOT use the home's central blower if flooding has occurred in it or in any of the ducts. Do NOT use fans if mold may have already started to grow -- more than 48 hours since flooding.
- Run dehumidifiers and window air conditioners to lower humidity.
- Do NOT turn up the heat or use heaters in confined areas, as higher temperatures *increase* the rate of mold growth.
- If water has soaked inside the walls, it may be necessary to open wall cavities, remove baseboards, and/or pry open wall paneling.

### **Who can I contact for more information?**

Should you need additional information on mold, please contact the Colorado Department of Public Health and Environment's Disease Control and Environmental Epidemiology Division at (303) 692-2700 or the department's Air Pollution Control Division at (303) 692-3100, [www.cdphe.state.co.us/ap/aphom.asp](http://www.cdphe.state.co.us/ap/aphom.asp).

### **FOR LOCAL ASSISTANCE:**

Contact your county or city health department, or your local housing, or Environmental Health Agency.

### **USEFUL PUBLICATIONS**

#### **General Information**

*Biological Pollutants in Your Home.* Concise booklet by U.S. EPA aimed at affected homeowner.  
*Mold and Moisture.* Appendix H in the U.S. EPA IAQ Tools for Schools

#### **Clean-up Guidance**

*Flood Cleanup.* Excellent resource by U.S. EPA, with access to the American Red Cross and FEMA. [www.epa.gov/iaq/pubs/flood.html](http://www.epa.gov/iaq/pubs/flood.html)

*Mold Remediation in Schools and Commercial Buildings.* Valuable guidance by U.S. EPA, is also applicable to residences.

[www.epa.gov/iaq/molds/mold\\_remediation.html](http://www.epa.gov/iaq/molds/mold_remediation.html)

#### **Additional Information:**

U.S. EPA IAQ INFO, (800) 438-4318, [www.epa.gov/iaq/molds/index.html](http://www.epa.gov/iaq/molds/index.html)

CDC Air Pollution and Respiratory Health Branch, National Center for Environmental Health, (404) 498-1000, [www.cdc.gov/nceh/airpollution/mold/](http://www.cdc.gov/nceh/airpollution/mold/)

California Department of Health Services, Indoor Air Quality Info Sheet Mold in My Home: What Do I Do? [www.cal-iaq.org/iaqsheet.htm#Mold](http://www.cal-iaq.org/iaqsheet.htm#Mold)

#### **References**

*Mold in My Home: What Should I Do?*, California Department of Health Services, Indoor Air Quality Info Sheet, July 2001.

*Facts About Mold*, New York City Department of Health and Mental Hygiene, Environmental and Occupational Disease Epidemiology, February 2001.

*Mold/Moisture/Mildew*, EPA, Indoor Air.