

# SUPPORT BUILDING SAFETY!

For more information about building codes and local requirements, contact your local building department below:

U.S. Environmental Protection Agency (EPA)  
[www.epa.gov](http://www.epa.gov)

Indoor Air Quality (IAQ) Home Page  
<http://www.epa.gov/iaq>

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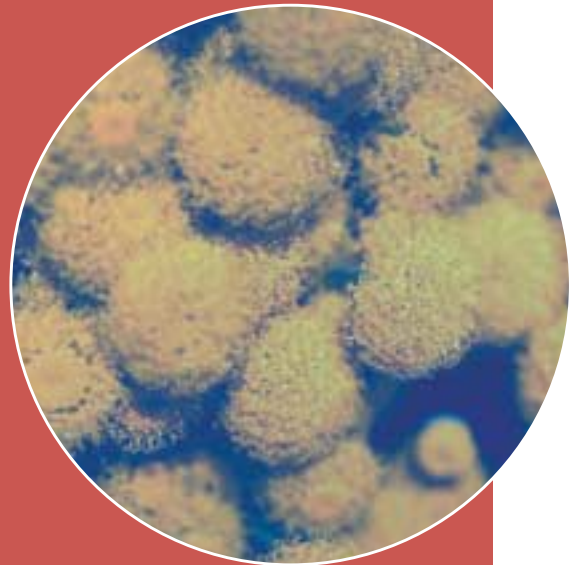
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# Mold

Tips on  
Prevention and  
Remediation





## MOLD PREVENTION

**Mold is caused when** microscopic, airborne spores land on moist surfaces and spread rapidly. Molds can have useful purposes. Life-saving penicillin is derived from mold. Many foods, such as blue cheese, require mold as part of the manufacturing process. And as owners of compost piles know, mold plays an important role in the cycle of nature, helping to break down organic materials.

But the mold that a growing number of builders and homeowners are encountering poses significant problems. Unchecked mold growth on interior wood, wallboard, paper, and carpet has been blamed for serious illnesses. It can be exceedingly difficult to eradicate, and has even rendered some buildings uninhabitable.

This mold has the same root causes as food mold. Tiny spores—less than 4 microns in size—land on damp spots when excessive moisture or water accumulates indoors. These spores then begin digesting whatever they are growing on in order to survive and spread.

According to the U.S. Environmental Protection Agency, there is no practical way to eliminate all mold and mold spores in the indoor environment. But mold can be controlled by controlling moisture.

It takes a concerted and concentrated effort to maintain a mold-resistant building. Builders and contractors must carefully construct buildings in accordance with approved plans and follow good construction practices in assembling the building components. Building owners and tenants must be observant and take immediate steps to maintain existing buildings and their systems to prevent moisture from accumulating.

### General Tips for Preventing Mold

Here are some commonsense precautions that builders, homeowners, and/or building owners can follow to avoid mold and ensure health and safety when building or maintaining a structure.

- ▶ Fix leaky plumbing and leaks in the building envelope as soon as possible.
- ▶ Watch for condensation and wet spots.
- ▶ Fix sources of moisture problems as soon as possible.

- ▶ Prevent moisture caused by condensation by increasing surface temperature or reducing the moisture level in air (humidity).
- ▶ Insulate or increase air circulation to increase surface temperature.
- ▶ Increase ventilation (if outside air is cold and dry), or dehumidify (if outdoor air is warm and humid) to reduce the moisture level in air, repair leaks, etc.
- ▶ Keep heating, ventilation, and air-conditioning drip pans clean, flowing properly, and unobstructed.
- ▶ Vent moisture-generating appliances, such as dryers, to the outside where possible.
- ▶ Maintain low indoor humidity, below 60 percent relative humidity (RH), ideally 30 to 50 percent, if possible.
- ▶ Adhere to a regular schedule of building/HVAC inspections and maintenance.
- ▶ Provide drainage outside foundation walls, and slope the ground away from the foundation to speed drying after rainfalls.

### What the Codes Say

The ICC *International Codes*<sup>®</sup> are the minimum requirements necessary to ensure safety. According to these codes, builders and owners must fight the problem of mold in a three-fold approach.

1. There must be proper ventilation of all interior habitable and occupiable areas along with specific concealed spaces.

- ▶ See Section 1202.1 of the *International Building Code*<sup>®</sup>, Section R303 of the *International Residential Code*<sup>®</sup>, and Chapter 4 of the *International Mechanical Code*<sup>®</sup>.

2. The exterior envelope of all buildings must be provided with vapor retarders, water-resistant barriers and the necessary flashing.

- ▶ See Chapter 14 of the *International Building Code* and Section R703 of the *International Residential Code*.

3. The maintenance of existing buildings and structures is of the utmost importance. This includes not only the exterior of the structure but also its plumbing and mechanical systems.

- ▶ See Sections 303, 403 and 504 of the *International Property Maintenance Code*<sup>®</sup>.





### If You Have To Remove Mold: Guidelines for Remediation

Mold can generally be removed from nonporous (hard) surfaces by wiping or scrubbing with water or with a combination of water and detergent. The use of a biocide, such as chlorine bleach, is not recommended as a routine practice during mold cleanup. Remember, biocides are toxic to humans, as well as to mold, and you should read and follow label precautions. Never mix chlorine bleach solution with cleaning solutions or detergents that contain ammonia because toxic fumes could be produced.

When a mold problem is discovered, it is important to protect the health of everyone involved—tenants, contractors, and work crews. These guidelines will help, even if you have little or no experience with mold remediation.

Refer to these guidelines when evaluating an in-house remediation plan or a remediation plan submitted by an outside contractor. Contractors and other professionals who respond to mold and moisture situations in commercial buildings and schools will also find these guidelines essential.

#### Investigate and evaluate moisture and mold problems.

- ▶ Assess the size of the moldy area (square feet).
- ▶ Consider the possibility of hidden mold.
- ▶ Clean up small mold problems and fix moisture problems before they become large problems.
- ▶ Select a remediation manager for medium- or large-sized mold problems.
- ▶ Investigate areas associated with occupant complaints.
- ▶ Identify sources or causes of water or moisture problems.

- ▶ Note type of water-damaged materials (wallboard, carpet).
- ▶ Check inside air ducts and air-handling unit.
- ▶ Throughout process, consult qualified professional if necessary or desired.

Communicate with building occupants at all stages of process, as appropriate.

- ▶ Designate a contact person for questions and comments about medium- or large-scale remediation as needed.

#### Develop a remediation plan.

- ▶ Adapt or modify remediation guidelines to fit your situation; use professional judgment.
- ▶ Select cleanup methods for moldy items.
- ▶ Select personal protection equipment to protect remediators.
- ▶ Select containment equipment to protect building occupants.
- ▶ Select experienced remediation personnel.
- ▶ Address the moisture problem at its source. Implement repair and/or maintenance plan.
- ▶ Dry wet, nonmoldy materials within 48 hours to prevent mold growth.
- ▶ Clean and dry moldy materials.
- ▶ Discard moldy porous items that cannot be cleaned.

#### During Cleanup Efforts: Reducing Your Exposure to Mold

During any mold cleanup process, mold spores will be released into the air. For protection during the cleanup operation:

- ▶ Use a HEPA filter respirator to reduce the number of mold spores you breathe in.
- ▶ Wear protective clothing that can be discarded.
- ▶ Wear rubber gloves.
- ▶ Work for a short while and then take breaks in the fresh air.
- ▶ Work with windows open and keep them open after cleanup.
- ▶ Turn off heat and air conditioning to prevent spores from being spread to other areas of the house.
- ▶ If there is an air return vent in the room, cover it tightly.
- ▶ Place a fan in a window to blow air out of the affected room.
- ▶ Double-bag all cleanup materials before removal from contaminated area.

If you use outside contractors or professionals, make sure they have experience cleaning up mold, check their references, and have them follow the recommendations presented in this brochure.

