



Frequently Asked Questions/Safe Work Practices

Coast Guard Mold and Moisture Issues



Question	Answer
What is mold?	Molds are fungi that can be found everywhere on earth, both indoors and outdoors. Over 100,000 different species of mold exist. Molds grow best in warm, damp, and humid conditions; reproduce by making tiny spores; and spread by releasing these spores into the air. Mold spores can survive harsh and dry environmental conditions that do not support mold growth.
What is Toxic Mold?	We often receive questions regarding “Toxic Black Mold”, or <i>Stachybotrys chartarum</i> , a greenish-black slime mold associated with long-term heavy water damage. Molds can be nearly any color and it is estimated that more than 1,000 mold species appear black in color. In addition, you might read or hear about the “mycotoxins” produced by mold. Other fungal species can also produce toxins. Regardless of the color or species of mold, our response remains the same; if you see mold, properly remove it.
What are Mycotoxins?	<p>You might have heard that mold (especially <i>Stachybotrys</i>) can produce dangerous substances called “mycotoxins”. Many fungi including several species of mold are known to produce mycotoxins given the right conditions. Fungi can produce a variety of byproducts during metabolism, which often serve as a chemical defense giving them a competitive growth advantage over other fungi. Those capable of causing harmful effects on other organisms are classified as mycotoxins, while those that are toxic to bacteria are classified as antibiotics (i.e. penicillin). Nearly 400 different mycotoxin compounds have been discovered with about a dozen that are recognized as a potential threat to human and animal health. Most of these mycotoxins are classified as aflatoxins and associated with crops, stored produce, and improperly fermented food items.</p> <p>Several commonly encounter mold species during indoor environmental quality investigations have the ability to produce mycotoxins when the proper conditions exist over a prolonged period of time. The good news is that these substances are not volatile and do not normally pose an airborne exposure risk unless disturbed. That is, the greatest risk of exposure is for personnel involved with abatement of building materials containing significant mold growth. Still, following some basic safe work practices will reduce the risk and protect personnel.</p>
Where are molds found?	Molds can be found in every environment, indoors and outdoors, year-round and can grow on just about any surface when enough moisture is present. They are commonly found on bathroom tile, basement walls, around windows and near leaky water sources.
What should be my primary concerns?	<p><u>Health Effects:</u></p> <p>We are all exposed to mold spores continuously in the air we breathe. Exposure to molds/spores may cause a variety of symptoms or often none at all. About 20% of the population are sensitive to molds and can experience allergy-type symptoms, including nasal stuffiness, throat irritation, coughing or wheezing, eye irritation, or, in some cases, skin irritation.</p> <p>More severe reactions/symptoms requiring medical care are extremely rare and are self-limiting since a person experiencing these reactions would naturally seek care. Molds are allergens and can cause symptoms whether actively growing or dead. The greatest exposure risks are for personnel involved with removal of moldy building materials.</p> <p><u>Other Concerns:</u></p> <p>Molds consume organic materials as they grow. Left unchecked, this growth can damage the material and produce foul odors. It is virtually impossible to remove all mold growth from porous materials such as clothes, bedding, and carpet, leading lead to increased maintenance costs.</p>



Frequently Asked Questions/Safe Work Practices Coast Guard Mold and Moisture Issues



Is it safe to occupy my facility that has visible mold growth?	<p>We have an obligation, under the OSH Act, to provide a workplace that is free of recognized hazards and exposure risks. The presence of visible mold growth in the workplace poses a risk to susceptible individuals/workers. Given that sensitivity is different for each person, identifying the actual health risk for each individual would require medical testing and air sampling at great expense in both time and money. Therefore, the Coast Guard safety and environmental health position is that personnel should not occupy facilities with unmitigated moisture problems and unaddressed mold growth. Therefore, the question of whether or not a facility is habitable depends upon the unit's ability to control mold growth until the moisture problems can be corrected. NOTE: <i>small amounts of fungal growth in wet areas such as: mildew in showers, mold on kitchen and window caulking, and similar issues are common, easily maintained with minor cleaning efforts, and are not grounds for a determination regarding habitability.</i></p> <ul style="list-style-type: none">• Low Risk Spaces: when routine cleaning can prevent visible mold on surfaces in occupied spaces, mechanical ventilation systems (i.e. HVAC) supplying air to the space are not impacted by mold growth, and there are not unsealed openings into other spaces containing large amounts of visible mold growth. Health risks for sensitive personnel would be comparable to being outdoors and non-sensitive personnel would not be expected to experience any mold-related symptoms.• High Risk Spaces: when routine cleaning cannot control/prevent visible mold from growing on surfaces in occupied spaces, mechanical ventilation systems (i.e. HVAC) supplying air to the spaces in question are impacted by mold growth, and/or the space has openings into other spaces containing large amounts of visible mold growth. Health risks for sensitive personnel are elevated compared to being outdoors. Sensitive personnel will likely experience symptoms and non-sensitive personnel may become more sensitive by occupying the spaces.
What about the building contents?	<p>We are often asked about the safety of building contents located in spaces containing visible mold growth including: furniture, tools, equipment, clothing, etc. The key in determining the need for cleaning is to evaluate the items for actual mold growth. As previously mentioned, mold spores can be found on every surface both indoors and outdoors, but only those items with sufficient moisture will sustain mold growth. Therefore, as a general rule, items without visible mold growth do not require cleaning, while items containing visible mold growth would require additional cleaning. For details regarding appropriate cleaning methods, refer to the "How do we clean mold?" section below.</p>
Why does mold grow?	<p>It is impossible to eliminate all molds and mold spores in the indoor environment. However, controlling moisture is the best mold prevention strategy. The most common moisture sources that lead to mold growth are high relative humidity and water leaks. Mold growth in a building is a symptom of moisture problems and, except for flooding incidents, is always a sign of a facility-related and/or mechanical system deficiencies.</p> <p><u>Indoor Causes:</u></p> <ul style="list-style-type: none">○ Poor ventilation/exhaust in high moisture areas (kitchen, bath)○ Domestic activities: cooking, houseplants, drying laundry/ storing wet gear indoors○ Appliances (gas furnace, laundry, etc) not vented directly outside or faulty○ Condensation on poorly insulated surfaces and on piping○ Missing/improper air-vapor barrier; always install on warm side of insulation○ Humidifiers or oversized air conditioners○ Pipe /plumbing leaks, drainpipe clogs, and pipe ruptures during cold weather <p><u>Outdoor Sources:</u></p> <ul style="list-style-type: none">○ Poor drainage and sloping grades toward structures (often disguised by mulch)○ Blocked exterior air circulation (vegetation, items too close to house)○ Water intrusion through roof leaks, improper door/window flashing, damaged gutters, etc.



How can we prevent mold growth?

The key to preventing mold growth is to control moisture; solutions include repairing any sources of water intrusion and immediately drying any items impacted by leaks, reducing the relative humidity, increasing air movement, increasing room air temperature, and/or increasing surface temperatures.

Moisture in Air (Relative Humidity):

Water vapor contained in very humid air can condense on cold surfaces, providing an environment ideal for mold growth. As air cools, it can hold less moisture and eventually approaches 100% relative humidity (think rain). As surfaces cool, the temperature at which moisture in the air will condense on surfaces gets higher (think dew). Maintain indoor relative humidity (RH) at 30-50% (ideal) and no higher than 65%. Thermo-hygrometers can be purchased at low cost and installed in rooms to monitor temperature and RH. Where RH is high, consider a combination of the following measures:

1. Reduce the moisture level in the air (humidity):

- Ensure proper operation & maintenance of air conditioning units; if A/C cycles on/off repeatedly, air may not be cooled to below the dew point, producing moist, cool air. Ensure condensate is draining properly and filters are the right size, clean, and changed periodically.
- Eliminate standing water and leaks. Do not store wet gear in poorly ventilated rooms.
- Ensure that all humid air from galleys/sculleries (kitchens), showers, clothes dryers, and steam pipes are vented directly outside; install externally venting fans in kitchens and baths.
- Carefully evaluate humidifier use. If essential, monitor adjacent carpeting, walls, and other surfaces for moisture. Clean unit and maintain filter per manufacturer's recommendations.
- Check for blocked furnace vents or chimney and insufficient combustion air; do not use unvented kerosene/gas heaters or appliances.
- Ensure floors of crawl spaces have a sealed air-vapor barrier.

2. Increase ventilation and air circulation- Effective if supplied air is less humid than room air and important in rooms where wet items are stored:

- For localized condensation, aim a small fan at area to circulate air; keep fan clean.
- If outdoor RH is lower than indoor RH, open windows; consider cross-ventilation. Do not open windows if A/C is operating.
- For inadequate attic ventilation, check insulation for blocked vents.

3. Increase the temperature of the surfaces where condensation is occurring:

- Insulate or add additional insulation to cold surfaces (i.e. cold water pipes)
- Increase air temperature within spaces to eliminate very cold surfaces.
- Insulate windows with additional glazing or other treatments to seal around all edges.

Water Intrusion:

1. Leaks:

- Regularly inspect plumbing for leaks and investigate reports/signs of moisture
- Regularly inspect drainage systems, including air conditioning and sub-pumps.
- Dry all wet or damp materials as soon as possible (within 48 hours).

2. Bulk water intrusion:

- Report and control leaks through roof, exterior walls, & flashing; repairing promptly.
- Ensure drainage moves water away from the structure; check, clean, & replace gutters and downspouts as needed. Slope surrounding soil away from foundation.



Frequently Asked Questions/Safe Work Practices

Coast Guard Mold and Moisture Issues



What should we do if we find mold?	<p>Follow these steps if you see mold:</p> <ol style="list-style-type: none">1. Remove visible mold using the cleaning procedures described below.2. Identify and eliminate sources of moisture. NOTE: Removing mold without correcting the moisture problems is not effective because the mold will just grow back.3. Used forced air ventilation and/or dehumidifiers to thoroughly dry wet areas/materials4. Contain contaminated areas; do not allow mold spores to spread.5. Monitor the area and continue to remove any mold until the moisture problems are resolved.6. Individuals experiencing physical symptoms should consult their medical provider.7. Contact HSWL SC (se-fo) for additional assistance/guidance.
Should we sample for mold?	<p>If visible mold is present, sampling is not generally needed. Exceptions may include sampling as part of a medical investigation where diagnosis by a licensed medical practitioner suggests issues related to moisture or biological contaminants; hidden mold; or to assess the adequacy of remediation. Because there are no recognized quantitative exposure limits for mold and effects can vary highly among individuals, the decision to perform sampling must be approached carefully; often these resources are better utilized by controlling the source moisture source. Sampling should only be performed by a professional experienced in mold assessment and interpreting results. Regardless of the species of mold present, the best approach is to correct underlying moisture problems and continue to remove visible mold until the source of moisture has effectively been controlled.</p>
How do we clean mold?	<p>All visible mold must be physically removed. Develop a clear work plan outlining cleaning and decontamination procedures, containment, and required PPE. CG personnel involved in mold removal must be trained to the OSHA HAZCOM standard, including the physical, chemical, and microbial hazards and controls of the operation; Safe Work Practices; and PPE. Generally, unit personnel can clean small (< 10 ft²) and medium (10-30 ft²) isolated areas of mold growth. NOTE: For large areas (> 30 ft²), mold growth in the HVAC system, suspected hidden mold, or reported significant medical symptoms, consult the command's Safety Manager and HSWL SC. CG personnel wearing respirators must be included in the unit's respiratory protection program (medically approved for use, fit testing, training, documentation, etc). NOTE: Before disturbing any surface coatings/building materials, confirm the absence of asbestos & lead.</p> <ol style="list-style-type: none">1. Assemble PPE: latex gloves, goggles, N-95 respirator, & disposable coveralls/boot covers. Depending on species & density of fungi, consider ½ or full face APR with P-100 filter.2. Turn off HVAC system; cover all ventilation openings with plastic sheeting.3. For areas >10 ft², isolate work area with polyethylene sheeting & seal with tape. Create negative pressure in room using an exhaust fan or HEPA air filtration device to direct air from within enclosure to outdoors.4. Non-porous items (e.g. metal, glass, hard plastics): HEPA vacuum, then damp-wipe with a detergent solution.5. Porous items (e.g. ceiling tiles, carpet): Bag moldy debris in 6-mil bags or poly sheeting, seal, & dispose. Bag moldy clothing/bedding & launder; items may require disposal due to odor and staining.6. Contaminated building materials: Remove carefully with razors/knives in large sections. Do not demolish with hammers, saws, etc. Place in 6-mil bags or poly sheeting, seal, & dispose.7. Clean work area and all access routes to outside used during remediation working from the clean toward the dirty area with a HEPA vacuum followed by damp wipe/mopping with a detergent solution.



Frequently Asked Questions/Safe Work Practices *Coast Guard Mold and Moisture Issues*



Safe Work Practices	<p>Observe the following Safe Work Practices during mold clean-up:</p> <ul style="list-style-type: none">• Do not allow eating, drinking, smoking in contaminated areas• Remove protective gear & wash hands before eating, drinking, smoking, or using bathroom• Wash hands and shower at the end of the work day• Wear appropriate PPE based on hazards present and don before entering containment area• Repair/replace damaged PPE• Dispose of PPE with other refuse before leaving containment Do not move used PPE from one area to another• Wear latex, chemically resistant, or vinyl gloves in containment area and when handling bagged materials• Wear a second pair of gloves to protect against injury when warranted (e.g. building demo)• If a glove is damaged, discard, wash hands with soap and water, and inspect hands for injury• Report injuries per unit's Pre-Mishap Plan as soon as possible
Should we use bleach or other biocides?	<p>The most important response measure is to physically remove all mold and control moisture sources. The use of chlorine bleach and other biocides isn't recommended as a routine practice for mold remediation. There are exceptions where disinfection is warranted, such as when an area was flooded with sewage or other contaminated water. If bleach will be used, proper ventilation and dilution is required; bleach should never be mixed with products containing ammonia.</p> <p>The application of commercial biocides requires consideration on a per case basis and requires strict control measures; contact HSWL SC (se) if you are considering using commercial biocides.</p>
Where can we find more information?	<ol style="list-style-type: none">1. Centers for Disease Control & Prevention (CDC), http://www.cdc.gov/mold/2. Environmental Protection Agency (2008). <i>Mold Remediation in Schools and Commercial Buildings</i>, EPA 402-K-01-001, https://www.epa.gov/sites/production/files/2014-08/documents/moldremediation.pdf3. National Institute for Occupational Safety and Health. (2012) <i>NIOSH Alert: Preventing Occupational Respiratory Disease from Exposures Cause by Dampness</i>, DHHS (NOISH) Pub No. 2013-102, http://www.cdc.gov/niosh/docs/2013-102/4. Institute for Inspection, Cleaning, and Restoration Certification (IICRC), Standards S500 and S520,5. World Health Organization Guidelines for Indoor Air Quality: Dampness and Mould (2009), https://www.who.int/publications/i/item/9789289041683
Who do we contact with additional questions?	<p>For additional questions, please contact your Health, Safety and Work-life Service Center (HSWL SC), Safety and Environmental Health Officer (SEHO). Additional resources and contact information are available on the HSWL SC CG Portal page: https://cglink.uscg.mil/2a056cd.</p>