Module 4

Mitigating Mold in Schools & Buildings

Module 4

The focus

- Key steps
- Questions to consider
- Remediation and moisture control
- Indoor air standards
- Containment
- Clean-up
- Check list

Welcome to the final module in this four-part course on mold. In this fourth module, the focus is on mitigating mold in schools and buildings.

Key steps - A

- Fix leaky plumbing and leaks in the building envelope as soon as possible.
- Watch for condensation and wet spots. Fix source(s) of moisture problem(s) as soon as possible.
- Prevent moisture due to condensation by increasing surface temperature or reducing the moisture level in air (humidity).
- To increase surface temperature, insulate or increase air circulation. To reduce the moisture level in air, repair leaks, increase ventilation (if outside air is cold and dry), or dehumidify (if outdoor air is warm and humid).
- Keep heating, ventilation, and air conditioning (HVAC) drip pans clean, flowing properly, and unobstructed.

Key steps - B

- Vent moisture-generating appliances, such as dryers, to the outside where possible.
- Maintain low indoor humidity, below 60% relative humidity (RH), ideally 30 – 50%, if possible.
- Perform regular building/HVAC inspections and maintenance as scheduled.
- Clean and dry wet or damp spots within 48 hours.
- Don’t let foundations stay wet. Provide drainage and slope the ground away from the foundation.

Questions to consider

- Are there existing moisture problems in the building?
- Have building materials been wet more than 48 hours?
- Are there hidden sources of water or is the humidity too high (high enough to cause condensation)?
- Are building occupants reporting musty or moldy odors?
- Are building occupants reporting health problems?
- Are building materials or furnishings visibly damaged?
- Has maintenance been delayed or the maintenance plan been altered?
- Has the building been recently remodeled or has building use changed?
- Is consultation with medical or health professionals indicated?

Remediation and moisture control

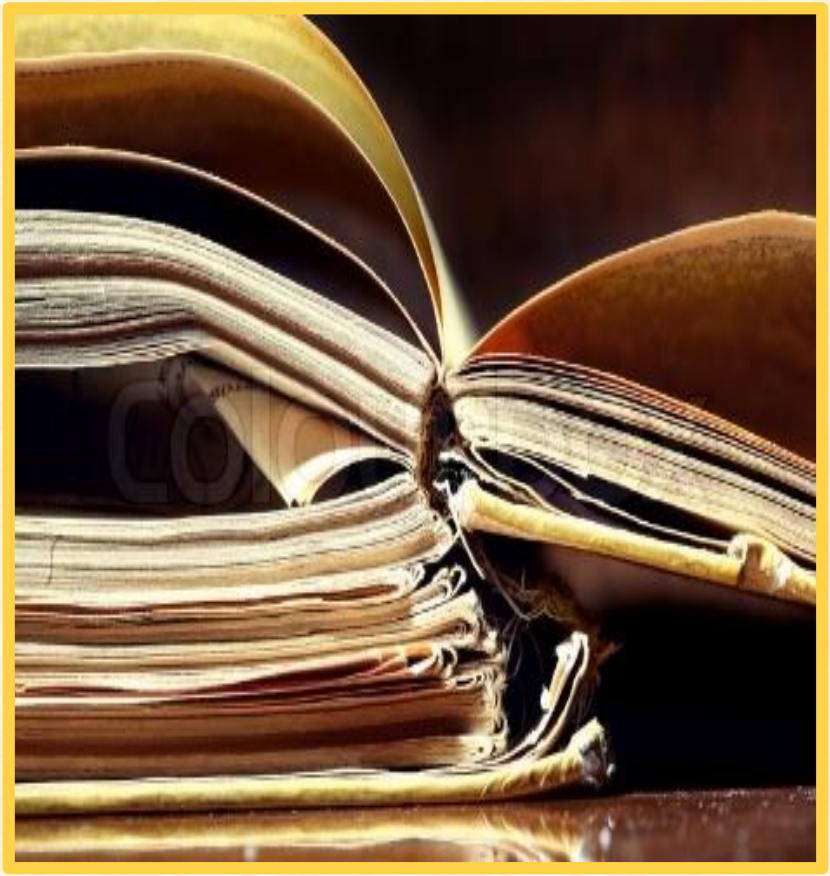
- Fix the water or humidity problem. Complete and carry out repair plan if appropriate. Revise and/or carry out maintenance plan if necessary. Revise remediation plan, as necessary, if more damage is discovered during remediation.
- Continue to communicate with building occupants, as appropriate to the situation.
- Completely clean up mold and dry water-damaged areas.

Guidelines

Here are guidelines for response to clean water damage. We begin with books and papers.

Books and papers

- For non-valuable items, discard books and papers.
- Photocopy valuable/important items, discard originals.
- Freeze (in frost-free freezer or meat locker) or freeze-dry.



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Carpet and backing

- Remove water with water extraction vacuum.
- Reduce ambient humidity levels with dehumidifier.
- Accelerate drying process with fans.
- Always dry within 24-48 hours.

Concrete or cinder blocks

- Remove water with water extraction vacuum.
- Accelerate drying process with dehumidifiers, fans, and/or heaters.

Flooring

Hard surface, porous flooring

- Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.
- Check to make sure underflooring is dry; dry underflooring if necessary.

Non-porous, hard surfaces

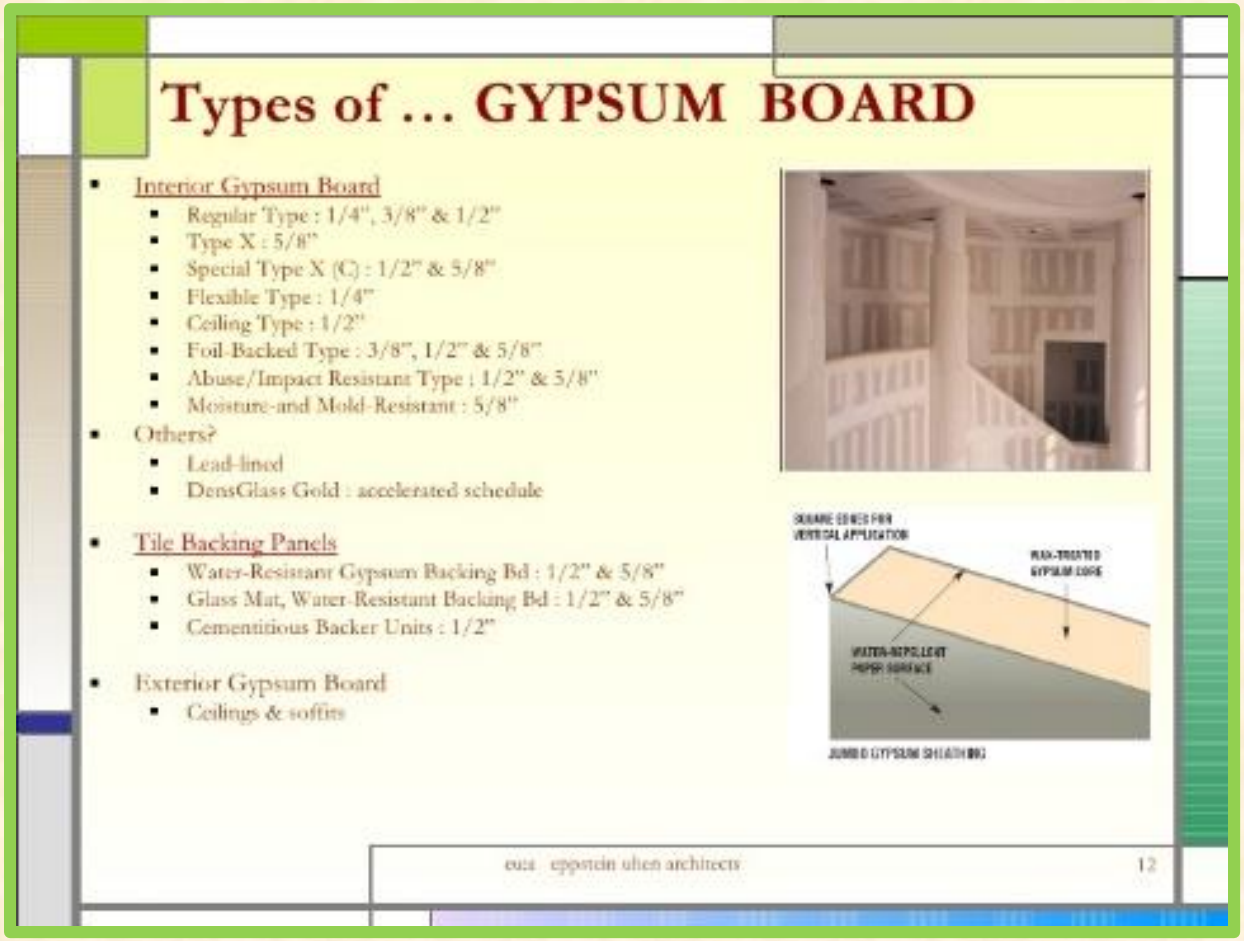
- Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.

Upholstery

- Remove water with water extraction vacuum.
- Accelerate drying process with dehumidifiers, fans, and/or heaters.
- May be difficult to completely dry within 48 hours. If the piece is valuable, you may wish to consult a restoration/water damage professional who specializes in furniture.

Wallboard

- May be dried in place if there is no obvious swelling and the seams are intact. If not, remove, discard, and replace.
- Ventilate the wall cavity, if possible.



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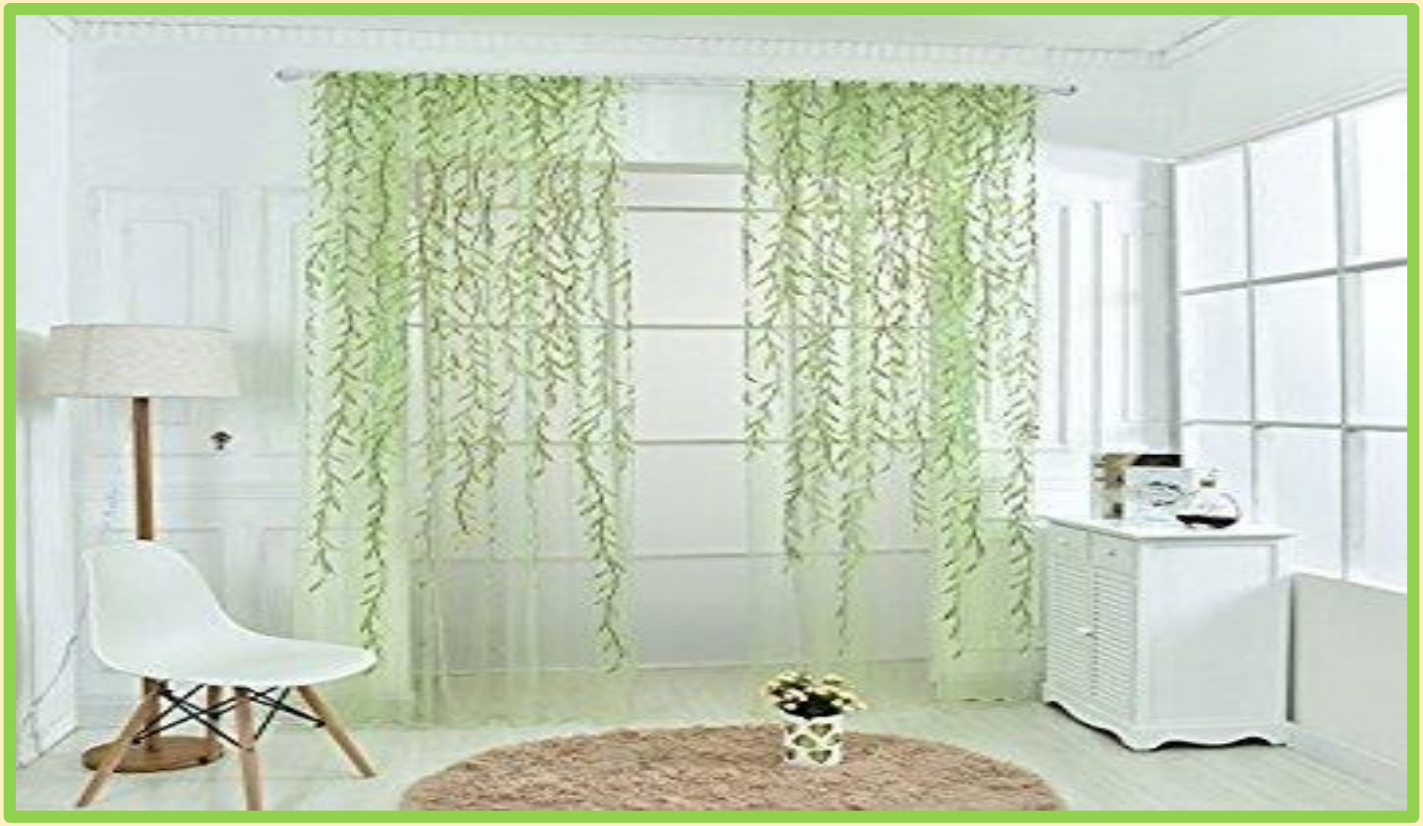
Window drapes

Follow laundering or cleaning instructions recommended by the manufacturer.



Wood surfaces

- Remove moisture immediately and use dehumidifiers, gentle heat, and fans for drying. (Use caution when applying heat to hardwood floors.)
- Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry.
- Wet paneling should be pried away from wall for drying.

Discard and replace

- Cellulose insulation
- Ceiling tiles
- Fiberglass insulation

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Mold remediation

- The purpose of mold remediation is to remove the mold to prevent human exposure and damage to building materials and furnishings.
- It is necessary to clean up mold contamination, not just to kill the mold. Dead mold is still allergenic, and some dead molds are potentially toxic.
- The use of a biocide, such as chlorine bleach, is not recommended as a routine practice during mold remediation, although there may be instances where professional judgment may indicate its use (for example, when immune-compromised individuals are present).

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Using disinfectants

If you choose to use disinfectants or biocides, always ventilate the area. Outdoor air may need to be brought in with fans. When using fans, take care not to distribute mold spores throughout an unaffected area.

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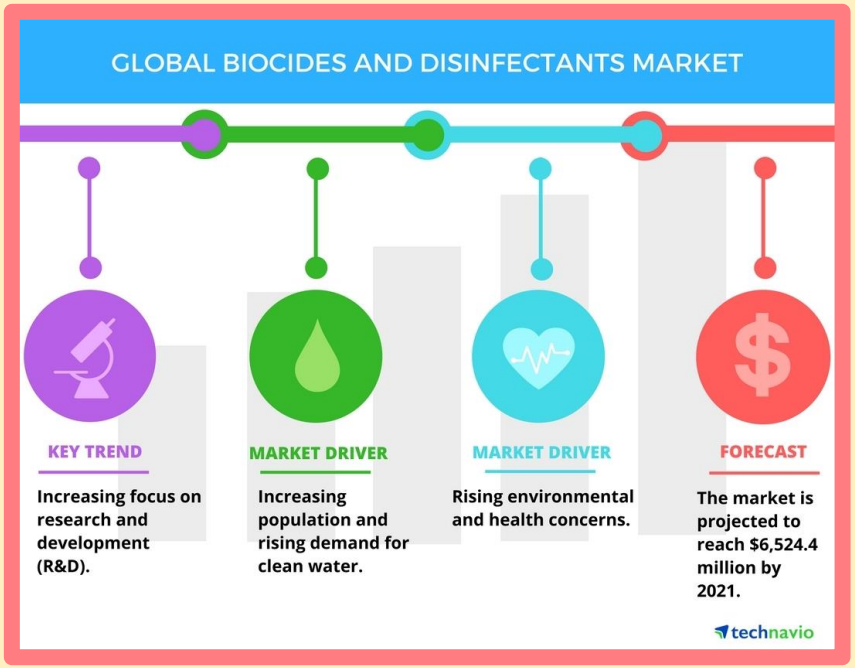
Using biocides

Biocides are toxic to humans, as well as to mold. You should also use appropriate PPE and read and follow label precautions. Never mix chlorine bleach solution with cleaning solutions or detergents that contain ammonia; toxic fumes could be produced.



More on biocides

- Some biocides are considered pesticides, and some states require that only registered pesticide applicators apply these products in schools.
- ***Make sure anyone applying a biocide is properly licensed,*** if necessary. Fungicides are commonly applied to outdoor plants, soil, and grains as a dust or spray. Examples include hexachlorobenzene, organomercurials, pentachlorophenol, phthalimides, and dithio-carbamates.
- ***Do not use fungicides developed for use outdoors*** for mold remediation or for any other indoor situation.

Full containment

Full containment is recommended for the cleanup of mold-contaminated surface areas greater than 100 ftor in any situation in which it appears likely that the occupant space would be further contaminated without full containment. ***Double layers of polyethylene*** should be used to create a barrier between the moldy area and other parts of the building. ***A decontamination chamber or airlock should be constructed for*** entry into and exit from the remediation area.

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More on containment

- The entryways to the airlock from the outside and from the airlock to the main containment area should consist of a slit entry with covering flaps on the outside surface of each slit entry.
- The chamber should be large enough to hold a waste container and allow a person to put on and remove PPE.
- All contaminated PPE, except respirators, should be placed in a sealed bag while in this chamber.

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Equipment

In the next few slides we will focus on equipment used in remediation in schools and buildings.

Humidity gauges

- Humidity meters can be used to monitor humidity indoors. Inexpensive (<$50) models are available that monitor both temperature and humidity.
- Homes should always monitor moisture levels.

Humidistat

A humidistat is a control device that can be connected to the HVAC system and adjusted so that, if the humidity level rises above a set point, the HVAC system will automatically come on.

Use HVAC

- Use high-quality filters in your HVAC system during remediation. Consult an engineer for the appropriate efficiency for your specific HVAC system and consider upgrading your filters if appropriate.
- Conventional HVAC filters are typically not effective in filtering particles the size of mold spores. Consider upgrading to a filter with a minimum efficiency of 50 to 60% or a rating of MERV 8, as determined by Test Standard 52.2 of the American Society of Heating, Refrigerating, and Air Conditioning Engineers.

Clean-up

How do you know when you're finished?

1. You must have completely fixed the water or moisture problem.
2. You should complete mold removal. Use professional judgment to determine if the cleanup is sufficient. Visible mold, mold-damaged materials, and moldy odors should not be present.
3. If you have sampled, the kinds and concentrations of mold and mold spores in the building should be similar to those found outside, once cleanup activities have been completed.
4. You should revisit the site(s) shortly after remediation, and it should show no signs of water damage or mold growth.
5. People should be able to occupy or re-occupy the space without health complaints or physical symptoms.
6. Ultimately, this is a judgment call; there is no easy answer.

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Final check-list

- Assess size of 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 remediation manager for medium or large size mold problem.
- Investigate areas associated with occupant complaints.
- Identify source(s) or cause of water or moisture problem(s).
- Note type of water-damaged materials (wallboard, carpet, etc.) .
- Check inside air ducts and air handling unit.
- Throughout process, consult qualified professional if necessary or desired.

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Communicate

- Designate contact person for questions and comments about medium or large scale remediation as needed
- Fix moisture problem, implement repair plan and/or maintenance plan
- Dry wet, non-moldy materials within 48 hours to prevent mold growth
- Clean and dry moldy materials
- Discard moldy porous items that can't be cleaned

Plan

- Adapt or modify remediation guidelines to fit your situation; use professional judgment
- Plan to dry wet, non-moldy materials within 48 hours to prevent mold growth
- Select cleanup methods for moldy items
- Select Personal Protection Equipment – protect remediators
- Select containment equipment – protect building occupants
- Select remediation personnel who have the experience and training needed to implement the remediation plan

Thank-you for joining us

The End of Module 4