

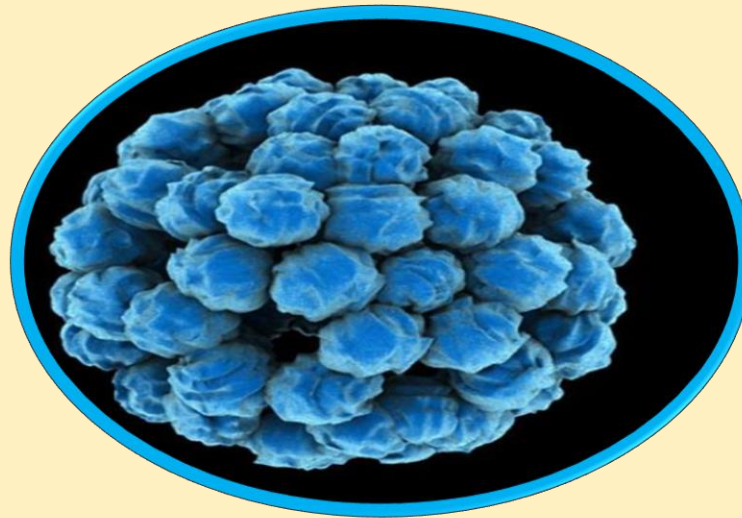
Conducting a Mold Inspection

Module 2

The focus

Welcome to Module 2. This module will focus on two goals:

1. Types of mold inspections
2. IAC2 mold inspection standards



Black mold

Module 2

Client concerns

Clients generally have 3 concerns:

Potential health effects of exposure to fungi and their byproducts

Effect of mold contamination on the structural integrity of the building

The negative aesthetic effects fungi can produce both visually and on the human olfactory system

Module 2

Key questions

1. Is there water intrusion in the building?
2. Are there any components in the building that are water-damaged?
3. Are there musty, moldy odors in the building?
4. Is there any visible, apparent mold?
5. Is that which is visible actually mold?
6. Are there indications of hidden mold growth?
7. Are there conditions conducive to mold growth?
8. What should be done if mold growth is discovered?



Module 2

Develop hypotheses

- A. There is no mold growth in the building (the Null Hypothesis).
- B. The occupants' health is being affected by mold exposure (the "Health-Affected" Hypothesis).
- C. Structural damage has been caused by mold growth in the building (the —Damaged Building Hypothesis).
- D. A musty odor indicates mold growth (the "Aesthetic" Hypothesis).

THE PURPOSE OF A HYPOTHESIS



A hypothesis should always:

- *explain what you expect to happen*
- *be clear and understandable*
- *be testible*
- *be measurable*
- *contain an independent and dependent variable*

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Module 2

Types of inspections

There are *two* types of mold inspections. One type is the "***Complete Mold Inspection.***" The other type is the "***Limited Mold Inspection.***" All sampling is performed according to the IAC2 Mold Sampling Procedures.



Module 2

Assessing a mold problem

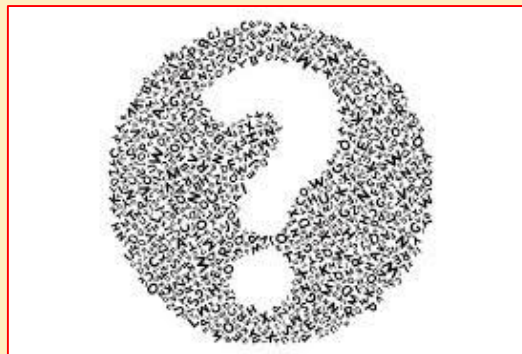
1. Before planning a remediation effort, the size and extent of the mold problem, and any ongoing moisture problems, should be assessed.
2. Remediation generally can be divided into small (less than 10 square feet of mold), medium (*10 to 100 square feet of mold*), and large jobs (*more than 100 square feet of mold*).
3. A remediation manager should be selected for medium or large jobs. An experienced health and safety professional in remediation projects should be consulted, particularly on large or complex jobs.



Module 2

Questions to consider

1. Are there existing moisture problems in the building?
2. Have building materials been wet longer than 48 hours?
3. Are there hidden sources of water, or is the humidity high enough to cause condensation?
4. Are the building's occupants reporting musty or moldy odors?
5. Are the building's occupants reporting health problems?



Module 2

The complete inspection

The Complete Mold Inspection is performed by an IAC2-certified mold inspector. (Refer to Section 2 of the IAC2 Mold Inspection Standards of Practice.) The Complete Mold Inspection is performed in accordance with the Mold Inspection Standards of Practice of the International Association of Certified Indoor Air Consultants (www.IAC2.org).



Module 2

The inspector's role

The inspector shall perform:

1. A non-invasive, visual examination of the readily accessible, visible, and installed systems and components of the building, as outlined in the IAC2 mold inspection standards of practice
2. Moisture, temperature and humidity measurements;
3. At least three air samples (one indoor and two outdoor)
4. Possibly one surface sampling at an area of concern

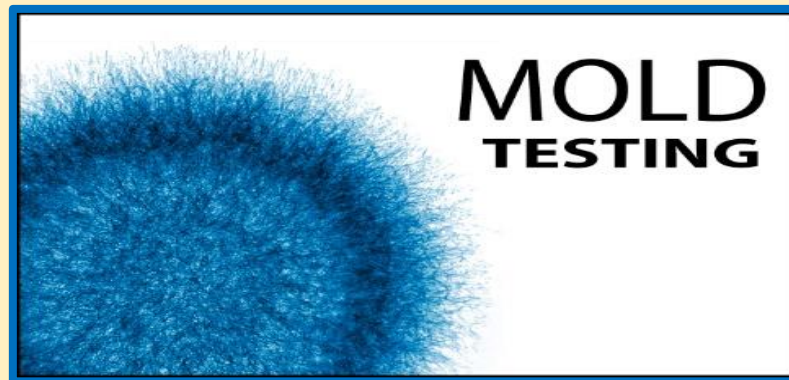
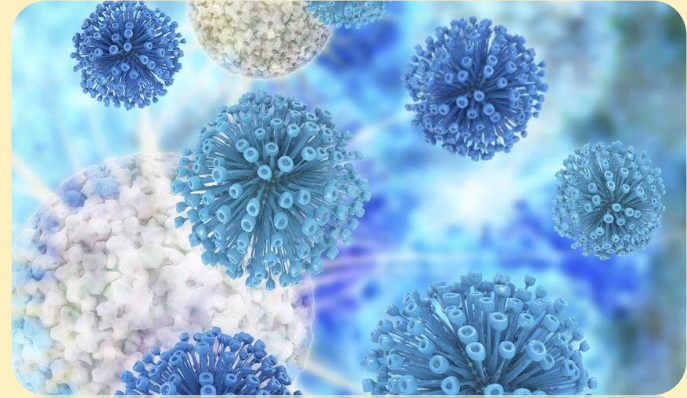


Module 2

Inspector's report

The inspector shall report:

1. Moisture intrusion
2. Water damage
3. Musty odors
4. Apparent mold growth
5. Conditions conducive to mold growth
6. Results of a laboratory analysis of all mold samplings taken at the building



Module 2

Limited mold inspection

The inspector's client requests a Limited Mold Inspection to be performed.

- A. The scope is specifically limited to the under-floor crawlspace of the building.
- B. Only the crawlspace will be inspected, including a non-invasive examination of the crawlspace.
- C. At least one mold sample will be taken, typically a tape sample, if apparent mold is visible.



Module 2

Inspector's role

- A. Visual examination *limited* to a specific, defined area of the building
- B. And mold samples



Module 2

Inspector's report

- A. Moisture intrusion
- B. Water damage
- C. Musty odors
- D. Apparent mold growth
- E. Conditions conducive to mold growth; and
- F. Results of a laboratory analysis of all mold samples taken at the building



Module 2

Standards of Practice

In the next several slides there will be specific information on the details of a complete mold inspection.

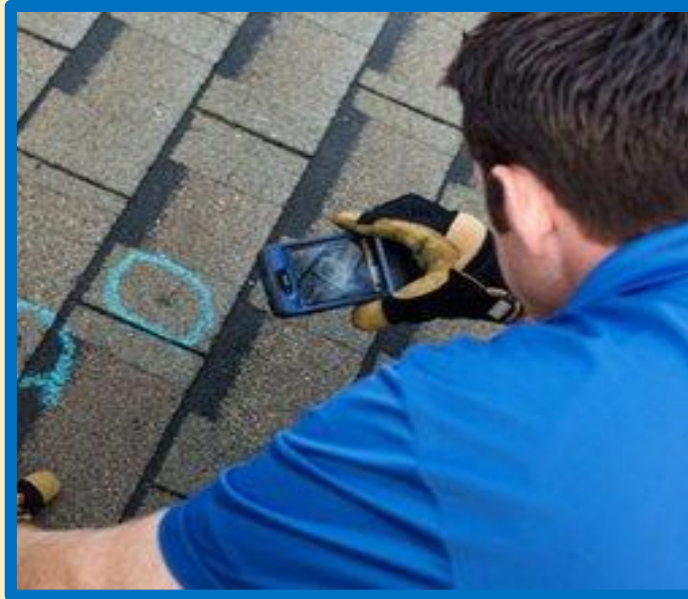


Module 2

The roof - a

The inspector shall inspect from the ground level or eaves:

- A. The roof covering
- B. The roof drainage system, including gutters and downspouts
- C. The vents, flashings, skylights, chimneys, and any other roof penetrations



Module 2

The roof - b

The inspector is not required to:

- A. Walk on any roof surface
- B. Predict the service-life expectancy
- C. Perform a water test



Module 2

Exterior & grounds

The inspector shall inspect from the ground level:

- A. The cladding, flashing and trim
- B. Exterior doors, windows, decks, stoops, steps, stairs, porches, railings, eaves, soffits and fascias
- C. The exterior grading surrounding the building's perimeter
- D. Items that penetrate the exterior siding or covering materials.



Module 2

Exterior & grounds

The inspector is not required to

- A. Inspect underground drainage systems
- B. Inspect window-well drainage
- C. Inspect defects not related to mold growth or moisture intrusion



Module 2

Basement, Foundation, Crawlspace & Structure

- A. The inspector shall inspect: A. the foundation, basement and/or crawlspace, including ventilation; and B. for moisture intrusion.
- B. The inspector is not required to: A. operate sump pumps with inaccessible floats; or B. inspect for structural defects not related to mold growth or moisture intrusion.



Module 2

Heating, cooling & ventilation

The inspector shall inspect:

- A. The air handler, circulating fan and air filter
- B. The condensate pump
- C. Readily visible ductwork
- D. A representative number of supply and return air registers
- E. The central humidifier
- F. The central air-conditioning unit



Module 2

Heating, cooling & ventilation

The inspector is not required to:

- A. Inspect the air-conditioning coil, if not readily accessible
- B. Inspect the condensate pan, if not readily accessible
- C. Test the performance or efficiency of the HVAC system
- D. Inspect the interior of the ductwork system.



Module 2

Plumbing

The inspector shall inspect:

- A. The readily visible main water line
- B. The readily visible water supply lines
- C. The readily visible drain, waste and vent pipes
- D. The hot water source
- E. Fixtures such as toilets, faucets, showers and tubs



Module 2

Plumbing

The inspector is not required to:

- A. Test the showers and tubs by filling them with water
- B. Test whirlpool tubs
- B. Saunas, steam rooms or hot tubs
- C. Inspect for plumbing defects that are not related to mold growth or moisture intrusion



Module 2

Attic, ventilation, insulation

The inspector shall inspect:

- A. the insulation
- B. ventilation of attic spaces
- C. framing and sheathing

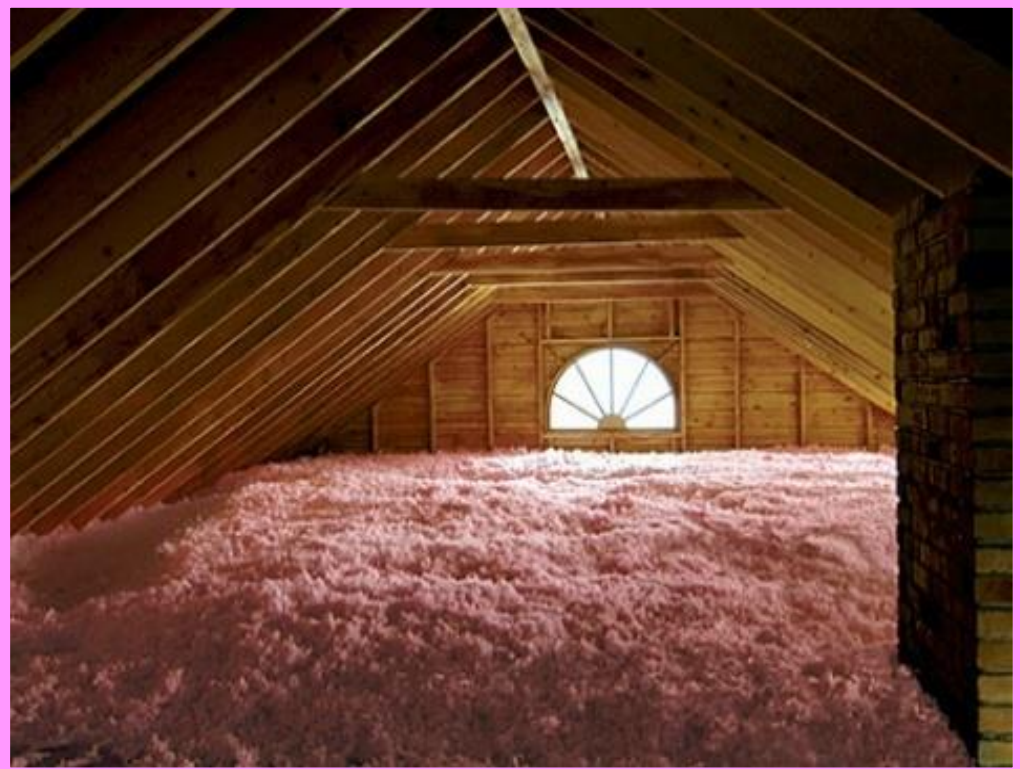


Module 2

Attic, ventilation, insulation

The inspector is not required to:

- A. Move, touch or disturb insulation
- B. Inspect for vapor retarders
- C. Break or otherwise damage the surface finish or weather seal on or around access panels and covers



Module 2

The interior

- A. The inspector shall inspect:
- B. The walls, ceilings, floors, doors and windows
- C. The ventilation in the kitchen, bathrooms and laundry
- D. Whole-house ventilation fans



Module 2

The interior

The inspector is not required to inspect for interior defects that are not related to mold growth or moisture intrusion.



Module 2

Moisture, humidity, temperature

The inspector shall measure:

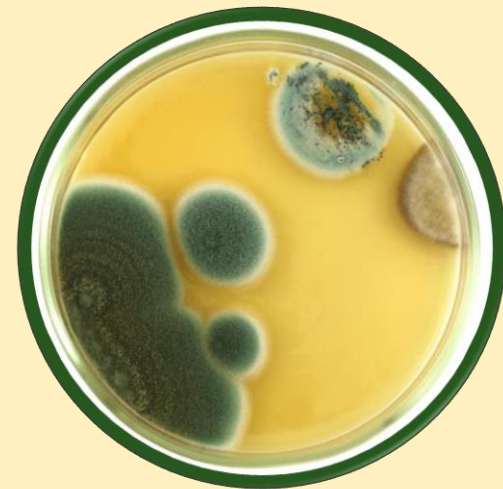
- A. Moisture of any room or area of the building that has moisture intrusion, water damage, moldy odors, apparent mold growth, or conditions conducive to mold growth
- B. The humidity of any room or area of the building (at the inspector's discretion)
- C. The temperature of any room or area of the building (at the inspector's discretion).



Module 2

Indoor & outdoor sampling

- Use the IAC2 Mold Sampling Decision Chart and the IAC2 Standards of Practice to assist in deciding when and where to take samples in a building.
- Samples of the indoor air and the outside air should be taken for comparison. There should not be any mold inside the house that is not found outside.
- The concentration of mold inside a home should not be higher than the concentration of mold outside.



Module 2

Using tape

A tape system provides a quick way to sample visible mold. A tape-lift system is the most common surface-sampling technique. It can be used instead of a swab sampling. Many tape samples can be collected in a short period of time. Samples that show hyphae fragments and reproductive structures can provide proof of mold growth.



Module 2

Inspection report

Each report should contain information on these areas of focus:

- Scope of work
- Property information
- Visual exam
- Sampling
- Lab results



Module 2

Standards of Practice - a

- 1.0 Scope
- 2.0 Complete Mold Inspection
- 3.0 Limited Mold Inspection
- 4.0 Standards of Practice
 - 4.1 Roof
 - 4.2 Exterior and Grounds
 - 4.3 Basement, Foundation, Crawlspace & Structure
 - 4.4 Heating, Cooling and Ventilation
 - 4.5 Plumbing
 - 4.6 Attic, Ventilation & Insulation
 - 4.7 Interior
 - 4.8 Moisture, Humidity & Temperature
- 5.0 IAC2 Mold Sampling Procedures
- 5.1 General Comments



Module 2

Standards of Practice - b

- 5.2 Air Flow Rate
- 5.3 Rotameter
- 5.4 Surface Sampling
- 5.5 Outdoor Air Sampling
- 5.6 Indoor Air Sampling
- 5.7 Mold Decision Chart
- 6.0 Limitations, Exceptions & Exclusions
- 7.0 Definitions



See the larger document here: <https://iac2.org/sop/>

Module 2

Inspection tools

There is a wide range of inspection tools which will be described in this next section.



Module 2

Moisture meter

- A mold inspector should use a moisture meter to find wet areas.
- Wherever there is moisture, dampness or wetness, there may be mold growing.
- Some areas having the greatest potential for microbial growth include ground water intrusion, roof leaks, condensation, and plumbing leaks.
- Mold can grow instantly. It does not take 24 or 48 hours, or a few days to grow.
- These meters measure the moisture in many types of building materials (substrates). They also can monitor the process of drying these materials.



Module 2

Using a moisture meter

A moisture meter typically has a thin probe that can be inserted into the material to be tested, or pressed directly against its surface. Moisture meters can be used on carpet, wallboard, wood, brick and concrete. Because mold often grows where moisture is high, a moisture meter can help an inspector locate hidden areas of mold growth.



Module 2

Digital camera

A digital camera should be used to take pictures of all the sampled surfaces. A digital image should be taken of all of the areas of moisture intrusion, water-damaged components, areas of apparent mold growth, rooms with musty odors, and any other systems or components of the building that may be contributing to mold growth.



Module 2

Infrared camera

An infrared camera can be used to detect moisture penetration that may not be visible to the human eye. An infrared camera is an inspection tool with many applications. It is a non-invasive instrument that can give clues to conditions that are behind the apparent, visible surface of a wall, floor and ceiling.



Module 2

Humidity Gauge

- An inspector should measure the humidity while performing an examination of the building. High humidity inside a building can lead to mold growth, so humidity gauges are very useful.
- When high humidity levels are measured inside a particular area or room in a building, that measurement may indicate hidden mold growth.
- Further evaluation is needed when high humidity levels are measured and mold growth is not visible.



Module 2

Borescope

Some investigators use borescopes to look for mold growth behind walls, without significantly damaging the drywall. A borescope may be useful when there is moisture intrusion, water damage, apparent mold growth, musty odors, or conditions conducive to mold growth, and the full extent of the problem cannot be ascertained by a visual inspection alone. A borescope is often used when moisture penetration is apparent at a wall but the extent of the moisture problem is suspected to originate within the wall's cavity. Mold may be growing behind a finished wall or above a finished ceiling.



Module 2

Other tools & equipment

- Duct tape for sealing the sleeves and legs of a work suit
- Digital camera (with fresh batteries, and extra batteries): for documenting inspection restrictions and conditions observable on the day of the inspection
- Probe or poker
- Screwdriver and hand tools for probing or knocking. Decayed and damaged wood components produce sounds that are different from sounds produced by solid wood
- Flashlight (with fresh batteries) use rechargeable batteries, and carry extra batteries into the crawlspace and other dark areas
- Laser pointer

Module 2

More tools

- Headlight or headlamp (with extra batteries) which can be used as a backup to a flashlight, and can be used as the primary light source
- Headlamps keep your hands free
- Non-contact voltage detector (with a beeper indicator): to check electrical wires and their condition. Oftentimes, an inspector will discover loose, disconnected, live wires hanging from the crawlspace ceiling
- Work lights which have the advantage over flashlights by flooding the space with light, and a work light does not require the use of hands
- GFCI protection especially when using a work light with an extension cord. Many extension cords have integrated GFCI-protection devices.

Module 2

More tools

- Extension cord with a heavy-gauge cable, at least 14-gauge (12-gauge wire is better). Make sure the cord is plugged into a properly wired and grounded receptacle
- Carpet square for cleanliness. Use the carpet to stand upon after exiting a crawlspace or attic, particularly if the access is an interior opening and the space is muddy
- GFCI tester to test all electric receptacles prior to using them
- Measuring tape
- Moisture meter to confirm what is visually observed
- Moisture gauge to confirm what is felt as musty, muggy or moisture-laden air

Module 2

Last tool list

- Infrared thermography camera to discover moisture penetration that cannot be seen with the human eye. Use a quality holster or carrying bag to offer padded protection
- A notepad and business cards when working in a vacant house, leave a note and a business card somewhere in the entry area to alert people entering the house of your location, and the reason for your presence



Module 2

Personal protection equipment



- Hand protection
- Protective clothing
- Foot protection
- Eye protection
- Head protection



Module 2

Use a respirator!

- The human respiratory system can endure only a small amount of exposure to toxic gases, fumes and particles before becoming dangerously affected.
- Some inhaled chemicals will destroy portions of the lungs.
- Chemicals in the lungs can be absorbed into the bloodstream where tissues and organs can be affected.
- Respirators can filter gases, vapors and particles in the air. OSHA regulates the use of respirators in the workplace.
- The agency states that all respirators must be approved and color-coded according to the known hazards, as well as individually fitted.



Module 2

Why use a respirator

- The use of PPE is especially necessary when mold is disturbed and likely to become airborne during a surface sampling. Airborne spores can pose a health threat when they are inhaled.
- Allergic reactions to mold may manifest when mold spores enter through the respiratory system. Therefore, a respirator is commonly used. There are many different types.
- The choice of respirator depends upon the job's scope, contamination conditions, and the requirements of the work to be done. The respirator is an important piece of PPE.



Module 2

How to use a respirator

- Only respirators approved by the National Institute for Occupational Safety and Health (NIOSH) should be worn during mold remediation.
- These respirators must be used according to applicable OSHA regulations.



Module 2

Selecting a respirator

- The selection of a proper respirator depends on the nature of the hazards
- The nature of the work or activity in the hazardous area
- The location of the hazardous area in relation to a safe area having clean, breathable air
- The length of time of exposure to hazards
- The effectiveness of the respirator
- The individual fit of the respirator



Module 2

Types of respirators

- **Filtering Disposable Face Mask** A particulate N-95 respirator is an air-purifying respirator used to provide protection in dusty, non-oil based environments, including jobs involving sanding, bagging and/or grinding.
- **Lower-Face or Half-Mask Respirator.** A lower-face respirator has a face-sealing flange and chin holder.



Module 2

The risks

- Mold inspectors and mold remediators can be at risk of developing Organic Dust Toxic Syndrome (ODTS) or Hypersensitivity Pneumonitis (HP).
- ODTS may manifest itself with flu-like symptoms after a single, heavy exposure to dust contaminated with fungi.
- It differs from HP in that it is not an immune-mediated disease and does not require repeated exposures to the same causative agent.



**Thank-you for
joining us**

The End of Module 2