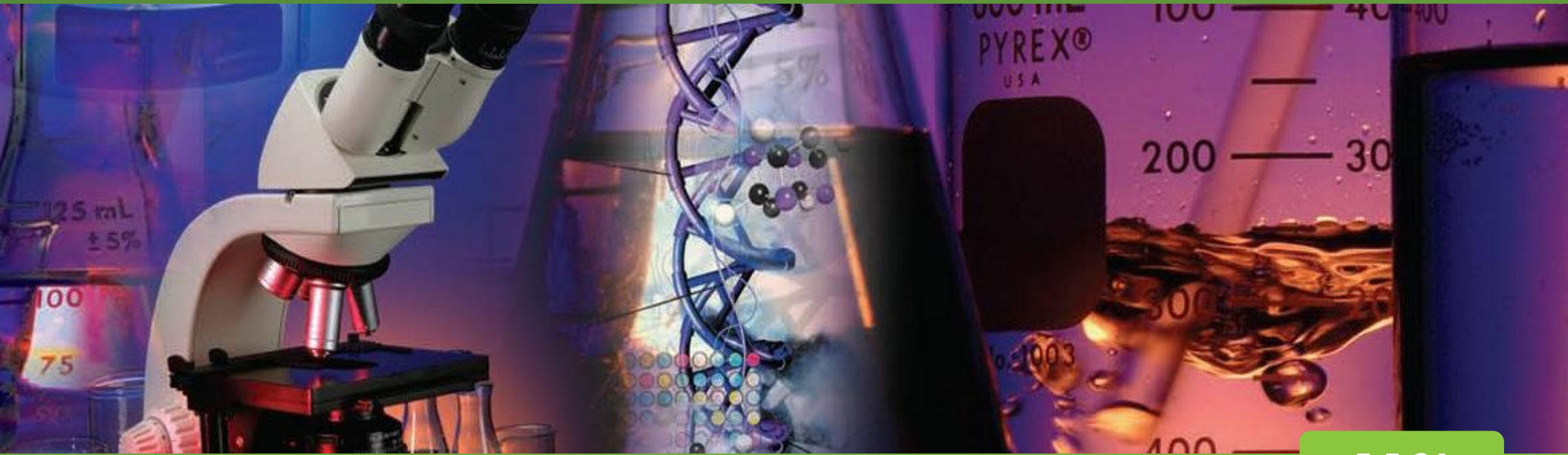


# STANDARDS OF PRACTICE



5-5-24



## **Instructor / Course Developer:**

Gary Rosen, PhD FLA Lic Building Contractor.  
FLA Lic Mold Assessor and Mold Remediator.  
FLA Independent Insurance Adjuster.  
PHD Biochemistry UCLA  
[gary@mold-free.org](mailto:gary@mold-free.org) [www.Mold-Free.org](http://www.Mold-Free.org)

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# ESSENTIALS OF A MOLD REPORT REPORT AND PROTOCOL

*Almost Everyone Gets This  
Completely Wrong*



# One of The Big Concerns for Assessments How Much Mold In A Wall?



- One of the biggest concerns of Mold Assessors is how to determine the **extent** of hidden mold **inside** a wall, ceiling, or behind cabinets or baseboards (assemblies) in order to write a Mold Remediation Protocol.
- Forget about what you've heard; you know; or think you know.
- You will never have any idea as to the extent of mold inside these assemblies before they are opened during remediation.
- The Mold Assessor's job in preparing a Mold Remediation Protocol is only to **point out** the likely locations of mold problems and that's it!

# Determining Extent of Hidden Mold

- The Assessor's Mold Remediation Protocol should recommend that a licensed and insured Mold Remediator be chosen to perform the remediation.
- It is the licensed remediator's job, for the purpose of formulating their remediation quote, to anticipate as best they can how much material has to be removed or if surface cleaning is all that is needed.
- The homeowner (HO) will get quotes from licensed Mold Remediators to fix the **identified** or **suspected** mold problems.



We never know extent of problem until walls opened up.

# Another Big Concern for Assessors Writing The Mold Remediation Protocol

- Another big concern for Assessors when writing a Mold Remediation Protocol... is how much detail?
- When a Home Inspector finds an electrical problem, does he explain how the State Licensed electrician will fix? No.
- Same with roofer, same with AC contractor.
- Well in Florida, the Mold Remediator is State Licensed.
- Beyond pointing out where to remediate and that the remediation should be performed by a State Licensed Remediator, why should a mold protocol tell the Mold Remediator how to do their job? They should not.



# A Protocol Is Not About Guessing



Some Mold Assessor protocols try to tell a remediator to cut 2' here and cut 3' there.



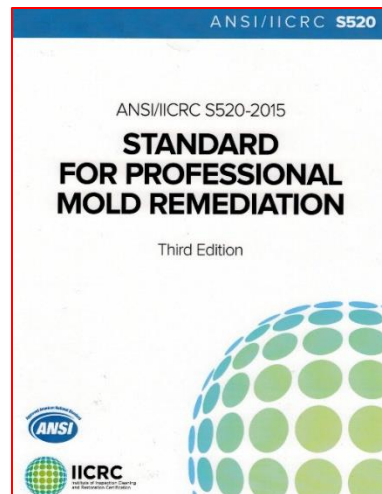
But one can only know the true extent of the hidden mold once the drywall, cabinets, toe kicks or baseboards are removed... **during remediation.**

**The Assessor's protocol should recommend that once remediation starts and walls are open:  
Remediate/remove to the extent needed to "restore to as new".  
Let the remediator determine how much to remove when he opens the walls.**

# Mold Remediation is Mold Removal. Not Just Killing



- Both EPA/OSHA (Federal mold guidelines) and IICRC S520 (Industry proposed mold guidelines) agree that ...
- Mold remediation is **mold removal** and **not simply killing** mold with chemicals that leaves both dead mold and [dangerous] chemical residues.





## Mold Removal Is ....

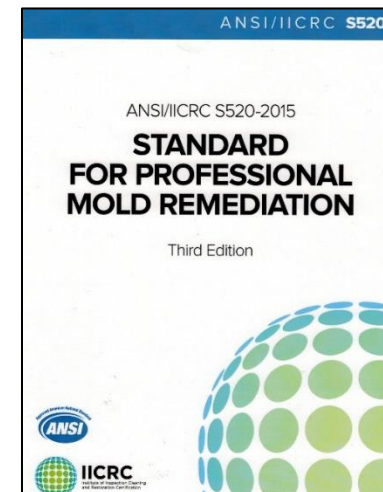
- Mold removal is accomplished by:
  - Surface cleaning; (Cleaning is removal.)
  - Air cleaning; (Cleaning is removal.)
  - Demolition (removal) of contaminated substrates such as water damaged and moldy drywall, carpet or cabinets;
  - Oxidation (removal by disintegration) using strong oxidizers such as strong bleach, Tilex<sup>®</sup>, strong hydrogen peroxide or ClO<sub>2</sub> gas none of which leave a toxic residue.

**Mold remediation is mold removal — to the extent needed to restore to as new.**

**Safely and without cross contaminating the building.**

# Mold Remediation Guidelines: NOT The Same

- But while both Federal (EPA/OSHA) and Industry (IICRC) proposed guidelines agree that mold remediation is mold removal and not killing mold...
- Their guidelines for mold remediation are drastically different.
- Which approach a remediator chooses ... why not leave that to the remediator.
- **Why should a Mold Assessor's protocol stipulate which method in their opinion the remediator should use? No reason to.**



## The Mold Assessor Protocol Does Not Care About...

What the Protocol should not care about. In addition to not caring about which remediation procedure the remediator uses.

- What type of Personal Protective Equipment (PPE) the remediator uses. Don't care.
- How thick the plastic film is for the containment. Don't care.
- Exactly how they rip out and bag the drywall. Don't care.
- The type of vacuum used. Don't care.
- Etc.
- **Leave these all up to the licensed Remediator.**



**Document wall cavity before closing up.**

# The Assessor Does Care About

What the Mold Assessor does care about:

- Has the remediation removed all the problem material in the identified areas without regard to any limitations in the Remediation Contract?
- Has the work been done properly in such a way as to avoid cross contamination (airborne spores or mold/mold spores in settled dust)?
- (I.E. Does the remediator know what they are doing?)
- These questions are only answered when the Mold Assessor is called back in to perform **Post Remediation Verification (PRV)**.



**Use containments to avoid cross contamination.**

# The Assessor Does Care About



One of the primary goals of a Mold Assessor is to make sure they are called back in to perform Post Remediation Verification (PRV.)



Yes. We are always concerned about making \$\$.



A low-angle photograph of a statue of Lady Justice, the personification of the goddess of justice. She is depicted holding a pair of golden scales in her left hand and a sword in her right hand. The statue is set against a clear, bright blue sky. The lighting is dramatic, with the statue appearing in silhouette against the sky. The scales are prominent in the foreground, and the sword points upwards towards the top of the frame.

# FLA MOLD LAW & PROTOCOLS

# FLA Mold Law: Ch 468.8411

Definitions.—As used in this part, the term:

(3) “Mold assessment” means a process performed by a mold assessor that includes the physical sampling and detailed evaluation of data obtained from a building history and inspection to formulate an initial hypothesis about the origin, identity, location, and extent of amplification of mold growth of greater than 10 square feet.



Nothing about “protocol” in FLA definition of Mold Assessment.



Some protocols are simply pictures of problem areas with arrows that say “Remediate Here”.



Some are 50 pages of mostly boilerplate pulled out of IICRC S520.

# FLA Mold Law & Protocols

- In Florida, there is absolutely no requirement for a mold remediator to follow a mold assessor's protocol unless the remediator's own signed Written Remediation Contract (Remediation Quote) says that they will.
- Why should remediators follow Mold Assessor protocols?
  - As most protocols are non-specific boilerplate?
  - As most protocols try to define exactly how much to cut, but in fact you can never know the extent of the problem until the walls or ceilings are opened.



**Why should remediators follow Mold Assessor protocols. Based on our experience there is generally no reason to.**



# Written Contracts Take Precedence

- Written Contracts Take Precedence: The Remediator's Written Remediation Contract (Quote) when **signed by the HO**, will be the only contractual agreement for the remediation work.
- There is no obligation for the remediator to follow a mold assessor's recommended protocol unless stipulated in the signed Remediation Contract/Quote.



# Remediators Need to Agree In Writing (In Their Contract) ... That They Will Pass PRV



- Unless spelled out in the **signed** Remediation Contract/Quote, the Remediator:
  - Not only does not have to follow the Assessor's protocol.
  - Unless spelled out in the Remediation Quote/Contract, the Remediator does not have to agree **that they must pass in order get paid** a 3rd party Post Remediation Verification to prove the home has not been left mold contaminated and is safe to re-occupy.

# FLA Mold Law & PRV Sampling

- **Post Remediation Verification Testing/Sampling:** In Florida, the Remediator can always perform his own PRV testing/sampling since there is always less than 10 sq ft of mold after remediation and FLA Mold Law is not applicable.
- So the Assessor needs to make the case (sell!) why there should be an **independent** PRV (why he should be called back in after remediation to test).



# PROTOCOL MUST DEFINE POST REMEDIATION VERIFICATION (PRV) CRITERIA



# Define PRV Testing Criteria

## Mold and Indoor Air Regulations and Standards

Standards or Threshold Limit Values (TLVs) for airborne concentrations of mold, or mold spores, have not been set. There are no EPA/OSHA regulations or standards for airborne mold contaminants.

- Since there are no State or Federal Standards or Threshold Limit Values for Mold, therefore the Assessor's Protocol must define the criteria to be used to Pass/Fail the remediation work.



# Assessors Must Define PRV Criteria



Remediators must know what they are signing up for.



But of course, unless the Written Remediation Contract incorporates the protocol and clearance criteria, the Remediator can do whatever he wants.



It is of the **utmost importance** that the Assessor defines the criteria to determine Pass/Fail for PRV.

# Assessor Warranty = Important Sales Tool

- Mold Remediators do not generally provide a Mold Free Warranty.
- When the Assessor gives the client the option for a Warranty that the Remediator will not provide, that drives Post Remediation Verification work.
- Doubles the \$\$.



# Assessor Warranty

We suggest in order to provide Assessor Warranty which is for **only the specific** work performed:

- PRV air testing should be performed both inside the containment before it is taken down as well as in the room but outside of the containment to make sure there has not been any cross contamination. A PRV should answer the following:
  - Are airborne mold levels Elevated or Not Elevated? Both inside and out of containment?
  - Are surfaces clean of settled dust/mold spores? Both inside and out of containment? **If no dust, then no mold spores in dust.**





## Clean and Then Encapsulate Cavities with White Primer

- After surface cleaning, seal any exposed wood or wall cavity drywall or rusted metal with white mold-inhibiting encapsulant (We prefer Zinsser Mold Kill.)
- Looks good. Looks are important. But also, how do you guarantee that these surfaces are mold free if not encapsulated.
- Do you need to surface test after encapsulation? How useful is swab testing in such a situation?



## Assessor Priorities. Provide Quote for PRV.

- The Mold Assessor should **always include** with their Quote and with their inspection report/protocol a Quote or Pro-Forma Invoice for the PRV inspection and Mold Free Warranty.
- Then for sure having the Assessor come back and perform the PRV will be always be at least discussed!
- And interested parties can see that PRV is a critical procedure that should not be performed by the Remediator on their own work.



## Remediator Priorities. No Independent PRV

- Remediators that will also be performing build back will generally have a different priority.
- They will not want to stop and come back later to close-up the walls/ceilings after a 3<sup>rd</sup> party PRV as this is inefficient and costly for the remediator.
- The homeowner may think the same way... that delaying rebuild to wait for testing inside the containment before closing-up is costly and unnecessary.
- Especially on smaller jobs, there is not always going to be an opportunity for the Mold Assessor to perform the PRV. The PRV testing will be done by the Remediator.



# Keep Mold Assessor Reports Simple

- Assessors: Generally, should keep Protocols, Reports, Quotes **simple** so that everyone including the remediator, Realtor®, HO, and/or buyer/seller can understand the report/quote, its focus, test results, and key recommendations.
- No need to explain to Remediators how to do their job by copying pages of boilerplate out of IICRC S520-2015.
- Or put all the excess baggage in an Appendix.
- **And Assessor should offer a Mold Free Warranty for the specific Remediation work performed so long as the Assessor performed a PRV while walls or ceilings were open.**



*Keep. It. Simple. Stupid.*

## By Keeping the Inspection Report Simple...



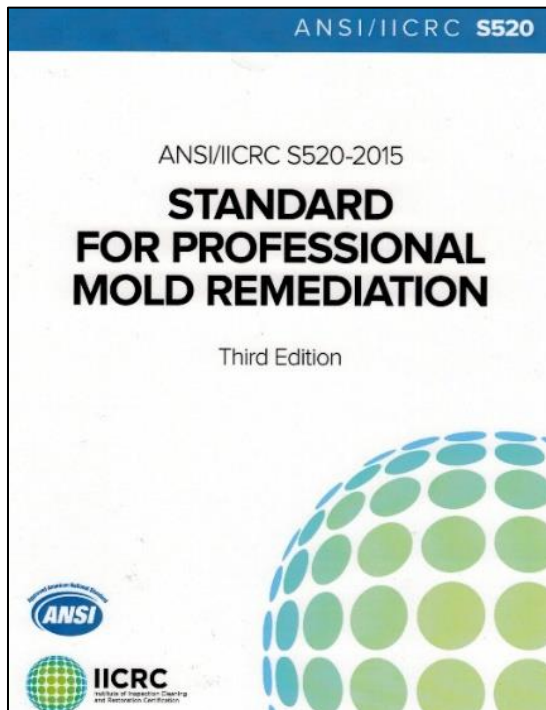
By keeping the inspection report simple, it will be easy for interested parties to find the Assessor's recommendation on the necessity for the Assessor to come back and perform a Post Remediation Verification inspection and get a **Mold Free Warranty for remediation work performed.**

# STANDARDS & DEFINITIONS FOR MOLD ASSESSMENT & REMEDIATION



# Standards & Definitions

- In this section we will review definitions/ procedures for Mold Assessment & Mold Remediation by:
  - State of Florida Mold Licensing
  - EPA/OSHA Guidelines
  - IICRC S520-2015



## Review: Assessor Priorities

- The Mold Assessor should **always include (top priority)** with their inspection report/protocol a Quote or Pro-Forma Invoice for the PRV.
- Or only have a single quote that includes both initial assessment as well as PRV.
- Then for sure having the Assessor come back and perform the PRV will be always be at least discussed!
- And interested parties can see that 3<sup>rd</sup> Party PRV is a critical procedure that should not be performed by the Remediator\* on their own work. **And that the only way to obtain a Mold Free Warranty because Remediators do not normally give them.**



\* On small jobs it may not be easy to convince the homeowner to pay to have a 3<sup>rd</sup> party PRV performed.



# STATE OF FLORIDA MOLD ASSESSMENT

Florida Department of  
Business &  
Professional  
Regulation

# State of Florida Mold Assessment Definition

“Mold assessment” means a process performed by an Assessor that includes the **physical sampling** and detailed evaluation of data obtained from a building history and inspection to formulate an initial hypothesis about the origin, identity, location, and extent of amplification of mold growth of greater than 10 square feet.”



# Initial Mold Sampling

- By Florida Law, in order for an initial mold inspection to be a Mold Assessment there must be sampling.
- If no sampling, the initial inspection is not covered by FLA Mold Law.
- Remediators can always do initial mold *inspections* needed to provide a quote so long as they do not include sampling.
- Remediators do “Initial Inspections” and not “Initial Assessments”.



# State of Florida 10 sq ft Rule for PRV

- If there is less than 10 sq ft of mold, FLA Mold Law does not apply.
- Therefore, anyone can perform a **post remediation** inspection with testing, **including the remediator** as there is always less than 10 sq ft of mold after remediation is complete.
- That's why the Mold Assessor must make the case to the homeowner that the Assessor be brought back in for Post Remediation Verification testing and for a Mold Free Warranty that the Remediator will generally not provide.



## 10 sq ft Rule And Initial Inspection



For FLA Mold Law applies only if there is more than 10 sq ft of mold.



If there is more than 10 sq ft of mold, a remediator may not take initial samples.



Does a mold remediator ever need to take initial mold samples for the purpose of their quote if there is obviously more than 10 sq ft of mold? Not really.

**In Florida, unlike New York, there is no requirement for a Mold Assessor to be involved in a mold remediation. The Mold Remediator can do the initial Inspection (no testing) and the PRV by themselves.**

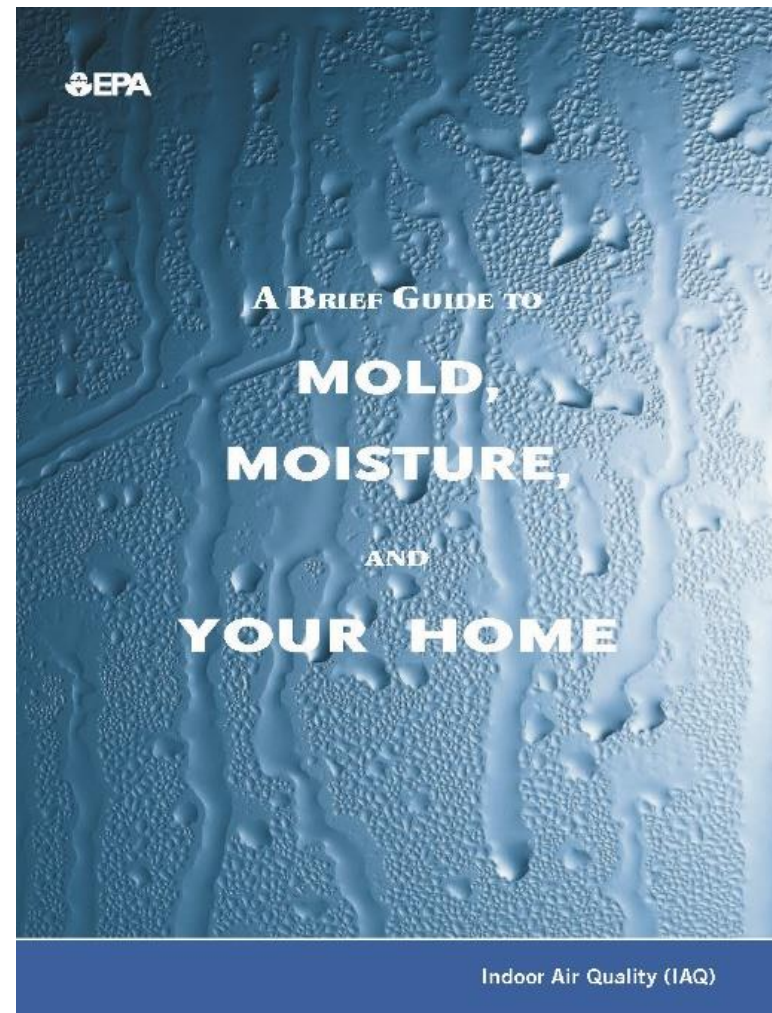
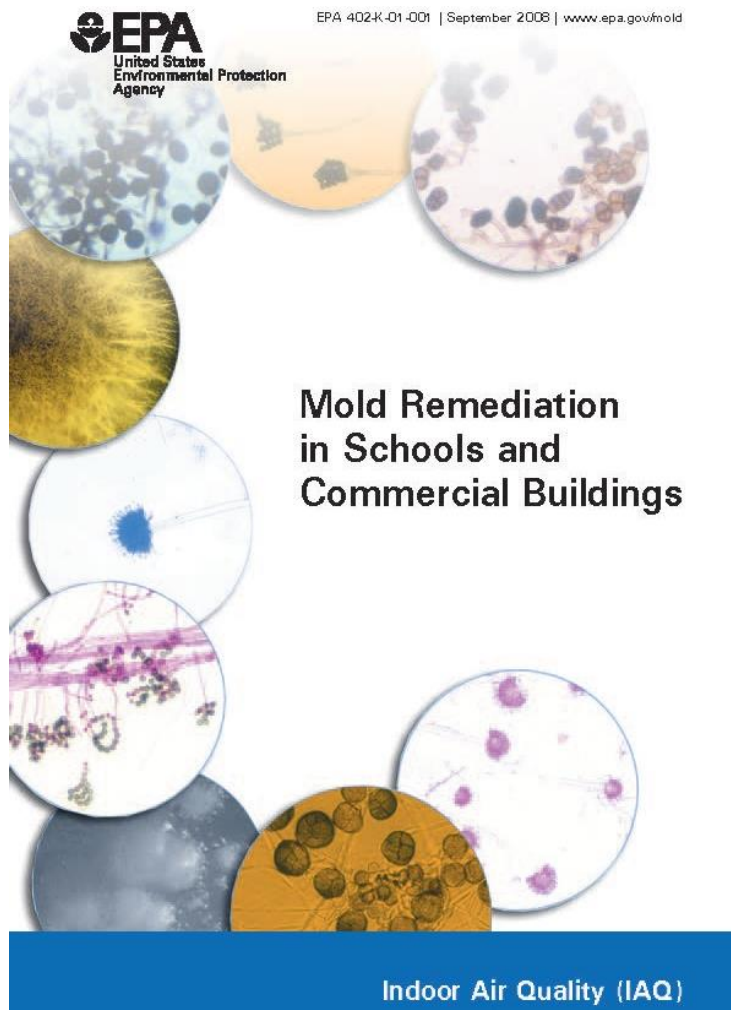
# State of Florida Law On Sub-Contracting

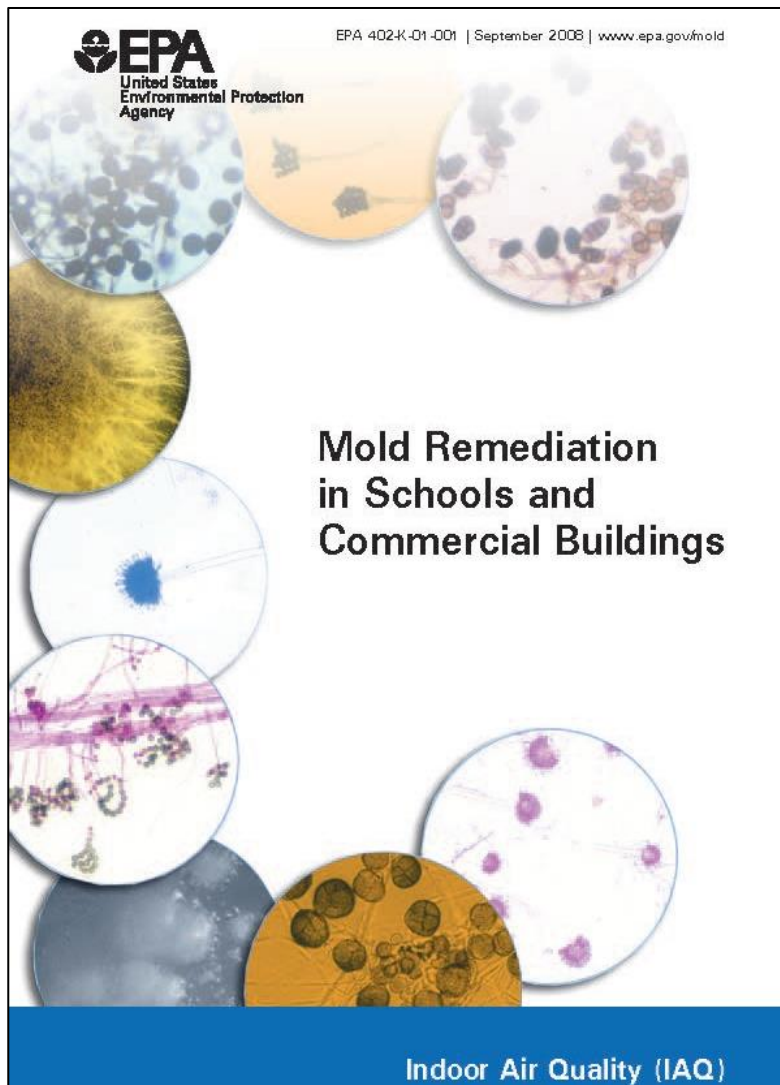
- Only a State Licensed General Contractor (GC/BC) can subcontract work to FL licensed contractors.
- That means that a Mold Remediator that is not also a GC/BC may not subcontract AC cleaning, Mold Assessment, Electrical work or Plumbing. If they do, the insurance carrier does not have to pay the (entire) invoice because the contract (invoice) includes illegal contracting.
- Recommendation for Remediators: Simply have the HO pay for these services separately and do not include in the Remediation invoice.



**Remediators cannot subcontract any trade: Plumbing, AC, etc.**

# EPA/OSHA Mold Remediation





- EPA/OSHA guidelines are widely used today.
- But guidelines are written for facility managers and not mold professionals.
- As such they **do not emphasize testing**. Find the moisture. Find the mold.
- But the EPA guidelines are practical and easy to understand.
- Easily tweaked (upgraded) for mold professionals by adding Testing.

**Per EPA: Mold is not a hazard. Mold is everywhere both inside and outside of homes and offices. Mold is part of the natural environment.**

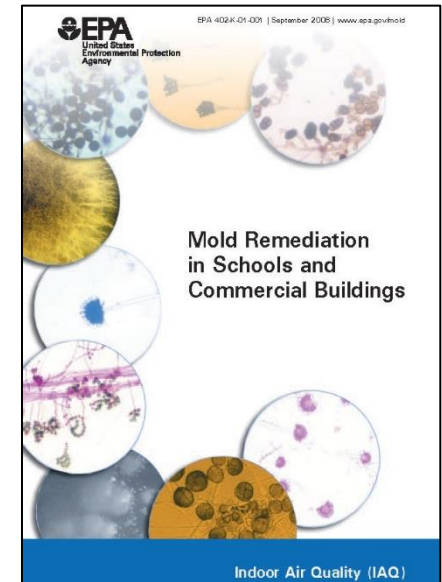


- EPA/OSHA mold assessment is to determine.
  - Source of moisture.
  - Location of mold for the purpose of identifying where to remediate.
  - The size of mold problem for the purpose of selecting the type of containment to use.
- Consider the possibility of hidden mold.
- Adapt remediation plans as required when walls are opened.
- Always check inside air ducts and air handling unit.

**MOISTURE**  
Control is the Key to  
**Mold Control**

# EPA/OSHA Mold Remediation. Job Size.

- EPA/OSHA. Set up containment **based on size of mold.**
- **Small jobs.** < 10 sq ft of mold. Per EPA: No containment needed. (But professionals always erect containments.)
- **Medium size jobs.** 10 – 100 sq ft. EPA **Limited** containment required.
- **Large jobs.** > 100 sq ft. EPA Large Scale containment required. This is a secure asbestos containment with a walk-in decontamination chamber.



**It is our recommendation that all Large jobs be broken down into multiple Medium size jobs where multiple Limited containments are used. Keep the containments as close to the source as possible to make exhausting contaminants outside as efficient as possible.**

# EPA/OSHA AC System

- EPA/OSHA: Emphasis on checking the AC and ducting for mold even if the water event does not involve the AC.
- Why? Could be hidden mold that affects the indoor environment that is not related to the specific area being mold remediated.



# EPA/OSHA Safety. Review.



3M 8511 N-95

- For the EPA/OSHA, the key to safety is to keep the work environment as clean as possible and not overly rely on PPE (Personal Protective Equipment).
- Since mold is part of the natural environment, it is permissible to exhaust the mold contaminated air from the containment to the outdoors using a high-speed axial fan (do not filter air being exhausted) in order to keep the work environment (inside containment) as clean as possible.
- Use no dust producing techniques such as sweeping or sanding.
- **EPA PPE minimum. N-95, gloves, goggles.**
- **OSHA Respiratory Plan: 29 CFR 1910 compliance NOT required with N-95. Required for all other respirators.**

# EPA/OSHA Mold Prevention Chemical Free

- Control the moisture and you keep the mold from coming back.
- Do not rely on chemicals (sanitizers/biocides/ anti-microbials) to kill mold or keep mold from returning.
- Dead mold is still an irritant/allergenic.
- Mold should be **removed and not just killed.**



# EPA/OSHA Mold Prevention: Drying

- See Table 1 Page 11. *Mold Remediation in School and Commercial Buildings*. "Guidelines for Response to Clean Water Damage within 24 – 48 Hours to Prevent Mold Growth."
- Mold grows fast. For the EPA ... in most cases drying before there is mold will not be effective.
- **When in doubt ... rip it out.**



## Table 1: Water Damage- Cleanup and Mold Prevention

Guidelines for Response to Clean Water within 24-48 Hours to Prevent Mold Growth	
Water-Damaged Material	Actions
Books and papers	<ul style="list-style-type: none"> <li>• For non-valuable items, discard books and papers.</li> <li>• Photocopy valuable/important items, discard originals.</li> <li>• Freeze (in frost-free freezer or meat locker) or freeze dry.</li> </ul>
Carpet and backing-dry within 24-48 hours	<ul style="list-style-type: none"> <li>• Remove water with water extraction vacuum.</li> <li>• Reduce ambient humidity levels with <b>dehumidifier</b>.</li> <li>• Accelerate drying process with <b>fans</b>.</li> </ul>
Ceiling tiles	<ul style="list-style-type: none"> <li>• Discard and replace.</li> </ul>
Cellulose insulation	<ul style="list-style-type: none"> <li>• Discard and replace.</li> </ul>
Concrete or cinder block surfaces	<ul style="list-style-type: none"> <li>• Remove water with water extraction vacuum.</li> <li>• Accelerate drying process with <b>dehumidifiers, fans, and/or heaters</b>.</li> </ul>
Fiberglass insulation	<ul style="list-style-type: none"> <li>• Discard and replace.</li> </ul>

Table 1 Page 11. Mold Remediation in School and Commercial Buildings.

# EPA Drying Recommendations AFTER 24–48 Hours. Remove. Do Not Dry.

## Table 1: Water Damage– Cleanup and Mold Prevention

Non-porous, hard surfaces (Plastics, metals)	<ul style="list-style-type: none"> <li>• Vacuum or damp wipe with water and mild detergent and allow to dry; scrub if necessary.</li> </ul>
Upholstered furniture	<ul style="list-style-type: none"> <li>• Remove water with water extraction vacuum.</li> <li>• Accelerate drying process with dehumidifiers, fans, and/or heaters.</li> <li>• 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.</li> </ul>
Wall board (Drywall and gypsum board)	<ul style="list-style-type: none"> <li>• May be dried in place if there is no obvious swelling and the seams are intact. If not, remove, discard, and replace.</li> <li>• Ventilate the wall cavity, if possible.</li> </ul>
Window drapes	<ul style="list-style-type: none"> <li>• Follow laundering or cleaning instructions recommended by the manufacturer.</li> </ul>
Wood surfaces	<ul style="list-style-type: none"> <li>• Remove moisture immediately and use dehumidifiers, gentle heat, and fans for drying. (Use caution when applying heat to hardwood floors.)</li> <li>• Treated or finished wood surfaces may be cleaned with mild detergent and clean water and allowed to dry.</li> <li>• Wet paneling should be pried away from wall for drying..</li> </ul>

*Table 1 Page 11. Mold Remediation in School and Commercial Buildings.*



# EPA/OSHA Mold Prevention Drying

- However simple the EPA Mold Prevention (drying) guidelines are, in practice they are generally good advice.
- In most cases emergency drying will not be effective in preventing mold. So EPA advice which is essentially “When in doubt ... rip it out” is pretty good advice.
- Why? Almost always ... either there was pre-existing mold, or the high temperatures associated drying equipment resulted in mold after drying.
  - **Mold grows fast.** Drywall wet? Don't bother to dry. Rip it out.
  - Mold and bacteria grow fast. Carpet wet? Don't bother to dry. Rip it out.



# EPA/OSHA Mold Prevention Application of Sanitizer/Biocide

**EPA/Federal law regulates biocide (sanitizer/anti-microbial) use.  
Must be:**

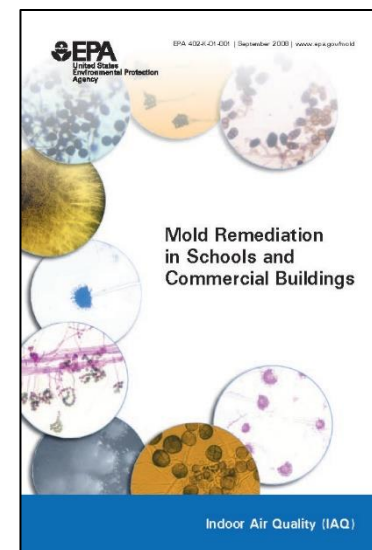
- Applied by methods approved on label (fog, spray?)
- EPA approved for household use. Not just EPA approved!
- Not “Hospital Grade” which means not suitable for residential use.
- For areas specified on the label (kitchen and food surfaces?)
- For surfaces recommended (hard surfaces, carpet, ducting, drywall, fabrics?)
- At the concentrations listed on the label.



# EPA/OSHA Upgrades for Mold Pros

- Because EPA/OSHA mold remediation procedures were developed for facility managers and not licensed mold professionals, needs to be upgraded for pros:
  - Mold professionals always set up containments even when less than 10 sq ft of mold.
  - Mold pros are going to perform Post Remediation Verification air testing for all jobs.
  - We do not build EPA defined large scale containments with decontamination chambers but always use multiple, smaller, simpler containments.
- Please download and review the EPA mold guide.

<https://www.epa.gov/sites/production/files/2014-08/documents/moldremediation.pdf>



# HUD ON MOLD ASSESSMENT

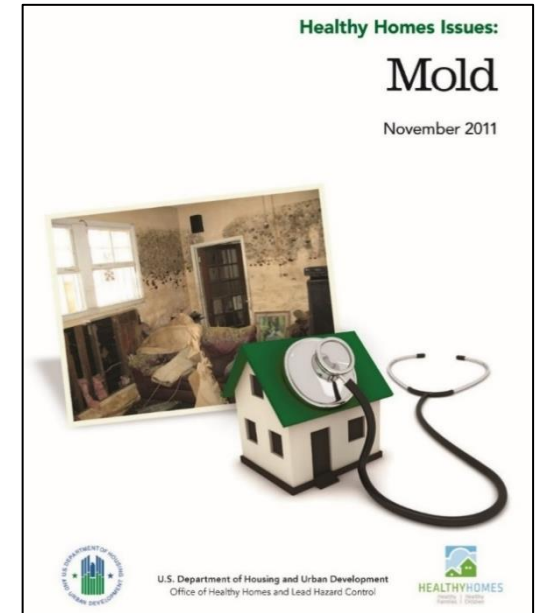




Healthy Homes Mold: Is a survey of methods used to assess mold growth in Homes or Offices.



It is targeted toward the professional Mold Assessor / Indoor Environmental Professional (IEP) and is a useful complement to the EPA/OSHA mold remediation guidelines targeted toward homeowners as well as school and commercial facility managers.



**The HUD procedures for Mold Testing + the EPA/OSHA procedures for Mold Remediation together = Federal Mold Guidelines.**

[https://www.hud.gov/sites/dfiles/HH/documents/HUD\\_Mold\\_Paper\\_Final\\_11-20-12.pdf](https://www.hud.gov/sites/dfiles/HH/documents/HUD_Mold_Paper_Final_11-20-12.pdf)

## Mold Inspection: Visual Observation + ...

- Per HUD: A mold inspection is visual observation of active or past microbial growth, plus:
  - Detection of musty odors;
  - Detection of dampness;
  - **As inhalation is the primary exposure pathway for molds, air sampling for mold can be used to estimate the likelihood of exposure.**



**Powered sampling pump. No count down timer. Not recommended.**

## For HUD: The Issue is Exposure

- Unlike with EPA/OSHA mold remediation guidelines, HUD is focused on measuring/assessing and eliminating **exposure that results in health issues**.
- Therefore, air sampling is considered an important part of the assessment but to complement visual inspection along with moisture detection.



# Air Sampling/Monitoring

- **Per HUD:** When/why do we take air samples?
  1. To determine if there are any health/exposure issues.
  2. To verify the efficacy of an intervention [for post remediation verification].
  - 3. If it is suspected that the ventilation system is contaminated.**





# Dust Sampling (Per HUD)

- Dust sampling of flood-affected hard surfaces, carpeting and furniture collected in New Orleans home following Hurricane Katrina **overestimated inhalation exposure risks by approximately 100-fold** for  $\beta$ -D-glucan [mold] and by 1000-fold for endotoxin [bacteria toxin].
- **Per HUD: Mold in surface dust is not related to exposure.** To remove the mold from surface dust, clean the dust. Then no mold in the dust since no dust.



**Bio tape. Flexible slides for taking surface samples.**

## Culture Method (Per HUD)

- The growth of fungal colonies on specially prepared nutrient media (culture method) from spores from air or dust samples is a common method used to assess mold populations by Mold Hygienists.
- Using culture methods, many types of fungi are identifiable to the genus and species level.
- Culture methods can distinguish not only Penicillium from Aspergillus but can distinguish species of Pen/Asp water damage indicators from general background mold. For example: Aspergillus versicolor.
- Indoor air spore counts are reported in *colony forming units (CFUs) per m<sup>3</sup>*.
- Compare this with spores traps that are counted as *spores per m<sup>3</sup>*.



**Culture testing gives you visible results.**

**Seeing is believing.**

# DNA Methods (PCR) vs Culture Method (Per HUD)

- **Benefits per HUD:** Of PCR/DNA dust or air samples vs culture method are:
  1. Unlike live culture analysis, it measures non-viable as well as viable molds, which is important because non-viable molds are potentially allergenic.
  2. It finds higher concentrations than culture analysis, sometimes by orders of magnitude.
  3. And we add that **it measures mold fragments where neither culture nor spore traps do.**



# DNA Methods (PCR)

- **Limitations Per HUD:** PCR-analyzed settled dust samples do not correlate with PCR-analyzed short term air samples.
- PCR results does not correlate with culture-analysis results.
- Perhaps the main limitation of PCR is that it does not measure whether the mold is growing/viable/live.
- **According to HUD: The best-established health effect of mold relates to the presence of active/live mold spores in the indoor air [not mold in dust or dead mold] which is why HUD/Mold Hygienists focus on culture testing.**

**Mold in Dust Test Kit**

**Why Test for Mold in Dust?**

Mold growth is not always visible to the eye and can be hidden in many areas of your home. Anytime you have a water leak in your home, such as a roof leak or pipe burst, mold will begin to grow on the building material inside your walls often leading to a musty smell in the air. After you identify and fix the water leak, the mold will then dry and those same mold spores end up in the dust on your floors and inside the carpet. As you move around your home you will kick up those dried mold spores and inhale them causing irritation to the occupants. This test will allow you to collect the dust in your home and then identify if any mold spores are present.

EMSL Analytical, Inc. is a leading nationwide testing laboratory that uses state-of-the-art testing, which generates rapid, cost effective, and accurate results.

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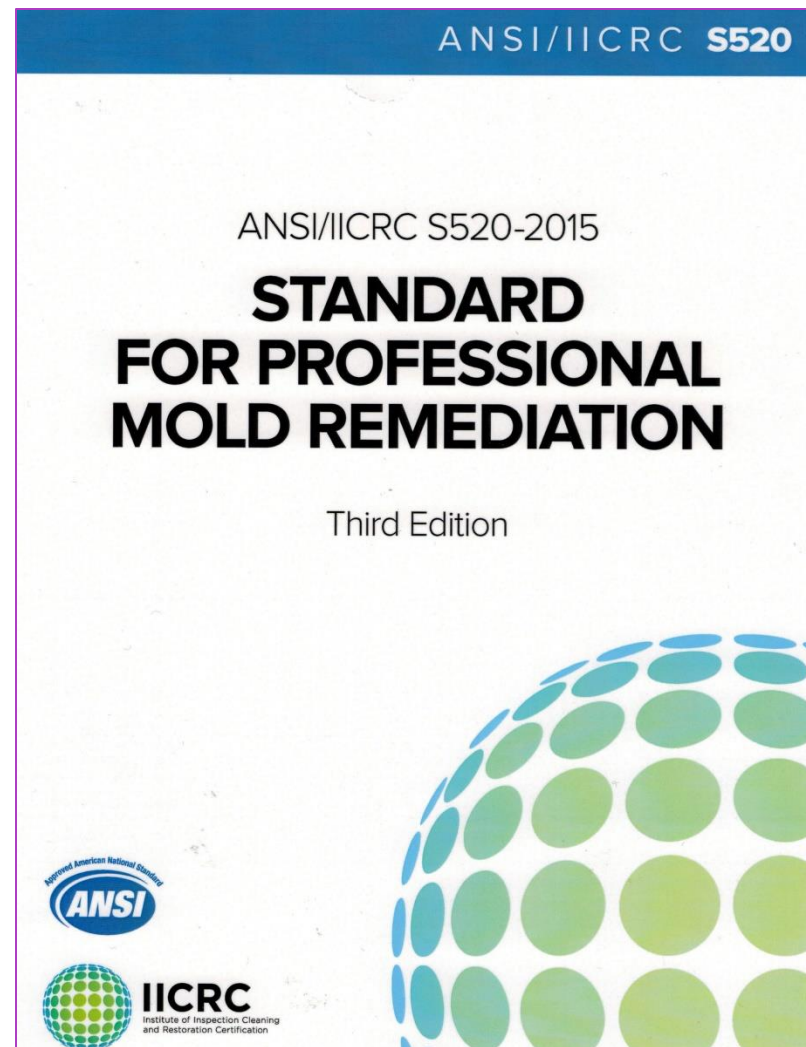
KEEP OUT OF REACH OF CHILDREN AND PETS

# For Much More About DNA Testing and Assessing Homes for Mold As a Source of Indoor Illness.

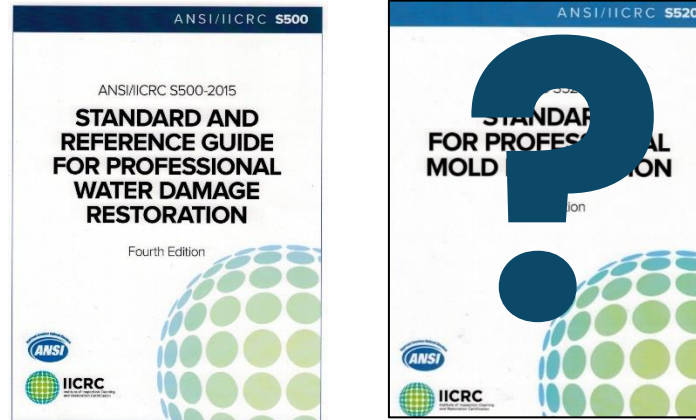
- For much more about DNA Testing and Assessing homes for mold as a cause of Indoor Illness see our web site: [www.SurvivingMold.org](http://www.SurvivingMold.org)
- Download our free 3-part series about how DNA testing is being abused by “Environmental Doctors”.



# ANSI/IICRC S520-2015 MOLD REMEDIATION



# IICRC S520-2015



- Make no mistake, S500-2015, the IICRC Standard for Professional Water Damage Restoration (while not perfect) is clearly the accepted industry standard for Water Damage Restoration.
- The same cannot be said about S520, the IICRC proposed mold remediation “standard”.
- IICRC S520 is certainly not the standard in Florida where S520’s basis for remediation is contrary to Florida Mold law which is based on assessing the size of mold area.

Thus, ANSI/IICRC S520 represents a philosophical shift away from using “size” of visible mold growth to determine the remediation response. Instead, it establishes mold contamination definitions, (Conditions 1, 2, and 3) and guidance, which, when properly applied, can assist remediators and others in determining remediation response or confirm remediation success.

- IICRC S520 rejects the EPA/ OSHA [and Florida] common sense and widely used recommendations on assessing and remediating mold based on the size of the growth.
- And has substituted their procedures for assessing and remediating mold based on what they call Conditions.

**Next up, we focus on IICRC S520–2015 proprietary procedures for Mold Remediation. And why they don't make sense; are not used; and not taught in IICRC approved mold remediation training courses. Sounds crazy but read on.**



## 8.3 Personal Protective Equipment (PPE)

According to 29 CFR 1910.132 employers shall provide their employees with the necessary PPE to reduce the risk of exposure to chemical, physical, or **biological hazards**.

### 8.3.1 Routes of Exposure:

- inhalation (respiratory);
- contact with mucous membranes (eyes, nose, mouth);
- ingestion; and
- dermal (contact with skin).

- IICRC considers mold spores a biohazard.
- In addition to inhalation danger, per IICRC, mold contact with skin and or eyes is dangerous ... requires moon suits for protection. (Versus N-95, gloves and goggles for EPA/OSHA mold safety compliance.)
- Per IICRC: As a hazard, mold cannot be exhausted outside during remediation.
- S520 treats mold as if it were hazardous Asbestos.

## 8.11 Safe Work Practices in Contaminated Buildings

dispose of contaminated protective clothing with other refuse before exiting the containment;

do not move used protective clothing from one area to another unless properly contained;

- Change your clothes or Tyveks when you move from one containment to the other?
- Does anyone do this in the real world? No.
- If the containment is kept clean by exhausting outdoors is this necessary? No.
- S520 treats mold as if it were Asbestos.

# IICRC S520–2015 Worker Safety

## 8.11 Safe Work Practices in Contaminated Buildings

use protective disposable coveralls with attached or separate shoe covers;  
don protective clothing before entering containment or other designated areas;

- If inside the containment the air is relatively clean because contaminants are constantly exhausted outdoors by a powerful axial fan (EPA/OSHA approach), do you need Tyveks that cause heat prostration? NO!
- Do you need to wear IICRC required Tyvek shoe covers to keep dirt and mold off of your shoes? NO!
- What about the risk of slipping with Tyvek shoe covers? That's a big risk!



## 8.11 Safe Work Practices in Contaminated Buildings

wear latex or nitrile chemical-resistant or vinyl gloves while inside containment areas, designated work areas, or while handling bagged contaminated materials;

wear a second pair of gloves (rubber, textile, or leather work gloves) to protect against personal injury;

- Wear two pairs of gloves while using knives and power tools? Does anyone in the real world do this? No.
- These over-the-top IICRC procedures were copied out of procedures for removing Asbestos.

# IICRC S520-2015. Requires OSHA Respiratory Plan Compliance

## 8.3.2.1.1 Respirators

Respirators range from NIOSH-approved N-95 filtering face-piece respirators, to full-face air-purifying respirators (APR) or powered air-purifying respirators (PAPR) equipped with HEPA (N100, R100, or P100) filter cartridges and air-supplied respirators, such as self-contained breathing apparatus (SCBA). HEPA filter cartridges should be used to protect against fungal spores and fragments, bacterial spores, dust, and particles. Organic vapor cartridges protect against microbial volatile organic compounds (MVOCs), and some chemicals used in other microbiological remediation projects. Cartridge selection should be based upon the chemicals that are present.

- When IICRC says “should” that means required to comply with the Standard.
- For IICRC, N95 respirators not sufficient. Not allowed by IICRC.
- S520 requires the use of HEPA filtered respirators for mold work because IICRC remediation procedures are based on mold being a biohazard.
- Therefore, requires compliance with onerous/expensive OSHA 29 CFR 1910.132 respiratory plan regulations or work is illegal.

# IICRC: Do Not Exhaust Contaminants Outdoors

## 12.1.1.3 Local Containment

Local or "mini" containments may be used when moderate levels of fungal growth are visible or suspected. A structural enclosure can be built to contain a work area and separate it from the unaffected section of the room or structure. In a local containment HEPA-filtered air filtration devices (AFDs), when used as negative air machines (NAMs), are installed to create negative pressure differentials in relation to surrounding areas. In local containments, a HEPA vacuum cleaner can be substituted if it is able to create the necessary pressure differential. However, this works only if the vacuum canister is adequately sized and located outside the containment area.

- For IICRC, mold is a hazardous material. Contaminants cannot be exhausted outdoors but **must be collected onto air scrubber filters instead, as is the case with asbestos that cannot be exhausted outdoors during asbestos remediation.**
- These over-the-top IICRC procedures were copied out of procedures for removing Asbestos.
- **EPA/OSHA on the other hand: Mold is not a hazard. Containment procedures exhaust contaminants outdoors. Exhaust air not filtered.**

## Exhaust Contaminants Outdoors or Not? Major Difference Between EPA & IICRC

- IICRC procedures that do not exhaust contaminants outdoors and by their own admission result in hazardous working conditions inside containments that require extensive worker protection.
- This triggers burdensome OSHA compliance.



**Exhausting outdoors. Not collecting contaminants onto air scrubber filters. Keeps the containment clean.**

## Exhaust Contaminants Outdoors or Not? Major Difference Between EPA & IICRC

- IICRC procedures because they do not exhaust contaminants released by demolition outdoors, will almost always result in cross contaminating the living space as workers are always going in and out of the hazardous contained work-space.
- This is the case whether there is an IICRC decontamination chamber or not. See next slide.





## 12.1.1.5 Decontamination Chamber

A decontamination chamber, sometimes referred to as a "decon unit" or "decon," is engineered to provide a transition space between the containment ("contaminated area") and surrounding clean areas, and are used for:

- entry to and exit from a work area; and
- decontaminating exterior surfaces of plastic bags or sheeting used to contain contaminated materials, remediation tools, and the exterior clothing of personnel when exiting the work area.

- Mold is all around us.
- Building a Decontamination Chamber to decontaminate the exteriors of garbage bags before discarding them after mold remediation?
- That's for Asbestos and NOT mold.

Thus, ANSI/IICRC S520 represents a philosophical shift away from using "size" of visible mold growth to determine the remediation response. Instead, it establishes mold contamination definitions, (Conditions 1, 2, and 3) and guidance, which, when properly applied, can assist remediators and others in determining remediation response or confirm remediation success.

- After IICRC S520 rejects the EPA/OSHA [and Florida] use of mold growth size for determining remediation response (size and type of containment)...

**They then go on to use size to determine the type of containment. See next page.**

## 12.1.1.2 Source Containment

Source containment may be used:

- to address relatively **small or limited areas** of mold growth, or it can be used in combination with other engineering controls to reduce the amount of spore release and dust generation;
- alone when mold growth is limited to small visible controllable areas where hidden mold growth is not anticipated; and
- within areas of more extensive mold growth in conjunction with other forms of containment.

When there are small or limited areas of mold growth, and hidden mold growth is suspected, a more extensive containment should be used.

**After IICRC S520 rejects the EPA/OSHA [and Florida] use of mold growth size for determining remediation response (size and type of containment)...**

**They then go on to use size (here small or limited areas) but do not define what these terms mean.**

## 12.1.1.3 Local Containment

Local or "mini" containments may be used when moderate levels of fungal growth are visible or suspected. A structural enclosure can be built to contain a work area and separate it from the unaffected section of the room or structure. In a local containment HEPA-filtered air filtration devices (AFDs), when used as negative air machines (NAMs), are installed to create negative pressure differentials in relation to surrounding areas. In local containments, a HEPA vacuum cleaner can be substituted if it is able to create the necessary pressure differential. However, this works only if the vacuum canister is adequately sized and located outside the containment area.

## 12.1.1.4 Full-Scale Containment

Full-scale containments normally are used when significant or extensive mold growth is present or suspected, and where source and local containments cannot effectively control or eliminate cross-contamination. Critical barriers are established to separate unaffected from affected areas.

**After IICRC S520 rejects the EPA/OSHA [and Florida] use of mold growth size for determining remediation response (size and type of containment)...**

**They then go on to use size (moderate, significant, extensive) but do not define what terms mean.**

# Remediation 6-mil Poly

**containment:** engineering controls used to minimize cross-contamination from affected to unaffected areas by airborne contaminants, foot traffic, or material handling. Containment systems normally consist of 6-mil polyethylene sheeting, often in combination with air pressure differentials, to prevent cross-contamination.

- Cut & Pasted from Asbestos guidelines. Do we need to use 6-mil poly because this was specified for semi-permanent asbestos containments?
- What is wrong with 0.31 painter's plastic film for temporary containment walls built with Zip poles? Not a thing.
- When you use 6 mil plastic film vs 0.31 mil plastic film for containments and for covering content your costs go way up. Not only due to the cost differential of the materials but you need 5-10x more garbage bags to discard non-compressible 6 mil vs painter's film. That is a lot of waste to take to the dump.



## IICRC Remediation. Clean New Materials 12.2.6

- not install new construction materials until post-remediation evaluation; or post-remediation verification as necessary, indicates that installation is appropriate. However, if new construction materials must be installed for structural integrity prior to completion of the remediation, those materials **should** also be cleaned along with the rest of the affected area.

Says: "Should" means IICRC required:

- Clean new construction materials before installing them!
- Come on. No one does this.



**IICRC**  
Institute of Inspection Cleaning  
and Restoration Certification

# IICRC Remediation. Focus on Dry Procedures

- remove mold growth on wood framing members by HEPA-vacuuming followed by damp wiping, wire brushing, sanding, or other appropriate method, while using HEPA-vacuuming or performing removal within the capture zone of an AFD, along with other appropriate controls;

IICRC: Dry, dust-producing, procedures are recommended.

- Sanding. Blasting. Brushing.
- Contrast with EPA/OSHA where they say to avoid dry, dust producing, techniques.



# IICRC S520–2015 Remediation

## 12.1.5 HEPA Vacuums

Remediation workers **should** use HEPA vacuums when performing remediation. HEPA vacuum units are designed for, and equipped with filtration media that removes 99.97% of particles at 0.3 microns. Only well-constructed professional HEPA vacuums should be used in mold remediation projects. Regular shop-type or standard consumer vacuums should not be used for remediation because they are not designed to prevent mold spores and fragments from passing through the equipment and re-entering the air.

Per IICRC required:

- Are we really worried about using a Shop Vac rather than a HEPA Vac inside a containment from which contaminants are being exhausted outdoors?
- Straight out of OSHA Asbestos Guidelines.
- Can a HEPA Vac clean up chunks of drywall and drywall screws? No. Best to use Shop Vac which can be equipped with a drywall dust bag before the HEPA filter.





# Shop-Vac vs. HEPA VAC



**Shop-Vac: High efficiency collection bags for fine particle pickup such as drywall and cement dust.**



**Shop-Vac: This replacement cartridge filter features an exclusive Gore-Tex nonstick surface that captures 99.97 percent of particles at 0.3 microns.**

# IICRC S520-2015 Remediation

Remediators **should** also:

- HEPA-vacuum and damp wipe entry and exit chamber ceilings, walls, flaps and floor of remediation areas;
- select cleaning methods and procedures based on the specifics of the project;
- repeat the cleaning process and procedures as necessary to achieve Condition 1;

Per IICRC, required:

- HEPA Vac the inside of containment sheeting before discarding? Cut & Pasted from Asbestos Standard for the Construction Industry.
- Test for fungal IICRC Condition 1 (Normal Fungal Ecology) before discarding sheeting. Come on. No one does this. But everyone states they follow IICRC!
- Straight out of asbestos guidelines because with asbestos you cannot take asbestos contaminated materials to the land fill.

# IICRC S520-2015 Remediation

## 12.2.10 Containment Exit Protocol

After bagging or wrapping, demolition debris is moved to an exit chamber.

Remediators should:

- HEPA-vacuum or damp wipe the outside of bags or wrapped materials, and thereafter place them into a second bag or wrapping, sealing before they are moved from the exit chamber;

Per IICRC required:

- HEPA Vac the outside of trash bags before putting the bags inside a second bag?
- Cut & Pasted from Asbestos Standard for the Construction Industry.



**Mold is NOT Asbestos which causes cancer.**

# IICRC S520-2015 Remediation

## 12.2.13 Breakdown of Containment

Remediators should:

- HEPA vacuum and damp wipe containment materials before containment is dismantled;

Per IICRC, requires:

- HEPA Vac & Damp Wipe containment before taking it down and discarding.
- Cut & Pasted from Asbestos Standard for the Construction Industry.



## 8.1 Applicable Regulations

Applicable sections of the Federal safety and health regulations that can impact the employees of a remediation business include but are not limited to the following OSHA Standards found in Title 29 of the Code of Federal Regulations (CFR) parts 1910 and 1926:

- 29 CFR 1910 – General Industry Standards
- 29 CFR 1926 – Construction Industry Standards

The OSHA Standards for the Construction Industry (29 CFR 1926) require that no employee "shall work in surroundings or under working conditions which are unsanitary, hazardous, or dangerous to his or her health or safety" (29 CFR 1926.10). Each state is required to use Federal OSHA as a minimum statutory requirement. Individual state and local governments may have additional safety and health requirements that are more restrictive than the Federal Occupational Safety and Health Act. Employers shall comply with these safety and health regulatory requirements. Safety and health plans shall be established as required by applicable laws, rules and regulations promulgated by federal, state, provincial, and local governmental authorities.

IICRC "Shall" means required by law:

- Because IICRC treats mold as a hazardous substance, work must comply with OSHA standards for dealing with biohazards. 29 CFR 1910.134

# IICRC S520-2015 Triggers OSHA Compliance

## 8.1.2 OSHA General and Specific Duty Clause

The OSHA "General Duty Clause" states that "Each employer shall:

- furnish to each of his employees employment and a place of employment which are free from recognized hazards that are causing or are likely to cause death or serious physical harm to his employees.
- comply with occupational safety and health standards promulgated under this Act." (See 29 USC 654, §5)

In the absence of a specific OSHA standard for mold remediation, it is important to recognize general principles of exposure prevention as they are covered in the "General and Specific Duty Clause," as well as to understand the current information available about health effects from occupational exposure in mold contaminated structures, systems, and contents.

IICRC "Shall" means required by law:

- Because IICRC treats mold as a hazardous substance, work must comply with OSHA standards for dealing with biohazards.
- Talks about causing death or serious physical harm. Makes no sense.
- Mold is all around us. You are always breathing mold spores... and often high levels of mold in the outside and apparently you do not die.

# IICRC S520–2015 Triggers OSHA Compliance

## 8.3.2.1 Respirator Use and Written Respiratory Protection Plan

Employees shall wear respirators whenever engineering and work practice controls are not adequate to prevent atmospheric contamination at the job site. Untrained visitors to work sites should be warned of hazards and encouraged to not enter the worksite. If visitors insist or must enter a worksite, they should be encouraged to wear respiratory protection and other appropriate PPE if they are able.

Respiratory protection regulations are found at 29 CFR 1910.134. Respiratory protection program outlines written program requirements, and shall include, but not be limited to:

- selection and use of NIOSH-approved respirators;
- medical evaluation;
- respirator fit testing;
- user instruction and training in the use and limitations of the respirator prior to wearing it;
- designated program administrator; and
- cleaning and maintenance program.

IICRC “Shall” means required by law:

- Because IICRC treats mold as a hazardous substance work must comply with OSHA standards for dealing with biohazards. 29 CFR 1910.134

# IICRC Mold Remediation = Hazardous Conditions

## IICRC containment procedures because they result in hazardous conditions inside of containments:

- This triggers burdensome OSHA 29 CFR 1910.132 respiratory program compliance.
- \$10,000 fine for non-compliance.
- The IICRC's required complex containments with decontamination chambers are costly to implement and require highly skilled workers to build such sophisticated containments.
- They might work in hospitals or for asbestos with a full time IEP/Hygienist supervising, but complex containments **never work** for mold remediation. The more complex, the worse the outcome. KISS!



Hazardous work conditions require Worker's Comp coverage for working under hazardous conditions. Since there is no Worker's Comp for mold, one must purchase Worker's Comp for Asbestos. Very expensive. No one has it. No one complies.



# IICRC S520-2015: Treats Mold As If Asbestos Makes No Sense

- Because S520 treats mold as if asbestos, contaminants aerosolized during demolition are not exhausted outdoors and results in “Hazardous” levels of contaminated air inside IICRC containments almost **always results in cross contamination.**
- Perhaps that is why S520 does **not require** Post Remediation Verification. See below.
- And perhaps that is why S520 **does not recognize any form of air sampling to test for cross contamination from failed remediation.**

## 12.2.12 Post-Remediation Verification

Following post-remediation evaluation by the remediator, **it may be requested or required** to verify the return of a structure, systems or contents to Condition 1. In such situations, post-remediation verification should be performed by an independent IEP. It is recommended that:

- the criteria and process used in the post-remediation verification be documented;
- the remediator and IEP clarify the minimum performance requirements of post-remediation verification prior to commencement of work; and
- if the IEP conducting any activity such as assessment or post-remediation verification is not independent from the remediator, they should disclose in writing to the client that they are deviating from the Standard.

## Section Summary

- IICRC treats mold remediation as if mold was a hazardous, cancer-causing agent. (EPA/OSHA says mold is all around us. Not a hazard.)
- IICRC recommends asbestos procedures for mold remediation.
- No one ever follows IICRC S520 required mold remediation procedures, yet remediation contractors always say that their remediation procedures comply with IICRC.
- When you get deposed (often happens on insurance claims) you will certainly be asked:
  - Why do you state you follow IICRC S520-2015 procedures but do not.
  - And if you follow S520 ... where is your OSHA compliance?
  - And if you follow S520 ... where is your proof of Worker's Comp for hazardous conditions?

**You will be asked: You claim to follow complex IICRC procedures to justify over charging for the work but based on the pictures and documentation provided you do not follow IICRC. Please explain why this is not fraud.**

**IICRC S520 is NOT an Industry Standard for Mold Remediation.**

**It is a proposed Industry Standard.**

**To be an Industry Standard people in the Industry need to use it/ follow it and not simply say they do.**

**But no one actually follows S520 remediation procedures because they were developed for asbestos and make no sense for mold.**



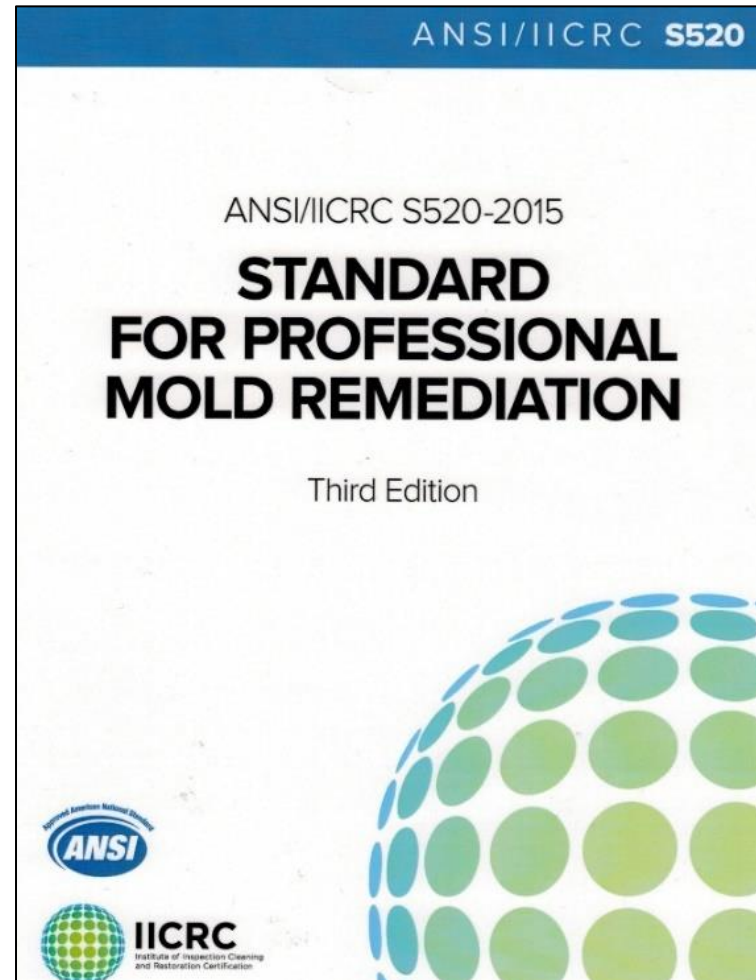
**IICRC S520 is NOT an Industry Standard for Mold Remediation. It is a proposed Industry Standard.**

**To be an Industry Standard, trainers need to teach it but do not.**

**But no one actually teaches S520 remediation procedures because they were developed for asbestos and make no sense for mold.**



# ANSI/IICRC S520-2015 MOLD CONTAMINATION CONDITIONS 1,2,3



## IICRC S520-2015 Mold Assessment Defined

- And you thought that IICRC S520 mold remediation procedures made no sense.
- We now look at S520 mold assessment procedures. And they will blow your mind.
- IICRC defines assessing for mold contamination problems only as testing for mold spores in settled dust.
- Not by Visual approach; not by using moisture meters or FLIRs, and **not by taking Air Samples.**
- I kid you not!



# Jim Holland Legacy

## ***A PRACTICAL AND PHILOSOPHICAL SHIFT AWAY FROM A VISUAL APPROACH TO DETERMINE THE APPROPRIATE RESPONSE TO MOLD REMEDIATION***

James Holland<sup>1</sup> REA, John Banta CAIH<sup>1</sup>, and Eugene C. Cole<sup>2</sup> DrPH

<sup>1</sup> RestCon Environmental, Sacramento, California

<sup>2</sup> Department of Health Science, Brigham Young University, Provo, Utah

- In 2007, Holland (then editor of S520) wrote “SHIFT AWAY FROM A VISUAL APPROACH TO DETERMINE APPROPRIATE RESPONSE TO MOLD REMEDIATION”.
- Instead of a visual approach (find the moisture/find the mold) Holland/S520 proposes Fungal Contamination Conditions 1,2,3 based on testing house dust for settled spores.
- [Holland was an Asbestos guy which is why both S520 Remediation and Assessment were essentially Asbestos standards made to be Mold standards by changing the word “Asbestos” to “Mold.”]



**Jim Holland**

# Jim Holland Legacy Testing House Dust

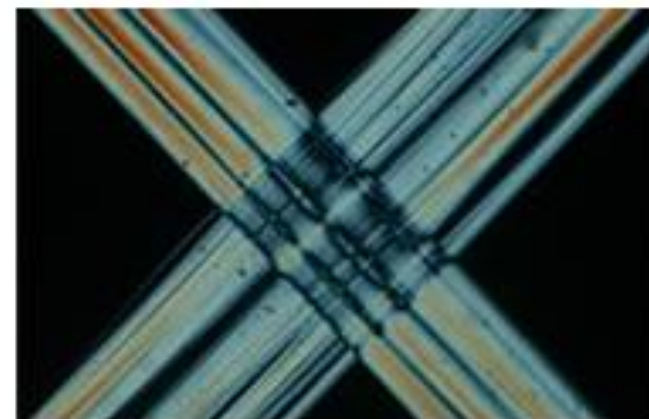
- How can testing for spores in house dust (**settled spores**) that could have been there for 10 years give you any indication as to extent, location of mold in a wall or ceiling or AC/ducting for the purpose of developing a remediation plan?
- It can't.
- Yet this is the legacy of S520, original editor/author Jim Holland.





## Jim Holland Legacy Testing House Dust

- S520 procedures for analyzing mold spores in dust are essentially copied from Asbestos analysis procedures. But make no sense for mold.
- With Asbestos, samples are analyzed using Transmission Electron Microscopy (TEM) which is capable of “seeing” asbestos fibers under layers of dust.



- But with mold spores ... dust (or spore trap) samples are analyzed by Direct Microscopic Examination (DME).
- Dust covers the mold spores in a dust sample. You can't see through the dust using DME. Quantifying spores in settled dust which is the basis of IICRC S520 assessment ... is not possible. Makes no sense. Does not work.

# IICRC Definition: Assessment for Conditions

**assessment:** a process performed by an indoor environmental professional (IEP) that includes the evaluation of data obtained from a building history and inspection to formulate an initial hypothesis about the origin, description,

location and extent of **Condition 2 or 3.** If necessary, a sampling plan is developed, and samples are collected and sent to a qualified mycology or microbiology laboratory (e.g., EMLAP, A2LA, NELAP, or equivalent program) or individual (e.g., National Registry of Microbiologists, Public Works Canada Accredited Mycologist, or equivalent program) for analysis. The subsequent data is interpreted by the IEP. Then, the IEP or other qualified individual may develop a remediation plan.

Assessment is defined in terms of testing for IICRC Mold Contamination Conditions.



# Important S520 Definitions. Mold Contamination Conditions

**Condition 1** (normal fungal ecology): an indoor environment that may have settled spores, fungal fragments or traces of actual growth whose identity, location, and quantity are reflective of a normal fungal ecology for a similar indoor environment.

**Condition 2** (settled spores or fungal fragments): an indoor environment which is primarily contaminated with settled spores or fungal fragments that were dispersed directly or indirectly from a Condition 3 area and which may have traces of actual growth.

**Condition 3** (actual growth): an indoor environment contaminated with the presence of actual mold growth, associated spores, and fungal fragments. Actual growth includes growth that is active or dormant, visible or hidden.

- Conditions 1 & 2: Defined in terms of settled spores and not mold in the air and not by visual determination and not by moisture meters or FLIRS.
- For IICRC, they do not test for mold in the air (spore traps) for either initial assessment or post remediation verification.
- Assessment is defined as analyzing settled dust to determine if the dust is primarily contaminated with spores that came from actual growth or were background (Normal Fungal Ecology.)

## Condition 2. Settled Spores From Actual Growth.

- There is no accepted reliable lab method to distinguish Condition 2 “settled spores” that came from “actual growth” from spores that are background/ just blew in (Condition 1) when a door or window was open.
- These definitions make absolutely no sense, but they are the basis of both IICRC initial assessment as well as IICRC post remediation verification.



**Surface sampling for spores in dust in this home? What will that tell you?**

# Important S520 Definitions. Post Remediation Verification

**post-remediation verification:** an inspection and assessment performed by an independent third-party IEP after a remediation project, which can include visual inspection, odor detection, analytical testing, or environmental sampling methodologies to verify that the structure, system, or contents **have been returned to Condition 1.**

- IICRC PRV: Defined in terms of returning structure to Condition 1 (Normal Fungal Ecology of the Settled Dust).
- Not by air sampling. Not by visual assessment. Makes NO sense.
- It is mold spores in the air that result in exposure (health concerns).
- But IICRC PRV procedures **do not** measure airborne mold.
- It is mold spores in the air in the indoor environment outside the containment that determines if there has been cross contamination of the indoor air as a result of failed remediation.
- **IICRC PRV procedures then do not in any way consider cross contamination / occupant health to be a concern when performing mold remediation.**

# What is Normal Fungal Ecology?

- What is normal? What could affect the settled spores and result in a False Positive for Actual (recent) mold growth?
  - How clean the house is of dust on content & floors
  - Old and/or dirty carpets
  - Earlier water events.
  - Windows open earlier.
  - Quality of air filter.
  - Mold in the AC, AC closet, plenum or ducting.



**Return a property to Normal Fungal Ecology with AC closet looking like this?**

## IICRC S520–2015 p. 6 States: No Mold Assessment Procedures

The ANSI/IICRC S520 is not intended to establish procedures or criteria for assessing mold contamination in an indoor environment.

- After defining Mold Conditions 1,2,3, and using Mold Contamination Conditions of surface dust as the basis for Initial Assessment; Remediation Response; as well as Post Remediation Verification ...
- IICRC S520–2015 states that (S520 page 6) **ANSI/IICRC S520 does not establish procedures or criteria for assessing mold contamination in an indoor environment.**

Does this blow your mind?



# Regarding Assessing Conditions Being Limited to Testing for Settled Spores

- Scott Armour current Vice-Chair of the S520 Consensus Body. Below is his personal opinion:

**“Determination of an IICRC-defined Condition (whether 1, 2, or 3) should not be limited to testing for only settled spores.”**

Scott contradicts S520 [but not officially]. We agree. (GR.)

Institute of Inspection, Cleaning and Restoration Certification Standard

## **IICRC S520 MOLD REMEDIATION CONSENSUS BODY MEMBERS**

**S520 Consensus Body Chair**

**Jim Pearson**

Mold Inspection Services, Inc.

**S520 Consensus Body Vice-Chair**

**Scott Armour**

Armour Applied Science, LLC.



## IICRC Mold Assessment Section Summary

- IICRC Conditions 1,2,3 are based on measuring settled spores and require distinguishing “normal settled spores” from settled spores that come from “actual mold growth.”
- Makes no sense. Cannot be done.
- And absolutely no one relies on testing surface dust for mold to determine remediation response. Swabs and lift tapes analyzed by DME (Direct Microscopic Examination) cannot be used to determine remediation response. Cannot tell you where, how or what to remediate.
- Yet Assessors ALWAYS say that they perform Assessment to determine IICRC Conditions and that the goal of Remediation is to restore to Condition 1. Normal fungal ecology.
- And when they get deposed (often happens on insurance claims) they are asked to explain but cannot. They look like idiots.

**IICRC S520 is NOT an Industry Standard for Mold Assessment.**

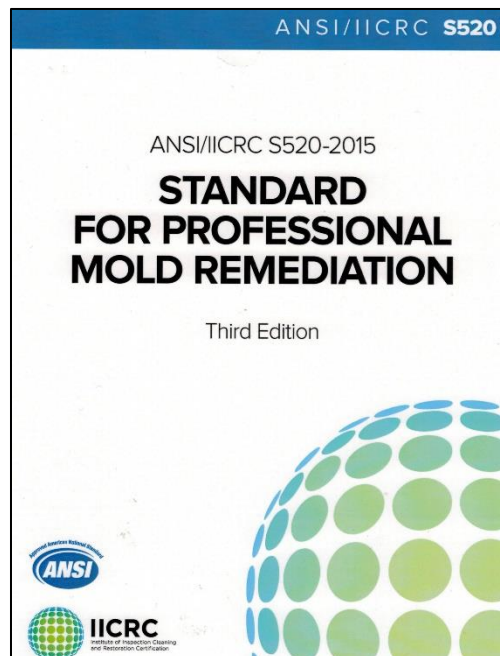
**It is a proposed Industry Standard.**

**To be an Industry Standard people in the Industry need to use it/ follow it and not simply say they do.**

**But no one actually follows S520 assessment procedures because they were developed for asbestos and make no sense for mold.**

**In fact, even IICRC says they make no sense. S520-2015 p 6.**

The ANSI/IICRC S520 is not intended to establish procedures or criteria for assessing mold contamination in an indoor environment.



**IICRC S520 is NOT an Industry Standard for Mold Remediation. It is a proposed Industry Standard.**

**To be an Industry Standard, trainers need to teach it but do not.**

**But no one actually teaches S520 Assessment procedures because they were developed for asbestos and make no sense for mold.**

**And because IICRC says that S520 “does not establish procedures or criteria for assessing mold contamination”.**

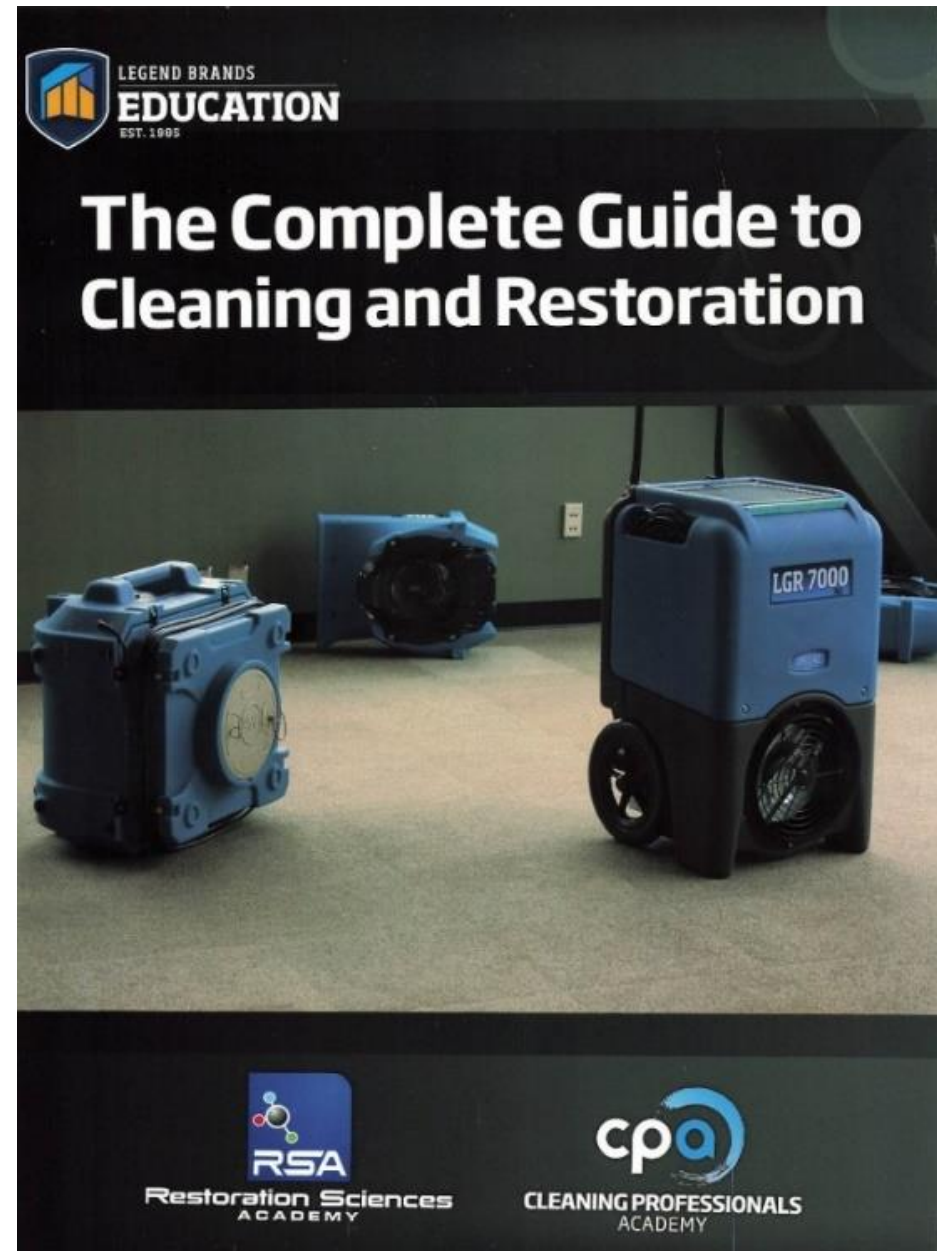
# Smoke & Mirrors

## ANSI-Approved S520 Is NOT Actually Taught



# Legends/RSA IICRC AMRT Training

- Legend/RSA is the #1 source for IICRC-Approved Mold Remediator Training (AMRT).
- IICRC-Approved AMRT training providers teach using the Legend/RSA training material.
- NOT by or with the actual ANSI-Approved IICRC S520 Standard.
- There are highly significant differences between the Legend/RSA training guide and IICRC S520 when it comes to both Remediation as well as Inspections.

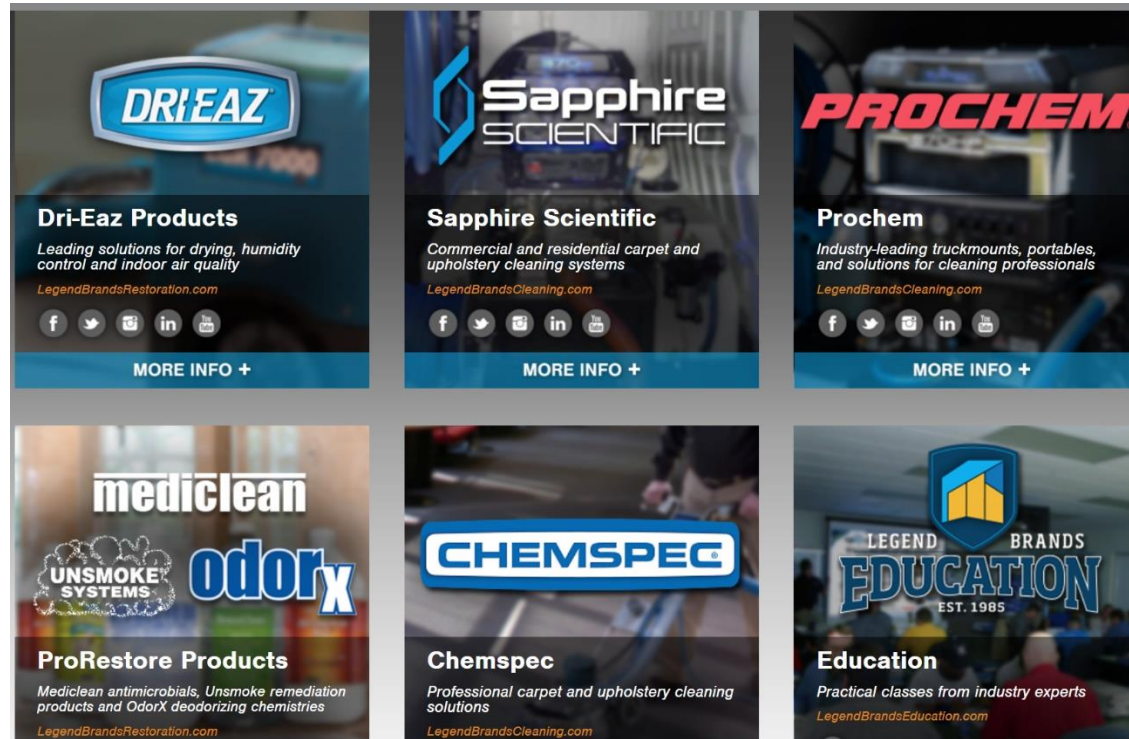


# ANSI-Approved S520 Is NOT Actually Taught

- Again: IICRC-Approved training providers teach the Mold Remediation (AMRT) course using the Legend/RSA training material. NOT by or with the actual S520 standard.
- **IICRC approves only the training providers and not their training materials.**
- IICRC has no jurisdiction as to what is in the training courses except that they must cover what is on the 100 questions IICRC AMRT exam.



# Legend Brands Education



- Legend is the world's largest water damage restoration equipment and chemical / biocide supplier.

**Rather than fighting with IICRC, trying to get IICRC to fix S520 as it makes no sense, Legend has developed their own Mold Remediation training manual.**

**No one teaches to IICRC S520. They teach to proprietary training material created by training providers.**



## Sampling Methods

Most remediation jobs have two sets of samples taken, one in the beginning to determine what is contaminated and level of contamination such as Condition 1, 2, or 3. The second set is taken at the end of the remediation project and is usually referred to as clearance testing. Depending upon the size of the job, a third set of samples may be taken, in the middle of the job, to be sure proper progress is being made. Various sampling methods can be used to determine if a building is contaminated. The most common types of samples are:

- Air sampling
- Tape lifts
- Swab wipes

Each of these sampling methods is used to answer different questions.



- Here Legend Brands Education explains Sampling Methods to determine IICRC Conditions 1,2,3.
- They do not define sampling as testing for spores in settled dust as does S520. But as generally accepted in the industry. As they should.

# IICRC AMRT Training Courses: S520 Is NOT Actually Taught

**Air sampling** is the most common method, used on virtually every mold remediation project. The air inside the structure is compared to the outdoor air. If the indoors is contaminated, then the sample will indicate to the CIH “what” the contaminants are, which can then lead to both answers and more questions. The process of air sampling has

- Page 44. Legends training for IICRC Mold Remediator ... “Air sampling is the most common method, used on virtually every mold remediation.”
- But air sampling is not even an IICRC S520 approved assessment procedure.
- **Makes sense to not base Mold Remediation training on S520.**



# Legend Training: PRV Necessary

The use of CIHs offers a mold remediator many advantages:

- Sampling by a CIH before fungal remediation work starts can help limit contractor liability. The scope of work and the CIH's protocol will help to ensure that the remediation plan of action is all encompassing and complete.
- The results of the sampling performed by the CIH can then be interpreted by an expert who has special training and extensive field experience. These results will be used as part of the protocol both before work has started, and at the end of the job, to be sure the contaminated area is, in fact, clean. This post-remediation verification is necessary to assure the remediation work was effective.

## 12.2.12 Post-Remediation Verification

Following post-remediation evaluation by the remediator, it may be requested or required to verify the return of a structure, systems or contents to Condition 1. In such situations, post-remediation verification should be performed by an independent IEP. It is recommended that:

- PRV is necessary according to Legend training.
- Contradicting S520 which clearly states PRV is not necessary/ not required by the Standard.
- Again, this makes sense.

# Defining Assessment. More Than Just Testing Dust

Sampling is a procedure that takes a representative sample of an environment to determine if the environment is contaminated, and with what substances. Other CIH tasks include gathering information about history of the building and its occupants, and conducting a visual and moisture inspection of the interior and exterior. All of this information can help both the CIH and the remediator make decisions about the best way to proceed.

- Per Legends: Besides sampling, other aspects of an Assessment include conducting a visual and moisture assessment.
- Visual inspection and Moisture Measurements and Air sampling are not part of determining IICRC Conditions 1,2,3.
- IICRC Conditions are based solely on testing the settled dust for mold spores as a method for both determining the type and location of the containments around the work area as well as for determining remediation success.
- Legend training makes sense. S520 does not.

## Section Summary

**The Legend's AMRT training reflects what people do. S520 does not.**

**Which is why IICRC Mold Remediation certification training (AMRT) uses the Legend training guide and not S520.**

**You say but ... IICRC S520 is ANSI-Approved. It must be used. It is the Standard. But ANSI does not in any way approve or even review content.**

**Fact not opinion.**



**It should now be clear why people say they follow S520–2015. But no one actually does.**

- a. Because S520 makes no sense.**
- b. Because no one is taught from the actual ANSI approved IICRC S520 Standard.**
- c. Because when training providers teach from the Legend's AMRT manual, they do not explain that Legend's training is in no way IICRC S520 compliant.**

# CAUTION

**When writing mold assessment or mold remediation reports, we strongly recommend that you do not say “Per IICRC S520”.**

**If/when you are deposed, the attorney can then ask you questions to explain IICRC S520 and why you did not follow it and that you are a liar or claim fraud.**

**Harsh but true.**

**Recommendation: For Mold Remediation say Federal Guidelines NOT S520.**

# CAUTION

**Contrast the Legend's reasonable and widely followed AMRT training to their WRT training.**

**Their WRT training teaches to ignore pre-existing mold and dry anyway.**

**Why because Legends sells the drying equipment and biocides (Microban, Mediclean, BotaniClean) and if you remediate you don't need their equipment or chemicals.**

**This is horrible.**

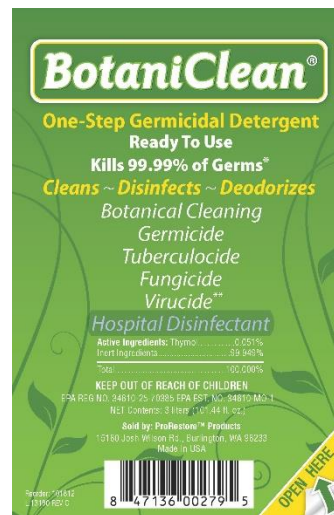


# Review

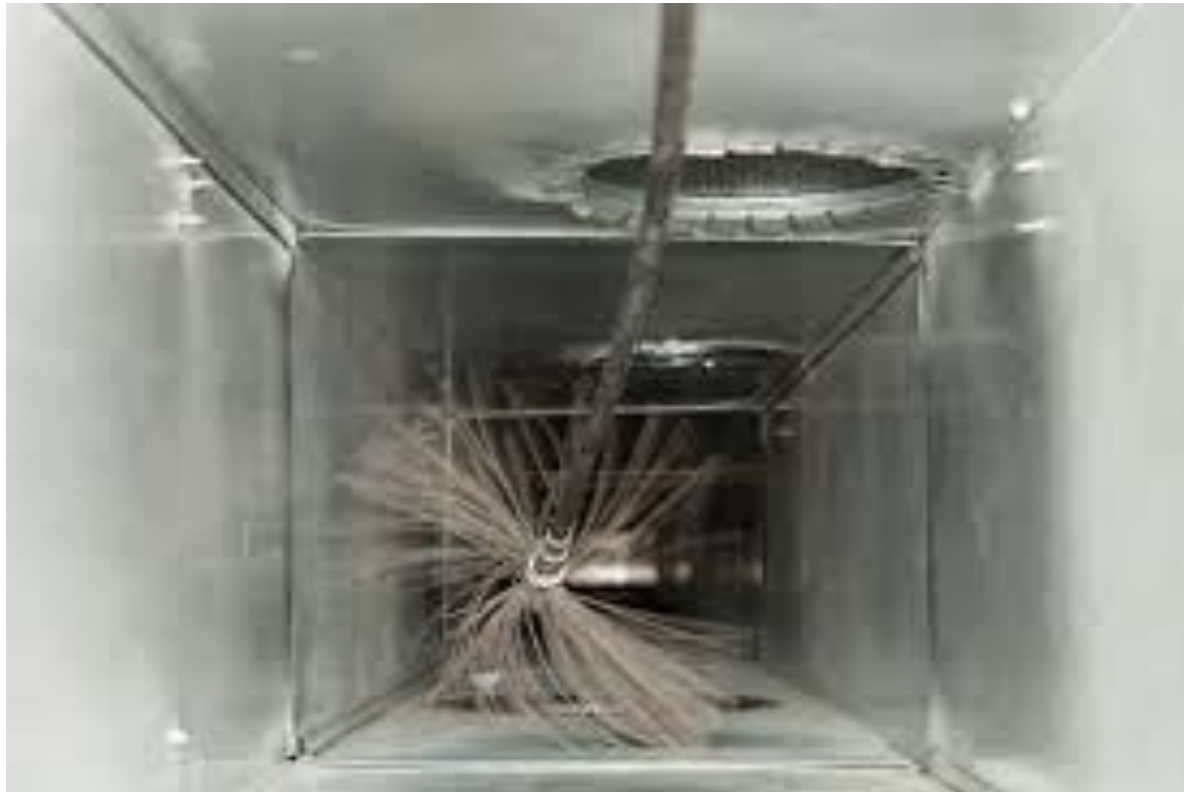
**BotaniClean** is a germicidal detergent with broad spectrum kill of gram positive and gram negative microorganisms formulated to clean, disinfect and deodorize in a simple one-step process when used according to disinfection directions. This botanical surface cleaner contains natural essential oil and non-corrosive ingredients.

**DIRECTIONS FOR USE:** It is a violation of Federal Law to use the product in a manner inconsistent with its labeling. Visible soil must be removed before applying cleaning solution.

**CLEANING AND DISINFECTING DIRECTIONS:** Apply to hard, nonporous surfaces by cloth, sponge, brush, coarse spray or by immersing equipment using normal cleaning methods. All hard surfaces must be wet thoroughly, and remain wet for at least 10 minutes and allowed to air dry. Thoroughly rinse all wetted and cleaned food contact surfaces with potable water. As the solution becomes dirty discard and replace with fresh solution. This is a complete product. **DO NOT MIX WITH OTHER CHEMICALS.**



# AIR DUCT CLEANING Standards of Practice



**Keep in mind: Mold growth even if extensive inside of walls or in attics is never a source of exposure.**

**Spores do not penetrate drywall (odors can.)**

**The #1 cause of mold related irritation and illness is a (for some people, even a slightly) contaminated AC system.**

**DON'T FORGET ABOUT THE AC SYSTEM WHEN IT COMES TO INDOOR IRRITATION.**

## HUD and EPA/OSHA Focus on Air Ducts as a Source of Irritation / Illness

- Usually, the cause of mold exposure is mold contaminated ducting/AC or defects in the AC closet allowing dirty attic air into the home.
  - Air sampling can sometimes detect such problems.
  - However, an intrusive visual inspection inside of the AC and ducting is generally needed to reliably determine or rule out AC/ducting contamination.
  - This requires partial disassembly. Requires a licensed AC contractor to assist the Mold Assessor. Does not happen often.
  - And Insurance does not cover.

**Usually contaminated AC/ducting is overlooked even though typically the ONLY source of indoor irritation.**

# HUD and EPA/OSHA Focus on Air Ducts as a Source of Irritation / Illness

- HUD and EPA/OSHA focus on Air Ducts as a Source of Irritation / Illness.
- But neither provides useful information as to how to either Assess or Remediate (Clean) mold from ducting.

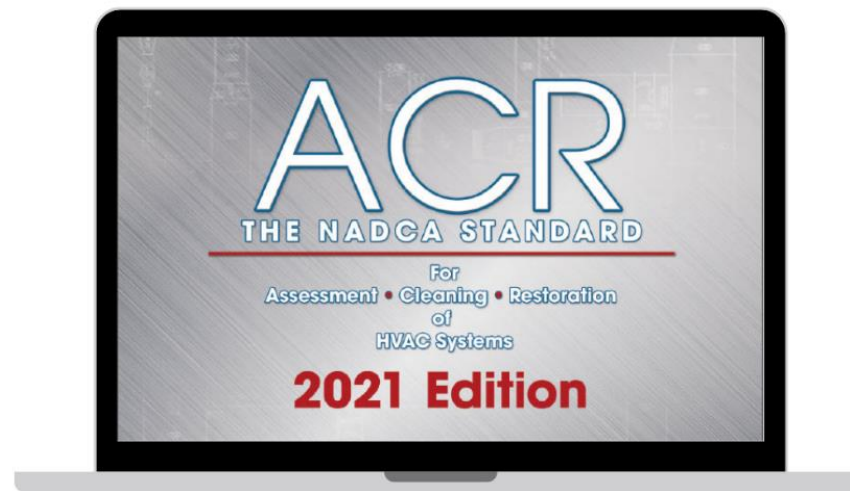


**Not very useful.**

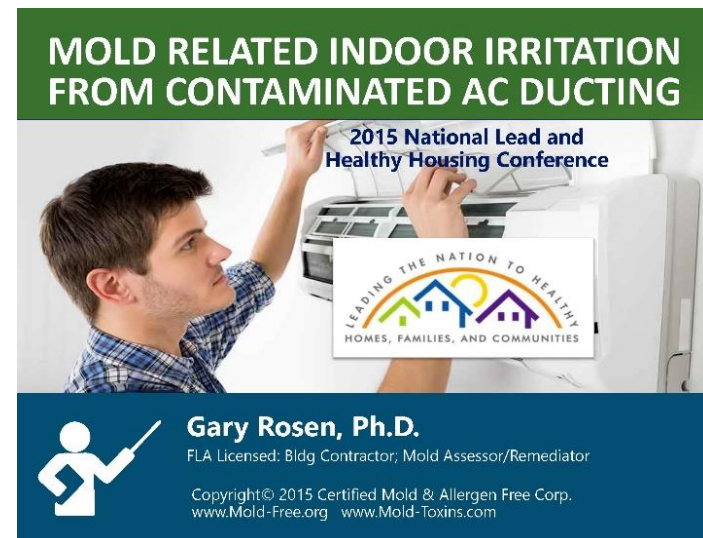
## 13.3 HVAC System Cleaning and NADCA ACR

If enough information is currently available to determine that Condition 2 or 3 exists throughout affected systems, remediation work plans, protocols, and specifications can be developed. In situations where there is visible mold growth and it cannot be determined that Condition 2 or 3 exists throughout the affected system, remediators should engage or recommend that customers or clients engage an IEP to assess the affected system.

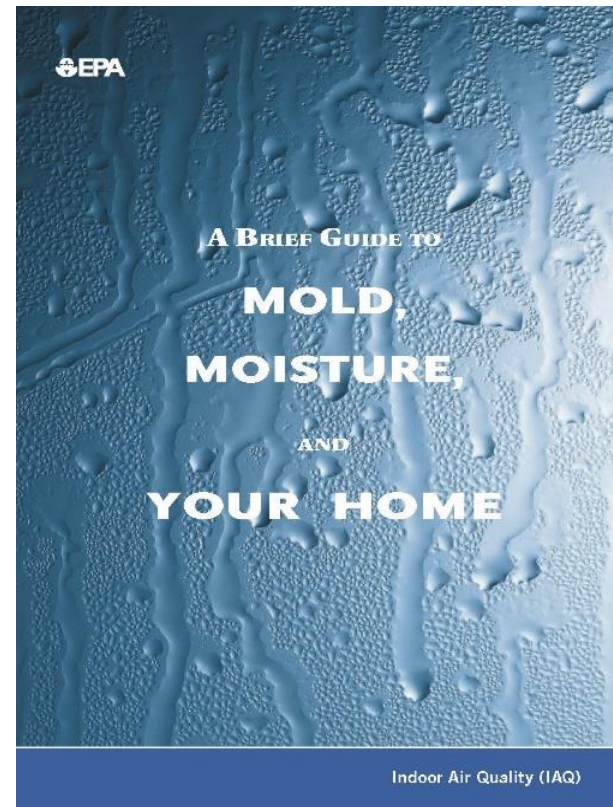
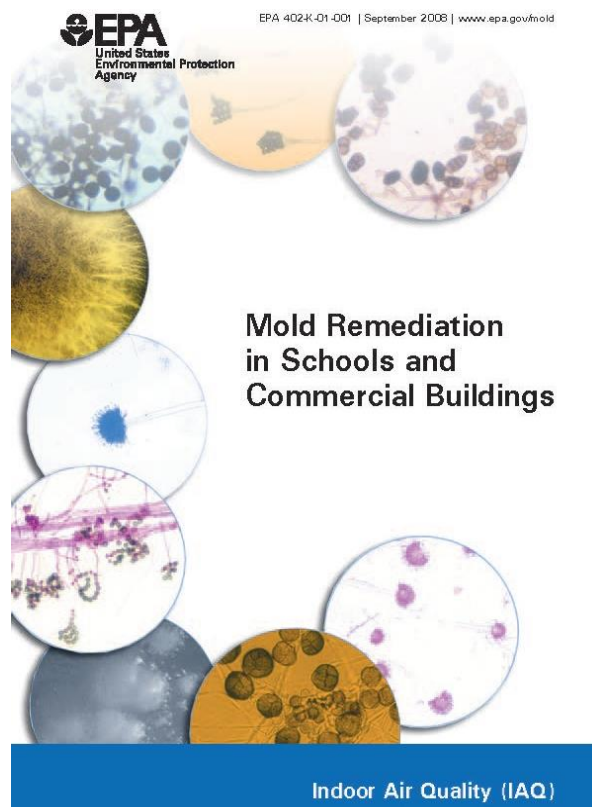
Once the HVAC system's condition has been assessed for cleanliness and mechanical corrections or enhancements have been completed, cleaning should be carried out in accordance with procedures described in *NADCA ACR, 2013* or current version, or equivalent industry standards.



- S520 talks about Mold Contamination Conditions when discussing HVAC cleaning.
- They refer to NADCA, which does not provide any useful information on air duct cleaning.
- In Florida, AC contractors are not licensed to remediate mold (anywhere) including ducting.
- In Florida, Air Duct Cleaners are not licensed and do not clean anything more than grills and the underlying cans.
- Assessors: Do not “Cut and Paste” IICRC S520 recommendations on Air Duct Cleaning. Do not agree to perform PRV after Duct Cleaning.
- We recommend the following.



# MOLD GROWS FAST





# Dr. Ralph Moon (Carrier Defense Expert)

## Fungal Growth Succession on Gypsum Board Wall Assemblies

Ralph E. Moon, Ph.D.<sup>1</sup>, Michael Bass<sup>1</sup>, Chin S. Yang, Ph.D.<sup>2</sup>

<sup>1</sup> HSA Engineers & Scientists, Tampa, Florida

<sup>2</sup> Prestige EnviroMicrobiology, Voorhees, New Jersey

\*Corresponding email: [rmoon@hsa-env.com](mailto:rmoon@hsa-env.com); [mbass@hsa-env.com](mailto:mbass@hsa-env.com);

[chins.yang@prestige-em.com](mailto:chins.yang@prestige-em.com)

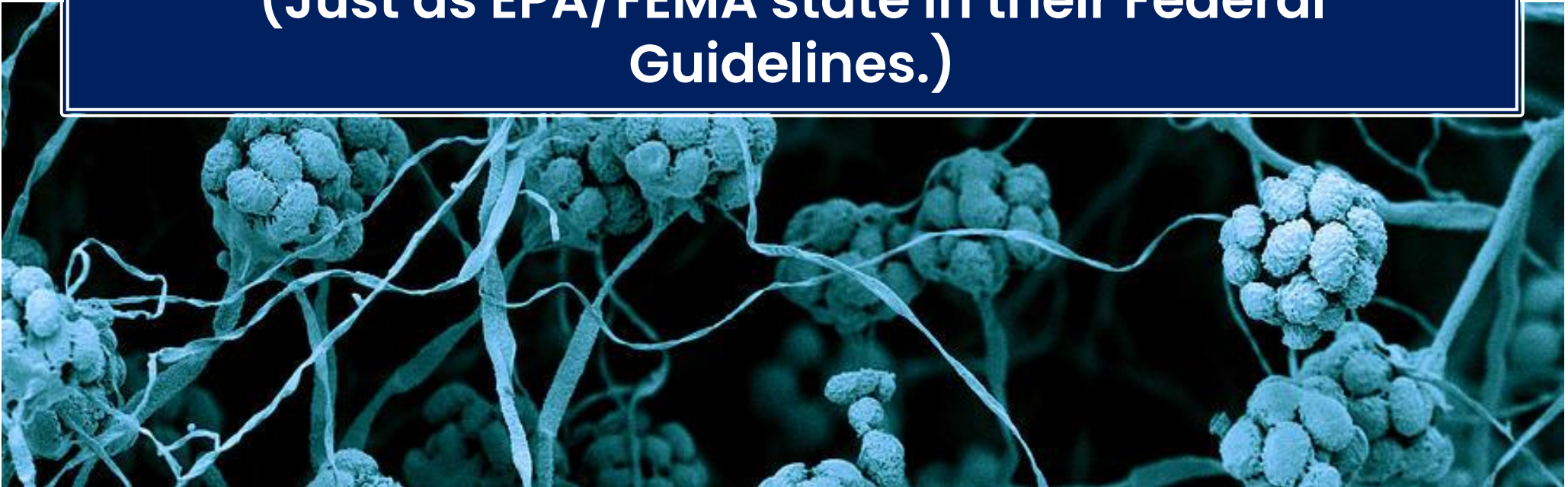
**Study on the rate of mold growth Dr. Moon (Carrier Defense Expert)**



## Moon: "Mold Grows Fast" Within a Few Days

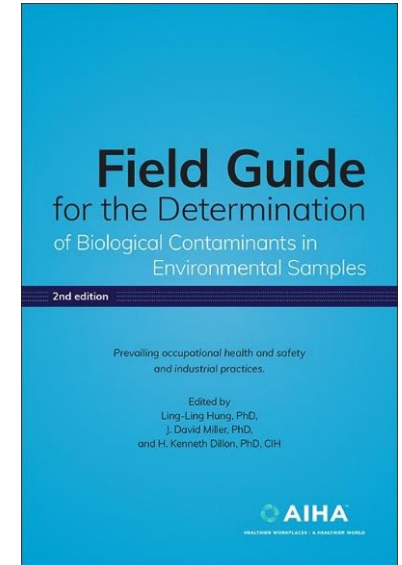
**Fungal Growth and Sequence:** Predictable fungal growth sequences were observed. Small, diffuse mats of mycelial growth were visible within two-three days of incubation. Visible growth first occurred on 50% of the wood sill plates where moisture was in direct contact with the assembly (Table 1). *Aspergillus* and *Trichoderma* structures were identified on Day 4 and 7

**Moon study: Mold grows fast within a few days.  
(Just as EPA/FEMA state in their Federal  
Guidelines.)**



# PER AIHA

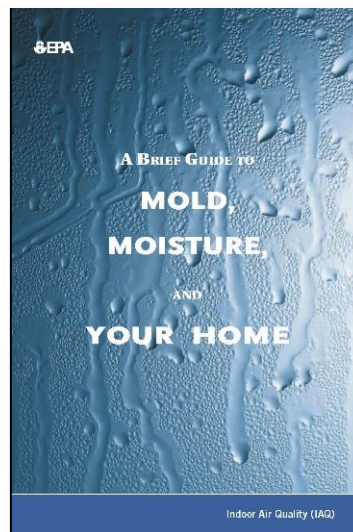
**“... growth and germination of a spore, which is microscopic, may form a visible colony on building substrates within 24 to 48 hours.”  
(Page 33)**



**Exactly what Moon finds.  
Exactly what EPA/FEMA say.**

## MOLD **BASICS**

- The key to mold control is moisture control.
- If mold is a problem in your home, you should clean up the mold promptly *and* fix the water problem.
- It is important to dry water-damaged areas and items within 24-48 hours to prevent mold growth.



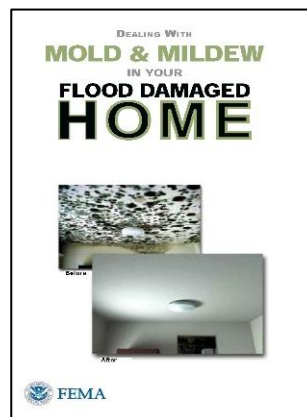
## MOLD IN YOUR HOME?

If your home has water damage due to -

- flooding,
- sewage back-up from flooding in the area,
- plumbing or roof leaks,
- damp basement or crawl space,
- overflows from sinks or bathtub, or
- high humidity: steam cooking, dryer vents, humidifiers,

**mildew and mold will develop within 24-48 hours of water exposure.**

Even worse, it will continue to grow until steps are taken to eliminate the source of moisture, and effectively deal with the mold problem.



# Always Mold Before or After Drying

## **IICRC S500-2021 1.2.2.1 Initial Inspection**

Restorers **should** inspect and document the **source and time** of the water intrusion, visible material deterioration, pre-existing damage and **visible microbial growth**. Professional moisture detection equipment should be used to inspect and document the extent of water migration and moisture intrusion **into** building materials and contents.

**Post-Drying Inspections:** Once drying goals have been achieved **in** some assemblies, **further inspection should** be done to ensure prolonged exposure has not created unacceptable damage. (IICRC S500-2021 16.2.4)

## **IICRC S500-2021 10.4.2 Regulated, Hazardous Materials and Mold**

For situations involving visible or suspected mold ... **should remediate mold prior to drying.**

**Mold grows fast. Always mold before drying.**

**Dry-Out Contractor never follow IICRC S500 to inspect inside walls before drying or after drying or to remediate mold before drying. Always mold after drying.**

# REVIEW



## Review Questions

Mold removal is accomplished by: Choose one or more of the following:

- 1. Surface cleaning; (Cleaning is removal.)**
- 2. Air cleaning; (Cleaning is removal.)**
- 3. Demolition of contaminated substrates such as water damaged and moldy drywall, carpet or cabinets;**
- 4. Oxidation/disintegration using strong oxidizers such as bleach, Tilex® or strong hydrogen peroxide none of which leave a toxic residue.**

Mold assessment is accomplished by: Choose one or more of the following:

- 1. Find the moisture ... find the mold.**
2. Fungal ecology.



# Review Questions

**IICRC Condition 1** (normal ecology) – may have \_\_\_\_\_, fungal fragments or traces of actual growth whose identity, location and quantity is reflective of a normal fungal ecology for an indoor environment. Fill in the blank:

**settled spores**



# Review Questions

**IICRC Condition 2** (\_\_\_\_\_ ) – an indoor environment which is primarily contaminated with settled spores that were dispersed directly or indirectly from a Condition 3 area, and which may have traces of actual growth. Fill in the blank:

**settled spores**



# Review Questions

IICRC exhausts contaminants outdoors?

T or F They capture contaminants onto filters. And then bag/discard.

When contaminants are NOT exhausted outdoors from inside containments during remediation, this results in hazardous work conditions per IICRC.

T or F



## Review Questions

Hazardous work conditions require the use of HEPA filtered respirators vs N-95 respirators? IICRC requires the use of HEPA filtered respirators ... not N-95s.

**T** or F

The use of HEPA filtered respirators vs N-95 respirators triggers mandatory compliance with onerous **OSHA 29 CFR 1910.132** regulations.

**T** or F (P.S. \$10000 fine.)

